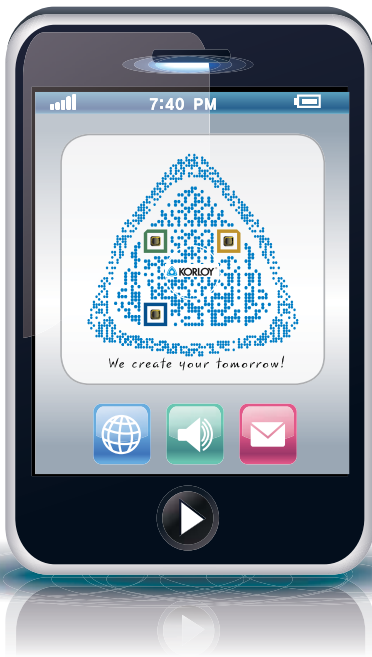


KORLOY

KORLOY CUTTING TOOLS
2015





How to use the Website on Mobile and Tablet PC

🎯 Access the internet on a smart phone.

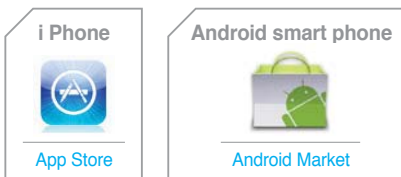
- 1 Get on the website ' <http://m.korloy.com> '. or
- 2 Type in the search word, 'korloy' in the search box. or
- 3 Link the website with scanning the QR code.

* Language selection (Korean/English) available

🎯 Access the internet on a table PC.

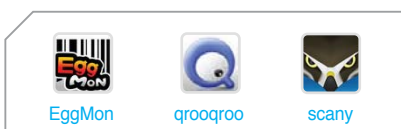
1 How to download QR code scan Application

- Search 'QR code scan' in the Application download market.



2 Free QR code scan Application

- There are many software for QR code scan in the Internet and you can use any of them for downloading the Application.



KORLOY CUTTING TOOLS

2015



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Tooling System

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● Parts

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● Old-fashioned product information

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SAFETY GUIDE OF CARBIDE PRODUCTS

**KORLOY Inc. is continuously trying to develop safer and higher quality products
Please be aware of the safety guidelines below prior to using KORLOY Inc. products**

- It is generally accepted that the proper handling of cemented carbide tools requires awareness of safety as noted above. For more information, please contact us.
- KORLOY does not accept any responsibility for any accident caused by inappropriate use, abuse of tools, or changes to the products.

1. PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached a WARNING label on the case of KORLOY products. There is no warning on the surface of the tools. Please read this safety guidelines before using carbide tools and provide safety education to all users.

2. Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of W, Ti, Al, Si, Ta, B etc and metal component like Co, Ni, Cr, Mo as binder. Cemented carbides tools have high hardness and specific gravity. Generally there's no smell but according to usage and treatment, appearance and color could be changed

3. Precaution for CEMENTED CARBIDE tools

- 1) Cemented carbides are extremely hard and brittle at the same time.
Impact shock or excessive clamping power could cause fracture or breaking of the tool.
- 2) Cemented carbides have large specific gravity, thus they require special attention as a heavy material when you handle big sizes or large quantities.
- 3) Cemented carbides have different thermal expansion coefficient with steel and ferrous materials. Shrink fit or swell fit products may cause trouble if they are used at undesirable conditions like extremely high or low temperatures.
- 4) There are several cemented carbide products having sharp cutting edges.
Be careful not to handle the tools with bare hands which may cause cuts or injury, especially when removing the tools from the case, do not touch the cutting edge and be careful not to drop it.
- 5) Storing carbide tools in a corrosive atmosphere may cause erosion which can reduce toughness.
- 6) Please refer to the catalogue safety guidance prior to handling the tools.
- 7) Do not abuse tools under inappropriate conditions.

4. Precaution for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

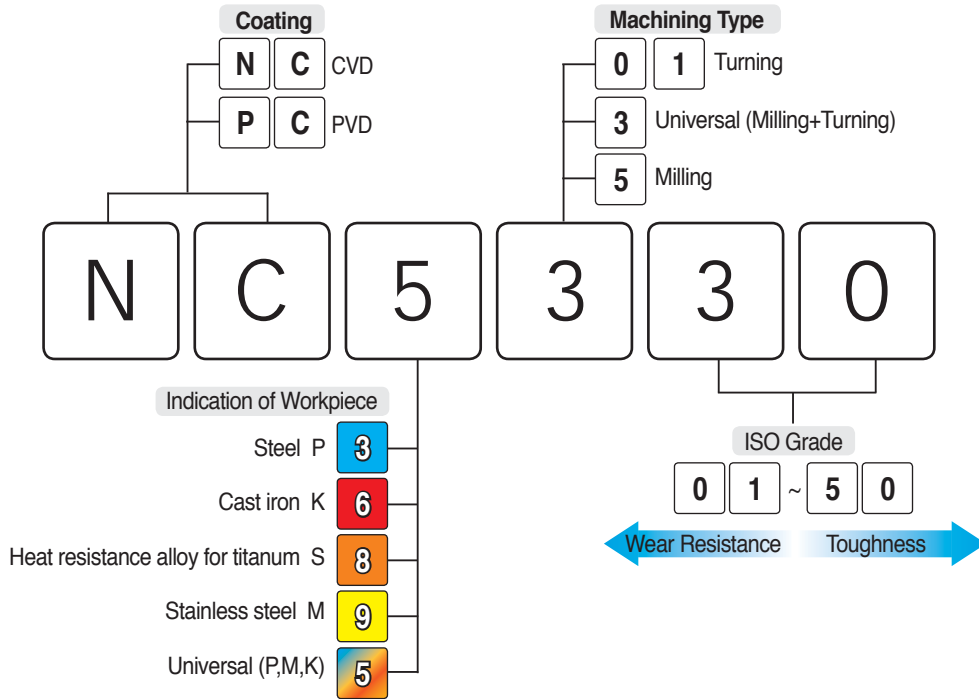
- 1) Surface condition can affect the toughness of the tool, so it is recommended to use a diamond grinding wheel.
- 2) Grinding of cemented carbide creates mist and dust. It contains harmful compositions like Co, thus it is recommended to use a mask, mist collection, and other protective facilities. If the dust gets in your skin or eye, rinse immediately with continuously running water.
- 3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problems. Handle the coolant according to the manufacturer's recommendations.
- 4) Check for cracks after re-grinding carbide tool and reuse.
- 5) Marking with laser or electric pen may cause cracks on the carbide tool. The crack can shorten tool life.
- 6) EDM of carbide may cause residual cracks on the carbide tool, so if necessary, remove the crack with a grinding process.
- 7) Brazing of carbide tools at extremely high or low temperatures compared with the melting point of brazing materials may cause loosening or breakage.
- 8) Overheating an oil base coolant may cause a fire or flames, thus be prepared for fire prevention.

SAFETY GUIDE OF CARBIDE PRODUCTS

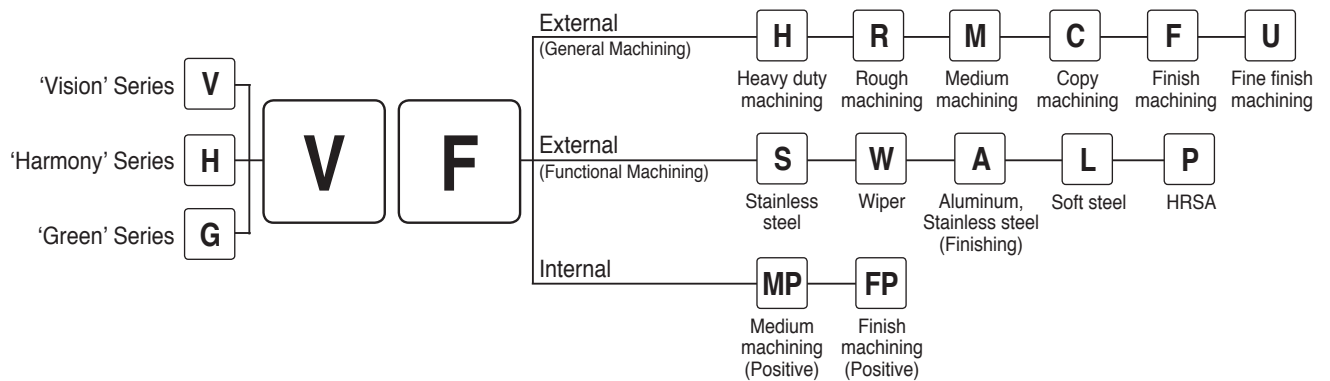
5. METALCUTTING SAFETY

| | DANGEROUS FACTOR | SAFETY COUNTERPLAN |
|-----------------|---|--|
| Cutting tools | · Sharp cutting edge of cutting tools may cut your bare-hand | · Use gloves when pulling out the insert from the case or mounting it on the machine |
| | · Inappropriate conditions or usage may cause fragmentation and expel parts of tools which may cause injury | · Use glasses or safety cover for your safety · Use the tools within the recommended range · Please refer to catalogue and safety guidelines first. |
| | · Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, causing fracture of the tool and may cause injury | · Use glasses or safety cover for your safety · Change the tool as required before excessive wear or fracture |
| | · Chips evacuated during cutting are hot and sharp and may cause burns and cuts | · Use glasses or safety cover for your safety · Stop machining and put safety glove on and use a hook tool to remove chips |
| | · Touching the workpiece immediately after cutting may cause burns | · Use gloves or safety cover for your safety |
| | · Be aware of sparks, fire, or explosion of hot chips generated during the cutting operation | · Do not use at the place where having explosive materials · Prepare for fire extinguishments |
| | · In case of high RPM machining, vibration and chattering may occur due to the improper balance of the machine | · Use glasses or safety cover for your safety · Check first if there's any chattering, vibration or strange noises prior to your main cutting operation |
| | · Touching a burr remaining on the workpiece with a bare-hand may cause a cut | · Do not touch the burr with bare-hand · Use gloves or safety cover for your safety |
| | · Loose clamping of the workpiece may cause the tool to fracture and result in damage to the cutter body and possible injury | · Clamp the workpiece tightly |
| Indexable tools | · Tools are operated to right-hand direction normally. Left-hand direction operation can cause fracture of tool and body damage | · Do not use left-hand direction without notice · Check the package of product to check the availability of left-hand operation |
| | · Loose clamping of inserts and parts may result in ejection of the tool during cutting and may cause serious injury | · Check the clamping of inserts and parts prior to machining, and use original parts only |
| | · Over loaded clamping of inserts by a lever (such as a pipe) may cause dangerous fracturing of parts and inserts | · Do not use lever inappropriately |
| Rotating tools | · In case of high speed machining, parts and inserts can be forced out by centrifugal force | · Use within recommended condition · Use glasses or safety cover for your safety |
| | · Since cutter has sharp cutting edges touching with a bare-hand may cause a cut | · Use gloves or safety cover for your safety |
| | · It is dangerous to use glove with rotating machine · Contact with body or clothes is dangerous with rotating parts | · Do not wear gloves when you work with rotating machine · Keep your body and clothes away from rotating machine |
| | · Vibration generated by balancing trouble may cause a fracture and ejection of the tool which may cause serious injury | · RPM should be controlled within recommended condition · Check the balance of rotating part periodically |
| | · In case of drilling, the uncut bottom core can fly out of the part with high speed and cause serious injury | · Use gloves or safety cover for your safety |
| Brazed tools | · The edges of small diameter drill are sharp and easy to break | · Use gloves or safety cover for your safety |
| | · Fragmentation and ejection of brazed carbide tip may cause injury | · Check the brazed tip before using. · Do not use at high temperature cutting condition |
| ETC | · There's a possibility of breaking the carbide tip after several brazing | · Do not use brazing a tip that has been brazed several times |
| | · Abusing may cause fragmentation of tool and is very dangerous. | · Stick to safety regulations and guidelines |

Grade Name for Coated Carbide



Chip Breaker



Terminology of tool formula

| TERM | CODE | UNIT |
|-----------------------|------|-------------------|
| Tool diameter | D | mm |
| Cutting speed | vc | m/min |
| Revolution per minute | n | min ⁻¹ |
| Feed per minute | vf | mm/min |
| Feed per revolution | fn | mm/rev |
| Feed per tooth | fz | mm/t |
| Tooth | z | |
| Axial depth of cut | ap | mm |
| Radial depth of cut | ae | mm |
| Peak feed | pf | mm |

| TERM | CODE | UNIT |
|-----------------------------|----------------|------|
| Horse power requirement | Pc | kW |
| Specific cutting resistance | kc | MPa |
| Torque | Mc | N.m |
| Thrust | Tc | N |
| Cycle time | tc | min |
| Tool life | T | min |
| Flank wear | V _B | mm |
| Crater wear | Kt | mm |
| Nose radius | r | mm |

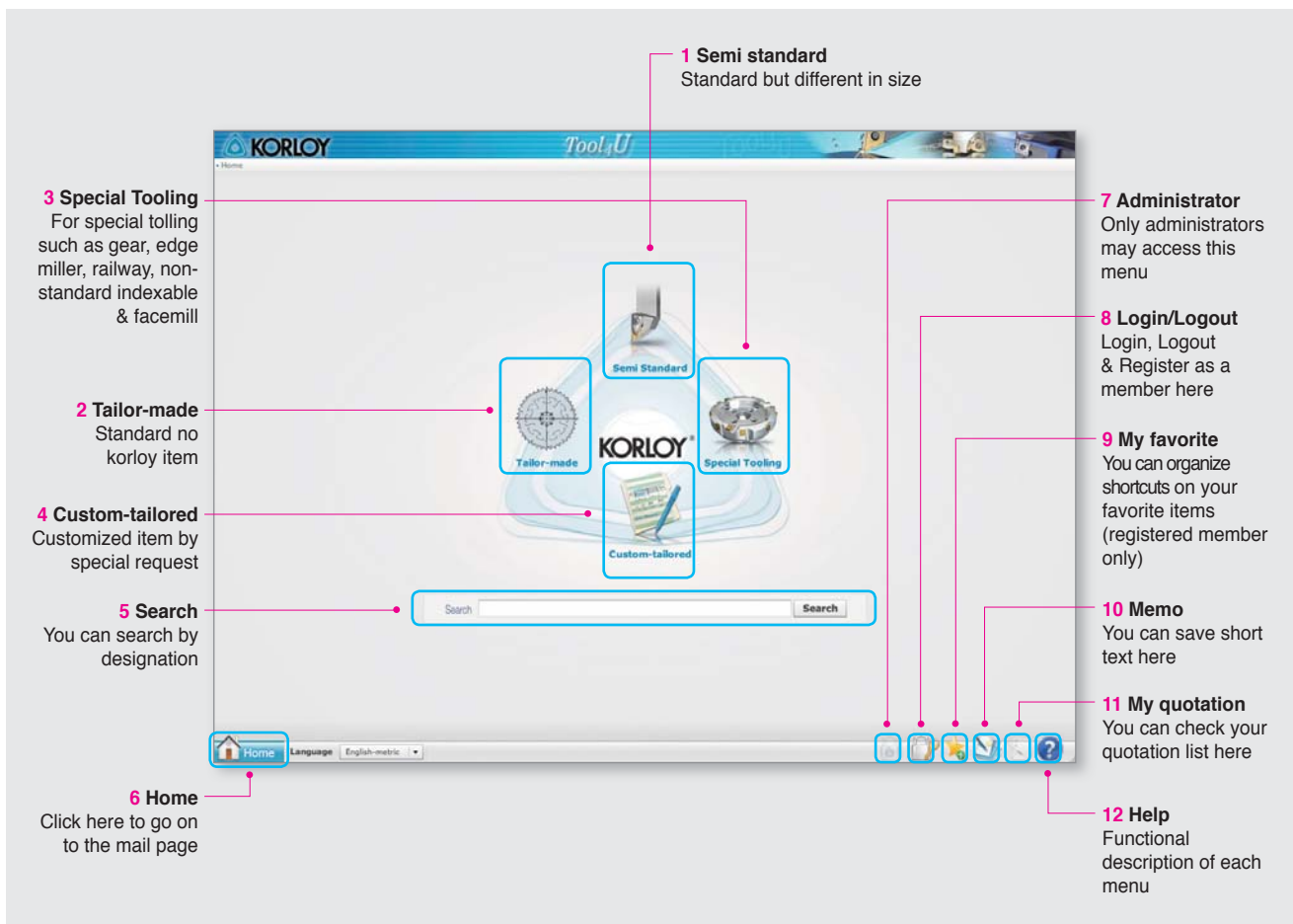
How to use Tool4U (Web quotation requirement)

1 Contact with Korloy Homepage

<http://www.korloy.com> (Korloy homepage)

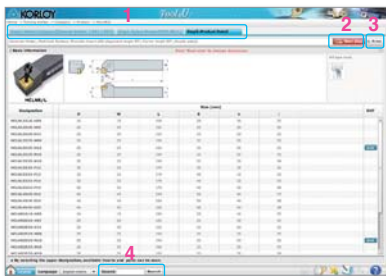
2 Click banner-icon on the web site

3 Main page



4 Screen shot

• Screen shot 1 : step3. Product detail



1. **Step** : Select category, product and check product detail
2. **Next step** : Open new window for changing dimension
3. **Print** : Print current page
4. **Search** : Search product by designation

• Screen shot 2 : Size input page



Enter essential information needed to quote and click "Quote" button to send e-mail

A

GRADES & CHIP BREAKERS

Korloys new grades are designed with optimal substrates for each application and are PVD coated for high temperature, high hardness and oxidation resistance, or CVD coated for high temperature and wear resistance. Additionally, the improved post-coating treatment provides superior surface finishes to ensure the highest levels of quality and productivity.

C O N T E N T S

CHIP

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Turning Grades

A03 Turning grade selections

A04 CVD coated grades

A08 PVD coated grades

A11 Uncoated grades

A12 Cermet grades

A13 Coated Cermet grades

Milling Grades

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GRADES & BREAKERS

Solid Endmills & Solid Drills Grades

- A23** Solid Endmills grade selections
- A24** Ultra fine cemented carbides
- A25** Solid Drills grade selections

Others (turning/milling/endmills)

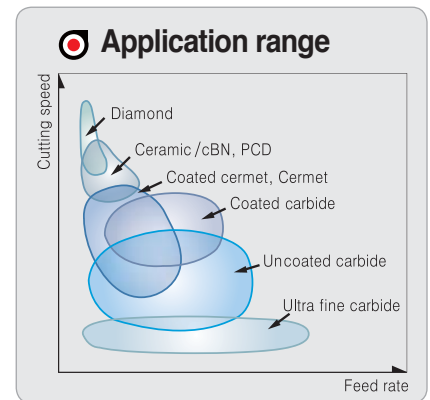
- A26** Diamond coated
DLC coated grades
- A27** cBN grades
- A30** PCD grades

Chip Breakers

- A31** Chip Breaker For Turning
- A33** Chip Breaker For Milling
- A34** Chip Breaker For Drilling

Grades system

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---|--|-------------------|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|----------------------|-----------------|--------|--------|--------|--------|--------|--|--|--|----------|--------|------|-----------|--------|--------|--------|--------|--------|--------|--|--|--|---|----------------|-------------------|--------|--------|--------|--------|-------|-------|--|--|--|--|
| Cutting Tool | Uncoated carbide | <table border="1"> <tr><td>P</td><td>Steel</td><td>ST05</td><td>ST10</td><td>ST15</td><td>ST20</td><td>ST30A</td><td>ST30N</td><td>ST30</td><td>ST40</td><td>ST45</td><td>ST46</td></tr> <tr><td>M</td><td>Stainless steel</td><td>U10</td><td>U20</td><td>ST30A</td><td>U40</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>K</td><td>Cast iron</td><td>H02</td><td>H01</td><td>H05</td><td>H10</td><td>G10</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>N</td><td>Non-ferrous metal</td><td>H01</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | P | Steel | ST05 | ST10 | ST15 | ST20 | ST30A | ST30N | ST30 | ST40 | ST45 | ST46 | M | Stainless steel | U10 | U20 | ST30A | U40 | | | | | | | K | Cast iron | H02 | H01 | H05 | H10 | G10 | | | | | | N | Non-ferrous metal | H01 | | | | | | | | | |
| | P | Steel | ST05 | ST10 | ST15 | ST20 | ST30A | ST30N | ST30 | ST40 | ST45 | ST46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | M | Stainless steel | U10 | U20 | ST30A | U40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | K | Cast iron | H02 | H01 | H05 | H10 | G10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | N | Non-ferrous metal | H01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Coated carbide for turning | <table border="1"> <tr><td>P</td><td>Steel</td><td>NC3010</td><td>NC3220</td><td>NC3120</td><td>NC3030</td><td>NC5330</td><td>NC500H</td><td></td><td></td><td></td><td></td></tr> <tr><td>M</td><td>Stainless steel</td><td>PC8110</td><td>NC9025</td><td>PC5300</td><td>PC9030</td><td>PC5400</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>K</td><td>Cast iron</td><td>NC6205</td><td>NC6210</td><td>NC315K</td><td>NC5330</td><td>PC5300</td><td>PC5400</td><td></td><td></td><td></td><td></td></tr> <tr><td>S</td><td>HRSA</td><td>PC8110</td><td>NC5330</td><td>PC5300</td><td>PC5400</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | P | Steel | NC3010 | NC3220 | NC3120 | NC3030 | NC5330 | NC500H | | | | | M | Stainless steel | PC8110 | NC9025 | PC5300 | PC9030 | PC5400 | | | | | | K | Cast iron | NC6205 | NC6210 | NC315K | NC5330 | PC5300 | PC5400 | | | | | S | HRSA | PC8110 | NC5330 | PC5300 | PC5400 | | | | | | |
| | P | Steel | NC3010 | NC3220 | NC3120 | NC3030 | NC5330 | NC500H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | M | Stainless steel | PC8110 | NC9025 | PC5300 | PC9030 | PC5400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | K | Cast iron | NC6205 | NC6210 | NC315K | NC5330 | PC5300 | PC5400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | S | HRSA | PC8110 | NC5330 | PC5300 | PC5400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Coated carbide for milling | <table border="1"> <tr><td>P</td><td>Steel</td><td>NC5330</td><td>NCM325</td><td>PC3600</td><td>PC5300</td><td>PC5400</td><td>NCM335</td><td>PC3545</td><td></td><td></td><td></td></tr> <tr><td>M</td><td>Stainless steel</td><td>NC5330</td><td>PC5300</td><td>PC9530</td><td>PC5400</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>K</td><td>Cast iron</td><td>PC8110</td><td>PC6510</td><td>PC5300</td><td>PC5400</td><td>NC5330</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>S</td><td>HRSA</td><td>PC5300</td><td>PC5400</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | P | Steel | NC5330 | NCM325 | PC3600 | PC5300 | PC5400 | NCM335 | PC3545 | | | | M | Stainless steel | NC5330 | PC5300 | PC9530 | PC5400 | | | | | | | K | Cast iron | PC8110 | PC6510 | PC5300 | PC5400 | NC5330 | | | | | | S | HRSA | PC5300 | PC5400 | | | | | | | | |
| | P | Steel | NC5330 | NCM325 | PC3600 | PC5300 | PC5400 | NCM335 | PC3545 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | M | Stainless steel | NC5330 | PC5300 | PC9530 | PC5400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | PC8110 | PC6510 | PC5300 | PC5400 | NC5330 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | HRSA | PC5300 | PC5400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Coated carbide for Drills, Endmills | <table border="1"> <tr><td>Coated</td><td>General</td><td>PC203F</td><td>PC205F</td><td>PC210F</td><td>PC210A</td><td>PC215F</td><td>PC220</td><td>PC210</td><td>PC210C</td><td>PC221F</td><td>PC230F</td></tr> <tr><td>Uncoated</td><td>General</td><td>H01</td><td>FS1</td><td>FA1</td><td>FA2</td><td>FG2</td><td>FCC</td><td></td><td></td><td></td><td></td></tr> </table> | Coated | General | PC203F | PC205F | PC210F | PC210A | PC215F | PC220 | PC210 | PC210C | PC221F | PC230F | Uncoated | General | H01 | FS1 | FA1 | FA2 | FG2 | FCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Coated | General | PC203F | PC205F | PC210F | PC210A | PC215F | PC220 | PC210 | PC210C | PC221F | PC230F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Uncoated | General | H01 | FS1 | FA1 | FA2 | FG2 | FCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turning Cermet | <table border="1"> <tr><td>P</td><td>Steel</td><td>CN1000</td><td>CN2000</td><td>CN20</td><td>CN30</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>K</td><td>Cast iron</td><td>CN1000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | P | Steel | CN1000 | CN2000 | CN20 | CN30 | | | | | | | K | Cast iron | CN1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P | Steel | CN1000 | CN2000 | CN20 | CN30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | CN1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Coated cermet | <table border="1"> <tr><td>P</td><td>Steel</td><td>CC105</td><td>CC115</td><td>CC125</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | P | Steel | CC105 | CC115 | CC125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P | Steel | CC105 | CC115 | CC125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Milling Cermet | <table border="1"> <tr><td>P</td><td>Steel</td><td>CN2000</td><td>CN20</td><td>CN30</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | P | Steel | CN2000 | CN20 | CN30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P | Steel | CN2000 | CN20 | CN30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| cBN | <table border="1"> <tr><td>P</td><td>Steel</td><td>KB320</td><td>KB330</td><td>KB350</td><td>KB360</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>K</td><td>Cast iron</td><td>KB410</td><td>KB350</td><td>KB370</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>S</td><td>HRSA</td><td>KB370</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>H</td><td>Hardened steel</td><td>KB410</td><td>KB420</td><td>KB425</td><td>DNC250</td><td>KB320</td><td>KB330</td><td>KB370</td><td></td><td></td><td></td></tr> </table> | P | Steel | KB320 | KB330 | KB350 | KB360 | | | | | | | K | Cast iron | KB410 | KB350 | KB370 | | | | | | | | S | HRSA | KB370 | | | | | | | | | | H | Hardened steel | KB410 | KB420 | KB425 | DNC250 | KB320 | KB330 | KB370 | | | | |
| P | Steel | KB320 | KB330 | KB350 | KB360 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | KB410 | KB350 | KB370 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | HRSA | KB370 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hardened steel | KB410 | KB420 | KB425 | DNC250 | KB320 | KB330 | KB370 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PCD | <table border="1"> <tr><td>N</td><td>Non-ferrous metal</td><td>DP90</td><td>DP150</td><td>DP200</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | N | Non-ferrous metal | DP90 | DP150 | DP200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous metal | DP90 | DP150 | DP200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diamond Coating | <table border="1"> <tr><td rowspan="3">N</td><td>Turning</td><td>ND1000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Milling</td><td>ND2000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Endmills</td><td>ND3000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | N | Turning | ND1000 | | | | | | | | | | Milling | ND2000 | | | | | | | | | | Endmills | ND3000 | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Turning | | ND1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Milling | | ND2000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Endmills | ND3000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DLC Coating | <table border="1"> <tr><td rowspan="3">N</td><td>Turning</td><td>PD1000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Milling</td><td>PD2000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>Endmills</td><td>PD3000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | N | Turning | PD1000 | | | | | | | | | | Milling | PD2000 | | | | | | | | | | Endmills | PD3000 | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Turning | | PD1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Milling | | PD2000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Endmills | PD3000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wear resistance Tool | Ultra fine grain cemented carbide | <table border="1"> <tr><td>Z</td><td>Ultra fine grain cemented carbide</td><td>FS1</td><td>FA1</td><td>FCC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | Z | Ultra fine grain cemented carbide | FS1 | FA1 | FCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Z | Ultra fine grain cemented carbide | FS1 | FA1 | FCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Uncoated carbide | <table border="1"> <tr><td>V</td><td>Wear parts</td><td>D1</td><td>D2</td><td>D3</td><td>G5</td><td>G6</td><td>K20G</td><td></td><td></td><td></td><td></td></tr> <tr><td>I</td><td>Corrosion resistance</td><td>IN10</td><td>IN20</td><td>IN40</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | V | Wear parts | D1 | D2 | D3 | G5 | G6 | K20G | | | | | I | Corrosion resistance | IN10 | IN20 | IN40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| V | Wear parts | D1 | D2 | D3 | G5 | G6 | K20G | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I | Corrosion resistance | IN10 | IN20 | IN40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mining Tool | Uncoated carbide | <table border="1"> <tr><td>E</td><td>General</td><td>GR10</td><td>GR20</td><td>GR30</td><td>GR35</td><td>GR40</td><td>GR50</td><td></td><td></td><td></td><td></td></tr> </table> | E | General | GR10 | GR20 | GR30 | GR35 | GR40 | GR50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | General | GR10 | GR20 | GR30 | GR35 | GR40 | GR50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

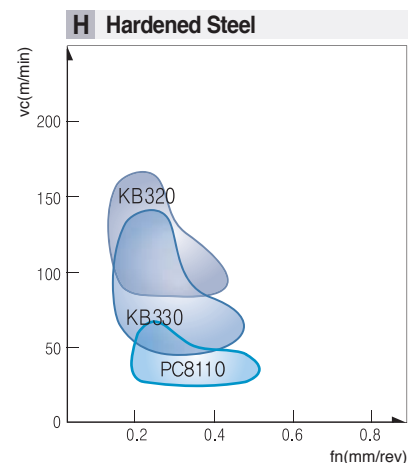
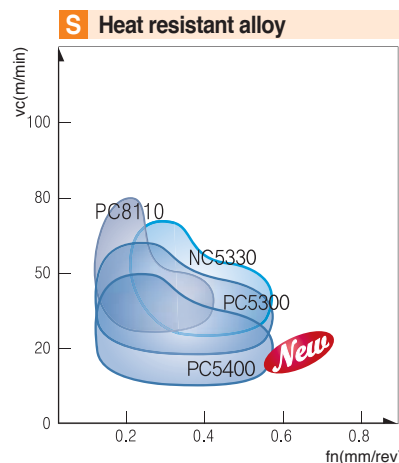
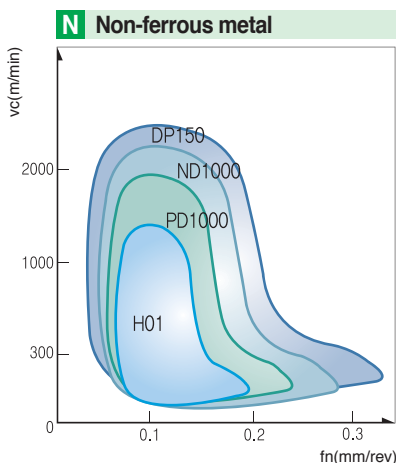
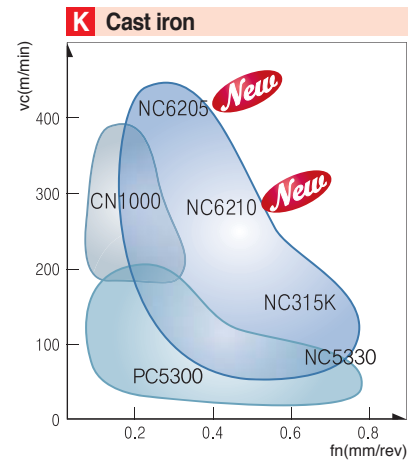
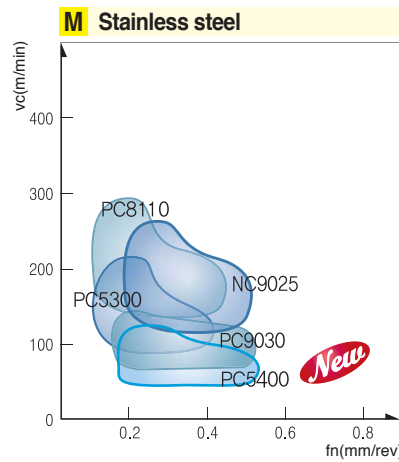
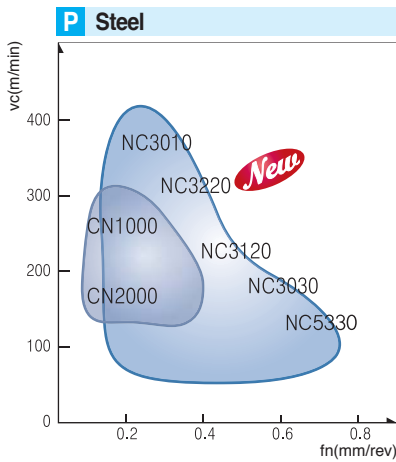


The best way to choose KORLOY turning inserts

Selection system

| | P Steel | | | | | M Stainless steel | | | | K Cast iron | | | | N Nonferrous | | | S HRSA | | | | H Hardened | | |
|------------------|-------------------|-----|-----|-----|-----|-------------------|-----|-----|-----|-------------------|-----|-----|-----|--------------|-----|-----|-------------------|-----|-----|-----|------------|-----|-----|
| | P01 | P10 | P20 | P30 | P40 | P50 | M10 | M20 | M30 | M40 | K01 | K10 | K20 | K30 | N10 | N20 | N30 | S10 | S20 | S30 | S40 | H01 | H10 |
| Coated carbide | NC3010 | | | | | PC8110 | | | | NC6205 <i>New</i> | | | | ND1000 | | | PC8110 | | | | PC8110 | | |
| | NC3220 <i>New</i> | | | | | | | | | NC6210 <i>New</i> | | | | PD1000 | | | PC5300 | | | | | | |
| | NC3120 | | | | | | | | | NC315K | | | | | | | | | | | | | |
| | NC3030 | | | | | | | | | NC5330 | | | | | | | PC5400 <i>New</i> | | | | | | |
| | NC5330 | | | | | | | | | PC5300 | | | | | | | | | | | | | |
| Cermet | CN1000 | | | | | | | | | CN1000 | | | | | | | | | | | | | |
| | CN2000 | | | | | | | | | | | | | | | | | | | | | | |
| | CN20 | | | | | | | | | | | | | | | | | | | | | | |
| cBN / PCD | | | | | | | | | | KB350 | | | | DP150 | | | | | | | KB320 | | |
| | | | | | | | | | | KB360 | | | | | | | | | | | KB330 | | |
| Uncoated carbide | ST05 | | | | | U10 | | | | H02 | | | | H01 | | | | | | | H01 | | |
| | ST10 | | | | | U20 | | | | H01 | | | | H01 | | | | | | | | | |
| | ST15 | | | | | U40 | | | | H05 | | | | H01 | | | | | | | | | |
| | ST20 | | | | | | | | | H10 | | | | G10 | | | | | | | | | |
| | ST30N ST40 | | | | | | | | | | | | | | | | | | | | | | |
| | ST30 | | | | | | | | | | | | | | | | | | | | | | |
| | ST46 | | | | | | | | | | | | | | | | | | | | | | |
| | ST45 | | | | | | | | | | | | | | | | | | | | | | |

Application range of turning grades



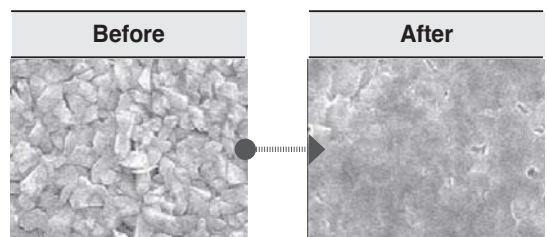
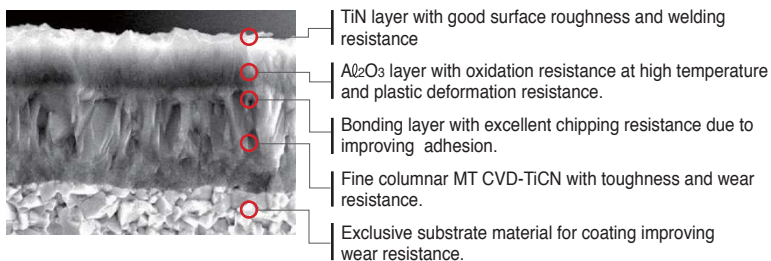
CVD coated Grade

Grade for all applications of steel

NC3220 *New*

- NC 3220 covers a wide application range for all kinds of steels (carbon steel, alloy steel, forged steel, rolled steel, tool steel, mild steel, bearing steel and other special steels) in both continuous and interrupted machining
- New substrate and new coating layer with good wear resistance provides longer tool life preventing plastic deformation in high speed and high temperature machining
- Improved coating layer with superior adhesion and new surface treatment provides excellent welding resistance and chipping resistance that leads to stability of machining and improvements in productivity
- Increased lubrication of coating layer improves the surface finish and reduces the cutting load to increase wear resistance.

Coating structure



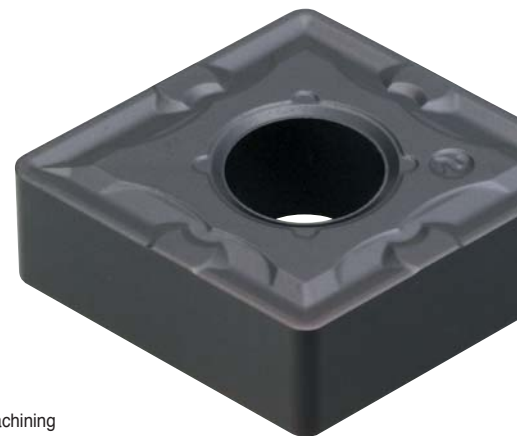
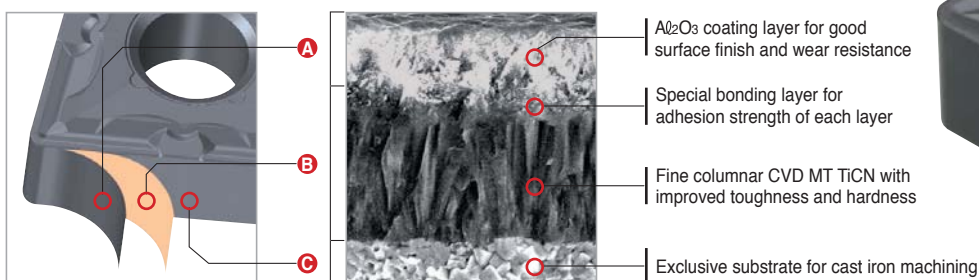
New technology of surface treatment improves welding resistance and stability in machining.

CVD turning grade for Cast iron

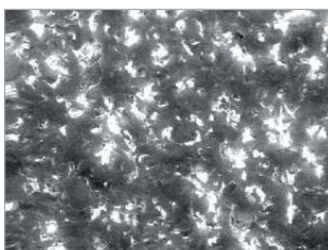
NC6205 *New* NC6210 *New*

- K-Power coating
- NC6205 - Superior cutting performance in continuous and high speed machining
- NC6210 - Stable tool life in continuous and interrupted turning

Features



K-Power coating



Outermost layer

Al₂O₃ layer with superior lubrication guarantees wear resistance and chipping resistance in high speed machining



Bonding layer (between MT-TiCN and Al₂O₃ layer)

Special bonding layer with superb adhesion strength improves flaking resistance and chipping resistance



Selection system

| Workpiece | Machining types | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|----------------------|---------------------|-------------------|----------------------------------|-----|-------------------|
| P Steel | Continuous cutting | NC3010 | 300 (200~400) | P01 | |
| | | | | P10 | |
| | | | | P15 | |
| | Interrupted cutting | NC3220 <i>New</i> | 280 (150~380) | P20 | |
| | | NC3120 | 250 (150~350) | P20 | |
| | | NC3030 | 200 (150~250) | P30 | |
| Interrupted cutting | NC5330 | 190 (100~230) | P35 | | |
| | NC500H | 100 (50~150) | P40 | | |
| | | | | | |
| M Stainless steel | Continuous cutting | NC9025 | 140 (80~220) | M30 | |
| | Interrupted cutting | | | M40 | |
| K Cast iron | Continuous cutting | NC6205 <i>New</i> | 450 (250~550) | K05 | |
| | | NC6210 <i>New</i> | 350 (250~450) | K10 | |
| | Interrupted cutting | NC315K | 200 (150~250) | K20 | |
| | | NC5330 | 180 (130~230) | K30 | |
| S HRSA | Continuous cutting | NC5330 | 40 (20~60) | S20 | |
| | Interrupted cutting | | | S30 | |

The features of CVD turning grades

| CVD Coated grades | ISO | Features |
|-------------------|--|---|
| NC3010 | P05 ~ P15 | <ul style="list-style-type: none"> High speed cutting for steel Combining excellent wear resistance substrate with chipping and heat resistance Al_2O_3 increased stability MT-TiCN + Al_2O_3 + TiN |
| NC3220 <i>New</i> | P15 ~ P25 | <ul style="list-style-type: none"> For medium machining of steel Universal grade combining substrate with wear resistance and toughness and Al_2O_3 coating with oxidation resistance and fracture resistance Special treatment on the outermost layer MT-TiCN + Al_2O_3 + TiN |
| NC3120 | P15 ~ P25 | <ul style="list-style-type: none"> Medium to roughing for steel Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability MT-TiCN + TiC + Al_2O_3 |
| NC3030 | P25 ~ P35 | <ul style="list-style-type: none"> For general cutting, interrupted cutting and roughing operations in steel and stainless steel Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability in wide ranges of cutting conditions MT-TiCN + TiC + Al_2O_3 + TiN |
| NC5330 | P30 ~ P40 M25 ~ M35 K15 ~ K25 S15 ~ S25 | <ul style="list-style-type: none"> Stainless Steel/General Cutting for Mild Steel & Forging Steel MT-TiCN + Al_2O_3 + TiN |
| NC9025 | M25 ~ M35 | <ul style="list-style-type: none"> Stainless Steel/General Cutting for Mild Steel & Forging Steel MT-TiCN + Al_2O_3 + TiN |
| NC500H | P25 ~ P35 | <ul style="list-style-type: none"> Heavy interrupted cutting for steel Plastic deformation and fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability in wide ranges of cutting conditions MT-TiCN + TiC + Al_2O_3 + TiN |
| NC6205 <i>New</i> | K01 ~ K10 | <ul style="list-style-type: none"> General cutting for gray cast iron and ductile cast iron High hardness substrate and improved adhesion of thick Al_2O_3 show superior wear resistance MT-TiCN + Al_2O_3 |
| NC6210 <i>New</i> | K05 ~ K15 | <ul style="list-style-type: none"> General cutting for gray cast iron and ductile cast iron Tough substrate and improved adhesion of thick Al_2O_3 show superior wear resistance MT-TiCN + Al_2O_3 |
| NC315K | K10 ~ K20 | <ul style="list-style-type: none"> Interrupted cutting and high-efficiency machining for cast iron Tough substrate and improved adhesion of thick Al_2O_3 show superior wear resistance MT-TiCN + Al_2O_3 + TiN |



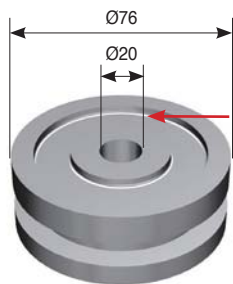
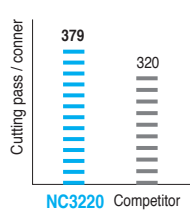
Cutting performance (NC3220)

P Alloy Steel (SCR420H, hot forging)

- **Cutting condition** $vc(m/min) = 360\sim430$
 $fn(mm/rev) = 0.2$
 $ap(mm) = 1.2\sim1.5$
(external machining / facing)
wet

- **Designation** INSERT CNMG120408-VB
HOLDER PCLNR2525-M12

■ Test result

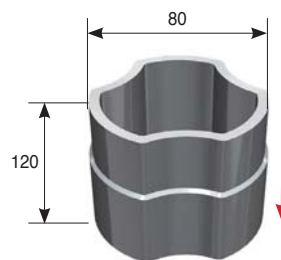
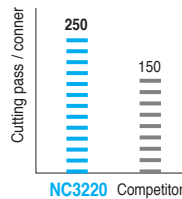


P Carbon Steel(S48C, cold forging)

- **Cutting condition** $vc(m/min) = 280$
 $fn(mm/rev) = 0.2\sim0.25$
 $ap(mm) = 1$
dry

- **Designation** INSERT CNMG120412-VB
HOLDER PCLNR2525-M12

■ Test result

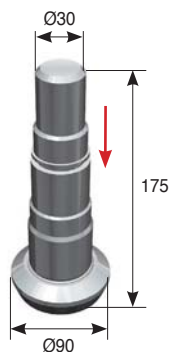
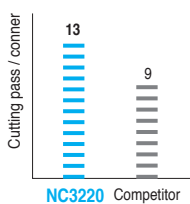


P Alloy Steel (SCM420H, hot forging)

- **Cutting condition** $vc(m/min) = 80\sim500$
 $fn(mm/rev) = 0.15\sim0.3$
(External machining / facing / grooving / tapping)
 $ap(mm) = 0.7\sim1.5$
wet

- **Designation** INSERT DNMG150608-VB
HOLDER PDJNR2525-M15

■ Test result

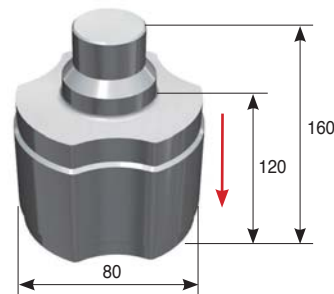
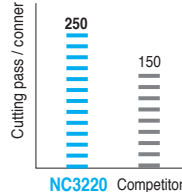


P Carbon Steel(S53C, cold forging)

- **Cutting condition** $vc(m/min) = 280$
 $fn(mm/rev) = 0.2\sim0.25$
(External machining / internal machining)
 $ap(mm) = 1$
dry

- **Designation** INSERT DNMG150608-VB
HOLDER PDJNR2525-M15

■ Test result

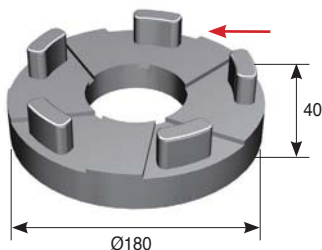
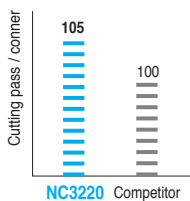


P Alloy Steel (SCR series, cold forging)

- **Cutting condition** $vc(m/min) = 314$
 $fn(mm/rev) = 0.25$
(external machining / facing)
 $ap(mm) = 1$
wet

- **Designation** INSERT CNMG120408-VM
HOLDER PCLNR2525-M12

■ Test result

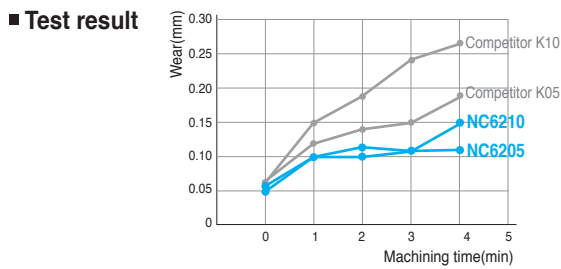


Cutting performance (NC6205 / NC6210)

K Gray cast iron(GC250), in high speed machining

Cutting condition $vc(m/min) = 600$
 $fn(mm/rev) = 0.30$
 $ap(mm) = 1.5$
 dry
 Continuous external machining

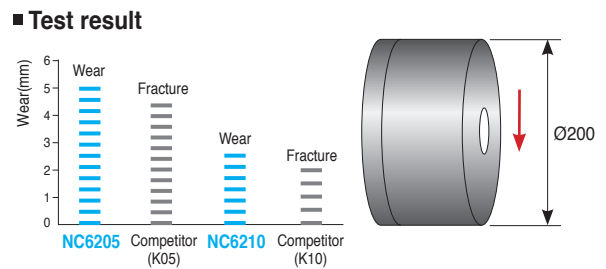
Designation **INSERT** CNMA120408
 (NC6205, NC6210)
HOLDER DCLNL3232-P12



K Ductile cast iron(GCD600), in interrupted machining

Cutting condition $vc(m/min) = 120$
 $fn(mm/rev) = 0.30$
 $ap(mm) = 1.5$
 wet
 Interrupted facing

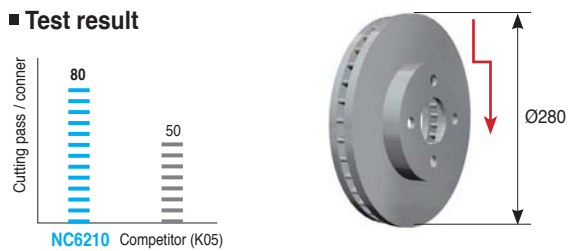
Designation **INSERT** CNMA120408
 (NC6205, NC6210)
HOLDER DCLNL3232-P12



K Gray cast iron(GC250), Brake Disc

Cutting condition $vc(m/min) = 390$
 $fn(mm/rev) = 0.25$
 $ap(mm) = 2.0$
 wet

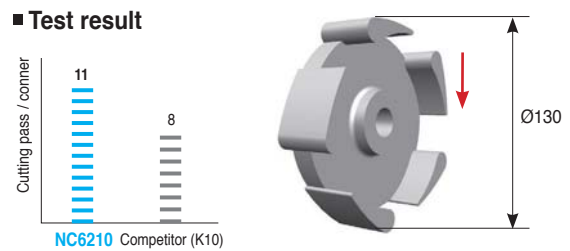
Designation **INSERT** CNMG120412-VK(NC6210)
HOLDER PCLNR2525-M12



K Gray cast iron(GC250), Nipple

Cutting condition $vc(m/min) = 350$
 $fn(mm/rev) = 0.25$
 $ap(mm) = 0.7$
 wet

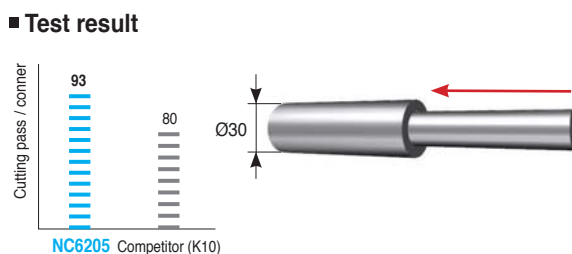
Designation **INSERT** CNMG120408-VK(NC6210)
HOLDER DCLNR2525-M12



K Ductile cast iron(GCD550), Shaft

Cutting condition $vc(m/min) = 120$
 $fn(mm/rev) = 0.28$
 $ap(mm) = 2.0$
 wet

Designation **INSERT** WNMG080412-VK(NC6205)
HOLDER DWLNL2525-M08

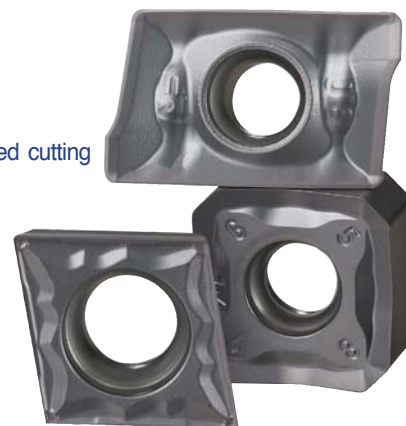


PVD coating Grade

PVD Coated grade for stainless steel and HRSA.

PC8110

- Micro grain carbide minimizes chipping of cutting edge due to enhanced edge strength
- Latest PVD coating technology with high hardness and high temperature oxidation resistance
- PC8110 provides high productivity during machining HRSA material in high speed, high feed cutting conditions

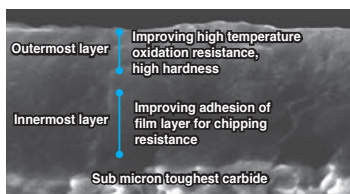


PVD turning grade for stainless steel and HRSA

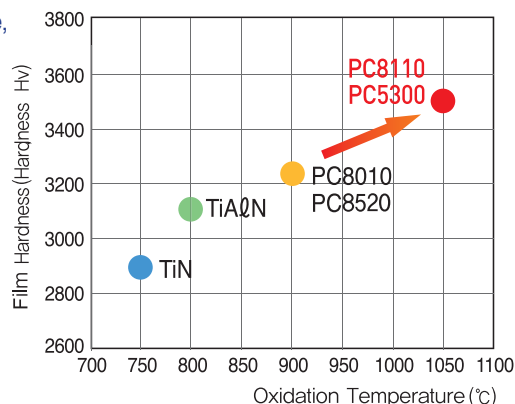
PC5300

- High efficiency during machining of carbon steel / cast iron / stainless steel / HRSA
- Stable machining due to specific carbide substrate with strong toughness and high hardness that reduces fracture by chipping
- Excellent wear resistance due to special PVD coating film with oxidation resistance, thermal stability, and surface smoothness

Coating structure



Latest PVD coating technology developed by KORLOY
New concept of coating with high temperature oxidation resistance and high hardness



PVD grade for turning of heat resisting alloy and stainless steel

PC5400 *New*

- New PVD coating layer with high toughness and lubrication
- High adhesive strength between substrate with high toughness and the coating layer
- Excellent cutting edge strength and chipping resistance ensure stable machinability for P, M, K, S.

Selection system

| Workpiece | Machining types | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|----------------------|---------------------|-------------------|----------------------------------|-----|-------------------|
| P Steel | Continuous cutting | PC5300 | 150(120~220) | P30 | PC5300 |
| | Interrupted cutting | | | P40 | |
| | Interrupted cutting | PC5400 <i>New</i> | 150(120~220) | P50 | PC5400 <i>New</i> |
| M Stainless steel | Continuous cutting | PC8110 | 200(150~250) | M10 | PC8110 |
| | Interrupted cutting | PC5300 | 170(120~220) | M20 | PC5300 |
| | | PC9030 | 120(50~180) | M30 | PC9030 |
| | | PC5400 <i>New</i> | 120(50~180) | M40 | PC5400 <i>New</i> |
| S HRSA | Continuous cutting | PC8110 | 60(40~90) | S10 | PC8110 |
| | Interrupted cutting | PC5300 | 50(30~70) | S20 | PC5300 |
| | | PC5400 <i>New</i> | 40(20~60) | S30 | |
| | | | | S40 | PC5400 <i>New</i> |



The features of PVD coated grades

| PVD Coated grades | ISO | Features |
|-------------------|--|---|
| PC9030 | M30 ~ M40 | <ul style="list-style-type: none"> • Medium, roughing and heavy interrupted cutting for stainless steel • TiAlN coating and ultra fine grain substrate adopted • High chipping and welding resistance for stable machining |
| PC8110 | M10 ~ M20 S10 ~ S20 | <ul style="list-style-type: none"> • High speed and continuous machining for stainless & HRSA • High chipping and welding resistance longer tool life • New TiAlN coating and ultra fine grain substrate adopted |
| PC5300 | P30 ~ P40 M20 ~ M30 K20 ~ K25 S20 ~ S30 | <ul style="list-style-type: none"> • Universal grade for stainless, HRSA, steel and interrupted cast iron machining • High chipping and welding resistance for longer tool life • New TiAlN coating and ultra fine grain substrate adopted |
| PC5400 <i>New</i> | P40 ~ P50 M30 ~ M40 K25 ~ K35 S25 ~ S35 | <ul style="list-style-type: none"> • For medium cutting for hard-to-cut materials, stainless steel, steel, and cast iron at medium or low speed • Stable machinability with chipping resistance, fracture resistance and welding resistance • Ultra fine substrate with high toughness and new AlCrN layer |

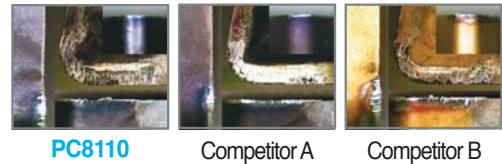
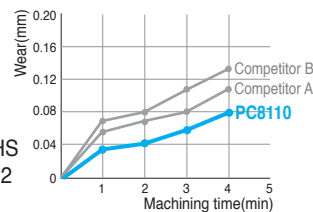
Cutting performance (PC8110)

S Inconel 718

- Cutting condition**
 $vc(m/min) = 60$
 $fn(mm/rev) = 0.2$
 $ap(mm) = 2$
 wet
 (4min machining)

- Designation**
 INSERT CNMG120408-HS
 HOLDER DCLNL2525-M12

Test result

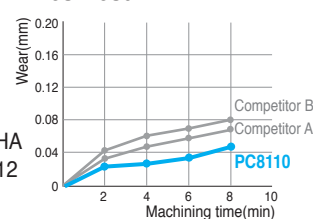


S Titanium

- Cutting condition**
 $vc(m/min) = 70$
 $fn(mm/rev) = 0.2$
 $ap(mm) = 1$
 wet
 (8min machining)

- Designation**
 INSERT CNMG120408-HA
 HOLDER PCLNR2525-M12

Test result

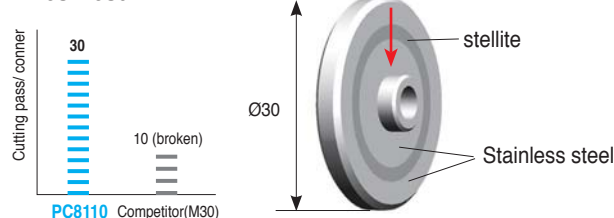


M S Stainless steel(Stellite welded)

- Cutting condition**
 $vc(m/min) = 60$
 $fn(mm/rev) = 0.2$
 $ap(mm) = 2$
 wet

- Designation**
 INSERT CNMG120408-GS
 HOLDER DCLNL2525-M12

Test result

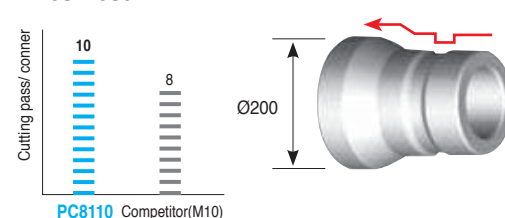


S Inconel 625

- Cutting condition**
 $vc(m/min) = 60$
 $fn(mm/rev) = 0.2$
 $ap(mm) = 2$
 wet

- Designation**
 INSERT DNMG150608-HS
 HOLDER DDLNL2525-M15

Test result



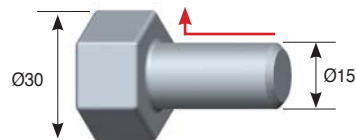
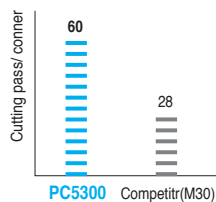
Cutting performance (PC5300)

M Stainless steel (STS304)

- Cutting condition**
 $vc(m/min) = 282$
 $fn(mm/rev) = 0.2$
 $ap(mm) = 3$
 wet

- Designation**
 INSERT CNMG120408-HS
 HOLDER DCLNL2525-M12

- Test result**

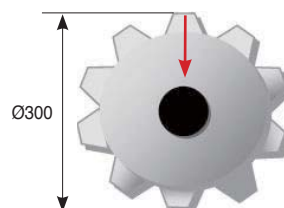
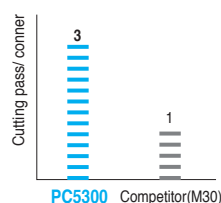


M Stainless steel (STS316)

- Cutting condition**
 $vc(m/min) = 120$
 $fn(mm/rev) = 0.2$
 $ap(mm) = 0.5\sim 1.5$
 wet

- Designation**
 INSERT SNMG120408-GS
 HOLDER DSBNL2525-M12

- Test result**



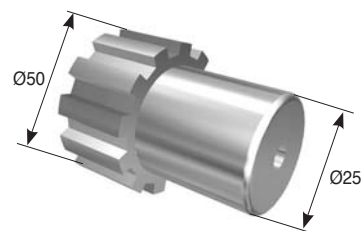
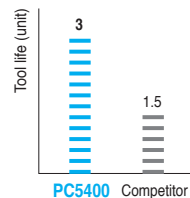
Cutting performance (PC5400)

M Stainless steel (STS304)

- Cutting condition**
 $vc(m/min) = 110$
 $fn(mm/rev) = 0.25$
 $ap(mm) = 1.0\sim 2.0$
 wet

- Designation**
 INSERT CNMG120408-VP3
 HOLDER DCLNL2525-M12

- Test result**

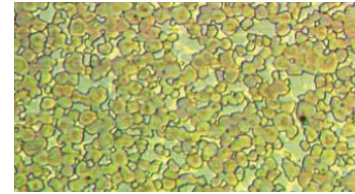


KORLOY Uncoated Carbide Grades

Features

- ▶ Korloy's uncoated cemented carbides are designed to optimize machining with uniform quality. Furthermore, Korloy's cemented carbides are manufactured with the highest quality tungsten carbides, cobalt, and refractory carbides (TiC, TaC) to produce superior toughness and wear resistance

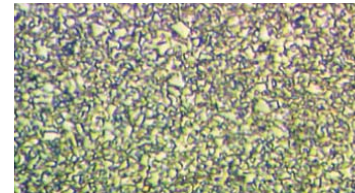
[Microstructure]



P

Advantages

- ▶ P.M.K cemented carbide can be applied for various workpiece
- ▶ Excellent thermal crack resistance makes it possible to machine in wet cutting conditions
- ▶ Fine grain and minimizing chemical affinity to workpiece
Specially designed by Korloy
- ▶ High toughness and low cutting force



K

Selection system

| Workpiece | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|------------------|-------------------|----------------------------------|-----|-------------------|
| P Steel | ST10 | 150 (100 ~ 200) | P10 | ST10 |
| | ST15 | 140 (90 ~ 190) | P20 | ST15 |
| | ST20 | 130 (70 ~ 180) | P30 | ST20 |
| | ST30A | 130 (70 ~ 180) | | ST30A |
| K Cast iron | H02 | 150 (100 ~ 200) | K01 | H02 |
| | H01, H05 | 140 (100 ~ 200) | K10 | H01 |
| | H10, G10 | 130 (90 ~ 190) | | H05 |
| Alloyed aluminum | H01 | 500 (300 ~ 800) | K20 | H10 |
| Alloyed copper | H01 | 200 (150 ~ 300) | K30 | G10 |

Main application

| ISO | Composition | Features | Workpiece |
|-----|---------------|---|--|
| P | WC-TiC-TaC-Co | Heat resistance, excellent plastic deformation resistance | Carbon steel, Alloy steel, Stainless steel |
| M | WC-TiC-TaC-Co | General tools stable heat resistance with strength | Carbon steel, Alloy steel, Stainless steel, Cast steel |
| K | WC-Co | High strength and superior wear resistance | Cast iron, Non-ferrous metal, Plastic, etc |

Properties of Uncoated Carbide

| ISO | Grade | Hardness (HRA) | TRS (kgf/mm ²) | Young's modulus (10 ³ kgf/mm ²) | Thermal expansion coefficient(10 ⁻⁶ /°C) | Thermal conductivity (cal/cm · sec·°C) |
|-----|-------|----------------|----------------------------|--|---|--|
| P | ST05 | 92.7 | 140 | - | - | - |
| | ST10 | 92.1 | 175 | 48 | 6.2 | 25 |
| | ST20 | 91.9 | 200 | 56 | 5.2 | 45 |
| | ST30A | 91.3 | 230 | 53 | 5.2 | - |
| M | U10 | 92.4 | 170 | 47 | - | - |
| | U20 | 91.1 | 210 | - | - | 88 |
| | ST30A | 91.3 | 230 | 53 | 5.2 | - |
| | A40 | 89.2 | 270 | - | - | - |
| K | H02 | 93.2 | 185 | 61 | 4.4 | 105 |
| | H01 | 92.9 | 210 | 66 | 4.7 | 109 |
| | G10 | 90.9 | 250 | 63 | - | 105 |

kPa = 102kg/mm², 1W/mk = 2.39×10⁻³cal/cm·sec·°C



Cermet Grade

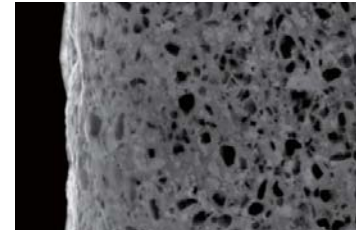
For steel, cast iron, other sintering alloy steel(P10, K10)

Continuous cutting exclusive cermet

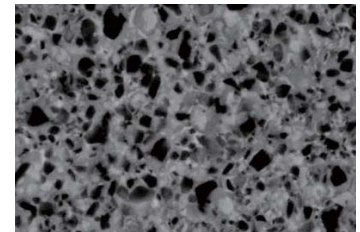
CN1000

- Functionally gradient cermet materialization leads excellent quality on both non-grinding and grinding inserts
- Due to increase of plastic deformation resistance, it maintains superior wear resistance and precision on workpiece dimension over long period usage with wet and dry cutting conditions
- Improved adhesion wear resistance on upper part and cutting edge, reduces tool s cutting load and makes surface finishing smooth after machining
- New cermet grade for finishing of cast iron, carbon steel, alloy steel, and other sintered steels

[Microstructure of Ticn-based cermets]



Surface



Core

Selection system

| Workpiece | Machining types | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|-------------|---------------------|-------------------|----------------------------------|------------|-------------------|
| P Steel | Continuous cutting | CN1000 | 280 (150 ~ 400) | P10 | CN1000 |
| | Interrupted cutting | CN20 | 210 (120 ~ 300) | P20 | CN20 |
| CN2000 | | CN2000 | | | |
| K Cast iron | Finishing | CN1000 | 280 (150 ~ 400) | K01 K10 | CN1000 |

The features of KORLOY main cermet grade

| Cermet | ISO | Features |
|--------|-----------------------|--|
| CN1000 | P05 ~ P15 / K05 ~ K10 | <ul style="list-style-type: none"> Cermet for finishing for steel, cast iron and sintered metals Functionally gradient material cermet as a next generation cermet |
| CN2000 | P10 ~ P20 | <ul style="list-style-type: none"> Wide ranges from finishing to roughing in steel machining Functionally gradient material cermet as a next generation cermet |
| CN20 | P10 ~ P20 | <ul style="list-style-type: none"> For general turning and milling for steel General purpose grade provided with both wear resistance and toughness CN20 : main grade for machining bearing |

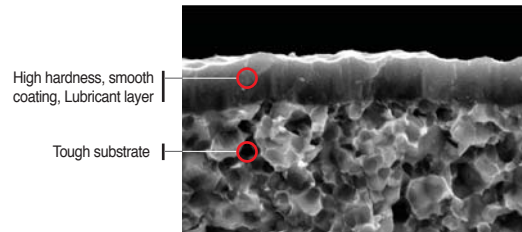
Properties of cermet

| ISO | Grade | Hardness | TRS | Specific Gravity |
|-----|--------|----------|-------|------------------|
| P | CN1000 | < 1900 | < 180 | 6.5 ~ 7.5 |
| | CN2000 | < 1800 | < 210 | 6.8 ~ 7.0 |
| | CN20 | < 1600 | < 220 | 6.7 ~ 7.0 |
| K | CN1000 | < 1900 | < 180 | 6.5 ~ 7.5 |



KORLOY Coated Cermet Grades

- Features**
- ▶ Impact resistance and superior toughness substrate prevents chipping and fracture at the initial stage ensuring longer tool life
 - ▶ Lubricant coating layer improves chip flow and reduces insert load



Selection system

| Workpiece | Machining types | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|----------------|---------------------|-------------------|----------------------------------|-----|-------------------|
| P Steel | Continuous cutting | CC105 | 350 (250 ~ 450) | P05 | CC105 |
| | Interrupted cutting | CC115 | 280 (230 ~ 400) | P10 | CC115 |
| | | CC125 | 230 (150 ~ 300) | P20 | CC125 |

The features of KORLOY coated cermet grade

| Coated cermet | ISO | Features |
|---------------|-----------|---|
| CC105 | P01 ~ P10 | <ul style="list-style-type: none"> • PVD coated Cermet • Light cutting for steel and cast iron in high speed machining • Optimized for precision boring |
| CC115 | P10 ~ P20 | <ul style="list-style-type: none"> • PVD coated Cermet • Light cutting for steel and cast iron in medium or high speed machining • Dry and wet cutting are available |
| CC125 | P15 ~ P25 | <ul style="list-style-type: none"> • PVD coated Cermet • High toughness cermet for milling |

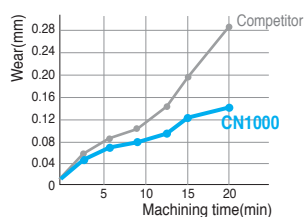


Cutting performance(CN1000)

P Carbon steel (SM45C)

- Cutting condition**
 - vc(m/min) = 400
 - fn(mm/rev) = 0.2
 - ap(mm) = 1.0
 - wet
 - (20min machining)
- Designation**
 - INSERT CNMG120408-VG
 - HOLDER PCLNL2525-M12

Test result



CN1000

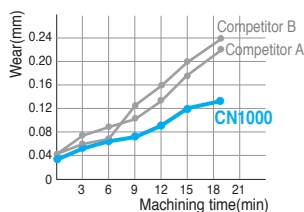


Competitor

K Cast iron(GC250)

- Cutting condition**
 - vc(m/min) = 300
 - fn(mm/rev) = 0.2
 - ap(mm) = 1.0
 - wet
 - (21min machining)
- Designation**
 - INSERT CNMG120408-B25
 - HOLDER PCLNR3232-P12

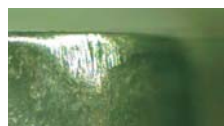
Test result



CN1000



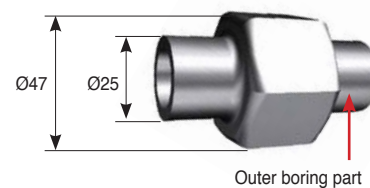
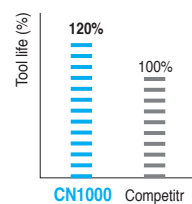
Competitor A



Competitor B

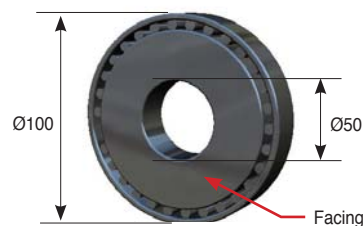
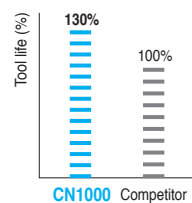
P Carbon steel (SM45C)

- Cutting condition**
 - vc(m/min) = 250
 - fn(mm/rev) = 0.1
 - ap(mm) = 0.2
 - wet
- Designation**
 - INSERT VNMG160404-VG
 - HOLDER MVQNR2525-M16
- Test result**



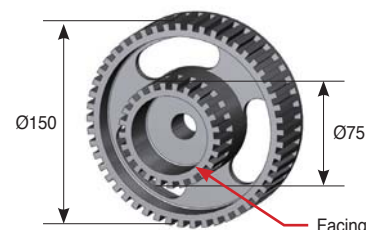
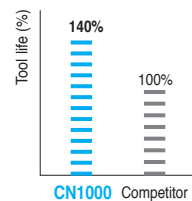
P Alloy steel (SCM420H)

- Cutting condition**
 - vc(m/min) = 250
 - fn(mm/rev) = 0.18
 - ap(mm) = 0.5
 - wet
- Designation**
 - INSERT DCMT11T304-C25
 - HOLDER SDJCR2020-K11
- Test result**



P Sintered ferrous metals

- Cutting condition**
 - vc(m/min) = 338
 - fn(mm/rev) = 0.2
 - ap(mm) = 0.5
 - wet
- Designation**
 - INSERT CNMG120408-B25
 - HOLDER PCLNR3232-P12
- Test result**



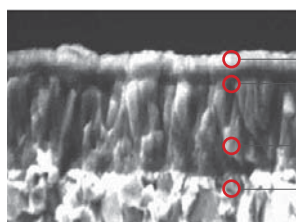
CVD Coated grade

CVD Coated grade for stainless steel and soft steel

NC5330

- Tough carbide, smooth coating for improved tool life
- Built-up-edge resistance, notch wear resistance, and the toughness have been improved
- Outstanding performance for stainless steel machining
- Excellent for machining sticky, soft steels, and forged steels
- Superior tool life for machining hard to cut material such as inconel and stellite

Coating structure



- TiN film : Smooth surface roughness and superior anti built-up-edge
- Fine columnar TiCN film : Optimal toughness and hardness
- Toughest dedicated carbide substrate employed
- Al₂O₃ film : Excellent oxidation resistance



Selection system

| Workpiece | Machining types | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|----------------------|---------------------|-------------------|----------------------------------|------------|-------------------|
| P Steel | Continuous cutting | NC5330 | 270(220~320) | P15 P20 | |
| | Continuous cutting | NCM325 | 250(150~300) | P25 P30 | |
| | Interrupted cutting | NCM335 | 230(120~280) | P35 P40 | |
| M Stainless steel | Continuous cutting | NC5330 | 200(150~250) | M10 M20 | |
| | Continuous cutting | NCM325 | 180(140~230) | M30 | |
| | Interrupted cutting | NCM335 | 170(120~210) | M40 | |
| K Cast iron | Continuous cutting | NC5330 | 170(130~220) | K20 K30 | |

The features of CVD Milling grades

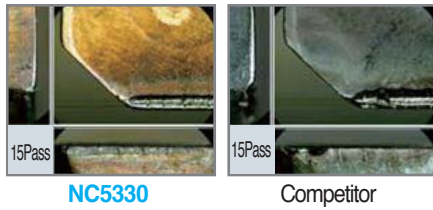
| CVD Coated grades | ISO | Features |
|-------------------|-------------------------------------|--|
| NC5330 | P15 ~ P25 M10 ~ M20 K10 ~ K20 | <ul style="list-style-type: none"> • For high speed milling of steel and stainless steel • Superior wear resistance and chipping resistance grade for steel and stainless steel • MT-TiCN + Al₂O₃ + TiN |
| NCM325 | P20 ~ P30 M20 ~ M30 | <ul style="list-style-type: none"> • For high speed milling of steel and stainless steel • Optimized grade for steel & stainless steel by employing proper substrate and hard coating • MT-TiCN + Al₂O₃ + TiN |
| NCM335 | P30 ~ P40 M30 ~ M40 | <ul style="list-style-type: none"> • For interrupted and rough milling of steel and stainless steel • Toughest substrate with hard coating provides stable cutting and tool life for severe interrupted cutting • MT-TiCN + Al₂O₃ + TiN |



Cutting performance(NC5330)

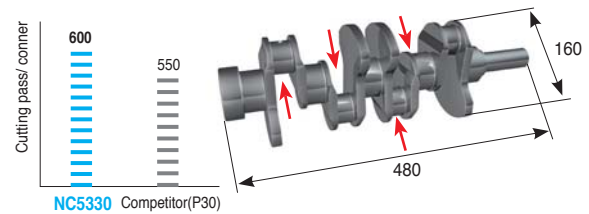
P Alloy steel (SCM440)

- Cutting condition**
 - vc(m/min) = 250
 - fz(mm/t) = 0.30
 - ap(mm) = 2.0
 - dry
- Designation**
 - INSERT SDKN1504AESN-SU
 - CUTTER ADN5125R
- Test result**



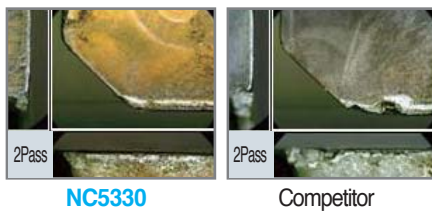
P Alloy steel (SCM440H)

- Cutting condition**
 - vc(m/min) = 130
 - fz(mm/t) = 0.30
 - ap(mm) = 3.5
 - dry
- Designation**
 - INSERT HS004072
- Test result**



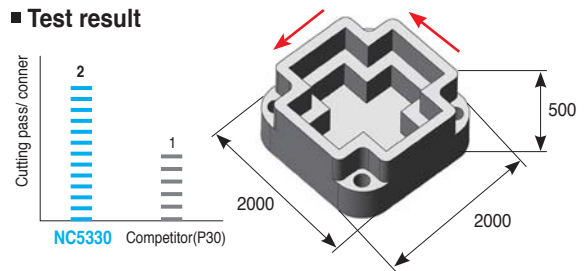
P Stainless steel (STS304)

- Cutting condition**
 - vc(m/min) = 150
 - fz(mm/t) = 0.25
 - ap(mm) = 2.0
 - dry
- Designation**
 - INSERT SDKN1504AESN-SU
 - CUTTER ADN5125R
- Test result**



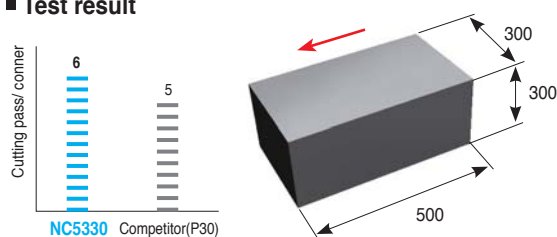
K Ductile cast iron (GCD500)

- Cutting condition**
 - vc(m/min) = 200
 - fz(mm/t) = 0.20
 - ap(mm) = 5.0
 - dry
- Designation**
 - INSERT SDKN1504AESN-SU
 - CUTTER ADN5100R
- Test result**



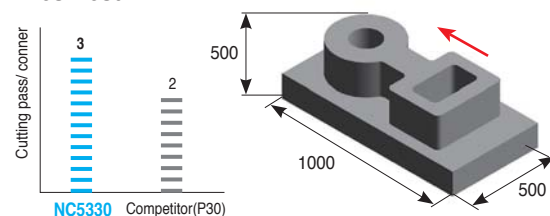
P Carbon steel (SM45C)

- Cutting condition**
 - vc(m/min) = 275
 - fz(mm/t) = 0.13
 - ap(mm) = 7.0
 - wet
- Designation**
 - INSERT TNMX2710AZNR-NM
 - CUTTER PBACM5125R-M
- Test result**



K Gray cast iron(GC400)

- Cutting condition**
 - vc(m/min) = 355
 - fz(mm/t) = 0.16
 - ap(mm) = 5.0
 - dry
- Designation**
 - INSERT SPKN1504EDSR-SU
 - CUTTER EPNM5100R
- Test result**



PVD coating Grade

PVD new grade for steel milling

PC3600(SU/MU) *New*

- Coating layer with high hardness and oxidation resistance at high temperature ensures stable tool life.
- Superior wear resistance and impact resistance in high speed machining of P grade materials
- **SU** : for general purpose - **MU** : for cost efficiency

Universal PVD Grade

PC5300

- High efficiency during machining for carbon steel / cast iron / stainless steel / HRSA
- Stable machining due to specific carbide substrate with strong toughness and high hardness that restrains fracture by chipping
- Excellent wear resistance due to special coating film with oxidation resistance, thermal stability, and surface smoothness

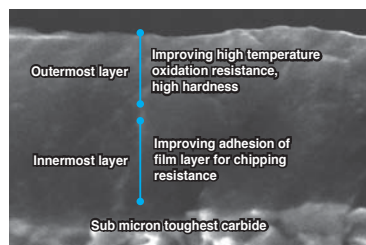


PVD grade for milling of heat resisting alloy and stainless steel

PC5400 *New*

- New PVD coating layer with high toughness and lubrication
- High adhesive strength between substrate with high toughness and the coating layer
- Excellent cutting edge strength and chipping resistance ensure stable machinability for P, M, K, S.

Coating structure



Latest PVD coating technology developed by KORLOY
New concept of coating equipped with high temperature oxidation resistance and high hardness

Selection system

| Workpiece | Machining types | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|--------------------------|---------------------|-----------------------------|----------------------------------|-----|-------------------|
| P Steel | Continuous cutting | PC3600 <i>New</i> | 200 (150~250) | P20 | |
| | | P30 | | | |
| | Interrupted cutting | PC5300 | 120 (100~150) | P40 | |
| | | PC5400 <i>New</i> PC3545 | | P50 | |
| M Stainless steel | Continuous cutting | PC5300 | 120 (100~150) | M20 | |
| | | PC9530 | 130 (50~200) | M30 | |
| | Interrupted cutting | PC5400 <i>New</i> | 120 (100~150) | M40 | |
| K Cast iron | Continuous cutting | PC8110 | 250 (200~400) | K01 | |
| | | PC6510 | 200 (150~250) | K05 | |
| | Interrupted cutting | PC5300 | 165 (120~210) | K10 | |
| | | | | K20 | |
| S HSRA | Continuous cutting | PC5300 | 70(40~100) | S20 | |
| | Interrupted cutting | PC5400 <i>New</i> | 50(30~70) | S30 | |
| H High hardness steel | Continuous cutting | PC210F | 250(150~300) | H01 | |
| | | | | H10 | |



🎯 The features of PVD coated grades

| PVD Coated grades | ISO | Features |
|--------------------------|--|---|
| PC3600 <i>New</i> | P20 ~ P30 | <ul style="list-style-type: none"> Milling grade for medium and roughing of steel New coating layer with superior wear resistance and oxidation resistance with high toughness substrate TiAlN / New coating • Grooving, Cutting, Milling |
| PC3545 | P35 ~ P45 | <ul style="list-style-type: none"> Medium and rough milling for steel Enhanced chipping resistant substrate • K-Gold coating |
| PC5300 | P30 ~ P40 S20 ~ S25 M20 ~ M30 K10 ~ K20 | <ul style="list-style-type: none"> Superior universal grade for steel, cast iron, hard to cut material, stainless steel New coating and ultra fine grain provide wear resistance and oxidation resistance For turning, milling, grooving, parting, drilling, and threading |
| PC5400 <i>New</i> | P35 ~ P50 S25 ~ S35 M30 ~ M40 K25 ~ K35 | <ul style="list-style-type: none"> Universal grade for interrupted machining of steel, cast iron, hard-to-cut materials and stainless steel with stable machinability New coating layer with high toughness and lubrication on ultra fine grain substrate with high toughness AlCrN series new coating • For turning, milling, grooving and drilling |
| PC8110 | K01 ~ K10 | <ul style="list-style-type: none"> Medium and rough cutting for hard to cut material and stainless steel Superior wear resistance for finishing cast iron New coating and ultra fine grain provide wear resistance and oxidation resistance For turning, milling, grooving, parting |
| PC6510 | K05 ~ K15 | <ul style="list-style-type: none"> High speed milling grade for cast iron and aluminum K-Gold coating |
| PC9530 | M20 ~ M35 | <ul style="list-style-type: none"> Milling grade for cast iron and aluminum in medium to low cutting speed The toughest sub-micron substrate provides excellent cutting performance at high feed TiAlN coating • For milling, drilling |
| PC210F | H01 ~ H10 | <ul style="list-style-type: none"> High speed milling grade for hardened steel, cast iron, and stainless steel(Laser Mill) New coating and ultra fine grain provide wear resistance and oxidation resistance Endmilling |

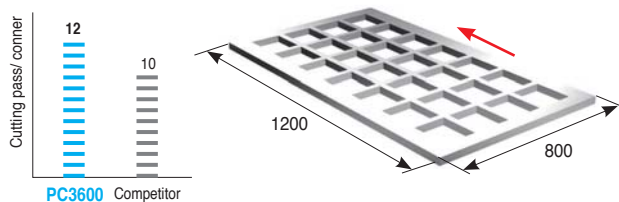
Cutting performance (PC3600)

P SS41

- **Cutting condition** $vc(m/min) = 216$
 $fz(mm/t) = 0.39$
 $ap(mm) = 1.0$
dry

- **Designation** INSERT TPKN2204PDSR-SU
CUTTER PPN4125R

■ Test result

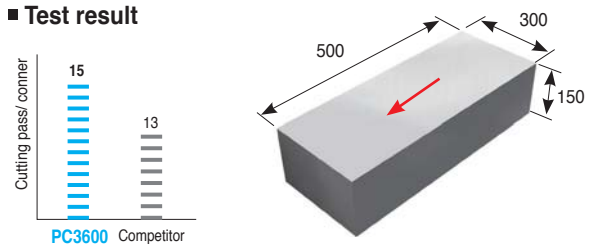


P SCM415

- **Cutting condition** $vc(m/min) = 228$
 $fz(mm/t) = 0.15$
 $ap(mm) = 1.0$
dry

- **Designation** INSERT SDKN1504AESN-SU
CUTTER ADN5315R

■ Test result

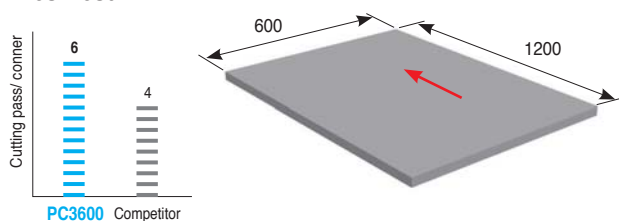


P SM45C

- **Cutting condition** $vc(m/min) = 306$
 $fz(mm/t) = 0.13$
 $ap(mm) = 2.0$
dry

- **Designation** INSERT SDKN1203AESN-SU
CUTTER ADN4315R

■ Test result

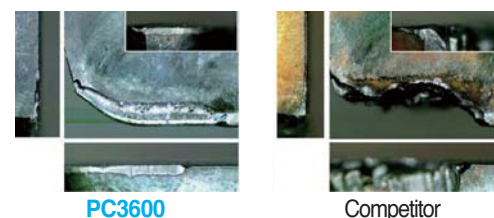


P STD11

- **Cutting condition** $vc(m/min) = 200$
 $fz(mm/t) = 0.2$
 $ap(mm) = 2.0$
dry

- **Designation** INSERT SPKN1504EDSR-SU
CUTTER EPN5160R

■ Test result (340min machining)

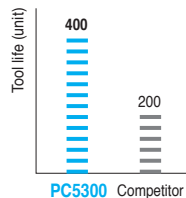


Cutting performance (PC5300)

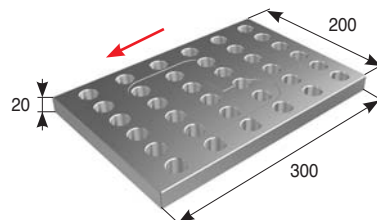
P KP4M

■ **Cutting condition** vc(m/min) = 250
fn(mm/rev) = 1.0
ap(mm) = 1.0
dry

■ **Test result**



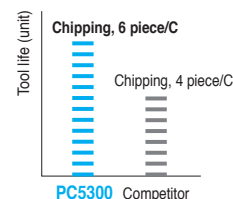
■ **Designation** INSERT WNMX130520ZNN-MM
CUTTER HRMDCM13050HR-3



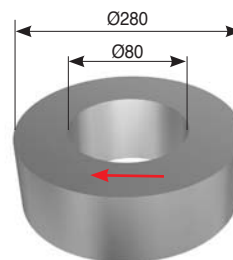
M Stainless steel(STS316)

■ **Cutting condition** vc(m/min) = 65
fn(mm/rev) = 0.14
ap(mm) = 3.0
wet

■ **Test result**



■ **Designation** INSERT SEET14M4AGSN-MM
CUTTER FMACM4100HR



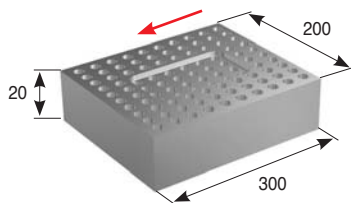
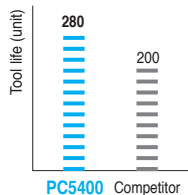
Cutting performance (PC5400)

P SM45C

■ **Cutting condition** vc(m/min) = 250
fz(mm/t) = 1.2
ap(mm) = 1.0
dry

■ **Designation** INSERT WNMX130520ZNN-MM
CUTTER HRMDCM13050HR-4

■ **Test result**

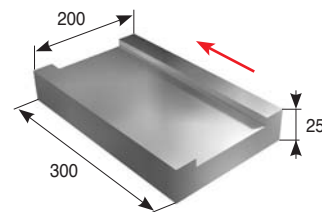
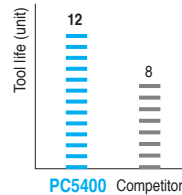


P SCR440

■ **Cutting condition** vc(m/min) = 180
fz(mm/t) = 0.2
ap(mm) = 2.0
dry

■ **Designation** INSERT PDKT1605M0-MM
CUTTER FMRC5063HRD-H

■ **Test result**

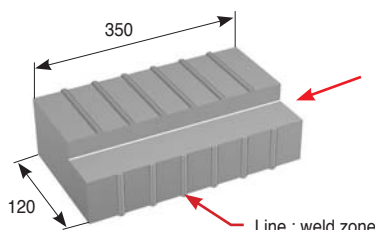
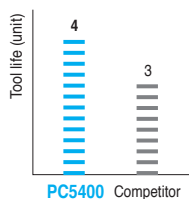


M Stainless steel(STS316)

■ **Cutting condition** vc(m/min) = 50
fz(mm/t) = 0.1
ap(mm) = 4.0 ae(mm) = 15.0
dry

■ **Designation** INSERT APMT1604PDSR-MM
CUTTER AMC3063HS

■ **Test result**

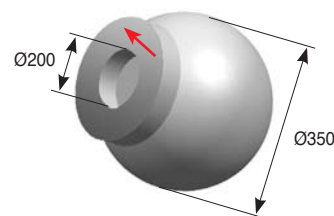
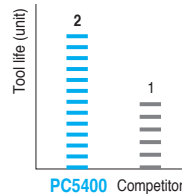


S INCONEL718

■ **Cutting condition** vc(m/min) = 60
fz(mm/t) = 0.1
ap(mm) = 2.5
wet

■ **Designation** INSERT SNMX1206ANN-MM
CUTTER RM8AC4080HR

■ **Test result**

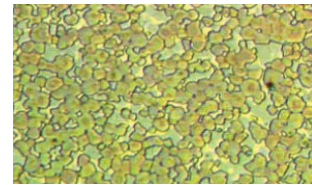


Uncoated Carbide Grades

Features

- ▶ Due to Korloys advanced sintering technology, our uncoated carbide grades have a fine alloy structure which is necessary to get superior quality from a uncoated cutting tool

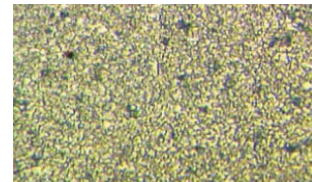
[Microstructure]



P

Advantages

- ▶ Consist of P,M,K carbide grades and can be used in all kinds of workpiece
- ▶ Excellent quality at machining with coolant, due to the superior thermal crack resistance of the carbide
- ▶ Due to the special design of carbides, it has fine micro structure and low affinity with workpiece
- ▶ It has excellent toughness and produces lower cutting loads



K

Selection system

| Workpiece | Grade | Recommended cutting speed(m/min) | ISO | Application range |
|-------------|----------------|----------------------------------|-----|-------------------|
| P Steel | ST30A | 130 (70 ~ 180) | P30 | ST30A |
| K Cast iron | H01, H05 | 150 (100 ~ 200) | K01 | |
| | H10, G10 | 140 (90 ~ 190) | K10 | H01, H05, G10 |
| | Aluminum alloy | H01 | K20 | |
| | Copper alloys | H01 | K30 | |

Main composition and application range

| ISO | Composition | Features | Workpiece |
|-----|---------------|---|--|
| P | WC-TiC-TaC-Co | Excellent thermal shock resistance and plastic deformation resistance | Carbon steel, Alloy steel, Stainless steel |
| M | WC-TiC-TaC-Co | General grades with thermal shock resistance and hardness | Carbon steel, Alloy steel, Stainless steel, Cast steel |
| K | WC-Co | High hardness and superior wear resistance | Cast iron, Non-ferrous metal, Non metal |

The physical properties of grades

| ISO | Grade | Hardness (H _v A) | TRS (kgf/mm ²) | Young's modulus (10 ³ kgf/mm ²) | Thermal expansion coefficient(10 ⁻⁶ /°C) | Thermal conductivity (cal/cm·sec·°C) |
|-----|-------|-----------------------------|----------------------------|--|---|--------------------------------------|
| P | ST05 | 92.7 | 140 | - | - | - |
| | ST10 | 92.1 | 175 | 48 | 6.2 | 25 |
| | ST20 | 91.9 | 200 | 56 | 5.2 | 45 |
| | ST30A | 91.3 | 230 | 53 | 5.2 | - |
| M | U10 | 92.4 | 170 | 47 | - | - |
| | U20 | 91.1 | 210 | - | - | 88 |
| | ST30A | 91.3 | 230 | 53 | 5.2 | - |
| | U40 | 89.2 | 270 | - | - | - |
| K | H02 | 93.2 | 185 | 61 | 4.4 | 105 |
| | H01 | 92.9 | 210 | 66 | 4.7 | 109 |
| | G10 | 90.9 | 250 | 63 | - | 105 |

1kPa = 102kg/m², 1w/m·k = 2.39×10⁻³ cal/cm·sec·°C



Milling Cermet Grades

- Features**
 - ▶ High hardness substrate ensures long tool life in high speed milling.
 - ▶ High toughness cutting edge ensures long tool life even in high impact machining.
 - ▶ Chemically stable substrate provides excellent surface finish of the workpiece.

- Application range**

Wide application range: carbon steel(from soft steel to high carbon steel), alloy steel, hardened steel(especially KP4M, NAK80), tool steel(STD61 and others)

Selection system

| Workpiece | Machining types | Grade | Recommended cutting speed(m/min) | ISO | Application range |
|-----------|---------------------|---------------|----------------------------------|-----------|-------------------|
| P Steel | Continuous cutting | CN2000 | 250 (200 ~ 300) | P10 ~ P20 | |
| | Continuous cutting | CN20 | 180 (130 ~ 230) | P15 ~ P25 | |
| | Interrupted cutting | CN30 | 150 (100 ~ 200) | P20 ~ P30 | |

The features of main cermet grades

| Cermet Grade | ISO | Features |
|---------------|-----------|--|
| CN2000 | P10 ~ P20 | • Universal grade from finishing to roughing of steel • Functionally Gradient Material |
| CN20 | P15 ~ P25 | • For general turning and milling of steel • Universal cermet with wear resistance and toughness |
| CN30 | P20 ~ P30 | • For milling of steel • Cermet with high toughness |

The physical properties of grades

| ISO | Grade | Hardness(Hv) | TRS(kgf/mm ²) | SG(g·cm ⁻³) |
|-----|---------------|--------------|---------------------------|-------------------------|
| P | CN2000 | < 1800 | 210 < | 6.8 ~ 7.0 |
| | CN20 | < 1600 | 220 < | 6.7 ~ 7.0 |
| | CN30 | < 1500 | 240 < | 7.0 ~ 7.3 |

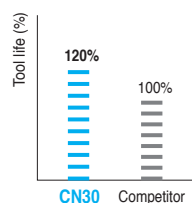
Cutting performance

P STD11, NAK80, SM45C, KP4M

- Cutting condition**
 - vc(m/min) = 120~150
 - fz(mm/t) = 0.07~0.13
 - ap(mm) = 2.0
 - dry

- Designation**
 - INSERT SDCN42MT
 - CUTTER ADN4315R

- Test result**

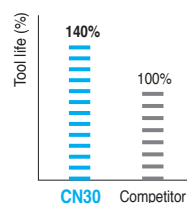


P SM55C, KP4M

- Cutting condition**
 - vc(m/min) = 230
 - fz(mm/t) = 0.1~0.15
 - ap(mm) = 1.0
 - dry

- Designation**
 - INSERT SDCN42MT
 - CUTTER ADN4315R

- Test result**



Selection system

| Workpiece | P Steel | | | | M Stainless steel | | | K Cast iron | | | N Nonferrous | | | S HRSA | | | H Hardened | | |
|------------------------------|------------|--------------|--------------------|-----------------------------|-------------------|--------------|--------------------|-------------|--------------|--------------------|--------------|--------------|-----------|------------|--------------|-----------|------------|--------------|-----------|
| | High speed | Medium speed | Low speed roughing | Interrupted heavy machining | High speed | Medium speed | Low speed roughing | High speed | Medium speed | Low speed roughing | High speed | Medium speed | Low speed | High speed | Medium speed | Low speed | High speed | Medium speed | Low speed |
| Coated Cemented Carbide | PC203F | | | | PC210 | | | PC203F | | | ND3000 | | | PC210 | | | PC203F | | |
| | PC220 | | | | PC220 | | | PC220 | | | PD3000 | | | PC210C | | | | | |
| Micro grain Cemented Carbide | FS1 | | | | FS1 | | | | | | H01 | | | | | | | | |
| | FA2 | | | | FCC | | | FA2 | | | FA2 | | | | | | | | |

Selection system

| Workpiece | Recommended grade | Recommended cutting speed(m/min) | ISO | Application range |
|-------------------|-------------------|----------------------------------|-----|-------------------|
| P Steel | PC203F(H-Max) | 130~260 | P01 | PC203F (H-Max) |
| | | | P10 | |
| | PC220(I-Max) | 80~150 | P20 | PC220 (I-Max) |
| | | | P30 | |
| M Stainless steel | PC210 | 80~150 | M10 | PC210 |
| | | | M20 | |
| K Cast iron | PC203F(H-Max) | 130~260 | K01 | PC203F (H-Max) |
| | | | K10 | |
| | PC220(I-Max) | 80~150 | K20 | PC220 (I-Max) |
| | | K30 | | |
| S HRSA | PC210 | 50~100 | S15 | PC210 |
| | | | S25 | |
| N Nonferrous | ND3000(D-Max) | 150~250 | N01 | ND3000(D-Max) |
| | PD3000 | 150~250 | N10 | PD3000 |
| | PC210C(C-Max) | 150~250 | N20 | PC210C(C-Max) |

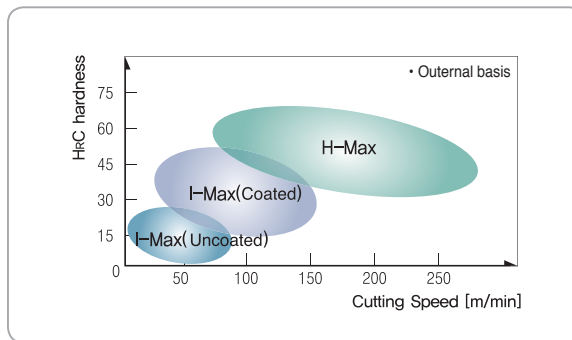
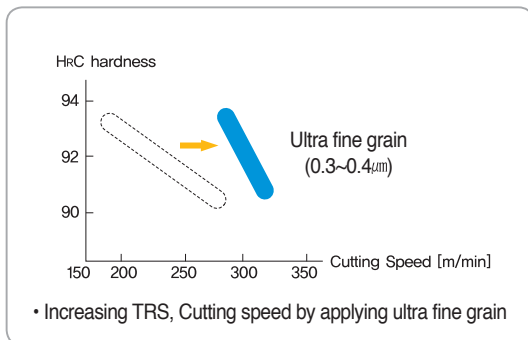
The features of PVD coated grades

| PVD Coated grades | ISO | Features |
|-------------------|------------------------|--|
| PC203F (H-Max) | P01 ~ P10 K01 ~ K10 | <ul style="list-style-type: none"> • Suitable for high speed cutting of steel • Combination of tough ultra fine grain substrate and PVD coating provide superior wear resistance and chipping resistance • New concept of coating equipped with high temperature oxidation resistance and high hardness |
| PC210 | M10 ~ S20 S15 ~ S25 | <ul style="list-style-type: none"> • Suitable for medium/low speed cutting of steel, stainless steel and super alloy • Ultra fine grain with coating provide superior tool life in high speed cutting |
| PC210C (C-Max) | N10 ~ N20 | <ul style="list-style-type: none"> • Medium to high speed machining of copper • Excellent combination of chipping resistance substrate and K-Silver coating file having wear resistance, good lubrication |
| PC220 (I-Max) | P15 ~ P35 K15 ~ K35 | <ul style="list-style-type: none"> • General cutting for steel • Combination ultra fine grain and hard coating provide wear resistance and chip welding resistance. • Superior new coating to better chipping resistance and wear resistance |
| ND3000 | N01 ~ N10 | <ul style="list-style-type: none"> • For electrode machining of graphite at medium to high speeds • Dia. coating layer with high wear resistance and lubrication |
| PD3000 | N05 ~ N15 | <ul style="list-style-type: none"> • For non-ferrous metals(Aluminum alloy) machining • DLC(Diamond Like Carbon) coating layer with high wear resistance and lubrication |



Ultra fine grain cemented carbide

- Features** ▶ Ultra fine grade has better toughness than general cemented carbide with same hardness. These properties allow it to replace High Speed Steel
- ▶ This is achieved through a high oxidation temperature(1200°C) with high hardness, and provides superior performance for high speed cutting and dry cutting



Features of Korloy endmills

| Index | Features |
|--|--|
| H-Max (for high speed, high hardened steel) | <ul style="list-style-type: none"> • New design for hardened steel cutting (over HRC53). Special sphere tool geometry provides increased tool life and allows higher speeds and feed operations • Combination TiAlN hard coating with suitable substrate increases tool life |
| I-Max (Coated, General machining) | <ul style="list-style-type: none"> • Superior wear resistance and chipping resistance by applying ultra fine grain and Korloy's exclusive PVD layer • Available for various machining from roughing to finishing |
| I-Max (Carbide endmills) | <ul style="list-style-type: none"> • Suitable for all milling types such as jig and molding with various designation • Multi purpose machining possible(shouldering, slotting) |
| Hard to cut machining, stainless steel | <ul style="list-style-type: none"> • Sharp cutting edge and high rake angle with streamline chip pocket shows good cutting performance in stainless steel machining where work hardening is a problem. |
| Carbide endmills for aluminum alloy (SSEA, SSBEA) | <ul style="list-style-type: none"> • Suitable for high speed machining in aluminum and other non-ferrous materials • Can accomplish excellent surface finishing, superior chip removal in high feed rate |
| Micro endmills (MSE/MSBE) | <ul style="list-style-type: none"> • Small size endmills, for various micro machining, has been strengthened in the neck for protection against fracture at high speeds |
| C-Max | <ul style="list-style-type: none"> • Excellent combination of chipping resistant substrate and CrN coating film having wear resistance and chipping resistance |
| D-Max | <ul style="list-style-type: none"> • Optimum coated property with fine diamond particle in nonferrous metal machining as graphi increasing tool life and good surface roughness through improved edge geometry • Available to cutting application in intermittent cutting condition and high precision machining as well |



Selection system

| Workpiece | P Steel | | | | M Stainless steel | | | K Cast iron | | | N Nonferrous | | | S HRSA | | | H Hardened | | | |
|------------------------------|------------|--------------|--------------------|-----------------------------|-------------------|--------------|--------------------|-------------|--------------|--------------------|--------------|--------------|-----------|------------|--------------|-----------|------------|--------------|-----------|-----|
| | High speed | Medium speed | Low speed roughing | Interrupted heavy machining | High speed | Medium speed | Low speed roughing | High speed | Medium speed | Low speed roughing | High speed | Medium speed | Low speed | High speed | Medium speed | Low speed | High speed | Medium speed | Low speed | |
| Coated Cemented Carbide | | PC205F | | | PC205F | | | PC205F | | | | | | PC205F | | | | PC205F | | |
| Micro grain Cemented Carbide | | FG2 | | | FG2 | | | FG2 | | | FG2 | | | | | | | | | FG2 |

Selection system

| Workpiece | Recommended grade | Recommended cutting speed (m/min) | ISO | Application range |
|-------------------|-------------------|-----------------------------------|-----|-------------------|
| P Steel | PC205F | 130~250 | P01 | |
| | | | P10 | |
| | | | P20 | |
| | | | P30 | |
| M Stainless steel | PC205F | 80~180 | M01 | |
| | | | M10 | |
| | | | M20 | |
| | | | M30 | |
| K Cast iron | PC205F | 130~250 | K01 | |
| | | | K10 | |
| | | | K20 | |
| | | | K30 | |
| S HRSA | PC205F | 80~130 | S01 | |
| | | | S10 | |
| | | | S20 | |
| | | | S30 | |

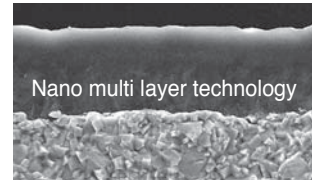
The features of PVD coated grades

| PVD Coated grades | ISO | Features |
|-------------------|--|--|
| PC205F | P15 ~ P30 M15 ~ M30 K15 ~ K30 S15 ~ S25 | <ul style="list-style-type: none"> Solid drill (under $\varnothing 20$) for steel, stainless steel and super alloy Superior wear resistance and chipping resistance with ultra fine grain |



Diamond Coated Grades

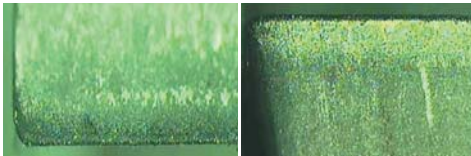
- Features**
 - Increased tool life of up to 150% due to Korloy Nano technology
 - The nano-size (~100nm) of diamond particles decreases the friction coefficient. Less friction leads to better chip flow
 - Due to the minimized built-up on the cutting edge, machined surfaces retain a better finish



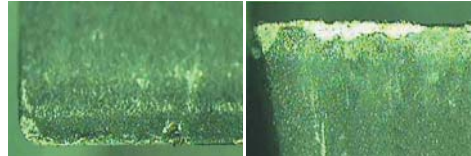
ND1000/ND2000 coating structure

Cutting Performance of ND2000

ND2000



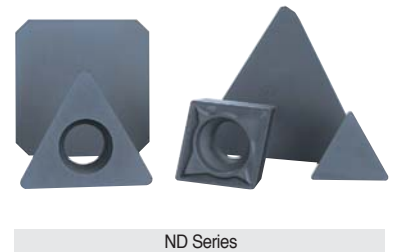
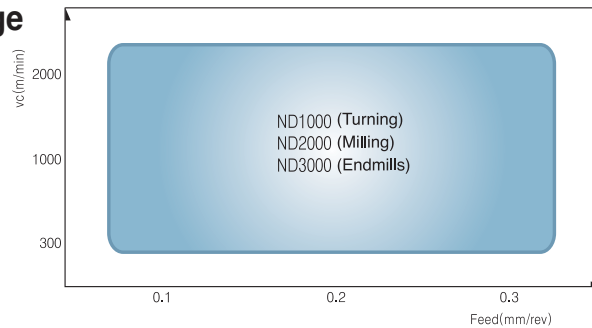
ND200



- Cutting length : 10m
- Workpiece : AC8A
- Speed(vc) : 950m/min
- Depth of cut(ap) : 5mm
- Feed(fz) : 0.15mm/t
- Coolant : Dry

(APKT1604PDR-MA, AMS3063S)

Application range

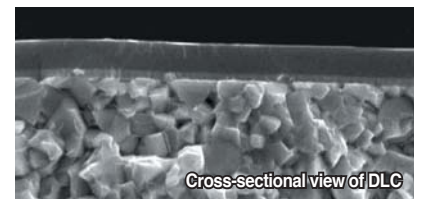


Available Products

- AR Chip breaker
- AK Chip breaker
- Insert for Aluminum machining

DLC Coated Grades

- Features**
 - Hardness of film is up to Hv 7000, tool life is 3~6times of cemented carbide cutting tool
 - Good surface finish can be acquired due to the lubrication effect that led from low friction coefficient (<0.1)
 - Suitable for non-ferrous material machining



Cross-sectional view of DLC

- Application**
 - For aluminum, carbon, plastic, wood / Insert, drill, endmill

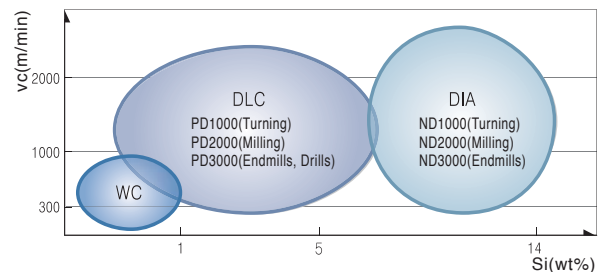
Cutting performance

(Built-up edge / surface finish, FMACM3100R)

| View Grade | Top face | Major cutting edge | Surface finish of workpiece |
|------------|----------|--------------------|-----------------------------|
| Uncoated | | | |
| DLC | | | |

- Workpiece : AC2B
- Cutting length : 12m • Cutting condition : vc=1500m/min, fz=0.15mm/t, ap=2mm, Dry

Application range



Leader of DLC coated cutting tool for aluminum machining

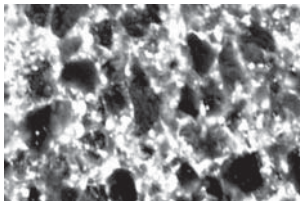


Brand new cBN insert

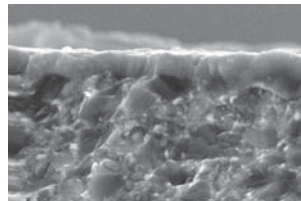
Coated Multi-Cornered cBN

DNC250

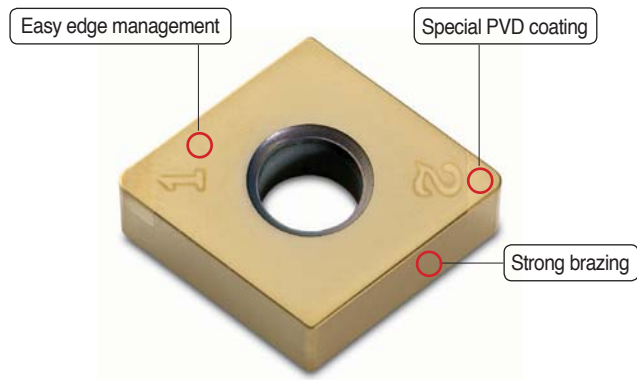
- Stable and long tool life
- Cost effective by multi-cornered one-use insert



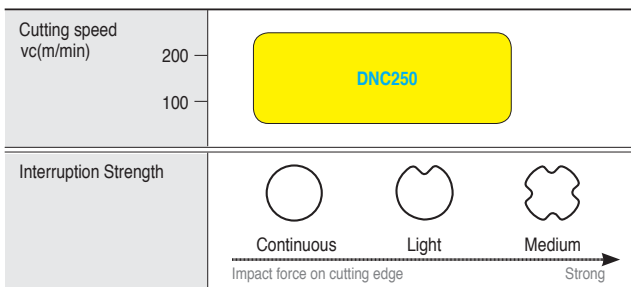
- Black Position : cBN
- White Position : paste



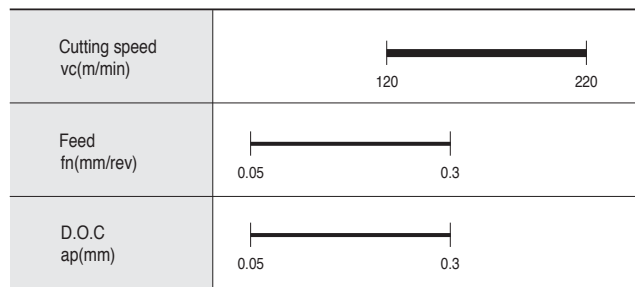
- New technology K-Gold PVD Coated
- Lubricant film
- Enhance wear Resistance



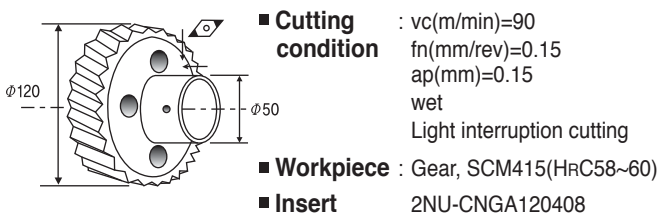
Application range



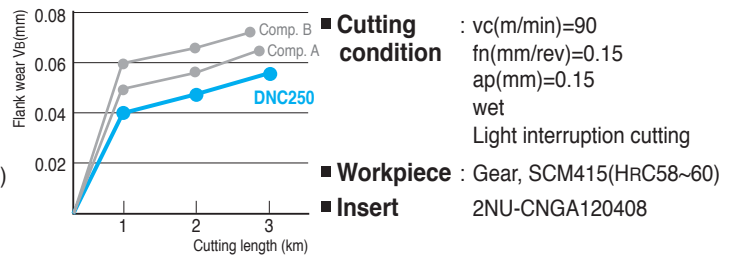
Recommended Cutting Condition



Application Example



Cutting performance Continuous

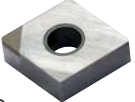
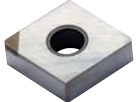
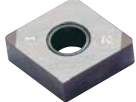
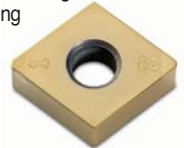


Features of cBN Grade

| Type | Grade | Applications | Features |
|----------|--------|---|---|
| Uncoated | KB410 | High speed continuous cutting of hardened steel | Best wear resistance grade and suitable for high speed continuous cutting |
| | KB420 | High efficiency cutting of hardened steel | Binder with high heat resistance improve tool life during high speed machining |
| | KB425 | High speed interrupted cutting of hardened steel | Superior fracture resistance and suitable for high speed interrupted hard turning |
| | KB320 | Continuous cutting and interrupted cutting of hardened steel | Micro grain cBN with ceramic binder improve fracture resistance and wear resistance |
| | KB210 | High speed continuous and interrupted cutting of hardened steel | Superior fracture resistance for high interrupted hard turning |
| | KB335 | Interrupted cutting of hardened steel | Micro grain cBN with higher fracture resistance and wear resistance |
| | KB350 | High speed precision machining of cast iron (GC/GCD) | High fracture resistance and wear resistance |
| Coated | KB370 | High speed machining of cast iron and Exotic alloys | The highest hardness and toughness acquire good performance for difficult-to-cut material and cast iron |
| | DNC250 | High efficiency and interrupted cutting of hardened steel | Excellent wear resistance, Cost effective by multi-cornered one-use insert |



● Type of cBN insert

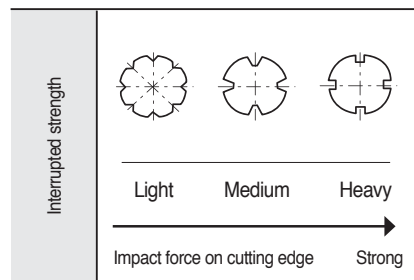
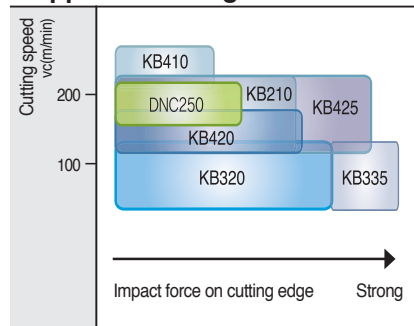
| Regrinding type | One use type | Multi edge type | cBN Coated Multi-Cornered cBN |
|--|--|---|---|
| | | | |
| <ul style="list-style-type: none"> Long tool life Excellent wear resistance, High hardness Saved tool cost due to the regrinding insert 3~4 time  <p>CNMA120408</p> | <ul style="list-style-type: none"> Economical price Cost down Simple tool management Various line-up Stable machining and long tool life due to strong brazing technology  <p>NU CNMA120408</p> | <ul style="list-style-type: none"> Insert with several brazed cBN Price per edge is more reasonable compare to normal single cornered, one-used type Wide application of continuous to interrupted machining  <p>2NU CNGA120408</p> | <ul style="list-style-type: none"> Easy Edge Management Specail PVD Coating Strong Brazing  |

● For general hardened steel machining

• Recommended cutting condition

| Grade | Cutting Speed, vc(m/min) | Feed | | | |
|--------|--------------------------|----------------|------------|----------------|------------|
| | | f_n (mm/rev) | a_p (mm) | f_n (mm/rev) | a_p (mm) |
| KB410 | 150 — 200 | 0 | 0.1 | 0.2 | 0.3 |
| | | 0.03 — 0.13 | 0.03 — 0.2 | | |
| KB420 | 120 — 150 | 0 | 0.1 | 0.2 | 0.3 |
| | | 0.03 — 0.3 | 0.03 — 0.5 | | |
| KB425 | 150 — 200 | 0 | 0.1 | 0.2 | 0.3 |
| | | 0.03 — 0.3 | 0.03 — 0.5 | | |
| KB320 | 80 — 120 | 0 | 0.1 | 0.2 | 0.3 |
| | | 0.03 — 0.2 | 0.03 — 0.3 | | |
| KB210 | 150 — 200 | 0 | 0.1 | 0.2 | 0.3 |
| | | 0.03 — 0.2 | 0.03 — 0.3 | | |
| KB335 | 80 — 110 | 0 | 0.1 | 0.2 | 0.3 |
| | | 0.03 — 0.2 | 0.03 — 0.3 | | |
| DNC250 | 120 — 220 | 0 | 0.1 | 0.2 | 0.3 |
| | | 0.05 — 0.3 | 0.05 — 0.3 | | |

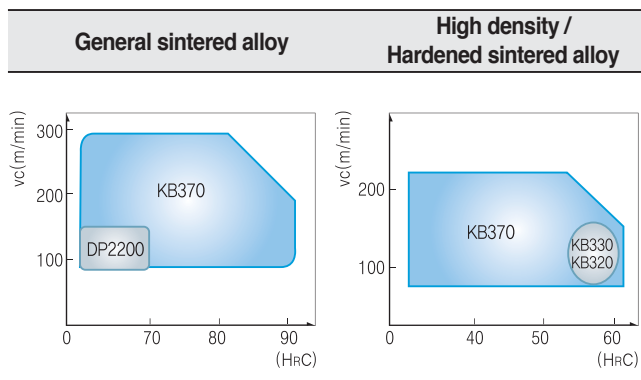
• Application range



● For valve seat ring (VSR)

| Division | Gasoline VSR material | Diesel VSR material |
|--------------------|-----------------------|---------------------|
| Plunge machining | KB370, KB330 | KB370, KB330 |
| Traverse machining | KB370, KB350 | KB370, KB350 |
| Hardness(HV) | Low ← HV300 → High | Low ← HV300 → High |

● For sintered component machining

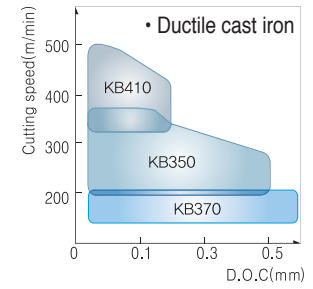
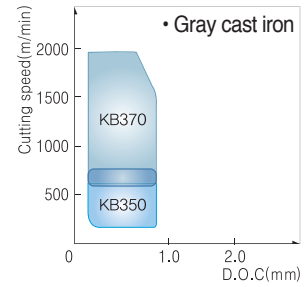


cBN for cast iron

• Recommended cutting condition

| division | Workpiece | | Cutting speed, vc(m/min) | | | fn (mm/rev) | ap (mm) |
|----------|-------------------|-------|--------------------------|------|------|----------------|------------|
| | Material | Grade | 100 | 1000 | 2000 | | |
| Turning | Gray cast iron | KB370 | 500 ————— 2000 | | | 0.1~0.5 | ≤ 1.0 |
| | | KB350 | 200 ————— 700 | | | 0.1~0.5 | ≤ 1.0 |
| | Alloyed cast iron | KB370 | 200 ————— 800 | | | 0.1~0.4 | ≤ 0.5 |
| | Ductile cast iron | KB370 | 80 ————— 200 | | | 0.1~0.4 | ≤ 0.6 |
| | | KB350 | 100 ————— 350 | | | 0.1~0.4 | ≤ 0.5 |
| | | KB410 | 250 ————— 500 | | | 0.1~0.4 | ≤ 0.5 |
| Milling | Gray cast iron | KB370 | 800 ————— 2000 | | | 0.1~0.5 | ≤ 0.5 |

• Application range



Technical information for PCD insert

Features KORLOY PCD products are manufactured by using high quality PCD tips under ultra high temperatures and pressure. The PCD tip is welded on the qualified KORLOY carbide insert
KORLOY high quality PCD products meet a wide range of application needs in turning, milling, and endmills.

- ▶ Excellent tool life for aluminum alloy and copper alloy
- ▶ Excellent tool life for Ceramic, high-Si aluminum and rock or stone
- ▶ Excellent tool life for rubber, carbon, graphite and wood

PCD Grade

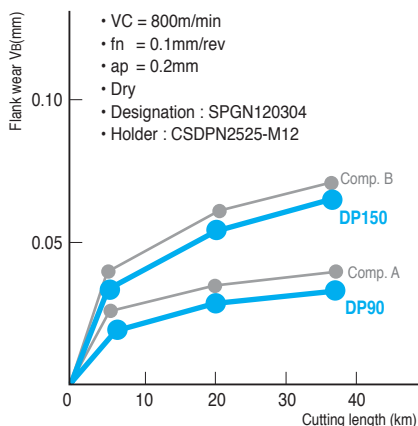
| Grade | Features | Application | Grain size(μm) | Hardness(Hv) | TRS(kgf/mm ²) |
|-------|---|---|-----------------------------|---------------|---------------------------|
| DP90 | Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy | Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone | 50 | 10,000~12,000 | 110 |
| DP150 | By use of fine diamond grain having good bonding property, it is suitable for machining of non-ferrous metal, graphite | High Si aluminum alloy Copper, Bronze alloy Rubber, Wood, Carbon | 5 | 10,000~12,000 | 200 |
| DP200 | By use of ultra fine diamond grain, it is possible to make sharp cutting edge. Thus it is appropriate grade to machine non-ferrous material | Plastic Wood Precise finishing of aluminum | 0.5 | 8,000~10,000 | 220 |

Recommended cutting condition

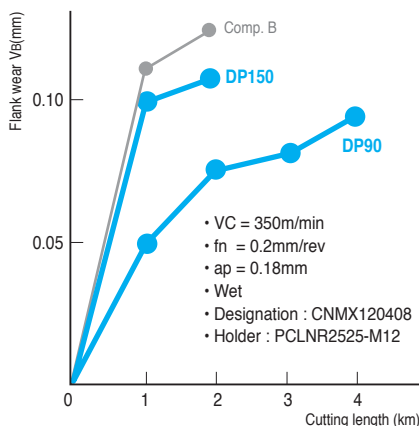
| Workpiece | Cutting speed (m/min) | Feed (mm/rev) | Depth of cut (mm) | Recommended grade | |
|-----------------------------|-----------------------|---------------|-------------------|-------------------|-----------------|
| | | | | 1 st | 2 nd |
| Aluminum alloy (4%~8% Si) | 1000 ~ 3000 | 0.1 ~ 0.6 | ~ 3 | DP150 | DP200 |
| Aluminum alloy (9%~14% Si) | 600 ~ 2500 | 0.1 ~ 0.5 | ~ 3 | DP150 | DP200 |
| Aluminum alloy (15%~18% Si) | 300 ~ 700 | 0.1 ~ 0.4 | ~ 3 | DP150 | DP200 |
| Copper, Bronze alloy | ~ 1000 | 0.05 ~ 0.2 | ~ 3 | DP150 | DP200 |
| Reinforced plastic | ~ 1000 | 0.1 ~ 0.3 | ~ 2 | DP150 | DP200 |
| Wood | ~ 4000 | 0.1 ~ 0.4 | - | DP150 | DP200 |
| Cemented carbide | 10 ~ 30 | ~ 0.2 | ~ 0.5 | DP90 | DP150 |

Cutting performance

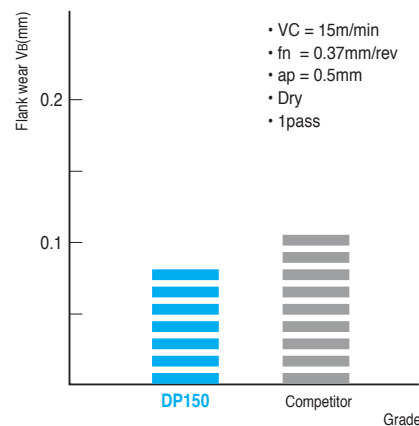
Continuous cutting test(Workpiece:Al-25%Si)











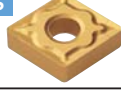


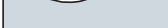
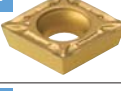
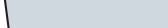
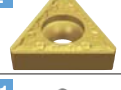
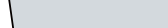

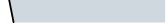
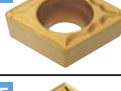

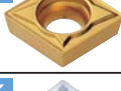
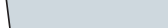

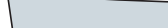


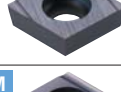
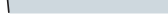
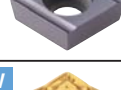
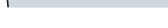

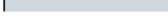
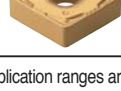
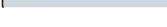
Interrupted cutting test(Workpiece:Al-20%Si)



Cutting test of cemented carbide



KORLOY Chip Breaker For Turning

| Geometry | Cutting edge | Application range | | | | | | | | | | | Features | | | | | | | | | | | |
|-------------------|--------------|---|---|---|------|------|-----|------|-----|-----|-----|------|----------|-----|------|-----|-----|-----|-----|-----|------|------|---|---|
| | | feed rate (mm/rev) | | | | | | | | | | | | | | | | | | | | | | |
| | | 0.04 | 0.063 | 0.10 | 0.16 | 0.25 | 0.4 | 0.63 | 1.0 | 1.6 | 2.5 | 4.0 | | 6.3 | | | | | | | | | | |
| depth of cut (mm) | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | 0.1 | 0.16 | 0.25 | 0.4 | 0.63 | 1.0 | 1.6 | 2.5 | 4.0 | 6.3 | 10.0 | 11.6 | 13 | |
| H Series | HS |  |  | | | | | | | | | | | | | | | | | | | | | For Medium cutting of Stainless steel <ul style="list-style-type: none"> • Exclusive design for stainless steel cutting provide longer tool life • Wear resistance have been reinforced through high rake angle of chip breaker land |
| G Series | GM |  |  | | | | | | | | | | | | | | | | | | | | | For Medium to Light cutting <ul style="list-style-type: none"> • Excellent chip control at general cutting conditions • Strong cutting edge strength provides good performance at intermittent and fast feed cutting |
| | GR |  |  | | | | | | | | | | | | | | | | | | | | | For Medium to Roughing <ul style="list-style-type: none"> • Suitable for deep depth of cut and high feed cutting of steel and cast iron • Suitable for intermittent cutting |
| | GH |  |  | | | | | | | | | | | | | | | | | | | | | For Heavy duty cutting <ul style="list-style-type: none"> • Suitable for heavy duty cutting due to strong cutting edge • Wide chip control range with low cutting force |
| | GS |  |  | | | | | | | | | | | | | | | | | | | | | For Medium to Roughing of Stainless-steel <ul style="list-style-type: none"> • Exclusive chip breaker for stainless steel |
| | B Series | B25 |  |  | | | | | | | | | | | | | | | | | | | | For General cutting <ul style="list-style-type: none"> • Suitable for general cutting condition cutting |
| V-post Series | VF |  |  | | | | | | | | | | | | | | | | | | | | For Finishing <ul style="list-style-type: none"> • Improved surface finish and size accuracy due to stable inner boring | |
| | VL |  |  | | | | | | | | | | | | | | | | | | | | For Finishing <ul style="list-style-type: none"> • Superior chip control in low carbon steel, pipes, and steel plates | |
| | VP1 |  |  | | | | | | | | | | | | | | | | | | | | For Finishing <ul style="list-style-type: none"> • Excellent chip control in application with micro depth of cut and low feed • Low cutting load and superb surface finish • Optimal for both internal and external machining | |
| H-post Series | HMP |  |  | | | | | | | | | | | | | | | | | | | | For Medium cutting <ul style="list-style-type: none"> • Excellent chip control at wide range of cutting conditions • Suitable for stainless steel cutting | |
| C Series | C25 |  |  | | | | | | | | | | | | | | | | | | | | For Medium cutting <ul style="list-style-type: none"> • Suitable for interrupted cutting and cast iron machining • Good surface finish due to low cutting force • Suitable for both boring and outer diameter turning | |
| AL Series | AK |  |  | | | | | | | | | | | | | | | | | | | | For Aluminum cutting <ul style="list-style-type: none"> • High rake angle and low resistance cutting edge secures long tool life in continuous cutting of aluminum turning • High speed of finishing operation | |
| | AR |  |  | | | | | | | | | | | | | | | | | | | | For Aluminum cutting <ul style="list-style-type: none"> • High stability of cutting edge secures great performance in high speed and interrupted machining • High speed of medium and interrupted operation | |
| Auto tool Series | KF |  |  | | | | | | | | | | | | | | | | | | | | For Finishing <ul style="list-style-type: none"> • Shallow depth of cut with sharp edge. • Longer tool life at high speed cutting due to low cutting force • Good surface finish | |
| | KM |  |  | | | | | | | | | | | | | | | | | | | | For Medium to Finish Cutting <ul style="list-style-type: none"> • Improved chip control makes tool life long and better machining | |
| Wiper tool Series | LW |  |  | | | | | | | | | | | | | | | | | | | | For Medium cutting(Wiper) <ul style="list-style-type: none"> • Guarantees excellent surface roughness and good chip controls at high feed machining | |
| | VW |  |  | | | | | | | | | | | | | | | | | | | | For Finishing(Wiper) <ul style="list-style-type: none"> • Improved surface roughness at shallow depth of cut and high feed due to strong cutting edge | |

Notice : Application ranges are based on main cutting material





B

TURNING

Korloy turning tools cover a wide application range with a full line-up of ISO tools and FGT tools that produce high quality and high precision parts for all manufacturers requirements.

TU

C O N T E N T S

Turning Chip Breakers

- B02** Application range of Korloy main Chip Breakers
- B04** Recommended Chip Breakers for Work piece
- B12** New chip breakers

Inserts

- B16** Turning Insert Code System(ISO)
- B18** Turning Insert
- B68** Aluminum Insert(Positive)
- B75** cBN Inserts
- B81** PCD Inserts

External Tool Holder

- B83** External tool Holder Code System(ISO)
- B84** Index for External Holder
- B87** Instruction of External Holder
- B88** Features of Double clamp / New lever lock system
- B89** Double clamp system
- B94** Lever Lock System
- B102** Wedge Clamp System
- B104** Clamp on System
- B106** Multi Lock System
- B113** Screw on System
- B120** Ceramic Holder



RNINING

Boring Bar

- B122** Boring Bar Code System(ISO)
- B123** Index for Boring Bar
- B125** Instruction of Boring Bar
- B126** Double clamp system
- B128** Lever Lock System
- B131** Clamp on System
- B132** Multi Lock System
- B134** Screw on System
- B140** Compact Mini
- B141** Carbide Shank Boring Bar

HSK/ KM Tooling system

- B146** HSK/ KM tooling system
Technical Information
- B148** HSK/ KM tooling system Index
- B149** HSK tooling system
- B155** KM tooling system

Cartridges

- B159** Cartridge Code System(ISO)
- B160** Index for Cartridge
- B161** Clamp on System
- B163** Screw on System

Auto tools

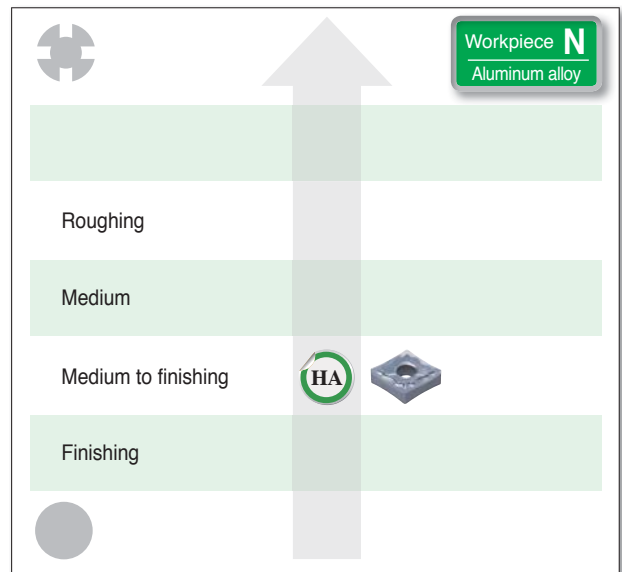
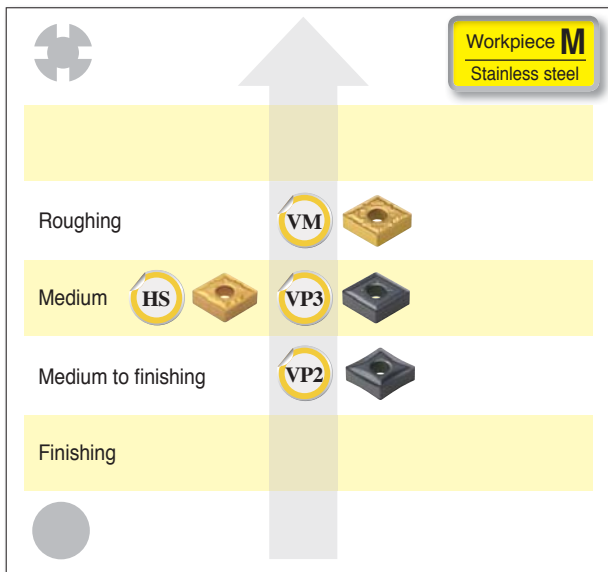
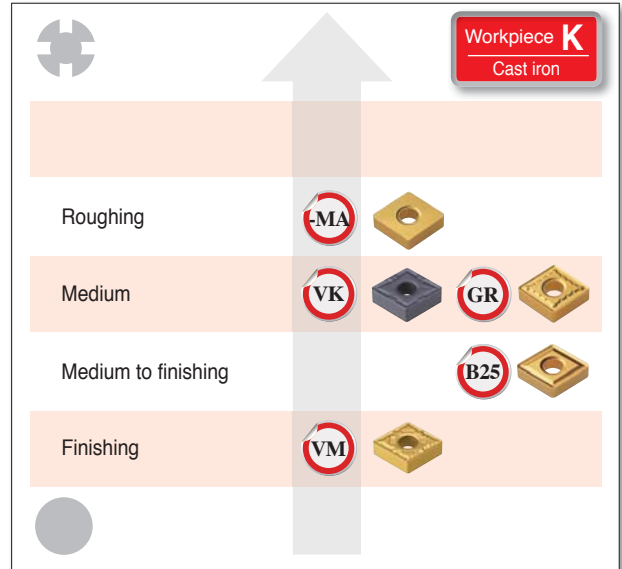
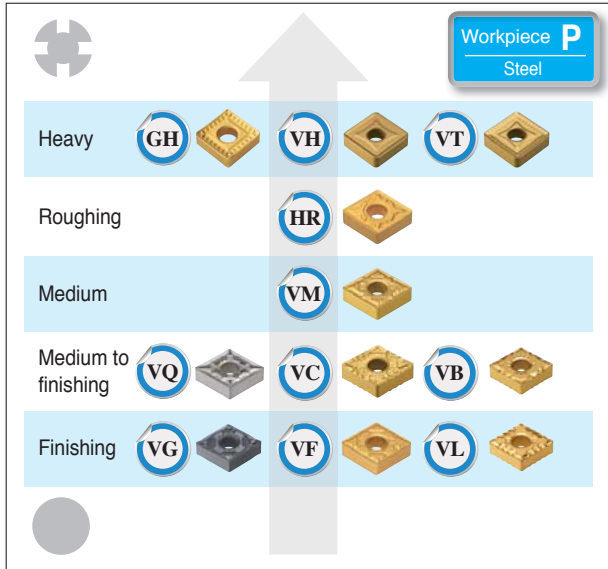
- B165** Technical Information for
Auto tools
- B166** Application Example / Index
- B167** ISO Type
- B169** Multi functional Type
- B171** MGT Type

MSB tools

- B172** MSB tools Technical Information
- B174** MSB tools
- B178** Sleeve

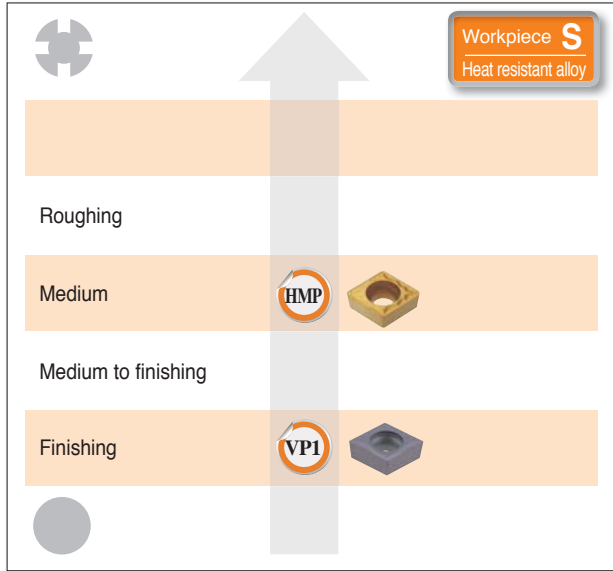
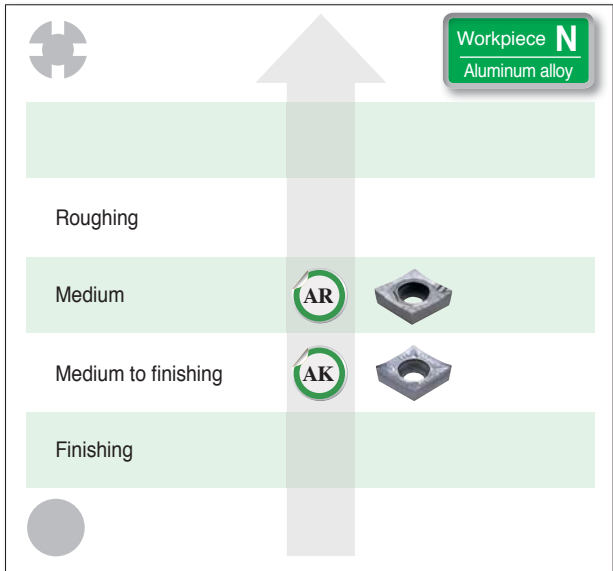
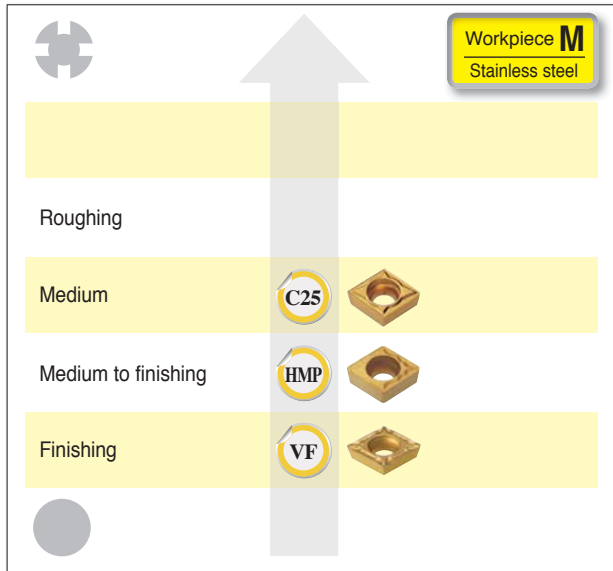
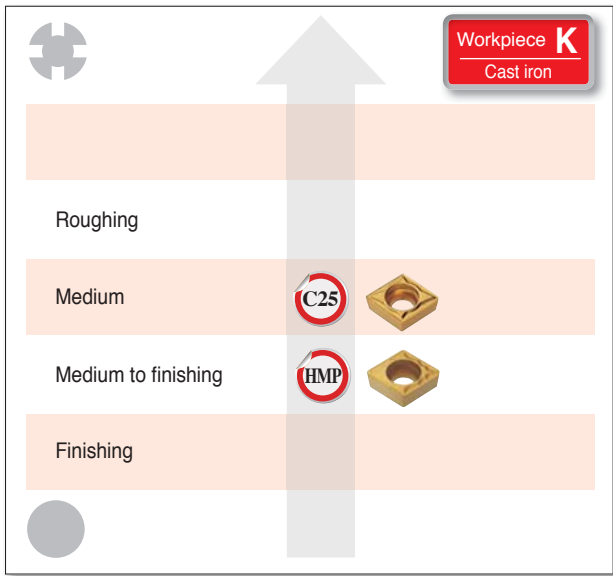
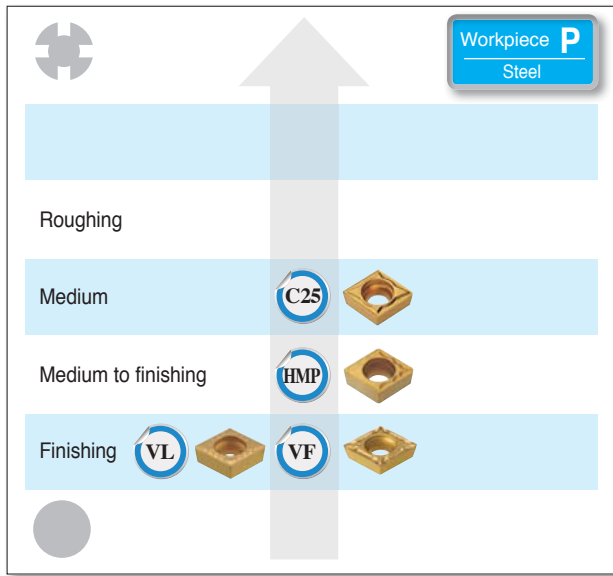
Applications range of chip breakers

🎯 Negative inserts



Applications range of chip breakers

Positive inserts



Recommended chip breaker for workpiece

Materials : SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel
 Hardness : under 180HB

Workpiece
P
 Steel

| Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | |
|--|-----|--------------|--------------------|--|--|----------------|----------------|----------------|----------------|----------------|----------------|
| | | | | | | 80° | 55° | 90° | 60° | 35° | 80° |
| Negative 0.2 ~ 1.5 finishing 0.5 ~ 1.5 finishing 0.5 ~ 2.0 finishing 0.5 ~ 3.5 medium to finishing 0.8 ~ 3.5 medium to finishing 1.0 ~ 5.0 medium machining 2.5 ~ 7.0 roughing 6.0 ~ 15.0 Heavy (General) 7.0 ~ 17.0 Heavy (High feed cutting) | VL | | 0.10 ~ 0.20 ~ 0.35 | NC3010 NC3220 CN1000 CN2000 | 300 300 270 260 | CNMG p. B20 | DNMG p. B25 | SNMG p. B31 | TNMG p. B38 | VNMG p. B43 | WNMG p. B46 |
| | VF | | 0.05 ~ 0.15 ~ 0.35 | NC3010 NC3120 NC3220 NC5330 | 310 270 310 230 | CNMG p. B20 | DNMG p. B25 | SNMG p. B32 | TNMG p. B39 | VNMG p. B43 | WNMG p. B46 |
| | VB | | 0.15 ~ 0.20 ~ 0.4 | NC3010 NC3220 CN1000 CN2000 | 300 250 230 200 | CNMG p. B20 | DNMG p. B25 | | TNMG p. B38 | | WNMG p. B46 |
| | VC | | 0.12 ~ 0.25 ~ 0.45 | NC3010 NC3220 NC3120 NC5330 | 290 250 250 200 | CNMG p. B20 | DNMG p. B25 | SNMG p. B31 | TNMG p. B38 | VNMG p. B43 | WNMG p. B46 |
| | HA | | 0.10 ~ 0.20 ~ 0.40 | NC3010 NC3120 NC3220 NC9025 | 300 230 230 180 | CNMG p. B19 | DNMG p. B24 | SNMG p. B30 | TNMG p. B37 | VNMG p. B42 | WNMG p. B45 |
| | VM | | 0.10 ~ 0.25 ~ 0.50 | NC3010 NC3120 NC3220 NC3030 NC5330 CN2000 | 270 230 230 210 200 220 | CNMG p. B21 | DNMG p. B25 | SNMG p. B32 | TNMG p. B39 | VNMG p. B44 | WNMG p. B47 |
| | HR | | 0.25 ~ 0.45 ~ 0.65 | NC3010 NC3120 NC3220 NC3030 | 150 130 130 100 | CNMG p. B19 | DNMG p. B24 | SNMG p. B31 | TNMG p. B38 | | WNMG p. B45 |
| | VH | | 0.70 ~ 1.00 ~ 1.40 | NC3010 NC3030 NC500H NC5330 | 50~250 50~150 50~150 50~150 | CNMM p. B22 | | SNMM p. B33 | | | |
| | VT | | 0.75 ~ 1.20 ~ 1.60 | NC3010 NC3030 NC500H NC5330 | 50~250 50~150 50~150 50~150 | CNMM p. B33 | | SNMM p. B33 | | | |

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Materials : SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel
Hardness : under 180HB

Workpiece
P
 Steel

| Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | |
|---|---------|--------------|---|--|---|--------------|--------|--------|---------|---------|--|
| | | | | | | | | | | | |
| Positive | VL | | 0.05 ~ 0.10 ~ 1.0 finishing | NC3010 NC3220 NC3120 NC5330 CN1000 CN2000 | 290 250 250 200 240 220 | CCMT | DCMT | SCMT | TC(P)MT | VC(B)MT | |
| | | | | | | | | | | | |
| | | | | | | p. B50 | p. B53 | p. B55 | p. B59 | p. B65 | |
| | | | | | | | | | | | |
| 0.1 ~ 0.5 ~ 1.5 finishing | VF | | 0.05 ~ 0.15 ~ 0.25 | NC3010 NC3220 NC3120 NC5330 CC105 CN1000 CN2000 | 280 250 250 260 240 220 | CCMT | DCMT | SCMT | TCMT | VCMT | |
| | | | | | | | | | | | |
| | | | | | | p. B50 | p. B53 | p. B55 | p. B59 | p. B45 | |
| | | | | | | | | | | | |
| 0.5 ~ 1.5 ~ 3.5 medium to finishing | HMP | | 0.08 ~ 0.20 ~ 0.40 | NC3010 NC3220 NC3120 NC5330 CN1000 CN2000 | 260 230 230 200 240 220 | CCMT | DCMT | SCMT | TCMT | VCMT | |
| | | | | | | | | | | | |
| | | | | | | p. B50 | p. B53 | p. B55 | p. B59 | p. B64 | |
| | | | | | | | | | | | |
| 1.0 ~ 2.0 ~ 3.0 medium machining | C25 | | 0.10 ~ 0.25 ~ 0.35 | NC3010 NC3220 NC3120 NC5330 CN1000 CN2000 | 250 220 220 200 240 220 | CCMT | DCMT | SCMT | TCMT | | |
| | | | | | | | | | | | |
| | | | | | | p. B50 | p. B54 | p. B55 | p. B59 | | |
| | | | | | | | | | | | |

●: The first recommended cutting condition



Recommended chip breaker for workpiece

Materials : S45C, S55C, SCM430, SCM440, etc. General steel
 Hardness : under 180~260HB

Workpiece
P
 Steel

| Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | | |
|-------------------|--|--------------|---------------|--------------------------|---|---|-------------------|-------------------|-------------------|-------------------|-------------------|----------------|
| | | | | | | 80° | 55° | 90° | 60° | 35° | 80° | |
| Negative | 0.5 ~ 1.0 ~ 1.5 finishing | VF | | 0.05 ~ 0.15 ~ 0.35 | NC3010 NC3220 NC3120 | 220 200 190 | CNMG p. B20 | DNMG p. B25 | SNMG p. B32 | TNMG p. B39 | VNMG p. B43 | WNMG p. B47 |
| | 0.5 ~ 1.0 ~ 2.0 finishing | VB | | 0.15 ~ 0.20 ~ 0.40 | NC3010 NC3220 CN1000 CN2000 | 300 250 230 200 | CNMG p. B20 | DNMG p. B25 | | TNMG p. B38 | | WNMG p. B46 |
| | 0.5 ~ 1.5 ~ 3.5 Medium to finishing | VC | | 0.12 ~ 0.25 ~ 0.45 | NC3010 NC3220 NC3120 CN5330 | 290 250 250 200 | CNMG p. B20 | DNMG p. B25 | SNMG p. B31 | TNMG p. B38 | VNMG p. B43 | WNMG p. B47 |
| | 1.0 ~ 2.5 ~ 5.0 medium machining | VM | | 0.10 ~ 0.25 ~ 0.50 | NC3010 NC3120 NC3220 NC3030 CN2000 | 200 170 180 150 170 | CNMG p. B21 | DNMG p. B25 | SNMG p. B32 | TNMG p. B39 | VNMG p. B44 | WNMG p. B47 |
| | 2.5 ~ 4.0 ~ 7.0 roughing | HR | | 0.25 ~ 0.45 ~ 0.65 | NC3010 NC3120 NC3220 NC3030 | 170 150 150 130 | CNMG p. B19 | DNMG p. B24 | SNMG p. B31 | TNMG p. B38 | | WNMG p. B46 |
| | 6.0 ~ 10.0 ~ 15.0 Heavy (General) | VH | | 0.70 ~ 1.00 ~ 1.40 | NC3010 NC3030 NC500H NC5330 | 50~250 50~150 50~150 50~150 | CNMM p. B22 | | SNMM p. B33 | | | |
| | 7.0 ~ 12.0 ~ 17.0 Heavy (High feed cutting) | VT | | 0.75 ~ 1.20 ~ 1.60 | NC3010 NC3030 NC500H NC5330 | 50~250 50~150 50~150 50~150 | CNMM p. B22 | | SNMM p. B33 | | | |
| Positive | 0.1 ~ 0.5 ~ 1.0 finishing | VL | | 0.05 ~ 0.10 ~ 0.20 | NC3010 NC3220 NC3120 NC5330 CN1000 CN2000 | 290 250 250 200 240 220 | CNMG p. B50 | DNMG p. B53 | SNMG p. B55 | TNMG p. B59 | VNMG p. B65 | |
| | 0.1 ~ 0.5 ~ 1.5 finishing | VF | | 0.05 ~ 0.15 ~ 0.25 | NC3010 NC3120 NC3220 NC5330 CC105 CN1000 CN2000 | 280 250 250 250 260 270 260 | CCMT p. B50 | DCMT p. B53 | SCMT p. B55 | TCMT p. B59 | VCMT p. B64 | |
| | 0.1 ~ 0.5 ~ 1.5 finishing | HFP | | 0.05 ~ 0.15 ~ 0.25 | NC3010 NC3120 NC3220 NC5330 CC105 CN1000 | 220 190 190 180 260 200 | CCG(M)T p. B50 | DCG(M)T p. B53 | SCG(M)T p. B55 | TCG(M)T p. B59 | VCG(M)T p. B64 | |
| | 1.0 ~ 2.0 ~ 3.0 medium machining | C25 | | 0.10 ~ 0.25 ~ 0.35 | NC3010 NC3120 NC3220 NC3030 CN1000 CN2000 | 200 170 180 150 170 160 | CCMT p. B50 | DCMT p. B54 | SCMT p. B55 | TCMT p. B59 | | |

● : The first recommended cutting condition

Recommended chip breaker for workpiece

Materials : SNC415, SNC815, SNCM240, SNCM439, STS12, STS61, etc
 SCM440, Hardened steel
 Hardness : 260~350HB

Workpiece
P
 Steel

| Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | |
|-------------------|---|--------------|--------------------|---|---|--------------|---------|---------|---------|---------|------|
| | | | | | | 80° | 55° | 90° | 60° | 35° | 80° |
| Negative | 0.5 ~ 1.0 ~ 1.5 finishing | VF | 0.08 ~ 0.15 ~ 0.30 | NC3010 NC3220 NC3120 | 130 110 110 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG |
| | 0.5 ~ 1.0 ~ 2.0 finishing | VB | 0.15 ~ 0.20 ~ 0.40 | NC3010 CN1000 CN2000 | 300 230 200 | CNMG | DNMG | | TNMG | | WNMG |
| | 0.5 ~ 1.5 ~ 3.5 Medium to finishing | VC | 0.12 ~ 0.25 ~ 0.45 | NC3010 NC3220 NC3120 CN5330 | 290 250 250 200 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG |
| | 1.0 ~ 2.5 ~ 5.0 medium to roughing | VM | 0.15 ~ 0.25 ~ 0.50 | NC3010 NC3120 NC3220 CN2000 | 130 100 110 90 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG |
| | 2.5 ~ 4.0 ~ 7.0 roughing | HR | 0.25 ~ 0.35 ~ 0.60 | NC3010 NC3120 NC3220 NC3030 | 100 90 90 80 | CNMG | DNMG | SNMG | TNMG | | WNMG |
| | 6.0 ~ 10.0 ~ 15.0 Heavy (General) | VH | 0.70 ~ 1.00 ~ 1.40 | NC3010 NC3030 NC500H NC5330 | 50~250 50~150 50~150 50~150 | CNMM | | SNMM | | | |
| | 7.0 ~ 12.0 ~ 17.0 Heavy (High feed cutting) | VT | 0.75 ~ 1.20 ~ 1.60 | NC3010 NC3030 NC500H NC5330 | 50~250 50~150 50~150 50~150 | CNMM | | SNMM | | | |
| Positive | 0.1 ~ 0.5 ~ 1.0 finishing | VL | 0.05 ~ 0.10 ~ 0.20 | NC3010 NC3220 NC3120 NC5330 CN1000 CN2000 | 290 250 250 200 200 180 | CCMT | DCMT | SCMT | TC(P)MT | VC(B)MT | |
| | 0.1 ~ 0.5 ~ 1.5 finishing | VF | 0.05 ~ 0.15 ~ 0.25 | NC3010 NC3120 NC3220 NC5330 CC105 CN1000 CN2000 | 280 250 250 250 260 250 240 | CCMT | DCMT | SCMT | TCMT | VCMT | |
| | 0.1 ~ 0.5 ~ 1.5 finishing | HFP | 0.05 ~ 0.15 ~ 0.25 | NC3010 NC3120 NC3220 CC105 | 130 110 120 120 | CCG(M)T | DCG(M)T | SCG(M)T | TCG(M)T | VCG(M)T | |
| | 1.0 ~ 2.0 ~ 3.0 medium machining | C25 | 0.10 ~ 0.25 ~ 0.35 | NC3010 NC3120 NC3220 NC3030 CN1000 CN2000 | 110 100 100 90 100 90 | CCMT | DCMT | SCMT | TCMT | | |

●: The first recommended cutting condition

B Turning Chip Breakers

Recommended chip breaker for workpiece

Materials : STS304, STS316, STS430, STS630
 Ferrite, austenite, martensite, precipitation hardening stainless steels
 Hardness : 135~300HB

Workpiece
M
 Stainless steel

| Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | | | | | | | | |
|--|---|-----------------------------------|-------------------------|--|---|---|---|--------|-------------------------|--|--|--------------------------|--------|--------|--------|--------|--------|--------|
| | | | | | | 80° | 55° | 90° | 60° | 35° | 80° | | | | | | | |
| Negative | 1.0 ~ 2.5 ~4.0 medium machining | | | 0.10 ~ 0.25 ~0.40 | PC8110 NC9025 PC5300 PC9030 | 280 200 160 120 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG | | | | | | |
| | | | | | | | p. B20 | p. B24 | p. B31 | p. B38 | p. B42 | p. B46 | | | | | | |
| | | | | | | | 2.0 ~ 4.5 ~6.5 roughing | | | 0.20 ~ 0.40 ~0.60 | PC8110 NC5330 PC5300 PC9030 | 250 180 150 120 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG |
| | | | | | | | | | | | | | p. B21 | p. B25 | p. B32 | p. B39 | p. B44 | p. B47 |
| | 0.5 ~ 1.5 ~4.0 Medium to finishing | | | 0.05 ~ 0.20 ~0.40 | PC8110 NC9025 PC5300 PC9030 | 250 180 150 120 | | | | | | | CNMG | DNMG | SNMG | TNMG | | WNMG |
| | | | | | | | | | | | | | p. B21 | p. B26 | p. B32 | p. B39 | | p. B48 |
| | | | | | | | 1.0 ~ 2.0 ~4.5 Medium | | | 0.10 ~ 0.25 ~0.45 | PC8110 NC9025 PC5300 PC9030 | 280 200 160 120 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG |
| | | | | | | | | | | | | | p. B21 | p. B26 | p. B32 | p. B39 | p. B43 | p. B48 |
| | Positive | 0.1 ~ 0.5 ~1.5 finishing | | 0.05 ~ 0.15 ~0.25 | NC3010 NC3120 NC3220 NC5330 CC105 CN1000 CN2000 | 280 250 250 250 260 270 260 | | | | | | | CCMT | DCMT | SCMT | TCMT | VCMT | |
| | | | | | | | | | | | | | p. B50 | p. B53 | p. B55 | p. B59 | p. B65 | |
| | | | | | | | 0.5 ~ 1.5 ~3.0 medium to finishing | | 0.10 ~ 0.20 ~0.30 | PC8110 NC9025 PC5300 PC9030 CN1000 CN2000 | 250 200 180 150 260 240 | CCMT | DCMT | SCMT | TCMT | VCMT | | |
| | | p. B50 | p. B53 | p. B55 | p. B59 | p. B65 | | | | | | | | | | | | |
| 1.0 ~ 1.5 ~3.0 medium machining | | | 0.15 ~ 0.25 ~0.35 | PC8110 NC9025 PC5300 PC9030 CN1000 CN2000 | 250 200 170 140 150 130 | CCMT | | | | | | DCMT | SCMT | TCMT | | | | |
| | | | | | | p. B50 | p. B54 | p. B55 | p. B59 | | | | | | | | | |

•: The first recommended cutting condition

Recommended chip breaker for workpiece

Materials : GC250, GC300, GCD400, GCD700, etc : Gray cast iron, Ductile cast iron
 Hardness : 135 ~185HB
 Tensile strength : 450N/mm²



| Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | | |
|---|--|--------------|--------------------|---|---|-------------------------------|--------|--------|--------|--------|--------|--------|
| | | | | | | 80° | 55° | 90° | 60° | 35° | 80° | |
| Negative 1.0 ~ 2.5 ~ 6.0 roughing | C/B None | | 0.15 ~ 0.30 ~ 0.60 | KB410 KB350 KB370 NC6205 NC6210 NC315K | 150 ~ 200 200 ~ 500 500 ~ 2000 250 ~ 450 200 ~ 350 150 ~ 300 | CNMA | DNMA | SNMA | TNMA | | | |
| | | | | | | p. B18 | p. B23 | p. B29 | p. B36 | | | |
| | 0.5 ~ 2.0 ~ 3.5 medium to finishing | B25 | | 0.20 ~ 0.35 ~ 0.60 | NC6205 NC6210 NC315K | 400~450 300~400 150~250 | CNMG | DNMG | SNMG | TNMG | VNMG | |
| | | | | | | | p. B18 | p. B23 | p. B29 | p. B36 | p. B45 | |
| | 1.0 ~ 2.5 ~ 4.0 medium machining | VM | | 0.15 ~ 0.30 ~ 0.50 | NC6205 NC6210 NC315K | 450~550 350~450 200~250 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG |
| | | | | | | | p. B21 | p. B25 | p. B32 | p. B39 | p. B44 | p. B47 |
| 1.0 ~ 3.0 ~ 4.5 medium to roughing | GR | | 0.20 ~ 0.35 ~ 0.50 | NC6205 NC6210 NC315K | 450~550 350~450 200~250 | CNMG | DNMG | SNMG | TNMG | | WNMG | |
| | | | | | | p. B19 | p. B23 | p. B30 | p. B37 | | p. B45 | |
| 1.0 ~ 2.5 ~ 5.0 medium to roughing | VK | | 0.15 ~ 0.25 ~ 0.50 | NC6205 NC6210 NC315K | 450~550 350~450 200~250 | CNMG | DNMG | SNMG | TNMG | VNMG | WNMG | |
| | | | | | | p. B22 | p. B26 | p. B33 | p. B40 | p. B44 | p. B48 | |
| 4.3 ~ 6.5 ~ 10.0 heavy roughing | GH | | 0.30 ~ 0.70 ~ 1.10 | NC6210 NC315K | 180 150 | CNMM | | SNMM | | | | |
| | | | | | | p. B22 | | p. B33 | | | | |
| Positive 0.5 ~ 1.5 ~ 3.0 medium to finishing | HMP | | 0.08 ~ 0.20 ~ 0.40 | NC6205 NC6210 NC315K | 250 230 200 | CCMT | DCMT | SCMT | TCMT | VCMT | | |
| | | | | | | p. B50 | p. B53 | p. B55 | p. B59 | p. B65 | | |
| 1.0 ~ 2.0 ~ 3.5 medium machining | C25 | | 0.10 ~ 0.25 ~ 0.40 | NC6205 NC6210 NC315K | 250 230 200 | CCMT | DCMT | SCMT | TCMT | | | |
| | | | | | | p. B50 | p. B54 | p. B55 | p. B59 | | | |

• : The first recommended cutting condition



B Turning Chip Breakers

Recommended chip breaker for workpiece

Materials : Aluminum alloy
Hardness : 20~110HB

Workpiece
N
Aluminum alloy

| | Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | |
|----------|--|-----|--------------|--------------------|-------------------------|-----------------------|--------------|------------|------------|------------|------------|------------|
| | | | | | | | 80° | 55° | 90° | 60° | 35° | 80° |
| Negative | 0.5 ~ 2.0 ~ 6.0 medium machining | HA | | 0.10 ~ 0.20 ~ 0.50 | H01 | 500 | p. B19 | p. B24 | p. B30 | p. B37 | p. B42 | p. B45 |
| | | | | | | | | | | | | |
| Positive | 0.1 ~ 1.0 ~ 4.0 medium to finishing | AK | | 0.03 ~ 0.20 ~ 0.40 | H01 ND1000 PD1000 | 1000 | p. B68 | p. B69 | p. B71 | p. B72 | p. B73 | p. B70 |
| | | | | | | | | | | | | |
| | 0.5 ~ 1.5 ~ 4.0 medium machining | AR | | 0.05 ~ 0.30 ~ 0.50 | H01 ND1000 PD1000 | 1000 | p. B68 | p. B69 | p. B71 | p. B72 | p. B73 | p. B70 |

• The first recommended cutting condition

Recommended chip breaker for workpiece

Materials : Copper Bronze alloy
Hardness : 20~110HB

Workpiece
N
Aluminum alloy

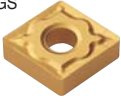







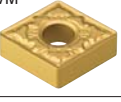
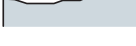










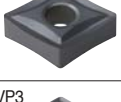













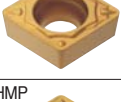



















| | Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | |
|----------|--|-----|--------------|--------------------|--------|-----------------------|--------------|------------|------------|------------|------------|------------|
| | | | | | | | 80° | 55° | 90° | 60° | 35° | 80° |
| Negative | 0.5 ~ 2.0 ~ 4.0 medium machinin | HA | | 0.10 ~ 0.20 ~ 0.50 | H01 | 1000 | p. B19 | p. B24 | p. B30 | p. B37 | p. B42 | p. B45 |
| | | | | | | | | | | | | |
| Positive | 0.1 ~ 1.0 ~ 3.0 medium to finishing | AK | | 0.03 ~ 0.20 ~ 0.30 | H01 | 1000 | p. B68 | p. B69 | p. B71 | p. B72 | p. B73 | p. B70 |
| | | | | | | | | | | | | |
| | 0.5 ~ 1.5 ~ 3.0 medium machinin | AR | | 0.05 ~ 0.25 ~ 0.40 | H01 | 1000 | p. B68 | p. B69 | p. B71 | p. B72 | p. B73 | p. B70 |

• The first recommended cutting condition

Recommended chip breaker for workpiece

Materials : Inconel, Nimonic, Stellite, Ti alloy
 Hardness : 160~350HB

Workpiece
S
 Heat resistant
 alloy

| Depth of cut (mm) | C/B | Cutting edge | Feed (mm/rev) | Grades | Cutting Speed (m/min) | Insert shape | | | | | | | | | | | | | |
|-------------------|---|---|---|-------------------------|--------------------------------------|----------------------|--|--|--|--|--|---|--------|--------|--------|--------|--------|--------|--|
| | | | | | | 80° | 55° | 90° | 60° | 35° | 80° | | | | | | | | |
| Negative | 1.5 ~ 3.0 ~5.5 medium to roughing |  |  | 0.15 ~ 0.30 ~0.50 | PC8110 NC9025 PC5300 | 80 50 30 | CNMG  | DNMG  | SNMG  | TNMG  | VNMG  | WNMG  | p. B19 | p. B24 | p. B30 | p. B37 | p. B45 | | |
| | 2.0 ~ 4.5 ~6.0 medium to roughing |  |  | 0.20 ~ 0.40 ~0.60 | PC8110 NC5330 PC5300 | 80 50 30 | CNMG  | DNMG  | SNMG  | TNMG  | VNMG  | WNMG  | p. B21 | p. B25 | p. B32 | p. B39 | p. B44 | p. B47 | |
| | 0.1 ~ 0.5 ~1.5 Finishing |  |  | 0.05 ~ 0.10 ~0.20 | PC8110 PC5300 NC5330 | 60 50 50 | CNMG  | DNMG  | | | | | | p. B21 | p. B26 | | | | |
| | 0.5 ~ 1.5 ~4.0 Medium to finishing |  |  | 0.05 ~ 0.20 ~0.40 | PC8110 PC5300 NC5330 | 60 50 50 | CNMG  | DNMG  | SNMG  | TNMG  | | | | p. B21 | p. B26 | p. B32 | p. B39 | p. B48 | |
| | 1.0 ~ 2.0 ~4.5 Medium |  |  | 0.10 ~ 0.25 ~0.45 | PC8110 PC5300 NC5330 | 60 50 50 | CNMG  | DNMG  | SNMG  | TNMG  | VNMG  | WNMG  | p. B21 | p. B26 | p. B32 | p. B39 | p. B43 | p. B48 | |
| Positive | 0.1 ~ 0.5 ~1.5 finishing |  |  | 0.05 ~ 0.15 ~0.25 | PC8110 NC9025 PC5300 | 80 50 30 | CCG(M)T  | DCG(M)T  | SCG(M)T  | TCG(M)T  | VCG(M)T  | | p. B50 | p. B53 | p. B55 | p. B59 | p. B65 | | |
| | 0.5 ~ 1.5 ~3.0 medium to finishing |  |  | 0.10 ~ 0.20 ~0.30 | PC8110 NC9025 PC5300 PC9030 | 80 50 60 30 | CCMT  | DCMT  | SCMT  | TCMT  | VCMT  | | p. B50 | p. B53 | p. B55 | p. B59 | p. B65 | | |
| | 1.0 ~ 1.5 ~3.0 medium machining |  |  | 0.15 ~ 0.25 ~0.35 | PC8110 NC9025 PC5300 | 80 50 30 | CCMT  | DCMT  | SCMT  | TCMT  | | | p. B50 | p. B54 | p. B55 | p. B59 | | | |

●: The first recommended cutting condition



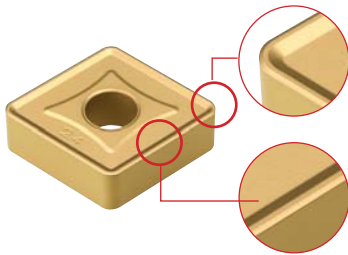
New Chip Breakers

VH / VT Chip Breaker (Heavy duty machining)

- Heavy duty chip breaker suitable for Heavy machining in the ship building and power plant industries
- Suitable for large horizontal machines when machining shafts, rollers, rotors and optimal for the big flange machining

Special features of VH

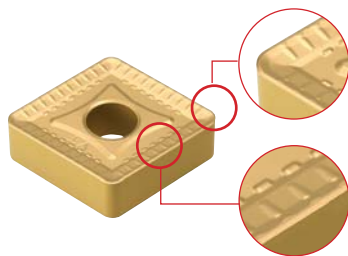
- For good chip control in heavy machining (comprehensive type)



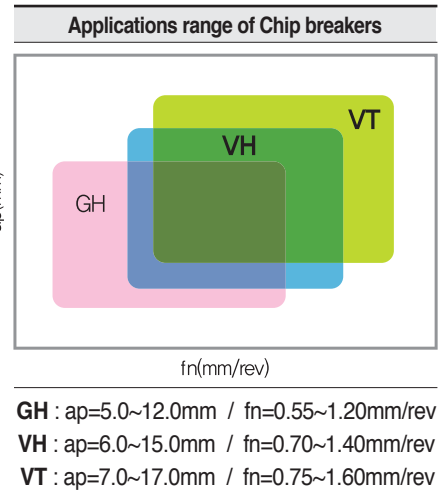
- ▶ Designed from the study of heavy cutting mechanism
- ▶ Smooth chip control from the high rake angle
- ▶ Wider cutting edge land provides stronger cutting
- ▶ Unique cutting edge treatment provides smooth cutting
- ▶ Optimized chip pocket design provides smooth chip flow

Special features of VT

- For long tool life and stable cutting (higher feeds, big depth) in heavy machining



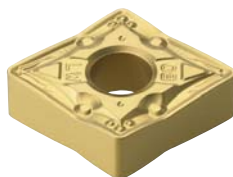
- ▶ Designed from the study of heavy cutting mechanism
- ▶ Strong edge design provides long and stable cutting (2 step rake angle of cutting edge)
- ▶ Varied cutting edge land strengthens the cutting edge
- ▶ The positioning of the chip breaking convex dot deflects the machining heat, optimizes inserts wear & absorb shock



LW / VW Chip Breaker (High feed cutting)

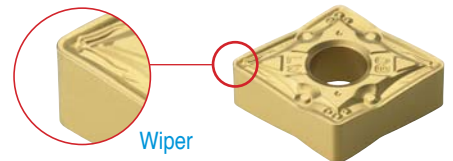
- Improved productivity with higher feed rates and surface finishes
- Improved wear resistance and toughness

Special features of LW



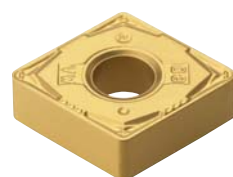
- ▶ **Curvilinear cutting edge**
 - Reduces cutting force
- ▶ **Cutting edge design able to handle deeper depth of cuts**
 - lower cutting load & reduces heat
- ▶ **Greater chip control at shallow depths of cuts**
 - Chip pocket design improves smooth chip flow
- ▶ **For shallow depth cutting and low speed machining**
 - 3D design at the corner

Wiper Insert

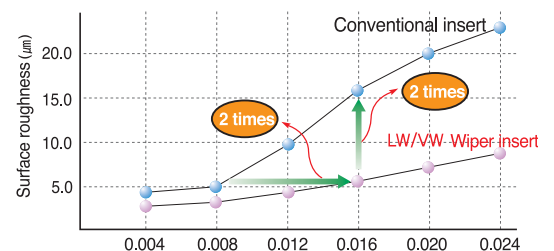


- ▶ High productivity
- ▶ Improved surface roughness
- ▶ High feed-reducing machining time
- ▶ Improved tool life due to reduce cutting force

Special features of VW



- ▶ **Excellent Finishing applications**
 - Excellent chip control
- ▶ **Insert design great for stable clamping**
 - Chip breaker designed close to the cutting edge
- ▶ **Similar cutting edge to C/B for medium**
 - strong cutting edge
- ▶ **3 Dimensional dot design on cutting corner**
 - reduces cutting force and good chip control at shallow depth of cut



New Chip Breakers

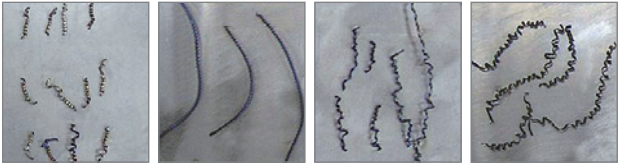
VL Chip Breaker (Mild steel)

- Improved chip control for machining material that have high toughness such as low carbon steel, pipe, steel plate etc
- Improved chip control and decreased cutting load on external, facing, and copying applications
- Improved strength of the cutting edge for measurable efficiency in automated production



- Special features of VL**
- ▶ 2 steps designed chip-breaker
 - Suitable Mild steel
 - Stable chip control on the low feed and cutting depth
 - Stable chip breaking on the low cutting depth
 - Improved chip control on facing, copying applications
 - Decreased cutting load and better surface finish
 - ▶ Designed with special dots
 - ▶ Applied side rake angle

Chip control test



- Workpiece : SM20C
- Cutting Condition : $v_c=250\text{m/min}$
 $f_n=0.2\text{mm/rev(Side)}$
 $a_p=0.5\text{mm}$
wet
- Designation : DNMG150408-VL

FEM Cutting simulation analysis in the design

- ▶ For design of geometry, chip shapes and chip flow are predictable
- ▶ Optimal chip breaker design by various cutting conditions and workpieces



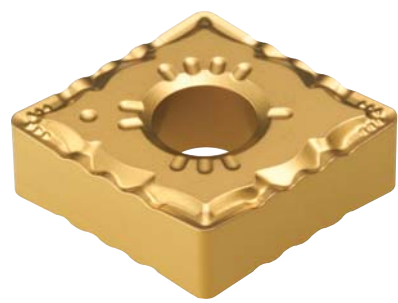
VB Chip Breaker (Copying)

- Excellent chip evacuation in continuous and high speed machining of various workpieces.
- Longer tool life due to 3 dimensional chip breaker realizing low cutting resistance and high rigidity of the cutting edge.
- Stable chip control in copying and internal machining.



Special features of VB

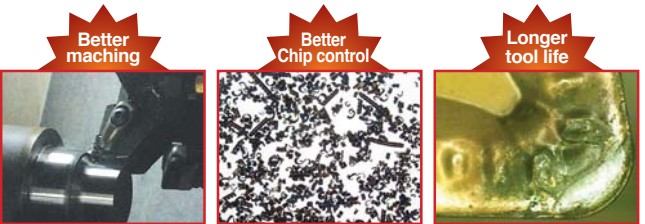
6 bumps on the insert corner
Superior chip control and chip cutting in copying with various depths of cut



Side rake angle
Superb chip cutting in facing and copying
Superior tool life due to improved surface roughness and lower cutting resistance

Cutting edge on 100° part for medium machining (For CNMG)
Excellent chip evacuation and toughness in machining with high depth of cut

Performance



VB Chip Breakers



Conventional chip breaker

New Chip Breakers

VC Chip Breaker (Medium-finishing)

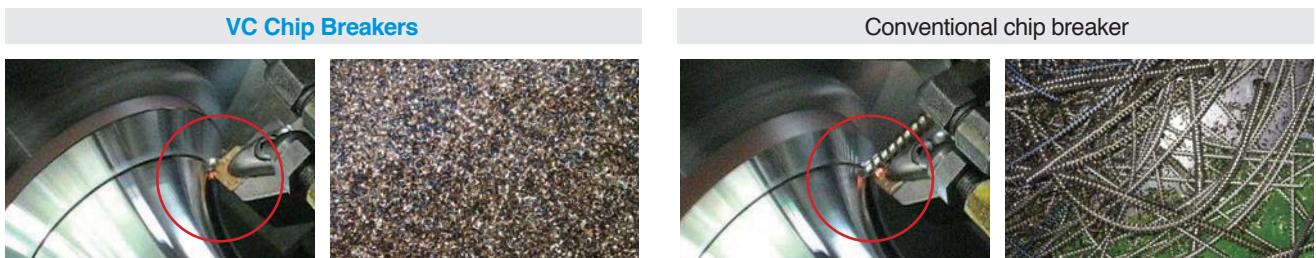
- Superior chip evacuation in high speed and continuous machining of various workpieces (carbon steel, alloy steel etc.)
- Korloy 3 dimensional chip breaker ensures longer tool life due to low cutting load and improved cutting edge strength.
- Stable chip control in copying and internal machining



Special features of VC 4 bums on the insert corner

Excellent chip control in various depths of cut and superb chip cutting in external, internal, copy machining and facing.

Superior chip control in copy machining



VP Chip Breaker (For hard-to-cut materials machining)

- High positive cutting edge reduces chip contact
- Minimized temperature while machining ensures longer tool life
- Stable machining with superior chip evacuation in high depths of cut

VP1(for finishing)

High positive cutting edge

- ▶ Longer tool life due to minimizing chip contact and reducing cutting heat while machining.
- ▶ Recommended cutting condition • $f_n=0.05\sim0.2\text{mm/rev}$ • $a_p=0.1\sim1.5\text{mm}$

VP2(for medium to finishing)

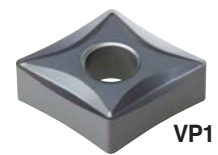
High positive cutting edge and side rake angle

- ▶ Improved machining performance with stable chip control in ball machining with various depth of cuts.
- ▶ Recommended cutting condition • $f_n=0.05\sim0.4\text{mm/rev}$ • $a_p=0.5\sim4.0\text{mm}$

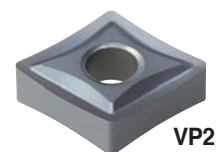
VP3(for medium machining)

High positive cutting edge and wide land

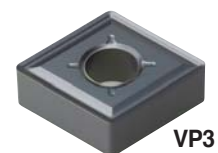
- ▶ Stable machinability in interrupted machining toughness. Stable chip evacuation and machining in machining with high depth of cut.
- ▶ Recommended cutting condition • $f_n=0.1\sim0.45\text{mm/rev}$ • $a_p=1.0\sim4.5\text{mm}$



VP1



VP2

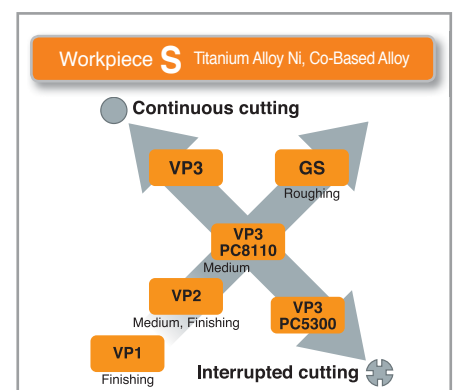


VP3

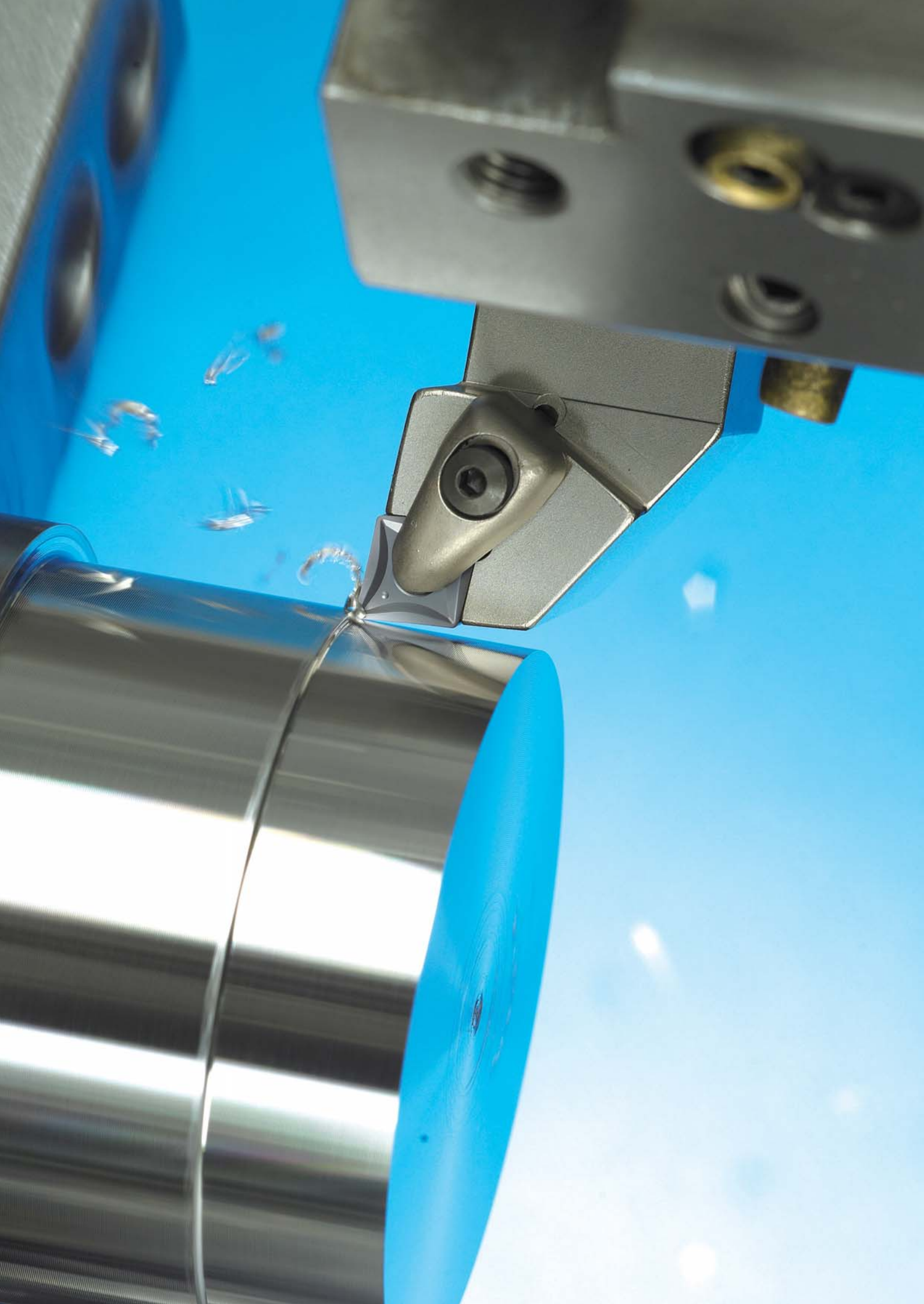
Machining of Hard-to-cut material

(Difficulty factors of Hard-to-cut material)

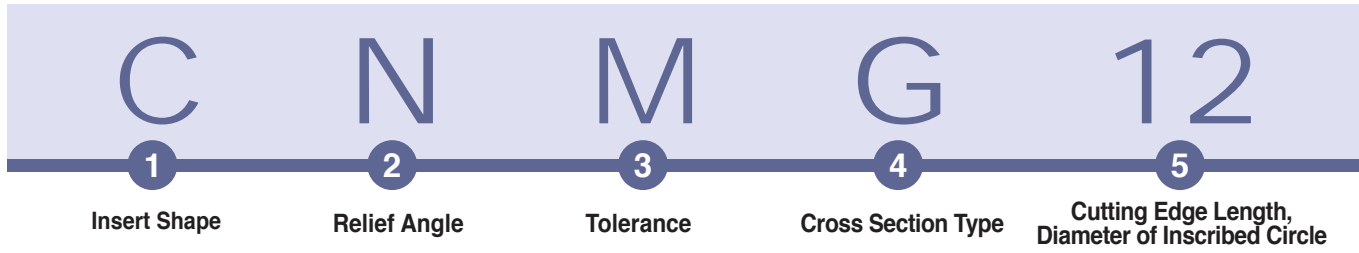
- ▶ Rapid wear on the cutting edge.
- ▶ Frequent fracture and chipping on the cutting edge.
- ▶ High cutting resistance.
- ▶ Rapidly rising temperature on the cutting edge.
- ▶ Increased built-up-edge due to bad chip control.



Line-up for chip breakers for hard-to-cut material machining



B Turning Insert Code System (ISO)



1 Insert Shape

C N M G 12 04 08 - VM

C D E K L
R S T V W

2 Relief Angle

C N M G 12 04 08 - VM

B C D E
F N P O

3 Tolerance

C N M G 12 04 08 - VM

d : Incribed circle
t : Thickness
m : Refer to figure

| Class | d | m | t |
|-------|---------------|---------------|--------|
| A | ±0.025 | ±0.005 | ±0.025 |
| C | ±0.025 | ±0.013 | ±0.025 |
| H | ±0.013 | ±0.013 | ±0.025 |
| E | ±0.025 | ±0.025 | ±0.025 |
| G | ±0.025 | ±0.025 | ±0.13 |
| J* | ±0.05 ~ ±0.15 | ±0.005 | ±0.025 |
| K* | ±0.05 ~ ±0.15 | ±0.013 | ±0.025 |
| L* | ±0.05 ~ ±0.15 | ±0.025 | ±0.025 |
| M* | ±0.05 ~ ±0.15 | ±0.08 ~ ±0.20 | ±0.13 |
| N* | ±0.05 ~ ±0.15 | ±0.08 ~ ±0.18 | ±0.025 |
| U* | ±0.08 ~ ±0.25 | ±0.13 ~ ±0.38 | ±0.13 |

(mm)

* Sides are based on unground insert

Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (Exceptional case)

| d | Tolerance on d | | Tolerance on m | |
|--------|----------------|-------|----------------|-------|
| | J, K, L, M, N | U | M, N | U |
| 6.35 | ±0.05 | ±0.08 | ±0.08 | ±0.13 |
| 9.525 | ±0.05 | ±0.08 | ±0.08 | ±0.13 |
| 12.7 | ±0.08 | ±0.13 | ±0.13 | ±0.20 |
| 15.875 | ±0.10 | ±0.18 | ±0.15 | ±0.27 |
| 19.05 | ±0.10 | ±0.18 | ±0.15 | ±0.27 |
| 25.4 | ±0.13 | ±0.25 | ±0.18 | ±0.38 |

Tolerance on D Insert Shape (Exceptional case)

| d | Tolerance on d | Tolerance on m |
|--------|----------------|----------------|
| 6.35 | ±0.05 | ±0.11 |
| 9.525 | ±0.05 | ±0.11 |
| 12.7 | ±0.08 | ±0.15 |
| 15.875 | ±0.10 | ±0.18 |
| 19.05 | ±0.10 | ±0.18 |

4 Cross Section Type

C N M G 12 04 08 - VM

A B C
F G H
J M N
Q R T
U W X

04

6

Height of Cutting Edge

08

7

Nose Radius (Nose R)

VM

8

Chip Breaker for Turning

5 Cutting Edge Length, Diameter of Incribed Circle

C N M G 12 04 08 - VM

| Symbol | | | | | | | IC |
|--------|----|----|----|----|----|----|---------------|
| C | d | S | T | R | V | W | |
| 03 | 04 | 03 | 06 | 03 | - | 02 | 1.2(5) 3.97 |
| 04 | 05 | 04 | 08 | 04 | 08 | S3 | 1.5(6) 4.76 |
| 05 | 06 | 05 | 09 | 05 | 09 | 03 | 1.8(7) 5.56 |
| - | - | - | - | 06 | - | - | - 6.00 |
| 06 | 07 | 06 | 11 | 06 | 11 | 04 | 2 6.35 |
| 08 | 09 | 07 | 13 | 07 | 13 | 05 | 2.5 7.94 |
| - | - | - | - | 08 | - | - | - 8.00 |
| 09 | 11 | 09 | 16 | 09 | 16 | 06 | 3 9.525 |
| - | - | - | - | 10 | - | - | - 10.00 |
| 11 | 13 | 11 | 19 | 11 | 19 | 07 | 3.5 11.11 |
| - | - | - | - | 12 | - | - | - 12.00 |
| 12 | 15 | 12 | 22 | 12 | 22 | 08 | 4 12.70 |
| 14 | 17 | 14 | 24 | 14 | 24 | 09 | 4.5 14.29 |
| 16 | 19 | 15 | 27 | 15 | 27 | 10 | 5 15.875 |
| - | - | - | - | 16 | - | - | - 16.00 |
| 17 | 21 | 17 | 30 | 17 | 30 | 11 | 5.5 17.46 |
| 19 | 23 | 19 | 33 | 19 | 33 | 13 | 6 19.05 |
| - | - | - | - | 20 | - | - | - 20.00 |
| 22 | 27 | 22 | 38 | 22 | 38 | 15 | 7 22.225 |
| - | - | - | - | 25 | - | - | - 25.00 |
| 25 | 31 | 25 | 44 | 25 | 44 | 17 | 8 25.40 |
| 32 | 38 | 31 | 54 | 31 | 54 | 21 | 10 31.75 |
| - | - | - | - | 32 | - | - | - 32.00 |

() Symbol for small size insert

6 Height of Cutting Edge

C N M G 12 04 08 - VM

| Symbol | | Height of Cutting Edge(t) | |
|--------|--------|---------------------------|-------|
| Metric | Inch | mm | Inch |
| 01 | 1(2) | 1.59 | 1/16 |
| T0 | 1.125 | 1.79 | 9/128 |
| T1 | 1.2 | 1.98 | 5/64 |
| 02 | 1.5(3) | 2.38 | 3/32 |
| T2 | 1.75 | 2.78 | 7/64 |
| 03 | 2 | 3.18 | 1/8 |
| T3 | 2.5 | 3.97 | 5/32 |
| 04 | 3 | 4.76 | 3/16 |
| 05 | 3.5 | 5.56 | 7/32 |
| 06 | 4 | 6.35 | 1/4 |
| 07 | 5 | 7.94 | 5/16 |
| 09 | 6 | 9.52 | 3/8 |
| 11 | 7 | 11.11 | 7/16 |
| 12 | 8 | 12.70 | 1/2 |

() Symbol for small size insert

7 Nose Radius (Nose R)

C N M G 12 04 08 - VM

| Symbol | | Corner Radius | |
|--------|------|----------------------|-------|
| Metric | Inch | Metric | Inch |
| 01 | 0 | 0.1 | 0.004 |
| 02 | 0.5 | 0.2 | 0.008 |
| 04 | 1 | 0.4 | 1/64 |
| 08 | 2 | 0.8 | 1/32 |
| 12 | 3 | 1.2 | 3/64 |
| 16 | 4 | 1.6 | 1/16 |
| 20 | 5 | 2.0 | 5/64 |
| 24 | 6 | 2.4 | 3/32 |
| 28 | 7 | 2.8 | 7/64 |
| 32 | 8 | 3.2 | 1/8 |
| 00 | - | Round insert(Inch) | |
| M0 | - | Round insert(Metric) | |

8 Chip Breaker for Turning

C N M G 12 04 08 - VM

VG VL VF VB VC VQ

VW VM VH VT VK VP1

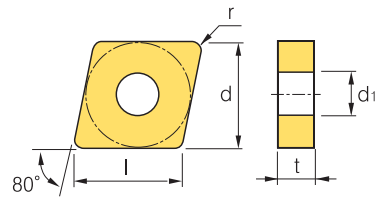
VP2 VP3 HA HS HR GS

GM GR GH B25 VF HMP

C25 AK AR

CNOO

Rhombic 80° Negative



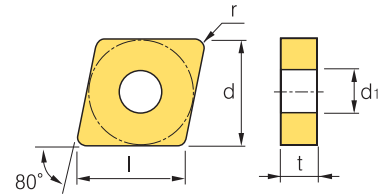
| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |



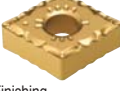



| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|-------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|------|------------------------|--------|------|----------------|-------------------------|---------------------|-------------|---------|------|
| | | NC3010 | NC3120 | NC3220 | NC3300 | NC500H | NC9020 | NC9205 | NC5330 | PC8110 | PC9300 | NC6205 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page | |
| Roughing | 120408-GR | ● | ● | ● | ● | | | | | | ● | ● | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | MCKNR/L | B106 | |
| | 120412-GR | ● | ● | ● | ● | | | | | | ● | ● | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.50 | 1.30-7.00 | MCKNR/L | B106 |
| | 120416-GR | | | | | | | | | | | ● | ● | | | | | | | | | | 11.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.25-0.60 | 1.80-6.00 | MCKNR/L | B106 |
| | 160608-GR | | | ● | ● | | | | | | | | | | | | | | | | | | 15.3 | 15.875 | 6.35 | 0.8 | 6.35 | 0.20-0.70 | 1.00-8.00 | MCKNR/L | B107 |
| | 160612-GR | ● | ● | ● | ● | | | | | | | ● | ● | | | | | | | | | | 14.8 | 15.875 | 6.35 | 1.2 | 6.35 | 0.25-0.70 | 1.30-8.00 | MCKNR/L | B94 |
| | 160616-GR | | ● | ● | ● | | | | | | | | | | | | | | | | | | 14.4 | 15.875 | 6.35 | 1.6 | 6.35 | 0.25-0.75 | 1.80-8.00 | MCKNR/L | B95 |
| | 190608-GR | | ● | ● | | | | | | | | ● | ● | | | | | | | | | | 18.5 | 19.05 | 6.35 | 0.8 | 7.93 | 0.20-0.70 | 1.70-10.00 | MCKNR/L | B106 |
| | 190612-GR | ● | ● | ● | ● | | | | | | | ● | ● | | | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.30-0.75 | 1.70-10.00 | MCKNR/L | B106 |
| | 190616-GR | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.30-0.80 | 1.80-10.00 | MCKNR/L | B106 |
| | 190624-GR | | | | | | | | | | | | | | | | | | | | | | 16.8 | 19.05 | 6.35 | 2.4 | 7.93 | 0.35-0.85 | 2.00-12.00 | MCKNR/L | B106 |
| 250724-GR | | | | | | | | | | | | | | | | | | | | | | 23.3 | 25.4 | 7.94 | 2.4 | 9.12 | 0.40-1.00 | 2.30-15.00 | MCKNR/L | B106 | |
| 250924-GR | | | ● | | | | ● | | | | | | | | | | | | | | | 23.3 | 25.4 | 9.52 | 2.4 | 9.12 | 0.40-1.00 | 2.30-15.00 | MCKNR/L | B106 | |
| Medium Roughing | 120404-GS | | | | | ● | ● | ● | ● | | | | | | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.25 | 0.10-3.00 | MCKNR/L | B106 | |
| | 120408-GS | | | ● | | ● | ● | ● | ● | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-5.00 | MCKNR/L | B106 |
| | 120412-GS | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.65 | 1.00-5.00 | MCKNR/L | B106 |
| | 160608-GS | | | | | | | | | | | | | | | | | | | | | | 15.3 | 15.875 | 6.35 | 0.8 | 6.35 | 0.10-0.50 | 1.00-6.50 | MCKNR/L | B107 |
| | 160612-GS | | | | | | | | | | | | | | | | | | | | | | 14.8 | 15.875 | 6.35 | 1.2 | 6.35 | 0.13-0.65 | 1.00-6.50 | MCKNR/L | B94 |
| | 190612-GS | | | | | | ● | | ● | | | | | | | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.13-0.65 | 1.00-7.80 | MCKNR/L | B95 |
| 190616-GS | | | | | | | | ● | | | | | | | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.13-0.65 | 1.00-7.80 | MCKNR/L | B95 | |
| Medium to finishing | 120404-HA | | | | | ● | ● | ● | ● | | | | | | | | | | | ● | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.20 | 0.80-3.50 | MCKNR/L | B106 | |
| | 120408-HA | | | | | ● | ● | ● | ● | | | | | | | | | | | | ● | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.80-3.50 | MCKNR/L | B106 |
| | 120412-HA | | | | | | | | | | ● | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.55 | 0.80-3.50 | MCKNR/L | B106 |
| Medium to finishing | 120404-HC | ● | | ● | | | | ● | | | | | | | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.80-3.50 | MCKNR/L | B106 | |
| | 120408-HC | ● | ● | ● | | | | ● | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.08-0.40 | 0.80-4.00 | MCKNR/L | B106 |
| | 120412-HC | | | | | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.17-0.50 | 1.00-4.00 | MCKNR/L | B106 |
| Roughing | 120404-HR | | | | | | | | | | | | | | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.30 | 0.80-6.00 | MCKNR/L | B106 | |
| | 120408-HR | ● | | ● | | | | ● | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | MCKNR/L | B106 |
| | 120412-HR | ● | | ● | | | | ● | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.70 | 1.30-7.00 | MCKNR/L | B106 |
| | 120416-HR | | | | | | | | | | | | | | | | | | | | | | 11.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.32-0.75 | 1.80-7.00 | MCKNR/L | B107 |
| | 160608-HR | | | | | | | | | | | | | | | | | | | | | | 15.3 | 15.875 | 6.35 | 0.8 | 6.35 | 0.20-0.50 | 1.00-8.00 | MCKNR/L | B94 |
| | 160612-HR | ● | ● | ● | | | | | | | | | | | | | | | | | | | 14.8 | 15.875 | 6.35 | 1.2 | 6.35 | 0.25-0.70 | 1.30-8.00 | MCKNR/L | B94 |
| | 160616-HR | ● | | | | | | | | | | | | | | | | | | | | | 14.4 | 15.875 | 6.35 | 1.6 | 6.35 | 0.30-0.80 | 1.80-8.00 | MCKNR/L | B94 |
| | 160624-HR | | | | | | | | | | | | | | | | | | | | | | 13.6 | 15.875 | 6.35 | 2.4 | 6.35 | 0.32-0.90 | 2.30-10.00 | MCKNR/L | B95 |
| | 190608-HR | | | | | | | | | | | | | | | | | | | | | | 18.5 | 19.05 | 6.35 | 0.8 | 7.93 | 0.20-0.50 | 1.70-10.00 | MCKNR/L | B106 |
| | 190612-HR | | | | ● | ● | | | | | | ● | | | | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.25-0.70 | 1.30-10.00 | MCKNR/L | B106 |
| | 190616-HR | | | ● | ● | | | | | | | | | | | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.30-0.80 | 1.80-10.00 | MCKNR/L | B106 |
| | 190624-HR | | | | | | | | | | | | | | | | | | | | | | 16.8 | 19.05 | 6.35 | 2.4 | 7.93 | 0.32-0.90 | 2.30-10.00 | MCKNR/L | B106 |
| 250924-HR | | | | | | | | | | | | | | | | | | | | | | 23.3 | 25.4 | 9.52 | 2.4 | 9.12 | 0.40-1.00 | 2.30-10.00 | MCKNR/L | B106 | |

B Turning Insert (Negative)

CN00

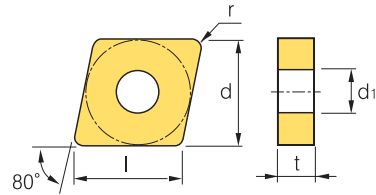
 Rhombic **80° Negative**



| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | ● | ● | ● | | | |
|--|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-----|------|-------|--------|-------------------|------|------------------------|----------------|-------------------------|---------------------|-------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | |
| Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | |
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC5330 | PC8110 | PC9030 | NC6205 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation |
|  CNMG-HS Medium cutting | 090304-HS | | | | ● | | | | | ● | | | | | | | | | 9.2 | 9.525 | 3.18 | 0.4 | 3.81 | 0.05-0.20 | 1.00-2.50 | MCKNR/L | B106 |
| | 090308-HS | | | | | | | | | ● | | | | | | | | | 8.8 | 9.525 | 3.18 | 0.8 | 3.81 | 0.10-0.20 | 1.00-2.50 | MCLNR/L | B106 |
| | 120404-HS | | | | ● | ● | | | | ● | ● | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.20 | 1.00-4.50 | MCMNN | B106 |
| | 120408-HS | | | | ● | ● | | | | ● | ● | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 1.00-4.50 | MCRNR/L | B107 |
| | 120412-HS | | | | | ● | | | | ● | ● | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.55 | 1.00-4.50 | PCBNR/L | B94 |
| | 160612-HS | | | | | | | | | | ● | | | | | | | | 14.8 | 15.875 | 6.35 | 1.2 | 6.35 | 0.13-0.55 | 2.00-6.00 | PCLNR/L | B95 |
| | 160616-HS | | | | | | | | | | ● | | | | | | | | 14.4 | 15.875 | 6.35 | 1.6 | 6.35 | 0.15-0.60 | 2.00-6.00 | | |
| | 190612-HS | | | | ● | | | | | ● | ● | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.13-0.55 | 2.00-7.30 | | |
| | 190616-HS | | | | | ● | | | | ● | ● | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.15-0.60 | 2.00-7.30 | | |
|  CNMG-LW Medium cutting(Wiper) | 120408-LW | | | | | | | | | ● | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.60 | 1.00-5.00 | MCKNR/L | B106 | |
| | 120412-LW | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.20-0.70 | 1.00-6.00 | MCLNR/L | B106 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | MCMNN |
|  CNMG-VB Finishing | 120404-VB | ● | ● | | | | | | | ● | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.35 | 0.30-2.00 | MCKNR/L | B106 | |
| | 120408-VB | ● | ● | | | | | | | ● | ● | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.45 | 0.50-2.00 | MCLNR/L | B106 |
| | 120412-VB | | | | | | | | | | | | | | | | | | 11.6 | 12.9 | 4.76 | 1.2 | 5.16 | 0.20-0.50 | 0.50-2.00 | MCMNN | B106 |
|  CNMG-VC Finishing (Mild steel) | 120404-VC | ● | ● | | | | | | | ● | ● | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.35 | 0.30-2.00 | MCKNR/L | B106 | |
| | 120408-VC | ● | ● | | | | | | | ● | ● | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.40 | 0.50-3.00 | MCLNR/L | B106 |
| | 120412-VC | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.15-0.45 | 0.50-3.00 | MCMNN | B106 |
|  CNMG-VL Mild steel | 120404-VL | ● | ● | | | | | | | ● | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.25 | 0.10-1.00 | MCKNR/L | B106 | |
| | 120408-VL | ● | ● | | | | | | | ● | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.35 | 0.20-1.50 | MCLNR/L | B106 |
| | 120412-VL | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.10-0.35 | 0.20-1.50 | MCMNN | B106 |
|  CNMG-VF Finishing | 090304-VF | ● | ● | ● | | | | | | | | | | | | | | 9.2 | 9.525 | 3.18 | 0.4 | 3.81 | 0.07-0.30 | 0.50-1.50 | MCKNR/L | B106 | |
| | 090308-VF | ● | ● | ● | | | | | | | | | | | | | | | 8.8 | 9.525 | 3.18 | 0.8 | 3.81 | 0.10-0.30 | 0.50-1.50 | MCLNR/L | B106 |
| | 120404-VF | ● | ● | ● | | | | | | ● | | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.07-0.30 | 0.50-1.50 | MCMNN | B106 |
| | 120408-VF | ● | ● | | | | | | | ● | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.50-1.50 | MCRNR/L | B107 |
| | 120412-VF | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.10-0.50 | 0.60-1.50 | PCBNR/L | B94 |

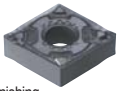
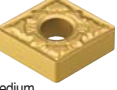
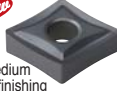

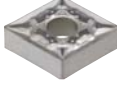
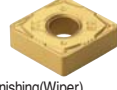
CN00

Rhombic 80° Negative



| Workpiece | Machining types | | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

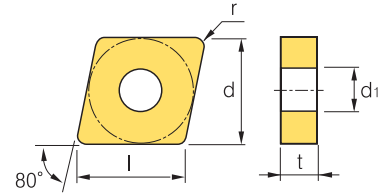
Machining types
 ● Continuous cutting
 ⊙ General cutting
 ⊕ Interrupted cutting

| Inserts | Designation | Material | | | | | | | | | | | | | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | |
|--|-------------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|-------|-----------------|-----|-----|------|-------|-------------------|------|------------------------|----------------|-------------------------|---------------------|-------------|------|
| | | NC3010 | NC3120 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC5400 | PC9030 | NC6205 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
|  Finishing | 090304-VG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.2 | 9.525 | 3.18 | 0.4 | 3.81 | 0.07~0.30 | 0.50~1.50 | MCKNR/L | B106 |
| | 090308-VG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.8 | 9.525 | 3.18 | 0.8 | 3.81 | 0.10~0.30 | 0.50~1.50 | MCLNR/L | B106 |
| | 120404-VG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.07~0.30 | 0.50~1.50 | MCMNN | B106 |
| | 120408-VG | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10~0.40 | 0.50~1.50 | MCRNR/L | B107 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | PCBNR/L | B94 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCLNR/L | B95 | |
|  Medium | 090304-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.2 | 9.525 | 3.18 | 0.4 | 3.81 | 0.05~0.30 | 0.90~3.50 | MCKNR/L | B106 | |
| | 090308-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.8 | 9.525 | 3.18 | 0.8 | 3.81 | 0.10~0.45 | 1.00~3.50 | MCLNR/L | B106 |
| | 120404-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05~0.30 | 0.90~5.00 | MCMNN | B106 |
| | 120408-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10~0.50 | 1.00~5.00 | MCRNR/L | B107 |
| | 120412-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13~0.60 | 1.30~5.00 | PCBNR/L | B94 |
| | 120416-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.20~0.60 | 1.50~5.50 | PCLNR/L | B95 |
| | 160608-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.3 | 15.875 | 6.35 | 0.8 | 6.35 | 0.10~0.50 | 1.00~6.70 | | |
| | 160612-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.8 | 15.875 | 6.35 | 1.2 | 6.35 | 0.13~0.60 | 1.30~6.70 | | |
| 190612-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.15~0.70 | 1.50~7.00 | | | |
|  Medium to finishing | 120404-VP2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05~0.30 | 0.10~3.00 | MCKNR/L | B106 | |
| | 120408-VP2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10~0.40 | 0.50~4.50 | MCLNR/L | B106 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | MCMNN | B106 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | MCRNR/L | B107 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCBNR/L | B94 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCLNR/L | B95 | |
|  Medium | 120404-VP3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05~0.30 | 0.10~3.00 | MCKNR/L | B106 | |
| | 120408-VP3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10~0.40 | 0.50~4.50 | MCLNR/L | B106 |
| | 120412-VP3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.12~0.50 | 0.50~5.00 | MCMNN | B106 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | MCRNR/L | B107 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCBNR/L | B94 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCLNR/L | B95 | |
|  Medium to finishing | 090304-VQ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.2 | 9.525 | 3.18 | 0.4 | 3.81 | 0.05~0.30 | 0.50~3.50 | MCKNR/L | B106 | |
| | 090308-VQ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.8 | 9.525 | 3.18 | 0.8 | 3.81 | 0.08~0.30 | 0.80~4.00 | MCLNR/L | B106 |
| | 120404-VQ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05~0.30 | 0.80~4.00 | MCMNN | B106 |
| | 120408-VQ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.08~0.40 | 0.80~4.00 | MCRNR/L | B107 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCBNR/L | B94 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCLNR/L | B95 | |
|  Finishing(Wiper) | 120404-VW | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10~0.30 | 0.50~3.00 | MCKNR/L | B106 | |
| | 120408-VW | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15~0.50 | 0.50~4.00 | MCLNR/L | B106 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | MCMNN | B106 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | MCRNR/L | B107 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCBNR/L | B94 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | PCLNR/L | B95 | |




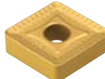



B Turning Insert (Negative)

CN00

 Rhombic **80° Negative**

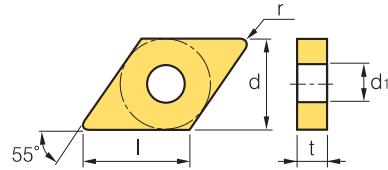


| Workpiece | Machining types | | | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | ● | ⊕ | ⊗ | ● | ⊕ | ⊗ | ● | ⊕ | ⊗ | ● | ⊕ | ⊗ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--------|------|-------|-------|-------------------|-----|------------------------|-------|--------|------|------|----------------|-------------------------|---------------------|-------------|------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC500H | NC9020 | NC9025 | NC5330 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
|  Medium Roughing | 120408-VK | | | | | | | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-5.00 | MCKNR/L | B106 | |
| | 120412-VK | | | | | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.50 | 1.30-6.00 | MCLNR/L | B106 |
| | 120416-VK | | | | | | | | | | | | | | | | | | | | | | 11.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.25-0.60 | 1.80-7.00 | MCMNN | B106 |
|  Heavy | 120408-GH | | | | | | | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.30-0.60 | 2.50-8.00 | MCKNR/L | B106 | |
| | 120412-GH | | | | | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.30-0.70 | 2.50-8.00 | MCLNR/L | B106 |
| | 160412-GH | | | | | | | | | | | | | | | | | | | | | | 14.8 | 15.875 | 4.76 | 1.2 | 6.35 | 0.30-0.70 | 2.50-8.00 | MCMNN | B106 |
| | 160424-GH | | | | | | | | | | | | | | | | | | | | | | 13.6 | 15.875 | 4.76 | 2.4 | 6.35 | 0.30-1.20 | 2.50-8.00 | MCRNR/L | B107 |
| | 160612-GH | | | | | | | | | | | | | | | | | | | | | | 14.8 | 15.875 | 6.35 | 1.2 | 6.35 | 0.30-0.90 | 2.50-8.00 | PCBNR/L | B94 |
| | 160616-GH | | | | | | | | | | | | | | | | | | | | | | 14.4 | 15.875 | 6.35 | 1.6 | 6.35 | 0.30-1.20 | 2.50-8.00 | PCLNR/L | B95 |
| | 160624-GH | | | | | | | | | | | | | | | | | | | | | | 13.6 | 15.875 | 6.35 | 2.4 | 6.35 | 0.30-1.50 | 2.50-8.00 | | |
| | 190608-GH | | | | | | | | | | | | | | | | | | | | | | 18.5 | 19.05 | 6.35 | 0.8 | 7.93 | 0.30-0.60 | 2.50-8.00 | | |
| | 190612-GH | | | | | | | | | | | | | | | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.30-0.70 | 3.00-8.00 | | |
| | 190616-GH | | | | | | | | | | | | | | | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.45-0.90 | 3.00-8.00 | | |
| | 190624-GH | | | | | | | | | | | | | | | | | | | | | | 16.8 | 19.05 | 6.35 | 2.4 | 7.93 | 0.55-1.20 | 4.00-9.00 | | |
|  Heavy(General) | 190612-VH | | | | | | | | | | | | | | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.50-0.90 | 5.00-10.00 | PCBNR/L | B94 | |
| | 190616-VH | | | | | | | | | | | | | | | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.50-1.10 | 5.00-10.00 | PCLNR/L | B95 |
| | 190624-VH | | | | | | | | | | | | | | | | | | | | | | 16.8 | 19.05 | 6.35 | 2.4 | 7.93 | 0.60-1.20 | 6.00-12.00 | | |
| | 250724-VH | | | | | | | | | | | | | | | | | | | | | | 23.3 | 25.4 | 7.94 | 2.4 | 9.12 | 0.70-1.40 | 6.00-15.00 | | |
| | 250924-VH | | | | | | | | | | | | | | | | | | | | | | 23.3 | 25.4 | 9.52 | 2.4 | 9.12 | 0.70-1.40 | 6.00-15.00 | | |
|  Heavy(High feed cutting) | 190612-VT | | | | | | | | | | | | | | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.60-1.00 | 6.00-13.00 | PCBNR/L | B94 | |
| | 190616-VT | | | | | | | | | | | | | | | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.60-1.10 | 5.00-10.00 | PCLNR/L | B95 |
| | 190624-VT | | | | | | | | | | | | | | | | | | | | | | 16.8 | 19.05 | 6.35 | 2.4 | 7.93 | 0.60-1.60 | 7.00-13.00 | | |
| | 250724-VT | | | | | | | | | | | | | | | | | | | | | | 23.3 | 25.4 | 7.94 | 2.4 | 9.12 | 0.75-16.0 | 7.00-17.00 | | |
| | 250924-VT | | | | | | | | | | | | | | | | | | | | | | 23.3 | 25.4 | 9.52 | 2.4 | 9.12 | 0.75-16.0 | 7.00-17.00 | | |
|  Medium | 120408-GM | | | | | | | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-5.00 | PCBNR/L | B94 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | PCLNR/L | B95 | |
|  Roughing | 120408-GR | | | | | | | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | PCBNR/L | B94 | |
| | 120412-GR | | | | | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.50 | 1.30-7.00 | PCLNR/L | B95 |
| | 190612-GR | | | | | | | | | | | | | | | | | | | | | | 18.1 | 19.05 | 6.35 | 1.2 | 7.93 | 0.30-0.75 | 1.70-10.00 | | |
| | 190616-GR | | | | | | | | | | | | | | | | | | | | | | 17.7 | 19.05 | 6.35 | 1.6 | 7.93 | 0.30-0.80 | 1.80-10.00 | | |
|  Medium to finishing | 120408-HA | | | | | | | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.80-3.50 | PCBNR/L | B94 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | PCLNR/L | B95 | |

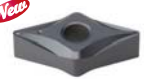
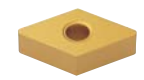

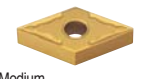

DN○○

 Rhombic 55° Negative



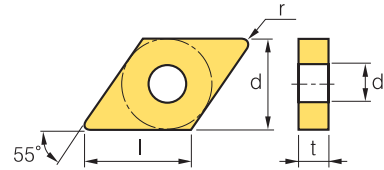
| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

● Continuous cutting
 ● General cutting
 ● Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-----|-------------------|------|------------------------|-------|------|------|----------------|-------------------------|---------------------|-------------|----------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
|  DNGG-VP1 Finishing | 150404-VP1 | | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.15 | 0.10-1.50 | MDJNR/L | B107 | |
| | 150408-VP1 | | | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.07-0.20 | 0.10-1.50 | MDNNN | B107 |
| | 150604-VP1 | | | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.05-0.15 | 0.10-1.50 | MDQNR/L | B108 |
| | 150608-VP1 | | | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.07-0.20 | 0.10-1.50 | PDJNR/L | B96, 150 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | PDNNR/L | B96 |
|  DNMA Roughing | 110408 | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 4.76 | 0.8 | 3.81 | 0.17-0.45 | 0.80-3.00 | MDJNR/L | B107 | |
| | 150404 | | | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.17-0.55 | 0.40-4.00 | MDNNN | B107 |
| | 150408 | | | | | | | | | | | ● | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.25-0.55 | 0.80-4.00 | MDQNR/L | B108 |
| | 150412 | | | | | | | | | | | ● | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.65 | 1.50-4.00 | MDUNR/L | B132 |
| | 150604 | | | | | | | | | | | ● | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.17-0.55 | 0.40-4.00 | PDJNR/L | B96, 150 |
| | 150608 | | | | | | | | | | | ● | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.25-0.55 | 0.80-4.00 | PDNNR/L | B96 |
| | 150612 | | | | | | | | | | | ● | | | | | | | | | | 14.4 | 12.7 | 6.35 | 1.2 | 5.16 | 0.25-0.65 | 1.20-4.00 | PDSNR/L | B128 |
| 190608 | | | | | | | | | | | | | | | | | | | | | 18.5 | 15.875 | 6.35 | 0.8 | 7.93 | 0.30-0.80 | 2.50-13.00 | PDUNR/L | B129 | |
|  DNMG-B25 Medium Roughing | 150402-B25 | | | | | | | | | | | | | | | | | | | | 15.3 | 12.7 | 4.76 | 0.2 | 5.16 | 0.15-0.40 | 0.50-3.50 | MDJNR/L | B107 | |
| | 150404-B25 | | | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.17-0.45 | 1.00-4.00 | MDNNN | B107 |
| | 150408-B25 | | | ● | | | | | | | | ● | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.17-0.55 | 1.50-4.00 | MDQNR/L | B108 |
| | 150412-B25 | | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.55 | 1.50-4.00 | MDUNR/L | B132 |
| | 150425-B25 | | | | | | | | | | | | | | | | | | | | | 13.2 | 12.7 | 4.76 | 2.5 | 5.16 | 0.35-0.65 | 2.50-5.50 | PDJNR/L | B96, 150 |
| | 150602-B25 | | | | | | | | | | | | | | | | | | | | | 15.2 | 12.7 | 6.35 | 0.2 | 5.16 | 0.15-0.40 | 0.50-3.50 | PDNNR/L | B96 |
| | 150604-B25 | | | | ● | ● | | ● | | | | ● | ● | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.17-0.55 | 1.50-4.00 | PDSNR/L | B128 |
| | 150608-B25 | | ● | ● | ● | | ● | ● | ● | | | ● | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.17-0.55 | 1.50-4.00 | PDUNR/L | B129 |
| | 150612-B25 | | | | | | | | | | | ● | | | | | | | | | | 14.4 | 12.7 | 6.35 | 1.2 | 5.16 | 0.25-0.55 | 1.50-4.00 | | |
| 150625-B25 | | | | | | | | | | | | | | | | | | | | | 13.2 | 12.7 | 6.35 | 2.5 | 5.16 | 0.35-0.65 | 2.50-5.50 | | | |
|  DNMG-GM Medium | 110308-GM | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 3.18 | 0.8 | 3.81 | 0.10-0.50 | 1.00-4.00 | MDJNR/L | B107 | |
| | 110404-GM | | | | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.90-4.00 | MDNNN | B107 |
| | 110408-GM | | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.50 | 1.00-4.00 | MDQNR/L | B108 |
| | 150404-GM | | | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.90-5.00 | MDUNR/L | B132 |
| | 150408-GM | | | | ● | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-5.00 | PDJNR/L | B96, 150 |
| | 150412-GM | | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.60 | 1.30-5.00 | PDNNR/L | B96 |
| | 150604-GM | | | | | | | | | | | ● | ● | ● | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.05-0.30 | 0.90-5.00 | PDSNR/L | B128 |
| | 150608-GM | | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.10-0.50 | 1.00-5.00 | PDUNR/L | B129 |
| 150612-GM | | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 6.35 | 1.2 | 5.16 | 0.13-0.60 | 1.30-5.00 | | | |
|  DNMG-GR Roughing | 150408-GR | | | ● | ● | | | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | MDJNR/L | B107 | |
| | 150412-GR | | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.90 | 1.30-7.00 | MDNNN | B107 |
| | 150416-GR | | | | | | | | | | | | | | | | | | | | | 14.0 | 12.7 | 4.76 | 1.6 | 5.16 | 0.30-0.75 | 1.80-7.00 | MDQNR/L | B108 |
| | 150608-GR | | | | ● | ● | | ● | | | | ● | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | MDUNR/L | B132 |
| | 150612-GR | | | | ● | ● | | | | | | ● | | | | | | | | | | 14.4 | 12.7 | 6.35 | 1.2 | 5.16 | 0.25-0.70 | 1.30-7.00 | PDJNR/L | B96, 150 |
| | 150616-GR | | | | ● | | ● | | | | | | | | | | | | | | | 14.0 | 12.7 | 6.35 | 1.6 | 5.16 | 0.20-0.75 | 1.80-7.00 | PDNNR/L | B96 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | PDSNR/L | B128 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | PDUNR/L | B129 | |

DN○○

Rhombic 55° Negative



| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types

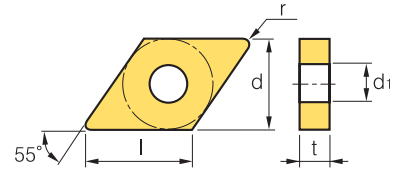
- Continuous cutting
- General cutting
- Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--------|--------|------|-------|-------------------|------|------------------------|------|-----|------|-----------|-----------|----------------|-------------------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC5400 | PC9030 | | | | NC6205 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) |
| Finishing | 150404-VB | ● | ● | | | | ● | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.35 | 0.30-2.00 | MDJNR/L | B107 |
| | 150408-VB | | | ● | | | ● | ● | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.45 | 0.50-2.00 | MDNRR/L | B108 |
| | 150604-VB | ● | | | | | ● | | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.10-0.35 | 0.30-2.00 | MDJNR/L | B132 |
| | 150608-VB | | | ● | | | ● | | ● | | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.15-0.45 | 0.50-2.00 | PDJNR/L | B96, 150 |
| | 150612-VB | | | ● | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 6.35 | 1.2 | 5.16 | 0.20-0.50 | 0.50-2.50 | PDNRR/L | B96 |
| Medium to finishing | 150404-VC | ● | ● | | | | ● | ● | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.35 | 0.30-2.00 | MDJNR/L | B107 |
| | 150408-VC | | | ● | | | ● | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.40 | 0.50-3.00 | MDNRR/L | B108 |
| | 150412-VC | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.15-0.45 | 0.50-3.00 | MDJNR/L | B132 |
| | 150604-VC | ● | ● | | | | ● | ● | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.10-0.35 | 0.30-2.00 | PDJNR/L | B96, 150 |
| | 150608-VC | ● | ● | | | | ● | | | | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.15-0.40 | 0.50-3.00 | PDNRR/L | B96 |
| Finishing (Mild steel) | 110408-VL | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 4.76 | 0.8 | 3.81 | 0.05-0.20 | 0.10-1.00 | MDJNR/L | B107 |
| | 150404-VL | ● | ● | | | | ● | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.25 | 0.10-1.50 | MDNRR/L | B108 |
| | 150408-VL | | | ● | | | ● | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.05-0.30 | 0.20-1.50 | MDJNR/L | B132 |
| | 150412-VL | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.10-0.30 | 0.25-1.50 | PDJNR/L | B96, 150 |
| | 150604-VL | ● | ● | | | | ● | | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.05-0.25 | 0.10-1.50 | PDNRR/L | B96 |
| Finishing | 110402-VF | | | | | | | | | | | | | | | | | | | | 11.4 | 9.525 | 4.76 | 0.2 | 3.81 | 0.05-0.20 | 0.20-1.00 | MDJNR/L | B107 |
| | 110404-VF | | | ● | | | ● | | | | | | | | | | | | | | 11.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.07-0.30 | 0.50-1.50 | MDNRR/L | B108 |
| | 110408-VF | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.50-1.50 | MDQNR/L | B132 |
| | 150404-VF | ● | ● | | | | ● | | ● | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.07-0.30 | 0.50-1.50 | MDJNR/L | B96, 150 |
| | 150408-VF | | | ● | | | ● | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.50-1.50 | PDJNR/L | B96 |
| | 150412-VF | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.15-0.50 | 0.60-1.50 | PDNRR/L | B128 |
| | 150604-VF | ● | ● | ● | | | ● | | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.13-0.30 | 0.50-1.50 | PDJNR/L | B129 |
| Finishing | 110404-VG | | | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.07-0.30 | 0.50-1.50 | MDJNR/L | B107 |
| | 110408-VG | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.50-1.50 | MDNRR/L | B108 |
| | 150404-VG | | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.07-0.30 | 0.50-1.50 | MDJNR/L | B132 |
| | 150408-VG | | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.50-1.50 | PDJNR/L | B96, 150 |
| | 150604-VG | | | | | | | | | | | ● | ● | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.13-0.30 | 0.50-1.50 | PDNRR/L | B96 |
| Medium | 110404-VM | | | ● | | | | | | | | ● | | | | | | | | | 11.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.90-4.00 | MDJNR/L | B107 |
| | 110408-VM | ● | ● | ● | | | ● | | | | | | | | | | | | | | 10.8 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.50 | 1.00-4.00 | MDNRR/L | B108 |
| | 110412-VM | | | | | | | | | | | | | | | | | | | | 10.3 | 9.525 | 4.76 | 1.2 | 3.81 | 0.13-0.50 | 1.30-4.00 | MDJNR/L | B132 |
| | 150404-VM | | | ● | ● | | ● | | ● | | | ● | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.90-5.00 | PDJNR/L | B96, 150 |
| | 150408-VM | ● | ● | ● | ● | | ● | ● | ● | | ● | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-5.00 | PDNRR/L | B96 |
| | 150412-VM | | | | | | | | | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.60 | 1.30-5.00 | PDSNR/L | B128 |
| | 150604-VM | ● | ● | ● | ● | | ● | | ● | ● | | ● | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.05-0.30 | 0.90-5.00 | PDJNR/L | B129 |

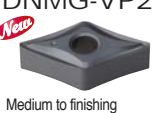



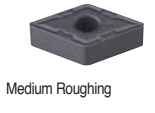

B Turning Insert (Negative)

DN○○

 Rhombic **55° Negative**



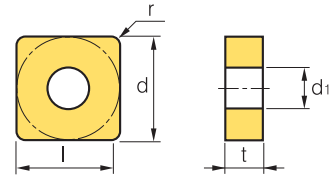
| Workpiece | Machining types | | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|---|---|---|---|---|---|---|---|---|---|---|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | P | M | K | N | S | H | ● | ◐ | ◑ | ◒ | ◓ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|-------|------------------------|-----|------|----------------|-------------|---------|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC5330 | PC8110 | PC5300 | PC5400 | PC9030 | NC6210 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation |
|  Medium to finishing | 150404-VP2 | | | | | | ● | ● | ● | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.10-3.00 | MDJNR/L | B107 |
| | 150408-VP2 | | | | | | ● | ● | ● | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.50-4.50 | MDNNN | B107 |
| | 150604-VP2 | ● | | | | | ● | ● | ● | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.05-0.30 | 0.10-3.00 | MDQNR/L | B108 |
| | 150608-VP2 | ● | | | | | ● | ● | ● | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.10-0.40 | 0.50-4.50 | MDUNR/L | B132 |
| | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | PDJNR/L |
|  Medium | 150404-VP3 | | | | | | ● | ● | ● | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.10-3.00 | MDJNR/L | B107 |
| | 150408-VP3 | | | | | | ● | ● | ● | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.45 | 0.50-5.00 | MDNNN | B107 |
| | 150412-VP3 | | | | | | ● | ● | | | | | | | | | | | | 14.4 | 12.7 | 6.35 | 0.4 | 5.16 | 0.12-0.50 | 0.50-5.00 | MDQNR/L | B108 |
| | 150604-VP3 | | | | | | ● | ● | ● | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.8 | 5.16 | 0.05-0.30 | 0.10-3.00 | MDUNR/L | B132 |
| | 150608-VP3 | | | | | | ● | ● | ● | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.45 | 0.50-5.00 | PDJNR/L | B96, 150 |
| | 150612-VP3 | | | | | | ● | ● | | | | | | | | | | | | 14.4 | 12.7 | 4.76 | 0.8 | 5.16 | 0.12-0.50 | 0.50-5.00 | PDNNR/L | B96, 150 |
|  Medium to finishing | 110404-VQ | | | | | | | | | | | | ● | | | | | | | 11.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.50-3.50 | MDJNR/L | B107 |
| | 110408-VQ | | | | | | | | | | | | ● | | | | | | | 10.8 | 9.525 | 4.76 | 0.8 | 3.81 | 0.08-0.40 | 0.80-4.00 | MDNNN | B107 |
| | 150404-VQ | | | | | | | | | | | | ● | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.80-3.50 | MDQNR/L | B108 |
| | 150408-VQ | | | | | | | | | | | | ● | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.08-0.40 | 0.80-4.00 | MDUNR/L | B132 |
| | 150604-VQ | | | | | | | | | | | | ● | ● | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.05-0.30 | 0.80-4.00 | PDJNR/L | B96, 150 |
| | 150608-VQ | | | | | | | | | | | | ● | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.08-0.40 | 0.80-4.00 | PDNNR/L | B96 |
|  Finishing (Wiper) | 150404-VW | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.35 | 0.30-3.00 | MDJNR/L | B107 |
| | 150408-VW | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.30-3.00 | MDNNN | B107 |
| | 150604-VW | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.10-0.35 | 0.30-3.00 | MDQNR/L | B108 |
| | 150608-VW | ● | | ● | | | | | | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.10-0.40 | 0.30-3.00 | MDUNR/L | B132 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | PDJNR/L |
|  Medium Roughing | 150404-VK | | | | | | | | | | | | ● | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.50 | 0.08-6.00 | PDNNR/L | B96 |
| | 150408-VK | | | | | | | | | | | | ● | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | PDNNR/L | B96 |
| | 150412-VK | | | | | | | | | | | | ● | ● | | | | | | 14.4 | 12.7 | 6.35 | 1.2 | 5.16 | 0.25-0.70 | 1.30-7.00 | PDNNR/L | B96 |
| | 150604-VK | | | | | | | | | | | | ● | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.20-0.50 | 1.00-7.00 | PDNNR/L | B96 |
| | 150608-VK | | | | | | | | | | | | ● | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | PDNNR/L | B96 |
| | 150612-VK | | | | | | | | | | | | ● | ● | | | | | | 14.4 | 12.7 | 6.35 | 1.2 | 5.16 | 0.25-0.70 | 1.30-7.00 | PDNNR/L | B96 |
|  Medium | 150404R-SH | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.30 | 1.00-4.00 | MDJNR/L | B107 |
| | 150408R-SH | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.50 | 1.50-5.00 | MDNNN | B107 |
| | 150604R-SH | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.15-0.30 | 1.00-4.00 | MDQNR/L | B108 |
| | 150608R-SH | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.15-0.50 | 1.50-5.00 | MDUNR/L | B132 |
| | 150404L-SH | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.30 | 1.00-4.00 | PDJNR/L | B96, 150 |
| | 150408L-SH | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.50 | 1.50-5.00 | PDNNR/L | B96, 150 |
| | 150604L-SH | | | | | | | | | | | | | | | | | | | 15.1 | 12.7 | 6.35 | 0.4 | 5.16 | 0.15-0.30 | 1.00-4.00 | PDSNR/L | B128 |
| | 150608L-SH | | | | | | | | | | | | | | | | | | | 14.7 | 12.7 | 6.35 | 0.8 | 5.16 | 0.15-0.50 | 1.50-5.00 | PDUNR/L | B129 |

SN00



Square 90° Negative



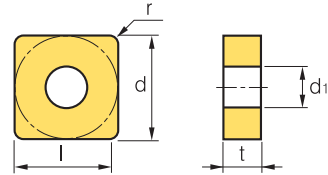
| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ◐ | ◑ | ◒ | ◓ | ◔ | ◕ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

● Continuous cutting
 ◐ General cutting
 ◑ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | |
|---------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-------|------|-------------------|--------|------------------------|------|-----------|----------------|-------------|---|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC500H | NC9025 | NC5330 | PC8110 | PC9030 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | ST30A | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation |
| SNGX Roughing | 120408R | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.35 | 1.00-4.00 | MSBNR/L B108 MSDNN B108 MSKNR/L B109 MSRNR/L B109 MSSNR/L B110 PSBNR/L B98 PSDNN B98 PSKNR/L B129 PSSNR/L B99 | |
| SNMA Medium Roughing | 090304 | | | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | 3.81 | 0.10-0.45 | 0.50-4.50 | MSBNR/L B108 MSDNN B108 | |
| | 090308 | | | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 3.81 | 0.15-0.50 | 0.50-4.50 | MSKNR/L B109 | |
| | 090312 | | | | | | | | | | | | | | | | | | | 8.3 | 9.525 | 3.18 | 1.2 | 3.81 | 0.20-0.50 | 0.50-4.50 | MSRNR/L B109 | |
| | 120402 | | | | | | | | | | | | | | | | | | | 12.5 | 12.7 | 4.76 | 0.2 | 5.16 | 0.10-0.50 | 1.00-4.50 | MSSNR/L B110 | |
| | 120404 | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.60 | 1.00-5.00 | PSBNR/L B98 | |
| | 120408 | ● | | | | | | | | ● | ● | | | | | | | | ● | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.70 | 1.00-6.00 | PSDNN B98 | |
| | 120412 | | | | | | | | | ● | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | 5.16 | 0.20-0.80 | 1.50-6.00 | PSKNR/L B129 | |
| | 120416 | | | | | | | | | ● | | | | | | | | | | 11.1 | 12.7 | 4.76 | 1.6 | 5.16 | 0.30-1.00 | 2.00-6.00 | PSSNR/L B99 | |
| | 120430 | | | | | | | | | | | | | | | | | | | 9.7 | 12.7 | 4.76 | 3.0 | 5.16 | 0.30-0.70 | 2.50-5.00 | | |
| | 150612 | | | | | | | | | ● | | | | | | | | | | 14.6 | 15.875 | 6.35 | 1.2 | 6.35 | 0.20-0.80 | 2.00-8.00 | | |
| | 150616 | | | | | | | | | | | | | | | | | | | 14.2 | 15.875 | 6.35 | 1.6 | 6.35 | 0.25-0.85 | 2.50-10.00 | | |
| | 190608 | | | | | | | | | | | | | | | | | | | 18.2 | 19.05 | 6.35 | 0.8 | 7.93 | 0.20-0.80 | 2.00-10.00 | | |
| | 190612 | | | | | | | | | ● | ● | | | | | | | | | 17.8 | 19.05 | 6.35 | 1.2 | 7.93 | 0.20-0.80 | 2.00-10.00 | | |
| 190616 | | | | | | | | | ● | ● | | | | | | | | | 17.4 | 19.05 | 6.35 | 1.6 | 7.93 | 0.25-0.85 | 2.50-10.00 | | | |
| 190624 | | | | | | | | | | | | | | | | | | | 16.6 | 19.05 | 6.35 | 2.4 | 7.93 | 0.35-0.90 | 3.00-10.00 | | | |
| 250724 | | | | | | | | | | | | | | | | | | | 23.0 | 25.4 | 7.94 | 2.4 | 9.12 | 0.40-1.00 | 3.00-13.00 | | | |
| 250924 | | | | | | | | | | | | | | | | | | | 23.0 | 25.4 | 9.52 | 2.4 | 9.12 | 0.40-1.00 | 3.00-13.00 | | | |
| SNMG-B25 Medium Roughing | 090308-B25 | | | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 3.81 | 0.17-0.45 | 0.80-3.50 | MSBNR/L B108 | |
| | 120404-B25 | ● | ● | | | | ● | | | ● | | | | | | | | | | 12.3 | 12.7 | 4.76 | 0.4 | 5.16 | 0.17-0.45 | 1.00-3.50 | MSDNN B108 | |
| | 120408-B25 | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.23-0.60 | 1.50-5.00 | MSKNR/L B109 | |
| | 120412-B25 | ● | ● | | | | ● | | | | ● | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.60 | 2.00-5.00 | MSRNR/L B109 | |
| | 120416-B25 | ● | | | | | ● | | | | | | | | | | | | | 11.1 | 12.7 | 4.76 | 1.6 | 5.16 | 0.35-0.70 | 2.50-5.00 | MSSNR/L B110 | |
| | 120420-B25 | | | | | | | | | | | | | | | | | | | 10.7 | 12.7 | 4.76 | 2.0 | 5.16 | 0.40-0.70 | 3.00-5.00 | PSBNR/L B98 | |
| | 150608-B25 | | | | | ● | | | | | | | | | | | | | | 15.0 | 15.875 | 6.35 | 0.8 | 6.35 | 0.25-0.60 | 1.50-6.00 | PSDNN B98 | |
| | 150612-B25 | | | | | ● | | | | | | | | | | | | | | 14.6 | 15.875 | 6.35 | 1.2 | 6.35 | 0.25-0.60 | 2.00-6.00 | PSKNR/L B129 | |
| | 150616-B25 | ● | ● | | | | | | | | | | | | | | | | | 14.2 | 15.875 | 6.35 | 1.6 | 6.35 | 0.35-0.70 | 2.00-6.00 | PSSNR/L B99 | |
| | 190608-B25 | | | | | ● | | | | | | | | | | | | | | 18.2 | 19.05 | 6.35 | 0.8 | 7.93 | 0.25-0.60 | 3.00-8.00 | | |
| | 190612-B25 | | | | | ● | ● | | | ● | ● | ● | | | | | | | | 17.8 | 19.05 | 6.35 | 1.2 | 7.93 | 0.30-0.60 | 3.00-8.00 | | |
| | 190616-B25 | | | | | ● | | | | ● | | | | | | | | | | 17.4 | 19.05 | 6.35 | 1.6 | 7.93 | 0.35-0.70 | 3.00-8.00 | | |
| | 250716-B25 | | | | | | | | | | | | | | | | | | | 23.8 | 25.4 | 7.94 | 1.6 | 9.12 | 0.35-0.70 | 4.00-12.00 | | |
| 250724-B25 | | | | | | | | | ● | | | | | | | | | | 23.0 | 25.4 | 7.94 | 2.4 | 9.12 | 0.50-1.00 | 5.00-12.00 | | | |

SN00





 Square **90° Negative**



| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊕ | ⊗ | ⊙ | ⊚ | ⊛ | ⊜ | ⊝ | ⊞ | ⊟ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types

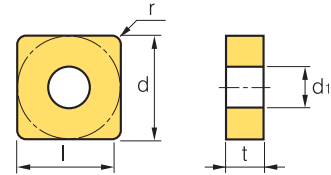
- Continuous cutting
- ⊕ General cutting
- ⊗ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-----|-------------------|------|------------------------|--------|------|------|----------------|-------------|--------------|--------------|------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC500H | NC9020 | NC5330 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| SNMG-HR  Roughing | 120408-HR | | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | MSBNR/L B108 | | |
| | 120412-HR | ● | | | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.70 | 1.30-7.00 | MSDNN B108 | |
| | 120416-HR | | | | | | | | | | | | | | | | | | | | | 11.1 | 12.7 | 4.76 | 1.6 | 5.16 | 0.32-0.75 | 1.80-7.00 | MSKNR/L B109 | |
| | 150608-HR | | | ● | | | | | | | | | | | | | | | | | | 15.0 | 15.875 | 6.35 | 0.8 | 6.35 | 0.20-0.50 | 1.80-8.00 | MSRNR/L B109 | |
| | 150612-HR | | | ● | | | | | | | | | | | | | | | | | | 14.6 | 15.875 | 6.35 | 1.2 | 6.35 | 0.20-0.70 | 1.30-8.00 | MSSNR/L B110 | |
| | 150616-HR | | | | | | | | | | | | | | | | | | | | | 14.2 | 15.875 | 6.35 | 1.6 | 6.35 | 0.30-0.80 | 1.80-8.00 | PSBNR/L B98 | |
| | 150624-HR | | | | | | | | | | | | | | | | | | | | | 13.4 | 15.875 | 6.35 | 2.4 | 6.35 | 0.32-0.90 | 2.20-8.00 | PSDNN B98 | |
| | 190608-HR | | | | | | | | | | | | | | | | | | | | | 18.2 | 19.05 | 6.35 | 0.8 | 7.93 | 0.20-0.50 | 1.00-10.00 | PSKNR/L B129 | |
| | 190612-HR | | | | | | | | | | | | | | | | | | | | | 17.8 | 19.05 | 6.35 | 1.2 | 7.93 | 0.25-0.70 | 1.30-10.00 | PSSNR/L B99 | |
| | 190616-HR | ● | | ● | | | | | | | | | | | | | | | | | | 17.4 | 19.05 | 6.35 | 1.6 | 7.93 | 0.30-0.80 | 1.80-10.00 | | |
| | 190624-HR | | | | | | | | | | | | | | | | | | | | | 16.6 | 19.05 | 6.35 | 2.4 | 7.93 | 0.32-0.90 | 2.30-10.00 | | |
| | 250724-HR | | | | | | | | | | | | | | | | | | | | | 23.0 | 25.4 | 7.94 | 2.4 | 9.12 | 0.40-1.20 | 2.30-15.00 | | |
| 250924-HR | | ● | ● | | | | | | | | | | | | | | | | | | 23.0 | 25.4 | 9.52 | 2.4 | 9.12 | 0.40-1.20 | 2.30-15.00 | | | |
| SNMG-HS  Medium | 090304-HS | | | | | ● | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | 3.81 | 0.05-0.25 | 1.00-2.50 | MSBNR/L B108 | | |
| | 090308-HS | | | | | | | ● | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 3.81 | 0.10-0.30 | 1.00-2.50 | MSDNN B108 | |
| | 120404-HS | | | | | ● | | | | | | | | | | | | | | | | 12.3 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 1.00-4.50 | MSKNR/L B109 | |
| | 120408-HS | | | | | ● | ● | | ● | ● | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 1.00-4.50 | MSRNR/L B109 | |
| | 120412-HS | | | | | ● | | | ● | ● | | | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.55 | 1.00-4.50 | MSSNR/L B110 | |
| | 150612-HS | | | | | | | | | | | | | | | | | | | | | 14.6 | 15.875 | 6.35 | 1.2 | 6.35 | 0.13-0.55 | 1.00-6.10 | PSBNR/L B98 | |
| | 150616-HS | | | | | | | | | | | | | | | | | | | | | 14.2 | 15.875 | 6.35 | 1.6 | 6.35 | 0.15-0.60 | 1.00-4.50 | PSDNN B98 | |
| | 190612-HS | | | | | | ● | | | ● | ● | | | | | | | | | | | 17.8 | 19.05 | 6.35 | 1.2 | 7.93 | 0.13-0.55 | 1.00-7.60 | PSKNR/L B129 | |
| 190616-HS | | | | | | | | | | ● | ● | | | | | | | | | | 17.4 | 19.05 | 6.35 | 1.6 | 7.93 | 0.15-0.60 | 1.00-7.60 | PSSNR/L B99 | | |
| SNMG-VC  Medium to finishing | 120408-VC | ● | ● | | | | ● | ● | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.40 | 0.50-3.50 | MSBNR/L B108 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MSDNN B108 | |
| SNMG-VL  Finishing(Mild steel) | 120408-VL | ● | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.35 | 0.20-1.50 | MSBNR/L B108 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MSDNN B108 | |




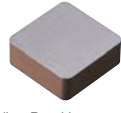
B Turning Insert (Negative)

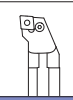
SN00

 Square 90° Negative



| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

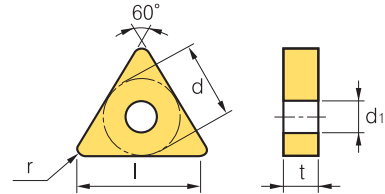
| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--------|------|-------|-------|-------------------|-----|------------------------|-------|--------|------|------|----------------|-------------|--------------|--------------|------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | NC5330 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | ST30A | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| SNMM-GR  Roughing | 120408-GR | | | | ● | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | MSBNR/L B108 | | |
| | 120412-GR | | | | ● | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.65 | 1.30-7.00 | MSDNN B108 | |
| | 190612-GR | | | | ● | | | | | | | | | | | | | | | | | | 17.8 | 19.05 | 6.35 | 1.2 | 7.93 | 0.25-0.65 | 1.30-11.50 | MSKNR/L B109 | |
| | 190616-GR | | | | | | | | | | | | | | | | | | | | | | 17.4 | 19.05 | 6.35 | 1.6 | 7.93 | 0.32-0.85 | 1.80-11.50 | MSRNR/L B109 | |
| SNMN  Medium Roughing | 120304 | | | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 3.18 | 0.4 | - | 0.17-0.45 | 1.00-3.50 | CSDNN B120 | | |
| | 120308 | | | | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 3.18 | 0.8 | - | 0.23-0.60 | 1.50-6.00 | CSKNR/L B121 | |
| | 120312 | | | | | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 3.18 | 1.2 | - | 0.25-0.60 | 2.00-5.00 | | |
| | 120404 | | | | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 4.76 | 0.4 | - | 0.17-0.45 | 1.00-3.50 | | |
| | 120408 | | | | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | - | 0.23-0.60 | 1.50-5.00 | | |
| | 120412 | | | | | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | - | 0.25-0.60 | 2.00-5.00 | | |
| | 150404 | | | | | | | | | | | | | | | | | | | | | | 15.5 | 15.875 | 4.76 | 0.4 | - | 0.20-0.50 | 1.50-6.00 | | |
| | 150408 | | | | | | | | | | | | | | | | | | | | | | 15.0 | 15.875 | 4.76 | 0.8 | - | 0.25-0.60 | 1.50-6.00 | | |
| | 150412 | | | | | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | - | 0.25-0.60 | 2.00-6.00 | | |
| 190416 | | | | | | | | | | | | | | | | | | | | | | 17.4 | 19.05 | 4.76 | 1.6 | - | 0.35-0.70 | 2.00-6.00 | | | |
| SNMX  Medium | 120408R | | | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.35 | 1.00-4.00 | MSBNR/L B108 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MSDNN B108 | |
| SNUN  Medium Roughing | 120408 | | | | | | | | | | | | | | | | | | ● | | | 11.9 | 12.7 | 4.76 | 0.8 | - | 0.23-0.60 | 1.50-5.00 | CSDNN B120 | | |
| | 120412 | | | | | | | | | | | | | | | | | | ● | | | | 11.5 | 12.7 | 4.76 | 1.2 | - | 0.25-0.60 | 2.00-5.00 | CSKNR/L B121 | |
| | 190412 | | | | | | | | | | | | | | | | | | | | | | 17.4 | 19.05 | 4.76 | 1.2 | - | 0.30-1.00 | 3.00-10.00 | | |
| | 120412TN | | | | | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | - | 0.25-0.60 | 2.00-5.00 | | |
| | 250724TN | | | | | | | | | | | | | | | | | | | | | | 23.0 | 25.4 | 7.94 | 2.4 | - | 0.30-1.20 | 3.00-12.00 | | |






B Turning Insert (Negative)

TN00

 Triangular **60° Negative**

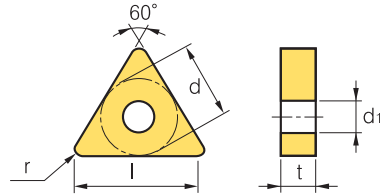


| Workpiece | Machining types | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|---|---|---|---|---|---|--------------------|-----------------|---------------------|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | P | M | K | N | S | H | Continuous cutting | General cutting | Interrupted cutting |
| Steel | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-------|-------------------|------|------------------------|--------|------|------|----------------|-------------|-----------|-------------|----------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC500H | NC9025 | NC5330 | PC8110 | PC5300 | PC9030 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | ST30A | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| TNGN  Medium | 110302 | | | | | | | | | | | | | | | | | | | | 10.5 | 6.35 | 3.18 | 0.2 | - | 0.05-0.25 | 0.20-2.50 | CTFNRL | B121 | |
| | 110304 | | | | | | | | | | | | | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | - | 0.10-0.30 | 0.50-2.50 | CTGNRL | B121 |
| | 110308 | | | | | | | | | | | | | | | | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | - | 0.10-0.30 | 0.80-2.50 | | |
| | 160302 | | | | | | | | | | | | | | | | | | | | | 16.0 | 9.525 | 3.18 | 0.2 | - | 0.05-0.30 | 0.20-3.00 | | |
| | 160304 | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 3.18 | 0.4 | - | 0.10-0.30 | 0.50-4.00 | | |
| | 160308 | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 3.18 | 0.8 | - | 0.10-0.40 | 0.80-4.00 | | |
| | 160404 | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | - | 0.10-0.40 | 0.50-4.00 | | |
| | 160408 | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | - | 0.10-0.40 | 1.00-4.00 | | |
| | 160412 | | | | | | | | | | | | | | | | | | | | | 13.5 | 9.525 | 4.76 | 1.2 | - | 0.10-0.50 | 1.50-4.50 | | |
| | 220404 | | | | | | | | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | - | 0.10-0.35 | 1.00-4.00 | | |
| | 220408 | | | | | | | | | | | | | | | ● | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | - | 0.15-0.40 | 1.50-5.00 | | |
| | 220412 | | | | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | - | 0.20-0.50 | 1.50-5.00 | | |
| | 220416 | | | | | | | | | | | | | | | | | | | | | 18.2 | 12.7 | 4.76 | 1.6 | - | 0.25-0.55 | 1.50-5.00 | | |
| 220424 | | | | | | | | | | | | | | | | | | | | | 17.4 | 12.7 | 4.76 | 2.4 | - | 0.30-0.65 | 2.00-5.00 | | | |
| 270630 | | | | | | | | | | | | | | | | | | | | | 19.7 | 15.875 | 6.35 | 3.0 | - | 0.35-0.70 | 2.00-5.00 | | | |
| TNMA  Roughing | 110308 | | | | | | | | | | | | | | | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | 2.40 | 0.05-0.30 | 0.50-3.00 | MTENN | B110 | |
| | 160404 | | | | | | | | | | | ● | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.10-0.30 | 1.00-4.00 | MTFNR/L | B110 |
| | 160408 | | | | | | | | | | | ● | ● | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 1.00-4.00 | MTGNR/L | B111 |
| | 160412 | | | | | | | | | | | ● | | | | | | | | | | 13.5 | 9.525 | 4.76 | 1.2 | 3.81 | 0.10-0.50 | 1.50-4.50 | MTJNR/L | B111 |
| | 160416 | | | | | | | | | | | | | | | | | | | | | 12.5 | 9.525 | 4.76 | 1.6 | 3.81 | 0.15-0.55 | 1.50-4.50 | PTFNR/L | B100,130 |
| | 220404 | | | | | | | | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.35 | 1.00-4.00 | PTGNR/L | B100 |
| | 220408 | | | | | | | | | | | | ● | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.40 | 1.50-5.00 | PTTNR/L | B101 |
| | 220412 | | | | | | | | | | | | ● | ● | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.20-0.50 | 1.50-5.00 | WTENN | B102 |
| | 220416 | | | | | | | | | | | | ● | ● | | | | | | | | 18.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.25-0.55 | 1.50-5.00 | WTJNR/L | B102 |
| | 220420 | | | | | | | | | | | | | | | | | | | | | 16.8 | 12.7 | 4.76 | 2.0 | 5.16 | 0.30-0.65 | 2.00-5.00 | WTXNR/L | B102 |
| | 220432 | | | | | | | | | | | | | | | | | | | | | 16.5 | 12.7 | 4.76 | 3.2 | 5.16 | 0.35-0.70 | 2.00-5.00 | | |
| | 270608 | | | | | | | | | | | | | | | | | | | | | 25.4 | 15.875 | 6.35 | 0.8 | 6.35 | 0.20-0.45 | 2.00-7.00 | | |
| | 270612 | | | | | | | | | | | | | | | | | | | | | 24.4 | 15.875 | 6.35 | 1.2 | 6.35 | 0.25-0.55 | 3.00-7.00 | | |
| 270616 | | | | | | | | | | | | | | | | | | | | | 23.3 | 15.875 | 6.35 | 1.6 | 6.35 | 0.30-0.65 | 3.00-7.00 | | | |
| 330924 | | | | | | | | | | | | | | | | | | | | | 27.1 | 15.875 | 9.52 | 2.4 | 7.93 | 0.35-0.75 | 3.00-9.00 | | | |
| TNMG-B25  Medium Roughing | 110308-B25 | | | | | | | | | | | | | | | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | 2.40 | 0.17-0.40 | 1.50-3.00 | MTENN | B110 | |
| | 160304-B25 | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 3.18 | 0.4 | 3.81 | 0.17-0.45 | 2.00-3.50 | MTFNR/L | B110 |
| | 160308-B25 | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 3.18 | 0.8 | 3.81 | 0.17-0.55 | 2.00-3.50 | MTGNR/L | B111 |
| | 160312-B25 | | | | | | | | | | | | | | | | | | | | | 13.5 | 9.525 | 3.18 | 1.2 | 3.81 | 0.25-0.55 | 2.00-3.50 | MTJNR/L | B111 |
| | 160316-B25 | | | | | | | | | | | | | | | | | | | | | 12.5 | 9.525 | 3.18 | 1.6 | 3.81 | 0.30-0.60 | 2.50-3.00 | PTFNR/L | B100,130 |
| | 160404-B25 | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.17-0.45 | 2.00-3.50 | PTGNR/L | B100 |
| | 160408-B25 | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.17-0.55 | 2.00-3.50 | PTTNR/L | B101 |
| | 160412-B25 | | | | | | | | | | | | | | | | | | | | | 13.5 | 9.525 | 4.76 | 1.2 | 3.81 | 0.25-0.55 | 2.00-3.50 | WTENN | B102 |
| | 160416-B25 | | | | | | | | | | | | | | | | | | | | | 12.5 | 9.525 | 4.76 | 1.6 | 3.81 | 0.30-0.60 | 2.50-3.00 | WTJNR/L | B102 |
| | 220404-B25 | | | | | | | | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | 5.16 | 0.17-0.45 | 1.50-5.00 | WTXNR/L | B102 |
| | 220408-B25 | | | | | | | | | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.17-0.55 | 2.00-5.00 | | |
| | 220412-B25 | | | | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.55 | 2.00-5.00 | | |
| | 220416-B25 | | | | | | | | | | | | | | | | | | | | | 18.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.30-0.60 | 2.00-5.00 | | |
| 220424-B25 | | | | | | | | | | | | | | | | | | | | | 17.2 | 12.7 | 4.76 | 2.4 | 5.16 | 0.35-0.70 | 3.00-7.00 | | | |
| 220432-B25 | | | | | | | | | | | | | | | | | | | | | 16.5 | 12.7 | 4.76 | 3.2 | 5.16 | 0.40-0.75 | 3.50-7.00 | | | |







TN00

 Triangular **60° Negative**



| Workpiece | Machining types | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

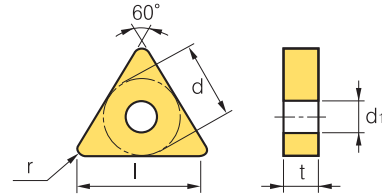
Machining types
 ● Continuous cutting
 ⊕ General cutting
 ⊕ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|------|------------------------|-------|-------|----------------|-------------|-----------|-------------|------------------|------------------|--------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC5400 | PC9030 | NC6205 | NC6210 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page | | |
|  Finishing | 160404-VL | ● | ● | | | | | | | | | | | | | | | | | | | 15.4 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.25 | 0.10-1.00 | MTENN B110 | B110 | | |
| | 160408-VL | ● | ● | | | ● | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.35 | 0.20-1.50 | MTGNR/L B111 | B111 | |
| | 220408-VL | | | | | | | | | | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.35 | 0.20-1.50 | PTFNR/L B100,130 | B111 | |
| | 220412-VL | | | | | | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.10-0.35 | 0.50-2.00 | PTGNR/L B100 | B101 |
|  Finishing | 110304-VF | | | | | ● | | | | | | | ● | | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 2.40 | 0.05-0.20 | 0.20-1.00 | MTENN B110 | B110 | |
| | 160404-VF | ● | ● | | | | ● | ● | | | | | ● | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.07-0.30 | 0.50-1.50 | MTGNR/L B111 | B111 |
| | 160408-VF | ● | ● | | | ● | | | | | | | ● | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.50-1.50 | MTJNR/L B111 | B111 |
| | 160412-VF | | | | | ● | | | | | | | | | | | | | | | | | | 13.5 | 9.525 | 4.76 | 1.2 | 3.81 | 0.15-0.50 | 0.50-1.50 | PTFNR/L B100,130 | B100 |
| | 220404-VF | | | | | ● | | | | ● | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.40 | 0.50-1.50 | PTTNR/L B101 | B102 |
| 220408-VF | | | | | ● | | | | | | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.50-1.50 | WTENN B102 | WTJNR/L B102 | |
|  Finishing | 110304-VG | | | | | | | | | | | | ● | ● | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 2.40 | 0.05-0.20 | 0.20-1.00 | MTENN B110 | B110 | |
| | 160404-VG | | | | | | | | | | | | ● | ● | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.07-0.30 | 0.50-1.50 | MTGNR/L B111 | B111 |
| | 160408-VG | | | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.50-1.50 | MTJNR/L B111 | B111 |
| | 220404-VG | | | | | | | | | | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10-0.40 | 0.50-1.50 | PTFNR/L B100,130 | B100 |
|  Medium | 110308-VM | | | | | | | | | | | | | | | | | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | 2.40 | 0.05-0.30 | 0.80-4.00 | MTENN B110 | B110 | |
| | 160404-VM | ● | ● | ● | ● | | ● | | | | | | ● | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.90-5.00 | MTGNR/L B111 | B111 |
| | 160408-VM | ● | ● | ● | ● | | ● | ● | ● | ● | | | ● | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.50 | 1.00-5.00 | MTJNR/L B111 | B111 |
| | 160412-VM | | | | | ● | | | | ● | | | | | | | | | | | | | | 13.5 | 9.525 | 4.76 | 1.2 | 3.81 | 0.13-0.60 | 1.30-5.00 | PTFNR/L B100,130 | B100 |
| | 220404-VM | | | | | ● | | | | | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.90-6.60 | PTTNR/L B101 | B102 |
| | 220408-VM | | | | | ● | ● | | ● | ● | ● | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-6.60 | WTENN B102 | WTJNR/L B102 |
| 220412-VM | | | | | ● | ● | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.60 | 1.30-6.60 | WTXNR/L B102 | B102 | |
|  Medium to finishing | 160404-VP2 | | | | | ● | | | ● | ● | ● | | | | | | | | | | | | 15.4 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.10-3.00 | MTENN B110 | B110 | |
| | 160408-VP2 | | | | | ● | | | ● | ● | ● | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.45 | 0.50-5.00 | MTGNR/L B111 | B111 |
|  Medium | 160404-VP3 | | | | | | | | ● | ● | ● | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.10-3.00 | MTENN B110 | B110 | |
| | 160408-VP3 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.45 | 0.50-5.00 | MTGNR/L B111 | B111 |





B Turning Insert (Negative)

TN00

 Triangular **60° Negative**

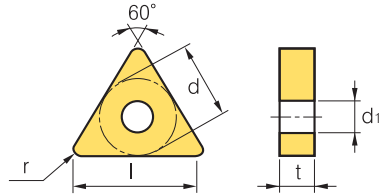


| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|---|---|---|---|---|---|---|---|---|---|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | P | M | K | N | S | H | ● | ◐ | ◑ | ◒ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-----|-------------------|------|------------------------|--------|------|------|----------------|-------------------------|---------------------|-------------|----------|----------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC3020 | NC3025 | NC3330 | PC8110 | PC5300 | PC9030 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page | |
|  Medium to finishing | 110304-VQ | | | | | | | | | | | | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 2.40 | 0.05-0.30 | 0.50-3.50 | MTENN | B110 | | |
| | 160404-VQ | | | | | | | | | | | | ● | ● | | | ● | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.35 | 0.50-3.50 | MTFNR/L | B110 | |
| | 160408-VQ | | | | | | | | | | | | | | | | ● | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.08-0.40 | 0.80-4.00 | MTGJR/L | B111 | |
| | 220404-VQ | | | | | | | | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.35 | 0.50-4.00 | PTFNR/L | B100,130 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | PTGJR/L | B100 |
|  Finishing(Wiper) | 160404-VW | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.10-0.35 | 0.30-3.00 | MTENN | B110 | | |
| | 160408-VW | | | | | | | | | | | | ● | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.30-3.00 | MTFNR/L | B110 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MTGJR/L | B111 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MTJNR/L | B111 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | PTFNR/L | B100,130 |
|  Heavy duty machining | 160404-VK | | | | | | | | | | | | ● | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.15-0.50 | 0.80-5.00 | MTENN | B110 | | |
| | 160408-VK | | | | | | | | | | | | ● | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.20-0.50 | 1.00-5.50 | MTFNR/L | B110 | |
| | 160416-VK | | | | | | | | | | | | | ● | | | | | | | | 12.5 | 9.525 | 4.76 | 1.6 | 3.81 | 0.15-0.50 | 1.50-5.50 | MTGJR/L | B111 | |
| | 220412-VK | | | | | | | | | | | | | | ● | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.60 | 1.50-6.00 | MTJNR/L | B111 | |
| | 220416-VK | | | | | | | | | | | | | | | ● | | | | | | 18.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.25-0.60 | 2.00-6.00 | PTFNR/L | B100,130 | |
|  Heavy | 160408-GH | | ● | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.20-0.50 | 1.00-7.00 | MTENN | B110 | | |
| | 220408-GH | | | | | | | | | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.25-0.60 | 1.30-7.00 | MTFNR/L | B110 | |
| | 220412-GH | | ● | ● | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.20-0.50 | 1.00-8.00 | MTGJR/L | B111 | |
| | 220416-GH | | | ● | | | | | | | | | | | | | | | | | | 18.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.25-0.60 | 1.30-8.00 | MTJNR/L | B111 | |
| | 270616-GH | | | | | | | | | | | | | | | | | | | | | 23.4 | 15.875 | 6.35 | 1.6 | 6.35 | 0.32-0.70 | 1.80-8.00 | PTFNR/L | B100,130 | |
| | 270624-GH | | | | | | | | | | | | | | | | | | | | | 21.3 | 15.875 | 6.35 | 2.4 | 6.35 | 0.35-0.50 | 1.80-13.00 | PTGJR/L | B100 | |
| | 330924-GH | | | | | | | | | | | | | | | | | | | | | 27.1 | 19.05 | 9.52 | 2.4 | 7.93 | 0.35-0.70 | 2.30-13.00 | PTTNR/L | B101 | |

TN000

Triangular **60° Negative**



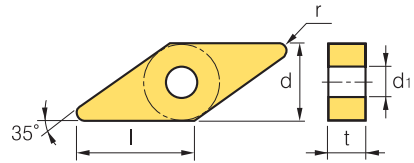
| Workpiece | Machining types | | | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | P | M | K | N | S | H | ● | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

| Inserts | Designation | Coated | | | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | |
|---------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-----|-----|------|-------|-------------------|------|------------------------|----------------------------|------------------------|-------------|----------|----------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page | |
| Medium | 160412-GM | | | | | | | | | | | | | | | | | | | | 13.5 | 9.525 | 4.76 | 1.2 | 3.81 | 0.13-0.60 | 1.30-5.00 | MTENN | B110 | |
| | 220408-GM | | | | | | | | | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-6.60 | MTFNR/L | B110 |
| | 220412-GM | | | | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.60 | 1.30-6.60 | MTGNR/L | B111 |
| | 220416-GM | | | | | | | | | | | | | | | | | | | | | 18.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.15-0.65 | 1.50-7.00 | MTJNR/L | B111 |
| Roughing | 220408-GR | | | | | | | | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.22-0.61 | 1.10-7.80 | PTFNR/L | B100,130 | |
| | 220412-GR | | | | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | 5.16 | 0.28-0.78 | 1.20-7.80 | PTGNR/L | B100 |
| | 220416-GR | | | | | | | | | | | | | | | | | | | | | 18.2 | 12.7 | 4.76 | 1.6 | 5.16 | 0.31-0.75 | 1.50-7.80 | PPTNR/L | B101 |
| Medium Roughing | 160408 | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | - | 0.10-0.30 | 1.00-4.00 | CTFNR/L | B121 | |
| | 220408 | | | | | | | | | | | | ● | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | - | 0.15-0.40 | 1.50-5.00 | CTGNR/L | B121 |
| | 220412 | | | | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | - | 0.20-0.50 | 1.50-5.00 | | |
| Medium Roughing | 160402R | | | | | | | | | | | | ● | | | | | | | | 16.5 | 9.525 | 4.76 | 0.2 | 3.81 | 0.10-0.30 | 0.50-3.00 | MTENN | B110 | |
| | 160404R | | ● | ● | ● | | | | | | | | ● | ● | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.12-0.30 | 1.00-3.50 | MTFNR/L | B110 |
| | 160408R | | | ● | ● | | ● | | | | | | | ● | ● | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 3.81 | 0.15-0.35 | 1.30-3.40 | MTGNR/L | B111 |
| | 220404R | | | | | | | | | | | | | | | | | | | | | 21.0 | 12.7 | 4.76 | 0.4 | 5.16 | 0.12-0.30 | 1.00-5.00 | MTJNR/L | B111 |
| | 220408R | | | | | | | | | | | | | | | | | | | | | 20.0 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.35 | 1.30-5.00 | PTFNR/L | B100,130 |
| | 160404L | | ● | ● | | | | | | | | | | ● | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 3.81 | 0.12-0.30 | 1.00-3.50 | PTGNR/L | B100 |
| Medium | 160404R-SH | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 6.30 | 0.15-0.30 | 0.50-4.00 | PPTNR/L | B101 | |
| | 160408R-SH | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 6.30 | 0.15-0.45 | 1.00-4.00 | WTENN | B102 |
| | 160404L-SH | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 6.30 | 0.15-0.30 | 0.50-4.00 | WTJNR/L | B102 |
| | 160408L-SH | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 6.30 | 0.15-0.45 | 1.00-4.00 | WTXNR/L | B102 |







B Turning Insert (Negative)

VN000

 Rhombic **35° Negative**

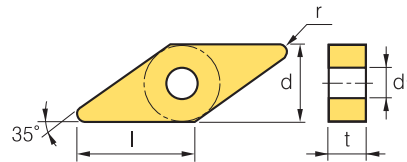


| Workpiece | Machining types | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|---|---|---|---|---|---|---|---|---|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | ● | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ | ⊕ |
| Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-----|-------------------|------|------------------------|-------|------|------|----------------|-------------------------|---------------------|--------------|--------------|--------------|--------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d _i | f _n (mm/rev) | a _p (mm) | Designation | Page | | |
| VNGG-HA  Medium to finishing | 160408-HA | | | | | | ● | | | | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.80-3.50 | MVJNR/L B111 | MVQNR/L B112 | MVVNN B112 | MVUNR/L B133 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VNMG-GM  Medium | 160404-GM | | ● | | | | | | | | | | ● | ● | | | | | | | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.08-0.45 | 0.50-3.50 | MVJNR/L B111 | MVQNR/L B112 | MVVNN B112 | MVUNR/L B133 |
| | 160408-GM | | ● | | | | | | | | | | ● | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.50 | 1.00-4.00 | | | | |
| VNMG-HA  Medium to finishing | 160404-HA | | | | | | ● | | | | | | | | | | | | ● | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.08-0.35 | 0.50-3.00 | MVJNR/L B111 | MVQNR/L B112 | MVVNN B112 | MVUNR/L B133 | |
| | 160408-HA | | | | | | ● | | | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.80-3.50 | | | | | |
| VNMG-HR  Roughing | 160408-HR | | | | | | | | | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.50 | 1.00-4.00 | MVJNR/L B111 | MVQNR/L B112 | MVVNN B112 | MVUNR/L B133 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VNMG-HS  Medium | 160404-HS | | | | ● | | ● | ● | ● | | | | | | | | | | | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.08-0.35 | 0.50-4.00 | MVJNR/L B111 | MVQNR/L B112 | MVVNN B112 | MVUNR/L B133 | |
| | 160408-HS | | | | | | ● | ● | ● | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 1.00-4.50 | | | | | |
| VNMG-VB  Finishing | 160404-VB | ● | ● | | | ● | | | | | | | | | | | | | | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.10-0.35 | 0.30-1.50 | MVJNR/L B111 | MVQNR/L B112 | MVVNN B112 | MVUNR/L B133 | |
| | 160408-VB | | ● | | | | | | | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.15-0.45 | 0.50-2.00 | | | | | |





VN000

Rhombic 35° Negative



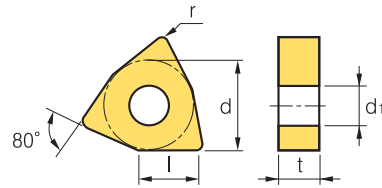
| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊙ | ⊕ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types
 ● Continuous cutting
 ⊙ General cutting
 ⊕ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|--------|----------|-----------------|-----|------|-------|-------|-------------------|----------------|-------------------------|---------------------|--------------|--------------|--|
| | | NC3010 | NC3120 | NC3220 | NC3300 | NC9025 | PC8110 | PC5330 | PC5400 | PC9030 | NC6205 | NC6210 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page | |
| VNMG-VC  Medium to finishing | 160404-VC | | | | | | | | | | | | | | | | | | | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.10~0.35 | 0.30~2.00 | MVJNR/L B111 | | |
| | 160408-VC | | | | | | | | | | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.15~4.00 | 0.50~3.00 | MVQNR/L B112 | |
| VNMG-VP3  Medium | 160404-VP3 | | | | | | | | | | | | | | | | | | | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05~0.30 | 0.10~3.00 | MVJNR/L B111 | | |
| | 160408-VP3 | | | | | | | | | | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10~0.45 | 0.50~5.00 | MVQNR/L B112 | |
| VNMG-VL  Finishing(Mild steel) | 160404-VL | ● | ● | | ● | | | | | | | | | | | | | | | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05~0.20 | 0.10~1.00 | MVJNR/L B111 | | |
| | 160408-VL | ● | ● | | ● | | | | | | | ● | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10~0.25 | 0.20~1.50 | MVQNR/L B112 | |
| VNMG-VF  Finishing | 160402-VF | ● | | | ● | | | | | | ● | ● | | | | | | | | | 16.1 | 9.525 | 4.76 | 0.2 | 3.81 | 0.06~0.20 | 0.30~1.00 | MVJNR/L B111 | | |
| | 160404-VF | ● | ● | | ● | | | | | | | ● | | | | | | | | | | 15.6 | 9.525 | 4.76 | 0.4 | 3.81 | 0.08~0.30 | 0.50~1.50 | MVQNR/L B112 | |
| | 160408-VF | ● | ● | | ● | | | | | | | | | | | | | | | | | 14.6 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10~0.40 | 0.50~1.50 | MVJNR/L B112 | |

WN○○

Trigon 80° Negative



| Workpiece | Machining types | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊕ | ⊕ | ⊕ | ⊕ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

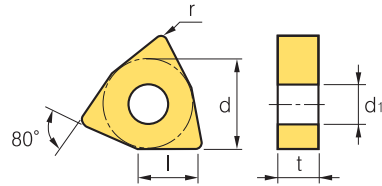
Machining types

- Continuous cutting
- ⊕ General cutting
- ⊕ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|------------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--------|--------|------|-------|-------------------|-----|------------------------|-------|------|------|-----------|-----------|----------------|-------------|---------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5330 | PC9030 | NC6205 | | | | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) |
| WNMA Roughing | 060404 | | | | | | | | | | | | | | | | | | | | 6.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.10-0.30 | 0.50-3.00 | MWLNRL B112 | | |
| | 060408 | | | | | | | | | | ● | | | | | | | | | | | 6.1 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.30 | 0.50-3.00 | PWLNRL B130 | |
| | 060412 | | | | | | | | | | | | | | | | | | | | | 6.0 | 9.525 | 4.76 | 1.2 | 3.81 | 0.10-0.40 | 1.00-3.00 | WWLNRL B103 | |
| | 080404 | | | | | | | | | | | | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.60 | 1.00-5.00 | | |
| | 080408 | | | | | | | | | | ● | ● | ● | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15-0.60 | 1.00-6.00 | | |
| 080412 | | | | | | | | | | | ● | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.15-0.70 | 1.50-6.00 | | | |
| WNMG-B25 Medium Roughing | 080404-B25 | | | | | | | | | | | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.17-0.45 | 1.00-5.00 | MWLNRL B112 | | |
| | 080408-B25 | | ● | ● | | | | | | | ● | | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.23-0.60 | 1.50-5.00 | PWLNRL B130 | |
| | 080412-B25 | | | | | | | | | | | | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.60 | 2.00-5.00 | WWLNRL B103 | |
| WNMG-GM Medium | 060404-GM | | | | | | | | | | | | | | | | | | | | 6.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.90-3.50 | MWLNRL B112 | | |
| | 060408-GM | | ● | ● | | | | | | | | | | | | | | | | | | 6.1 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.45 | 1.00-3.50 | PWLNRL B130 | |
| | 080404-GM | | | | ● | | | | | | | | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.90-5.00 | WWLNRL B103 | |
| | 080408-GM | | ● | ● | ● | | | | | | | | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-5.00 | | |
| 080412-GM | | ● | | | | | | | | | ● | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.18-0.60 | 0.30-5.00 | | | |
| WNMG-GR Roughing | 080404-GR | | | | | | | | | | | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15-0.50 | 0.08-6.00 | MWLNRL B112 | | |
| | 080408-GR | | ● | ● | ● | ● | | | | | ● | ● | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | PWLNRL B130 | |
| | 080412-GR | | ● | ● | ● | ● | ● | | | | | ● | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.50 | 1.30-7.00 | WWLNRL B103 | |
| | 080416-GR | | ● | | | | | | | | | | | | | | | | | | | 8.1 | 12.7 | 4.76 | 1.6 | 5.16 | 0.25-0.60 | 1.80-6.00 | | |
| WNMG-GS Medium Roughing | 060404-GS | | | | | | | | | | | | | | | | | | | | 6.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.25 | 0.10-3.00 | MWLNRL B112 | | |
| | 060408-GS | | | | | | | | | | ● | ● | | | | | | | | | | 6.1 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.50 | 1.00-4.00 | PWLNRL B130 | |
| | 060412-GS | | | | | | | | | | | | | | | | | | | | | 6.0 | 9.525 | 4.76 | 1.2 | 3.81 | 0.10-0.50 | 1.00-4.00 | WWLNRL B103 | |
| | 080404-GS | | | | ● | | | | | | | ● | ● | ● | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.25 | 0.10-3.00 | | |
| | 080408-GS | | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.50 | 1.00-5.00 | | |
| 080412-GS | | | | | | | | | | | | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.65 | 1.00-5.00 | | | |
| WNMG-HA Medium to finishing | 060404-HA | | | | | | | | | | | | | | | | | | | | 6.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.10-3.00 | MWLNRL B112 | | |
| | 060408-HA | | | | | | | | | | | | | | | | | | | | | 6.1 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10-0.40 | 0.80-3.50 | PWLNRL B130 | |
| | 080404-HA | | ● | | ● | | | | | | | ● | ● | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.80-3.50 | WWLNRL B103 | |
| | 080408-HA | | | | ● | | | | | | | ● | ● | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10-0.40 | 0.80-3.50 | | |
| | 080412-HA | | | | | | | | | | | | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.13-0.55 | 0.80-3.50 | | |
| WNMG-HC Medium to finishing | 060404-HC | | | | | | | | | | | | | | | | | | | | 6.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05-0.30 | 0.80-4.00 | MWLNRL B112 | | |
| | 080404-HC | | | | | | | | | | | | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05-0.30 | 0.80-4.00 | PWLNRL B130 | |
| | 080408-HC | | ● | | ● | | | | | | | | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.08-0.40 | 0.80-4.00 | WWLNRL B103 | |
| WNMG-HR Roughing | 060408-HR | | | | | | | | | | | | | | | | | | | | 6.1 | 9.525 | 4.76 | 0.8 | 3.81 | 0.20-0.40 | 1.00-5.50 | MWLNRL B112 | | |
| | 060412-HR | | | | | | | | | | | | | | | | | | | | | 6.0 | 9.525 | 4.76 | 1.2 | 3.81 | 0.25-0.50 | 1.10-5.50 | PWLNRL B130 | |
| | 080408-HR | | ● | | ● | | | | | | | | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20-0.50 | 1.00-7.00 | WWLNRL B103 | |
| | 080412-HR | | ● | | ● | | | | | | | | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25-0.65 | 1.30-7.00 | | |
| | 080416-HR | | | | | | | | | | | | | | | | | | | | | 8.1 | 12.7 | 4.76 | 1.6 | 5.16 | 0.32-0.70 | 1.80-7.00 | | |




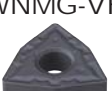



WN○○

 **Trigon 80° Negative**



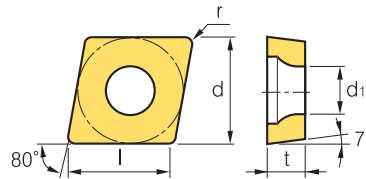
| Workpiece | Machining types | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ● | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ | ⊙ | ⊕ | ⊖ | ● | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types
 ● Continuous cutting
 ⊙ General cutting
 ⊕ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--------|--------|------|-------|-------------------|--------|------------------------|------|------|-----------|------------|-------------|----------------|-------------------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC5400 | PC9030 | | | | NC6210 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) |
|  Medium | O60402-VM | | | | | | | | | | | | | | | | | | | | 6.5 | 9.525 | 4.76 | 0.2 | 3.81 | 0.05~0.30 | 0.90~3.50 | MWLNRL B112 | |
| | O60404-VM | ● | ● | ● | | ● | | | | | | | | | | | | | | | 6.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.10~0.45 | 1.00~3.50 | PWLNRL B130 | |
| | O60408-VM | ● | ● | ● | | ● | ● | | | | ● | | | | | | | | | | 6.1 | 9.525 | 4.76 | 0.8 | 3.81 | 0.10~0.50 | 1.00~4.00 | WWLNRL B103 | |
| | O60412-VM | | | | | | | | | | | | | | | | | | | | 6.0 | 9.525 | 4.76 | 1.2 | 3.81 | 0.13~0.60 | 1.30~4.00 | | |
| | O80404-VM | | ● | ● | | ● | | ● | | | ● | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05~0.30 | 0.90~5.00 | | |
| | O80408-VM | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.10~0.50 | 1.00~5.00 | | |
| | O80412-VM | ● | ● | ● | | ● | ● | | | | ● | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.10~0.50 | 1.00~5.00 | | |
|  Medium to finishing | O60404-VQ | | | | | | | | | | | ● | | | | | | | | 6.2 | 9.525 | 4.76 | 0.4 | 3.81 | 0.05~0.30 | 0.50~4.00 | MWLNRL B112 | | |
| | O60408-VQ | | | | | | | | | | | ● | | | | | | | | 6.1 | 9.525 | 4.76 | 0.8 | 3.81 | 0.08~0.30 | 0.80~4.00 | PWLNRL B130 | | |
| | O80404-VQ | | | | | | | | | | | ● | ● | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.05~0.30 | 0.50~4.00 | WWLNRL B103 | | |
| | O80408-VQ | | | | | | | | | | | ● | ● | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.08~0.40 | 0.80~4.00 | | | |
|  Finishing(Wiper) | O80404-VW | | | | | | | | | | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10~0.30 | 0.50~3.00 | MWLNRL B112 | | |
| | O80408-VW | | | | | | | | | | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.15~0.50 | 0.50~4.00 | PWLNRL B130 | | |
|  Medium Roughing | O80404-VK | | | | | | | | | | | ● | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.15~5.00 | 0.08~6.00 | MWLNRL B112 | | |
| | O80408-VK | | | | | | | | | | | ● | ● | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.20~5.00 | 1.00~7.00 | PWLNRL B130 | | |
| | O80412-VK | | | | | | | | | | | ● | ● | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.25~5.00 | 1.30~7.00 | WWLNRL B103 | | |
| | O80416-VK | | | | | | | | | | | | | | | | | | | 8.1 | 12.7 | 4.76 | 1.6 | 5.16 | 0.25~6.00 | 1.89~6.00 | | | |
|  Medium to finishing | O80404-VP2 | | ● | | | | ● | ● | ● | | | | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10~0.45 | 0.50~5.00 | MWLNRL B112 | | |
| | O80408-VP2 | | ● | | | | ● | ● | ● | | | | | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.12~0.50 | 0.50~5.00 | PWLNRL B130 | | |
| | O80412-VP2 | | | | | | | | | | | | | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.05~0.30 | 0.10~3.00 | WWLNRL B103 | | |
|  Medium | O80404-VP3 | | | | | | | | | | | ● | | | | | | | | 8.4 | 12.7 | 4.76 | 0.4 | 5.16 | 0.10~0.45 | 0.50~5.00 | MWLNRL B112 | | |
| | O80408-VP3 | | | | | | | | | | | ● | ● | | | | | | | 8.3 | 12.7 | 4.76 | 0.8 | 5.16 | 0.12~0.50 | 0.50~5.00 | PWLNRL B130 | | |
| | O80412-VP3 | | | | | | | | | | | ● | ● | | | | | | | 8.2 | 12.7 | 4.76 | 1.2 | 5.16 | 0.05~0.30 | 0.10~3.00 | WWLNRL B103 | | |
|  Medium Roughing | 100608-B25 | | | ● | | | | | | | | | | | | | | | | 10.0 | 15.875 | 6.35 | 0.8 | 6.35 | 0.30~0.80 | 3.00~8.00 | MWLNRL B112 | | |
| | 130612-B25 | | | | | | | | | | | | | | | | | | | 12.0 | 19.05 | 6.35 | 1.2 | 7.93 | 0.40~0.90 | 4.00~10.00 | PWLNRL B130 | | |

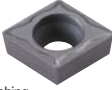

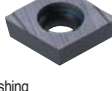

CCOO

Rhombic 80° Positive
Relief Angle : 7°




| Workpiece | Machining types | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

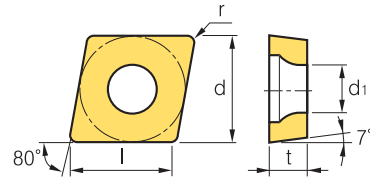
Machining types
 ● Continuous cutting
 ● General cutting
 ● Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-----|-------------------|------|------------------------|------|------|-----------|----------------|-------------------------|---------------------|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation |
| CCGT-C05  Finishing | 060202-C05 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.06-0.11 | 0.06-1.70 | SCACRL | B113 |
| | 060204-C05 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.08-0.17 | 0.10-1.70 | SCLCR/L | B113 |
| | 09T304-C05 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.11-0.23 | 0.10-2.00 | | |
| | 09T308-C05 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08-0.30 | 0.20-2.00 | | |
| | 120404-C05 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.5 | 0.07-0.27 | 0.10-2.70 | | |
| | 120408-C05 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.5 | 0.08-0.30 | 0.20-2.70 | | |
| CCGT-HFP  Finishing | 060202-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.06 | 0.06-1.20 | SCACRL | B113 |
| | 060204-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05-0.12 | 0.10-1.20 | SCLCR/L | B113 |
| | 060208-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 5.6 | 6.35 | 2.38 | 0.8 | 2.8 | 0.05-0.12 | 0.12-1.40 | | |
| | 09T302-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.16 | 0.08-1.50 | | |
| | 09T304-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.06-0.18 | 0.10-1.50 | | |
| | 09T308-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08-0.25 | 0.20-1.50 | | |
| | 120404-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.5 | 0.06-0.20 | 0.10-2.00 | | |
| | 120408-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 12.0 | 12.7 | 4.76 | 0.8 | 5.5 | 0.10-0.25 | 0.20-2.00 | | |
| CCGT-KF  Finishing | 0602003R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | SCACRL | B113 | |
| | 060201R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | SCLCR/L | B113 |
| | 060202R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T3003R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.05-1.50 | | |
| | 09T301R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T302R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | | |
| | 0602003L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | | |
| | 060201L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | | |
| | 060202L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T3003L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.05-1.50 | | |
| | 09T301L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T302L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | | |
| CCGT-KM  Medium to finishing | 0602003R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | SCACRL | B113 | |
| | 060201R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | SCLCR/L | B113 |
| | 060202R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T3003R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.06-1.50 | | |
| | 09T301R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T302R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | | |
| | 0602003L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | | |
| | 060201L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | | |
| | 060202L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 6.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T3003L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.06-1.50 | | |
| | 09T301L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.11 | 0.06-1.70 | | |
| | 09T302L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.7 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | | |

B Turning Insert (Positive)







CC○○

 Rhombic **80° Positive**
Relief Angle : 7°



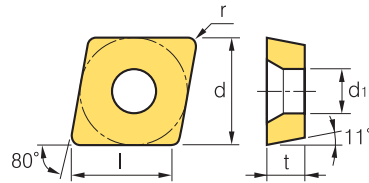
| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

● Continuous cutting
 ● General cutting
 ● Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--------|------|-------|-------|-------------------|-------|------------------------|------|-----------|-----------|----------------|----------------------------|------------------------|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | NC5330 | PC8110 | PC5300 | PC5400 | PC9030 | NC6210 | NC315K | | | | CN1000 | CN2000 | CN20 | CC105 | CC115 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation |
|  Finishing | 060201-VP1 | | | | | | | ● | ● | | | | | | | | | | | | | | 6.4 | 6.35 | 2.38 | 0.1 | 2.8 | 0.05~0.06 | 0.06~1.00 | SCACR/L | B113 | |
| | 060202-VP1 | | | | | | | ● | ● | | | | | | | | | | | | | | | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.10 | 0.08~1.50 | SCLCR/L | B113 |
| | 060204-VP1 | | ● | | | | | | ● | ● | | | | | | | | | | | | | | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05~0.12 | 0.10~1.50 | | |
| | 09T301-VP1 | | | | | | | | ● | ● | | | | | | | | | | | | | | 9.6 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03~0.13 | 0.06~1.00 | | |
| | 09T302-VP1 | | | | | | | | ● | ● | | | | | | | | | | | | | | 9.2 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04~0.15 | 0.08~1.50 | | |
| | 09T304-VP1 | | ● | | | | | | ● | ● | | | | | | | | | | | | | | 8.8 | 9.525 | 3.97 | 0.4 | 4.4 | 0.06~0.20 | 0.10~1.50 | | |
|  Medium | 060202-C25 | | ● | ● | | | | | | | | | | | | | | | | | | | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.12 | 0.40~2.00 | SCACR/L | B113 | |
| | 060204-C25 | ● | ● | ● | | | ● | | ● | ● | | ● | | | | ● | | | | | | | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05~0.15 | 0.60~2.30 | SCLCR/L | B113 | |
| | 060208-C25 | | ● | ● | | | | | | | | ● | | | | | | | | | | | 5.6 | 6.35 | 2.38 | 0.8 | 2.8 | 0.07~0.20 | 0.80~2.30 | | | |
| | 080308-C25 | | ● | | | | | | | | | | | | | | | | | | | | 7.2 | 7.94 | 3.18 | 0.8 | 3.4 | 0.08~0.25 | 0.80~2.30 | | | |
| | 09T304-C25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.08~0.25 | 0.80~3.00 | | | |
| | 09T308-C25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.10~0.30 | 1.00~3.00 | | | |
| | 120404-C25 | | ● | ● | | | ● | | ● | | ● | | ● | | | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.5 | 0.10~0.32 | 0.80~3.00 | | | |
| | 120408-C25 | ● | ● | ● | | | ● | | ● | | ● | | ● | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.5 | 0.12~0.36 | 1.20~3.50 | | | |
| 120412-C25 | | ● | ● | | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.5 | 0.15~0.40 | 1.40~3.50 | | | | |
|  Finishing | 060202-HFP | | | | | | | | | | | | | | | | | | | | | | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.06 | 0.08~1.20 | SCACR/L | B113 | |
| | 060204-HFP | | | | | | | | | | | | | | | | | | | | | | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05~0.12 | 0.10~1.20 | SCLCR/L | B113 | |
| | 060208-HFP | | | | | | | | | | | | | | | | | | | | | | 5.6 | 6.35 | 2.38 | 0.8 | 2.8 | 0.05~0.12 | 0.10~1.40 | | | |
| | 09T302-HFP | | | | | | | | | | | | | | | | | | | | | | 9.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04~0.16 | 0.08~1.50 | | | |
| | 09T304-HFP | | ● | | | | | | | | | | | | | | | | | | | | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.06~0.18 | 0.10~1.50 | | | |
| | 09T308-HFP | | | | | | | | | | | | | | | | | | | | | | 0.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08~0.25 | 0.20~1.50 | | | |
| | 120404-HFP | | | | | | | | | | | | | | | | | | | | | | 2.4 | 12.7 | 4.76 | 0.4 | 5.5 | 0.07~0.22 | 0.10~2.00 | | | |
| | 120408-HFP | | | | | | | | | | | | | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.5 | 0.08~0.30 | 0.12~2.20 | | | |
|  Medium to finishing | 060202-HMP | ● | ● | ● | | | ● | | ● | | | | | | | | | | | | | | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.12 | 0.10~1.50 | SCACR/L | B113 | |
| | 060204-HMP | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.06~0.17 | 0.20~2.40 | SCLCR/L | B113 | |
| | 060208-HMP | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 5.6 | 6.35 | 2.38 | 0.8 | 2.8 | 0.08~0.23 | 0.40~2.40 | | | |
| | 09T302-HMP | | | | | | | | | | | | | | | | | | | | | | 9.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.07~0.22 | 0.10~2.00 | | | |
| | 09T304-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.08~0.23 | 0.30~3.00 | | | |
| | 09T308-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.8 | 9.525 | 3.97 | 0.4 | 4.4 | 0.10~0.30 | 0.50~3.00 | | | |
| | 120404-HMP | | ● | ● | ● | | | ● | | ● | | ● | | ● | | | | | | | | | 12.4 | 12.7 | 4.76 | 0.4 | 5.5 | 0.09~0.27 | 0.30~3.60 | | | |
| | 120408-HMP | ● | ● | ● | | | ● | | ● | | ● | | ● | | | | | | | | | | 12.0 | 12.7 | 4.76 | 0.8 | 5.5 | 0.24~0.36 | 1.00~3.60 | | | |
| 120412-HMP | | ● | ● | | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 1.2 | 5.5 | 0.14~0.43 | 0.70~3.60 | | | | |
|  Finishing | 09T304-VL | ● | ● | | | | ● | ● | | | | | | | | | | | | | | | 9.4 | 9.525 | 3.97 | 0.4 | 4.4 | 0.05~0.10 | 0.10~1.00 | SCACR/L | B113 | |
| | 09T308-VL | | ● | | | | ● | ● | | | | | | | | | | | | | | | 9.2 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08~0.15 | 0.10~1.00 | SCLCR/L | B113 | |
|  Finishing | 060202-VF | ● | ● | | | | ● | ● | | | | | | | | | | | | | | | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.05~0.20 | 0.30~1.00 | SCACR/L | B113 | |
| | 060204-VF | ● | ● | | | | ● | ● | | | | | | | | | | | | | | | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.10~0.25 | 0.30~1.00 | SCLCR/L | B113 | |
| | 09T302-VF | | | | | | | | | | | | | | | | | | | | | | 9.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04~0.16 | 0.80~1.50 | | | |
| | 09T304-VF | ● | ● | | | | ● | ● | | | | | | | | | | | | | | | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.05~0.20 | 0.30~1.50 | | | |
| | 09T308-VF | | | | | | | | | | | | | | | | | | | | | | 8.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.10~0.25 | 0.30~1.50 | | | |
| | 120404-VF | ● | ● | | | | | | | | | | | | | | | | | | | | 12.4 | 12.70 | 4.76 | 0.4 | 5.5 | 0.07~0.22 | 0.10~2.00 | | | |

CP00



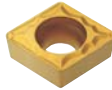

 Rhombic **80° Positive**
Relief Angle : 11°



| Workpiece | Machining types | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types

- Continuous cutting
- General cutting
- Interrupted cutting

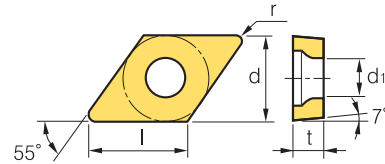
| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-------|-----|-------------------|-------|------------------------|------|-----|----------------|-------------------------|---------------------|-------------|-----------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | ST30A | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
| CPGT  Finishing | 080202 | | | | | | | | | | | ● | | | | | | | | | 7.8 | 7.94 | 2.38 | 0.2 | 3.4 | 0.06-0.20 | 0.10-2.00 | SCLPR/L | B134 |
| | 080204 | | | | | | | | | | | ● | ● | | | | | | | | 7.6 | 7.94 | 2.38 | 0.4 | 3.4 | 0.08-0.20 | 0.30-2.00 | | |
| | 080208 | | | | | | | | | | | | | | | | | | | | 7.2 | 7.94 | 2.38 | 0.8 | 3.4 | 0.10-0.25 | 0.50-2.00 | | |
| | 090302 | | | | | | | | | | | | | | | | | | | | 9.4 | 9.525 | 3.18 | 0.2 | 4.4 | 0.04-0.20 | 0.30-1.50 | | |
| | 090304 | | | | | | | | | | | | ● | ● | | | | | | | 9.2 | 9.525 | 3.18 | 0.4 | 4.4 | 0.06-0.25 | 0.50-2.00 | | |
| | 090308 | | | | | | | | | | | | | | | | | | | | 8.8 | 9.525 | 3.18 | 0.8 | 4.4 | 0.08-0.30 | 0.70-2.50 | | |
| CPGT-C05  Finishing | 080204-C05 | | ● | | | | | | | | | | | | | | | | | 7.6 | 7.94 | 2.38 | 0.4 | 3.4 | 0.02-0.15 | 0.50-1.70 | SCLPR/L | B134 | |
| | 080208-C05 | | | | | | | | | | | | | | | | | | | 7.2 | 7.94 | 2.38 | 0.8 | 3.4 | 0.04-0.18 | 0.50-1.70 | | | |
| | 090304-C05 | | | ● | | | | | | | | | | | | | | | | | 9.2 | 9.525 | 3.18 | 0.4 | 4.4 | 0.03-0.20 | | | 0.70-2.00 |
| | 090308-C05 | | | | | | | | | | | | | | | | | | | | 8.8 | 9.525 | 3.18 | 0.8 | 4.4 | 0.05-0.20 | | | 0.70-2.00 |
| CPGT-HMP  Medium to finishing | 090308-HMP | | | | | | | | | | | | | | | | | | | 8.8 | 9.525 | 3.18 | 0.8 | 4.4 | 0.05-0.20 | 0.70-2.00 | SCLPR/L | B134 | |
| CPMT-VF  Finishing | 080204-VF | | | | | | | | | | | | | | | | | | | 7.6 | 7.94 | 2.38 | 0.4 | 3.4 | 0.05-0.20 | 0.30-1.20 | SCLPR/L | B134 | |
| | 080208-VF | | | | | | | | | | | | | | | | | | | 7.6 | 7.94 | 2.38 | 0.8 | 3.4 | 0.10-0.25 | 0.30-1.20 | | | |
| | 090304-VF | | | | | | | | | | | | | | | | | | | | 9.2 | 9.525 | 3.18 | 0.4 | 4.4 | 0.05-0.20 | | | 0.30-1.50 |
| | 090308-VF | | | | | | | | | | | | | | | | | | | | 8.8 | 9.525 | 3.18 | 0.8 | 4.4 | 0.10-0.25 | | | 0.30-1.50 |

B Turning Insert (Positive)

DC○○



Rhombic **55° Positive**
Relief Angle : 7°



| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

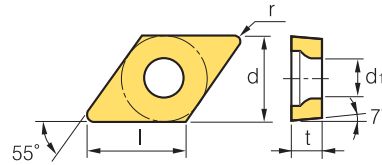
● Continuous cutting
 ● General cutting
 ● Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|-------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-----|-------------------|-----|------------------------|-------|------|------|----------------|-------------|-----------|------------------|------------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC5330 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | A30 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| Finishing | 070202-C05 | | | | | | | | | | | | | | | | | | | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.06-0.11 | 0.06-1.50 | SDACR/L | B113 | |
| | 070204-C05 | | | | | | | | | | | | | | | | | | | | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05-0.17 | 0.08-1.50 | SDJCR/L | B114, 167 |
| | 11T302-C05 | | | | | | | | | | | | | | | | | | | | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | SDNCN | B114, 168 |
| | 11T304-C05 | | | | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.06-0.23 | 0.10-2.00 | SDQCR/L | B135 |
| | 11T308-C05 | | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08-0.30 | 0.20-2.00 | SDUCR/L | B135 |
| Finishing | 070202-HFP | | | | | | | | | | | | | | | | | | | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.10 | 0.06-1.00 | SDACR/L | B113 | |
| | 070204-HFP | | | | | | | | | | | | | | | | | | | | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05-0.12 | 0.08-1.00 | SDJCR/L | B114, 167 |
| | 070208-HFP | | | | | | | | | | | | | | | | | | | | | 6.8 | 6.35 | 2.38 | 0.8 | 2.8 | 0.06-0.12 | 0.10-1.00 | SDNCN | B114, 168 |
| | 11T301-HFP | | | | | | | | | | | | | | | | | | | | | 11.5 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.13 | 0.06-1.00 | SDQCR/L | B135 |
| | 11T302-HFP | | | | | | | | | | | | | | | | | | | | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-1.50 | SDUCR/L | B135 |
| | 11T304-HFP | | | | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.06-0.20 | 0.10-1.50 | SDZCR/L | B136 |
| Finishing | 070201-VP1 | | | | | | | | | | | | | | | | | | | | 7.7 | 6.35 | 2.38 | 0.1 | 2.8 | 0.03-0.06 | 0.06-1.00 | SDACR/L | B113 | |
| | 070202-VP1 | | | | | | | | | | | | | | | | | | | | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.10 | 0.08-1.50 | SDJCR/L | B114 |
| | 070204-VP1 | | | | | | | | | | | | | | | | | | | | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05-0.12 | 0.10-1.50 | SDNCN | B114 |
| | 11T301-VP1 | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.13 | 0.06-1.00 | | |
| | 11T302-VP1 | | | | | | | | | | | | | | | | | | | | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-1.50 | | |
| | 11T304-VP1 | | | | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.06-0.20 | 0.10-1.50 | | |
| Finishing | 0702003R-KF | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | SDJCR/L | B114, 167 | |
| | 070201R-KF | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | SDNCN | B114, 168 |
| | 070202R-KF | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.50 | | |
| | 11T3003R-KF | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.05-1.50 | | |
| | 11T301R-KF | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.11 | 0.06-1.70 | | |
| | 11T302R-KF | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | | |
| | 0702003L-KF | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | | |
| | 070201L-KF | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | | |
| | 070202L-KF | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.50 | | |
| | 11T3003L-KF | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.05-1.50 | | |
| Medium to finishing | 0702003R-KM | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | SDJCR/L | B114, 167 | |
| | 070201R-KM | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | SDNCN | B114, 168 |
| | 070202R-KM | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.50 | | |
| | 11T3003R-KM | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.05-1.50 | | |
| | 11T301R-KM | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.11 | 0.06-1.70 | | |
| | 11T302R-KM | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | | |
| | 0702003L-KM | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.03 | 2.8 | 0.01-0.06 | 0.04-1.30 | | |
| | 070201L-KM | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.1 | 2.8 | 0.02-0.08 | 0.05-1.50 | | |
| | 070202L-KM | | | | | | | | | | | | | | | | | | | | | 7.8 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03-0.11 | 0.06-1.50 | | |
| | 11T3003L-KM | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.03 | 4.4 | 0.02-0.08 | 0.05-1.50 | | |
| | 11T301L-KM | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03-0.11 | 0.06-1.70 | | |
| | 11T302L-KM | | | | | | | | | | | | | | | | | | | | | 11.6 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04-0.15 | 0.08-2.00 | | |

DC○○○



Rhombic **55° Positive**
Relief Angle : 7°



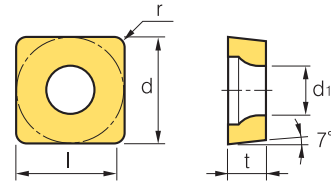
| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ | ⊙ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types
 ● Continuous cutting
 ⊙ General cutting
 ⊕ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | | | | | | | |
|-------------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--------|------|-------|-------|-------------------|------|------------------------|-------|------|-----|----------------|----------------------------|------------------------|-------------|-------------|--|--|--|--|--|--|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | PC8110 | PC5300 | PC5400 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | H01 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page | | | | | | |
| DCMT-C25 Medium | 070202-C25 | | | ● | | | | | | | | | | ● | ● | | | | | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.15 | 0.30~2.00 | SDACR/L | B113 | | | | | | | |
| | 070204-C25 | | | ● | | | | | | | | | | | ● | | | | | | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05~0.20 | 0.50~2.50 | SDJCR/L | B114 | | | | | | |
| | 070208-C25 | | | ● | | | | | | | | | | | | | | | | | | 6.8 | 6.35 | 2.38 | 0.8 | 2.8 | 0.06~0.25 | 0.80~2.50 | SDNCN | B114 | | | | | | |
| | 11T302-C25 | | | | | | | | | | | | | | | | | | | | | 11.3 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04~0.25 | 0.50~2.50 | SDQCR/L | B135 | | | | | | |
| | 11T304-C25 | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.08~0.30 | 0.80~3.00 | SDUCR/L | B135 | | | | | | |
| 11T308-C25 | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | | | | | | 10.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.10~0.30 | 1.00~3.00 | SDZCR/L | B136 | | | | | | | |
| DCMT-HFP Finishing | 070202-HFP | | | | | | ● | | | | | | | | | | | | | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.10 | 0.06~1.00 | SDACR/L | B113 | | | | | | | |
| | 070204-HFP | | | | | | | | | | | | | | | | | | | | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05~0.12 | 0.08~1.00 | SDJCR/L | B114 | | | | | | |
| | 070208-HFP | | | | | | | | | | | | | | | | | | | | | 6.8 | 6.35 | 2.38 | 0.8 | 2.8 | 0.06~0.12 | 0.10~1.00 | SDNCN | B114 | | | | | | |
| | 11T301-HFP | | | | | | | | | | | | | | | | | | | | | 11.5 | 9.525 | 3.97 | 0.1 | 4.4 | 0.03~0.13 | 0.06~1.00 | SDQCR/L | B135 | | | | | | |
| | 11T302-HFP | | | | | | | | | | | | | | | | | | | | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04~0.15 | 0.08~1.50 | SDUCR/L | B135 | | | | | | |
| | 11T304-HFP | | | | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.06~0.20 | 0.10~1.50 | SDZCR/L | B136 | | | | | | |
| 11T308-HFP | | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08~0.25 | 0.20~1.50 | | | | | | | | | |
| DCMT-HMP Medium to finishing | 070202-HMP | | | ● | | | | | | | | | | | | | | | | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.12 | 0.10~1.50 | SDACR/L | B113 | | | | | | | |
| | 070204-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.06~0.17 | 0.20~2.30 | SDJCR/L | B114 | | | | | | |
| | 070208-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | 6.8 | 6.35 | 2.38 | 0.8 | 2.8 | 0.08~0.23 | 0.40~2.30 | SDNCN | B114 | | | | | | |
| | 11T302-HMP | | | | | | | | | | | | | | | | | | | | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04~0.22 | 0.10~2.00 | SDQCR/L | B135 | | | | | | |
| | 11T304-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.08~0.23 | 0.30~3.00 | SDUCR/L | B135 | | | | | | |
| 11T308-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | 10.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.10~0.30 | 0.50~3.00 | SDZCR/L | B136 | | | | | | | |
| DCMT-VL Finishing | 11T304-VL | ● | ● | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.05~0.10 | 0.10~1.00 | SDACR/L | B113 | | | | | | | |
| | 11T308-VL | ● | ● | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08~0.15 | 0.10~1.00 | SDJCR/L | B114 | | | | | | |
| DCMT-VF Finishing | 070202-VF | ● | ● | | | | | | | | | | | | | | | | | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.03~0.10 | 0.06~1.00 | SDACR/L | B113 | | | | | | | |
| | 070204-VF | ● | ● | | | | | | | | | | | | | | | | | | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.05~0.20 | 0.30~1.20 | SDJCR/L | B114 | | | | | | |
| | 11T302-VF | ● | ● | | | | | | | | | | | | | | | | | | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.04~0.15 | 0.08~1.50 | SDNCN | B114 | | | | | | |
| | 11T304-VF | | | | | | | | | | | | | | | | | | | | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.05~0.20 | 0.30~1.50 | SDQCR/L | B135 | | | | | | |
| | 11T308-VF | | | | | | | | | | | | | | | | | | | | | 10.8 | 9.525 | 3.18 | 0.8 | 4.4 | 0.10~0.25 | 0.30~1.50 | SDUCR/L | B135 | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |






SC○○

 Square **90° Positive**
Relief Angle : 7°



| Workpiece | Machining types | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

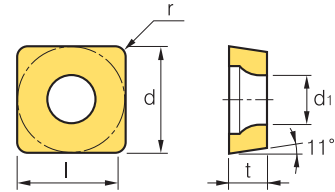
Machining types
 ● Continuous cutting
 ● General cutting
 ● Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-----|-------------------|-----|------------------------|-------|------|-----|----------------|-------------|-----------|-----------------|-----------------|
| | | NC3010 | NC3120 | NC3220 | NC3300 | NC9025 | PC8110 | PC5300 | PC5400 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | A30 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
|  Medium | 060204-C25 | | | ● | | | | | | | | | | | | | | | | | 5.9 | 6.35 | 2.38 | 0.4 | 2.8 | 0.08-0.25 | 0.40-2.50 | SSBCR/L | B115 | |
| | 09T304-C25 | | | ● | ● | ● | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.97 | 0.4 | 4.4 | 0.08-0.25 | 0.60-3.00 | SSDCN | B115 |
| | 09T308-C25 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.97 | 0.8 | 4.4 | 0.10-0.30 | 1.00-3.00 | SSKCR/L | B116,163 |
| | 120404-C25 | | | ● | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 4.76 | 0.4 | 5.5 | 0.10-0.30 | 0.80-3.80 | SSSCR/L | B116 |
| | 120408-C25 | ● | ● | ● | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.5 | 0.12-0.38 | 1.20-3.80 | | |
|  Finishing | 09T304-HFP | ● | | | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.97 | 0.4 | 4.4 | 0.05-0.25 | 0.10-1.50 | SSBCR/L | B115 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSDCN | B115 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSKCR/L | B116,163 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSSCR/L | B116 | |
|  Medium to finishing | 09T304-HMP | | ● | ● | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.97 | 0.4 | 4.4 | 0.08-0.23 | 0.30-3.00 | SSBCR/L | B115 | |
| | 09T308-HMP | ● | ● | ● | | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.97 | 0.8 | 4.4 | 0.10-0.30 | 0.50-3.00 | SSDCN | B115 |
| | 120404-HMP | | | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 4.76 | 0.4 | 5.5 | 0.09-0.27 | 0.30-3.60 | SSKCR/L | B116,163 |
| | 120408-HMP | | | ● | ● | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.5 | 0.12-0.36 | 0.60-3.60 | SSSCR/L | B116 |
|  Finishing | 09T304-VL | ● | ● | | ● | ● | | | | | | | ● | | | | | | | | 9.1 | 9.525 | 3.97 | 0.4 | 4.4 | 0.05-0.10 | 0.10-1.00 | SSBCR/L | B115 | |
| | 09T308-VL | | ● | | ● | ● | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.97 | 0.8 | 4.4 | 0.08-0.15 | 0.10-1.00 | SSDCN | B115 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSKCR/L | B116,163 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSSCR/L | B116 | |
|  Finishing | 09T304-VF | | ● | | | ● | ● | | | | | | ● | | | | | | | | 9.1 | 9.525 | 3.97 | 0.4 | 4.4 | 0.05-0.20 | 0.30-1.50 | SSBCR/L | B115 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSDCN | B115 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSKCR/L | B116,163 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | SSSCR/L | B116 | |

B Turning Insert (Positive)

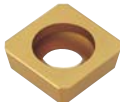
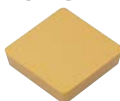

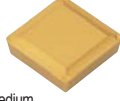
SP 00

 Square **90° Positive**
Relief Angle : 11°



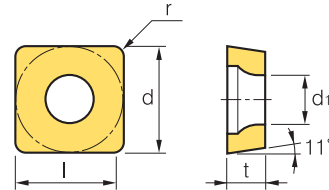
| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

● Continuous cutting
 ● General cutting
 ● Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermets | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|--|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|----------|--------|-----------------|-------|-------|-------|------|-------------------|--------|------------------------|------|-----|----------------|-------------------------|---------------------|-------------|------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | PC6510 | NC9025 | NC5330 | PC8110 | PC5300 | PC9030 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC115 | ST30A | ST30N | ST20 | G10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
|  SPGA Medium to finishing | 060204 | | | | | | | | | | | | | | | | | | | | 5.9 | 6.35 | 2.38 | 0.4 | 2.8 | 0.50-0.25 | 0.50-2.00 | - | - | |
| | 090308T | | | | | | | | | | | | ● | ● | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 4.5 | 0.10-0.25 | 0.70-3.00 | - | - |
| | 090308T-Z (Z=Special Nega land) | | | | | | | | | | | | ● | ● | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 3.4 | 0.10-0.25 | 0.70-3.00 | - | - |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  SPGN Medium to finishing | 070202 | | | | | | | | | | | | | | | | | | | | 7.7 | 7.94 | 2.38 | 0.2 | - | 0.03-0.10 | 0.50-2.00 | | | |
| | 070208 | | | | | | | | | | | | | | | | | | | | | 7.8 | 7.94 | 2.38 | 0.8 | - | 0.10-0.25 | 0.70-3.00 | | |
| | 090302 | | | | | | | | | | | | | | | | | | | | | 9.3 | 9.525 | 3.18 | 0.2 | - | 0.03-0.10 | 0.50-3.00 | | |
| | 090304 | | | | | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | - | 0.08-0.20 | 0.70-3.50 | | |
| | 090308 | | | | ● | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | - | 0.10-0.25 | 0.70-3.50 | | |
| | 120302 | | | | | | | | | | | | | | | | | | | | | 12.5 | 12.7 | 3.18 | 0.2 | - | 0.03-0.20 | 0.50-3.00 | | |
| | 120304 | | | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 3.18 | 0.4 | - | 0.08-0.20 | 1.00-5.00 | | |
| | 120308 | | | | ● | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 3.18 | 0.8 | - | 0.10-0.25 | 1.00-5.00 | | |
| | 120312 | | | | | | | | | | | | | | | | | | | ● | | 11.5 | 12.7 | 3.18 | 1.2 | - | 0.15-0.30 | 1.00-5.00 | | |
| | 120316 | | | | | | | | | | | | | | | | | | | | | 11.1 | 12.7 | 3.18 | 1.6 | - | 0.18-0.33 | 1.00-5.00 | | |
| | 120402 | | | | | | | | | | | | | | | | | | | | | 12.5 | 12.7 | 4.76 | 0.2 | - | 0.03-0.20 | 0.50-3.00 | | |
| | 120404 | | | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 4.76 | 0.4 | - | 0.08-0.20 | 1.00-5.00 | | |
| | 120408 | | | | | | | | | | | | | | | | | | | | ● | 11.9 | 12.7 | 4.76 | 0.8 | - | 0.10-0.25 | 1.00-5.00 | | |
| | 120412 | | | | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 4.76 | 1.2 | - | 0.15-0.30 | 1.00-5.00 | - | - |
| | 120416 | | | | | | | | | | | | | | | | | | | | | 11.1 | 12.7 | 4.76 | 1.6 | - | 0.18-0.33 | 1.00-5.00 | | |
| | 120430 | | | | | | | | | | | | | | | | | | | | | 9.7 | 12.7 | 4.76 | 3.0 | - | 0.20-0.60 | 2.00-5.00 | | |
| | 120440 | | | | | | | | | | | | | | | | | | | | | 8.7 | 12.7 | 4.76 | 4.0 | - | 0.25-0.70 | 3.00-5.00 | | |
| | 150404 | | | | | | | | | | | | | | | | | | | | | 15.5 | 15.875 | 4.76 | 0.4 | - | 0.08-0.20 | 1.50-7.00 | | |
| | 150408 | | | | | | | | | | | | | | | | | | | | | 15.0 | 15.875 | 4.76 | 0.8 | - | 0.10-0.25 | 1.50-7.00 | | |
| | 150412 | | | | | | | | | | | | | | | | | | | | | 14.8 | 15.875 | 4.76 | 1.2 | - | 0.15-0.30 | 1.50-7.00 | | |
| 150416 | | | | | | | | | | | | | | | | | | | | | 14.2 | 15.875 | 4.76 | 1.6 | - | 0.18-0.33 | 1.50-7.00 | | | |
| 150420 | | | | | | | | | | | | | | | | | | | | | 13.9 | 15.875 | 4.76 | 2.0 | - | 0.20-0.45 | 1.50-7.00 | | | |
| 190404 | | | | | | | | | | | | | | | | | | | | | 18.7 | 19.05 | 4.76 | 0.4 | - | 0.08-0.20 | 1.50-9.00 | | | |
| 190408 | | | | | | | | | | | | | | | | | | | | ● | 18.3 | 19.05 | 4.76 | 0.8 | - | 0.10-0.25 | 1.50-9.00 | | | |
| 190412 | | | | | | | | | | | | | | | | | | | | | 17.8 | 19.05 | 4.76 | 1.2 | - | 0.15-0.45 | 1.50-9.00 | | | |
| 190416 | | | | | | | | | | | | | | | | | | | | | 17.4 | 19.05 | 4.76 | 1.6 | - | 0.18-0.60 | 1.50-9.00 | | | |
| 190424 | | | | | | | | | | | | | | | | | | | | | 16.7 | 19.05 | 4.76 | 2.4 | - | 0.25-0.70 | 2.50-9.00 | | | |
|  SPGR-F Finishing | 090304-F | | | | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | - | 0.05-0.20 | 0.30-2.00 | CSDPN | B104 | |
| | 120304-F | | | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 3.18 | 0.4 | - | 0.10-0.25 | 0.50-2.00 | CSKPR/L | B105 |
|  SPGR-M Medium | 090308-M | | | | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | - | 0.10-0.40 | 1.00-3.50 | CSDPN | B104 | |
| | 120308-M | | | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 3.18 | 0.8 | - | 0.20-0.40 | 1.50-4.00 | CSKPR/L | B105 |



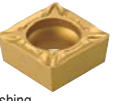
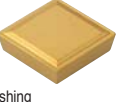
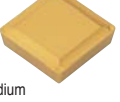
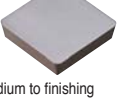
SP ○ ○

 Square **90° Positive**
Relief Angle : 11°



| Workpiece | Machining types | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ● | ● | ● | ● | ● | ● | ● |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

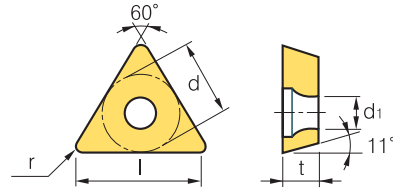
Machining types
 ● Continuous cutting
 ● General cutting
 ● Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-------|-------|-------|-------------------|------|------------------------|--------|------|-----|----------------|-------------|------------------|--------------|-----------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC5330 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | ST30A | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
|  Medium to finishing | 090304R | | | | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | 3.4 | 0.08-0.23 | 0.30-3.00 | SSKPR/L | B136 | |
| | 090308R | | | | | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 3.4 | 0.10-0.30 | | | 0.50-3.00 |
| | 090304L | | | | | | | | | | | | | ● | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | 3.4 | 0.08-0.23 | | | 0.30-3.00 |
| | 090308L | | | | | | | | | | | | | ● | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 3.4 | 0.10-0.30 | | | 0.50-3.00 |
|  Finishing | 090304-C05 | | | | | | | | | | | | ● | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | 4.4 | 0.11-0.23 | 0.10-2.00 | SSKPR/L | B136 | |
| | 090308-C05 | | | | | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 4.4 | 0.08-0.30 | | | 0.20-2.00 |
|  Finishing | 090304-VF | | | | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | 3.4 | 0.05-0.20 | 0.30-1.50 | SSKPR/L | B136 | |
| | 090308-VF | | | | | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | 3.4 | 0.10-0.25 | | | 0.30-1.50 |
|  Finishing | 090304-F | | | | | | | | | | | | | | | | | | | | 9.1 | 9.525 | 3.18 | 0.4 | - | 0.05-0.20 | 0.30-2.00 | CSDPN CSKPR/L | B104 B131 | |
| | 120304-F | ● | ● | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 3.18 | 0.4 | - | 0.10-0.25 | | | 0.50-2.00 |
|  Medium | 090308-M | | ● | ● | | | | | | | | | | | | | | | | | 8.7 | 9.525 | 3.18 | 0.8 | - | 0.10-0.40 | 1.00-3.50 | CSDPN CSKPR/L | B104 B131 | |
| | 120308-M | | ● | ● | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 3.18 | 0.8 | - | 0.10-0.40 | | | 1.50-4.00 |
| | 120312-M | | | ● | | | | | | | | | | | | | | | | | | 11.5 | 12.7 | 3.18 | 1.2 | - | 0.20-0.40 | | | 1.50-4.00 |
|  Medium to finishing | 120304 | | | | | | | | | | | | | | | | | | | | 12.3 | 12.7 | 3.18 | 0.4 | - | 0.10-0.30 | 1.00-5.00 | | | |
| | 120308 | | ● | | | | | | | | | | | | | | | ● | ● | | | 11.9 | 12.7 | 3.18 | 0.8 | - | 0.15-0.40 | | | 1.00-5.00 |
| | 150412 | | | | | | | | | | | | | | | | | ● | | | | 14.6 | 15.875 | 4.76 | 1.2 | - | 0.20-0.50 | | | 1.00-5.00 |
| | 190412 | | | ● | | | | | | | | | | | | | | ● | | | | 17.8 | 19.05 | 4.76 | 1.2 | - | 0.20-0.50 | | | 1.50-7.00 |
| | 190416 | | | | | | | | | | | | | | | | | | | | | 17.5 | 19.05 | 4.76 | 1.6 | - | 0.25-0.60 | | | 2.00-7.00 |
| | 250620 | | | | | | | | | | | | | | | | | | | | | 23.4 | 25.4 | 6.35 | 2.0 | - | 0.30-0.80 | | | 3.00-10.0 |
| 120308SN | | | | | | | | | | | | | | | | | | | | | 11.9 | 12.7 | 3.18 | 0.8 | - | 0.15-0.40 | 1.00-5.00 | | | |

TP ○○



Triangular 60° Positive
Relief Angle : 11°



| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ | ⊙ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types

- Continuous cutting
- ⊙ General cutting
- ⊕ Interrupted cutting

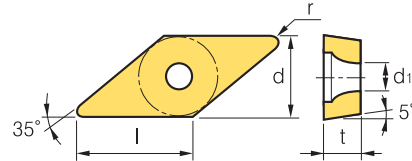
| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|------|-------|-------------------|------|------------------------|--------|------|-----|----------------|-------------|-----------|-------------|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | NC5330 | PC8110 | PC9300 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | ST20 | ST30A | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| TPGN Medium to finishing | 160310 | | | | | | | | | | | | | | | | | | | | | 13.4 | 9.525 | 3.18 | 1.0 | - | 0.10~0.25 | 1.00~5.00 | | | |
| | 160312 | | | ● | | | | | | | | | | | | | | | | ● | | | 13.5 | 9.525 | 3.18 | 1.2 | - | 0.15~0.30 | 1.00~5.00 | | |
| | 160316 | | | ● | | | | | | | | | | | | | | | | | | | 12.5 | 9.525 | 3.18 | 1.6 | - | 0.15~0.30 | 1.00~5.00 | | |
| | 160404 | | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | - | 0.07~0.20 | 1.00~5.00 | | |
| | 220404 | | | ● | | | | | | | | | | | | | | | | | ● | ● | 21.0 | 12.7 | 4.76 | 0.4 | - | 0.07~0.20 | 1.50~7.00 | | |
| | 220408 | | | ● | | | | | | | | | | | | | | | | | ● | | 20.0 | 12.7 | 4.76 | 0.8 | - | 0.10~0.25 | 1.50~7.00 | | |
| | 220412 | | | ● | | | | | | | | | | | | | | | | | | | 19.0 | 12.7 | 4.76 | 1.2 | - | 0.15~0.30 | 1.50~7.00 | | |
| | 220430 | | | | | | | | | | | | | | | | | | | | ● | | 14.2 | 12.7 | 4.76 | 3.0 | - | 0.30~0.45 | 1.50~7.00 | | |
| | 220440 | | | | | | | | | | | | | | | | | | | | | | 11.6 | 12.7 | 4.76 | 4.0 | - | 0.30~0.50 | 1.50~7.00 | | |
| | 270408 | | | | | | | | | | | | | | | | | | | | | | 25.4 | 15.875 | 4.76 | 0.8 | - | 0.15~0.25 | 3.00~8.00 | | |
| 270608 | | | | | | | | | | | | | | | | | | | | | | 25.4 | 15.875 | 6.35 | 0.8 | - | 0.15~0.25 | 3.00~8.00 | | | |
| TPGR-F Finishing | 110302-F | | | | | | | | | | | | | | | | | | | | | 10.5 | 6.35 | 3.18 | 0.2 | - | 0.05~0.15 | 0.10~1.50 | CTFPR/L | B105 | |
| | 110304-F | | | | | | | | | | | | | | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | - | 0.05~0.20 | 0.30~1.50 | CTGPR/L | B105 |
| | 160304-F | | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 3.18 | 0.4 | - | 0.08~0.25 | 0.50~2.00 | | |
| TPGR-M Medium | 110308-M | | | | | | | | | | | | | | | | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | - | 0.13~0.30 | 1.00~3.00 | CTFPR/L | B105 | |
| | 160308-M | | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 3.18 | 0.8 | - | 0.13~0.30 | 1.00~5.00 | CTGPR/L | B105 |
| TPGT Medium to finishing | 080202R | | | | | | | | | | | | | | | | | | | | | 7.7 | 4.76 | 2.38 | 0.2 | 2.3 | 0.05~0.20 | 0.30~1.50 | STFPR/L | B137 | |
| | 110302R | | | | | | | | | | | | | | | | | | | | | | 10.5 | 6.35 | 3.18 | 0.2 | 3.4 | 0.05~0.20 | 0.30~1.50 | STUPR/L | B140 |
| | 110304R | | | | | | | | | | | | ● | ● | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 3.4 | 0.05~0.20 | 0.50~2.00 | | |
| | 110308R | | | | | | | | | | | | | | ● | | | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | 3.4 | 0.07~0.25 | 0.50~2.00 | | |
| | 160404R | | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 4.4 | 0.05~0.20 | 0.70~3.00 | | |
| | 160408R | | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 4.4 | 0.05~0.20 | 0.70~3.00 | | |
| | 080202L | | | | | | | | | | | | | | | | | | | | ● | ● | 7.7 | 4.76 | 2.38 | 0.2 | 2.3 | 0.05~0.20 | 0.30~1.50 | | |
| | 110302L | | | | | | | | | | | | | | | | | | | | | | 10.5 | 6.35 | 3.18 | 0.2 | 3.4 | 0.05~0.20 | 0.30~1.50 | | |
| | 110304L | | | | | | | | | | | | | | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 3.4 | 0.05~0.20 | 0.50~2.00 | | |
| | 110308L | | | | | | | | | | | | | | | | | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | 3.4 | 0.07~0.25 | 0.50~2.00 | | |
| | 160404L | | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 4.4 | 0.05~0.20 | 0.70~3.00 | | |
| 160408L | | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 4.76 | 0.8 | 4.4 | 0.05~0.20 | 0.70~3.00 | | | |
| TPGT-C05 Finishing | 110304-C05 | | | | | | | | | | | | | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 3.4 | 0.05~0.30 | 0.50~2.00 | STFPR/L | B137 | |
| | 160404-C05 | | | | | | | | | | | | | | | | | | | | | | 15.5 | 9.525 | 4.76 | 0.4 | 4.4 | 0.05~0.30 | 0.80~2.00 | | |
| TPGT-HFP Finishing | 110304-HFP | | | | | | | | | | | | | | | | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 3.4 | 0.05~0.25 | 0.30~1.50 | STFPR/L | B137 | |
| | 160308-HFP | | | | | | | | | | | | | | | | | | | | | | 14.5 | 9.525 | 3.18 | 0.8 | 4.4 | 0.05~0.25 | 0.30~1.50 | | |



VB000



Rhombic 35° Positive
Relief Angle : 5°



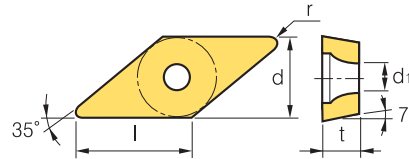
| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊙ | ⊕ | ⊖ | ⊗ | ⊘ | ⊙ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types
 ● Continuous cutting
 ⊙ General cutting
 ⊕ Interrupted cutting



| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | | |
|--------------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|------|------------------------|-------|------|----------------|-------------|-----------|--|--|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9025 | NC5330 | PC8110 | PC5300 | PC5400 | PC9030 | NC6205 | NC6210 | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page | |
| VBGT Medium to finishing | 160404 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.07~0.20 | 0.50~1.50 | SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L | B117 B118 B118,168 B119 B138 B139 | |
| | 160408 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.15~0.25 | 0.70~2.00 | | |
| VBGT-HFP Finishing | 110301-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.1 | 2.8 | 0.07~0.20 | 0.50~1.50 | SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L | B117 B118 B118 B119 B138 B139 | |
| | 160408-HFP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.15~0.25 | 0.70~2.00 | | |
| VBGT-KF Finishing | 1103003R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.03 | 2.8 | 0.01~0.06 | 0.04~1.30 | SVJBR/L | B118 | |
| | 110301R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.1 | 2.8 | 0.02~0.08 | 0.05~1.50 | | | |
| | 110302R-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.2 | 2.8 | 0.03~0.13 | 0.06~1.70 | | | |
| | 1103003L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.03 | 2.8 | 0.01~0.06 | 0.04~1.30 | | |
| | 110301L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.1 | 2.8 | 0.02~0.08 | 0.05~1.50 | | |
| 110302L-KF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.2 | 2.8 | 0.03~0.13 | 0.06~1.70 | | | |
| VBGT-KM Medium to finishing | 1103003R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.03 | 2.8 | 0.01~0.06 | 0.04~1.30 | SVJBR/L | B118 | |
| | 110301R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.1 | 2.8 | 0.02~0.08 | 0.05~1.50 | | | |
| | 110302R-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.2 | 2.8 | 0.03~0.13 | 0.06~1.70 | | | |
| | 1103003L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.03 | 2.8 | 0.01~0.06 | 0.04~1.30 | | |
| | 110301L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.1 | 2.8 | 0.02~0.08 | 0.05~1.50 | | |
| 110302L-KM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.2 | 2.8 | 0.03~0.13 | 0.06~1.70 | | | |
| VBMT Medium to finishing | 160404 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.07~0.20 | 0.50~1.50 | SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L | B117 B118 B118 B119 B138 B139 | |
| | 160408 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.15~0.25 | 0.70~2.00 | | |
| VBMT-VM Medium | 160404-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.07~0.20 | 0.20~2.70 | SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L | B117 B118 B118 B119 B138 B139 | |
| | 160408-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.09~0.27 | 0.50~2.70 | | |
| VBMT-HMP Medium to finishing | 110204-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 10.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.03~0.20 | 0.15~2.50 | SVABR/L | B117 | |
| | 110208-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.0 | 6.35 | 2.38 | 0.8 | 2.8 | 0.03~0.25 | 0.15~2.50 | SVHBR/L | B118 |
| | 110304-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 10.0 | 6.35 | 3.18 | 0.4 | 3.4 | 0.03~0.20 | 0.15~2.70 | SVJBR/L | B118 |
| | 110308-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 9.0 | 6.35 | 3.18 | 0.8 | 3.4 | 0.05~0.25 | 0.40~2.70 | SVVBN | B119 |
| | 160404-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.07~0.20 | 0.20~2.70 | SVQBR/L | B138 |
| | 160408-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.09~0.27 | 0.50~2.70 | SVUBR/L | B139 |
| 160412-HMP | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 13.5 | 9.525 | 4.76 | 1.2 | 4.4 | 0.11~0.32 | 0.50~2.70 | | | |
| VBMT-VF Finishing | 160404-VF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.05~0.20 | 0.30~1.00 | SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L | B117 B118 B118 B119 B138 B139 | |
| | 160408-VF | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.10~0.25 | 0.30~1.00 | | |
| VBMT-VL Finishing(Mild steel) | 160404-VL | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.05~0.20 | 0.30~1.50 | SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L | B117 B118 B118 B119 B138 B139 | |
| | 160408-VL | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.10~0.20 | 0.30~1.50 | | |
| | 160412-VL | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 13.5 | 9.525 | 4.76 | 1.2 | 4.4 | 0.10~0.25 | 0.30~1.50 | | |

VC○○

 Rhombic **35° Positive**
Relief Angle : 7°

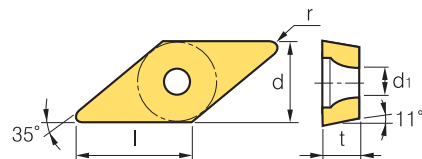


| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊕ | ⊗ | ⊙ | ⊚ | ⊛ | ⊜ | ⊝ | ⊞ | ⊟ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |


| Inserts | Designation | Coated | | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|-------|------------------------|------|-----|----------------|-------------|-----------|-----------------------------|----------------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | NC5330 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| VCMT-VM  Medium | 160404-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.10~0.25 | 0.30~2.60 | SVJCR/L | B118 |
| | 160408-VM | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.3 | 9.525 | 4.76 | 0.8 | 4.4 | 0.13~0.33 | 0.60~2.60 | SVVCN SVQCR/L SVUCR/L | B119 B138 B139 |
| VCMT-VL  Finishing(Mild steel) | 160404-VL | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.05~0.20 | 0.30~1.50 | SVJCR/L | B118 | |
| | 160408-VL | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.05~0.20 | 0.30~1.50 | SVVCN | B119 |
| | 160412-VL | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 13.5 | 9.525 | 4.76 | 1.2 | 4.4 | 0.10~0.25 | 0.30~1.50 | SVQCR/L SVUCR/L | B138 B139 |

VP○○

 Rhombic **35° Positive**
Relief Angle : 11°



| Workpiece | Machining types | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ⊕ | ⊗ | ⊙ | ⊚ | ⊛ | ⊜ | ⊝ | ⊞ | ⊟ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

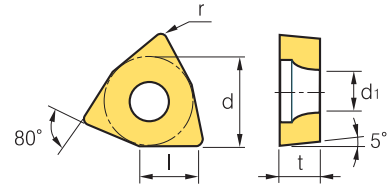
| Inserts | Designation | Coated | | | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | | |
|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|------|------------------------|------|-----|----------------|-------------|-----------|-------------|------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC9025 | NC5330 | PC8110 | PC5300 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| VPGT-VP1  Finishing | 110301-VP1 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.1 | 2.8 | 0.02~0.15 | 0.05~0.50 | SVABR/L | B117 | |
| | 110302-VP1 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.2 | 2.8 | 0.02~0.18 | 0.10~1.00 | SVJBR/L | B118 |
| | 110304-VP1 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 11.0 | 6.35 | 3.18 | 0.4 | 2.8 | 0.03~0.18 | 0.15~1.20 | SVVBN | B119 |

B Turning Insert (Positive)

WB00



Trigon 80° Positive
Relief Angle : 5°



| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ◐ | ◑ | ◒ | ◓ | ◔ | ◕ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

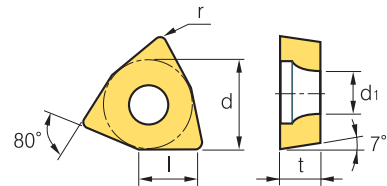
● Continuous cutting
 ◐ General cutting
 ◑ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | |
|---------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|------|------------------------|-----|-----|----------------|-------------|---------|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC5330 | PC8110 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation |
| WBGT Medium to finishing | 020102R | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 2.6 | 3.97 | 1.59 | 0.2 | 2.2 | 0.01-0.05 | 0.10-0.30 | SWUBR/L | B140 |
| | S30204R | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 3.0 | 4.76 | 2.38 | 0.4 | 2.4 | 0.01-0.10 | 0.10-0.50 | | |
| | 020102L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 2.6 | 3.97 | 1.59 | 0.2 | 2.2 | 0.01-0.08 | 0.10-0.40 | | |
| | S30202L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 3.1 | 4.76 | 2.38 | 0.2 | 2.4 | 0.01-0.08 | 0.10-0.40 | | |
| | S30204L | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 3.0 | 4.76 | 2.38 | 0.4 | 2.4 | 0.01-0.10 | 0.10-0.50 | | |

WC00



Trigon 80° Positive
Relief Angle : 7°



| Workpiece | Machining types | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ◐ | ◑ | ◒ | ◓ | ◔ | ◕ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

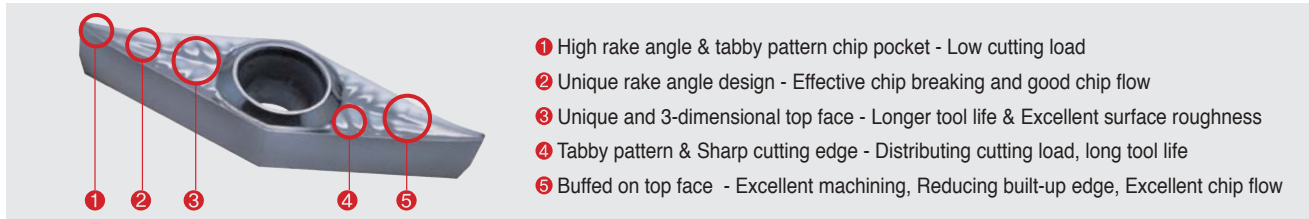
● Continuous cutting
 ◐ General cutting
 ◑ Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Coated | Uncoated | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | | | | | | |
|-------------------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|-------|-------|-----|-----|-------------------|------|------------------------|-----|-----|----------------|-------------|---------|-------------|
| | | NC3010 | NC3120 | NC3220 | NC3030 | NC9020 | NC5330 | PC8110 | PC9030 | NC6205 | NC6210 | NC315K | CN1000 | CN2000 | CN20 | CC105 | CC115 | U20 | H01 | G10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation |
| WCGT-C05 Medium to finishing | 080408-C05 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 8.3 | 12.7 | 4.76 | 0.8 | 5.5 | 0.08-0.30 | 0.20-2.70 | SWACR/L | B119 |
| | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |

Technical Information for Aluminum

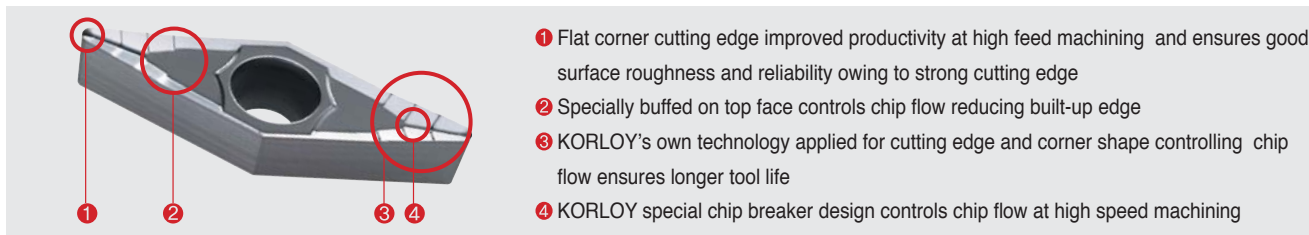
AK special chip breaker for aluminum

- ▶ Unique and 3-dimensional rake angle controls chip breaking and chip flow ensuring longer tool life and reducing cutting load
- ▶ High rake angle at cutting edge part reduces cutting load to increase tool life.
- ▶ Buffed finish on top face controls chip flow reducing built-up edge

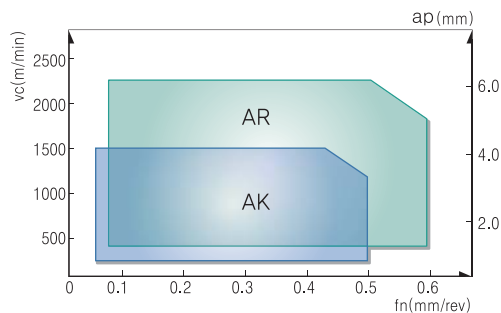


AR special chip breaker for aluminum

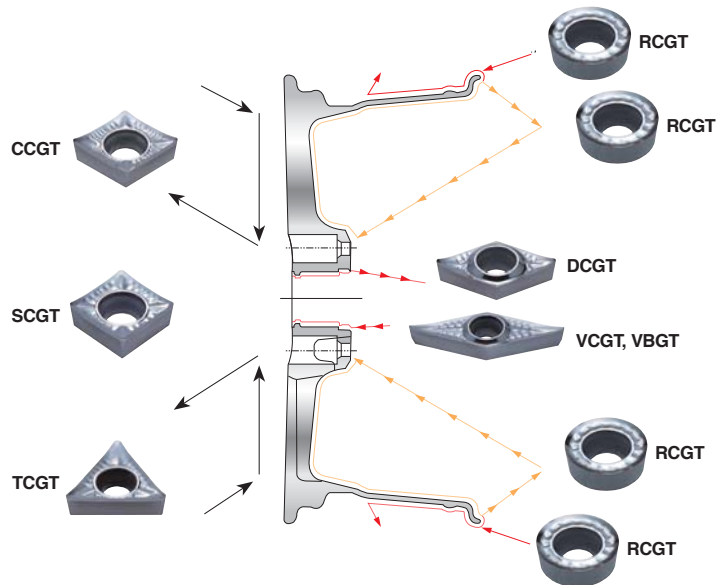
- ▶ AR chip breaker ensures reliability and good cutting performance at high feed, speed and interrupted machining



AK and AR chip breaker specially developed for aluminum



| | Recommendation range | Grades |
|----|---|---|
| AK | $ap = 0.1 \sim 5.0 \text{ mm}$ $fn = 0.03 \sim 0.5 \text{ mm/rev}$ | H01(Uncoated cemented carbides K10~K20) ND1000(Diamond coating) |
| AR | $ap = 0.5 \sim 6.0 \text{ mm}$ $fn = 0.05 \sim 0.6 \text{ mm/rev}$ | H01(Uncoated cemented carbides K10~K20) ND1000(Diamond coating) PD1000(DLC coating) |



Features of H01

- ▶ Useful for aluminum and alloyed steel machining
- ▶ Buffed on top face reduced built-up edge
- ▶ 3-dimensional design reduced cutting load and shows good performance at high feed and speed machining

| Workpiece | | Hardness(HB) | kc(MPa) | vc(m/min) | fn(mm/rev) |
|------------------------|-----------------------|--------------|-----------|-------------|------------|
| Aluminum alloy(forged) | before heat treatment | 50 ~ 70 | 500 ~ 600 | 1000 ~ 2500 | 0.1 ~ 0.6 |
| | after heat treatment | 90 ~ 110 | 700 ~ 900 | 300 ~ 1000 | 0.1 ~ 0.5 |
| Aluminum alloy (cast) | before heat treatment | 70 ~ 80 | 700 ~ 800 | 300 ~ 1000 | 0.1 ~ 0.6 |
| | after heat treatment | 80 ~ 100 | 800 ~ 950 | 200 ~ 600 | 0.1 ~ 0.4 |
| Copper alloy | - | 90 ~ 110 | 700 | 250 ~ 600 | 0.1 ~ 0.5 |
| Non-ferrous metal, etc | - | 100 | 1700 | 150 ~ 300 | 0.1 ~ 0.6 |

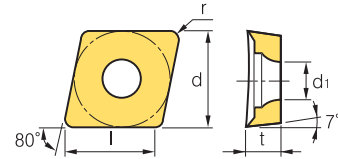


B Aluminum Insert (Positive)

CC ○○




Rhombic **80° Positive**
Relief Angle : 7°

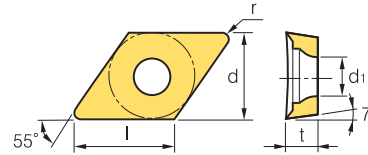


| | | | | | | | | | | | | | |
|-----------|--------------------------------------|---|---|---|---|---|---|---|---|---|-----------------|---|---------------------|
| Workpiece | Steel | P | | | | | | | | | Machining types | ● | Continuous cutting |
| | Stainless steel | M | | | | | | | | | | ● | General cutting |
| | Cast iron | K | | | | | | | | | | ● | Interrupted cutting |
| | Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | | | |
| | Heat resistant alloy, Titanium alloy | S | | | | | | | | | | | |
| | Hardened steel | H | | | | | | | | | | | |



| Inserts | Designation | Coated | | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | |
|-------------|-------------|--------|--------|--------|----------|-----|-----------------|-------|------|-----|----------------|-------------------|-----------|------------------------|------|
| | | PC205K | PC8110 | PD1000 | H01 | H10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
| CCGT-AK | 060202-AK | | | | ● | | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.01~0.12 | 0.05~3.00 | SCLCR/L | B134 |
| | 060204-AK | | | | ● | | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.02~0.15 | 0.10~3.00 | | |
| | 060208-AK | | | | ● | | 5.6 | 6.35 | 2.38 | 0.8 | 2.8 | 0.02~0.20 | 0.10~4.00 | | |
| | 09T302-AK | | | | ● | | 9.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.02~0.20 | 0.05~3.00 | | |
| | 09T304-AK | | | | ● | | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.02~0.30 | 0.10~5.00 | | |
| | 09T308-AK | | | | ● | | 8.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.03~0.50 | 0.10~5.00 | | |
| | 120402-AK | | | | ● | | 12.6 | 12.7 | 4.76 | 0.2 | 5.5 | 0.02~0.30 | 0.05~4.00 | | |
| | 120404-AK | | | | ● | ● | 12.4 | 12.7 | 4.76 | 0.4 | 5.5 | 0.03~0.50 | 0.10~5.00 | | |
| | 120408-AK | | | | ● | | 12.0 | 12.7 | 4.76 | 0.8 | 5.5 | 0.04~0.80 | 0.10~5.50 | | |
| CCGT-AR | 060202-AR | | | | ● | | 6.2 | 6.35 | 2.38 | 0.2 | 2.8 | 0.02~0.30 | 0.30~4.00 | SCACR/L | B134 |
| | 060204-AR | | | | ● | | 6.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.03~0.35 | 0.50~4.50 | | |
| | 060208-AR | | | | ● | | 5.6 | 6.35 | 2.38 | 0.8 | 2.8 | 0.04~0.50 | 0.50~4.50 | | |
| | 09T302-AR | | | | ● | | 9.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.03~0.45 | 0.30~4.00 | | |
| | 09T304-AR | | | | ● | | 9.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.04~0.50 | 0.50~4.50 | | |
| | 09T308-AR | | | | ● | | 8.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.05~0.60 | 0.50~6.00 | | |
| | 120402-AR | | | | ● | | 12.6 | 12.7 | 4.76 | 0.2 | 5.5 | 0.04~0.50 | 0.30~5.00 | | |
| | 120404-AR | | | | ● | | 12.4 | 12.7 | 4.76 | 0.4 | 5.5 | 0.05~0.60 | 0.50~6.00 | | |
| | 120408-AR | | | | ● | | 12.0 | 12.7 | 4.76 | 0.8 | 5.5 | 0.06~0.65 | 0.50~6.00 | | |
| | 120412-AR | | | | ● | | 11.6 | 12.7 | 4.76 | 1.2 | 5.5 | 0.08~0.70 | 0.50~6.50 | | |

DC ○○

 Rhombic **55° Positive**
Relief Angle : 7°



| Workpiece | Steel | P | | | | | | | | Machining types | ● | ● | ⊕ |
|-----------|--------------------------------------|---|---|---|---|---|---|--|--|-----------------|---|---------------------|---|
| | Stainless steel | M | | | | | | | | | ● | Continuous cutting | |
| | Cast iron | K | | | | | | | | | ● | General cutting | |
| | Non-ferrous metal | N | ⊕ | ⊕ | ● | ⊕ | ⊕ | | | | ⊕ | Interrupted cutting | |
| | Heat resistant alloy, Titanium alloy | S | | | | | | | | | | | |
| | Hardened steel | H | | | | | | | | | | | |

| Inserts | Designation | Coated | | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | |
|---|-------------|--------|--------|--------|----------|-----|-----------------|-------|------|-----|----------------|-------------------|-----------|------------------------|-------------|
| | | PC205K | PC8110 | PD1000 | H01 | H10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
|  | 070202-AK | | | | ● | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.01~0.20 | 0.05~3.00 | SDACR/L | B113 |
| | 070204-AK | | | | ● | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.02~0.30 | 0.10~4.00 | SDJCR/L | B114 |
| | 070208-AK | | | | ● | | 6.8 | 6.35 | 2.38 | 0.8 | 2.8 | 0.03~0.40 | 0.10~4.00 | SDNCN | B114 |
| | 11T302-AK | | | | ● | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.02~0.30 | 0.05~4.00 | SDQCR/L | B135 |
| | 11T304-AK | | | ● | ● | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.03~0.50 | 0.10~5.00 | SDUCR/L | B135 |
| | 11T308-AK | | | | ● | | 10.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.03~0.50 | 0.10~5.00 | SDZCR/L | B136 |
| | 11T312-AK | | | | ● | | 10.4 | 9.525 | 3.97 | 1.2 | 4.4 | 0.04~0.60 | 0.15~5.00 | | |
|  | 070202-AR | | | | ● | | 7.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.02~0.30 | 0.30~4.00 | SDACR/L | B113 |
| | 070204-AR | | | | ● | | 7.3 | 6.35 | 2.38 | 0.4 | 2.8 | 0.03~0.40 | 0.50~5.00 | SDJCR/L | B114 |
| | 070208-AR | | | | ● | | 6.8 | 6.35 | 2.38 | 0.8 | 2.8 | 0.04~0.50 | 0.50~5.00 | SDNCN | B114 |
| | 11T302-AR | | | | ● | | 11.4 | 9.525 | 3.97 | 0.2 | 4.4 | 0.03~0.45 | 0.30~6.00 | SDQCR/L | B135 |
| | 11T304-AR | | | | ● | | 11.2 | 9.525 | 3.97 | 0.4 | 4.4 | 0.04~0.50 | 0.50~6.00 | SDUCR/L | B135 |
| | 11T308-AR | | | | ● | | 10.8 | 9.525 | 3.97 | 0.8 | 4.4 | 0.05~0.60 | 0.50~6.00 | SDZCR/L | B136 |
| | 11T312-AR | | | | ● | | 10.4 | 9.525 | 3.97 | 1.2 | 4.4 | 0.08~0.65 | 0.50~6.50 | | |

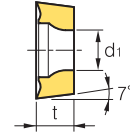
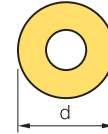


B Aluminum Insert (Positive)

RC ○○



Round **Positive**
Relief Angle : 7°



| | | | | | | | | | | | | | | |
|-----------|--------------------------------------|----------|---|---|---|---|---|---|---|---|---|---|---|--|
| Workpiece | Steel | P | | | | | | | | | | | | Machining types Continuous cutting General cutting Interrupted cutting |
| | Stainless steel | M | | | | | | | | | | | | |
| | Cast iron | K | | | | | | | | | | | | |
| | Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | Heat resistant alloy, Titanium alloy | S | | | | | | | | | | | | |
| | Hardened steel | H | | | | | | | | | | | | |

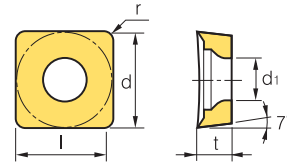
| Inserts | Designation | Coated | | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | |
|-------------|-------------|--------|--------|--------|----------|-----|-----------------|------|------|---|----------------|-------------------------|---------------------|------------------------|--------------|
| | | PC205K | PC8110 | PD1000 | H01 | H10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
| RCGT-AK | 0602M0-AK | | | | ● | | - | 6.0 | 2.38 | - | 2.8 | 0.05-0.20 | 0.50-2.00 | SRDCN SRGCR/L | B114 B115 |
| | 0803M0-AK | | | | ● | | - | 8.0 | 3.18 | - | 3.35 | 0.05-0.25 | 0.50-2.50 | | |
| | 1003M0-AK | | | | ● | | - | 10.0 | 3.18 | - | 4.0 | 0.10-0.30 | 1.00-3.00 | | |
| | 10T3M0-AK | | | | | | - | 10.0 | 3.97 | - | 4.4 | 0.10-0.30 | 1.00-3.00 | | |
| | 1204M0-AK | | | | | ● | - | 12.0 | 4.76 | - | 4.4 | 0.10-0.35 | 1.00-3.50 | | |
| RCGT-AR | 0602M0-AR | | | | | | - | 6.0 | 2.38 | - | 2.8 | 0.05-0.20 | 0.50-2.00 | SRDCN SRGCR/L | B114 B115 |
| | 0803M0-AR | | | | | | - | 8.0 | 3.18 | - | 3.35 | 0.05-0.25 | 0.50-2.50 | | |
| | 1003M0-AR | | | | ● | | - | 10.0 | 3.18 | - | 4.0 | 0.10-0.30 | 1.00-3.00 | | |
| | 10T3M0-AR | | | | | | - | 10.0 | 3.97 | - | 4.4 | 0.10-0.30 | 1.00-3.00 | | |
| | 1204M0-AR | | | | | | - | 12.0 | 4.76 | - | 4.4 | 0.10-0.35 | 1.00-3.50 | | |



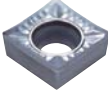
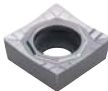
SC ○○



Square **90° Positive**
Relief Angle : 7°



| | | | | | | | | | | | |
|-----------|--------------------------------------|----------|---|---|---|---|---|--|--|--|--|
| Workpiece | Steel | P | | | | | | | | | Machining types ● Continuous cutting ● General cutting ⊕ Interrupted cutting |
| | Stainless steel | M | | | | | | | | | |
| | Cast iron | K | | | | | | | | | |
| | Non-ferrous metal | N | ⊕ | ⊕ | ● | ⊕ | ⊕ | | | | |
| | Heat resistant alloy, Titanium alloy | S | | | | | | | | | |
| | Hardened steel | H | | | | | | | | | |

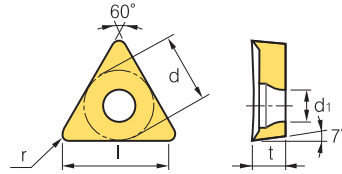
| Inserts | Designation | Coated | | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | |
|---|-------------|--------|--------|--------|----------|-----|-----------------|-------|------|-----|----------------|-------------------------|---------------------|------------------------|-------------|
| | | PC205K | PC8110 | PD1000 | H01 | H10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
| SCGT-AK  | 09T302-AK | | | | | | 9.3 | 9.525 | 3.97 | 0.2 | 4.4 | 0.02-0.30 | 0.10-4.00 | SSBCRL | B115 |
| | 09T304-AK | | | | ● | | 9.1 | 9.525 | 3.97 | 0.4 | 4.4 | 0.04-0.40 | 0.10-5.00 | SSDCN | B115 |
| | 09T308-AK | | | | ● | | 8.7 | 9.525 | 3.97 | 0.8 | 4.4 | 0.03-0.40 | 0.10-5.00 | SSKCR/L | B116 |
| | 120404-AK | | | | ● | | 12.3 | 12.7 | 4.76 | 0.4 | 5.5 | 0.03-0.50 | 0.10-5.00 | SSSCR/L | B116 |
| | 120408-AK | | | | ● | | 11.9 | 12.7 | 4.76 | 0.8 | 5.5 | 0.04-0.60 | 0.15-5.50 | | |
| | 120416-AK | | | | | | 11.1 | 12.7 | 4.76 | 1.6 | 5.5 | 0.04-0.60 | 0.15-5.50 | | |
| SCGT-AR  | 09T302-AR | | | | | | 9.3 | 9.525 | 3.97 | 0.2 | 4.4 | 0.03-0.40 | 0.50-5.00 | SSBCRL | B115 |
| | 09T304-AR | | | | ● | | 9.1 | 9.525 | 3.97 | 0.4 | 4.4 | 0.04-0.50 | 0.50-6.00 | SSDCN | B115 |
| | 09T308-AR | | | | ● | | 8.7 | 9.525 | 3.97 | 0.8 | 4.4 | 0.04-0.50 | 0.50-6.50 | SSKCR/L | B116 |
| | 120404-AR | | | | ● | | 12.3 | 12.7 | 4.76 | 0.4 | 4.4 | 0.05-0.60 | 0.50-6.50 | SSSCR/L | B116 |
| | 120408-AR | | | | | | 11.9 | 12.7 | 4.76 | 0.8 | 5.5 | 0.05-0.60 | 0.50-7.00 | | |
| | 120416-AR | | | | | | 11.1 | 12.7 | 4.76 | 1.6 | 5.5 | 0.05-0.60 | 0.50-7.00 | | |



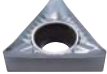
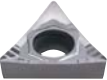
B Aluminum Insert (Positive)

TC ○○

 Triangular **60° Positive**
Relief Angle : 7°



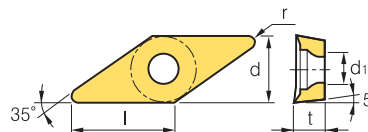
| Workpiece | Steel | P | | | | | | | | Machining types | ● | ● | ● |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|--------------------------|---------------|---|---|
| | Stainless steel | M | | | | | | | | | ● | ● | ● |
| Cast iron | K | | | | | | | | | ● <td>● <td>● </td></td> | ● <td>● </td> | ● | |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● <td>● <td>● </td></td> | ● <td>● </td> | ● | |
| Heat resistant alloy, Titanium alloy | S | | | | | | | | | ● <td>● <td>● </td></td> | ● <td>● </td> | ● | |
| Hardened steel | H | | | | | | | | | ● <td>● <td>● </td></td> | ● <td>● </td> | ● | |

| Inserts | Designation | Coated | | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | |
|---|-------------|--------|--------|--------|----------|-----|-----------------|-------|------|-----|----------------|-------------------|-----------|------------------------|-------------|
| | | PC205K | PC8110 | PD1000 | H01 | H10 | l | d | t | r | d ₁ | fn (mm/rev) | ap (mm) | Designation | Page |
|  | 090202-AK | | | | ● | | 9.1 | 5.56 | 2.38 | 0.2 | 2.5 | 0.01~0.12 | 0.05~3.00 | STACR/L | B116 |
| | 090204-AK | | | | ● | | 8.6 | 5.56 | 2.38 | 0.4 | 2.5 | 0.02~0.15 | 0.10~4.00 | STFCR/L | B116 |
| | 110202-AK | | | | ● | | 10.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.02~0.20 | 0.05~4.00 | STFCR/L | B137 |
| | 110204-AK | | | | ● | | 10.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.03~0.30 | 0.10~4.00 | STGCR/L | B117 |
| | 110208-AK | | | | ● | | 9.0 | 6.35 | 2.38 | 0.8 | 2.8 | 0.03~0.40 | 0.10~5.00 | STTCR/L | B117 |
| | 16T302-AK | | | | ● | | 15.0 | 9.525 | 3.97 | 0.2 | 4.4 | 0.02~0.30 | 0.05~5.00 | | |
| | 16T304-AK | | | | ● | | 15.5 | 9.525 | 3.97 | 0.4 | 4.4 | 0.03~0.40 | 0.10~5.50 | | |
| | 16T308-AK | | | | ● | | 14.5 | 9.525 | 3.97 | 0.8 | 4.4 | 0.03~0.50 | 0.10~5.50 | | |
| | 16T312-AK | | | | ● | | 13.5 | 9.525 | 3.97 | 1.2 | 4.4 | 0.04~0.60 | 0.15~5.50 | | |
| | 16T316-AK | | | | ● | | 12.5 | 9.525 | 3.97 | 1.6 | 4.4 | 0.05~0.80 | 0.15~5.50 | | |
| | 16T325-AK | | | | | | 10.0 | 9.525 | 3.97 | 2.5 | 4.4 | 0.06~0.90 | 0.20~7.00 | | |
|  | 090202-AR | | | | | | 9.1 | 5.56 | 2.38 | 0.2 | 2.5 | 0.02~0.18 | 0.30~3.00 | STACR/L | B116 |
| | 090204-AR | | | | ● | | 8.6 | 5.56 | 2.38 | 0.4 | 2.5 | 0.02~0.25 | 0.30~5.00 | STFCR/L | B116 |
| | 110202-AR | | | | | | 10.5 | 6.35 | 2.38 | 0.2 | 2.8 | 0.02~0.30 | 0.30~4.00 | STFCR/L | B137 |
| | 110204-AR | | | | ● | | 10.0 | 6.35 | 2.38 | 0.4 | 2.8 | 0.03~0.40 | 0.30~5.00 | STGCR/L | B117 |
| | 110208-AR | | | | | | 9.0 | 6.35 | 2.38 | 0.8 | 2.8 | 0.04~0.45 | 0.50~6.00 | STTCR/L | B117 |
| | 16T302-AR | | | | ● | | 15.0 | 9.525 | 3.97 | 0.2 | 4.4 | 0.03~0.45 | 0.30~5.00 | | |
| | 16T304-AR | | | | ● | | 15.5 | 9.525 | 3.97 | 0.4 | 4.4 | 0.04~0.50 | 0.50~6.00 | | |
| | 16T308-AR | | | | ● | | 14.5 | 9.525 | 3.97 | 0.8 | 4.4 | 0.05~0.60 | 0.50~6.00 | | |
| | 16T312-AR | | | | | | 13.5 | 9.525 | 3.97 | 1.2 | 4.4 | 0.06~0.65 | 0.50~6.00 | | |
| | 16T316-AR | | | | | | 12.5 | 9.525 | 3.97 | 1.6 | 4.4 | 0.08~0.70 | 0.50~6.50 | | |
| | 16T325-AR | | | | | | 10.0 | 9.525 | 3.97 | 2.5 | 4.4 | 0.10~0.10 | 0.80~7.00 | | |

VB ○○



Rhombic **35° Positive**
Relief Angle : 5°



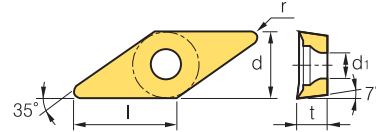
| Workpiece | Steel | P | | | | | | | | Machining types | ● | ● | ⊕ |
|--------------------------------------|-----------------|---|---|---|---|---|--|--|--|-----------------|--------------------------|--------------|---|
| | Stainless steel | M | | | | | | | | | ● | ● | ⊕ |
| Cast iron | K | | | | | | | | | | ● <td>● <td>⊕</td> </td> | ● <td>⊕</td> | ⊕ |
| Non-ferrous metal | N | ⊕ | ⊕ | ● | ⊕ | ⊕ | | | | | ● <td>● <td>⊕</td> </td> | ● <td>⊕</td> | ⊕ |
| Heat resistant alloy, Titanium alloy | S | | | | | | | | | | ● <td>● <td>⊕</td> </td> | ● <td>⊕</td> | ⊕ |
| Hardened steel | H | | | | | | | | | | ● <td>● <td>⊕</td> </td> | ● <td>⊕</td> | ⊕ |

| Inserts | Designation | Coated | | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | |
|-------------|-------------|--------|--------|--------|----------|-----|-----------------|-------|------|-----|----------------|-------------------------|---------------------|------------------------|-------------|
| | | PC205K | PC8110 | PD1000 | H01 | H10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
| VBGT-AK | 110302-AK | | | | ● | | 10.5 | 6.35 | 3.18 | 0.2 | 2.8 | 0.02~0.15 | 0.05~3.00 | SVABR/L | B117 |
| | 110304-AK | | | | ● | | 10.0 | 6.35 | 3.18 | 0.4 | 2.8 | 0.02~0.15 | 0.10~4.00 | SVJBR/L | B118 |
| | 110308-AK | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | 2.8 | 0.03~0.18 | 0.10~5.00 | SVVBN | B119 |
| | 160402-AK | | | | | | 16.1 | 9.525 | 4.76 | 0.2 | 4.4 | 0.03~0.30 | 0.05~4.00 | SVQBR/L | B138 |
| | 160404-AK | | | | ● | | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.03~0.40 | 0.10~5.00 | SVUBR/L | B139 |
| | 160408-AK | | | | ● | | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.03~0.50 | 0.10~5.00 | | |
| | 160412-AK | | | | | | 13.6 | 9.525 | 4.76 | 1.2 | 4.4 | 0.05~0.60 | 0.10~5.50 | | |
| VBGT-AR | 110302-AR | | | | | | 10.5 | 6.35 | 3.18 | 0.2 | 2.8 | 0.02~0.35 | 0.30~3.00 | SVABR/L | B117 |
| | 110304-AR | | | | | | 10.0 | 6.35 | 3.18 | 0.4 | 2.8 | 0.03~0.45 | 0.30~4.00 | SVJBR/L | B118 |
| | 110308-AR | | | | | | 9.0 | 6.35 | 3.18 | 0.8 | 2.8 | 0.03~0.50 | 0.50~6.00 | SVVBN | B119 |
| | 160402-AR | | | | | | 16.1 | 9.525 | 4.76 | 0.2 | 4.4 | 0.04~0.45 | 0.30~5.00 | SVQBR/L | B138 |
| | 160404-AR | | | | ● | | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.04~0.50 | 0.50~6.00 | SVUBR/L | B139 |
| | 160408-AR | | | | ● | | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.05~0.60 | 0.50~6.00 | | |
| | 160412-AR | | | | | | 13.6 | 9.525 | 4.76 | 1.2 | 4.4 | 0.05~0.70 | 0.50~6.50 | | |



B Aluminum Insert (Positive)

VC ○○

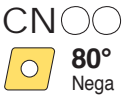
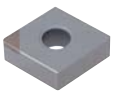

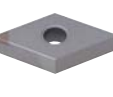

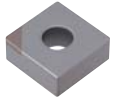
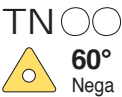


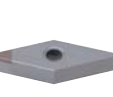

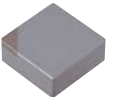

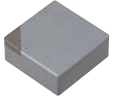
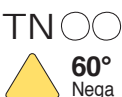





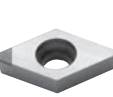
 Rhombic **35° Positive**
Relief Angle : 7°



| Workpiece | Steel | P | | | | | | | | Machining types | ● | ● | ● |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---------------------|---|--------------------|---|
| | Stainless steel | M | | | | | | | | | | Continuous cutting | ● |
| Cast iron | K | | | | | | | | | General cutting | ● | ● | ● |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | Interrupted cutting | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | S | | | | | | | | | | | | |
| Hardened steel | H | | | | | | | | | | | | |

| Inserts | Designation | Coated | | | Uncoated | | Dimensions (mm) | | | | | Cutting Condition | | Available tool holders | |
|---|-------------|--------|--------|--------|----------|-----|-----------------|-------|------|-----|----------------|-------------------------|---------------------|------------------------|-------------|
| | | PC205K | PC8110 | PD1000 | H01 | H10 | l | d | t | r | d ₁ | f _n (mm/rev) | a _p (mm) | Designation | Page |
|  | 110301-AK | | | | | | 10.2 | 6.35 | 3.18 | 0.1 | 2.8 | 0.02~0.15 | 0.05~3.00 | SVJCR/L | B118 |
| | 110302-AK | | | | ● | | 10.5 | 6.35 | 3.18 | 0.2 | 2.8 | 0.02~0.20 | 0.05~3.00 | SVVCN | B119 |
| | 110304-AK | | | | ● | | 10.0 | 6.35 | 3.18 | 0.4 | 2.8 | 0.02~0.25 | 0.10~4.00 | SVQCR/L | B138 |
| | 110308-AK | | | | ● | | 9.0 | 6.35 | 3.18 | 0.8 | 2.8 | 0.03~0.30 | 0.10~5.00 | SVUCR/L | B139 |
| | 130302-AK | | | | ● | | 10.5 | 7.94 | 3.18 | 0.2 | 3.4 | 0.02~0.35 | 0.10~5.00 | | |
| | 130304-AK | | | | ● | | 10.0 | 7.94 | 3.18 | 0.4 | 3.4 | 0.03~0.35 | 0.10~5.00 | | |
| | 130308-AK | | | | ● | | 9.0 | 7.94 | 3.18 | 0.8 | 3.4 | 0.04~0.40 | 0.10~5.00 | | |
| | 160402-AK | | | | ● | | 16.1 | 9.525 | 4.76 | 0.2 | 4.4 | 0.02~0.30 | 0.05~5.00 | | |
| | 160404-AK | | | ● | ● | | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.03~0.40 | 0.10~5.00 | | |
| | 160408-AK | | | | ● | | 14.0 | 9.525 | 4.76 | 0.8 | 4.4 | 0.03~0.50 | 0.10~5.00 | | |
| | 160412-AK | | | | ● | | 13.6 | 9.525 | 4.76 | 1.2 | 4.4 | 0.03~0.50 | 0.10~5.00 | | |
| | 220516-AK | | | | | | 18.0 | 12.7 | 5.56 | 1.6 | 5.6 | 0.03~0.60 | 0.10~7.00 | | |
| | 220525-AK | | | | | | 15.6 | 12.7 | 5.56 | 2.5 | 5.6 | 0.05~0.70 | 0.10~7.00 | | |
| | 220530-AK | | | | ● | | 14.3 | 12.7 | 5.56 | 3.0 | 5.6 | 0.08~1.00 | 0.10~7.00 | | |
|  | 110301-AR | | | | | | 10.2 | 6.35 | 3.18 | 0.1 | 2.8 | 0.02~0.20 | 0.10~3.00 | SVJCR/L | B118 |
| | 110302-AR | | | | | | 10.5 | 6.35 | 3.18 | 0.2 | 2.8 | 0.02~0.25 | 0.30~3.00 | SVVCN | B119 |
| | 110304-AR | | | | ● | | 10.0 | 6.35 | 3.18 | 0.4 | 2.8 | 0.03~0.35 | 0.30~4.00 | SVQCR/L | B138 |
| | 110308-AR | | | | ● | | 9.0 | 6.35 | 3.18 | 0.8 | 2.8 | 0.04~0.45 | 0.50~6.00 | SVUCR/L | B139 |
| | 130302-AR | | | | | | 10.5 | 7.94 | 3.18 | 0.2 | 3.4 | 0.02~0.40 | 0.50~3.00 | | |
| | 130304-AR | | | | ● | | 10.0 | 7.94 | 3.18 | 0.4 | 3.4 | 0.03~0.45 | 0.50~4.00 | | |
| | 130308-AR | | | | ● | | 9.0 | 7.94 | 3.18 | 0.8 | 3.4 | 0.04~0.50 | 0.50~5.00 | | |
| | 160402-AR | | | | ● | | 16.1 | 9.525 | 4.76 | 0.2 | 4.4 | 0.03~0.40 | 0.30~5.00 | | |
| | 160404-AR | | | | ● | | 15.6 | 9.525 | 4.76 | 0.4 | 4.4 | 0.04~0.50 | 0.50~6.00 | | |
| | 160408-AR | | | | ● | | 14.6 | 9.525 | 4.76 | 0.8 | 4.4 | 0.05~0.60 | 0.50~6.00 | | |
| | 160412-AR | | | | ● | | 13.6 | 9.525 | 4.76 | 1.2 | 4.4 | 0.06~0.65 | 0.50~6.50 | | |
| | 220516-AR | | | | | | 18.0 | 12.7 | 5.56 | 1.6 | 5.6 | 0.10~0.65 | 0.80~6.50 | | |
| | 220525-AR | | | | ● | | 15.6 | 12.7 | 5.56 | 2.5 | 5.6 | 0.10~0.70 | 0.80~7.00 | | |
| | 220530-AR | | | | | | 14.3 | 12.7 | 5.56 | 3.0 | 5.6 | 0.12~0.75 | 1.00~7.00 | | |








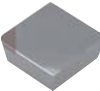






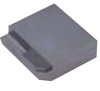
cBN Regrinding (Negative / Positive)

| Inserts | Designation | Grades | | | | | | | Dimensions (mm) | | | | Available tool holders | |
|--|--|-------------|-------|-------|-------|-------|-------|-------|-----------------|------------------|-----------|--------|------------------------|--|
| | | KB410 | KB420 | KB425 | KB320 | KB210 | KB335 | KB350 | KB370 | Inscribed circle | Thickness | Nose R | Hole size | Designation |
| CN  80° Nega |  | CNMA 120404 | | | | ● | | | | 12.7 | 4.76 | 0.4 | 5.16 | DCBNR/L MCKNR/L B89 B106 DCLNR/L MCLNR/L B89 B106 PCBNR/L MCMNN B94 B106 PCLNR/L B95 |
| | | 120404W | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | |
| | | 120408 | | | | ● | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 120408W | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 120412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | 120412W | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| DN  55° Nega |  | DNMA 150404 | | | | ● | | | | 12.7 | 4.76 | 0.4 | 5.16 | DDJNR/L MDJNR/L B90 B107 MDNN MDQR/L B107 B108 MDJNR/L PDJNR/L B132 B95 PDNNR/L PSDNR/L B96 B127 PDJNR/L B129 |
| | | 150408 | | | | ● | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 150412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | | | | | | | | | | | | | |
| SN  90° Nega |  | SNMA 120404 | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | DSBNR/L MSBNR/L B90 B108 MSDNN MSKNR/L B108 B109 MSNR/L MSSNR/L B109 B110 PSBNR/L PSDNN B98 B98 PSKNR/L B99 |
| | | 120408 | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 120412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | | | | | | | | | | | | | |
| TN  60° Nega |  | TNMA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | MTNNS MTFNR/L B110 B110 MTGNR/L MTJNR/L B111 B111 PTFNR/L PTGNR/L B100 B100 PTTNR/L WTENN B101 B102 WTJNR/L WTXNR/L B102 B102 |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | |
| | | 220404 | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | |
| | | 220408 | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 220412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| VN  35° Nega |  | VNMA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | MVJNR/L B111 MVQNR/L B112 MVUNR/L B133 MVVNN B112 |
| | | 160408 | | | | ● | | | | 9.525 | 4.76 | 0.8 | 3.81 | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | |
| | | | | | | | | | | | | | | |
| CN  80° Nega |  | CNGN 090304 | | | | | | | | 9.525 | 3.18 | 0.4 | - | CCLNR/L B120 |
| | | 090308 | | | | | | | | 9.525 | 3.18 | 0.8 | - | |
| | | 090312 | | | | | | | | 9.525 | 3.18 | 1.2 | - | |
| | | 090404 | | | | | | | | 12.7 | 4.76 | 0.4 | - | |
| | | 090408 | | | | | | | | 12.7 | 4.76 | 0.8 | - | |
| | | 090412 | | | | | | | | 12.7 | 4.76 | 1.2 | - | |
| SN  90° Nega |  | SNGN 090304 | | | | | | | | 9.525 | 3.18 | 0.4 | - | CSDNN B120 CSKNR/L B121 |
| | | 090308 | | | | | | | | 9.525 | 3.18 | 0.8 | - | |
| | | 090312 | | | | | | | | 9.525 | 3.18 | 1.2 | - | |
| | | 120404 | | | | | | | | 12.7 | 4.76 | 0.4 | - | |
| | | 120408 | | | | | | | | 12.7 | 4.76 | 0.8 | - | |
| | | 120412 | | | | | | | | 12.7 | 4.76 | 1.2 | - | |
| TN  60° Nega |  | TNGN 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | - | CTFNR/L B121 CTGNR/L B121 |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | - | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | - | |
| | | | | | | | | | | | | | | |
| CC  80° CP  80° Posi |  (CCMW) | CCMW 09T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | SCACR/L B113 SCLCR/L B113 |
| | | 09T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | |
| | | CPGB 080204 | | | | | | | | 7.94 | 2.38 | 0.4 | 3.8 | |
| | | 080208 | | | | | | | | 7.94 | 2.38 | 0.8 | 3.8 | |
| | | 090304 | | | | | | | | 9.525 | 3.18 | 0.4 | 2.8 | |
| | | 090308 | | | | | | | | 9.525 | 3.18 | 0.8 | 2.8 | |
| | | 090312 | | | | | | | | 9.525 | 3.18 | 1.2 | 2.8 | |
| | | CPGW 080204 | | | | | | | | 7.94 | 2.38 | 0.4 | 3.8 | |
| 080208 | | | | | | | | 7.94 | 2.38 | 0.8 | 3.8 | | | |
| DC  55° Posi |  | DCMW 070204 | | | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | SDACR/L B113 SDJCR/L B114 SDNCN B114 SDQCR/L B135 SDUCR/L B135 SDZCR/L B136 |
| | | 070208 | | | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | |
| | | 070212 | | | | | | | | 6.35 | 2.38 | 1.2 | 2.8 | |
| | | 11T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | |
| | | 11T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | |
| | | 11T312 | | | | | | | | 9.525 | 3.97 | 1.2 | 4.4 | |

● : Stock item




CBN Regrinding (Negative / Positive)


| Inserts | Designation | Grades | | | | | | | Dimensions (mm) | | | | Available tool holders | | |
|---|---|---------------|-------|-------|-------|-------|-------|-------|-----------------|------------------|-----------|--------|---|---|----------------------------|
| | | KB410 | KB420 | KB425 | KB320 | KB210 | KB335 | KB350 | KB370 | Inscribed circle | Thickness | Nose R | Hole size | Designation | Page |
| SC ○○  |  | SCMW 09T304 | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | SSBCR/L SSDCN SSKCR/L SSSCR/L | B115 B115 B116 B116 | |
| | | 09T308 | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | | | |
| | | 09T312 | | | | | | | 9.525 | 3.97 | 1.2 | 4.4 | | | |
| | | | | | | | | | | | | | | | |
| TC ○○  |  | TCGW 110204 | | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | STACR/L STFCR/L STFPR/L STGCR/L STTCR/L | B116 B116 B144 B117 B117 | |
| | | 110208 | | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | | | |
| | | 16T304 | | | | | | | 9.525 | 3.97 | 0.4 | 2.8 | | | |
| | | 16T308 | | | | | | | 9.525 | 3.97 | 0.8 | 2.8 | | | |
| | | 16T312 | | | | | | | 9.525 | 3.97 | 1.2 | 2.8 | | | |
| VB ○○ VC ○○  |  | VBMW 110204 | | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | SVABR/L SVHBR/L SVJBR/L SVQBR/L SVUBR/L | B117 B118 B118 B138 B139 | |
| | | 110208 | | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | | | |
| | | 110304 | | | | | | | 6.35 | 3.18 | 0.4 | 3.3 | | | |
| | | 110308 | | | | | | | 6.35 | 3.18 | 0.8 | 3.3 | | | |
| | | 160404 | | | | ● | | | 9.525 | 3.97 | 0.4 | 3.81 | | | |
| | | 160408 | | | | | | | 9.525 | 3.97 | 0.8 | 3.81 | | | |
| | | 160412 | | | | | | | 9.525 | 3.97 | 1.2 | 3.81 | | | |
| | | VCMW 160404 | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | | | |
| | | 160408 | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | | | |
| | | 160412 | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | | | |
| SP ○○  |  | SPGN 090304 | | | | | | | 9.525 | 3.18 | 0.4 | - | CSDPN CSKPR/L | B104 B105 | |
| | | 090308 | | | | | | | 9.525 | 3.18 | 0.8 | - | | | |
| | | 090312 | | | | | | | 9.525 | 3.18 | 1.2 | - | | | |
| | | 120304 | | | | | | | 12.7 | 3.18 | 0.4 | - | | | |
| | | 120308 | | | | | | | 12.7 | 3.18 | 0.8 | - | | | |
| | | 120312 | | | | | | | 12.7 | 3.18 | 1.2 | - | | | |
| TB ○○ TP ○○  |  | TBGN 060102-B | | | | | | | 3.97 | 1.59 | 0.2 | - | STUBR/L | B140 | |
| | | 060104-B | | | | | | | 3.97 | 1.59 | 0.4 | - | | | |
| | | 060108-B | | | | | | | 3.97 | 1.59 | 0.8 | - | | | |
| | | TPGN 110304 | | | | | | | | 6.35 | 3.18 | 0.4 | - | CTFPR/L CTGPR/L | B105 B105 |
| | | 110308 | | | | | | | 6.35 | 3.18 | 0.8 | - | | | |
| | | 110312 | | | | | | | 6.35 | 3.18 | 1.2 | - | | | |
| | | 160304 | | | | | | | 9.525 | 3.18 | 0.4 | - | | | |
| | | 160308 | | | | | | | 9.525 | 3.18 | 0.8 | - | | | |
| | | 160312 | | | | | | | 9.525 | 3.18 | 1.2 | - | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| RN ○○  |  | RNGN 120400-B | | | | | | | 12.7 | 6.4 | - | - | CRDNN CRGNR/L | B120 B120 | |
| | | | | | | | | | | | | | | | |
| RB ○○ RC ○○ RT ○○  |  | RBG 08-B | | | | | | | 8.00 | 6.5 | - | - | | | |
| | | 10-B | | | | | | | 10.0 | 9.0 | - | - | | | |
| | | 12-B | | | | | | | 12.0 | 11.0 | - | - | | | |
| | | 16-B | | | | | | | 16.0 | 13.0 | - | - | | | |
| | | 20-B | | | | | | | 20.0 | 15.0 | - | - | | | |
| | | 26-B | | | | | | | 26.0 | 15.0 | - | - | | | |
| | | RCGA 0906M0 | | | | | | | 9.0 | 6.4 | - | - | | | |
| | | RTGN 0508M0 | | | | | | | 5.0 | 7.5 | - | - | | | |
| | | 0608M0 | | | | | | | 6.0 | 7.5 | - | - | | | |
| | | 0711M0 | | | | | | | 7.0 | 11.0 | - | - | | | |
| | | 0811M0 | | | | | | | 8.0 | 11.0 | - | - | | | |
| | | 0914M0 | | | | | | | 9.0 | 11.0 | - | - | | | |
| | | 1014M0 | | | | | | | 10.0 | 14.0 | - | - | | | |
| | | 1214M0 | | | | | | | 12.0 | 14.0 | - | - | | | |
| Milling Insert |  | SNEN 1504ADTR | | | | | | | - | 4.76 | - | - | | | |
| | | 1504ADTL | | | | | | | - | 4.76 | - | - | | | |
| | | 1504DTR-W | | | | | | | - | 4.76 | - | - | | | |
| | | 1504DTL-W | | | | | | | - | 4.76 | - | - | | | |
| | | | | | | | | | | | | | | | |

● : Stock item

cBN Grooving and Threading

| Inserts | Designation | Grades | | | Dimensions (mm) | | | | | Available tool holders | |
|---|-------------|--------|-------|-------|-----------------|-------------|--------|-------------|----------------|------------------------|------|
| | | KB420 | KB320 | KB335 | Edge Thickness | Edge length | Nose R | Tool length | Tool Thickness | Designation | Page |
| BN○○  | BNGNT 0200L | | | | 2.0 | 4.0 | 0.2 | 25 | 6.0 | | |
| | 0200R | | | | 2.0 | 4.0 | 0.2 | 25 | 6.0 | | |
| | 0250L | | | | 2.5 | 4.0 | 0.2 | 25 | 6.0 | | |
| | 0250R | | | | 2.5 | 4.0 | 0.2 | 25 | 6.0 | | |
| | 0300L | | | | 3.0 | 5.0 | 0.4 | 25 | 6.0 | | |
| | 0300R | | | | 3.0 | 5.0 | 0.4 | 25 | 6.0 | | |
| | 0400L | | | | 4.0 | 6.0 | 0.4 | 26 | 6.0 | | |
| | 0400R | | | | 4.0 | 6.0 | 0.4 | 26 | 6.0 | | |
| | 0500L | | | | 5.0 | 6.0 | 0.4 | 26 | 6.0 | | |
| | 0500R | | | | 5.0 | 6.0 | 0.4 | 26 | 6.0 | | |
| | 0600L | | | | 6.0 | 7.0 | 0.4 | 27 | 6.0 | | |
| | 0600R | | | | 6.0 | 7.0 | 0.4 | 27 | 6.0 | | |
| | BNTT 1020L | | | | Pitch 1.0~2.0 | | 0.13 | 25 | 2.0 | | |
| | 1020R | | | | Pitch 1.0~2.0 | | 0.13 | 25 | 2.0 | | |
| | 1530L | | | | Pitch 1.5~3.0 | | 0.13 | 25 | 2.0 | | |
| | 1530R | | | | Pitch 1.5~3.0 | | 0.13 | 25 | 2.0 | | |


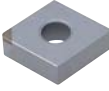

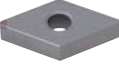

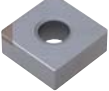



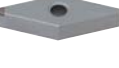

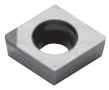

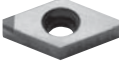

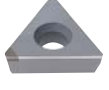
cBN Mini Boring bar

| Inserts | Designation | Grades | Min. boring dia. | Dimensions (mm) | | | | Available tool holders | |
|--|-------------|--------|------------------|-----------------|----------|-------|--------|------------------------|------|
| | | KB350 | | Tool length | Diameter | Width | Nose R | Designation | Page |
| BN○○R  | BNBB 03R | | 3.5 | 60 | 3.5 | 2.4 | 0.2 | | |
| | 035R | | 4.0 | 60 | 3.5 | 2.9 | 0.2 | | |
| | 04R | | 4.5 | 60 | 4.0 | 3.4 | 0.2 | | |
| | 045R | | 5.0 | 60 | 4.5 | 3.9 | 0.2 | | |
| | 05R | | 5.5 | 80 | 5.0 | 4.4 | 0.2 | | |
| | 055R | | 6.0 | 80 | 5.5 | 4.9 | 0.2 | | |
| | 06R | | 6.5 | 80 | 6.0 | 5.4 | 0.2 | | |
| | 065R | | 7.0 | 80 | 6.5 | 5.9 | 0.2 | | |
| | 07R | | 7.5 | 100 | 7.0 | 6.4 | 0.2 | | |
| | 075R | | 8.0 | 100 | 7.5 | 6.9 | 0.2 | | |
| | 08R | | 8.5 | 100 | 8.0 | 7.4 | 0.2 | | |

● : Stock item




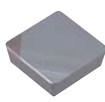

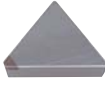


CBN One-Use Type (Negative / Positive)


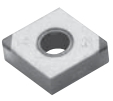

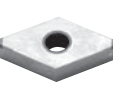
| Inserts | Designation | Grades | | | | | | | Dimensions (mm) | | | | Available tool holders | |
|---|---|----------------|-------|-------|-------|-------|-------|-------|-----------------|------------------|-----------|--------|------------------------|---|
| | | KB410 | KB420 | KB425 | KB320 | KB210 | KB335 | KB350 | KB370 | Inscribed circle | Thickness | Nose R | Hole size | Designation |
| CN ○○  80° Nega |  | NU-CNMA 120404 | | | | ● | | | | 12.7 | 4.76 | 0.4 | 5.16 | DCBNR/L, DCLNR/L, B 89 B 89 MCKNR/L, MCLNR/L, B106 B106 MCMNN, PCBNR/L, B106 B 94 PCLNR/L, B 95 |
| | | 120408 | | | | ● | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 120412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | | | | | | | | | | | | | |
| DN ○○  55° Nega |  | NU-DNMA 150404 | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | DDJNR/L, MDJNR/L, B 90 B107 MDNNR/L, MDQNR/L, B107 B108 MDUNR/L, PDJNR/L, B132 B 95 PDNNR/L, PDSNR/L, B 96 B128 PDUNR/L, B129 |
| | | 150408 | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 150412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | | | | | | | | | | | | | |
| SN ○○  90° Nega |  | NU-SNMA 120404 | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | DSBNR/L, MSBNR/L, B90 B108 MSDNN, MSKNR/L, B108 B109 MSNR/L, MSSNR/L, B109 B110 PSBNR/L, PSDNN, B98 B98 PSKNR/L, B99 |
| | | 120408 | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | 120412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | | | | | | | | | | | | | |
| TN ○○  60° Nega |  | NU-TNMA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | MTENN, MTFNR/L, B110 B110 MTGNR/L, MTJNR/L, B111 B111 PTFNR/L, PTGNR/L, B100 B100 PTTNR/L, WTENN, B101 B102 WTJNR/L, WTXNR/L, B102 B102 |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | |
| | | | | | | | | | | | | | | |
| VN ○○  35° Nega |  | NU-VNMA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | MVJNR/L, B111 MVQNR/L, B112 MVUNR/L, B133 MVVNN, B112 |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | |
| | | | | | | | | | | | | | | |
| CC ○○ CP ○○  80° Posi |  | NU-CCMW 060202 | | | | | | | | 6.35 | 2.38 | 0.2 | 2.8 | SCACR/L, B113 SCLCR/L, B113 SCLPR/L, B142 |
| | | 060204 | | | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | |
| | | 060208 | | | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | |
| | | 09T302 | | | | | | | | 9.525 | 3.97 | 0.2 | 4.4 | |
| | | 09T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | |
| | | 09T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | |
| | | NU-CPMB 080204 | | | | | | | | 7.94 | 2.38 | 0.4 | 3.4 | |
| | | 080208 | | | | | | | | 7.94 | 2.38 | 0.8 | 3.4 | |
| | | 090304 | | | | | | | | 9.525 | 3.18 | 0.4 | 4.4 | |
| | | 090308 | | | | | | | | 9.525 | 3.18 | 0.8 | 4.4 | |
| DC ○○  55° Posi |  | NU-DCMW 070202 | | | | | | | | 6.35 | 2.38 | 0.2 | 2.8 | SDACR/L, B113 SDJCR/L, B114 SDNCN, B135 SDQCR/L, B135 SDUCR/L, B135 SDZCR/L, B136 |
| | | 070204 | | | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | |
| | | 070208 | | | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | |
| | | 11T302 | | | | | | | | 9.525 | 3.97 | 0.2 | 4.4 | |
| | | 11T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | |
| | | 11T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | |
| | | | | | | | | | | | | | | |
| TC ○○ TP ○○  60° Posi |  | NU-TCGW 090204 | | | | | | | | 5.56 | 2.38 | 0.4 | 2.8 | STACR/L, B116 STFGR/L, B116 STFPR/L, B144 STGCR/L, B117 STTCR/L, B117 STFPR/L, B137 STWPR/L, B137 STUPR/L, B145 |
| | | 090208 | | | | | | | | 5.56 | 2.38 | 0.8 | 2.8 | |
| | | 110202 | | | | | | | | 6.35 | 2.38 | 0.2 | 2.3 | |
| | | 110204 | | | | | | | | 6.35 | 2.38 | 0.4 | 2.3 | |
| | | 110208 | | | | | | | | 6.35 | 2.38 | 0.8 | 2.3 | |
| | | 16T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.3 | |
| | | 16T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.3 | |
| | | NU-TPGW 080202 | | | | | | | | 7.94 | 2.38 | 0.2 | 3.4 | |
| | | 080204 | | | | | | | | 7.94 | 2.38 | 0.4 | 3.4 | |
| | | 080208 | | | | | | | | 7.94 | 2.38 | 0.8 | 3.4 | |
| | | 090204 | | | | | | | | 5.56 | 2.38 | 0.4 | 2.8 | |
| | | 090208 | | | | | | | | 5.56 | 2.38 | 0.8 | 2.8 | |
| | | 110302 | | | | | | | | 6.35 | 3.18 | 0.2 | 2.8 | |
| | | 110304 | | | | | | | | 6.35 | 3.18 | 0.4 | 2.8 | |
| | | 110308 | | | | | | | | 6.35 | 3.18 | 0.8 | 2.8 | |
| | | 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

● : Stock item

cBN One-Use Type (Positive)

| Inserts | Designation | Grades | | | | | | | Dimensions (mm) | | | | Available tool holders | |
|--|---|----------------|-------|-------|-------|-------|-------|-------|-----------------|------------------|-----------|--------------------|---|---|
| | | KB410 | KB420 | KB425 | KB320 | KB210 | KB335 | KB350 | KB370 | Inscribed circle | Thickness | Nose R | Hole size | Designation |
| VB ○○ VC ○○  35° Posi |  | NU-VBMW 110202 | | | | | | | 6.35 | 2.38 | 0.2 | 2.3 | SVABR/L SVHBR/L SVJBR/L SVQBR/L SVUBR/L | B117 B118 B118 B138 B139 |
| | | 110204 | | | | | | | 6.35 | 2.38 | 0.4 | 2.3 | | |
| | | 110302 | | | | | | | 6.35 | 3.18 | 0.2 | 2.8 | | |
| | | 110304 | | | | | | | 6.35 | 3.18 | 0.4 | 2.8 | | |
| | | 110308 | | | | | | | 6.35 | 3.18 | 0.8 | 2.8 | | |
| | | 160402 | | | | | | | 12.7 | 4.76 | 0.2 | 4.4 | | |
| | | 160404 | | | | | | | 12.7 | 4.76 | 0.4 | 4.4 | | |
| | | 160408 | | | | | | | 12.7 | 4.76 | 0.8 | 4.4 | | |
| | | NU-VCMW 110304 | | | | | | | 6.35 | 3.18 | 0.4 | 2.8 | SVJCR SVVCN | B118 B119 |
| | | 110308 | | | | | | 6.35 | 3.18 | 0.8 | 2.8 | | | |
| | | 160404 | | | | | | 12.7 | 4.76 | 0.4 | 4.4 | | | |
| | | 160408 | | | | | | 12.7 | 4.76 | 0.8 | 4.4 | | | |
| | | 160412 | | | | | 12.7 | 4.76 | 1.2 | 4.4 | | | | |
| SP ○○  90° Posi |  | NU-SPGN 090304 | | | | | | 9.525 | 3.18 | 0.4 | - | CSDPN CSKPR/L | B104 B105 | |
| | | 090308 | | | | | | 9.525 | 3.18 | 0.8 | - | | | |
| | | 120304 | | | | | | 12.7 | 3.18 | 0.4 | - | | | |
| | | 120308 | | | | | | 12.7 | 3.18 | 0.8 | - | | | |
| | | 120404 | | | | | | 12.7 | 4.76 | 0.4 | - | | | |
| | | 120408 | | | | | | 12.7 | 4.76 | 0.8 | - | | | |
| TP ○○  60° Posi |  | NU-TPGN 110304 | | | | | | 6.35 | 3.18 | 0.4 | - | CTFPR/L CTGPR/L | B105 B105 | |
| | | 110308 | | | | | | 6.35 | 3.18 | 0.8 | - | | | |
| | | 160304 | | | | | | 9.525 | 3.18 | 0.4 | - | | | |
| | | 160308 | | | | | | 9.525 | 3.18 | 0.8 | - | | | |
| | | | | | | | | | | | | | | |


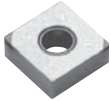

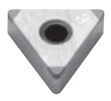

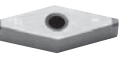

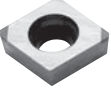

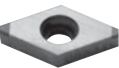

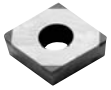




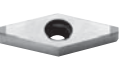
cBN Multi-Corner Type (Negative / Positive)

| Inserts | Designation | Uncoated | | | | | | | Coated | | Dimensions (mm) | | | | Available tool holders | |
|--|---|-----------------|-------|-------|-------|-------|-------|-------|--------|--------|-----------------|------------------|---|--|---|-------------|
| | | KB410 | KB420 | KB425 | KB320 | KB210 | KB335 | KB350 | KB370 | DNC250 | DNC280 | Inscribed circle | Thickness | Nose R | Hole size | Designation |
| CN ○○  80° Nega |  | 2NU-CNGA 120404 | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | DCBNR/L MCKNR/ MCMNN PCLNR/L DCLNR/L MCLNR/L PCBNR/L | B 89 B106 B106 B 94 B 95 | |
| | | 120404W | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | | | |
| | | 120408 | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | |
| | | 120408W | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | |
| | | 120412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | |
| | | 120412W | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | |
| | | 4NU-CNGA 120404 | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | | | |
| | | 120404W | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | | | |
| | | 120408 | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | |
| | | 120408W | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | |
| | | 120412 | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | |
| | | 120412W | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | |
| DN ○○  55° Nega |  | 2NU-DNGA 150404 | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | DDJNR/ MDJNR/L MDJNR/L MDJNR/L PDJNR/L PDJNR/L PDJNR/L MDQNR/L PDQNR/L PDSNR/L | B 90 B107 B107 B132 B 95 B 96 B128 B129 | | |
| | | 150408 | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | | |
| | | 150412 | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | | |
| | | 4NU-DNGA 150404 | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | | | | |
| | | 150408 | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | | |
| | | 150412 | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

● : Stock item


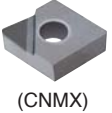

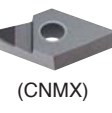

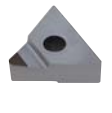

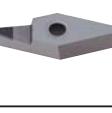

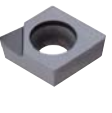

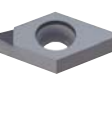

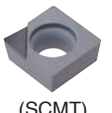


CBN Multi-Corner Type (Negative / Positive)

| Inserts | Designation | Uncoated | | | | | | | | Coated | | Dimensions (mm) | | | | Available tool holders | | | |
|--|---|------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|------------------|-----------|--|---|------------------------|------|--|--|
| | | KB410 | KB420 | KB425 | KB320 | KB210 | KB335 | KB350 | KB370 | DNC250 | DNC280 | Inscribed circle | Thickness | Nose R | Hole size | Designation | Page | | |
| SN ○○  90° Nega |  | 2NU-SNGA 120404 | | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | DSBNR/L MSBNR/L B90 B108 MSDNN MSKNR/L B108 B109 MSRNR/L MSSNR/L B109 B110 PSBNR/L PSDNN B98 B98 PSKNR/L B99 | | | | |
| | | 120408 | | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | | | |
| | | 120412 | | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | | | |
| | | 4NU-SNGA 120404 | | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | | | | | |
| | | 120408 | | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | | | |
| | | 120412 | | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | | | |
| | | 8NU-SNGA 120404 | | | | | | | | | 12.7 | 4.76 | 0.4 | 5.16 | | | | | |
| | | 120408 | | | | | | | | | 12.7 | 4.76 | 0.8 | 5.16 | | | | | |
| 120412 | | | | | | | | | 12.7 | 4.76 | 1.2 | 5.16 | | | | | | | |
| TN ○○  60° Nega |  | 3NU-TNGA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | MTENN MTFNR/L B110 B110 MTGNR/ MTJNR/L B111 B111 PTFNR/L PTGNR/L B100 B100 PTTNR/L WTENN B101 B102 WTJNR/L WTXNR/L B102 B102 | | | | | |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | | | | | | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | | | | | | |
| | | 6NU-TNGA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | | | | | | |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | | | | | | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | | | | | | |
| VN ○○  35° Nega |  | 2NU-VNGA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | MVJNR/L B111 MVQNR/L B112 MVUNR/L B133 MVVNN B112 | | | | | |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | | | | | | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | | | | | | |
| | | 4NU-VNGA 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | | | | | | |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | | | | | | |
| | | 160412 | | | | | | | | 9.525 | 4.76 | 1.2 | 3.81 | | | | | | |
| CC ○○  80° Posi |  | 2NU-CCMW060204 | | | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | SCACR/L B113 SCLCR/L B113 | | | | | |
| | | 2NU-CCGW 060204W | | | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | | | | | | |
| | | 2NU-CCMW060208 | | | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | | | | | | |
| | | 2NU-CCGW 060208W | | | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | | | | | | |
| | | 09T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | | | | | | |
| | | 09T304W | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | | | | | | |
| | | 09T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | | | | | | |
| | | 09T308W | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | | | | | | |
| | | 09T312 | | | | | | | | 9.525 | 3.97 | 1.2 | 4.4 | | | | | | |
| 09T312W | | | | | | | | 9.525 | 3.97 | 1.2 | 4.4 | | | | | | | | |
| DC ○○  55° Posi |  | 2NU-DCGW 11T302 | | | | | | | | 9.525 | 3.97 | 0.2 | 4.4 | SDACR/L B113 SDJCR/L B114 SDNCN B135 SDQCR/L B135 SDUCR/L B136 SDZCR/L | | | | | |
| | | 11T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | | | | | | |
| | | 11T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| SC ○○  90° Posi |  | 4NU-SCGW 09T304 | | | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | SDACR/L B113 SDJCR/L B114 SDNCN B135 SDQCR/L B135 SDUCR/L B136 SDZCR/L | | | | | |
| | | 09T308 | | | | | | | | 9.525 | 3.97 | 0.8 | 4.4 | | | | | | |
| | | 09T312 | | | | | | | | 9.525 | 3.97 | 1.2 | 4.4 | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| TP ○○  60° Posi |  | 3NU-TPGN 110304 | | | | | | | | 6.35 | 3.18 | 0.4 | - | CTFPR/L B105 CTGPR/L B105 | | | | | |
| | | 110308 | | | | | | | | 6.35 | 3.18 | 0.8 | - | | | | | | |
| | | 160404 | | | | | | | | 9.525 | 3.18 | 0.4 | - | | | | | | |
| | | 160408 | | | | | | | | 9.35 | 3.18 | 0.8 | - | | | | | | |
| |  | 3NU-TPGB 110304 | | | | | | | | 6.35 | 3.18 | 0.4 | 2.4 | | | | | | |
| | | 110308 | | | | | | | | 6.35 | 3.18 | 0.8 | 2.4 | | | | | | |
| | | 3NU-TPGW 160404 | | | | | | | | 9.525 | 4.76 | 0.4 | 3.81 | | | | | | |
| | | 160408 | | | | | | | | 9.525 | 4.76 | 0.8 | 3.81 | | | | | | |
| VB ○○  35° Posi |  | 2NU-VBGW 110304 | | | | | | | | 6.35 | 3.18 | 0.4 | 2.8 | SVABR/L B117 SVHBR/L B118 SVJBR/L B118 SVQBR/L B138 SVUBR/L B139 | | | | | |
| | | 110308 | | | | | | | | 6.35 | 3.18 | 0.8 | 2.8 | | | | | | |
| | | 160404 | | | | | | | | 12.7 | 4.76 | 0.4 | 4.4 | | | | | | |
| | | 160408 | | | | | | | | 12.7 | 4.76 | 0.8 | 4.4 | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

● : Stock item








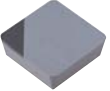
PCD Insert (Negative / Positive)

| Inserts | Designation | Grades | | | Dimensions (mm) | | | | Available tool holders | | |
|--|---|--|---|-------|------------------|-----------|--------|-----------|------------------------|------|--|
| | | DP90 | DP150 | DP200 | Inscribed circle | Thickness | Nose R | Hole size | Designation | Page | |
| CN ○○  80° Nega |  (CNMX) | CNMM | 120404 | | ● | | 12.7 | 4.76 | 0.4 | 5.16 | DCBNR/L DCLNR/L B 89 B 89 MCKNR/L MCLNR/L B106 B106 MCMNN PCLNR/L B106 B 94 PCLNR/L B 95 |
| | | | 120408 | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | | 120412 | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | CNMX | 120404 | | | | 12.7 | 4.76 | 0.4 | 5.16 | |
| | | | 120408 | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | | 120412 | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| DN ○○  55° Nega |  (CNMX) | DNMM | 150404 | | | | 12.7 | 4.76 | 0.4 | 5.16 | DDJNR/L MDJNR/L B90 B107 MDNNN MDQNR/L B107 B108 MDUNR/L PDJNR/L B132 B95 PDNNR/L PDSNR/L B96 B128 PDUNR/L B129 |
| | | | 150408 | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | | 150412 | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| | | DNMX | 150404 | | | | 12.7 | 4.76 | 0.4 | 5.16 | |
| | | | 150408 | | | | 12.7 | 4.76 | 0.8 | 5.16 | |
| | | | 150412 | | | | 12.7 | 4.76 | 1.2 | 5.16 | |
| TN ○○  60° Nega |  | TNMX | 160404 | | | | 9.525 | 4.76 | 0.4 | 3.81 | MTENNS MTFNR/L B110 B110 MTGNR/L MTJNR/L B111 B111 PTFNR/L PTGNR/L B100 B100 PTTNR/L WTENN B101 B102 WTJNR/L WTXNR/L B102 B102 |
| | | | 160408 | | | | 9.525 | 4.76 | 0.8 | 3.81 | |
| | | | 160412 | | | | 9.525 | 4.76 | 1.2 | 3.81 | |
| | | | | | | | | | | | |
| VN ○○  35° Nega |  | VNMX | 160404 | | | | 9.525 | 4.76 | 0.4 | 3.81 | MVJNR/L B111 MVQNR/L B112 MVUNR/L B133 MVVNN B112 |
| | | | 160408 | | | | 9.525 | 4.76 | 0.8 | 3.81 | |
| | | | 160412 | | | | 9.525 | 4.76 | 1.2 | 3.81 | |
| | | | | | | | | | | | |
| CC ○○ CP ○○  80° Posi |  | CCMT | 060202 | | ● | | 6.35 | 2.38 | 0.2 | 2.8 | SCACR/L B113 SCLCR/L B113 |
| | | | 060204 | | ● | | 6.35 | 2.38 | 0.4 | 2.8 | |
| | | | 060208 | | | | 6.35 | 2.38 | 0.8 | 2.8 | |
| | | | 09T304 | | ● | | 9.525 | 3.97 | 0.4 | 4.4 | |
| | | | 09T308 | | ● | | 9.525 | 3.97 | 0.8 | 4.4 | |
| | | | 09T312 | | | | 9.525 | 3.97 | 1.2 | 4.4 | |
| | | CPMT | 080204 | | | | 7.94 | 2.38 | 0.4 | 3.4 | |
| | | | 080208 | | | | 7.94 | 2.38 | 0.8 | 3.4 | |
| | | | 080212 | | | | 7.94 | 2.38 | 1.2 | 3.4 | |
| | | | 090304 | | | | 9.525 | 3.18 | 0.4 | 4.4 | |
| | | | 090308 | | | | 9.525 | 3.18 | 0.8 | 4.4 | |
| | | | 090312 | | | | 9.525 | 3.18 | 1.2 | 4.4 | |
| | | DC ○○  55° Posi |  | DCMT | 070202 | | ● | | 6.35 | 2.38 | |
| | 070204 | | | | | | 6.35 | 2.38 | 0.4 | 2.8 | |
| | 070208 | | | | | | 6.35 | 2.38 | 0.8 | 2.8 | |
| | 11T302 | | | | | | 9.525 | 3.97 | 0.2 | 4.4 | |
| | 11T304 | | | | | | 9.525 | 3.97 | 0.4 | 4.4 | |
| | 11T308 | | | | ● | | 9.525 | 3.97 | 0.8 | 4.4 | |
| | | | | | | | | | | | |
| SC ○○ SP ○○  90° Posi |  (SCMT) | SCMT | 09T304 | | | | 9.525 | 3.97 | 0.4 | 4.4 | SSBCR/L B115 SSSCN B115 SSKCR/L B116 SSSCR/L B116 |
| | | | 09T308 | | | | 9.525 | 3.97 | 0.8 | 4.4 | |
| | | | 09T312 | | | | 9.525 | 3.97 | 1.2 | 4.4 | |
| | | SPGW | 090302 | | | | 9.525 | 3.18 | 0.2 | 4.4 | |
| | | | 090304 | | | | 9.525 | 3.18 | 0.4 | 4.4 | |
| | | | 090308 | | | | 9.525 | 3.18 | 0.8 | 4.4 | |
| | | | | | | | | | | | |

● : Stock item



PCD Insert (Negative / Positive)

| Inserts | Designation | Grades | | | Dimensions (mm) | | | | Available tool holders | | |
|---|---|---|---|-------|------------------|-----------|--------|-----------|------------------------|---------|-------------|
| | | DP90 | DP150 | DP200 | Inscribed circle | Thickness | Nose R | Hole size | Designation | Page | |
| TB ○○ TC ○○ TP ○○  60° Posi |  (TBGN) | TBGW | 060102 | | | 3.97 | 1.59 | 0.2 | 2.8 | STUBR/L | B140 |
| | | | 060104 | | | 3.97 | 1.59 | 0.4 | 2.8 | | |
| | | TCMT | 090201 | | | 5.56 | 2.38 | 0.1 | 2.5 | STACR/L | B116 |
| | | | 090202 | | | 5.56 | 2.38 | 0.2 | 2.5 | STFCR/L | B116 |
| | | | 090204 | | | 5.56 | 2.38 | 0.4 | 2.5 | STFPR/L | B144 |
| | | | 110201 | | | 6.35 | 2.38 | 0.1 | 2.8 | STGCR/L | B117 |
| | | | 110202 | | | 6.35 | 2.38 | 0.2 | 2.8 | STTCR/L | B117 |
| | | | 110204 | | | 6.35 | 2.38 | 0.4 | 2.8 | | |
| | | TPGB | 080204 | | | 4.76 | 2.38 | 0.4 | 2.4 | | |
| | | | 080208 | | | 4.76 | 2.38 | 0.8 | 2.4 | | |
| | | | 090204 | | | 5.56 | 2.38 | 0.4 | 2.5 | | |
| | | | 090208 | | | 5.56 | 2.38 | 0.8 | 2.5 | | |
| | | | 110304 | | | 6.35 | 3.18 | 0.4 | 3.3 | | |
| | | | 110308 | | | 6.35 | 3.18 | 0.8 | 3.3 | | |
| | | TPGW | 080202 | | | 4.76 | 2.38 | 0.2 | 2.4 | | |
| | | | 080204 | | | 4.76 | 2.38 | 0.4 | 2.4 | | |
| | | | 110302 | | | 6.35 | 3.18 | 0.2 | 3.4 | | |
| | | | 110304 | | | 6.35 | 3.18 | 0.4 | 3.4 | | |
| | | | 110308 | | | 6.35 | 3.18 | 0.8 | 3.4 | | |
| | | | 160404 | | | 9.525 | 4.76 | 0.4 | 3.81 | | |
| | 160408 | | | 9.525 | 4.76 | 0.8 | 3.81 | | | | |
| TPGT | 110302 | | | 6.35 | 3.18 | 0.2 | 3.4 | | | | |
| | 110304 | | | 6.35 | 3.18 | 0.4 | 3.4 | | | | |
| VB ○○ VC ○○  35° Posi |  (VCMT) | VBMT | 110302 | | | 6.35 | 3.18 | 0.2 | 3.4 | SVABR/L | B117 |
| | | | 110304 | | | 6.35 | 3.18 | 0.4 | 3.4 | SVHBR/L | B118 |
| | | | 110308 | | | 6.35 | 3.18 | 0.8 | 3.4 | SVJBR/L | B92 |
| | | | 160402 | | | 9.525 | 4.76 | 0.2 | 4.4 | SVQBR/L | B138 |
| | | | 160404 | | | 9.525 | 4.76 | 0.4 | 4.4 | SVUBR/L | B139 |
| | | | 160408 | | | 9.525 | 4.76 | 0.8 | 4.4 | | |
| | | | 160412 | | | 9.525 | 4.76 | 1.2 | 4.4 | | |
| | | VCMT | 110302 | | | 6.35 | 3.18 | 0.2 | 3.4 | SVJCR | B118 |
| | | | 110304 | | | 6.35 | 3.18 | 0.4 | 3.4 | SVVCN | B119 |
| | | | 110308 | | | 6.35 | 3.18 | 0.8 | 3.4 | | |
| | | | 160404 | | | 9.525 | 4.76 | 0.4 | 4.4 | | |
| | | | 160408 | | | 9.525 | 4.76 | 0.8 | 4.4 | | |
| | | | 160412 | | | 9.525 | 4.76 | 1.2 | 4.4 | | |
| | | TP ○○  60° Posi |  | TPGN | 090204 | | | 5.56 | 2.38 | 0.4 | - |
| | 090208 | | | | | 5.56 | 2.38 | 0.8 | - | CTGPR/L | B105 |
| | 110302 | | | | | 6.35 | 3.18 | 0.2 | - | | |
| | 110304 | | | | | 6.35 | 3.18 | 0.4 | - | | |
| | 110308 | | | | | 6.35 | 3.18 | 0.8 | - | | |
| | 160302 | | | | | 9.525 | 3.18 | 0.2 | - | | |
| | 160304 | | | | | 9.525 | 3.18 | 0.4 | - | | |
| | 160308 | | | | | 9.525 | 3.18 | 0.8 | - | | |
| SP ○○  90° Posi |  | SPGN | 090304 | | | 9.525 | 3.18 | 0.4 | - | CSDPN | B104 |
| | | | 090308 | | | 9.525 | 3.18 | 0.8 | - | CSKPR/L | B105 |
| | | | 120304 | | | 12.7 | 3.18 | 0.4 | - | | |
| | | | 120308 | | | 12.7 | 3.18 | 0.8 | - | | |

● : Stock item

P S K N R 25 25 - M 12

1

2

3

4

5

6

7

8

9

Clamping Method of Insert

Insert Shape

Holder Style

Clearance Angle of Insert

Hand

Height of Shank

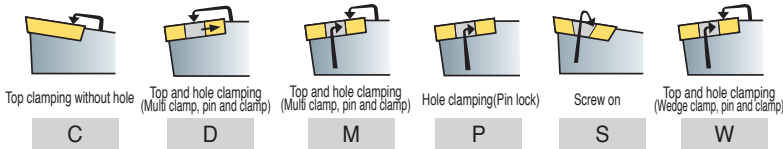
Width of Shank

Length of Holder

Length of Insert Cutting Edge

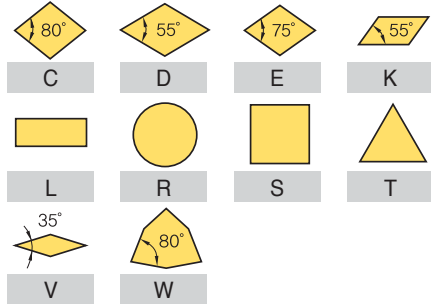
1 Clamping Method of Insert

P S K N R 25 25 - M 12



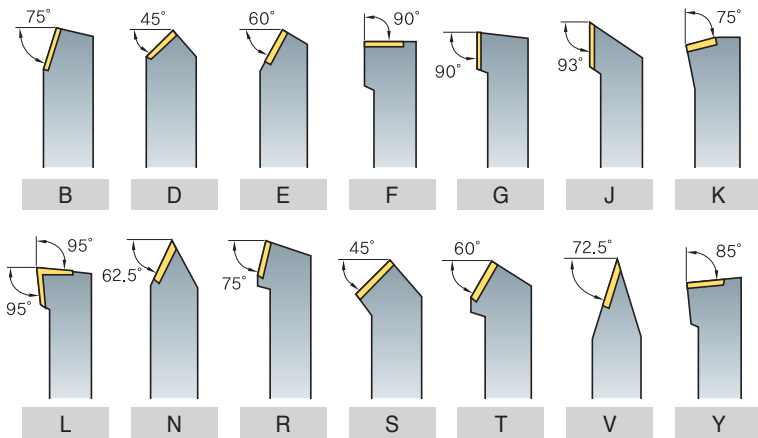
2 Insert Shape

P S K N R 25 25 - M 12



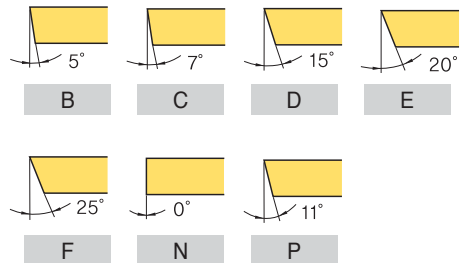
3 Holder Style

P S K N R 25 25 - M 12



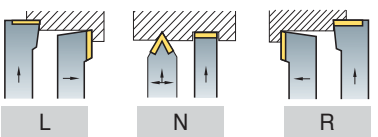
4 Clearance Angle of Insert

P S K N R 25 25 - M 12



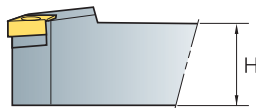
5 Hand

P S K N R 25 25 - M 12



6 Height of Shank

P S K N R 25 25 - M 12



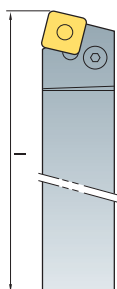
7 Width of Shank

P S K N R 25 25 - M 12



8 Length of Holder

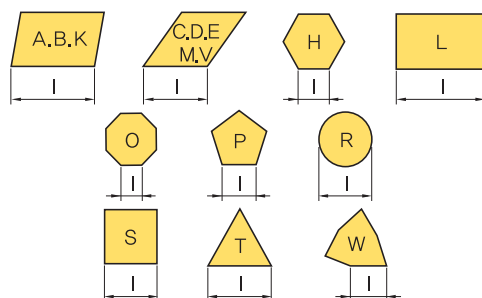
P S K N R 25 25 - M 12



| | | | |
|--------|---------|---------|----------------|
| A - 32 | H - 100 | Q - 180 | X-Special Item |
| B - 40 | J - 110 | R - 200 | |
| C - 50 | K - 125 | S - 250 | |
| D - 60 | L - 140 | T - 300 | |
| E - 70 | M - 150 | U - 350 | |
| F - 80 | N - 160 | V - 400 | |
| G - 90 | P - 170 | W - 450 | |

9 Length of Insert Cutting Edge

P S K N R 25 25 - M 12



Double Clamp System

| | | | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|-------|---------|---------|---------|---------|
| Cutting Shape | | | | | | | | | | |
| Designation | DCBNR/L | DCKNR/L | DCLNR/L | DDJNR/L | DSBNR/L | DSDNN | DSKNR/L | DSSNR/L | DTFNR/L | DTGNR/L |
| Approach angle | 75° | 75° | 95° | 93° | 75° | 45° | 75° | 45° | 90° | 90° |
| Page | B89 | B89 | B89 | B90 | B90 | B91 | B91 | B91 | B92 | B92 |
| Turning | ● | | ● | ● | ● | ● | | ● | | ● |
| Copying | | | | ● | | | | | | |
| Facing | | ● | ● | | | | ● | ● | ● | |
| Chamfering | | | | | | ● | | | | |
| Back turning | | | ● | ● | | | | | | |

| | | | | | | | | | | |
|----------------|---------|-------|------|--|--|--|--|--|--|--|
| Cutting Shape | | | | | | | | | | |
| Designation | DVJNR/L | DVVNN | DWLN | | | | | | | |
| Approach angle | 93° | 72.5° | 95° | | | | | | | |
| Page | B92 | B93 | B93 | | | | | | | |
| Turning | ● | ● | ● | | | | | | | |
| Copying | ● | ● | | | | | | | | |
| Facing | | | ● | | | | | | | |
| Chamfering | | | | | | | | | | |
| Back turning | ● | | ● | | | | | | | |

Lever Lock System

| | | | | | | | | | | |
|----------------|---------|---------|---------|----------|---------|-------|---------|---------|-------|---------|
| Cutting Shape | | | | | | | | | | |
| Designation | PCBNR/L | PCKNR/L | PCLNR/L | PDJNR/L | PDNNR/L | PRDCN | PRGCR/L | PSBNR/L | PSDNN | PSKNR/L |
| Approach angle | 75° | 75° | 95° | 93° | 63° | - | - | 75° | 45° | 75° |
| Page | B94 | B94 | B95 | B95, B96 | B96 | B97 | B97 | B98 | B98 | B99 |
| Turning | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| Copying | | | | ● | ● | ● | ● | | | |
| Facing | | | ● | | | | | | | ● |
| Chamfering | | | | | | | | | | |
| Back turning | | | ● | ● | | | | | | |

| | | | | | | | | | | |
|----------------|---------|---------|---------|---------|--------|--|--|--|--|--|
| Cutting Shape | | | | | | | | | | |
| Designation | PSSNR/L | PTFNR/L | PTGNR/L | PTTNR/L | PWLNRL | | | | | |
| Approach angle | 45° | 90° | 90° | 60° | 95° | | | | | |
| Page | B99 | B100 | B100 | B101 | B101 | | | | | |
| Turning | ● | | ● | ● | ● | | | | | |
| Copying | | | | | | | | | | |
| Facing | ● | ● | | | ● | | | | | |
| Chamfering | | | | ● | | | | | | |
| Back turning | | | | | ● | | | | | |



Wedge Clamp System

| | | | | | | | | | | |
|----------------|-------|---------|---------|---------|--|--|--|--|--|--|
| Cutting Shape | | | | | | | | | | |
| Designation | WTENN | WTJNR/L | WTXNR/L | WWLNR/L | | | | | | |
| Approach angle | 60° | 93° | 105° | 95° | | | | | | |
| Page | B102 | B102 | B102 | B103 | | | | | | |
| Turning | ● | ● | ● | ● | | | | | | |
| Copying | ● | ● | ● | | | | | | | |
| Facing | | | | ● | | | | | | |
| Chamfering | | | | | | | | | | |
| Back turning | | ● | ● | ● | | | | | | |

Clamp on System

| | | | | | | | | | | |
|----------------|---------|---------|-------|---------|---------|---------|--|--|--|--|
| Cutting Shape | | | | | | | | | | |
| Designation | CKJNR/L | CKNNR/L | CSDPN | CSKPR/L | CTFPR/L | CTGPR/L | | | | |
| Approach angle | 93° | 62.5° | 45° | 75° | 90° | 90° | | | | |
| Page | B104 | B104 | B104 | B105 | B105 | B105 | | | | |
| Turning | ● | ● | ● | | | ● | | | | |
| Copying | ● | ● | | | | | | | | |
| Facing | | | | ● | ● | | | | | |
| Chamfering | | | | | | | | | | |
| Back turning | ● | | | | | | | | | |

Multi Lock System

| | | | | | | | | | | |
|----------------|---------|---------|-------|---------|---------|-------|---------|---------|-------|---------|
| Cutting Shape | | | | | | | | | | |
| Designation | MCKNR/L | MCLNR/L | MCMNN | MCRNR/L | MDJNR/L | MDNNN | MDQNR/L | MSBNR/L | MSDNN | MSKNR/L |
| Approach angle | 75° | 95° | 50° | 75° | 93° | 62.5° | 107.5° | 75° | 45° | 75° |
| Page | B106 | B106 | B106 | B107 | B107 | B107 | B108 | B108 | B108 | B109 |
| Turning | | ● | ● | ● | ● | ● | ● | ● | ● | |
| Copying | | | | | ● | ● | ● | | | |
| Facing | ● | ● | | | | | | | | ● |
| Chamfering | | | | | | | | | | |
| Back turning | | ● | | | ● | | ● | | | |

| | | | | | | | | | | |
|----------------|---------|---------|-------|---------|---------|---------|---------|---------|-------|---------|
| Cutting Shape | | | | | | | | | | |
| Designation | MSRNR/L | MSSNR/L | MTENN | MTFNR/L | MTGNR/L | MTJNR/L | MVJNR/L | MVQNR/L | MVVNN | MWLNR/L |
| Approach angle | 75° | 45° | 60° | 90° | 90° | 93° | 93° | 117.5° | 72.5° | 95° |
| Page | B109 | B110 | B110 | B110 | B111 | B111 | B111 | B112 | B112 | B112 |
| Turning | ● | ● | ● | | ● | ● | ● | ● | ● | ● |
| Copying | | | ● | | | ● | ● | ● | ● | |
| Facing | | ● | | ● | | ● | | | | ● |
| Chamfering | | | | | | | | | | |
| Back turning | | | | | | ● | ● | ● | | ● |



Screw on System

| | | | | | | | | | | |
|----------------|---------|---------|---------|---------|-------|-------|---------|---------|-------|---------|
| Cutting Shape | | | | | | | | | | |
| Designation | SCACR/L | SCLCR/L | SDACR/L | SDJCR/L | SDNCN | SRDCN | SRGCR/L | SSBCR/L | SSDCN | SSKCR/L |
| Approach angle | 90° | 95° | 90° | 93° | 62.5° | - | - | 75° | 45° | 75° |
| Page | B113 | B113 | B113 | B114 | B114 | B114 | B115 | B115 | B115 | B116 |
| Turning | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| Copying | | | ● | ● | ● | ● | ● | | | |
| Facing | | ● | | | | | | | | ● |
| Chamfering | | | | | | | | | | |
| Back turning | | ● | | ● | | | | | | |

| | | | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| Cutting Shape | | | | | | | | | | |
| Designation | SSSCR/L | STACR/L | STFCR/L | STGCR/L | STTCR/L | SVABR/L | SVHBR/L | SVJBR/L | SVJCR/L | SVVBN |
| Approach angle | 45° | 90° | 90° | 90° | 60° | 90° | 107.5° | 93° | 93° | 72.5° |
| Page | B116 | B116 | B116 | B117 | B117 | B117 | B118 | B118 | B118 | B119 |
| Turning | ● | ● | | ● | ● | ● | ● | ● | ● | ● |
| Copying | | | | | | ● | ● | ● | ● | ● |
| Facing | ● | | ● | | | | | | | |
| Chamfering | | | | | | | | | | |
| Back turning | | | | | | ● | ● | ● | ● | |

| | | | | | | | | | | |
|----------------|-------|---------|--|--|--|--|--|--|--|--|
| Cutting Shape | | | | | | | | | | |
| Designation | SVVCN | SWACR/L | | | | | | | | |
| Approach angle | 72.5° | 90° | | | | | | | | |
| Page | B119 | B119 | | | | | | | | |
| Turning | ● | ● | | | | | | | | |
| Copying | ● | | | | | | | | | |
| Facing | | | | | | | | | | |
| Chamfering | | | | | | | | | | |
| Back turning | | | | | | | | | | |

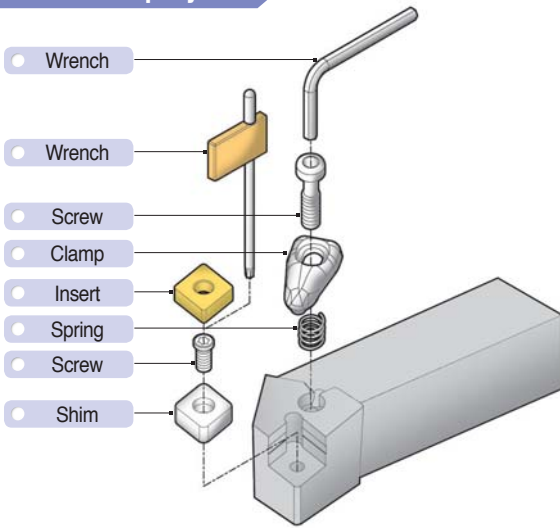
Ceramic Holder

| | | | | | | | | | | |
|----------------|---------|-------|---------|-------|---------|---------|---------|--|--|--|
| Cutting Shape | | | | | | | | | | |
| Designation | CCNLR/L | CRDNN | CRGNR/L | CSDNN | CSKNR/L | CTFNR/L | CTGNR/L | | | |
| Approach angle | 95° | - | - | 45° | 75° | 90° | 90° | | | |
| Page | B120 | B120 | B120 | B120 | B121 | B121 | B121 | | | |
| Turning | ● | ● | ● | ● | | | ● | | | |
| Copying | | | ● | | | | | | | |
| Facing | ● | | | | ● | ● | | | | |
| Chamfering | | | | | | | | | | |
| Back turning | ● | | | | | | | | | |

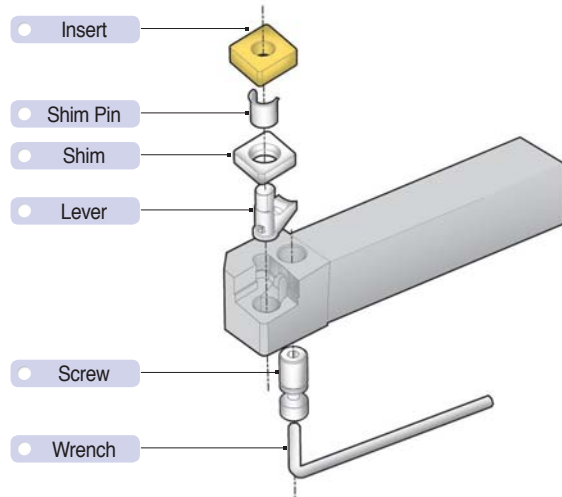


Instruction of External Holder

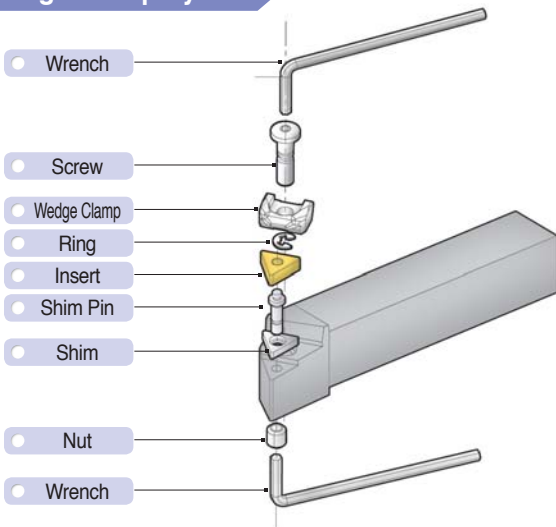
Double Clamp System



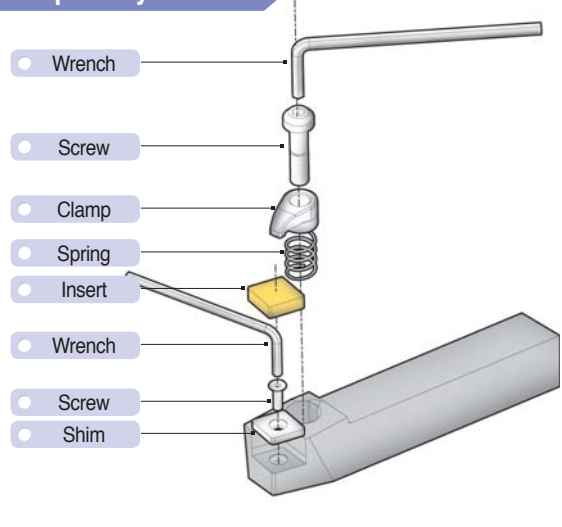
Lever Lock System



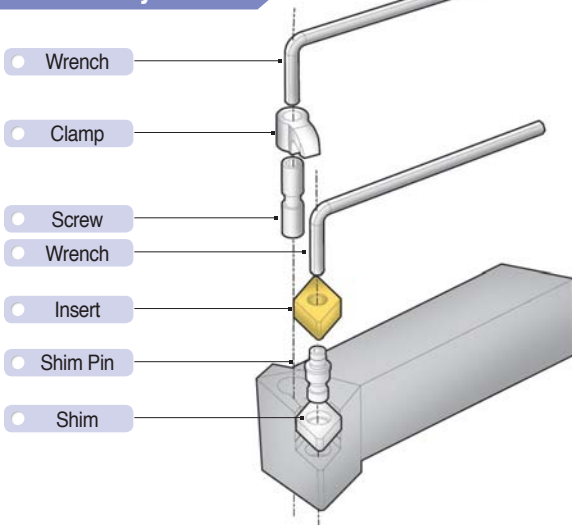
Wedge Clamp System



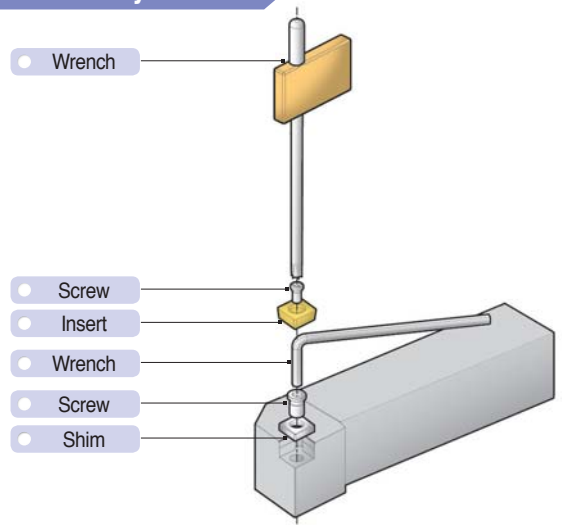
Clamp on System



Multi Lock System



Screw on System

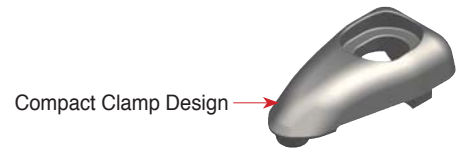
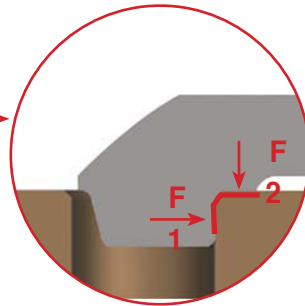
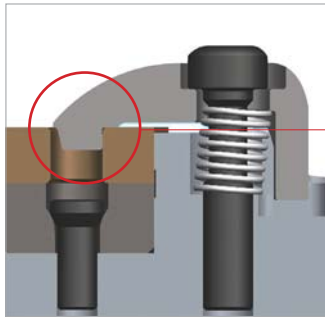
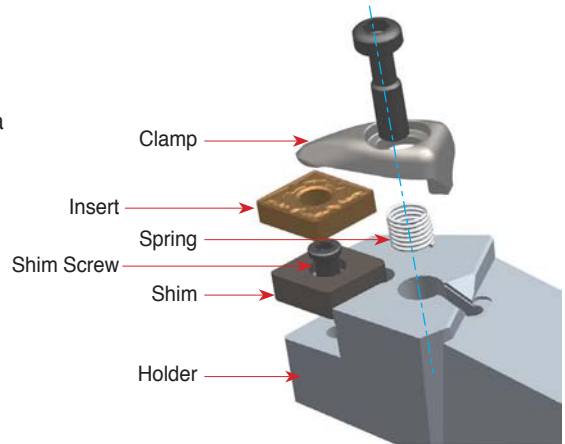


B Features of Double Clamp / Lever Lock System

Double Clamp System

Stable clamping with double clamp system

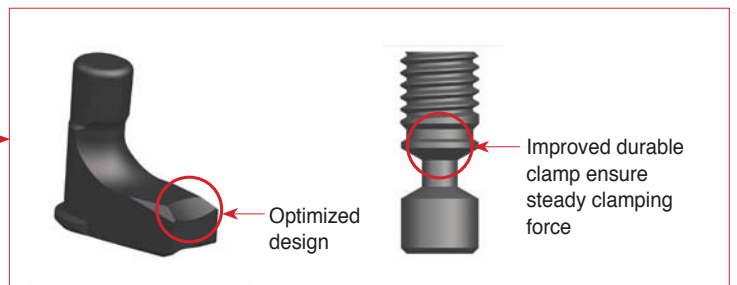
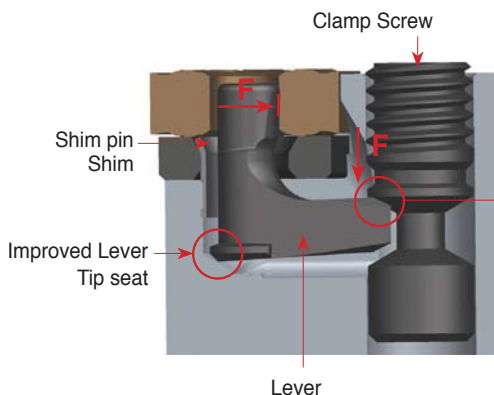
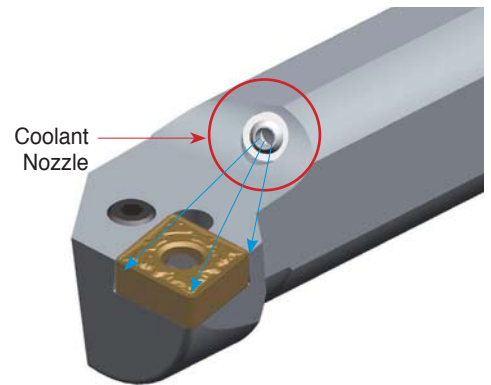
- **Features**
 - ▶ Simple and powerful clamping system operated by only a single clamp screw
 - ▶ The powerful double-clamping system (upper and internal) is suitable for machining in very tough cutting conditions
 - ▶ The holder offers precision due to the special design in the rear of the clamp
 - ▶ Compact and optimized design for avoiding chip interference with a powerful clamp



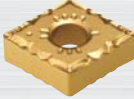
Lever Lock System

Stable clamping with double clamp system

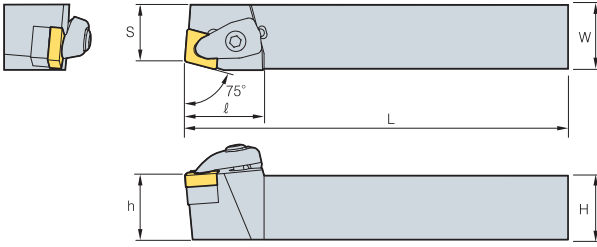
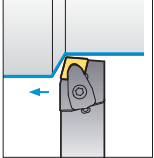
- **Features**
 - ▶ The holder offers precision due to the special design due to the improved Lever tip seat
 - ▶ The durability of parts has been improved
 - ▶ Superior tool life due to powerful clamping system and optimized design of part.
 - ▶ Part designation on holder body makes it easy to check the right part description for each product
 - ▶ Adjustable coolant nozzle gives the option to change the direction of the coolant to optimize chip control and improve tool life











DCBNR/L



CN□□





75°
• R type insert

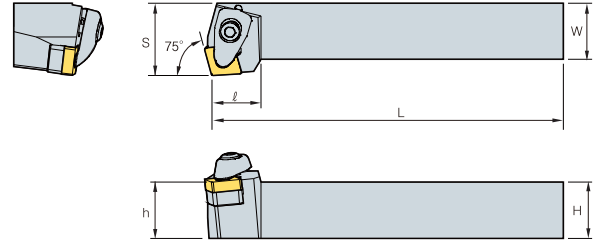
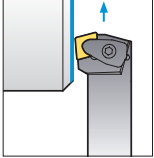
| Designation | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench | |
|-------------|----------|----|----|-----|----|----|--------|--|---|---|---|---|---|-------|
| | | | | | | | |  |  |  |  |  |  | |
| DCBNR/L | 2020-K12 | 20 | 20 | 125 | 17 | 20 | 31 | CN□□1204□□ |  | CHX0518 | SC44V | FTKA0410 | SPR0714 | HW30P |
| | 2525-M12 | 25 | 25 | 150 | 22 | 25 | 31 | | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 22 | 32 | 31 | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 22 | 25 | 36 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 27 | 32 | 36 | | | | | | | |
| DCBNR/L | 3232-P19 | 32 | 32 | 170 | 27 | 32 | 40 | CN□□1606□□ |  | CHX0622 | SC54V | FTNA0511 | SPR0811 | HW40L |
| | 4040-S19 | 40 | 40 | 250 | 35 | 40 | 40 | | | | | | | |
| | 4040-S19 | 40 | 40 | 250 | 35 | 40 | 40 | | | | | | | |

Applicable inserts, see pages B18~B22









DCKNR/L



CN□□

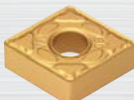



75°
• R type insert

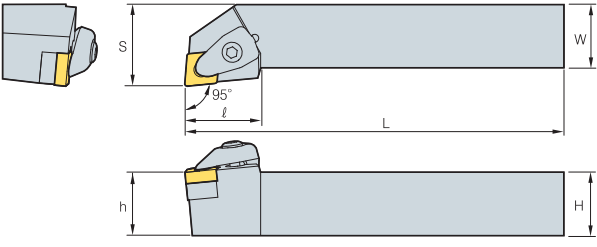
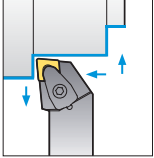
| Designation | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench | |
|-------------|----------|----|----|-----|----|----|--------|--|---|---|---|---|---|-------|
| | | | | | | | |  |  |  |  |  |  | |
| DCKNR/L | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 21 | CN□□1204□□ |  | CHX0518 | SC44V | FTKA0410 | SPR0714 | HW30P |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 21 | | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 32 | 32 | 21 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 26 | | | | | | | |
| | 4040-S16 | 40 | 40 | 250 | 50 | 40 | 26 | | | | | | | |
| DCKNR/L | 4040-S16 | 40 | 40 | 250 | 50 | 40 | 26 | CN□□1606□□ |  | CHX0622 | SC54V | FTNA0511 | SPR0811 | HW40L |

Applicable inserts, see pages B18~B22











DCLNR/L



CN□□

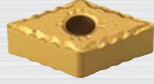
95°
• R type insert

| Designation | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench | | |
|-------------|----------|----------|----|-----|-----|----|--------|--|---|---|---|---|---|---------|-------|
| | | | | | | | |  |  |  |  |  |  | | |
| DCLNR/L | 2020-K09 | 20 | 20 | 125 | 25 | 20 | 24.5 | CN□□0903□□ |  | CHX0415 | SC32V | FTKA0307 | SPR0510 | HW25P | |
| | 2525-M09 | 25 | 25 | 150 | 32 | 25 | 24.5 | | | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 30 | CN□□1204□□ |  | CHX0518 | SC44V | FTKA0410 | SPR0714 | HW30P | |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 30 | | | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 32 | 32 | 30 | | | | | | | | |
| | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 30 | | | | | | | | |
| | DCLNR/L | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 36 | CN□□1606□□ |  | CHX0622 | SC54V | FTNA0511 | SPR0811 | HW40L |
| | | 3225-P16 | 32 | 25 | 170 | 32 | 32 | 36 | | | | | | | |
| | | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | | | |
| | | 2525-M19 | 25 | 25 | 150 | 32 | 25 | 40 | | | | | | | |
| 3225-P19 | | 32 | 25 | 170 | 32 | 32 | 40 | CN□□1906□□ |  | CHX0622 | SC63V | FTNA0511 | SPR0811 | HW40L | |
| 3232-P19 | | 32 | 32 | 170 | 40 | 32 | 40 | | | | | | | | |
| 3232-P19 | | 32 | 32 | 170 | 40 | 32 | 40 | | | | | | | | |
| 4040-S19 | | 40 | 40 | 250 | 50 | 40 | 40 | | | | | | | | |

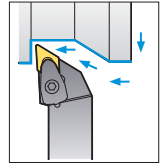
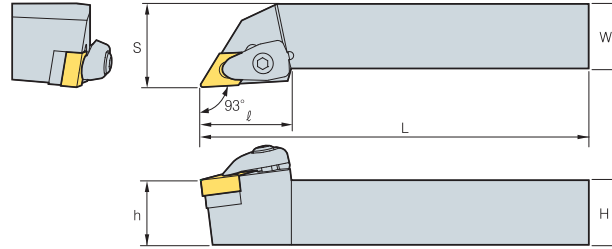
Applicable inserts, see pages B18~B22

B Double Clamp System

DDJNR/L



DN□□



93°

• R type insert

(mm)

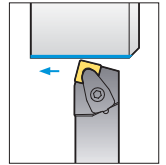
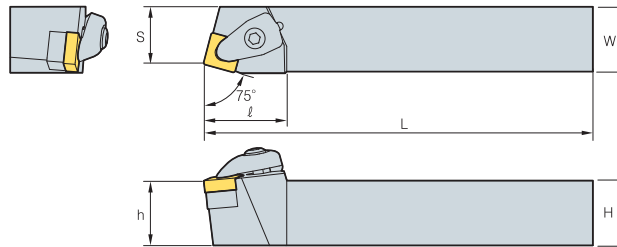
| Designation | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench | |
|-------------|------------|----|----|-----|----|----|------------|-------|-------------|-------|------------|---------|--------|----|
| | | | | | | | | | | | | | | |
| DDJNR/L | 2020-K11 | 20 | 20 | 125 | 25 | 20 | DN□□1104□□ | | CHX0415 | SD32V | FTKA0307 | SPR0510 | HW25P | |
| | 2525-M11 | 25 | 25 | 150 | 32 | 25 | | | | | | | | 30 |
| | 3225-P11 | 32 | 25 | 170 | 32 | 32 | | | | | | | | 30 |
| | 3232-P11 | 32 | 32 | 170 | 40 | 32 | | | | | | | | 30 |
| DDJNR/L | 2020-K15 | 20 | 20 | 125 | 25 | 20 | DN□□1506□□ | | CHX0518 | SD43V | FTKA0410 | SPR0714 | HW30P | |
| | 2525-M15 | 25 | 25 | 150 | 32 | 25 | | | | | | | | 35 |
| | 3225-P15 | 32 | 25 | 170 | 32 | 32 | | | | | | | | 35 |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | | | | | | | | 35 |
| DDJNR/L | 2020-K15-3 | 20 | 20 | 125 | 25 | 20 | DN□□1504□□ | | CHX0518 | SD44V | FTKA0410 | SPR0714 | HW30P | |
| | 2525-M15-3 | 25 | 25 | 150 | 32 | 25 | | | | | | | | 35 |
| | 3232-P15-3 | 32 | 32 | 170 | 40 | 32 | | | | | | | | 35 |

Applicable inserts, see pages B23~B26

DSBNR/L



SN□□



75°

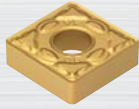
• R type insert

(mm)

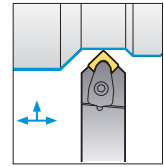
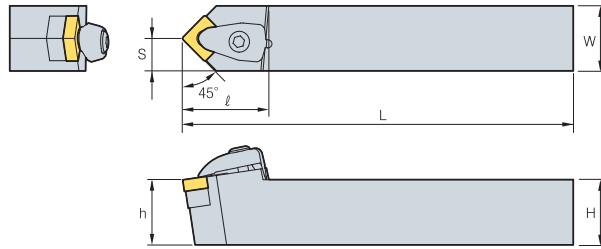
| Designation | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench | |
|-------------|----------|----|----|-----|----|----|------------|------------|-------------|---------|------------|----------|---------|-------|
| | | | | | | | | | | | | | | |
| DSBNR/L | 2020-K09 | 20 | 20 | 125 | 17 | 20 | SN□□0903□□ | | CHX0415 | SS32V | FTKA0307 | SPR0510 | HW25P | |
| | 2525-M09 | 25 | 25 | 150 | 22 | 25 | | | | | | | | 25 |
| | 2020-K12 | 20 | 20 | 125 | 17 | 20 | | | | | | | | 32 |
| DSBNR/L | 2525-M12 | 25 | 25 | 150 | 22 | 25 | SN□□1204□□ | | CHX0518 | SS44V | FTKA0410 | SPR0714 | HW30P | |
| | 3225-P12 | 32 | 25 | 170 | 22 | 32 | | | | | | | | 32 |
| | 3232-P12 | 32 | 32 | 170 | 27 | 32 | | | | | | | | 32 |
| | 2525-M15 | 25 | 25 | 150 | 22 | 25 | | | | | | | | 38 |
| DSBNR/L | 3225-P15 | 32 | 25 | 170 | 22 | 32 | SN□□1506□□ | | CHX0622 | SS54V | FTNA0511 | SPR0811 | HW40L | |
| | 3232-P15 | 32 | 32 | 170 | 27 | 32 | | | | | | | | 38 |
| | 3232-P19 | 32 | 32 | 170 | 27 | 32 | | | | | | | | 43 |
| DSBNR/L | 4040-S19 | 40 | 40 | 250 | 35 | 40 | 43 | SN□□1906□□ | | CHX0622 | SS64V | FTNA0511 | SPR0811 | HW40L |

Applicable inserts, see pages B28~B34

DSDNN



SN□□



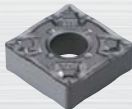
45°

(mm)

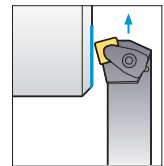
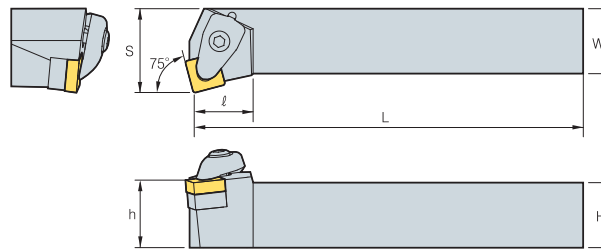
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-------------|----------|----|----|-----|------|----|------|------------|-------|-------------|-------|------------|---------|--------|
| DSDNN | 2020-K09 | 20 | 20 | 125 | 10 | 20 | 26.5 | SN□□0903□□ | CVH3 | CHX0415 | SS32V | FTKA0307 | SPR0510 | HW25P |
| | 2020-K12 | 20 | 20 | 125 | 10 | 20 | 33 | SN□□1204□□ | CVH4 | CHX0518 | SS44V | FTKA0410 | SPR0714 | HW30P |
| | 2525-M12 | 25 | 25 | 150 | 12.5 | 25 | 33 | | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 12.5 | 32 | 33 | | | | | | | |
| | 3232-P12 | 32 | 32 | 170 | 16 | 32 | 33 | SN□□1506□□ | CVH5 | CHX0622 | SS54V | FTNA0511 | SPR0811 | HW40L |
| | 2525-M15 | 25 | 25 | 150 | 12.5 | 25 | 39.4 | | | | | | | |
| | 3232-P15 | 32 | 32 | 170 | 16 | 32 | 38 | | | | | | | |
| | 3232-P19 | 32 | 32 | 170 | 16 | 32 | 43 | SN□□1906□□ | CVH6 | CHX0622 | SS64V | FTNA0511 | SPR0811 | HW40L |
| | 4040-S19 | 40 | 40 | 250 | 20 | 40 | 45 | | | | | | | |

Applicable inserts, see pages B28~B34

DSKNR/L



SN□□



75°

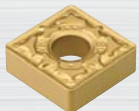
• R type insert

(mm)

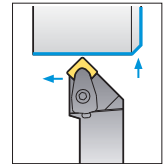
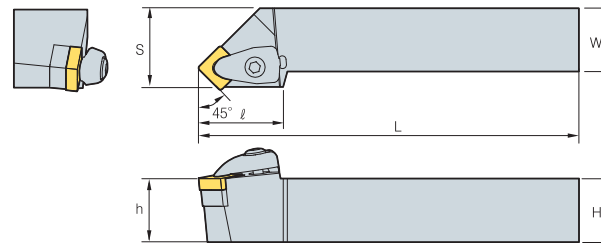
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench | |
|-------------|----------|----|----|-----|----|----|----|------------|------------|-------------|---------|------------|----------|---------|-------|
| DSKNR/L | 2020-K09 | 20 | 20 | 125 | 25 | 20 | 20 | SN□□0903□□ | CVH3 | CHX0415 | SS32V | FTKA0307 | SPR0510 | HW25P | |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 23 | SN□□1204□□ | CVH4 | CHX0518 | SS44V | FTKA0410 | SPR0714 | HW30P | |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 23 | | | | | | | | |
| | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 23 | | | | | | | | |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | 28 | SN□□1506□□ | CVH5 | CHX0622 | SS54V | FTNA0511 | SPR0811 | HW40L | |
| | 3232-P19 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | | |
| | 4040-S19 | 40 | 40 | 250 | 50 | 40 | 43 | | | | | | | | |
| | | | | | | | | | SN□□1906□□ | CVH6 | CHX0622 | SS64V | FTNA0511 | SPR0811 | HW40L |

Applicable inserts, see pages B28~B34

DSSNR/L



SN□□



45°

• R type insert

(mm)

| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-------------|----------|----|----|-----|----|----|------|------------|-------|-------------|-------|------------|---------|--------|
| DSSNR/L | 2020-K09 | 20 | 20 | 125 | 25 | 20 | 28.5 | SN□□0903□□ | CVH3 | CHX0415 | SS32V | FTKA0307 | SPR0510 | HW25P |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 35 | SN□□1204□□ | CVH4 | CHX0518 | SS44V | FTKA0410 | SPR0714 | HW30P |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 32 | 32 | 35 | | | | | | | |
| | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 35 | SN□□1506□□ | CVH5 | CHX0622 | SS54V | FTNA0511 | SPR0811 | HW40L |
| | 2525-M15 | 25 | 25 | 150 | 32 | 25 | 38.5 | | | | | | | |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | 38.5 | | | | | | | |
| | 3232-P19 | 32 | 32 | 170 | 40 | 32 | 46 | SN□□1906□□ | CVH6 | CHX0622 | SS64V | FTNA0511 | SPR0811 | HW40L |
| | 4040-S19 | 40 | 40 | 250 | 50 | 40 | 46 | | | | | | | |

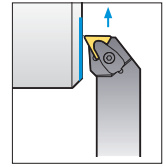
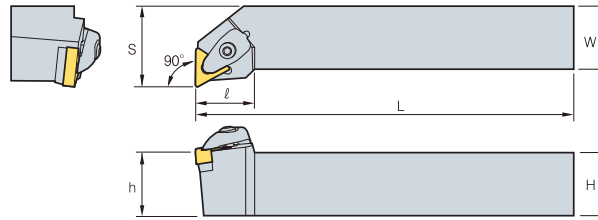
Applicable inserts, see pages B28~B34

B Double Clamp System

DTFNR/L



TN□□



90°

• R type insert

(mm)

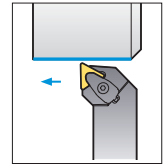
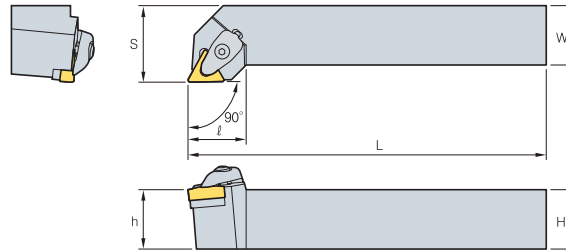
| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-------------|----------|----|----|-----|----|----|------|------------|-------|-------------|------|------------|--------|--------|
| DTFNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 24.5 | TN□□1604□□ | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 24.5 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 23.5 | | | | | | | |
| | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 33 | | | | | | | |
| DTFNR/L | 3225-P22 | 32 | 25 | 170 | 32 | 32 | 33 | TN□□2204□□ | | | | | | |
| | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 33 | | | | | | | |

Applicable inserts, see pages B35~B41

DTGNR/L



TN□□



90°

• R type insert

(mm)

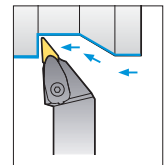
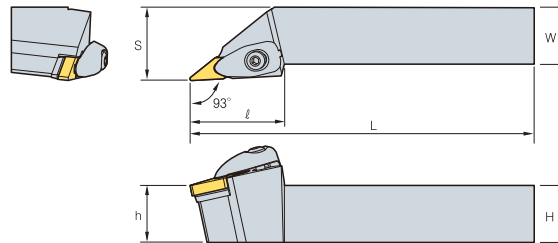
| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-------------|----------|----|----|-----|----|----|------|------------|-------|-------------|------|------------|--------|--------|
| DTGNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 24.5 | TN□□1604□□ | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 24.5 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 24.5 | | | | | | | |
| | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 32.6 | | | | | | | |
| DTGNR/L | 3225-P22 | 32 | 25 | 170 | 32 | 32 | 32.6 | TN□□2204□□ | | | | | | |
| | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 32.6 | | | | | | | |

Applicable inserts, see pages B35~B41

DVJNR/L



VN□□



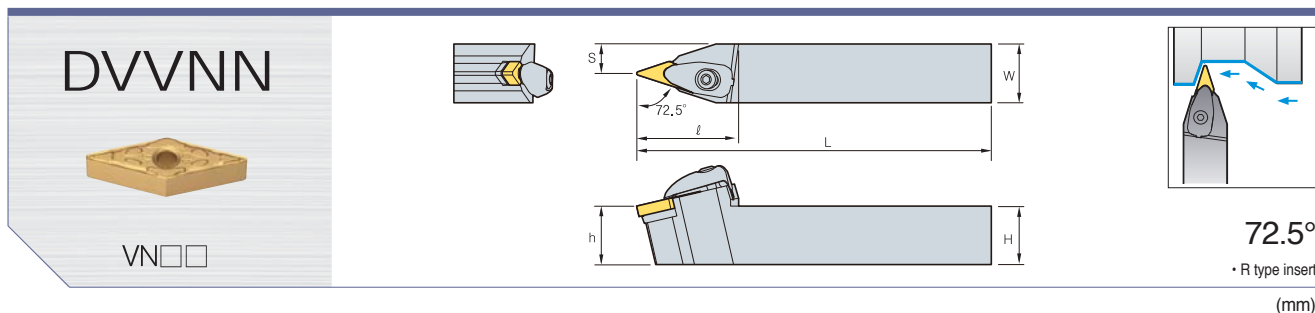
93°

• R type insert

(mm)

| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-------------|----------|----|----|-----|----|----|------|------------|-------|-------------|------|------------|--------|--------|
| DVJNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 41.5 | VN□□1604□□ | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 41.5 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 41.5 | | | | | | | |

Applicable inserts, see pages B42~B44

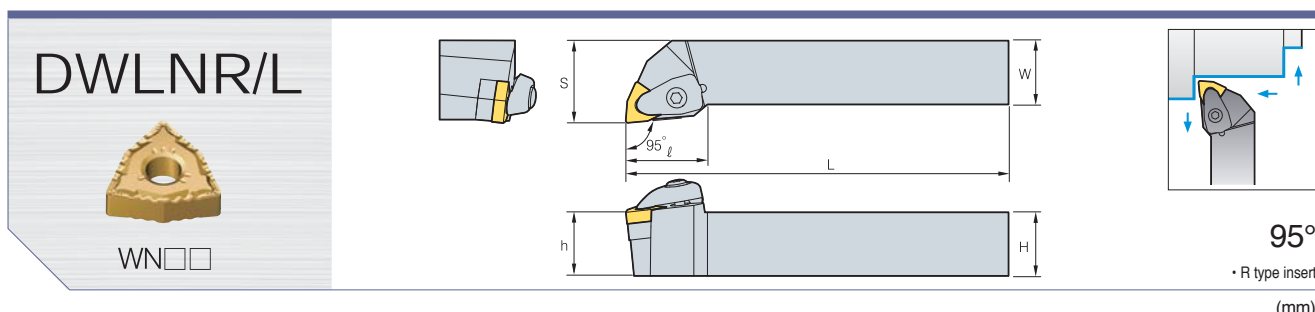


72.5°
• R type insert

(mm)

| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-------------|----------|----|----|-----|------|----|----|------------|-------|-------------|------|------------|--------|--------|
| DVVNN | 2020-K16 | 20 | 20 | 125 | 10 | 20 | 40 | VN□□1604□□ | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 12.5 | 25 | 40 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | | |

Applicable inserts, see pages B42~B44



95°
• R type insert

(mm)

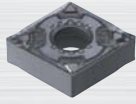
| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|-------|-------------|------|------------|--------|--------|
| DWLNR/L | 2020-K06 | 20 | 20 | 125 | 25 | 20 | 26 | WN□□0604□□ | | | | | | |
| | 2525-M06 | 25 | 25 | 150 | 32 | 25 | 26 | | | | | | | |
| | 2020-K08 | 20 | 20 | 125 | 25 | 20 | 32 | WN□□0804□□ | | | | | | |
| | 2525-M08 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | | |

Applicable inserts, see pages B45~B48

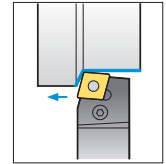
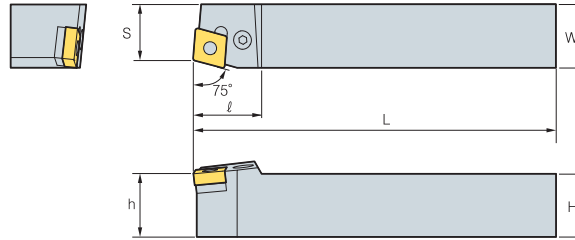


B Lever Lock System

PCBNR/L



CN□□



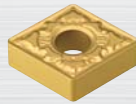
75°

• R type insert

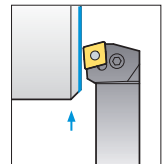
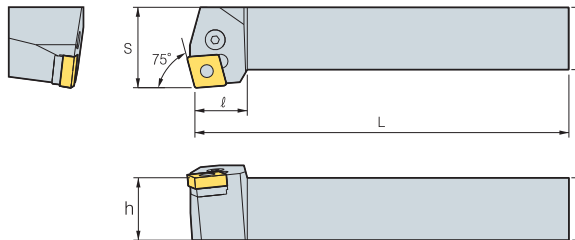
| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shim Pin Punch |
|-------------|-----------|----|-----|-----|----|----|-------------|-------------|-------|-----------|-------|----------|--------|----------------|
| PCBNR/L | 2020-K12 | 20 | 20 | 125 | 17 | 20 | 27 | CN□□ 1204□□ | LV4 | VHX0821 | SC42 | SP4 | HW30L | LSPS8 |
| | 2525-M12 | 25 | 25 | 150 | 22 | 25 | 27 | | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 22 | 32 | 27 | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 22 | 25 | 33 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 27 | 32 | 33 | CN□□ 1606□□ | LV5 | VHX0825 | SC53 | SP5 | HW30L | LSPS6 |
| | 3232-P19 | 32 | 32 | 170 | 27 | 32 | 36 | CN□□ 1906□□ | LV6N | VHX1027N | SC63N | SP6N | HW40L | LSPS6 |
| | 4040-S19 | 40 | 40 | 250 | 35 | 40 | 36 | CN□□ 2509□□ | LV8N | VHX1236N | SC84N | SP8N | HW50L | LSPS8 |
| | 4040-S25 | 40 | 40 | 250 | 35 | 40 | 47 | CN□□ 2507□□ | | | | | | |
| 4040-S25-5 | 40 | 40 | 250 | 35 | 40 | 47 | CN□□ 2507□□ | | | | | | | |
| PCBNR/L | 2020-K12N | 20 | 20 | 125 | 17 | 20 | 27 | CN□□ 1204□□ | LV4N | VHX0820N | SC42N | SP4N | HW30L | LSPS4 |
| | 2525-M12N | 25 | 25 | 150 | 22 | 25 | 27 | | | | | | | |
| | 3225-P12N | 32 | 25 | 170 | 22 | 32 | 27 | | | | | | | |
| | 2525-M16N | 25 | 25 | 150 | 22 | 25 | 33 | CN□□ 1606□□ | LV5N | VHX0820AN | SC53N | SP5N | HW30L | LSPS5 |
| | 3232-P16N | 32 | 32 | 170 | 27 | 32 | 33 | | | | | | | |

Applicable inserts, see pages B18~B22

PCKNR/L



CN□□



95°

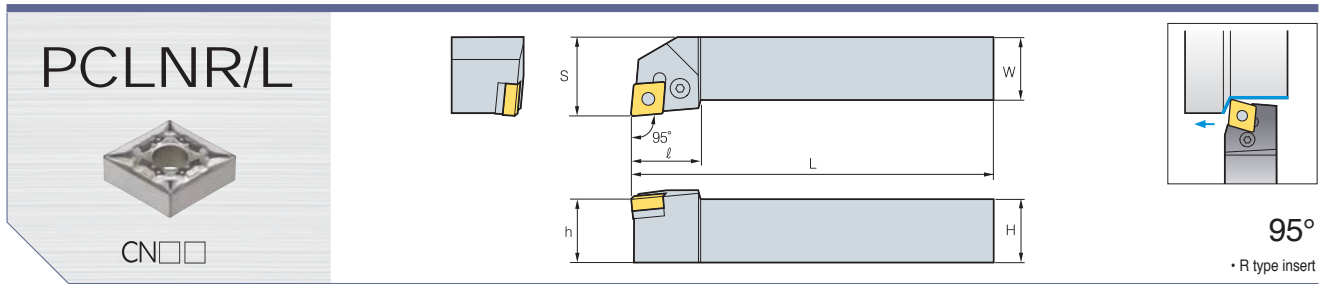
• R type insert

| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shim Pin Punch |
|-------------|-----------|----|----|-----|----|----|----|-------------|-------|-----------|-------|----------|--------|----------------|
| PCKNR/L | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 27 | CN□□ 1204□□ | LV4 | VHX0821 | SC42 | SP4 | HW30L | LSPS4 |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 27 | | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 40 | 32 | 30 | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 26 | CN□□ 1606□□ | LV5 | VHX0825 | SC53 | SP5 | HW30L | HW30L |
| | 4040-S16 | 40 | 40 | 250 | 50 | 40 | 25 | | | | | | | |
| PCKNR/L | 2020-K12N | 20 | 20 | 125 | 25 | 20 | 27 | CN□□ 1204□□ | LV4N | VHX0820N | SC42N | SP4N | HW30L | LSPS4 |
| | 2525-M12N | 25 | 25 | 150 | 32 | 25 | 27 | | | | | | | |
| | 3225-P12N | 32 | 25 | 170 | 40 | 32 | 30 | | | | | | | |
| | 3232-P16N | 32 | 32 | 170 | 40 | 32 | 26 | CN□□ 1606□□ | LV5N | VHX0820AN | SC53N | SP5N | HW30L | LSPS5 |
| | 4040-S16N | 40 | 40 | 250 | 50 | 40 | 25 | | | | | | | |

Applicable inserts, see pages B18~B22

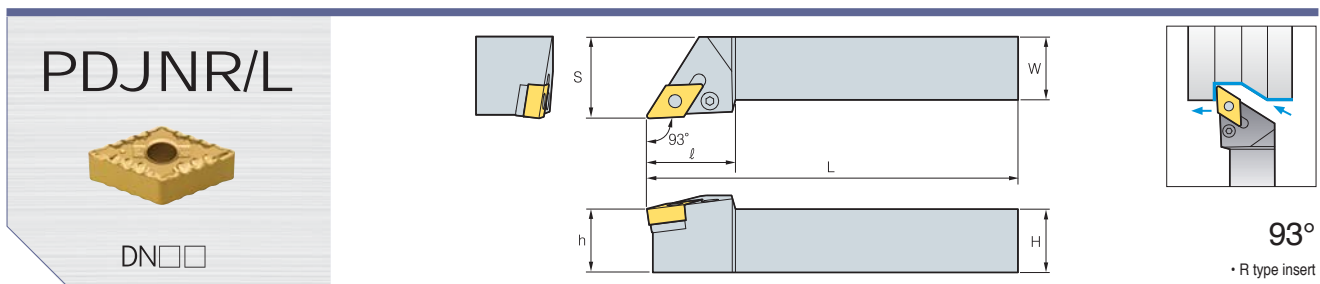


- Improved holders and parts ensure performance and durability
- "N" stand for New type (Holders and parts)



| Designation | | H | W | L | S | h | l | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch | |
|-------------|------------|-----------|----|-----|-----|----|----|------------|------------|-----------|----------|----------|--------|---------------|-------|
| PCLNR/L | 1616-H09 | 16 | 16 | 100 | 20 | 16 | 20 | CN□□0903□□ | LV3 | VHX0617 | SC32 | SP3 | HW25L | LSPS3 | |
| | 2020-K09 | 20 | 20 | 125 | 25 | 20 | 22 | | | | | | | | |
| | 2525-M09 | 25 | 25 | 150 | 32 | 25 | 22 | | | | | | | | |
| | PCLNR/L | 1616-H12 | 16 | 16 | 100 | 20 | 16 | 28 | CN□□1204□□ | LV4 | VHX0821 | SC42 | SP4 | HW30L | LSPS4 |
| | | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 28 | | | | | | | |
| | | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 28 | | | | | | | |
| | | 3225-P12 | 32 | 25 | 170 | 32 | 32 | 28 | | | | | | | |
| | | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 28 | | | | | | | |
| | | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 33 | | | | | | | |
| | PCLNR/L | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 33 | CN□□1606□□ | LV5 | VHX0825 | SC53 | SP5 | HW30L | LSPS5 |
| | | 2525-M19 | 25 | 25 | 150 | 32 | 25 | 36 | | | | | | | |
| | | 3225-P19 | 32 | 25 | 170 | 32 | 32 | 36 | | | | | | | |
| | | 3232-P19 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | | | |
| | | 4040-P19 | 40 | 40 | 170 | 50 | 40 | 36 | | | | | | | |
| | | 4040-S19 | 40 | 40 | 250 | 50 | 40 | 36 | | | | | | | |
| 4040-S25 | | 40 | 40 | 250 | 50 | 40 | 47 | | | | | | | | |
| PCLNR/L | 5050-T25 | 50 | 50 | 300 | 60 | 50 | 47 | CN□□2509□□ | LV8N | VHX1236N | SC84N | SP8N | HW50L | LSPS8 | |
| | 4040-S25-5 | 40 | 40 | 250 | 50 | 40 | 47 | | | | | | | | |
| | 5050-S25-5 | 50 | 50 | 300 | 60 | 50 | 47 | | | | | | | | |
| PCLNR/L | 1616-H09N | 16 | 16 | 100 | 20 | 16 | 20 | CN□□0903□□ | LV3N | VHX0617N | SC32N | SP3N | HW25L | LSPS3 | |
| | 2020-K09N | 20 | 20 | 125 | 25 | 20 | 22 | | | | | | | | |
| | 2525-M09N | 25 | 25 | 150 | 32 | 25 | 22 | | | | | | | | |
| | PCLNR/L | 1616-H12N | 16 | 16 | 100 | 20 | 16 | 28 | CN□□1204□□ | LV4N | VHX0820N | SC42N | SP4N | HW30L | LSPS4 |
| | | 2020-K12N | 20 | 20 | 125 | 25 | 20 | 28 | | | | | | | |
| | | 2525-M12N | 25 | 25 | 150 | 32 | 25 | 28 | | | | | | | |
| | | 3225-P12N | 32 | 25 | 170 | 32 | 32 | 28 | | | | | | | |
| | | 3232-P12N | 32 | 32 | 170 | 40 | 32 | 28 | | | | | | | |
| | | 2525-M16N | 25 | 25 | 150 | 32 | 25 | 33 | | | | | | | |
| | 3232-P16N | 32 | 32 | 170 | 40 | 32 | 33 | | | | | | | | |
| PCLNR/L | | | | | | | | CN□□1606□□ | LV5N | VHX0820AN | SC53N | SP5N | HW30L | LSPS5 | |

Applicable inserts, see pages B18~B22

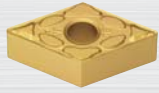


| Designation | | H | W | L | S | h | l | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch |
|-------------|------------|----|----|-----|----|----|----|------------|-------|---------|-------|----------|--------|---------------|
| PDJNR/L | 1616-H11 | 16 | 16 | 100 | 20 | 16 | 25 | DN□□1104□□ | LV3 | VHX0617 | SD317 | SP3 | HW25L | LSPS3 |
| | 2020-K11 | 20 | 20 | 125 | 25 | 20 | 25 | | | | | | | |
| | 2525-M11 | 25 | 25 | 150 | 32 | 25 | 30 | | | | | | | |
| PDJNR/L | 2020-K15 | 20 | 20 | 125 | 25 | 20 | 35 | DN□□1506□□ | LV4B | VHX0821 | SD42 | SP4 | HW30L | LSPS4 |
| | 2525-M15 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | | |
| | 3225-P15 | 32 | 25 | 170 | 32 | 32 | 35 | | | | | | | |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | |
| PDJNR/L | 2020-K15-3 | 20 | 20 | 125 | 25 | 20 | 35 | DN□□1504□□ | LV4 | VHX0821 | SD42 | SP4 | HW30L | LSPS4 |
| | 2525-M15-3 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | | |
| | 3232-P15-3 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | |

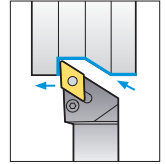
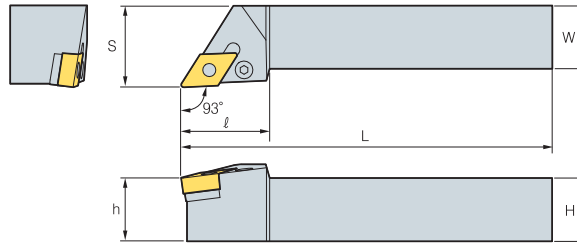
Applicable inserts, see pages B23~B26

B Lever Lock System

PDJNR/L



DN□□



93°

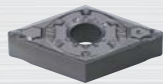
• R type insert

(mm)

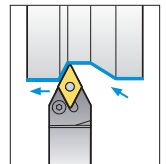
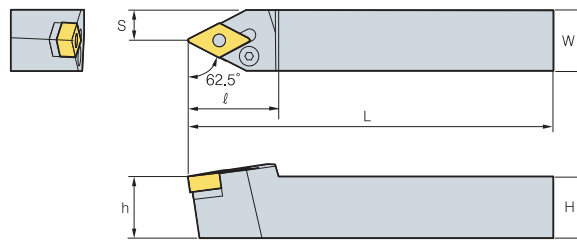
| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch |
|-------------|-------------|----|----|-----|----|----|----|-------------|-------|-------|------|----------|--------|---------------|
| PDJNR/L | 1616-H11N | 16 | 16 | 100 | 20 | 16 | 25 | DN□□ 1104□□ | | | | | | |
| | 2020-K11N | 20 | 20 | 125 | 25 | 20 | 25 | | | | | | | |
| | 2525-M11N | 25 | 25 | 150 | 32 | 25 | 30 | | | | | | | |
| | 2020-K15N | 20 | 20 | 125 | 25 | 20 | 35 | | | | | | | |
| PDJNR/L | 2525-M15N | 25 | 25 | 150 | 32 | 25 | 35 | DN□□ 1506□□ | | | | | | |
| | 3225-P15N | 32 | 25 | 170 | 32 | 32 | 35 | | | | | | | |
| | 3232-P15N | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | |
| | 2020-K15-3N | 20 | 20 | 125 | 25 | 20 | 35 | | | | | | | |
| PDJNR/L | 2525-M15-3N | 25 | 25 | 150 | 32 | 25 | 35 | DN□□ 1504□□ | | | | | | |
| | 3232-P15-3N | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | |

Applicable inserts, see pages B23~B26

PDNNR/L



DN□□



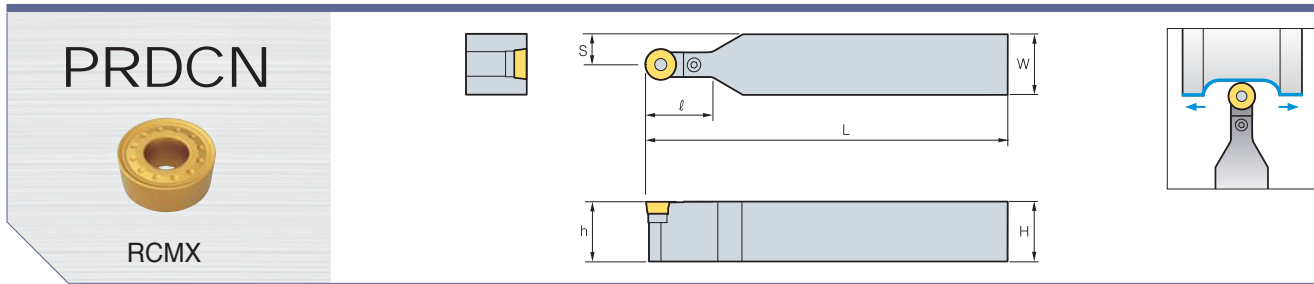
62.5°

• R type insert

(mm)

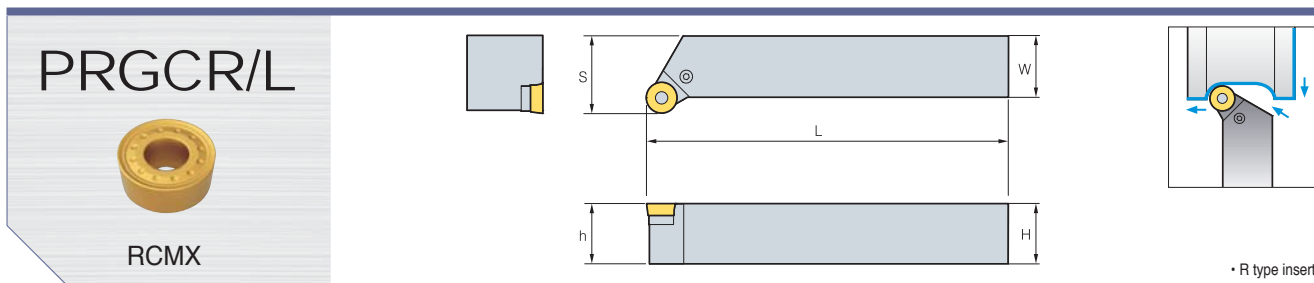
| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch |
|-------------|-------------|----|----|-----|------|----|----|-------------|-------|-------|------|----------|--------|---------------|
| PDNNR/L | 2020-K15 | 20 | 20 | 125 | 8 | 20 | 37 | DN□□ 1506□□ | | | | | | |
| | 2525-M15 | 25 | 25 | 150 | 12.5 | 25 | 37 | | | | | | | |
| | 3232-P15 | 32 | 32 | 150 | 16 | 32 | 37 | | | | | | | |
| | 4025-M15 | 40 | 25 | 170 | 12.5 | 32 | 37 | | | | | | | |
| | 2525-M15-3 | 25 | 25 | 150 | 12.5 | 25 | 37 | | | | | | | |
| PDNNR/L | 4025-M15-3 | 40 | 25 | 150 | 12.5 | 25 | 37 | DN□□ 1504□□ | | | | | | |
| | 2020-K15N | 20 | 20 | 125 | 8 | 20 | 37 | | | | | | | |
| PDNNR/L | 2525-M15N | 25 | 25 | 150 | 12.5 | 25 | 37 | DN□□ 1506□□ | | | | | | |
| | 3232-P15N | 32 | 32 | 170 | 16 | 32 | 37 | | | | | | | |
| PDNNR/L | 2525-M15-3N | 25 | 25 | 150 | 12.5 | 25 | 37 | DN□□ 1504□□ | | | | | | |
| | 3232-P15-3N | 32 | 32 | 170 | 16 | 32 | 37 | | | | | | | |

Applicable inserts, see pages B23~B26



| Designation | | H | W | L | S | h | l | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch |
|-------------|----------|----|-----|------|------|----|-------------|-------------|-------|---------|------|----------|--------|---------------|
| PRDCN | 2020-M10 | 20 | 20 | 150 | 15 | 20 | 24 | RCMX 1003M0 | | VHX0514 | SR10 | SP3 | HW20L | LSPS3 |
| | 2525-M10 | 25 | 25 | 150 | 17.5 | 25 | 24 | | | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 18.5 | 25 | 24 | | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 16 | 20 | 24 | RCMX 1204M0 | | | | | | |
| | 3225-Q12 | 32 | 25 | 180 | 18.5 | 32 | 24 | | | | | | | |
| | 2525-Q16 | 25 | 25 | 180 | 20.5 | 25 | 30 | RCMX 1606M0 | | | | | | |
| | 3225-Q16 | 32 | 25 | 180 | 20.5 | 32 | 30 | | | | | | | |
| | 3232-Q16 | 32 | 32 | 180 | 24 | 32 | 35 | | | | | | | |
| | 3232-Q20 | 32 | 32 | 180 | 26 | 32 | 40 | RCMX 2006M0 | | | | | | |
| | 4040-S25 | 40 | 40 | 250 | 32.5 | 40 | 42 | RCMX 2507M0 | | | | | | |
| 4040-T25 | 40 | 40 | 300 | 32.5 | 40 | 42 | | | | | | | | |
| 5050-U32 | 50 | 50 | 350 | 41 | 50 | 52 | RCMX 3209M0 | | | | | | | |

Applicable inserts, see pages B54



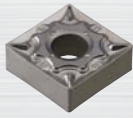
| Designation | | H | W | L | S | h | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch |
|-------------|----------|----|----|-----|----|----|-------------|-------|---------|------|----------|--------|---------------|
| PRGCR/L | 2020-K10 | 20 | 20 | 125 | 25 | 20 | RCMX 1003M0 | | VHX0514 | SR10 | SP3 | HW20L | LSPS3 |
| | 2525-M10 | 25 | 25 | 150 | 32 | 25 | | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | | | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | RCMX 1204M0 | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 32 | 32 | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | RCMX 1606M0 | | | | | | |
| | 3225-P16 | 32 | 25 | 170 | 32 | 32 | | | | | | | |
| | 3232-P20 | 32 | 32 | 170 | 40 | 32 | | | | | | | |
| | 4040-S25 | 40 | 40 | 250 | 50 | 40 | RCMX 2006M0 | | | | | | |
| | | | | | | | RCMX 2507M0 | | | | | | |

Applicable inserts, see pages B54

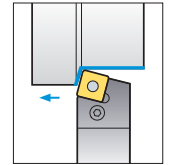
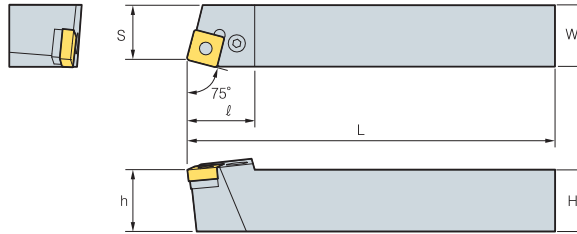


B Lever Lock System

PSBNR/L



SN□□



75°

• R type insert

(mm)

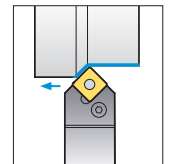
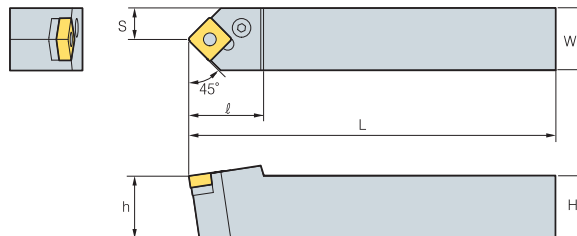
| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch | |
|-------------|------------|-----------|----|-----|-----|----|----|------------|------------|----------|-----------|----------|--------|---------------|-------|
| PSBNR/L | 1616-H09 | 16 | 16 | 100 | 13 | 16 | 21 | SN□□0903□□ | LV3 | VHX0617 | SS32 | SP3 | HW25L | LSPS3 | |
| | 2020-K09 | 20 | 20 | 125 | 17 | 20 | 23 | | | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 17 | 20 | 28 | | | | | | | | |
| | PSBNR/L | 2525-M12 | 25 | 25 | 150 | 22 | 25 | 28 | SN□□1204□□ | LV4 | VHX0821 | SS42 | SP4 | HW30L | LSPS4 |
| | | 3225-P12 | 32 | 32 | 170 | 22 | 32 | 28 | | | | | | | |
| | | 3232-P12 | 32 | 32 | 170 | 27 | 32 | 28 | | | | | | | |
| | PSBNR/L | 2525-M15 | 25 | 25 | 150 | 22 | 25 | 35 | SN□□1506□□ | LV5 | VHX0825 | SS53 | SP5 | HW30L | LSPS5 |
| | | 3232-P15 | 32 | 32 | 170 | 27 | 32 | 35 | | | | | | | |
| | PSBNR/L | 3232-P19 | 32 | 32 | 170 | 27 | 32 | 40 | SN□□1906□□ | LV6N | VHX1027N | SS63N | SP6N | HW40L | LSPS6 |
| | | 4040-S19 | 40 | 40 | 250 | 35 | 40 | 40 | | | | | | | |
| PSBNR/L | 4040-S25 | 40 | 40 | 250 | 35 | 40 | 50 | SN□□2507□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 | |
| | 4040-S25-6 | 40 | 40 | 250 | 35 | 40 | 50 | | | | | | | | |
| PSBNR/L | 5050-T25 | 50 | 50 | 300 | 43 | 50 | 50 | SN□□2507□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 | |
| PSBNR/L | 1616-H09N | 16 | 16 | 100 | 13 | 16 | 21 | SN□□0903□□ | LV3N | VHX0617N | SS32N | SP3N | HW25L | LSPS3 | |
| | 2020-K09N | 20 | 20 | 125 | 17 | 20 | 23 | | | | | | | | |
| | 2020-K12N | 20 | 20 | 125 | 17 | 20 | 28 | | | | | | | | |
| | PSBNR/L | 2525-M12N | 25 | 25 | 150 | 22 | 25 | 28 | SN□□1204□□ | LV4N | VHX0820N | SS42N | SP4N | HW30L | LSPS4 |
| | | 3225-P12N | 32 | 25 | 150 | 22 | 25 | 28 | | | | | | | |
| | | 3232-P12N | 32 | 32 | 170 | 27 | 32 | 28 | | | | | | | |
| | PSBNR/L | 2525-M15N | 25 | 25 | 150 | 22 | 25 | 35 | SN□□1506□□ | LV5N | VHX0820AN | SS53N | SP5N | HW30L | LSPS5 |
| | | 3232-P15N | 32 | 32 | 170 | 27 | 32 | 35 | | | | | | | |

Applicable inserts, see pages B28~B34

PSDNN



SN□□



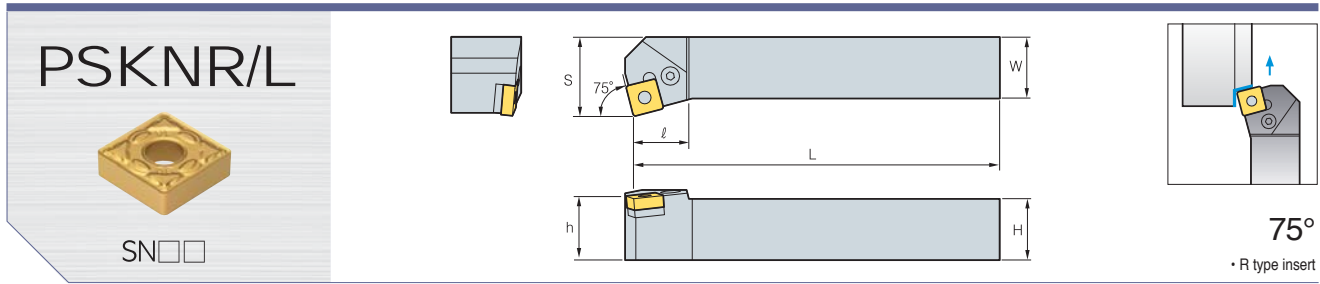
45°

(mm)

| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch | |
|-------------|------------|-----------|----|-----|------|------|----|------------|------------|----------|-----------|----------|--------|---------------|-------|
| PSDNN | 1616-H09 | 16 | 16 | 100 | 8 | 16 | 23 | SN□□0903□□ | LV3 | VHX0617 | SS32 | SP3 | HW25L | LSPS3 | |
| | 2020-K12 | 20 | 20 | 125 | 10 | 20 | 30 | | | | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 12.5 | 25 | 30 | | | | | | | | |
| | PSDNN | 3232-P12 | 32 | 32 | 170 | 16 | 32 | 40 | SN□□1204□□ | LV4 | VHX0821 | SS42 | SP4 | HW30L | LSPS4 |
| | | 2525-M15 | 25 | 25 | 150 | 12.5 | 25 | 40 | | | | | | | |
| | | 3232-P15 | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | | |
| | PSDNN | 3225-P19 | 32 | 25 | 170 | 12.5 | 32 | 40 | SN□□1506□□ | LV5 | VHX0825 | SS53 | SP5 | HW30L | LSPS5 |
| | | 3232-P19 | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | | |
| | PSDNN | 4040-S19 | 40 | 40 | 250 | 20 | 40 | 40 | SN□□1906□□ | LV6N | VHX1027N | SS63N | SP6N | HW40L | LSPS6 |
| | | 4040-S25 | 40 | 40 | 250 | 20 | 40 | 50 | | | | | | | |
| PSDNN | 4040-S25-6 | 40 | 40 | 250 | 20 | 40 | 50 | SN□□2507□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 | |
| | 5050-T25 | 50 | 50 | 300 | 25 | 50 | 50 | | | | | | | | |
| PSDNN | 5050-T25-6 | 50 | 50 | 300 | 25 | 50 | 50 | SN□□2509□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 | |
| PSDNN | 1616-H09N | 16 | 16 | 100 | 8 | 16 | 23 | SN□□0903□□ | LV3N | VHX0617N | SS32N | SP3N | HW25L | LSPS3 | |
| | 2020-K12N | 20 | 20 | 125 | 10 | 20 | 30 | | | | | | | | |
| | 2525-M12N | 25 | 25 | 150 | 12.5 | 20 | 30 | | | | | | | | |
| | PSDNN | 3225-P12N | 32 | 25 | 170 | 12.5 | 32 | 30 | SN□□1204□□ | LV4N | VHX0820N | SS42N | SP4N | HW30L | LSPS4 |
| | | 3232-P12N | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | | |
| | | 2525-M15N | 25 | 25 | 150 | 12.5 | 25 | 40 | | | | | | | |
| | PSDNN | 3232-P15N | 32 | 32 | 170 | 16 | 32 | 40 | SN□□1506□□ | LV5N | VHX0820AN | SS53N | SP5N | HW30L | LSPS5 |

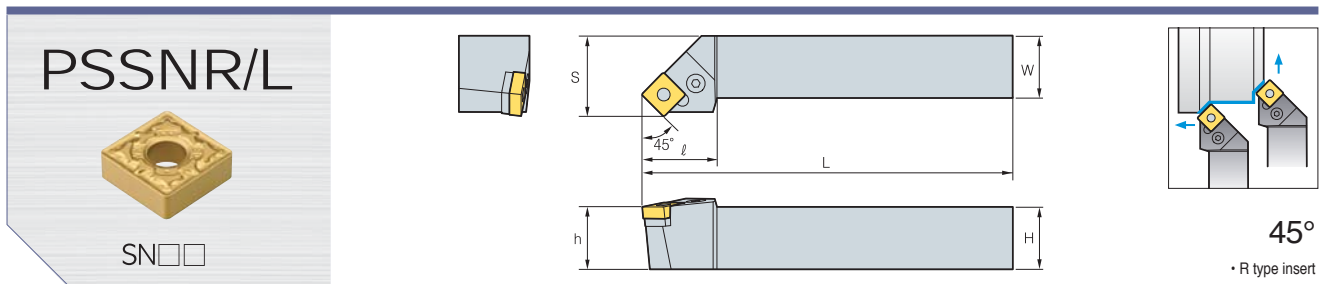
Applicable inserts, see pages B28~B34





| Designation | | H | W | L | S | h | l | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch |
|-------------|------------|----|-----|-----|----|------|------------|------------|----------|-----------|-------|----------|--------|---------------|
| PSKNR/L | 1616-HO9 | 16 | 16 | 100 | 20 | 16 | 17 | SN□□0903□□ | LV3 | VHX0617 | SS32 | SP3 | HW25L | LSPS3 |
| | 2020-KO9 | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 23 | SN□□1204□□ | LV4 | VHX0821 | SS42 | SP4 | HW30L | LSPS4 |
| | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 23 | | | | | | | |
| | 2525-M15 | 25 | 25 | 150 | 32 | 25 | 28 | SN□□1506□□ | LV5 | VHX0825 | SS53 | SP5 | HW30L | LSPS5 |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | 28 | | | | | | | |
| | 3232-P19 | 32 | 32 | 170 | 40 | 32 | 41.5 | SN□□1906□□ | LV6N | VHX1027N | SS63N | SP6N | HW40L | LSPS6 |
| | 4040-S19 | 40 | 40 | 250 | 50 | 40 | 41.5 | | | | | | | |
| | 4040-S25 | 40 | 40 | 250 | 50 | 40 | 46 | SN□□2507□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 |
| | 4040-S25-6 | 40 | 40 | 250 | 50 | 40 | 46 | | | | | | | |
| 5050-T25-6 | 50 | 50 | 300 | 60 | 50 | 37.5 | SN□□2509□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 | |
| PSKNR/L | 1616-HO9N | 16 | 16 | 100 | 20 | 16 | 17 | SN□□0903□□ | LV3N | VHX0617N | SS32N | SP3N | HW25L | LSPS3 |
| | 2020-KO9N | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | | |
| | 2020-K12N | 20 | 20 | 125 | 25 | 20 | 26 | SN□□1204□□ | LV4N | VHX0820N | SS42N | SP4N | HW30L | LSPS4 |
| | 3232-P12N | 32 | 32 | 170 | 40 | 32 | 26 | | | | | | | |
| | 2525-M15N | 25 | 25 | 150 | 32 | 25 | 32 | SN□□1506□□ | LV5N | VHX0820AN | SS53N | SP5N | HW30L | LSPS5 |
| | 3232-P15N | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | | |

Applicable inserts, see pages B28~B34



| Designation | | H | W | L | S | h | l | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch |
|-------------|-----------|----|-----|-----|----|----|------------|------------|----------|-----------|-------|----------|--------|---------------|
| PSSNR/L | 1616-HO9 | 16 | 16 | 100 | 20 | 16 | 25 | SN□□0903□□ | LV3 | VHX0617 | SS32 | SP10 | HW25L | LSPS3 |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 30 | | | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 36 | SN□□1204□□ | LV4 | VHX0821 | SS42 | SP4 | HW30L | LSPS4 |
| | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 40 | | | | | | | |
| | 2525-M15 | 25 | 25 | 150 | 32 | 25 | 36 | SN□□1506□□ | LV5 | VHX0825 | SS53 | SP5 | HW30L | LSPS5 |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | 45 | | | | | | | |
| | 3232-P19 | 32 | 32 | 170 | 40 | 32 | 41.5 | SN□□1906□□ | LV6N | VHX1027N | SS63N | SP6N | HW40L | LSPS6 |
| | 4040-R19 | 40 | 40 | 200 | 50 | 40 | 41.5 | | | | | | | |
| | 4040-S19 | 40 | 40 | 250 | 50 | 40 | 41.5 | SN□□2507□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 |
| | 4040-S25 | 40 | 40 | 250 | 50 | 40 | 48 | | | | | | | |
| 4040-S25-6 | 40 | 40 | 250 | 50 | 40 | 48 | SN□□2509□□ | LV8N | VHX1236N | SS84N | SP8N | HW50L | LSPS8 | |
| PSSNR/L | 1616-HO9N | 16 | 16 | 100 | 20 | 16 | 25 | SN□□0903□□ | LV3N | VHX0617N | SS32N | SP10 | HW25L | LSPS3 |
| | 2020-K12N | 20 | 20 | 125 | 25 | 20 | 30 | | | | | | | |
| | 2525-M12N | 25 | 25 | 150 | 32 | 25 | 36 | SN□□1204□□ | LV4N | VHX0821N | SS42N | SP4 | HW30L | LSPS4 |
| | 3225-P12N | 32 | 25 | 170 | 32 | 32 | 45 | | | | | | | |
| | 3232-P12N | 32 | 32 | 170 | 40 | 32 | 40 | SN□□1506□□ | LV5N | VHX08209N | SS53N | SP5 | HW30L | LSPS5 |
| | 2525-M15N | 25 | 25 | 150 | 32 | 25 | 36 | | | | | | | |
| | 3232-P15N | 32 | 32 | 170 | 40 | 32 | 45 | | | | | | | |

Applicable inserts, see pages B28~B34

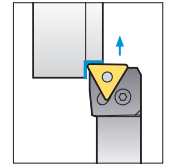
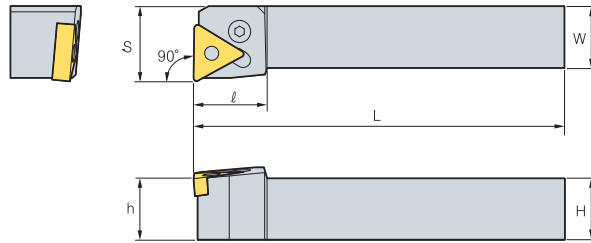


B Lever Lock System

PTFNR/L



TN□□



90°

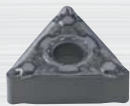
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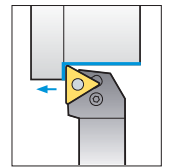
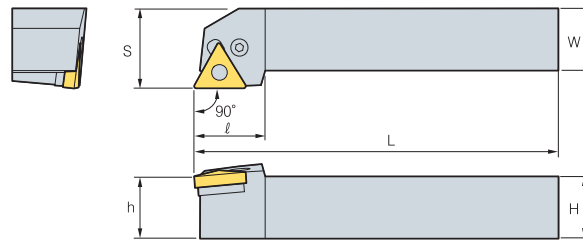
| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch | |
|-------------|----------|----------|----|-----|-----|----|----|------------|------------|---------|---------|----------|--------|---------------|-------|
| PTFNR/L | 1616-H16 | 16 | 16 | 100 | 20 | 16 | 20 | TN□□1604□□ | LV3 | VHX0617 | ST317 | SP3 | HW25L | LSPS3 | |
| | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 20 | | | | | | | | |
| | PTFNR/L | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 25 | TN□□2204□□ | LV4 | VHX0821 | ST42 | SP4 | HW30L | LSPS4 |
| | | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 25 | | | | | | | |
| | | 3232-P27 | 32 | 32 | 170 | 40 | 32 | 34 | | | | | | | |
| PTFNR/L | 4040-S27 | 40 | 40 | 250 | 50 | 40 | 34 | TN□□2706□□ | LV5 | VHX0825 | ST53 | SP5 | HW30L | LSPS5 | |

Applicable inserts, see pages B35~B41

PTGNR/L



TN□□



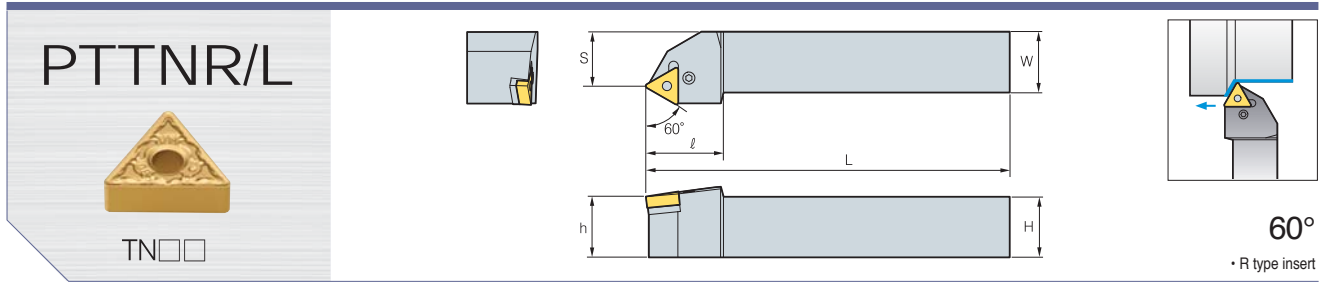
90°

• R type insert

(mm)

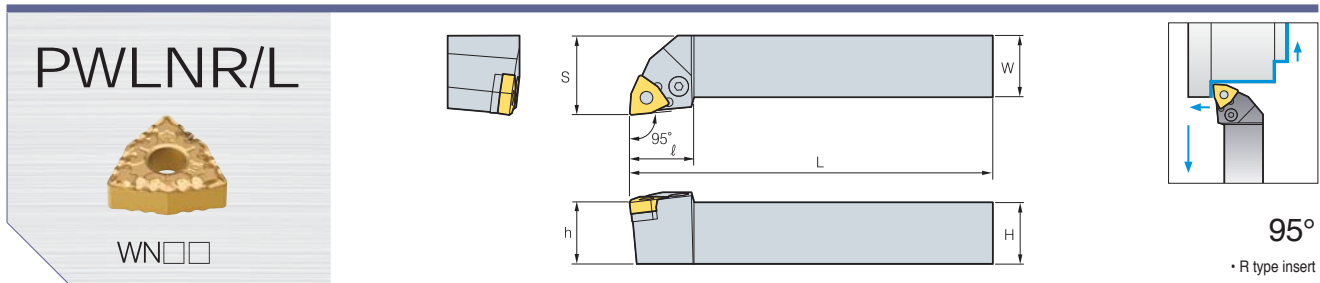
| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shimpin Punch | | |
|-------------|----------|----------|----------|-----|-----|-----|----|------------|------------|------------|---------|----------|--------|---------------|-------|-------|
| PTGNR/L | 1212-F11 | 12 | 12 | 80 | 16 | 12 | 16 | TN□□1103□□ | LV2 | VHX0509B | - | - | HW20L | - | | |
| | 1616-H11 | 16 | 16 | 100 | 20 | 16 | 18 | | | | | | | | | |
| | 2020-K11 | 20 | 20 | 125 | 25 | 20 | 19 | | | | | | | | | |
| | 2525-M11 | 25 | 25 | 150 | 32 | 25 | 20 | | | | | | | | | |
| | PTGNR/L | 1616-H16 | 16 | 16 | 100 | 20 | 16 | 20 | TN□□1604□□ | LV3 | VHX0617 | ST317 | SP3 | HW25L | LSPS3 | |
| | | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | | | |
| | | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 20 | | | | | | | | |
| | | PTGNR/L | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 20 | TN□□2204□□ | LV4 | VHX0821 | ST42 | SP4 | HW30L | LSPS4 |
| | | | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 28 | | | | | | | |
| | | | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 28 | | | | | | | |
| PTGNR/L | 3232-P27 | 32 | 32 | 170 | 40 | 32 | 33 | TN□□2706□□ | LV5 | VHX0825 | T53 | SP5 | HW30L | LSPS5 | | |

Applicable inserts, see pages B35~B41



| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shim Pin Punch |
|-------------|-----------|----|----|-----|----|----|----|------------|-------|----------|--------|----------|--------|----------------|
| PTTNR/L | 1616-H16 | 16 | 16 | 100 | 13 | 16 | 25 | TN□□1604□□ | LV3 | VHX0617 | ST317 | SP3 | HW25L | LSPS3 |
| | 2020-K16 | 20 | 20 | 125 | 17 | 20 | 25 | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 22 | 25 | 32 | TN□□2204□□ | LV4 | VHX0821 | ST42 | SP4 | HW30L | LSPS4 |
| | 2525-M22 | 25 | 25 | 150 | 22 | 25 | 32 | | | | | | | |
| PTTNR/L | 1616-H16N | 16 | 16 | 100 | 13 | 16 | 25 | TN□□1604□□ | LV3N | VHX0617N | ST317N | SP3N | HW25L | LSPS3 |
| | 2020-K16N | 20 | 20 | 125 | 17 | 20 | 25 | | | | | | | |
| | 2525-M16N | 25 | 25 | 150 | 22 | 25 | 32 | TN□□2204□□ | LV4N | VHX0820N | ST42N | SP4N | HW30L | LSPS4 |
| | 2525-M22N | 25 | 25 | 150 | 22 | 25 | 32 | | | | | | | |

Applicable inserts, see pages B35~B41



| Designation | | H | W | L | S | h | ℓ | Insert | Lever | Screw | Shim | Shim Pin | Wrench | Shim Pin Punch |
|-------------|-----------|----|-----|-----|----|----|----|------------|-------|----------|--------|----------|--------|----------------|
| PWLNR/L | 1616-H06 | 16 | 16 | 100 | 20 | 16 | 20 | WN□□0604□□ | LV3 | VHX0617 | SW317 | SP3 | HW25L | LSPS3 |
| | 2020-K06 | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | | |
| | 2525-M06 | 25 | 25 | 150 | 32 | 25 | 20 | WN□□0804□□ | LV4 | VHX0821 | SW42 | SP4 | HW30L | LSPS4 |
| | 2020-K08 | 20 | 20 | 125 | 25 | 20 | 26 | | | | | | | |
| 2525-M08 | 25 | 25 | 150 | 32 | 25 | 26 | | | | | | | | |
| PWLNR/L | 1616-H06N | 16 | 16 | 100 | 20 | 16 | 20 | WN□□0604□□ | LV3N | VHX0617N | ST317N | SP3N | HW25L | LSPS3 |
| | 2020-K06N | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | | |
| | 2525-M06N | 25 | 25 | 150 | 32 | 25 | 20 | WN□□0804□□ | LV4N | VHX0820N | ST42N | SP4N | HW30L | LSPS4 |
| | 2020-K08N | 20 | 20 | 125 | 25 | 20 | 26 | | | | | | | |
| 2525-M08N | 25 | 25 | 150 | 32 | 25 | 26 | | | | | | | | |

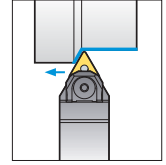
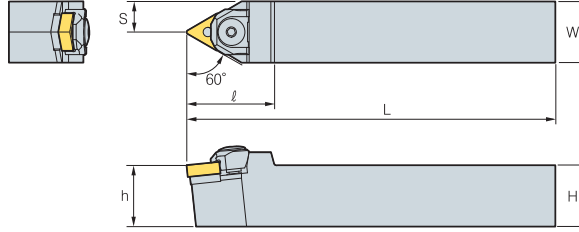
Applicable inserts, see pages B45~B48

B Wedge Clamp System

WTENN



TN□□



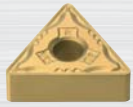
60°

(mm)

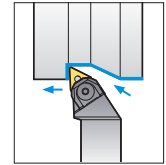
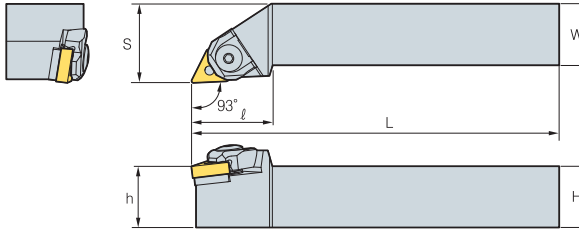
| Designation | | H | W | L | S | h | ℓ | Insert | Wedge Clamp | Screw | Stopper Ring | Shim | Shim Pin | Nut | Wrench |
|-------------|----------|----|----|-----|------|----|----|------------|-------------|-------|--------------|------|----------|-----|--------|
| WTENN | 2020-K16 | 20 | 20 | 125 | 10 | 20 | 36 | TN□□1604□□ | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 12.5 | 25 | 36 | | | | | | | | |
| | 2525-M22 | 25 | 25 | 150 | 12.5 | 25 | 42 | | | | | | | | |
| | 3232-P22 | 32 | 32 | 170 | 16 | 32 | 42 | TN□□2204□□ | | | | | | | |

Applicable inserts, see pages B35~B41

WTJNR/L



TN□□



93°

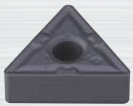
• R type insert

(mm)

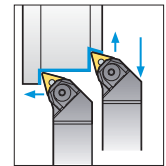
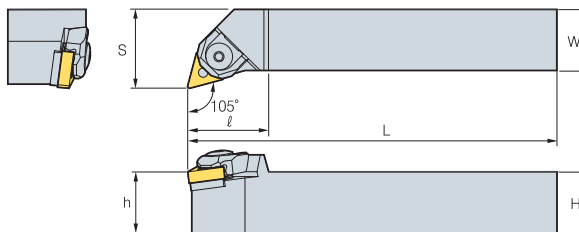
| Designation | | H | W | L | S | h | ℓ | Insert | Wedge Clamp | Screw | Stopper Ring | Shim | Shim Pin | Nut | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|-------------|-------|--------------|------|----------|-----|--------|
| WTJNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 33 | TN□□1604□□ | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 33 | | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 33 | | | | | | | | |
| | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | | | |
| | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 35 | TN□□2204□□ | | | | | | | |

Applicable inserts, see pages B35~B41

WTXNR/L



TN□□



105°

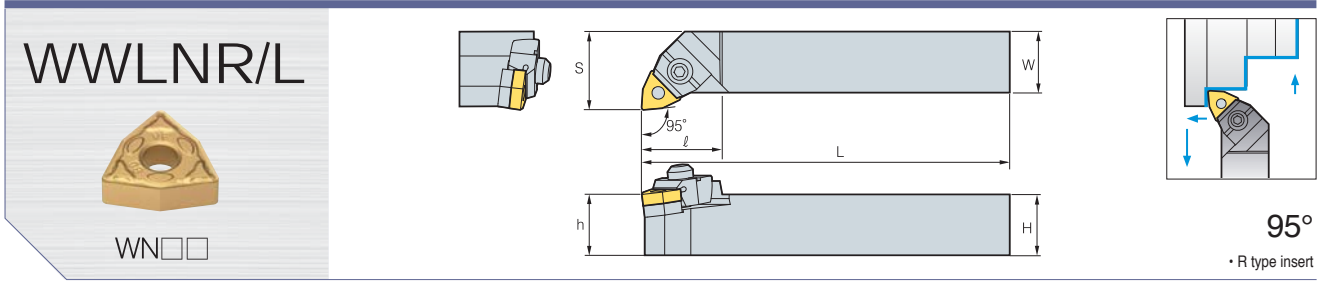
• R type insert

(mm)

| Designation | | H | W | L | S | h | ℓ | Insert | Wedge Clamp | Screw | Stopper Ring | Shim | Shim Pin | Nut | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|-------------|-------|--------------|------|----------|-----|--------|
| WTXNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 30 | TN□□1604□□ | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 33 | | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 33 | | | | | | | | |

Applicable inserts, see pages B35~B41





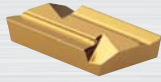
| Designation | | H | W | L | S | h | ℓ | Insert | Wedge Clamp | Screw | C-Ring | Shim | Shim Pin | Nut | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|-------------|---------|--------|-------|----------|-------|--------|
| WWLNR/L | 2020-K08 | 20 | 20 | 125 | 25 | 20 | 32 | WN□□0804□□ | CMH6R/L3 | | | | SP2M | | |
| | 2525-M08 | 25 | 25 | 150 | 32 | 25 | 33 | | CMH6R2 | MHX0630 | CR05 | SW43M | SP4M | N0508 | HW30L |
| | 3232-P08 | 32 | 32 | 170 | 40 | 32 | 33 | | CMH6R2 | | | | | | HW40L |

Applicable inserts, see pages B45~B48

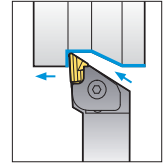
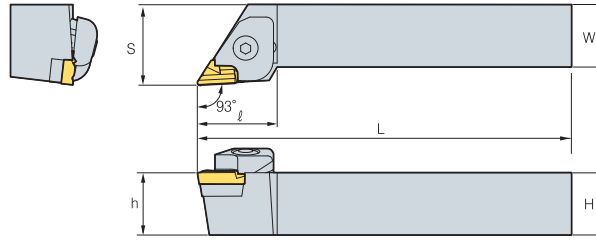


B Clamp on System

CKJNR/L



KN□□



93°

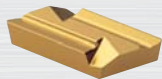
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(mm)

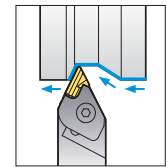
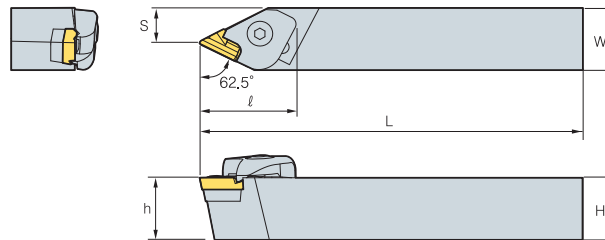
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Spring | Shim | pin+Spring | Shim Screw | Wrench |
|-------------|----------|----|-----|-----|----|----|--------|-------------|-------|-------------|------------|---------|-------------|------------|--------|
| CKJNR | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 32 | KN□□1604□□R | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | | | |
| | 3225-M16 | 32 | 25 | 150 | 32 | 32 | 32 | | | | | | | | |
| | 3225-P16 | 32 | 25 | 170 | 32 | 32 | 32 | | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | | | |
| 4040-R16 | 40 | 40 | 200 | 50 | 40 | 32 | CTH6R1 | CHX0625 | SR3 | SK33C | PN0515 SR4 | SHX0310 | HW20L HW40L | | |
| CKJNL | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 32 | KN□□1604□□L | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | | | |
| | 4040-R16 | 40 | 40 | 200 | 50 | 40 | 32 | | | | | | | | |

Applicable inserts, see pages B27

CKNNR/L



KN□□



62.5°

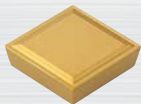
• R type insert

(mm)

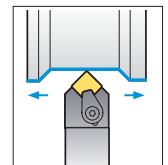
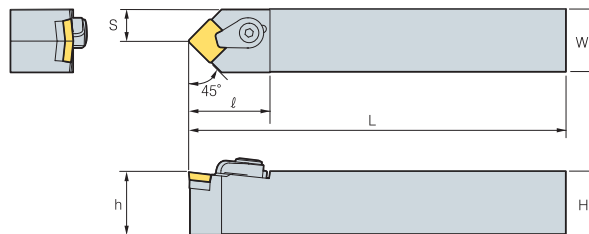
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Spring | Shim | pin+Spring | Shim Screw | Wrench |
|-------------|----------|----|----|-----|------|----|----|--------------|-------|-------------|--------|------|------------|------------|--------|
| CKNNR | 2525-M16 | 25 | 25 | 150 | 14.3 | 25 | 37 | KN□□ 1604□□R | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 16.8 | 32 | 37 | | | | | | | | |
| CKNNL | 2525-M16 | 25 | 25 | 150 | 14.3 | 25 | 37 | KN□□ 1604□□L | | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 16.8 | 32 | 37 | | | | | | | | |

Applicable inserts, see pages B27

CSDPN



SP□R



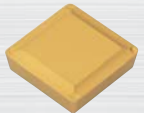
45°

(mm)

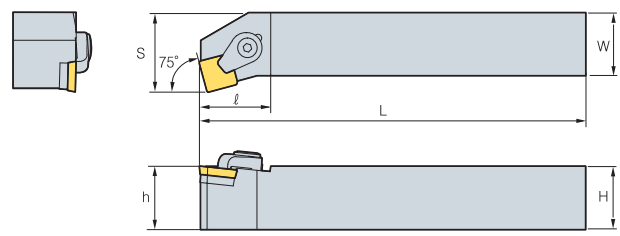
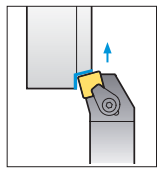
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | C-ring | Wrench |
|-------------|----------|----|----|-----|------|----|----|-------------|--------|-------------|-------|----------|--------|--------|
| CSDPN | 1616-H09 | 16 | 16 | 100 | 8 | 16 | 30 | SP□R 0903□□ | CH53R1 | CH0515C | SS32C | SP3C | CR03C | HW25L |
| | 2525-M12 | 25 | 25 | 150 | 12.5 | 25 | 35 | SP□R 1203□□ | CH6R5 | CHX0622C | SS42C | SP3C | CR04C | HW30L |

Applicable inserts, see pages B56~B57

CSKPR/L










SP□R


75°
• R type insert

(mm)

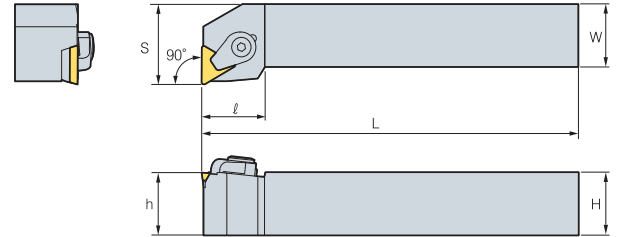
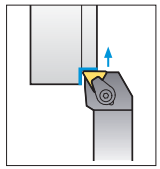
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | C-ring | Wrench |
|------------------|----|----|-----|----|----|----|-------------|---|---|---|---|---|---|
| CSKPR/L 2525-M12 | 25 | 25 | 150 | 32 | 20 | 32 | SP□R 1203□□ |  |  |  |  |  |  |

 Applicable inserts, see pages B56~B57

CTFPR/L










TP□R


90°
• R type insert

(mm)

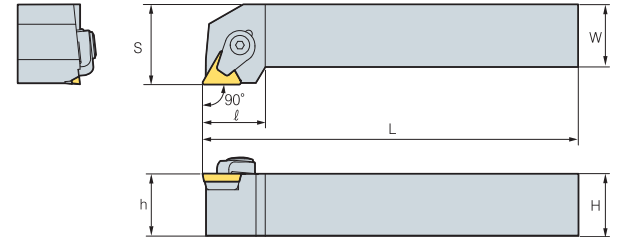
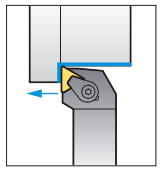
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | C-ring | Wrench |
|------------------|----|----|-----|----|----|----|-------------|---|---|---|---|---|---|
| CTFPR/L 2020-K16 | 20 | 20 | 125 | 25 | 20 | 32 | TP□R 1603□□ |  |  |  |  |  |  |
| 2525-M16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | | |

 Applicable inserts, see pages B61~B62

CTGPR/L






















TP□R

90°
• R type insert

(mm)

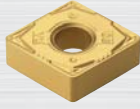
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | C-ring | Wrench |
|------------------|----|----|-----|----|----|----|-------------|---|---|---|---|---|---|
| CTGPR/L 1212-F11 | 12 | 12 | 80 | 16 | 12 | 20 | TP□R 1103□□ |  |  |  |  |  |  |
| 1616-H11 | 16 | 16 | 100 | 20 | 16 | 20 | | | | | | | |
| 2020-K11 | 20 | 20 | 125 | 25 | 20 | 20 | | | | | | | |
| 2020-K16 | 20 | 20 | 125 | 25 | 20 | 25 | TP□R 1603□□ |  |  |  |  |  |  |
| 2525-M16 | 25 | 25 | 150 | 32 | 25 | 25 | | | | | | | |
| 2525-M22 | 25 | 25 | 150 | 32 | 25 | 32 | TP□R 2204□□ |  |  |  |  |  |  |
| 3232-P22 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | | |

 Applicable inserts, see pages B61~B62

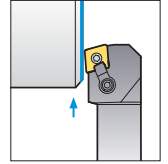
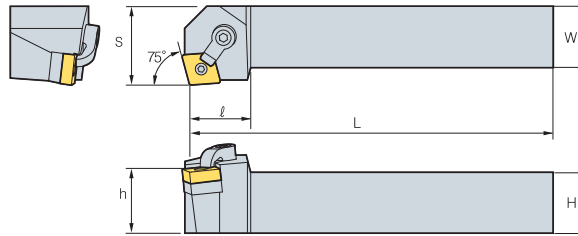


B Multi Lock System

MCKNR/L



CN□□



75°

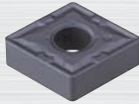
• R type insert

(mm)

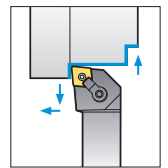
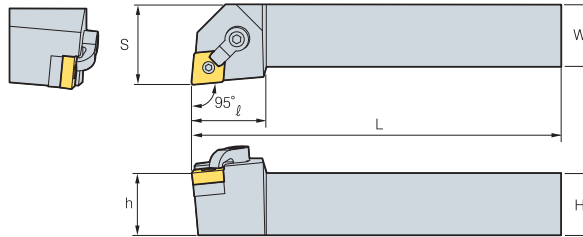
| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|----|-----|----|----|----|-------------|-------|-------------|-------|----------|--------------------|
| MCKNR/L | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 32 | CN□□ 1204□□ | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | |
| | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | |
| | | | | | | | | | CDH6N | DHA1/4-25 | SC43D | SP4D | HW31.8L HW23.8L |

Applicable inserts, see pages B18~B22

MCLNR/L



CN□□



95°

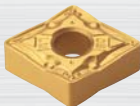
• R type insert

(mm)

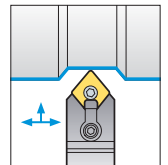
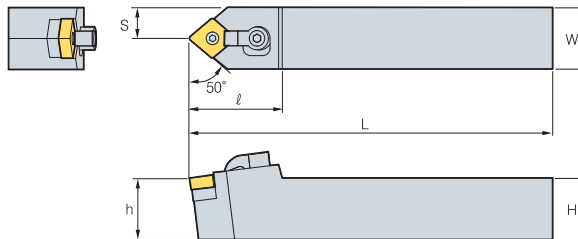
| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|-----|-----|----|----|-------------|-------------|-----------|-------------|------|--------------------|--------|
| MCLNR/L | 1616-H09 | 16 | 16 | 100 | 20 | 16 | 25 | CN□□ 0903□□ | | | | | |
| | 2020-K09 | 20 | 20 | 125 | 25 | 20 | 25 | | | | | | |
| | 2525-M09 | 25 | 25 | 150 | 32 | 25 | 25 | CN□□ 1204□□ | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 32 | | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | |
| | 3225-P12 | 32 | 25 | 170 | 32 | 32 | 32 | | | | | | |
| | 3232-P12 | 32 | 32 | 170 | 40 | 32 | 32 | CN□□ 1606□□ | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 33 | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 33 | | | | | | |
| | 4040-S16 | 40 | 40 | 250 | 50 | 40 | 33 | CN□□ 1906□□ | | | | | |
| 2525-M19 | 25 | 25 | 150 | 32 | 25 | 38 | | | | | | | |
| 3232-P19 | 32 | 32 | 170 | 40 | 32 | 38 | | | | | | | |
| 4040-S19 | 40 | 40 | 250 | 50 | 40 | 38 | | | | | | | |
| 4040-S25 | 40 | 40 | 250 | 50 | 40 | 38 | CN□□ 2507□□ | CDH8N3 | DHA3/8-35 | SC84D | SP8D | HW39.7L HW47.6L | |

Applicable inserts, see pages B18~B22

MCMNN



CN□□



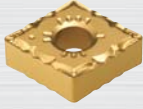
50°

(mm)

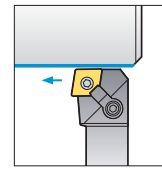
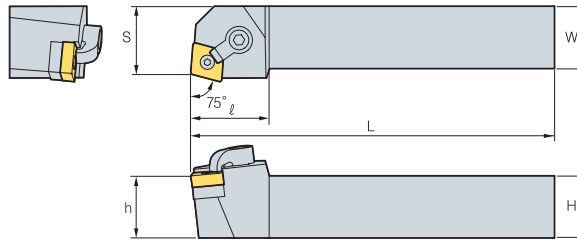
| Designation | | H | W | L | S | h | l | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|-----|-----|------|----|-------------|-------------|------------|-------------|------|--------------------|--------|
| MCMNN | 2020-K12 | 20 | 20 | 125 | 10 | 20 | 32 | CN□□ 1204□□ | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 12.5 | 25 | 32 | | | | | | |
| | 3232-P12 | 32 | 32 | 170 | 16 | 32 | 32 | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 12.5 | 25 | 40 | CN□□ 1606□□ | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | |
| | 3232-P19 | 32 | 32 | 170 | 16 | 32 | 40 | | | | | | |
| 4040-S19 | 40 | 40 | 250 | 20 | 40 | 32 | CN□□ 1906□□ | CDH8N | DHA5/16-32 | SD63D | SP6D | HW39.7L HW35.7L | |

Applicable inserts, see pages B18~B22

MCRNR/L



CN□□



75°

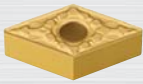
• R type insert

(mm)

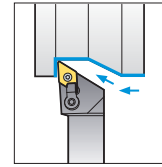
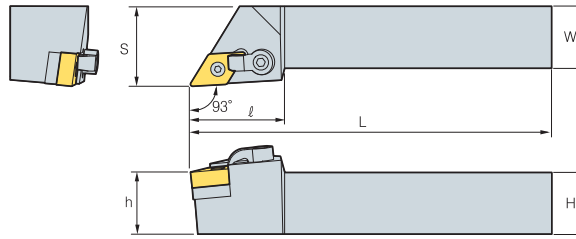
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------------|----|----|-----|----|----|----|-------------|--------|-------------|-------|----------|--------------------|
| MCRNR/L 2020-K12 | 20 | 20 | 125 | 22 | 20 | 32 | CN□□ 1204□□ | CDH8N1 | DHA5/16-32 | SC43D | SP4D | HW39.7L HW23.8L |
| 2525-M12 | 25 | 25 | 150 | 27 | 25 | 32 | | | | | | |
| 2525-M16 | 25 | 25 | 150 | 27 | 25 | 33 | CN□□ 1606□□ | CDH8N1 | DHA5/16-32 | SC53D | SP5D | HW39.7L HW31.8L |
| 3232-P16 | 32 | 32 | 170 | 35 | 32 | 33 | | | | | | |
| 3232-P19 | 32 | 32 | 170 | 35 | 32 | 38 | CN□□ 1906□□ | CDH8N1 | DHA5/16-32 | SC63D | SP6D | HW39.7L HW35.7L |
| 4040-S19 | 40 | 40 | 250 | 43 | 40 | 38 | | | | | | |

Applicable inserts, see pages B18~B22

MDJNR/L



DN□□



93°

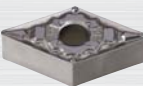
• R type insert

(mm)

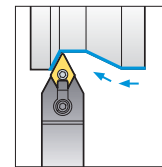
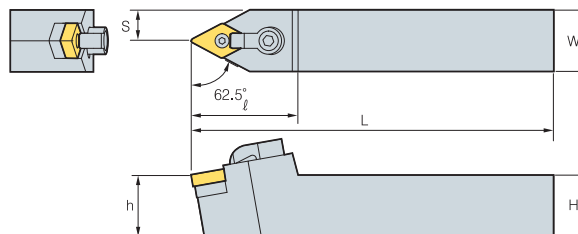
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------------|----|----|-----|----|----|----|-------------|-------|-------------|-------|----------|--------------------|
| MDJNR/L 2020-K11 | 20 | 20 | 125 | 25 | 20 | 32 | DN□□ 1104□□ | CDH6N | DHA1/4-19 | SD32D | SP3D | HW31.8L HW19.8L |
| 2525-M11 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | |
| 2020-K15-3 | 20 | 20 | 125 | 25 | 20 | 36 | DN□□ 1504□□ | CDH6N | DHA1/4-25 | SD43D | SP4D | HW31.8L HW23.8L |
| 2525-M15-3 | 25 | 25 | 150 | 32 | 25 | 36 | | | | | | |
| 3232-P15-3 | 32 | 32 | 170 | 40 | 32 | 36 | DN□□ 1506□□ | CDH6N | DHA1/4-25 | SD43D | SP4DL | HW31.8L HW23.8L |
| 2020-K15 | 20 | 20 | 125 | 25 | 20 | 36 | | | | | | |
| 2525-M15 | 25 | 25 | 150 | 32 | 25 | 36 | DN□□ 1506□□ | CDH6N | DHA1/4-25 | SD43D | SP4DL | HW31.8L HW23.8L |
| 3232-P15 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | | |

Applicable inserts, see pages B18~B22

MDNNN



DN□□



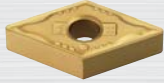
62.5°

(mm)

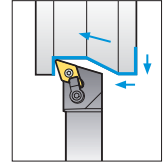
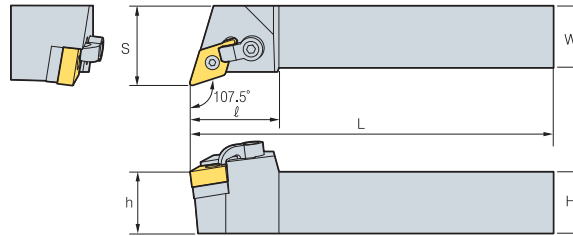
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|------------------|----|----|-----|------|----|----|-------------|-------|-------------|-------|----------|--------------------|
| MDNNN 2525-M15-3 | 25 | 25 | 150 | 12.5 | 25 | 41 | DN□□ 1504□□ | CDH8N | DHA5/16-32 | SD43D | SP4D | HW39.7L HW23.8L |
| 2525-M15 | 25 | 25 | 150 | 12.5 | 25 | 41 | DN□□ 1506□□ | CDH8N | DHA5/16-32 | SD43D | SP4DL | HW39.7L HW23.8L |

Applicable inserts, see pages B18~B22

MDQNR/L



DN□□



107.5°

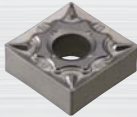
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(mm)

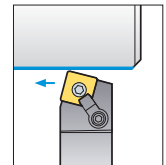
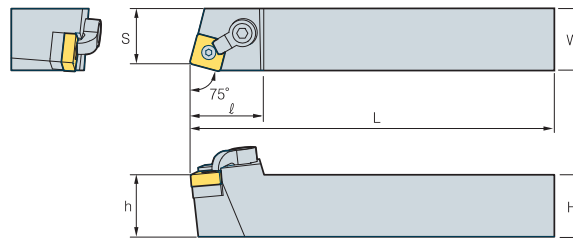
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|------------|----|----|-----|----|----|----|-------------|-------|-------------|------|----------|--------|
| MDQNR/L | 2525-M15-3 | 25 | 25 | 150 | 32 | 25 | 36 | DN□□ 1504□□ | | | | | |
| | 3232-P15-3 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | | |
| MDQNR/L | 2525-M15 | 25 | 25 | 150 | 32 | 25 | 36 | DN□□ 1506□□ | | | | | |
| | 3232-M15 | 32 | 32 | 170 | 40 | 32 | 36 | | | | | | |

Applicable inserts, see pages B23~B26

MSBNR/L



SN□□



75°

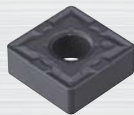
• R type insert

(mm)

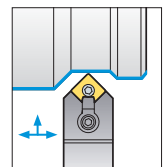
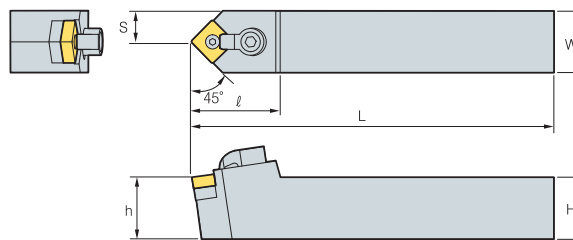
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|----|-----|----|----|----|-------------|-------|-------------|------|----------|--------|
| MSBNR/L | 2020-K12 | 20 | 20 | 125 | 17 | 20 | 32 | SN□□ 1204□□ | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 22 | 25 | 32 | | | | | | |
| MSBNR/L | 2525-M15 | 25 | 25 | 150 | 22 | 25 | 35 | SN□□ 1506□□ | | | | | |
| | 3232-P15 | 32 | 32 | 170 | 22 | 32 | 35 | | | | | | |
| MSBNR/L | 3232-P19 | 32 | 32 | 170 | 27 | 32 | 40 | SN□□ 1906□□ | | | | | |
| | 4040-S19 | 40 | 40 | 250 | 35 | 40 | 40 | | | | | | |

Applicable inserts, see pages B28~B34

MSDNN



SN□□

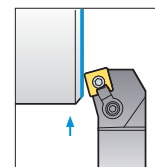
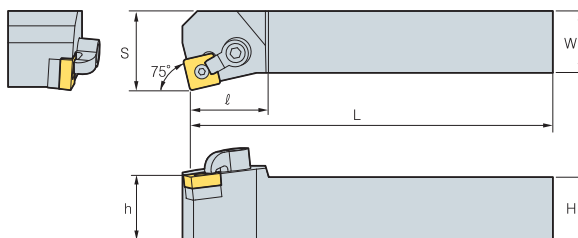


45°

(mm)

| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----------|----|-----|------|----|----|-------------|-------|-------------|------|----------|--------|
| MSDNN | 1616-H09 | 16 | 16 | 100 | 8 | 16 | 28 | SN□□ 0903□□ | | | | | |
| | 2020-K09 | 20 | 20 | 125 | 10 | 20 | 28 | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 10 | 20 | 32 | | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 12.5 | 25 | 32 | | | | | | |
| MSDNN | 3225-P12 | 32 | 25 | 170 | 12.5 | 32 | 32 | SN□□ 1204□□ | | | | | |
| | 2525-M15 | 25 | 25 | 150 | 12.5 | 25 | 35 | | | | | | |
| | 3225-P15 | 32 | 25 | 170 | 12.5 | 32 | 35 | | | | | | |
| | 3232-P15 | 32 | 32 | 170 | 16 | 32 | 35 | | | | | | |
| MSDNN | 4040-S15 | 40 | 40 | 250 | 20 | 40 | 35 | SN□□ 1506□□ | | | | | |
| | 3232-P19 | 32 | 32 | 170 | 16 | 32 | 42 | | | | | | |
| | 4040-S19 | 40 | 40 | 250 | 20 | 40 | 42 | | | | | | |
| | MSDNN | 4040-S19 | 40 | 40 | 250 | 20 | 40 | | | | | | |

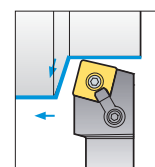
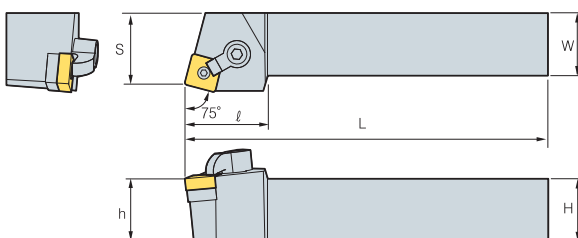
Applicable inserts, see pages B28~B34



75°
• R type insert

| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|-----|-----|----|----|------------|------------|-----------|-------------|-------|--------------------|--------------------|
| MSKNR/L | 1616-H09 | 16 | 16 | 100 | 20 | 16 | 28 | SN□□0903□□ | CDH7N | DHA10-32-19 | SS32D | SP3DS | HW19.8L HW23.8L |
| | 2020-K09 | 20 | 20 | 125 | 22 | 20 | 28 | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 32 | SN□□1204□□ | CDH8N1 | DHA5/16-32 | SS43D | SP4D | HW39.7L HW23.8L |
| | 3225-P12 | 32 | 25 | 170 | 32 | 32 | 32 | | | | | | |
| | 2525-M15 | 25 | 25 | 150 | 32 | 25 | 35 | SN□□1506□□ | CDH8N | DHA5/16-32 | SS53D | SP5D | HW39.7L HW31.8L |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | |
| | 3232-P19 | 32 | 32 | 170 | 40 | 32 | 40 | SN□□1906□□ | CDH8N | DHA5/16-32 | SS63D | SP6D | HW39.7L HW35.7L |
| | 4040-S19 | 40 | 40 | 250 | 50 | 40 | 40 | | | | | | |
| 4040-S25 | 40 | 40 | 250 | 50 | 40 | 40 | SN□□2507□□ | CDH8N3 | DHA3/8-35 | SS84D | SP8D | HW47.6L HW39.7L | |

Applicable inserts, see pages B28~B34



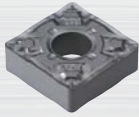
75°
• R type insert

| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|-----|-----|----|----|------------|------------|-----------|-------------|-------|--------------------|--------------------|
| MSRNR/L | 1616-H09 | 16 | 16 | 100 | 17 | 16 | 28 | SN□□0903□□ | CDH7N | DHA10-32-19 | SS32D | SP3DS | HW19.8L HW23.8L |
| | 2020-K09 | 20 | 20 | 125 | 22 | 20 | 28 | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 22 | 20 | 32 | SN□□1204□□ | CDH8N1 | DHA5/16-32 | SS43D | SP4D | HW39.7L HW23.8L |
| | 2525-M12 | 25 | 25 | 150 | 27 | 25 | 32 | | | | | | |
| | 2525-M15 | 25 | 25 | 150 | 27 | 25 | 35 | SN□□1506□□ | CDH8N | DHA5/16-32 | SS53D | SP5D | HW39.7L HW31.8L |
| | 3232-P15 | 32 | 32 | 170 | 35 | 32 | 35 | | | | | | |
| | 3225-P19 | 32 | 25 | 170 | 27 | 32 | 40 | SN□□1906□□ | CDH8N | DHA5/16-32 | SS63D | SP6D | HW39.7L HW35.7L |
| | 3232-P19 | 32 | 32 | 170 | 35 | 32 | 40 | | | | | | |
| 4040-S19 | 40 | 40 | 250 | 43 | 40 | 40 | SN□□2507□□ | CDH8N3 | DHA3/8-35 | SS84D | SP8D | HW47.6L HW39.7L | |
| 4040-S25 | 40 | 40 | 250 | 43 | 40 | 40 | | | | | | | |

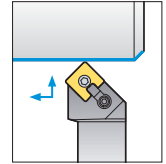
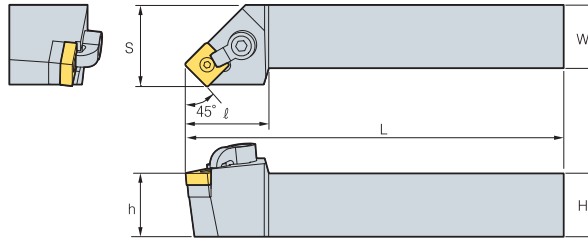
Applicable inserts, see pages B28~B34



MSSNR/L



SN□□



45°

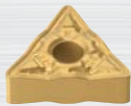
• R type insert

(mm)

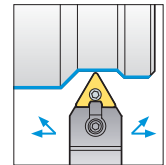
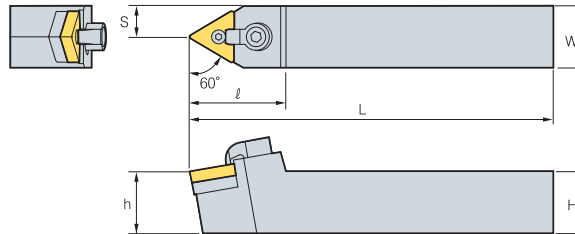
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench | | | | | | | | | |
|-------------|----------|----|-----|-----|----|----|------------|------------|------------|-------------|-------|----------|---------|------------|-------|------|------------|--------|------------|-------|------|---------|
| MSSNR/L | 1616-H09 | 16 | 16 | 100 | 20 | 16 | 28 | SN□□0903□□ | CDH7N | DHA10-32-19 | SS32D | SP3DS | HW19.8L | | | | | | | | | |
| | 2020-K09 | 20 | 20 | 125 | 25 | 20 | 28 | | | | | | HW23.8L | | | | | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 25 | 20 | 32 | SN□□1204□□ | | | | | CDH8N1 | DHA5/16-32 | SS43D | SP4D | HW39.7L | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | | | | | HW23.8L | | | | | |
| | 2525-M15 | 25 | 25 | 150 | 32 | 25 | 35 | | | | | | | | | | SN□□1506□□ | CDH8N1 | DHA5/16-32 | SS53D | SP5D | HW39.7L |
| | 3232-P15 | 32 | 32 | 170 | 40 | 32 | 35 | | | | | | | | | | | | | | | HW31.8L |
| 3232-P19 | 32 | 32 | 170 | 40 | 32 | 40 | SN□□1906□□ | CDH8N1 | DHA5/16-32 | SS63D | SP6D | HW39.7L | | | | | | | | | | |
| 4040-S19 | 40 | 40 | 250 | 50 | 40 | 40 | | | | | | HW35.7L | | | | | | | | | | |

Applicable inserts, see pages B28~B34

MTENN



TN□□



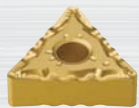
60°

(mm)

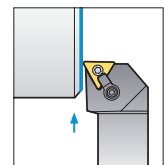
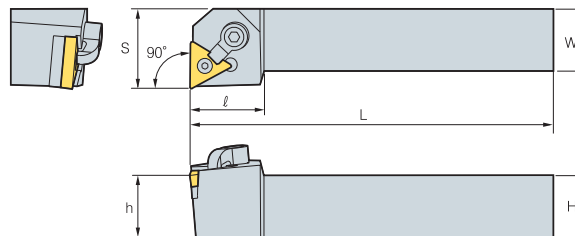
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench | | | | |
|-------------|----------|----|-----|-----|------|----|------------|------------|------------|-------------|-------|----------|---------|------------|-------|------|------------|
| MTENN | 2020-K16 | 20 | 20 | 125 | 10 | 20 | 32 | TN□□1604□□ | CDH7N | DHA10-32-19 | ST32D | SP3D | HW23.8L | | | | |
| | 2525-M16 | 25 | 25 | 150 | 12.5 | 25 | 32 | | | | | | HW19.8L | | | | |
| | 2525-M22 | 25 | 25 | 150 | 12.5 | 25 | 35 | TN□□2204□□ | | | | | CDH8N1 | DHA5/16-32 | ST43D | SP4D | HW39.7L |
| | 3232-P27 | 32 | 32 | 170 | 16 | 32 | 35 | | | | | | | | | | HW23.8L |
| | 4040-S33 | 40 | 40 | 250 | 20 | 40 | 40 | | | | | | | | | | TN□□2706□□ |
| 3232-P27 | 32 | 32 | 170 | 16 | 32 | 35 | HW31.8L | | | | | | | | | | |
| 4040-S33 | 40 | 40 | 250 | 20 | 40 | 40 | TN□□3307□□ | CDH8N | DHA5/16-32 | ST63D | SP6DL | HW39.7L | | | | | |
| 4040-S33 | 40 | 40 | 250 | 20 | 40 | 40 | HW35.7L | | | | | | | | | | |

Applicable inserts, see pages B35~B41

MTFNR/L



TN□□



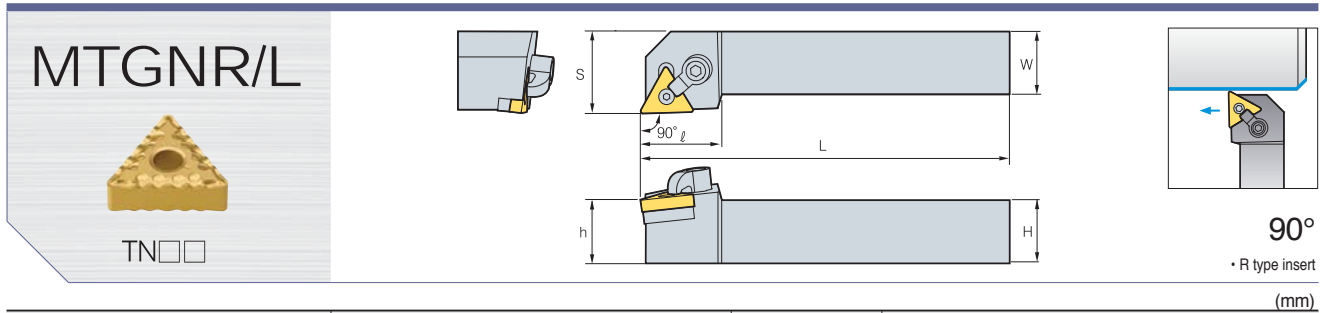
90°

• R type insert

(mm)

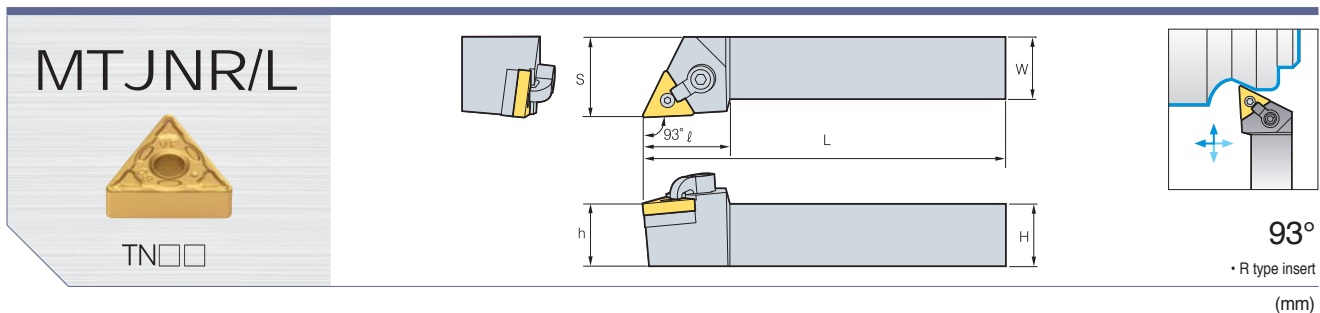
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench | | | | | | | | | | | | |
|-------------|----------|----|-----|-----|----|----|------------|------------|-------|-------------|-------|----------|------------|--------|------------|-------|------|---------|------------|-------|------|------------|-------|-------|---------|
| MTFNR/L | 1616-H16 | 16 | 16 | 100 | 20 | 16 | 32 | TN□□1604□□ | CDH7N | DHA10-32-19 | ST32D | SP3D | HW23.8L | | | | | | | | | | | | |
| | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 32 | | | | | | HW19.8L | | | | | | | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | TN□□2204□□ | CDH8N1 | DHA5/16-32 | ST43D | SP4D | HW39.7L | | | | | | | |
| | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | | | | | | HW23.8L | | | | | | | |
| | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 32 | TN□□2706□□ | | | | | | | | | | CDH8N1 | DHA5/16-32 | ST53D | SP5D | HW39.7L | | | |
| | 4040-S22 | 40 | 40 | 250 | 50 | 40 | 32 | | | | | | | | | | | | | | | HW31.8L | | | |
| | 3232-P27 | 32 | 32 | 170 | 40 | 32 | 35 | TN□□3307□□ | | | | | CDH8N | | | | | | | | | DHA5/16-32 | ST63D | SP6DL | HW39.7L |
| | 4040-S27 | 40 | 40 | 250 | 50 | 40 | 35 | | | | | | | | | | | | | | | | | | HW35.7L |
| 4040-S33 | 40 | 40 | 250 | 50 | 40 | 40 | TN□□3307□□ | | CDH8N | DHA5/16-32 | ST63D | SP6DL | | | | | | | | | | | | | HW39.7L |
| 4040-S33 | 40 | 40 | 250 | 50 | 40 | 40 | | | | | | | | | | | | | | | | | | | HW35.7L |

Applicable inserts, see pages B35~B41



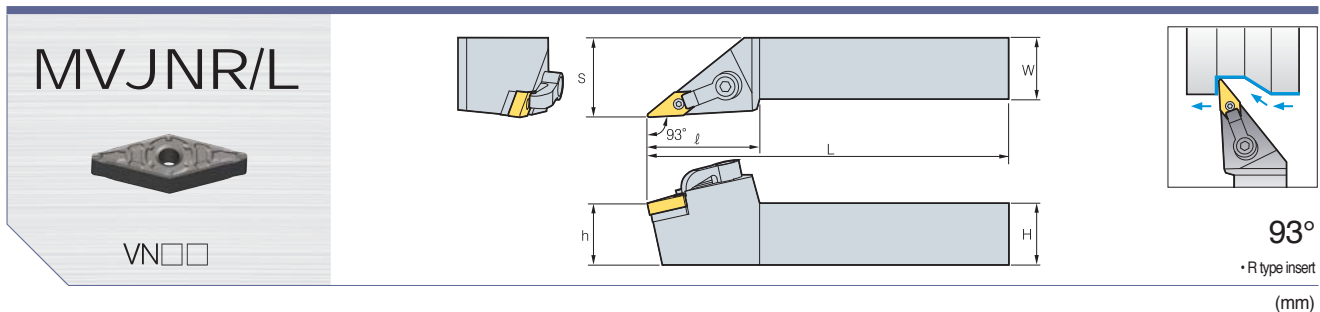
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|-----|-----|----|----|-------------|-------------|------------|-------------|-------|--------------------|--------------------|
| MTGNR/L | 1616-H16 | 16 | 16 | 100 | 20 | 16 | 32 | TN□□ 1604□□ | CDH7N | DHA10-32-19 | ST32D | SP3D | HW23.8L HW19.8L |
| | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 32 | | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 32 | TN□□ 2204□□ | CDH8N1 | DHA5/16-32 | ST43D | SP4D | HW39.7L HW23.8L |
| | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | |
| | 3232-P27 | 32 | 32 | 170 | 40 | 32 | 35 | TN□□ 2706□□ | CDH8N1 | DHA5/16-32 | ST53D | SP5D | HW39.7L HW31.8L |
| | 4040-S27 | 40 | 40 | 250 | 50 | 40 | 35 | | | | | | |
| 4040-S33 | 40 | 40 | 250 | 50 | 40 | 40 | TN□□ 3307□□ | CDH8N | DHA5/16-32 | ST63D | SP6DL | HW39.7L HW35.7L | |

Applicable inserts, see pages B35~B41



| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|-----|-----|----|----|-------------|-------------|------------|-------------|-------|--------------------|--------------------|
| MTJNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 32 | TN□□ 1604□□ | CDH7N | DHA10-32-19 | ST32D | SP3D | HW23.8L HW19.8L |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | |
| | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 32 | TN□□ 2204□□ | CDH8N1 | DHA5/16-32 | ST43D | SP4D | HW39.7L HW23.8L |
| | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | |
| | 3232-P27 | 32 | 32 | 170 | 40 | 32 | 35 | TN□□ 2706□□ | CDH8N1 | DHA5/16-32 | ST53D | SP5D | HW39.7L HW31.8L |
| | 4040-S27 | 40 | 40 | 250 | 50 | 40 | 35 | | | | | | |
| 4040-S33 | 40 | 40 | 250 | 50 | 40 | 40 | TN□□ 3307□□ | CDH8N | DHA5/16-32 | ST63D | SP6DL | HW39.7L HW35.7L | |

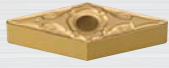
Applicable inserts, see pages B35~B41



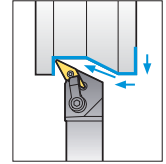
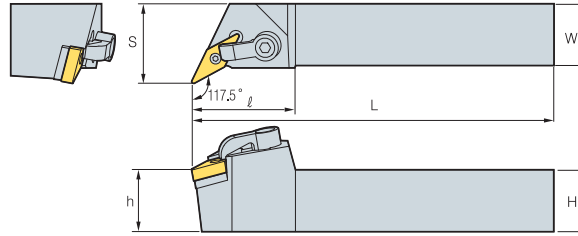
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|----|-----|----|----|----|-------------|--------|-------------|-------|----------|--------------------|
| MVJNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 37 | VN□□ 1604□□ | CDH8N2 | DHA5/16-32 | SV32D | SP3D | HW39.7L HW19.8L |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 37 | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 37 | | | | | | |
| | 2525-M22 | 25 | 25 | 150 | 32 | 25 | 50 | VN□□ 2204□□ | CDH8N2 | DHA5/16-32 | SV43D | SP4D | HW39.7L HW23.8L |
| | 3232-P22 | 32 | 32 | 170 | 40 | 32 | 50 | | | | | | |
| | 4040-S22 | 40 | 40 | 250 | 50 | 40 | 50 | | | | | | |

Applicable inserts, see pages B42~B44

MVQNR/L



VN□□



117.5°

• R type insert

(mm)

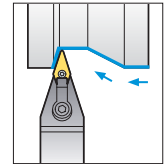
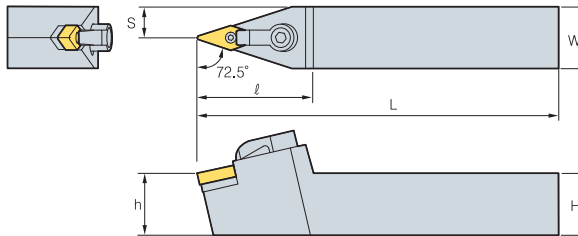
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|--------|-------------|-------|----------|--------------------|
| MVQNR/L | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 42 | VN□□1604□□ | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 42 | | | | | | |
| | 3232-P16 | 32 | 32 | 170 | 40 | 32 | 37 | | | | | | |
| | | | | | | | | | CDH8N2 | DHA5/16-32 | SV32D | SP3D | HW39.7L HW19.8L |

Applicable inserts, see pages B42~B44

MVVNN



VN□□



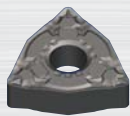
72.5°

(mm)

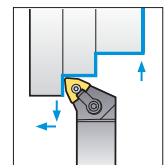
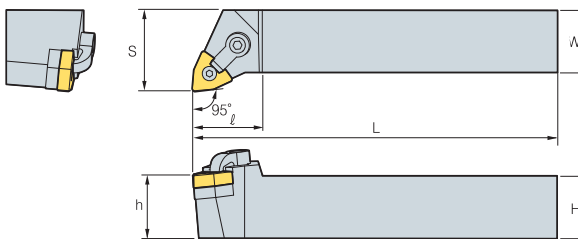
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|--------|-------------|-------|----------|--------------------|
| MVVNN | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 42 | VN□□1604□□ | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 42 | | | | | | |
| | | | | | | | | | CDH8N2 | DHA5/16-32 | SV32D | SP3D | HW39.7L HW19.8L |

Applicable inserts, see pages B42~B44

MWLNR/L



WN□□



95°

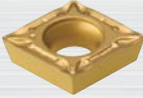
• R type insert

(mm)

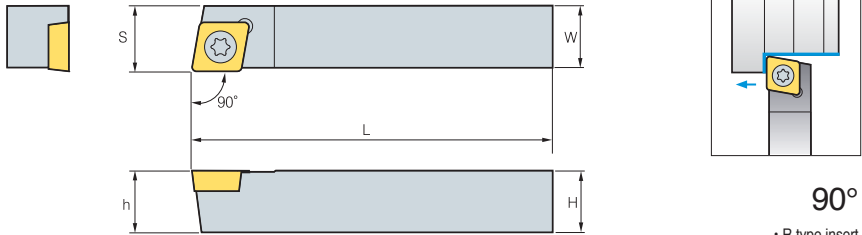
| Designation | | H | W | L | S | h | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Pin | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|-------|-------------|-------|----------|--------------------|
| MWLNR/L | 2020-K06 | 20 | 20 | 125 | 25 | 20 | 32 | WN□□0604□□ | | | | | |
| | 2525-M06 | 25 | 25 | 150 | 32 | 25 | 32 | | | | | | |
| | 3232-P06 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | |
| | 2020-K08 | 20 | 20 | 125 | 25 | 20 | 32 | | | | | | |
| | 2525-M08 | 25 | 25 | 150 | 32 | 25 | 32 | WN□□0804□□ | | | | | |
| | 3232-P08 | 32 | 32 | 170 | 40 | 32 | 32 | | | | | | |
| | | | | | | | | | CDH7N | DHA10-32-19 | SW32D | SP3D | HW19.8L HW23.8L |
| | | | | | | | | | CDH6N | DHA1/4-21 | SW43D | SP4D | HW31.8L HW23.8L |

Applicable inserts, see pages B45~B48

SCACR/L



CC□□



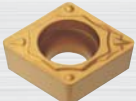
90°
• R type insert

(mm)

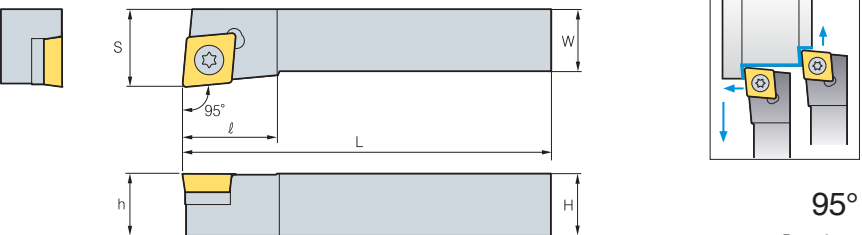
| Designation | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|------------------|----|----|----|------|----|------------|-----------|------|-----------|--------|
| SCACR/L 1010-E06 | 10 | 10 | 70 | 10.5 | 10 | CC□□0602□□ | FTKA02565 | - | - | TW07P |
| 1212-F09 | 12 | 12 | 80 | 12.5 | 12 | CC□□09T3□□ | FTKA03508 | - | - | TW15P |

Applicable inserts, see pages B49~B50, B68

SCLCR/L



CC□□



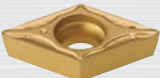
95°
• R type insert

(mm)

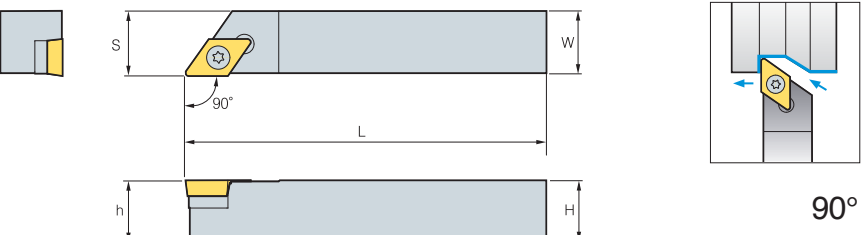
| Designation | H | W | L | S | h | ℓ | Insert | Screw | Shim | ShimScrew | Wrench |
|------------------|----|----|-----|----|----|----|------------|-----------|-------|-----------|----------------|
| SCLCR/L 0808-D06 | 08 | 08 | 60 | 10 | 08 | 10 | CC□□0602□□ | FTKA02565 | - | - | TW07P |
| 1010-E06 | 10 | 10 | 70 | 16 | 10 | 10 | | | | | |
| 1212-F09 | 12 | 12 | 80 | 20 | 12 | 16 | CC□□09T3□□ | FTGA03508 | - | - | TW15P |
| 1616-H09 | 16 | 16 | 100 | 20 | 16 | 16 | | | | | |
| 2020-K09 | 20 | 20 | 125 | 25 | 20 | 16 | | | | | |
| 2020-K12 | 20 | 20 | 125 | 25 | 20 | 25 | CC□□1204□□ | FTGA0411F | SC42S | SHXN0610F | TW15P HW40L |
| 2525-M12 | 25 | 25 | 150 | 32 | 25 | 26 | | | | | |

Applicable inserts, see pages B49~B50, B68

SDACR/L



DC□□



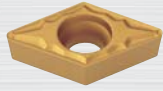
90°
• R type insert

(mm)

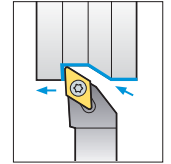
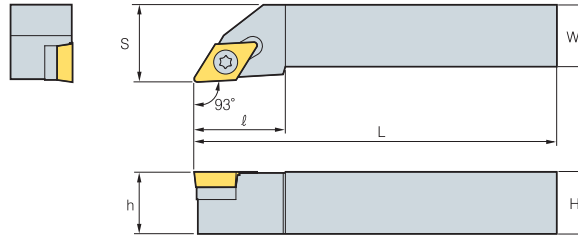
| Designation | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|------------------|----|----|-----|------|----|------------|-----------|-------|-----------|--------------|
| SDACR/L 1010-E07 | 10 | 10 | 70 | 10.5 | 10 | DC□□0702□□ | FTKA02565 | - | - | TW07P |
| 1212-F11 | 12 | 12 | 80 | 12.5 | 12 | DC□□11T3□□ | FTKA03508 | - | - | TW15P |
| 1616-H11 | 16 | 16 | 100 | 16.5 | 16 | | FTGA03512 | SD32S | SHXN0509F | TW15P, HW35L |

Applicable inserts, see pages B52~B53, B69

SDJCR/L



DC□□



93°

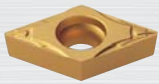
• R type insert

(mm)

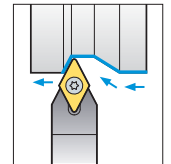
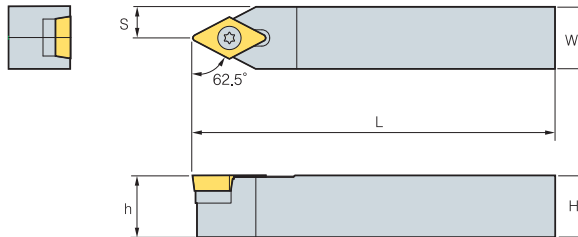
| Designation | | H | W | L | S | h | ℓ | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|-----------|-------|-----------|--------------|
| SDJCR/L | 1010-E07 | 10 | 10 | 70 | 12 | 10 | 15 | DC□□0702□□ | FTKA02565 | - | - | TW07P |
| | 1212-F07 | 12 | 12 | 80 | 16 | 12 | 15 | | | | | |
| | 1616-H07 | 16 | 16 | 100 | 20 | 16 | 18 | | | | | |
| | 2020-K07 | 20 | 20 | 125 | 25 | 20 | 15 | | | | | |
| | 1212-F11 | 12 | 12 | 80 | 16 | 12 | 15 | DC□□11T3□□ | FTGA03512 | SD32S | SHXN0509F | TW15P, HW35L |
| | 1616-H11 | 16 | 16 | 100 | 20 | 16 | 24 | | | | | |
| | 2020-K11 | 20 | 20 | 125 | 25 | 20 | 24 | | | | | |
| | 2525-M11 | 25 | 25 | 150 | 32 | 25 | 29 | | | | | |

Applicable inserts, see pages B52~B53, B69

SDNCN



DC□□



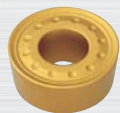
62.5°

(mm)

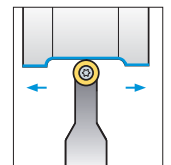
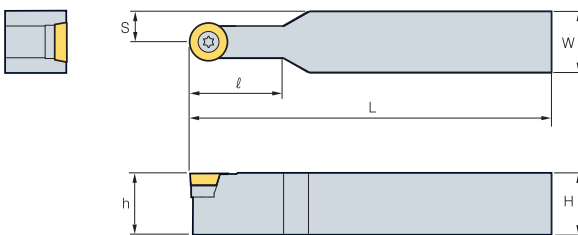
| Designation | | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|----|----|------------|-----------|-------|-----------|--------------|
| SDNCN | 1010-E07 | 10 | 10 | 70 | 5 | 10 | DC□□0702□□ | FTKA02565 | - | - | TW07P |
| | 1212-F07 | 12 | 12 | 80 | 6 | 12 | DC□□11T3□□ | | | | |
| | 1212-H11 | 12 | 12 | 100 | 6 | 12 | DC□□11T3□□ | FTGA03508 | - | - | TW15P |
| | 1616-H11 | 16 | 16 | 100 | 8 | 16 | DC□□11T3□□ | FTGA03512 | SD32S | SHXN0509F | TW15P, HW35L |
| | 2020-K11 | 20 | 20 | 125 | 10 | 20 | | | | | |

Applicable inserts, see pages B52~B53, B69

SRDCN



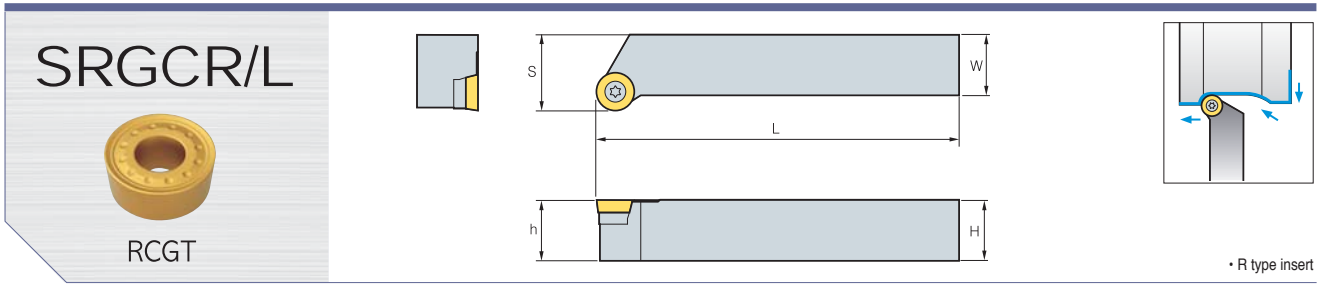
RCGT



(mm)

| Designation | | H | W | L | S | h | ℓ | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|------|----|----|-------------|------------|-------|-----------|----------------|
| SRDCN | 1010-E06 | 10 | 10 | 70 | 5 | 10 | 10 | RCGT 0602M0 | FTKA02565 | | | TW07P |
| | 1212-F06 | 12 | 12 | 80 | 6 | 12 | 12 | | | | | |
| | 1616-H06 | 16 | 16 | 100 | 8 | 16 | 12 | | | | | |
| | 2525-M06 | 25 | 25 | 150 | 12.5 | 25 | 20 | | | | | |
| | 1616-H08 | 16 | 16 | 100 | 8 | 16 | 16 | RCGT 0803M0 | FTNA0307 | - | - | TW09P |
| | 2020-K08 | 20 | 20 | 125 | 10 | 20 | 20 | | | | | |
| | 2525-M08 | 25 | 25 | 150 | 12.5 | 25 | 20 | | | | | |
| | 1616-H10 | 16 | 16 | 100 | 8 | 16 | 25 | | | | | |
| | 2020-K10 | 20 | 20 | 125 | 10 | 20 | 25 | RCGT 1003M0 | FTKA03511A | SR10S | SHXN0509F | TW15P HW35L |
| | 2525-M10 | 25 | 25 | 150 | 12.5 | 25 | 25 | | | | | |
| | 2020-K12 | 20 | 20 | 125 | 10 | 20 | 28 | | | | | |
| | 2525-M12 | 25 | 25 | 150 | 12.5 | 25 | 28 | | | | | |

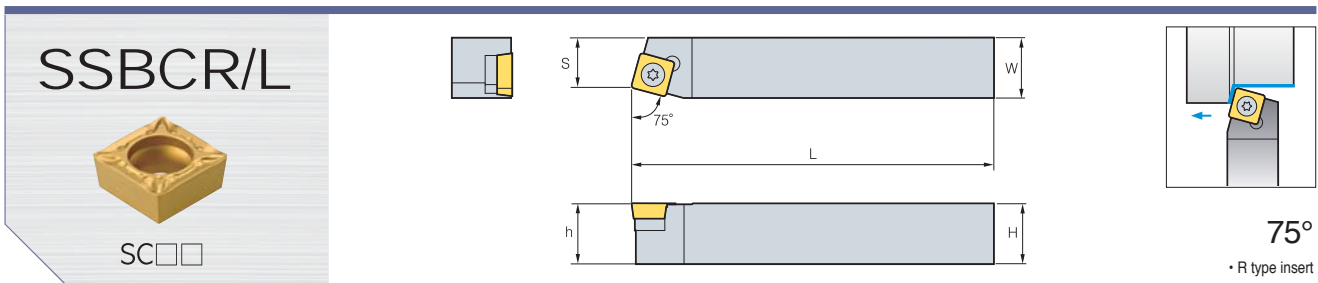
Applicable inserts, see pages B54~B70



• R type insert

| Designation | | H | W | L | S | h | ℓ | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|----|----|---|-------------|------------|-------|-----------|----------------|
| SRGCR/L | 1010-E06 | 10 | 10 | 70 | 12 | 10 | - | RCGT 0602M0 | FTKA02565 | | | TW07P |
| | 1212-F06 | 12 | 12 | 80 | 16 | 12 | - | | | | | |
| | 1616-H06 | 16 | 16 | 100 | 20 | 16 | - | | | | | |
| SRGCR/L | 1616-H08 | 16 | 16 | 100 | 20 | 16 | - | RCGT 0803M0 | FTNA0307 | | | TW09P |
| | 2020-K08 | 20 | 20 | 125 | 25 | 20 | - | | | | | |
| | 2525-M08 | 25 | 25 | 150 | 32 | 25 | - | | | | | |
| SRGCR/L | 1616-H10 | 16 | 16 | 100 | 20 | 16 | - | RCGT 1003M0 | FTKA03511A | SR10S | SHXN0509F | TW15P HW35L |
| | 2020-K10 | 20 | 20 | 125 | 25 | 20 | - | | | | | |
| | 2525-M10 | 25 | 25 | 150 | 32 | 25 | - | | | | | |
| SRGCR/L | 2020-K12 | 20 | 20 | 125 | 25 | 20 | - | RCGT 1204M0 | FTGA03512 | SR12S | SHXN0509F | TW15P HW35L |
| | 2525-M12 | 25 | 25 | 150 | 32 | 25 | - | | | | | |

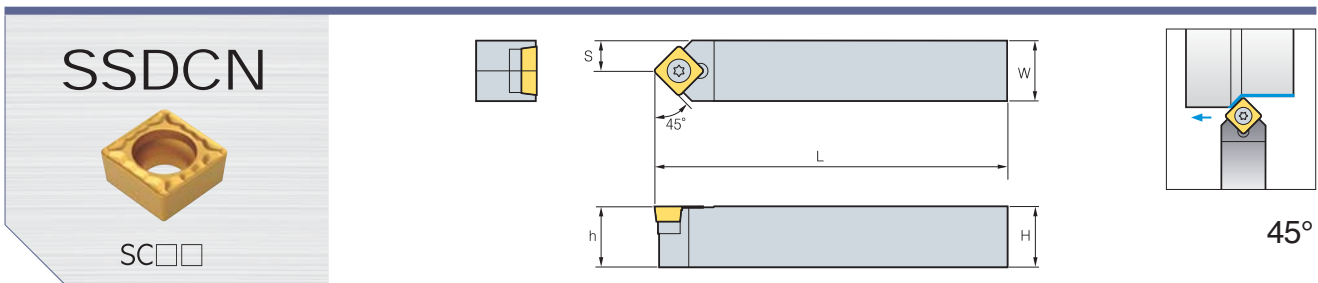
Applicable inserts, see pages B54~B70



75°
• R type insert

| Designation | | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|----|----|------------|-----------|-------|-----------|--------------|
| SSBCR/L | 1212-F09 | 12 | 12 | 80 | 11 | 12 | SC□□09T3□□ | FTGA03508 | - | - | TW15P |
| | 1616-H09 | 16 | 16 | 100 | 13 | 16 | | FTGA03512 | SS32S | SHXN0509F | TW15P, HW35L |
| | 2020-K12 | 20 | 20 | 125 | 17 | 20 | | FTGA0411F | SS42S | SHXN0610F | TW15P, HW40L |

Applicable inserts, see pages B54, B71

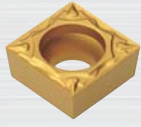


45°

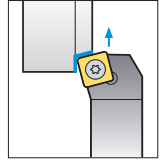
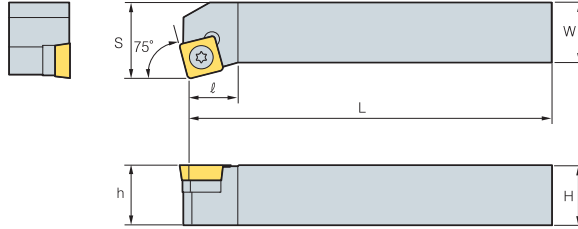
| Designation | | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|---|----|------------|-----------|-------|-----------|--------------|
| SSDCN | 1212-F09 | 12 | 12 | 80 | 6 | 12 | SC□□09T3□□ | FTGA03508 | - | - | TW15P |
| | 1616-H09 | 16 | 16 | 100 | 8 | 16 | | FTGA03512 | SS32S | SHXN0509F | TW15P, HW35L |

Applicable inserts, see pages B54, B71

SSKCR/L



SC□□



75°

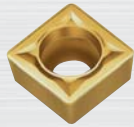
• R type insert

(mm)

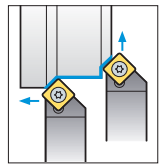
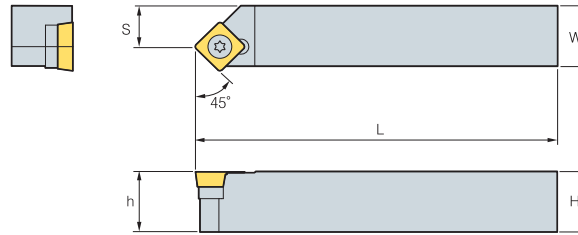
| Designation | H | W | L | S | h | ℓ | Insert | Screw | Shim | ShimScrew | Wrench |
|------------------|----|----|-----|----|----|----|------------|-----------|-------|-----------|--------------|
| SSKCR/L 1616-H09 | 16 | 16 | 100 | 20 | 16 | 13 | SC□□09T3□□ | FTGA03512 | SS32S | SHXN0509F | TW15P, HW35L |

Applicable inserts, see pages B54, B71

SSSCR/L



SC□□



45°

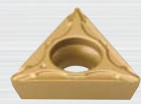
• R type insert

(mm)

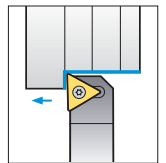
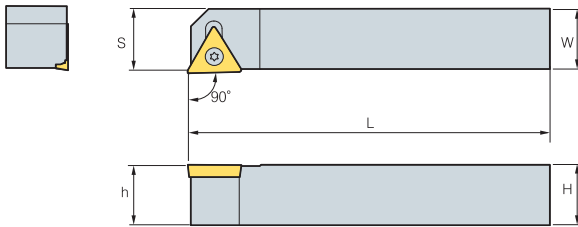
| Designation | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|------------------|----|----|-----|----|----|------------|-----------|-------|-----------|--------------|
| SSSCR/L 1616-H09 | 16 | 16 | 100 | 17 | 16 | SC□□09T3□□ | FTGA03512 | SS32S | SHXN0509F | TW15P, HW35L |
| 2020-K12 | 20 | 20 | 125 | 21 | 20 | SC□□1204□□ | FTGA0411F | SS42S | SHXN0610F | TW15P, HW40L |

Applicable inserts, see pages B54, B71

STACR/L



TC□□



90°

• R type insert

(mm)

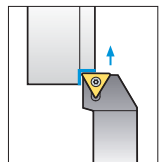
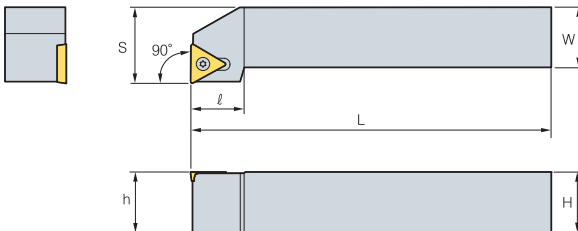
| Designation | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|------------------|----|----|----|------|----|------------|-----------|------|-----------|--------|
| STACR/L 1010-E09 | 10 | 10 | 70 | 10.5 | 10 | TC□□0902□□ | FTKA02206 | - | - | TW06P |
| 1212-F11 | 12 | 12 | 80 | 12.5 | 12 | TC□□1102□□ | FTKA02565 | - | - | TW07P |

Applicable inserts, see pages B59, B72

STFCR/L



TC□□



90°


• R type insert

(mm)

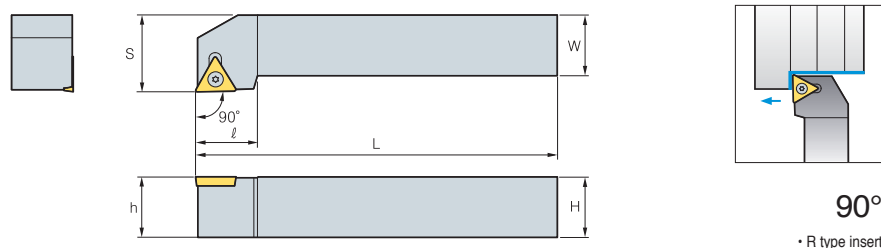
| Designation | H | W | L | S | h | ℓ | Insert | Screw | Shim | ShimScrew | Wrench |
|------------------|----|----|-----|----|----|----|------------|-----------|-------|-----------|--------------|
| STFCR/L 1010-E09 | 10 | 10 | 70 | 12 | 10 | 10 | TC□□0902□□ | FTKA02206 | - | - | TW06P |
| 1212-F11 | 12 | 12 | 80 | 16 | 12 | 14 | TC□□1102□□ | FTKA02565 | - | - | W07P |
| 1616-H11 | 16 | 16 | 100 | 20 | 16 | 14 | | | | | |
| 1616-H16 | 16 | 16 | 100 | 20 | 16 | 19 | TC□□16T3□□ | FTGA03512 | ST32S | SHXN0509F | TW15P, HW35L |
| 2020-K16 | 20 | 20 | 125 | 25 | 20 | 19 | | | | | |

Applicable inserts, see pages B59, B72

STGCR/L



TC□□




90°
• R type insert

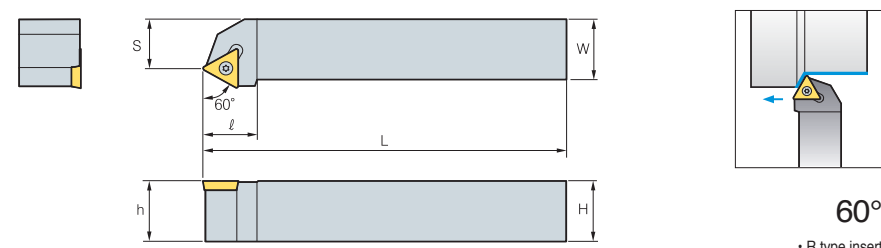
| Designation | | H | W | L | S | h | l | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|-----|-----|----|----|------------|------------|-----------|-----------|--------------|--------|
| STGCR/L | 0808-D09 | 08 | 08 | 60 | 10 | 08 | 11 | TC□□0902□□ | FTKA02206 | - | - | TW06P |
| | 1010-E09 | 10 | 10 | 70 | 12 | 10 | 11 | | | | | |
| | 1212-F11 | 12 | 12 | 80 | 16 | 12 | 14 | TC□□1102□□ | FTKA02565 | - | - | TW07P |
| | 1616-H11 | 16 | 16 | 100 | 20 | 16 | 16 | | | | | |
| 2020-K16 | 20 | 20 | 125 | 25 | 20 | 21 | TC□□16T3□□ | FTGA03512 | ST32S | SHXN0509F | TW15P, HW35L | |
| 2525-M16 | 25 | 25 | 150 | 32 | 25 | 21 | | | | | | |

Applicable inserts, see pages B59, B72

STTCR/L



TC□□




60°
• R type insert

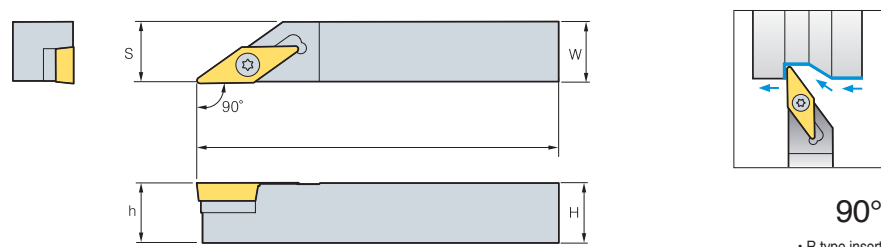
| Designation | | H | W | L | S | h | l | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|----|----|----|------------|-----------|-------|-----------|--------------|
| STTCR/L | 1616-H11 | 16 | 16 | 100 | 13 | 16 | 14 | TC□□1102□□ | FTKA02565 | - | - | TW07P |
| | 1616-H16 | 16 | 16 | 100 | 13 | 16 | 19 | | | | | |
| | 2020-K16 | 20 | 20 | 125 | 17 | 20 | 19 | TC□□16T3□□ | FTGA03512 | ST32S | SHXN0509F | TW15P, HW35L |

Applicable inserts, see pages B59, B72

SVABR/L



VB□□

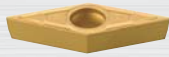


90°
• R type insert

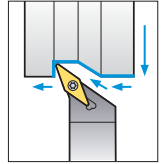
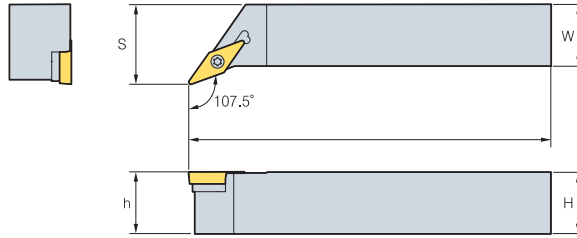
| Designation | | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|------|----|------------|-----------|-------|-----------|--------------|
| SVABR/L | 1616-H16 | 16 | 16 | 100 | 16.5 | 16 | VB□□1604□□ | FTGA03512 | SV32S | SHXN0509F | TW15P, HW35L |
| | 2020-K16 | 20 | 20 | 125 | 20.5 | 20 | | | | | |

Applicable inserts, see pages B63, B64, B73

SVHBR/L



VB□□



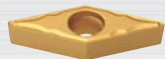
107.5°
• R type insert

(mm)

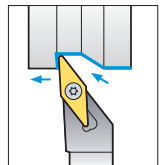
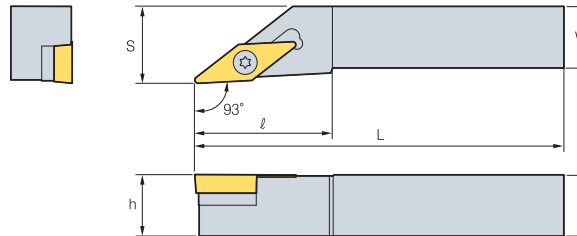
| Designation | | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|----|----|------------|-----------|-------|-----------|----------------|
| SVHBR/L | 2525-M16 | 25 | 25 | 150 | 32 | 25 | VB□□1604□□ | FTGA03512 | SV32S | SHXN0509F | TW15P HW35L |
| | 3225-P16 | 32 | 25 | 170 | 32 | 32 | | | | | |

Applicable inserts, see pages B63, B64, B73

SVJBR/L



VB□□



93°
• R type insert

(mm)

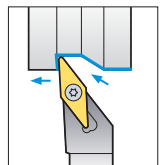
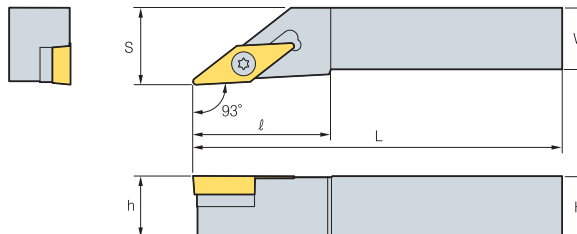
| Designation | | H | W | L | S | h | l | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|-----|-----|----|----|------------|------------|-----------|-----------|--------------|--------------|
| SVJBR/L | 1212-F11 | 12 | 12 | 80 | 16 | 12 | 27 | VB□□1102□□ | FTKA02565 | - | - | TW07P |
| | 1616-H11 | 16 | 16 | 100 | 20 | 16 | 27 | | | | | |
| | 2020-K11 | 20 | 20 | 125 | 25 | 20 | 27 | | | | | |
| | 1616-H16 | 16 | 16 | 100 | 20 | 16 | 36 | VB□□1604□□ | FTGA03512 | SV32S | SHXN0509F | TW15P, HW35L |
| | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 41 | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 32 | 25 | 41 | | | | | |
| 3225-P16 | 32 | 25 | 170 | 32 | 32 | 55 | VB□□1604□□ | FTGA03512 | SV32S | SHXN0509F | TW15P, HW35L | |

Applicable inserts, see pages B63, B64, B73

SVJCR/L



VC□□

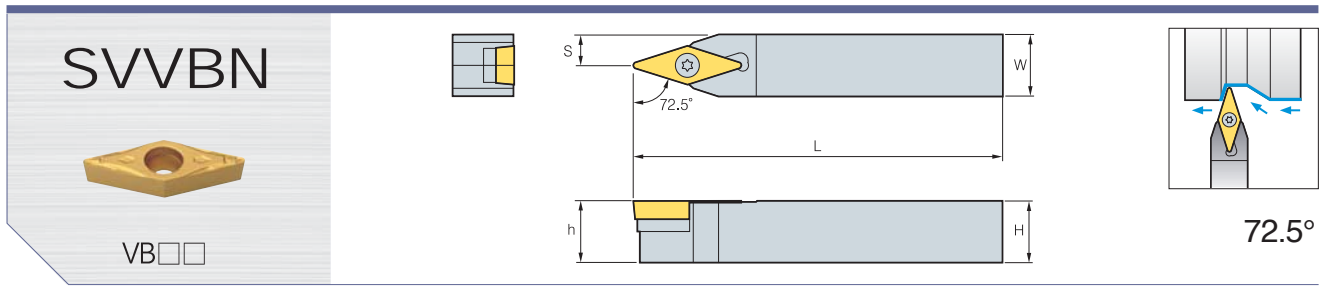


93°
• R type insert

(mm)

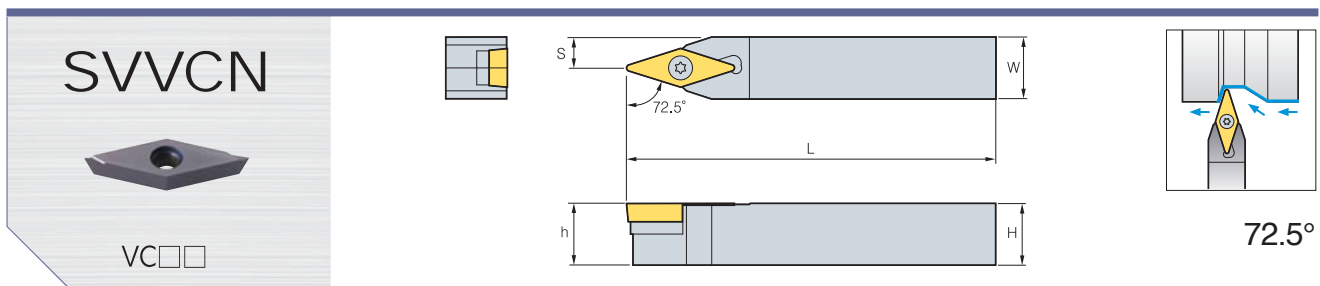
| Designation | | H | W | L | S | h | l | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|-----|-----|----|----|----|------------|-----------|-------|-----------|----------------|
| SVJCR/L | 1212-F11 | 12 | 12 | 80 | 16 | 12 | 25 | VC□□1103□□ | FTKA02565 | - | - | TW07P |
| | 1616-H11 | 16 | 16 | 100 | 20 | 16 | 25 | | | | | |
| | 2020-K11 | 20 | 20 | 125 | 25 | 20 | 25 | | | | | |
| | 1212-F13 | 12 | 12 | 80 | 16 | 12 | 32 | VC□□1303□□ | FTKA0307 | - | - | TW09P |
| | 1616-H13 | 16 | 16 | 100 | 20 | 16 | 32 | | | | | |
| | 2020-K13 | 20 | 20 | 125 | 25 | 20 | 32 | | | | | |
| | 1616-H16 | 16 | 16 | 100 | 20 | 16 | 40 | VC□□1604□□ | FTGA03512 | SV32S | SHXN0509F | TW15P HW35L |
| | 2020-K16 | 20 | 20 | 125 | 25 | 20 | 40 | | | | | |
| 2525-M16 | 25 | 25 | 150 | 32 | 25 | 40 | | | | | | |

Applicable inserts, see pages B65, B74



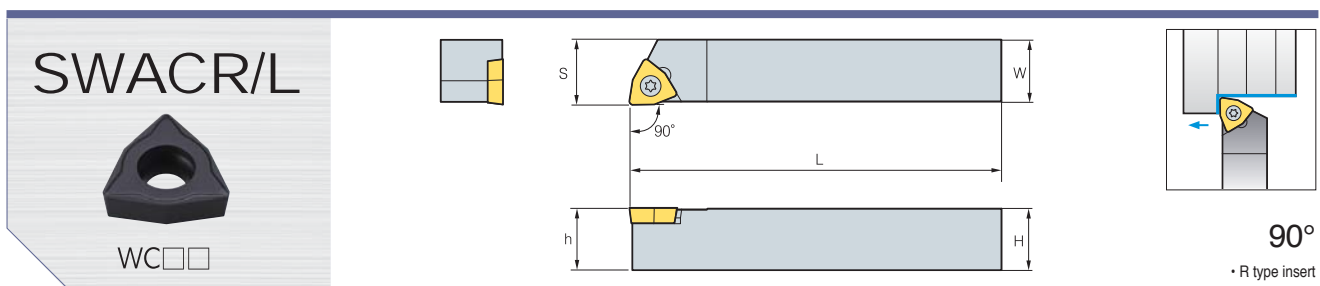
| Designation | | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|------|----|------------|-----------|-----------|--------------|--------|
| SVVBN | 1212-F11 | 12 | 12 | 80 | 6 | 12 | VB□□1102□□ | FTKA02565 | - | - | TW07P |
| | 1616-H11 | 16 | 16 | 100 | 8 | 16 | | | | | |
| | 2020-K11 | 20 | 20 | 125 | 10 | 20 | | | | | |
| | 1616-H16 | 16 | 16 | 100 | 8 | 16 | | | | | |
| VB□□1604□□ | 2020-K16 | 20 | 20 | 125 | 10 | 20 | FTGA03512 | SV32S | SHXN0509F | TW15P, HW35L | |
| | 2525-M16 | 25 | 25 | 150 | 12.5 | 25 | | | | | |
| | 3225-P16 | 32 | 25 | 170 | 12.5 | 32 | | | | | |

Applicable inserts, see pages B63, B64, B73



| Designation | | H | W | L | S | h | Insert | Screw | Shim | ShimScrew | Wrench |
|-------------|----------|----|----|-----|------|----|------------|-----------|-----------|----------------|--------|
| SVVCN | 1212-F11 | 12 | 12 | 80 | 6 | 12 | VC□□1103□□ | FTKA02565 | - | - | TW07P |
| | 1616-H11 | 16 | 16 | 100 | 8 | 16 | | | | | |
| | 2020-K11 | 20 | 20 | 125 | 10 | 20 | | | | | |
| | 1212-F13 | 12 | 12 | 80 | 6 | 12 | | | | | |
| VC□□1303□□ | 1616-H13 | 16 | 16 | 100 | 8 | 16 | FTNA0307 | - | - | TW09P | |
| | 2020-K13 | 20 | 20 | 125 | 10 | 20 | | | | | |
| VC□□1604□□ | 1616-H16 | 16 | 16 | 100 | 8 | 16 | FTGA03512 | SV32S | SHXN0509F | TW15P HW35L | |
| | 2020-K16 | 20 | 20 | 125 | 10 | 20 | | | | | |
| | 2525-M16 | 25 | 25 | 150 | 12.5 | 25 | | | | | |

Applicable inserts, see pages B65, B74

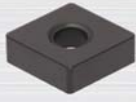


| Designation | | H | W | L | S | h | Insert | Screw | Wrench |
|-------------|----------|----|----|-----|------|----|------------|-----------|--------|
| SWACR/L | 1010-E04 | 10 | 10 | 70 | 10.1 | 10 | WC□□0402□□ | FTKA02565 | TW07P |
| | 1212-F04 | 12 | 12 | 80 | 12.1 | 12 | | | |
| | 1616-H06 | 16 | 16 | 100 | 16.1 | 16 | | | |
| | 2020-K08 | 20 | 20 | 125 | 20.1 | 20 | | | |
| WC□□06T3□□ | | | | | | | FTGA03508 | TW15P | |
| WC□□0804□□ | | | | | | | FTGA0411F | TW15P | |

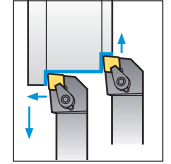
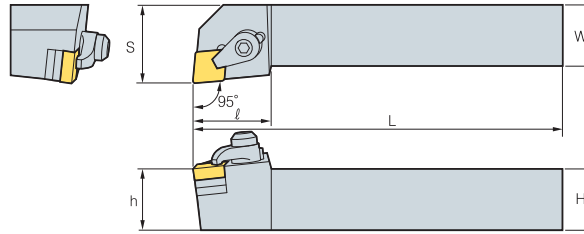
Applicable inserts, see pages B66

B Ceramic Holder

CCLNR/L



CN□N



95°

• R type insert

(mm)

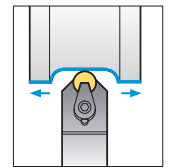
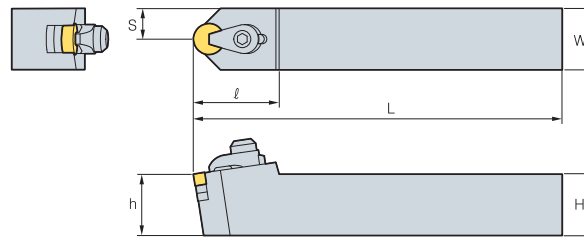
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Screw | Shim | Spring | Wrench |
|-------------------|----|----|-----|----|----|----|-----------------------|-------|--------------------|--------|--------|----------------|
| CCLNR/L 2525-M12C | 25 | 25 | 150 | 32 | 25 | 32 | CN□N 1204□□ 1207□□ | CH6R3 | MHX0630 SHX0310 | SC42CC | SR3 | HW40L HW20L |

Applicable inserts, see pages B75

CRDNN



RN□N



(mm)

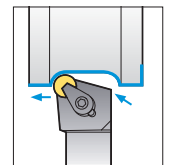
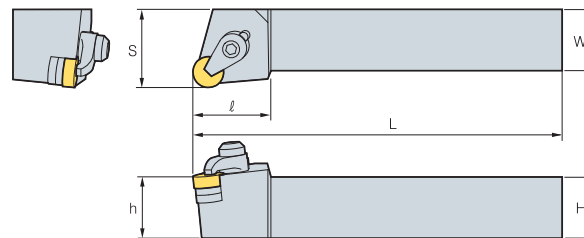
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Screw | Shim | Spring | Wrench |
|-----------------|----|----|-----|------|----|----|-----------------------|-------|--------------------|--------|--------|----------------|
| CRDNN 2525-M12C | 25 | 25 | 150 | 12.5 | 25 | 35 | RN□N 1204□□ 1207□□ | CH6R3 | MHX0630 SHX0310 | SR42CC | SR3 | HW40L HW20L |

Applicable inserts, see pages B76

CRGNR/L



RN□N



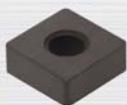
• R type insert

(mm)

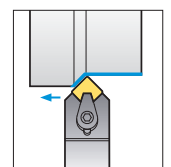
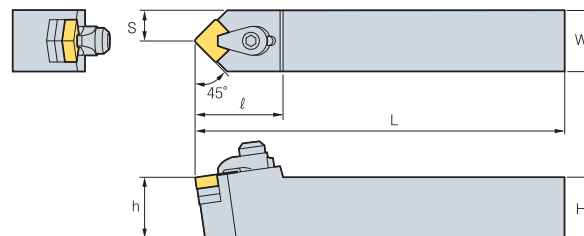
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Screw | Shim | Spring | Wrench |
|-------------------|----|----|-----|----|----|----|-----------------------|-------|--------------------|--------|--------|----------------|
| CRGNR/L 2525-M12C | 25 | 25 | 150 | 32 | 25 | 32 | RN□N 1204□□ 1207□□ | CH6R3 | MHX0630 SHX0310 | SR42CC | SR3 | HW40L HW20L |

Applicable inserts, see pages B76

CSDNN



SN□N



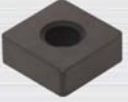
45°

(mm)

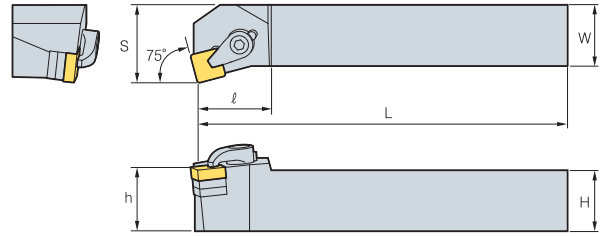
| Designation | H | W | L | S | h | ℓ | Insert | Clamp | Screw | Shim | Spring | Wrench |
|-----------------|----|----|-----|------|----|----|-----------------------|-------|--------------------|--------|--------|----------------|
| CSDNN 2525-M12C | 25 | 25 | 125 | 12.5 | 25 | 35 | SN□N 1204□□ 1207□□ | CH6R3 | MHX0630 SHX0310 | SS42CC | SR3 | HW40L HW20L |

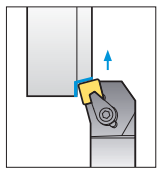
Applicable inserts, see pages B75

CSKNR/L



SN□N






75°
• R type insert

(mm)

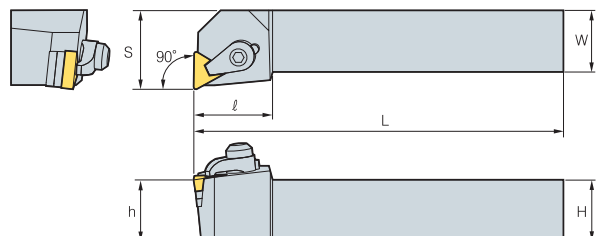
| Designation | H | W | L | S | h | l | Insert | Clamp | Screw | Shim | Spring | Wrench |
|-------------------|----|----|-----|----|----|----|-----------------------|-------|--------------------|--------|--------|----------------|
| CSKNR/L 2525-M12C | 25 | 25 | 150 | 32 | 25 | 28 | SN□N 1204□□ 1207□□ | CH6R3 | MHX0630 SHX0310 | SR42CC | SR3 | HW40L HW20L |

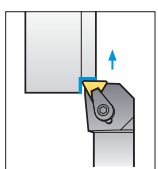
Applicable inserts, see pages B75

CTFNR/L



TN□N






90°
• R type insert

(mm)

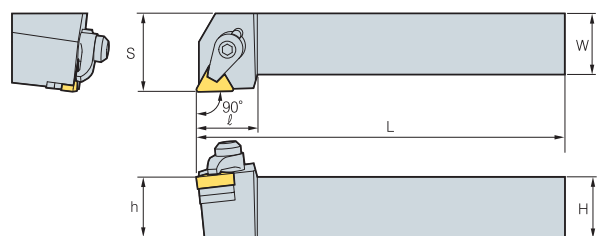
| Designation | H | W | L | S | h | l | Insert | Clamp | Screw | Shim | Spring | Wrench |
|-------------------|----|----|-----|----|----|----|-----------------------|-------|--------------------|--------|--------|----------------|
| CTFNR/L 2525-M16C | 25 | 25 | 150 | 32 | 25 | 32 | TN□N 1604□□ 1607□□ | CH6R3 | MHX0630 SHX0310 | ST32CC | SR3 | HW40L HW20L |

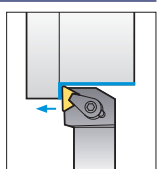
Applicable inserts, see pages B75

CTGNR/L



TN□N





90°
• R type insert

(mm)

| Designation | H | W | L | S | h | l | Insert | Clamp | Screw | Shim | Spring | Wrench |
|-------------------|----|----|-----|----|----|----|-----------------------|-------|--------------------|--------|--------|----------------|
| CTGNR/L 2525-M16C | 25 | 25 | 150 | 32 | 25 | 32 | TN□N 1604□□ 1607□□ | CH6R3 | MHX0630 SHX0310 | ST32CC | SR3 | HW40L HW20L |

Applicable inserts, see pages B75



Note) Generally, two shims are clamped to a Ceramic Holder.
However, only one shim is used in clamping 1207□□ and 1607□□ sized inserts.

S 12 M - S T F P R - 11

1

Type of Bar

2

Bar Diameter

3

Bar Length

4

Method of Mounting Insert

5

Insert Shape

6

Lead Angle of Boring Bar

7

Relief Angle of Insert

8

Hand of Bar

9

Length of Cutting Edge

1

Type of Bar

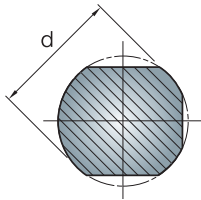
S12M-STFPR-11

- "A" Steel with coolant hole
- "E" Carbide bar with fixed steel head and coolant hole
- "C" Carbide shank
- "S" Steel shank
- "X" Special type

2

Bar Diameter

S12M-STFPR-11



3

Bar Length

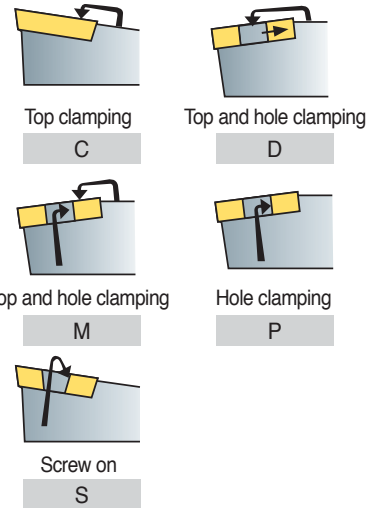
S12M-STFPR-11

| length(L) (mm) | |
|----------------|-----|
| H | 100 |
| J | 110 |
| K | 125 |
| M | 150 |
| N | 160 |
| Q | 180 |
| R | 200 |
| S | 250 |
| T | 300 |
| U | 350 |
| V | 400 |
| W | 450 |
| Y | 500 |

4

Method of Mounting Insert

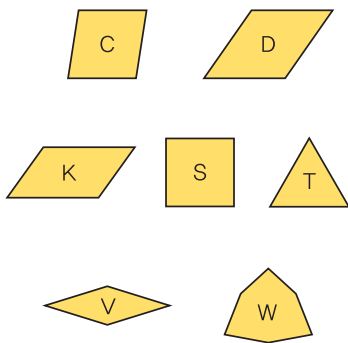
S12M-STFPR-11



5

Insert Shape

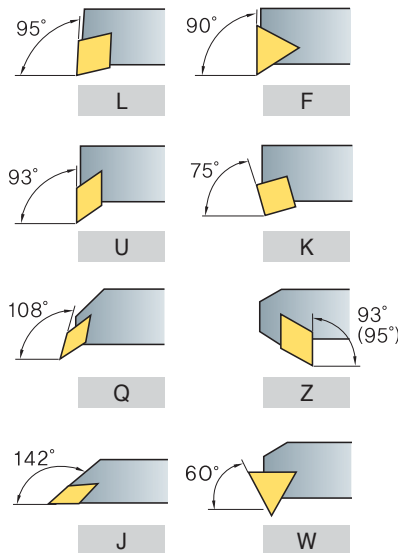
S12M-STFPR-11



6

Lead Angle of Boring Bar

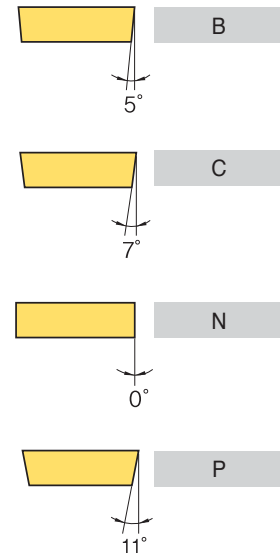
S12M-STFPR-11



7

Relief Angle of Insert

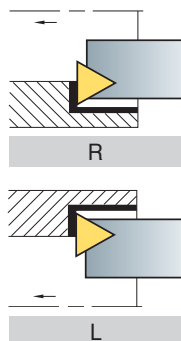
S12M-STFPR-11



8

Hand of Bar

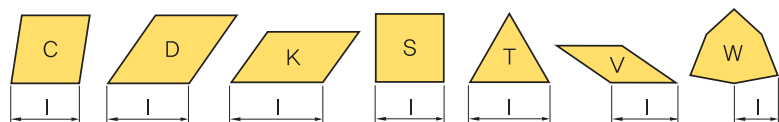
S12M-STFPR-11



9

Length of Cutting Edge

S12M-STFPR-11



Double Clamp System

| | | | | | | | | |
|----------------|---------|---------|---------|---------|----------|--|--|--|
| Cutting Shape | | | | | | | | |
| Designation | DCLNR/L | DDUNR/L | DSKNR/L | DTFNR/L | DWLNLR/L | | | |
| Approach angle | 95° | 93° | 75° | 90° | 95° | | | |
| Page | B126 | B126 | B126 | B127 | B127 | | | |
| Copying | | ● | | | | | | |
| Facing | ● | | | | ● | | | |
| Back turning | | ● | | | | | | |
| Turning | ● | ● | ● | ● | ● | | | |

Lever Lock System

| | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|----------|--|--|
| Cutting Shape | | | | | | | | |
| Designation | PCLNR/L | PDSNR/L | PDUNR/L | PSKNR/L | PTFNR/L | PWLNLR/L | | |
| Approach angle | 95° | 62.5° | 93° | 75° | 90° | 95° | | |
| Page | B128 | B128 | B129 | B129 | B130 | B130 | | |
| Copying | | ● | ● | | | | | |
| Facing | ● | | | | | ● | | |
| Back turning | | ● | ● | | | ● | | |
| Turning | ● | ● | ● | ● | ● | ● | | |

Clamp on System

| | | | | | | | | |
|----------------|---------|---------|---------|--|--|--|--|--|
| Cutting Shape | | | | | | | | |
| Designation | CKUNR/L | CSKPR/L | CTFPR/L | | | | | |
| Approach angle | 93° | 75° | 90° | | | | | |
| Page | B131 | B131 | B131 | | | | | |
| Copying | | | | | | | | |
| Facing | | | | | | | | |
| Back turning | ● | | | | | | | |
| Turning | ● | ● | ● | | | | | |

Multi Lock System

| | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|----------|--|--|
| Cutting Shape | | | | | | | | |
| Designation | MCLNR/L | MDUNR/L | MSKNR/L | MTFNR/L | MVUNR/L | MWLNLR/L | | |
| Approach angle | 95° | 93° | 75° | 90° | 93° | 95° | | |
| Page | B132 | B132 | B132 | B133 | B133 | B133 | | |
| Copying | | ● | | | ● | | | |
| Facing | ● | | | | | ● | | |
| Back turning | | ● | | | ● | | | |
| Turning | ● | ● | ● | ● | ● | ● | | |



Screw on System

| | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Cutting Shape | | | | | | | | |
| Designation | SCLCR/L | SCLPR/L | SDQCR/L | SDUCR/L | SDZCR/L | SSKCR/L | SSKPR/L | STFCR/L |
| Approach angle | 95° | 95° | 107.5° | 93° | 3° | 75° | 75° | 90° |
| Page | B134 | B134 | B135 | B135 | B136 | B136 | B136 | B137 |
| Copying | | | ● | ● | | | | |
| Facing | ● | ● | | | | | | |
| Back turning | | | ● | ● | ● | | | |
| Turning | ● | ● | ● | ● | ● | ● | ● | ● |

| | | | | | | | | |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Cutting Shape | | | | | | | | |
| Designation | STFPR/L | STWPR/L | SVJCR/L | SVQBR/L | SVQCR/L | SVUBR/L | SVUCR/L | SWLCR/L |
| Approach angle | 90° | 60° | 142° | 108° | 108° | 93° | 93° | 95° |
| Page | B137 | B137 | B138 | B138 | B138 | B139 | B139 | B139 |
| Copying | | | ● | ● | ● | ● | ● | ● |
| Facing | | | | | | | | |
| Back turning | | | | ● | ● | ● | ● | ● |
| Turning | ● | ● | ● | ● | ● | ● | ● | ● |

Compact Mini

| | | | | | | | | |
|----------------|---------|---------|---------|---------|--|--|--|--|
| Cutting Shape | | | | | | | | |
| Designation | SCLCR/L | STUBR/L | STUPR/L | SWUBR/L | | | | |
| Approach angle | 95° | 93° | 93° | 93° | | | | |
| Page | B140 | B140 | B140 | B140 | | | | |
| Copying | | | | | | | | |
| Facing | ● | ● | | | | | | |
| Back turning | | | ● | | | | | |
| Turning | ● | ● | ● | ● | | | | |

Carbide Shank Boring Bar

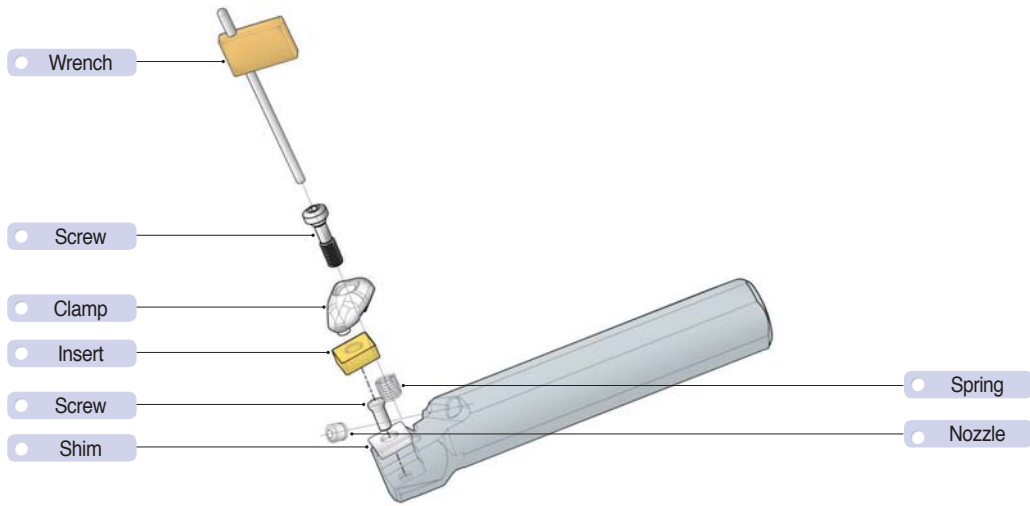
| | | | | | |
|----------------|---------|---------|---------|---------|---------|
| Designation | SCLCR/L | SCLPR/L | SDQCR/L | SDUCR/L | STFCR/L |
| Approach angle | 95° | 95° | 107.5° | 93° | 91° |
| Page | B141 | B142 | B142 | B143 | B143 |
| Designation | STFPR/L | STUBR/L | STUPR/L | SWUBR/L | - |
| Approach angle | 91° | 93° | 93° | 93° | - |
| Page | B144 | B144 | B145 | B145 | - |

Sleeve

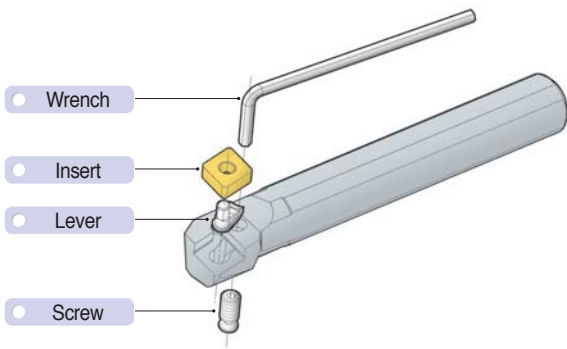
| | | |
|-------------|------|--|
| Shape | | |
| Designation | SL | |
| Page | B178 | |

Instructions of Boring Bar assembly

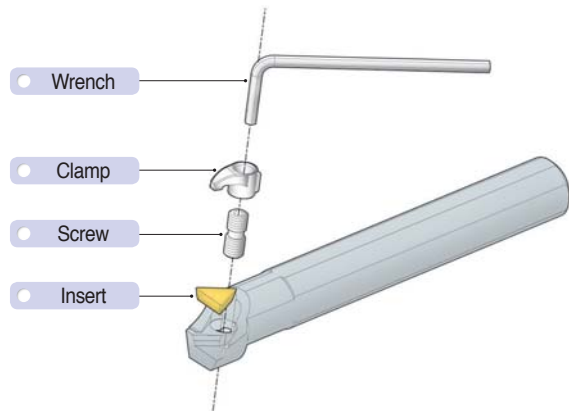
Double Clamp System



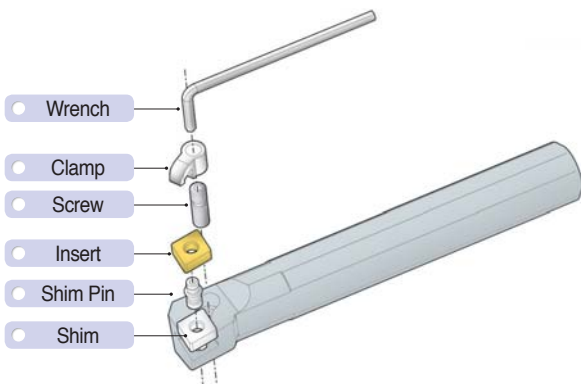
Lever Lock System



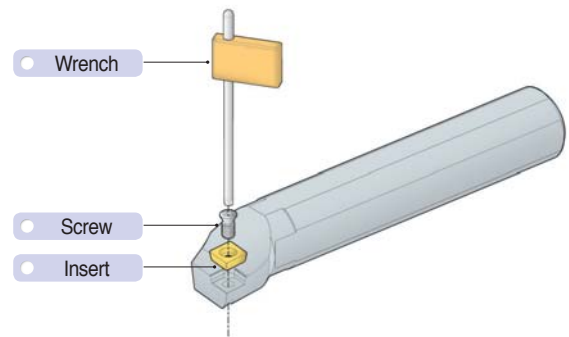
Clamp on System



Multi Lock System

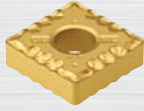


Screw on System

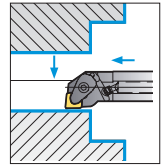
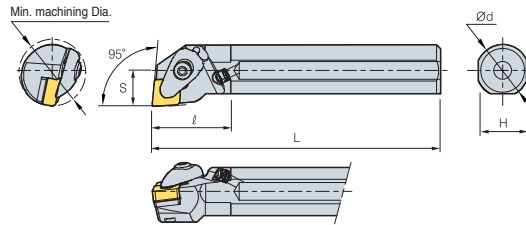


B Double Clamp System

DCLNR/L



CN□□



95°

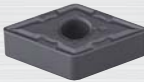
• R type insert

(mm)

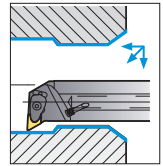
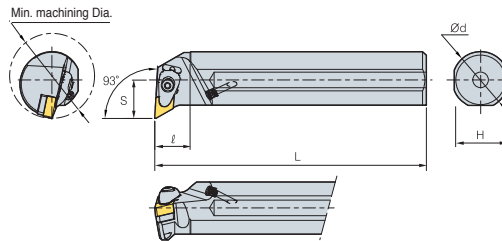
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Nozzle | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-------|-------------|-------|------------|---------|--------|--------|
| A25R-DCLNR/L-09 | 32 | 25 | 23 | 200 | 17 | 27 | CN□□0903□□ | CVH3 | CHX0415 | SC32V | FTKA0307 | SPR0510 | CN0605 | HW25P |
| A25R-DCLNR/L-12 | 32 | 25 | 23 | 200 | 17 | 28 | CN□□1204□□ | CVH4 | CHX0518 | SC42V | FTKA0410 | SPR0714 | CN0605 | HW30P |
| A32S-DCLNR/L-12 | 40 | 32 | 30 | 250 | 22 | 27 | | | | | | | | |
| A40T-DCLNR/L-12 | 50 | 40 | 37 | 300 | 27 | 30 | CN□□1604□□ | CVH5 | CHX0622 | SC54V | FTNA0511 | SPR0811 | CN0605 | HW40L |
| A50U-DCLNR/L-16 | 63 | 50 | 47 | 350 | 35 | 40 | | | | | | | | |

Applicable inserts, see pages B18~B22

DDUNR/L



DN□□



93°

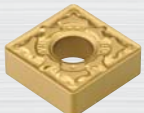
• R type insert

(mm)

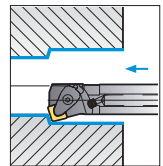
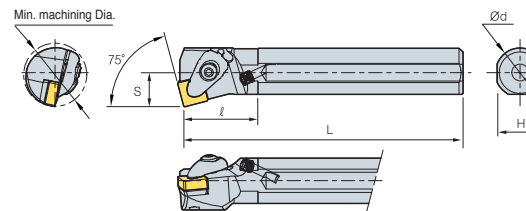
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Nozzle | Wrench |
|-------------------|----|----|----|-----|----|----|------------|-------|-------------|-------|------------|---------|--------|--------|
| A40T-DDUNR/L-15 | 50 | 40 | 37 | 300 | 27 | 25 | DN□□1506□□ | CVH4 | CHX0518 | SD44V | FTKA0410 | SPR0714 | CN0605 | HW30P |
| A50U-DDUNR/L-15 | 63 | 50 | 47 | 350 | 35 | 30 | | | | | | | | |
| A40T-DDUNR/L-15-3 | 50 | 40 | 37 | 300 | 27 | 25 | DN□□1504□□ | CVH4 | CHX0518 | SD43V | FTKA0410 | SPR0714 | CN0605 | HW30P |
| A50U-DDUNR/L-15-3 | 63 | 50 | 47 | 350 | 35 | 30 | | | | | | | | |

Applicable inserts, see pages B23~B26

DSKNR/L



SN□□



75°

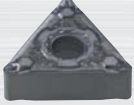
• R type insert

(mm)

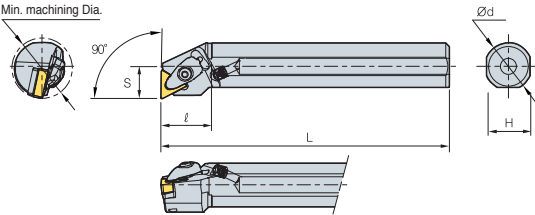
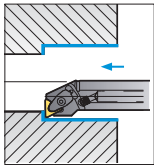
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Nozzle | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-------|-------------|-------|------------|---------|--------|--------|
| A25R-DSKNR/L-09 | 32 | 25 | 23 | 200 | 17 | 27 | SN□□0903□□ | CVH3 | CHX0415 | SS32V | FTKA0307 | SPR0510 | CN0605 | HW25P |
| A25R-DSKNR/L-12 | 32 | 25 | 23 | 200 | 17 | 28 | SN□□1204□□ | CVH4 | CHX0518 | SS42V | FTKA0410 | SPR0714 | CN0605 | HW30P |
| A32S-DSKNR/L-12 | 40 | 32 | 30 | 250 | 22 | 28 | | | | | | | | |
| A40T-DSKNR/L-12 | 50 | 40 | 37 | 300 | 27 | 28 | | | | | | | | |

Applicable inserts, see pages B28~B34

DTFNR/L



TN□□





90°
• R type insert

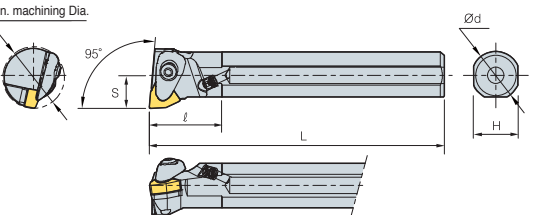
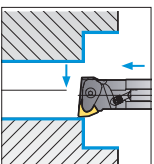
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Nozzle | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-------|-------------|-------|------------|---------|--------|--------|
| | | | | | | | | | | | | | | |
| A25R-DTFNR/L-16 | 32 | 25 | 23 | 200 | 17 | 27 | TN□□1604□□ | CVH3 | CHX0415 | ST32V | FTKA0307 | SPR0510 | CN0605 | HW25P |
| A32S-DTFNR/L-16 | 40 | 32 | 30 | 250 | 22 | 27 | TN□□2204□□ | CVH4 | CHX0518 | ST44V | FTKA0410 | SPR0714 | CN0605 | HW30P |
| A40T-DTFNR/L-22 | 50 | 40 | 37 | 300 | 27 | 33 | | | | | | | | |
| A50U-DTFNR/L-22 | 63 | 50 | 47 | 350 | 35 | 33 | | | | | | | | |

Applicable inserts, see pages B35~B41

DWLNLR/L



WN□□

95°
• R type insert

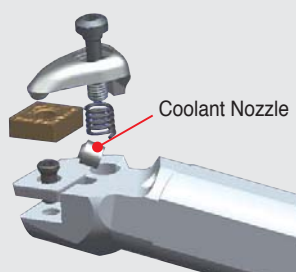
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim Screw | Spring | Nozzle | Wrench |
|------------------|----|----|----|-----|----|----|------------|-------|-------------|-------|------------|---------|--------|--------|
| | | | | | | | | | | | | | | |
| A25R-DWLNLR/L-06 | 32 | 25 | 23 | 200 | 17 | 19 | WN□□0604□□ | CVH3 | CHX0415 | SW32V | FTKA0307 | SPR0510 | CN0605 | HW25P |
| A32S-DWLNLR/L-06 | 40 | 32 | 30 | 250 | 22 | 20 | | | | | | | | |
| A40T-DWLNLR/L-06 | 50 | 40 | 37 | 300 | 27 | 25 | | | | | | | | |
| A25R-DWLNLR/L-08 | 33 | 25 | 23 | 200 | 17 | 20 | WN□□0804□□ | CVH4 | CHX0518 | SW42V | FTKA0410 | SPR0714 | CN0605 | HW30P |
| A32S-DWLNLR/L-08 | 40 | 32 | 30 | 250 | 22 | 24 | | | | | | | | |
| A40T-DWLNLR/L-08 | 50 | 40 | 37 | 300 | 27 | 25 | | | | | | | | |
| A50U-DWLNLR/L-08 | 63 | 50 | 47 | 350 | 35 | 32 | | | | | | | | |

Applicable inserts, see pages B45~B48



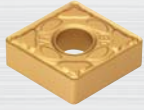
Features of Double Clamp (Boring bar)

Longer tool life and excellent surface finish can be achieved with the adjustable Coolant Nozzle

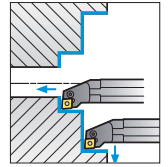
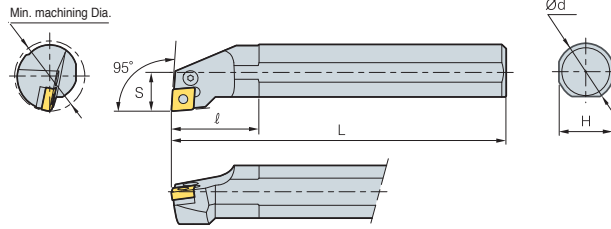


B Lever Lock System

PCLNR/L



CN□□



95°

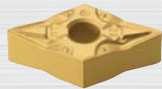
• R type insert

(mm)

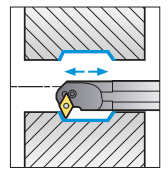
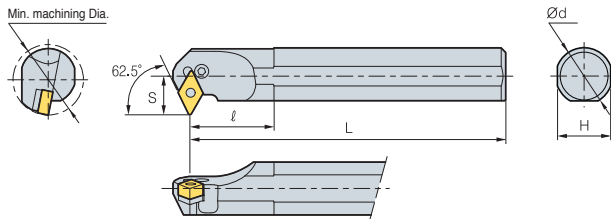
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Lever | Screw | Shim | Shim pin | Shimpin Punch | Wrench |
|------------------|----|----|----|-----|----|----|------------|-------|-----------|-------|----------|---------------|--------|
| S16R-PCLNR/L-09 | 20 | 16 | 15 | 200 | 11 | 28 | CN□□0903□□ | LV3C | VHX0509B | - | - | - | HW20L |
| S20S-PCLNR/L-09 | 25 | 20 | 18 | 250 | 13 | 32 | | LV4A | VHX0613A | - | - | - | HW25L |
| S25R-PCLNR/L-09 | 32 | 25 | 23 | 200 | 17 | 36 | CN□□1204□□ | LV4 | VHX0821 | SC42B | SP4 | LSPS4 | HW30L |
| S25R-PCLNR/L-12 | 32 | 25 | 23 | 200 | 17 | 40 | | LV4A | VHX0613A | - | - | - | HW25L |
| S32S-PCLNR/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | LV6 | VHX1027 | SC63 | SP6 | LSPS6 | HW40L |
| S40T-PCLNR/L-12 | 50 | 40 | 37 | 300 | 27 | 55 | | LV4A | VHX0613A | - | - | - | HW25L |
| S50U-PCLNR/L-12 | 63 | 50 | 47 | 350 | 35 | 55 | CN□□1906□□ | LV4 | VHX0821 | SC42B | SP4 | LSPS4 | HW30L |
| S50U-PCLNR/L-19 | 70 | 50 | 47 | 350 | 35 | 63 | | LV6 | VHX1027 | SC63 | SP6 | LSPS6 | HW40L |
| A25R-PCLNR/L-12 | 32 | 25 | 24 | 200 | 17 | 40 | CN□□1204□□ | LV4 | VHX0821 | SC42B | SP4 | LSPS4 | HW30L |
| A32S-PCLNR/L-12 | 44 | 32 | 31 | 250 | 22 | 50 | | LV4 | VHX0821 | SC42B | SP4 | LSPS4 | HW30L |
| A40T-PCLNR/L-12 | 50 | 40 | 47 | 300 | 27 | 60 | | | | | | | |
| S16R-PCLNR/L-09N | 20 | 16 | 15 | 200 | 11 | 25 | CN□□0903□□ | LV3CN | VHX0509BN | - | - | - | HW20L |
| S20S-PCLNR/L-09N | 25 | 20 | 18 | 250 | 13 | 25 | | LV4AN | VHX0613N | - | - | - | HW25L |
| S25R-PCLNR/L-09N | 32 | 25 | 23 | 200 | 17 | 25 | CN□□1204□□ | LV4AN | VHX0613N | - | - | - | HW25L |
| S25R-PCLNR/L-12N | 32 | 25 | 23 | 200 | 17 | 25 | | LV4AN | VHX0613N | - | - | - | HW25L |
| S25T-PCLNR/L-12N | 32 | 25 | 23 | 300 | 17 | 25 | | LV4N | VHX0817N | SC42N | SP4N | LSPS4 | HW30L |
| S32S-PCLNR/L-12N | 40 | 32 | 30 | 250 | 22 | 30 | | LV4AN | VHX0820N | SC42N | SP4N | LSPS4 | HW30L |
| S32U-PCLNR/L-12N | 40 | 32 | 30 | 350 | 22 | 30 | CN□□1906□□ | LV4AN | VHX0820N | SC42N | SP4N | LSPS4 | HW30L |
| S40T-PCLNR/L-12N | 50 | 40 | 37 | 300 | 27 | 30 | | LV4N | VHX0820N | SC42N | SP4N | LSPS4 | HW30L |
| S50U-PCLNR/L-12N | 63 | 50 | 47 | 350 | 35 | 30 | CN□□1906□□ | LV6N | VHX1027N | SC63N | SP6N | LSPS6 | HW40L |
| S50U-PCLNR/L-19N | 63 | 50 | 47 | 350 | 35 | 30 | | LV6N | VHX1027N | SC63N | SP6N | LSPS6 | HW40L |
| A16R-PCLNR/L-09N | 20 | 16 | 15 | 200 | 11 | 28 | CN□□0903□□ | LV3CN | VHX0509BN | - | - | - | HW20L |
| A20S-PCLNR/L-09N | 25 | 20 | 18 | 250 | 13 | 25 | | LV4AN | VHX0613N | - | - | - | HW25L |
| A25R-PCLNR/L-09N | 32 | 25 | 23 | 200 | 17 | 25 | CN□□1204□□ | LV4AN | VHX0613N | - | - | - | HW25L |
| A25R-PCLNR/L-12N | 32 | 25 | 23 | 200 | 17 | 25 | | LV4AN | VHX0613N | - | - | - | HW25L |
| A32R-PCLNR/L-12N | 40 | 32 | 30 | 250 | 22 | 30 | | LV4N | VHX0817N | SC42N | SP4N | LSPS4 | HW30L |
| A40T-PCLNR/L-12N | 50 | 40 | 37 | 300 | 27 | 30 | | LV4N | VHX0820N | SC42N | SP4N | LSPS4 | HW30L |
| A50U-PCLNR/L-12N | 63 | 50 | 47 | 350 | 35 | 30 | CN□□1906□□ | LV4N | VHX0820N | SC42N | SP4N | LSPS4 | HW30L |
| A50U-PCLNR/L-19N | 63 | 50 | 47 | 350 | 35 | 30 | | LV6N | VHX1027N | SC63N | SP6N | LSPS6 | HW40L |

Applicable inserts, see pages B18~B22

PDSNR/L



DN□□



62.5°

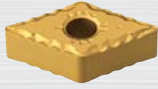
• R type insert

(mm)

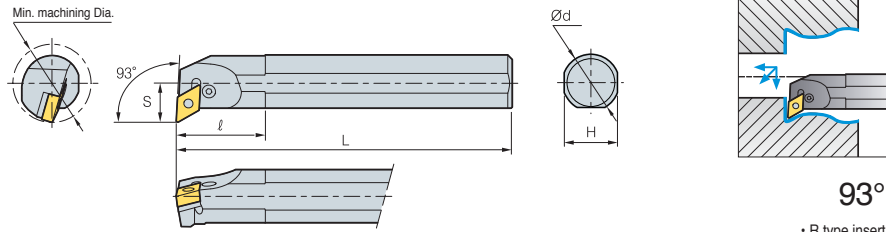
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Lever | Screw | Shim | Shim pin | Shimpin Punch | Wrench |
|--------------------|----|----|----|-----|----|----|------------|-------|---------|-------|----------|---------------|--------|
| S32S-PDSNR/L-15 | 40 | 32 | 30 | 250 | 22 | 45 | DN□□1506□□ | LV4B | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S40T-PDSNR/L-15 | 50 | 40 | 37 | 300 | 27 | 43 | | LV4 | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S32S-PDSNR/L-15-3 | 40 | 32 | 30 | 450 | 22 | 45 | DN□□1504□□ | LV4B | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S40T-PDSNR/L-15-3 | 50 | 40 | 37 | 300 | 27 | 43 | | LV4 | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| A32S-PDSNR/L-15 | 40 | 32 | 31 | 250 | 22 | 45 | DN□□1506□□ | LV4B | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| A32S-PDSNR/L-15-3 | 40 | 32 | 31 | 250 | 22 | 45 | | LV4 | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S32S-PDSNR/L-15N | 40 | 32 | 30 | 250 | 22 | 15 | DN□□1506□□ | LV4BN | VHX0821 | SD42N | SP4N | LSPS4 | HW30L |
| S40T-PDSNR/L-15N | 50 | 40 | 37 | 300 | 27 | 15 | | LV4BN | VHX0821 | SD43N | SP4N | LSPS4 | HW30L |
| S32S-PDSNR/L-15-3N | 40 | 32 | 30 | 250 | 22 | 15 | DN□□1504□□ | LV4BN | VHX0821 | SD43N | SP4N | LSPS4 | HW30L |
| S40T-PDSNR/L-15-3N | 50 | 40 | 37 | 300 | 27 | 15 | | LV4BN | VHX0821 | SD42N | SP4N | LSPS4 | HW30L |
| A32S-PDSNR/L-15N | 40 | 32 | 30 | 250 | 22 | 15 | DN□□1506□□ | LV4BN | VHX0821 | SD42N | SP4N | LSPS4 | HW30L |
| A40T-PDSNR/L-15N | 50 | 40 | 37 | 300 | 27 | 15 | | LV4BN | VHX0821 | SD43N | SP4N | LSPS4 | HW30L |
| A32S-PDSNR/L-15-3N | 40 | 32 | 30 | 450 | 22 | 15 | DN□□1504□□ | LV4BN | VHX0821 | SD43N | SP4N | LSPS4 | HW30L |
| A40T-PDSNR/L-15-3N | 50 | 40 | 37 | 300 | 27 | 15 | | LV4BN | VHX0821 | SD43N | SP4N | LSPS4 | HW30L |

Applicable inserts, see pages B23~B26

PDUNR/L



DN□□

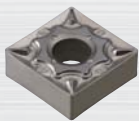


93°
• R type insert
(mm)

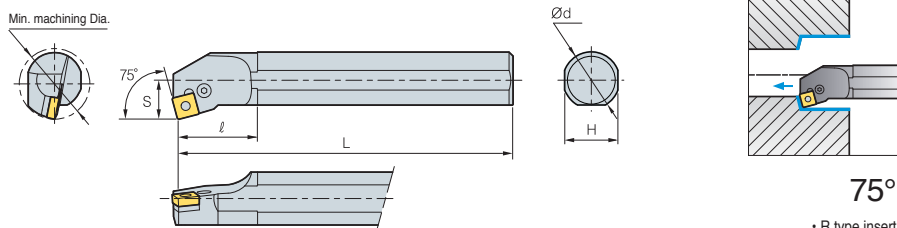
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Lever | Screw | Shim | Shim pin | Shimpin Punch | Wrench |
|--------------------|----|----|----|-----|----|----|------------|-------|-----------|--------|----------|---------------|--------|
| S20S-PDUNR/L-11 | 25 | 20 | 18 | 250 | 13 | 30 | DN□□1104□□ | LV3D | VHX0512B | - | - | - | HW20L |
| S25R-PDUNR/L-11 | 32 | 25 | 23 | 200 | 17 | 35 | | LV3 | VHX0617 | SD317 | SP3 | LSPS3 | HW25L |
| S32S-PDUNR/L-11 | 40 | 32 | 30 | 250 | 22 | 40 | | LV4B | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S32S-PDUNR/L-15 | 40 | 32 | 30 | 250 | 22 | 50 | DN□□1506□□ | LV4 | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S40T-PDUNR/L-15 | 50 | 40 | 37 | 300 | 27 | 50 | | LV4B | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S50U-PDUNR/L-15 | 63 | 50 | 47 | 350 | 35 | 63 | | LV4 | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S32S-PDUNR/L-15-3 | 40 | 32 | 30 | 250 | 22 | 50 | DN□□1506□□ | LV4B | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S40T-PDUNR/L-15-3 | 50 | 40 | 37 | 300 | 27 | 50 | | LV4 | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| A32S-PDUNR/L-15 | 40 | 32 | 31 | 250 | 22 | 50 | | LV4B | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| A32S-PDUNR/L-15-3 | 40 | 32 | 31 | 250 | 22 | 50 | DN□□1504□□ | LV4 | VHX0821 | SD42 | SP4 | LSPS4 | HW30L |
| S20S-PDUNR/L-11N | 25 | 20 | 18 | 250 | 13 | 25 | DN□□1104□□ | LV3DN | VHX0512BN | - | - | - | HW20L |
| S25R-PDUNR/L-11N | 32 | 25 | 23 | 200 | 17 | 35 | | LV3AN | VHX0617N | SD317N | SP3N-1 | LSPS3 | HW30L |
| S32S-PDUNR/L-11N | 40 | 32 | 30 | 250 | 22 | 40 | | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | HW30L |
| S32S-PDUNR/L-15N | 40 | 32 | 30 | 250 | 22 | 50 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | HW30L |
| S32U-PDUNR/L-15N | 40 | 32 | 30 | 350 | 22 | 50 | | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |
| S40T-PDUNR/L-15N | 50 | 40 | 37 | 300 | 27 | 50 | | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |
| S50U-PDUNR/L-15N | 63 | 50 | 47 | 350 | 35 | 50 | DN□□1506□□ | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |
| S32S-PDUNR/L-15-3N | 40 | 32 | 30 | 250 | 22 | 50 | | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |
| S40T-PDUNR/L-15-3N | 50 | 40 | 37 | 300 | 27 | 50 | | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |
| A20S-PDUNR/L-11N | 25 | 20 | 18 | 250 | 13 | 25 | DN□□1104□□ | LV3DN | VHX0512BN | - | - | - | HW20L |
| A25R-PDUNR/L-11N | 32 | 25 | 23 | 200 | 17 | 35 | | LV3AN | VHX0617N | SD317N | SP3N-1 | LSPS3 | HW30L |
| A32S-PDUNR/L-11N | 40 | 32 | 30 | 250 | 22 | 40 | | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | HW30L |
| A32S-PDUNR/L-15N | 40 | 32 | 30 | 250 | 22 | 50 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | HW30L |
| A40T-PDUNR/L-15N | 50 | 40 | 37 | 300 | 27 | 50 | | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | HW30L |
| A50U-PDUNR/L-15N | 63 | 50 | 47 | 350 | 35 | 50 | | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |
| A32S-PDUNR/L-15-3N | 40 | 32 | 30 | 250 | 22 | 50 | DN□□1506□□ | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |
| A40T-PDUNR/L-15-3N | 50 | 40 | 37 | 300 | 27 | 50 | | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | HW30L |

Applicable inserts, see pages B23~B26

PSKNR/L



SN□□



75°
• R type insert
(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Lever | Screw | Shim | Shim pin | Shimpin Punch | Wrench |
|------------------|----|----|----|-----|----|----|------------|-------|----------|-------|----------|---------------|--------|
| S25R-PSKNR/L-12 | 32 | 25 | 23 | 200 | 17 | 42 | SN□□1204□□ | LV4A | VHX0613A | - | - | - | HW25L |
| S32S-PSKNR/L-12 | 40 | 32 | 30 | 250 | 22 | 45 | | LV4 | VHX0821 | SS42B | SP4 | LSPS4 | HW30L |
| S40T-PSKNR/L-12 | 50 | 40 | 37 | 300 | 27 | 50 | | LV4A | VHX0613A | - | SP4 | - | HW25L |
| A25R-PSKNR/L-12 | 32 | 25 | 23 | 200 | 17 | 42 | SN□□1204□□ | LV4 | VHX0821 | SS42B | SP4 | LSPS4 | HW30L |
| A32S-PSKNR/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | LV4AN | VHX0613N | - | - | - | HW25L |
| S25R-PSKNR/L-12N | 32 | 25 | 23 | 200 | 17 | 25 | SN□□1204□□ | LV4N | VHX0821N | SS42N | SP4N | LSPS4 | HW30L |
| S32S-PSKNR/L-12N | 40 | 32 | 30 | 250 | 22 | 30 | | LV4AN | VHX0613N | - | - | - | HW25L |
| S40T-PSKNR/L-12N | 50 | 40 | 37 | 300 | 27 | 30 | | LV4N | VHX0821N | SS42N | SP4N | LSPS4 | HW30L |
| A25R-PSKNR/L-12N | 32 | 25 | 23 | 200 | 17 | 25 | SN□□1204□□ | LV4AN | VHX0613N | - | - | - | HW25L |
| A32S-PSKNR/L-12N | 40 | 32 | 30 | 250 | 22 | 30 | | LV4N | VHX0821N | SS42N | SP4N | LSPS4 | HW30L |
| A40T-PSKNR/L-12N | 50 | 40 | 37 | 300 | 27 | 30 | | LV4N | VHX0821N | SS42N | SP4N | LSPS4 | HW30L |

Applicable inserts, see pages B28~B34



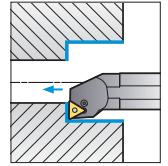
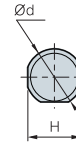
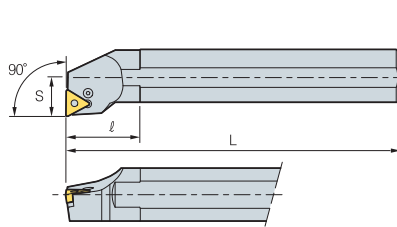
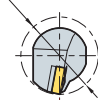
B Lever Lock System

PTFNR/L



TN□□

Min. machining Dia.



90°

• R type insert

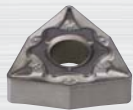
(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Lever | Screw | Shim | Shim pin | Shimpin Punch | Wrench |
|------------------|----|----|----|-----|----|----|------------|-------|----------|------|----------|---------------|--------|
| S16R-PTFNR/L-11 | 20 | 16 | 15 | 200 | 11 | 28 | TN□□1103□□ | LV2 | VHX0509B | - | - | - | HW25L |
| S20S-PTFNR/L-11 | 25 | 20 | 18 | 250 | 13 | 33 | | | | | | | |
| S25R-PTFNR/L-11 | 32 | 25 | 23 | 200 | 17 | 36 | | | | | | | |
| S25R-PTFNR/L-16 | 32 | 25 | 23 | 200 | 17 | 42 | TN□□1604□□ | LV3B | VHX0512B | - | - | - | HW20L |
| S32S-PTFNR/L-16 | 44 | 32 | 30 | 250 | 22 | 50 | | | | | | | |
| S40T-PTFNR/L-16 | 54 | 40 | 37 | 300 | 27 | 55 | | | | | | | |
| A25R-PTFNR/L-16 | 32 | 25 | 24 | 200 | 17 | 40 | | | | | | | |
| A32S-PTFNR/L-16 | 40 | 32 | 31 | 250 | 22 | 50 | | | | | | | |
| S25R-PTFNR/L-16N | 32 | 25 | 23 | 200 | 17 | 42 | | | | | | | |
| S25T-PTFNR/L-16N | 32 | 25 | 23 | 300 | 17 | 40 | TN□□1604□□ | LV3B | VHX0512B | - | - | - | HW20L |
| S32S-PTFNR/L-16N | 44 | 32 | 30 | 250 | 22 | 50 | | | | | | | |
| S40T-PTFNR/L-16N | 54 | 40 | 37 | 300 | 27 | 55 | | | | | | | |
| A25R-PTFNR/L-16N | 32 | 25 | 23 | 200 | 17 | 42 | TN□□1604□□ | LV3BN | VHX0512B | - | - | - | HW20L |
| A32S-PTFNR/L-16N | 44 | 32 | 30 | 250 | 22 | 50 | | | | | | | |
| A40T-PTFNR/L-16N | 54 | 40 | 37 | 300 | 27 | 55 | | | | | | | |
| | | | | | | | | | | | | | |



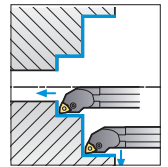
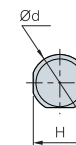
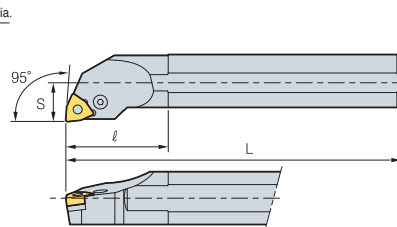
Applicable inserts, see pages B35~B41

PWLNR/L



WN□□

Min. machining Dia.



95°

• R type insert

(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Lever | Screw | Shim | Shim pin | Shimpin Punch | Wrench |
|------------------|----|----|----|-----|----|----|------------|----------|-----------|------|----------|---------------|--------|
| S20S-PWLNR/L-06 | 25 | 20 | 18 | 250 | 13 | 40 | WN□□0604□□ | LV3B | VHX0512B | - | - | - | HW20L |
| S25R-PWLNR/L-06 | 32 | 25 | 23 | 200 | 17 | 40 | | | | | | | |
| S32S-PWLNR/L-06 | 44 | 32 | 30 | 250 | 22 | 45 | | | | | | | |
| S25R-PWLNR/L-08 | 32 | 25 | 23 | 200 | 17 | 45 | WN□□0804□□ | LV4A | VHX0613A | - | - | - | HW25L |
| S32S-PWLNR/L-08 | 44 | 32 | 30 | 250 | 22 | 50 | | | | | | | |
| S20S-PWLNR/L-06N | 25 | 20 | 18 | 250 | 13 | 40 | WN□□0604□□ | LV3BN | VHX0512BN | - | - | - | HW20L |
| S25R-PWLNR/L-06N | 32 | 25 | 23 | 200 | 17 | 40 | | | | | | | |
| S32S-PWLNR/L-06N | 44 | 32 | 30 | 250 | 22 | 45 | | | | | | | |
| S25R-PWLNR/L-08N | 32 | 25 | 23 | 200 | 17 | 25 | WN□□0804□□ | LV4AN | VHX0613N | - | - | - | HW25L |
| S32S-PWLNR/L-08N | 44 | 32 | 30 | S | 22 | 25 | | | | | | | |
| | | | | | | | LV4N | VHX0820N | SW42N | SP4N | LSPS4 | HW30L | |




Applicable inserts, see pages B45~B48

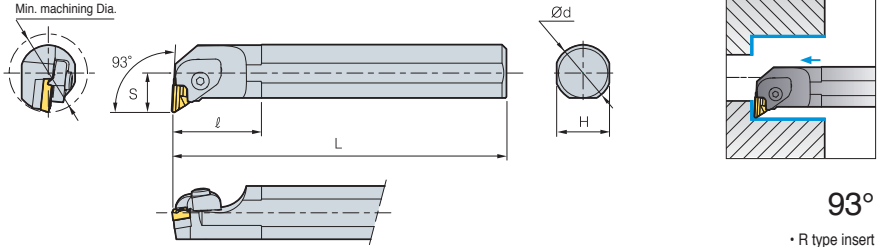


- Improved holders and parts ensure performance and durability
- “N” stand for New type (Holders and parts)

CKUNR/L



KN□□




93°
• R type insert

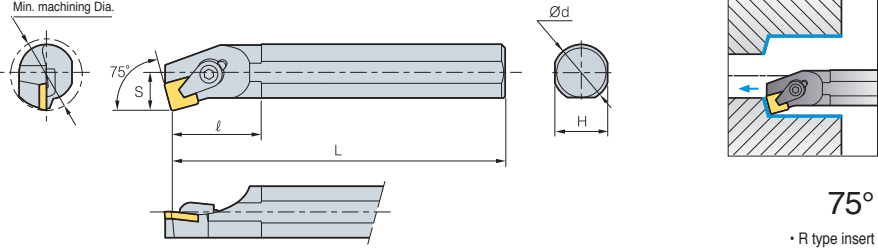
| Designation | ØD | Ød | H | L | S | l | Insert | (mm) | | | | | | |
|---------------|----|----|----|-----|----|----|-------------|--------|-------------|------------|--------|------------|------------|----------------|
| | | | | | | | | Clamp | Clamp Screw | Spring | Shim | pin+Spring | Shim Screw | Wrench |
| S32S-CKUNR-16 | 40 | 32 | 30 | 250 | 22 | 70 | KN□□1604□□L | CTH6LI | CHX0625 | SR3 SR4 | SK33CL | PN0515 | SHX0310 | HW40L HW20L |
| S40T-CKUNR-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | | | | |
| S50U-CKUNR-16 | 63 | 50 | 43 | 350 | 35 | 55 | | | | | | | | |
| S32S-CKUNL-16 | 40 | 32 | 30 | 250 | 22 | 70 | KN□□1604□□R | CTH6RI | CHX0625 | SR3 SR4 | SK33C | PN0515 | SHX0310 | HW40L HW20L |
| S40T-CKUNL-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | | | | |
| S50U-CKUNL-16 | 63 | 50 | 43 | 350 | 35 | 55 | | | | | | | | |

Applicable inserts, see pages B27

CSKPR/L



SP□□




75°
• R type insert

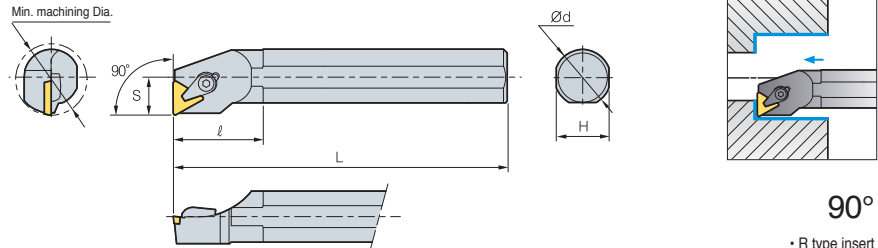
| Designation | ØD | Ød | H | L | S | l | Insert | (mm) | | | |
|-----------------|----|----|----|-----|----|----|------------|--------|-------------|--------|--------|
| | | | | | | | | Clamp | Clamp Screw | C-ring | Wrench |
| S16R-CSKPR/L-09 | 20 | 16 | 15 | 200 | 11 | 30 | SP□□0903□□ | CH4R1C | CHX0414 | CR02C | HW25L |
| S20S-CSKPR/L-09 | 25 | 20 | 18 | 250 | 13 | 36 | | CH5R5C | CHX0519C | CR03C | HW30L |
| S20S-CSKPR/L-12 | 25 | 20 | 18 | 250 | 13 | 28 | SP□□1203□□ | CH6R5 | CH0616 | CR04C | HW30L |
| S25R-CSKPR/L-12 | 32 | 25 | 23 | 300 | 17 | 40 | | | | | |

Applicable inserts, see pages B55~B57

CTFPR/L



TP□□

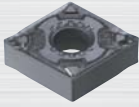


90°
• R type insert

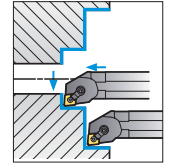
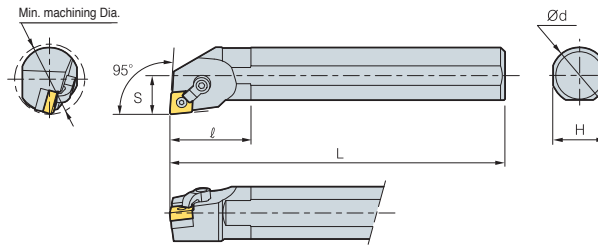
| Designation | ØD | Ød | H | L | S | l | Insert | (mm) | | | | | | |
|-----------------|----|----|----|-----|----|----|------------|--------|-------------|--------|-------|----------|--------|-------|
| | | | | | | | | Clamp | Clamp Screw | C-ring | Shim | Shim pin | Wrench | |
| S12M-CTFPR/L-11 | 16 | 12 | 11 | 150 | 9 | 26 | TP□□1103□□ | CH4R1C | CHX0414C | CR02C | - | - | - | HW25L |
| S16R-CTFPR/L-11 | 20 | 16 | 15 | 200 | 11 | 40 | | | | | | | | |
| S20S-CTFPR/L-11 | 25 | 20 | 18 | 250 | 13 | 40 | | | | | | | | |
| S16R-CTFPR/L-16 | 20 | 16 | 15 | 200 | 11 | 40 | TP□□1603□□ | CH5R5C | CHX0519C | CR03C | - | - | - | HW30L |
| S20S-CTFPR/L-16 | 25 | 20 | 18 | 250 | 13 | 40 | | | | | | | | |
| S25R-CTFPR/L-16 | 32 | 25 | 23 | 200 | 17 | 40 | | | | | | | | |
| S32S-CTFPR/L-16 | 40 | 32 | 30 | 250 | 22 | 45 | | | | | | | | |
| S40T-CTFPR/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | TP□□2204□□ | CH6R5 | CHX0622C | CR04C | ST32C | SP3C | - | - |
| S40T-CTFPR/L-22 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | | | | |
| S40T-CTFPR/L-22 | 50 | 40 | 37 | 300 | 27 | 60 | TP□□2204□□ | CH83R1 | CH0823C | CR05C | ST43C | SP4C | HW40L | |

Applicable inserts, see pages B61~B62

MCLNR/L



CN□□



95°

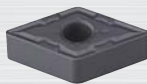
• R type insert

(mm)

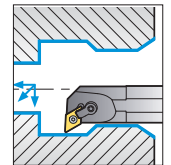
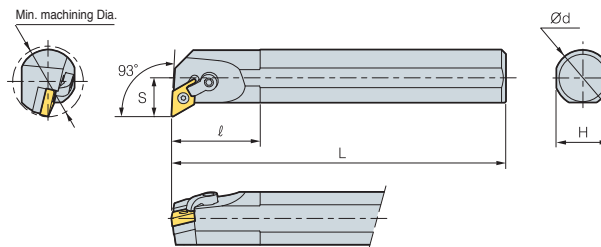
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim pin | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-------|-------------|------|----------|--------------------|
| S20S-MCLNR/L-09 | 25 | 20 | 18 | 250 | 13 | 30 | CN□□0903□□ | CDH7N | DHA10-32-19 | - | SP3D3 | HW19.8L HW23.8L |
| S25R-MCLNR/L-09 | 32 | 25 | 23 | 200 | 17 | 36 | CN□□1204□□ | CDH6N | DHA1/4-21 | - | SP4DS | HW31.8L |
| S25R-MCLNR/L-12 | 32 | 25 | 23 | 200 | 17 | 36 | | | | - | SP4D | HW23.8L |
| S32S-MCLNR/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | CN□□1204□□ | CDH6N | DHA1/4-21 | - | SP4DS | HW31.8L |
| S40T-MCLNR/L-12 | 50 | 40 | 37 | 300 | 27 | 60 | | | | - | SP4D | HW23.8L |
| A25R-MCLNR/L-12 | 32 | 25 | 23 | 200 | 17 | 40 | CN□□1204□□ | CDH6N | DHA1/4-21 | - | SP4DS | HW31.8L |
| A32S-MCLNR/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | | | - | SP4D | HW23.8L |

Applicable inserts, see pages B18~B22

MDUNR/L



DN□□



93°

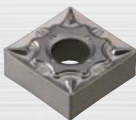
• R type insert

(mm)

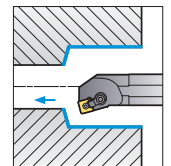
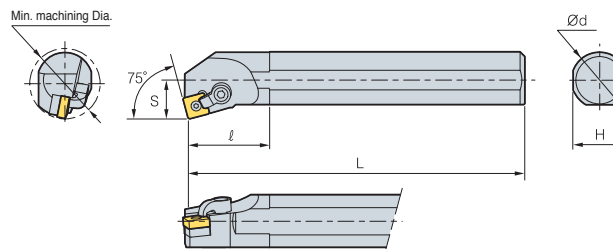
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim pin | Wrench |
|-------------------|----|----|----|-----|----|----|------------|-------|-------------|-------|----------|--------------------|
| S32S-MDUNR/L-15-3 | 40 | 32 | 30 | 250 | 22 | 50 | DN□□1504□□ | CDH6N | DHA1/4-21 | SD43D | SP4D | HW31.8L HW23.8L |
| S40T-MDUNR/L-15-3 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | | |
| A32S-MDUNR/L-15-3 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | | |

Applicable inserts, see pages B23~B26

MSKNR/L



SN□□



75°

• R type insert

(mm)

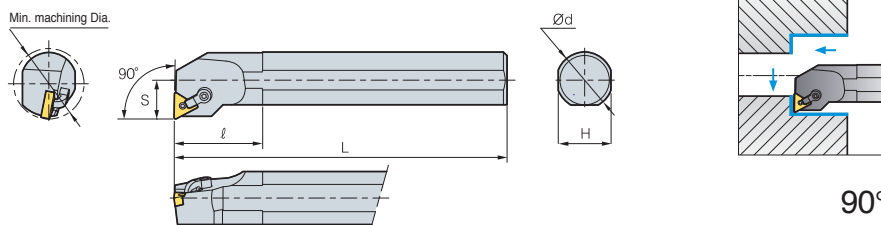
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Clamp | Clamp Screw | Shim | Shim pin | Wrench |
|-----------------|----|----|----|-----|----|----|------------|--------|-------------|------|----------|---------|
| S25R-MSKNR/L-12 | 32 | 25 | 23 | 200 | 17 | 36 | SN□□1204□□ | CDH8N1 | DHA5/16-28 | - | SP4DS | HW39.7L |
| S32S-MSKNR/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | | | - | SP4D | HW23.8L |
| S40T-MSKNR/L-12 | 50 | 40 | 37 | 300 | 27 | 60 | | | | - | SP4D | HW23.8L |
| A25R-MSKNR/L-12 | 32 | 25 | 23 | 200 | 17 | 40 | SN□□1204□□ | CDH8N1 | DHA5/16-28 | - | SP4DS | HW39.7L |
| A32S-MSKNR/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | | | | - | SP4D | HW23.8L |
| A40T-MSKNR/L-12 | 50 | 40 | 37 | 300 | 27 | 60 | | | | - | SP4D | HW23.8L |

Applicable inserts, see pages B28~B34

MTFNR/L



TN□□



90°

• R type insert

(mm)

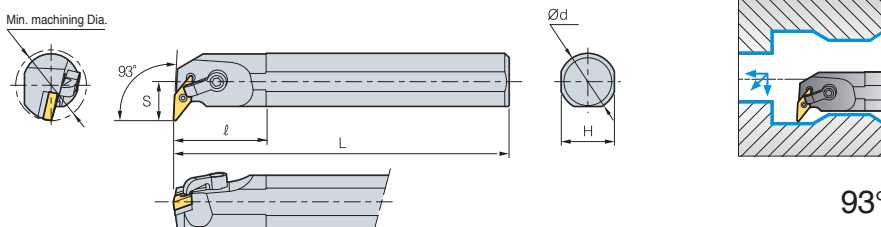
| Designation | ØD | Ød | H | L | S | l | Insert | Clamp | Clamp Screw | Shim | Shim pin | Wrench |
|-----------------|----|----|----|-----|----|----|------------|--------|-------------|-------|----------|---------|
| S25R-MTFNR/L-16 | 32 | 25 | 23 | 200 | 17 | 36 | TN□□1604□□ | CDH7N1 | DHA10-32-19 | - | SP3D3 | HW23.8L |
| S32S-MTFNR/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | | | | ST32D | SP3D | HW19.8L |
| S40T-MTFNR/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | - | SP3D3 | HW23.8L |
| A25R-MTFNR/L-16 | 32 | 25 | 23 | 200 | 17 | 40 | TN□□1604□□ | CDH7N1 | DHA10-32-19 | - | SP3D3 | HW23.8L |
| A32S-MTFNR/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | | | | ST32D | SP3D | HW19.8L |

Applicable inserts, see pages B35~B41

MVUNR/L



VN□□



93°

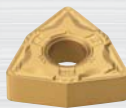
• R type insert

(mm)

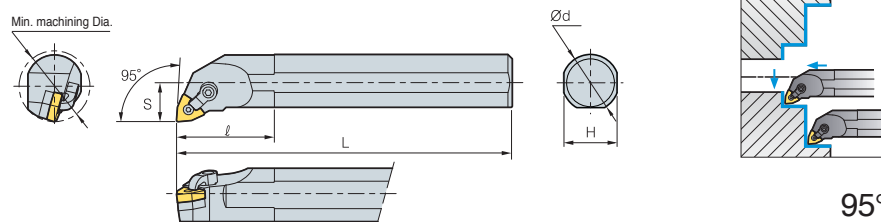
| Designation | ØD | Ød | H | L | S | l | Insert | Clamp | Clamp Screw | Shim | Shim pin | Wrench |
|-----------------|----|----|----|-----|----|----|------------|--------|-------------|-------|----------|---------|
| S32S-MVUNR/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | VN□□1604□□ | CDH8N2 | DHA5/16-28 | SV32D | SP3D | HW39.7L |
| S40T-MVUNR/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | | HW19.8L |
| A32S-MVUNR/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | VN□□1604□□ | CDH8N2 | DHA5/16-28 | SV32D | SP3D | HW39.7L |
| A40T-MVUNR/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | | HW19.8L |

Applicable inserts, see pages B42~B44

MWLNLR/L



WN□□



95°

• R type insert

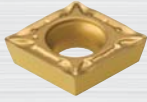
(mm)

| Designation | ØD | Ød | H | L | S | l | Insert | Clamp | Clamp Screw | Shim | Shim pin | Wrench |
|------------------|----|----|----|-----|----|----|------------|-------|-------------|-------|----------|---------|
| S25R-MWLNLR/L-06 | 32 | 25 | 23 | 200 | 17 | 36 | WN□□0604□□ | CDH7N | DHA10/32-19 | - | SP3D3 | HW23.8L |
| S32S-MWLNLR/L-06 | 40 | 32 | 30 | 250 | 22 | 50 | | | | SW32D | SP3D | HW19.8L |
| S40T-MWLNLR/L-06 | 50 | 40 | 37 | 300 | 27 | 60 | | | | - | SP4DS | HW31.8L |
| S25R-MWLNLR/L-08 | 32 | 25 | 23 | 200 | 17 | 36 | WN□□0804□□ | CDH6N | DHA1/4-21 | SW43D | SP4D | HW23.8L |
| S32S-MWLNLR/L-08 | 40 | 32 | 30 | 250 | 22 | 50 | | | | | | HW31.8L |
| S40T-MWLNLR/L-08 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | | HW23.8L |
| A25R-MWLNLR/L-06 | 32 | 25 | 23 | 200 | 17 | 40 | WN□□0604□□ | CDH7N | DHA10/32-19 | - | SP3D3 | HW31.8L |
| A32S-MWLNLR/L-06 | 40 | 32 | 30 | 250 | 22 | 50 | | | | SW32D | SP3D | HW19.8L |
| A25R-MWLNLR/L-08 | 32 | 25 | 23 | 200 | 17 | 40 | WN□□0804□□ | CDH6N | DHA1/4-21 | - | SP4DS | HW31.8L |
| A32S-MWLNLR/L-08 | 40 | 32 | 30 | 250 | 22 | 50 | | | | SW43D | SP4D | HW23.8L |

Applicable inserts, see pages B45~B48

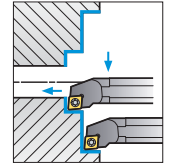
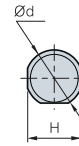
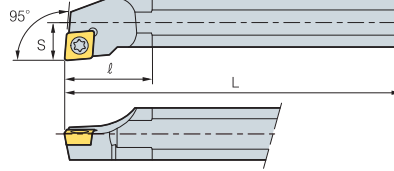
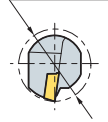
B Screw on System

SCLCR/L



CC□□

Min. machining Dia.



95°

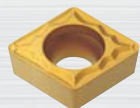
• R type insert

(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Shim | Shim Screw | Wrench |
|-----------------|----|----|-----|-----|----|------|------------|-----------|-----------|--------------|--------|
| S08K-SCLCR/L-06 | 10 | 8 | 7 | 125 | 5 | 14 | CC□□0602□□ | FTKA02555 | | | TW07P |
| S10K-SCLCR/L-06 | 12 | 10 | 9 | 125 | 6 | 14 | | FTKA02565 | - | - | |
| S10M-SCLCR/L-06 | 12 | 10 | 9 | 150 | 6 | 14 | | | | | |
| S12M-SCLCR/L-06 | 16 | 12 | 11 | 150 | 9 | 25 | | | | | |
| S16R-SCLCR/L-06 | 20 | 16 | 15 | 200 | 11 | 32 | CC□□09T3□□ | FTGA03508 | | | TW15P |
| S12M-SCLCR/L-09 | 16 | 12 | 11 | 150 | 9 | 25 | | FTGA03510 | - | - | |
| S16R-SCLCR/L-09 | 20 | 16 | 15 | 200 | 11 | 32.5 | | | | | |
| S20S-SCLCR/L-09 | 25 | 20 | 18 | 250 | 13 | 38 | | | | | |
| S25R-SCLCR/L-09 | 32 | 25 | 23 | 200 | 17 | 45 | CC□□1204□□ | FTGA0411F | - | - | TW15P |
| S25R-SCLCR/L-12 | 32 | 25 | 23 | 200 | 17 | 45 | | SC42S | SHXN0610F | HW40L, TW15P | |
| S32S-SCLCR/L-12 | 40 | 32 | 30 | 250 | 22 | 50 | CC□□09T3□□ | FTKA02555 | | | TW07P |
| A08F-SCLCR/L-06 | 10 | 8 | 7.5 | 80 | 5 | 14 | | FTKA02565 | - | - | |
| A10H-SCLCR/L-06 | 12 | 10 | 9.5 | 100 | 6 | 14 | | | | | |
| A12K-SCLCR/L-06 | 16 | 12 | 11 | 125 | 9 | 25 | | | | | |
| A12K-SCLCR/L-09 | 16 | 12 | 11 | 125 | 9 | 25 | CC□□09T3□□ | FTGA03508 | | | TW15P |
| A16M-SCLCR/L-09 | 20 | 16 | 15 | 150 | 11 | 32.5 | | FTGA03510 | - | - | |
| A20Q-SCLCR/L-09 | 25 | 20 | 19 | 180 | 13 | - | | | | | |
| A25R-SCLCR/L-09 | 32 | 25 | 24 | 200 | 17 | 45 | | | | | |
| A25R-SCLCR/L-12 | 32 | 25 | 24 | 200 | 17 | 45 | CC□□1204□□ | FTGA0411F | - | - | TW15P |
| A32S-SCLCR/L-12 | 40 | 32 | 31 | 250 | 32 | 50 | | SC42S | SHXN0610F | HW40L, TW15P | |

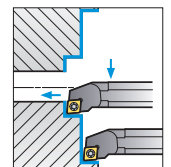
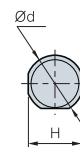
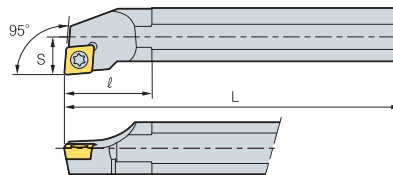
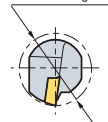
Applicable inserts, see pages B49~B50, B68

SCLPR/L



CP□□

Min. machining Dia.



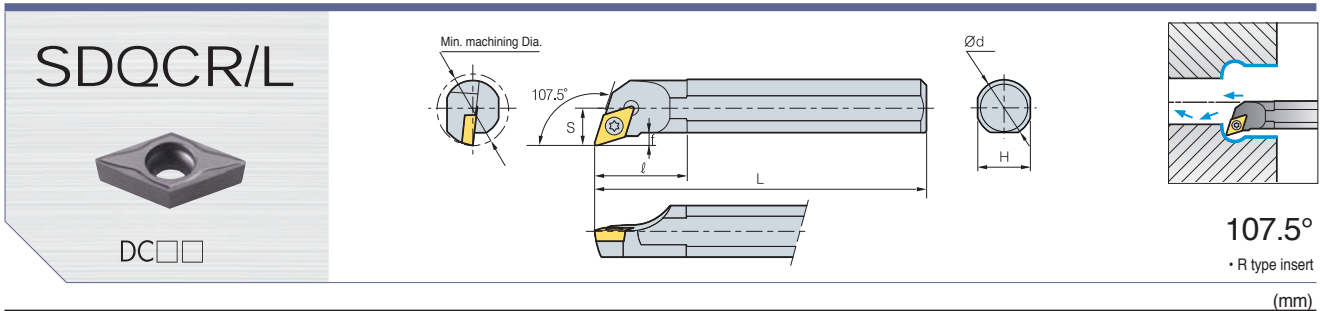
95°

• R type insert

(mm)

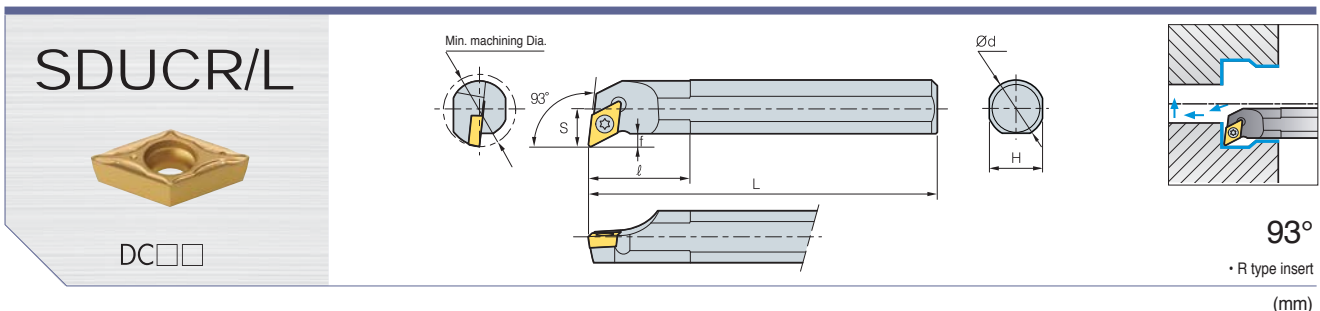
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Wrench |
|-----------------|----|----|-----|-----|------|----|------------|----------|--------|
| S10M-SCLPR/L-08 | 12 | 10 | 9 | 150 | 6 | - | CP□□0802□□ | FTNA0305 | TW09P |
| S12M-SCLPR/L-08 | 16 | 12 | 11 | 150 | 8 | 15 | | FTNA0307 | |
| S16N-SCLPR/L-09 | 20 | 16 | 15 | 160 | 10 | 15 | CP□□0903□□ | FTNA0408 | TW15P |
| S16R-SCLPR/L-09 | 20 | 16 | 15 | 200 | 11 | 35 | | | |
| S20N-SCLPR/L-09 | 25 | 20 | 18 | 160 | 12.5 | 20 | | | |
| S20S-SCLPR/L-09 | 25 | 20 | 15 | 250 | 12.5 | 20 | | | |
| A10H-SCLPR/L-08 | 12 | 10 | 9.5 | 100 | 9 | - | CP□□0802□□ | FTNA0305 | TW09P |
| A12K-SCLPR/L-08 | 16 | 12 | 11 | 125 | 8 | 20 | | FTNA0307 | |
| A16M-SCLPR/L-09 | 20 | 16 | 15 | 150 | 10 | 25 | CP□□0903□□ | FTNA0408 | TW15P |
| A20Q-SCLPR/L-09 | 25 | 20 | 19 | 180 | 12.5 | 28 | | | |

Applicable inserts, see pages B51



| Designation | ØD | Ød | H | L | S | ℓ | f | Insert | Screw | Wrench |
|-----------------|----|----|-----|-----|----|----|-----|------------|-----------|--------|
| S10M-SDQCR/L-07 | 13 | 10 | 9 | 150 | 7 | 20 | 2.5 | DC□□0702□□ | FTKA02555 | TW07P |
| S12M-SDQCR/L-07 | 16 | 12 | 11 | 150 | 9 | 22 | 3.5 | | FTKA02565 | |
| S16R-SDQCR/L-07 | 20 | 16 | 15 | 200 | 11 | 27 | 4 | | | |
| S16R-SDQCR/L-11 | 20 | 16 | 15 | 200 | 11 | 32 | 4 | DC□□11T3□□ | FTGA03508 | TW15P |
| S20S-SDQCR/L-11 | 25 | 20 | 18 | 250 | 13 | 32 | 4.5 | | FTGA03510 | |
| S25R-SDQCR/L-11 | 32 | 25 | 23 | 200 | 17 | 32 | 7 | | | |
| A10H-SDQCR/L-07 | 13 | 10 | 9.5 | 100 | 7 | 20 | 2 | DC□□0702□□ | FTKA02555 | TW07P |
| A12K-SDQCR/L-07 | 16 | 12 | 11 | 125 | 9 | 22 | 3 | | FTKA02565 | |
| A16M-SDQCR/L-11 | 20 | 16 | 15 | 150 | 11 | 27 | 3 | | | |
| A20Q-SDQCR/L-11 | 25 | 20 | 19 | 180 | 13 | 32 | 3 | DC□□11T3□□ | FTGA03508 | TW15P |
| A25R-SDQCR/L-11 | 32 | 25 | 24 | 200 | 17 | 32 | 4 | | FTGA03510 | |

Applicable inserts, see pages B52, B53, B69

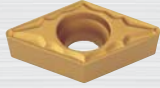


| Designation | ØD | Ød | H | L | S | ℓ | f | Insert | Screw | Wrench |
|-----------------|----|----|-----|-----|----|----|-----|------------|-----------|--------|
| S10M-SDUCR/L-07 | 13 | 10 | 9 | 150 | 7 | 0 | 2.5 | DC□□0702□□ | FTKA02555 | TW07P |
| S12M-SDUCR/L-07 | 16 | 12 | 11 | 150 | 9 | 22 | 3.5 | | FTKA02565 | |
| S16R-SDUCR/L-07 | 20 | 16 | 15 | 200 | 11 | 27 | 4 | | | |
| S16R-SDUCR/L-11 | 20 | 16 | 15 | 200 | 11 | 27 | 4 | DC□□11T3□□ | FTGA03508 | TW15P |
| S20S-SDUCR/L-11 | 25 | 20 | 18 | 250 | 13 | 40 | 4.3 | | FTGA03510 | |
| S25R-SDUCR/L-11 | 32 | 25 | 23 | 200 | 17 | 46 | 6.8 | | | |
| S32S-SDUCR/L-11 | 40 | 32 | 30 | 250 | 22 | 50 | 8.4 | | | |
| A10H-SDUCR/L-07 | 13 | 10 | 9.5 | 100 | 7 | 0 | 2 | DC□□0702□□ | FTKA02555 | TW07P |
| A12K-SDUCR/L-07 | 16 | 12 | 11 | 125 | 9 | 22 | 3 | | FTKA02565 | |
| A16M-SDUCR/L-07 | 20 | 16 | 15 | 150 | 11 | 27 | 3 | | | |
| A20Q-SDUCR/L-11 | 25 | 20 | 19 | 180 | 13 | 35 | 3 | DC□□11T3□□ | FTGA03508 | TW15P |
| A25R-SDUCR/L-11 | 32 | 25 | 24 | 200 | 17 | 46 | 4.5 | | FTGA03510 | |

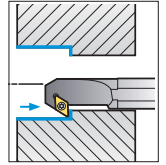
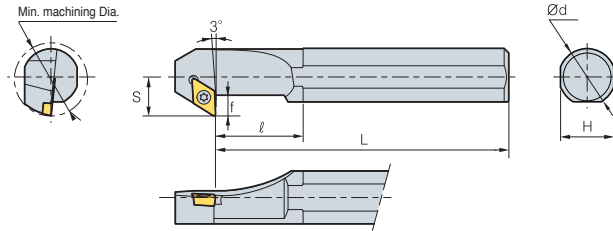
Applicable inserts, see pages B52, B53, B69



SDZCR/L



DC□□



3°

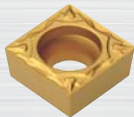
• R type insert

(mm)

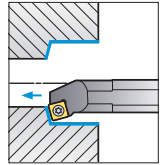
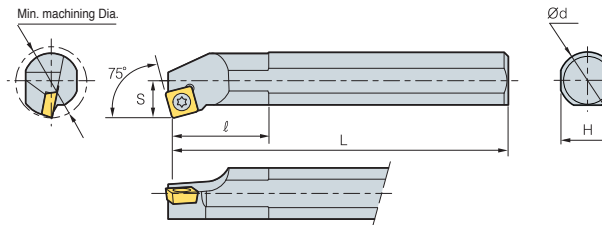
| Designation | ØD | Ød | H | L | S | ℓ | f | Insert | Screw | Shim | ShimScrew | Wrench |
|-----------------|----|----|----|-----|----|------|-----|------------|-----------|-------|-----------|--------------|
| | | | | | | | | | | | | |
| S16R-SDZCR/L-07 | 20 | 16 | 15 | 200 | 11 | 29 | 4 | DC□□0702□□ | FTKA02565 | - | - | TW07P |
| S20S-SDZCR/L-07 | 25 | 20 | 18 | 250 | 13 | 36.5 | 4.5 | DC□□11T3□□ | FTGA03510 | - | - | TW15P |
| S25R-SDZCR/L-11 | 32 | 25 | 23 | 200 | 17 | 30 | 6.9 | | FTGA03512 | SD32S | SHXN0509F | TW15P, HW35L |
| S32S-SDZCR/L-11 | 40 | 32 | 30 | 250 | 22 | 39 | 8.4 | | FTGA03510 | - | - | TW15P |
| S40T-SDZCR/L-11 | 50 | 40 | 37 | 300 | 27 | 47 | 9.4 | | FTGA03512 | SD32S | SHXN0509F | TW15P, HW35L |
| A25R-SDZCR/L-11 | 32 | 25 | 24 | 200 | 17 | 30 | 4.5 | | FTGA03510 | - | - | TW15P |
| A32S-SDZCR/L-11 | 40 | 32 | 31 | 250 | 22 | 39 | 6 | | FTGA03512 | SD32S | SHXN0509F | TW15P, HW35L |

Applicable inserts, see pages B52, B53, B69

SSKCR/L



SC□□



75°

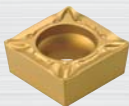
• R type insert

(mm)

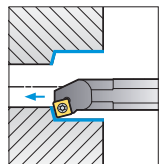
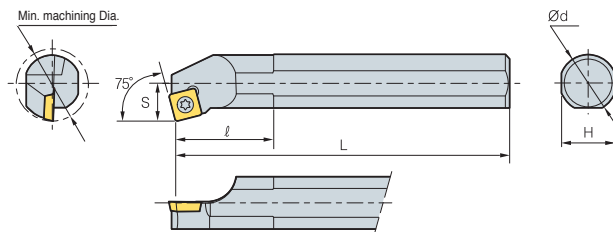
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Shim | ShimScrew | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-----------|-------|-----------|--------------|
| | | | | | | | | | | | |
| S12M-SSKCR/L-09 | 16 | 20 | 11 | 150 | 9 | 26 | SC□□09T3□□ | FTGA03507 | - | - | TW15P |
| S16R-SSKCR/L-09 | 20 | 16 | 15 | 200 | 11 | 40 | | FTGA03508 | - | - | TW15P |
| S20S-SSKCR/L-09 | 25 | 20 | 18 | 250 | 13 | 46 | | FTGA0411F | SS42S | SHXN0610F | TW15P, HW40L |
| S25R-SSKCR/L-12 | 32 | 25 | 23 | 200 | 17 | 36 | SC□□1204□□ | FTGA03507 | - | - | TW15P |
| S32S-SSKCR/L-12 | 40 | 32 | 30 | 250 | 22 | 43 | | FTGA0411F | SS42S | SFXN0610F | TW15P, HW40L |
| A12K-SSKCR/L-09 | 16 | 12 | 11 | 125 | 9 | 26 | SC□□09T3□□ | FTGA03507 | - | - | TW15P |
| A16M-SSKCR/L-09 | 20 | 16 | 15 | 150 | 11 | 32 | | FTGA03508 | - | - | TW15P |
| A20Q-SSKCR/L-09 | 25 | 20 | 19 | 180 | 13 | 34 | SC□□1204□□ | FTGA0411F | SS42S | SFXN0610F | TW15P |
| A25R-SSKCR/L-12 | 32 | 25 | 24 | 200 | 17 | 36 | | FTGA0411F | SS42S | SFXN0610F | TW15P, HW40L |
| A32S-SSKCR/L-12 | 40 | 32 | 31 | 250 | 22 | 43 | | FTGA0411F | SS42S | SFXN0610F | TW15P, HW40L |

Applicable inserts, see pages B55, B71

SSKPR/L



SP□□



75°

• R type insert

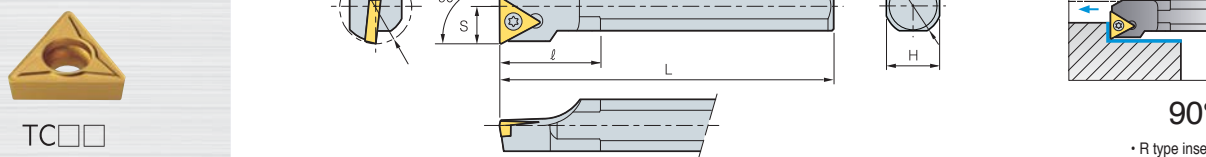
(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Wrench |
|-----------------|----|----|----|-----|------|----|------------|----------|--------|
| | | | | | | | | | |
| S12M-SSKPR/L-09 | 16 | 12 | 11 | 150 | 8 | 18 | SP□□0903□□ | FTNA0307 | TW09P |
| S16N-SSKPR/L-09 | 20 | 16 | 15 | 160 | 10 | 30 | | | |
| S16R-SSKPR/L-09 | 20 | 16 | 15 | 200 | 10 | 32 | | | |
| S20N-SSKPR/L-09 | 25 | 20 | 18 | 160 | 12.5 | 32 | | FTNA0305 | TW09P |
| S20S-SSKPR/L-09 | 25 | 20 | 18 | 250 | 12.5 | 35 | | | |
| A12K-SSKPR/L-09 | 16 | 12 | 11 | 125 | 8 | 21 | | | |
| A16M-SSKPR/L-09 | 20 | 16 | 15 | 150 | 10 | 30 | SP□□0903□□ | FTNA0307 | TW09P |
| A20Q-SSKPR/L-09 | 25 | 20 | 19 | 180 | 12.5 | 32 | | | |

Applicable inserts, see pages B56~B57

• Holder is opposed to hand of insert

STFCR/L



TC□□

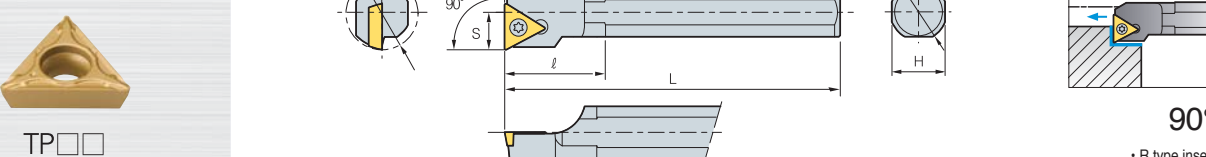
Min. machining Dia. 90° S L L H Ød

90°
• R type insert
(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Shim | Shim Screw | Wrench |
|-----------------|----|----|-----|-----|----|----|------------|-----------|-------|------------|--------------|
| S10M-STFCR/L-09 | 13 | 10 | 9 | 150 | 7 | 23 | TC□□0902□□ | FTKA02206 | - | - | TW06P |
| S12M-STFCR/L-09 | 16 | 12 | 11 | 150 | 9 | 28 | TC□□1102□□ | FTKA02565 | - | - | TW07P |
| S12M-STFCR/L-11 | 16 | 12 | 11 | 150 | 9 | 30 | | | | | |
| S16R-STFCR/L-11 | 20 | 16 | 15 | 200 | 11 | 35 | TC□□16T3□□ | FTGA03510 | - | - | TW15P |
| S20S-STFCR/L-11 | 25 | 20 | 18 | 250 | 13 | 36 | | | | | |
| S20S-STFCR/L-16 | 25 | 20 | 18 | 250 | 13 | 36 | TC□□16T3□□ | FTGA03512 | ST32S | SHXN0509F | TW15P, HW35L |
| S25R-STFCR/L-16 | 32 | 25 | 23 | 200 | 17 | 49 | | | | | |
| S32S-STFCR/L-16 | 40 | 32 | 30 | 250 | 22 | 50 | TC□□16T3□□ | FTGA03512 | ST32S | SHXN0509F | TW15P, HW35L |
| S40T-STFCR/L-16 | 50 | 40 | 37 | 300 | 27 | 60 | | | | | |
| A10H-STFCR/L-09 | 13 | 10 | 9.5 | 100 | 7 | 23 | TC□□0902□□ | FTKA02206 | - | - | TW06P |
| A12K-STFCR/L-09 | 16 | 12 | 11 | 125 | 9 | 23 | | | | | |
| A12K-STFCR/L-11 | 16 | 12 | 11 | 125 | 9 | 30 | TC□□1102□□ | FTKA02565 | - | - | TW07P |
| A16M-STFCR/L-11 | 20 | 16 | 15 | 150 | 11 | 30 | | | | | |
| A20Q-STFCR/L-11 | 25 | 20 | 19 | 180 | 13 | 36 | TC□□16T3□□ | FTKA03510 | - | - | TW15P |
| A25R-STFCR/L-16 | 32 | 25 | 24 | 200 | 17 | 49 | | | | | |
| A32S-STFCR/L-16 | 40 | 32 | 31 | 250 | 22 | 50 | TC□□16T3□□ | FTGA03512 | ST32S | SHXN0509F | TW15P, HW35L |

Applicable inserts, see pages B59, B72

STFPR/L



TP□□

Min. machining Dia. 90° S L L H Ød

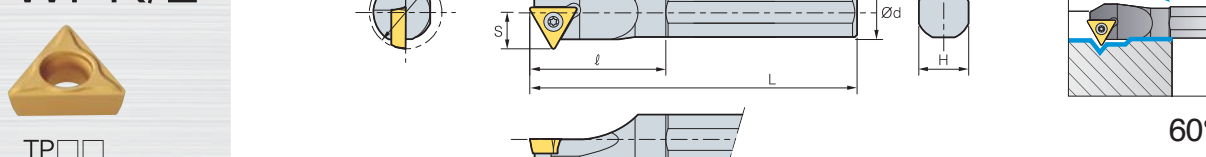
90°
• R type insert
(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Wrench |
|-----------------|----|----|-----|-----|------|----|------------|----------|--------|
| S10M-STFPR/L-11 | 12 | 10 | 9 | 150 | 6 | - | TP□□1103□□ | FTNA0305 | TW09P |
| S12M-STFPR/L-11 | 16 | 12 | 11 | 150 | 8 | 10 | | FTNA0307 | TW09P |
| S16N-STFPR/L-11 | 20 | 16 | 15 | 160 | 10 | 12 | TP□□1604□□ | FTNA0408 | TW15P |
| S16R-STFPR/L-11 | 20 | 16 | 15 | 200 | 10 | 12 | | | |
| S20N-STFPR/L-16 | 25 | 20 | 18 | 160 | 12.5 | 32 | TP□□1604□□ | FTNA0408 | TW15P |
| S20S-STFPR/L-16 | 25 | 20 | 18 | 250 | 12.5 | 14 | | | |
| A10H-STFPR/L-11 | 12 | 10 | 9.5 | 100 | 6 | - | TP□□1103□□ | FTNA0305 | TW09P |
| A12K-STFPR/L-11 | 16 | 12 | 11 | 125 | 8 | 10 | | | |
| A16M-STFPR/L-11 | 20 | 16 | 15 | 150 | 10 | 23 | TP□□1604□□ | FTNA0307 | TW09P |
| A20Q-STFPR/L-16 | 25 | 20 | 19 | 180 | 12.5 | 41 | | | |

Applicable inserts, see pages B61~B62

• Holder is opposed to hand of insert

STWPR/L



TP□□

Min. machining Dia. S L L H Ød

60°
• R type insert
(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Wrench |
|-----------------|----|----|----|-----|------|----|--------------------------|----------|--------|
| S10M-STWPR/L-11 | 12 | 10 | 9 | 150 | 6 | 23 | TPGH1102□□ | FTNA0305 | TW09P |
| S12M-STWPR/L-11 | 16 | 12 | 11 | 150 | 8 | 30 | TPGH1103□□ TPMT1103□□ | FTNA0306 | TW09P |
| S16R-STWPR/L-11 | 20 | 16 | 15 | 180 | 10 | 35 | | | |
| S20R-STWPR/L-11 | 25 | 20 | 19 | 200 | 12.5 | 40 | | | |

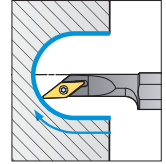
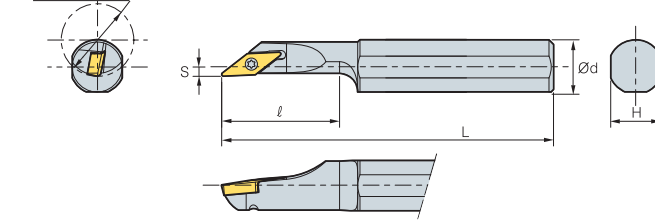
Applicable inserts, see pages B61~B62

SVJCR/L



VC□□

Min. machining Dia.



142°

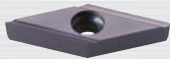
• R type insert

(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Wrench |
|-----------------|----|----|----|-----|---|----|------------|----------|--------|
| S12M-SVJCR/L-08 | 16 | 12 | 11 | 150 | 2 | 26 | VCMT0802□□ | FTNA0204 | TW06P |
| S16Q-SVJCR/L-08 | 20 | 16 | 15 | 180 | 2 | 36 | | | |

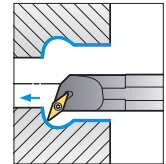
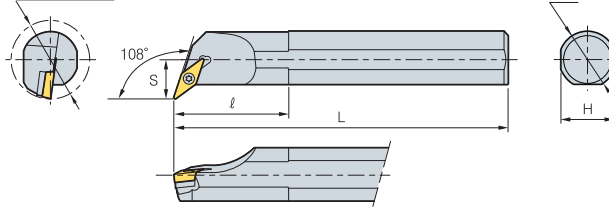
Applicable inserts, see pages B65, B74

SVQBR/L



VB□□

Min. machining Dia.



108°

• R type insert

(mm)

| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Shim | Shim Screw | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-----------|-------|------------|--------------|
| S32S-SVQBR/L-16 | 40 | 32 | 30 | 250 | 22 | 56 | VB□□1604□□ | FTGA03512 | SV32S | SHXN0509F | TW15P, HW35L |
| S40T-SVQBR/L-16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | | |
| A32S-SVQBR/L-16 | 40 | 32 | 31 | 250 | 22 | 56 | | | | | |

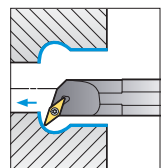
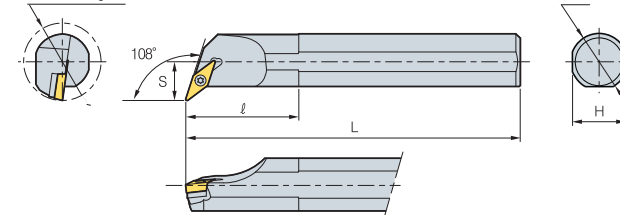
Applicable inserts, see pages B63, B73

SVQCR/L



VC□□

Min. machining Dia.



108°

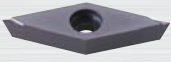
• R type insert

(mm)

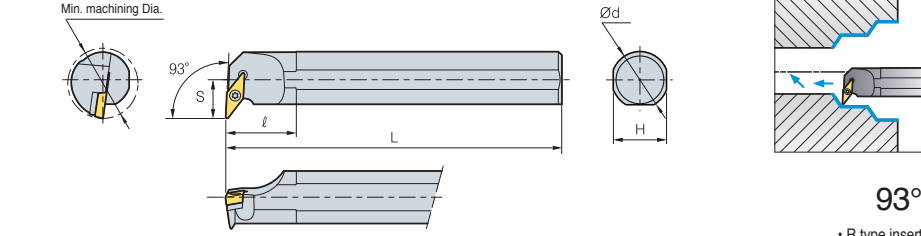
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Shim | Shim Screw | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-----------|------|------------|--------|
| S16R-SVQCR/L-11 | 20 | 16 | 15 | 200 | 11 | 35 | VC□□1103□□ | FTKA02565 | - | - | TW07P |
| S20S-SVQCR/L-11 | 25 | 20 | 18 | 250 | 13 | 38 | | | | | |
| S25R-SVQCR/L-11 | 32 | 25 | 23 | 200 | 17 | 42 | | | | | |
| S20S-SVQCR/L-13 | 25 | 20 | 18 | 250 | 13 | 42 | VC□□1303□□ | FTKA0307 | - | - | TW07P |
| S25R-SVQCR/L-13 | 32 | 25 | 23 | 200 | 17 | 45 | | | | | |
| S25R-SVQCR/L-16 | 32 | 25 | 23 | 200 | 17 | 50 | VC□□1604□□ | FTGA03510 | - | - | TW15P |
| S32S-SVQCR/L-16 | 40 | 32 | 30 | 250 | 22 | 56 | | | | | |
| S40T-SVQCR/L-16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | | |

Applicable inserts, see pages B65, B74

SVUBR/L



VB□□



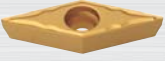
93°
• R type insert

(mm)

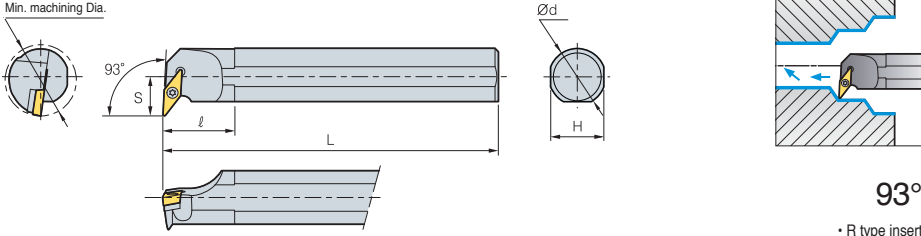
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Shim | Shim Screw | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-----------|-------|------------|--------------|
| S32S-SVUBR/L-16 | 40 | 32 | 30 | 250 | 22 | 56 | VB□□1604□□ | FTGA03512 | SV32S | SHXN0509F | TW15P, HW35L |
| S40T-SVUBR/L-16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | | |
| A32S-SVUBR/L-16 | 40 | 32 | 31 | 250 | 22 | 56 | | | | | |

Applicable inserts, see pages B63, B73

SVUCR/L



VC□□




93°
• R type insert

(mm)

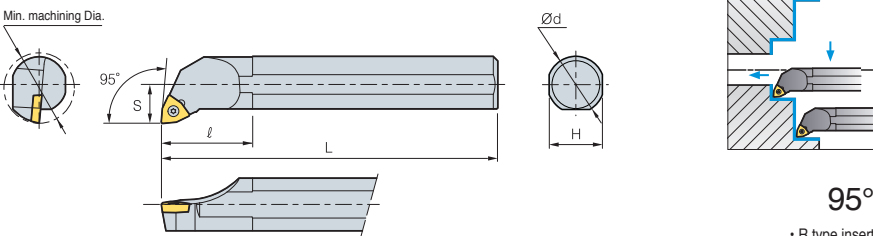
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Shim | Shim Screw | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-----------|------|------------|--------|
| S16R-SVUCR/L-11 | 22 | 16 | 15 | 200 | 13 | 30 | VC□□1103□□ | FTKA02565 | - | - | TW07P |
| S20S-SVUCR/L-11 | 25 | 20 | 18 | 250 | 14 | 33 | | | | | |
| S25T-SVUCR/L-11 | 32 | 25 | 23 | 300 | 17 | 38 | | | | | |
| S20S-SVUCR/L-13 | 28 | 20 | 18 | 250 | 16 | 35 | VC□□1303□□ | FTKA0307 | - | - | TW09P |
| S25R-SVUCR/L-13 | 32 | 25 | 23 | 200 | 17 | 40 | | | | | |
| S25R-SVUCR/L-16 | 32 | 25 | 23 | 200 | 19 | 50 | VC□□1604□□ | FTGA03510 | - | - | TW15P |
| S32S-SVUCR/L-16 | 40 | 32 | 30 | 250 | 22 | 56 | | | | | |
| S40T-SVUCR/L-16 | 50 | 40 | 37 | 300 | 27 | 64 | | | | | |

Applicable inserts, see pages B65, B74

SWLCR/L



WC□□



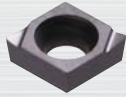
95°
• R type insert

(mm)

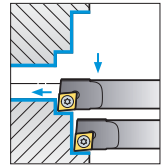
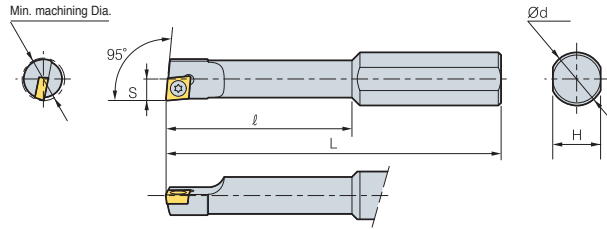
| Designation | ØD | Ød | H | L | S | ℓ | Insert | Screw | Wrench |
|-----------------|----|----|----|-----|----|----|------------|-----------|--------|
| S25R-SWLCR/L-08 | 32 | 25 | 23 | 200 | 17 | 46 | WC□□0804□□ | FTGA0411F | TW15P |
| S32S-SWLCR/L-08 | 40 | 32 | 30 | 250 | 22 | 51 | | | |
| A25R-SWLCR/L-08 | 32 | 25 | 24 | 200 | 17 | 46 | WC□□0804□□ | FTGA0411F | TW15P |
| A32S-SWLCR/L-08 | 40 | 32 | 31 | 250 | 22 | 51 | | | |

Applicable inserts, see pages B66

SCLCR/L



CCET



95°

• R type insert

(mm)

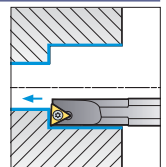
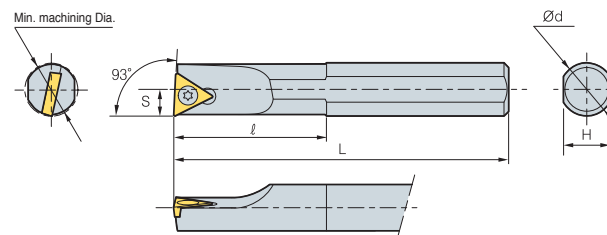
| Designation | ØD | Ød | H | L | S | l | Insert | Screw | Wrench |
|-------------------|----|----|---|-----|-----|----|-------------|-----------|--------|
| S10H-SCLCR/L-0305 | 5 | 10 | 9 | 100 | 2.5 | 25 | CCET 0301□□ | FTNA01633 | TW06P |
| S10H-SCLCR/L-0306 | 6 | 10 | 9 | 100 | 3.0 | 25 | | | |
| S10J-SCLCR/L-0407 | 7 | 10 | 9 | 110 | 3.5 | 30 | CCET 0401□□ | FTNA0238 | TW06P |
| S10J-SCLCR/L-0408 | 8 | 10 | 9 | 110 | 4.0 | 30 | | | |

Applicable inserts, see pages B49~B50

STUBR/L



TB□□



93°

• R type insert

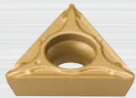
(mm)

| Designation | ØD | Ød | H | L | S | l | Insert | Screw | Wrench |
|-----------------|----|----|-----|-----|---|----|---------------|----------|--------|
| S08K-STUBR/L-06 | 8 | 8 | 7 | 125 | 4 | 30 | TB□□0601□□R/L | FTNA0204 | TW06P |
| A08F-STUBR/L-06 | 8 | 8 | 7.5 | 80 | 4 | 30 | | | |

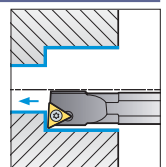
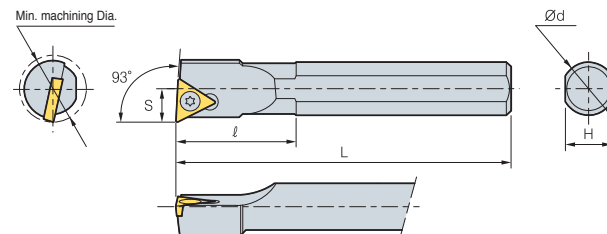
Applicable inserts, see pages B58

• Holder is opposed to hand of insert

STUPR/L



TP□□



93°

• R type insert

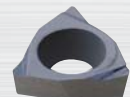
(mm)

| Designation | ØD | Ød | H | L | S | l | Insert | Screw | Wrench |
|-----------------|----|----|-----|-----|---|----|---------------|-----------|--------|
| S08K-STUPR/L-08 | 10 | 8 | 7 | 125 | 4 | 18 | TP□□0802□□R/L | FTNA02205 | TW06P |
| A08F-STUPR/L-08 | 10 | 8 | 7.5 | 80 | 4 | 18 | | | |

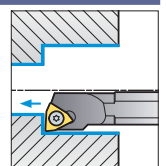
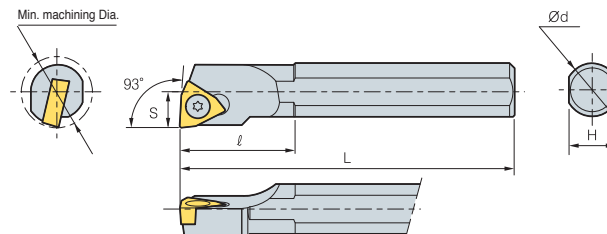
Applicable inserts, see pages B60~B62

• Holder is opposed to hand of insert

SWUBR/L



WBGT



93°

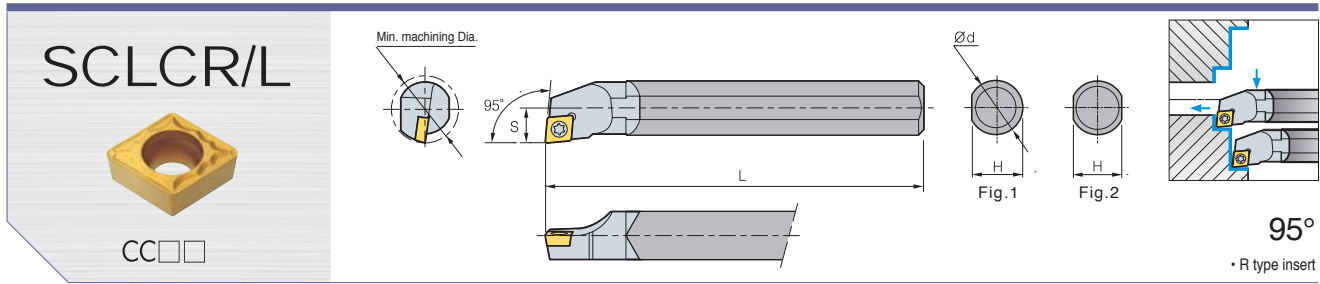
• R type insert

(mm)

| Designation | ØD | Ød | H | L | S | l | Insert | Screw | Wrench |
|-----------------|-----|----|-----|-----|------|----|----------------|-----------|--------|
| S05H-SWUBR/L-02 | 5.5 | 5 | 4.5 | 100 | 2.75 | - | WBGT 0201□□R/L | FTNA0203 | TW06P |
| S08K-SWUBR/L-02 | 8 | 8 | 7 | 125 | 4 | 30 | | | |
| S08K-SWUBR/L-S3 | 10 | 8 | 7 | 125 | 5 | 18 | WBGT S302□□R/L | FTNA02205 | TW06P |
| A08F-SWUBR/L-02 | 8 | 8 | 7.5 | 80 | 4 | 30 | WBGT 0201□□R/L | FTNA0203 | TW06P |
| A08F-SWUBR/L-S3 | 10 | 8 | 7.5 | 80 | 5 | 16 | WBGT S302□□R/L | FTNA02205 | TW06P |

Applicable inserts, see pages B66

• Holder is opposed to hand of insert



95°

• R type insert

(mm)

| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|-----|-----|-----|----------------|-----------|--------|------|
| C04G-SCLCR/L-03 | 5 | 4 | 3.8 | 90 | 2.5 | CC □ T0301 □ □ | FTNA01633 | TW06P | 1 |
| C05H-SCLCR/L-03 | 6 | 5 | 4.4 | 100 | 3 | | | | |
| C06H-SCLCR/L-04 | 7 | 6 | 5.4 | 100 | 3.5 | | | | |
| C07K-SCLCR/L-04 | 8 | 7 | 6.4 | 125 | 4 | CC □ T0401 □ □ | FTNA0238 | TW06P | 1 |
| C08K-SCLCR/L-06 | 10 | 8 | 7 | 125 | 5 | | | | |
| C10K-SCLCR/L-06 | 12 | 10 | 9 | 125 | 6 | CC □ T0602 □ □ | FTKA02555 | TW07P | 2 |
| C10M-SCLCR/L-06 | 12 | 10 | 9 | 150 | 6 | | | | |
| C12M-SCLCR/L-06 | 14 | 12 | 11 | 150 | 7 | | | | |
| C12Q-SCLCR/L-06 | 14 | 12 | 11 | 180 | 7 | | | | |
| C12M-SCLCR/L-09 | 15 | 12 | 11 | 150 | 8 | | | | |
| C12Q-SCLCR/L-09 | 15 | 12 | 11 | 180 | 8 | CC □ T09T3 □ □ | FTGA03508 | TW15P | 2 |
| C16R-SCLCR/L-09 | 20 | 16 | 15 | 200 | 10 | | | | |
| C16S-SCLCR/L-09 | 20 | 16 | 15 | 250 | 10 | | | | |
| C20R-SCLCR/L-09 | 25 | 20 | 18 | 200 | 13 | | | | |
| C20S-SCLCR/L-09 | 25 | 20 | 18 | 250 | 13 | | | | |
| C25T-SCLCR/L-12 | 32 | 25 | 23 | 300 | 17 | CC □ T1204 □ □ | FTGA0411F | | |
| E06H-SCLCR/L-04 | 7 | 6 | 5.4 | 100 | 3.5 | CC □ T0401 □ □ | FTNA0238 | TW06P | 1 |
| E07K-SCLCR/L-04 | 8 | 7 | 6.4 | 125 | 4 | | | | |
| E08K-SCLCR/L-06 | 10 | 8 | 7 | 125 | 5 | CC □ T0602 □ □ | FTKA02555 | TW07P | 2 |
| E10K-SCLCR/L-06 | 12 | 10 | 9 | 125 | 6 | | | | |
| E10M-SCLCR/L-06 | 12 | 10 | 9 | 150 | 6 | | | | |
| E12M-SCLCR/L-06 | 14 | 12 | 11 | 150 | 7 | | | | |
| E12Q-SCLCR/L-06 | 14 | 12 | 11 | 180 | 7 | | | | |
| E12M-SCLCR/L-09 | 15 | 12 | 11 | 150 | 8 | CC □ T09T3 □ □ | FTGA03508 | TW15P | 2 |
| E12Q-SCLCR/L-09 | 15 | 12 | 11 | 180 | 8 | | | | |
| E16R-SCLCR/L-09 | 20 | 16 | 15 | 200 | 11 | | | | |
| E16S-SCLCR/L-09 | 20 | 16 | 15 | 250 | 10 | | | | |
| E20R-SCLCR/L-09 | 25 | 20 | 18 | 200 | 13 | | | | |
| E20S-SCLCR/L-09 | 25 | 20 | 19 | 250 | 13 | CC □ T1204 □ □ | FTGA0411F | | |
| E25T-SCLCR/L-12 | 32 | 25 | 23 | 300 | 17 | | | | |

Applicable inserts, see pages B49~B50



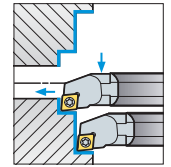
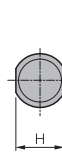
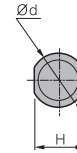
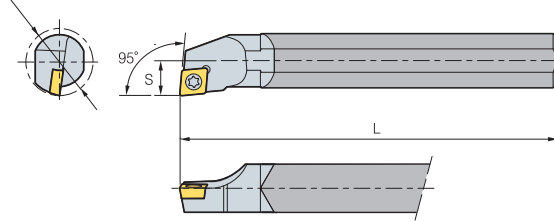
B Carbide Shank Boring Bar

SCLPR/L



CP□□

Min. machining Dia.



95°

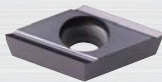
• R type insert

(mm)

| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|----|-----|-----|--------------|--------------|----------|-------|
| C10K-SCLPR/L-08 | 12 | 10 | 9 | 125 | 6 | CP □T0802 □□ | FTNA0305 | TW09P | 2 |
| C10M-SCLPR/L-08 | 12 | 10 | 9 | 150 | 6 | | | | |
| C12M-SCLPR/L-08 | 15 | 12 | 11 | 150 | 7.5 | | FTNA0306 | | |
| C12Q-SCLPR/L-08 | 15 | 12 | 11 | 180 | 7.5 | CP □T0903 □□ | FTNA0408 | TW15P | |
| C12M-SCLPR/L-09 | 15 | 12 | 11 | 150 | 8 | | | | |
| C12Q-SCLPR/L-09 | 15 | 12 | 11 | 180 | 8 | | | | |
| C16R-SCLPR/L-09 | 20 | 16 | 15 | 200 | 10 | CP □T0802 □□ | FTNA0305 | TW09P | 2 |
| C16S-SCLPR/L-09 | 20 | 16 | 15 | 250 | 10 | | | | |
| C20R-SCLPR/L-09 | 25 | 20 | 18 | 200 | 13 | | FTNA0407 | | |
| C20S-SCLPR/L-09 | 25 | 20 | 18 | 250 | 13 | CP □T0903 □□ | FTNA0408 | TW15P | |
| E10K-SCLPR/L-08 | 12 | 10 | 9 | 125 | 6 | | | | |
| E10M-SCLPR/L-08 | 12 | 10 | 9 | 150 | 6 | | | | |
| E12M-SCLPR/L-08 | 15 | 12 | 11 | 150 | 7.5 | CP □T0802 □□ | FTNA0305 | TW09P | |
| E12Q-SCLPR/L-08 | 15 | 12 | 11 | 180 | 7.5 | | | | |
| E12M-SCLPR/L-09 | 15 | 12 | 11 | 150 | 8 | | CP □T0903 □□ | FTNA0408 | TW15P |
| E12Q-SCLPR/L-09 | 15 | 12 | 11 | 180 | 8 | | | | |
| E16R-SCLPR/L-09 | 20 | 16 | 15 | 200 | 10 | | | | |
| E16S-SCLPR/L-09 | 20 | 16 | 15 | 250 | 10 | CP □T0802 □□ | FTNA0305 | TW09P | 2 |
| E20R-SCLPR/L-09 | 25 | 20 | 18 | 200 | 13 | | | | |
| E20S-SCLPR/L-09 | 25 | 20 | 18 | 250 | 13 | | FTNA0407 | | |

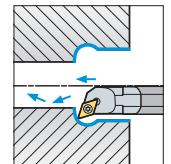
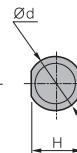
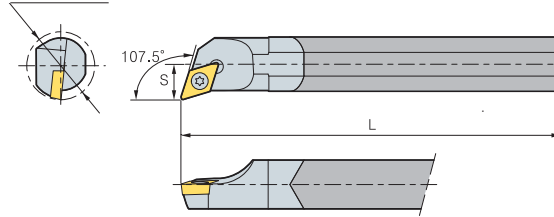
Applicable inserts, see pages B51

SDQCR/L



DC□□

Min. machining Dia.



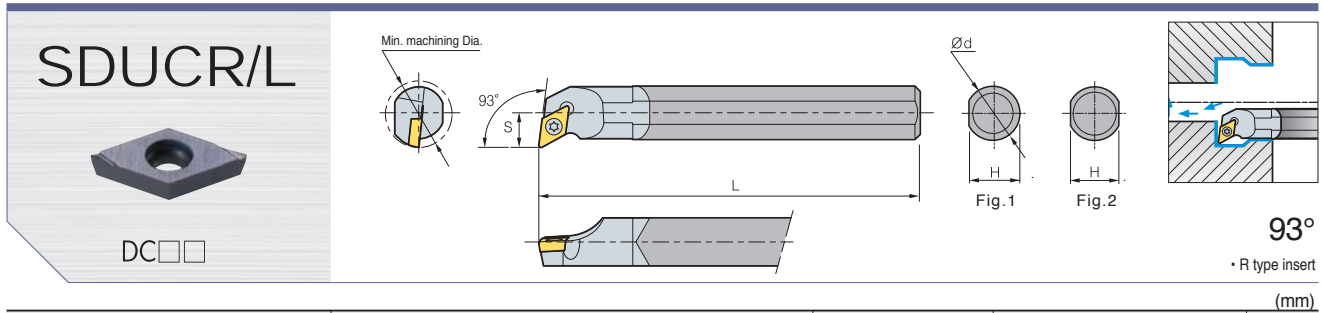
107.5°

• R type insert

(mm)

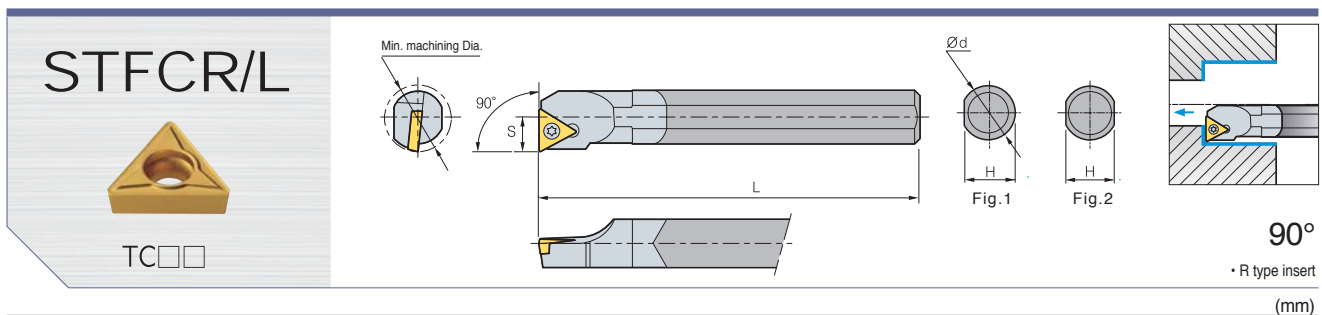
| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|----|-----|----|--------------|-----------|--------|------|
| C08K-SDQCR/L-07 | 10 | 8 | 7 | 125 | 6 | DC □T0702 □□ | FTKA02555 | TW07P | 2 |
| C10K-SDQCR/L-07 | 13 | 10 | 9 | 125 | 7 | | | | |
| C12M-SDQCR/L-07 | 16 | 12 | 11 | 150 | 9 | | FTKA02565 | | |
| C16R-SDQCR/L-07 | 20 | 16 | 15 | 200 | 11 | DC □T11T3 □□ | FTGA03508 | TW15P | |
| C16R-SDQCR/L-11 | 20 | 16 | 15 | 200 | 11 | | | | |
| C20R-SDQCR/L-11 | 25 | 20 | 18 | 200 | 13 | | | | |
| C20S-SDQCR/L-11 | 25 | 20 | 18 | 250 | 13 | DC □T0702 □□ | FTKA02555 | TW07P | 2 |
| E08K-SDQCR/L-07 | 10 | 8 | 7 | 125 | 6 | | | | |
| E10K-SDQCR/L-07 | 13 | 10 | 9 | 125 | 7 | | FTKA02565 | | |
| E12M-SDQCR/L-07 | 16 | 12 | 11 | 150 | 9 | DC □T11T3 □□ | FTGA03508 | TW15P | |
| E16R-SDQCR/L-07 | 20 | 16 | 15 | 200 | 11 | | | | |
| E16R-SDQCR/L-11 | 20 | 16 | 15 | 200 | 11 | | | | |
| E20R-SDQCR/L-11 | 25 | 20 | 18 | 200 | 13 | DC □T0702 □□ | FTKA02555 | TW07P | 2 |
| E20S-SDQCR/L-11 | 25 | 20 | 19 | 250 | 13 | | | | |

Applicable inserts, see pages B52~B53, B69



| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|----|-----|----|--------------|--------------|--------------|-----------|
| | | | | | | | | | |
| C10K-SDUCR/L-07 | 13 | 10 | 9 | 125 | 7 | DC □T0702 □□ | FTKA02555 | TW07P | 2 |
| C10M-SDUCR/L-07 | 13 | 10 | 9 | 150 | 7 | | | | |
| C12M-SDUCR/L-07 | 16 | 12 | 11 | 150 | 9 | | FTKA02565 | | |
| C12Q-SDUCR/L-07 | 16 | 12 | 11 | 180 | 9 | | | | |
| C16R-SDUCR/L-07 | 20 | 16 | 15 | 200 | 11 | | DC □T11T3 □□ | | |
| C16S-SDUCR/L-07 | 20 | 16 | 15 | 250 | 11 | | | | |
| C16R-SDUCR/L-11 | 20 | 16 | 15 | 200 | 11 | FTGA03510 | | | |
| C16S-SDUCR/L-11 | 20 | 16 | 15 | 250 | 11 | | | | |
| C20R-SDUCR/L-11 | 25 | 20 | 18 | 200 | 13 | DC □T11T3 □□ | | FTGA03508 | |
| C20S-SDUCR/L-11 | 25 | 20 | 18 | 250 | 13 | | | | |
| C25T-SDUCR/L-11 | 32 | 25 | 23 | 300 | 17 | | FTGA03510 | | |
| E10K-SDUCR/L-07 | 13 | 10 | 9 | 125 | 7 | | | DC □T0702 □□ | FTKA02555 |
| E10M-SDUCR/L-07 | 13 | 10 | 9 | 150 | 7 | | | | |
| E12M-SDUCR/L-07 | 16 | 12 | 11 | 150 | 9 | FTKA02565 | | | |
| E12Q-SDUCR/L-07 | 16 | 12 | 11 | 180 | 9 | | | | |
| E16R-SDUCR/L-07 | 20 | 16 | 15 | 200 | 11 | DC □T11T3 □□ | FTGA03508 | | |
| E16S-SDUCR/L-07 | 20 | 16 | 15 | 250 | 11 | | | | |
| E16R-SDUCR/L-11 | 20 | 16 | 15 | 200 | 11 | | FTGA03510 | | |
| E16S-SDUCR/L-11 | 20 | 16 | 15 | 250 | 11 | | | | |
| E20R-SDUCR/L-11 | 25 | 20 | 18 | 200 | 13 | | FTGA03510 | | |
| E20S-SDUCR/L-11 | 25 | 20 | 18 | 250 | 13 | | | | |
| E25T-SDUCR/L-11 | 32 | 25 | 23 | 300 | 17 | | | | |

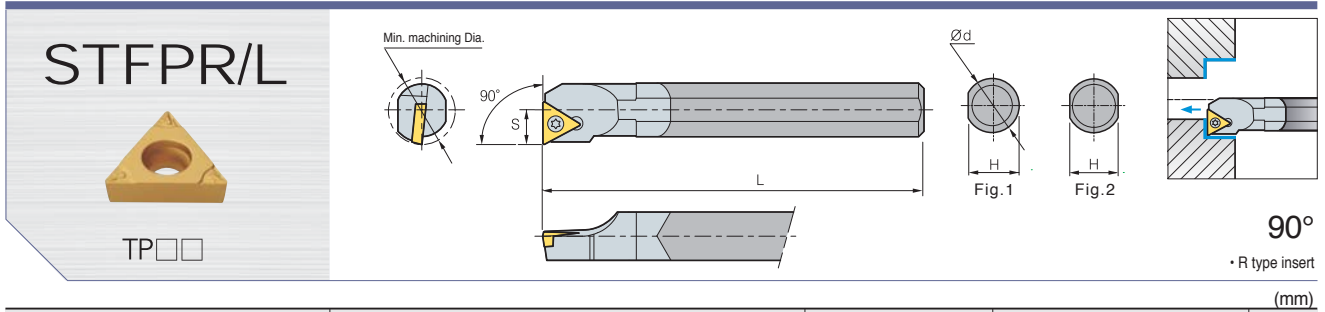
Applicable inserts, see pages B52~B53, B69



| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|----|-----|----|--------------|--------------|-----------|------|
| | | | | | | | | | |
| C08K-STFCR/L-09 | 10 | 8 | 7 | 125 | 5 | TC □T0902 □□ | FTKA02206 | TW06P | 2 |
| C10K-STFCR/L-09 | 12 | 10 | 9 | 125 | 6 | | | | |
| C10K-STFCR/L-11 | 12 | 10 | 9 | 125 | 6 | TC □T1102 □□ | FTKA02565 | | |
| C12M-STFCR/L-11 | 15 | 12 | 11 | 150 | 8 | | | | |
| C16R-STFCR/L-11 | 20 | 16 | 15 | 200 | 10 | | FTGA03510 | | |
| C20R-STFCR/L-11 | 25 | 20 | 18 | 200 | 13 | | | | |
| C20S-STFCR/L-11 | 25 | 20 | 18 | 250 | 13 | | FTGA03510 | | |
| C20R-STFCR/L-16 | 25 | 20 | 18 | 200 | 13 | | | | |
| C20S-STFCR/L-16 | 25 | 20 | 18 | 250 | 13 | TC □T0902 □□ | FTKA02206 | | |
| E08K-STFCR/L-09 | 10 | 8 | 7 | 125 | 5 | | | | |
| E10K-STFCR/L-09 | 12 | 10 | 9 | 125 | 6 | | FTKA02565 | | |
| E10K-STFCR/L-11 | 12 | 10 | 9 | 125 | 6 | | | | |
| E12M-STFCR/L-11 | 15 | 12 | 11 | 150 | 8 | | TC □T1102 □□ | FTKA02565 | |
| E16R-STFCR/L-11 | 20 | 16 | 15 | 200 | 11 | | | | |
| E20R-STFCR/L-11 | 25 | 20 | 18 | 200 | 13 | FTGA03510 | | | |
| E20S-STFCR/L-11 | 25 | 20 | 18 | 250 | 13 | | | | |
| E20R-STFCR/L-16 | 25 | 20 | 18 | 200 | 13 | FTGA03510 | | | |
| E20S-STFCR/L-16 | 25 | 20 | 19 | 250 | 13 | | | | |

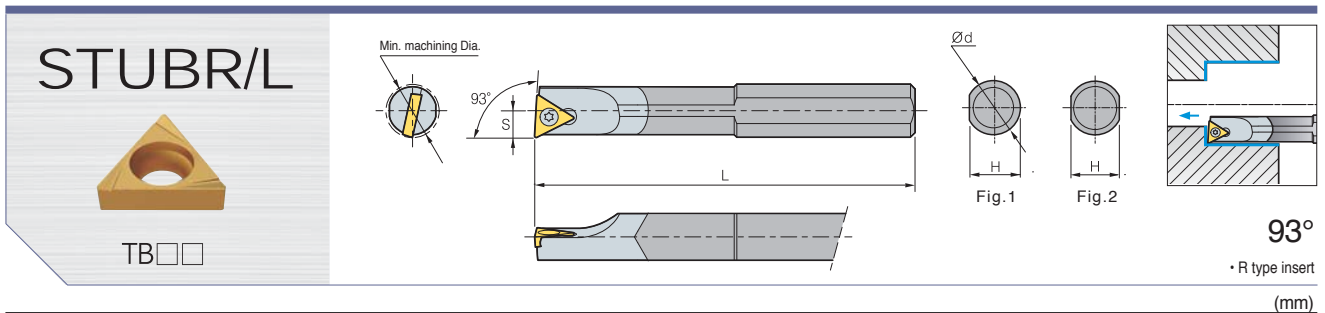
Applicable inserts, see pages B59, B72

B Carbide Shank Boring Bar



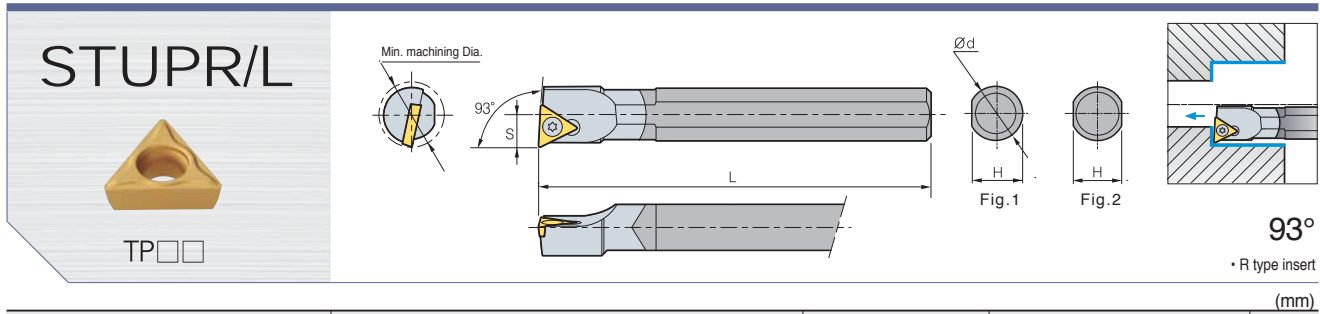
| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. | |
|-----------------|----|----|----|-----|----|--------------|-----------|--------|------|---|
| C08K-STFPR/L-08 | 10 | 8 | 7 | 125 | 5 | TP □T0802 □□ | FTNA02205 | TW06P | 2 | |
| C10K-STFPR/L-11 | 12 | 10 | 9 | 125 | 6 | TP □T1103 □□ | FTNA0305 | TW09P | | |
| C10M-STFPR/L-11 | 12 | 10 | 9 | 150 | 6 | | | | | |
| C12M-STFPR/L-11 | 15 | 12 | 11 | 150 | 8 | | | | | |
| C12Q-STFPR/L-11 | 15 | 12 | 11 | 180 | 8 | | | | | |
| C16R-STFPR/L-11 | 20 | 16 | 15 | 200 | 10 | | | | | |
| C16S-STFPR/L-11 | 20 | 16 | 15 | 250 | 10 | | | | | |
| C20R-STFPR/L-11 | 25 | 20 | 18 | 200 | 13 | | | | | |
| C20S-STFPR/L-11 | 25 | 20 | 18 | 250 | 13 | | | | | |
| C20R-STFPR/L-16 | 25 | 20 | 18 | 200 | 13 | TP □T1604 □□ | FTNA0408 | TW15P | | |
| C20S-STFPR/L-16 | 25 | 20 | 18 | 250 | 13 | TP □T1604 □□ | FTNA0408 | TW15P | | |
| C25T-STFPR/L-16 | 32 | 25 | 23 | 300 | 17 | | | | | |
| E08K-STFPR/L-08 | 10 | 8 | 7 | 125 | 5 | TP □T0802 □□ | FTNA02205 | TW06P | | 2 |
| E10K-STFPR/L-11 | 12 | 10 | 9 | 125 | 6 | TP □T1103 □□ | FTNA0305 | TW09P | | |
| E10M-STFPR/L-11 | 12 | 10 | 9 | 150 | 6 | | | | | |
| E12M-STFPR/L-11 | 15 | 12 | 11 | 150 | 8 | | | | | |
| E12Q-STFPR/L-11 | 15 | 12 | 11 | 180 | 8 | | | | | |
| E16R-STFPR/L-11 | 20 | 16 | 15 | 200 | 10 | | | | | |
| E16S-STFPR/L-11 | 20 | 16 | 15 | 250 | 10 | | | | | |
| E20R-STFPR/L-11 | 25 | 20 | 18 | 200 | 13 | | | | | |
| E20S-STFPR/L-11 | 25 | 20 | 18 | 250 | 13 | | | | | |
| E20R-STFPR/L-16 | 25 | 20 | 18 | 200 | 13 | TP □T1604 □□ | FTNA0408 | TW15P | | |
| E20S-STFPR/L-16 | 25 | 20 | 18 | 250 | 13 | TP □T1604 □□ | FTNA0408 | TW15P | | |
| E25T-STFPR/L-16 | 32 | 25 | 23 | 300 | 17 | | | | | |

Applicable inserts, see pages B60~B62



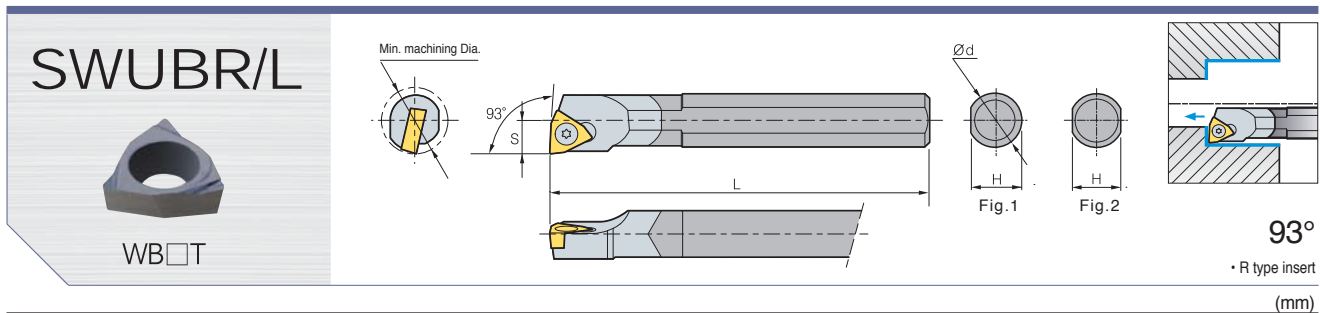
| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|---|-----|---|--------------|----------|--------|--------------|
| C08K-STUBR/L-06 | 10 | 8 | 7 | 125 | 5 | TB □T0601 □□ | FTNA0204 | TW06P | 2 |
| C10K-STUBR/L-06 | 12 | 10 | 9 | 125 | 6 | TB □T0601 □□ | FTNA0204 | TW06P | |
| E08K-STUBR/L-06 | 10 | 8 | 7 | 125 | 5 | | | | TB □T0601 □□ |
| E10K-STUBR/L-06 | 12 | 10 | 9 | 125 | 6 | | | | |

Applicable inserts, see pages B58



| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|----|-----|----|--------------|-----------|--------|------|
| C08K-STUPR/L-08 | 10 | 8 | 7 | 125 | 5 | TP □T0802 □□ | FTNA02205 | TW06P | 2 |
| C10K-STUPR/L-11 | 12 | 10 | 9 | 125 | 6 | TP □T1103 □□ | FTNA0305 | TW09P | |
| C10M-STUPR/L-11 | 12 | 10 | 9 | 150 | 6 | | | | |
| C12M-STUPR/L-11 | 15 | 12 | 11 | 150 | 8 | | | | |
| C12Q-STUPR/L-11 | 15 | 12 | 11 | 180 | 8 | | | | |
| C16R-STUPR/L-11 | 20 | 16 | 15 | 200 | 10 | | | | |
| C16S-STUPR/L-11 | 20 | 16 | 15 | 250 | 10 | | | | |
| C20R-STUPR/L-11 | 25 | 20 | 18 | 200 | 13 | | | | |
| C20S-STUPR/L-11 | 25 | 20 | 18 | 250 | 13 | | | | |
| C20R-STUPR/L-16 | 25 | 20 | 18 | 200 | 13 | TP □T1604 □□ | FTNA0408 | TW15P | |
| C25T-STUPR/L-16 | 32 | 25 | 23 | 300 | 17 | | | | |
| E08K-STUPR/L-08 | 10 | 8 | 7 | 125 | 5 | TP □T0802 □□ | FTNA02205 | TW06P | 2 |
| E10K-STUPR/L-11 | 12 | 10 | 9 | 125 | 6 | TP □T1103 □□ | FTNA0305 | TW09P | |
| E10M-STUPR/L-11 | 12 | 10 | 9 | 150 | 6 | | | | |
| E12M-STUPR/L-11 | 15 | 12 | 11 | 150 | 8 | | | | |
| E12Q-STUPR/L-11 | 15 | 12 | 11 | 180 | 8 | | | | |
| E16R-STUPR/L-11 | 20 | 16 | 15 | 200 | 10 | | | | |
| E16S-STUPR/L-11 | 20 | 16 | 15 | 250 | 10 | | | | |
| E20R-STUPR/L-11 | 25 | 20 | 18 | 200 | 13 | | | | |
| E20S-STUPR/L-11 | 25 | 20 | 18 | 250 | 13 | | | | |
| E20R-STUPR/L-16 | 25 | 20 | 18 | 200 | 13 | TP □T1604 □□ | FTNA0408 | TW15P | |
| E25T-STUPR/L-16 | 32 | 25 | 23 | 300 | 17 | | | | |

Applicable inserts, see pages B60~B62



| Designation | ØD | Ød | H | L | S | Insert | Screw | Wrench | Fig. |
|-----------------|----|----|-----|-----|-----|--------------|-----------|--------|------|
| C05H-SWUBR/L-02 | 6 | 5 | 4.4 | 100 | 3 | WB □T0201 □□ | FTNA0203 | TW06P | 1 |
| C06H-SWUBR/L-02 | 7 | 6 | 5.4 | 100 | 3.5 | | FTNA02033 | | 2 |
| C08K-SWUBR/L-02 | 9 | 8 | 7 | 125 | 4.5 | | FTNA02205 | | |
| C08K-SWUBR/L-S3 | 10 | 8 | 7 | 125 | 4.5 | WB □TS301 □□ | FTNA0203 | TW06P | 1 |
| E06H-SWUBR/L-02 | 7 | 6 | 5.4 | 100 | 3.5 | WB □T0201 □□ | FTNA02033 | | 2 |
| E08K-SWUBR/L-02 | 9 | 8 | 7 | 125 | 4.5 | WB □TS301 □□ | FTNA02205 | | |
| E08K-SWUBR/L-S3 | 10 | 8 | 7 | 125 | 5 | | | | |

Applicable inserts, see pages B66

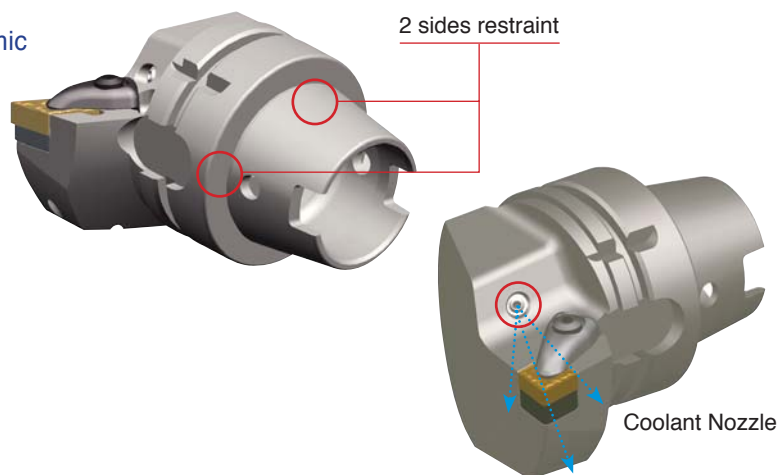


※ See page B178 for applicable sleeves

2 sides restraint - side and taper part

HSK Tooling System (For Multi-task Machines)

- 2 sides restraint - side and taper part
- Toughness guaranteed for static and dynamic movements
- Precision guaranteed on shaft and repeat directions
- Suitable at high speeds
- Suitable for small work pieces
- Coolant Nozzle is easily adjustable



HSK Tooling code system

C : 80° Diamond **D** : 55° Diamond
S : 90° Square **T** : 60° Triangle
V : 35° Diamond **W** : 80° Hexagon

N = 0°
B = 5°

DX : 65
H : 100
L : 140

Insert Shape **Clearance angle of insert** **Length of tool holder**



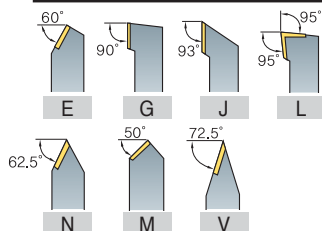
Taper design & size

ICTM=HSK standard

Clamping Type

D : Double Clamp
M : Multi Clamp
P : Lever Lock
S : Screw On
W : Wedge Clamp

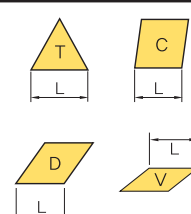
Holder Style



Hand

R : Right
L : Left
N : No Hand

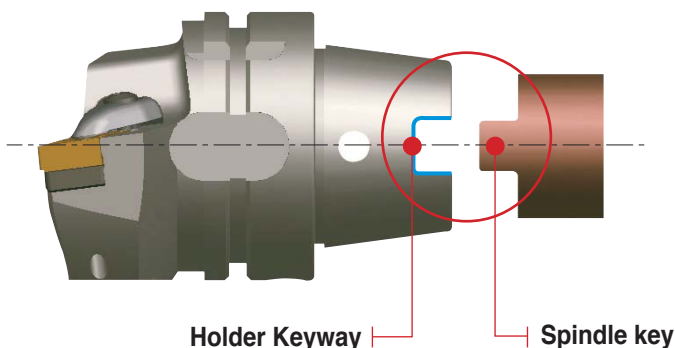
Cutting edge Length



ICTM (Interface Committee for Turning Mill)

- ▶ Interface for Multi-task machines turning tool, which is tooling system based on ICTM standard from 17 major Japanese companies cooperation and is compatible with conventional HSK-A type and common to Multi-task machines and machining centers

Tolerance of Keyway has been improved : HSK-T63



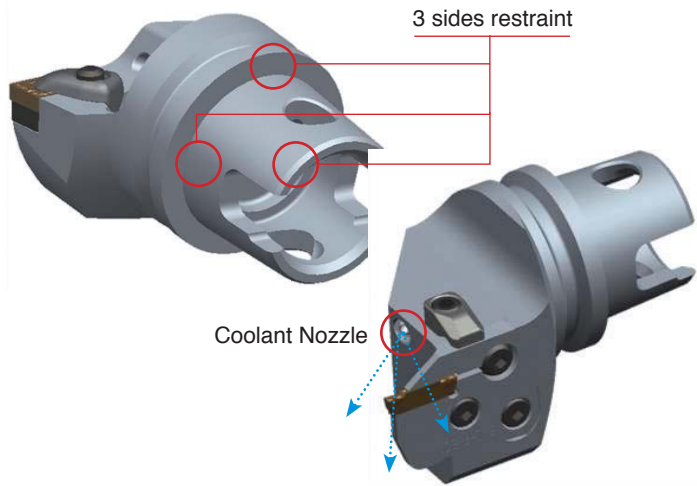
Tolerance comparison(Example) (mm)

| Remarks | Maximum Tolerance | Minimum Tolerance |
|-----------------------|-------------------|-------------------|
| ICTM STANDARD HSK-T63 | 0.075 | 0.035 |
| ISO STANDARD HSK-A63 | 0.33 | 0.08 |

3 Face Binding - Superior precision

KM Tooling System (For Multi-task Machines)

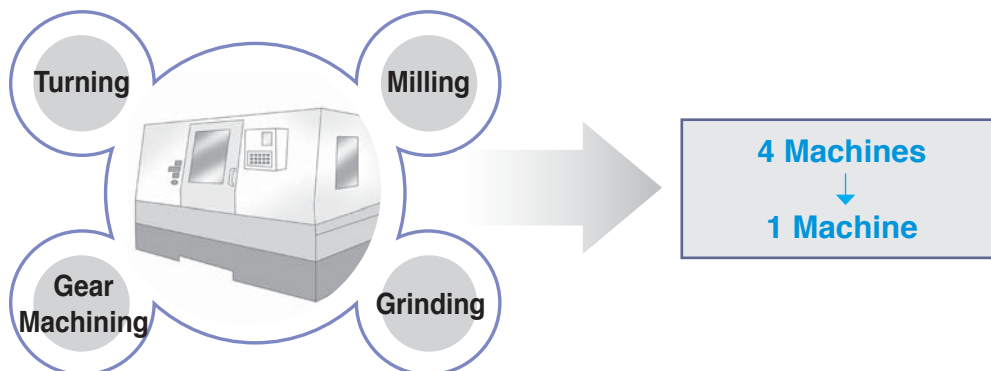
- 3 Face Binding / Superior precision
- Flexible Clamping System / Superior Rigidity
- Various Size & Style
- Appropriate for Turning & Milling
- Adjustable coolant direction with Coolant Nozzle



🔍 KM Tooling code system

| | | | | | | | |
|--------------------------------|---|---|----------------------------------|--|---|----------------------------|-------------|
| | C : 80° Diamond S : 90° Square V : 35° Diamond | D : 55° Diamond T : 60° Triangle W : 80° Hexagon | N = 0° B = 5° | DX : 65 H : 100 L : 140 | | | |
| | Insert Shape | | Clearance angle of insert | Length of tool holder | | | |
| KM50 | D | C | L | N | R | DX | - 12 |
| Taper design & size | Clamping Type | | Holder Style | | Hand | Cutting edge Length | |
| 50, 63UT 80ATC, 100 | D : Double Clamp M : Multi Clamp P : Lever Lock S : Screw On W : Wedge Clamp | | | | R : Right L : Left N : No Hand | | |

🔍 Multi-Tasking Machine



KM Tooling system is superior for wide application.

External Process

Internal Process

Grooving Process

Drill Process

Parting-off Process

KM50, KM63UT, KM80, KM100 Standard and Special type can be produced.

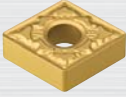
Index for HSK Tooling System

| | | | | | | | | |
|------------------|-------------------|------------------|-------------------|------------------|---------------------------|------------------|-------------------|------------------|
| Cutting Shape | | | | | | | | |
| Designation | H63T-DCLNR/L-DX12 | H63T-DCMNN-H/L12 | H63T-DDJNR/L-DX15 | H63T-DDNNN-H/L15 | H63T-PCLNR/L-DX12 | H63T-PCMNN-H/L12 | H63T-PDJNR/L-DX15 | H63T-PDNNN-H/L15 |
| Approach angle | 95° | 95° | 93° | 107.5° | 95° | 95° | 93° | 107.5° |
| Page | B149 | B149 | B149 | B149 | B150 | B150 | B150 | B150 |
| Turning | ● | ● | ● | ● | ● | ● | ● | ● |
| Copying | | | ● | ● | | | ● | ● |
| Facing | ● | ● | ● | ● | ● | ● | ● | ● |
| Back turning | ● | ● | ● | ● | ● | ● | ● | ● |
| Internal turning | | | | | | | | |
| Cutting Shape | | | | | | | | |
| Designation | H63T-PRDCR-DX12 | H63T-PRDCN-H/L12 | H63T-SVPBR/L-DX16 | H63T-SVVBH-H/L16 | H63T-A25K/A32L-DCLNR/L-12 | H63T-MCHR/L | H63T-MCHR/L | |
| Approach angle | - | - | 117.5° | 117.5° | 95° | - | - | |
| Page | B151 | B151 | B151 | B151 | B153 | B152 | B152 | |
| Turning | ● | ● | ● | ● | ● | ● | | |
| Copying | ● | ● | ● | ● | | ● | | |
| Facing | ● | ● | ● | ● | ● | ● | ● | |
| Back turning | ● | ● | ● | ● | ● | | | |
| Internal turning | | | | | ● | | | |

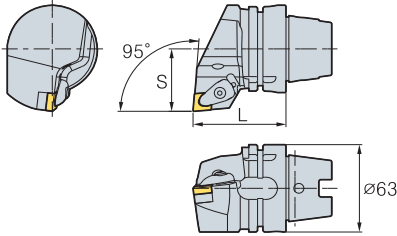
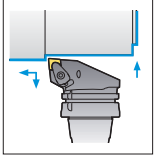
Index for KM Tooling System

| | | | | | | |
|------------------|--|--|--|--|--|--|
| Cutting Shape | | | | | | |
| Designation | KM50-DCLNR/L-C12 KM63UT-DCLNR/L-D12 | KM50-DCMNN-C12 KM63UT-DCMNN-D12 | KM50-DDJNR/L-C15(-3) KM63UT-DCLNR/L-D15(-3) | KM50-DDNNN-C15(-3) KM63UT-DDNNN-D15(-3) | KM50-A25K-DCLNR/L-12 KM50-A32K-DCLNR/L-12 KM63UT-A25K-DCLNR/L-12 KM63UT-A32L-DCLNR/L-12 | KM50-PCLNR/L-C12 KM63UT-PCLNR/L-D12 |
| Approach angle | 95° | 95° | 93° | 107.5° | 95° | 95° |
| Page | B155 | B155 | B155 | B156 | B158 | B156 |
| Turning | ● | ● | ● | ● | ● | ● |
| Copying | | | ● | ● | | |
| Facing | ● | ● | ● | ● | ● | ● |
| Back turning | ● | ● | ● | ● | ● | ● |
| Internal turning | | | | | ● | |
| Cutting Shape | | | | | | |
| Designation | KM50-PCMNN-C12 KM63UT-PCMNN-D12 | KM50-PDJNR/L-C15(-3) KM63UT-PCLNR/L-D15(-3) | KM50-PDNNN-C15(-3) KM63UT-PDNNN-D15(-3) | KM50-MCHR/L KM63UT-MCHR/L | | |
| Approach angle | 95° | 93° | 107.5° | - | | |
| Page | B156 | B157 | B157 | B157 | | |
| Turning | ● | ● | ● | ● | | |
| Copying | | ● | ● | ● | | |
| Facing | ● | ● | ● | | | |
| Back turning | ● | ● | ● | ● | | |
| Internal turning | | | | | | |

DCLNR/L



CN□□

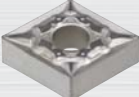



95°
• R type insert

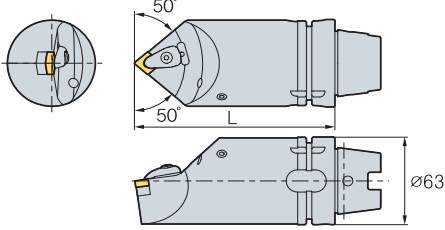
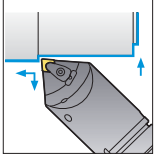
| Designation | L | S | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench | Coolant Pipe |
|-------------------|----|----|------------|-------|---------|-------|------------|---------|--------|------|--------|--------------|
| H63T-DCLNR/L-DX12 | 65 | 45 | CN□□1204□□ | CVH4 | CHX0518 | SC44V | FTKA0410 | SPR0714 | CN0605 | - | HW30P | CP63T |

Applicable inserts, see pages B18~B22

DCMNN



CN□□





95°

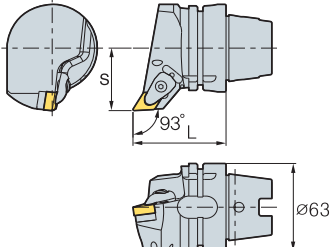
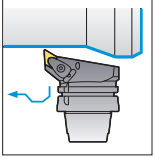
| Designation | L | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench | Coolant Pipe |
|----------------|-----|------------|-------|---------|-------|------------|---------|--------|---------|--------|--------------|
| H63T-DCMNN-H12 | 100 | CN□□1204□□ | CVH4 | CHX0518 | SC44V | FTKA0410 | SPR0714 | CN0605 | KHA0808 | HW30P | CP63T |
| H63T-DCMNN-L12 | 140 | | | | | | | | | | |

Applicable inserts, see pages B18~B22

DDJNR/L



DN□□

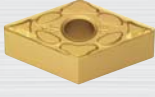



93°
• R type insert

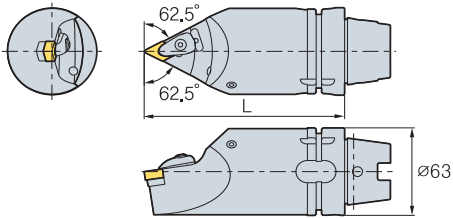
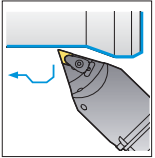
| Designation | L | S | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench | Coolant Pipe |
|---------------------|----|----|------------|-------|---------|-------|------------|---------|--------|------|--------|--------------|
| H63T-DDJNR/L-DX15 | 65 | 45 | DN□□1506□□ | CVH4 | CHX0518 | SD43V | FTKA0410 | SPR0714 | CN0605 | - | HW30P | CP63T |
| H63T-DDJNR/L-DX15-3 | 65 | 45 | DN□□1504□□ | | | SD44V | | | | | | |

Applicable inserts, see pages B23~B26

DDNNN



DN□□

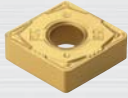



107.5°

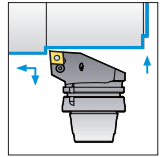
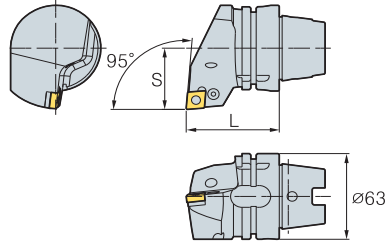
| Designation | L | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench | Coolant Pipe |
|------------------|-----|------------|-------|---------|-------|------------|---------|--------|---------|--------|--------------|
| H63T-DDNNN-H15 | 100 | DN□□1506□□ | CVH4 | CHX0518 | SD43V | FTKA0410 | SPR0714 | CN0605 | KHA0808 | HW30P | CP63T |
| H63T-DDNNN-L15 | 140 | | | | SD44V | | | | | | |
| H63T-DDNNN-H15-3 | 100 | DN□□1504□□ | CVH4 | CHX0518 | SD44V | FTKA0410 | SPR0714 | CN0605 | KHA0808 | HW30P | CP63T |
| H63T-DDNNN-L15-3 | 140 | | | | | | | | | | |

Applicable inserts, see pages B23~B26

PCLNR/L



CN□□



95°

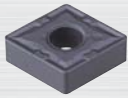
• R type insert

(mm)

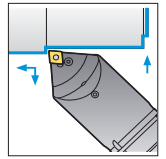
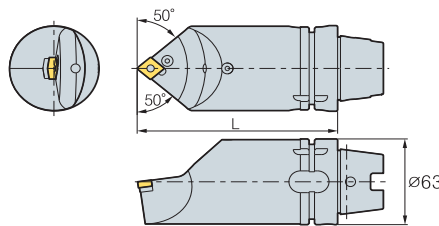
| Designation | L | S | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench | Coolant Pipe |
|-------------------|----|----|------------|-------|----------|-------|----------|----------|--------|------|--------|--------------|
| H63T-PCLNR/L-DX12 | 65 | 45 | CN□□1204□□ | LV4N | VHX0820N | SC42N | SP4N | LSPS4 | CN0605 | - | HW30L | CP63T |

Applicable inserts, see pages B18~B22

PCMNN



CN□□



95°

(mm)

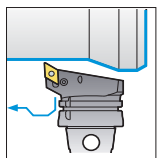
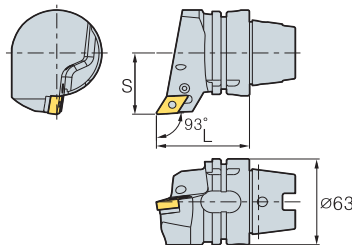
| Designation | L | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench | Coolant Pipe |
|----------------|-----|------------|-------|----------|-------|----------|----------|--------|---------|--------|--------------|
| H63T-PCMNN-H12 | 100 | CN□□1204□□ | LV4N | VHX0820N | SC42N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L | CP63T |
| H63T-PCMNN-L12 | 140 | | | | | | | | | | |

Applicable inserts, see pages B18~B22

PDJNR/L



DN□□



95°

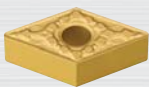
• R type insert

(mm)

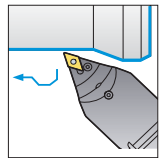
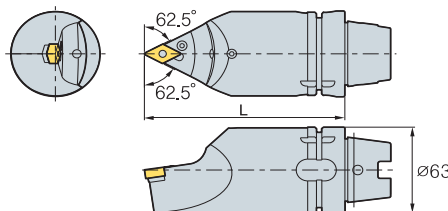
| Designation | L | S | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench | Coolant Pipe |
|---------------------|----|----|------------|-------|----------|-------|----------|----------|--------|------|--------|--------------|
| H63T-PDJNR/L-DX15 | 65 | 45 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | CN0605 | - | HW30L | CP63T |
| H63T-PDJNR/L-DX15-3 | 65 | 45 | DN□□1504□□ | | | SD43N | | | | | | |

Applicable inserts, see pages B23~B26

PDNNN



DN□□




107.5°

(mm)

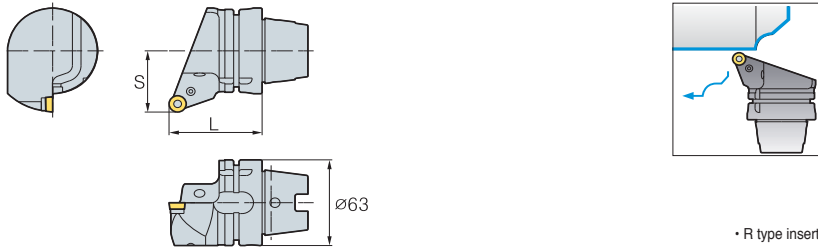
| Designation | L | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench | Coolant Pipe |
|------------------|-----|------------|-------|----------|-------|----------|----------|--------|---------|--------|--------------|
| H63T-PDNNN-H15 | 100 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L | CP63T |
| H63T-PDNNN-L15 | 140 | | | | | | | | | | |
| H63T-PDNNN-H15-3 | 100 | DN□□1504□□ | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L | CP63T |
| H63T-PDNNN-L15-3 | 140 | | | | | | | | | | |

Applicable inserts, see pages B23~B26

PRGCR/L



RCMX1204M0




• R type insert

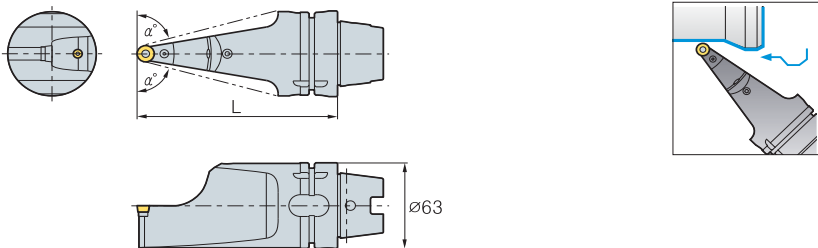
| Designation | L | S | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench | Coolant Pipe |
|-------------------|----|----|------------|-------|---------|------|----------|----------|--------|------|--------|--------------|
| H63T-PRGCR/L-DX12 | 65 | 45 | RCMX1204M0 | LR12 | VHX0617 | SR12 | SP3 | LSPS3 | CN0605 | - | HW25L | CP63T |

Applicable inserts, see pages B54

PRDCN



RCMX1204M0

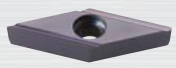


(mm)

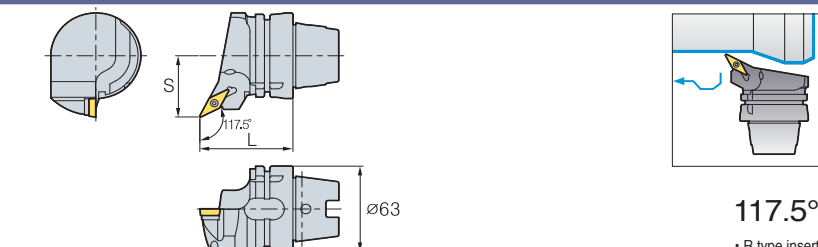
| Designation | L | α° | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench | Coolant Pipe |
|----------------|-----|----------------|------------|-------|---------|------|----------|----------|--------|------|--------|--------------|
| H63T-PRDCN-H12 | 100 | 69 | RCMX1204M0 | LR12 | VHX0617 | SR12 | SP3 | LSPS3 | CN0605 | - | HW25L | CP63T |
| H63T-PRDCN-L12 | 140 | 75 | | | | | | | | | | |

Applicable inserts, see pages B54

SVPBR/L



VB□

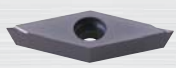


117.5°
• R type insert

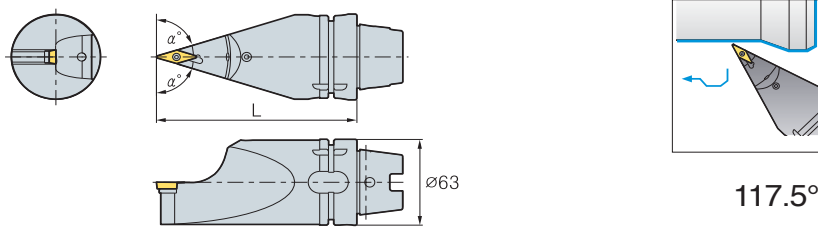
| Designation | L | S | Insert | Screw | Shim Screw | Shim | Nozzle | Plug | Wrench | Wrench | Coolant Pipe |
|-------------------|----|----|------------|-----------|------------|-------|--------|------|--------|--------|--------------|
| H63T-SVPBR/L-DX16 | 65 | 45 | VB□T1604□□ | FTGA03512 | SHXN0509F | SV32S | CN0605 | - | TW15P | HW32L | CP63T |

Applicable inserts, see pages B63~B64, B73

SVVBN



VB□



117.5°

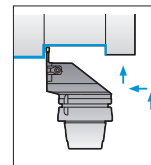
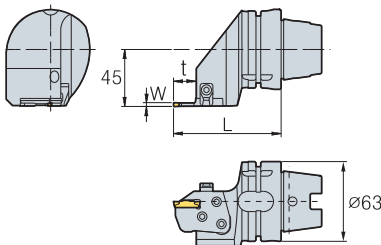
| Designation | L | α° | Insert | Screw | Shim Screw | Shim | Nozzle | Plug | Wrench | Wrench | Coolant Pipe |
|----------------|-----|----------------|------------|-----------|------------|-------|--------|---------|--------|--------|--------------|
| H63T-SVVBN-H16 | 100 | 66.5 | VB□T1604□□ | FTGA03512 | SHXN0509F | SV32S | CN0605 | KHA0808 | TW15P | HW32L | CP63T |
| H63T-SVVBN-L16 | 140 | 72.5 | | | | | | | | | |

Applicable inserts, see pages B63~B64, B73

MCHR/L



MGMN / MGMR/L
MGGN / MRMN



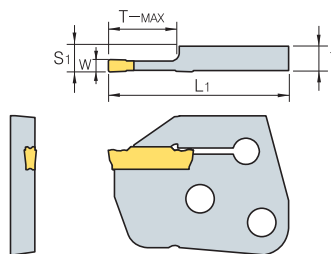
• R type insert

| Designation | L | t | W | T-max | Insert | Cartridge | (mm) | | | | | | | |
|-------------|----|----|---|-------|--------|-------------|-------|-------------|-------------|----------|--------|------|--------|--------------|
| | | | | | | | Clamp | Clamp Screw | Hinge Screw | Screw | Nozzle | Plug | Wrench | Coolant Pipe |
| H63T-MCHR/L | 85 | 18 | 3 | 16 | MGMN | MCER/L3-T16 | CXH8N | DHA0818F | RHA0613 | FHGA0618 | CN0605 | - | HW40L | CP63T |
| | 85 | 18 | 4 | 16 | MGMR/L | MCER/L4-T16 | | | | | | | | |
| | 89 | 22 | 5 | 20 | MGGN | MCER/L5-T20 | | | | | | | | |
| | 89 | 22 | 6 | 20 | MRMN | MCER/L6-T20 | | | | | | | | |

MCER/L (Cartridge)



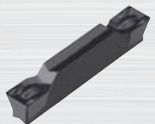
MGMN / MGMR/L
MGGN / MRMN



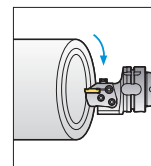
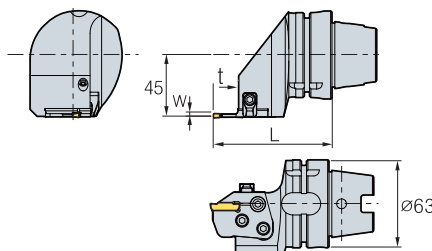
• R type insert

| Designation | L | L ₁ | S ₁ | T-max | Insert | | Available tool holders | |
|-------------|-------|----------------|----------------|-------|--------|-------------|------------------------|--------------|
| | | | | | W | Designation | | |
| MCER/L | 3-T16 | 6.00 | 44.5 | 6.35 | 16 | 3 | MGMN | H-63T-MCHR/L |
| | 4-T16 | 5.97 | 44.5 | 6.35 | 16 | 4 | MGMR/L | |
| | 5-T20 | 5.87 | 48.5 | 6.35 | 20 | 5 | MGGN | |
| | 6-T20 | 5.82 | 48.5 | 6.35 | 20 | 6 | MGMN | |

MCHR/L



MFMN300
MGMN400

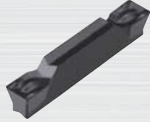


• R type insert

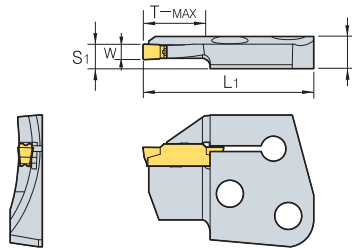
| Designation | L | t | W | T-max | Insert | Cartridge | (mm) | | | | | | | |
|-------------|----|----|---|-------|---------|---------------------|-------|-------------|-------------|----------|--------|------|--------|--------------|
| | | | | | | | Clamp | Clamp Screw | Hinge Screw | Screw | Nozzle | Plug | Wrench | Coolant Pipe |
| H63T-MCHR/L | 85 | 18 | 3 | 16 | MFMN300 | MCFR/L3-24/35-T16 | CXH8N | DHA0818F | RHA0613 | FHGA0618 | CN0605 | - | HW40L | |
| | 85 | 18 | 3 | 16 | | MCFR/L3-29/40-T16 | | | | | | | | |
| | 85 | 18 | 3 | 16 | | MCFR/L3-34/50-T16 | | | | | | | | |
| | 85 | 18 | 3 | 16 | | MCFR/L3-44/70-T16 | | | | | | | | |
| | 85 | 18 | 3 | 16 | MGMN400 | MCFR/L3-64/99-T16 | | | | | | | | |
| | 85 | 18 | 3 | 16 | | MCFR/L4-44/60-T16 | | | | | | | | |
| | 85 | 18 | 3 | 16 | | MCFR/L4-60/120-T16 | | | | | | | | |
| | 85 | 18 | 3 | 16 | | MCFR/L4-112/200-T16 | | | | | | | | |



MCFR/L (Cartridge)



MFMN300
MGMN400

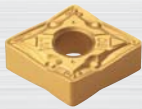


• R type insert

(mm)

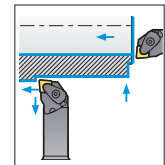
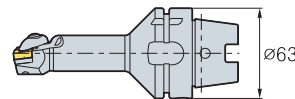
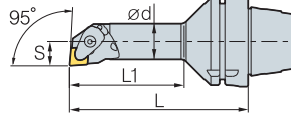
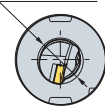
| Designation | T | L ₁ | S ₁ | T-max | Insert | | Available tool holders |
|-------------------|------|----------------|----------------|-------|--------|-------------|------------------------|
| | | | | | W | Designation | |
| MCFR/L3-24/35-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | MFMN300 | H63T-MCHR/L |
| 29/40-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | | |
| 34/50-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | | |
| 44/70-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | | |
| 64/99-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | | |
| MCFR/L4-44/60-T16 | 7.97 | 44.5 | 6.35 | 16 | 4 | MGMN400 | |
| 60/120-T16 | 7.97 | 44.5 | 6.35 | 16 | 4 | | |
| 112/200-T16 | 7.97 | 44.5 | 6.35 | 16 | 4 | | |

DCLNR/L



CN□□

Min. machining Dia.



95°

• R type insert

(mm)

| Designation | ØD | Ød | L | L ₁ | S | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench | Coolant Pipe |
|----------------------|----|----|-----|----------------|----|------------|-------|---------|-------|------------|---------|--------|------|--------|--------------|
| | | | | | | | | | | | | | | | |
| H63T-A25K-DCLNR/L-12 | 32 | 25 | 125 | 80 | 17 | CN□□1204□□ | CVH4 | CHX0518 | SC42V | FTKA0410 | SPR0714 | CN0605 | - | HW30P | CP63T |
| H63T-A32K-DCLNR/L-12 | 40 | 32 | 140 | 98 | 22 | | | | | | | | | | |

Applicable inserts, see pages B18~B22

Blank Tool

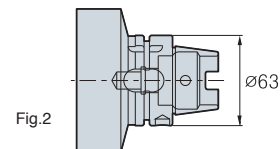
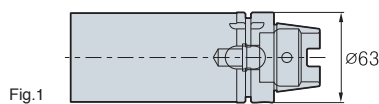
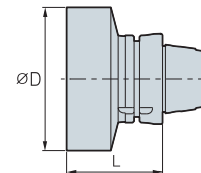
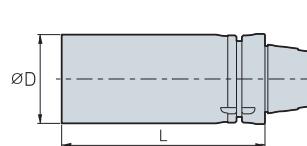


Fig.1

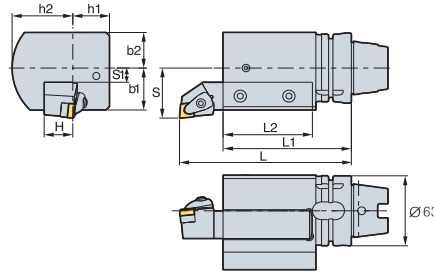
Fig.2

(mm)

| Designation | ØD | L | Fig. | Coolant Pipe |
|------------------|-----|-----|--------|--------------|
| HSK-T63-BL62-102 | 62 | 102 | Fig. 1 | |
| HSK-T63-BL62-142 | 62 | 142 | Fig. 1 | |
| HSK-T63-BL100-67 | 100 | 67 | Fig. 2 | |
| HSK-T63-BL120-70 | 120 | 70 | Fig. 2 | |



EV2525R/L-112



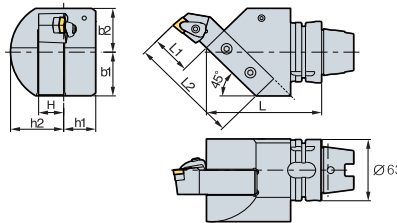
- **Holder information**
- Holder size: 25 x 25
- Before setting the holder, please cut the holder length to 115mm.

• R type insert

(mm)

| Designation | L | L1 | L2 | H | h1 | h2 | S | S1 | b1 | b2 | Screw | Plug | Nozzle | Wrench | Coolant Pipe |
|---------------|-----|-----|----|----|----|----|----|-------|-------|----|---------|---------|--------|--------|--------------|
| EV2525R/L-112 | 150 | 112 | 77 | 25 | 32 | 53 | 45 | 12.75 | 37.75 | 32 | KHA1231 | KHA0808 | CN0605 | HW50L | CP63T |

EV2525R/L-115



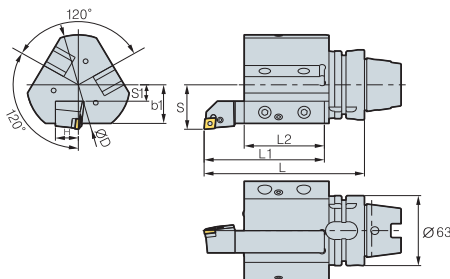
- **Holder information**
- Holder size: 25 x 25
- Before setting the holder, please cut the holder length to 110mm.

• R type insert

(mm)

| Designation | L | L1 | L2 | H | h1 | h2 | b1 | b2 | Screw | Plug | Nozzle | Wrench | Coolant Pipe |
|---------------|-----|----|-----|----|----|----|----|----|---------|---------|--------|--------|--------------|
| EV2525R/L-115 | 115 | 40 | 110 | 25 | 32 | 53 | 45 | 45 | KHA1231 | KHA0808 | CN0605 | HW50L | CP63T |

EV2525R/L-105-3



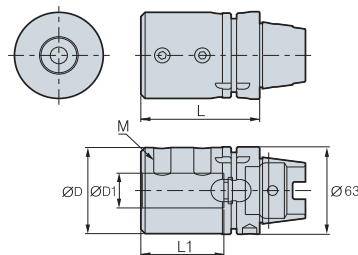
- **Holder information**
- Holder size: 25 x 25
- Before setting the holder, please cut the holder length to 105mm.

• R type insert

(mm)

| Designation | L | L1 | L2 | H | ØD | S | S1 | B1 | Screw | Plug | Nozzle | Wrench | Coolant Pipe |
|-----------------|-----|-----|----|----|----|----|----|----|---------|---------|--------|--------|--------------|
| EV2020R/L-105-3 | 140 | 105 | 70 | 20 | 90 | 40 | 15 | 35 | KHA1231 | KHA0808 | CN0605 | HW50L | CP63T |

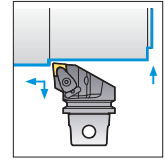
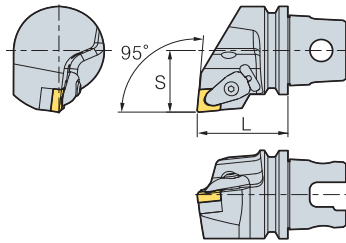
B○○-○○



• R type insert

(mm)

| Designation | ØD | ØD1 | L | L1 | M | Screw | Wrench | Coolant Pipe |
|-------------|----|-----|----|----|-----|---------|--------|--------------|
| B08-65 | 28 | 8 | 65 | 40 | M8 | KHA1218 | HW50L | CP63T |
| B10-70 | 35 | 10 | 70 | 45 | M8 | | | |
| B12-70 | 42 | 12 | 70 | 45 | M8 | | | |
| B16-75 | 48 | 16 | 75 | 50 | M10 | | | |
| B20-75 | 52 | 20 | 75 | 50 | M10 | | | |
| B25-83 | 62 | 25 | 83 | 58 | M12 | | | |
| B32-87 | 62 | 32 | 87 | 62 | M12 | | | |
| B40-97 | 65 | 40 | 97 | 72 | M16 | | | |



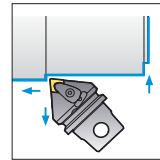
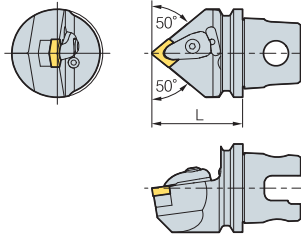
95°

· R type insert

(mm)

| Designation | L | S | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench |
|--------------------|----|----|------------|-------|---------|-------|------------|---------|--------|------|--------|
| KM50-DCLNR/L-C12 | 50 | 35 | CN□□1204□□ | CVH4 | CHX0518 | SC44V | FTKA0410 | SPR0714 | CNO605 | - | HW30P |
| KM63UT-DCLNR/L-D12 | 60 | 43 | | | | | | | | | |

Applicable inserts, see pages B18~B22

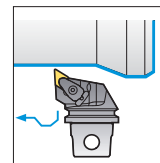
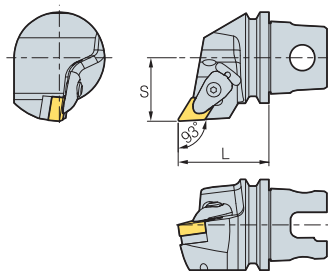


95°

(mm)

| Designation | L | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench |
|------------------|----|------------|-------|---------|-------|------------|---------|--------|---------|--------|
| KM50-DCMNN-C12 | 50 | CN□□1204□□ | CVH4 | CHX0518 | SC44V | FTKA0410 | SPR0714 | CNO605 | KHA0808 | HW30P |
| KM63UT-DCMNN-D12 | 60 | | | | | | | | | |

Applicable inserts, see pages B18~B22



93°

· R type insert

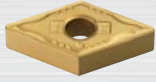
(mm)

| Designation | L | S | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench |
|----------------------|----|----|------------|-------|---------|-------|------------|---------|--------|------|--------|
| KM50-DDJNR/L-C15 | 50 | 35 | DN□□1506□□ | CVH4 | CHX0518 | SD43V | FTKA0410 | SPR0714 | CNO605 | - | HW30P |
| KM50-DDJNR/L-C15-3 | 50 | 35 | DN□□1504□□ | CVH4 | CHX0518 | SD44V | FTKA0410 | SPR0714 | CNO605 | - | HW30P |
| KM63UT-DDJNR/L-D15 | 60 | 43 | DN□□1506□□ | CVH4 | CHX0518 | SD43V | FTKA0410 | SPR0714 | CNO605 | - | HW30P |
| KM63UT-DDJNR/L-D15-3 | 60 | 43 | DN□□1504□□ | CVH4 | CHX0518 | SD44V | FTKA0410 | SPR0714 | CNO605 | - | HW30P |

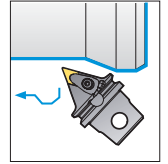
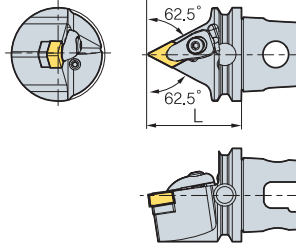
Applicable inserts, see pages B23~B26



DDNNN



DN□□



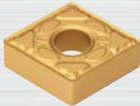
117.5°

(mm)

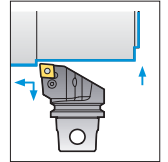
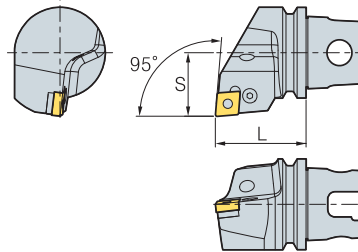
| Designation | L | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench |
|--------------------|----|------------|-------|---------|-------|------------|---------|--------|---------|--------|
| KM50-DDNNN-C15 | 50 | DN□□1506□□ | CVH4 | CHX0518 | SD43V | FTKA0410 | SPR0714 | CN0605 | KHA0808 | HW30P |
| KM50-DDNNN-C15-3 | 50 | DN□□1504□□ | CVH4 | CHX0518 | SD44V | FTKA0410 | SPR0714 | CN0605 | KHA0808 | HW30P |
| KM63UT-DDNNN-D15 | 60 | DN□□1506□□ | CVH4 | CHX0518 | SD43V | FTKA0410 | SPR0714 | CN0605 | KHA0808 | HW30P |
| KM63UT-DDNNN-D15-3 | 60 | DN□□1504□□ | CVH4 | CHX0518 | SD44V | FTKA0410 | SPR0714 | CN0605 | KHA0808 | HW30P |

Applicable inserts, see pages B23~B26

PCLNR/L



CN□□



95°

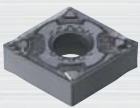
• R type insert

(mm)

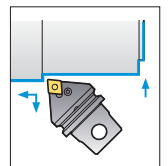
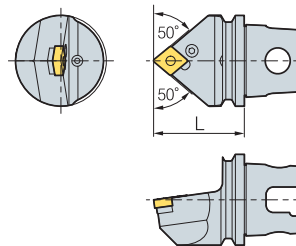
| Designation | L | S | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench |
|--------------------|----|----|------------|-------|----------|-------|----------|----------|--------|------|--------|
| KM50-PCLNR/L-C12 | 50 | 35 | CN□□1204□□ | LV4N | VHX0820N | SC42N | SP4N | LSPS4 | CN0605 | - | HW30L |
| KM63UT-PCLNR/L-D12 | 60 | 43 | | | | | | | | | |

Applicable inserts, see pages B18~B22

PCMNN



CN□□



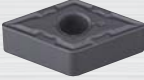
95°

(mm)

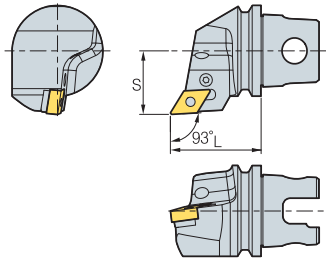
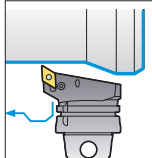
| Designation | L | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench |
|------------------|----|------------|-------|----------|-------|----------|----------|--------|---------|--------|
| KM50-PCMNN-C12 | 50 | CN□□1204□□ | LV4N | VHX0820N | SC42N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L |
| KM63UT-PCMNN-D12 | 60 | | | | | | | | | |

Applicable inserts, see pages B18~B22

PDJNR/L



DN□□


93°
• R type insert

(mm)

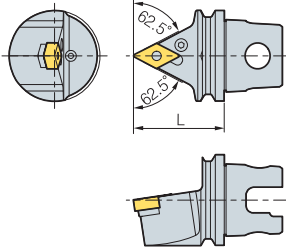
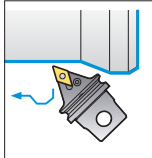
| Designation | L | S | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench |
|----------------------|----|----|------------|-------|----------|-------|----------|----------|--------|------|--------|
| KM50-PDJNR/L-C15 | 50 | 35 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | CN0605 | - | HW30L |
| KM50-PDJNR/L-C15-3 | 50 | 35 | DN□□1504□□ | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | CN0605 | - | HW30L |
| KM63UT-PDJNR/L-D15 | 60 | 43 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | CN0605 | - | HW30L |
| KM63UT-PDJNR/L-D15-3 | 60 | 43 | DN□□1504□□ | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | CN0605 | - | HW30L |

Applicable inserts, see pages B23~B26

PDNNN



DN□□


107.5°

(mm)

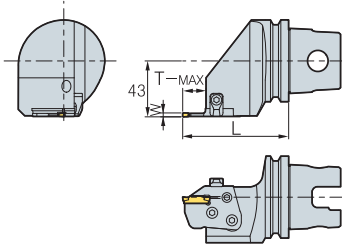
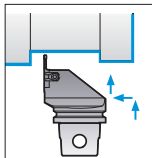
| Designation | L | Insert | Lever | Screw | Shim | Shim Pin | Punching | Nozzle | Plug | Wrench |
|--------------------|----|------------|-------|----------|-------|----------|----------|--------|---------|--------|
| KM50-PDNNN-C15 | 50 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L |
| KM50-PDNNN-C15-3 | 50 | DN□□1504□□ | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L |
| KM63UT-PDNNN-D15 | 60 | DN□□1506□□ | LV4BN | VHX0821N | SD42N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L |
| KM63UT-PDNNN-D15-3 | 60 | DN□□1504□□ | LV4BN | VHX0821N | SD43N | SP4N | LSPS4 | CN0605 | KHA0808 | HW30L |

Applicable inserts, see pages B23~B26

MCHR/L



MGMN / MGMR/L
MGGN / MRMN

• R type insert

(mm)

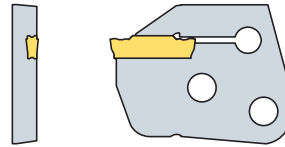
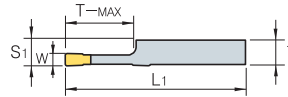
| Designation | S | L | t | W | T-max | Insert | Cartridge | Clamp | Clamp Screw | Hinge Screw | Screw | Nozzle | Plug | Wrench |
|---------------|----|------|----|---|-------|----------------|-------------|-------|-------------|-------------|----------|--------|------|--------|
| KM50-MCHR/L | 35 | 72.5 | 18 | 3 | 16 | MGMN MGMR/L | MCER/L3-T16 | CHX8N | DHA0818F | RHA0613 | FHGA0618 | CN0605 | - | HW40L |
| | 35 | 72.5 | 18 | 4 | 16 | | MCER/L4-T16 | | | | | | | |
| | 35 | 76.5 | 22 | 5 | 20 | | MCER/L5-T20 | | | | | | | |
| | 35 | 76.5 | 22 | 6 | 20 | | MCER/L6-T20 | | | | | | | |
| KM63UT-MCHR/L | 43 | 81.5 | 18 | 3 | 16 | MGGN MRMN | MCER/L3-T16 | CHX8N | DHA0818F | RHA0613 | FHGA0618 | CN0605 | - | HW40L |
| | 43 | 81.5 | 18 | 4 | 16 | | MCER/L4-T16 | | | | | | | |
| | 43 | 85.5 | 22 | 5 | 20 | | MCER/L5-T20 | | | | | | | |
| | 43 | 85.5 | 22 | 6 | 20 | | MCER/L6-T20 | | | | | | | |

Applicable inserts, see pages D22

MCER/L (Cartridge)



MGMN / MGMR/L
MGGN / MRMN



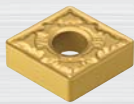
• R type insert

(mm)

| Designation | T | L ₁ | S ₁ | T-max | Insert | | Available tool holders |
|--------------|------|----------------|----------------|-------|--------|-------------|------------------------|
| | | | | | W | Designation | |
| MCER/L 3-T16 | 6.00 | 44.5 | 6.35 | 16 | 3 | MGMN | H-63T-MCHR/L |
| 4-T16 | 5.97 | 44.5 | 6.35 | 16 | 4 | MGMR/L | |
| 5-T20 | 5.87 | 48.5 | 6.35 | 20 | 5 | MGGN | |
| 6-T20 | 5.82 | 48.5 | 6.35 | 20 | 6 | MRMN | |

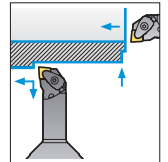
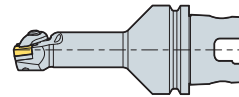
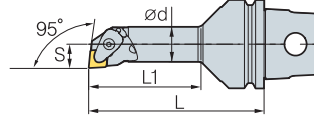
Applicable inserts, see pages D22

KM00 -DCLNR/L



CN□□

Min. machining Dia.



95°

• R type insert

(mm)

| Designation | ØD | Ød | L | L ₁ | S | Insert | Clamp | Screw | Shim | Shim Screw | Spring | Nozzle | Plug | Wrench |
|------------------------|----|----|-----|----------------|----|------------|-------|-------|------|------------|--------|--------|------|--------|
| KM50-A25K-DCLNR/L-12 | 32 | 25 | 125 | 80 | 17 | CN□□1204□□ | | | | | | | | |
| KM50-A32L-DCLNR/L-12 | 40 | 32 | 140 | 98 | 22 | | | | | | | | | |
| KM63UT-A25K-DCLNR/L-12 | 32 | 25 | 125 | 80 | 17 | | | | | | | | | |
| KM63UT-A32L-DCLNR/L-12 | 40 | 32 | 140 | 98 | 22 | | | | | | | | | |

Applicable inserts, see pages B18~B22

Blank Tool



Fig.1

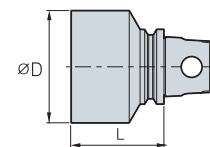


Fig.2

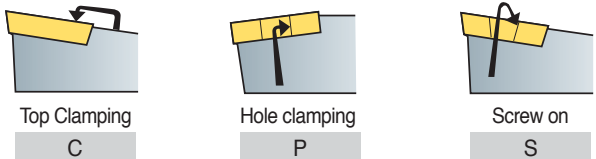
(mm)

| Designation | ØD | L | Ød | Fig. |
|-----------------|-----|-----|----|--------|
| KM50-BL7562 | 45 | 62 | 50 | Fig. 1 |
| KM50-BL10562 | 105 | 62 | 50 | Fig. 2 |
| KM63UT-BL65200 | 65 | 200 | 50 | Fig. 1 |
| KM63UT-BL115150 | 115 | 150 | 50 | Fig. 2 |

S T F C R 12 C A - 16

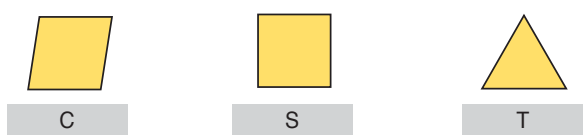
1 Method of Mounting Insert
 2 Insert Shape
 3 Holder Style
 4 Relief Angle of Insert
 5 Hand
 6 Height of Cutting Edge
 7 Cartridge Code
 8 Type of Cartridge
 9 Length of Cutting Edge

1 Method of Mounting Insert
 S T F C R 12 C A - 16



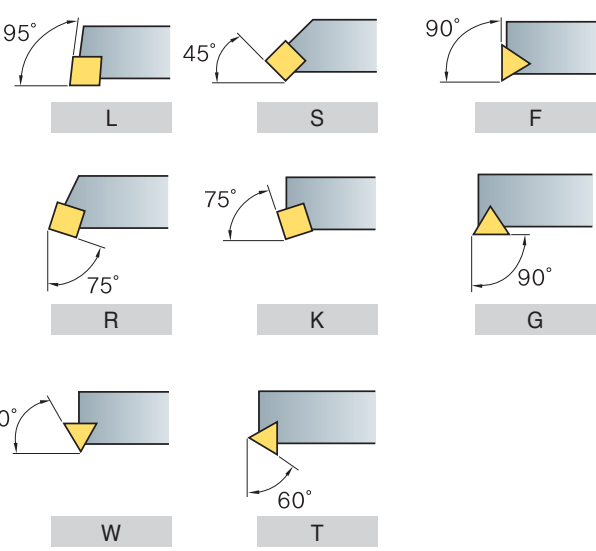
Top Clamping **C** Hole clamping **P** Screw on **S**

2 Insert Shape
 S T F C R 12 C A - 16



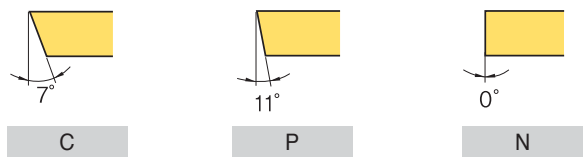
C **S** **T**

3 Holder Style
 S T F C R 12 C A - 16



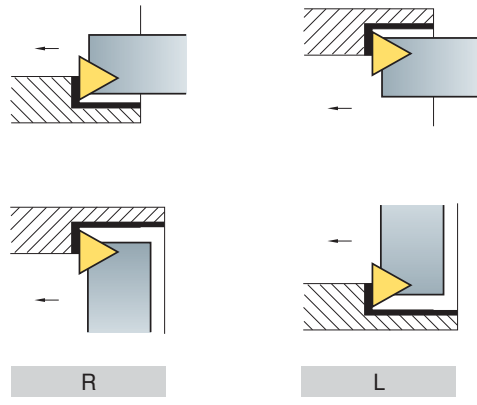
L **S** **F**
R **K** **G**
W **T**

4 Relief Angle of Insert
 S T F C R 12 C A - 16



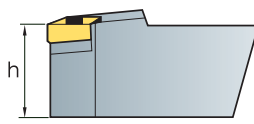
C **P** **N**

5 Hand
 S T F C R 12 C A - 16



R **L**

6 Height of Cutting Edge
 S T F C R 12 C A - 16



h

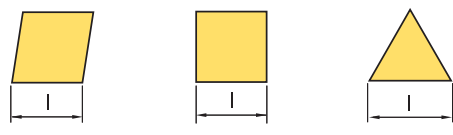
7 Cartridge Code
 S T F C R 12 C A - 16

C (Cartridge)

8 Type of Cartridge
 S T F C R 12 C A - 16

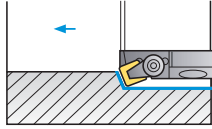
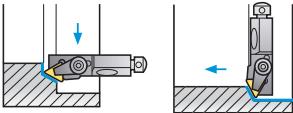
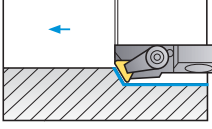
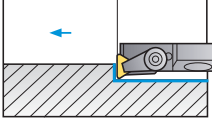
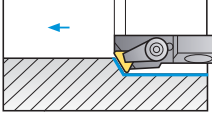
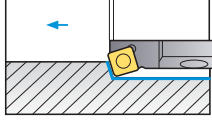
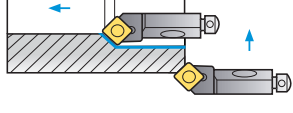
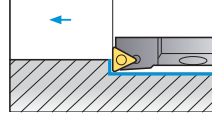
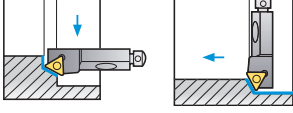
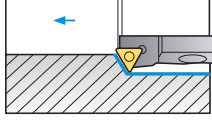
A (ISO5611)

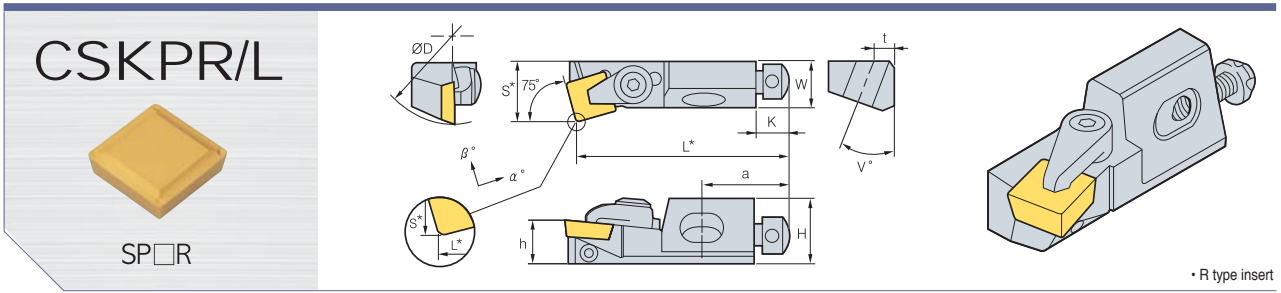
9 Length of Cutting Edge
 S T F C R 12 C A - 16



l **l** **l**

B Index for Cartridge

| Cutting Shape | | Turning | Copying | Facing | Chamfering | Applicable inserts | Page |
|-----------------|---|---------|---------|--------|------------|-----------------------|------|
| Clamp on System | CSKPR/L  10CA-09 12CA-12 | • | | | | SP□R 0903□□ 1203□□ | B161 |
| | CTTPR/L  10CA-11 12CA-16 | • | | | | TP□R 1103□□ 1603□□ | B162 |
| | CTWPR/L  10CA-11 12CA-16 | • | | | | TP□R 1103□□ 1603□□ | B162 |
| | CTFPR/L  10CA-11 12CA-16 | • | | • | | TP□R 1103□□ 1603□□ | B161 |
| | CTSPR/L  10CA-11 12CA-16 | • | | | | TP□R 1103□□ 1603□□ | B161 |
| Screw on System | SSKCR/L  10CA-09 12CA-12 | • | | | | SC□T 09T3□□ 1204□□ | B163 |
| | SSSCR/L  10CA-09 12CA-12 | • | | | • | SC□T 09T3□□ 1204□□ | B163 |
| | STFCR/L  10CA-11 12CA-16 | • | | • | | TC□T 1102□□ 16T3□□ | B163 |
| | STTCR/L  10CA-11 12CA-16 | • | | • | | TC□T 1102□□ 16T3□□ | B164 |
| | STWCR/L  10CA-11 12CA-16 | • | | | | TC□T 1102□□ 16T3□□ | B164 |



• R type insert

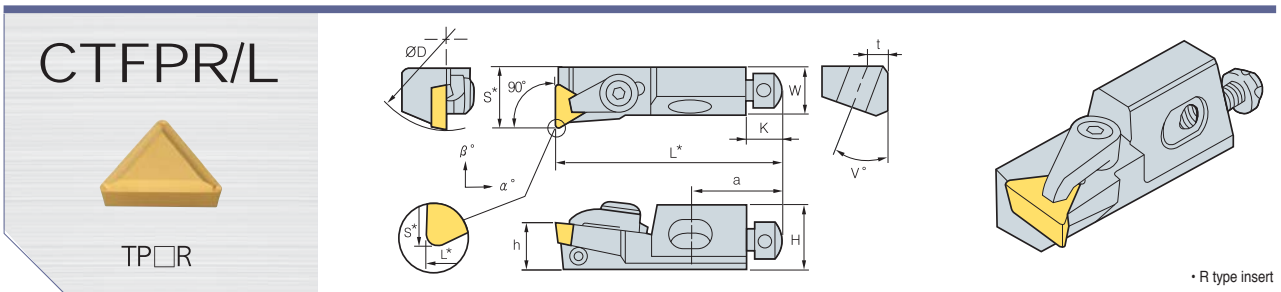
(mm)

| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|-----------------|
| CSKPR/L 10CA-09 | 40 | 15 | 11 | 50 | 14 | 10 | 8 | 6 | 0 | 20 | 5 | 20 | SP □ R 0903 □ □ |
| 12CA-12 | 50 | 20 | 15 | 55 | 20 | 12 | 8 | 6 | 0 | 20 | 6 | 20 | 1203 □ □ |

Applicable inserts, see pages B56–B57

• a base Insert : r = 0.8 D = Min. machining Dia.

| Parts | Clamp | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-------|--------------------|---------------------|----------------|--------|--------|--------|
| CSKPR/L 10CA-09 | CA05R | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW15L | HW20L |
| 12CA-12 | CA06R | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW15L | HW20L |



• R type insert

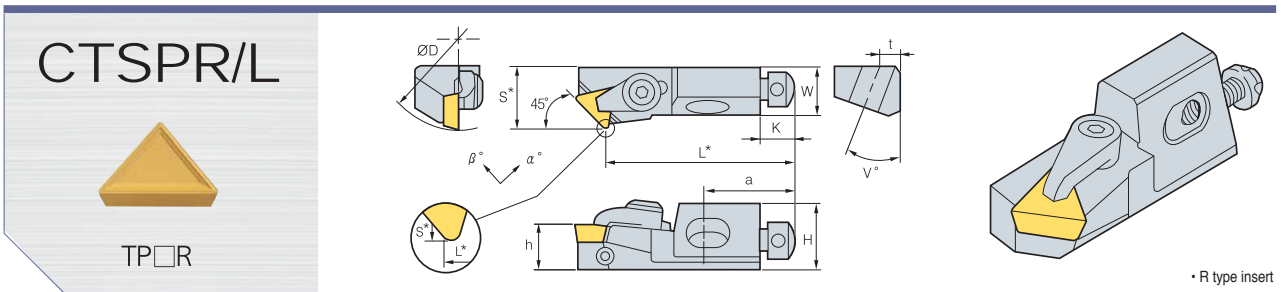
(mm)

| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|-----------------|
| CTFPR/L 10CA-11 | 40 | 15 | 11 | 50 | 14 | 10 | 8 | 6 | 0 | 20 | 5 | 20 | TP □ R 1103 □ □ |
| 12CA-16 | 50 | 20 | 15 | 55 | 20 | 12 | 8 | 6 | 0 | 20 | 6 | 20 | 1603 □ □ |

Applicable inserts, see pages B61–B62

• a base Insert : r = 0.4 (l = 11) r = 0.8 (l = 16) D = Min. machining Dia.

| Parts | Clamp | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-------|--------------------|---------------------|----------------|--------|--------|--------|
| CTFPR/L 10CA-11 | CA05R | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW25L | HW20L |
| 12CA-16 | CA06R | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW30L | HW20L |



• R type insert

(mm)

| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|-----------------|
| CTSPR/L 10CA-11 | 40 | 15 | 11 | 44 | 14 | 10 | 8 | 4 | 0 | 20 | 5 | 20 | TP □ R 1103 □ □ |
| 12CA-16 | 50 | 20 | 15 | 47 | 20 | 12 | 8 | 5 | 0 | 20 | 6 | 20 | 1603 □ □ |

Applicable inserts, see pages B61–B62

• a base Insert : r = 0.4 (l = 11) r = 0.8 (l = 16) D = Min. machining Dia.

| Parts | Clamp | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-------|--------------------|---------------------|----------------|--------|--------|--------|
| CTSPR/L 10CA-11 | CA05R | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW25L | HW20L |
| 12CA-16 | CA06R | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW30L | HW20L |

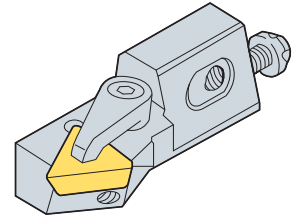
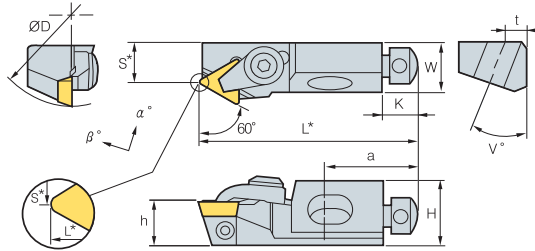


B Clamp on System

CTTPR/L



TP□R



• R type insert

(mm)

| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|-----------------------------|
| CTTPR/L 10CA-11 | 40 | 15 | 11 | 50 | 9 | 10 | 8 | 5 | 0 | 20 | 5 | 20 | TP □ R 1103 □ □ 1603 □ □ |
| CTTPR/L 12CA-16 | 50 | 20 | 15 | 55 | 20 | 12 | 8 | 5 | 0 | 20 | 6 | 20 | |

Applicable inserts, see pages B61~B62

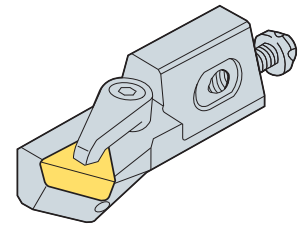
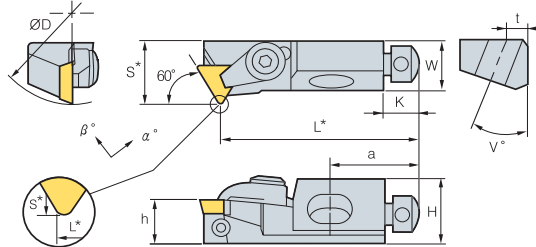
• a base Insert : r = 0.8 D = Min. machining Dia.

| Parts | Clamp | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-------|--------------------|---------------------|----------------|--------|--------|--------|
| CTTPR/L 10CA-11 | CA05R | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW25L | HW20L |
| CTTPR/L 12CA-16 | CA06R | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW30L | HW20L |

CTWPR/L



TP□R



• R type insert

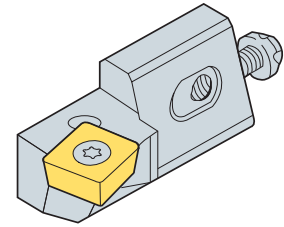
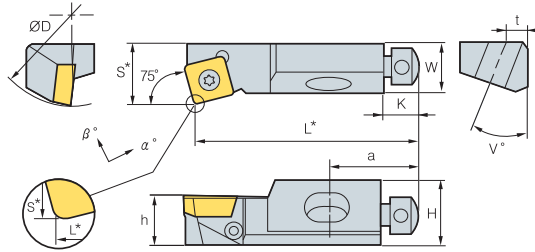
(mm)

| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|-----------------------------|
| CTWPR/L 10CA-11 | 40 | 15 | 11 | 44 | 14 | 10 | 8 | 5 | 0 | 20 | 5 | 20 | TP □ R 1103 □ □ 1603 □ □ |
| CTWPR/L 12CA-16 | 50 | 20 | 15 | 47 | 20 | 12 | 8 | 5 | 0 | 20 | 6 | 20 | |

Applicable inserts, see pages B61~B62

• a base Insert : r = 0.8 D = Min. machining Dia.

| Parts | Clamp | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-------|--------------------|---------------------|----------------|--------|--------|--------|
| CTWPR/L 10CA-11 | CA05R | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW25L | HW20L |
| CTWPR/L 12CA-16 | CA06R | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW30L | HW20L |

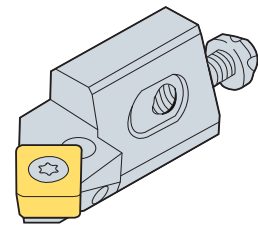
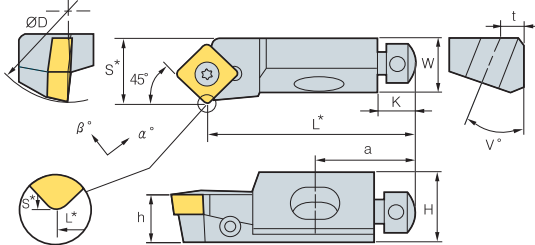


• R type insert
(mm)

| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|---------------|
| SSKCR/L 10CA-09 | 40 | 15 | 11 | 50 | 14 | 10 | 8 | 0 | -4 | 20 | 5 | 20 | SC □□ 09T3 □□ |
| 12CA-12 | 50 | 20 | 15 | 55 | 20 | 12 | 8 | 0 | -4 | 20 | 6 | 20 | SC □□ 1204 □□ |

Applicable inserts, see pages B54, B71 • a base Insert : r = 0.8 D = Min. machining Dia.

| Parts | Screw | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-----------|--------------------|---------------------|----------------|--------|--------|--------|
| SSKCR/L 10CA-09 | FTGA03508 | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW 15P | HW20L |
| 12CA-12 | FTGA0411F | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW 15P | HW20L |

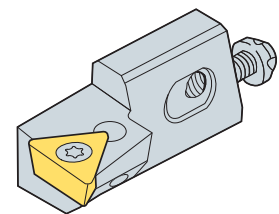
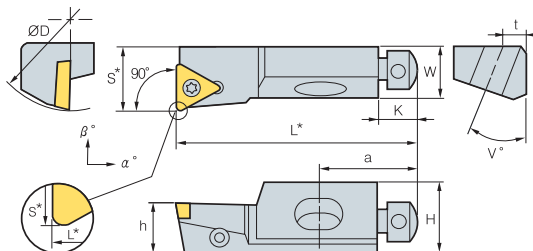


• R type insert
(mm)

| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|---------------|
| SSSCR/L 10CA-09 | 40 | 15 | 11 | 44 | 14 | 10 | 8 | -5 | 0 | 20 | 5 | 20 | SC □□ 09T3 □□ |
| 12CA-12 | 50 | 20 | 15 | 47 | 20 | 12 | 8 | -5 | 0 | 20 | 6 | 20 | SC □□ 1204 □□ |

Applicable inserts, see pages B54, B71 • a base Insert : r = 0.8 D = Min. machining Dia.

| Parts | Screw | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-----------|--------------------|---------------------|----------------|--------|--------|--------|
| SSSCR/L 10CA-09 | FTGA03508 | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW 15P | HW20L |
| 12CA-12 | FTGA0411F | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW 15P | HW20L |



• R type insert
(mm)

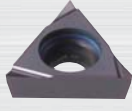
| Designation | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-----------------|----|----|----|----|----|----|---|----|----|----|---|----|---------------|
| STFCR/L 10CA-11 | 40 | 15 | 11 | 50 | 14 | 10 | 8 | 0 | -3 | 20 | 5 | 20 | TC □□ 1102 □□ |
| 12CA-16 | 50 | 20 | 15 | 55 | 20 | 12 | 8 | 0 | -3 | 20 | 6 | 20 | TC □□ 16T3 □□ |

Applicable inserts, see pages B59, B72 • a base Insert : r = 0.4 (l=11) r = 0.8 (l=16) D = Min. machining Dia.

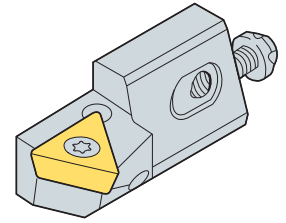
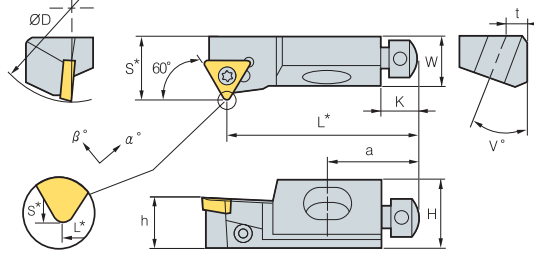
| Parts | Screw | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-----------|--------------------|---------------------|----------------|--------|--------|--------|
| STFCR/L 10CA-11 | FTKA02565 | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW 15P | HW20L |
| 12CA-16 | FTKA03508 | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW 15P | HW20L |



STTCR/L



TC□□



• R type insert

(mm)

| Designation | | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-------------|---------|----|----|----|----|----|----|---|----|----|----|---|----|---------------|
| STTCR/L | 10CA-11 | 40 | 15 | 11 | 50 | 9 | 10 | 8 | -5 | 0 | 20 | 5 | 20 | TC □□ 1102 □□ |
| | 12CA-16 | 50 | 20 | 15 | 47 | 20 | 12 | 8 | -3 | 0 | 20 | 6 | 20 | TC □□ 16T3 □□ |



Applicable inserts, see pages B59, B72

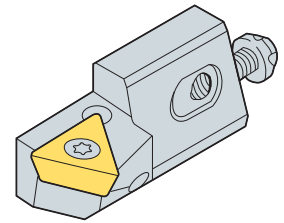
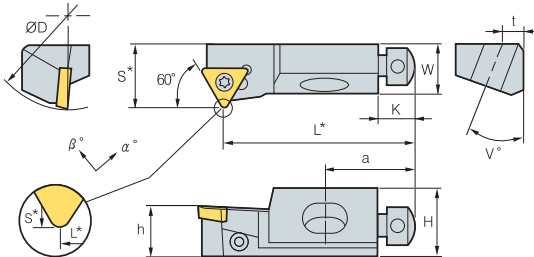
• a base Insert : r = 0.4 (l = 11) r = 0.8 (l = 16) D = Min. machining Dia.

| Parts | Screw | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-----------|--------------------|---------------------|----------------|--------|--------|--------|
| STTCR/L 10CA-11 | FTKA02565 | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW 07P | HW20L |
| STTCR/L 12CA-16 | FTKA03508 | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW 15P | HW20L |

STWCR/L



TC□□



• R type insert

(mm)

| Designation | | ØD | H | W | L* | S* | h | K | α° | β° | a | t | v° | Insert |
|-------------|---------|----|----|----|----|----|----|---|----|----|----|---|----|---------------|
| STWCR/L | 10CA-11 | 40 | 15 | 11 | 44 | 14 | 10 | 8 | 0 | -4 | 20 | 5 | 20 | TC □□ 1102 □□ |
| | 12CA-16 | 50 | 20 | 15 | 47 | 20 | 12 | 8 | -5 | 0 | 20 | 6 | 20 | TC □□ 16T3 □□ |



Applicable inserts, see pages B59, B72

• a base Insert : r = 0.4 (l = 11) r = 0.8 (l = 16) D = Min. machining Dia.

| Parts | Screw | Axial Adjust Screw | Radial Adjust Screw | Mounting Screw | Washer | Wrench | Wrench |
|-----------------|-----------|--------------------|---------------------|----------------|--------|--------|--------|
| STWCR/L 10CA-11 | FTKA02565 | AZ0508F | KHA0408 | RHA0620 | WA0602 | TW 15P | HW20L |
| STWCR/L 12CA-16 | FTKA03508 | AZ0508F | KHA0412 | RHA0625 | WA0602 | TW 15P | HW20L |

Excellent for precision machining

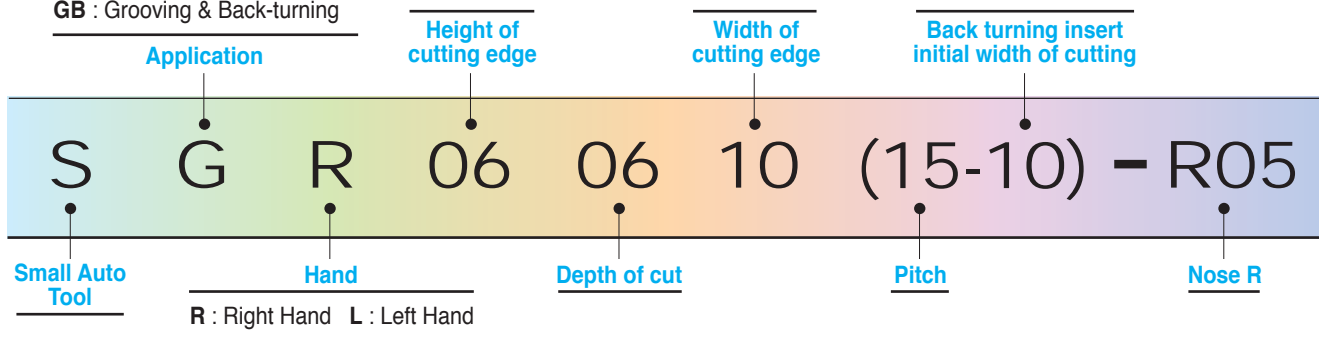
Auto Tools

- Excellent for precision machining
- Excellent for complicated machining
- Excellent for small part machining
- Available for various types of machining
- Whole inserts can be clamped on only one FGT holders
- ISO whole holders Offset "0"



Auto Tools code system

B : Back-turning G : Grooving
 C : Parting-off T : Threading
 GB : Grooving & Back-turning

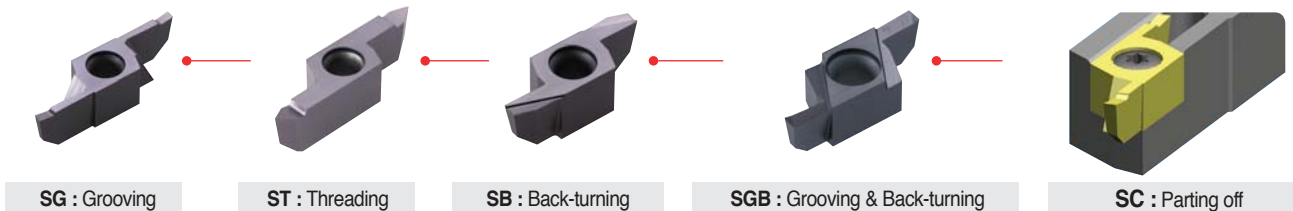


Type



Multi functional auto tool(FGT)

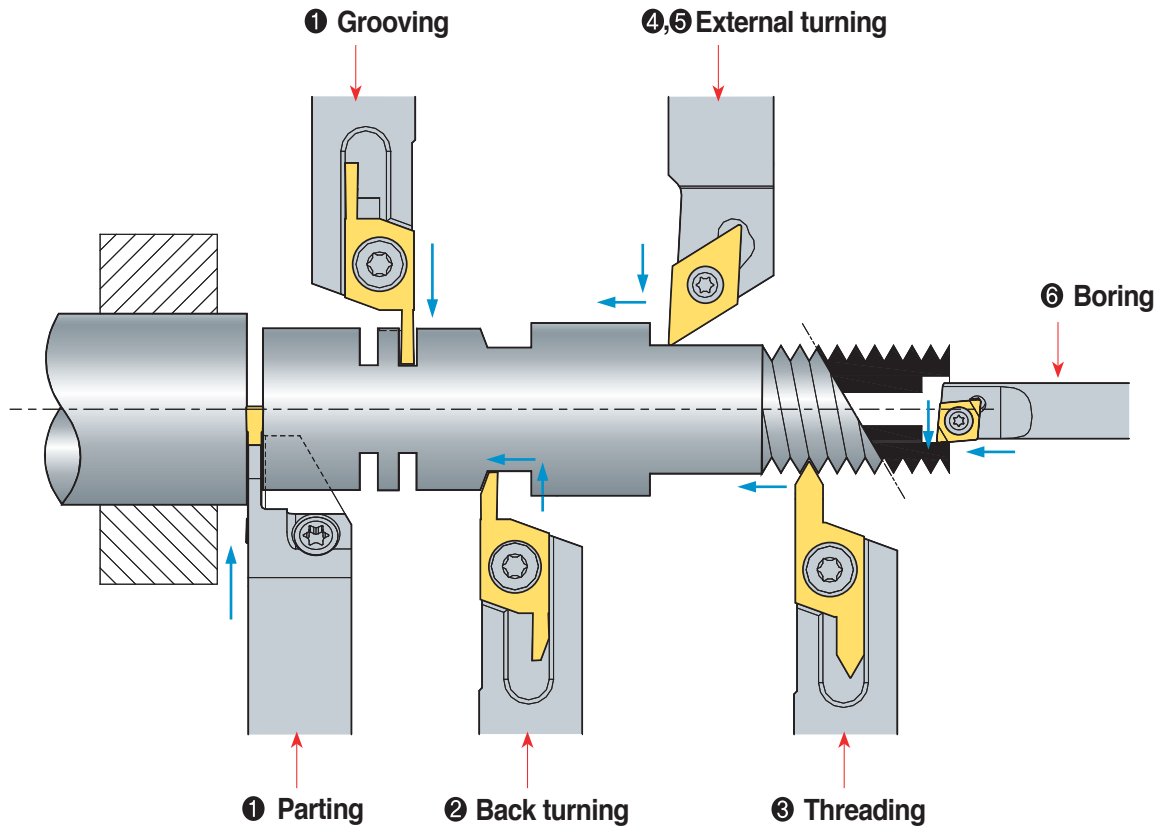
Possible to clamp on only one holder (Ex : 06 size whole inserts - Clamping on the 06 size holder)



Recommended cutting condition

| Workpiece | Turning | | Grooving | | Parting off | | Back-turning | |
|--------------------|----------------------|--------------|----------------------|--------------|----------------------|--------------|----------------------|--------------|
| | Cutting Speed(m/min) | Feed(mm/rev) | Cutting Speed(m/min) | Feed(mm/rev) | Cutting Speed(m/min) | Feed(mm/rev) | Cutting Speed(m/min) | Feed(mm/rev) |
| Stainless steel | 50 ~ 120 | 0.02 ~ 0.20 | 30 ~ 120 | 0.02 ~ 0.05 | 30 ~ 120 | 0.02 ~ 0.05 | 30 ~ 120 | 0.02 ~ 0.20 |
| Carbon steel | 50 ~ 150 | 0.01 ~ 0.25 | 50 ~ 150 | 0.02 ~ 0.08 | 50 ~ 150 | 0.01 ~ 0.08 | 50 ~ 150 | 0.01 ~ 0.25 |
| Free-cutting steel | 30 ~ 150 | 0.02 ~ 0.25 | 30 ~ 150 | 0.02 ~ 0.08 | 30 ~ 150 | 0.01 ~ 0.08 | 30 ~ 150 | 0.01 ~ 0.25 |
| Non-ferrous metal | 70 ~ 200 | 0.03 ~ 0.25 | 70 ~ 200 | 0.03 ~ 0.10 | 70 ~ 200 | 0.03 ~ 0.10 | 70 ~ 200 | 0.03 ~ 0.30 |

Application Example



Index

| | ① Parting and Grooving | | | ② Back turning | | ③ Threading |
|----------------------|------------------------|-----------|-----------|----------------|-----------|-----------------|
| Holder | SXGNR/L | SXGNR/L | MGEHR/L | SXGNR/L | SXGNR/L | SXGNR/L |
| Insert | SG | SC | MGMN | SB | SGB | ST |
| Holder size | 10 ~ 20mm | 10 ~ 20mm | 10 ~ 16mm | 10 ~ 20mm | 10 ~ 20mm | 10 ~ 20mm |
| Insert shape | | | | | | |
| Cutting width | 1 ~ 3mm | 1 ~ 3mm | 1.5~2.5mm | 2 ~ 4mm | 2 ~ 3mm | Pitch ranges |
| ØDmax | Ø18 | Ø18 | Ø32 | Tmax8 | Tmax8.5 | 0.5~1.5/1.5~3.0 |
| Page | B169 | B169 | B171 | B169 | B169 | B169 |

| | ④ External turning and Copy machining | | | |
|---------------------|---------------------------------------|----------|-----------|-----------|
| Holder | SDJCR/L | SDNCN | SVJBR/L | SVJCR/L |
| Insert | DC□T | DC□T | VB□T | VC□T |
| Holder size | 8 ~ 16mm | 8 ~ 16mm | 10 ~ 16mm | 10 ~ 16mm |
| Insert shape | | | | |
| Feature | Offset "0" | | | |
| Page | B167 | B168 | B168 | B168 |

| | ⑤ External turning and Facing | | |
|---------------------|-------------------------------|----------|----------|
| Holder | SCACR/L | SCLCR/L | STACR/L |
| Insert | CC□T | CC□T | TC□T |
| Holder size | 8 ~ 16mm | 8 ~ 16mm | 8 ~ 10mm |
| Insert shape | | | |
| Feature | Offset "0" | | |
| Page | B167 | B167 | B168 |

| | ⑥ Boring | | | | |
|-----------------------|----------|---------|---------|---------|-----------|
| Holder | SCLCR/L | STUBR/L | STUPR/L | SWUBR/L | MSB |
| Insert | CC□T | TB□T | TP□T | WB□T | - |
| Shank diameter | Ø4~10 | Ø8 | Ø8 | Ø5~Ø8 | Ø4~Ø6 |
| Insert shape | | | | | |
| ØDmin | Ø5 | Ø8 | Ø10 | Ø5.5 | Ø3.2 |
| Page | B140 | B140 | B140 | B140 | B172~B178 |

SCACR/L

CCGT

* Only SCACR/L1010-X09A is designed as above picture.

90°

• R type insert

| Designation | H | W | L | S | h | ℓ | Insert | Screw | Wrench | |
|-------------|-----------|----|-----|-----|----|----|--------------|--------------|-----------|--------|
| | | | | | | | | | | |
| SCACR/L | 0808-X06A | 8 | 8 | 120 | 8 | 8 | 10 | CCGT 0602 □□ | FTKA02565 | TW 07P |
| | 1010-X06A | 10 | 10 | 120 | 10 | 10 | 10 | | | |
| | 1010-X09A | 10 | 10 | 120 | 12 | 10 | 13 | | | |
| | 1212-X09A | 12 | 12 | 120 | 12 | 12 | 16 | | | |
| 1616-X09A | 16 | 16 | 120 | 16 | 16 | 16 | CCGT 09T3 □□ | FTKA0410 | TW 15P | |

Applicable inserts, see pages B50, B68

SCLCR/L

CCGT

* Only SCLCR/L1010-X09A is designed as above picture.

95°

• R type insert

| Designation | H | W | L | S | h | ℓ | Insert | Screw | Wrench | |
|-------------|-----------|----|-----|-----|----|----|--------------|--------------|-----------|--------|
| | | | | | | | | | | |
| SCLCR/L | 0808-X06A | 8 | 8 | 120 | 8 | 8 | 10 | CCGT 0602 □□ | FTKA02565 | TW 07P |
| | 1010-X06A | 10 | 10 | 120 | 10 | 10 | 10 | | | |
| | 1010-X09A | 10 | 10 | 120 | 12 | 10 | 13 | | | |
| | 1212-X09A | 12 | 12 | 120 | 12 | 12 | 16 | | | |
| 1616-X09A | 16 | 16 | 120 | 16 | 16 | 16 | CCGT 09T3 □□ | FTKA0410 | TW 15P | |

Applicable inserts, see pages B50, B68

SDJCR/L

DCGT

* Only SDJCR/L0808-X07A, 1010-X11A, 1212-X11A is designed as above picture.

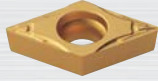
93°

• R type insert

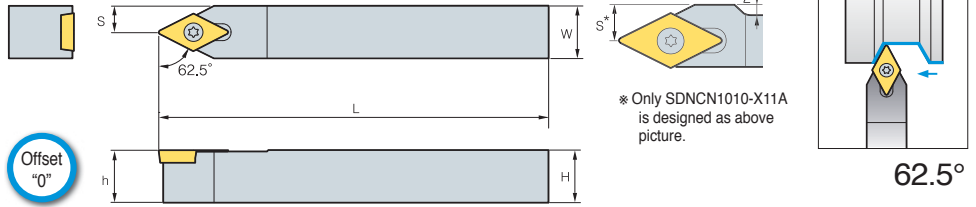
| Designation | H | W | L | S | h | K | ℓ | Insert | Screw | Wrench | |
|-------------|-----------|----|-----|-----|----|----|----|--------------|--------------|-----------|--------|
| | | | | | | | | | | | |
| SDJCR/L | 0808-X07A | 8 | 8 | 120 | 10 | 8 | 2 | 18 | DCGT 0702 □□ | FTKA02565 | TW 07P |
| | 1010-X07A | 10 | 10 | 120 | 10 | 10 | - | 15 | | | |
| | 1010-X11A | 10 | 10 | 120 | 14 | 10 | 4 | 18 | | | |
| | 1212-X11A | 12 | 12 | 120 | 14 | 12 | 2 | 18 | | | |
| 1616-X11A | 16 | 16 | 120 | 16 | 16 | - | 22 | DCGT 11T3 □□ | FTKA0410 | TW 15P | |

Applicable inserts, see pages B52, B69

SDNCN



DCGT



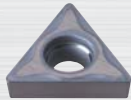
62.5°

(mm)

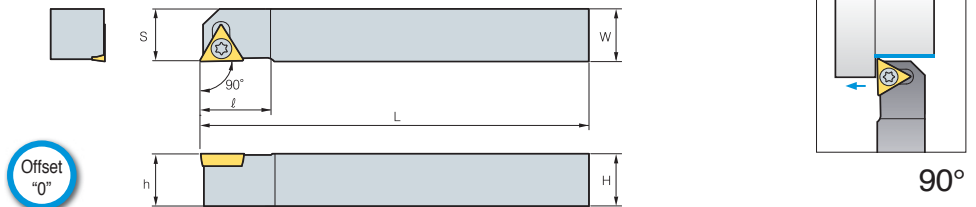
| Designation | | H | W | L | S | h | Insert | Screw | Wrench |
|-------------|-----------|----|----|-----|---|----|--------------|-----------|--------|
| SDNCN | 0808-X07A | 8 | 8 | 120 | 4 | 8 | DCGT 0702 □□ | FTKA02565 | TW 07P |
| | 1010-X07A | 10 | 10 | 120 | 5 | 10 | | | |
| | 1010-X11A | 10 | 10 | 120 | 7 | 10 | | | |
| | 1212-X11A | 12 | 12 | 120 | 6 | 12 | | | |
| | 1616-X11A | 16 | 16 | 120 | 8 | 16 | DCGT 11T3 □□ | FTKA0410 | TW 15P |

Applicable inserts, see pages B52~B53, B69

STACR/L



TCGT



90°

• R type insert

(mm)

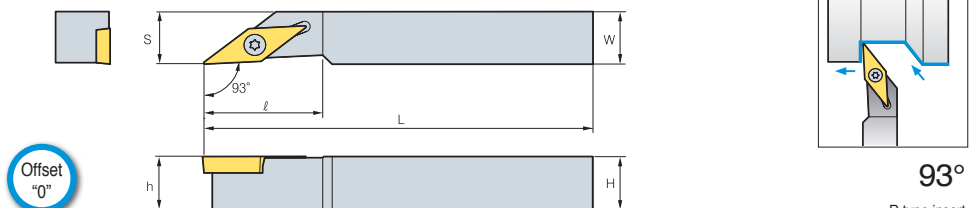
| Designation | | H | W | L | S | h | K | ℓ | Insert | Screw | Wrench |
|-------------|-----------|-----------|----|-----|-----|----|----|----|--------------|-----------|--------|
| STACR/L | 0808-X08A | 8 | 8 | 120 | 8 | 8 | 1 | 12 | TCGT 0802 □□ | FTNA 0206 | TW 06P |
| | | 1010-X08A | 10 | 10 | 120 | 10 | 10 | 3 | | | |

Applicable inserts, see pages B59, B72

SVJBR/L



VBGT



93°

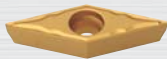
• R type insert

(mm)

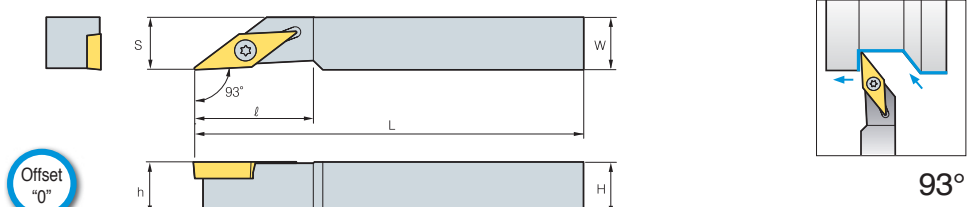
| Designation | | H | W | L | S | h | ℓ | Insert | Screw | Wrench |
|-------------|-----------|----|----|-----|----|----|----|--------------|------------|--------|
| SVJBR/L | 1010-X11A | 10 | 10 | 120 | 10 | 10 | 22 | VBGT 1103 □□ | FTKA 02565 | TW 07P |
| | 1212-X11A | 12 | 12 | 120 | 12 | 12 | 22 | | | |
| | 1616-X11A | 16 | 16 | 120 | 16 | 16 | 24 | | | |

Applicable inserts, see pages B63~B64, B73

SVJCR/L



VCGT



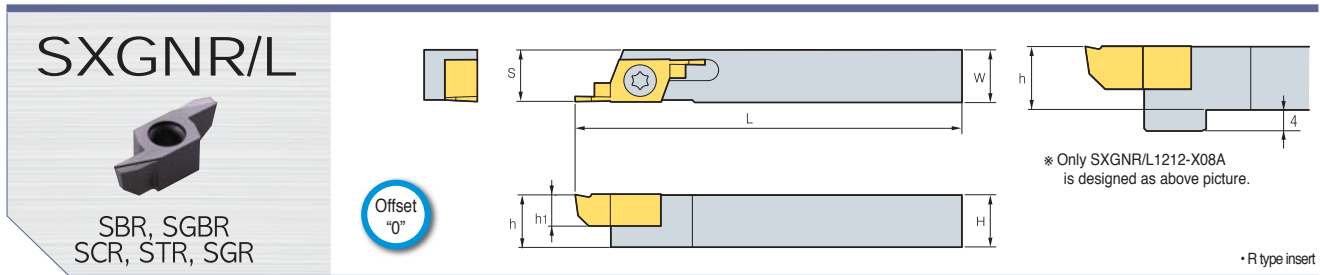
93°

• R type insert

(mm)

| Designation | | H | W | L | S | h | ℓ | Insert | Screw | Wrench |
|-------------|-----------|----|----|-----|----|----|----|--------------|------------|--------|
| SVJCR/L | 1010-X11A | 10 | 10 | 120 | 10 | 10 | 22 | VCGT 1103 □□ | FTKA 02565 | TW 07P |
| | 1212-X11A | 12 | 12 | 120 | 12 | 12 | 22 | | | |
| | 1616-X11A | 16 | 16 | 120 | 16 | 16 | 24 | | | |

Applicable inserts, see pages B65, B74




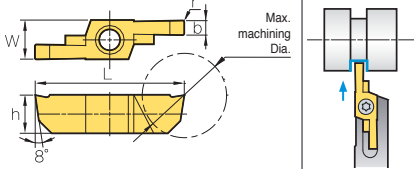
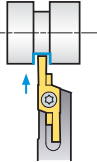
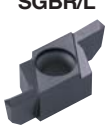
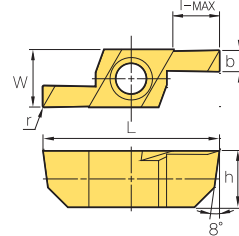
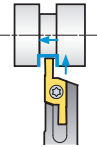
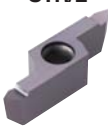
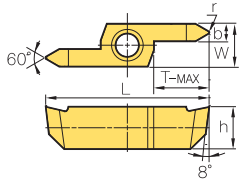
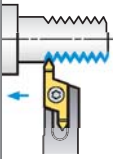
| Designation | | H | W | L | S | h | h ₁ | Insert | Screw | Wrench |
|-------------|-----------|----|-----|-----|----|----|----------------|-----------|-----------|--------|
| SXG NR/L | 1010-X06A | 10 | 10 | 125 | 10 | 10 | 6 | S□R/L 06 | FTNA 0408 | TW 15P |
| | 1212-X06A | 12 | 12 | 125 | 12 | 12 | 6 | | | |
| | 1616-X06A | 16 | 16 | 125 | 16 | 16 | 6 | | | |
| | 2020-X06A | 20 | 20 | 125 | 20 | 20 | 6 | | | |
| | 1212-X08A | 12 | 12 | 130 | 12 | 12 | 8 | | | |
| | 1616-X08A | 16 | 16 | 130 | 16 | 16 | 8 | | | |
| 2020-X08A | 20 | 20 | 130 | 20 | 20 | 8 | S□R/L 08 | FTNA 0411 | TW 15P | |

Insert

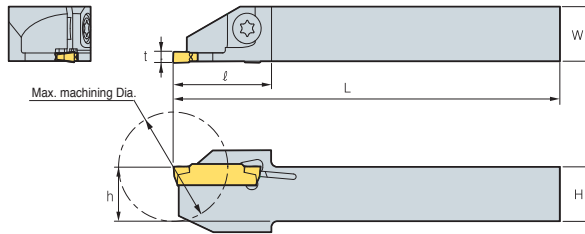
| Application | Picture | Designation | Coated | Dimensions (mm) | | | | | | | | Configuration | Feed Direction |
|---------------|---------|---------------------|--------|-----------------|-----|------|----|------|----|------------------|----|---------------|----------------|
| | | | PC5300 | b ₁ | b | W | L | r | h | T _{MAX} | øD | | |
| Back Turning | | SBR/L 060520-10-R00 | | 1 | 2 | 8 | 22 | 0 | 6 | 5.5 | - | | |
| | | 060520-10-R05 | | 1 | 2 | 8 | 22 | 0.05 | 6 | 5.5 | - | | |
| | | 060520-10-R10 | | 1 | 2 | 8 | 22 | 0.1 | 6 | 5.5 | - | | |
| | | 060630-20-R00 | | 2 | 3 | 8 | 24 | 0 | 6 | 6.5 | - | | |
| | | 060630-20-R05 | | 2 | 3 | 8 | 24 | 0.05 | 6 | 6.5 | - | | |
| | | 060630-20-R10 | | 2 | 3 | 8 | 24 | 0.1 | 6 | 6.5 | - | | |
| | | 080630-20-R00 | | 2 | 3 | 8 | 23 | 0 | 8 | 6.5 | - | | |
| | | 080630-20-R05 | | 2 | 3 | 8 | 23 | 0.05 | 8 | 6.5 | - | | |
| | | 080630-20-R10 | | 2 | 3 | 8 | 23 | 0.1 | 8 | 6.5 | - | | |
| | | 080840-20-R00 | | 2 | 4 | 8 | 27 | 0 | 8 | 8.5 | - | | |
| | | 080840-20-R05 | | 2 | 4 | 8 | 27 | 0.05 | 8 | 8.5 | - | | |
| 080840-20-R10 | | 2 | 4 | 8 | 27 | 0.1 | 8 | 8.5 | - | | | | |
| Parting off | | SCR/L 060610-R00 | | - | 1 | 8 | 24 | 0 | 6 | - | 11 | | |
| | | 060610-R05 | | - | 1 | 8 | 24 | 0.05 | 6 | - | 11 | | |
| | | 060610-R10 | | - | 1 | 8 | 24 | 0.1 | 6 | - | 11 | | |
| | | 060615-R00 | | - | 1.5 | 8 | 24 | 0 | 6 | - | 11 | | |
| | | 060615-R05 | | - | 1.5 | 8 | 24 | 0.05 | 6 | - | 11 | | |
| | | 060615-R10 | | - | 1.5 | 8 | 24 | 0.1 | 6 | - | 11 | | |
| | | 060620-R00 | | - | 2 | 8 | 24 | 0 | 6 | - | 11 | | |
| | | 060620-R05 | | - | 2 | 8 | 24 | 0.05 | 6 | - | 11 | | |
| | | 060620-R10 | | - | 2 | 8 | 24 | 0.1 | 6 | - | 11 | | |
| | | 081015-R00 | | - | 1.5 | 8 | 31 | 0 | 8 | - | 18 | | |
| | | 081015-R05 | | - | 1.5 | 8 | 31 | 0.05 | 8 | - | 18 | | |
| | | 081015-R10 | | - | 1.5 | 8 | 31 | 0.1 | 8 | - | 18 | | |
| | | 081020-R00 | | - | 2 | 8 | 31 | 0 | 8 | - | 18 | | |
| | | 081020-R05 | | - | 2 | 8 | 31 | 0.05 | 8 | - | 18 | | |
| | | 081020-R10 | | - | 2 | 8 | 31 | 0.1 | 8 | - | 18 | | |
| | | 081025-R00 | | - | 2.5 | 8 | 31 | 0 | 8 | - | 18 | | |
| | | 081025-R05 | | - | 2.5 | 8 | 31 | 0.05 | 8 | - | 18 | | |
| | | 081025-R10 | | - | 2.5 | 8 | 31 | 0.1 | 8 | - | 18 | | |
| 081030-R00 | | - | 3 | 8 | 31 | 0 | 8 | - | 18 | | | | |
| 081030-R05 | | - | 3 | 8 | 31 | 0.05 | 8 | - | 18 | | | | |
| 081030-R10 | | - | 3 | 8 | 31 | 0.1 | 8 | - | 18 | | | | |

●: Stock item

Insert

| Application | Picture | Designation | Coated | Dimensions (mm) | | | | | | | | Configuration | Feed Direction |
|-------------------------|---|--------------------|--------|-----------------|------|----|------|----|------------------|----|---------|---|---|
| | | | PC5300 | b | W | L | r | h | T _{MAX} | ØD | Pitch | | |
| | | | R | | | | | | | | | | |
| Grooving |  | SGR/L 060610-R00 | | 1 | 8 | 24 | 0 | 6 | - | 11 | - |  |  |
| | | 060610-R05 | | 1 | 8 | 24 | 0.05 | 6 | - | 11 | - | | |
| | | 060610-R10 | | 1 | 8 | 24 | 0.1 | 6 | - | 11 | - | | |
| | | 060615-R00 | | 1.5 | 8 | 24 | 0 | 6 | - | 11 | - | | |
| | | 060615-R05 | | 1.5 | 8 | 24 | 0.05 | 6 | - | 11 | - | | |
| | | 060615-R10 | | 1.5 | 8 | 24 | 0.1 | 6 | - | 11 | - | | |
| | | 060620-R00 | | 2 | 8 | 24 | 0 | 6 | - | 11 | - | | |
| | | 060620-R05 | | 2 | 8 | 24 | 0.05 | 6 | - | 11 | - | | |
| | | 060620-R10 | | 2 | 8 | 24 | 0.1 | 6 | - | 11 | - | | |
| | | 081015-R00 | | 1.5 | 8 | 31 | 0 | 8 | - | 18 | - | | |
| | | 081015-R05 | | 1.5 | 8 | 31 | 0.05 | 8 | - | 18 | - | | |
| | | 081015-R10 | | 1.5 | 8 | 31 | 0.1 | 8 | - | 18 | - | | |
| | | 081020-R00 | | 2 | 8 | 31 | 0 | 8 | - | 18 | - | | |
| | | 081020-R05 | | 2 | 8 | 31 | 0.05 | 8 | - | 18 | - | | |
| | | 081020-R10 | | 2 | 8 | 31 | 0.1 | 8 | - | 18 | - | | |
| | | 081025-R00 | | 2.5 | 8 | 31 | 0 | 8 | - | 18 | - | | |
| | | 081025-R05 | | 2.5 | 8 | 31 | 0.05 | 8 | - | 18 | - | | |
| 081025-R10 | | 2.5 | 8 | 31 | 0.1 | 8 | - | 18 | - | | | | |
| 081030-R00 | | 3 | 8 | 31 | 0 | 8 | - | 18 | - | | | | |
| 081030-R05 | | 3 | 8 | 31 | 0.05 | 8 | - | 18 | - | | | | |
| 081030-R10 | | 3 | 8 | 31 | 0.1 | 8 | - | 18 | - | | | | |
| Grooving & Back Turning |  | SGBR/L 0604520-R00 | | 2 | 8 | 22 | 0 | 6 | 5 | - | - |  |  |
| | | 0604520-R05 | | 2 | 8 | 22 | 0.05 | 6 | 5 | - | - | | |
| | | 0604520-R10 | | 2 | 8 | 22 | 0.1 | 6 | 5 | - | - | | |
| | | 0604525-R00 | | 2.5 | 8 | 22 | 0 | 6 | 5 | - | - | | |
| | | 0604525-R05 | | 2.5 | 8 | 22 | 0.05 | 6 | 5 | - | - | | |
| | | 0604525-R10 | | 2.5 | 8 | 22 | 0.1 | 6 | 5 | - | - | | |
| | | 0605530-R00 | | 3 | 8 | 24 | 0 | 6 | 6 | - | - | | |
| | | 0605530-R05 | | 3 | 8 | 24 | 0.05 | 6 | 6 | - | - | | |
| | | 0605530-R10 | | 3 | 8 | 24 | 0.1 | 6 | 6 | - | - | | |
| | | 0805525-R00 | | 2.5 | 8 | 24 | 0 | 8 | 6 | - | - | | |
| | | 0805525-R05 | | 2.5 | 8 | 24 | 0.05 | 8 | 6 | - | - | | |
| | | 0805525-R10 | | 2.5 | 8 | 24 | 0.1 | 8 | 6 | - | - | | |
| | | 0806530-R00 | | 3 | 8 | 26 | 0 | 8 | 7 | - | - | | |
| 0806530-R05 | | 3 | 8 | 26 | 0.05 | 8 | 7 | - | - | | | | |
| 0806530-R10 | | 3 | 8 | 26 | 0.1 | 8 | 7 | - | - | | | | |
| Threading |  | STR/L 06073215 | | 3.2 | 8 | 25 | 0.06 | 6 | 7 | - | 0.5-1.5 |  |  |
| | | 06073230 | | 3.2 | 8 | 25 | 0.19 | 6 | 7 | - | 1.5-3.0 | | |
| | | 08103215 | | 3.2 | 8 | 31 | 0.06 | 8 | 10.5 | - | 0.5-1.5 | | |
| | | 08103230 | | 3.2 | 8 | 31 | 0.19 | 8 | 10.5 | - | 1.5-3.0 | | |
| | | | | | | | | | | | | | |

● : Stock item



• R type insert

| Designation | | ØD | H=h | W | L | l | t | Insert | Screw | Wrench |
|-------------|-----------|----|-----|----|-----|------|-----|--------------------------|-----------|--------|
| MGEHR/L | 1010-X15A | 20 | 10 | 10 | 125 | 18 | 1.5 | MG MN150-G | ETNA 0412 | TW 15L |
| | 1212-X15A | 25 | 12 | 12 | 125 | 19.5 | 1.5 | | | |
| | 1010-X20A | 20 | 10 | 10 | 125 | 18 | 2 | MG MN200-M MG MN200-G | ETNA 0412 | TW 15L |
| | 1212-X20A | 25 | 12 | 12 | 125 | 19.5 | 2 | | | |
| | 1616-X20A | 32 | 16 | 16 | 125 | 25 | 2 | | | |
| | 1010-X25A | 20 | 10 | 10 | 125 | 20 | 2.5 | MG MN250-M MG MN250-G | ETNA 0412 | TW 15L |
| | 1212-X25A | 25 | 12 | 12 | 125 | 20 | 2.5 | | | |
| | 1616-X25A | 32 | 16 | 16 | 125 | 25 | 2.5 | | | |

Insert

| Application | Picture | Designation | Coated | | | | | | Cermet | | | Uncoated | | | Dimensions (mm) | | | | | Configuration |
|----------------------|---------|-------------|--------|--------|--------|--------|--------|--------|--------|------|-----|----------|-----|------|-----------------|-----|------|---|--|---------------|
| | | | NC3120 | NC3220 | NC5330 | NC3030 | PC5300 | PC9030 | CN2000 | CN20 | H01 | G10 | U20 | b | r | l | d | t | | |
| Grooving-Parting off | | MG MN 150-G | ● | ● | ● | ● | ● | | | ● | | | 1.5 | 0.15 | 16 | 1.2 | 3.5 | | | |
| | | 200-G | ● | ● | ● | ● | ● | | | ● | | | 2 | 0.2 | 16 | 1.6 | 3.5 | | | |
| | | 200-M | ● | ● | ● | ● | ● | | | ● | | | 2 | 0.2 | 16 | 1.6 | 3.5 | | | |
| | | 250-G | ● | ● | ● | ● | ● | | | ● | | | 2.5 | 0.2 | 18.5 | 2 | 3.85 | | | |
| | | 250-M | ● | ● | ● | ● | ● | | | ● | | | 2.5 | 0.2 | 18.5 | 2 | 3.85 | | | |

●: Stock item



Korloy specialized grade ensures long tool life

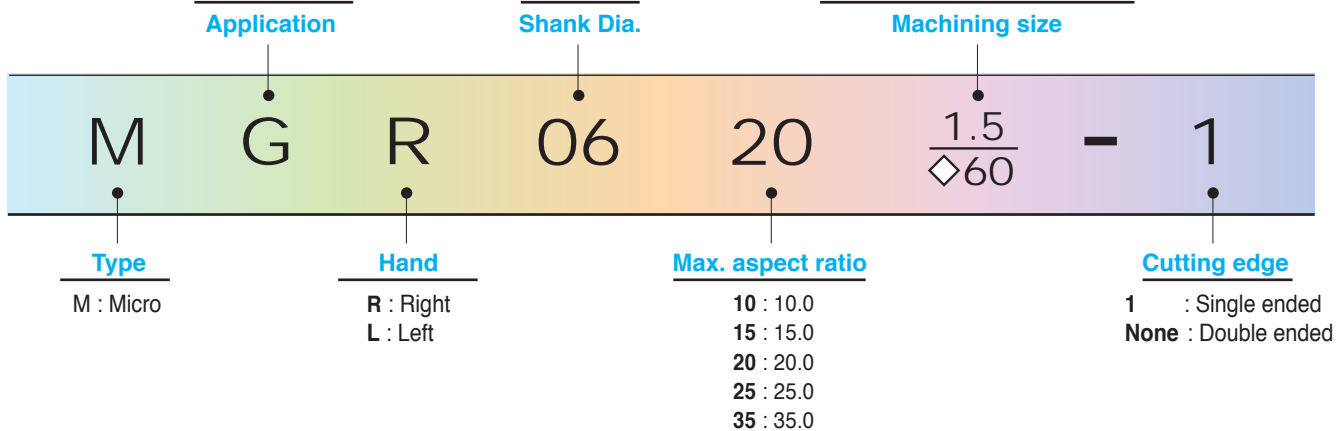
MSB Tools

- High hardness grade guarantees longer tool life.
- Various kinds of machining(Fitting, Valve, Medical parts, Automobile component, and Semiconductor equipment) are available.
- Various types of MSB tools (Boring, Grooving, Threading)

Code System

| | |
|----------------------------|------------------|
| B : Boring | |
| BC : Copying | |
| BB : Back Boring | |
| BF : Chamfering | 03 : 3.0 |
| G : Square Grooving | 04 : 4.0 |
| GR : Round Grooving | 06 : 6.0 |
| GF : Face Grooving | 08 : 8.0 |
| T : Threading | 10 : 10.0 |

| | | |
|-----------|-----------------|------------------|
| Boring | No Code | |
| Copying | Width of Groove | |
| Threading | 60° | 55° |
| | Pitch | tpi |
| ◇ | F | 0.25~1.0 72~24 |
| | A | 0.5~1.5 48~16 |
| | AG | 0.5~3.0 48~8 |



MSB tool code system

| Types | | Application | Designation |
|-------|-----------|-----------------|---------------------|
| 01 | Boring | Boring | MBR/LOO☆☆ |
| 02 | | Copying | MBCR/LOO☆☆ |
| 03 | | Back Boring | MBBR/LOO☆☆ |
| 04 | | Chamfering | MBFR/LOO☆☆ |
| 05 | Grooving | Square Grooving | MGR/LOO☆☆-□□ |
| 06 | | Round Grooving | MGRR/LOO☆☆-□□ |
| 07 | | Face Grooving | MGFR/LOO00-□□ |
| 08 | Threading | Partial | 60° MTR/LOO☆☆-◇60 |
| | | | 55° MTR/LOO☆☆-◇55 |

Details

| Marks | ○○ | Shank Dia. | Shank Dia. |
|-------|---------------------|-----------------|----------------------|
| | ☆☆ | Depth of cut | Max. depth of boring |
| | □□ | Width of groove | Width of groove |
| | ◇ | Pitch/tpi | F 0.25~1.0 72~24 |
| | A 0.5~1.5 48~16 | | |
| | AG 0.5~3.0 48~8 | | |



Grades

| Grades | Coating | Application and features |
|--------|-------------|--|
| Z12M | Carbide | Ultra fine grain substrate ensures superior wear resistance and toughness. Application: Cast iron, Aluminum alloy and Non-ferrous metals machining |
| PC30M | TiN coating | TiN coated ultra fine grain substrate ensures long tool life. Application: Stainless steel, heat resisting alloy and hard-to-cut material machining |

Machining Types

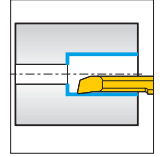
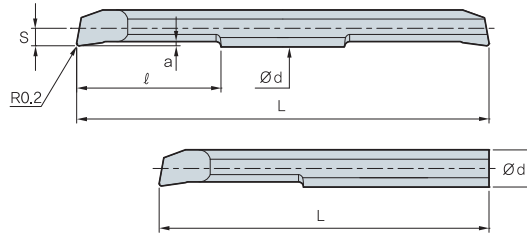


Types

| | | | | |
|------------------|---|---|--|---|
| Boring | | | | |
| | Boring Min. dia. of machining : Ø3.2 | Copying Min. dia. of machining : Ø4.2 | Back Boring Min. dia. of machining : Ø3.2 | Chamfering Min. dia. of machining : Ø4.2 |
| | Grooving | | | |
| | | Square Grooving Min. dia. of machining : Ø3.2 | Round Grooving Min. dia. of machining : Ø3.2 | Face Grooving Min. dia. of machining : Ø6.0 |
| Threading | | | | |
| | Threading Min. dia. of machining : Ø3.3 | | | |



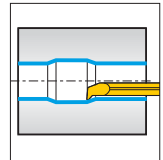
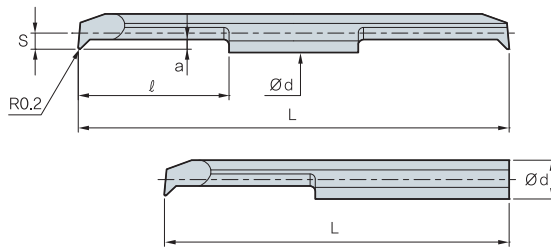
Boring



| Double ended | | | Single ended | | | ød | Min.dia. of machining | l | Overall length | | Detailed cutting edge | |
|--------------|--------|----------|--------------|--------|----------|------|-----------------------|----|----------------|--------------|-----------------------|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | | L | | a | S |
| | PC30M | Z12M | | PC30M | Z12M | | | | Double ended | Single ended | | |
| MBR 0310 | | | MBR 0310-1 | | | 3.0 | 3.2 | 10 | 40 | 35 | 0.5 | 1.4 |
| | ● | | | 0315-1 | | | | | 15 | 50 | | |
| 0410 | | | 0410-1 | | | 4.0 | 4.2 | 10 | 40 | 35 | 0.6 | 1.9 |
| 0415 | ● | | 0415-1 | | | | | 15 | 50 | 45 | | |
| 0420 | | | 0420-1 | | | | | 20 | 60 | 50 | | |
| 0610 | | | 0610-1 | | | 6.0 | 6.2 | 10 | 45 | 40 | 0.75 | 2.9 |
| 0615 | ● | | 0615-1 | | | | | 15 | 55 | 45 | | |
| 0620 | | | 0620-1 | | | | | 20 | 65 | 50 | | |
| 0810 | | | 0810-1 | | | 8.0 | 8.2 | 10 | 50 | 45 | 0.8 | 3.9 |
| 0820 | ● | | 0820-1 | | | | | 20 | 70 | 60 | | |
| 0830 | | | 0830-1 | | | | | 30 | 80 | 70 | | |
| 1015 | | | 1015-1 | | | 10.0 | 10.2 | 15 | 60 | 60 | 1.0 | 4.9 |
| 1025 | ● | | 1025-1 | | | | | 25 | 80 | 70 | | |
| 1035 | | | 1035-1 | | | | | 35 | 100 | 80 | | |

●: Stock item

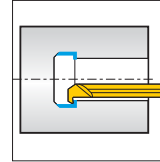
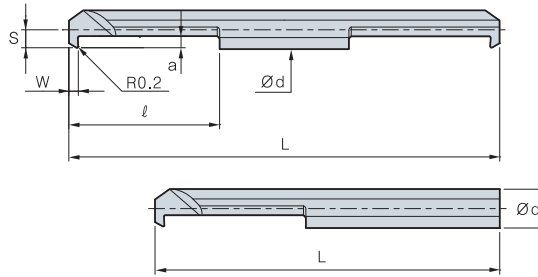
Copying



| Double ended | | | Single ended | | | ød | Min.dia. of machining | l | Overall length | | Detailed cutting edge | |
|--------------|--------|----------|--------------|--------|----------|-----|-----------------------|----|----------------|--------------|-----------------------|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | | L | | a | S |
| | PC30M | Z12M | | PC30M | Z12M | | | | Double ended | Single ended | | |
| MBCR 0410 | | | MBCR 0410-1 | | | 4.0 | 4.2 | 10 | 40 | 35 | 1.0 | 1.9 |
| 0415 | | | 0415-1 | | | | | 15 | 50 | 45 | | |
| 0420 | | | 0420-1 | | | | | 20 | 60 | 50 | | |
| 0610 | | | 0610-1 | | | 6.0 | 6.2 | 10 | 45 | 40 | 1.3 | 2.9 |
| 0615 | | | 0615-1 | | | | | 15 | 55 | 45 | | |
| 0620 | | | 0620-1 | | | | | 20 | 60 | 50 | | |

●: Stock item

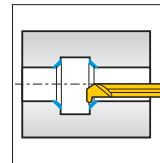
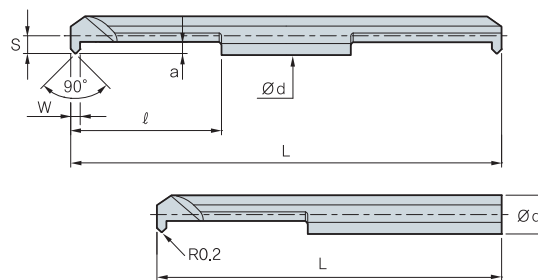
Back Boring



| Double ended | | | Single ended | | | ød | Min.dia. of machining | l | Overall length | | Detailed cutting edge | | |
|--------------|--------|----------|--------------|--------|----------|-----|-----------------------|----|----------------|--------------|-----------------------|-----|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | | L | | W | a | S |
| | PC30M | Z12M | | PC30M | Z12M | | | | Double ended | Single ended | | | |
| MBBR 0310 | | | MBBR 0310-1 | | | 3.0 | 3.2 | 10 | 40 | 35 | 1.5 | 0.8 | 1.4 |
| | | | | | | | | 15 | 50 | 45 | | | |
| | | | | | | | | 10 | 40 | 35 | | | |
| 0410 | | | 0410-1 | | | 4.0 | 4.2 | 15 | 50 | 45 | 2.0 | 1.3 | 1.9 |
| | | | | | | | | 20 | 60 | 50 | | | |
| | | | | | | | | 10 | 45 | 40 | | | |
| 0610 | | | 0610-1 | | | 6.0 | 6.2 | 15 | 55 | 45 | 2.0 | 1.9 | 2.9 |
| | | | | | | | | 20 | 65 | 50 | | | |
| | | | | | | | | | | | | | |

●: Stock item

Chamfering

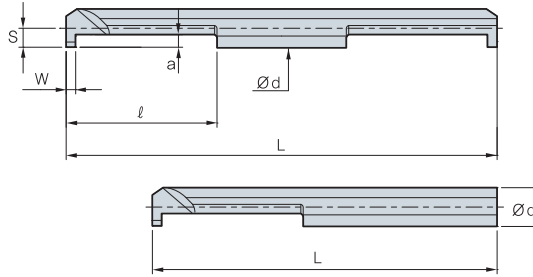


| Double ended | | | Single ended | | | ød | Min.dia. of machining | l | Overall length | | Detailed cutting edge | | |
|--------------|--------|----------|--------------|--------|----------|-----|-----------------------|----|----------------|--------------|-----------------------|-----|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | | L | | W | a | S |
| | PC30M | Z12M | | PC30M | Z12M | | | | Double ended | Single ended | | | |
| MBFR 0410 | | | MBFR 0410-1 | | | 4.0 | 4.2 | 10 | 40 | 35 | 0.8 | 1.0 | 1.9 |
| | | | | | | | | 15 | 50 | 45 | | | |
| | | | | | | | | 20 | 60 | 50 | | | |
| 0610 | | | 0610-1 | | | 6.0 | 6.2 | 10 | 45 | 40 | 1.4 | 1.2 | 2.9 |
| | | | | | | | | 15 | 55 | 45 | | | |
| | | | | | | | | 20 | 65 | 50 | | | |

●: Stock item



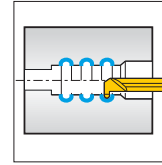
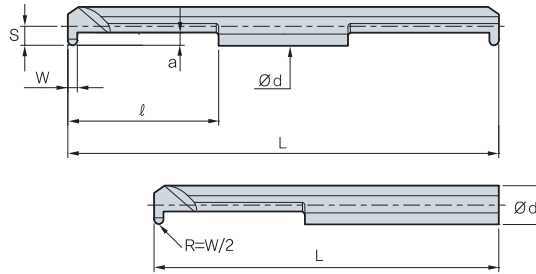
Square Grooving



| Double ended | | | Single ended | | | $\varnothing d$ | Min.dia. of machining | l | Overall length | | Detailed cutting edge | | | |
|--------------|--------|----------|----------------|--------|----------|-----------------|-----------------------|-----|----------------|--------------|-----------------------|-----|-----|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | | L | | W | a | S | |
| | PC30M | Z12M | | PC30M | Z12M | | | | Double ended | Single ended | | | | |
| MGR 0310-1.0 | | | MGR 0310-1.0-1 | | | 3.0 | 3.2 | 10 | 40 | 35 | 1.0 | 0.8 | 1.4 | |
| 0315-1.0 | | | 0315-1.0-1 | | | | | 15 | 50 | 45 | | | | |
| 0310-1.5 | | | 0310-1.5-1 | | | | | 10 | 40 | 35 | 1.5 | | | |
| 0315-1.5 | | | 0315-1.5-1 | | | | | 15 | 50 | 45 | | | | |
| 0410-1.0 | | | 0410-1.0-1 | | | 4.0 | 4.2 | 10 | 40 | 35 | 1.0 | 1.4 | 1.9 | |
| 0420-1.0 | | | 0420-1.0-1 | | | | | 20 | 60 | 50 | | | | |
| 0410-1.5 | | | 0410-1.5-1 | | | | | 10 | 40 | 35 | 1.5 | | | |
| 0420-1.5 | | | 0420-1.5-1 | | | | | 20 | 60 | 50 | | | | |
| 0410-2.0 | | | 0410-2.0-1 | | | 6.0 | 6.2 | 10 | 40 | 35 | 2.0 | 1.8 | 2.9 | |
| 0420-2.0 | | | 0420-2.0-1 | | | | | 20 | 60 | 50 | | | | |
| 0610-1.0 | | | 0610-1.0-1 | | | | | 10 | 45 | 40 | 1.0 | | | |
| 0620-1.0 | | | 0620-1.0-1 | | | | | 20 | 65 | 50 | | | | |
| 0610-1.5 | | | 0610-1.5-1 | | | 10 | 45 | 40 | 1.5 | 2.0 | | | | |
| 0620-1.5 | | | 0620-1.5-1 | | | 20 | 65 | 50 | | | | | | |
| 0610-2.0 | | | 0610-2.0-1 | | | 10 | 45 | 40 | 2.0 | | | | | |
| 0620-2.0 | | | 0620-2.0-1 | | | 20 | 65 | 50 | | | | | | |
| 0610-2.5 | | | 0610-2.5-1 | | | 10 | 45 | 40 | 2.5 | 2.0 | | | | |
| 0620-2.5 | | | 0620-2.5-1 | | | 20 | 65 | 50 | | | | | | |
| 0820-1.5 | | | 0820-1.5-1 | | | 8.0 | 8.2 | 20 | 70 | 60 | 1.5 | 2.5 | 3.9 | |
| 0820-2.0 | | | 0820-2.0-1 | | | | | | | | 2.0 | | | |
| 0820-2.5 | | | 0820-2.5-1 | | | | | | | | 2.5 | | | 3.5 |
| 0820-3.0 | | | 0820-3.0-1 | | | | | | | | 3.0 | | | |
| 1025-1.5 | | | 1025-1.5-1 | | | 10.0 | 10.2 | 25 | 80 | 70 | 1.5 | 2.5 | 4.9 | |
| 1025-2.0 | | | 1025-2.0-1 | | | | | | | | 2.0 | | | |
| 1025-2.5 | | | 1025-2.5-1 | | | | | | | | 2.5 | | | 3.5 |
| 1025-3.0 | | | 1025-3.0-1 | | | | | | | | 3.0 | | | |

●: Stock item

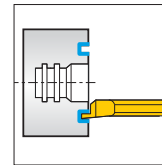
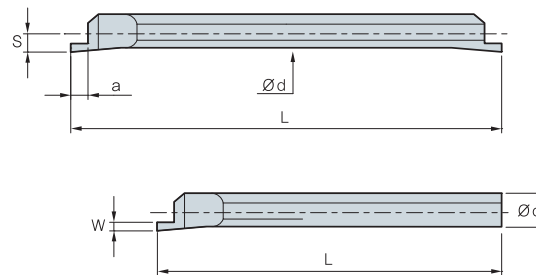
Round Grooving



| Double ended | | | Single ended | | | ød | Min.dia. of machining | l | Overall length | | Detailed cutting edge | | | | |
|---------------|--------|----------|-----------------|--------|----------|------|-----------------------|----|----------------|--------------|-----------------------|-----|-----|-----|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | | L | | W | a | S | | |
| | PC30M | Z12M | | PC30M | Z12M | | | | Double ended | Single ended | | | | | |
| MGRR 0310-0.8 | | | MGRR 0310-0.8-1 | | | 3.0 | 3.2 | 10 | 40 | 35 | 0.8 | 0.8 | 1.4 | | |
| | | | | | | | | | 15 | 50 | | | | 45 | |
| 0410-1.0 | | | 0410-1.0-1 | | | 4.0 | 4.2 | 10 | 40 | 35 | 1.0 | 1.0 | 1.9 | | |
| 0420-1.0 | | | 0420-1.0-1 | | | | | | 20 | 60 | | | | 50 | |
| 0610-1.0 | | | 0610-1.0-1 | | | 6.0 | 6.2 | 10 | 45 | 40 | 1.0 | | | | |
| 0620-1.0 | | | 0620-1.0-1 | | | | | | 20 | 65 | | | | 50 | |
| 0610-1.5 | | | 0610-1.5-1 | | | | | | 10 | 45 | 40 | 1.5 | 2.0 | 2.9 | |
| 0620-1.5 | | | 0620-1.5-1 | | | | | | 20 | 65 | 50 | | | | |
| 0610-2.0 | | | 0610-2.0-1 | | | 6.0 | 6.2 | 10 | 45 | 40 | 2.0 | | | | |
| 0620-2.0 | | | 0620-2.0-1 | | | | | | 20 | 65 | | | | 50 | |
| 0820-1.0 | | | 0820-1.0-1 | | | 8.0 | 8.2 | 20 | 70 | 60 | 1.5 | 2.3 | 3.9 | | |
| 0820-1.5 | | | 0820-1.5-1 | | | | | | | | | | | | |
| 0820-2.0 | | | 0820-2.0-1 | | | | | | | | | | | | 2.0 |
| 1025-1.0 | | | 1025-1.0-1 | | | 10.0 | 10.2 | 25 | 80 | 70 | 1.0 | 2.8 | 4.9 | | |
| 1025-1.5 | | | 1025-1.5-1 | | | | | | | | | | | | |
| 1025-2.0 | | | 1025-2.0-1 | | | | | | | | | | | | 2.0 |

●: Stock item

Face Grooving

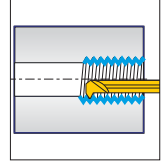
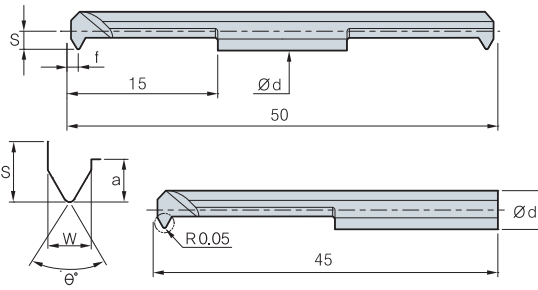


| Double ended | | | Single ended | | | ød | Min.dia. of machining | Overall length | | Detailed cutting edge | | |
|---------------|--------|----------|-----------------|--------|----------|------|-----------------------|----------------|--------------|-----------------------|-----|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | L | | W | a | S |
| | PC30M | Z12M | | PC30M | Z12M | | | Double ended | Single ended | | | |
| MGFR 0400-1.0 | | | MGFR 0400-1.0-1 | | | 4.0 | 6.0 | 50 | 45 | 1.0 | 1.5 | 1.8 |
| | | | | | | | | | | 1.5 | 2.0 | |
| 0600-1.0 | | | 0600-1.0-1 | | | 6.0 | 8.5 | 50 | 45 | 1.0 | 1.5 | 2.9 |
| 0600-1.5 | | | 0600-1.5-1 | | | | | | | 1.5 | 2.0 | |
| 0600-2.0 | | | 0600-2.0-1 | | | 8.0 | 10.4 | 70 | 60 | 2.0 | 2.5 | 3.9 |
| 0800-1.0 | | | 0800-1.0-1 | | | | | | | 1.0 | 1.5 | |
| 0800-1.5 | | | 0800-1.5-1 | | | | | | | 1.5 | 2.0 | |
| 0800-2.0 | | | 0800-2.0-1 | | | | | | | 2.0 | 2.5 | |
| 1000-2.0 | | | 1000-2.0-1 | | | 10.0 | 12.4 | 80 | 70 | 2.0 | 2.5 | 4.9 |
| 1000-2.5 | | | 1000-2.5-1 | | | | | | | 2.5 | 3.0 | |
| 1000-3.0 | | | 1000-3.0-1 | | | | | | | 3.0 | 3.5 | |
| 1000-3.5 | | | 1000-3.5-1 | | | | | | | 3.5 | 4.0 | |
| 1000-4.0 | | | 1000-4.0-1 | | | | | | | 4.0 | 4.5 | |
| 1000-4.5 | | | 1000-4.5-1 | | | | | | | 4.5 | 5.0 | |

●: Stock item



Threading

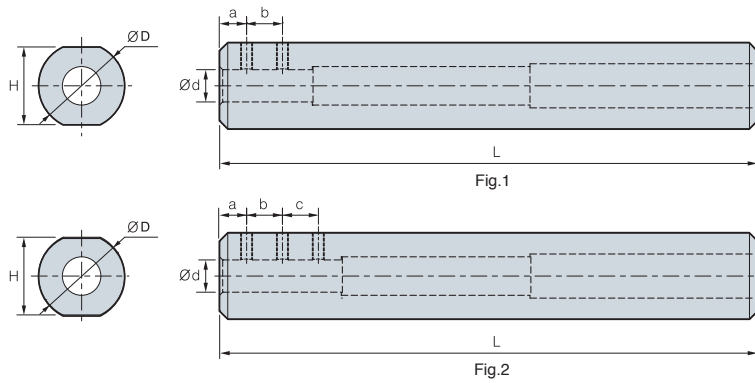


| Double ended | | | Single ended | | | ød | Min.dia. of machining | Threading | | | Detailed cutting edge | | |
|--------------|--------|----------|----------------|--------|----------|-----|-----------------------|-----------|-------------|-----|-----------------------|-----|-----|
| Designation | Coated | Uncoated | Designation | Coated | Uncoated | | | W | Pitch / tpi | θ° | S | a | f |
| | PC30M | Z12M | | PC30M | Z12M | | | | | | | | |
| MTR 0315-F60 | | | MTR 0315-F60-1 | | | 3.0 | 3.3 | 1.2 | 0.5~1.0 | 60° | 1.45 | 1.2 | 0.6 |
| | | | | | | 4.0 | 4.3 | | | | 1.95 | | |
| | | | | | | 6.0 | 6.2 | | | | 2.0 | | |
| MTR 0415-F60 | | | MTR 0415-F60-1 | | | 3.0 | 3.3 | 1.2 | 48~24 | 55° | 1.45 | 1.2 | 0.6 |
| | | | | | | 4.0 | 4.3 | | | | 1.95 | | |
| | | | | | | 6.0 | 6.2 | | | | 2.0 | | |

●: Stock item

SLEEVE

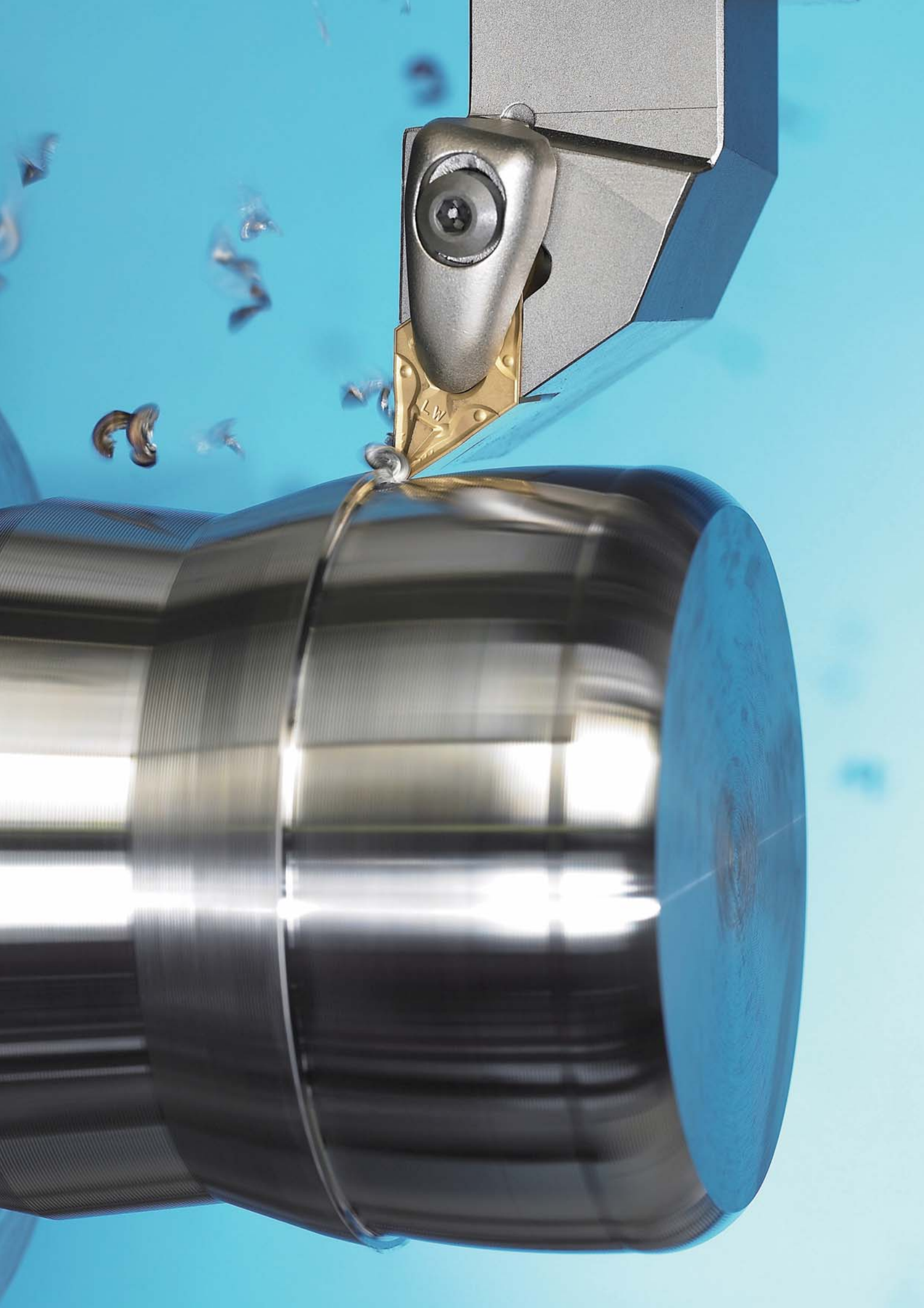
SL (SLEEVE)

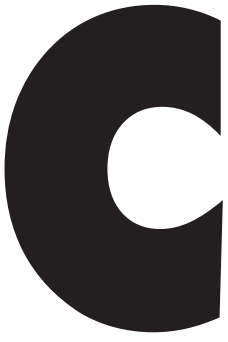


(mm)

| Designation | Ød | a | b | c | ØD | H | L | Screw | Wrench | Fig. |
|-------------|----|---|----|----|----|----|-----|-------|--------|------|
| SL1603 | 3 | 5 | - | - | 16 | 14 | 100 | M3 | HW15L | 1 |
| SL1604 | 4 | 5 | 6 | - | 16 | 14 | 100 | M4 | HW20L | |
| SL1605 | 5 | 5 | 8 | - | 16 | 14 | 100 | M4 | HW20L | |
| SL1606 | 6 | 5 | 6 | 6 | 16 | 14 | 100 | M4 | HW20L | 2 |
| SL1607 | 7 | 5 | 6 | 8 | 16 | 14 | 100 | M4 | HW20L | |
| SL2008 | 8 | 5 | 10 | 10 | 20 | 18 | 100 | M4 | HW20L | 2 |
| SL2010 | 10 | 5 | 10 | 10 | 20 | 18 | 100 | M5 | HW20L | |

* Fine tolerance and surface roughness





MULTI FUNCTIONAL TOOLS

Korloy multi-functional tool can machine grooving, part-off, facing and forming in various applications. Its design ensures superior machinability and productivity.

MULTI

C O N T E N T S

Application Example

C02 Application Example

KGT Series

C04 Technical Information for KGT
C08 KGT Holder
C13 Available Insert for KGT Series

MGT Series

C14 Technical Information for MGT
C19 MGT Holder
C20 MGT Cartridge
C21 MGT
C27 MGT Face Grooving
C29 Available Insert for MGT Series
C31 Special MGT Insert Order Form
C32 Special order form for V-Pulley insert

MGT Aluminum Wheel Series

C33 Technical Information for MGT Aluminum Wheel
C34 MGT Aluminum Wheel Holder
C36 MGT Aluminum Wheel Insert



FUNCTIONAL TOOLS

Saw-man

C37 Saw-man

Grooving / Parting off

C39 IGH
C39 DBH
C40 GFT
C40 GFIP
C41 TBH
C41 GH
C42 GFIK
C43 EH
C43 PH

New Fine Tools

C44 Technical Information
for New Fine Tools
C45 New Fine Tools
C46 Available Insert for
New Fine Tools

Multi Turn

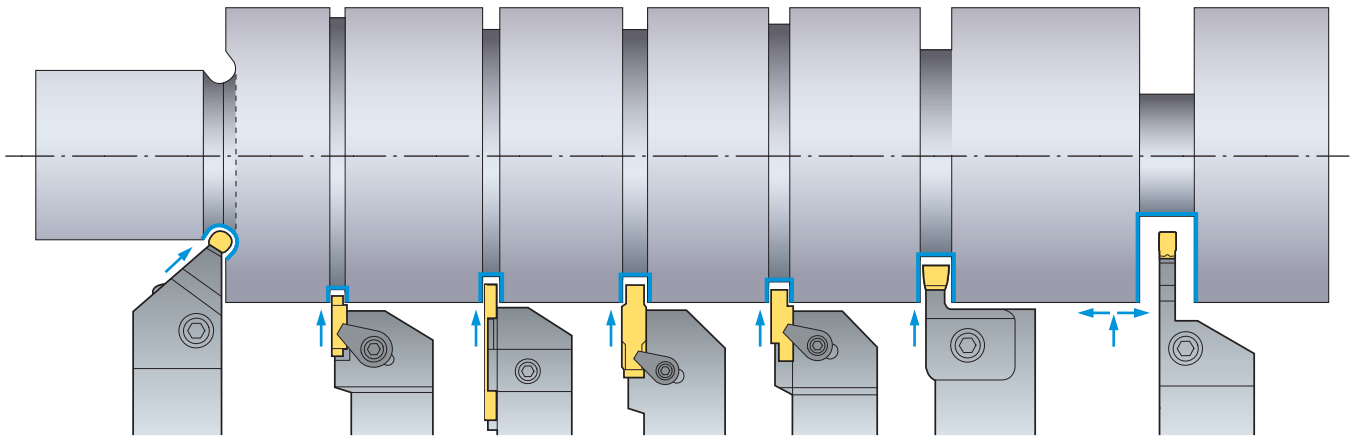
C47 Technical Information
for Multi Turn
C49 Multi Turn


















Bearing Solutions

C50 Technical Information
for Bearing Solutions
C51 Bearing Solutions
C57 Special Bearing Insert
Order Form

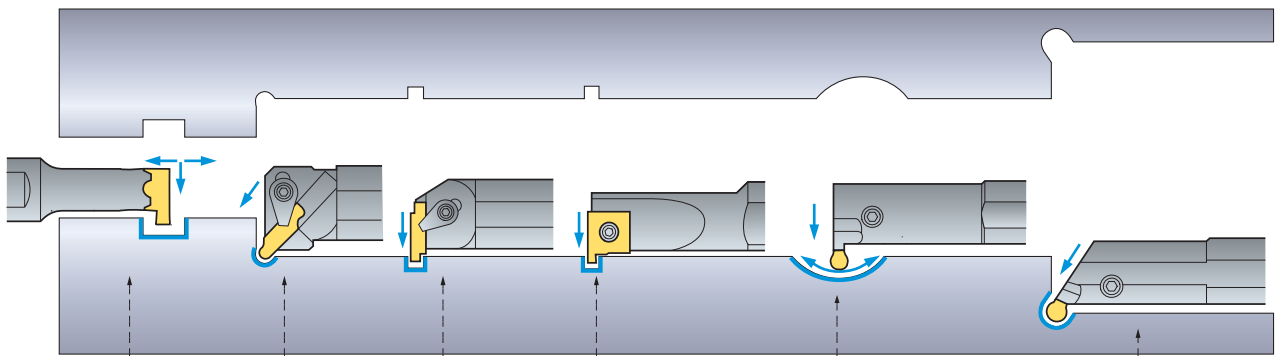
C Application Example
















For external machining



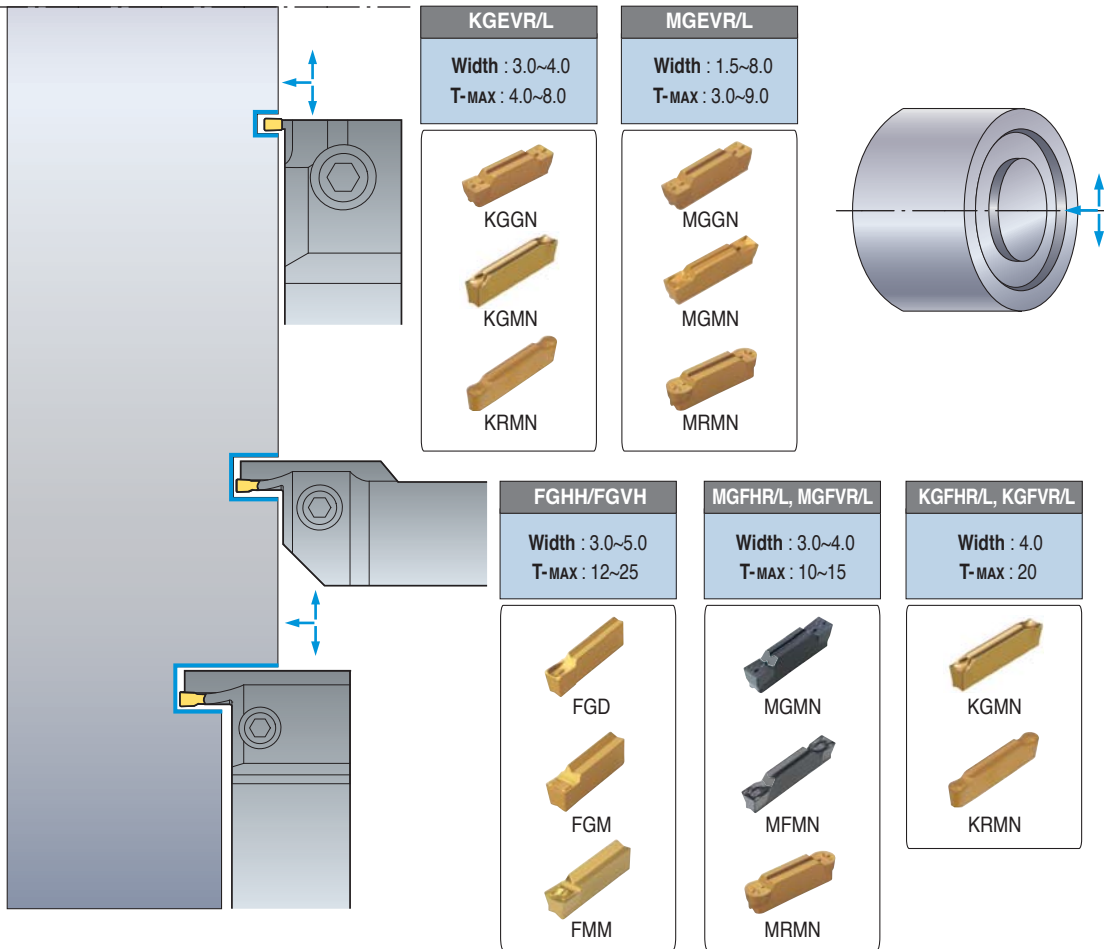
| KGEUR/L | MGEUR/L | TBH | PH | GH | GFT | DBH | KGEHR/L | MGEHR/L |
|---|---|---|--|--|--|--|---|--|
| Width : 2.5 T-MAX : 3.0 | Width : 3.0~8.0 T-MAX : 3.0~5.0 | Width : 1.25~4.5 T-MAX : 1.5~5.0 | Width : 3.0~5.0 ØD-MAX : 30~50 | Width : 1.23~4.28 T-MAX : 1.5~4.0 | Width : 1.1~8.0 T-MAX : 2.1~9.0 | Width : 3.0~8.0 T-MAX : 14 | Width : 2.0~8.0 T-MAX : 17~20 | Width : 1.5~8.0 T-MAX : 10~28 |
|  KRMN |  MRMN |  TB |  POB |  GO  GS |  GW  BF |  DC  DB |  KGMN  KRMN  KGGN |  MGMN  MRMN  MRGN  MGGN |

For internal machining

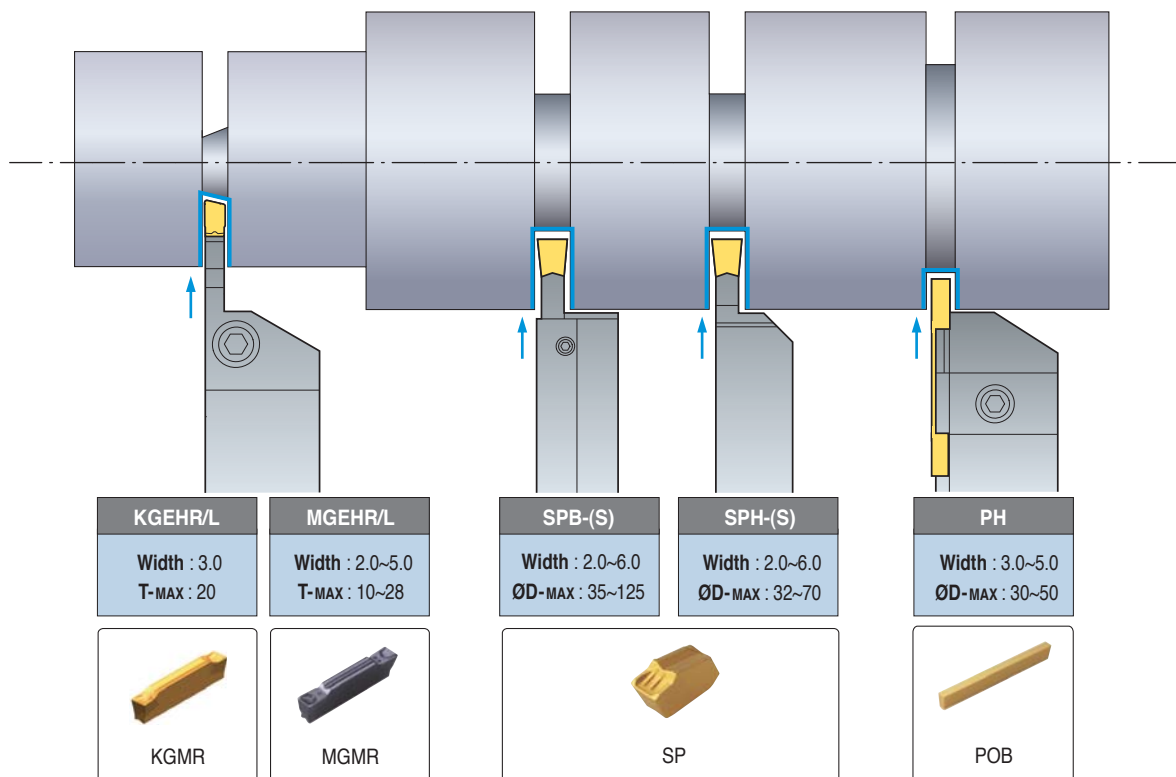


| NFTIH | GFIK | GFIP | IGH | KGIVR/L | MGIVR/L | KGIUR/L | MGIUR/L |
|---|---|--|---|--|--|---|---|
| Width : 0.75~4.02 T-MAX : 1.3~4.6 | Width : 2.0~8.0 T-MAX : 2.0~8.0 | Width : 1.1~8.0 T-MAX : 2.1~9.0 | Width : 1.25~2.8 T-MAX : 1.5~2.3 | Width : 2.0~4.0 T-MAX : 7.0~8.0 | Width : 1.5~8.0 T-MAX : 4.0~10 | Width : 3.0 T-MAX : 3.0 | Width : 3.0~8.0 T-MAX : 3.5~6.5 |
|  NFTG  NFTF  NFTT |  GR |  GW  BF |  IG |  KGMi  KRMN |  MGMN  MRMN  MRGN  MGGN |  KRMN |  MRMN |

For face grooving



For parting off

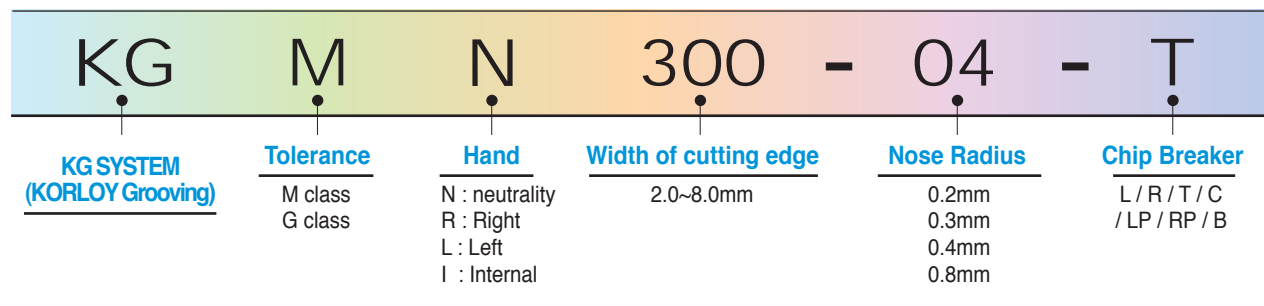


Multi-functional machining with strong clamping system and new technology

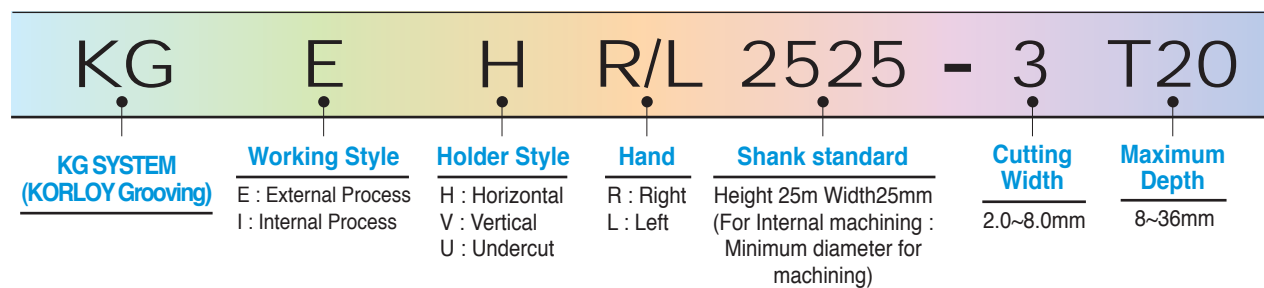
KGT Series

- Double-sided inserts of KGT series reduces machining cost.
- Strong clamping system ensures stable and accurate machining.
- New grade and new technology provide superior tool life.
- Various tooling solutions of the KGT series improve productivity.
- The foreside and clearance face of the KGT insert having cutting edges are optimal for grooving, parting-off, turning and facing with reducing processing time.
- Three-dimensional chip breaker ensures excellent chip control in various applications.
- The KGT inserts with various chip breakers are available for wide application range.
- Special cutting edges are available for quotation.

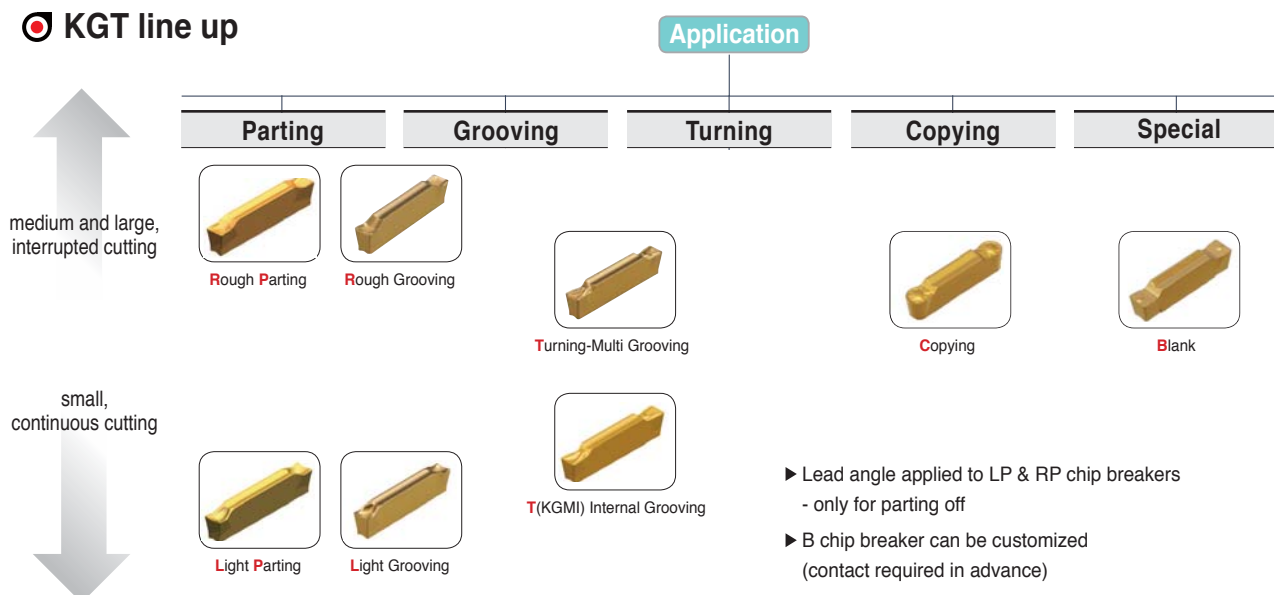
Insert Code System











Holder Code System



KGT line up



Recommended Insert

| Designation | Geometry | Picture | Designation | | | | | | | | | |
|-------------|-----------------------------|---|------------------------|----------|---------|-------------------|---------|------------------------|---------|---------|---------------|-------------------|
| | | | For external machining | | | For face grooving | | For Internal machining | | Copying | For relieving | Special machining |
| | | | Parting | Grooving | Turning | Grooving | Turning | Grooving | Turning | Copying | Relieving | Special |
| KGMN | L Light Grooving |  | ○ | ⊙ | | ○ | | | | | | |
| | R Rough Grooving |  | ○ | ⊙ | | ○ | | | | | | |
| | T Turning-Multi Grooving |  | ○ | ⊙ | ⊙ | ⊙ | ⊙ | | | | | |
| KGMI | T Internal Grooving |  | | | | | | ⊙ | ⊙ | | | |
| KRMN | C Copying |  | | | | | | | | ⊙ | ⊙ | |
| KGMRL | LP Light Parting |  | ⊙ | | | | | | | | | |
| | RP Rough Parting |  | ⊙ | | | | | | | | | |
| KGGN | B Blank |  | | ○ | | | | | | | | ⊙ |

⊙ First choice, ○ Second choice

Features

Top side(Insert)

Clamping area



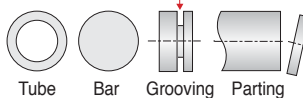
Clamping area

- Strong clamping → Higher machining reliability
- Self-centering → Higher accuracy
- Anti-chattering design → Fine surface finish

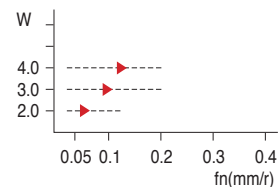


☉ C/B guide

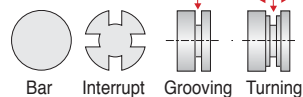
L For Light Grooving



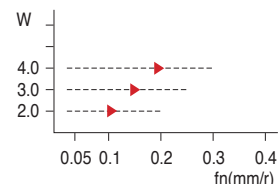
- sharp cutting edge
- low feed machining
- small diameter component
- low carbon steel
- carbon steel
- alloy steel
- stainless



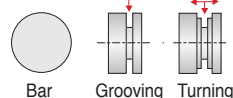
R For Rough Grooving



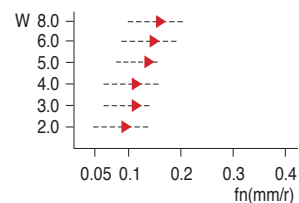
- strong cutting edge
- high feed machining
- interrupted cutting
- carbon steel
- alloy steel
- stainless
- cast iron



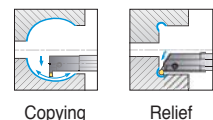
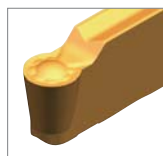
T For Turning and Multi Grooving



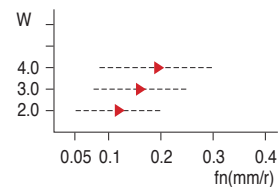
- sharp cutting edge
- improved chip control
- turning & grooving machining
- carbon steel
- alloy steel
- stainless
- cast iron



C For Copying and Relief



- improved chip control
- copying
- relief
- carbon steel
- alloy steel
- stainless
- cast iron



☉ Grades for recommended application range

| Workpiece | Grade | Order of recommended grade | Recommended cutting speed(m/min) | | | | |
|-------------------|-------------|----------------------------|----------------------------------|-----|-----|-----|-----|
| | | | 50 | 100 | 150 | 200 | 250 |
| P Steel | Steel | PC5300 1 | | 80 | 180 | | |
| | | NC3220 2 | | 100 | 220 | | |
| | | NC5330 3 | | 90 | 190 | | |
| | Alloy Steel | PC5300 1 | | 70 | 160 | | |
| | | NC3220 2 | | 100 | 200 | | |
| | | NC5330 3 | | 70 | 170 | | |
| M Stainless steel | PC5300 1 | | 40 | 170 | | | |
| | PC9030 2 | | 40 | 170 | | | |
| | NC5330 3 | | 40 | 170 | | | |
| K Cast iron | PC5300 1 | | 50 | 150 | | | |
| | NC5330 2 | | | 100 | 200 | | |
| S HRSA | PC5300 1 | | 40 | 100 | | | |

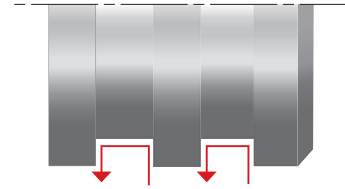
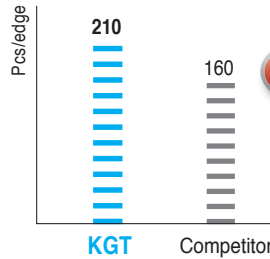
🎯 Cutting Performance

Multi-function machining

Turning + Grooving repetition

Optimized geometry for turning + grooving - High efficiency.

- **Workpiece** C45
- **Cutting condition**
 - vc = 170(m/min)
 - fn = 0.15(mm/rev)
 - ap = 2mm
 - W = 3mm
 - wet
- **Designation** KGMN300-04-T(PC5300)

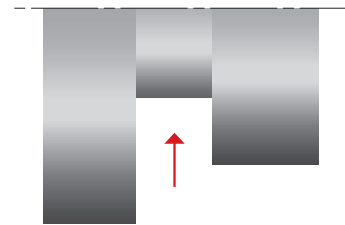
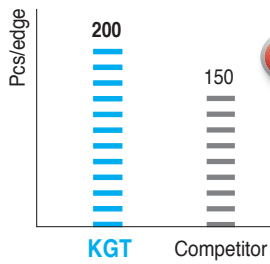


Grooving

Shoulder Grooving

Tough geometry for interrupted and deep grooving.

- **Workpiece** X5CrNi18-9
- **Cutting condition**
 - vc = 120(m/min)
 - fn = 0.12(mm/rev)
 - ap = 5mm
 - W = 4mm
 - wet
- **Designation** KGMN400-03-R(PC5300)

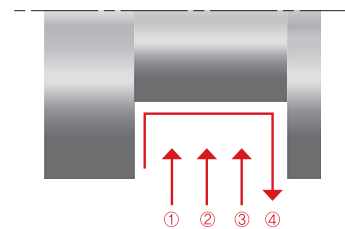
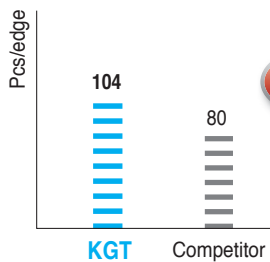


Shaft machining

Grooving(Roughing)&Turning(Finishing)

Excellent chip control for higher efficiency.

- **Workpiece** 42CrM04
- **Cutting condition**
 - vc = 150(m/min)
 - fn = 0.15(mm/rev)
 - ap = 5mm
 - W = 3mm x 3
 - wet
- **Designation** KGMN300-04-T(PC5300)

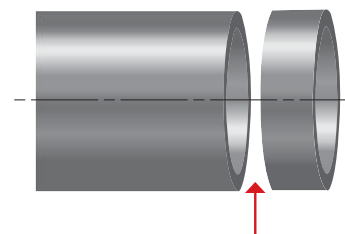
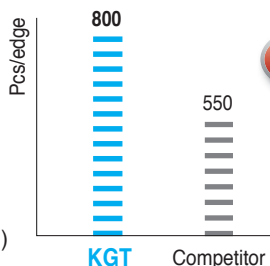


Parting off

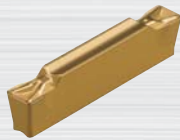
Pipe Parting-off

Exclusive parting-off chip breaker for longer tool life. / Sharp geometry for less burr.

- **Workpiece** X5CrNi18-9
- **Cutting condition**
 - vc = 140(m/min)
 - fn = 0.15(mm/rev)
 - ap = 2mm
 - W = 3mm
 - wet
- **Designation** KGMR300-6D-LP(PC5300)

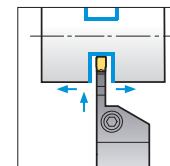
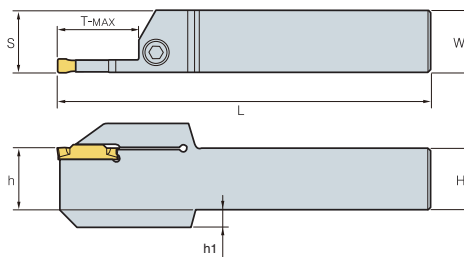
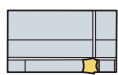


KGEHR/L



KGGN KGMN
KGMR KRMN

For grooving, Turning, Parting off, Relieving, machining

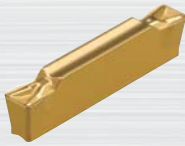


R type insert
(mm)

| Designation | | H=(h) | W | L | S | h1 | T-MAX | Inserts | Screw | Wrench |
|-------------|------------|-------|----|-----|------|----|-------|---|---------|--------|
| KGEHR/L | 1616-2-T08 | 16 | 16 | 100 | 16.2 | - | 8 | KGMN200-□-□ KGMR200-□-□ KRMN200-C | MHA0512 | HW40L |
| | 2020-2-T08 | 20 | 20 | 125 | 20.2 | - | 8 | | | |
| | 2525-2-T08 | 25 | 25 | 150 | 25.2 | - | 8 | | | |
| | 1616-2-T12 | 16 | 16 | 100 | 16.2 | - | 12 | | | |
| | 2020-2-T12 | 20 | 20 | 125 | 20.2 | - | 12 | | | |
| | 2525-2-T12 | 25 | 25 | 150 | 25.2 | - | 12 | | | |
| | 1616-2-T17 | 16 | 16 | 100 | 16.2 | - | 17 | | | |
| | 2020-2-T17 | 20 | 20 | 125 | 20.2 | - | 17 | | | |
| | 2525-2-T17 | 25 | 25 | 150 | 25.2 | - | 17 | | | |
| | 1616-3-T10 | 16 | 16 | 100 | 16.4 | - | 10 | KGMN300-□-□ KGMR300-□-□ KRMN300-C KGGN-□-□-□ | MHA0512 | HW40L |
| | 2020-3-T10 | 20 | 20 | 125 | 20.4 | - | 10 | | | |
| | 2525-3-T10 | 25 | 25 | 150 | 25.4 | - | 10 | | | |
| | 1616-3-T13 | 16 | 16 | 100 | 16.4 | - | 13 | | | |
| | 2020-3-T13 | 20 | 20 | 125 | 20.4 | - | 13 | | | |
| | 2525-3-T13 | 25 | 25 | 150 | 25.4 | - | 13 | | | |
| | 1616-3-T20 | 16 | 16 | 100 | 16.4 | - | 20 | | | |
| | 2020-3-T20 | 20 | 20 | 125 | 20.4 | - | 20 | | | |
| | 2525-3-T20 | 25 | 25 | 150 | 25.4 | - | 20 | | | |
| | 3232-3-T20 | 32 | 32 | 170 | 32.4 | - | 20 | KGMN400-□-□ KGMR400-□-□ KRMN400-C | BHA0616 | HW50L |
| | 2525-3-T25 | 25 | 25 | 150 | 25.4 | - | 25 | | | |
| | 1616-4-T10 | 16 | 16 | 100 | 16.4 | - | 10 | | | |
| | 2020-4-T10 | 20 | 20 | 125 | 20.4 | - | 10 | | | |
| | 2525-4-T10 | 25 | 25 | 150 | 25.4 | - | 10 | | | |
| | 1616-4-T15 | 16 | 16 | 100 | 16.4 | - | 15 | | | |
| | 2020-4-T15 | 20 | 20 | 125 | 20.4 | - | 15 | | | |
| | 2525-4-T15 | 25 | 25 | 150 | 25.4 | - | 15 | | | |
| | 1616-4-T20 | 16 | 16 | 100 | 16.4 | - | 20 | | | |
| | 2020-4-T20 | 20 | 20 | 125 | 20.4 | - | 20 | | | |
| | 2525-4-T20 | 25 | 25 | 150 | 25.4 | - | 20 | | | |
| | 3232-4-T20 | 32 | 32 | 170 | 32.4 | - | 20 | | | |
| | 1616-4-T25 | 16 | 16 | 100 | 16.4 | - | 25 | KGMN500-□-□ KRMN500-C | BHA0616 | HW50L |
| | 2020-4-T25 | 20 | 20 | 125 | 20.4 | - | 25 | | | |
| | 2525-4-T25 | 25 | 25 | 150 | 25.4 | - | 25 | | | |
| | 2020-5-T12 | 20 | 20 | 125 | 20.5 | - | 12 | | | |
| | 2525-5-T12 | 25 | 25 | 150 | 25.5 | - | 12 | | | |
| | 2020-5-T20 | 20 | 20 | 125 | 20.5 | - | 20 | | | |
| | 2525-5-T20 | 25 | 25 | 150 | 25.5 | - | 20 | KGMN600-□-□ KRMN600-C | BHA0616 | HW50L |
| | 3232-5-T20 | 32 | 32 | 170 | 32.5 | - | 20 | | | |
| | 2525-5-T32 | 25 | 25 | 150 | 25.5 | 7 | 32 | | | |
| | 2020-6-T12 | 20 | 20 | 125 | 20.5 | - | 12 | | | |
| | 2525-6-T12 | 25 | 25 | 150 | 25.5 | - | 12 | | | |
| | 2020-6-T20 | 20 | 20 | 125 | 20.5 | - | 20 | | | |
| | 2525-6-T20 | 25 | 25 | 150 | 25.5 | - | 20 | KGMN800-□-□ KRMN800-C | BHA0616 | HW50L |
| | 3232-6-T20 | 32 | 32 | 170 | 32.5 | - | 20 | | | |
| | 2525-6-T32 | 25 | 25 | 150 | 25.5 | 7 | 32 | | | |
| | 2525-8-T16 | 25 | 25 | 150 | 26 | - | 16 | | | |
| | 2525-8-T25 | 25 | 25 | 150 | 26 | - | 25 | | | |
| | 3232-8-T25 | 32 | 32 | 170 | 33 | - | 25 | | | |
| | 2525-8-T36 | 25 | 25 | 150 | 26 | 7 | 36 | KGMN800-□-□ KRMN800-C | BHA0616 | HW50L |
| | 3232-8-T36 | 32 | 32 | 170 | 33 | - | 36 | | | |

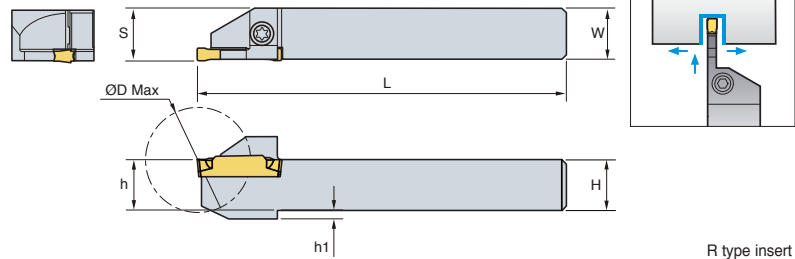
Applicable inserts **C13**

KGEHR/L-D00A (AUTO-TOOL)



KGGN KGMN
KGMR KRMN

For grooving, Turning, Parting off



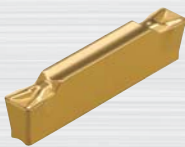
R type insert

(mm)

| Designation | | H=(h) | W | L | S | h1 | ØD Max | Inserts | Screw | Wrench |
|-------------|-------------|-------|----|-----|------|----|--------|--|----------|--------|
| KGEHR/L | 1010-2-D20A | 10 | 10 | 125 | 10.2 | 2 | 20 | KGMN200-□□ KGMR200-□□ KRMN200-C | ETNA0412 | TW15L |
| | 1212-2-D25A | 12 | 12 | 125 | 12.2 | 2 | 25 | | | |
| | 1414-2-D25A | 14 | 14 | 125 | 14.2 | - | 25 | | | |
| | 1616-2-D32A | 16 | 16 | 125 | 16.2 | - | 32 | | | |
| | 1212-3-D25A | 12 | 12 | 125 | 12.4 | 2 | 25 | KGMN300-□□ KGMR300-□□ KRMN300-C KGGN-□□□□ | | |
| | 1616-3-D32A | 16 | 16 | 125 | 16.4 | - | 32 | | | |

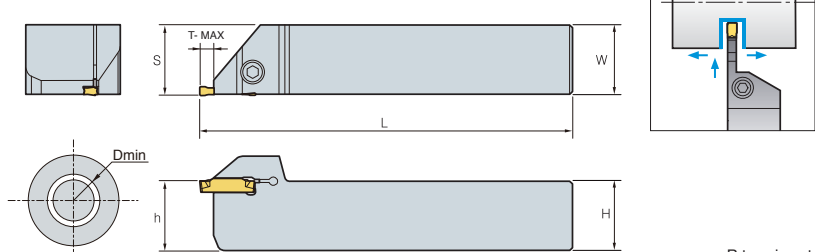
Applicable inserts **C13**

KGEHR/L-T00



KGMN KRMN KGGN

For grooving, Turning, Face grooving



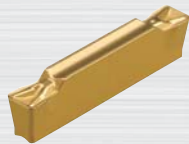
R type insert

(mm)

| Designation | | H=(h) | W | L | S | ØD Min | T-MAX | Inserts | Screw | Wrench | |
|-------------|------------|------------|----|-----|------|--------|-------|--------------------------------------|---------|--------|-------------------------|
| KGEHR/L | 2525-3-T00 | 25 | 25 | 150 | 25.4 | 80 | 4.8 | KGMN300-□□ KRMN300-C KGGN-□□□□ | MHA0512 | HW40L | |
| | 1616-4-T00 | 16 | 16 | 100 | 16.4 | 80 | 4.8 | | | | |
| | 2020-4-T00 | 20 | 20 | 125 | 20.4 | 80 | 4.8 | | | | |
| | | 2525-4-T00 | 25 | 25 | 150 | 25.4 | 80 | 4.8 | | | KGMN400-□□ KRMN400-C |
| | | 2020-6-T00 | 20 | 20 | 125 | 20.5 | 80 | 6.0 | | | |
| | | 2525-6-T00 | 25 | 25 | 150 | 25.5 | 80 | 6.0 | | | KGMN600-□□ KRMN600-C |

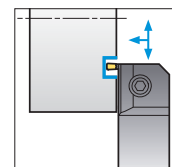
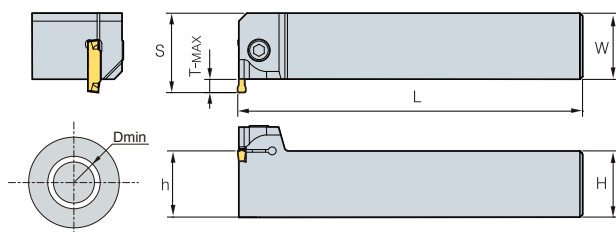
Applicable inserts **C13**

KGEVR/L-T00



KGMN KRMN KGGN

For grooving, Turning, Face grooving



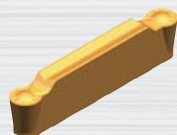
R type insert

(mm)

| Designation | H=(h) | W | L | S | ØD Min | T-MAX | Inserts | Screw | Wrench |
|--------------------|------------|----|-----|------|--------|-------|--|---------|--------|
| KGEVR/L 2020-3-T00 | 20 | 20 | 125 | 25 | 80 | 4.8 | KGMN300-□-□ KRMN300-C KGGN-□-□-□ | MHA0512 | HW40L |
| | 2525-3-T00 | 25 | 25 | 150 | 30 | 80 | | | |
| 2020-4-T00 | 20 | 20 | 125 | 25 | 80 | 4.8 | KGMN400-□-□ KRMN400-C KGGN-□-□-□ | BHA0616 | HW50L |
| | 2525-4-T00 | 25 | 25 | 150 | 30 | 80 | | | |
| 2525-6-T00 | 25 | 25 | 150 | 31.5 | 80 | 6 | KGMN600-□-□ KRMN600-C KGGN-□-□-□ | BHA0616 | HW50L |

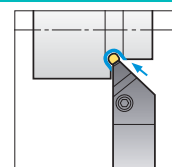
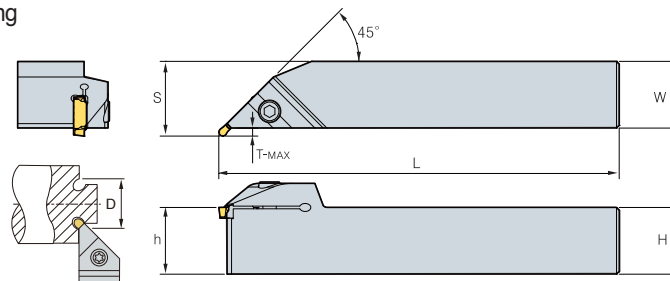
Applicable inserts C13

KGEUR/L



KRMN

For relieving



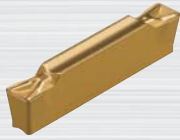
R type insert

(mm)

| Designation | H=(h) | W | L | S | ØD Min | T-MAX | Inserts | Screw | Wrench | |
|----------------|--------|----|-----|------|--------|-------|-----------|---------|--------|-----|
| KGEUR/L 1616-3 | 16 | 16 | 100 | 19 | 40 | 2.8 | KRMN300-C | MHA0512 | HW40L | |
| | 2020-3 | 20 | 20 | 125 | 23 | 40 | | | | 2.8 |
| | 2525-3 | 25 | 25 | 150 | 28 | 40 | | | | 2.8 |
| 1616-4 | 16 | 16 | 100 | 19 | 40 | 2.8 | KRMN400-C | BHA0616 | HW50L | |
| | 2020-4 | 20 | 20 | 125 | 23 | 40 | | | | 2.8 |
| | 2525-4 | 25 | 25 | 150 | 28 | 40 | | | | 2.8 |
| 2525-6 | 25 | 25 | 150 | 28.5 | 50 | 3.3 | KRMN600-C | BHA0616 | HW50L | |

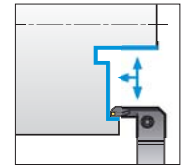
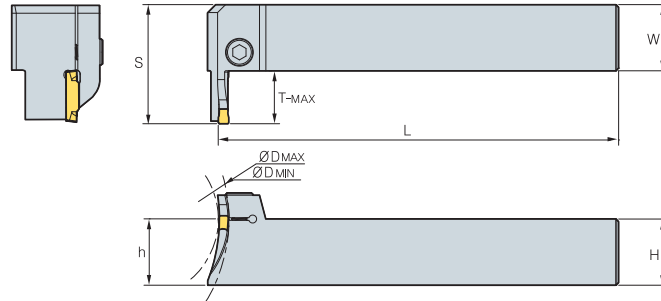
Applicable inserts C13

KGFR/L



KGMN
KRMN

For face
grooving



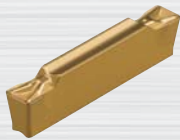
R type insert

(mm)

| Designation | H=(h) | W | L | S | T-MAX | ØD | | Inserts | Screw | Wrench |
|----------------------|-------|----|-----|------|-------|-----|-----|-------------------------|---------|--------|
| | | | | | | Min | Max | | | |
| KGFR/L 425-44/70-T20 | 25 | 25 | 150 | 45.5 | 20 | 44 | 70 | KGMN400-□□ KRMN400-C | BHA0616 | HW50L |
| | 25 | 25 | 150 | 45.5 | 20 | 60 | 120 | | | |
| | 25 | 25 | 150 | 45.5 | 20 | 112 | 200 | | | |

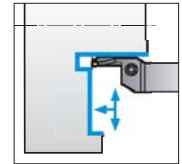
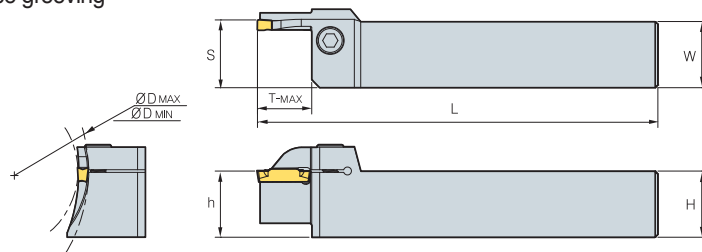
Applicable inserts C13

KGFR/L



KGMN
KRMN

For face
grooving



R type insert

(mm)

| Designation | H=(h) | W | L | S | T-MAX | ØD | | Inserts | Screw | Wrench |
|----------------------|-------|----|-----|------|-------|-----|-----|-------------------------|---------|--------|
| | | | | | | Min | Max | | | |
| KGFR/L 425-44/70-T20 | 25 | 25 | 150 | 25.4 | 20 | 44 | 70 | KGMN400-□□ KRMN400-C | BHA0616 | HW50L |
| | 25 | 25 | 150 | 25.4 | 20 | 60 | 120 | | | |
| | 25 | 25 | 150 | 25.4 | 20 | 112 | 200 | | | |

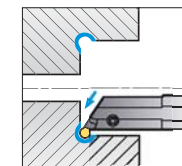
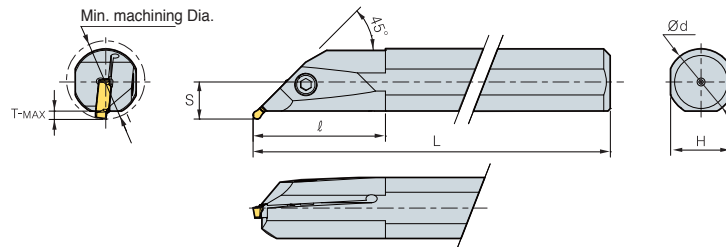
Applicable inserts C13

KGIUR/L



KRMN

For relieving



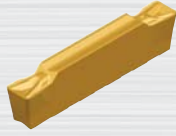
R type insert

(mm)

| Designation | ØD | Ød | L | l | T-MAX | H | S | Inserts | Screw | Wrench |
|-------------|----|----|---|---|-------|---|---|---------|-------|--------|
| | | | | | | | | | | |

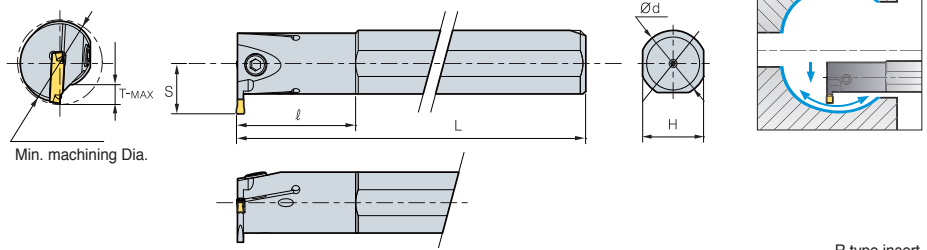
Applicable inserts C13

KGIVR/L



KGM1

For grooving, Turning, Profiling machining



R type insert
(mm)


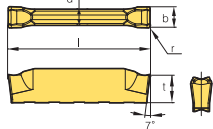

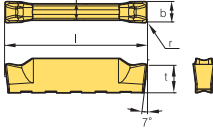

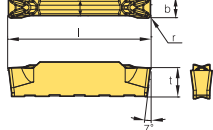

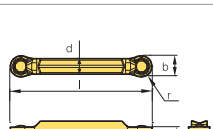

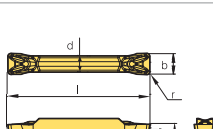

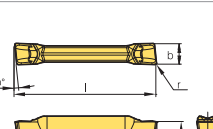

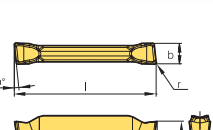

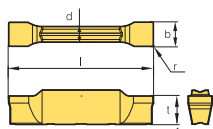
| Designation | | ØD | Ød | L | l | T-MAX | H | S | Inserts | Screw | Wrench |
|-------------|--------|----|----|-----|----|-------|----|------|-------------|---------|--------|
| KGIVR/L | 2520-2 | 25 | 20 | 150 | 45 | 6.5 | 18 | 15.5 | KGM1200-□-□ | MHB0410 | HW30L |
| | 3225-2 | 32 | 25 | 200 | 45 | 7 | 23 | 19 | | MHA0512 | HW40L |
| KGIVR/L | 2520-3 | 25 | 20 | 150 | 45 | 6.5 | 18 | 15.5 | KGM1300-□-□ | MHB0410 | HW30L |
| | 3225-3 | 32 | 25 | 200 | 45 | 7 | 23 | 19 | | MHA0512 | HW40L |
| | 4032-3 | 40 | 32 | 250 | 55 | 7.5 | 30 | 22.5 | | BHA0616 | HW50L |
| KGIVR/L | 2520-4 | 25 | 20 | 150 | 45 | 6.5 | 18 | 15.5 | KGM1400-□-□ | MHB0410 | HW30L |
| | 3225-4 | 32 | 25 | 200 | 45 | 7 | 23 | 19 | | MHA0512 | HW40L |
| | 4032-4 | 40 | 32 | 250 | 55 | 7.5 | 30 | 22.5 | | BHA0616 | HW50L |



Applicable inserts **C13**

• External insert : Min. machining Dia(ØD) is over 50mm.

Available Insert for KGT

| Application | Designation | Picture | Coated | | | | Dimensions (mm) | | | | | Picture | Page | |
|----------------------|-------------|---|----------------|--------|--------|--------|-----------------|-----|-----|------|-----|---------|---|--------------------------|
| | | | NC3220 | NC5330 | PC5300 | PC9030 | b | r | l | d | a | | | |
| Grooving-Parting off | KGMN-L |  | KGMN 200-02-L | ● | ● | ● | ● | 2.0 | 0.2 | 20 | 1.7 | - |  | C08 C09 C10 C11 |
| | | | 300-02-L | ● | ● | ● | ● | 3.0 | 0.2 | 20 | 2.3 | - | | |
| | | | 400-02-L | ● | ● | ● | ● | 4.0 | 0.2 | 20 | 3.3 | - | | |
| | | | 500-03-L | | | | | 5.0 | 0.3 | 25 | 4.1 | - | | |
| | | | 600-03-L | | | | | 6.0 | 0.3 | 25 | 5.1 | - | | |
| | | | | | | | | | | | | | | |
| Grooving-Parting off | KGMN-R |  | KGMN 200-02-R | ● | ● | ● | ● | 2.0 | 0.2 | 20 | 1.7 | - |  | C08 C09 C10 C11 |
| | | | 300-02-R | ● | ● | ● | ● | 3.0 | 0.2 | 20 | 2.3 | - | | |
| | | | 400-03-R | ● | ● | ● | ● | 4.0 | 0.3 | 20 | 3.3 | - | | |
| | | | 500-03-R | | | | | 5.0 | 0.3 | 25 | 4.1 | - | | |
| | | | 600-03-R | | | | | 6.0 | 0.3 | 25 | 5.1 | - | | |
| | | | 800-04-R | | | | | 8.0 | 0.4 | 30 | 6.1 | - | | |
| Grooving-Turning | KGMN-T |  | KGMN 200-02-T | ● | ● | ● | ● | 2.0 | 0.2 | 20 | 1.7 | - |  | C08 C09 C10 C11 |
| | | | 300-02-T | ● | ● | ● | ● | 3.0 | 0.2 | 20 | 2.3 | - | | |
| | | | 300-04-T | ● | ● | ● | ● | 3.0 | 0.4 | 20 | 2.3 | - | | |
| | | | 400-04-T | ● | ● | ● | ● | 4.0 | 0.4 | 20 | 3.3 | - | | |
| | | | 400-08-T | ● | | ● | ● | 4.0 | 0.8 | 20 | 3.3 | - | | |
| | | | 500-04-T | ● | ● | ● | ● | 5.0 | 0.4 | 25 | 4.1 | - | | |
| | | | 500-08-T | ● | | ● | ● | 5.0 | 0.8 | 25 | 4.1 | - | | |
| | | | 600-04-T | ● | ● | ● | | 6.0 | 0.4 | 25 | 5.1 | - | | |
| | | | 800-08-T | ● | | ● | | 8.0 | 0.8 | 30 | 6.1 | - | | |
| Copying-Relieving | KRMN-C |  | KRMN 200-C | | | | | 2.0 | 1.0 | 20 | 1.7 | - |  | C08 C09 C10 C11 |
| | | | 300-C | | ● | ● | | 3.0 | 1.5 | 20 | 2.2 | - | | |
| | | | 400-C | | ● | ● | | 4.0 | 2.0 | 20 | 3.2 | - | | |
| | | | 500-C | | | ● | | 5.0 | 2.5 | 25 | 4.0 | - | | |
| | | | 600-C | | | ● | | 6.0 | 3.0 | 25 | 5.0 | - | | |
| | | | 800-C | | | | | 8.0 | 4.0 | 30 | 6.0 | - | | |
| Grooving-Internal | KGMN-T |  | KGMI 200-02-T | | | ● | | 2.0 | 0.2 | 20 | 1.7 | - |  | C12 |
| | | | 300-04-T | | | ● | | 3.0 | 0.4 | 20 | 2.3 | - | | |
| | | | 400-04-T | | | ● | | 4.0 | 0.4 | 20 | 3.3 | - | | |
| | | | | | | | | | | | | | | |
| Parting off | KGMR-RP |  | KGMR 200-6D-RP | | | | | 2.0 | 0.2 | 20 | 1.7 | 6.0 |  | C08 C09 |
| | | | 200-15D-RP | | | | | 2.0 | 0.2 | 20 | 1.7 | 15 | | |
| | | | 300-6D-RP | | ● | ● | | 3.0 | 0.2 | 20 | 2.3 | 6.0 | | |
| | | | 300-15D-RP | | | | | 3.0 | 0.2 | 20 | 2.3 | 15 | | |
| | | | 400-4D-RP | | | | | 4.0 | 0.3 | 20 | 3.3 | 4.0 | | |
| | | | 400-15D-RP | | | | | 4.0 | 0.3 | 20 | 3.3 | 15 | | |
| Parting off | KGMR-LP |  | KGMR 200-6D-LP | | | ● | | 2.0 | 0.2 | 20 | 1.7 | 6.0 |  | C08 C09 |
| | | | 200-15D-LP | | | | | 2.0 | 0.2 | 20 | 1.7 | 15 | | |
| | | | 300-6D-LP | | ● | ● | | 3.0 | 0.2 | 20 | 2.3 | 6.0 | | |
| | | | 300-15D-LP | | | | | 3.0 | 0.2 | 20 | 2.3 | 15 | | |
| | | | 400-4D-LP | | | | | 4.0 | 0.3 | 20 | 3.3 | 4.0 | | |
| | | | 400-15D-LP | | ● | | | 4.0 | 0.3 | 20 | 3.3 | 15 | | |
| Special | KGGN-B |  | KGGN 300-B | | | | | 3.4 | 0.4 | 20.2 | 2.3 | - |  | C08 C09 C10 |
| | | | | | | | | | | | | | | |

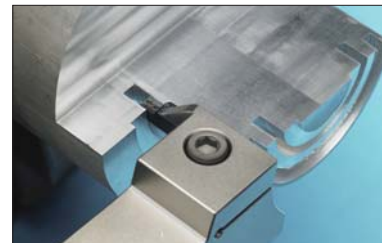
• Chip breaker 'B' : User self-grind type.

● : Stock item

Inserts are offered with two edges, for better economical machining

MGT Series

- Inserts are offered with two edges, for better economical machining
- Multi function operations - Reduce cycle time & increase productivity with the ability to groove, turn, face or copy in an application.
- Shorten time & save on tool cost - Korloy's MGT system allows a machinist to apply one tool against many applications, reducing the number of tools
- Flat Cutting Edge - MGT tools have a flat geometry on its cutting edge to ensure excellent surface finishes. Even in high Feed applications by using a wiper function, Korloy ensures excellent surface finishes in roughing operations.



Geometry of chip breaker

MGM(G)N-M



- Specially designed chip breaker allows a smoother chip flow versus conventional flat-top geometries through the use of a central chip breaker
- Specially placed convex dots assists with chip control in external machining, for a smoother chip flow.
- Chip breaker designed for turning & grooving applications

MGMN-G



- Specially designed chip breaker allows narrower chips to promote better chip flow
- Specifically designed for grooving applications

MRMN-M



- Full radius geometry for applications that require profiling
- Available for relief machining

MFMN300



- Specially designed chip breaker allows narrower chips to promote better chip flow
- Chip breaker specially designed for face-grooving

MRGN-A



- Specially designed high positive geometry, ideal for machining aluminum
- The chip breaker's super buffed, high rake angle allows optimal chip flow of aluminum

MGMR-PS



- Sharply designed cutting edge.
- Recommended in machining low carbon steel and stainless steel
- Specially designed chip breaker allows narrower chips to promote better chip flow.
- Able to machine Feed rates and small diameter cutting

MGMR-PT



- Stronger cutting edge with a negative land for tougher applications
- Able to machine at Feed rates as high and bar stock
- Chip breaker design helps narrow chips for better flow

MGMN-L



- Sharp cutting edge
- Low cutting resistance
- For auto CNC machine
- For small Dia. processing

MGMN-R



- Strong cutting edge
- For high Feed rate reprocessing

MGMN-T



- For turning & grooving
- Reduced chipwidth & smooth chip control by dot designed on the top corner

MGGN-A



- Smooth chip flow
- Reduced build up on cutting edge

Parting off (MGMN / MGMR/L)

| Workpiece | Cutting Speed(vc=m/min) | | | | | | | | | | Feed(fn=mm/rev) | | | | | | |
|-------------------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------|--------------------|-----------|-----------|-----------|-----------|---|
| | CVD | | | | | PVD | | | | | Uncoated | Cutting width (mm) | | | | | |
| | NC3120 | NC3030 | NCM325 | NC5330 | NC500H | PC230 | PC8110 | PC5300 | PC3500 | PC6510 | | ST30A | 2 | 3 | 4 | 5 | 6 |
| SM□□C | 80~180 | | | 80~180 | | 80~180 | | | | | | 0.02~0.15 | 0.03~0.2 | 0.08~0.3 | 0.10~0.4 | 0.12~0.5 | |
| SCM | 70~150 | 70~150 | 70~150 | 70~150 | 70~150 | 70~150 | | | 70~150 | | | 0.02~0.15 | 0.03~0.2 | 0.08~0.3 | 0.10~0.4 | 0.12~0.5 | |
| GC/GCD | | | | 50~100 | | | | | | 50~100 | 50~100 | 0.05~0.12 | 0.1~0.25 | 0.1~0.30 | 0.1~0.35 | 0.1~0.40 | |
| STS | | | 50~120 | 50~120 | | 50~120 | 60~140 | | | | | 0.02~0.1 | 0.03~0.15 | 0.08~0.25 | 0.1~0.35 | 0.12~0.40 | |
| Non-ferrous metal(AL, Copper) | | | | | | | | | | | 200~450 | 0.05~0.1 | 0.05~0.2 | 0.05~0.25 | 0.05~0.30 | 0.05~0.35 | |

Facing (FGD / FGM / FMM / MFMN / MGMN)

| Workpiece | Cutting Speed(vc=m/min) | | | | | | | | Feed(fn=mm/rev) | | | | | |
|-------------------------------|-------------------------|--------|---------|---------|--------|---------|---------------|-----|-----------------|--------------------|-----------|-----------|--|--|
| | CVD | | | | PVD | | | | Uncoated | Cutting width (mm) | | | | |
| | NC6110 | NC3030 | NC5330 | NC3120 | PC3500 | PC215K | PC8110/PC5300 | H01 | | 3 | 4 | 5 | | |
| SM□□C | | | 100~160 | 100~160 | | | | | | 0.05~0.1 | 0.05~0.12 | 0.05~0.15 | | |
| SCM | | 50~130 | 50~130 | 50~130 | 50~130 | | | | | 0.05~0.1 | 0.05~0.12 | 0.05~0.15 | | |
| GC/GCD | 120~150 | | 120~150 | | | 120~150 | | | | 0.05~0.1 | 0.05~0.12 | 0.05~0.15 | | |
| STS | | | 60~150 | | | | 60~150 | | | 0.05~0.1 | 0.05~0.12 | 0.05~0.15 | | |
| Non-ferrous metal(AL, Copper) | | | | | | | | | 200~800 | 0.05~0.15 | 0.08~0.15 | 0.08~0.15 | | |





Grooving, Turning (MGMN / MRMN)

| Workpiece | Cutting Speed(vc=m/min) | | | | | | | | | | Feed(fn=mm/rev) | | | | | | | |
|-------------------------------|-------------------------|--------|--------|---------|--------|--------|--------|--------|--------|--------|-----------------|--------|--------------------|-----------|-----------|-----------|-----------|-----------|
| | CVD | | | | PVD | | | | Cermet | | Uncoated | | Cutting width (mm) | | | | | |
| | NC3010 | NC3120 | NC3030 | NC5330 | PC215K | PC5300 | PC230 | PC3500 | CN20 | CT10 | ST30A | ST20 | 0.5~1.0 | 1.0~2.0 | 2~3 | 3~4 | 4~5 | 6~8 |
| SM□□C | 80~200 | 80~200 | | 80~200 | | 80~180 | 80~200 | | 80~120 | 80~120 | | 80~120 | 0.03~0.08 | 0.04~0.09 | 0.05~0.1 | 0.05~0.12 | 0.05~0.15 | 0.05~0.2 |
| SCM | 80~180 | 80~180 | 80~180 | 80~180 | | 80~160 | 80~180 | 80~180 | 80~120 | | 80~120 | 80~120 | 0.03~0.07 | 0.04~0.08 | 0.05~0.08 | 0.05~0.1 | 0.05~0.12 | 0.05~0.15 |
| GC/GCD | | | 60~130 | | 60~130 | | | | | | | | 0.03~0.07 | 0.04~0.08 | 0.05~0.08 | 0.05~0.1 | 0.05~0.10 | 0.05~0.12 |
| STS | | | 60~100 | 60~100 | | | | | | | 60~100 | | 0.03~0.08 | 0.04~0.09 | 0.05~0.10 | 0.05~0.12 | 0.05~0.12 | 0.05~0.15 |
| Non-ferrous metal(AL, Copper) | | | | 150~300 | | | | | | | 150~400 | | 0.05~0.12 | 0.05~0.15 | 0.05~0.15 | 0.08~0.15 | 0.08~0.15 | 0.10~0.20 |

Face grooving tools






For Shallow Grooving

- ▶ Economical tools utilizing a double ended cutting edge system
- ▶ Newly designed chip breakers that help ensure chip control for various face grooving applications
- ▶ Korloy face grooving tools provide various holder line-ups to give you more options and benefits

| MFMN300 | MGMN400-M | Horizontal MGFHR | Vertical MGFVR |
|---|---|--|---|
|  |  |  |  |
| Cutting Width 3mm | Cutting Width 4mm | Machining Dia. Ø24~200mm | Machining Dia. Ø24~60mm |

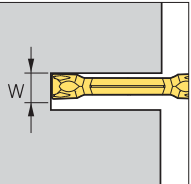
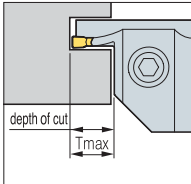
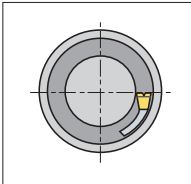
For Deep Grooving

- ▶ These tools are suitable for deep grooving with a single cutting edge (Tmax 25mm)
- ▶ A variety of chip breakers enable a machinist to apply a wide range of functions in machining
- ▶ A variety of holders ensures multiple application ranges

| FGD | FGM | FMM | Horizontal FGHH | Vertical FGHV |
|---|---|---|--|---|
|  |  |  |  |  |
| Deep face grooving (G class) | Wide face grooving turning (G class) | Wide face grooving turning (M class) | Machining Dia. Ø25~140mm | Machining Dia. Ø25~140mm |

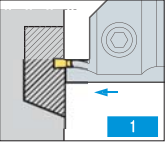
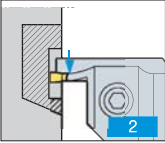
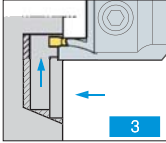
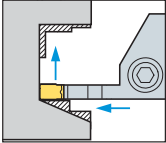
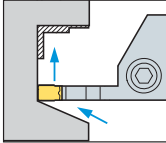
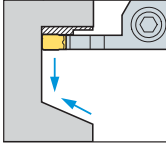
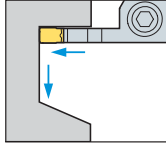
Selection System of Holder

▶ Follow these 3 simple directions to choose the right insert and holder for your application

| | | | | | |
|---|--|---|--|---|--|
|  | Insert and holder Choose an insert and holder that best applies to your application according to the cutting width and part of workpiece to be machined. |  | Holder Tmax Choose the holder with the shortest overhang that will still meet the cutting depth required |  | Machining Dia. Choose the largest size of shank depending on the initial grooving diameter required in the application |
|---|--|---|--|---|--|

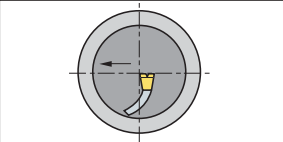
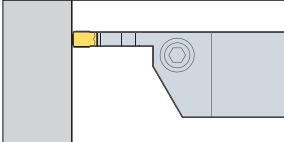
Notice: To minimize chattering, use the shortest holder according to Tmax.

Optimization of Face Grooving

| Roughing : When face grooving decreases the cutting speed 40% below a normal face turning operation | | | Finishing : When face grooving decreases the cutting speed 40% below a normal face turning operation | | | |
|---|---|---|--|--|---|---|
|  |  |  |  |  |  |  |
| • Grooving at the initial diameter | • Face turning away from center | • Face turning to center | • Grooving at the initial diameter to the final cutting depth and face turning away from center | • Radius operation toward final dimension at the bottom | • Face turning to center | • Grooving for the right dimension you want |

Notice for Face Grooving

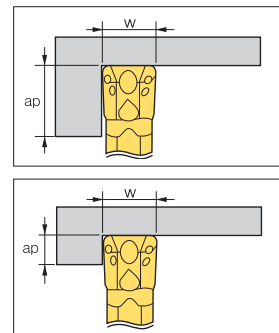
▶ Before machining, check and adjust the following holder position

| | | | |
|---|--|--|--|
|  | <ul style="list-style-type: none"> • Check the cutting edge height at the center of the workpiece • Machine towards the center and check for burrs |  | <ul style="list-style-type: none"> • For better surface roughness, set up the insert in order to perpendicular at center line |
|---|--|--|--|

Turning and Grooving

Selection of Insert

- ▶ Feed rate - Decide maximum feed rate after considering the insert's characteristics and machine capabilities. ($F_{max} = W \times 0.075$)
 - Max feed rate should not be larger than the corner radius of the insert
 - In grooving applications, chip evacuation problems can be remedied by using step feed methods at small intervals
- ▶ Depth of cut - The minimum depth of cut should be bigger than corner radius of insert
 - When deciding on the max depth of cut please consider the machine's cutting load
 - Depending on the shape of the insert, deflection of work piece and clearance angle can be changed

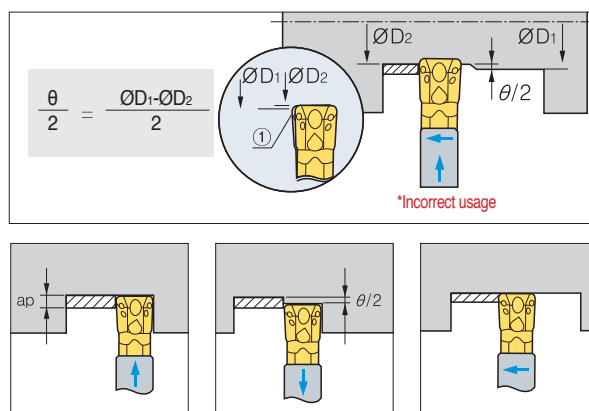


Notice for turning

- ▶ MGT tools are designed to incur side cutting force from its clearance angle; this feature gives you advantage over a standard ISO insert.
- ▶ The standard MGT insert also provides a "wiper" effect to improve surface roughness

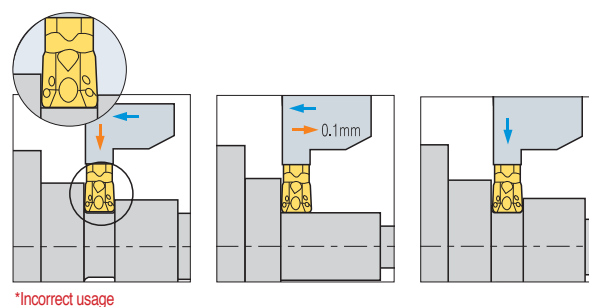
Notice for Finishing (offset need final quality)

- ▶ After desired diameter is grooved, continuous turning operation might cause some deflection of the workpiece. In these cases follow the given formula, offsetting these factors enables the desired diameter that you want
- ▶ To eliminate the difference in the machined diameter by utilizing the clearance angle (which is commonly generated during the final turning operation) follow the directions above when machining
 - To obtain a good surface roughness without offsetting in an application follows the directions below
 - 1) Groove to the desired diameter
 - 2) Pull the tool backs a total distance of $\theta/2$
 - 3) Continue the external turning operation to desired diameter

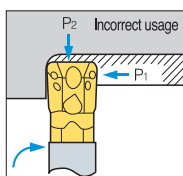


Notice for MGT turning applications

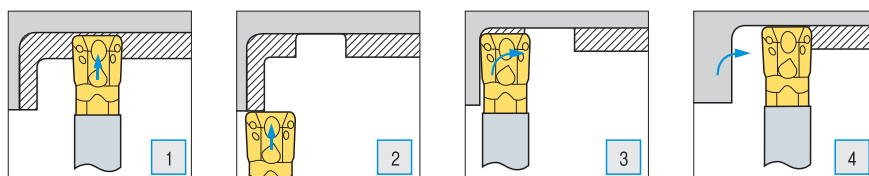
- ▶ M.G.T tools are available for grooving and turning as a multifunctional tool. When using a M.G.T tool keep in mind that the tool imitates a standard ISO turning application. The application uses a positive clearance angle where a tool's cutting force and depth of cut are all applied in an application. This might create normal wear on the insert, after turning, a grooving process might not meet the desired diameter on the work piece. To off set this, adjust the tool 0.004 inches and return to the original position of the grooving application



Machining workpiece with a radius bigger than the insert's corner radius



Stabilize your tool pressure. MGT tools create a cutting load when machining a workpiece with a radius larger than the corner radius of insert (shown in the picture). The unequal cutting force might initially break the insert or holder



Parting off & Grooving

Insert

| Lead angle applications | Lead angle 0°(Neutral) | Lead angle 4° ~ 8° | Lead angle 8°~15° |
|--|--|--|--|
| | | | |
| <ul style="list-style-type: none"> • 4°- Pipe (Tubing and hollow bar) • 6°- Pipe and solid bar • 8°- Solid bar • 15°- Small diameter Solid bar | <ul style="list-style-type: none"> • Parting off on solid bar type • Occurring the center stub when parting off • Prevent to be deflected workpiece by cutting direction during parting off • Available for use deep parting depth | <ul style="list-style-type: none"> • Reduce the center stub when parting off on solid bar type • Reduce the burr when parting off on tubing or hollow bar type | <ul style="list-style-type: none"> • Parting off on small diameter and hollow bar type • Reduce the burr and center stub when parting off on small diameter solid bar type |

※ Available Inserts : MGMR/L □□□ - □□ - PS/PT
Lead angle(°)

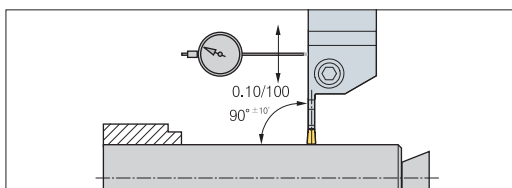
Selection of Insert

- ▶ To properly match the insert and cutting condition, the following factors should be considered
 - Width of insert
 - Chip breaker
 - Grade and nose R
- ▶ The relationship between the cutting width and cutting depth
 - Neutral type, inserts with a 0 degree lead angle are best when used an applications maximum depth of cut
 - In general alloy steel, the maximum depth of cut = $W \times 0.8$
- ▶ Insert with lead angle
 - To reduce burrs, we recommend using insert with a lead angle.
 - Insert that have larger lead angles reduce burrs but will also deareases tool life.
 - In the case where burrs are acceptable, we recommend using a neutral type insert



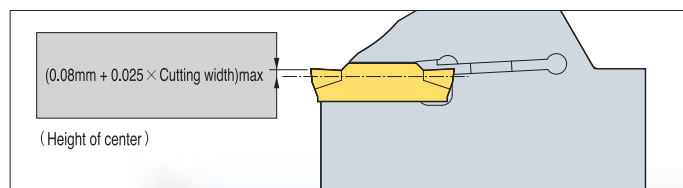
Setting of Holders

- ▶ The cutting position should be exactly mounted on machined axis in order to create a perpendicular direction or 90 to minimize vibration



Setting of Parting off

- ▶ The edge height of an insert should be set within ± 0.1 mm based on the center line
 - Parting off should be done as close to the chuck as possible to minimize vibration



Notice

- ▶ Keep a consistent cutting speed and feed
 - Use proper amounts of coolant for better performance
 - Properly clean the insert pocket before mounting insert

Usage

- ▶ If insert is worn, immediately replace with a new insert. This is to prevent the damage on the workpiece
 - If the holder seat is worn or damaged replace with a new one immediately for stable clamping
 - Do not grind or regrind the holder seat

Selection of Chip Breaker

Our chip breakers are designed to narrow chips during grooving operations.

Narrow chips usually offer the following advantages

- ▶ Deareases friction between chips and the workpiece. This usually gives a better surface roughness finish
- ▶ With better chip flow, a machinist is able to increase feed rates due to a reduced cutting load

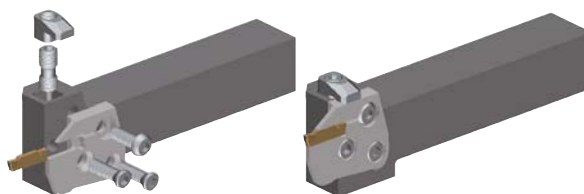


MGT Cartridge

System Figure

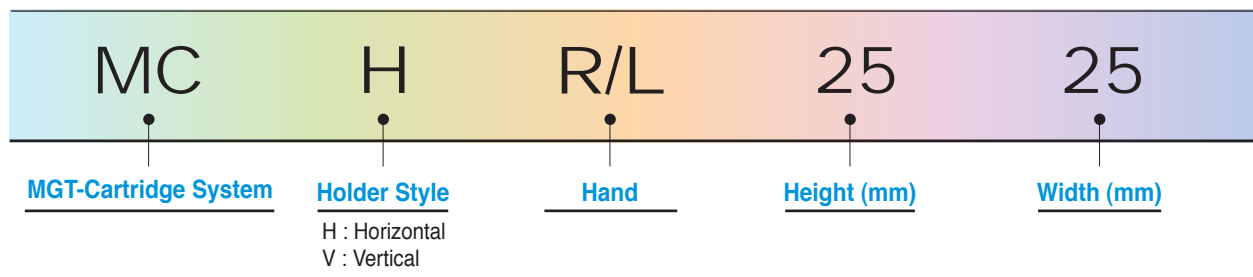
- ▶ Compatible and Economical due to divided cartridge & exclusive holder system from existing single body system
- ▶ Interchangeable cartridge
 - Various assembly depends on working style
 - Reduce cutting tool costs by over 30%
 - Setting with upper clamp & side screw
- ▶ Strong & Stable setting force
 - Simultaneous assembly of insert & cartridge
 - Easy assembly & tool exchange
- ▶ Stable assembly system
 - Simple & Superior setting force

Stable Assembly thanks to double screw & clamp

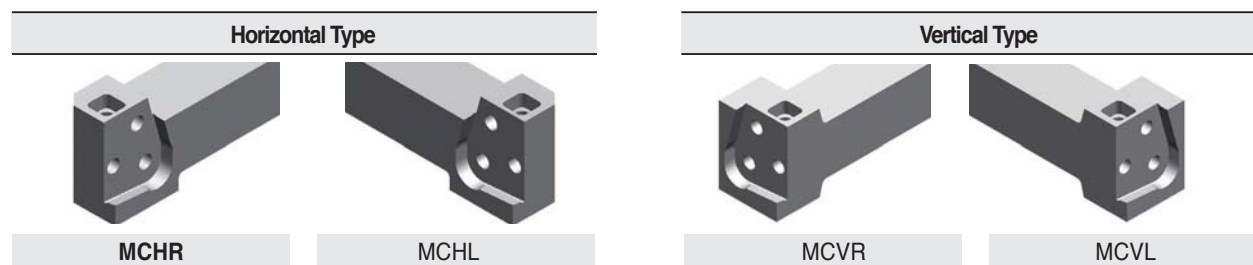


Simple & Strong Setting

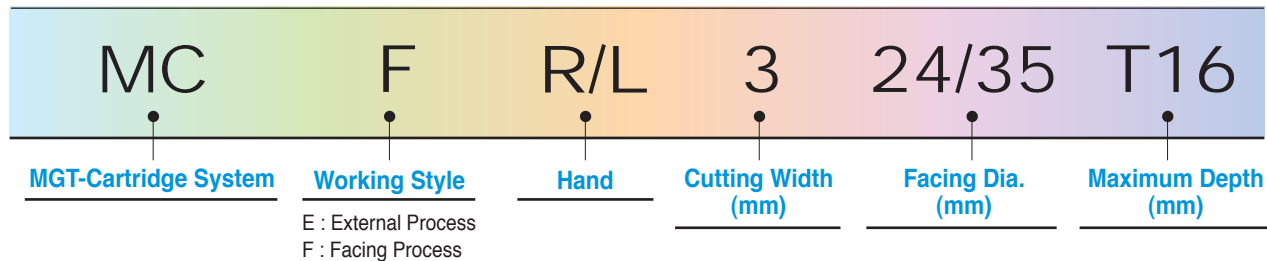
Holder Code System



Holder



Cartridge Code System



Cartridge

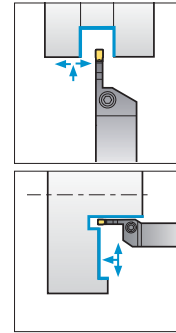
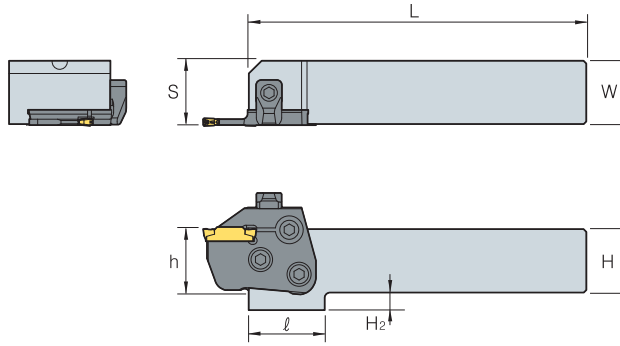


MCHR/L (Holder)



MCER/L
MCFR/L

For Grooving, Turning, Parting off, Relieving, Profiling machining



R type insert

(mm)

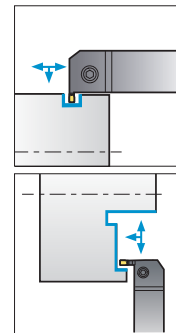
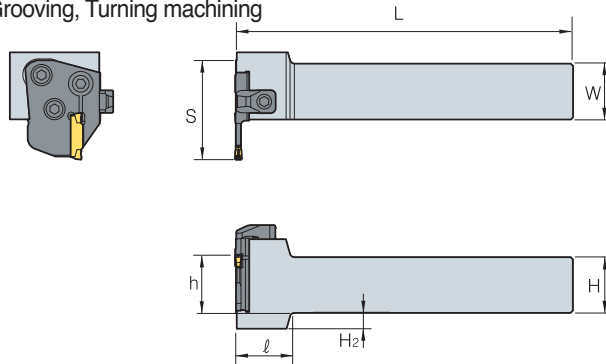
| Designation | | H=(h) | W | L | S | l | H ₂ | Cartridge | Clamp | Clamp Screw | Hinge Screw | Clamping Screw | Wrench | | | | | |
|-------------|------|-------|----|-----|------|----|----------------|------------------|-------|-------------|-------------|----------------|--------|-------|----------|---------|----------|-------|
| MCHR/L | 2020 | 20 | 20 | 133 | 20.7 | 30 | 12 | MCER/L MCFR/L | | | | | | | | | | |
| | 2525 | 25 | 25 | 133 | 25.7 | 30 | 7 | | | | | | | CXH8N | DHA0818F | RHA0613 | FHGA0618 | HW40L |
| | 3232 | 32 | 32 | 153 | 32.7 | - | - | | | | | | | | | | | |

MCVR/L (Holder)



MCER/L
MCFR/L

For Face Grooving, Turning machining

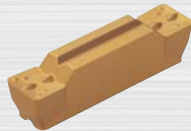


R type insert

(mm)

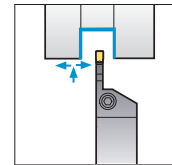
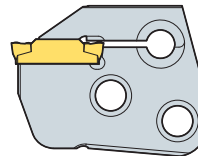
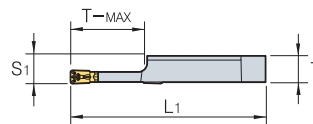
| Designation | | H=(h) | W | L | S | l | H ₂ | Cartridge | Clamp | Clamp Screw | Hinge Screw | Clamping Screw | Wrench | | | | | |
|-------------|------|-------|----|-----|----|----|----------------|------------------|-------|-------------|-------------|----------------|--------|-------|----------|---------|----------|-------|
| MCVR/L | 2020 | 20 | 20 | 150 | 38 | 30 | 12 | MCER/L MCFR/L | | | | | | | | | | |
| | 2525 | 25 | 25 | 150 | 43 | 30 | 7 | | | | | | | CXH8N | DHA0818F | RHA0613 | FHGA0618 | HW40L |
| | 3232 | 32 | 32 | 170 | 50 | - | - | | | | | | | | | | | |

MCER/L (Cartridge)



MGMN
MGMR
MGGN
MRMN

For Grooving, Turning, Parting off, Relieving, Profiling machining



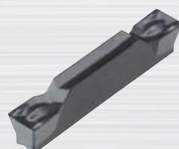
R type insert

(mm)

| Designation | T | L ₁ | S ₁ | T-max | Inserts | | Holder |
|-------------|-------|----------------|----------------|-------|---------|-------------|------------------|
| | | | | | Width | Designation | |
| MCER/L | 3-T16 | 6.00 | 44.5 | 6.35 | 16 | 3 | MCVR/L MCHR/L |
| | 4-T16 | 5.97 | 44.5 | 6.35 | 16 | 4 | |
| | 5-T20 | 5.87 | 48.5 | 6.35 | 20 | 5 | |
| | 6-T20 | 5.82 | 48.5 | 6.35 | 20 | 6 | |

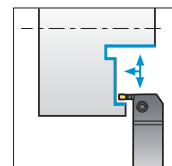
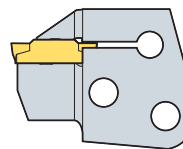
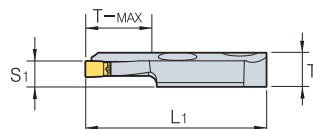
Applicable inserts C29, C30

MCFR/L (Cartridge)



MFNM
MGMN

For Face Grooving, Turning machining



R type insert

(mm)

| Designation | T | L ₁ | S ₁ | T-max | Inserts | | Holder |
|-------------|---------------|----------------|----------------|-------|---------|-------------|------------------|
| | | | | | Width | Designation | |
| MCFR/L | 3-24/35-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | MCVR/L MCHR/L |
| | 3-29/40-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | |
| | 3-34/50-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | |
| | 3-44/70-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | |
| | 3-64/99-T16 | 8.00 | 44.5 | 6.35 | 16 | 3 | |
| | 4-44/60-T16 | 7.97 | 44.5 | 6.35 | 16 | 4 | MGMN400 |
| | 4-60/120-T16 | 7.97 | 44.5 | 6.35 | 16 | 4 | |
| | 4-112/200-T16 | 7.97 | 44.5 | 6.35 | 16 | 4 | |

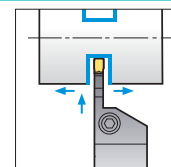
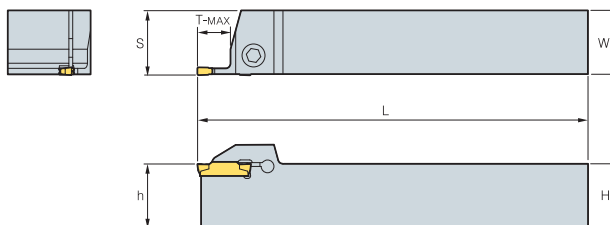
Applicable inserts C29, C30

MGEHR/L






MGMN MGMR
MGGN MRMN
MRGN

For Grooving, Turning, Parting off, Relieving, Profiling machining



R type insert
(mm)

| Designation | | H=(h) | W | L | S | T-MAX | Inserts | Clamping Screw  | Wrench  |
|-------------|-------------|-------|----|-----|-------|-------|---|---|---|
| MGEHR/L | 1616-1.5 | 16 | 16 | 100 | 16.2 | 14 | MGMN150-G | LTX0514 | TW20L |
| | 2020-1.5 | 20 | 20 | 125 | 20.2 | 14 | | | |
| | 2525-1.5 | 25 | 25 | 150 | 25.2 | 14 | | | |
| | 1212-2 | 12 | 12 | 100 | 14.25 | 14 | MGMN200-G MGMN200-M MGMR200-□□-□□ | MHA0512 | HW40L |
| | 1616-2 | 16 | 16 | 100 | 16.25 | 14 | | | |
| | 2020-2 | 20 | 20 | 125 | 20.25 | 14 | | | |
| | 2525-2 | 25 | 25 | 150 | 25.25 | 14 | MGMN250-G MGMN250-M | MHA0512 | HW40L |
| | 1616-2.5 | 16 | 16 | 100 | 16.30 | 16 | | | |
| | 2020-2.5 | 20 | 20 | 125 | 20.30 | 16 | | | |
| | 2525-2.5 | 25 | 25 | 150 | 25.30 | 16 | MGMN300-M/T MGGN300-□□-M MRMN300-M MGMR300-□□-□□ MGMN300-□□-L/R | BHA0616 | HW50L |
| | 1616-3 | 16 | 16 | 100 | 16.35 | 18 | | | |
| | 2020-3 | 20 | 20 | 125 | 20.4 | 18 | | | |
| | 2020-3-T10 | 20 | 20 | 125 | 20.4 | 10 | | | |
| | 2525-3 | 25 | 25 | 150 | 25.4 | 18 | | | |
| | 2525-3-T10 | 25 | 25 | 150 | 25.4 | 10 | | | |
| | 3232-3 | 32 | 32 | 170 | 32.4 | 18 | | | |
| | 3232-3-T10 | 32 | 32 | 170 | 32.4 | 10 | | | |
| | 2020-4 | 20 | 20 | 125 | 20.4 | 18 | | | |
| | 2020-4-T10 | 20 | 20 | 125 | 20.4 | 10 | | | |
| | 2525-4 | 25 | 25 | 150 | 25.4 | 18 | MGMN400-M/T MGGN400-□□-M MRMN400-M MGMR400-□□-□□ MGMN400-□□-L/R | BHA0616 | HW50L |
| | 2525-4-T10 | 25 | 25 | 150 | 25.4 | 10 | | | |
| | 3232-4 | 32 | 32 | 170 | 32.4 | 18 | | | |
| | 3232-4-T10 | 32 | 32 | 170 | 32.4 | 10 | MGMN500-M/T MGGN500-□□-M MRMN500-M MGMR500-□□-□□ MGMN500-□□-L/R | BHA0616 | HW50L |
| | 2020-5 | 20 | 20 | 150 | 20.5 | 23 | | | |
| | 2020-5-T15 | 20 | 20 | 150 | 20.5 | 15 | | | |
| | 2525-5 | 25 | 25 | 150 | 25.5 | 23 | | | |
| | 2525-5-T15 | 25 | 25 | 150 | 25.5 | 15 | | | |
| | 3232-5 | 32 | 32 | 170 | 32.5 | 23 | | | |
| | 3232-5-T15 | 32 | 32 | 170 | 32.5 | 15 | | | |
| | 2020-6 | 20 | 20 | 125 | 20.6 | 23 | | | |
| | 2020-6-T15 | 20 | 20 | 125 | 20.6 | 15 | | | |
| | 2525-6 | 25 | 25 | 150 | 25.6 | 23 | | | |
| | 2525-6-T15 | 25 | 25 | 150 | 25.6 | 15 | | | |
| | 3232-6 | 32 | 32 | 170 | 32.6 | 23 | | | |
| | 3232-6-T15 | 32 | 32 | 170 | 32.6 | 15 | MRMN800-M MGMN800-M | BHA0616 | HW50L |
| | 2525-8 | 25 | 25 | 150 | 26.1 | 28 | | | |
| | 2525-8-T15 | 25 | 25 | 150 | 26.1 | 15 | | | |
| | 3232-8 | 32 | 32 | 170 | 33.1 | 28 | | | |
| | 3232-8-T15 | 32 | 32 | 170 | 33.1 | 16 | MRGN600-A | BHA0616 | HW50L |
| | 2525-6A | 25 | 25 | 150 | 25.6 | 23 | | | |
| | 2525-6A-T15 | 25 | 25 | 150 | 25.6 | 15 | | | |
| | 3232-6A | 32 | 32 | 170 | 32.6 | 23 | | | |
| | 3232-6A-T15 | 32 | 32 | 170 | 32.6 | 15 | MRGN800-A | BHA0616 | HW50L |
| | 2525-8A | 25 | 25 | 150 | 26.1 | 28 | | | |
| | 2525-8A-T15 | 25 | 25 | 150 | 26.1 | 16 | | | |
| | 3232-8A | 32 | 32 | 170 | 33.1 | 28 | | | |
| | 3232-8A-T15 | 32 | 32 | 170 | 33.1 | 15 | | | |

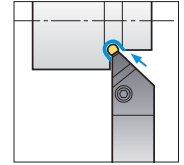
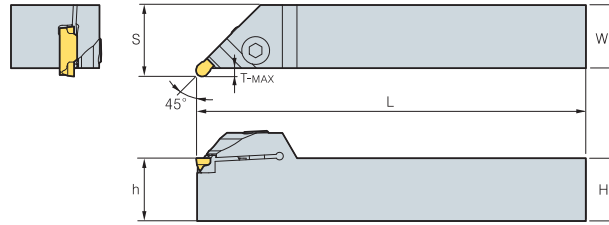
 Applicable inserts C29, C30

MGEUR/L



MRMN
MRGN

For Relieving, Profiling machining



R type insert
(mm)

| Designation | | H=(h) | W | L | S | T-MAX | Inserts | Clamping Screw | Wrench |
|-------------|---------|-------|----|-----|----|-------|-----------|----------------|--------|
| MGEUR/L | 2020-3 | 20 | 20 | 125 | 23 | 3 | MRMN300-M | BHA0616 | HW50L |
| | 2525-3 | 25 | 25 | 150 | 28 | 3 | | | |
| | 3232-3 | 32 | 32 | 170 | 35 | 3 | | | |
| 2020-4 | 2020-4 | 20 | 20 | 125 | 23 | 3 | MRMN400-M | | |
| | 2525-4 | 25 | 25 | 150 | 28 | 3 | | | |
| | 3232-4 | 32 | 32 | 170 | 35 | 3 | | | |
| 2020-5 | 2020-5 | 20 | 20 | 125 | 24 | 4 | MRMN500-M | | |
| | 2525-5 | 25 | 25 | 150 | 29 | 4 | | | |
| | 3232-5 | 32 | 32 | 170 | 36 | 4 | | | |
| 2020-6 | 2020-6 | 20 | 20 | 125 | 24 | 4 | MRMN600-M | | |
| | 2525-6 | 25 | 25 | 150 | 29 | 4 | | | |
| | 3232-6 | 32 | 32 | 170 | 36 | 4 | | | |
| 2525-8 | 2525-8 | 25 | 25 | 150 | 30 | 5 | MRMN800-M | | |
| | 3232-8 | 32 | 32 | 170 | 37 | 5 | | | |
| 2525-6A | 2525-6A | 25 | 25 | 150 | 29 | 4 | MRGN600-A | | |
| | 3232-6A | 32 | 32 | 170 | 36 | 4 | | | |
| 2525-8A | 2525-8A | 25 | 25 | 150 | 30 | 5 | MRGN800-A | | |
| | 3232-8A | 32 | 32 | 170 | 37 | 5 | | | |

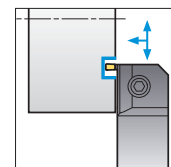
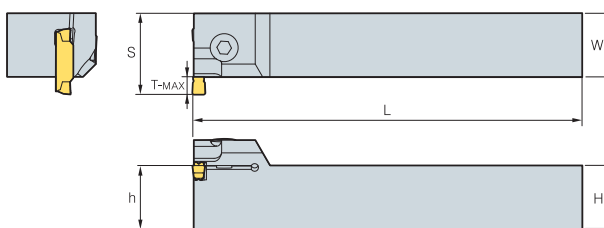
Applicable inserts C30

MGEVR/L



MGMN MGGN
MRMN MRGN

For Grooving, Turning, Profiling machining



R type insert

(mm)

| Designation | | H=(h) | W | L | S | T-MAX | Min. machining Dia. | Inserts | Screw | Wrench |
|-------------|----------|-------|----|-----|------|-------|---------------------|--|---------|--------|
| MGEVR/L | 2020-1.5 | 20 | 20 | 125 | 23 | 3 | 85 | MGMN150-G | LTX0514 | TW20L |
| | 2525-1.5 | 25 | 25 | 150 | 28 | 3 | 85 | | | |
| | 3232-1.5 | 32 | 32 | 170 | 35 | 3 | 85 | | | |
| | 2020-2 | 20 | 20 | 125 | 23.5 | 3.5 | 65 | MGMN200-M MGMN200-G | | |
| | 2525-2 | 25 | 25 | 150 | 28.5 | 3.5 | 65 | | | |
| | 3232-2 | 32 | 32 | 170 | 35.5 | 3.5 | 65 | | | |
| | 2020-2.5 | 20 | 20 | 125 | 24 | 4 | 65 | MGMN250-M MGMN250-G | | |
| | 2525-2.5 | 25 | 25 | 150 | 29 | 4 | 65 | | | |
| | 3232-2.5 | 32 | 32 | 170 | 36 | 4 | 65 | | | |
| | 2020-3 | 20 | 20 | 125 | 25.5 | 5 | 75 | MGMN300-M/T MGGN300-□□-M MRMN300-M MGMN300-□□-L/R | | |
| | 2525-3 | 25 | 25 | 150 | 30.5 | 5 | 75 | | | |
| | 3232-3 | 32 | 32 | 170 | 37.5 | 5 | 75 | | | |
| | 2020-4 | 20 | 20 | 125 | 25.5 | 5 | 70 | MGMN400-M/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R | | |
| | 2525-4 | 25 | 25 | 150 | 30.5 | 5 | 70 | | | |
| | 3232-4 | 32 | 32 | 170 | 37.5 | 5 | 70 | | | |
| | 2020-5 | 20 | 20 | 125 | 27 | 7 | 75 | MGMN500-M/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R | BHA0616 | HW50L |
| | 2525-5 | 25 | 25 | 150 | 32 | 7 | 75 | | | |
| | 3232-5 | 32 | 32 | 170 | 39 | 7 | 75 | | | |
| | 2020-6 | 20 | 20 | 125 | 27 | 7 | 70 | MGMN600-M MGGN600-□□-M MRMN600-M | | |
| | 2525-6 | 25 | 25 | 150 | 32 | 7 | 70 | | | |
| | 3232-6 | 32 | 32 | 170 | 39 | 7 | 70 | | | |
| | 2525-8 | 25 | 25 | 150 | 34 | 9 | 50 | MRMN800-M MGMN800-M | | |
| | 3232-8 | 32 | 32 | 170 | 41 | 9 | 50 | | | |
| | 2525-6A | 25 | 25 | 150 | 32 | 7 | 70 | MRGN600-A | | |
| | 3232-6A | 32 | 32 | 170 | 39 | 7 | 70 | | | |
| | 2525-8A | 25 | 25 | 150 | 34 | 9 | 45 | MRGN800-A | | |
| | 3232-8A | 32 | 32 | 170 | 41 | 9 | 45 | | | |

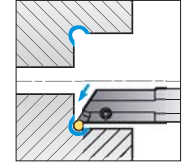
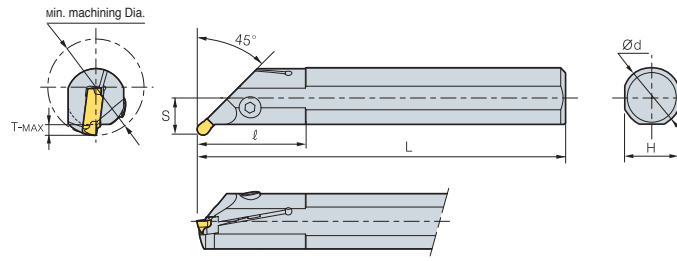
Applicable inserts C29, C30

MGIUR/L



MRMN
MRGN

For Grooving, Turning, Profiling machining



R type insert
(mm)

| Designation | | ØD | Ød | L | ℓ | T-MAX | H | S | Inserts | Screw | Wrench |
|-------------|---------|----|----|-----|----|-------|----|------|-----------|--------------------|--------|
| MGIUR/L | 3520-3 | 35 | 20 | 150 | 45 | 3.5 | 18 | 13 | MRMN300-M | MHA0512 | HW40L |
| | 4025-3 | 40 | 25 | 200 | 45 | 3.5 | 23 | 15.5 | | | |
| | 5032-3 | 50 | 32 | 250 | 65 | 3.5 | 30 | 19 | | | |
| MGIUR/L | 3520-4 | 35 | 20 | 150 | 45 | 3.5 | 18 | 13 | MRMN400-M | MHA0512 | HW40L |
| | 4025-4 | 40 | 25 | 200 | 45 | 3.5 | 23 | 15.5 | | | |
| | 5032-4 | 50 | 32 | 250 | 65 | 3.5 | 30 | 19 | | | |
| MGIUR/L | 4025-5 | 40 | 25 | 200 | 45 | 3.5 | 23 | 15.5 | MRMN500-M | BHA0616 BHA0620 | HW50L |
| | 5032-5 | 50 | 32 | 250 | 65 | 3.5 | 30 | 19 | MRMN600-M | BHA0616 BHA0620 | |
| | 4025-6 | 40 | 25 | 200 | 45 | 3.5 | 23 | 19 | MRMN800-M | BHA0616 BHA0620 | |
| MGIUR/L | 5032-6 | 50 | 32 | 250 | 65 | 3.5 | 30 | 19 | MRGN600-A | BHA0616 BHA0620 | HW50L |
| | 4025-8 | 40 | 25 | 200 | 45 | 6.5 | 23 | 15.5 | | | |
| | 5032-8 | 50 | 32 | 250 | 65 | 6.5 | 30 | 19 | | | |
| MGIUR/L | 4025-6A | 40 | 25 | 200 | 45 | 3.5 | 23 | 15.5 | MRGN800-A | BHA0616 BHA0620 | HW50L |
| | 5032-6A | 50 | 32 | 250 | 65 | 3.5 | 30 | 19 | | | |
| | 4025-8A | 40 | 25 | 200 | 45 | 5.0 | 23 | 18.5 | | | |
| MGIUR/L | 5032-8A | 50 | 32 | 250 | 65 | 6.5 | 30 | 22 | | | |

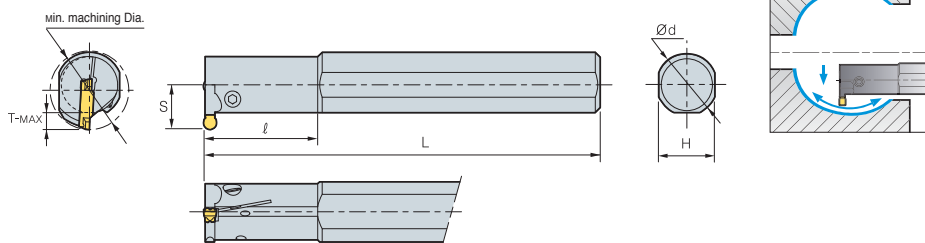
Applicable inserts C29, C30

MGIVR/L



MGMN MRMN
MGN MRGN

For Grooving, Turning, Profiling machining

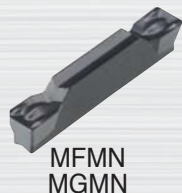


R type insert
(mm)

| Designation | | ØD | Ød | L | ℓ | T-MAX | H | S | Inserts | Screw | Wrench |
|-------------|----------|----|-----|-----|-----|-------|------|---|---|---|---------|
| MGIVR/L | 2016-1.5 | 20 | 16 | 125 | 35 | 3.5 | 15 | 11.3 | MGMN150-G | MHB0310 | HW25L |
| | 2520-1.5 | 25 | 20 | 150 | 45 | 3.5 | 18 | 13.1 | | MHA0512 | HW40L |
| 2925-1.5 | 29 | 25 | 200 | 45 | 3.5 | 23 | 16.2 | MGMN200-G MGMN200-M MRMN200-M | | MHB0310 | HW25L |
| 2016-2 | 20 | 16 | 125 | 35 | 4.5 | 15 | 12.4 | | MHA0512 | HW40L | |
| 2520-2 | 25 | 20 | 150 | 45 | 4.5 | 18 | 14.0 | | MGMN250-G MGMN250-M | MHB0310 | HW25L |
| 2925-2 | 29 | 25 | 200 | 45 | 4.5 | 23 | 17.2 | MHA0512 | | HW40L | |
| 2016-2.5 | 20 | 16 | 125 | 35 | 4.5 | 15 | 12.5 | MGMN300-M/G/T MGN300-□□-M MRMN300-M MGMN300-□□-L/R | | MHB0310 | HW25L |
| 2520-2.5 | 25 | 20 | 150 | 45 | 4.5 | 18 | 15.1 | | MHA0512 | HW40L | |
| 2925-2.5 | 29 | 25 | 200 | 45 | 4.5 | 23 | 18.2 | | | MGMN400-M/G/T MGN400-□□-M MRMN400-M MGMN400-□□-L/R | MHB0310 |
| 2520-3 | 25 | 20 | 150 | 45 | 5 | 18 | 15.6 | MHA0512 | | | HW40L |
| 3125-3 | 31 | 25 | 200 | 45 | 6 | 23 | 18.9 | | MGMN500-M/G/T MGN500-□□-M MRMN500-M MGMN500-□□-L/R | | MHB0310 |
| 3732-3 | 37 | 32 | 250 | 65 | 6 | 30 | 21.5 | | | MHA0512 | HW40L |
| 2520-4 | 25 | 20 | 150 | 45 | 6 | 18 | 15.6 | MGMN600-MG MGN600-□□-M MRMN600-M | | | BHA0616 |
| 3125-4 | 31 | 25 | 200 | 45 | 6 | 23 | 18.9 | | BHA0620 | | |
| 3732-4 | 37 | 32 | 250 | 65 | 6 | 30 | 21.5 | | | MRMN800-M MGMN800-M | |
| 3125-5 | 31 | 25 | 200 | 45 | 8 | 23 | 19.4 | BHA0616 | | | HW50L |
| 3732-5 | 37 | 32 | 250 | 65 | 8 | 30 | 21.5 | | BHA0620 | | |
| 3125-6 | 31 | 25 | 200 | 45 | 8 | 23 | 19.4 | | | MRGN600-A | |
| 3732-6 | 37 | 32 | 250 | 65 | 8 | 30 | 21.5 | BHA0616 | | | |
| 3732-8 | 37 | 32 | 250 | 65 | 10 | 30 | 23.4 | | MRGN800-A | | |
| 4540-8 | 45 | 40 | 300 | 70 | 10 | 37 | 27.2 | | | BHA0620 | |
| 3125-6A | 31 | 25 | 200 | 45 | 8 | 23 | 19.4 | BHA0616 | | | |
| 3732-6A | 37 | 32 | 250 | 65 | 8 | 30 | 21.5 | | BHA0620 | | |
| 3732-8A | 37 | 32 | 250 | 65 | 10 | 30 | 23.4 | | | BHA0616 | |
| 4540-8A | 45 | 40 | 300 | 70 | 10 | 37 | 27.2 | BHA0620 | | | |

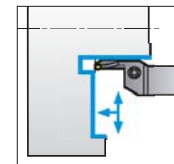
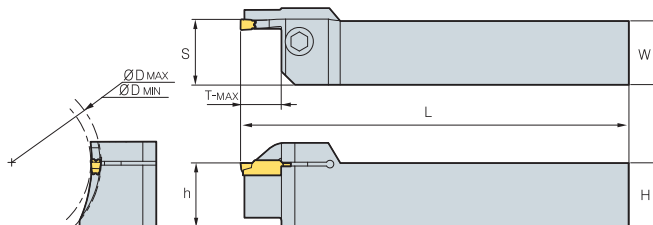
Applicable inserts C29, C30

MGFHR/L



MFMN
MGMN

For Face Grooving machining

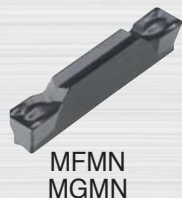


R type insert
(mm)

| Designation | H=(h) | W | L | S | T-MAX | øD | | Inserts | Screw | Wrench |
|-----------------------|-------|----|-----|------|-------|-----|-----|-------------------------------|---------|--------|
| | | | | | | Min | Max | | | |
| MGFHR/L 325-24/35-T10 | 25 | 25 | 150 | 25.6 | 10 | 24 | 35 | MFMN300 | BHA0616 | HW50L |
| 325-29/40-T10 | 25 | 25 | 150 | 25.6 | 10 | 29 | 40 | | | |
| 325-34/50-T10 | 25 | 25 | 150 | 25.6 | 10 | 34 | 50 | | | |
| 325-44/70-T10 | 25 | 25 | 150 | 25.6 | 10 | 44 | 70 | | | |
| 325-64/99-T10 | 25 | 25 | 150 | 25.6 | 10 | 64 | 99 | | | |
| 425-62/120-T15 | 25 | 25 | 150 | 25.6 | 15 | 62 | 120 | MGMN400-M/T MGMN400-□□-L/R | BHA0616 | HW50L |
| 425-112/200-T15 | 25 | 25 | 150 | 25.6 | 15 | 112 | 200 | | | |

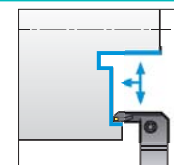
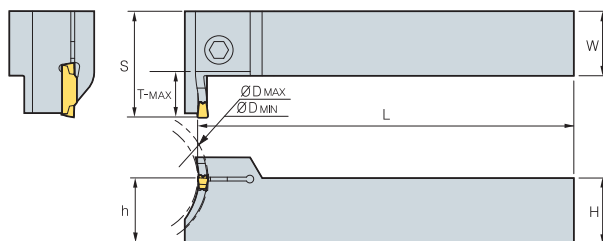
Applicable inserts C29, C30

MGFVR/L



MFMN
MGMN

For Face Grooving machining

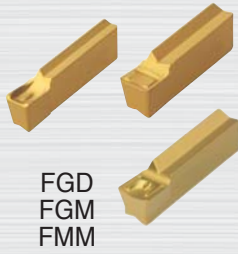


R type insert
(mm)

| Designation | H=(h) | W | L | S | T-MAX | øD | | Inserts | Screw | Wrench |
|-----------------------|-------|----|-----|----|-------|-----|-----|-------------------------------|---------|--------|
| | | | | | | Min | Max | | | |
| MGFVR/L 325-24/35-T10 | 25 | 25 | 150 | 36 | 10 | 24 | 35 | MFMN300 | MHA0512 | HW40L |
| 325-29/40-T10 | 25 | 25 | 150 | 36 | 10 | 29 | 40 | | | |
| 325-34/50-T10 | 25 | 25 | 150 | 36 | 10 | 34 | 50 | | | |
| 325-44/70-T10 | 25 | 25 | 150 | 36 | 10 | 44 | 70 | | | |
| 325-64/99-T10 | 25 | 25 | 150 | 36 | 10 | 64 | 99 | | | |
| 425-44/60-T10 | 25 | 25 | 150 | 41 | 15 | 44 | 60 | MGMN400-M/T MGMN400-□□-L/R | BHA0616 | HW50L |
| 425-60/120-T10 | 25 | 25 | 150 | 41 | 15 | 60 | 120 | | | |
| 425-112/200-T10 | 25 | 25 | 150 | 41 | 15 | 112 | 200 | | | |

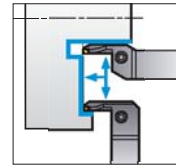
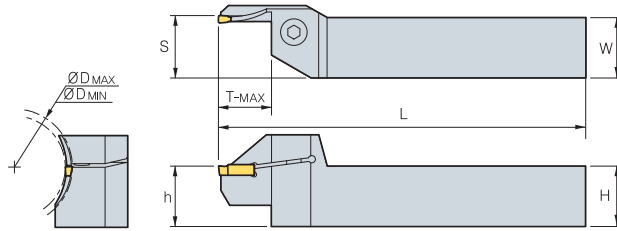
Applicable inserts C29, C30

FGHH





For Face Grooving, Turning machining

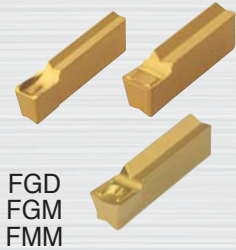
• FGHH



R type insert
(mm)

| Designation | H=(h) | W | L | S | T-MAX | øD | | Inserts | Screw  | Wrench  |
|-------------------|---------|----|-----|------|-------|-----|-----|--------------------------|--|---|
| | | | | | | Min | Max | | | |
| FGHH 320R - 25/30 | 20 | 20 | 125 | 20.6 | 12 | 25 | 30 | FMM300R-03 | BHA0616 | HW50L |
| | 30/35 | 20 | 20 | 125 | 20.6 | 12 | 30 | | | |
| | 35/48 | 20 | 20 | 125 | 20.6 | 12 | 35 | | | |
| | 48/60 | 20 | 20 | 125 | 20.6 | 22 | 48 | | | |
| | 60/75 | 20 | 20 | 125 | 20.6 | 22 | 60 | | | |
| | 75/100 | 20 | 20 | 125 | 20.6 | 22 | 75 | | | |
| 325R - 25/30 | 20 | 20 | 125 | 20.6 | 22 | 100 | 140 | FGD300R-03 FGM300R-03 | BHA0616 | HW50L |
| | 30/35 | 25 | 25 | 150 | 25.6 | 12 | 30 | | | |
| | 35/48 | 25 | 25 | 150 | 25.6 | 12 | 35 | | | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 22 | 48 | | | |
| | 60/75 | 25 | 25 | 150 | 25.6 | 22 | 60 | | | |
| | 75/100 | 25 | 25 | 150 | 25.6 | 22 | 75 | | | |
| 420R - 25/30 | 25 | 25 | 150 | 25.6 | 12 | 25 | 30 | FMM400R-04 | BHA0616 | HW50L |
| | 30/35 | 25 | 25 | 150 | 25.6 | 12 | 30 | | | |
| | 35/48 | 25 | 25 | 150 | 25.6 | 12 | 35 | | | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | |
| | 60/75 | 25 | 25 | 150 | 25.6 | 25 | 60 | | | |
| | 75/100 | 25 | 25 | 150 | 25.6 | 25 | 75 | | | |
| 425R - 25/30 | 20 | 20 | 125 | 20.6 | 25 | 100 | 140 | FGD400R-04 FGM400R-04 | BHA0616 | HW50L |
| | 30/35 | 20 | 20 | 125 | 20.6 | 12 | 30 | | | |
| | 35/48 | 20 | 20 | 125 | 20.6 | 12 | 35 | | | |
| | 48/60 | 20 | 20 | 125 | 20.6 | 25 | 48 | | | |
| | 60/75 | 20 | 20 | 125 | 20.6 | 25 | 60 | | | |
| | 75/100 | 20 | 20 | 125 | 20.6 | 25 | 75 | | | |
| 520R - 25/30 | 25 | 25 | 150 | 25.6 | 12 | 25 | 30 | FMM500R-04 | BHA0616 | HW50L |
| | 30/35 | 25 | 25 | 150 | 25.6 | 12 | 30 | | | |
| | 35/40 | 25 | 25 | 150 | 25.6 | 20 | 35 | | | |
| | 40/48 | 25 | 25 | 150 | 25.6 | 20 | 40 | | | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | |
| | 60/75 | 25 | 25 | 150 | 25.6 | 25 | 60 | | | |
| 525R - 25/30 | 20 | 20 | 125 | 20.6 | 25 | 100 | 140 | FGD500R-04 FGM500R-04 | BHA0616 | HW50L |
| | 30/35 | 20 | 20 | 125 | 20.6 | 12 | 30 | | | |
| | 35/40 | 20 | 20 | 125 | 20.6 | 20 | 35 | | | |
| | 40/48 | 20 | 20 | 125 | 20.6 | 20 | 40 | | | |
| | 48/60 | 20 | 20 | 125 | 20.6 | 25 | 48 | | | |
| | 60/75 | 20 | 20 | 125 | 20.6 | 25 | 60 | | | |
| 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | 100 | FMM500R-04 | BHA0616 | HW50L |
| | 30/35 | 25 | 25 | 150 | 25.6 | 12 | 30 | | | |
| | 35/40 | 25 | 25 | 150 | 25.6 | 20 | 35 | | | |
| | 40/48 | 25 | 25 | 150 | 25.6 | 20 | 40 | | | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | |
| | 60/75 | 25 | 25 | 150 | 25.6 | 25 | 60 | | | |
| 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | 100 | FGD500R-04 FGM500R-04 | BHA0616 | HW50L |
| | 75/100 | 25 | 25 | 150 | 25.6 | 25 | 75 | | | |
| | 100/140 | 25 | 25 | 150 | 25.6 | 25 | 100 | | | |
| | 100/140 | 25 | 25 | 150 | 25.6 | 25 | 100 | | | |
| | 100/140 | 25 | 25 | 150 | 25.6 | 25 | 100 | | | |
| | 100/140 | 25 | 25 | 150 | 25.6 | 25 | 100 | | | |

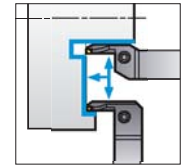
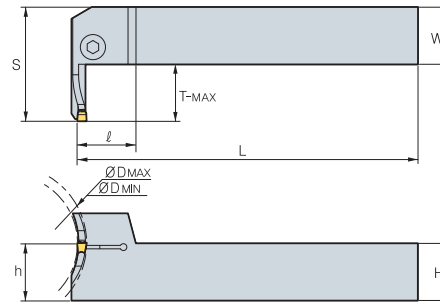
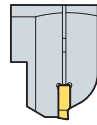
FGVH



FGD
FGM
FMM

For Face Grooving, Turning machining

• FGVH



R type insert

(mm)

| Designation | H=(h) | W | L | S | T-MAX | øD | | Inserts | Screw | Wrench | | |
|-------------------|--------------|----|-----|------|-------|-----|-----|--------------------------|---------|--------|-----|------------|
| | | | | | | Min | Max | | | | | |
| FGVH 320R - 25/30 | 20 | 20 | 125 | 20.6 | 12 | 25 | 30 | FMM300R-03 | BHA0616 | HW50L | | |
| | 30/35 | 20 | 20 | 125 | 20.6 | 12 | 30 | | | | | |
| | 35/48 | 20 | 20 | 125 | 20.6 | 12 | 35 | | | | | |
| | 48/60 | 20 | 20 | 125 | 20.6 | 22 | 48 | | | | | |
| | 60/75 | 20 | 20 | 125 | 20.6 | 22 | 60 | | | | | |
| | 75/100 | 20 | 20 | 125 | 20.6 | 22 | 75 | | | | | |
| 325R - 25/30 | 20 | 20 | 125 | 20.6 | 22 | 100 | 140 | FGD300R-03 FGM300R-03 | | | | |
| | 325R - 25/30 | 25 | 25 | 150 | 25.6 | 12 | 25 | | | | 30 | FMM300R-03 |
| | 30/35 | 25 | 25 | 150 | 25.6 | 12 | 30 | | | | 35 | |
| | 35/48 | 25 | 25 | 150 | 25.6 | 12 | 35 | | | | 48 | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 22 | 48 | | | | 60 | |
| | 60/75 | 25 | 25 | 150 | 25.6 | 22 | 60 | | | | 75 | |
| 420R - 25/30 | 25 | 25 | 150 | 25.6 | 22 | 75 | 100 | FGD300R-03 FGM300R-03 | | | | |
| | 420R - 25/30 | 20 | 20 | 125 | 20.6 | 12 | 25 | | | | 30 | FMM400R-04 |
| | 30/35 | 20 | 20 | 125 | 20.6 | 12 | 30 | | | | 35 | |
| | 35/48 | 20 | 20 | 125 | 20.6 | 12 | 35 | | | | 48 | |
| | 48/60 | 20 | 20 | 125 | 20.6 | 25 | 48 | | | | 60 | |
| | 60/75 | 20 | 20 | 125 | 20.6 | 25 | 60 | | | | 75 | |
| 425R - 25/30 | 20 | 20 | 125 | 20.6 | 25 | 100 | 140 | FGD400R-04 FGM400R-04 | | | | |
| | 425R - 25/30 | 25 | 25 | 150 | 25.6 | 12 | 25 | | | | 30 | FMM400R-04 |
| | 30/35 | 25 | 25 | 150 | 25.6 | 12 | 30 | | | | 35 | |
| | 35/48 | 25 | 25 | 150 | 25.6 | 12 | 35 | | | | 48 | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | | 60 | |
| | 60/75 | 25 | 25 | 150 | 25.6 | 25 | 60 | | | | 75 | |
| 520R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | 100 | FGD400R-04 FGM400R-04 | | | | |
| | 520R - 25/30 | 20 | 20 | 125 | 20.6 | 12 | 25 | | | | 30 | FMM500R-04 |
| | 30/35 | 20 | 20 | 125 | 20.6 | 12 | 30 | | | | 35 | |
| | 35/40 | 20 | 20 | 125 | 20.6 | 20 | 35 | | | | 40 | |
| | 40/48 | 20 | 20 | 125 | 20.6 | 20 | 40 | | | | 48 | |
| | 48/60 | 20 | 20 | 125 | 20.6 | 25 | 48 | | | | 60 | |
| 525R - 25/30 | 20 | 20 | 125 | 20.6 | 25 | 100 | 140 | FGD500R-04 FGM500R-04 | | | | |
| | 525R - 25/30 | 25 | 25 | 150 | 25.6 | 12 | 25 | | | | 30 | FMM500R-04 |
| | 30/35 | 25 | 25 | 150 | 25.6 | 12 | 30 | | | | 35 | |
| | 35/40 | 25 | 25 | 150 | 25.6 | 20 | 35 | | | | 40 | |
| | 40/48 | 25 | 25 | 150 | 25.6 | 20 | 40 | | | | 48 | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | | 60 | |
| 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | 100 | FGD500R-04 FGM500R-04 | | | | |
| | 525R - 25/30 | 20 | 20 | 125 | 20.6 | 25 | 100 | | | | 140 | FMM500R-04 |
| | 30/35 | 20 | 20 | 125 | 20.6 | 25 | 30 | | | | 35 | |
| | 35/40 | 20 | 20 | 125 | 20.6 | 20 | 35 | | | | 40 | |
| | 40/48 | 20 | 20 | 125 | 20.6 | 20 | 40 | | | | 48 | |
| | 48/60 | 20 | 20 | 125 | 20.6 | 25 | 48 | | | | 60 | |
| 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 60 | 75 | FGD500R-04 FGM500R-04 | | | | |
| | 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | | | | 100 | FMM500R-04 |
| | 30/35 | 25 | 25 | 150 | 25.6 | 25 | 30 | | | | 35 | |
| | 35/40 | 25 | 25 | 150 | 25.6 | 20 | 35 | | | | 40 | |
| | 40/48 | 25 | 25 | 150 | 25.6 | 20 | 40 | | | | 48 | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | | 60 | |
| 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | 100 | FGD500R-04 FGM500R-04 | | | | |
| | 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 100 | | | | 140 | FMM500R-04 |
| | 30/35 | 25 | 25 | 150 | 25.6 | 25 | 30 | | | | 35 | |
| | 35/40 | 25 | 25 | 150 | 25.6 | 20 | 35 | | | | 40 | |
| | 40/48 | 25 | 25 | 150 | 25.6 | 20 | 40 | | | | 48 | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | | 60 | |
| 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 60 | 75 | FGD500R-04 FGM500R-04 | | | | |
| | 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | | | | 100 | FMM500R-04 |
| | 30/35 | 25 | 25 | 150 | 25.6 | 25 | 30 | | | | 35 | |
| | 35/40 | 25 | 25 | 150 | 25.6 | 20 | 35 | | | | 40 | |
| | 40/48 | 25 | 25 | 150 | 25.6 | 20 | 40 | | | | 48 | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | | 60 | |
| 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 75 | 100 | FGD500R-04 FGM500R-04 | | | | |
| | 525R - 25/30 | 25 | 25 | 150 | 25.6 | 25 | 100 | | | | 140 | FMM500R-04 |
| | 30/35 | 25 | 25 | 150 | 25.6 | 25 | 30 | | | | 35 | |
| | 35/40 | 25 | 25 | 150 | 25.6 | 20 | 35 | | | | 40 | |
| | 40/48 | 25 | 25 | 150 | 25.6 | 20 | 40 | | | | 48 | |
| | 48/60 | 25 | 25 | 150 | 25.6 | 25 | 48 | | | | 60 | |

Applicable inserts C29

Inserts

| Application | Picture | Designation | Coated | | | | | | | | | Cermet | Dimensions (mm) | | | | | Configuration | Page | |
|--------------------|---------|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------|------|------|------|------|---------------|--------------------------|-----|
| | | | NC3010 | NC3030 | NC3120 | NC3220 | PC5300 | PC9030 | NC5330 | PC6510 | PC8110 | CN20 | b | r | l | d | t | | | |
| Face Grooving | | FGD 300R-03 | | ● | | | | | | | | | 3.0 | 0.3 | 15.0 | 2.0 | 4.0 | | C27 C28 | |
| | | 400R-04 | | ● | | | | | | | | | 4.0 | 0.4 | 15.0 | 3.0 | 4.5 | | | |
| | | 500R-04 | | ● | | | | | | | | | 5.0 | 0.4 | 15.0 | 4.0 | 5.0 | | | |
| Face Grooving | | FGM 300R-03 | | | | | | | | | | | 3.0 | 0.3 | 15.0 | 2.0 | 4.0 | | C27 C28 | |
| | | 400R-04 | | ● | | | | | | | | | 4.0 | 0.4 | 15.0 | 3.0 | 4.5 | | | |
| | | 500R-04 | | | | | | | | | | | 5.0 | 0.4 | 15.0 | 4.0 | 5.0 | | | |
| Face Grooving | | FMM 300R-03 | | ● | | | | | | | ● | | 3.0 | 0.3 | 15.0 | 2.0 | 3.91 | | C27 C28 | |
| | | 400R-04 | | ● | | | | | | | | | 4.0 | 0.4 | 15.0 | 3.0 | 3.96 | | | |
| | | 500R-04 | | ● | | | | | | | | | 5.0 | 0.4 | 15.0 | 4.0 | 4.42 | | | |
| Grooving · Turning | | MGMN 300-02-M | | | | ● | | | | | | | 3.0 | 0.2 | 18.0 | 2.0 | 3.0 | | C20 C26 | |
| | | 300-04-M | | | | | | | | | | | | 3.0 | 0.2 | 18.0 | 2.0 | | | 3.0 |
| | | 300-08-M | | | | | | | | | | | | 3.0 | 0.2 | 18.0 | 2.0 | | | 3.0 |
| | | 400-02-M | | | | | | | | | | | | 4.0 | 0.2 | 21.0 | 3.3 | | | 4.8 |
| | | 400-04-M | | | | | | | | | | | | 4.0 | 0.4 | 21.0 | 3.3 | | | 4.8 |
| | | 400-08-M | | | | | | | | | | | | 4.0 | 0.8 | 21.0 | 3.3 | | | 4.8 |
| | | 500-02-M | | | | | | | | | | | | 5.0 | 0.2 | 26.0 | 4.1 | | | 5.8 |
| | | 500-04-M | | | | | | | | | | | | 5.0 | 0.4 | 26.0 | 4.1 | | | 5.8 |
| | | 500-08-M | | | | | | | | | | | | 5.0 | 0.8 | 26.0 | 4.1 | | | 5.8 |
| | | 600-02-M | | | | | | | | | | | | 6.0 | 0.2 | 26.0 | 5.0 | | | 5.8 |
| | | 600-04-M | | | | | | | | | | | | 6.0 | 0.4 | 26.0 | 5.0 | | | 5.8 |
| 600-08-M | | | | | | | | | | | | 6.0 | 0.8 | 26.0 | 5.0 | 5.8 | | | | |
| Grooving | | MGMN 150-G | | ● | | ● | ● | ● | | | | | 1.5 | 0.15 | 16.0 | 1.2 | 3.5 | | C20 C21 C23 C25 | |
| | | 200-G | | ● | ● | ● | ● | ● | | | | | 2.0 | 0.2 | 16.0 | 1.6 | 3.5 | | | |
| | | 250-G | | ● | | ● | ● | ● | | | | | 2.5 | 0.2 | 18.5 | 2.0 | 3.85 | | | |
| | | 300-G | | ● | ● | ● | ● | ● | ● | | | | 3.0 | 0.4 | 21.0 | 2.35 | 4.8 | | | |
| | | 400-G | | ● | ● | ● | ● | ● | ● | | | | 4.0 | 0.4 | 21.0 | 3.3 | 4.8 | | | |
| | | 500-G | | | | | | | | | | | | 5.0 | 0.8 | 26.0 | 4.1 | | | 5.8 |
| | | 600-G | | | | | | | | | | | | 6.0 | 0.8 | 26.0 | 5.0 | | | 5.8 |
| Grooving · Turning | | MGMN 200-M | | ● | ● | ● | ● | ● | ● | | | | 2.0 | 0.2 | 16.0 | 1.2 | 3.5 | | C21 C23 C25 C26 | |
| | | 250-M | | ● | ● | ● | ● | ● | ● | | | | 2.5 | 0.2 | 18.5 | 2.0 | 3.85 | | | |
| | | 300-02-M | | | | | | | | | ● | | 3.0 | 0.2 | 21.0 | 2.35 | 4.8 | | | |
| | | 300-M | ● | ● | ● | ● | ● | ● | | | | | 3.0 | 0.4 | 21.0 | 2.35 | 4.8 | | | |
| | | 350-03-M | | | | | | | | | | | | 3.5 | 0.3 | 21.0 | 2.9 | | | 4.8 |
| | | 400-02-M | | | | | | | | | | | | 4.0 | 0.2 | 21.0 | 3.3 | | | 4.8 |
| | | 400-M | | ● | ● | ● | ● | ● | ● | | | | 4.0 | 0.4 | 21.0 | 3.3 | 4.8 | | | |
| | | 500-04-M | | ● | | | | | | | | | | 5.0 | 0.4 | 26.0 | 4.1 | | | 5.8 |
| | | 500-M | | ● | ● | ● | | | | | ● | | 5.0 | 0.8 | 26.0 | 4.1 | 5.8 | | | |
| | | 600-M | | ● | ● | ● | | | | | ● | | 6.0 | 0.8 | 26.0 | 5.0 | 5.8 | | | |
| 800-M | | ● | | | | | | | ● | | 8.0 | 0.8 | 31.0 | 6.0 | 6.5 | | | | | |


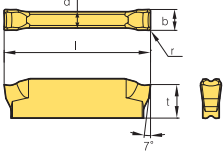

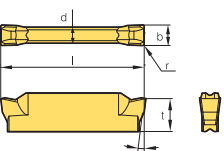

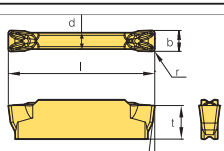

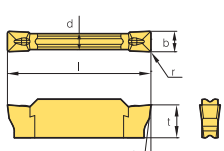

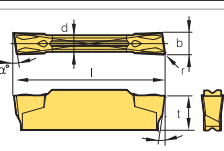

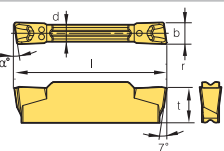

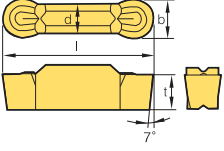

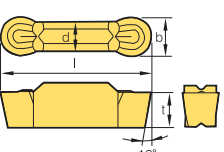

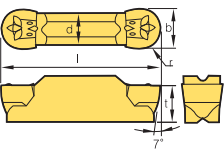
● : Stock item



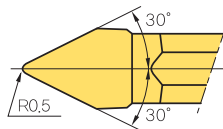
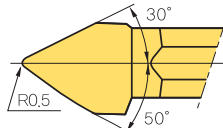
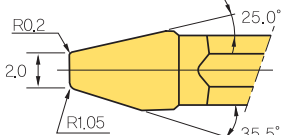
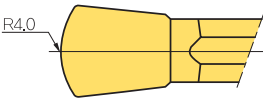
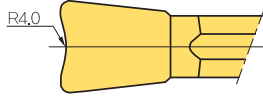
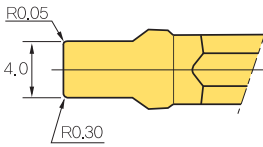
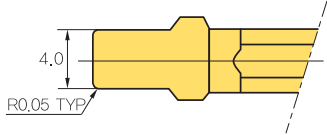
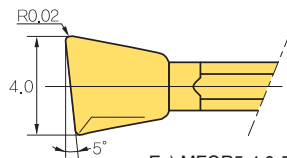
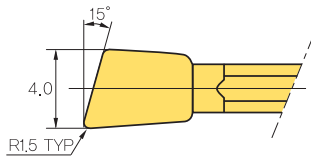
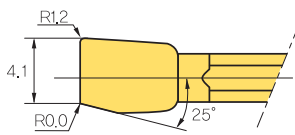
Multi functional Tools

C Available Insert for MGT

Inserts

| Application | Picture | Designation | Coated | | | | | | | | | Uncoated | | Dimensions (mm) | | | | | | Configuration | Page |
|----------------------|---|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|-------|----------|-----|-----------------|------|------|------|------|---|---|-------------------|
| | | | NC3030 | NC3120 | NC3220 | PC8110 | PC9030 | PC3525 | PC5300 | PC6510 | PC230 | NC5330 | H01 | G10 | b | r | l | d | t | | |
| Grooving |  | MGMN 200-02-L | | | | | | | | | | | | 2.0 | 0.2 | 16 | 1.60 | 3.5 | - |  | C20 C21 C26 |
| | | MGMN 300-02-L | | | | | | ● | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | - | | |
| | | MGMN 400-02-L | | | | | | | ● | | | | | 4.0 | 0.2 | 21 | 3.3 | 4.8 | - | | |
| | | MGMN 200-04-L | | | | | | | | | | | | 2.0 | 0.4 | 20 | 1.7 | 3.5 | - | | |
| | | MGMN 300-04-L | | | | | | | | | | | | 3.0 | 0.4 | 20 | 2.3 | 4.0 | - | | |
| | | MGMN 400-04-L | | | | | | | | | | | | 4.0 | 0.4 | 20 | 3.3 | 4.0 | - | | |
| | | MGMN 500-04-L | | | | | | | | | | | | 5.0 | 0.4 | 26 | 4.1 | 5.8 | - | | |
| Grooving Parting off |  | MGMN 200-02-R | | | | | | | | | | | 2.0 | 0.2 | 16 | 1.60 | 3.5 | - |  | C20 C21 C26 | |
| | | MGMN 300-02-R | ● | | | | | ● | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | - | | | |
| | | MGMN 400-02-R | ● | | | | | | ● | | | | 4.0 | 0.2 | 21 | 3.3 | 4.8 | - | | | |
| | | MGMN 200-04-R | | | | | | | | | | | | 2.0 | 0.4 | 20 | 1.7 | 3.5 | | | - |
| | | MGMN 300-04-R | | | | | | | | | | | | 3.0 | 0.4 | 20 | 2.3 | 4.0 | | | - |
| | | MGMN 400-04-R | | | | | | | | | | | | 4.0 | 0.4 | 20 | 3.3 | 4.0 | | | - |
| | | MGMN 500-04-R | ● | | | | | | | ● | | | | 5.0 | 0.4 | 26 | 4.1 | 5.8 | | | - |
| Grooving Turning |  | MGMN 200-T | | | | | | | | | | | 2.0 | 0.2 | 16 | 1.60 | 3.5 | - |  | C20 C26 | |
| | | MGMN 300-T | ● | | | | | | ● | | | | 3.0 | 0.4 | 21 | 2.35 | 4.8 | - | | | |
| | | MGMN 400-T | ● | | | | | | | ● | | | 4.0 | 0.4 | 21 | 3.3 | 4.8 | - | | | |
| | | MGMN 500-T | ● | | | | | | | | ● | | 5.0 | 0.8 | 26 | 4.1 | 5.8 | - | | | |
| Grooving |  | MGGN 300-02-A | | | | | | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | - |  | C20 C21 C23 C25 | |
| | | MGGN 300-04-A | | | | | | | | | | | 3.0 | 0.4 | 21 | 2.35 | 4.8 | - | | | |
| | | MGGN 300-08-A | | | | | | | | | | | 3.0 | 0.8 | 21 | 2.35 | 4.8 | - | | | |
| | | MGGN 400-02-A | | | | | | | | | | | 4.0 | 0.2 | 21 | 3.3 | 4.8 | - | | | |
| | | MGGN 400-04-A | | | | | | | | | | | 4.0 | 0.4 | 21 | 3.3 | 4.8 | - | | | |
| | | MGGN 400-08-A | | | | | | | | | | | 4.0 | 0.8 | 21 | 3.3 | 4.8 | - | | | |
| | | MGGN 500-02-A | | | | | | | | | | | 5.0 | 0.2 | 26 | 4.1 | 5.8 | - | | | |
| | | MGGN 500-04-A | | | | | | | | | | | 5.0 | 0.4 | 26 | 4.1 | 5.8 | - | | | |
| | | MGGN 500-08-A | | | | | | | | | | | 5.0 | 0.8 | 26 | 4.1 | 5.8 | - | | | |
| Parting off |  | MGMR/L 300-6D-PS | | | | | | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | 6.0 |  | C20 C21 | |
| | | MGMR/L 300-8D-PS | | | | | | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | 8.0 | | | |
| | | MGMR/L 300-15D-PS | | | | | | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | 15.0 | | | |
| | | MGMR/L 400-4D-PS | | | | | | | | | | | 4.0 | 0.3 | 21 | 3.3 | 4.8 | 4.0 | | | |
| | | MGMR/L 500-4D-PS | | | | | | | | | | | 5.0 | 0.3 | 26 | 4.1 | 5.8 | 4.0 | | | |
| Parting off |  | MGMR/L 200-6D-PT | | | | | | | | | | | 2.0 | 0.2 | 16 | 1.6 | 3.6 | 6.0 |  | C20 C21 | |
| | | MGMR/L 300-6D-PT | | | | | | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | 6.0 | | | |
| | | MGMR/L 300-8D-PT | | | | | | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | 8.0 | | | |
| | | MGMR/L 300-15D-PT | ● | | | | | | | | | | 3.0 | 0.2 | 21 | 2.35 | 4.8 | 15.0 | | | |
| | | MGMR/L 400-4D-PT | | | | | | | | | | | 4.0 | 0.3 | 21 | 3.3 | 4.8 | 4.0 | | | |
| MGMR/L 500-4D-PT | | | | | | | | | | | 5.0 | 0.3 | 26 | 4.1 | 5.8 | 4.0 | | | | | |
| Aluminum |  | MRGN 400-A | | | | | | | | | | | 4.0 | 2.0 | 21.0 | 3.3 | 4.8 | - |  | C20 C21 C23 C24 C25 | |
| | | MRGN 500-A | | | | | | | | | | | 5.0 | 2.5 | 26.0 | 4.1 | 5.8 | - | | | |
| Aluminum |  | MRGN 600-A | | | | | | | | | | | 6.0 | 3.0 | 26.0 | 5.0 | 5.8 | - |  | C20 C21 C23 C24 C25 | |
| | | MRGN 800-A | | | | | | | | | | | 8.0 | 4.0 | 31.0 | 6.0 | 6.5 | - | | | |
| Relieving Profiling |  | MRMN 200-M | ● | ● | ● | | | | | | | | 2.0 | 1.0 | 16.0 | 1.50 | 3.5 | - |  | C20 C21 C23 C24 C25 | |
| | | MRMN 300-M | ● | ● | ● | ● | | | | | | | 3.0 | 1.5 | 21.0 | 2.35 | 4.8 | - | | | |
| | | MRMN 400-M | ● | ● | ● | | | | | | | | 4.0 | 2.0 | 21.0 | 3.3 | 4.8 | - | | | |
| | | MRMN 500-M | ● | ● | ● | | | | | | | | 5.0 | 2.5 | 26.0 | 4.1 | 5.8 | - | | | |
| | | MRMN 600-M | ● | ● | ● | | | | | | | | 6.0 | 3.0 | 26.0 | 5.0 | 5.8 | - | | | |
| | | MRMN 800-M | ● | ● | ● | | | | | | | | 8.0 | 4.0 | 31.0 | 6.0 | 6.5 | - | | | |
| | | MRMN 500-M | ● | ● | ● | ● | | | | | | | 5.0 | 2.5 | 26.0 | 4.1 | 5.8 | - | | | |

● : Stock item

| Designation | Configuration |
|--|--|
| <p>M F G N 4 - 0.5R - 30D</p> <p>① ② ③ ④ ⑤ ⑥ ⑦</p> <p>① Multi ② Forming ③ Grinding ④ Feed Direction ⑤ Clamp part : 4mm ⑥ Nose Radius : 0.5 ⑦ Degree : 30°</p> |  <p>Ex) MFGN4-0.5R-30D</p> |
| <p>MFGN4 - 0.5R - L 50 D - R 30D</p> <p>① ② ③ ④ ⑤ ⑥</p> <p>① Refer to No. 1 ② Nose Radius : 0.5 ③ Left ④ Degree : 50° ⑤ Right ⑥ Degree > 30°</p> |  <p>Ex) MFGN4-0.5R-L50D-R30D</p> |
| <p>MFGN4 - 2.0 - R 020 250 - L 105 335</p> <p>① ② ③ ④ ⑤ ⑥ ⑦ ⑧</p> <p>① Refer to No. 1 ② Width of cutting edge : 2.0mm ③ Right ④ Nose Radius : 0.20 ⑤ Degree : 25.0° ⑥ Left ⑦ Nose Radius : 1.05 ⑧ Degree : 35.5°</p> |  <p>Ex) MFGN4-2.0-R020250-L105335</p> |
| <p>MFGN5 - 4.0R F</p> <p>① ② ③</p> <p>① Refer to No. 1 ② Radius : 4.0 ③ Front(Concave)</p> |  <p>Ex) MFGN5-4.0RF</p> |
| <p>MFGN5 - 4.0R B</p> <p>① ② ③</p> <p>① Refer to No. 1 ② Radius : 4.0 ③ Back(Concave)</p> |  <p>Ex) MFGN5-4.0RB</p> |
| <p>MFGN5 - 4.0 - R 005 - L 030</p> <p>① ② ③ ④ ⑤ ⑥</p> <p>① Refer to No. 1 ② Width of cutting edge : 4.0mm ③ Right ④ Nose Radius : 0.05 ⑤ Left ⑥ Nose Radius : 0.30</p> |  <p>Ex) MFGN5-4.0-R005-L030</p> |
| <p>MFGN5 - 4.0 - 0.05 R</p> <p>① ② ③</p> <p>① Refer to No. 1 ② Width of cutting edge: 4.0mm ③ Nose Radius : 0.05</p> |  <p>Ex) MFGN5-4.0-0.05R</p> |
| <p>MFG R 5 - 4.0 - 5D - R 002 - L 115</p> <p>① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨</p> <p>① Refer to No. 1 ② Right ③ Clamp part: 5mm ④ Width of cutting edge : 4.0mm ⑤ Lead angle : 5° ⑥ Right ⑦ Nose Radius : 0.02 ⑧ Left ⑨ Nose Radius : 1.15</p> |  <p>Ex) MFGR5-4.0-5D-R002-L115</p> |
| <p>MFG L 5 - 4.0 - 15D - 1.5R</p> <p>① ② ③ ④ ⑤ ⑥</p> <p>① Refer to No. 1 ② Left ③ Clamp part: 5mm ④ Width of cutting edge : 4.0mm ⑤ Lead angle : 15° ⑥ Right Nose Radius : 1.5</p> |  <p>Ex) MFG L 5 - 4.0 - 15D - 1.5R</p> |
| <p>MFG R 5 - 4.10 - 25D - R012 - L000</p> <p>① ② ③ ④ ⑤ ⑥ ⑦</p> <p>① Refer to No. 1 ② Right ③ Clamp part: 5mm ④ Width of cutting edge : 4.1mm ⑤ Degree : 25° ⑥ Right Nose Radius : 1.2 ⑦ Left Nose Radius : 0.0</p> |  <p>Ex) MFG R 5 - 4.10 - 25D - R012 - L000</p> |

C Special order form for V-Pulley insert

Code System

KP
27
064
-
R0.425
N3

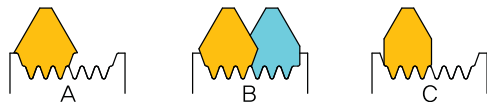
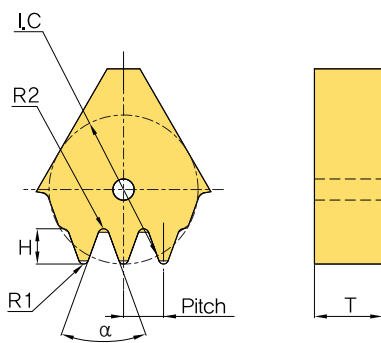
KORLOY PULLEY
 $\varnothing d$
W
R1
No. of Flutes

Ex)

| | | | |
|--------------------|-----|-------|---|
| I.C | T | R | Z |
| $\varnothing 12.7$ | 6.4 | 0.425 | 3 |

► Special types are available for quotation.

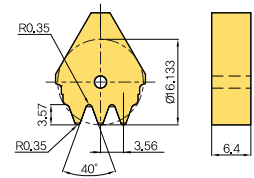
Insert for machining of pulley



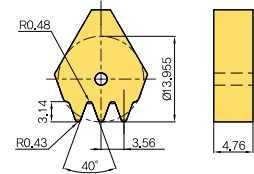
Standard designation

Specifications

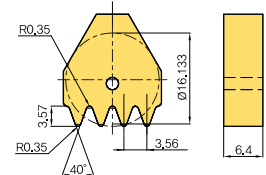
KP27064-R0.35-N3
(DF356-3B)



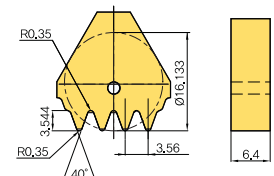
KP27064-R0.43-N3
(DF356-3SR)



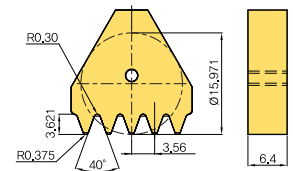
KP27064-R0.35-N4
(DF356-4B)



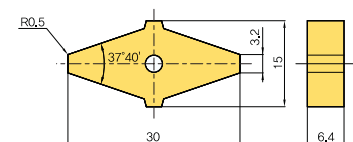
KP27064-R0.35-N4-A
(DF356-4X)



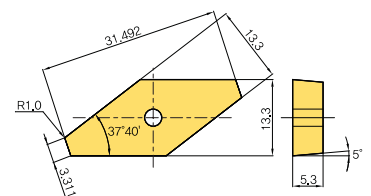
KP27064-R0.375-N5
(DF356-5B)



UF320



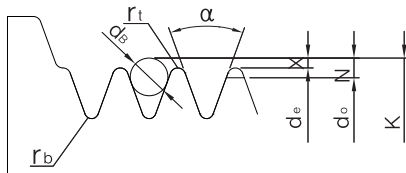
VF13M522



► For reference: KS specifications and codes for V-pulley for vehicles(PK)

Diameter

Code system



- d_e : Effective diameter
- d_o : Diameter
- K : Diameter of ball or rod
- d_a : Diameter of ball for inspection and rod

P 6 PK96.3

Pulley
 No. of hole
 Cross section of hole
 Effective diameter(mm)

| Cross section | | PH | PJ | PK | PL | PM |
|---------------|-------|-------------------------|--|-------------|----------------------------------|----------------------------------|
| Pitch of hole | | 1.6 ± 0.03 | 2.34 ± 0.03 | 3.56 ± 0.05 | 4.7 ± 0.05 | 9.4 ± 0.08 |
| Hole angle | ±0.5° | 40° | 40° | 40° | 40° | 40° |
| r_t | Min | 0.15 | 0.2 | 0.25 | 0.4 | 0.75 |
| r_b | Max | 0.3 | 0.4 | 0.5 | 0.4 | 0.75 |
| d_b | ±0.01 | 1 | 1.5 | 2.5 | 3.3 | 6.4 |
| application | | Electricity Electron | Machine with light duty, Compressor, Pump | Vehicles | Small agricultural machine | Large agricultural machine |





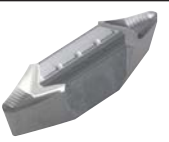
MGT - Machining Al Wheels

- Features**
- ▶ Optimally designed inserts for aluminum wheel machining
 - ▶ Longer tool life when matched with the best grade for application
 - ▶ Unique clamping mechanism places a strong clamp over the insert
 - ▶ A variety of insert types for multi application functions

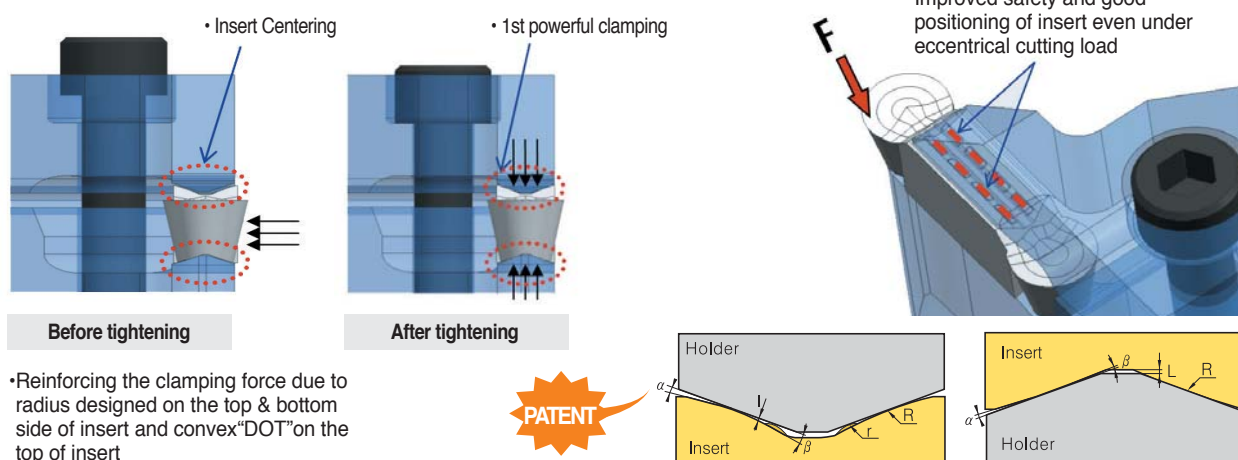


Various insert types

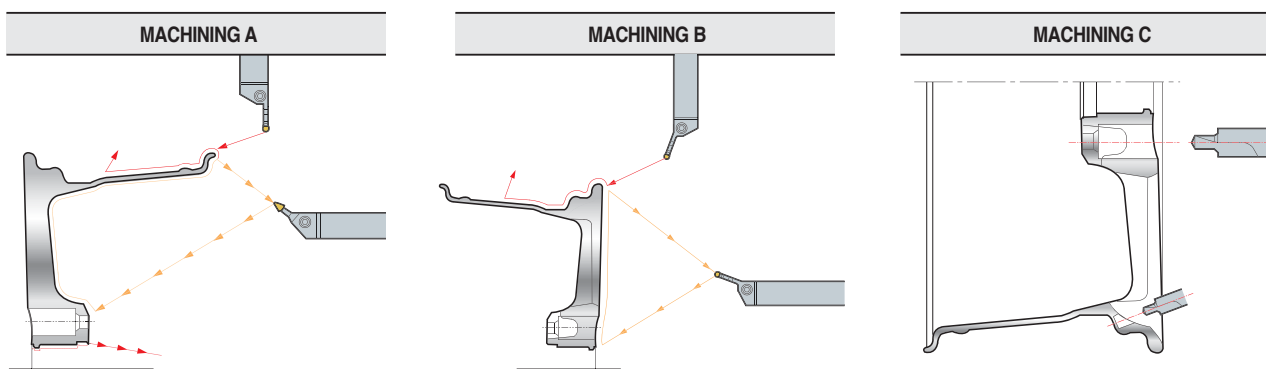
MRGN type : Full "Round" geometry

| MRGN-A(For general) | MRGN-A5(For copying) | MRGN-AM(Medium finishing) | MRGN-AP(PCD) | MVGN-A(For fine finishing) |
|---|---|---|--|---|
|  |  |  |  |  |
| High rake angle, Sharp cutting edge | Reinforced clamping force | For ductile cast iron | Improved chip control | High rake and relief angle |

New clamping system



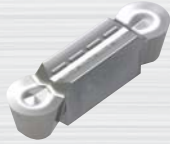
Application of Al Wheels



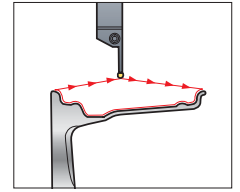
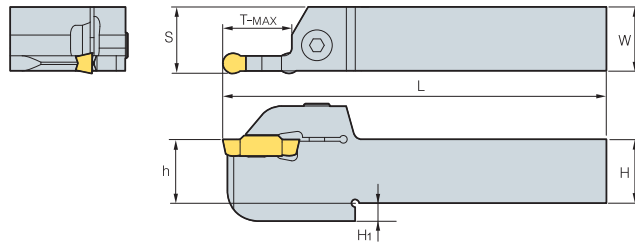
Recommended cutting condition

| Workpiece | | Hardness Brinell (HB) | kc (MPa) | vc (m/min) | fn (mm/rev) |
|-------------------------|------------|-----------------------|-----------|---------------|-------------|
| Aluminum alloy (Forged) | Unhardened | 50 ~ 70 | 500 ~ 600 | 1,000 ~ 2,500 | 0.1 ~ 0.6 |
| | Hardened | 90 ~ 110 | 700 ~ 900 | 300 ~ 1,000 | 0.1 ~ 0.5 |
| Aluminum alloy (Cast) | Unhardened | 70 ~ 80 | 700 ~ 800 | 300 ~ 1,000 | 0.1 ~ 0.5 |
| | Hardened | 80 ~ 110 | 800 ~ 950 | 200 ~ 600 | 0.1 ~ 0.4 |
| Copper alloy | | 90 ~ 110 | 700 ~ 900 | 300 ~ 800 | 0.1 ~ 0.5 |
| Magnesium alloy | | 70 ~ 80 | 700 ~ 800 | 300 ~ 1,000 | 0.1 ~ 0.5 |

MGEHR/L



MRGN



R type insert
(mm)

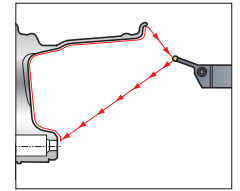
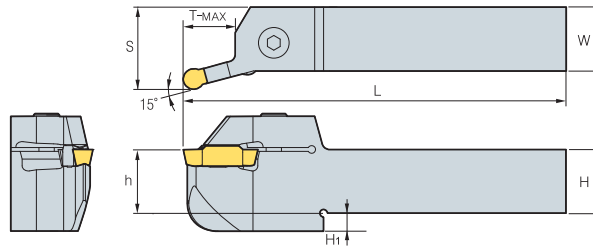
| Designation | H=(h) | H ₁ | W | L | S | T-MAX | Inserts | Screw | Wrench |
|----------------|-------|----------------|----|-----|-------|-------|------------------------------------|---------|--------|
| MGEHR/L 25N-6A | 25 | 7 | 25 | 150 | 25.55 | 23.5 | MRGN6N-A MRGN6N-AP MRGN6N-AM | BHA0620 | HW50L |
| 32N-6A | 32 | 8 | 32 | 150 | 32.55 | 27 | | | |
| 25N-6A5 | 25 | 7 | 25 | 150 | 25.55 | 23.5 | | | |
| 32N-6A5 | 32 | 8 | 32 | 150 | 32.55 | 27 | MRGN6N-A5 | | |
| 25N-8A | 25 | 7 | 25 | 150 | 25.55 | 23.5 | MRGN8N-A MRGN8N-AP MRGN8N-AM | | |
| 32N-8A | 32 | 8 | 32 | 150 | 32.55 | 27 | | | |
| 25N-8A5 | 25 | 7 | 25 | 150 | 25.55 | 23.5 | | | |
| 32N-8A5 | 32 | 8 | 32 | 150 | 32.55 | 27 | MRGN8N-A5 | | |

Applicable inserts C36

MGEHR/L-15



MRGN

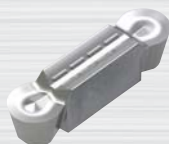


R type insert
(mm)

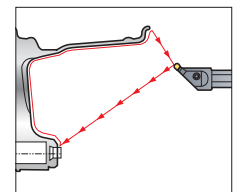
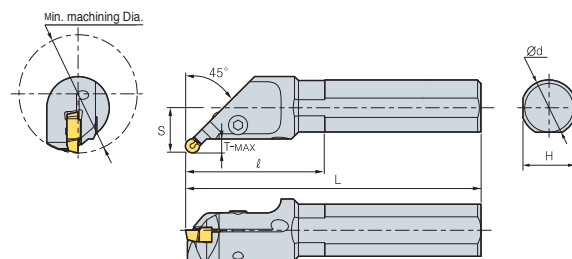
| Designation | H=(h) | H ₁ | W | L | S | T-MAX | Inserts | Screw | Wrench |
|-------------------|-------|----------------|----|-----|------|-------|------------------------------------|---------|--------|
| MGEHR/L 25N-6A-15 | 25 | 7 | 25 | 150 | 32.2 | 20 | MRGN6N-A MRGN6N-AP MRGN6N-AM | BHA0620 | HW50L |
| 32N-6A-15 | 32 | 8 | 32 | 150 | 39.2 | 25 | | | |
| 25N-6A5-15 | 25 | 7 | 25 | 150 | 32.2 | 20 | | | |
| 32N-6A5-15 | 32 | 8 | 32 | 150 | 39.2 | 25 | MRGN6N-A5 | | |
| 25N-8A-15 | 25 | 7 | 25 | 150 | 32.2 | 20 | MRGN8N-A MRGN8N-AP MRGN8N-AM | | |
| 32N-8A-15 | 32 | 8 | 32 | 150 | 39.2 | 25 | | | |
| 25N-8A5-15 | 25 | 7 | 25 | 150 | 32.2 | 20 | | | |
| 32N-8A5-15 | 32 | 8 | 32 | 150 | 39.2 | 25 | MRGN8N-A5 | | |

Applicable inserts C36

MGIUR/L-MR



MRGN

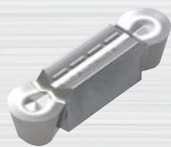


R type insert
(mm)

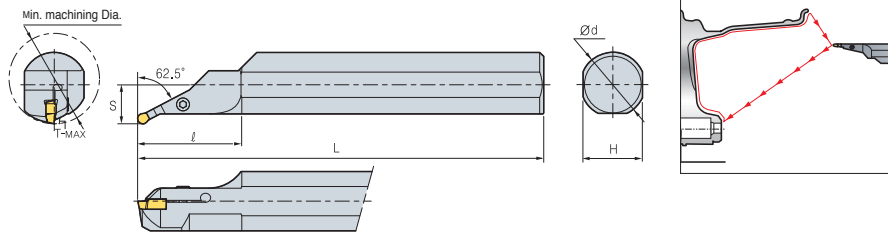
| Designation | ØD | Ød | L | ℓ | T-MAX | H | S | Inserts | Screw | Wrench |
|--------------------|----|----|-----|----|-------|----|----|-----------------------------|---------|--------|
| MGIUR/L 6832-8A-MR | 68 | 32 | 170 | 65 | 7 | 30 | 26 | MRGN8N-A/AM/AP MRGN8N-A5 | BHA0620 | HW50L |
| 6832-8A5-MR | 68 | 32 | 170 | 65 | 7 | 30 | 26 | | | |

Applicable inserts C36

MGIXR/L-MR



MRGN

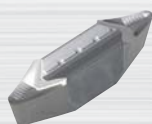


R type insert
(mm)

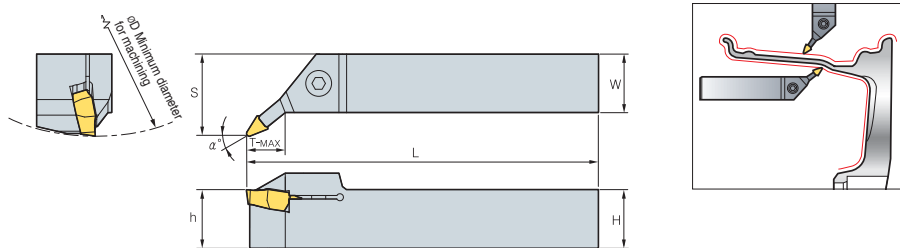
| Designation | ØD | Ød | L | l | T-MAX | H | S | Inserts | Screw | Wrench |
|--------------------|----|----|-----|----|-------|----|------|-----------------------------|---------|--------|
| MGIXR/L 7050-8A-MR | 70 | 50 | 350 | 80 | 5.5 | 46 | 30.2 | MRGN8N-A/AM/AP MRGN8N-A5 | BHA0620 | HW50L |
| 7050-8A5-MR | 70 | 50 | 350 | 80 | 5.5 | 46 | 30.2 | | | |

Applicable inserts C36

MGEXR/L



MVGN

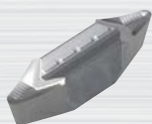


R type insert
(mm)

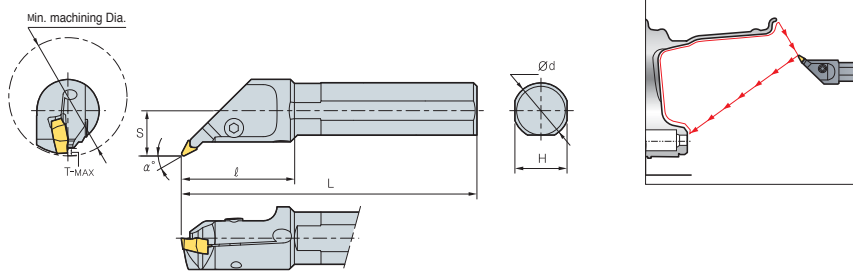
| Designation | H=(h) | W | L | S | T-MAX | α ° | Inserts | Screw | Wrench |
|-------------------|-------|----|-----|----|-------|------|--------------------------------|---------|--------|
| MGEXR/L 25N-8A-5V | 25 | 25 | 150 | 29 | 23.5 | 5 | MVGN8N-A-R1.2 MVGN8N-A-R1.6 | BHA0620 | HW50L |
| 25N-8A-22.5V | 25 | 25 | 150 | 35 | 27 | 22.5 | | | |

Applicable inserts C36

MGIUR/L-MV



MVGN




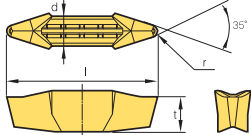

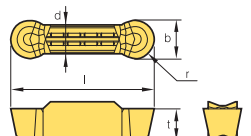
R type insert
(mm)

| Designation | ØD | Ød | L | l | T-MAX | H | S | α ° | Inserts | Screw | Wrench |
|--------------------|----|----|-----|----|-------|----|----|------|--------------------------------|---------|--------|
| MGIUR/L 6832-8A-MV | 68 | 32 | 170 | 65 | 4.5 | 30 | 26 | 27.5 | MVGN8N-A-R1.2 MVGN8N-A-R1.6 | BHA0620 | HW50L |

Applicable inserts C36

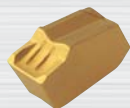
C Available Insert for MGT Aluminum Wheel

Inserts

| Application | Picture | Designation | Coated | Uncoated | Dimensions (mm) | | | | | Configuration | Page |
|--------------------|---|----------------|--------|----------|-----------------|-----|------|-----|-----|---|------|
| | | | DP150 | G10 | b | r | l | d | t | | |
| For Aluminum Wheel |  | MVGN 8N-A-R1.2 | | ● | - | 1.2 | 30.0 | 6.0 | 6.9 |  | C21 |
| | | MVGN 8N-A-R1.6 | | | - | 1.6 | 30.0 | 6.0 | 6.9 | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| For Aluminum Wheel |  | MRGN 6N-A | | ● | 6.0 | 3.0 | 26.0 | 5.0 | 5.9 |  | C21 |
| | | MRGN-A 6N-AM | | | 6.0 | 3.0 | 26.0 | 5.0 | 5.9 | | |
| | | MRGN-A 6N-AP | | | 6.0 | 3.0 | 26.0 | 5.0 | 5.9 | | |
| | | MRGN-A 6N-A5 | | ● | 6.0 | 3.0 | 26.0 | 5.0 | 5.9 | | |
| | | MRGN-A 8N-A | | | 8.0 | 4.0 | 30.0 | 6.0 | 6.5 | | |
| | | MRGN-A 8N-AM | | | 8.0 | 4.0 | 30.0 | 6.0 | 6.5 | | |
| | | MRGN-A 8N-AP | | | 8.0 | 4.0 | 30.0 | 6.0 | 6.5 | | |
| | | MRGN-A 8N-A5 | | ● | 8.0 | 4.0 | 30.0 | 6.0 | 6.5 | | |

●: Stock item

SPB/SPB-S (Blades)



SP

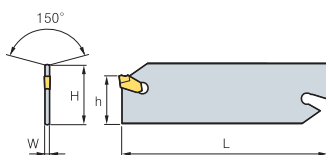


Fig. 1

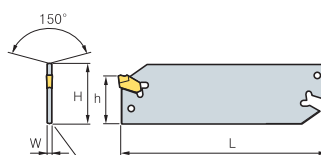
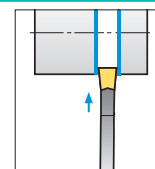


Fig. 2



| Designation | H | W | L | h | Inserts | Wrench | | Fig. | |
|-------------|-------|----|-----|-----|---------|---------------|-------|-------|---|
| | | | | | | | | | |
| SPB | 226 | 26 | 1.6 | 110 | 21 | SP200, 200R/L | SW50L | - | 1 |
| | 326 | 26 | 2.4 | 110 | 21 | SP300, 300R/L | | | |
| | 426 | 26 | 3.2 | 110 | 21 | SP400, 400R/L | | | |
| | 526 | 26 | 4.0 | 110 | 21 | SP500, 500R/L | | | |
| | 626 | 26 | 5.2 | 110 | 21 | SP600, 600R/L | | | |
| | 232 | 32 | 1.6 | 150 | 25 | SP200, 200R/L | | | |
| | 332 | 32 | 2.4 | 150 | 25 | SP300, 300R/L | | | |
| | 432 | 32 | 3.2 | 150 | 25 | SP400, 400R/L | | | |
| | 532 | 32 | 4.0 | 150 | 25 | SP500, 500R/L | | | |
| SPB | 632 | 32 | 5.2 | 150 | 25 | SP600, 600R/L | - | SW15S | 2 |
| | 226-S | 26 | 1.6 | 110 | 21 | SP200, 200R/L | | | |
| | 326-S | 26 | 2.4 | 110 | 21 | SP300, 300R/L | | | |
| | 426-S | 26 | 3.2 | 110 | 21 | SP400, 400R/L | | | |
| | 526-S | 26 | 4.0 | 110 | 21 | SP500, 500R/L | | | |
| | 626-S | 26 | 5.2 | 110 | 21 | SP600, 600R/L | | | |
| | 232-S | 32 | 1.6 | 150 | 25 | SP200, 200R/L | | | |
| | 332-S | 32 | 2.4 | 150 | 25 | SP300, 300R/L | | | |
| | 432-S | 32 | 3.2 | 150 | 25 | SP400, 400R/L | | | |
| | 532-S | 32 | 4.0 | 150 | 25 | SP500, 500R/L | | | |
| | 632-S | 32 | 5.2 | 150 | 25 | SP600, 600R/L | | | |

Applicable inserts C38

SPH/SPH-S (Holder)



SP

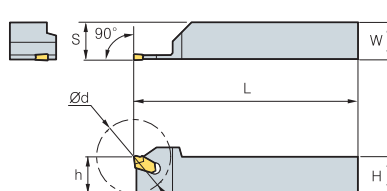


Fig. 1

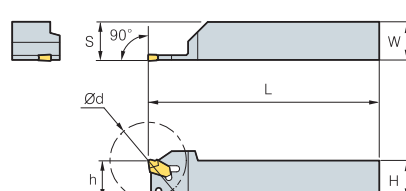
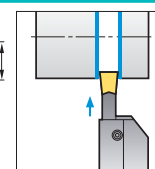


Fig. 2



R type insert

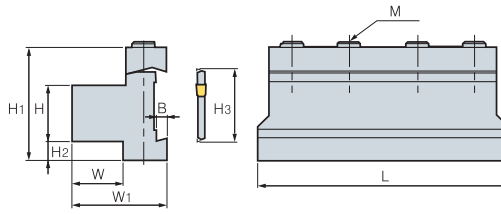
| Designation | H=(h) | W | L | Ød | S | Inserts | Wrench | | Fig. | |
|-------------|----------|----|----|-----|----|---------|---------------|-------|-------|---|
| | | | | | | | | | | |
| SPH | 316R/L | 16 | 16 | 100 | 32 | 16.3 | SP300, 300R/L | SW50L | - | 1 |
| | 320R/L | 20 | 20 | 120 | 40 | 20.3 | SP300, 300R/L | | | |
| | 420R/L | 20 | 20 | 120 | 50 | 20.4 | SP400, 400R/L | | | |
| | 520R/L | 20 | 20 | 120 | 60 | 20.5 | SP500, 500R/L | | | |
| | 325R/L | 25 | 25 | 150 | 50 | 25.3 | SP300, 300R/L | | | |
| | 425R/L | 25 | 25 | 150 | 60 | 25.4 | SP400, 400R/L | | | |
| | 525R/L | 25 | 25 | 150 | 70 | 25.5 | SP500, 500R/L | | | |
| SPH | 316R/L-S | 16 | 16 | 100 | 32 | 16.3 | SP300, 300R/L | - | SW15S | 2 |
| | 320R/L-S | 20 | 20 | 120 | 40 | 20.3 | SP300, 300R/L | | | |
| | 420R/L-S | 20 | 20 | 120 | 50 | 20.4 | SP400, 400R/L | | | |
| | 520R/L-S | 20 | 20 | 120 | 60 | 20.5 | SP500, 500R/L | | | |
| | 325R/L-S | 25 | 25 | 150 | 50 | 25.3 | SP300, 300R/L | | | |
| | 425R/L-S | 25 | 25 | 150 | 60 | 25.4 | SP400, 400R/L | | | |
| | 525R/L-S | 25 | 25 | 150 | 70 | 25.5 | SP500, 500R/L | | | |

Applicable inserts C38

SMBB (Block)



SPB□□□(-S)


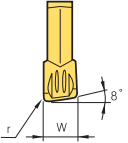
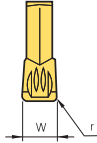
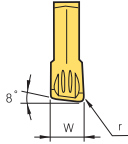
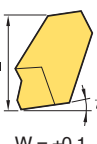


(mm)

| Designation | H | W | H ₃ | L | H ₁ | H ₂ | W ₁ | B | M | Blades | Wrench |
|-------------|----|----|----------------|-----|----------------|----------------|----------------|-----|------|------------|--------|
| SMBB 1626 | 16 | 12 | 26 | 86 | 43 | 13 | 30 | 5.3 | 3-M6 | SPB□26(-S) | HW50L |
| 2026 | 20 | 19 | 26 | 86 | 43 | 9 | 38 | 5.3 | 3-M6 | | |
| 2032 | 20 | 19 | 32 | 100 | 50 | 13 | 38 | 5.3 | 4-M6 | | |
| 2526 | 25 | 23 | 26 | 86 | 43 | 4 | 42 | 5.3 | 4-M6 | | |
| 2532 | 25 | 23 | 32 | 110 | 50 | 8 | 42 | 5.3 | 4-M6 | | |
| 3232 | 32 | 30 | 32 | 110 | 54 | 5 | 48 | 5.3 | 4-M6 | | |

Inserts

(mm)

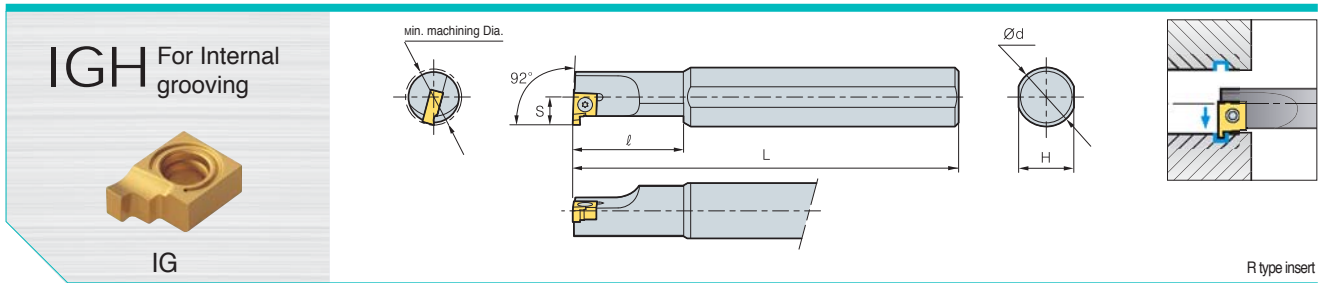
| Application | Picture | Designation | Coated | | | | | | | | | | W | l | r | Configuration | | |
|---------------|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|------|------|---------------|--|--------|
| | | | NC3120 | NC3220 | NC3030 | NCM325 | NC5330 | NC9020 | PC3500 | NC500H | PC8110 | PC5300 | | | | | PC9030 | PC6510 |
| parting tools |  | SP 160 | | | | | | | | | | | | 1.6 | 7.8 | 0.16 | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>R type</p>  </div> <div style="text-align: center;"> <p>Standard</p>  </div> </div> <div style="margin-top: 10px;"> <p>L type</p>  </div> <div style="margin-top: 10px;">  <p>W = ±0.1</p> </div> | |
| | | SP 180 | | | | | | | | | | | | | 1.8 | 9.3 | | 0.16 |
| | | SP 200 | | ● | ● | ● | ● | | | | ● | ● | ● | | 2.2 | 9.3 | | 0.2 |
| | | SP 200R | | ● | ● | | | | | | | | ● | | 2.2 | 9.3 | | 0.2 |
| | | SP 200L | | | | | | | | | | | | ● | 2.2 | 9.3 | | 0.2 |
| | | SP 300 | | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | 3.1 | 11.3 | | 0.2 |
| | | SP 300R | | ● | ● | ● | | | | | ● | | | | 3.1 | 11.3 | | 0.2 |
| | | SP 300L | | | | | | | | | | | | ● | 3.1 | 11.3 | | 0.2 |
| | | SP 400 | | ● | ● | ● | ● | ● | | | ● | ● | ● | ● | 4.1 | 11.3 | | 0.25 |
| | | SP 400R | | ● | ● | | | | | | ● | | | | 4.1 | 11.3 | | 0.25 |
| | | SP 400L | | | ● | | | | | | | | | ● | 4.1 | 11.3 | | 0.25 |
| | | SP 500 | | ● | ● | ● | ● | | | | ● | ● | ● | ● | 5.1 | 11.4 | | 0.3 |
| | | SP 500R | | ● | ● | ● | | | | | ● | | | | 5.1 | 11.4 | | 0.3 |
| | | SP 500L | | | | | | | | | | | | ● | 5.1 | 11.4 | | 0.3 |
| SP 600 | | ● | ● | ● | | | | | | ● | ● | | 6.4 | 11.4 | 0.35 | | | |
| SP 600R | | ● | ● | | | | | | | ● | | | 6.4 | 11.4 | 0.35 | | | |
| SP 600L | | | | | | | | | | | | ● | 6.4 | 11.4 | 0.35 | | | |

●: Stock item

Features of multi parting tools

- ▶ Available for various workpiece
 - Alloy steel, Cast iron, Stainless steel, etc
- ▶ Cutting tool life has been increased due to specially designed rake angle
- ▶ Minimum size of Nose radius R has been employed to eliminate "Burr"
- ▶ Line-up of various lead angles for the best machining
- ▶ Small width of chip can be acquired due to special chip breaker & cutting edge design

| Workpiece | CVD | | | | | PVD | | | | | Uncoated | Cutting width (mm) | | | | |
|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------------------|-----------|-----------|-----------|-----------|
| | NC3120 | NC3030 | NCM325 | NC5330 | NC500H | PC230 | PC8110 | PC5300 | PC3500 | PC6510 | | ST30A | 2 | 3 | 4 | 5 |
| SM□□C | 80~180 | | | 80~180 | | 80~180 | | | | | | 0.02~0.15 | 0.03~0.2 | 0.08~0.3 | 0.10~0.4 | 0.12~0.5 |
| SCM | 70~150 | 70~150 | 70~150 | 70~150 | 70~150 | 70~150 | | | | 70~150 | | " | " | " | " | " |
| GC/GCD | | | | 50~100 | | | | | | 50~100 | 50~100 | 0.05~0.12 | 0.1~0.25 | 0.1~0.30 | 0.1~0.35 | 0.1~0.40 |
| STS | | | 50~120 | 50~120 | | | 50~120 | 60~140 | | | | 0.02~0.1 | 0.03~0.15 | 0.08~0.25 | 0.1~0.35 | 0.12~0.40 |
| Non-ferrous metal (AL, Copper) | | | | | | | | | | | 200~450 | 0.05~0.1 | 0.05~0.2 | 0.05~0.25 | 0.05~0.30 | 0.05~0.35 |

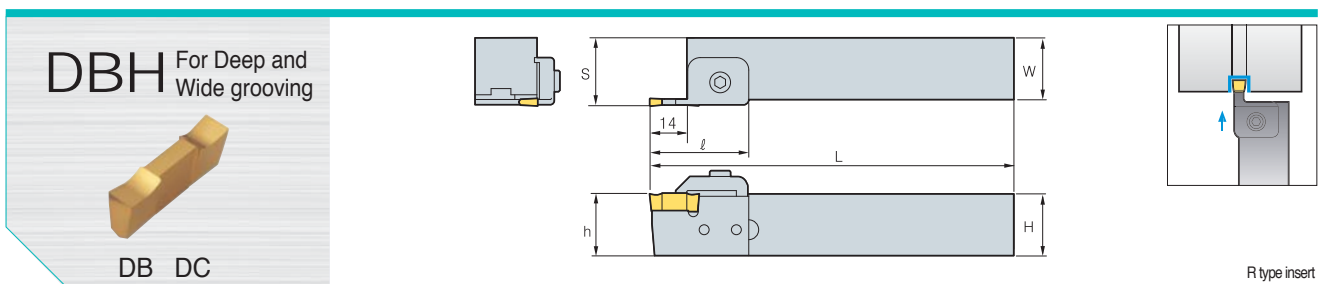


| Designation | ØD | Ød | H | L | l | S | Inserts | Screw | Wrench |
|-------------|--------|----|----|----|-----|----|-----------|-----------|--------|
| IGH | 214R/L | 14 | 16 | 15 | 150 | 25 | IG125~280 | FTKA02565 | TW07P |
| | 216R/L | 16 | 16 | 15 | 150 | 30 | | | |
| | 220R/L | 20 | 20 | 18 | 200 | 40 | | | |

Available Inserts

| Application | Picture | Designation | Coated | | | Uncoated | | | b | g | t | d | d _i | Configuration | |
|-------------------|---------|-------------|--------|--------|--------|----------|-----|-------|---|------|-----|------|----------------|---------------|--|
| | | | NC3010 | NC3120 | NC3220 | H01 | G10 | ST30A | | | | | | | |
| Internal grooving | | IG | 125 | | | | | | ● | 1.25 | 1.5 | 3.18 | 6.35 | 2.8 | |
| | | | 145 | | | | | | ● | 1.45 | 1.5 | 3.18 | 6.35 | 2.8 | |
| | | | 175 | | | | | | ● | 1.75 | 1.5 | 3.18 | 6.35 | 2.8 | |
| | | | 200 | | | | | | ● | 2.0 | 2.3 | 3.18 | 6.35 | 2.8 | |
| | | | 230 | | | | | | ● | 2.3 | 2.3 | 3.18 | 6.35 | 2.8 | |
| | | | 280 | | | | | | ● | 2.8 | 2.3 | 3.18 | 6.35 | 2.8 | |

●: Stock item



| Designation | H=(h) | W | L | l | S | | Inserts | | Clamp | Clamp Screw | Screw | Locator | Wrench | | |
|-------------|--------|----|----|-----|----|------|---------|-------|-------|-------------|-------|---------|--------|--|-------|
| | | | | | * | ** | * | ** | | | | | | | |
| DBH | 320R/L | 20 | 20 | 150 | 40 | 22.3 | 22.8 | DB300 | DB400 | | | | | | |
| | 325R/L | 25 | 25 | 150 | 40 | 27.3 | 27.8 | DC300 | DC400 | | | | | | |
| | 520R/L | 20 | 20 | 150 | 40 | 23.8 | 24.3 | DB500 | | | | | | | |
| | 525R/L | 25 | 25 | 150 | 40 | 28.8 | 29.3 | DC500 | DB600 | | | | | | |
| | 720R/L | 20 | 20 | 150 | 40 | 25.8 | 26.3 | | DB700 | | | | | | DB800 |
| | 725R/L | 25 | 25 | 150 | 40 | 30.8 | 31.3 | | | | | | | | |

Inserts

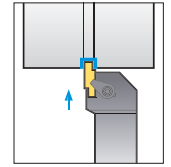
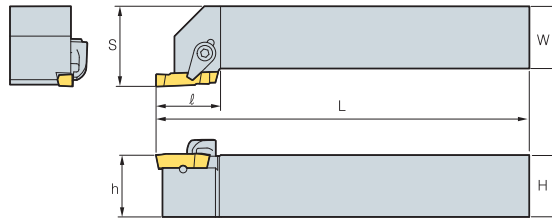
| Application | Picture | Designation | Coated | | | Cermet | Uncoated | | b | l | t | r | Configuration | | |
|-------------|---------|-------------|--------|--------|--------|--------|----------|-----|-----|-----|-----|-----|---------------|-----|-----|
| | | | NC3010 | NC3120 | NC3220 | CN20 | H01 | G10 | | | | | | | |
| Grooving | | DB | 300 | | | | ● | | 3.0 | 20 | 7.5 | 0.2 | | | |
| | | | 400 | | | | ● | | 4.0 | 20 | 7.5 | 0.2 | | | |
| | | | 500 | | | | | ● | | 5.0 | 20 | 7.5 | | 0.2 | |
| | | | 600 | | | | | ● | | 6.0 | 20 | 7.5 | | 0.2 | |
| | | | 700 | | | | | | ● | | 7.0 | 20 | | 7.5 | 0.2 |
| | | | 800 | | | | | | ● | | 8.0 | 20 | | 7.5 | 0.2 |
| | | DC | 300 | | | | | ● | | 3.0 | 20 | 7.5 | 0.2 | | |
| | | | 400 | | | | | ● | | 4.0 | 20 | 7.5 | 0.25 | | |
| | | | 500 | | | | | | ● | | 5.0 | 20 | 7.5 | | 0.3 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

●: Stock item

GFT external grooving



GW BF



R type insert

(mm)

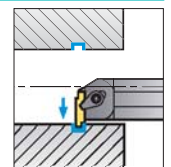
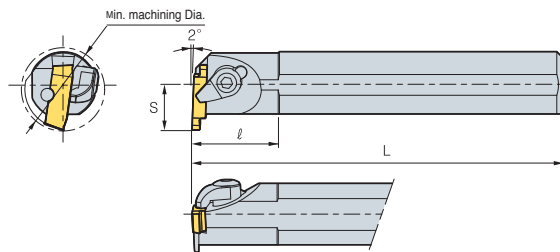
| Designation | H=(h) | W | L | l | S | Inserts | Clamp | Screw | Pin | Wrench |
|-------------|-------|----|-----|------|----|------------------|-------|---------|--------|--------|
| GFT 320R/L | 20 | 20 | 125 | 23.5 | 25 | GW110~300R/L,BF3 | CS5R1 | DHA0514 | PN0310 | HW25L |
| GFT 325R/L | 25 | 25 | 150 | 23.5 | 32 | | | | | |
| GFT 525R/L | 25 | 25 | 150 | 25.5 | 32 | GW315~500R/L,BF5 | CS6R1 | DHA0617 | PN0310 | HW30L |
| GFT 825R/L | 25 | 25 | 150 | 28.5 | 32 | GW600~800R/L,BF8 | CS8R1 | DHA0820 | PN0314 | HW40L |

• Use same hand of tools

GFIP Internal grooving



BF GW



R type insert

(mm)

| Designation | ØD | Ød | H | L | l | S | Inserts | Clamp | C-ring | Screw | Pin | Wrench |
|-------------|----|----|----|-----|----|----|------------------|-------|--------|---------|--------|--------|
| GFIP 316R/L | 20 | 16 | 15 | 150 | 17 | 11 | GW110~300R/L,BF3 | CH5R2 | CR04 | CHX0513 | PN0310 | HW25L |
| GFIP 320R/L | 26 | 20 | 18 | 150 | 22 | 13 | | | | | | |
| GFIP 325R/L | 32 | 25 | 23 | 200 | 22 | 17 | | | | | | |
| GFIP 340R/L | 50 | 40 | 37 | 300 | 32 | 27 | GW315~500R/L,BF5 | CH6R2 | CR05 | CHX0616 | PN0310 | HW30L |
| GFIP 525R/L | 32 | 25 | 23 | 200 | 22 | 17 | | | | | | |
| GFIP 540R/L | 50 | 40 | 37 | 300 | 32 | 27 | | | | | | |
| GFIP 840R/L | 50 | 40 | 37 | 300 | 32 | 27 | GW600~800R/L,BF8 | CS8R1 | - | DHA0820 | PN0314 | HW40L |

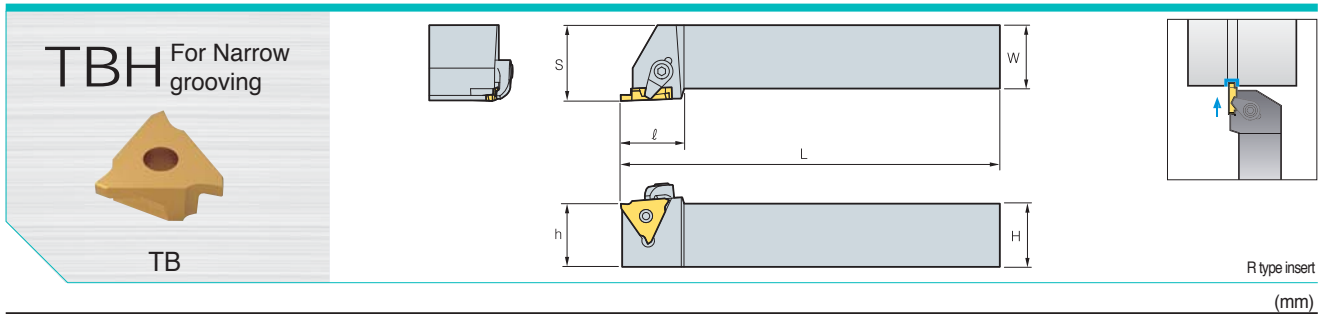
• Use right-hand insert for left-hand holder

Inserts

(mm)

| Application | Picture | Designation | Uncoated | | b | g | W | l | t | r | Configuration |
|-------------|---------|-------------|----------|---|------|-----|-----|------|------|-----|---------------|
| | | | ST30A | | | | | | | | |
| Blank | | BF -3 | ● | | | | 3.1 | 16.4 | 5.26 | - | |
| | | BF -5 | | | | | 5.1 | 22.4 | 6.26 | - | |
| | | BF -8 | | | | | 8.1 | 27.4 | 7.26 | - | |
| Grooving | | GW 110R/L | ● | ● | 1.1 | 2.1 | 3.1 | 16 | 5.0 | 0.2 | |
| | | GW 130R/L | ● | ● | 1.3 | 2.3 | 3.1 | 16 | 5.0 | 0.2 | |
| | | GW 160R/L | ● | ● | 1.6 | 2.6 | 3.1 | 16 | 5.0 | 0.2 | |
| | | GW 185R/L | ● | ● | 1.85 | 2.9 | 3.1 | 16 | 5.0 | 0.2 | |
| | | GW 215R/L | ● | ● | 2.15 | 3.2 | 3.1 | 16 | 5.0 | 0.2 | |
| | | GW 265R/L | ● | ● | 2.65 | 3.7 | 3.1 | 16 | 5.0 | 0.2 | |
| | | GW 300R/L | ● | ● | 3.0 | 4.0 | 3.1 | 16 | 5.0 | 0.2 | |
| | | GW 315R/L | ● | ● | 3.15 | 4.2 | 5.1 | 22 | 6.0 | 0.3 | |
| | | GW 415R/L | ● | ● | 4.15 | 5.2 | 5.1 | 22 | 6.0 | 0.3 | |
| | | GW 500R/L | ● | ● | 5.0 | 6.0 | 5.1 | 22 | 6.0 | 0.3 | |
| | | GW 600R/L | | | 6.0 | 7.0 | 8.1 | 27 | 7.0 | 0.3 | |
| | | GW 800R/L | | | 8.0 | 9.0 | 8.1 | 27 | 7.0 | 0.3 | |

●: Stock item



| Designation | H=(h) | W | L | l | S | Inserts | Clamp | Clamp Screw | Wrench |
|-------------|-----------|----|----|-----|------|---------|-------|-------------|--------|
| | | | | | | | | | |
| TBH | 320R/L-23 | 20 | 20 | 125 | 25.5 | 25 | CS6R1 | DHA0617 | HW30L |
| | 320R/L-33 | 20 | 20 | 125 | 25.5 | 25 | | | |
| | 320R/L-43 | 20 | 20 | 125 | 25.5 | 25 | | | |
| | 325R/L-23 | 25 | 25 | 150 | 25.5 | 30 | | | |
| | 325R/L-33 | 25 | 25 | 150 | 25.5 | 30 | | | |
| | 325R/L-43 | 25 | 25 | 150 | 25.5 | 30 | | | |
| | 420R/L-23 | 20 | 20 | 125 | 25.5 | 25 | | | |
| | 420R/L-33 | 20 | 20 | 125 | 25.5 | 25 | | | |
| | 420R/L-45 | 20 | 20 | 125 | 25.5 | 25 | | | |
| | 425R/L-23 | 25 | 25 | 150 | 25.5 | 30 | | | |
| | 425R/L-33 | 25 | 25 | 150 | 25.5 | 30 | | | |
| | 425R/L-45 | 25 | 25 | 150 | 25.5 | 30 | | | |

Available Inserts

| Application | Picture | Designation | Coated | | | | Cermet | | Uncoated | b | g | W | r | d | Configuration | | | |
|-----------------|---------|-------------|--------|------------|--------|--------|--------|--------|----------|------|-----|------|-----|-------|---|------|------|--|
| | | | NC3010 | NC3120 | NC3220 | PC8110 | PC5300 | CN2000 | CN20 | | | | | | | ST20 | | |
| | | | | | | | | | | | | | | | | | | |
| Narrow grooving | | TB 3125R/L | | | | | | | | 1.25 | 1.5 | 4.76 | 0.2 | 9.525 | <p>Feature of TB-M</p> <ul style="list-style-type: none"> • Suitable for automated line with Chip breaker • Superior surface | | | |
| | | 3145R/L | | | | | | | | 1.45 | 1.5 | 4.76 | 0.2 | 9.525 | | | | |
| | | 3175R/L | | | | | | | | 1.75 | 2.5 | 4.76 | 0.2 | 9.525 | | | | |
| | | 3185R/L | | | | | | | | 1.85 | 2.5 | 4.76 | 0.2 | 9.525 | | | | |
| | | 3200R/L | | | | | | | | 2.00 | 2.5 | 4.76 | 0.2 | 9.525 | | | | |
| | | 3230R/L | | | | | | | | 2.30 | 3.5 | 4.76 | 0.3 | 9.525 | | | | |
| | | 3280R/L | | | | | | | | 2.80 | 3.5 | 4.76 | 0.3 | 9.525 | | | | |
| | | 3330R/L | | | | | | | | 3.30 | 3.5 | 4.76 | 0.3 | 9.525 | | | | |
| | | 3430R/L | | | | | | | | 4.30 | 3.5 | 4.76 | 0.4 | 9.525 | | | | |
| | | 4125R/L | | | | | | ● | ● | 1.25 | 2.0 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4145R/L | | | | | | ● | ● | 1.45 | 2.0 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4150R/L | | | | | | ● | ● | 1.50 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4175R/L | | | | | | ● | ● | 1.75 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4185R/L | | | | | | ● | ● | 1.85 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4200R/L | | | | | | ● | ● | 2.00 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4215R/L | | | | | | ● | ● | 2.15 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4230R/L | | | | | | ● | ● | 2.30 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| | | 4250R/L | | | | | | ● | ● | 2.50 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| | | 4265R/L | | | | | | ● | | 2.65 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| | | 4280R/L | | | | | | | ● | 2.80 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| | | 4300R/L | | | | | | ● | ● | 3.00 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| | | 4330R/L | | | | | | ● | ● | 3.30 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| | | 4350R/L | | | | | | | | 3.50 | 5.0 | 4.76 | 0.3 | 12.7 | | | | |
| | | 4400R/L | | | | | | | | 4.00 | 5.0 | 4.76 | 0.4 | 12.7 | | | | |
| | | 4430R/L | | | | | | ● | | 4.30 | 5.0 | 4.76 | 0.4 | 12.7 | | | | |
| | | 4450R/L | | | | | | | | 4.50 | 5.0 | 4.76 | 0.4 | 12.7 | | | | |
| | | TB-M | | TB 4150R-M | | | | | | | | 1.50 | 3.5 | 4.76 | | 0.2 | 12.7 | |
| | | | | 4175R-M | | | | | | | | 1.75 | 3.5 | 4.76 | | 0.2 | 12.7 | |
| 4185R-M | | | | | | | | | | 1.85 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| 4200R-M | | | | | | | | | | 2.00 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| 4215R-M | | | | | | | | | | 2.15 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| 4230R-M | | | | | | | | | | 2.30 | 3.5 | 4.76 | 0.2 | 12.7 | | | | |
| 4250R-M | | | | | | | | | | 2.50 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| 4265R-M | | | | | | | | | | 2.65 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| 4280R-M | | | | | | | | | | 2.80 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| 4300R-M | | | | | | | | ● | | 3.00 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| 4330R-M | | | | | | | | | | 3.30 | 4.0 | 4.76 | 0.3 | 12.7 | | | | |
| 4350R-M | | | | | | | | | | 3.50 | 5.0 | 4.76 | 0.3 | 12.7 | | | | |
| 4400R-M | | | | | | | | 4.00 | 5.0 | 4.76 | 0.4 | 12.7 | | | | | | |
| 4430R-M | | | | | | | | 4.30 | 5.0 | 4.76 | 0.4 | 12.7 | | | | | | |
| 4450R-M | | | | | | | | 4.50 | 5.0 | 4.76 | 0.4 | 12.7 | | | | | | |

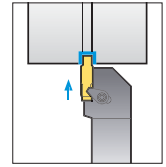
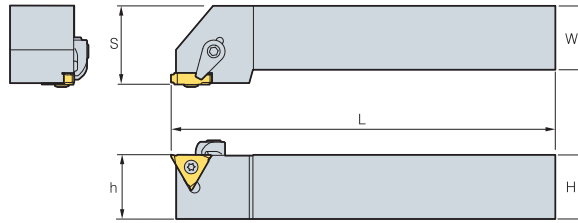
●: Stock item

C Grooving Tools

GH For O-ring grooving
Snap-ring grooving



GO GS



R type insert

(mm)

| Designation | H=(h) | W | L | S | Inserts | Clamp | Clamp Screw | Screw | Wrench |
|--------------|-------|----|-----|----|--------------|-------|-------------|-----------|-------------|
| GH 2020R/L-3 | 20 | 20 | 125 | 22 | GS 125~280 | CS6R1 | DHA0617 | PTMA03508 | TW09P-HW30L |
| 2525R/L-3 | 25 | 25 | 150 | 27 | GO 250 | | | | |
| 2020R/L-4 | 20 | 20 | 125 | 21 | GS 330 / 430 | | | | |
| 2525R/L-4 | 25 | 25 | 150 | 26 | GO 320 / 410 | | | | |

Inserts

(mm)

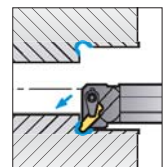
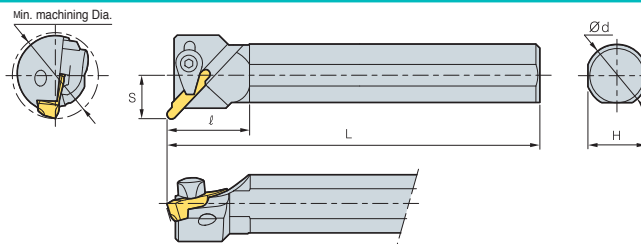
| Application | Picture | Designation | Coated | | | Uncoated | | | b | g | W | r | d | Configuration |
|---------------------------------------|---------|-------------|--------|--------|--------|----------|------|-------|-----|-------|------|-------|---|---------------|
| | | | NC3010 | NC3120 | NC3220 | H01 | ST20 | ST30A | | | | | | |
| Grooving(Narrow · O-ring · Snap-ring) | | GO 250 | | | | | | 2.5 | 1.5 | 3.3 | 0.35 | 9.525 | | |
| | | 320 | | | | | | 3.2 | 2.0 | 3.8 | 0.35 | 9.525 | | |
| | | 410 | | | | | | 4.1 | 2.5 | 4.5 | 0.65 | 9.525 | | |
| | | GS 125 | | | | | ● | 1.23 | 1.5 | 2.5 | 0.2 | 9.525 | | |
| | | 145 | | | | | ● | 1.43 | 1.5 | 2.5 | 0.2 | 9.525 | | |
| | | 175 | | | | | ● | 1.73 | 2.0 | 2.5 | 0.2 | 9.525 | | |
| | | 185 | | | | | ● | 1.83 | 2.0 | 2.5 | 0.2 | 9.525 | | |
| | | 200 | | | | | ● | 2.03 | 2.5 | 2.5 | 0.2 | 9.525 | | |
| | | 230 | | | | | ● | 2.28 | 3.5 | 2.8 | 0.2 | 9.525 | | |
| | | 280 | | | | | ● | 2.78 | 3.5 | 3.3 | 0.3 | 9.525 | | |
| 330 | | | | | ● | 3.28 | 4.0 | 3.8 | 0.3 | 9.525 | | | | |
| 430 | | | | | ● | 4.28 | 4.0 | 4.5 | 0.4 | 9.525 | | | | |

●: Stock item

GFIK For Relieving



GR



R type insert

(mm)

| Designation | ØD | Ød | H | L | ℓ | S | Inserts | Clamp | C-ring | Screw | Pin | Wrench |
|-------------|----|----|----|-----|------|----|---------|-------|--------|---------|--------|--------|
| GFIK 316R/L | 22 | 16 | 15 | 150 | 21.5 | 11 | GR3□□ | CH5R2 | CR04 | CHX0513 | PN0310 | HW25L |
| 325R/L | 32 | 25 | 23 | 200 | 21.5 | 17 | | CH5R2 | CR04 | CHX0513 | PN0310 | HW25L |
| 340R/L | 50 | 40 | 37 | 300 | 35.4 | 27 | | CS5R1 | - | DHA0514 | PN0310 | HW25L |
| 525R/L | 32 | 25 | 23 | 200 | 27.5 | 17 | GR5□□ | CS6R1 | - | DHA0617 | PN0314 | HW30L |
| 540R/L | 50 | 40 | 37 | 300 | 39.5 | 27 | GR8□□ | CS8R1 | - | DHA0820 | PN0314 | HW40L |
| 840R/L | 50 | 40 | 37 | 300 | 41.8 | 27 | | CS8R1 | - | DHA0820 | PN0314 | HW40L |

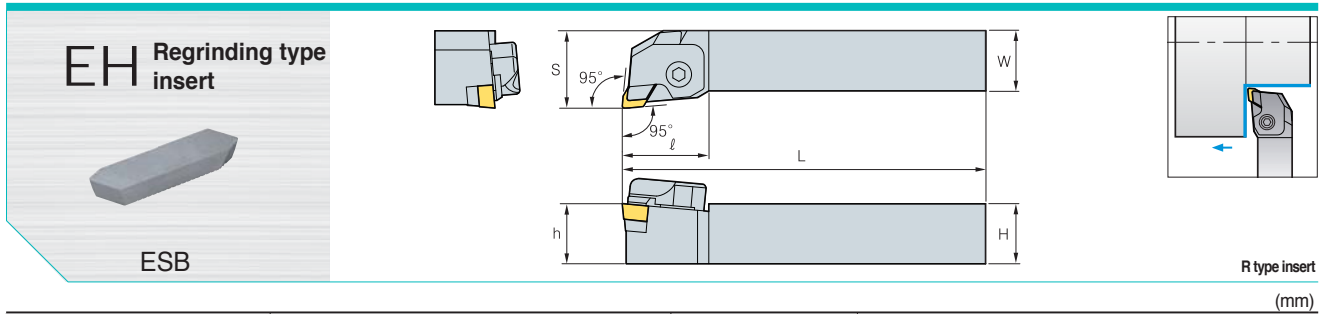
• Use same hand of tools

Inserts

(mm)

| Application | Picture | Designation | Coated | | | Uncoated | | | b | g | W | l | t | r | Configuration |
|-------------|---------|-------------|--------|--------|--------|----------|------|-------|-----|-----|------|-----|-----|---|---------------|
| | | | NC3010 | NC3120 | NC3220 | H01 | ST20 | ST30A | | | | | | | |
| Relief | | GR 310R | | | | | | 2.0 | 2.0 | 3.1 | 15.9 | 5.0 | 1.0 | | |
| | | 315R | | | | | | 3.0 | 2.9 | 3.1 | 15.9 | 5.0 | 1.5 | | |
| | | 520R | | | | | | 4.0 | 4.0 | 5.1 | 21.9 | 6.0 | 2.0 | | |
| | | 525R | | | | | | 5.0 | 5.0 | 5.1 | 21.8 | 6.0 | 2.5 | | |
| | | 830R | | | | | | 6.0 | 6.0 | 8.1 | 26.8 | 7.0 | 3.0 | | |
| | | 840R | | | | | | 8.0 | 8.0 | 8.1 | 26.7 | 7.0 | 4.0 | | |

●: Stock item

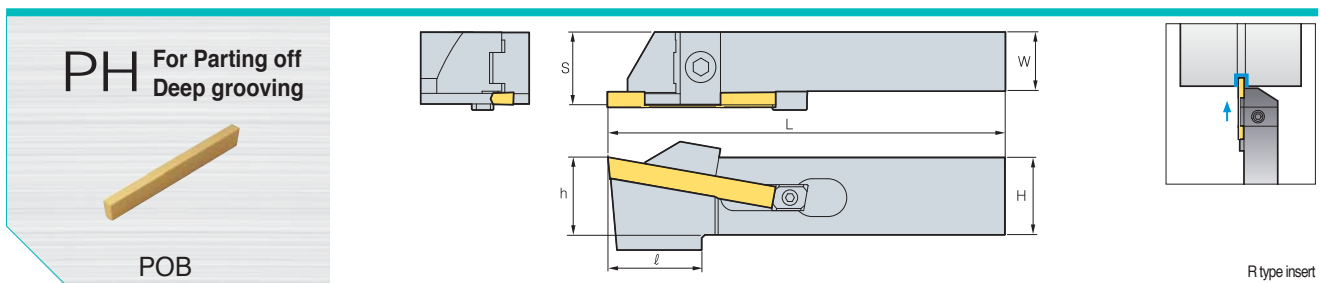


| Designation | H=(h) | W | L | ℓ | S | Inserts | Clamp | Clamp Screw | Chip Breaker | Shim | Shim Screw | Wrench |
|-------------|-------|----|-----|----|---------|---------|-------|-------------|--------------|------|------------|--------|
| EH 620R | 20 | 20 | 125 | 36 | 27 | ESB 34 | | | | | | |
| EH 625R | 25 | 25 | 150 | 36 | CTH 6R2 | | | | | | | |

Inserts

| Picture | Designation | Uncoated | | W | l | t | Configuration |
|---------|-------------|----------|------|-------|------|------|---------------|
| | | ST10 | ST20 | | | | |
| | ESB 34 | | | 9.525 | 30.0 | 6.35 | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

● Stock item



| Designation | H | W | L | ℓ | S | h | Max (Ø) | Inserts | Clamp | Clamp Screw | Stopper | Stopper Screw | Wrench |
|-------------|----|----|-----|----|-------|----|---------|---------|-------|-------------|---------|---------------|--------|
| PH 320R/L | 19 | 19 | 150 | 34 | 22.25 | 19 | 30 | POB300 | | | | | |
| PH 325R/L | 25 | 19 | 150 | 34 | 22.25 | 25 | 40 | | | | | | |
| PH 420R/L | 19 | 19 | 150 | 34 | 23.5 | 19 | 30 | POB400 | | | | | |
| PH 425R/L | 25 | 19 | 150 | 34 | 23.5 | 25 | 40 | | | | | | |
| PH 520R/L | 19 | 19 | 150 | 34 | 24.4 | 19 | 50 | POB500 | | | | | |
| PH 525R/L | 25 | 19 | 150 | 34 | 24.4 | 25 | 50 | | | | | | |

Inserts

| Picture | Designation | Uncoated | | W | l | t | Configuration |
|---------|-------------|----------|------|-----|----|-----|---------------|
| | | ST10 | ST20 | | | | |
| | POB 300 | | ● | 3.0 | 55 | 6.0 | |
| | POB 400 | | ● | 4.0 | 55 | 7.0 | |
| | POB 500 | | ● | 5.0 | 55 | 8.0 | |
| | | | | | | | |

● Stock item

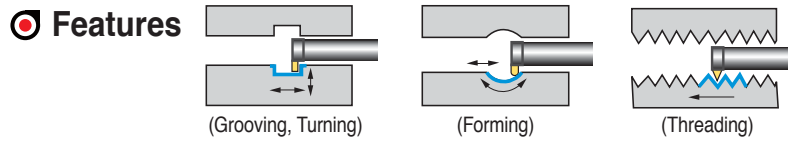
Six kinds of inserts can be used in one holder for various operations

New Fine Tools

- Strong clamping system and specially designed insert are suitable for small diameter machining.
- Six kinds of inserts can be clamped in one holder for various operations
- Guaranteed long tool life due to good toughness substrate with new TiAlN
- High accuracy ground insert ensures high precision machining



Application range ▶ Internal grooving, Profiling, Threading and Boring at $\varnothing 8\text{mm} \sim \varnothing 16\text{mm}$



Application examples

NFTIH 08 3 12 - S

minimum Diameter
Overhang (l/ØD)
Shank Dia.
Shank Type

S : Steel, C : Carbide

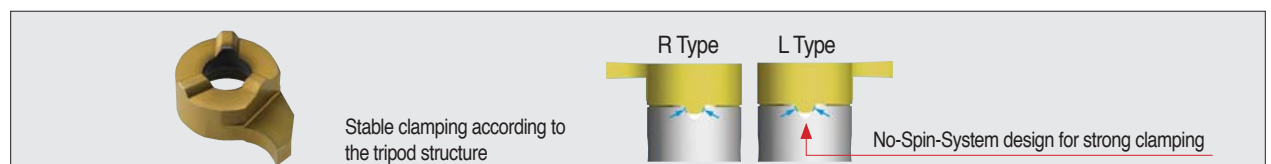
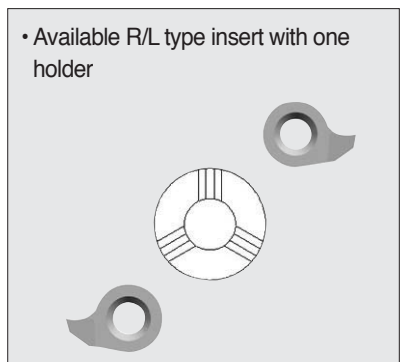
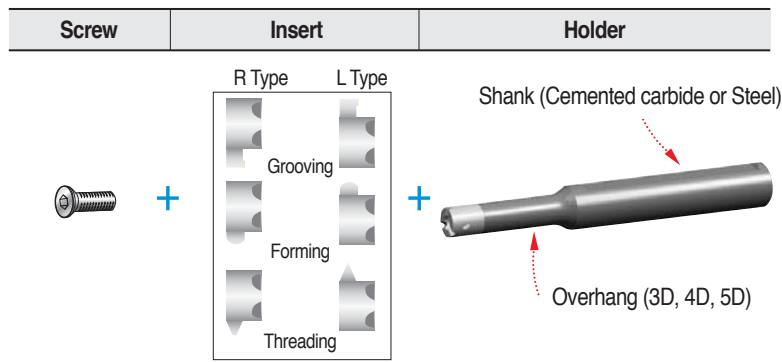
Recommended cutting condition

| Workpiece | Grade | Cutting Condition | | | | |
|-------------------|-------|---------------------|------------------|------------------|------------------|-----------|
| | | Min. machining Dia. | | | | |
| | PC130 | $\varnothing 8$ | $\varnothing 11$ | $\varnothing 14$ | $\varnothing 16$ | |
| Carbon steel | ◎ | vc(m/min) | 30~80 | 30~100 | 30~100 | 30~100 |
| | | fn(m/rev) | 0.01~0.04 | 0.01~0.05 | 0.02~0.05 | 0.02~0.06 |
| Alloy steel | ◎ | vc(m/min) | 30~80 | 30~100 | 30~100 | 30~100 |
| | | fn(m/rev) | 0.01~0.02 | 0.01~0.04 | 0.02~0.04 | 0.02~0.05 |
| Cast iron | ○ | vc(m/min) | 30~80 | 30~100 | 30~100 | 30~100 |
| | | fn(m/rev) | 0.01~0.05 | 0.01~0.05 | 0.02~0.05 | 0.02~0.05 |
| Non-ferrous alloy | ○ | vc(m/min) | 70~150 | 100~150 | 100~150 | 100~150 |
| | | fn(m/rev) | 0.02~0.06 | 0.02~0.06 | 0.02~0.06 | 0.02~0.06 |

Note

- In case of chattering, reduce the cutting speed and feed
- To find the optimal cutting conditions, advise to gradually increase from the lowest cutting condition of the above recommendation
- In case of the unilateral grooving depth over 1mm, work to the step feed rate

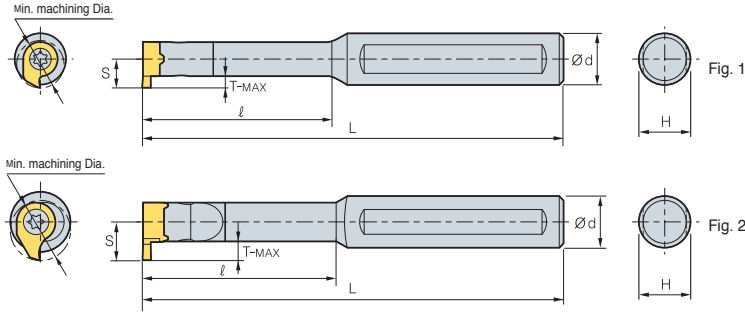
Clamping system



NFTIH



NFTF
NFTT
NFTG



• For NFTIH14~.
R type insert

| Designation | ØD | Ød | L | l | T-MAX | H | S | Inserts | | Screw | Wrench | Fig. |
|-------------|--------|----|----|-----|-------|-----|----|-----------------|------------------|-----------|--------|------|
| | | | | | | | | NFTG : Grooving | NFTT : Threading | | | |
| NFTIH | 08206C | 8 | 6 | 65 | - | 1.0 | 4 | 4.8 | | PTKA02508 | TW08P | 1 |
| | 08212C | 8 | 12 | 70 | 16 | 1.0 | 10 | 4.8 | NFTG08□□□R/L | | | |
| | 08312C | 8 | 12 | 80 | 24 | 1.0 | 10 | 4.8 | NFTT08□□□R/L | | | |
| | 08312S | 8 | 12 | 80 | 24 | 1.0 | 10 | 4.8 | NFTF08□□□R/L | | | |
| | 08412C | 8 | 12 | 90 | 32 | 1.0 | 10 | 4.8 | | | | |
| | 08512C | 8 | 12 | 100 | 40 | 1.0 | 10 | 4.8 | | PTKA03510 | TW15P | 2 |
| | 11208C | 11 | 8 | 80 | - | 2.3 | 7 | 6.7 | | | | |
| | 11212C | 11 | 12 | 75 | 22 | 2.3 | 11 | 6.7 | NFTG11□□□R/L | | | |
| | 11312C | 11 | 12 | 95 | 33 | 2.3 | 11 | 6.7 | NFTT11□□□R/L | | | |
| | 11312S | 11 | 12 | 95 | 33 | 2.3 | 11 | 6.7 | NFTF11□□□R/L | | | |
| | 11412C | 11 | 12 | 110 | 44 | 2.3 | 11 | 6.7 | | PTKA0412 | TW15P | 2 |
| | 11512C | 11 | 12 | 120 | 55 | 2.3 | 11 | 6.7 | | | | |
| | 14012C | 14 | 12 | 75 | 20 | 4.0 | 11 | 9.0 | | | | |
| | 14016C | 14 | 16 | 75 | 20 | 4.0 | 15 | 9.0 | | | | |
| | 14112C | 14 | 12 | 100 | 34 | 4.0 | 11 | 9.0 | NFTG14□□□R/L | | | |
| | 14116C | 14 | 16 | 100 | 34 | 4.0 | 15 | 9.0 | NFTT14□□□R/L | PTKA0512 | TW20P | 2 |
| | 14212C | 14 | 12 | 110 | 45 | 4.0 | 11 | 9.0 | NFTF14□□□R/L | | | |
| | 14216C | 14 | 16 | 110 | 45 | 4.0 | 15 | 9.0 | | | | |
| | 14312C | 14 | 12 | 130 | 64 | 4.0 | 11 | 9.0 | | | | |
| | 14316C | 14 | 16 | 130 | 64 | 4.0 | 15 | 9.0 | | | | |
| | 16312C | 16 | 12 | 130 | 48 | 4.3 | 11 | 10.2 | | PTKA0512 | TW20P | 2 |
| | 16312S | 16 | 12 | 130 | 48 | 4.3 | 11 | 10.2 | | | | |
| | 16412C | 16 | 12 | 130 | 64 | 4.3 | 11 | 10.2 | NFTG16□□□R/L | | | |
| | 16512C | 16 | 12 | 150 | 80 | 4.3 | 11 | 10.2 | NFTT16□□□R/L | | | |
| | 16316C | 16 | 16 | 130 | 48 | 4.3 | 15 | 10.2 | NFTF16□□□R/L | | | |
| | 16416C | 16 | 16 | 130 | 64 | 4.3 | 15 | 10.2 | | | | |
| | 16516C | 16 | 16 | 150 | 80 | 4.3 | 15 | 10.2 | | | | |

Applicable inserts C45, C46


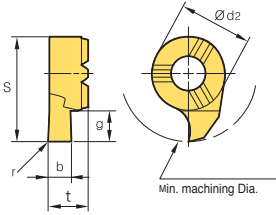

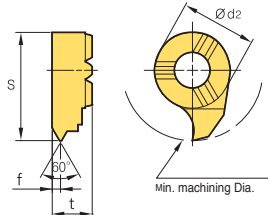
Inserts

| Application | Picture | Designation | Coated | | D | b | r | S | g | Ød ₂ | t | Configuration |
|-------------|---------|---------------|--------|------|------|------|------|------|-----|-----------------|------|---------------|
| | | | PC130 | | | | | | | | | |
| | | | R | L | | | | | | | | |
| Profiling | | NFTF 08082R/L | ● | | 8 | 0.82 | 0.41 | 7.75 | 1.3 | 5.9 | 3.85 | |
| | | 08122R/L | ● | | 8 | 1.22 | 0.61 | 7.75 | 1.3 | 5.9 | 3.85 | |
| | | 08182R/L | ● | | 8 | 1.82 | 0.91 | 7.75 | 1.3 | 5.9 | 3.85 | |
| | | 11082R/L | ● | | 11 | 0.82 | 0.41 | 10.7 | 2.6 | 8 | 4.9 | |
| | | 11122R/L | ● | | 11 | 1.22 | 0.61 | 10.7 | 2.6 | 8 | 4.9 | |
| | | 11182R/L | ● | | 11 | 1.82 | 0.91 | 10.7 | 2.6 | 8 | 4.9 | |
| | | 11202R/L | ● | | 11 | 2.02 | 1.01 | 10.7 | 2.6 | 8 | 4.9 | |
| | | 11302R/L | ● | | 11 | 3.02 | 1.51 | 10.7 | 2.6 | 8 | 4.9 | |
| | | 14122R/L | ● | | 14 | 1.22 | 0.61 | 13.5 | 4.3 | 9 | 5.85 | |
| | | 14182R/L | ● | | 14 | 1.82 | 0.91 | 13.5 | 4.3 | 9 | 5.85 | |
| | | 14202R/L | ● | | 14 | 2.02 | 1.01 | 13.5 | 4.3 | 9 | 5.85 | |
| | | 14222R/L | ● | | 14 | 2.22 | 1.11 | 13.5 | 4.3 | 9 | 5.85 | |
| | | 14302R/L | ● | | 14 | 3.02 | 1.51 | 13.5 | 4.3 | 9 | 5.85 | |
| | | 16182R/L | ● | | 16 | 1.82 | 0.91 | 15.7 | 4.6 | 11 | 5.8 | |
| | | 16222R/L | ● | | 16 | 2.22 | 1.11 | 15.7 | 4.6 | 11 | 5.8 | |
| | | 16302R/L | ● | | 16 | 3.02 | 1.51 | 15.7 | 4.6 | 11 | 5.8 | |
| 16402R/L | ● | | 16 | 4.02 | 2.01 | 15.7 | 4.6 | 11 | 5.8 | | | |

●: Stock item

Inserts

(mm)

| Application | Picture | Designation | Coated | | ØD | b | r | S | g | Ød ₂ | t | Pitch | f | Configuration |
|-------------|---|---------------|--------|---|----|------|-----|------|-----|-----------------|------|-------|-----|---|
| | | | PC130 | | | | | | | | | | | |
| | | | R | L | | | | | | | | | | |
| Grooving |  | NFTG 08075R/L | ● | | 8 | 0.75 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - |  |
| | | 08085R/L | ● | | 8 | 0.85 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - | |
| | | 08095R/L | ● | | 8 | 0.95 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - | |
| | | 08121R/L | ● | | 8 | 1.21 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - | |
| | | 08141R/L | ● | | 8 | 1.41 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - | |
| | | 08152R/L | ● | | 8 | 1.52 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - | |
| | | 08171R/L | ● | | 8 | 1.71 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - | |
| | | 08202R/L | ● | | 8 | 2.02 | - | 7.75 | 1.3 | 5.9 | 3.85 | - | - | |
| | | 11075R/L | ● | | 11 | 0.75 | - | 10.7 | 1.8 | 8.0 | 4.9 | - | - | |
| | | 11085R/L | ● | | 11 | 0.85 | - | 10.7 | 1.8 | 8.0 | 4.9 | - | - | |
| | | 11095R/L | ● | | 11 | 0.95 | - | 10.7 | 1.8 | 8.0 | 4.9 | - | - | |
| | | 11121R/L | ● | | 11 | 1.21 | - | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 11141R/L | ● | | 11 | 1.41 | - | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 11152 R/L | ● | | 11 | 1.52 | - | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 11171R/L | ● | | 11 | 1.71 | - | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 11202R/L | ● | | 11 | 2.02 | - | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 11202R-02/L | ● | | 11 | 2.02 | 0.2 | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 11252R/L | ● | | 11 | 2.52 | - | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 11302R/L | ● | | 11 | 3.02 | - | 10.7 | 2.6 | 8.0 | 4.9 | - | - | |
| | | 14075R/L | ● | | 14 | 0.75 | - | 13.5 | 1.8 | 9.0 | 5.85 | - | - | |
| | | 14085R/L | ● | | 14 | 0.85 | - | 13.5 | 1.8 | 9.0 | 5.85 | - | - | |
| | | 14095R/L | ● | | 14 | 0.95 | - | 13.5 | 1.8 | 9.0 | 5.85 | - | - | |
| | | 14121R/L | ● | | 14 | 1.21 | - | 13.5 | 4.3 | 9.0 | 5.85 | - | - | |
| | | 14141R/L | ● | | 14 | 1.41 | - | 13.5 | 4.3 | 9.0 | 5.85 | - | - | |
| | | 14152R/L | ● | | 14 | 1.52 | - | 13.5 | 4.3 | 9.0 | 5.85 | - | - | |
| | | 14171R/L | ● | | 14 | 1.71 | - | 13.5 | 4.3 | 9.0 | 5.85 | - | - | |
| | | 14202R/L | ● | | 14 | 2.02 | - | 13.5 | 4.3 | 9.0 | 5.85 | - | - | |
| | | 14252R/L | ● | | 14 | 2.52 | - | 13.5 | 4.3 | 9.0 | 5.85 | - | - | |
| | | 14302R/L | ● | | 14 | 3.02 | - | 13.5 | 4.3 | 9.0 | 5.85 | - | - | |
| | | 16075R/L | ● | | 16 | 0.75 | - | 15.7 | 1.8 | 11 | 5.8 | - | - | |
| | | 16085R/L | ● | | 16 | 0.85 | - | 15.7 | 1.8 | 11 | 5.8 | - | - | |
| | | 16095R/L | ● | | 16 | 0.95 | - | 15.7 | 1.8 | 11 | 5.8 | - | - | |
| | | 16121R/L | ● | | 16 | 1.21 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| | | 16141R/L | ● | | 16 | 1.41 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| | | 16171R/L | ● | | 16 | 1.71 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| | | 16202R/L | ● | | 16 | 2.02 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| | | 16252R/L | ● | | 16 | 2.52 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| | | 16302R/L | ● | | 16 | 3.02 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| | | 16352R/L | ● | | 16 | 3.52 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| | | 16402R/L | ● | | 16 | 4.02 | - | 15.7 | 4.6 | 11 | 5.8 | - | - | |
| Threading |  | NFTT 0805MR/L | ● | | 8 | - | - | 7.75 | - | 6 | 3.85 | 0.5 | 1.0 |  |
| | | 0810MR/L | ● | | 8 | - | - | 7.75 | - | 6 | 3.85 | 1.0 | 1.0 | |
| | | 0815MR/L | ● | | 8 | - | - | 7.75 | - | 6 | 3.85 | 1.5 | 1.2 | |
| | | 1110MR/L | ● | | 11 | - | - | 10.7 | - | 8 | 4.9 | 1.0 | 1.2 | |
| | | 1115MR/L | ● | | 11 | - | - | 10.7 | - | 8 | 4.9 | 1.5 | 1.2 | |
| | | 1120MR/L | ● | | 11 | - | - | 10.7 | - | 8 | 4.9 | 2.0 | 1.2 | |
| | | 1125MR/L | ● | | 11 | - | - | 10.7 | - | 8 | 4.9 | 2.5 | 1.2 | |
| | | 1410MR/L | ● | | 14 | - | - | 13.5 | - | 9 | 5.85 | 1.0 | 1.2 | |
| | | 1415MR/L | ● | | 14 | - | - | 13.5 | - | 9 | 5.85 | 1.5 | 1.2 | |
| | | 1420MR/L | ● | | 14 | - | - | 13.5 | - | 9 | 5.85 | 2.0 | 1.2 | |
| | | 1425MR/L | ● | | 14 | - | - | 13.5 | - | 9 | 5.85 | 2.5 | 1.2 | |
| | | 1610MR/L | ● | | 16 | - | - | 15.7 | - | 11 | 5.8 | 1.0 | 1.2 | |
| | | 1615MR/L | ● | | 16 | - | - | 15.7 | - | 11 | 5.8 | 1.5 | 1.2 | |
| | | 1620MR/L | ● | | 16 | - | - | 15.7 | - | 11 | 5.8 | 2.0 | 1.2 | |
| | | 1625MR/L | ● | | 16 | - | - | 15.7 | - | 11 | 5.8 | 2.5 | 1.2 | |
| | | 1630MR/L | ● | | 16 | - | - | 15.7 | - | 11 | 5.8 | 3.0 | 1.5 | |
| 1635MR/L | ● | | 16 | - | - | 15.7 | - | 11 | 5.8 | 3.5 | 1.6 | | | |
| 1640MR/L | ● | | 16 | - | - | 15.7 | - | 11 | 5.8 | 4.0 | 1.8 | | | |

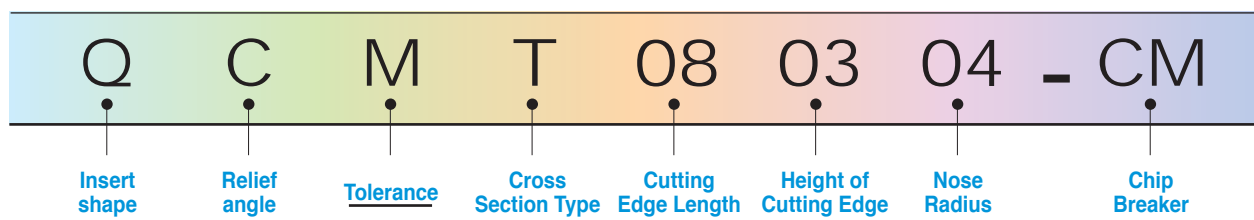
● : Stock item

Multi Turn

Holder code system

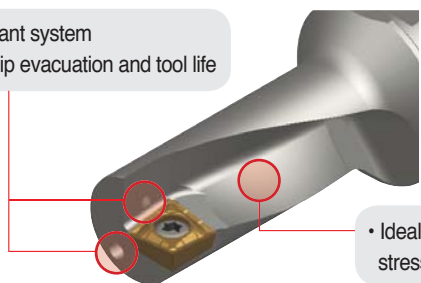


Insert code system

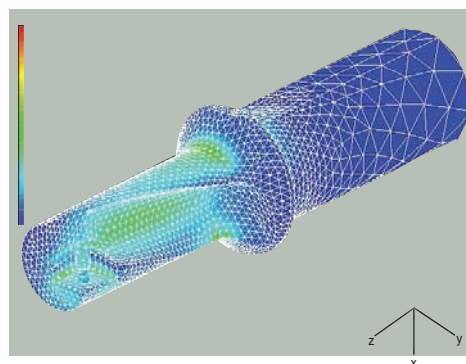


Tool design by FEM analysis

- Double coolant system
- Excellent chip evacuation and tool life



- Ideal flute design minimizing stress concentrations



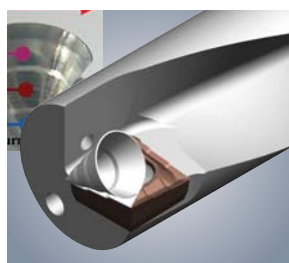
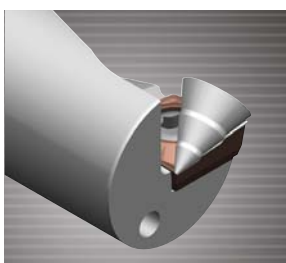
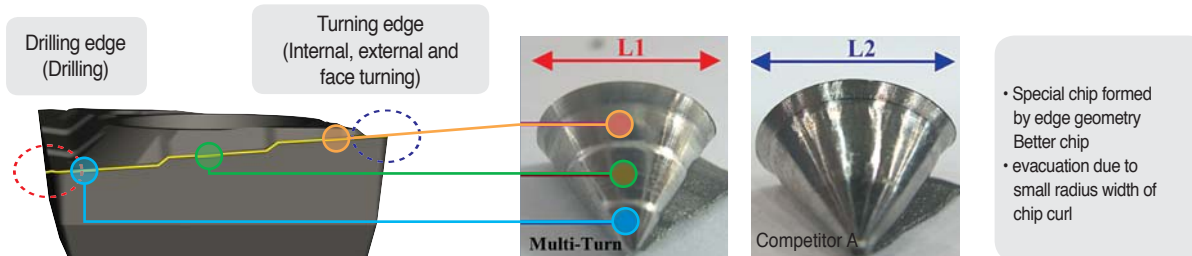
- Minimized stress during cutting, prevented damage from vibration and longer tool life
- Optimized design

※ Clamping tip

- Correct : High cutting edge position
- Wrong : Low cutting edge position



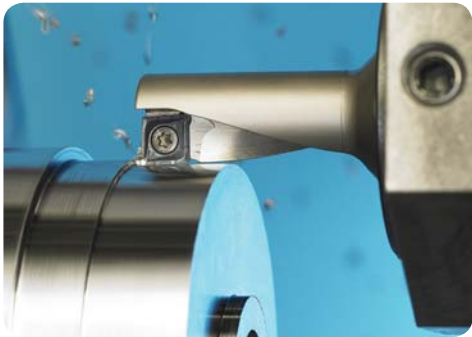
Creative stepping cutting edge



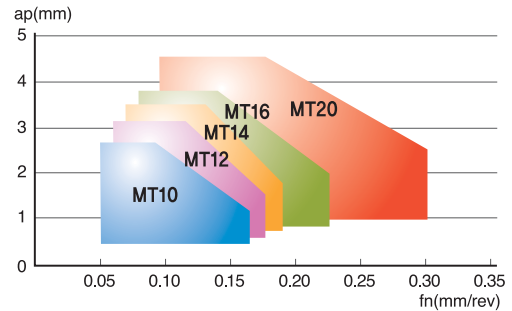
| Comparison | Multi turn | Competitor A | Competitor B |
|---------------------------|------------|--------------|--------------|
| Feed fn(mm/rev) = 0.08 | | | |
| Feed fn(mm/rev) = 0.10 | | | |
| Chip width (rate) | 80% | 100% | 120% |

🎯 User's guide

External / Internal turning



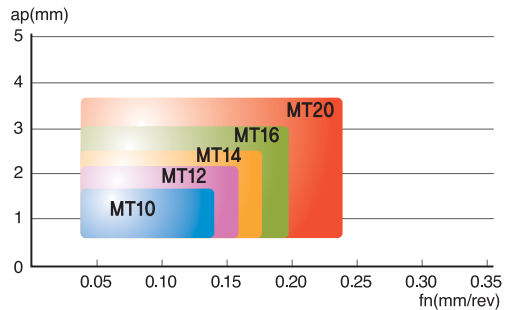
● Application range



Facing



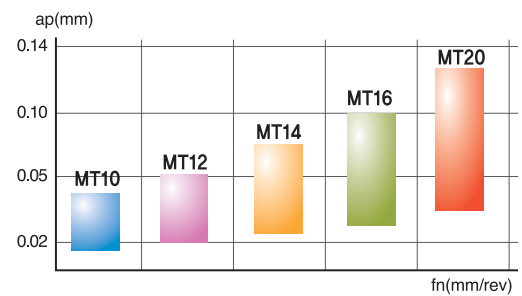
● Application ranges of facing



Drilling

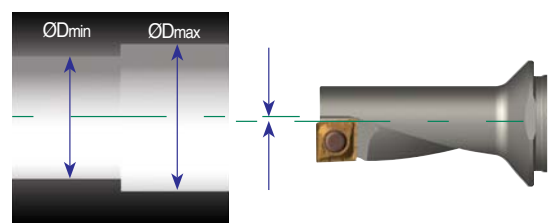


● Drilling feed range by designation



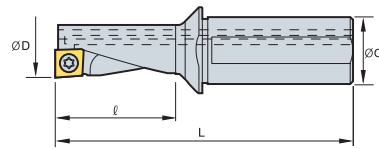
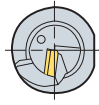
Offset (Diameter compensation)

| Disignation | Machined diameter(mm) | ØDmin(mm) | ØDmax(mm) |
|---------------|-----------------------|-----------|-----------|
| MT10R/L-2.25D | 10 | 9.85 | 10.35 |
| MT12R/L-2.25D | 12 | 11.85 | 12.35 |
| MT14R/L-2.25D | 14 | 13.85 | 14.35 |
| MT16R/L-2.25D | 16 | 15.85 | 16.35 |
| MT20R/L-2.25D | 20 | 19.85 | 20.35 |



Drill diameter is adjustable by the offset compensation

MT (Multi-Turn)



| Designation | ØD | Ød | ℓ | L | Inserts | (mm) | |
|---------------|----|----|------|-------|------------|------------|--------|
| | | | | | | Screw | Wrench |
| MT10R/L-2.25D | 10 | 12 | 22.5 | 69.5 | QC..050204 | FTNA0204S | TW06P |
| MT12R/L-2.25D | 12 | 16 | 27.0 | 78.0 | QC..060204 | FTNA02205S | TW06P |
| MT14R/L-2.25D | 14 | 16 | 31.5 | 83.5 | QC..070304 | FTKA02555 | TW07P |
| MT16R/L-2.25D | 16 | 20 | 36.0 | 94.0 | QC..080304 | FTNA0306 | TW09P |
| MT20R/L-2.25D | 20 | 25 | 45.0 | 111.0 | QC..10T304 | FTNA03508 | TW15P |

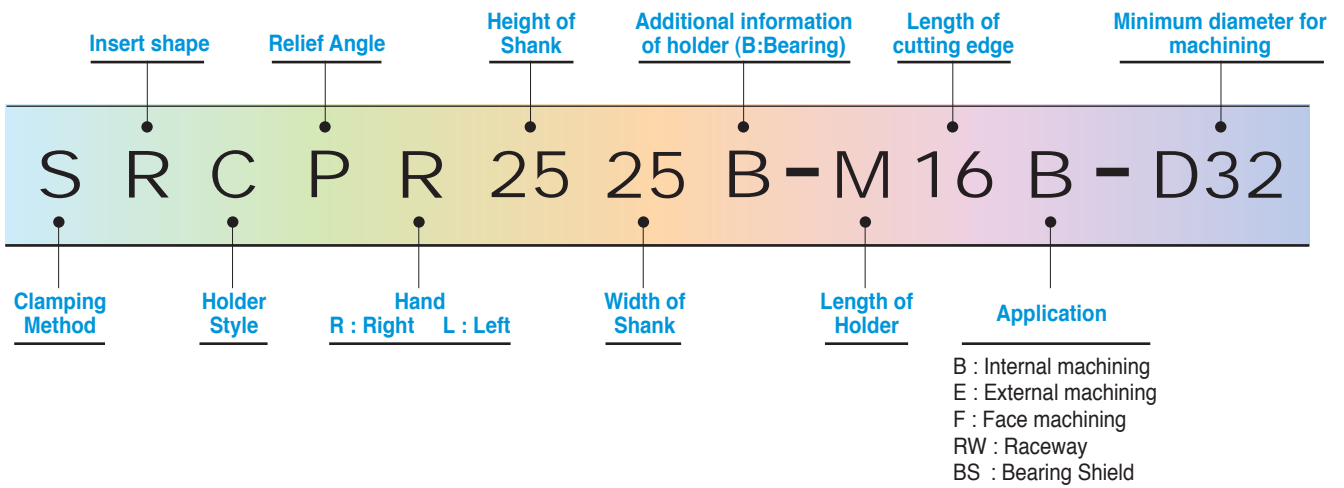
Inserts

| Picture | Designation | P | | M | K | l | d | t | r | Ød ₁ | Configuration |
|---------|----------------|--------|--------|--------|--------|------|------|------|-----|-----------------|---------------|
| | | NC3120 | NC3220 | PC5300 | NC6210 | | | | | | |
| | QCMT 050204-CM | | ● | ● | | 5.0 | 5.4 | 2.10 | 0.4 | 2.3 | |
| | 060204-CM | | ● | ● | | 6.0 | 6.4 | 2.38 | 0.4 | 2.5 | |
| | 070304-CM | | ● | ● | ● | 7.0 | 7.4 | 3.18 | 0.4 | 2.8 | |
| | 080304-CM | | ● | ● | ● | 8.0 | 8.4 | 3.18 | 0.4 | 3.4 | |
| | 10T304-CM | | ● | ● | ● | 10.0 | 10.4 | 3.97 | 0.4 | 4.0 | |

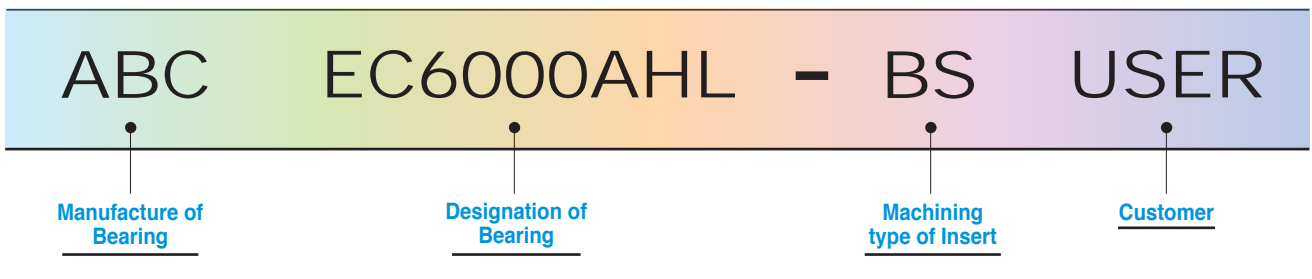
● : Stock item

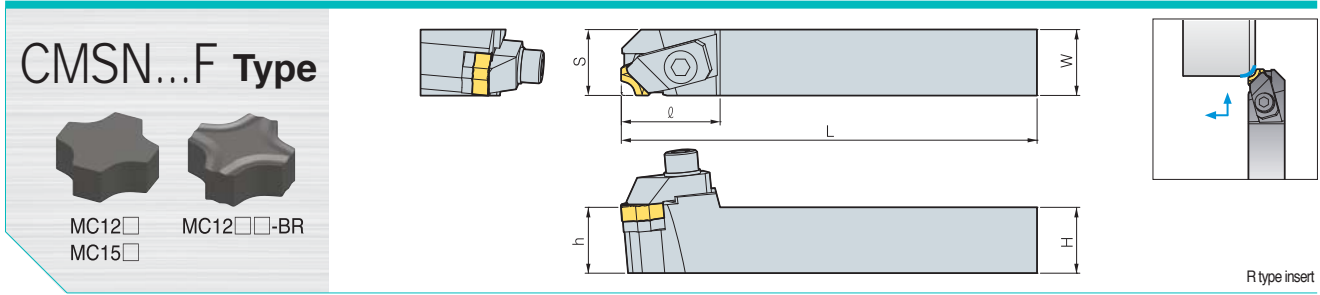
Bearing Solution

Holder Code System

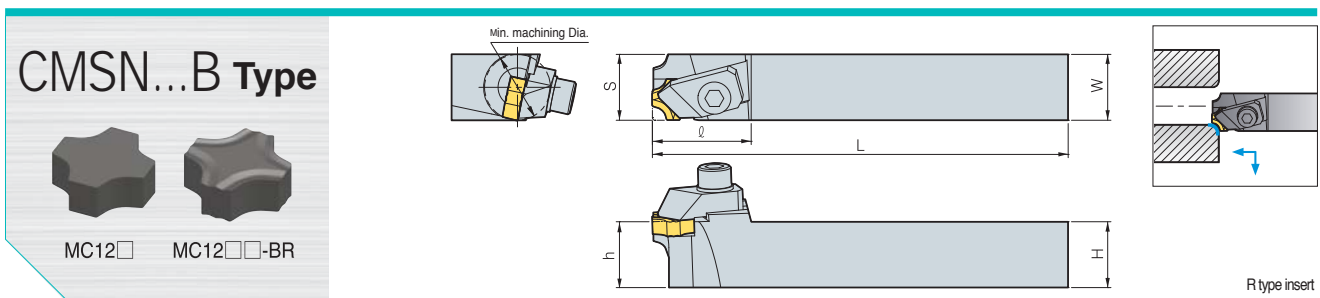


Insert Code System for race way and bearing shield machining





| Designation | H | W | L | S | h | ℓ | Inserts | (mm) | | | | |
|--------------------|----|----|-----|----|----|----|-----------|----------|-------------|--------|------------|--------|
| | | | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Wrench |
| CMSNR/L 2020B-L12F | 20 | 20 | 140 | 21 | 20 | 33 | MC12□□ | CH6R/L1B | BHA0620 | SX42CB | SS0308 | HW50L |
| 2023B-L12F | 20 | 23 | 140 | 24 | 20 | 33 | MC12□□-BR | CH6R/L1B | BHA0620 | SX42CB | SS0308 | HW50L |
| 2525B-L15F | 25 | 25 | 140 | 26 | 25 | 35 | MC15□□ | CH6R/L1B | BHA0620 | SX52CB | SS0408 | HW50L |



| Designation | ØD | H | W | L | S | h | ℓ | Inserts | (mm) | | | | |
|------------------------|----|----|----|-----|----|----|----|-----------|----------|-------------|--------|------------|--------|
| | | | | | | | | | Clamp | Clamp Screw | Shim | Shim Screw | Wrench |
| CMSNR/L 2020B-L12B-D28 | 28 | 20 | 20 | 140 | 21 | 20 | 33 | MC12□□ | CH6R/L1B | BHA0620 | SX42CB | SS0308 | HW50L |
| 2525B-L12B-D28 | 28 | 25 | 25 | 140 | 26 | 25 | 33 | MC12□□ | CH6R/L1B | BHA0620 | SX42CB | SS0308 | HW50L |
| 1620B-L12B-D20 | 20 | 16 | 20 | 140 | 18 | 16 | 32 | MC12□□-BR | CH6R/L1B | BHA0620 | - | - | HW50L |
| 2023B-L12B-D28 | 28 | 20 | 23 | 140 | 24 | 20 | 33 | MC12□□-BR | CH6R/L1B | BHA0620 | SX42CB | SS0308 | HW50L |

Inserts

| Application | Picture | Designation | Cermet | | R | θ° | B | d | t | Configuration |
|--------------|---------|-------------|--------|--------|-----|------|--------|--------|------|---------------|
| | | | CN20 | CN2000 | | | | | | |
| R-Chamfering | | MC0906 | | | 0.6 | 12 | 1.8 | 9.525 | 3.18 | |
| | | MC0910 | | | 1.0 | 12 | 2.4 | 9.525 | 3.18 | |
| | | MC1206 | | | 0.6 | 18 | 1.8 | 12.7 | 4.76 | |
| | | MC1210 | | | 1.0 | 18 | 2.4 | 12.7 | 4.76 | |
| | | MC1212 | | | 1.2 | 18 | 2.2 | 12.7 | 4.76 | |
| | | MC1215 | | | 1.5 | 18 | 3.0 | 12.7 | 4.76 | |
| | | MC1220 | | | 2.0 | 18 | 3.8 | 12.7 | 4.76 | |
| | | MC1225 | | | 2.5 | 18 | 2.8 | 12.7 | 4.76 | |
| | | MC1525 | | | 2.5 | 18 | 4.0 | 15.875 | 5.56 | |
| | | MC1530 | | | 3.0 | 18 | 4.7 | 15.875 | 5.56 | |
| | MC1540 | | | 4.0 | 20 | 4.7 | 15.875 | 5.56 | | |
| | | MC1206-BR | | | 0.6 | 18 | 1.8 | 12.7 | 4.76 | |
| | | MC1210-BR | | | 1.0 | 18 | 2.4 | 12.7 | 4.76 | |
| | | MC1212-BR | | | 1.2 | 18 | 2.2 | 12.7 | 4.76 | |
| | | MC1215-BR | | | 1.5 | 18 | 3.0 | 12.7 | 4.76 | |
| | | MC1220-BR | | | 2.0 | 18 | 3.2 | 12.7 | 4.76 | |
| MC1230-BR | | | | 3.0 | 18 | 3.7 | 12.7 | 4.76 | | |
| MC1235-BR | | | 3.5 | 18 | 3.9 | 12.7 | 4.76 | | | |

● : Stock item

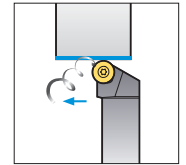
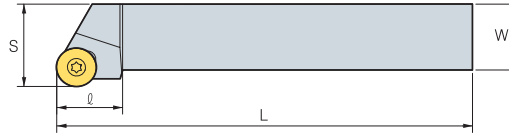
Special order-form

| Designation | CN20 | CN2000 | R | θ° | B | d | t | Configuration |
|-------------|------|--------|---|----|---|---|---|---------------|
| | | | | | | | | |

SRGP...E Type



RPGT1203M0
RPGT1604M0
RPGT2004M0



R type insert

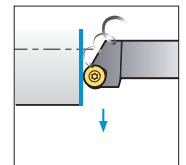
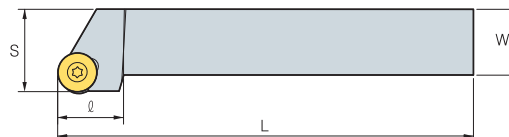
(mm)

| Designation | H | W | L | S | h | l | Inserts | Screw | Shim | Shim Screw | Wrench |
|--------------------|----|----|-----|----|----|----|------------|----------|---------|------------|--------|
| SRGPR/L 2020B-L12E | 20 | 20 | 140 | 25 | 20 | 20 | RPGT1203M0 | FTKA0410 | SR1203S | SHXN0609F | TW15P |
| 2020B-L16E | 20 | 20 | 140 | 25 | 20 | 20 | RPGT1604M0 | FTNA0513 | SR16T3S | SHXN0712F | TW20P |
| 2525B-L20E | 25 | 25 | 140 | 32 | 25 | 30 | RPGT2004M0 | FTNA0513 | SR20T3S | SHXN0712F | TW20P |

SRGP...F Type



RPGT1203M0
RPGT1604M0
RPGT2004M0



R type insert

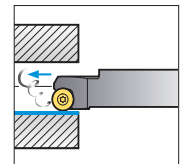
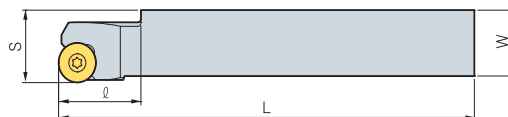
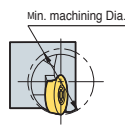
(mm)

| Designation | H | W | L | S | h | l | Inserts | Screw | Shim | Shim Screw | Wrench |
|--------------------|----|----|-----|----|----|----|------------|----------|---------|------------|--------|
| SRGPR/L 2020B-L12F | 20 | 20 | 140 | 25 | 20 | 20 | RPGT1203M0 | FTKA0410 | SR1203S | SHXN0609F | TW15P |
| 2020B-L16F | 20 | 20 | 140 | 25 | 20 | 20 | RPGT1604M0 | FTNA0513 | SR16T3S | SHXN0712F | TW20P |
| 2525B-L20F | 25 | 25 | 140 | 32 | 25 | 30 | RPGT2004M0 | FTNA0513 | SR20T3S | SHXN0712F | TW20P |

SRCP...B Type



RPGT0802M0
RPGT1203M0
RPGT1604M0

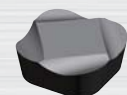


R type insert

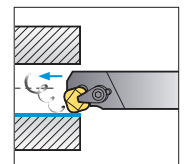
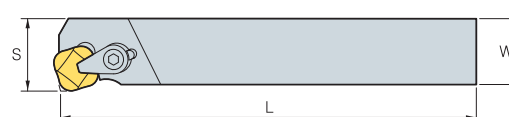
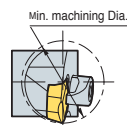
(mm)

| Designation | ØD | H | W | L | S | h | l | Inserts | Screw | Wrench |
|------------------------|----|----|----|-----|------|------|----|------------|----------|--------|
| SRCPR/L 2020B-L08B-D12 | 12 | 20 | 20 | 140 | 21.5 | 15.5 | 25 | RPGT0802M0 | FTKA0305 | TW09P |
| 1919B-L12B-D15 | 15 | 19 | 19 | 140 | 21 | 16 | 25 | RPGT1203M0 | FTNA0408 | TW15P |
| 2020B-L12B-D20 | 20 | 20 | 20 | 140 | 22 | 15.5 | 25 | RPGT1203M0 | FTNA0408 | TW15P |
| 2525B-L16B-D32 | 32 | 25 | 25 | 140 | 27 | 20 | 30 | RPGT1604M0 | FTKA0510 | TW20P |

CSKP...B Type



SPGR120440L

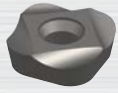


R type insert

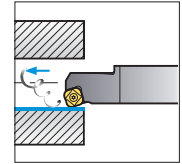
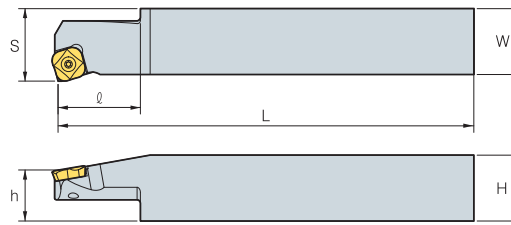
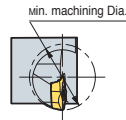
(mm)

| Designation | ØD | H | W | L | S | h | l | Inserts | Clamp | Clamp Screw | Wrench |
|------------------------|----|----|----|-----|----|----|----|---------------|-------|-------------|--------|
| CSKPR/L 2022B-L12B-D30 | 30 | 20 | 22 | 140 | 27 | 20 | 37 | SPGR120440R/L | CH5R1 | CHX0510 | HW30L |

SSKP...B Type



SPGH090330L



R type insert

(mm)

| Designation | ØD | H | W | L | S | h | l | Inserts | Screw | Wrench |
|------------------------|----|----|----|-----|------|----|----|---------------|----------|--------|
| SSKPR/L 2020B-L09B-D12 | 12 | 20 | 20 | 140 | 21.7 | 19 | 20 | SPGH090330R/L | FTNA0307 | TW09P |
| 2020B-L09B-D13 | 13 | 20 | 20 | 140 | 21.7 | 19 | 20 | | | |
| 2020B-L09B-D20 | 20 | 20 | 20 | 140 | 21.7 | 19 | 20 | | | |

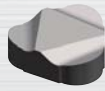
Inserts

(mm)

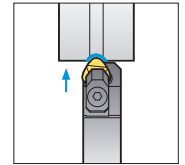
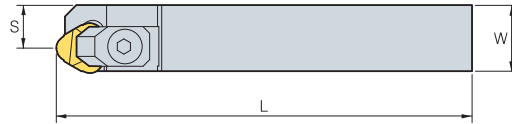
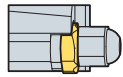
| Application | Picture | Designation | Cermet | | r | d | d ₁ | t | Configuration |
|------------------|---------|-------------|--------|--------|-----|-------|----------------|------|---------------|
| | | | CN20 | CN2000 | | | | | |
| Internal turning | | RPGT0802M0 | | | - | 8 | 3.4 | 2.38 | |
| | | RPGT1203M0 | ● | | - | 12 | 4.4 | 3.18 | |
| | | RPGT1604M0 | | | - | 16 | 5.5 | 4.76 | |
| | | RPGT2004M0 | | | - | 20 | 5.5 | 4.76 | |
| Internal turning | | SPGR120440L | | | 4.0 | 12.7 | - | 4.76 | |
| | | | | | | | | | |
| Internal turning | | SPGH090330L | | | 3.0 | 9.525 | 3.4 | 3.18 | |
| | | | | | | | | | |

● : Stock item

CKFN...RW Type



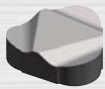
KORIC



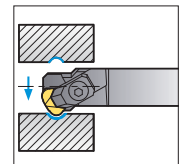
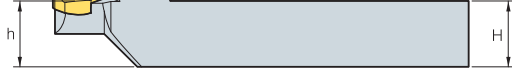
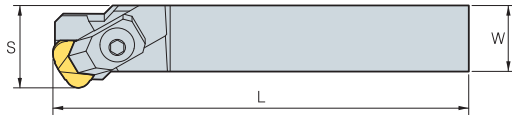
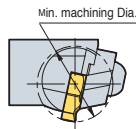
R type insert

| Designation | H | W | L | S | h | Inserts | Clamp | Clamp Screw | Shim | Shim Screw | Wrench |
|---------------------|----|----|-----|------|----|--------------|----------|-------------|--------|------------|--------|
| CKFNR/L 2020B-L22RW | 20 | 20 | 140 | 12.5 | 20 | KORIC2204R/L | CH6N1B | BHA0620 | ST42CB | SS0408 | HW50L |
| 2022B-L27RW | 20 | 22 | 140 | 13 | 20 | KORIC2704R/L | CH8R/L1B | BHA0820 | ST52CB | SS0408 | HW60L |
| 2025B-L33RW | 20 | 25 | 140 | 16 | 20 | KORIC3306R/L | CH8R/L1B | BHA0820 | ST62CB | SS0408 | HW60L |
| 2533B-L44RW | 25 | 33 | 140 | 21 | 25 | KORIC4408R/L | CH8R/L1B | BHA0820 | ST82CB | SS0408 | HW60L |

CKGN...RW Type



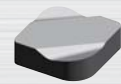
KORIC



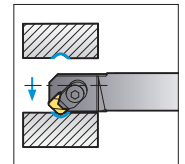
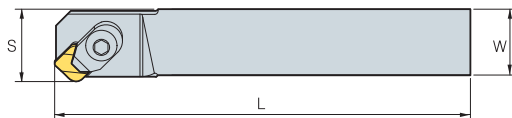
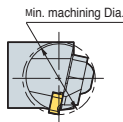
R type insert

| Designation | ØD | H | W | L | S | h | Inserts | Clamp | Clamp Screw | Shim | Shim Screw | Wrench |
|-----------------------|----|----|----|-----|----|----|--------------|----------|-------------|--------|------------|--------|
| CKGNR 2022B-L22RW-D23 | 23 | 20 | 22 | 140 | 30 | 20 | KORIC2204R/L | CH6R/L3B | BHA0620 | ST42CB | SS0408 | HW50L |
| 2022B-L27RW-D29 | 29 | 20 | 22 | 140 | 34 | 20 | KORIC2704R/L | CH6R/L7B | BHA0620 | ST52CB | SS0408 | HW50L |
| 2025B-L33RW-D38 | 38 | 20 | 25 | 140 | 33 | 20 | KORIC3306R/L | CH6R/L5B | BHA0620 | ST62CB | SS0408 | HW50L |
| 2528B-L38RW-D50 | 50 | 25 | 28 | 140 | 46 | 25 | KORIC3806R/L | CH8R/L2B | BHA0820 | ST72CB | SS0408 | HW60L |
| 2528B-L44RW-D52 | 52 | 25 | 28 | 140 | 50 | 25 | KORIC4408R/L | CH8R/L2B | BHA0820 | ST82CB | SS0408 | HW60L |

CSGN...RW Type



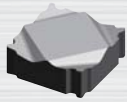
SNGN



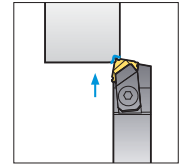
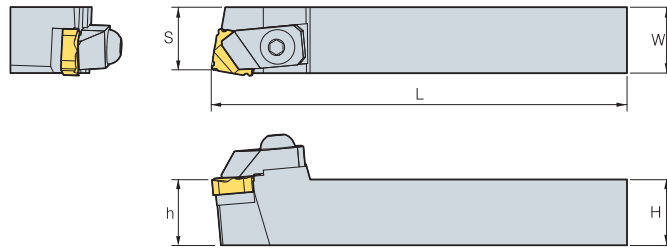
R type insert

| Designation | ØD | H | W | L | S | h | Inserts | Clamp | Clamp Screw | Wrench |
|-------------------------|----|----|----|-----|----|----|--------------|-------|-------------|--------|
| CSGNR/L 2020B-L09RW-D17 | 17 | 20 | 20 | 140 | 22 | 20 | SNGN0903WR/L | CH5R1 | CHX0510 | HW30L |
| 2020B-L09RW-D22 | 22 | 20 | 20 | 140 | 22 | 20 | SNGN0903WR/L | CH5R1 | CHX0510 | HW30L |

CSBN...BS Type



SNGN

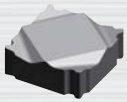


R type insert

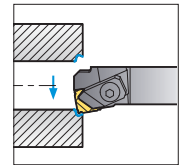
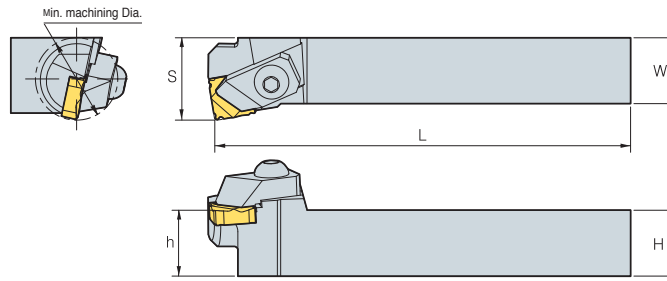
(mm)

| Designation | H | W | L | S | h | Inserts | Clamp | Clamp Screw | Shim | Shim Screw | Wrench |
|---------------------|----|----|-----|----|----|--------------|--------|-------------|--------|------------|--------|
| CSBNR/L 2023B-L12BS | 20 | 23 | 140 | 21 | 20 | SNGN1204SR/L | CH6N1B | BHA0620 | SS42CB | SS0308 | HW50L |
| 2525B-L15BS | 25 | 25 | 140 | 23 | 25 | SNGN1504SR/L | CH6N1B | BHA0620 | SS52CB | SS0408 | HW50L |

CSKN...BS Type



SNGN

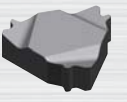


R type insert

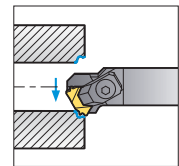
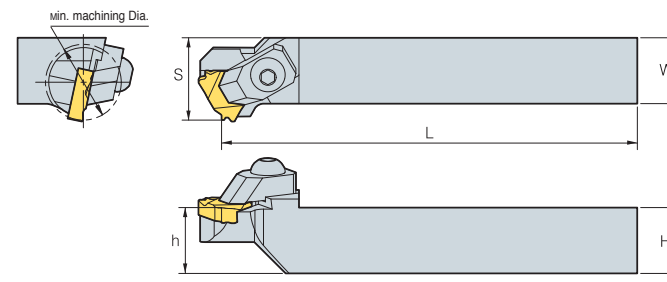
(mm)

| Designation | ØD | H | W | L | S | h | Inserts | Clamp | Clamp Screw | Shim | Shim Screw | Wrench |
|-------------------------|----|----|----|-----|----|----|--------------|----------|-------------|--------|------------|--------|
| CSKNR/L 1622B-L09BS-D14 | 14 | 16 | 22 | 140 | 16 | 16 | SNGN0903SR/L | CH6R/L2B | BHA0620 | - | - | HW50L |
| 2022B-L12BS-D26 | 26 | 20 | 22 | 140 | 27 | 20 | SNGN1204SR/L | CH6R/L1B | BHA0620 | SS42CB | SS0308 | HW50L |
| 2525B-L15BS-D35 | 35 | 25 | 25 | 140 | 31 | 25 | SNGN1504SR/L | CH6R/L3B | BHA0620 | SS52CB | SS0408 | HW50L |

CTGN...BS Type



TNGN

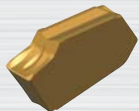


R type insert

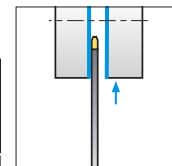
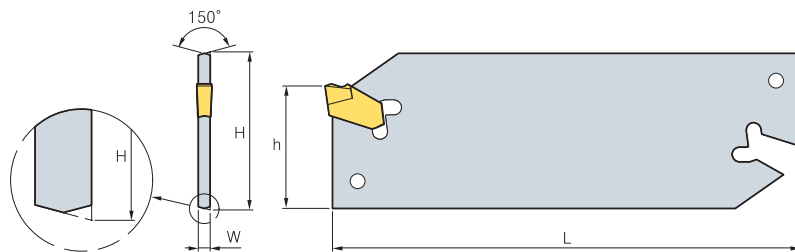
(mm)

| Designation | ØD | H | W | L | S | h | Inserts | Clamp | Clamp Screw | Shim | Shim Screw | Wrench |
|-------------------------|----|----|----|-----|----|----|--------------|----------|-------------|--------|------------|--------|
| CTGNR/L 2021B-K22BS-D25 | 25 | 20 | 21 | 140 | 30 | 20 | TNGN2204SR/L | CH6R/L7B | BHA0620 | ST42CB | SS0408 | HW50L |

SPB-S Type



SP



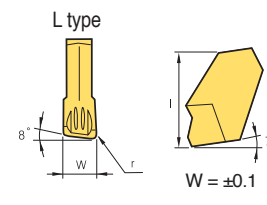
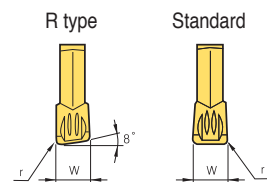
(mm)

| Designation | H | W | L | h | Inserts | Wrench |
|-------------|----|-----|-----|----|-----------------|--------|
| SPB 1626-S | 26 | 1.3 | 110 | 21 | SP160 | SW15S |
| 1826-S | 26 | 1.5 | 110 | 21 | SP180 | |
| 226-S | 26 | 1.6 | 110 | 21 | SP200, SP200R/L | |
| 326-S | 26 | 2.4 | 110 | 21 | SP300, SP300R/L | |
| 426-S | 26 | 3.2 | 110 | 21 | SP400, SP400R/L | |
| 526-S | 26 | 4.0 | 110 | 21 | SP500, SP500R/L | |
| 626-S | 26 | 5.2 | 110 | 21 | SP600, SP600R/L | |
| 1632-S | 32 | 1.3 | 150 | 25 | SP160 | |
| 1832-S | 32 | 1.5 | 150 | 25 | SP180 | |
| 232-S | 32 | 1.6 | 150 | 25 | SP200, SP200R/L | |
| 332-S | 32 | 2.4 | 150 | 25 | SP300, SP300R/L | |
| 432-S | 32 | 3.2 | 150 | 25 | SP400, SP400R/L | |
| 532-S | 32 | 4.0 | 150 | 25 | SP500, SP500R/L | |
| 632-S | 32 | 5.2 | 150 | 25 | SP600, SP600R/L | |

Inserts

(mm)

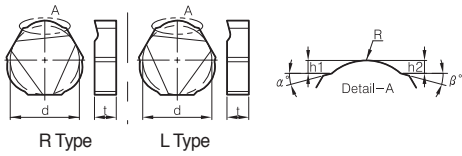
| Application | Picture | Designation | Coated | | | | | | | | | | | W | l | r | Configuration | | |
|---------------|---------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|------|---------------|------------|--------------|
| | | | NC3120 | NC3220 | NC3030 | NCM325 | NC5330 | NC9020 | PC3500 | NC500H | PC8110 | PC5300 | PC9030 | | | | | PC6510 | ST30A |
| parting tools | | SP 160 | | | | | | | | | | | | | 1.6 | 7.8 | 0.16 | R type | Standard |
| | | 180 | | | | | | | | | | | | | 1.8 | 9.3 | 0.16 | | |
| | | 200 | ● | ● | ● | ● | | | | ● | ● | ● | | | 2.2 | 9.3 | 0.2 | | |
| | | 200R | ● | ● | | | | | | | | ● | | | 2.2 | 9.3 | 0.2 | | |
| | | 200L | | | | | | | | | | | | | 2.2 | 9.3 | 0.2 | | |
| | | 300 | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | 3.1 | 11.3 | 0.2 | | |
| | | 300R | ● | ● | ● | | | | | | ● | | | | 3.1 | 11.3 | 0.2 | | |
| | | 300L | | | | | | | | | | | | | 3.1 | 11.3 | 0.2 | | |
| | | 400 | ● | ● | ● | ● | | | | | ● | ● | ● | ● | 4.1 | 11.3 | 0.25 | | |
| | | 400R | ● | ● | | | | | | | ● | | | | 4.1 | 11.3 | 0.25 | | |
| | | 400L | | | ● | | | | | | | | | | 4.1 | 11.3 | 0.25 | | |
| | | 500 | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | 5.1 | 11.4 | 0.3 | | |
| | | 500R | ● | ● | | | | | | | ● | | | | 5.1 | 11.4 | 0.3 | | |
| | | 500L | | | | | | | | | | | | | 5.1 | 11.4 | 0.3 | | |
| | | 600 | ● | ● | | ● | | | | | | ● | ● | | 6.4 | 11.4 | 0.35 | | |
| | | 600R | ● | ● | | | | | | | | ● | | | 6.4 | 11.4 | 0.35 | | |
| 600L | | | | | | | | | | | | | 6.4 | 11.4 | 0.35 | | | | |



●: Stock item

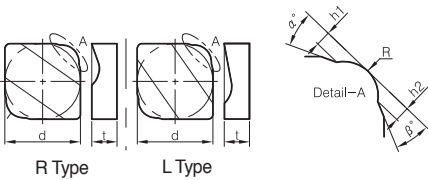
Machining Race-way

KORIC... R/L Type



| | d | t | R | h ₁ | h ₂ | α° | β° |
|---------------|--------|------|---|----------------|----------------|----|----|
| KORIC 2204R/L | 12.7 | 4.76 | | | | | |
| 2704R/L | 15.875 | 4.76 | | | | | |
| 3306R/L | 19.05 | 6.0 | | | | | |
| 3806R/L | 22.225 | 6.0 | | | | | |
| 4408R/L | 25.4 | 8.0 | | | | | |

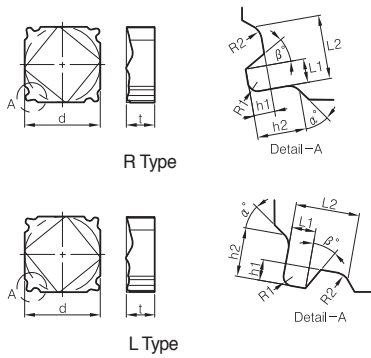
SNGN... WR/L Type



| | d | t | R | h ₁ | h ₂ | α° | β° |
|--------------|--------|------|---|----------------|----------------|----|----|
| SNGN0903WR/L | 9.525 | 3.18 | | | | | |
| 1504WR/L | 15.875 | 4.76 | | | | | |
| 1905WR/L | 19.05 | 5.56 | | | | | |

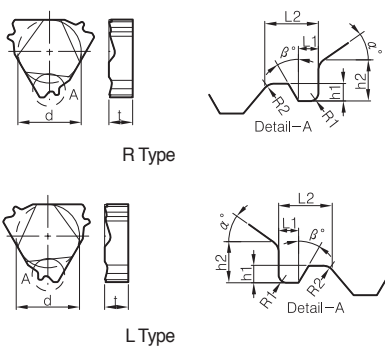
Machining for Bearing shield

SNGN...SR/L Type



| | d | t | L ₁ | L ₂ | h ₁ | h ₂ | R ₁ | R ₂ | α° | β° |
|--------------|--------|------|----------------|----------------|----------------|----------------|----------------|----------------|----|----|
| SNGN0903SR/L | 9.525 | 3.18 | | | | | | | | |
| 1204SR/L | 12.7 | 4.76 | | | | | | | | |
| 1504SR/L | 15.875 | 4.76 | | | | | | | | |

TNGN...SR/L Type



| | d | t | L ₁ | L ₂ | h ₁ | h ₂ | R ₁ | R ₂ | α° | β° |
|---------------|------|------|----------------|----------------|----------------|----------------|----------------|----------------|----|----|
| TNGN02204SR/L | 12.7 | 4.76 | | | | | | | | |



D

THREADING

Korloy threading tools are available for machining of various shapes of thread at various pitches with high quality.

C O N T E N T S

T H R E A D I N G

Threading Code System

- D02** Thread Insert Code System
- D02** External / Internal Code System

Technical Information for Threading

- D03** Technical Information for Threading
- D09** Threading Insert with Chip Breaker

Thread Inserts

- D10** Partial profile 60°
- D11** Partial profile 55°
- D12** ISO Metric
- D16** American UN
- D18** Whit Worth
- D22** British Standard Pipe Thread
- D22** National Pipe Thread
- D23** National Pipe Thread - Dry seal
- D23** Round DIN405
- D24** Trapez DIN103



ADDITION

Thread Inserts

- D24** American ACME
- D25** Stub ACME
- D26** UNJ
- D28** American Buttress
- D28** British Buttress
- D29** Metric Buttress
- D29** API
- D30** API Buttress Casing
- D30** API Round Casing & Tubing
- D30** Extreme Line Casing

Thread Holders

- D31** External Holder
- D32** Internal Holder
- D33** Vertical Type Holder

Thread Milling Inserts

- D34** Technical Information for Thread Milling Inserts
- D44** Thread Milling Inserts
- D49** Thread Milling Holders

Thread Milling Solid Endmill

- D50** Technical Information for Thread Milling Solid Endmill
- D51** Thread Milling Solid Endmill

D Threading Code System

Threading Holder Code System

E R H 10 (N) - 11 (C)

1 2 3 4 5 6 7

Holder Type Hand of Insert Name Height of shank Shim Insert Size (mm) Clamping System

1 Holder Type
E R H 10 (N) - 11 (C)

E : For External I : For Internal

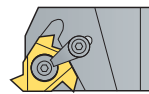
2 Hand of Insert
E R H 10 (N) - 11 (C)

R : Right handed L : Left handed

3 Name
E R H 10 (N) - 11 (C)

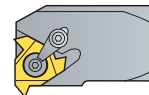
H : Holder

4 Height of shank
E R H 10 (N) - 11 (C)



- External

8, 10, 12, 16, 20,
25, 32, 40, 50



- Internal

10, 12, 13, 16, 20,
25, 32, 49, 50, 60

• Refer to the specification for shank diameter information

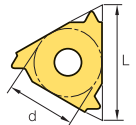
6 Insert Size (mm)
E R H 10 (N) - 11 (C)

11 : d=6.35

16 : d=9.525

22 : d=12.7

27 : d=15.875



5 Shim
E R H 10 (N) - 11 (C)

No code : Shim required
N : No shim required

7 Clamping System
E R H 10 (N) - 11 (C)

No code : Screw on system
C : Clamp on system

Threading Insert Code System

E R M 16 - 1.5 ISO

1 2 3 4 5 6

Insert Type Hand of Insert Chip Breaker Insert Size (mm) Pitch Standard

1 Insert Type
E R M 16 - 1.5 ISO

E : External thread I : Internal thread

2 Hand of Insert
E R M 16 - 1.5 ISO

R : Right handed L : Left handed

3 Chip Breaker
E R M 16 - 1.5 ISO

M : With Chip Breaker

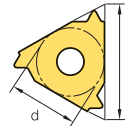
4 Insert Size (mm)
E R M 16 - 1.5 ISO

11 : d=6.35

16 : d=9.525

22 : d=12.7

27 : d=15.875



Insert Shape



<ER/IR>



<ERM/IRM>

5 Pitch
E R M 16 - 1.5 ISO

| Full profile | | Partial profile | |
|--------------|------|-----------------|-------|
| mm | tpi | mm | tpi |
| 0.35-6.0 | 72-3 | A 0.5-1.5 | 48-16 |
| | | AG 0.5-3.0 | 48-8 |
| | | G 1.75-3.0 | 14-8 |
| | | N 3.5-5.0 | 7-5 |
| | | Q 5.5-6.0 | 4.5-4 |

6 Standard
E R M 16 - 1.5 ISO

Partial profile 60°
Partial Profile 55°
ISO Metric (Full Profile)
American UN (Full Profile) UN, UNC, UNF, UNEF
Whitworth (Full Profile) BSW, BSF, BSP
British Standard Pipe thread (Full Profile) BSPT
National Pipe Thread (Full Profile) NPT
National Pipe Threads-Dryseal (Full Profile) NPTF
Round DIN 405
Trapez DIN 103
American ACME
Stub ACME
UNJ
American Buttress
British Buttress
Metric Buttress-Sagengewinde
API
API Buttress Casing
API Round Casing & Tubing
EL-Extreme Line

Special Features

External Thread

A thread on the external surface of a cylinder screw or cone

Depth of Thread

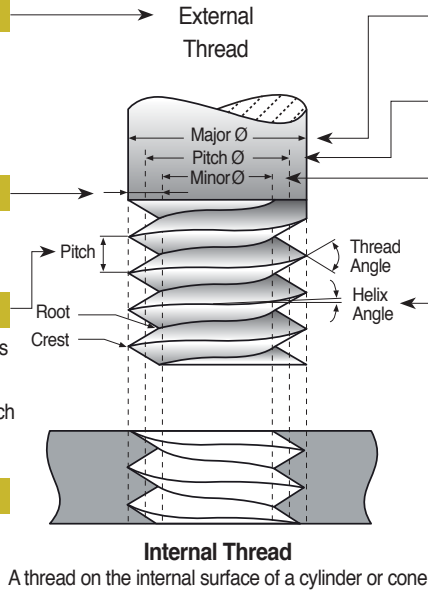
The distance between the crest and root measured from normal to the axis

Pitch

The distance between the corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the tpi (threads per inch), which is the reciprocal of the pitch

Nominal Diameter

The diameter of which the diameter limits are derived by the application of deviation allowances and tolerances



Major Diameter

The largest diameter of a screw thread

Pitch Diameter

On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal

Minor Diameter

The smallest diameter of a screw thread

Helix Angle

For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

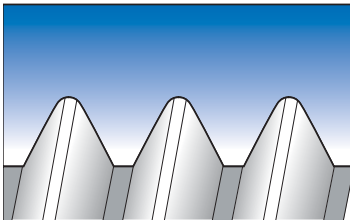
Straight Thread

A thread formed on a cylinder

Taper Thread

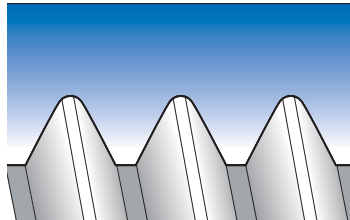
A thread formed on a cone

Left handed thread



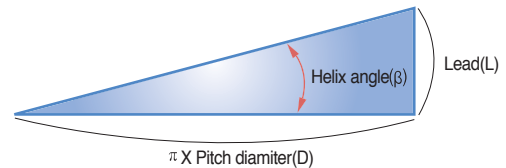
A thread which, when viewed axially, winds in a counter clockwise and receding direction. All left handed threads are designated LH

Right handed thread



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right handed unless they are specified

The Helix Angle (β)

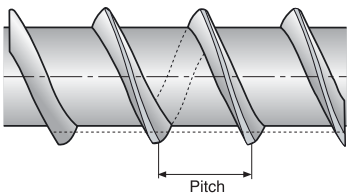


For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

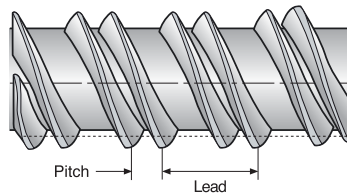
Machining a Multi-start Thread

► A thread in which the lead is an integral multiple, greater than one, of the pitch. A multi-start thread permits a more rapid advance without a coarser (larger) thread form

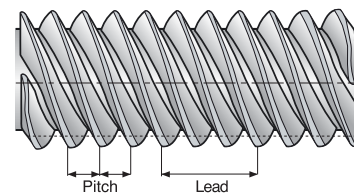
First Start Machined



Second Start Machined

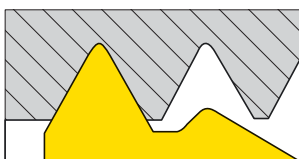


Third Start Machined (Final, 3 Starts Thread)



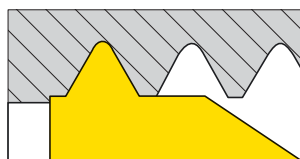
Insert Profile Style

Partial Profile



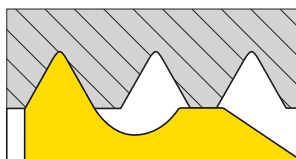
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle

Full Profile



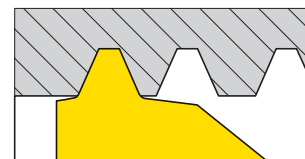
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required

Full Profile for Fine Pitches



The full profile for Fine Pitches will form a complete thread. The topping of the outer diameter is generated by second tooth

Semi Full

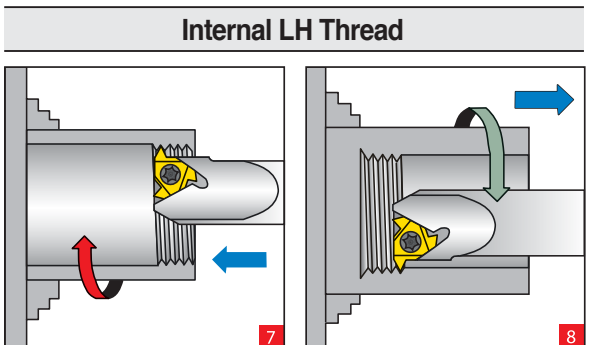
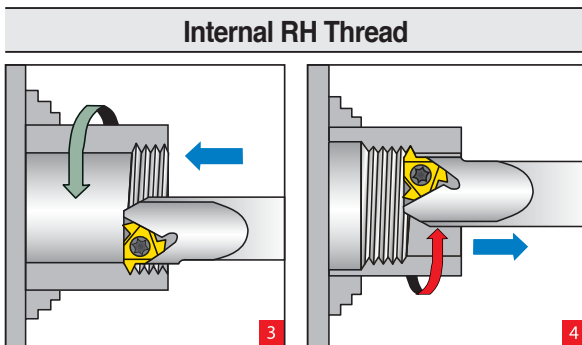
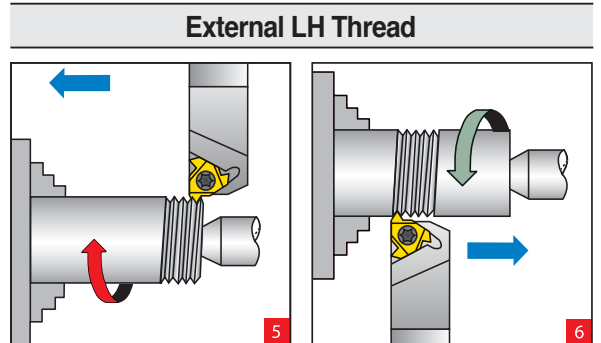
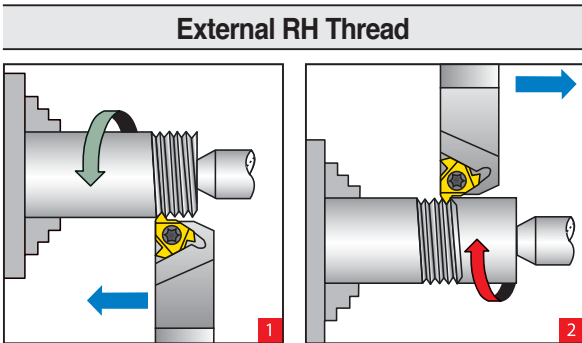


The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter. Mainly used for trapezoidal profiles

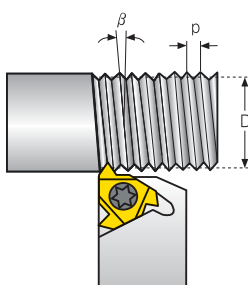


Thread Turning Method

| Thread | Inserts & Tool holder | Rotation | Feed Direction | Helix Method | Drawing No. |
|---------------------|-----------------------|-------------------|----------------|--------------|-------------|
| Right Hand External | EX RH | Counter clockwise | Towards chuck | Regular | 1 |
| | EX LH | Clockwise | From chuck | Reversed | 2 |
| Right Hand Internal | IN RH | Counter clockwise | Towards chuck | Regular | 3 |
| | IN LH | Clockwise | From chuck | Reversed | 4 |
| Left Hand External | EX LH | Counter clockwise | Towards chuck | Regular | 5 |
| | EX RH | Clockwise | From chuck | Reversed | 6 |
| Left Hand Internal | IN LH | Counter clockwise | Towards chuck | Regular | 7 |
| | IN RH | Clockwise | From chuck | Reversed | 8 |



Calculating the Helix Angle(β)

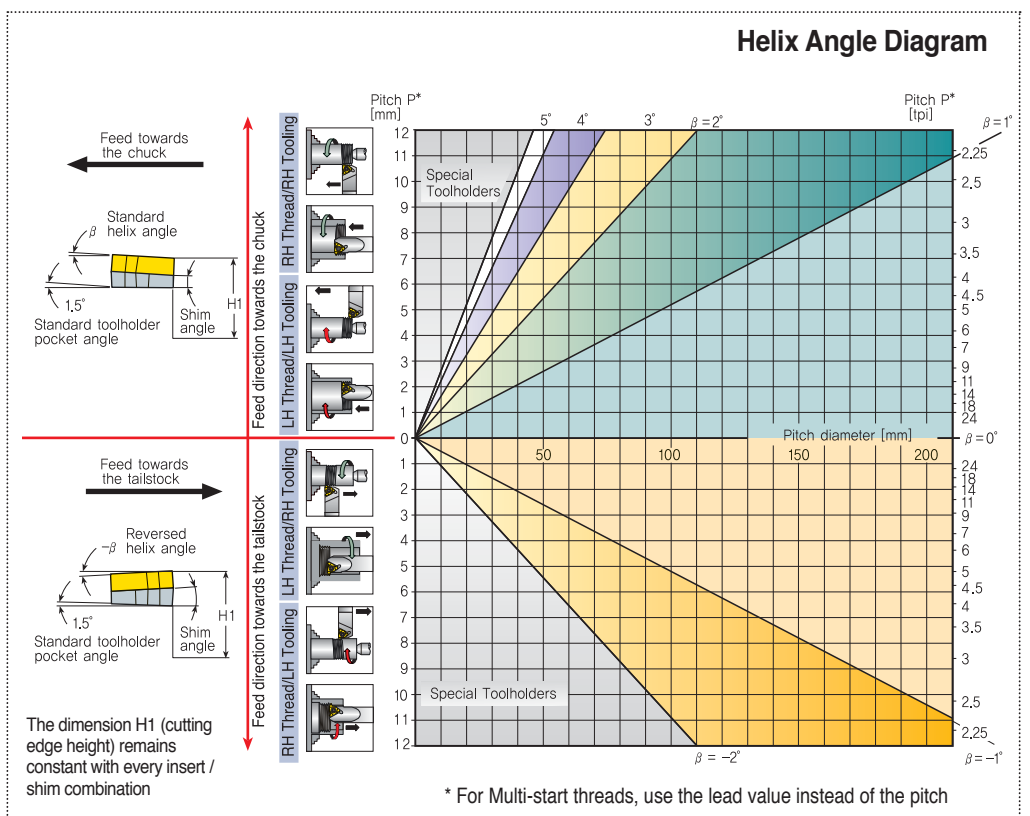


- The helix angle is calculated by the following formula :

$$\beta = \tan^{-1} \frac{P \times N}{\pi \times D}$$

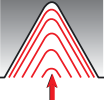
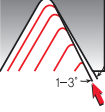

- β - Helix angle ()°
- P - Pitch(mm)
- N - No. of starts
- D - Pitch diameter(mm)
- Lead = P x N

- The helix angle can also be found from the diagram below



* For Multi-start threads, use the lead value instead of the pitch

Thread Infeed Method

| Radial Infeed | Flank Infeed (modified) | Alternate Flank Infeed |
|---|---|--|
|  <p>Radial infeed is the simplest and quickest method. The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation. Radial infeed is recommended in 3 cases</p> |  <p>Flank infeed is recommended in the following cases</p> |  <p>Use of the alternate flank method is recommended especially in large pitches and for materials with long chils</p> |
| <ul style="list-style-type: none"> • when the pitch is smaller than 16 tpi • for material with short chips • for work with hardened material | <ul style="list-style-type: none"> • When the thread pitch is greater than 16 tpi. Using the radial method, the effective cutting edge length is too large, resulting in chatter. For TRAPEZ and ACME. The radial method results in three cutting edges, making chip flow very difficult | <ul style="list-style-type: none"> • This method divides the load equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming, and is not available on all lathes |

Shim



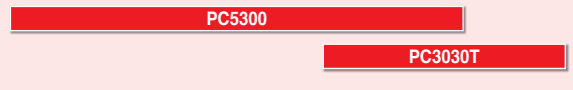
| Standard Shim | ATE | | ATI | | Helix angle 1.5° | Insert Size | | Holder | | Ordering Code | |
|---------------|-----|--|-----|--|------------------|-------------|----|--------|--------|---------------|-------|
| | ATE | | ATI | | | d | L | ER(L)H | IR(L)H | ATE22 | ATI27 |
| | ATE | | ATI | | | 9.525 | 16 | ER(L)H | IR(L)H | ATE22 | ATI27 |
| | ATE | | ATI | | | 12.7 | 22 | ER(L)H | IR(L)H | ATE27 | ATI27 |
| | ATE | | ATI | | | 15.875 | 27 | ER(L)H | IR(L)H | ATE27 | ATI27 |

* Standard shim has lead angle 1.5°

Application grade

| Grade | Features | Available insert type |
|---------|---|---------------------------------------|
| PC5300 | <ul style="list-style-type: none"> • PVD Universal Grade For chip breaker type only Stable machining on a wide application due to fine-grained carbide substrate with balanced heat resistance and toughness Excellent wear resistance and oxidation resistance due to AlTiN coating film Outstanding performance on high speed machining | ERM/IRM (Insert with Chip breaker) |
| PC3030T | <ul style="list-style-type: none"> • General Grade A tough sub-micron substrate with TiAlN coating provides good fracture toughness and excellent wear resistance Outstanding performance on STS and hard to cut materials | ER/IR (Ground insert) |

Recommended Cutting Speed as per workpiece(vc)

| ISO | Work piece | Recommended Cutting Speed (vc) |
|-----|---|--|
| P | Carbon steel, Alloy steel, Cast Steel |  |
| M | Stainless steel, Heat resistant steel, Titanium alloy steel |  |
| K | Carbon Iron, Aluminum, Cast Steel, Copper |  |

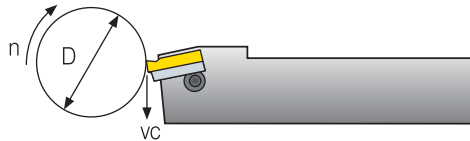
D Technical Information for Threading

Recommended Cutting Speed as per workpiece(vc)

| Material | | Hardness Brinell (HB) | ISO vc(m/min) PC3030T |
|-------------------------|--|-----------------------------------|--------------------------|
| P | Carbon steel | Low carbon (C=0.1-0.25 %) | 125 |
| | | Medium carbon (C=0.25-0.55 %) | 150 |
| | | High carbon (C=0.55-0.85 %) | 170 |
| | Low alloy steel (alloying elements ≤ 5%) | Non hardened | 180 |
| | | Hardened | 275 |
| | | Hardened | 350 |
| | High alloy steel (alloying elements > 5%) | Annealed | 200 |
| | | Hardened | 325 |
| Cast steel | Low alloy (alloying elements <5%) | 200 | |
| | High alloy (alloying elements >5%) | 225 | |
| M | Stainless steel Ferritic | Non hardened | 200 |
| | | Hardened | 330 |
| | Stainless steel Austenitic | Austenitic | 180 |
| | | Super austenitic | 200 |
| | Stainless steel Cast ferritic | Non hardened | 200 |
| | | Hardened | 330 |
| | Stainless steel Cast austenitic | Austenitic | 200 |
| | | Hardened | 330 |
| | High temperature alloy | Annealed (Iron based) | 200 |
| | | Aged (Iron based) | 280 |
| | | Annealed (Nickel or Cobalt based) | 250 |
| | | Aged (Nickel or Cobalt based) | 350 |
| | Titanium alloy | 99.5% pure Titanium | 400Rm |
| | | Titanium alloy | 1050Rm |
| K | Extra hard steel | Hardened & tempered | 55HrC |
| | Malleable cast iron | Ferritic (short chips) | 130 |
| | | Pearlitic (long chips) | 230 |
| | Gray cast iron | Low tensile strength | 180 |
| | | High tensile strength | 260 |
| | Nodular SG iron | Ferritic | 160 |
| | | Pearlitic | 260 |
| | Aluminum alloy Wrought | Non aging | 60 |
| | | Aged | 100 |
| | Aluminum alloy | Cast | 75 |
| | | Cast & aged | 90 |
| Cast Si 13-22% | | 130 | |
| Copper and copper alloy | Brass | 90 | |
| | Bronze and non leaded copper | 100 | |

Calculation of N [RPM]

$$n = \frac{vc \times 1000}{\pi \times D} \quad vc = \frac{\pi \times D \times n}{1000}$$



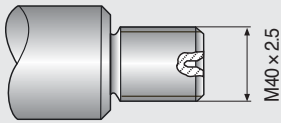
n - Revolution Per Minute [min⁻¹]
vc - Cutting Speed [m/min]
D - Workpiece Diameter [mm]

Number of Passes

| Pitch | mm | 0.50 | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 | 4.50 | 5.00 | 5.50 | 6.00 | 8.00 |
|---------------|-----|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|
| | tpi | 48 | 32 | 24 | 20 | 16 | 14 | 12 | 10 | 8 | 7 | 6 | 5.5 | 5 | 4.5 | 4 | 3 |
| No. of passes | | 4~6 | 4~7 | 4~8 | 5~9 | 6~10 | 7~12 | 7~12 | 8~14 | 9~16 | 10~18 | 11~18 | 11~19 | 12~20 | 12~20 | 12~20 | 15~24 |

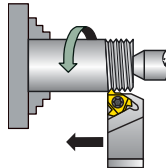
* One cutting depth is calculated by total cutting depth divided into machining times
ex) ER16-1.5ISO, hmin 0.92 : If 10times machining, one cutting depth is 0.092(0.92/10)

Step by step Thread Turning



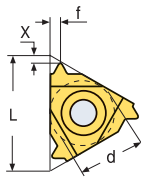
Application Thread : External Right Hand ISO Metric M40 x 2.5
Material : 4140 (25 HRC)

1 Choose the Thread Turning Method



Feed direction towards the chuck was chosen
Therefore an external right hand insert and an external right hand holder will be used

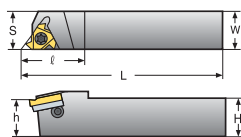
2 Choose the Insert Size



Chosen insert : **ER16 - 2.5 ISO**

| Insert size | Pitch | Ordering Code | Shim | Tool holder |
|-------------|-------|---------------|-------|-------------|
| d | mm | RH | RH | |
| 9.525 | 2.5 | ER16-2.5ISO | ATE16 | ERH□□-16 |

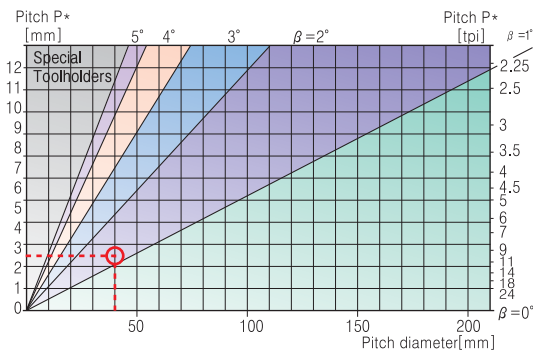
3 Choose the Tool holder



Chosen tool holder : **ERH 25 - 16**

| Insert size | Ordering code | Dimensions(mm) | | | | | |
|-------------|---------------|----------------|----|----|-------|----|--|
| d | RH | H=h | W | S | L | ℓ | |
| 9.525 | ERH25-16 | 25 | 25 | 25 | 153.6 | 30 | |

4 Determine the Helix Angle



From the table, using a pitch of 2.5 mm (10 tpi) and a workpiece diameter of 40mm (1.57"), we find the helix angle to be 1.5°

5 Choose the Correct Shim

Shim Chosen : **ATE16**

| Resultant Helix Angle | | 1.5° |
|-----------------------|---|-------|
| Insert size | d | 9.525 |
| | L | 16 |
| Ordering Code | | ATE16 |

6 Choose the Carbide Grade and Cutting Speed

Carbide grade chosen : PC3030T / Cutting speed : 140m/min

| Material | HB | vc(m/min) | |
|---|--------------|-----------|--------|
| | | PC3030T | |
| P Low alloy steel (alloying elements ≤ 5%) | Non hardened | 180 | 85~145 |
| | Hardened | 275 | 75~140 |
| | Hardened | 350 | 70~135 |

7 Determine the Number of Passes

Carbide grade chosen : PC3030T
Cutting speed : 140m/min

| Pitch | mm | 1.50 | 1.75 | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 |
|---------------|-----|------|------|------|------|------|-------|-------|
| | tpi | 16 | 14 | 12 | 10 | 8 | 7 | 6 |
| No. of passes | | 6~10 | 7~12 | 7~12 | 8~14 | 9~16 | 10~18 | 11~18 |

8 Summary

| Thread type | ISO M40 x 2.5 External Right Hand |
|---------------------|-----------------------------------|
| 1. Feed Direction | Towards the chuck |
| 2. Insert and Grade | ER16-2.5 ISO, PC3030T |
| 3. Tool holder | ERH25-16 |
| 4. Helix Angle | 1.5° |
| 5. Shim | ATE16 |
| 6. Cutting Speed | 140 m/min |
| 7. Number of Passes | 10 |



🎯 Cutting Condition depending on

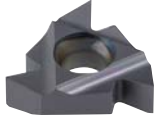
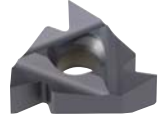




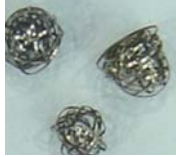




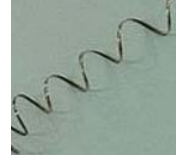
| | | | | | |
|--------------------|---|--|------------------------|--------------------------------|---------------------------|
| Workpiece | Material Type | | Coolant | Coolant Type | |
| | Material Dimension | | | Holders | Holder Cross Section Area |
| | Diameter and Length Chipflow Character | | Holder Overhang | | |
| | Material Hardness | | Through Coolant Option | | |
| Thread Application | External or Internal | | Insert | Shank Type: Carbide, Alloy, | |
| | Profile Shape | | | Carbide Implant Grade | |
| | Surface Finish | | | Profile Shape: Pitch and Depth | |
| Machine | Machine Stability | | Nose Radius | | |
| | Max. RPM | | Chipbreaker Style | | |
| | Clamping System Stability | | | | |

🎯 Trouble Shooting


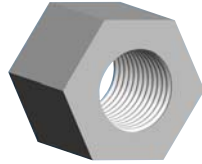
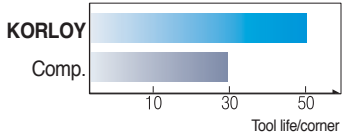
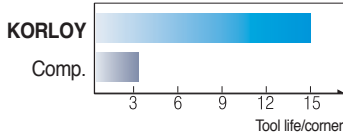
| Problem | Possible Cause | Solution |
|-------------------------------|---|---|
| Increased flank wear | <ul style="list-style-type: none"> Cutting speed too high Depth of cut too low/too many passes Unsuitable carbide grade Insufficient cooling | <ul style="list-style-type: none"> Reduce cutting speed/ use coated insert Increase the depth of cut per pass Use a coated carbide grade Increase coolant flow rate |
| Uneven cutting edge wear | <ul style="list-style-type: none"> Incorrect helix angle Wrong infeed method | <ul style="list-style-type: none"> Choose the correct shim Use the Alternating Flank Infeed method |
| Extreme plastic deformation | <ul style="list-style-type: none"> Depth of cut too large Insufficient cooling Cutting speed too high Unsuitable carbide grade Nose radius too small | <ul style="list-style-type: none"> Decrease depth of cut/ increase number of passes Increase coolant flow rate Reduce cutting speed Use a tougher carbide Use an insert with a larger radius, if possible |
| Cutting edge breakage | <ul style="list-style-type: none"> Depth of cut too large Extreme plastic deformation Insufficient cooling Unsuitable carbide grade Instability | <ul style="list-style-type: none"> Decrease depth of cut/ increase number of passes. Use a tougher carbide Increase flow rate and/ or correct flow direction Use a tougher carbide Check stability of the system |
| Built-up edge | <ul style="list-style-type: none"> Incorrect cutting speed Unsuitable carbide grade | <ul style="list-style-type: none"> Change the cutting speed Use a coated carbide |
| Thread profile is too shallow | <ul style="list-style-type: none"> The tool is not at the workpiece axis height Insert is not machining the thread crest Worn insert | <ul style="list-style-type: none"> Change tool height Measure the workpiece diameter Change the cutting edge sooner |
| Poor surface quality | <ul style="list-style-type: none"> Too low cutting speed Wrong shim Flank infeed method is not appropriate | <ul style="list-style-type: none"> Increase cutting speed Choose correct shim Use the alternate flank or radial infeed method |

Threading insert with chip breaker

- Features**
- ▶ Economical insert
 - ▶ Good toughness and high accuracy as ground type inserts
 - ▶ Exclusive insert design improves chip control.
 - ▶ New grade for general application of various kinds of workpieces

| Type | Ground insert | | Insert with a chip breaker | | | |
|--------------|---|---|--|--|--|---|
| C/B Code | None | | None | U | | |
| Designation | ER16-1.5ISO | | ERM16-1.5ISO | | ERM16-1.5ISO-U | |
| Machining | External | Internal | External | Internal | External | Internal |
| Insert Shape |  |  |  |  |  |  |
| Chip Shape |  |  |  |  |  |  |
| Class | P, M, K, N, S | | P, M, K | | P, M, K | |
| Application | G-Class | | M-Class | | M-Class | |
| Features | <ul style="list-style-type: none"> • Groove-shaped chip breaker with superior chip evacuation lowers cutting load. • Enables high precision machining. • Applicable for machining of various shapes of threads. • Applicable for machining of various workpieces. | | <ul style="list-style-type: none"> • Unique 3 dimensional chip breaker improves machinability with good chip control. • Excellent cutting edge treatment technology ensures high precision sharp cutting edge. | | <ul style="list-style-type: none"> • Groove-shaped chip breaker with superior chip evacuation lowers cutting load. • Reduces machining pass by 10~30%. • Excellent cutting edge treatment achieves high precision sharp cutting edge. | |

Machining Example

| Korloy | | ERM16-1.5ISO [PC3030T] | IRM16-2.0ISO [PC3030T] | |
|-------------------|---|---|---|--|
| Competitor tools | | ERM16-1.5ISO [K-Maker] | IRM16-2.0ISO [S-Maker] | |
| Workpiece | Material | SCM440 | STS304 | |
| | Figure |  |  | |
| Cutting condition | Cutting speed (m/min) | 63 | 120 | |
| | Pass | 8 | 9 | |
| | Machining | Radial infeed | Radial infeed | |
| | Pitch | 1.5 | 2.0 | |
| Coolant | | Wet | Wet | |
| Result |  | |  | |
| | Increased tool life with good chip breaking | | Prevention outbreak damage of insert due to smooth chip control | |



Partial profile 60°

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|----------|-------|------------|----|------|-----|-----|---------|
| | | | | | (mm) | (tpi) | d | L | r | x | f | |
| External | ER 11-A60 | ● | EL 11-A60 | | 0.5~1.5 | 48~16 | 6.35 | 11 | 0.05 | 0.8 | 0.9 | |
| | 16-A60 | ● | 16-A60 | ● | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.05 | 0.8 | 0.9 | |
| | 16-G60 | ● | 16-G60 | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.27 | 1.2 | 1.7 | |
| | 16-AG60 | ● | 16-AG60 | ● | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | 22-N60 | ● | 22-N60 | | 3.5~5.0 | 7~5 | 12.7 | 22 | 0.53 | 1.7 | 2.5 | |
| | 27-Q60 | ● | 27-Q60 | | 5.5~6.0 | 4.5~4 | 15.875 | 27 | 0.64 | 2.1 | 3.1 | |
| Internal | IR 11-A60 | ● | IL 11-A60 | | 0.5~1.5 | 48~16 | 6.35 | 11 | 0.05 | 0.8 | 0.9 | |
| | 16-A60 | ● | 16-A60 | | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.05 | 0.8 | 0.9 | |
| | 16-G60 | ● | 16-G60 | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.16 | 1.2 | 1.7 | |
| | 16-AG60 | ● | 16-AG60 | ● | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.05 | 1.2 | 1.7 | |
| | 22-N60 | ● | 22-N60 | | 3.5~5.0 | 7~5 | 12.7 | 22 | 0.30 | 1.7 | 2.5 | |
| | 27-Q60 | ● | 27-Q60 | | 5.5~6.0 | 4.5~4 | 15.875 | 27 | 0.30 | 1.8 | 2.7 | |

● Applicable holders, see pages D31, D32

● : Stock item

Partial profile 60° (M Chip Breaker)

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|----------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | (tpi) | d | L | r | x | f | |
| External | ERM 16-A60 | ● | | | | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.05 | 0.8 | 0.9 | |
| | 16-G60 | ● | | | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.27 | 1.2 | 1.7 | |
| | 16-AG60 | ● | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | 22-N60 | ● | | | | 3.5~5.0 | 7~5 | 12.7 | 22 | 0.53 | 1.7 | 2.5 | |
| Internal | IRM 11-A60 | ● | | | | 0.5~1.5 | 48~16 | 6.35 | 11 | 0.08 | 0.8 | 0.9 | |
| | 16-A60 | ● | | | | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.08 | 0.8 | 0.9 | |
| | 16-G60 | ● | | | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.12 | 1.2 | 1.7 | |
| | 16-AG60 | ● | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | 22-N60 | ● | | | | 3.5~5.0 | 7~5 | 12.7 | 22 | 0.30 | 1.7 | 2.5 | |

● Applicable holders, see pages D31, D32

● : Stock item

Partial profile 60° (U Chip Breaker)

New

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | (tpi) | d | L | r | x | f | |
| External | ERM 16-AG60-U | | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Internal | IRM 16-AG60-U | | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

● Applicable holders, see pages D31, D32

● : Stock item

Partial profile 55°

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|----------|-------|------------|----|------|-----|-----|---------|
| | | | | | (mm) | (tpi) | d | L | r | x | f | |
| External | ER 11-A55 | | EL 11-A55 | | 0.5~1.5 | 48~16 | 6.35 | 11 | 0.05 | 0.8 | 0.9 | |
| | 16-A55 | ● | 16-A55 | ● | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.05 | 0.8 | 0.9 | |
| | 16-G55 | ● | 16-G55 | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.21 | 1.2 | 1.7 | |
| | 16-AG55 | ● | 16-AG55 | ● | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.07 | 1.2 | 1.7 | |
| | 22-N55 | ● | 22-N55 | | 3.5~5.0 | 7~5 | 12.7 | 22 | 0.43 | 1.7 | 2.5 | |
| | 27-Q55 | ● | 27-Q55 | | 5.5~6.0 | 4.5~4 | 15.875 | 27 | 0.60 | 2.0 | 2.9 | |
| Internal | IR 11-A55 | ● | IL 11-A55 | | 0.5~1.5 | 48~16 | 6.35 | 11 | 0.05 | 0.8 | 0.9 | |
| | 16-A55 | ● | 16-A55 | | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.05 | 0.8 | 0.9 | |
| | 16-G55 | ● | 16-G55 | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.21 | 1.2 | 1.7 | |
| | 16-AG55 | ● | 16-AG55 | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.07 | 1.2 | 1.7 | |
| | 22-N55 | ● | 22-N55 | | 3.5~5.0 | 7~5 | 12.7 | 22 | 0.43 | 1.7 | 2.5 | |
| | 27-Q55 | ● | 27-Q55 | | 5.5~6.0 | 4.5~4 | 15.875 | 27 | 0.60 | 2.0 | 2.9 | |

Applicable holders, see pages D31, D32

● : Stock item

Partial profile 55° (M Chip Breaker)

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|----------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | (tpi) | d | L | r | x | f | |
| External | ERM 16-A55 | ● | | | | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.08 | 0.8 | 0.9 | |
| | 16-G55 | ● | | | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.21 | 1.2 | 1.7 | |
| | 16-AG55 | ● | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.07 | 1.2 | 1.7 | |
| | 22-N55 | ● | | | | 3.5~5.0 | 7~5 | 12.7 | 27 | 0.43 | 1.7 | 2.5 | |
| Internal | IRM 11-A55 | ● | | | | 0.5~1.5 | 48~16 | 6.35 | 11 | 0.08 | 0.8 | 0.9 | |
| | 16-A55 | | | | | 0.5~1.5 | 48~16 | 9.525 | 16 | 0.05 | 0.8 | 0.9 | |
| | 16-G55 | | | | | 1.75~3.0 | 14~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | 16-AG55 | ● | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | 22-N55 | ● | | | | 3.5~5.0 | 7~5 | 12.7 | 22 | 0.43 | 1.7 | 2.5 | |

Applicable holders, see pages D31, D32

● : Stock item

Partial profile 55° (U Chip Breaker) *New*

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | (tpi) | d | L | r | x | f | |
| External | ERM 16-AG55-U | | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.07 | 1.2 | 1.7 | |
| | | | | | | | | | | | | | |
| Internal | IRM 16-AG55-U | | | | | 0.5~3.0 | 48~8 | 9.525 | 16 | 0.08 | 1.2 | 1.7 | |
| | | | | | | | | | | | | | |

Applicable holders, see pages D31, D32

● : Stock item

ISO Metric

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | (mm) | d | L | hmin | x | f | |
| External | ER 11-0.35ISO | | EL 11-0.35ISO | | 0.35 | 6.35 | 11 | 0.21 | 0.8 | 0.4 | |
| | 11-0.4ISO | | 11-0.4ISO | | 0.4 | 6.35 | 11 | 0.25 | 0.7 | 0.4 | |
| | 11-0.45ISO | | 11-0.45ISO | | 0.45 | 6.35 | 11 | 0.28 | 0.7 | 0.4 | |
| | 11-0.5ISO | | 11-0.5ISO | | 0.5 | 6.35 | 11 | 0.31 | 0.6 | 0.4 | |
| | 11-0.6ISO | | 11-0.6ISO | | 0.6 | 6.35 | 11 | 0.37 | 0.6 | 0.6 | |
| | 11-0.7ISO | | 11-0.7ISO | | 0.7 | 6.35 | 11 | 0.43 | 0.6 | 0.6 | |
| | 11-0.75ISO | | 11-0.75ISO | | 0.75 | 6.35 | 11 | 0.46 | 0.6 | 0.6 | |
| | 11-0.8ISO | | 11-0.8ISO | | 0.8 | 6.35 | 11 | 0.49 | 0.6 | 0.6 | |
| | 11-1.0ISO | ● | 11-1.0ISO | | 1.0 | 6.35 | 11 | 0.61 | 0.7 | 0.7 | |
| | 11-1.25ISO | | 11-1.25ISO | | 1.25 | 6.35 | 11 | 0.77 | 0.8 | 0.9 | |
| | 11-1.5ISO | | 11-1.5ISO | | 1.5 | 6.35 | 11 | 0.92 | 0.8 | 1.0 | |
| | 11-1.75ISO | | 11-1.75ISO | | 1.75 | 6.35 | 11 | 1.07 | 0.8 | 1.1 | |
| | 16-0.35ISO | | 16-0.35ISO | | 0.35 | 9.525 | 16 | 0.21 | 0.8 | 0.4 | |
| | 16-0.4ISO | ● | 16-0.4ISO | | 0.4 | 9.525 | 16 | 0.25 | 0.7 | 0.4 | |
| | 16-0.45ISO | | 16-0.45ISO | | 0.45 | 9.525 | 16 | 0.28 | 0.7 | 0.4 | |
| | 16-0.5ISO | ● | 16-0.5ISO | | 0.5 | 9.525 | 16 | 0.31 | 0.6 | 0.4 | |
| | 16-0.6ISO | | 16-0.6ISO | | 0.6 | 9.525 | 16 | 0.37 | 0.6 | 0.6 | |
| | 16-0.7ISO | ● | 16-0.7ISO | | 0.7 | 9.525 | 16 | 0.43 | 0.6 | 0.6 | |
| | 16-0.75ISO | ● | 16-0.75ISO | | 0.75 | 9.525 | 16 | 0.46 | 0.6 | 0.6 | |
| | 16-0.8ISO | ● | 16-0.8ISO | | 0.8 | 9.525 | 16 | 0.49 | 0.6 | 0.6 | |
| | 16-1.0ISO | ● | 16-1.0ISO | ● | 1.0 | 9.525 | 16 | 0.61 | 0.7 | 0.7 | |
| | 16-1.25ISO | ● | 16-1.25ISO | | 1.25 | 9.525 | 16 | 0.77 | 0.8 | 0.9 | |
| | 16-1.5ISO | ● | 16-1.5ISO | ● | 1.5 | 9.525 | 16 | 0.92 | 0.8 | 1.0 | |
| | 16-1.75ISO | ● | 16-1.75ISO | | 1.75 | 9.525 | 16 | 1.07 | 0.9 | 1.2 | |
| | 16-2.0ISO | ● | 16-2.0ISO | ● | 2.0 | 9.525 | 16 | 1.23 | 1.0 | 1.3 | |
| | 16-2.5ISO | ● | 16-2.5ISO | ● | 2.5 | 9.525 | 16 | 1.53 | 1.1 | 1.5 | |
| | 16-3.0ISO | ● | 16-3.0ISO | ● | 3.0 | 9.525 | 16 | 1.84 | 1.2 | 1.6 | |
| | 22-3.5ISO | ● | 22-3.5ISO | | 3.5 | 12.7 | 22 | 2.15 | 1.6 | 2.3 | |
| | 22-4.0ISO | ● | 22-4.0ISO | | 4.0 | 12.7 | 22 | 2.45 | 1.6 | 2.3 | |
| | 22-4.5ISO | ● | 22-4.5ISO | | 4.5 | 12.7 | 22 | 2.78 | 1.7 | 2.4 | |
| | 22-5.0ISO | ● | 22-5.0ISO | | 5.0 | 12.7 | 22 | 3.07 | 1.7 | 2.5 | |
| | 27-5.5ISO | | 27-5.5ISO | | 5.5 | 15.875 | 27 | 3.37 | 1.9 | 2.7 | |
| | 27-6.0ISO | | 27-6.0ISO | | 6.0 | 15.875 | 27 | 3.68 | 2.0 | 2.9 | |

● Applicable holders, see pages D31

● : Stock item

ISO Metric (M Chip Breaker)

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | d | L | hmin | x | f | |
| External | ERM 16-1.0ISO | | | | | 1.0 | 9.525 | 16 | 0.61 | 0.7 | 0.7 | |
| | 16-1.25ISO | | | | | 1.25 | 9.525 | 16 | 0.77 | 0.8 | 0.9 | |
| | 16-1.5ISO | ● | | | | 1.5 | 9.525 | 16 | 0.93 | 0.8 | 1.0 | |
| | 16-1.75ISO | ● | | | | 1.75 | 9.525 | 16 | 1.09 | 0.9 | 1.2 | |
| | 16-2.0ISO | ● | | | | 2.0 | 9.525 | 16 | 1.25 | 1.0 | 1.3 | |
| | 16-2.5ISO | ● | | | | 2.5 | 9.525 | 16 | 1.55 | 1.1 | 1.5 | |
| | 16-3.0ISO | ● | | | | 3.0 | 9.525 | 16 | 1.87 | 1.2 | 1.6 | |

Applicable holders, see pages D31

● : Stock item

ISO Metric (U Chip Breaker) *New*

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | d | L | hmin | x | f | |
| External | ERM 16-1.5ISO-U | | | | | 1.5 | 9.525 | 16 | 0.93 | 0.8 | 1.0 | |
| | 16-2.0ISO-U | | | | | 2.0 | 9.525 | 16 | 1.25 | 1.0 | 1.3 | |
| | | | | | | | | | | | | |

Applicable holders, see pages D31

● : Stock item



ISO Metric

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (mm) | Dimensions | | | | | Picture |
|-----------|---------------------|-----------|--------------------|---------|------------|------------|------|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| Internal | IR 11-0.35ISO | | IL 11-0.35ISO | | 0.35 | 6.35 | 11 | 0.20 | 0.8 | 0.3 | |
| | 11-0.4ISO | | 11-0.4ISO | | 0.4 | 6.35 | 11 | 0.23 | 0.8 | 0.4 | |
| | 11-0.45ISO | | 11-0.45ISO | | 0.45 | 6.35 | 11 | 0.26 | 0.8 | 0.4 | |
| | 11-0.5ISO | ● | 11-0.5ISO | | 0.5 | 6.35 | 11 | 0.29 | 0.6 | 0.4 | |
| | 11-0.6ISO | | 11-0.6ISO | | 0.6 | 6.35 | 11 | 0.35 | 0.6 | 0.6 | |
| | 11-0.7ISO | | 11-0.7ISO | | 0.7 | 6.35 | 11 | 0.40 | 0.6 | 0.6 | |
| | 11-0.75ISO | ● | 11-0.75ISO | | 0.75 | 6.35 | 11 | 0.43 | 0.6 | 0.6 | |
| | 11-0.8ISO | | 11-0.8ISO | | 0.8 | 6.35 | 11 | 0.46 | 0.6 | 0.6 | |
| | 11-1.0ISO | ● | 11-1.0ISO | | 1.0 | 6.35 | 11 | 0.58 | 0.6 | 0.7 | |
| | 11-1.25ISO | ● | 11-1.25ISO | | 1.25 | 6.35 | 11 | 0.72 | 0.8 | 0.9 | |
| | 11-1.5ISO | ● | 11-1.5ISO | | 1.5 | 6.35 | 11 | 0.87 | 0.8 | 1.0 | |
| | 11-1.75ISO | ● | 11-1.75ISO | | 1.75 | 6.35 | 11 | 1.01 | 0.9 | 1.1 | |
| | 11-2.0ISO | ● | 11-2.0ISO | | 2.0 | 6.35 | 11 | 1.15 | 0.9 | 1.1 | |
| | 11-2.5ISO | ● | 11-2.5ISO | | 2.5 | 6.35 | 11 | 1.44 | 0.8 | 1.1 | |
| | 16-0.35ISO | | 16-0.35ISO | | 0.35 | 9.525 | 16 | 0.20 | 0.8 | 0.3 | |
| | 16-0.4ISO | | 16-0.4ISO | | 0.4 | 9.525 | 16 | 0.23 | 0.8 | 0.4 | |
| | 16-0.45ISO | | 16-0.45ISO | | 0.45 | 9.525 | 16 | 0.26 | 0.8 | 0.4 | |
| | 16-0.5ISO | ● | 16-0.5ISO | | 0.5 | 9.525 | 16 | 0.29 | 0.6 | 0.4 | |
| | 16-0.6ISO | | 16-0.6ISO | | 0.6 | 9.525 | 16 | 0.35 | 0.6 | 0.6 | |
| | 16-0.7ISO | ● | 16-0.7ISO | | 0.7 | 9.525 | 16 | 0.40 | 0.6 | 0.6 | |
| | 16-0.75ISO | ● | 16-0.75ISO | | 0.75 | 9.525 | 16 | 0.43 | 0.6 | 0.6 | |
| | 16-0.8ISO | ● | 16-0.8ISO | | 0.8 | 9.525 | 16 | 0.46 | 0.6 | 0.6 | |
| | 16-1.0ISO | ● | 16-1.0ISO | | 1.0 | 9.525 | 16 | 0.58 | 0.6 | 0.7 | |
| | 16-1.25ISO | ● | 16-1.25ISO | | 1.25 | 9.525 | 16 | 0.72 | 0.8 | 0.9 | |
| | 16-1.5ISO | ● | 16-1.5ISO | | 1.5 | 9.525 | 16 | 0.87 | 0.8 | 1.0 | |
| | 16-1.75ISO | ● | 16-1.75ISO | | 1.75 | 9.525 | 16 | 1.01 | 0.9 | 1.2 | |
| | 16-2.0ISO | ● | 16-2.0ISO | | 2.0 | 9.525 | 16 | 1.15 | 1.0 | 1.3 | |
| | 16-2.5ISO | ● | 16-2.5ISO | ● | 2.5 | 9.525 | 16 | 1.44 | 1.1 | 1.5 | |
| | 16-3.0ISO | ● | 16-3.0ISO | | 3.0 | 9.525 | 16 | 1.73 | 1.1 | 1.5 | |
| | 22-3.5ISO | ● | 22-3.5ISO | | 3.5 | 12.7 | 22 | 2.02 | 1.6 | 2.3 | |
| | 22-4.0ISO | ● | 22-4.0ISO | | 4.0 | 12.7 | 22 | 2.31 | 1.6 | 2.3 | |
| | 22-4.5ISO | ● | 22-4.5ISO | | 4.5 | 12.7 | 22 | 2.60 | 1.6 | 2.4 | |
| | 22-5.0ISO | ● | 22-5.0ISO | | 5.0 | 12.7 | 22 | 2.89 | 1.6 | 2.3 | |
| 27-5.5ISO | ● | 27-5.5ISO | | 5.5 | 15.875 | 27 | 3.17 | 1.6 | 2.3 | | |
| 27-6.0ISO | | 27-6.0ISO | | 6.0 | 15.875 | 27 | 3.46 | 1.8 | 2.5 | | |

● Applicable holders, see pages D32

● : Stock item

ISO Metric (M Chip Breaker)

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | d | L | hmin | x | f | |
| Internal | IRM 11-1.5ISO | ● | | | | 1.5 | 6.35 | 11 | 0.85 | 0.8 | 1.0 | |
| | 16-1.0ISO | | | | | 1.0 | 9.525 | 16 | 0.58 | 0.6 | 0.7 | |
| | 16-1.25ISO | | | | | 1.25 | 9.525 | 16 | 0.72 | 0.8 | 0.9 | |
| | 16-1.5ISO | ● | | | | 1.5 | 9.525 | 16 | 0.85 | 0.8 | 1.0 | |
| | 16-1.75ISO | | | | | 1.75 | 9.525 | 16 | 1.01 | 0.9 | 1.2 | |
| | 16-2.0ISO | ● | | | | 2.0 | 9.525 | 16 | 1.12 | 1.0 | 1.3 | |
| | 16-2.5ISO | | | | | 2.5 | 9.525 | 16 | 1.44 | 1.1 | 1.5 | |
| | 16-3.0ISO | ● | | | | 3.0 | 9.525 | 16 | 1.69 | 1.1 | 1.5 | |

● Applicable holders, see pages D32

● : Stock item

ISO Metric (U Chip Breaker) *New*

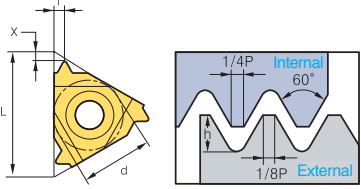
| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (mm) | d | L | hmin | x | f | |
| Internal | IRM 16-1.5ISO-U | | | | | 1.5 | 9.525 | 16 | 0.85 | 0.8 | 1.0 | |
| | 16-2.0ISO-U | | | | | 2.0 | 9.525 | 16 | 1.12 | 1.0 | 1.3 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

● Applicable holders, see pages D32

● : Stock item



American UN (UN, UNC, UNF, UNEF, UNS)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|----------|--------------------|---------|--------|------------|------|------|-----|-----|---|
| | | | | | (tpi) | d | L | hmin | x | f | |
| External | ER 11-72UN | | EL 11-72UN | | 72 | 6.35 | 11 | 0.22 | 0.8 | 0.4 |  |
| | 11-64UN | | 11-64UN | | 64 | 6.35 | 11 | 0.24 | 0.8 | 0.4 | |
| | 11-56UN | | 11-56UN | | 56 | 6.35 | 11 | 0.28 | 0.7 | 0.4 | |
| | 11-48UN | | 11-48UN | | 48 | 6.35 | 11 | 0.32 | 0.6 | 0.6 | |
| | 11-44UN | | 11-44UN | | 44 | 6.35 | 11 | 0.35 | 0.6 | 0.6 | |
| | 11-40UN | | 11-40UN | | 40z | 6.35 | 11 | 0.39 | 0.6 | 0.6 | |
| | 11-36UN | | 11-36UN | | 36 | 6.35 | 11 | 0.43 | 0.6 | 0.6 | |
| | 11-32UN | | 11-32UN | | 32 | 6.35 | 11 | 0.49 | 0.6 | 0.6 | |
| | 11-28UN | | 11-28UN | | 28 | 6.35 | 11 | 0.56 | 0.6 | 0.7 | |
| | 11-27UN | | 11-27UN | | 27 | 6.35 | 11 | 0.58 | 0.7 | 0.8 | |
| | 11-24UN | | 11-24UN | | 24 | 6.35 | 11 | 0.65 | 0.7 | 0.8 | |
| | 11-20UN | | 11-20UN | | 20 | 6.35 | 11 | 0.78 | 0.8 | 0.9 | |
| | 11-18UN | | 11-18UN | | 18 | 6.35 | 11 | 0.87 | 0.8 | 1.0 | |
| | 11-16UN | | 11-16UN | | 16 | 6.35 | 11 | 0.97 | 0.9 | 1.1 | |
| | 11-14UN | | 11-14UN | | 14 | 6.35 | 11 | 1.11 | 0.9 | 1.1 | |
| | 16-72UN | | 16-72UN | | 72 | 9.525 | 16 | 0.22 | 0.8 | 0.4 | |
| | 16-64UN | | 16-64UN | | 64 | 9.525 | 16 | 0.24 | 0.8 | 0.4 | |
| | 16-56UN | | 16-56UN | | 56 | 9.525 | 16 | 0.28 | 0.7 | 0.4 | |
| | 16-48UN | | 16-48UN | | 48 | 9.525 | 16 | 0.32 | 0.6 | 0.6 | |
| | 16-44UN | | 16-44UN | | 44 | 9.525 | 16 | 0.35 | 0.6 | 0.6 | |
| | 16-40UN | | 16-40UN | | 40 | 9.525 | 16 | 0.39 | 0.6 | 0.6 | |
| | 16-36UN | | 16-36UN | | 36 | 9.525 | 16 | 0.43 | 0.6 | 0.6 | |
| | 16-32UN | ● | 16-32UN | | 32 | 9.525 | 16 | 0.49 | 0.6 | 0.6 | |
| | 16-28UN | ● | 16-28UN | | 28 | 9.525 | 16 | 0.56 | 0.6 | 0.7 | |
| | 16-27UN | | 16-27UN | | 27 | 9.525 | 16 | 0.58 | 0.7 | 0.8 | |
| | 16-24UN | ● | 16-24UN | | 24 | 9.525 | 16 | 0.65 | 0.7 | 0.8 | |
| | 16-20UN | ● | 16-20UN | | 20 | 9.525 | 16 | 0.78 | 0.8 | 0.9 | |
| | 16-18UN | ● | 16-18UN | | 18 | 9.525 | 16 | 0.87 | 0.8 | 1.0 | |
| | 16-16UN | ● | 16-16UN | | 16 | 9.525 | 16 | 0.97 | 0.9 | 1.1 | |
| | 16-14UN | ● | 16-14UN | | 14 | 9.525 | 16 | 1.11 | 1.0 | 1.2 | |
| | 16-13UN | ● | 16-13UN | | 13 | 9.525 | 16 | 1.20 | 1.0 | 1.3 | |
| | 16-12UN | ● | 16-12UN | | 12 | 9.525 | 16 | 1.30 | 1.1 | 1.4 | |
| | 16-11.5UN | | 16-11.5UN | | 11.5 | 9.525 | 16 | 1.35 | 1.1 | 1.5 | |
| | 16-11UN | ● | 16-11UN | | 11 | 9.525 | 16 | 1.42 | 1.1 | 1.5 | |
| | 16-10UN | ● | 16-10UN | | 10 | 9.525 | 16 | 1.56 | 1.1 | 1.5 | |
| | 16-9UN | ● | 16-9UN | | 9 | 9.525 | 16 | 1.73 | 1.2 | 1.7 | |
| | 16-8UN | ● | 16-8UN | | 8 | 9.525 | 16 | 1.95 | 1.2 | 1.6 | |
| | 22-7UN | | 22-7UN | | 7 | 12.7 | 22 | 2.22 | 1.6 | 2.3 | |
| | 22-6UN | ● | 22-6UN | | 6 | 12.7 | 22 | 2.60 | 1.6 | 2.3 | |
| | 22-5UN | | 22-5UN | | 5 | 12.7 | 22 | 3.12 | 1.7 | 2.5 | |
| 27-4.5UN | | 27-4.5UN | | 4.5 | 15.875 | 27 | 3.46 | 1.9 | 2.7 | | |
| 27-4UN | | 27-4UN | | 4 | 15.875 | 27 | 3.89 | 2.1 | 3.0 | | |

Applicable holders, see pages D31

● : Stock item

American UN (UN, UNC, UNF, UNEF, UNS)

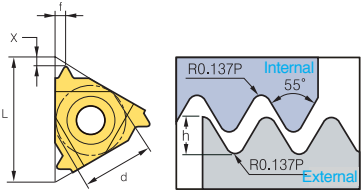
| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|----------|--------------------|---------|--------|------------|------|------|-----|-----|---------|
| | | | | | (tpi) | d | L | hmin | x | f | |
| Internal | IR 11-72UN | | IL 11-72UN | | 72 | 6.35 | 11 | 0.20 | 0.8 | 0.3 | |
| | 11-64UN | | 11-64UN | | 64 | 6.35 | 11 | 0.23 | 0.8 | 0.4 | |
| | 11-56UN | | 11-56UN | | 56 | 6.35 | 11 | 0.26 | 0.7 | 0.4 | |
| | 11-48UN | | 11-48UN | | 48 | 6.35 | 11 | 0.31 | 0.6 | 0.6 | |
| | 11-44UN | | 11-44UN | | 44 | 6.35 | 11 | 0.33 | 0.6 | 0.6 | |
| | 11-40UN | | 11-40UN | | 40 | 6.35 | 11 | 0.37 | 0.6 | 0.6 | |
| | 11-36UN | | 11-36UN | | 36 | 6.35 | 11 | 0.41 | 0.6 | 0.6 | |
| | 11-32UN | | 11-32UN | | 32 | 6.35 | 11 | 0.46 | 0.6 | 0.6 | |
| | 11-28UN | | 11-28UN | | 28 | 6.35 | 11 | 0.52 | 0.6 | 0.7 | |
| | 11-27UN | | 11-27UN | | 27 | 6.35 | 11 | 0.54 | 0.7 | 0.8 | |
| | 11-24UN | | 11-24UN | | 24 | 6.35 | 11 | 0.61 | 0.7 | 0.8 | |
| | 11-20UN | | 11-20UN | | 20 | 6.35 | 11 | 0.73 | 0.8 | 0.9 | |
| | 11-18UN | | 11-18UN | | 18 | 6.35 | 11 | 0.81 | 0.8 | 1.0 | |
| | 11-16UN | | 11-16UN | | 16 | 6.35 | 11 | 0.92 | 0.9 | 1.1 | |
| | 11-14UN | | 11-14UN | | 14 | 6.35 | 11 | 1.05 | 0.9 | 1.1 | |
| | 11-12UN | | 11-12UN | | 12 | 6.35 | 11 | 1.22 | 0.8 | 1.1 | |
| | 11-11UN | ● | 11-11UN | ● | 11 | 6.35 | 11 | 1.33 | 0.8 | 1.1 | |
| | 16-72UN | | 16-72UN | | 72 | 9.525 | 16 | 0.20 | 0.8 | 0.3 | |
| | 16-64UN | | 16-64UN | | 64 | 9.525 | 16 | 0.23 | 0.8 | 0.4 | |
| | 16-56UN | | 16-56UN | | 56 | 9.525 | 16 | 0.26 | 0.7 | 0.4 | |
| | 16-48UN | | 16-48UN | | 48 | 9.525 | 16 | 0.31 | 0.6 | 0.6 | |
| | 16-44UN | | 16-44UN | | 44 | 9.525 | 16 | 0.33 | 0.6 | 0.6 | |
| | 16-40UN | | 16-40UN | | 40 | 9.525 | 16 | 0.37 | 0.6 | 0.6 | |
| | 16-36UN | | 16-36UN | | 36 | 9.525 | 16 | 0.41 | 0.6 | 0.6 | |
| | 16-32UN | | 16-32UN | | 32 | 9.525 | 16 | 0.51 | 0.6 | 0.6 | |
| | 16-28UN | ● | 16-28UN | | 28 | 9.525 | 16 | 0.52 | 0.6 | 0.7 | |
| | 16-27UN | | 16-27UN | | 27 | 9.525 | 16 | 0.54 | 0.7 | 0.8 | |
| | 16-24UN | ● | 16-24UN | | 24 | 9.525 | 16 | 0.61 | 0.7 | 0.8 | |
| | 16-20UN | ● | 16-20UN | | 20 | 9.525 | 16 | 0.73 | 0.8 | 0.9 | |
| | 16-18UN | ● | 16-18UN | | 18 | 9.525 | 16 | 0.81 | 0.8 | 1.0 | |
| | 16-16UN | ● | 16-16UN | | 16 | 9.525 | 16 | 0.92 | 0.9 | 1.1 | |
| | 16-14UN | ● | 16-14UN | | 14 | 9.525 | 16 | 1.05 | 0.9 | 1.2 | |
| | 16-13UN | | 16-13UN | | 13 | 9.525 | 16 | 1.13 | 1.0 | 1.3 | |
| | 16-12UN | ● | 16-12UN | | 12 | 9.525 | 16 | 1.22 | 1.1 | 1.4 | |
| | 16-11.5UN | | 16-11.5UN | | 11.5 | 9.525 | 16 | 1.28 | 1.1 | 1.5 | |
| 16-11UN | ● | 16-11UN | | 11 | 9.525 | 16 | 1.33 | 1.1 | 1.5 | | |
| 16-10UN | ● | 16-10UN | | 10 | 9.525 | 16 | 1.47 | 1.1 | 1.5 | | |
| 16-9UN | ● | 16-9UN | | 9 | 9.525 | 16 | 1.63 | 1.2 | 1.7 | | |
| 16-8UN | ● | 16-8UN | | 8 | 9.525 | 16 | 1.83 | 1.2 | 1.5 | | |
| 22-7UN | | 22-7UN | | 7 | 12.7 | 22 | 2.09 | 1.6 | 2.3 | | |
| 22-6UN | | 22-6UN | | 6 | 12.7 | 22 | 2.44 | 1.6 | 2.3 | | |
| 22-5UN | | 22-5UN | | 5 | 12.7 | 22 | 2.93 | 1.7 | 2.3 | | |
| 27-4.5UN | | 27-4.5UN | | 4.5 | 15.875 | 27 | 3.26 | 1.9 | 2.4 | | |
| 27-4UN | | 27-4UN | | 4 | 15.875 | 27 | 3.67 | 2.1 | 2.7 | | |

Applicable holders, see pages D32

● : Stock item



Whitworth (BSW, BSF, BSP, BSB)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|------|------|-----|-----|---|
| | | | | | | d | L | hmin | x | f | |
| External | ER 11-72W | | EL 11-72W | | 72 | 6.35 | 11 | 0.23 | 0.7 | 0.4 |  |
| | 11-60W | | 11-60W | | 60 | 6.35 | 11 | 0.27 | 0.7 | 0.4 | |
| | 11-56W | | 11-56W | | 56 | 6.35 | 11 | 0.29 | 0.7 | 0.4 | |
| | 11-48W | | 11-48W | | 48 | 6.35 | 11 | 0.34 | 0.6 | 0.6 | |
| | 11-40W | | 11-40W | | 40 | 6.35 | 11 | 0.41 | 0.6 | 0.6 | |
| | 11-36W | | 11-36W | | 36 | 6.35 | 11 | 0.45 | 0.6 | 0.6 | |
| | 11-32W | | 11-32W | | 32 | 6.35 | 11 | 0.51 | 0.6 | 0.6 | |
| | 11-28W | | 11-28W | | 28 | 6.35 | 11 | 0.58 | 0.6 | 0.7 | |
| | 11-26W | | 11-26W | | 26 | 6.35 | 11 | 0.63 | 0.7 | 0.8 | |
| | 11-24W | | 11-24W | | 24 | 6.35 | 11 | 0.68 | 0.7 | 0.8 | |
| | 11-22W | | 11-22W | | 22 | 6.35 | 11 | 0.74 | 0.8 | 0.9 | |
| | 11-20W | | 11-20W | | 20 | 6.35 | 11 | 0.81 | 0.8 | 0.9 | |
| | 11-19W | | 11-19W | | 19 | 6.35 | 11 | 0.86 | 0.8 | 1.0 | |
| | 11-18W | | 11-18W | | 18 | 6.35 | 11 | 0.90 | 0.8 | 1.0 | |
| | 11-16W | | 11-16W | | 16 | 6.35 | 11 | 1.02 | 0.9 | 1.1 | |
| | 11-14W | | 11-14W | | 14 | 6.35 | 11 | 1.16 | 1.0 | 1.2 | |
| | 16-72W | | 16-72W | | 72 | 9.525 | 16 | 0.23 | 0.7 | 0.4 | |
| | 16-60W | | 16-60W | | 60 | 9.525 | 16 | 0.27 | 0.7 | 0.4 | |
| | 16-56W | | 16-56W | | 56 | 9.525 | 16 | 0.29 | 0.7 | 0.4 | |
| | 16-48W | | 16-48W | | 48 | 9.525 | 16 | 0.34 | 0.6 | 0.6 | |
| | 16-40W | | 16-40W | | 40 | 9.525 | 16 | 0.41 | 0.6 | 0.6 | |
| | 16-36W | | 16-36W | | 36 | 9.525 | 16 | 0.45 | 0.6 | 0.6 | |
| | 16-32W | | 16-32W | | 32 | 9.525 | 16 | 0.51 | 0.6 | 0.6 | |
| | 16-30W | | 16-30W | | 30 | 9.525 | 16 | 0.55 | 0.6 | 0.7 | |
| | 16-28W | ● | 16-28W | | 28 | 9.525 | 16 | 0.58 | 0.6 | 0.7 | |
| | 16-26W | ● | 16-26W | | 26 | 9.525 | 16 | 0.63 | 0.7 | 0.8 | |
| | 16-24W | ● | 16-24W | | 24 | 9.525 | 16 | 0.68 | 0.7 | 0.8 | |
| | 16-22W | | 16-22W | | 22 | 9.525 | 16 | 0.74 | 0.8 | 0.9 | |
| | 16-20W | ● | 16-20W | | 20 | 9.525 | 16 | 0.81 | 0.8 | 0.9 | |
| | 16-19W | ● | 16-19W | | 19 | 9.525 | 16 | 0.86 | 0.8 | 1.0 | |
| | 16-18W | ● | 16-18W | | 18 | 9.525 | 16 | 0.90 | 0.8 | 1.0 | |
| | 16-16W | ● | 16-16W | | 16 | 9.525 | 16 | 1.02 | 0.9 | 1.1 | |
| | 16-14W | ● | 16-14W | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-12W | ● | 16-12W | | 12 | 9.525 | 16 | 1.36 | 1.1 | 1.4 | |
| | 16-11W | ● | 16-11W | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |
| | 16-10W | ● | 16-10W | | 10 | 9.525 | 16 | 1.63 | 1.1 | 1.5 | |
| | 16-9W | ● | 16-9W | | 9 | 9.525 | 16 | 1.81 | 1.2 | 1.7 | |
| | 16-8W | ● | 16-8W | | 8 | 9.525 | 16 | 2.03 | 1.2 | 1.5 | |
| | 22-7W | | 22-7W | | 7 | 12.7 | 22 | 3.32 | 1.6 | 2.3 | |
| | 22-6W | ● | 22-6W | | 6 | 12.7 | 22 | 2.71 | 1.6 | 2.3 | |
| | 22-5W | | 22-5W | | 5 | 12.7 | 22 | 3.25 | 1.7 | 2.4 | |
| | 27-4.5W | | 27-4.5W | | 4.5 | 15.875 | 27 | 3.61 | 1.8 | 2.6 | |
| 27-4W | | 27-4W | | 4 | 15.875 | 27 | 4.07 | 2.0 | 2.9 | | |

● Applicable holders, see pages D31

● : Stock item

Whitworth (M Chip Breaker) *New*

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | | d | L | hmin | x | f | |
| External | ERM 16-14W | | | | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-11W | | | | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Applicable holders, see pages D31

● : Stock item

Whitworth (U Chip Breaker) *New*

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | | d | L | hmin | x | f | |
| External | ERM 16-14W-U | | | | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-11W-U | | | | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Applicable holders, see pages D31

● : Stock item



Whitworth (BSW, BSF, BSP, BSB)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|------|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| Internal | IR 11-72W | | IL 11-72W | | 72 | 6.35 | 11 | 0.23 | 0.7 | 0.4 | |
| | 11-60W | | 11-60W | | 60 | 6.35 | 11 | 0.27 | 0.7 | 0.4 | |
| | 11-56W | | 11-56W | | 56 | 6.35 | 11 | 0.29 | 0.7 | 0.4 | |
| | 11-48W | | 11-48W | | 48 | 6.35 | 11 | 0.34 | 0.6 | 0.6 | |
| | 11-40W | | 11-40W | | 40 | 6.35 | 11 | 0.41 | 0.6 | 0.6 | |
| | 11-36W | | 11-36W | | 36 | 6.35 | 11 | 0.45 | 0.6 | 0.6 | |
| | 11-32W | | 11-32W | | 32 | 6.35 | 11 | 0.51 | 0.6 | 0.6 | |
| | 11-28W | | 11-28W | | 28 | 6.35 | 11 | 0.58 | 0.6 | 0.7 | |
| | 11-26W | | 11-26W | | 26 | 6.35 | 11 | 0.63 | 0.7 | 0.8 | |
| | 11-24W | | 11-24W | | 24 | 6.35 | 11 | 0.68 | 0.7 | 0.8 | |
| | 11-22W | | 11-22W | | 22 | 6.35 | 11 | 0.74 | 0.8 | 0.9 | |
| | 11-20W | | 11-20W | | 20 | 6.35 | 11 | 0.81 | 0.8 | 0.9 | |
| | 11-19W | ● | 11-19W | | 19 | 6.35 | 11 | 0.86 | 0.8 | 1.0 | |
| | 11-18W | | 11-18W | | 18 | 6.35 | 11 | 0.90 | 0.8 | 1.0 | |
| | 11-16W | ● | 11-16W | | 16 | 6.35 | 11 | 1.02 | 0.9 | 1.1 | |
| | 11-14W | ● | 11-14W | | 14 | 6.35 | 11 | 1.16 | 0.9 | 1.1 | |
| | 11-12W | | 11-12W | | 12 | 6.35 | 11 | 1.32 | 0.9 | 1.2 | |
| | 16-72W | | 16-72W | | 72 | 9.525 | 16 | 0.23 | 0.7 | 0.4 | |
| | 16-60W | | 16-60W | | 60 | 9.525 | 16 | 0.27 | 0.7 | 0.4 | |
| | 16-56W | | 16-56W | | 56 | 9.525 | 16 | 0.29 | 0.7 | 0.4 | |
| | 16-48W | | 16-48W | | 48 | 9.525 | 16 | 0.34 | 0.6 | 0.6 | |
| | 16-40W | | 16-40W | | 40 | 9.525 | 16 | 0.41 | 0.6 | 0.6 | |
| | 16-36W | | 16-36W | | 36 | 9.525 | 16 | 0.45 | 0.6 | 0.6 | |
| | 16-32W | | 16-32W | | 32 | 9.525 | 16 | 0.51 | 0.6 | 0.6 | |
| | 16-30W | | 16-30W | | 30 | 9.525 | 16 | 0.55 | 0.6 | 0.7 | |
| | 16-28W | | 16-28W | | 28 | 9.525 | 16 | 0.58 | 0.6 | 0.7 | |
| | 16-26W | ● | 16-26W | | 26 | 9.525 | 16 | 0.63 | 0.7 | 0.8 | |
| | 16-24W | | 16-24W | | 24 | 9.525 | 16 | 0.68 | 0.7 | 0.8 | |
| | 16-22W | | 16-22W | | 22 | 9.525 | 16 | 0.74 | 0.8 | 0.9 | |
| | 16-20W | ● | 16-20W | | 20 | 9.525 | 16 | 0.81 | 0.8 | 0.9 | |
| | 16-19W | ● | 16-19W | | 19 | 9.525 | 16 | 0.86 | 0.8 | 1.0 | |
| | 16-18W | ● | 16-18W | | 18 | 9.525 | 16 | 0.90 | 0.8 | 1.0 | |
| | 16-16W | ● | 16-16W | | 16 | 9.525 | 16 | 1.02 | 0.9 | 1.1 | |
| | 16-14W | ● | 16-14W | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-12W | ● | 16-12W | | 12 | 9.525 | 16 | 1.36 | 1.1 | 1.4 | |
| | 16-11W | ● | 16-11W | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |
| | 16-10W | ● | 16-10W | | 10 | 9.525 | 16 | 1.63 | 1.1 | 1.5 | |
| | 16-9W | ● | 16-9W | | 9 | 9.525 | 16 | 1.81 | 1.2 | 1.7 | |
| | 16-8W | | 16-8W | | 8 | 9.525 | 16 | 2.03 | 1.2 | 1.5 | |
| | 22-7W | | 22-7W | | 7 | 12.7 | 22 | 3.32 | 1.6 | 2.3 | |
| 22-6W | | 22-6W | | 6 | 12.7 | 22 | 2.71 | 1.6 | 2.3 | | |
| 22-5W | | 22-5W | | 5 | 12.7 | 22 | 3.25 | 1.7 | 2.4 | | |
| 27-4.5W | | 27-4.5W | | 4.5 | 15.875 | 27 | 3.61 | 1.8 | 2.6 | | |
| 27-4W | ● | 27-4W | | 4 | 15.875 | 27 | 4.07 | 2.0 | 2.9 | | |

Applicable holders, see pages D32

● : Stock item

Whitworth (M Chip Breaker) *New*

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (tpi) | d | L | hmin | x | f | |
| Internal | IRM 16-14W | | | | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-11W | | | | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Applicable holders, see pages D32

● : Stock item

Whitworth (U Chip Breaker) *New*

| Type | Designation (Right) | PC3030T | PC5300 | Designation (Left) | PC3030T | Pitch | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------|--------------------|---------|-------|------------|----|------|-----|-----|---------|
| | | | | | | (tpi) | d | L | hmin | x | f | |
| Internal | IRM 16-14W-U | | | | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-11W-U | | | | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Applicable holders, see pages D32

● : Stock item



British Standard Pipe Thread (BSPT)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | Picture | |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|---------|---|
| | | | | | | d | L | hmin | x | | f |
| External | ER 11-28BSPT | | EL 11-28BSPT | | 28 | 6.35 | 11 | 0.58 | 0.6 | 0.6 | |
| | 11-19BSPT | | 11-19BSPT | | 19 | 6.35 | 11 | 0.86 | 0.8 | 0.9 | |
| | 11-14BSPT | | 11-14BSPT | | 14 | 6.35 | 11 | 1.16 | 0.9 | 1.0 | |
| | 16-28BSPT | | 16-28BSPT | | 28 | 9.525 | 16 | 0.58 | 0.6 | 0.6 | |
| | 16-19BSPT | ● | 16-19BSPT | | 19 | 9.525 | 16 | 0.86 | 0.8 | 0.9 | |
| | 16-14BSPT | ● | 16-14BSPT | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-11BSPT | ● | 16-11BSPT | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |
| Internal | IR 11-28BSPT | | IL 11-28BSPT | | 28 | 6.35 | 11 | 0.58 | 0.6 | 0.6 | |
| | 11-19BSPT | | 11-19BSPT | | 19 | 6.35 | 11 | 0.86 | 0.8 | 0.9 | |
| | 11-14BSPT | | 11-14BSPT | | 14 | 6.35 | 11 | 1.16 | 0.9 | 1.0 | |
| | 16-28BSPT | | 16-28BSPT | | 28 | 9.525 | 16 | 0.58 | 0.6 | 0.6 | |
| | 16-19BSPT | ● | 16-19BSPT | | 19 | 9.525 | 16 | 0.86 | 0.8 | 0.9 | |
| | 16-14BSPT | ● | 16-14BSPT | | 14 | 9.525 | 16 | 1.16 | 1.0 | 1.2 | |
| | 16-11BSPT | ● | 16-11BSPT | | 11 | 9.525 | 16 | 1.48 | 1.1 | 1.5 | |

● Applicable holders, see pages D31, D32

● : Stock item

National Pipe Thread (NPT)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | Picture | |
|----------|---------------------|---------|--------------------|---------|-------------|------------|------|------|-----|---------|---|
| | | | | | | d | L | hmin | x | | f |
| External | ER 11-27NPT | | EL 11-27NPT | | 27 | 6.35 | 11 | 0.66 | 0.7 | 0.8 | |
| | 11-18NPT | | 11-18NPT | | 18 | 6.35 | 11 | 1.01 | 0.8 | 1.0 | |
| | 11-14NPT | | 11-14NPT | | 14 | 6.35 | 11 | 1.33 | 0.8 | 1.0 | |
| | 16-27NPT | | 16-27NPT | | 27 | 9.525 | 16 | 0.66 | 0.7 | 0.8 | |
| | 16-18NPT | ● | 16-18NPT | | 18 | 9.525 | 16 | 1.01 | 0.8 | 1.0 | |
| | 16-14NPT | ● | 16-14NPT | | 14 | 9.525 | 16 | 1.33 | 0.9 | 1.2 | |
| | 16-11.5NPT | ● | 16-11.5NPT | | 11.5 | 9.525 | 16 | 1.64 | 1.1 | 1.5 | |
| 16-8NPT | ● | 16-8NPT | | 8 | 9.525 | 16 | 2.42 | 1.3 | 1.8 | | |
| Internal | IR 11-27NPT | ● | IL 11-27NPT | | 27 | 6.35 | 11 | 0.66 | 0.7 | 0.8 | |
| | 11-18NPT | ● | 11-18NPT | | 18 | 6.35 | 11 | 1.01 | 0.8 | 1.0 | |
| | 11-14NPT | ● | 11-14NPT | | 14 | 6.35 | 11 | 1.33 | 0.8 | 1.0 | |
| | 16-27NPT | | 16-27NPT | | 27 | 9.525 | 16 | 0.66 | 0.7 | 0.8 | |
| | 16-18NPT | ● | 16-18NPT | | 18 | 9.525 | 16 | 1.01 | 0.8 | 1.0 | |
| | 16-14NPT | ● | 16-14NPT | | 14 | 9.525 | 16 | 1.33 | 0.9 | 1.2 | |
| | 16-11.5NPT | ● | 16-11.5NPT | | 11.5 | 9.525 | 16 | 1.64 | 1.1 | 1.5 | |
| 16-8NPT | ● | 16-8NPT | | 8 | 9.525 | 16 | 2.42 | 1.3 | 1.8 | | |

● Applicable holders, see pages D31, D32

● : Stock item

National Pipe Threads-Dryseal (NPTF)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 11-27NPTF | | EL 11-27NPT | | 27 | 6.35 | 11 | 0.64 | 0.7 | 0.8 | |
| | 11-18NPTF | | 11-18NPT | | 18 | 6.35 | 11 | 1.00 | 0.8 | 1.0 | |
| | 11-14NPTF | | 11-14NPT | | 14 | 6.35 | 11 | 1.35 | 0.8 | 1.0 | |
| | 16-27NPTF | | 16-27NPT | | 27 | 9.525 | 16 | 0.64 | 0.7 | 0.8 | |
| | 16-18NPTF | | 16-18NPT | | 18 | 9.525 | 16 | 1.00 | 0.8 | 1.0 | |
| | 16-14NPTF | | 16-14NPT | | 14 | 9.525 | 16 | 1.35 | 0.9 | 1.2 | |
| | 16-11.5NPTF | | 16-11.5NPT | | 11.5 | 9.525 | 16 | 1.63 | 1.1 | 1.5 | |
| | 16-8NPTF | | 16-8NPT | | 8 | 9.525 | 16 | 2.38 | 1.3 | 1.8 | |
| Internal | IR 11-27NPTF | | IL 11-27NPT | | 27 | 6.35 | 11 | 0.64 | 0.7 | 0.8 | |
| | 11-18NPTF | | 11-18NPT | | 18 | 6.35 | 11 | 1.00 | 0.8 | 1.0 | |
| | 11-14NPTF | | 11-14NPT | | 14 | 6.35 | 11 | 1.35 | 0.8 | 1.0 | |
| | 16-27NPTF | | 16-27NPT | | 27 | 9.525 | 16 | 0.64 | 0.7 | 0.8 | |
| | 16-18NPTF | | 16-18NPT | | 18 | 9.525 | 16 | 1.00 | 0.8 | 1.0 | |
| | 16-14NPTF | | 16-14NPT | | 14 | 9.525 | 16 | 1.35 | 0.9 | 1.2 | |
| | 16-11.5NPTF | | 16-11.5NPT | | 11.5 | 9.525 | 16 | 1.63 | 1.1 | 1.5 | |
| | 16-8NPTF | | 16-8NPT | | 8 | 9.525 | 16 | 2.38 | 1.3 | 1.8 | |

Applicable holders, see pages D31, D32

● : Stock item

Round DIN 405

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 16-10RD | | EL 16-10RD | | 10 | 9.525 | 16 | 1.27 | 1.1 | 1.2 | |
| | 16-8RD | ● | 16-8RD | | 8 | 9.525 | 16 | 1.59 | 1.4 | 1.3 | |
| | 16-6RD | ● | 16-6RD | | 6 | 9.525 | 16 | 2.12 | 1.5 | 1.7 | |
| | 22-6RD | | 22-6RD | | 6 | 12.7 | 22 | 2.12 | 1.5 | 1.7 | |
| | 22-4RD | ● | 22-4RD | | 4 | 12.7 | 22 | 3.18 | 2.2 | 2.3 | |
| | 27-4RD | | 27-4RD | | 4 | 15.875 | 27 | 3.18 | 2.2 | 2.3 | |
| Internal | IR 16-10RD | | IL 16-10RD | | 10 | 9.525 | 16 | 1.27 | 1.1 | 1.2 | |
| | 16-8RD | | 16-8RD | | 8 | 9.525 | 16 | 1.59 | 1.4 | 1.4 | |
| | 16-6RD | | 16-6RD | | 6 | 9.525 | 16 | 2.12 | 1.4 | 1.5 | |
| | 22-6RD | | 22-6RD | | 6 | 12.7 | 22 | 2.12 | 1.5 | 1.7 | |
| | 22-4RD | | 22-4RD | | 4 | 12.7 | 22 | 3.18 | 2.2 | 2.3 | |
| | 27-4RD | | 27-4RD | | 4 | 15.875 | 27 | 3.18 | 2.2 | 2.3 | |

Applicable holders, see pages D31, D32

● : Stock item

Trapez DIN 103 (TR)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (mm) | Dimensions | | | | | Picture |
|----------|---------------------|----------|--------------------|---------|------------|------------|------|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 11-1.5TR | | EL 11-1.5TR | | 1.5 | 6.35 | 11 | 0.90 | 0.8 | 0.9 | |
| | 16-1.5TR | | 16-1.5TR | | 1.5 | 9.525 | 16 | 0.90 | 1.0 | 1.1 | |
| | 16-2.0TR | | 16-2.0TR | | 2.0 | 9.525 | 16 | 1.25 | 1.1 | 1.3 | |
| | 16-3.0TR | ● | 16-3.0TR | | 3.0 | 9.525 | 16 | 1.75 | 1.3 | 1.5 | |
| | 22-4.0TR | ● | 22-4.0TR | | 4.0 | 12.7 | 22 | 2.25 | 1.7 | 1.9 | |
| | 22-5.0TR | ● | 22-5.0TR | | 5.0 | 12.7 | 22 | 2.75 | 2.1 | 2.5 | |
| | 27-6.0TR | ● | 27-6.0TR | | 6.0 | 15.875 | 27 | 3.50 | 2.3 | 2.7 | |
| Internal | IR 11-1.5TR | | IL 11-1.5TR | | 1.5 | 6.35 | 11 | 0.90 | 0.8 | 0.9 | |
| | 16-1.5TR | | 16-1.5TR | | 1.5 | 9.525 | 16 | 0.90 | 1.0 | 1.1 | |
| | 16-2.0TR | | 16-2.0TR | | 2.0 | 9.525 | 16 | 1.25 | 1.1 | 1.3 | |
| | 16-2.5TR | | 16-2.5TR | | 2.5 | 9.525 | 16 | 1.53 | 1.2 | 1.4 | |
| | 16-3.0TR | ● | 16-3.0TR | | 3.0 | 9.525 | 16 | 1.75 | 1.3 | 1.5 | |
| | 22-4.0TR | ● | 22-4.0TR | | 4.0 | 12.7 | 22 | 2.25 | 1.7 | 1.9 | |
| | 22-5.0TR | ● | 22-5.0TR | | 5.0 | 12.7 | 22 | 2.75 | 2.1 | 2.5 | |
| 27-6.0TR | | 27-6.0TR | | 6.0 | 15.875 | 27 | 3.50 | 2.3 | 2.7 | | |

Applicable holders, see pages D31, D32

● : Stock item

American ACME (ACME)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|----------|--------------------|---------|-------------|------------|------|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 11-16ACME | | EL 11-16ACME | | 16 | 6.35 | 11 | 0.92 | 1.0 | 1.1 | |
| | 16-16ACME | | 16-16ACME | | 16 | 9.525 | 16 | 0.92 | 1.0 | 1.1 | |
| | 16-14ACME | | 16-14ACME | | 14 | 9.525 | 16 | 1.03 | 1.0 | 1.2 | |
| | 16-12ACME | | 16-12ACME | | 12 | 9.525 | 16 | 1.19 | 1.1 | 1.2 | |
| | 16-10ACME | | 16-10ACME | | 10 | 9.525 | 16 | 1.52 | 1.3 | 1.4 | |
| | 16-8ACME | | 16-8ACME | | 8 | 9.525 | 16 | 1.84 | 1.4 | 1.5 | |
| | 16-6ACME | | 16-6ACME | | 6 | 9.525 | 16 | 2.37 | 1.7 | 1.9 | |
| | 22-6ACME | ● | 22-6ACME | ● | 6 | 12.7 | 22 | 2.37 | 1.8 | 2.1 | |
| | 22-5ACME | ● | 22-5ACME | ● | 5 | 12.7 | 22 | 2.79 | 2.0 | 2.3 | |
| 27-4ACME | | 27-4ACME | | 4 | 15.875 | 27 | 3.43 | 2.4 | 2.7 | | |
| Internal | IR 11-16ACME | | IL 11-16ACME | | 16 | 6.35 | 11 | 0.92 | 0.9 | 0.9 | |
| | 16-16ACME | | 16-16ACME | | 16 | 9.525 | 16 | 0.92 | 1.0 | 1.1 | |
| | 16-14ACME | | 16-14ACME | | 14 | 9.525 | 16 | 1.03 | 1.1 | 1.2 | |
| | 16-12ACME | | 16-12ACME | | 12 | 9.525 | 16 | 1.19 | 1.2 | 1.3 | |
| | 16-10ACME | | 16-10ACME | | 10 | 9.525 | 16 | 1.52 | 1.2 | 1.3 | |
| | 16-8ACME | | 16-8ACME | | 8 | 9.525 | 16 | 1.84 | 1.4 | 1.5 | |
| | 16-6ACME | | 16-6ACME | | 6 | 9.525 | 16 | 2.37 | 1.7 | 1.9 | |
| | 22-6ACME | | 22-6ACME | | 6 | 12.7 | 22 | 2.37 | 1.8 | 2.1 | |
| | 22-5ACME | ● | 22-5ACME | | 5 | 12.7 | 22 | 2.79 | 2.0 | 2.3 | |
| 27-4ACME | | 27-4ACME | | 4 | 15.875 | 27 | 3.43 | 2.3 | 2.6 | | |

Applicable holders, see pages D31, D32

● : Stock item

Stub ACME (STACME)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | Picture | | | |
|-------------|---------------------|----------------|--------------------|----------------|-------------|------------|-------|------|------|---------|---|-----|--|
| | | | | | | d | L | hmin | x | | f | | |
| External | ER 11-16STACME | | EL 11-16STACME | | 16 | 6.35 | 11 | 0.60 | 1.0 | 1.0 | | | |
| | 16-16STACME | | 16-16STACME | | 16 | 9.525 | 16 | 0.60 | 1.0 | 1.0 | | | |
| | 16-14STACME | | 16-14STACME | | 14 | 9.525 | 16 | 0.67 | 1.1 | 1.1 | | | |
| | 16-12STACME | | 16-12STACME | | 12 | 9.525 | 16 | 0.76 | 1.2 | 1.2 | | | |
| | 16-10STACME | | 16-10STACME | | 10 | 9.525 | 16 | 1.02 | 1.2 | 1.3 | | | |
| | 16-8STACME | | 16-8STACME | | 8 | 9.525 | 16 | 1.21 | 1.4 | 1.5 | | | |
| | 16-6STACME | | 16-6STACME | | 6 | 9.525 | 16 | 1.52 | 1.7 | 1.8 | | | |
| | 22-6STACME | | 22-6STACME | | 6 | 12.7 | 22 | 1.52 | 1.7 | 1.8 | | | |
| | 22-5STACME | | 22-5STACME | | 5 | 12.7 | 22 | 1.78 | 2.1 | 2.3 | | | |
| | 27-4STACME | | 27-4STACME | | 4 | 15.875 | 27 | 2.16 | 2.3 | 2.4 | | | |
| | 27-3STACME | | 27-3STACME | | 3 | 15.875 | 27 | 2.79 | 2.9 | 2.9 | | | |
| | Internal | IR 11-16STACME | | IL 11-16STACME | | 16 | 6.35 | 11 | 0.60 | 1.0 | | 1.0 | |
| | | 16-16STACME | | 16-16STACME | | 16 | 9.525 | 16 | 0.60 | 1.0 | | 1.0 | |
| 16-14STACME | | | 16-14STACME | | 14 | 9.525 | 16 | 0.67 | 1.1 | 1.1 | | | |
| 16-12STACME | | | 16-12STACME | | 12 | 9.525 | 16 | 0.76 | 1.1 | 1.2 | | | |
| 16-10STACME | | | 16-10STACME | | 10 | 9.525 | 16 | 1.02 | 1.2 | 1.3 | | | |
| 16-8STACME | | | 16-8STACME | | 8 | 9.525 | 16 | 1.21 | 1.4 | 1.5 | | | |
| 16-6STACME | | | 16-6STACME | | 6 | 9.525 | 16 | 1.52 | 1.7 | 1.8 | | | |
| 22-6STACME | | | 22-6STACME | | 6 | 12.7 | 22 | 1.52 | 1.7 | 1.8 | | | |
| 22-5STACME | | | 22-5STACME | | 5 | 12.7 | 22 | 1.78 | 2.1 | 2.3 | | | |
| 27-4STACME | | | 27-4STACME | | 4 | 15.875 | 27 | 2.16 | 2.3 | 2.4 | | | |
| 27-3STACME | | | 27-3STACME | | 3 | 15.875 | 27 | 2.79 | 2.9 | 2.9 | | | |

Applicable holders, see pages D31, D32

● : Stock item



UNJ (Unified Constant Thread)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 11-48UNJ | | EL 11-48UNJ | | 48 | 6.35 | 11 | 0.31 | 0.6 | 0.5 | |
| | 11-44UNJ | | 11-44UNJ | | 44 | 6.35 | 11 | 0.33 | 0.6 | 0.6 | |
| | 11-40UNJ | | 11-40UNJ | | 40 | 6.35 | 11 | 0.37 | 0.6 | 0.6 | |
| | 11-36UNJ | | 11-36UNJ | | 36 | 6.35 | 11 | 0.41 | 0.6 | 0.6 | |
| | 11-32UNJ | | 11-32UNJ | | 32 | 6.35 | 11 | 0.46 | 0.6 | 0.7 | |
| | 11-28UNJ | | 11-28UNJ | | 28 | 6.35 | 11 | 0.52 | 0.7 | 0.7 | |
| | 11-24UNJ | ● | 11-24UNJ | | 24 | 6.35 | 11 | 0.61 | 0.7 | 0.8 | |
| | 11-20UNJ | | 11-20UNJ | | 20 | 6.35 | 11 | 0.73 | 0.8 | 0.9 | |
| | 11-18UNJ | | 11-18UNJ | | 18 | 6.35 | 11 | 0.81 | 0.8 | 1.0 | |
| | 11-16UNJ | | 11-16UNJ | | 16 | 6.35 | 11 | 0.92 | 0.9 | 1.1 | |
| | 11-14UNJ | | 11-14UNJ | | 14 | 6.35 | 11 | 1.05 | 1.0 | 1.2 | |
| | 16-48UNJ | | 16-48UNJ | | 48 | 9.525 | 16 | 0.31 | 0.6 | 0.5 | |
| | 16-44UNJ | | 16-44UNJ | | 44 | 9.525 | 16 | 0.33 | 0.6 | 0.6 | |
| | 16-40UNJ | | 16-40UNJ | | 40 | 9.525 | 16 | 0.37 | 0.6 | 0.6 | |
| | 16-36UNJ | | 16-36UNJ | | 36 | 9.525 | 16 | 0.41 | 0.6 | 0.6 | |
| | 16-32UNJ | | 16-32UNJ | | 32 | 9.525 | 16 | 0.46 | 0.6 | 0.7 | |
| | 16-28UNJ | | 16-28UNJ | | 28 | 9.525 | 16 | 0.52 | 0.7 | 0.7 | |
| | 16-24UNJ | | 16-24UNJ | | 24 | 9.525 | 16 | 0.61 | 0.7 | 0.8 | |
| | 16-20UNJ | | 16-20UNJ | | 20 | 9.525 | 16 | 0.73 | 0.8 | 0.9 | |
| | 16-18UNJ | | 16-18UNJ | | 18 | 9.525 | 16 | 0.81 | 0.8 | 1.0 | |
| | 16-16UNJ | | 16-16UNJ | | 16 | 9.525 | 16 | 0.92 | 0.9 | 1.1 | |
| | 16-14UNJ | | 16-14UNJ | | 14 | 9.525 | 16 | 1.05 | 1.0 | 1.2 | |
| | 16-13UNJ | | 16-13UNJ | | 13 | 9.525 | 16 | 1.13 | 1.0 | 1.3 | |
| | 16-12UNJ | ● | 16-12UNJ | | 12 | 9.525 | 16 | 1.22 | 1.1 | 1.3 | |
| | 16-11UNJ | | 16-11UNJ | | 11 | 9.525 | 16 | 1.33 | 1.2 | 1.5 | |
| | 16-10UNJ | | 16-10UNJ | | 10 | 9.525 | 16 | 1.47 | 1.2 | 1.5 | |
| | 16-9UNJ | | 16-9UNJ | | 9 | 9.525 | 16 | 1.63 | 1.3 | 1.7 | |
| | 16-8UNJ | | 16-8UNJ | | 8 | 9.525 | 16 | 1.83 | 1.2 | 1.6 | |
| | 22-7UNJ | | 22-7UNJ | | 7 | 12.7 | 22 | 2.09 | 1.7 | 2.3 | |
| | 22-6UNJ | | 22-6UNJ | | 6 | 12.7 | 22 | 2.44 | 1.7 | 2.3 | |
| | 22-5UNJ | | 22-5UNJ | | 5 | 12.7 | 22 | 2.93 | 1.8 | 2.5 | |
| | 27-4.5UNJ | | 27-4.5UNJ | | 4.5 | 15.875 | 27 | 3.26 | 2.0 | 2.7 | |
| | 27-4UNJ | | 27-4UNJ | | 4 | 15.875 | 27 | 3.67 | 2.2 | 3.0 | |

● Applicable holders, see pages D31

● : Stock item

UNJ (Unified Constant Thread)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| Internal | IR 11-48UNJ | | IL 11-48UNJ | | 48 | 6.35 | 11 | 0.28 | 0.6 | 0.5 | |
| | 11-44UNJ | | 11-44UNJ | | 44 | 6.35 | 11 | 0.30 | 0.6 | 0.6 | |
| | 11-40UNJ | | 11-40UNJ | | 40 | 6.35 | 11 | 0.33 | 0.6 | 0.6 | |
| | 11-36UNJ | | 11-36UNJ | | 36 | 6.35 | 11 | 0.37 | 0.6 | 0.6 | |
| | 11-32UNJ | | 11-32UNJ | | 32 | 6.35 | 11 | 0.42 | 0.6 | 0.7 | |
| | 11-28UNJ | | 11-28UNJ | | 28 | 6.35 | 11 | 0.47 | 0.7 | 0.7 | |
| | 11-24UNJ | | 11-24UNJ | | 24 | 6.35 | 11 | 0.55 | 0.7 | 0.8 | |
| | 11-20UNJ | | 11-20UNJ | | 20 | 6.35 | 11 | 0.66 | 0.8 | 0.9 | |
| | 11-18UNJ | | 11-18UNJ | | 18 | 6.35 | 11 | 0.74 | 0.8 | 1.0 | |
| | 11-16UNJ | | 11-16UNJ | | 16 | 6.35 | 11 | 0.83 | 0.9 | 1.1 | |
| | 11-14UNJ | | 11-14UNJ | | 14 | 9.525 | 11 | 0.95 | 1.0 | 1.2 | |
| | 16-48UNJ | | 16-48UNJ | | 48 | 9.525 | 16 | 0.28 | 0.6 | 0.5 | |
| | 16-44UNJ | | 16-44UNJ | | 44 | 9.525 | 16 | 0.30 | 0.6 | 0.6 | |
| | 16-40UNJ | | 16-40UNJ | | 40 | 9.525 | 16 | 0.33 | 0.6 | 0.6 | |
| | 16-36UNJ | | 16-36UNJ | | 36 | 9.525 | 16 | 0.37 | 0.6 | 0.6 | |
| | 16-32UNJ | | 16-32UNJ | | 32 | 9.525 | 16 | 0.42 | 0.6 | 0.7 | |
| | 16-28UNJ | | 16-28UNJ | | 28 | 9.525 | 16 | 0.47 | 0.7 | 0.7 | |
| | 16-24UNJ | | 16-24UNJ | | 24 | 9.525 | 16 | 0.55 | 0.7 | 0.8 | |
| | 16-20UNJ | | 16-20UNJ | | 20 | 9.525 | 16 | 0.66 | 0.8 | 0.9 | |
| | 16-18UNJ | | 16-18UNJ | | 18 | 9.555 | 16 | 0.74 | 0.8 | 1.0 | |
| | 16-16UNJ | | 16-16UNJ | | 16 | 9.525 | 16 | 0.83 | 0.9 | 1.1 | |
| | 16-14UNJ | | 16-14UNJ | | 14 | 9.525 | 16 | 0.95 | 1.0 | 1.2 | |
| | 16-13UNJ | | 16-13UNJ | | 13 | 9.525 | 16 | 1.02 | 1.0 | 1.3 | |
| | 16-12UNJ | | 16-12UNJ | | 12 | 9.525 | 16 | 1.11 | 1.1 | 1.3 | |
| | 16-11UNJ | | 16-11UNJ | | 11 | 9.525 | 16 | 1.21 | 1.2 | 1.5 | |
| | 16-10UNJ | | 16-10UNJ | | 10 | 9.525 | 16 | 1.33 | 1.2 | 1.5 | |
| | 16-9UNJ | | 16-9UNJ | | 9 | 9.525 | 16 | 1.48 | 1.3 | 1.7 | |
| | 16-8UNJ | | 16-8UNJ | | 8 | 9.525 | 16 | 1.66 | 1.2 | 1.6 | |
| | 22-7UNJ | | 22-7UNJ | | 7 | 12.7 | 22 | 1.90 | 1.7 | 2.3 | |
| | 22-6UNJ | | 22-6UNJ | | 6 | 12.7 | 22 | 2.21 | 1.7 | 2.3 | |
| | 22-5UNJ | | 22-5UNJ | | 5 | 12.7 | 22 | 2.66 | 1.8 | 2.5 | |
| | 27-4.5UNJ | | 27-4.5UNJ | | 4.5 | 15.875 | 27 | 2.95 | 2.0 | 2.7 | |
| | 27-4UNJ | | 27-4UNJ | | 4 | 15.875 | 27 | 3.32 | 2.2 | 3.0 | |

Applicable holders, see pages D32

● : Stock item



American Buttress (ABUT)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 11-20ABUT | | EL 11-20ABUT | | 20 | 6.35 | 11 | 0.84 | 1.0 | 1.4 | |
| | 11-16ABUT | | 11-16ABUT | | 16 | 6.35 | 11 | 1.05 | 1.3 | 1.9 | |
| | 16-20ABUT | | 16-20ABUT | | 20 | 9.525 | 16 | 0.84 | 1.0 | 1.4 | |
| | 16-16ABUT | | 16-16ABUT | | 16 | 9.525 | 16 | 1.05 | 1.3 | 1.9 | |
| | 16-12ABUT | | 16-12ABUT | | 12 | 9.525 | 16 | 1.40 | 1.4 | 2.0 | |
| | 16-10ABUT | | 16-10ABUT | | 10 | 9.525 | 16 | 1.68 | 1.5 | 2.3 | |
| | 22-8ABUT | | 22-8ABUT | | 8 | 12.7 | 22 | 2.10 | 2.0 | 3.2 | |
| | 22-6ABUT | | 22-6ABUT | | 6 | 12.7 | 22 | 2.80 | 2.2 | 3.5 | |
| Internal | IR 11-20ABUT | | IL 11-20ABUT | | 20 | 6.35 | 11 | 0.84 | 1.0 | 1.4 | |
| | 11-16ABUT | | 11-16ABUT | | 16 | 6.35 | 11 | 1.05 | 1.3 | 1.9 | |
| | 16-20ABUT | | 16-20ABUT | | 20 | 9.525 | 16 | 0.84 | 1.0 | 1.4 | |
| | 16-16ABUT | | 16-16ABUT | | 16 | 9.525 | 16 | 1.05 | 1.3 | 1.9 | |
| | 16-12ABUT | | 16-12ABUT | | 12 | 9.525 | 16 | 1.40 | 1.4 | 2.0 | |
| | 16-10ABUT | | 16-10ABUT | | 10 | 9.525 | 16 | 1.68 | 1.5 | 2.3 | |
| | 22-8ABUT | | 22-8ABUT | | 8 | 12.7 | 22 | 2.10 | 2.0 | 3.2 | |
| | 22-6ABUT | | 22-6ABUT | | 6 | 12.7 | 22 | 2.80 | 2.2 | 3.5 | |

Applicable holders, see pages D31, D32

● : Stock item

British Buttress (BBUT)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 16-16BBUT | | EL 16-16BBUT | | 16 | 9.525 | 16 | 0.80 | 1.1 | 1.6 | |
| | 16-12BBUT | | 16-12BBUT | | 12 | 9.525 | 16 | 1.07 | 1.4 | 2.1 | |
| | 16-10BBUT | | 16-10BBUT | | 10 | 9.525 | 16 | 1.28 | 1.4 | 2.2 | |
| | 16-8BBUT | ● | 16-8BBUT | | 8 | 9.525 | 16 | 1.61 | 1.6 | 2.5 | |
| | 22-8BBUT | | 22-8BBUT | | 8 | 12.7 | 22 | 1.61 | 1.6 | 2.5 | |
| Internal | IR 16-16BBUT | | IL 16-16BBUT | | 16 | 9.525 | 16 | 0.80 | 1.1 | 1.6 | |
| | 16-12BBUT | | 16-12BBUT | | 12 | 9.525 | 16 | 1.07 | 1.4 | 2.1 | |
| | 16-10BBUT | | 16-10BBUT | | 10 | 9.525 | 16 | 1.28 | 1.4 | 2.2 | |
| | 16-8BBUT | | 16-8BBUT | | 8 | 9.525 | 16 | 1.61 | 1.6 | 2.5 | |
| | 22-8BBUT | | 22-8BBUT | | 8 | 12.7 | 22 | 1.61 | 1.6 | 2.5 | |

Applicable holders, see pages D31, D32

● : Stock item

Metric Buttress (SAGE)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (mm) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|------------|------------|----|------|------|------|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 16-2.0SAGE | | EL 16-2.0SAGE | | 2.0 | 9.525 | 16 | 1.74 | 1.47 | 2.08 | |
| | 22-2.0SAGE | | 22-2.0SAGE | | 2.0 | 12.7 | 22 | 1.74 | 1.47 | 2.08 | |
| | 22-3.0SAGE | | 22-3.0SAGE | | 3.0 | 12.7 | 22 | 2.60 | 1.79 | 2.60 | |
| | 27-4.0SAGE | ● | 27-4.0SAGE | | 4.0 | 15.875 | 27 | 3.55 | 1.93 | 3.20 | |
| Internal | IR 16-2.0SAGE | | IL 16-2.0SAGE | | 2.0 | 9.525 | 16 | 1.50 | 1.52 | 2.2 | |
| | 22-3.0SAGE | | 22-3.0SAGE | | 3.0 | 12.7 | 22 | 2.25 | 1.66 | 2.9 | |
| | 27-4.0SAGE | ● | 27-4.0SAGE | | 4.0 | 5/8 | 27 | 3.09 | 2.12 | 3.2 | |
| | | | | | | | | | | | |

Applicable holders, see pages D31, D32

● : Stock item

API

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch (tpi) | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------------|------------|----|------|-----|-----|---------|
| | | | | | | d | L | hmin | x | f | |
| External | ER 22-4API382 | ● | EL 22-4API382 | | 4 | 12.7 | 22 | 3.09 | 2.1 | 2.8 | |
| | 22-4API383 | | 22-4API383 | | 4 | 12.7 | 22 | 3.08 | 2.1 | 2.8 | |
| | 22-4API502 | | 22-4API502 | | 4 | 12.7 | 22 | 3.75 | 2.0 | 2.9 | |
| | 22-4API503 | | 22-4API503 | | 4 | 12.7 | 22 | 3.74 | 2.0 | 2.9 | |
| | 22-5API403 | ● | 22-5API403 | | 5 | 12.7 | 22 | 2.99 | 1.8 | 2.6 | |
| | 22-6API551 | | 22-6API551 | | 6 | 12.7 | 22 | 1.41 | 2.6 | 2.0 | |
| | 27-4API382 | ● | 27-4API382 | | 4 | 15.875 | 27 | 3.09 | 2.1 | 2.8 | |
| | 27-4API383 | ● | 27-4API383 | | 4 | 15.875 | 27 | 3.08 | 2.1 | 2.8 | |
| | 27-4API502 | ● | 27-4API502 | | 4 | 15.875 | 27 | 3.75 | 2.1 | 3.1 | |
| | 27-4API503 | | 27-4API503 | | 4 | 15.875 | 27 | 3.74 | 2.1 | 3.1 | |
| | 27-5API403 | | 27-5API403 | | 5 | 15.875 | 27 | 2.99 | 1.9 | 2.7 | |
| Internal | IR 22-4API382 | | IL 22-4API382 | | 4 | 12.7 | 22 | 3.09 | 2.1 | 2.8 | |
| | 22-4API383 | | 22-4API383 | | 4 | 12.7 | 22 | 3.08 | 2.1 | 2.8 | |
| | 22-4API502 | | 22-4API502 | | 4 | 12.7 | 22 | 3.75 | 2.1 | 3.1 | |
| | 22-4API503 | | 22-4API503 | | 4 | 12.7 | 22 | 3.74 | 2.0 | 2.9 | |
| | 22-5API403 | ● | 22-5API403 | | 5 | 12.7 | 22 | 2.99 | 1.8 | 2.6 | |
| | 22-6API551 | | 22-6API551 | | 6 | 12.7 | 22 | 1.41 | 2.6 | 2.0 | |
| | 27-4API382 | ● | 27-4API382 | | 4 | 15.875 | 27 | 3.09 | 2.1 | 2.8 | |
| | 27-4API383 | | 27-4API383 | | 4 | 15.875 | 27 | 3.08 | 2.1 | 2.8 | |
| | 27-4API502 | ● | 27-4API502 | | 4 | 15.875 | 27 | 3.75 | 2.1 | 3.1 | |
| | 27-4API503 | | 27-4API503 | | 4 | 15.875 | 27 | 3.74 | 2.1 | 3.1 | |
| | 27-5API403 | | 27-5API403 | | 5 | 15.875 | 27 | 2.99 | 1.9 | 2.7 | |

Applicable holders, see pages D31, D32

● : Stock item

API Buttress Casing (BUT)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------|------|------------|----|------|-----|-----|---------|
| | | | | | (mm) | IPF | d | L | hmin | x | f | |
| External | ER 22-5BUT75 | ● | EL 22-5BUT75 | | 5 | 0.75 | 12.7 | 22 | 1.55 | 3.1 | 1.9 | |
| | 22-5BUT1 | | 22-5BUT1 | | 5 | 1 | 12.7 | 22 | 1.55 | 3.1 | 1.9 | |
| Internal | IR 22-5BUT75 | ● | IL 22-5BUT75 | | 5 | 0.75 | 12.7 | 22 | 1.55 | 2.8 | 1.9 | |
| | 22-5BUT1 | | 22-5BUT1 | | 5 | 1 | 12.7 | 22 | 1.55 | 2.8 | 1.9 | |

Applicable holders, see pages D31, D32

● : Stock item

API Round Casing & Tubing (APIRD)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------|--|------------|----|------|-----|-----|---------|
| | | | | | (tpi) | | d | L | hmin | x | f | |
| External | ER 16-10APIRD | ● | EL 16-10APIRD | | 10 | | 9.525 | 16 | 1.41 | 1.2 | 1.4 | |
| | 16-8APIRD | | 16-8APIRD | | 8 | | 9.525 | 16 | 1.81 | 1.3 | 1.5 | |
| Internal | IR 16-10APIRD | ● | IL 16-10APIRD | | 10 | | 9.525 | 16 | 1.41 | 1.2 | 1.4 | |
| | 16-8APIRD | | 16-8APIRD | | 8 | | 9.525 | 16 | 1.81 | 1.3 | 1.5 | |

Applicable holders, see pages D31, D32

● : Stock item

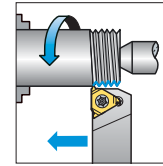
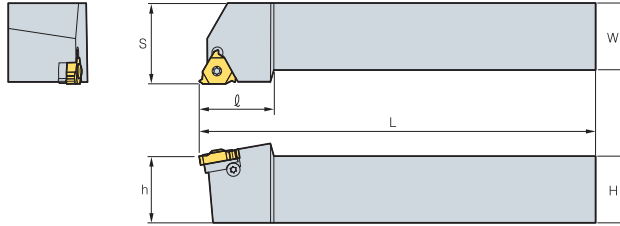
Extreme Line Casing (EL)

| Type | Designation (Right) | PC3030T | Designation (Left) | PC3030T | Pitch | | Dimensions | | | | | Picture |
|----------|---------------------|---------|--------------------|---------|-------|------|------------|----|------|-----|-----|---------|
| | | | | | (mm) | IPF | d | L | hmin | x | f | |
| External | ER 22-6EL15 | | EL 22-6EL15 | | 6 | 1.5 | 12.7 | 22 | 1.21 | 1.9 | 1.9 | |
| | 22-5EL125 | | 22-5EL125 | | 5 | 1.25 | 12.7 | 22 | 1.71 | 2.3 | 2.4 | |
| Internal | IR 22-6EL15 | | IL 22-6EL15 | | 6 | 1.5 | 12.7 | 22 | 1.39 | 1.8 | 1.9 | |
| | 22-5EL125 | | 22-5EL125 | | 5 | 1.25 | 12.7 | 22 | 1.91 | 2.2 | 2.4 | |

Applicable holders, see pages D31, D32

● : Stock item

ER(L)H (Screw on system)

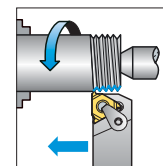
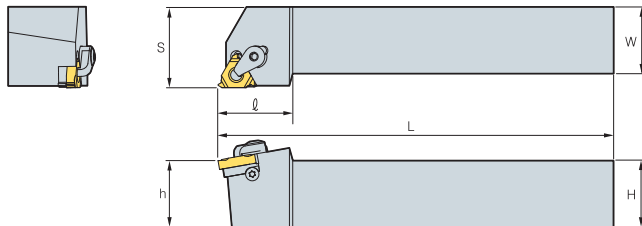


Righthand drawing
(mm)

| Designation | | Inscribed circle | H | W | L | S | h | l | Insert Screw | Shim Screw | Screw RH | Screw LH | Wrwnch |
|-------------|--------|------------------|------|-------|-------|----|------|------|--------------|------------|----------|----------|--------|
| ER(L)H | 08N-11 | 6.35 | 8 | 8 | 136.4 | 11 | 8 | 17.5 | ST11N | - | - | - | TW08P |
| | 10N-11 | 6.35 | 10 | 10 | 70.0 | 11 | 10 | 17.5 | | | | | |
| | 12N-11 | 6.35 | 12 | 12 | 80.0 | 12 | 12 | 17.5 | | | | | |
| | 12N-16 | 9.525 | 12 | 12 | 83.2 | 16 | 12 | 22 | ST16N | - | - | - | TW10P |
| | 09-16 | 9.525 | 9.52 | 9.52 | 63.6 | 16 | 9.52 | 20.5 | ST16 | STA16 | ATE16 | AT16 | TW10P |
| | 12-16 | 9.525 | 12 | 12 | 83.2 | 16 | 12 | 22 | | | | | |
| | 16-16 | 9.525 | 16 | 16 | 100.0 | 16 | 16 | 20.5 | | | | | |
| | 20-16 | 9.525 | 20 | 20 | 128.6 | 20 | 20 | 30 | | | | | |
| | 25-16 | 9.525 | 25 | 25 | 153.6 | 25 | 25 | 30 | | | | | |
| | 32-16 | 9.525 | 32 | 32 | 173.6 | 32 | 32 | 30 | | | | | |
| | 32-22 | 12.7 | 32 | 32 | 175.7 | 32 | 32 | 36 | ST22 | STA22 | ATE22 | AT122 | TW20P |
| | 40-22 | 12.7 | 40 | 40 | 205.7 | 40 | 40 | 36 | ST27 | STA27 | ATE27 | AT127 | TW25L |
| | 25-27 | 15.875 | 25 | 25 | 151.6 | 32 | 25 | 35 | | | | | |
| | 32-27 | 15.875 | 32 | 32 | 176.6 | 32 | 32 | 40 | | | | | |
| | 40-27 | 15.875 | 40 | 40 | 206.6 | 40 | 40 | 40 | | | | | |
| 50-27 | 15.875 | 50 | 50 | 256.6 | 50 | 50 | 40 | | | | | | |

Applicable inserts, see pages D10~D13, D16, D18, D19, D22, D23~D26 • Helix angle is 1.5° for all holders.
• No shim needed for N type holder

ER(L)H-C (Clamp on system)



Righthand drawing
(mm)

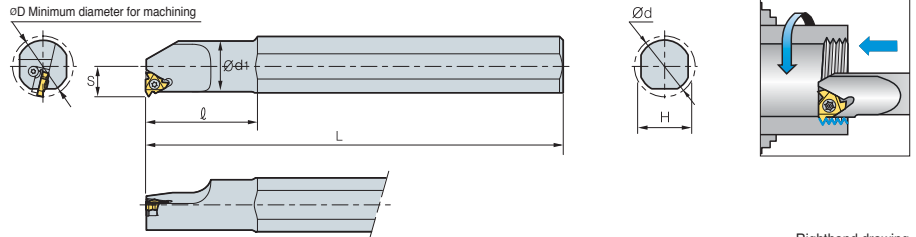
| Designation | | Inscribed circle | H | W | L | S | h | l | Shim Screw | Clamp | Screw RH | Screw LH | Wrwnch |
|-------------|--------|------------------|----|----|-------|----|----|----|------------|-------|----------|----------|--------|
| ER(L)H-C | 20-16C | 9.525 | 20 | 20 | 128.6 | 20 | 20 | 30 | STA16 | CTH16 | ATE16 | AT16 | TW10P |
| | 25-16C | 9.525 | 25 | 25 | 153.6 | 25 | 25 | 30 | | | | | TW15P |
| | 32-16C | 9.525 | 32 | 32 | 173.6 | 32 | 32 | 30 | | | | | |
| | 32-22C | 12.7 | 32 | 32 | 175.7 | 32 | 32 | 36 | STA22 | CTH22 | ATE22 | AT122 | TW20P |
| | 40-22C | 12.7 | 40 | 40 | 205.7 | 40 | 40 | 36 | STA27 | CTH27 | ATE27 | AT127 | TW25L |
| | 25-27C | 15.875 | 25 | 25 | 151.6 | 25 | 25 | 35 | | | | | |
| | 32-27C | 15.875 | 32 | 32 | 176.6 | 32 | 32 | 40 | | | | | |
| | 40-27C | 15.875 | 40 | 40 | 206.6 | 40 | 40 | 40 | | | | | |
| | 50-27C | 15.875 | 50 | 50 | 256.6 | 50 | 50 | 40 | | | | | |

Applicable inserts, see pages D10~D13, D16, D18, D19, D22, D23~D26 • Helix angle is 1.5° for all holders.



D Internal Holder

IR(L)H (Screw on system)



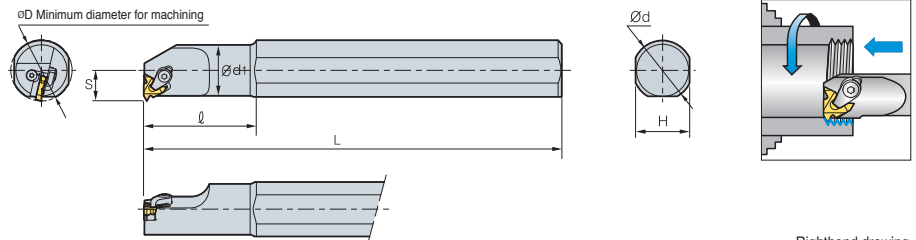
Righthand drawing

| Designation | | Inscribed circle | ØD | Ød | Ød1 | H | L | S | ℓ | Insert Screw | Shim Screw | Screw LH | Screw RH | Wrwnch |
|-------------|---------|------------------|----|----|------|------|-----|------|----|--------------|------------|----------|----------|--------|
| IR(L)H | 10DN-11 | 6.35 | 13 | 10 | 10.0 | 9.5 | 100 | 7.3 | - | ST11N | - | - | - | TW08P |
| | 10N-11 | 6.35 | 13 | 20 | 10.0 | 18.0 | 180 | 7.3 | 25 | | | | | |
| | 13N-11 | 6.35 | 16 | 20 | 13.0 | 18.0 | 180 | 8.9 | 32 | | | | | |
| | 13N-16 | 9.525 | 17 | 20 | 12.7 | 18.0 | 180 | 10.3 | 32 | ST16N | - | - | - | TW10P |
| | 16N-16 | 9.525 | 20 | 20 | 16.0 | 18.0 | 180 | 11.5 | 40 | | | | | |
| | 16DN-16 | 9.525 | 20 | 16 | 16.0 | 15.2 | 150 | 11.3 | 32 | | | | | |
| | 20-16 | 9.525 | 24 | 20 | 20.0 | 18.0 | 180 | 13.4 | 40 | ST16 | STA16 | ATI16 | ATE16 | TW10P |
| | 25-16 | 9.525 | 29 | 32 | 25.0 | 29.0 | 250 | 16.3 | 60 | | | | | |
| | 25D-16 | 9.525 | 29 | 25 | 24.5 | 22.6 | 200 | 16.1 | 45 | | | | | |
| | 32-16 | 9.525 | 36 | 32 | 32.0 | 29.0 | 250 | 19.6 | 60 | | | | | |
| | 40-16 | 9.525 | 44 | 40 | 40.0 | 36.0 | 300 | 23.8 | 60 | | | | | |
| | 20N-22 | 12.7 | 27 | 20 | 20.0 | 18.0 | 180 | 15.6 | 50 | | | | | |
| | 25-22 | 12.7 | 32 | 32 | 25.0 | 29.0 | 250 | 17.4 | 60 | ST22 | STA22 | ATI22 | ATE22 | TW20P |
| | 25D-22 | 12.7 | 32 | 25 | 24.6 | 22.6 | 200 | 17.2 | 45 | | | | | |
| | 32-22 | 12.7 | 39 | 32 | 32.0 | 29.0 | 250 | 21.5 | 60 | | | | | |
| | 40-22 | 12.7 | 47 | 40 | 40.0 | 36.0 | 300 | 25.8 | 60 | | | | | |
| | 32-27 | 15.875 | 40 | 32 | 32.0 | 29.0 | 250 | 22.4 | 60 | ST27 | STA27 | ATI27 | ATE27 | TW25L |
| | 40-27 | 15.875 | 48 | 40 | 40.0 | 36.0 | 300 | 26.4 | 60 | | | | | |
| | 50-27 | 15.875 | 58 | 50 | 50.0 | 45.0 | 350 | 31.4 | 75 | | | | | |
| | 60-27 | 15.875 | 69 | 60 | 60.0 | 54.0 | 400 | 36.4 | 75 | | | | | |

Applicable inserts, see pages D10, D11, D14, D15, D17, D 20~D25, D27~D30

- Helix angle is 1.5° for all holders.
- No shim needed for N type holder

IR(L)H-C (Clamp on system)

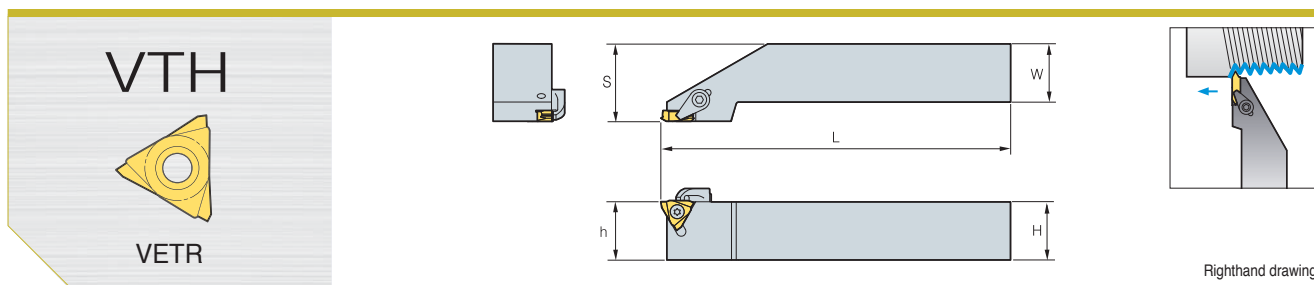






Righthand drawing

| Designation | | Inscribed circle | ØD | Ød | Ød1 | H | L | S | ℓ | Shim Screw | Clamp | Screw LH | Screw RH | Wrwnch |
|-------------|---------|------------------|----|----|------|------|-----|------|----|------------|-------|----------|----------|----------------|
| IR(L)H | 20-16C | 9.525 | 24 | 20 | 20.0 | 18.0 | 180 | 13.4 | 50 | STA16 | CTH16 | ATI16 | ATE16 | TW10P TW15P |
| | 25-16C | 9.525 | 29 | 32 | 25.0 | 28.0 | 250 | 16.3 | 60 | | | | | |
| | 25D-16C | 9.525 | 29 | 25 | 24.6 | 22.6 | 200 | 16.1 | 45 | | | | | |
| | 32-16C | 9.525 | 36 | 32 | 32.0 | 29.0 | 250 | 19.6 | 60 | | | | | |
| | 40-16C | 9.525 | 44 | 40 | 40.0 | 36.0 | 300 | 23.8 | 60 | STA22 | CTH22 | ATI22 | ATE22 | TW20P |
| | 25-22C | 12.7 | 32 | 32 | 25.0 | 29.0 | 250 | 17.4 | 60 | | | | | |
| | 25D-22C | 12.7 | 32 | 25 | 24.6 | 22.6 | 200 | 17.2 | 45 | | | | | |
| | 32-22C | 12.7 | 39 | 32 | 32.0 | 29.0 | 250 | 21.5 | 60 | | | | | |
| | 40-22C | 12.7 | 47 | 40 | 40.0 | 36.0 | 300 | 25.8 | 60 | STA27 | CTH27 | ATI27 | ATE27 | TW25L |
| | 32-27C | 15.875 | 40 | 32 | 32.0 | 29.0 | 250 | 22.4 | 60 | | | | | |
| | 40-27C | 15.875 | 48 | 40 | 40.0 | 36.0 | 300 | 26.4 | 60 | | | | | |
| | 50-27C | 15.875 | 58 | 50 | 50.0 | 45.0 | 350 | 31.4 | 75 | | | | | |
| | 60-27C | 15.875 | 69 | 60 | 60.5 | 54.0 | 400 | 36.4 | 75 | | | | | |


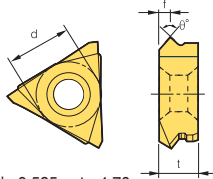
Applicable inserts, see pages D10, D11, D14, D15, D17, D 20~D25, D27~D30

- Helix angle is 1.5° for all holders.



| Designation | | H=(h) | W | L | S | Inserts | Clamp | Clamp Screw | Screw | Wrwnch |
|-------------|-------|-------|----|-----|------|---------|---|---|---|---|
| VTH | 2020R | 20 | 20 | 125 | 26.4 | VETR |  |  |  |  |
| | 2525R | 25 | 25 | 150 | 33.4 | | | | | |
| | 3225R | 32 | 25 | 170 | 33.4 | | | | | |

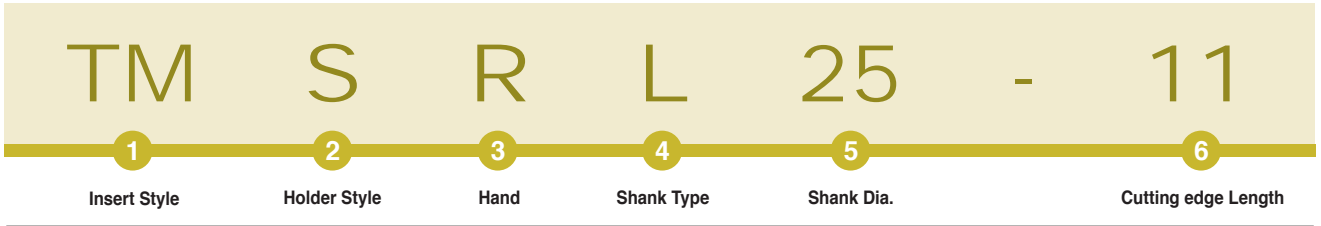
Vertical Type Thread Insert

| Picture | Designation | Coated | Cermet | Uncoated | Dimensions | | | Picture | |
|---|-------------|--------|--------|----------|------------|----------|-----|---|-----|
| | | PC130 | CN20 | ST10 | Pitch (mm) | θ | f | | |
|  | VETR 080 | | | | 0.8 | 60° | 1.4 |  | |
| | 100 | | | ● | 1.0 | 60° | 1.4 | | |
| | 125 | | | | 1.25 | 60° | 1.4 | | |
| | 150 | | | ● | 1.5 | 60° | 1.2 | | |
| | 175 | | | | 1.75 | 60° | 1.2 | | |
| | 200 | | | ● | 2.0 | 60° | 1.2 | | |
| | 250 | | | ● | 2.5 | 60° | 1.4 | | |
| | 300 | | | ● | 3.0 | 60° | 1.6 | | |
| | 150F | | ● | ● | ● | 0.8~1.5 | 60° | | 1.4 |
| | 300F | | ● | ● | ● | 1.5~3.0 | 60° | | 1.6 |

● : Stock item

D Technical Information for Thread Milling

Thread Milling Holders code system



1 Insert Style
TM S R L 25 - 11

Thread Milling Holder

3 Hand
 T M S **R** L 25 - 11

R : Right Hand L : Left Hand

5 Shank Dia.
 T M S R L **25** - 11

25 : 25.0

2 Holders Style
 T M **S** R L 25 - 11

S : Shank Type

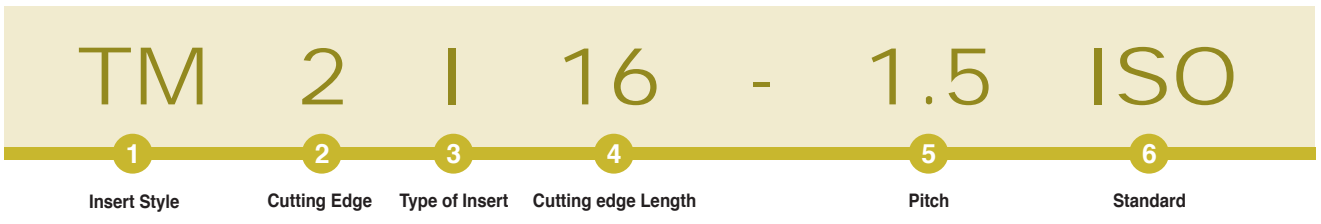
4 Shank Type
 T M S R **L** 25 - 11

None : Standard
 L : Long Type
 T : Taper Type

6 Cutting edge Length
 T M S R L 25 - **11**

| | |
|-----------|-----------|
| 10 : 10.4 | 22 : 22 |
| 11 : 11 | 27 : 27 |
| 16 : 16 | 38 : 38.5 |

Thread Milling Inserts code system



1 Insert Style
TM 2 I 16 - 1.5 ISO

Thread Milling Holder

4 Cutting edge Length
 T M 2 I **16** - 1.5 ISO

| |
|-----------|
| 10 : 10.4 |
| 11 : 11 |
| 16 : 16 |
| 22 : 22 |
| 27 : 27 |
| 38 : 38.5 |

6 Standard
 T M 2 I 16 - 1.5 **ISO**

ISO Metric
 American UN(UNC, UNF, UNEF)
 UNJ
 Whit Worth (BSW, BSF, BSP, BSB)
 National Pipe Thread (NPT)
 National Pipe Thread (NPTF)
 British Standard Pipe Thread (BSPT)

2 Cutting Edge
 T M **2** I 16 - 1.5 ISO

None : 1 cutting edge
 2 : 2 cutting edge

3 Type of Insert
 T M 2 I **I** 16 - 1.5 ISO

I : Internal
 E : External
 EI : External & Internal

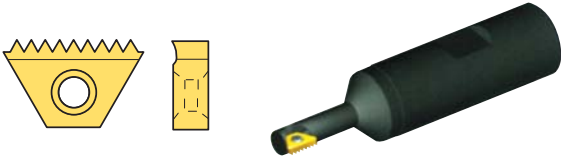
5 Pitch
 T M 2 I 16 - **1.5** ISO

mm : 0.5 - 6.0 tpi : 48 - 6

Thread Milling

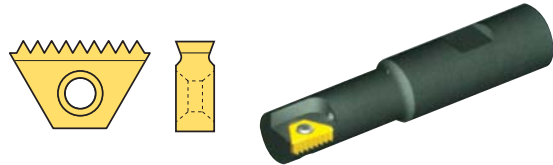
🎯 The right Tool for the Job

Small diameter type



Tool holder : TMSR **Insert :** TM L=10.4mm
For small bore diameters down to 9.5mm

Standard Type



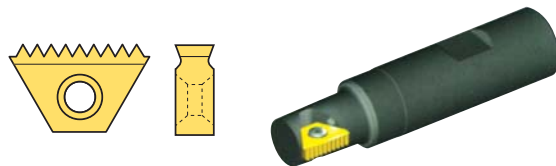
Tool holder : TMSR **Insert :** TM2
For standard length threads

Long Type



Tool holder : TMSR **Insert :** TM2
For long or remote threads

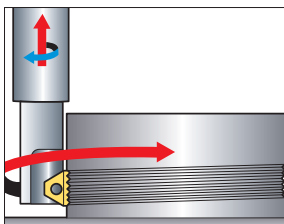
Tapered Type



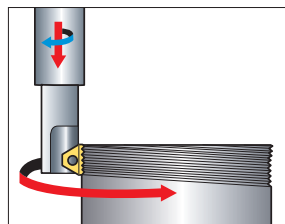
Tool holder : TMSR **Insert :** TM2(BSPT, NPT, NPTF)
standard length threads

🎯 Thread milling methods

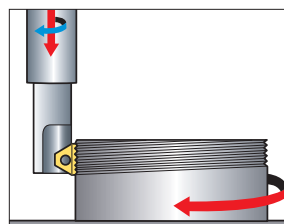
External threading



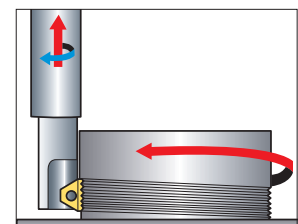
Right handed Thread
Conventional Milling



Left handed Thread
Conventional Milling

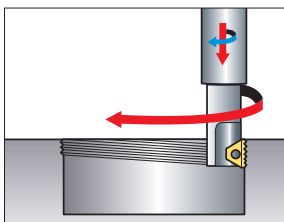


Right handed Thread
Conventional Milling

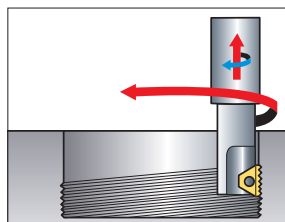


Left handed Thread
Conventional Milling

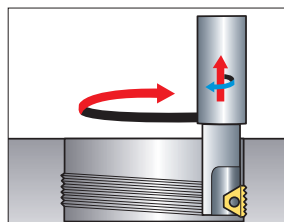
Internal threading



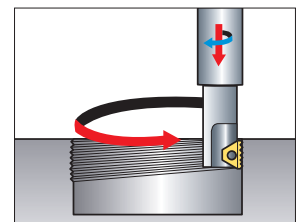
Right handed Thread
Conventional Milling



Left handed Thread
Conventional Milling

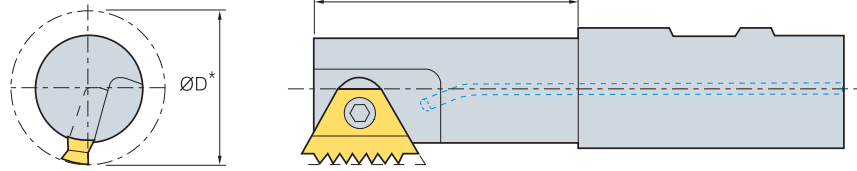


Right handed Thread
Conventional Milling



Left handed Thread
Conventional Milling

Tooling recommendation* for given INTERNAL thread specification



ISO

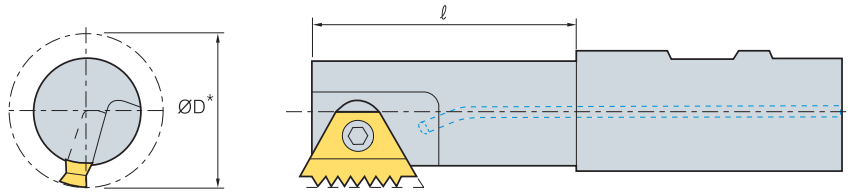
| Pitch (mm) | Nominal Dia. (mm) | Holder | Insert | ℓ-Tool holder | D-Tool | Min.Thread Depth |
|---------------|----------------------|-------------|-----------------|---------------|---------------|------------------|
| | | | | overhang | cutting dia.* | Profile depth |
| 0.75 | 11 | TMSR 12-10 | TM2I 10-0.75ISO | 12.0 | 9.0 | 0.43 |
| 1.0 | 12-14 | TMSR 12-10 | TM2I 10-1.0ISO | 12.0 | 9.0 | 0.58 |
| | 15-18 | TMSR 12-11 | TM2I 11-1.0ISO | 12.0 | 11.5 | |
| | 20 | TMSR 16-16 | TM2I 16-1.0ISO | 22.0 | 17.0 | |
| | 22 | TMSR 20-22 | TM2I 22-1.0ISO | 29.0 | 19.0 | |
| | 24 | TMSR 20-16 | TM2I 16-1.0ISO | 43.0 | 20.0 | |
| | 25-28 | TMSRL 25-16 | TM2I 16-1.0ISO | 25.0 | 22.0 | |
| 1.25 | 14 | TMSR 12-10 | TM2I 10-1.25ISO | 12.0 | 9.0 | 0.72 |
| 1.5 | 14-15 | TMSR 12-10 | TM2I 10-1.5ISO | 12.0 | 9.0 | 0.87 |
| | 16-20 | TMSR 12-11 | TM2I 11-1.5ISO | 12.0 | 11.5 | |
| | 22 | TMSR 16-16 | TM2I 16-1.5ISO | 22.0 | 17.0 | |
| | 24 | TMSR 20-22 | TM2I 22-1.5ISO | 29.0 | 19.0 | |
| | 25-26 | TMSR 20-16 | TM2I 16-1.5ISO | 43.0 | 20.0 | |
| | 27-30 | TMSRL 25-16 | TM2I 16-1.5ISO | 25.0 | 22.0 | |
| | 35-42 | TMSR 25-27 | TM2I 27-1.5ISO | 52.0 | 30.0 | |
| | 45 | TMSR 32-27 | TM2I 27-1.5ISO | 58.0 | 37.0 | |
| 2.0 | 22 | TMSRT 16-16 | TM2I16-2.0ISO | 22.0 | 15.5 | 1.15 |
| | 24 | TMSR 16-16 | TM2I 16-2.0ISO | 22.0 | 17.0 | |
| | 25 | TMSR 20-22 | TM2I 22-2.0ISO | 29.0 | 19.0 | |
| | 27 | TMSR 20-16 | TM2I 16-2.0ISO | 43.0 | 20.0 | |
| | 28-32 | TMSRL 25-16 | TM2I 16-2.0ISO | 25.0 | 22.0 | |
| | 39-42 | TMSR 25-27 | TM2I 27-2.0ISO | 52.0 | 30.0 | |
| | 45-48 | TMSR 32-27 | TM2I 27-2.0ISO | 58.0 | 37.0 | |
| 3.0 | 42-48 | TMSR 25-27 | TM2I 27-3.0ISO | 52.0 | 30.0 | 1.73 |
| | 50-52 | TMSR 32-27 | TM2I 27-3.0ISO | 58.0 | 37.0 | |
| 4.0 | 45-52 | TMSR 25-27 | TM2I 27-4.0ISO | 52.0 | 30.0 | 2.31 |
| | 55 | TMSR 32-38 | TM2I 38-4.0ISO | 55.0 | 35.0 | |
| | 56-58 | TMSR 32-27 | TM2I 27-4.0ISO | 58.0 | 37.0 | |
| | 60-65 | TMSR 40-38 | TM2I 38-4.0ISO | 65.0 | 46.0 | |
| 5.0 | 48-52 | TMSR 32-38 | TM2I 38-5.0ISO | 55.0 | 35.0 | 2.89 |
| 5.5 | 56 | TMSR 32-38 | TM2I 38-5.5ISO | 55.0 | 35.0 | 3.17 |
| | 60 | TMSR 40-38 | TM2I 38-5.5ISO | 65.0 | 46.0 | |
| 6.0 | 64-68 | TMSR 40-38 | TM2I 38-6.0ISO | 65.0 | 46.0 | 3.46 |

• The recommended holder is the largest for the given thread specification

* Holder with smaller or equal cutting diameters (D2) can also be used



Tooling recommendation* for given INTERNAL thread specification



UN

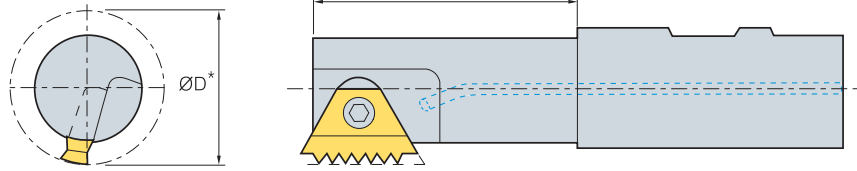
| Pitch tpi | Nominal Dia. inch | Holder | Insert | ℓ-Tool holder | D-Tool | Min.Thread Depth Profile depth |
|---------------|----------------------|--------------|---------------|---------------|---------------|-----------------------------------|
| | | | | overhang | cutting dia.* | |
| 32 | 7/16-1/2 | TMSR 12-10 | TMI 10-32UN | 12.0 | 9.0 | 0.46 |
| | 9/16-11/16 | TMSR 12-11 | TM2I 11-32UN | 12.0 | 11.5 | |
| | 3/4-13/16 | TMSR 16-16 | TM2I 16-32UN | 22.0 | 17.0 | |
| | 7/8-15/16 | TMSR 20-16 | TM2I 16-32UN | 43.0 | 20.0 | |
| | 1 | TMSR 25-16 | TM2I 16-32UN | 25.0 | 22.0 | |
| 28 | 7/16-1/2 | TMSR 12-10 | TMI 10-28UN | 12.0 | 9.0 | 0.52 |
| | 9/16-3/4 | TMSR 12-11 | TM2I 11-28UN | 12.0 | 11.5 | |
| | 13/16-7/8 | TMSR 16-16 | TM2I 16-28UN | 22.0 | 17.0 | |
| | 15/16 | TMSR 20-16 | TM2I 16-28UN | 43.0 | 20.0 | |
| | 1-1 1/8 | TMSRL 25-16 | TM2I 16-28UN | 25.0 | 22.0 | |
| 24 | 9/16-11/16 | TMSR 12-11 | TM2I 11-24UN | 12.0 | 11.5 | 0.61 |
| 20 | 1/2-9/16 | TMSR 12-10 | TMI 10-20UN | 12.0 | 9.0 | 0.73 |
| | 5/8-13/16 | TMSR 12-11 | TM2I 11-20UN | 12.0 | 11.5 | |
| | 7/8 | TMSR 16-16 | TM2I 16-20UN | 22.0 | 17.0 | |
| | 15/16-1 | TMSR 20-16 | TM2I 16-20UN | 43.0 | 20.0 | |
| | 1 1/16-1 1/8 | TMSRL 25-16 | TM2I 16-20UN | 25.0 | 22.0 | |
| | 1 3/8-1 5/8 | TMSR 25-27 | TM2I 27-20UN | 52.0 | 30.0 | |
| | 1 11/16-1 13/16 | TMSR 32-27 | TM2I 27-20UN | 28.0 | 37.0 | |
| 18 | 5/8 | TMSR 12-11 | TM2I 11-18UN | 12.0 | 11.5 | 0.81 |
| | 1 1/16-1 3/16 | TMSRL 25-16 | TM2I 16-18UN | 25.0 | 22.0 | |
| | 1 7/16-1 5/8 | TMSR 25-27 | TM2I 27-18UN | 52.0 | 30.0 | |
| | 1 11/16 | TMSR 32-27 | TM2I 27-18UN | 58.0 | 37.0 | |
| | 11/16-13/16 | TMSR 12-11 | TM2I 11-16UN | 12.0 | 11.5 | |
| 16 | 7/8-15/16 | TMSR 16-16 | TM2I 16-16UN | 22.0 | 17.0 | 0.92 |
| | 1 | TMSR 20-16 | TM2I 16-16UN | 43.0 | 20.0 | |
| | 1 1/16-1 3/16 | TMSRL 25-16 | TM2I 16-16UN | 25.0 | 22.0 | |
| | 1 7/16-1 5/8 | TMSR 25-27 | TM2I 27-16UN | 52.0 | 30.0 | |
| | 1 11/16-1 7/8 | TMSR 32-27 | TM2I 27-16UN | 58.0 | 37.0 | |
| | 11/16-13/16 | TMSR 12-11 | TM2I 11-14UN | 12.0 | 11.5 | |
| 14 | 7/8 | TMSR 12-11 | TM2I 11-14UN | 12.0 | 11.5 | 1.05 |
| | 7/8 | TMSRT 16-16 | TM2I 16-12UN | 22.0 | 15.5 | |
| | 15/16 | TMSR 16-16 | TM2I 16-12UN | 22.0 | 17.0 | |
| | 1 | TMSR 20-22 | TM2I 22-12UN | 29.0 | 19.0 | |
| | 1 1/16 | TMSR 20-16 | TM2I 16-12UN | 43.0 | 20.0 | |
| | 1 1/8-1 1/4 | TMSRL 25-16 | TM2I 16-12UN | 25.0 | 22.0 | |
| | 1 1/2-1 11/16 | TMSR 25-27 | TM2I 27-12UN | 52.0 | 30.0 | |
| 1 3/4-1 15/16 | TMSR 32-27 | TM2I 27-12UN | 58.0 | 37.0 | | |
| 8 | 1 11/16-1 15/16 | TMSR 25-27 | TM2I 27-8UN | 52.0 | 30.0 | 1.83 |
| | 2-1 1/8 | TMSR 32-27 | TM2I 27-8UN | 58.0 | 37.0 | |
| 6 | 2-2 1/8 | TMSR 25-27 | TM2I 27-6UN | 52.0 | 30.0 | 2.44 |
| | 2 1/4 | TMSR 32-27 | TM2I 27-6UN | 58.0 | 37.0 | |
| | 2 3/8-2 1/2 | TMSR 40-38 | TM2I 38-6UN | 65.0 | 46.0 | |
| 4.5 | 2-2 1/4 | TMSR 32-38 | TM2I 38-4.5UN | 55.0 | 35.0 | 3.26 |
| 4 | 2 1/2 | TMSR 40-38 | TM2I 38-4UN | 65.0 | 46.0 | 3.67 |

• The recommended holder is the largest for the given thread specification

* Holder with smaller or equal cutting diameters (D2) can also be used



Tooling recommendation* for given INTERNAL thread specification



UNJ

| Pitch tpi | Nominal Dia. inch | Holder | Insert | ℓ-Tool holder | D-Tool | Min.Thread Depth |
|--------------|----------------------|-------------|---------------|---------------|---------------|------------------|
| | | | | overhang | cutting dia.* | Profile depth |
| 24 | 9/16-11/16 | TMSR 12-11 | TM2I 11-24UNJ | 12.0 | 11.5 | 0.55 |
| 20 | 1/2 | TMSR 12-10 | TMI 10-20UNJ | 12.0 | 9.0 | 0.66 |
| | 3/4-13/16 | TMSR 12-11 | TM2I 11-20UNJ | 12.0 | 11.5 | |
| | 7/8 | TMSR 16-16 | TM2I 16-20UNJ | 22.0 | 17.0 | |
| | 15/16-1 | TMSR 20-16 | TM2I 16-20UNJ | 43.0 | 20.0 | |
| 18 | 5/8 | TMSR 12-11 | TM2I 11-18UNJ | 12.0 | 11.5 | 0.74 |
| | 1 1/16-1 3/16 | TMSRL 25-16 | TM2I 16-18UNJ | 25.0 | 22.0 | |
| 16 | 11/16-13/16 | TMSR 12-11 | TM2I 11-16UNJ | 12.0 | 11.5 | 0.83 |
| | 7/8-15/16 | TMSR 16-16 | TM2I 16-16UNJ | 22.0 | 17.0 | |
| | 1 | TMSR 20-16 | TM2I 16-16UNJ | 43.0 | 20.0 | |
| | 1 1/16-1 3/16 | TMSRL 25-16 | TM2I 16-16UNJ | 25.0 | 22.0 | |
| | 1 7/16-1 5/8 | TMSR 25-27 | TM2I 27-16UNJ | 52.0 | 30.0 | |
| 14 | 1 11/16-1 7/8 | TMSR 32-27 | TM2I 27-16UNJ | 58.0 | 37.0 | 0.95 |
| | 7/8 | TMSR 12-11 | TM2I 11-14UNJ | 12.0 | 11.5 | |
| 12 | 7/8 | TMSRT 16-16 | TM2I 16-12UNJ | 22.0 | 15.5 | 1.11 |
| | 15/16-1 | TMSR 16-16 | TM2I 16-12UNJ | 22.0 | 17.0 | |
| | 1 1/16 | TMSR 20-16 | TM2I 16-12UNJ | 43.0 | 20.0 | |
| | 1 1/8-1 1/4 | TMSRL 25-16 | TM2I 16-12UNJ | 25.0 | 22.0 | |
| | 1 1/2-1 11/16 | TMSR 25-27 | TM2I 27-12UNJ | 52.0 | 30.0 | |
| | 1 3/4-1 15/16 | TMSR 32-27 | TM2I 27-12UNJ | 58.0 | 37.0 | |

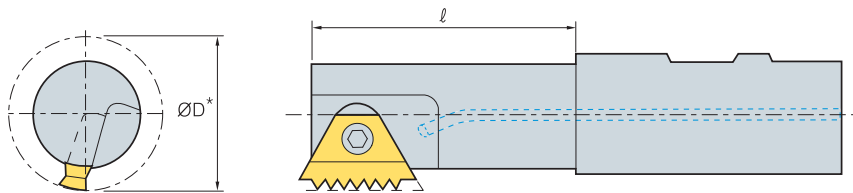
W

| Pitch tpi | Nominal Dia. inch | Holder | Insert | ℓ-Tool holder | D-Tool | Min.Thread Depth |
|--------------|----------------------|-------------|---------------|---------------|---------------|------------------|
| | | | | overhang | cutting dia.* | Profile depth |
| 26 | 1/2-9/16 | TMSR 12-10 | TMEI 10-26W | 12.0 | 9.0 | 0.63 |
| | 5/8-3/4 | TMSR 12-11 | TM2EI 11-26 W | 12.0 | 11.5 | |
| | 13/16-7/8 | TMSR 16-16 | TM2EI 16-26W | 22.0 | 17.0 | |
| | 15/16-1 | TMSR 20-16 | TM2EI 16-26W | 43.0 | 20.0 | |
| | 1 1/16-1 1/8 | TMSRL 25-16 | TM2EI 16-26W | 25.0 | 22.0 | |
| 20 | 9/16 | TMSR 12-10 | TM2EI 10-20W | 12.0 | 9.0 | 0.81 |
| | 5/8-13/16 | TMSR 12-11 | TM2EI 11-20W | 12.0 | 11.5 | |
| | 7/8-15/16 | TMSR 16-16 | TM2EI 16-20W | 22.0 | 17.0 | |
| | 1 | TMSR 20-16 | TM2EI 16-20W | 43.0 | 20.0 | |
| | 1 1/16-1 3/16 | TMSRL 25-16 | TM2EI 16-20W | 25.0 | 22.0 | |
| 16 | 13/16 | TMSR 16-16 | TM2EI 16-16W | 22.0 | 15.5 | 1.02 |
| | 7/8-15/16 | TMSR 16-16 | TM2EI 16-16W | 22.0 | 17.0 | |
| | 1-1 1/16 | TMSR 20-16 | TM2EI 16-16W | 43.0 | 20.0 | |
| | 1 1/8-1 1/4 | TMSRL 25-16 | TM2EI 16-16W | 25.0 | 22.0 | |
| | 1.4-1 5/8 | TMSR 25-27 | TM2EI 27-16W | 52.0 | 30.0 | |
| | 1 3/4-1.9 | TMSR 32-27 | TM2EI 27-16W | 28.0 | 37.0 | |
| 12 | 1 1/2-1 3/4 | TMSR 25-27 | TM2EI 27-12W | 52.0 | 30.0 | 1.36 |
| | 1 7/8 | TMSR 32-27 | TM2EI 27-12W | 58.0 | 37.0 | |
| 8 | 1 7/8-1.9 | TMSR 25-27 | TM2EI 27-8W | 52.0 | 30.0 | 2.03 |
| | 2.1-2 1/8 | TMSR 32-27 | TM2EI 27-8W | 58.0 | 37.0 | |
| 7 | 2 | TMSR 25-27 | TM2EI 27-7W | 52.0 | 30.0 | 2.32 |
| 6 | 2.1-2 1/8 | TMSR 25-27 | TM2EI 27-6W | 52.0 | 30.0 | 2.71 |
| | 2 1/4 | TMSR 32-38 | TM2EI 38-6W | 55.0 | 35.0 | |
| | 2 3/8-2.6 | TMSR 32-27 | TM2EI 27-6W | 58.0 | 37.0 | |
| | 2 5/8-2 3/4 | TMSR 40-38 | TM2EI 38-6W | 65.0 | 46.0 | |
| 5 | 3 | TMSR 40-38 | TM2EI 38-5W | 65.0 | 46.0 | 3.25 |
| 4.5 | 3 1/2 | TMSR 40-38 | TM2EI 38-4.5W | 65.0 | 46.0 | 3.61 |

* The recommended holder is the largest for the given thread specification

* Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation* for given INTERNAL thread specification



BSPT

| Pitch tpi | Nominal Dia. inch | Holder | Insert | ℓ-Tool holder | D-Tool | Min.Thread Depth |
|--------------|----------------------|-------------|------------------|---------------|---------------|------------------|
| | | | | overhang | cutting dia.* | Profile depth |
| 19 | 3/8 | TMSR 21-11 | TM2EI 11-19 BSPT | 20.0 | 11.5 | 0.86 |
| 14 | 1/2-3/4 | TMSRT 16-11 | TM2EI 16-14 BSPT | 22.0 | 15.5 | 1.16 |
| 11 | 1-1 1/4 | TMSRT 20-16 | TM2EI 16-11 BSPT | 23.0 | 19.0 | 1.48 |
| | 1 1/2 | TMSR 25-27 | TM2EI 27-11 BSPT | 52.0 | 30.0 | |
| | 2-6 | TMSRT 32-27 | TM2EI 27-11 BSPT | 58.0 | 37.0 | |

NPT

| Pitch tpi | Nominal Dia. inch | Holder | Insert | ℓ-Tool holder | D-Tool | Min.Thread Depth |
|--------------|----------------------|-------------|-------------------|---------------|---------------|------------------|
| | | | | overhang | cutting dia.* | Profile depth |
| 14 | 1/2 | TMSRT 16-16 | TM2EI 16-14 NPT | 22.0 | 15.5 | 1.33 |
| | 3/4 | TMSRT 20-16 | TM2EI 16-14 NPT | 23.0 | 19.0 | |
| 11.5 | 1 | TMSRT 20-16 | TM2EI 16-11.5 NPT | 23.0 | 19.0 | 1.64 |
| | 1 1/4 | TMSR 25-27 | TM2EI 27-11.5 NPT | 52.0 | 30.0 | |
| | 1 1/2-2 | TMSRT 32-27 | TM2EI 27-11.5 NPT | 58.0 | 37.0 | |
| 8 | 2 1/2 | TMSRT 32-27 | TM2EI 27-8 NPT | 58.0 | 37.0 | 2.42 |
| | 3-24 | TMSR 40-38 | TM2EI 38-8 NPT | 65.0 | 46.0 | |

NPTF

| Pitch tpi | Nominal Dia. inch | Holder | Insert | ℓ-Tool holder | D-Tool | Min.Thread Depth |
|--------------|----------------------|-------------|--------------------|---------------|---------------|------------------|
| | | | | overhang | cutting dia.* | Profile depth |
| 14 | 1/2 | TMSRT 16-16 | TM2EI 16-14 NPTF | 22.0 | 15.5 | 1.35 |
| | 3/4 | TMSRT 20-16 | TM2EI 16-14 NPTF | 23.0 | 19.0 | |
| 11.5 | 1 | TMSRT 20-16 | TM2EI 16-11.5 NPTF | 23.0 | 19.0 | 1.63 |
| | 1 1/2 | TMSR 25-27 | TM2EI 27-11.5 NPTF | 52.0 | 30.0 | |
| | 2 | TMSRT 32-27 | TM2EI 27-11.5 NPTF | 58.0 | 37.0 | |
| 8 | 2 1/2 | TMSRT 32-27 | TM2EI 27-8 NPTF | 58.0 | 37.0 | 2.38 |
| | 3 | TMSR 40-38 | TM2EI 38-8 NPTF | 65.0 | 46.0 | |

• The recommended holder is the largest for the given thread specification

* Holder with smaller or equal cutting diameters (D2) can also be used



Minimum Bore Diameters for Thread milling

| Pitch | 0.5 | 0.6 | 0.7 | 0.75 0.80 | 0.9 | 1.0 | 1.25 | 1.5 | 1.75 | 2.0 | - | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | - | 6.0 | - | |
|--------------------|---|------|------|--------------|------|------|----------|----------|----------|------|----------|------------|------|--------|------|------|------|------|------|------|------|------|
| | tpi | 48 | 44 | 36 | 32 | 28 | 26 24 | 20 19 | 18 16 | 14 | 13 12 | 11.5 11 | 10 | 9 8 | 7 | 6 | - | 5 | - | 4.5 | - | 4 |
| Holder Designation | diameter Minimum diameter for machining | | | | | | | | | | | | | | | | | | | | | |
| TMSR 12-10 | 9.0 | 9.5 | 9.7 | 9.9 | 10.0 | 10.4 | 10.7 | 11.4 | 12.0 | | | | | | | | | | | | | |
| TMSR 20-10 | 9.0 | 9.5 | 9.7 | 9.9 | 10.0 | 10.4 | 10.7 | 11.4 | 12.0 | | | | | | | | | | | | | |
| TMSR 12-11 | 11.5 | 12.0 | 12.2 | 12.4 | 12.5 | 12.9 | 13.2 | 13.9 | 14.5 | 15.1 | | | | | | | | | | | | |
| TMSR 20-11 | 11.5 | 12.0 | 12.2 | 12.4 | 12.5 | 12.9 | 13.2 | 13.9 | 14.5 | 15.1 | | | | | | | | | | | | |
| TMSRL 25-11 | 11.5 | 12.0 | 12.2 | 12.4 | 12.5 | 12.9 | 13.2 | 13.9 | 14.5 | 15.1 | | | | | | | | | | | | |
| TMSRT 16-16 | 15.5 | 16.0 | 16.2 | 16.4 | 16.5 | 16.9 | 17.2 | 17.9 | 18.5 | 19.0 | 19.5 | 20.0 | | | | | | | | | | |
| TMSR 16-16 | 17.0 | 17.6 | 17.8 | 18.0 | 18.2 | 18.7 | 19.0 | 19.6 | 20.0 | 20.5 | 21.0 | 21.5 | | | | | | | | | | |
| TMSR 16-22 | 17.0 | 17.6 | 17.8 | 18.0 | 18.2 | 18.7 | 19.0 | 19.6 | 20.0 | 20.5 | 21.0 | 21.5 | | | | | | | | | | |
| TMSR 20-22 | 19.0 | 19.7 | 20.0 | 20.2 | 20.4 | 20.8 | 21.0 | 21.6 | 22.0 | 22.5 | 23.0 | 23.5 | | | | | | | | | | |
| TMSRT 20-16 | 19.0 | 19.7 | 20.0 | 20.2 | 20.4 | 20.8 | 21.0 | 21.6 | 22.0 | 22.5 | 23.0 | 23.5 | | | | | | | | | | |
| TMSR 20-16 | 20.0 | 20.7 | 21.0 | 21.2 | 21.4 | 21.8 | 22.0 | 22.6 | 23.0 | 23.5 | 24.0 | 24.5 | | | | | | | | | | |
| TMSRW 25-22 | 22.0 | 22.7 | 23.0 | 23.2 | 23.4 | 23.8 | 24.0 | 24.6 | 25.0 | 25.5 | 26.0 | 26.5 | | | | | | | | | | |
| TMSRL 25-22 | 22.0 | 22.7 | 23.0 | 23.2 | 23.4 | 23.8 | 24.0 | 24.6 | 25.0 | 25.5 | 26.0 | 26.5 | | | | | | | | | | |
| TMSRL 25-16 | 22.0 | 22.7 | 23.0 | 23.2 | 23.4 | 23.8 | 24.0 | 24.6 | 25.0 | 25.5 | 26.0 | 26.5 | | | | | | | | | | |
| TMSR 25-27 | 30.0 | 30.7 | 31.0 | 31.2 | 31.4 | 31.8 | 32.0 | 32.8 | 33.5 | 34.1 | 34.6 | 35.6 | 36.6 | 39.0 | 42.0 | 45.0 | 48.0 | | | | | |
| TMSRL 25-27 | 30.0 | 30.7 | 31.0 | 31.2 | 31.4 | 31.8 | 32.0 | 32.8 | 33.5 | 34.1 | 34.6 | 35.6 | 36.6 | 39.0 | 42.0 | 45.0 | 48.0 | | | | | |
| TMSR 32-38 | 35.0 | | | | | | | | 38.5 | 39.1 | 39.6 | 40.6 | 42.0 | 44.0 | 47.0 | 50.0 | 53.4 | 42.5 | 50.0 | 44.6 | 57.5 | 56.6 |
| TMSR 32-27 | 37.0 | 38.0 | 38.2 | 38.4 | 38.6 | 39.1 | 39.5 | 40.4 | 41.0 | 41.5 | 42.0 | 43.0 | 44.0 | 46.5 | 49.0 | 52.0 | 55.5 | | | | | |
| TMSRL 32-27 | 37.0 | 38.0 | 38.2 | 38.4 | 38.6 | 39.1 | 39.5 | 40.4 | 41.0 | 41.5 | 42.0 | 43.0 | 44.0 | 46.5 | 49.0 | 52.0 | 55.5 | | | | | |
| TMSRT 32-27 | 37.0 | 38.0 | 38.2 | 38.4 | 38.6 | 39.1 | 39.5 | 40.0 | 41.0 | 41.5 | 42.0 | 43.0 | 44.0 | 46.5 | 49.0 | 52.0 | 55.5 | | | | | |
| TMSR 40-38 | 46.0 | | | | | | | | 49.5 | 50.1 | 50.6 | 51.6 | 53.0 | 55.0 | 55.2 | 55.6 | 55.0 | 52.5 | 54.0 | 54.5 | 57.5 | 56.6 |
| TMSRL 40-38 | 46.0 | | | | | | | | 49.5 | 50.1 | 50.6 | 51.6 | 53.0 | 55.0 | 55.2 | 55.6 | 55.0 | 52.5 | 54.0 | 54.5 | 57.5 | 56.6 |

In order to perform a thread milling operation, a milling machine with three-axis control capability of helical interpolation is required. Helical interpolation is a CNC function producing tool movement along a helical path. This helical motion combines circular movement in one plane with a simultaneous linear motion in a plane perpendicular to the first. For example, the path from point A to point B (Fig.A) on the envelope of the cylinder combines a circular movement in the xy plane with a linear displacement in the z direction. On most CNC systems this function can be executed in two different ways:

- GO2 : Helical interpolation in a clockwise direction
- GO3 : Helical interpolation in a counter-clockwise direction

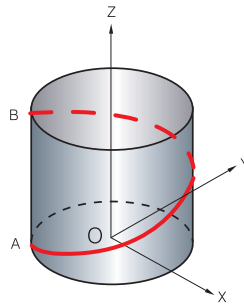


Fig.A

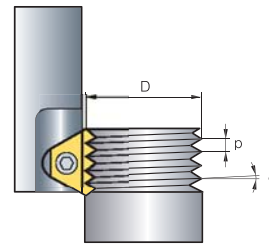


Fig.B

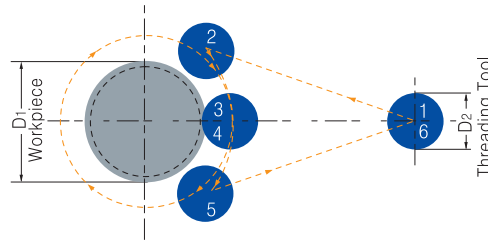
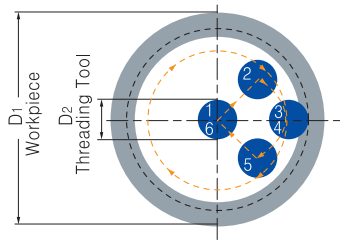
The thread milling operation (Fig. B) consists of circular rotation of the tool around its own axis together with an orbiting motion along the bore or workpiece circumference. During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry create the required thread form. There are three acceptable ways of approaching the workpiece with the tool to initiate production of the thread:

1. Tangential Arc Approach
2. Radial Approach
3. Tangential Line Approach

Tangential Arc Approach

With this method, the tool enters and exits the workpiece smoothly. No marks are left on the workpiece and there is no vibration, even with harder materials. Although it requires slightly more complex programming than the radial approach (see below), this is the method recommended for machining the highest quality threads

| Internal Thread | External Thread |
|-----------------|-----------------|
|-----------------|-----------------|



- 1-2 : rapid approach
- 2-3 : tool entry along tangential arc, with simultaneous feed along z-axis
- 3-4 : helical movement during one full orbit (360°)
- 4-5 : tool exit along tangential arc, with continuing feed along z-axis
- 5-6 : rapid return

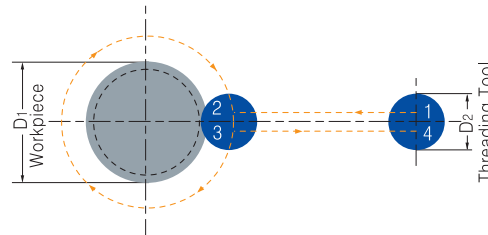
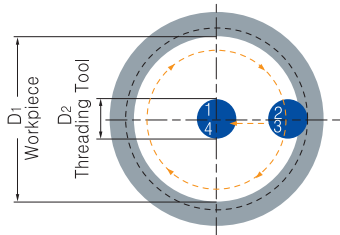
Radial Approach

This is the simplest method. There are two characteristics worth noting about the radial approach:

- A. a small vertical mark may be left at the entry (and exit) point. This is of no significance to the thread itself
- B. when using this method with very hard materials, there may be a tendency of the tool to vibrate as it approaches the full cutting depth

Note: Radial feed during entry to the full profile depth should only be 1/3 of the subsequent circular feed!

| Internal Thread | External Thread |
|-----------------|-----------------|
|-----------------|-----------------|

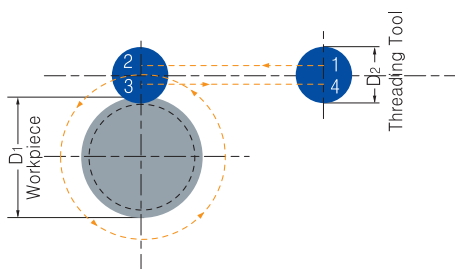


- 1-2 : radial entry
- 2-3 : helical movement during one full orbit (360°)
- 3-4 : radial exit

Tangential Line Approach

This method is very simple, and has all of the advantages of the tangential arc method. However, it is applicable only with external threads

| External Thread |
|-----------------|
|-----------------|

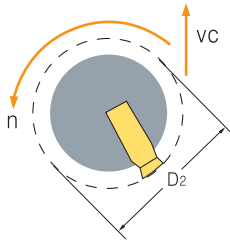


- 1-2 : radial entry with simultaneous feed along z axis
- 2-3 : helical movement during one full orbit (360°)
- 3-4 : radial exit



Preparing for the Thread Milling Operation

Calculation of Rotational Velocity and Feed at the Cutting Edge



$$n = \frac{vc \times 1000}{\pi \times D_2}$$

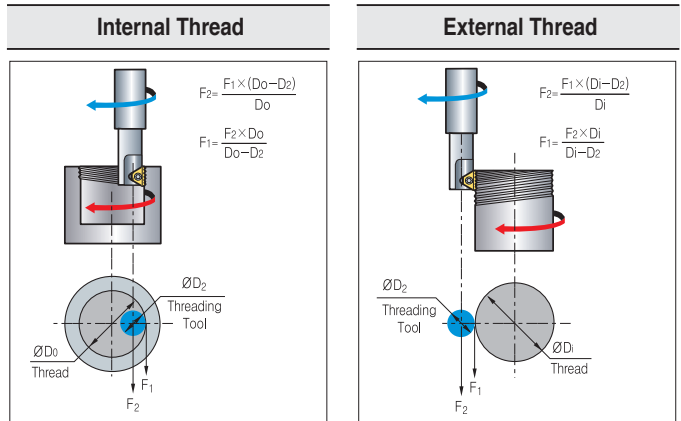
$$vc = \frac{n \times \pi \times D_2}{1000}$$

$$F_1 = n \times z \times f_n$$

- n** - Rotational Velocity [R.P.M]
- vc** - Cutting Speed [m/min]
- D₂** - Tool holder Cutting Dia. [mm]
- F₁** - Real Feed rate at the Cutting edges [mm/min]
- z** - No. of Cutting Edges
- f_n** - Feed per Root per Rotation [mm/rev]

Calculation of Feed Rates at the Tool Center Line

On most CNC machines, the feed rate required for programming is that of the center-line of the tool. When dealing with linear tool movement, the feed rate at the cutting edge and the center line are identical, but with circular tool movement this is not the case. The equations define the relationship between feed rates at the cutting edge and at the tool center line.



Grades and Applications

| Grade | Application |
|----------------|--|
| PC9570T | First Choice for steel and cast iron A tough sub-micron substrate with TiCN coating Provides good fracture toughness and excellent wear resistance |
| PC9070T | General grade Enhance wear Resistance with new-coating technology Multi layer film Superior performance for stainless steel and HSS |

Trouble shooting

| Problem | Possible | Solution |
|---------------------------------------|---|--|
| Increased insert flank wear | Cutting speed too high Chip is too thin Insufficient coolant | Reduce cutting speed/use coated insert Increase feed rate Increase coolant flow rate |
| Chipping of cutting edge | Chip is too thick Vibration | Reduce feed rate / Use the tangential arc method Increase RPM Check stability |
| Material Built-up on the cutting edge | Incorrect cutting speed Unsuitable carbide grade | Change cutting speed Use a coated carbide grade |
| Chatter / Vibration | Feed rate is too high Profile is too deep Thread length is too long | Reduce the feed. Execute two passes, each with increased cutting depth/ Execute two passes, each cutting only half the thread length Execute two passes, each cutting only half the thread length |
| Insufficient thread accuracy | Tool deflection | Reduce feed rate / Execute a "zero" cut |

Recommended cutting condition

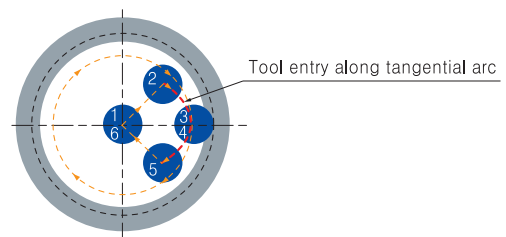
| | Workpiece | Hardness Brinell HB | vc[m/min] | | Feed fz[mm/t] | | |
|--------------------------|---|----------------------------------|---------------------|-----------|---------------------|------------------|-------------|
| | | | Grade | | Indexable Insert | Solid Endmill | |
| | | | PC9570T | PC9070M | | | |
| P | Unalloyed steel | Low carbon(C+0.1-0.25%) | 125 | 100 ~ 210 | 80 ~ 250 | 0.05 ~ 0.3 | 0.03 ~ 0.15 |
| | | Medium carbon(C=0.25-0.55%) | 150 | 100 ~ 180 | 80 ~ 230 | 0.05 ~ 0.25 | 0.03 ~ 0.1 |
| | | High carbon (C=0.55-0.85%) | 170 | 100 ~ 170 | 80 ~ 200 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| | Low alloy steel (alloying elements≤5%) | Non hardened | 180 | 90 ~ 160 | 60 ~ 180 | 0.05 ~ 0.25 | 0.03 ~ 0.1 |
| | | Hardened | 275 | 80 ~ 150 | 60 ~ 170 | 0.05 ~ 0.2 | 0.03 ~ 0.07 |
| | | Hardened | 350 | 70 ~ 140 | 60 ~ 160 | 0.05 ~ 0.15 | 0.01 ~ 0.03 |
| | High alloy steel | Annealed | 200 | 60 ~ 130 | 40 ~ 100 | 0.05 ~ 0.2 | 0.03 ~ 0.05 |
| | | Hardened | 325 | 70 ~ 110 | 30 ~ 80 | 0.05 ~ 0.1 | 0.01 ~ 0.03 |
| | Cast steel | Low alloy (alloying elements<5%) | 200 | 100 ~ 170 | 80 ~ 250 | 0.05 ~ 0.15 | 0.03 ~ 0.1 |
| | | High alloy(alloying elements>5%) | 225 | 70 ~ 120 | 60 ~ 170 | 0.05 ~ 0.1 | 0.01 ~ 0.03 |
| M | Stainless steel Feritic | Non hardened | 200 | 100 ~ 170 | 60 ~ 150 | 0.05 ~ 0.15 | 0.04 ~ 0.1 |
| | | Hardened | 330 | 100 ~ 170 | 60 ~ 120 | 0.05 ~ 0.1 | 0.01 ~ 0.05 |
| | Stainless steel Austenitic | Austenitic | 180 | 70 ~ 140 | 60 ~ 140 | 0.05 ~ 0.15 | 0.04 ~ 0.1 |
| | | Super austenitic | 200 | 70 ~ 140 | 60 ~ 130 | 0.05 ~ 0.1 | 0.04 ~ 0.1 |
| | Stainless steel Cast feritic | Non hardened | 200 | 70 ~ 140 | 60 ~ 160 | 0.05 ~ 0.15 | 0.04 ~ 0.1 |
| | | Hardened | 330 | 70 ~ 140 | 60 ~ 110 | 0.05 ~ 0.1 | 0.03 ~ 0.05 |
| | Stainless steel Cast austenitic | Austenitic | 200 | 70 ~ 120 | 60 ~ 150 | 0.05 ~ 0.15 | 0.04 ~ 0.1 |
| | | Hardened | 330 | 70 ~ 120 | 60 ~ 100 | 0.05 ~ 0.1 | 0.03 ~ 0.05 |
| | High eimperature alloys | Annealed (Iron based) | 200 | 20 ~ 45 | 30 ~ 60 | 0.05 ~ 0.1 | 0.04 ~ 0.1 |
| | | Aged (Iron based) | 280 | 20 ~ 30 | 20 ~ 50 | 0.02 ~ 0.05 | 0.01 ~ 0.03 |
| | | Annealed(Nickel or Cobalt based) | 250 | 15 ~ 20 | 15 ~ 35 | 0.02 ~ 0.05 | 0.01 ~ 0.03 |
| | | Aged (Nickel or Cobalt based) | 350 | 10 ~ 15 | 15 ~ 30 | 0.02 ~ 0.05 | 0.01 ~ 0.03 |
| | Titanium alloys | Pure 99.5 Ti | 400Rm | 70 ~ 140 | 40 ~ 80 | 0.02 ~ 0.05 | 0.03 ~ 0.05 |
| | | α +β alloys | 1050Rm | 20 ~ 50 | 20 ~ 50 | 0.02 ~ 0.05 | 0.03 ~ 0.05 |
| | K | Extra hard steel | Hardened & tempered | 55HrC | 20 ~ 45 | 15 ~ 45 | 0.01 ~ 0.03 |
| Malleable cast iron | | Ferritic (short chips) | 130 | 60 ~ 130 | 70 ~ 160 | 0.02 ~ 0.08 | 0.01 ~ 0.03 |
| | | Pearlitic (long chips) | 230 | 60 ~ 120 | 60 ~ 150 | 0.02 ~ 0.05 | 0.03 ~ 0.05 |
| Grey cast iron | | Low tensile strength | 180 | 60 ~ 130 | 70 ~ 160 | 0.05 ~ 0.15 | 0.05 ~ 0.1 |
| | | High tensile strength | 260 | 60 ~ 100 | 40 ~ 120 | 0.05 ~ 0.1 | 0.03 ~ 0.05 |
| Nodular SG iron | | Ferritic | 160 | 60 ~ 125 | 40 ~ 110 | 0.05 ~ 0.15 | 0.05 ~ 0.1 |
| | | Pearlitic | 260 | 50 ~ 90 | 40 ~ 100 | 0.05 ~ 0.1 | 0.03 ~ 0.05 |
| Aluminum alloys Wrought | | Non aging | 60 | 100 ~ 250 | 200 ~ 300 | 0.1 ~ 0.4 | 0.1 ~ 0.25 |
| | | Aged | 100 | 100 ~ 180 | 150 ~ 250 | 0.1 ~ 0.3 | 0.1 ~ 0.2 |
| Aluminum alloys | | Cast | 75 | 150 ~ 400 | 100 ~ 200 | 0.1 ~ 0.3 | 0.1 ~ 0.2 |
| | | Cast & aged | 90 | 150 ~ 280 | 120 ~ 220 | 0.05 ~ 0.25 | 0.1 ~ 0.15 |
| | | Cast Si 13-22% | 130 | 80 ~ 150 | 200 ~ 300 | 0.1 ~ 0.3 | 0.1 ~ 0.2 |
| Copper and copper alloys | Brass | 90 | 120 ~ 210 | 200 ~ 300 | 0.1 ~ 0.3 | 0.1 ~ 0.25 | |
| | Bronze and mom leaded copper | 100 | 120 ~ 210 | 150 ~ 250 | 0.05 ~ 0.25 | 0.1 ~ 0.2 | |

Recommendation :

At tool entry, set the Feed f [mm/tooth] to 70% lower than the threading Feed

Example :

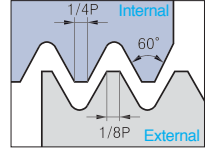
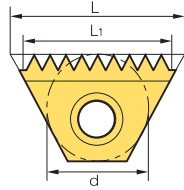
Threading Feed: 0.3[mm/t]
Tool entry Feed: 0.09[mm/t]



D Thread Milling Inserts

ISO Metric

External / Internal



Defined by : R262 (DIN 13)
Tolerance class : 6g/6H

(mm)

| Insert Size | | Pitch (mm) | Designation | | | | L ₁ | Tooth | Tool holder | |
|-------------|------|---------------|-------------|------------|-----------|------------|----------------|-------|-------------|-----------|
| d | L | | External | PC9570T | Internal | PC9570T | | | | |
| 6.0 | 10.4 | 0.5 | - | | TMI | 10-0.5ISO | ● | 10.0 | TMSR - 10 | |
| | | 0.75 | - | | | 10-0.75ISO | | 9.75 | | |
| | | 1.0 | - | | | 10-1.0ISO | ● | 9.0 | | |
| | | 1.25 | - | | | 10-1.25ISO | | 8.75 | | |
| | | 1.5 | - | | | 10-1.5ISO | | 9.0 | | |
| 6.35 | 11 | 0.5 | - | | TM2I | 11-0.5ISO | | 10.0 | TMSR - 11 | |
| | | 0.75 | TM2E | 11-0.75ISO | | | 11-0.75ISO | ● | | 10.5 |
| | | 1.0 | | 11-1.0ISO | | | 11-1.0ISO | ● | | 10.0 |
| | | 1.25 | | 11-1.25ISO | | | - | | | 10.0 |
| | | 1.25 | | - | | | 11-1.25ISO | | | 8.75 |
| | | 1.5 | | 11-1.5ISO | | | - | | | 9.0 |
| | | 1.5 | | - | | | 11-1.5ISO | ● | | 10.5 |
| 9.525 | 16 | 0.5 | - | | TM2I | 16-0.5ISO | | 15.0 | TMSR - 16 | |
| | | 0.75 | TM2E | 16-0.75ISO | | | 16-0.75ISO | | | 15.0 |
| | | 0.8 | | - | | | 16-0.8ISO | | | 14.4 |
| | | 1.0 | | 16-1.0ISO | | | - | | | 14.0 |
| | | 1.0 | | - | | | 16-1.0ISO | | | 15.0 |
| | | 1.25 | | 16-1.25ISO | | | 16-1.25ISO | | | 15.0 |
| | | 1.5 | | 16-1.5ISO | | | 16-1.5ISO | ● | | 15.0 |
| | | 1.75 | | 16-1.75ISO | | | 16-1.75ISO | | | 14.0 |
| 2.0 | | 16-2.0ISO | | | 16-2.0ISO | ● | 14.0 | | | |
| 9.525B | 22 | 1.0 | TM2E | 22-1.0ISO | | TM2I | 22-1.0ISO | | 22.0 | TMSR - 22 |
| | | 1.25 | | 22-1.25ISO | | | 22-1.25ISO | | 21.25 | |
| | | 1.5 | | 22-1.5ISO | | | 22-1.5ISO | ● | 21.0 | |
| | | 1.75 | | 22-1.75ISO | | | 22-1.75ISO | | 21.0 | |
| | | 2.0 | | 22-2.0ISO | | | 22-2.0ISO | ● | 22.0 | |
| 15.875 | 27 | 1.0 | TM2E | 27-1.0ISO | | TM2I | 27-1.0ISO | | 26.0 | TMSR - 27 |
| | | 1.25 | | 27-1.25ISO | | | 27-1.25ISO | | 25.0 | |
| | | 1.5 | | 27-1.5ISO | | | 27-1.5ISO | ● | 25.5 | |
| | | 1.75 | | 27-1.75ISO | | | 27-1.75ISO | | 24.5 | |
| | | 2.0 | | 27-2.0ISO | | | 27-2.0ISO | ● | 24.0 | |
| | | 2.5 | | 27-2.5ISO | | | 27-2.5ISO | | 25.0 | |
| | | 3.0 | | 27-3.0ISO | | | 27-3.0ISO | ● | 24.0 | |
| | | 3.5 | | 27-3.5ISO | | | 27-3.5ISO | ● | 24.5 | |
| | | 4.0 | | 27-4.0ISO | | | 27-4.0ISO | ● | 24.0 | |
| 4.5 | | 27-4.5ISO | | | 27-4.5ISO | ● | 22.5 | | | |
| 19.05B | 38.5 | 1.5 | TM2E | 38-1.5ISO | | TM2I | 38-1.5ISO | | 36.0 | TMSR - 38 |
| | | 2.0 | | 38-2.0ISO | | | 38-2.0ISO | | 36.0 | |
| | | 3.0 | | 38-3.0ISO | | | 38-3.0ISO | | 36.0 | |
| | | 4.0 | | 38-4.0ISO | | | 38-4.0ISO | | 32.0 | |
| | | 4.5 | | 38-4.5ISO | | | 38-4.5ISO | | 31.5 | |
| | | 5.0 | | 38-5.0ISO | | | 38-5.0ISO | ● | 30.0 | |
| | | 5.5 | | 38-5.5ISO | | | 38-5.5ISO | | 33.0 | |
| | | 6.0 | | 38-6.0ISO | | | 38-6.0ISO | ● | 30.0 | |

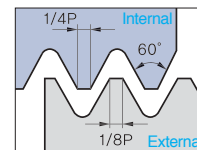
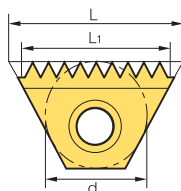
● Applicable holders, see pages D49

All inserts except TMI10 code have 2 cutting edges

● : Stock item

American UN

External / Internal



Defined by : ANSI B1.1.74
Tolerance class : Class 2A/2B

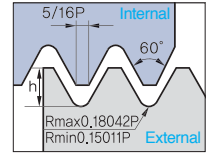
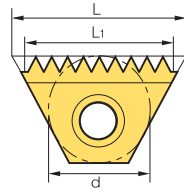
(mm)

| Insert Size | | Pitch (tpi) | Designation | | | | L1 | Tooth | Tool holder |
|-------------|--------|----------------|--------------|---------|--------------|---------|-------|-------|-------------|
| d | L | | External | PC9570T | Internal | PC9570T | | | |
| 6.0 | 10.4 | 32 | - | | TMI 10-32UN | | 9.53 | 12 | TMSR - 10 |
| | | 28 | - | | 10-28UN | | 9.07 | 10 | |
| | | 24 | - | | 10-24UN | | 9.53 | 9 | |
| | | 20 | - | | 10-20UN | | 8.89 | 7 | |
| | | 18 | - | | 10-18UN | | 8.47 | 6 | |
| | | 16 | - | | 10-16UN | | 7.94 | 5 | |
| 6.35 | 11 | 48 | - | | TM2I 11-48UN | | 10.05 | 19 | TMSR - 11 |
| | | 40 | - | | 11-40UN | | 10.16 | 16 | |
| | | 32 | - | | 11-32UN | | 10.32 | 13 | |
| | | 28 | TM2E 11-28UN | | 11-28UN | | 9.98 | 11 | |
| | | 27 | 11-27UN | | 11-27UN | | 10.35 | 11 | |
| | | 24 | 11-24UN | | 11-24UN | | 9.53 | 9 | |
| | | 20 | 11-20UN | | 11-20UN | ● | 10.16 | 8 | |
| | | 18 | 11-18UN | | 11-18UN | | 9.88 | 7 | |
| | | 16 | 11-16UN | | 11-16UN | | 9.53 | 6 | |
| | | 14 | 11-14UN | | 11-14UN | | 9.07 | 5 | |
| 9.525 | 16 | 40 | - | | TM2I 16-40UN | | 14.61 | 40 | TMSR - 16 |
| | | 32 | - | | 16-32UN | | 15.08 | 32 | |
| | | 28 | TM2E 16-28UN | | 16-28UN | | 14.51 | 28 | |
| | | 27 | 16-27UN | | 16-27UN | | 14.11 | 27 | |
| | | 24 | 16-24UN | | 16-24UN | | 14.82 | 24 | |
| | | 20 | 16-20UN | | 16-20UN | | 13.97 | 20 | |
| | | 18 | 16-18UN | | 16-18UN | | 14.11 | 18 | |
| | | 16 | 16-16UN | | 16-16UN | | 14.29 | 16 | |
| | | 14 | 16-14UN | | 16-14UN | ● | 14.51 | 14 | |
| | | 13 | 16-13UN | | 16-13UN | | 13.68 | 13 | |
| | | 12 | 16-12UN | | 16-12UN | ● | 14.82 | 12 | |
| | | 11.5 | 16-11.5UN | | 16-11.5UN | | 13.25 | 11.5 | |
| 9.525B | 22 | 24 | TM2E 22-24UN | | TM2I 22-24UN | | 21.16 | 20 | TMSR - 22 |
| | | 20 | 22-20UN | | 22-20UN | | 21.59 | 17 | |
| | | 18 | 22-18UN | | 22-18UN | | 21.17 | 15 | |
| | | 16 | 22-16UN | | 22-16UN | | 20.64 | 13 | |
| | | 14 | 22-14UN | | 22-14UN | | 21.77 | 12 | |
| | | 13 | 22-13UN | | 22-13UN | | 21.49 | 11 | |
| | | 12 | 22-12UN | | 22-12UN | | 21.17 | 10 | |
| 15.875 | 27 | 24 | TM2E 27-24UN | | TM2I 27-24UN | | 25.40 | 24 | TMSR - 27 |
| | | 20 | 27-20UN | | 27-20UN | | 25.40 | 20 | |
| | | 18 | 27-18UN | | 27-18UN | | 25.40 | 18 | |
| | | 16 | 27-16UN | | 27-16UN | | 25.40 | 16 | |
| | | 14 | 27-14UN | | 27-14UN | | 25.40 | 14 | |
| | | 13 | 27-13UN | | 27-13UN | | 25.40 | 13 | |
| | | 12 | 27-12UN | | 27-12UN | | 25.40 | 12 | |
| | | 11.5 | 27-11.5UN | | 27-11.5UN | | 24.30 | 11 | |
| | | 11 | 27-11UN | | 27-11UN | | 25.40 | 11 | |
| | | 10 | 27-10UN | | - | | 22.86 | 9 | |
| | | 10 | - | | 27-10UN | | 25.40 | 10 | |
| | | 9 | 27-9UN | | 27-9UN | | 22.58 | 8 | |
| | | 8 | 27-8UN | | 27-8UN | | 22.23 | 7 | |
| | | 7 | 27-7UN | | - | | 21.77 | 6 | |
| | | 7 | - | | 27-7UN | | 25.40 | 7 | |
| 6 | 27-6UN | | - | | 21.17 | 5 | | | |
| 6 | - | | 27-6UN | | 25.40 | 6 | | | |
| 19.05 | 38.5 | 6 | TM2E 38-6UN | | TM2I 38-6UN | | 38.87 | 8 | TMSR - 38 |
| | | 5 | 38-5UN | | 38-5UN | | 30.48 | 6 | |
| | | 4.5 | 38-4.5UN | | 38-4.5UN | | 33.87 | 6 | |
| | | 4 | 38-4UN | | 38-4UN | | 31.75 | 5 | |

D Thread Milling Inserts

UNJ (Unified Constant Thread)

External / Internal



Defined by : MIL-S-8879C
Tolerance class : 3A/3B

(mm)

| Insert Size | | Pitch (tpi) | Designation | | | | L ₁ | Tooth | Tool holder | | |
|-------------|------|----------------|-------------|----------|----------|----------|----------------|-------|-------------|-----------|-----------|
| d | L | | External | PC9570T | Internal | PC9570T | | | | | |
| 6.0 | 10.4 | 24 | - | | TMI | 10-24UNJ | | 9.53 | 9 | TMSR - 10 | |
| | | 20 | - | | | 10-20UNJ | | 8.89 | 7 | | |
| | | 18 | - | | | 10-18UNJ | | 8.47 | 6 | | |
| | | 16 | - | | | 10-16UNJ | | 9.53 | 8 | | |
| 6.35 | 11 | 24 | TM2E | 11-24UNJ | | TM2I | 11-24UNJ | | 9.53 | 9 | TMSR - 11 |
| | | 20 | | 11-20UNJ | | | 11-20UNJ | | 10.16 | 8 | |
| | | 18 | | - | | | 11-18UNJ | | 9.88 | 7 | |
| | | 16 | | 11-16UNJ | | | 11-16UNJ | | 9.53 | 6 | |
| | | 14 | | 11-14UNJ | | | 11-14UNJ | | 9.07 | 5 | |
| 9.525 | 16 | 24 | TM2E | 16-24UNJ | | | 16-24UNJ | | 14.82 | 14 | TMSR - 16 |
| | | 20 | | 16-20UNJ | | | 16-20UNJ | | 13.97 | 11 | |
| | | 18 | | 16-18UNJ | | | 16-18UNJ | | 14.11 | 10 | |
| | | 16 | | 16-16UNJ | | | 16-16UNJ | | 14.29 | 9 | |
| | | 14 | | 16-14UNJ | | | 16-14UNJ | | 14.51 | 8 | |
| | | 13 | | 16-13UNJ | | | - | | 13.68 | 7 | |
| | | 12 | | 16-12UNJ | | | 16-12UNJ | | 14.82 | 7 | |
| 15.875 | 27 | 16 | TM2E | 27-16UNJ | | | 27-16UNJ | | 25.40 | 16 | TMSR - 27 |
| | | 12 | | 27-12UNJ | | | 27-12UNJ | | 25.40 | 12 | |
| | | 11 | | 27-11UNJ | | | 27-11UNJ | | 25.40 | 11 | |



Applicable holders, see pages D49

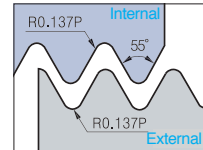
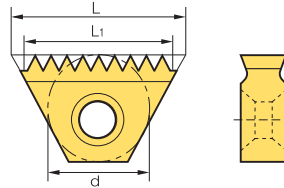
All inserts except TMI10 code have 2 cutting edges

● : Stock item



Whithworth (BSW, BSF, BSP, BSB)

External / Internal



BSW Defined by : B.S.84:1956, DIN 259, ISO228/1:1982
 BSP Defined by : B.S.2779:1956
 Tolerance class : BSW-Medium class A, BSP-Medium class

(mm)

| Insert Size | | Pitch (tpi) | Designation | | L1 | Tooth | Tool holder |
|-------------|------|----------------|---------------------|---------|-------|--------|-------------|
| d | L | | External + Internal | PC9570T | | | |
| 6.0 | 10.4 | 28 | TMEI | 10-28W | 9.07 | 10 | TMSR - 10 |
| | | 26 | | 10-26W | 8.79 | 9 | |
| | | 24 | | 10-24W | 9.53 | 9 | |
| | | 20 | | 10-20W | 8.89 | 7 | |
| | | 19 | | 10-19W | 9.36 | 7 | |
| 6.35 | 11 | 28 | TM2EI | 11-28W | 9.98 | 11 | TMSR - 11 |
| | | 26 | | 11-26W | 9.77 | 10 | |
| | | 24 | | 11-24W | 9.53 | 9 | |
| | | 20 | | 11-20W | 10.16 | 8 | |
| | | 19 | | 11-19W | 9.36 | 7 | |
| | | 14 | | 11-14W | 9.07 | 5 | |
| 9.525 | 16 | 26 | TM2EI | 16-26W | 14.65 | 15 | TMSR - 16 |
| | | 24 | | 16-24W | 14.82 | 14 | |
| | | 20 | | 16-20W | 13.97 | 11 | |
| | | 19 | | 16-19W | 14.71 | 11 | |
| | | 18 | | 16-18W | 14.11 | 10 | |
| | | 16 | | 16-16W | 14.29 | 9 | |
| | | 14 | | 16-14W | 14.51 | 8 | |
| | | 12 | | 16-12W | 14.82 | 7 | |
| | | 11 | | 16-11W | 13.85 | 6 | |
| 9.525B | 22 | 24 | TM2EI | 22-24W | 21.17 | 20 | TMSR - 22 |
| | | 20 | | 22-20W | 21.59 | 17 | |
| | | 19 | | 22-19W | 21.39 | 16 | |
| | | 18 | | 22-18W | 21.17 | 15 | |
| | | 16 | | 22-16W | 20.64 | 13 | |
| | | 14 | | 22-14W | 21.77 | 12 | |
| | | 12 | | 22-12W | 21.17 | 10 | |
| | | 11 | | 22-11W | 20.78 | 9 | |
| 15.875 | 27 | 16 | TM2EI | 27-16W | 25.4 | 16 | TMSR - 27 |
| | | 14 | | 27-14W | 25.4 | 14 | |
| | | 12 | | 27-12W | 23.28 | 11 | |
| | | 11 | | 27-11W | 23.09 | 10 | |
| | | 10 | | 27-10W | 25.40 | 10 | |
| | | 9 | | 27-9W | 22.58 | 8 | |
| | | 8 | | 27-8W | 22.23 | 7 | |
| | | 7 | | 27-7W | 21.77 | 6 | |
| | | 6 | | 27-6W | 21.17 | 5 | |
| | | 19.05B | 38.5 | 11 | TM2EI | 38-11W | |
| 6 | | | | 38-6W | 33.87 | 8 | |
| 5 | | | | 38-5W | 30.48 | 6 | |
| 4.5 | | | | 38-4.5W | 33.87 | 6 | |
| - | | | | 38-15W | - | - | |

Applicable holders, see pages D49

All inserts except TMI10 code have 2 cutting edges

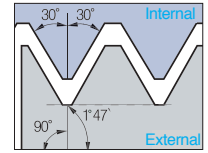
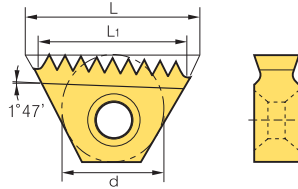
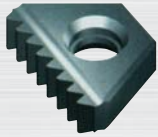
• : Stock item



D Thread Milling Inserts

NPT

External / Internal



Defined by : USAS B2.1:1968
Tolerance class : Standard NPT

(mm)

| Insert Size | | Pitch (tpi) | Designation | | L ₁ | Tooth | Tool holder | |
|-------------|------|----------------|---------------------|---------|----------------|-------|-------------|------------|
| d | L | | External + Internal | PC9570T | | | RH | LH |
| 9.525 | 16 | 18 | TM2E 16-18NPT * | | 14.11 | 10 | TMSRT - 16 | TMSLT - 16 |
| | | 14 | TM2EI 16-14NPT | | 14.51 | 8 | | |
| | | 11.5 | 16-11.5NPT | | 13.25 | 6 | | |
| 9.525B | 22 | 14 | TM2EI 22-14NPT | | 21.77 | 12 | TMSRT - 22 | TMSLT - 22 |
| 15.875 | 27 | 11.5 | TM2EI 27-11.5NPT | | 24.30 | 11 | TMSR - 27 | TMSL - 27 |
| | | 8 | 27-8NPT | | 22.23 | 7 | | |
| 19.05B | 38.5 | 11.5 | TM2EI 38-11.5NPT | | 35.34 | 16 | TMSR - 38 | TMSL - 38 |
| | | 8 | 38-8NPT | | 31.75 | 10 | | |

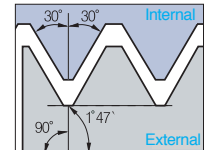
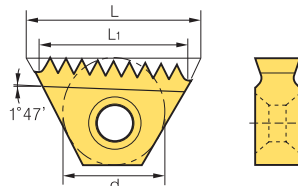
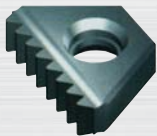
Applicable holders, see pages D49

* TM2E16-18NPT is for external threading

● : Stock item

NPTF

External / Internal



Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF

(mm)

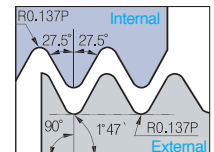
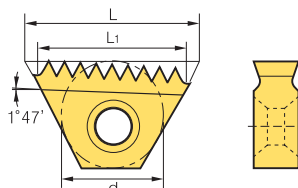
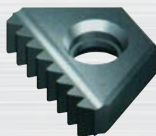
| Insert Size | | Pitch (tpi) | Designation | | L ₁ | Tooth | Tool holder | |
|-------------|------|----------------|---------------------|---------|----------------|-------|-------------|------------|
| d | L | | External + Internal | PC9570T | | | RH | LH |
| 9.525 | 16 | 14 | TM2EI 16-14NPTF | ● | 14.51 | 8 | TMSRT - 16 | TMSLT - 16 |
| | | 11.5 | 16-11.5NPTF | | 13.25 | 6 | | |
| 9.525B | 22 | 14 | TM2EI 22-14NPTF | | 21.77 | 12 | TMSRT - 22 | TMSLT - 22 |
| | | 11.5 | 22-11.5NPTF | | 19.88 | 9 | | |
| 15.875 | 27 | 11.5 | TM2EI 27-11.5NPTF | | 24.30 | 11 | TMSR - 27 | TMSL - 27 |
| | | 8 | 27-8NPTF | | 22.23 | 7 | | |
| 19.05B | 38.5 | 11.5 | TM2EI 38-11.5NPTF | | 35.34 | 16 | TMSR - 38 | TMSL - 38 |
| | | 8 | 38-8NPTF | | 31.75 | 10 | | |

Applicable holders, see pages D49

● : Stock item

BSPT

External / Internal



Defined by : B.S 21:1985
Tolerance class : Standard BSPT

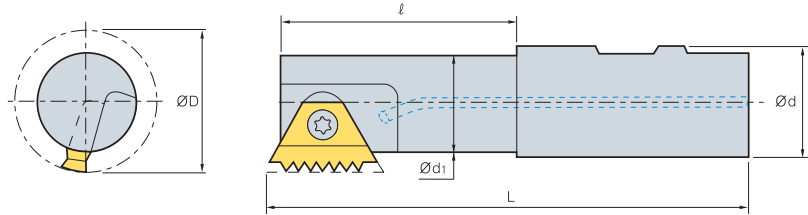
(mm)

| Insert Size | | Pitch (tpi) | Designation | | L ₁ | Tooth | Tool holder | |
|-------------|----|----------------|---------------------|---------|----------------|-------|-------------|------------|
| d | L | | External + Internal | PC9570T | | | RH | LH |
| 6.35 | 11 | 19 | TM2EI 11-19BSPT | | 9.36 | 7 | TMSR - 10 | TMSL - 10 |
| 9.525 | 16 | 14 | TM2EI 16-14BSPT | | 14.51 | 8 | TMSRT - 16 | TMSLT - 16 |
| | | 11 | 16-11BSPT | | 13.85 | 6 | | |
| 15.875 | 27 | 11 | TM2EI 27-11BSPT | | 23.09 | 10 | TMSR - 27 | TMSL - 27 |

Applicable holders, see pages D49

● : Stock item

Standard Type

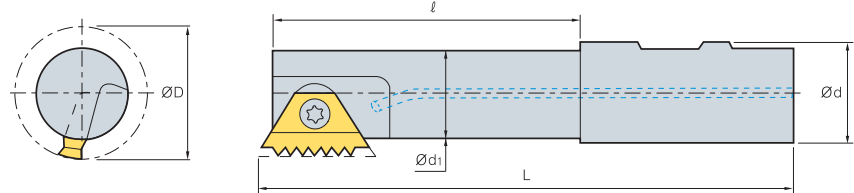


(mm)

| Insert Size d | Designation | ØD | Ød | Ød ₁ | ℓ | L | Screw | Wrwnch |
|------------------|-------------|------|----|-----------------|------|-------|---------|--------|
| | | | | | | | | |
| 6.0 | TMSR 12-10 | 9.0 | 12 | 6.8 | 12.0 | 69.0 | STM10 | TW07P |
| | 20-10 | 9.0 | 20 | 6.8 | 17.0 | 84.0 | | |
| 6.35 | TMSR 12-11 | 11.5 | 12 | 8.9 | 12.0 | 70.0 | STM11 | TW08P |
| | 20-11 | 11.5 | 20 | 8.9 | 20.0 | 85.0 | | |
| 9.525 | TMSR 16-16 | 17.0 | 16 | 13.6 | 22.0 | 90.0 | STM1622 | TW10P |
| | 20-16 | 20.0 | 20 | 16.6 | 43.0 | 95.0 | | |
| 9.525B | TMSR 16-22 | 17.0 | 16 | 13.5 | 29.0 | 79.5 | STM1622 | TW10P |
| | 20-22 | 19.0 | 20 | 15.5 | 29.0 | 81.5 | | |
| | 25-22 | 19.0 | 25 | 15.5 | 30.0 | 92.3 | | |
| 15.875 | TMSRW 25-22 | 22.0 | 25 | 18.5 | 30.0 | 90.8 | STM27 | TW25L |
| | TMSR 25-27 | 30.0 | 25 | 24.0 | 52.0 | 110.0 | | |
| | TMSL 25-27 | 30.0 | 25 | 24.0 | 52.0 | 110.0 | | |
| 19.05 | TMSR 32-27 | 37.0 | 32 | 31.0 | 58.0 | 120.0 | STM38 | TW30L |
| | TMSR 32-38 | 35.0 | 32 | 27.0 | 53.0 | 115.0 | | |
| | 40-38 | 46.0 | 40 | 38.0 | 63.0 | 135.0 | | |

Applicable inserts, see pages D44 ~ D48

Long Type

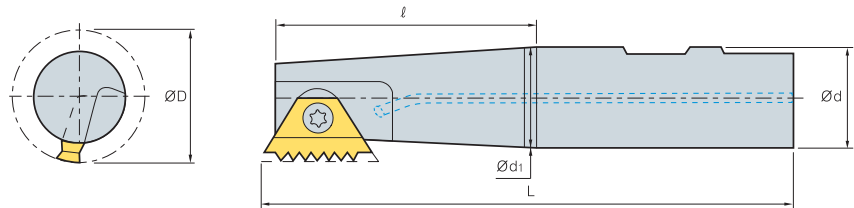


(mm)

| Insert Size d | Designation | ØD | Ød | Ød ₁ | ℓ | L | Screw | Wrwnch |
|------------------|-------------|------|----|-----------------|------|-------|---------|--------|
| | | | | | | | | |
| 6.35 | TMSRL 25-11 | 11.5 | 25 | 8.9 | 17.0 | 125.0 | STM11 | TW08P |
| 9.525B | TMSRL 25-16 | 22.0 | 25 | 18.6 | 25.0 | 125.0 | STM1622 | TW10P |
| 9.525B | TMSRL 20-22 | 19.0 | 20 | 15.5 | 44.0 | 96.5 | STM1622 | TW10P |
| | 25-22 | 22.0 | 25 | 18.6 | 63.5 | 125.0 | | |
| 15.875 | TMSRL 25-27 | 30.0 | 25 | 24.0 | 92.0 | 150.0 | STM27 | TW25L |
| | 32-27 | 37.0 | 32 | 31.0 | 98.0 | 160.0 | | |
| 19.05B | TMSRL 40-38 | 46.0 | 40 | 38.0 | 93.0 | 168.0 | STM38 | TW30L |

Applicable inserts, see pages D44 ~ D48

Tapered Type



(mm)

| Insert Size d | Designation | ØD | Ød | Ød ₁ | ℓ | L | Screw | Wrwnch |
|------------------|-------------|------|----|-----------------|------|-------|---------|--------|
| | | | | | | | | |
| 9.525 | TMSRT 16-16 | 15.5 | 16 | 12.5 | 22.0 | 90.0 | STM1622 | TW10P |
| | 20-16 | 19.0 | 20 | 15.0 | 23.0 | 85.0 | STMT16 | |
| 9.525B | TMSRT 16-22 | 17.0 | 16 | 13.5 | 29.0 | 79.5 | STM1622 | TW10P |
| | 20-22 | 19.0 | 20 | 15.5 | 29.0 | 81.5 | | |
| 15.875 | TMSRT 32-27 | 37.0 | 32 | 31.0 | 58.0 | 120.0 | STM27 | TW25L |

Applicable inserts, see pages D44 ~ D48

Thread Milling Solid Endmill code system

STM D 3T 03 012 L034 - I 0.35 ISO

1 Type 2 Flute style 3 No. of Flutes 4 Shank Dia. 5 Cutting Dia. 6 Cutting edge Length 7 Type of Tool 8 Pitch 9 Standard

| | | |
|--|---|---|
| <p>1 Type STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>Solid Threading Endmill</p> | <p>4 Shank Dia. STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>03 : 3.0</p> | <p>8 Pitch STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>mm : 0.35 ~ 3.0 tpi : 72 ~ 12</p> |
| <p>2 Flute style STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>HC : Heli Cool HCR : Heli Radial Cooling HCC : Heli Cool Chamfering HCD : Heli Cool C/F & Drilling D : Deep Threading</p> | <p>5 Cutting Dia. STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>012 : 1.20</p> | <p>9 Standard STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>ISO Metric American UN Cutting edge Length UNJ Whit Worth (BSW, BSF, BSP, BSB) National Pipe Thread (NPT) National Pipe Thread (NPTF) British Standard Pipe Thread (BSPT)</p> |
| <p>3 No. of Flutes STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>3T : 3 Flutes 2L : 4 Flutes, Left Flutes</p> | <p>6 Cutting edge Length STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>L034 : 3.4</p> | |
| <p>7 Type of Tool STM D 3T 03 012 L034 - I 0.35 ISO</p> <p>I : Internal</p> | | |

TM-INFO User Guide

CNC Program Composition
TM-INFO composes CNC program for Thread Milling process in a short time

▶ Multilingual ▶ Window operation

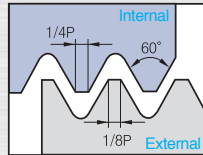


| | | | |
|------------------------------------|--|---|--|
| <p>1 Select thread type</p> | <p>2 Select thread standard</p> | <p>3 Select thread type</p> | <p>4 Input thread parameter</p> |
| <p>5 Select working way</p> | <p>6 Select tool</p> | <p>7 Confirm the working data & controller</p> | <p>download Pls. visit our web-site to download. http://www.korloy.com</p> |

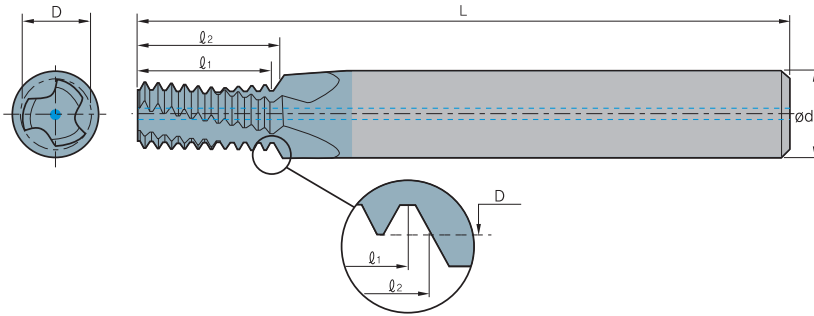
ISO Metric

Helical Flutes with Thru-Hole Coolant

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



($l_2 \leq 1.5 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | | No. of Flute | Tooth | *Bore Dia. |
|----------|--------------|-------|-------------------------|---------|----------------|-------|----|----------------|----------------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | L | l ₁ | l ₂ | z | zt | mm |
| M3x0.5 | M3.5~M16x0.5 | 0.5 | STMHC 04024L04-I0.50ISO | | 4 | 2.40 | 45 | 4.5 | 4.7 | 3 | 9 | 2.5 |
| M4x0.7 | | 0.7 | 04031L06-I0.70ISO | | 4 | 3.15 | 45 | 6.3 | 6.6 | 3 | 9 | 3.3 |
| M5x0.8 | | 0.8 | 04039L07-I0.80ISO | | 4 | 3.90 | 45 | 7.2 | 7.6 | 3 | 9 | 4.2 |
| M6x1.0 | M8~M40x1.0 | 1.0 | 06048L09-I1.00ISO | ● | 6 | 4.80 | 57 | 9.0 | 9.5 | 3 | 9 | 5.0 |
| M8x1.25 | | 1.25 | 08065L13-I1.25ISO | ● | 8 | 6.50 | 61 | 12.5 | 13.1 | 3 | 10 | 6.8 |
| M10x1.5 | M12~M48x1.5 | 1.5 | 10082L15-I1.50ISO | | 10 | 8.20 | 73 | 15.0 | 15.7 | 3 | 10 | 8.5 |
| M12x1.75 | | 1.75 | 10099L18-I1.75ISO | | 10 | 9.90 | 73 | 17.5 | 18.4 | 4 | 10 | 10.2 |
| M14x2.0 | M17~M80x2.0 | 2.0 | 12116L21-I2.00ISO | | 12 | 11.60 | 73 | 20.0 | 21.0 | 4 | 10 | 12.0 |
| M16x2.0 | M17~M80x2.0 | 2.0 | 14136L25-I2.00ISO | | 14 | 13.60 | 92 | 24.0 | 25.0 | 4 | 12 | 14.0 |

($l_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | | No. of Flute | Tooth | *Bore Dia. |
|----------|--------------|-------|-------------------------|---------|----------------|-------|-----|----------------|----------------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | L | l ₁ | l ₂ | z | zt | mm |
| M3x0.5 | M3.5~M16x0.5 | 0.5 | STMHC 04024L06-I0.50ISO | | 4 | 2.40 | 45 | 6.0 | 6.2 | 3 | 12 | 2.5 |
| | M4x0.5 | 0.5 | 04032L08-I0.50ISO | | 4 | 3.20 | 45 | 8.0 | 8.2 | 3 | 16 | 3.5 |
| | M5x0.5 | 0.5 | 06042L10-I0.50ISO | ● | 6 | 4.20 | 57 | 10.0 | 10.2 | 3 | 20 | 4.5 |
| M4x0.7 | | 0.7 | 04031L08-I0.70ISO | ● | 4 | 3.15 | 45 | 8.4 | 8.7 | 3 | 12 | 3.3 |
| | M6x0.75 | 0.75 | 06050L12-I0.75ISO | | 6 | 5.00 | 57 | 12.0 | 12.4 | 3 | 16 | 5.3 |
| M5x0.8 | | 0.8 | 04039L10-I0.80ISO | ● | 4 | 3.90 | 45 | 10.4 | 10.8 | 3 | 13 | 4.2 |
| M6x1.0 | M8~M40x1.0 | 1.0 | 06048L12-I1.00ISO | ● | 6 | 4.80 | 57 | 12.0 | 12.5 | 3 | 12 | 5.0 |
| | M8x1.0 | 1.0 | 08067L16-I1.00ISO | | 8 | 6.70 | 61 | 16.0 | 16.5 | 3 | 16 | 7.0 |
| | M10x1.0 | 1.0 | 10087L20-I1.00ISO | | 10 | 8.70 | 73 | 20.0 | 20.5 | 3 | 20 | 9.0 |
| | M12x1.0 | 1.0 | 12107L24-I1.00ISO | | 12 | 10.70 | 73 | 24.0 | 24.5 | 4 | 24 | 11.0 |
| M8x1.25 | | 1.25 | 08065L16-I1.25ISO | ● | 8 | 6.50 | 61 | 16.2 | 16.9 | 3 | 13 | 6.8 |
| | M10x1.25 | 1.25 | 10085L20-I1.25ISO | ● | 10 | 8.50 | 73 | 20.0 | 20.6 | 3 | 16 | 8.8 |
| M10x1.5 | M12~M48x1.5 | 1.5 | 10082L20-I1.50ISO | ● | 10 | 8.20 | 73 | 19.5 | 20.2 | 3 | 13 | 8.5 |
| | M12x1.5 | 1.5 | 10099L24-I1.50ISO | ● | 10 | 9.90 | 73 | 24.0 | 24.7 | 4 | 16 | 10.5 |
| | M14x1.5 | 1.5 | 12119L29-I1.50ISO | | 12 | 11.90 | 80 | 28.5 | 29.2 | 4 | 19 | 12.5 |
| | M16x1.5 | 1.5 | 14139L32-I1.50ISO | ● | 14 | 13.90 | 92 | 31.5 | 32.2 | 4 | 21 | 14.5 |
| M12x1.75 | | 1.75 | 10099L25-I1.75ISO | ● | 10 | 9.90 | 73 | 24.5 | 25.4 | 4 | 14 | 10.2 |
| M14x2.0 | M17~M80x2.0 | 2.0 | 12116L29-I2.00ISO | ● | 12 | 11.60 | 80 | 28.0 | 29.0 | 4 | 14 | 12.0 |
| M16x2.0 | M17~M80x2.0 | 2.0 | 14136L33-I2.00ISO | ● | 14 | 13.60 | 92 | 32.0 | 33.0 | 4 | 16 | 14.0 |
| M18x2.5 | | 2.5 | 16148L36-I2.50ISO | | 16 | 14.80 | 92 | 35.0 | 36.2 | 4 | 14 | 15.5 |
| M 20x2.5 | | 2.5 | 18171L41-I2.50ISO | ● | 18 | 17.10 | 102 | 40.0 | 41.2 | 4 | 16 | 17.5 |
| M 24x3.0 | | 3.0 | 20199L49-I3.00ISO | ● | 20 | 19.90 | 102 | 48.0 | 49.5 | 4 | 16 | 21.0 |

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

● : Stock item

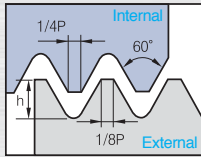


D Solid Threading Endmills

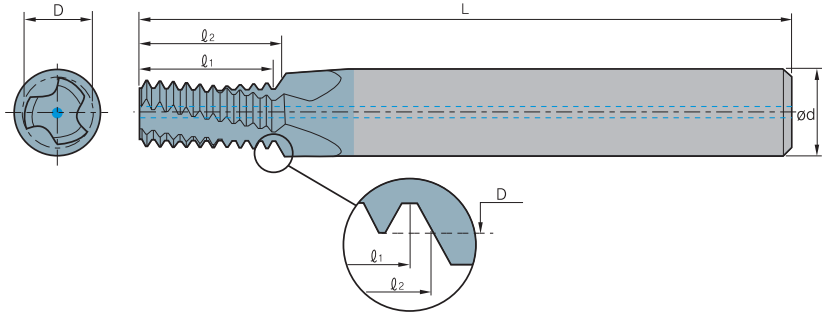
American UN

Helical Flutes with Thru-Hole Coolant

Internal



Defined by : ANSI B1.1.74
Tolerance class : 2B



($l_2 \leq 1.5 \times \text{Thread Diameter}$)

| Thread | | | Pitch (tpi) | Designation | | Dimensions(mm) | | | | | No. of Flute z | Tooth zt | *Bore Dia. mm |
|-----------|------------------|---------------------|----------------|-----------------------|---------|----------------|-------|----|----------------|----------------|-------------------|-------------|------------------|
| UNC | UNF | UNEF | | Internal | PC9070M | Ød | D | L | l ₁ | l ₂ | | | |
| No.10~24 | 5/16" , 3/8" x24 | 9/16"~11/16" x24 | 24 | STMHC 04035L07-I24UNC | | 4 | 3.58 | 45 | 7.4 | 7.9 | 3 | 7 | 3.8 |
| No.10~24 | 5/16" , 3/8" x24 | 9/16"~11/16" x24 | 24 | 06041L08-I24UNC | | 6 | 4.15 | 57 | 8.5 | 9.0 | 3 | 8 | 4.5 |
| 1/4" x20 | 7/16" , 1/2" x20 | 3/4"~1" x20 | 20 | 06048L09-I20UNC | | 6 | 4.88 | 57 | 8.9 | 9.5 | 3 | 7 | 5.2 |
| 5/16" x18 | 9/16" , 5/8" x18 | 11/16"~1 11/16" x18 | 18 | 08061L11-I18UNC | | 8 | 6.15 | 61 | 11.3 | 12.0 | 3 | 8 | 6.5 |
| 3/8" x16 | 3/4" x16 | | 16 | 08076L15-I16UNC | | 8 | 7.65 | 61 | 14.3 | 15.1 | 3 | 9 | 8.0 |
| 7/16" x14 | 7/8" x14 | | 14 | 10090L17-I14UNC | | 10 | 9.00 | 73 | 16.3 | 17.2 | 3 | 9 | 9.3 |
| 1/2" x13 | | | 13 | 12104L20-I13UNC | | 12 | 10.35 | 73 | 19.5 | 20.5 | 4 | 10 | 10.8 |
| 9/16" x12 | 1"~1 1/2" x12 | | 12 | 12118L22-I12UNC | | 12 | 11.80 | 73 | 21.2 | 22.2 | 4 | 10 | 12.3 |

($l_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | | Pitch (tpi) | Designation | | Dimensions(mm) | | | | | No. of Flute z | Tooth zt | *Bore Dia. mm |
|-----------|------------------|---------------------|----------------|-----------------------|---------|----------------|-------|-----|----------------|----------------|-------------------|-------------|------------------|
| UNC | UNF | UNEF | | Internal | PC9070M | Ød | D | L | l ₁ | l ₂ | | | |
| | No.10~32 | No. 12~3/8" x32 | 32 | STMHC 04038L09-I32UNF | | 4 | 3.80 | 45 | 9.5 | 9.9 | 3 | 12 | 4.0 |
| | | No. 12~3/8" x32 | 32 | 06044L11-I32UNEF | | 6 | 4.40 | 57 | 11.1 | 11.5 | 3 | 14 | 4.7 |
| | No.12, 1/4" x28 | 7/16" , 1/2" x28 | 28 | 06043L11-I28UNF | | 6 | 4.30 | 57 | 10.9 | 11.3 | 3 | 12 | 4.6 |
| | 1/4" x28 | 7/16" , 1/2" x28 | 28 | 06052L13-I28UNF | ● | 6 | 5.15 | 57 | 12.7 | 13.1 | 3 | 14 | 5.5 |
| | | 7/16" , 1/2" x28 | 28 | 10099L22-I28UNEF | | 10 | 9.90 | 73 | 21.8 | 22.2 | 3 | 24 | 10.2 |
| No.10~24 | 5/16" , 3/8" x24 | 9/16"~11/16" x24 | 24 | 04035L10-I24UNC | | 4 | 3.58 | 45 | 9.5 | 10.0 | 3 | 9 | 3.8 |
| No.12~24 | 5/16" , 3/8" x24 | 9/16"~11/16" x24 | 24 | 06041L11-I24UNC | | 6 | 4.15 | 57 | 10.6 | 11.1 | 3 | 10 | 4.5 |
| | 5/16" , 3/8" x24 | 9/16"~11/16" x24 | 24 | 08066L16-I24UNF | | 8 | 6.68 | 61 | 15.9 | 16.4 | 3 | 15 | 6.8 |
| | 3/8" x24 | 9/16"~11/16" x24 | 24 | 10082L19-I24UNF | | 10 | 8.20 | 73 | 19.0 | 19.6 | 3 | 18 | 8.5 |
| | | 9/16"~11/16" x24 | 24 | 14129L29-I24UNEF | | 14 | 12.90 | 92 | 28.6 | 29.1 | 4 | 27 | 13.2 |
| 1/4" x20 | 7/16" , 1/2" x20 | 3/4"~1" x20 | 20 | 06048L13-I20UNC | | 6 | 4.88 | 57 | 12.7 | 13.3 | 3 | 10 | 5.2 |
| | 7/16" , 1/2" x20 | 3/4"~1" x20 | 20 | 10096L22-I20UNF | | 10 | 9.60 | 73 | 21.6 | 22.2 | 3 | 17 | 9.8 |
| | 1/2" x20 | 3/4"~1" x20 | 20 | 12111L26-I20UNF | | 12 | 11.10 | 80 | 25.4 | 26.0 | 3 | 20 | 11.5 |
| | | 3/4"~1" x20 | 20 | 18174L38-I20UNEF | | 18 | 17.40 | 102 | 38.1 | 38.7 | 4 | 30 | 17.8 |
| 5/16" x18 | 9/16" , 5/8" x18 | 11/16"~1 11/16" x18 | 18 | 08061L16-I18UNC | | 8 | 6.15 | 61 | 15.5 | 16.2 | 3 | 11 | 6.5 |
| | 9/16" , 5/8" x18 | 11/16"~1 11/16" x18 | 18 | 14125L28-I18UNF | | 14 | 12.50 | 92 | 28.2 | 28.9 | 4 | 20 | 12.8 |
| | 5/8" x18 | 11/16"~1 11/16" x18 | 18 | 16141L31-I18UNF | | 16 | 14.10 | 92 | 31.0 | 31.7 | 4 | 22 | 14.5 |
| 3/8" x16 | 3/4" x16 | | 16 | 08076L19-I16UNC | | 8 | 7.65 | 61 | 19.0 | 19.8 | 3 | 12 | 8.0 |
| | 3/4" x16 | | 16 | 18170L38-I16UNF | | 18 | 17.00 | 102 | 38.1 | 38.8 | 4 | 24 | 17.5 |
| 7/16" x14 | 7/8" x14 | | 14 | 10090L22-I14UNC | | 10 | 9.00 | 73 | 21.8 | 22.7 | 3 | 12 | 9.3 |
| | 7/8" x14 | | 14 | 20199L44-I14UNF | | 20 | 19.90 | 102 | 43.5 | 44.4 | 4 | 24 | 20.5 |
| 1/2" x13 | | | 13 | 12104L26-I13UNC | | 12 | 10.35 | 80 | 25.4 | 26.4 | 4 | 13 | 10.8 |
| 9/16" x12 | 1"~1 1/2" x12 | | 12 | 12118L28-I12UNC | | 12 | 11.80 | 80 | 27.5 | 28.6 | 4 | 13 | 12.3 |
| | 1"~1 1/2" x12 | | 12 | 20199L51-I12UNF | | 20 | 19.90 | 102 | 50.8 | 51.9 | 4 | 24 | 23.5 |
| 5/8" x11 | | | 11 | 14131L33-I11UNC | | 14 | 13.10 | 92 | 32.3 | 33.5 | 4 | 14 | 13.5 |
| 3/4" x10 | | | 10 | 16159L39-I10UNC | | 16 | 15.90 | 92 | 38.1 | 39.4 | 4 | 15 | 16.5 |
| 7/8" x9 | | | 9 | 20190L46-I9UNC | | 20 | 19.00 | 102 | 45.2 | 46.6 | 4 | 16 | 19.5 |
| 1" x8 | | | 8 | 20199L52-I8UNC | | 20 | 19.90 | 102 | 50.8 | 52.4 | 4 | 16 | 22.0 |

* Bore Diameter applies to smallest thread Dia

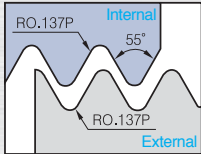
Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

● : Stock item

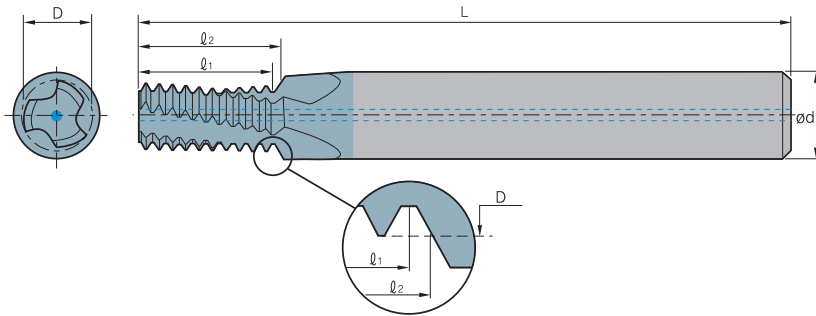
Whitworth

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : B.S.84 : 1956,
DIN 259, ISO228/1 : 1982
Tolerance class : Medium class A



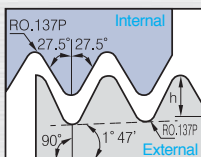
($L_2 \leq 2 \times \text{Thread Diameter}$)

| BSW | Thread | Pitch (tpi) | Designation | | Dimensions(mm) | | | | | No. of Flute z | Tooth zt | *Bore Dia. mm |
|-----------|-----------------|-------------|---------------------|------------------|----------------|-------|-----|----------------|----------------|----------------|----------|---------------|
| | | | External / Internal | PC9070M | Ød | D | L | l ₁ | l ₂ | | | |
| | 1/4"×26 | 26 | STMHC | 06050L13-EI26BSF | 6 | 5.00 | 57 | 12.7 | 13.2 | 3 | 13 | 5.3 |
| | 5/16"×22 | 22 | | 08063L16-EI22BSF | 8 | 6.35 | 61 | 16.2 | 16.7 | 3 | 14 | 6.7 |
| 1/4"×20 | 3/8"×20 | 20 | | 06044L13-EI20BSW | 6 | 4.45 | 57 | 12.7 | 13.3 | 3 | 10 | 5.0 |
| | 3/8"×20 | 20 | | 08076L19-EI20BSF | 8 | 7.65 | 61 | 19.0 | 19.7 | 3 | 15 | 8.2 |
| 5/16"×18 | 7/16"×18 | 18 | | 06058L16-EI18BSW | 6 | 5.85 | 57 | 15.5 | 16.2 | 3 | 11 | 6.5 |
| | 7/16"×18 | 18 | | 10092L23-EI18BSF | 10 | 9.20 | 73 | 22.6 | 23.3 | 3 | 16 | 9.7 |
| 3/8"×16 | 1/2", 9/16"×16 | 16 | | 08072L19-EI16BSW | 8 | 7.20 | 61 | 19.0 | 19.8 | 3 | 12 | 7.9 |
| | 1/2", 9/16"×16 | 16 | | 12105L26-EI16BSF | 12 | 10.50 | 80 | 25.4 | 26.2 | 4 | 16 | 11.1 |
| | 9/16"×16 | 16 | | 14122L29-EI16BSF | 14 | 12.15 | 92 | 28.6 | 29.4 | 4 | 18 | 12.6 |
| 7/16"×14 | 5/8", 11/16"×14 | 14 | | 10085L22-EI14BSW | 10 | 8.50 | 73 | 21.8 | 22.7 | 3 | 12 | 9.2 |
| | 5/8", 11/16"×14 | 14 | | 14134L31-EI14BSF | 14 | 13.40 | 92 | 30.8 | 31.7 | 4 | 17 | 14.0 |
| | 11/16"×14 | 14 | | 16150L35-EI14BSF | 16 | 15.00 | 92 | 34.5 | 35.4 | 4 | 19 | 15.6 |
| 1/2"×12 | 3/4"×12 | 12 | | 10096L26-EI12BSW | 10 | 9.65 | 73 | 25.4 | 26.5 | 3 | 12 | 10.5 |
| 9/16"×12 | 3/4"×12 | 12 | | 12113L28-EI12BSW | 12 | 11.25 | 80 | 27.5 | 28.6 | 4 | 13 | 12.1 |
| | 3/4"×12 | 12 | | 18162L39-EI12BSF | 18 | 16.20 | 102 | 38.1 | 39.2 | 4 | 18 | 16.8 |
| 5/8"×11 | 7/8"×11 | 11 | | 14126L33-EI11BSW | 14 | 12.60 | 92 | 32.3 | 33.5 | 4 | 14 | 13.4 |
| 11/16"×11 | | 11 | | 16142L35-EI11BSW | 16 | 14.20 | 92 | 34.6 | 35.8 | 4 | 15 | 15.0 |

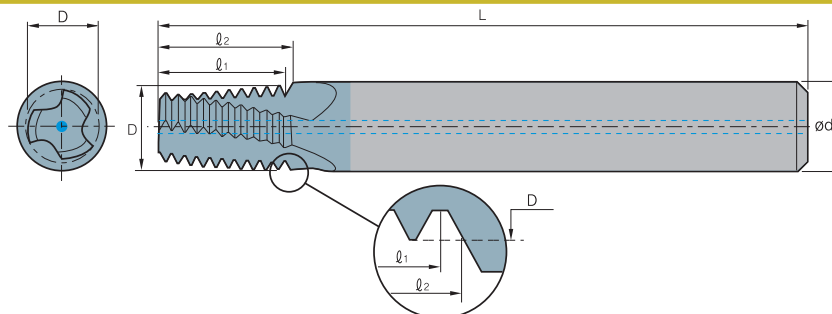
BSPT

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : B.S.21 : 1985
Tolerance class : Standard BSPT



| Standard | Thread | Pitch (tpi) | Designation | | Dimensions(mm) | | | | | No. of Flute z | Tooth zt | *Bore Dia. mm |
|----------|---------------------------|-------------|-------------|-------------------|----------------|-------|-----|----------------|----------------|----------------|----------|---------------|
| | | | Internal | PC9070M | Ød | D | L | l ₁ | l ₂ | | | |
| | 1/16"×28 | 28 | STMHC | 06059L10-EI28BSPT | 6 | 5.90 | 57 | 10.0 | 10.2 | 3 | 11 | 6.7 |
| | 1/8"×28 | 28 | | 08076L10-EI28BSPT | 8 | 7.65 | 61 | 10.0 | 10.2 | 3 | 11 | 8.7 |
| | 1/4"×19 | 19 | | 10099L15-EI19BSPT | 10 | 9.90 | 73 | 14.7 | 15.4 | 3 | 11 | 11.8 |
| | 3/8"×19 | 19 | | 12111L15-EI19BSPT | 12 | 11.15 | 73 | 14.7 | 15.4 | 4 | 11 | 15.2 |
| | 1/2", 3/4"×14 | 14 | | 16142L22-EI14BSPT | 16 | 14.25 | 92 | 21.8 | 22.7 | 4 | 12 | 19.0 |
| | 1", 1 1/2", 2", 2 1/2"×11 | 11 | | 20196L28-EI11BSPT | 20 | 19.60 | 102 | 27.7 | 28.9 | 4 | 12 | 30.7 |

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

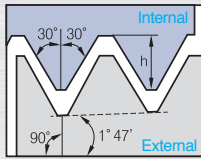
• : Stock item

D Solid Threading Endmills

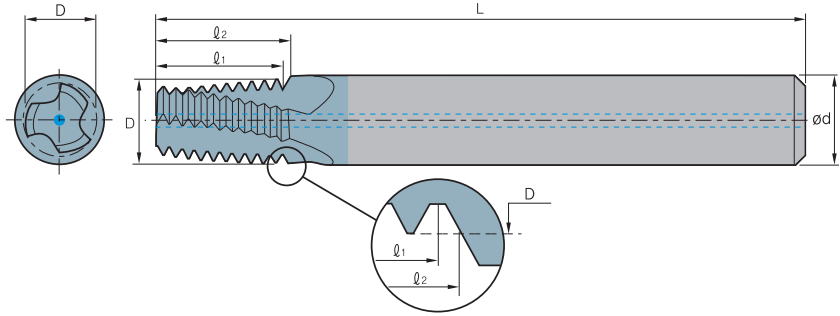
NPT

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : USAS B2.1:1968
Tolerance class : Standard NPT

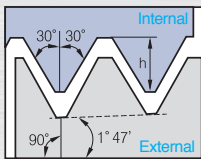


| Thread Standard | Pitch (tpi) | Designation | | Dimensions(mm) | | | | | No.of Flute z | Tooth zt | *Bore Dia. mm |
|----------------------------|-------------|------------------------|---------|----------------|-------|-----|------|------|---------------|----------|------------------------|
| | | Internal | PC9070M | Ød | D | L | l1 | l2 | | | |
| 1/16"×27 | 27 | STMHC 06059L09-EI27NPT | ● | 6 | 5.90 | 57 | 9.4 | 9.9 | 3 | 10 | 6.3 |
| 1/8"×27 | 27 | 08076L09-EI27NPT | ● | 8 | 7.65 | 61 | 9.4 | 9.9 | 3 | 10 | 8.5 |
| 1/4"×18 | 18 | 10099L14-EI18NPT | ● | 10 | 9.90 | 73 | 14.1 | 14.8 | 3 | 10 | 11.1 |
| 3/8"×18 | 18 | 12111L14-EI18NPT | ● | 12 | 11.15 | 73 | 14.1 | 14.8 | 4 | 10 | 14.5 |
| 1/2", 3/4"×14 | 14 | 16142L19-EI14NPT | ● | 16 | 14.25 | 92 | 18.1 | 19.0 | 4 | 10 | 17.7, 23.0 |
| 1", 1 1/4, 1 1/2", 2"×11.5 | 11.5 | 20196L23-EI11.5NPT | | 20 | 19.60 | 102 | 22.1 | 23.2 | 4 | 10 | 29.0, 37.7, 44.0, 56.0 |
| 2 1/2"×8 ; 3"×8 | 8 | 20196L33-EI8NPT | | 20 | 19.60 | 102 | 31.7 | 33.3 | 4 | 10 | 66.5, 82.1 |

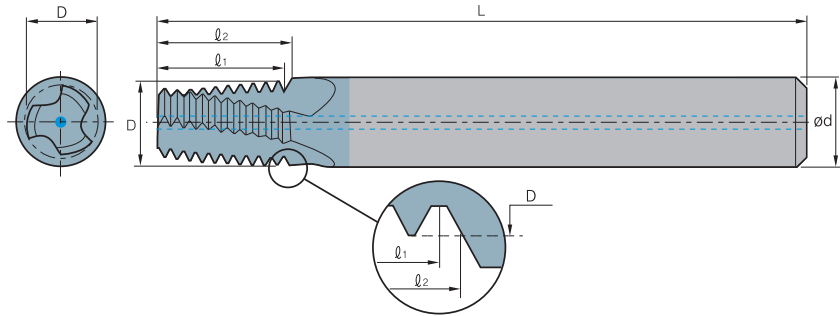
NPTF

Helical Flutes with Thru-Hole Coolant

External / Internal



Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF



| Thread Standard | Pitch (tpi) | Designation | | Dimensions(mm) | | | | | No.of Flute z | Tooth zt | *Bore Dia. mm |
|----------------------------|-------------|-------------------------|---------|----------------|-------|-----|------|------|---------------|----------|------------------------|
| | | Internal | PC9070M | Ød | D | L | l1 | l2 | | | |
| 1/16"×27 | 27 | STMHC 06059L09-EI27NPTF | ● | 6 | 5.90 | 57 | 9.4 | 9.9 | 3 | 10 | 6.3 |
| 1/8"×27 | 27 | 08076L09-EI27NPTF | | 8 | 7.65 | 61 | 9.4 | 9.9 | 3 | 10 | 8.5 |
| 1/4"×18 | 18 | 10099L14-EI18NPTF | | 10 | 9.90 | 73 | 14.1 | 14.8 | 3 | 10 | 11.1 |
| 3/8"×18 | 18 | 12111L14-EI18NPTF | ● | 12 | 11.15 | 73 | 14.1 | 14.8 | 4 | 10 | 14.5 |
| 1/2", 3/4"×14 | 14 | 16142L19-EI14NPTF | | 16 | 14.25 | 92 | 18.1 | 19.0 | 4 | 10 | 17.7, 23.4 |
| 1", 1 1/4, 1 1/2", 2"×11.5 | 11.5 | 20196L23-EI11.5NPTF | | 20 | 19.60 | 102 | 22.1 | 23.2 | 4 | 10 | 29.0, 37.7, 43.7, 55.6 |
| 2 1/2"×8 ; 3"×8 | 8 | 20196L33-EI8NPTF | | 20 | 19.60 | 102 | 31.7 | 33.3 | 4 | 10 | 66.3, 82.1 |

* Bore Diameter applies to smallest thread Dia

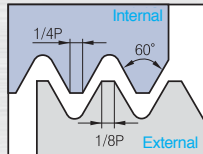
Maximum thread length = $l_2 - \frac{\text{Pitch}}{4}$

● : Stock item

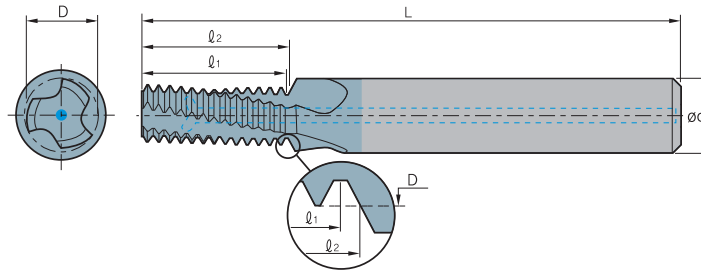
ISO Metric

Helical Flutes with Radial Cooling

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



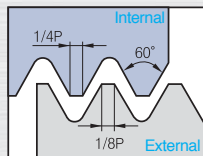
($\ell_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | | No. of Flute | Tooth | *Bore Dia. |
|----------|-------------|-------|--------------------------|---------|----------------|------|----|------|------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | L | ℓ1 | ℓ2 | z | zt | mm |
| M6x1.0 | M8~M40x1.0 | 1.0 | STMHCR 06048L12-I1.00ISO | | 6 | 4.8 | 57 | 12.0 | 12.5 | 3 | 12 | 5.0 |
| | M10x1.0 | 1.0 | 10087L20-I1.00ISO | | 10 | 8.7 | 73 | 20.0 | 20.5 | 3 | 20 | 9.0 |
| | M12x1.0 | 1.0 | 12107L24-I1.00ISO | | 12 | 10.7 | 73 | 24.0 | 24.5 | 4 | 24 | 11.0 |
| M8x1.25 | | 1.25 | 08065L16-I1.25ISO | | 8 | 6.5 | 64 | 16.3 | 16.9 | 3 | 13 | 6.8 |
| M10x1.5 | M12~M48x1.5 | 1.5 | 10082L20-I1.50ISO | | 10 | 8.2 | 73 | 19.5 | 20.3 | 3 | 13 | 8.5 |
| | M12x1.5 | 1.5 | 10099L24-I1.50ISO | | 10 | 9.9 | 73 | 24.0 | 24.8 | 4 | 16 | 10.5 |
| | M14x1.5 | 1.5 | 12119L29-I1.50ISO | | 12 | 11.9 | 84 | 28.5 | 29.3 | 4 | 19 | 12.5 |
| | M16x1.5 | 1.5 | 14139L32-I1.50ISO | | 14 | 13.9 | 84 | 31.5 | 32.3 | 4 | 21 | 14.5 |
| M12x1.75 | | 1.75 | 10099L25-I1.75ISO | | 10 | 9.9 | 73 | 24.5 | 25.4 | 4 | 14 | 10.2 |

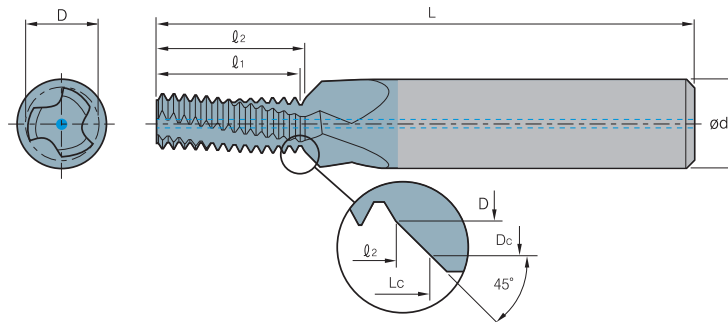
ISO Metric

Helical Flutes with Thru-Hole Coolant - Thru & Chamfer

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



($\ell_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | | | | No. of Flute | Tooth | *Bore Dia. |
|----------|-------------|-------|--------------------------|---------|----------------|------|------|----|------|------|------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | Dc | L | ℓ1 | ℓ2 | Lc | z | zt | mm |
| M6x1.0 | M8~M40x1.0 | 1.0 | STMHCC 08048L12-I1.00ISO | | 8 | 4.8 | 6.3 | 61 | 12.0 | 12.5 | 13.3 | 3 | 12 | 5.0 |
| | M10x1.0 | 1.0 | 12087L20-I1.00ISO | | 12 | 8.7 | 10.3 | 73 | 20.0 | 20.5 | 21.3 | 3 | 20 | 9.0 |
| | M12x1.0 | 1.0 | 14107L24-I1.00ISO | | 14 | 10.7 | 12.3 | 80 | 24.0 | 24.5 | 25.3 | 4 | 24 | 11.0 |
| M8x1.25 | | 1.25 | 10065L16-I1.25ISO | | 10 | 6.5 | 8.3 | 73 | 16.3 | 16.9 | 17.8 | 3 | 13 | 6.8 |
| M10x1.5 | M12~M48x1.5 | 1.5 | 12082L20-I1.50ISO | | 12 | 8.2 | 10.3 | 80 | 19.5 | 20.3 | 21.3 | 3 | 13 | 8.5 |
| | M12x1.5 | 1.5 | 14099L24-I1.50ISO | | 14 | 9.9 | 12.3 | 80 | 24.0 | 24.8 | 26.0 | 4 | 16 | 10.5 |
| | M14x1.5 | 1.5 | 16119L29-I1.50ISO | | 16 | 11.9 | 14.3 | 92 | 28.5 | 29.3 | 30.5 | 4 | 19 | 12.5 |
| | M16x1.5 | 1.5 | 18139L32-I1.50ISO | | 18 | 13.9 | 16.3 | 92 | 31.5 | 32.3 | 33.5 | 4 | 21 | 14.5 |
| M12x1.75 | | 1.75 | 14099L25-I1.75ISO | | 14 | 9.9 | 12.3 | 80 | 24.5 | 25.4 | 26.6 | 4 | 14 | 10.2 |

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

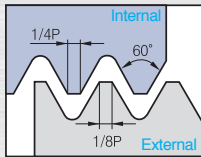
● : Stock item

D Solid Threading Endmills

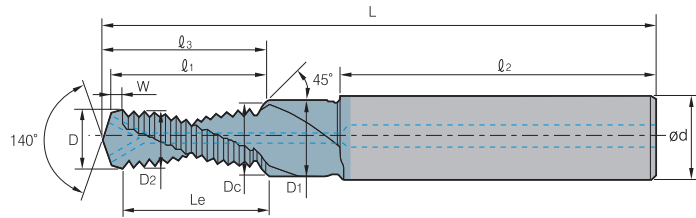
ISO Metric

Drill, Chamfer & Thread with Thru-Hole Coolant

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



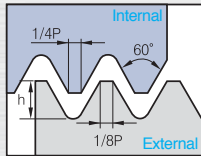
| Thread | Pitch (mm) | Designation | | Dimensions(mm) | | | | | | | | | | | No.of Flute z | Tooth zt |
|----------|---------------|-------------|-----------------|----------------|----------------|----------------|----------------|-----|------|------|----|----------------|----------------|----------------|------------------|-------------|
| | | Internal | PC9070M | L | l ₃ | l ₁ | l ₂ | W | Le | D | Ød | D ₁ | D _c | D ₂ | | |
| M6×1.0 | 1.0 | STMHCD - | IM6×1.0ISO-2D | 62.0 | 14.5 | 13.7 | 36 | 1.0 | 12.7 | 5.0 | 8 | 6.6 | 6.3 | 4.85 | 2 | 11 |
| M8×1.25 | 1.25 | | IM8×1.25ISO-2D | 74.0 | 18.2 | 17.1 | 40 | 1.3 | 15.8 | 6.8 | 10 | 9.0 | 8.3 | 6.45 | 2 | 11 |
| M10×1.5 | 1.5 | | IM10×1.5ISO-2D | 79.0 | 23.4 | 22.1 | 45 | 1.5 | 20.6 | 8.5 | 12 | 11.0 | 10.3 | 8.08 | 2 | 12 |
| M12×1.75 | 1.75 | | IM12×1.75ISO-2D | 89.0 | 27.1 | 25.5 | 45 | 1.5 | 24.0 | 10.3 | 14 | 13.5 | 12.3 | 9.74 | 2 | 12 |

| Thread | Pitch (mm) | Designation | | Dimensions(mm) | | | | | | | | | | | No.of Flute z | Tooth zt |
|---------|---------------|-------------|------------------|----------------|----------------|----------------|----------------|-----|------|-----|----|----------------|----------------|----------------|------------------|-------------|
| | | Internal | PC9070M | L | l ₃ | l ₁ | l ₂ | W | Le | D | Ød | D ₁ | D _c | D ₂ | | |
| M6×1.0 | 1.0 | STMHCD - | IM6×1.0ISO-2.5D | 62.0 | 16.5 | 15.7 | 36 | 1.0 | 14.7 | 5.0 | 8 | 6.6 | 6.3 | 4.85 | 2 | 13 |
| M8×1.25 | 1.25 | | IM8×1.25ISO-2.5D | 74.0 | 23.2 | 22.1 | 40 | 1.3 | 20.8 | 6.8 | 10 | 9.0 | 8.3 | 6.45 | 2 | 15 |
| M10×1.5 | 1.5 | | IM10×1.5ISO-2.5D | 79.0 | 27.9 | 26.6 | 45 | 1.5 | 25.1 | 8.5 | 12 | 11.0 | 10.3 | 8.08 | 2 | 15 |

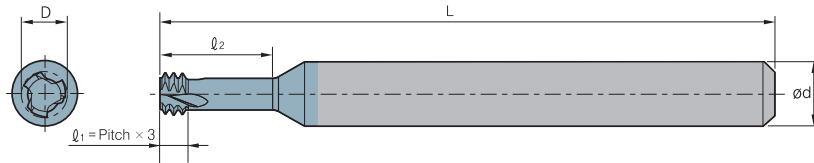
ISO Metric

Deep Threading

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



($\ell_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No. of Flute | Tooth | *Bore Dia. |
|-----------|--------------|-------|---------------------------|---------|----------------|------|----|------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | L | ℓ2 | z | zt | mm |
| M1.6x0.35 | | 0.35 | STMD3T 03012L034-I0.35ISO | | 3 | 1.20 | 30 | 3.4 | 3 | 3 | 1.25 |
| M2x0.4 | | 0.4 | 06015L042-I0.4ISO | | 6 | 1.55 | 57 | 4.2 | 3 | 3 | 1.6 |
| M2.2x0.45 | | 0.45 | 06016L046-I0.45ISO | | 6 | 1.65 | 57 | 4.6 | 3 | 3 | 1.75 |
| M2.5x0.45 | | 0.45 | 06019L052-I0.45ISO | | 6 | 1.95 | 57 | 5.2 | 3 | 3 | 2.05 |
| M3x0.5 | M3.5~M16x0.5 | 0.5 | 06024L062-I0.5ISO | | 6 | 2.40 | 57 | 6.2 | 3 | 3 | 2.5 |
| M3.5x0.6 | | 0.6 | 06027L073-I0.6ISO | | 6 | 2.75 | 57 | 7.3 | 3 | 3 | 2.9 |
| M4x0.7 | | 0.7 | 06031L083-I0.7ISO | | 6 | 3.15 | 57 | 8.3 | 3 | 3 | 3.3 |
| M5x0.8 | | 0.8 | 06040L104-I0.8ISO | | 6 | 4.05 | 57 | 10.4 | 3 | 3 | 4.2 |
| M6x1.0 | M8~M40x1.0 | 1.0 | 06048L125-I1.0ISO | | 6 | 4.80 | 57 | 12.5 | 3 | 3 | 5.0 |
| M8x1.25 | | 1.25 | 08065L166-I1.25ISO | | 8 | 6.50 | 63 | 16.6 | 3 | 3 | 6.8 |
| M10x1.5 | M12~M48x1.50 | 1.5 | 10082L208-I1.50ISO | | 10 | 8.20 | 73 | 20.8 | 3 | 3 | 8.5 |
| M12x1.75 | | 1.75 | 10099L250-I1.75ISO | | 10 | 9.90 | 73 | 25.0 | 3 | 3 | 10.3 |

3d ($\ell_2 \leq 3 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No. of Flute | Tooth | *Bore Dia. |
|-----------|--------------|-------|---------------------------|---------|----------------|------|----|------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | L | ℓ2 | z | zt | mm |
| M1.6x0.35 | | 0.35 | STMD3T 03012L050-I0.35ISO | | 3 | 1.20 | 30 | 5.0 | 3 | 3 | 1.25 |
| M2x0.4 | | 0.4 | 06015L062-I0.4ISO | | 6 | 1.55 | 57 | 6.2 | 3 | 3 | 1.6 |
| M2.5x0.45 | | 0.45 | 06019L077-I0.45ISO | | 6 | 1.95 | 57 | 7.0 | 3 | 3 | 2.05 |
| M3x0.5 | M3.5~M16x0.5 | 0.5 | 06024L092-I0.5ISO | | 6 | 2.40 | 57 | 9.2 | 3 | 3 | 2.5 |
| M4x0.7 | | 0.7 | 06031L123-I0.7ISO | | 6 | 3.15 | 57 | 12.3 | 3 | 3 | 3.3 |
| M5x0.8 | | 0.8 | 06040L154-I0.8ISO | | 6 | 4.05 | 57 | 15.4 | 3 | 3 | 4.2 |
| M6x1.0 | M8~M40x1.0 | 1.0 | 06048L185-I1.0ISO | | 6 | 4.80 | 57 | 18.5 | 3 | 3 | 5.0 |
| M8x1.25 | | 1.25 | 08065L246-I1.25ISO | | 8 | 6.50 | 63 | 24.6 | 3 | 3 | 6.8 |

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

● : Stock item

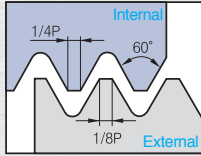


D Solid Threading Endmills

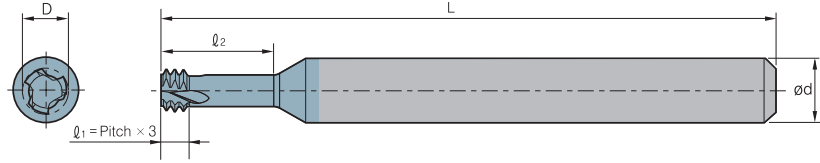
American UN

Deep Threading

Internal



Defined by : ANSI B1.1.74
Tolerance class : 2B



($l_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No. of Flute | Tooth | *Bore Dia. |
|---------------|-----------|-------|------------------------|---------|----------------|------|----|-------|--------------|-------|------------|
| UNC | UNF | (tpi) | Internal | PC9070M | Ød | D | L | l_2 | z | zt | mm |
| | No.1~72 | 72 | STMD3T 06014L039-I72UN | | 6 | 1.45 | 57 | 3.9 | 3 | 3 | 1.6 |
| No.1~64 | No.2~64 | 64 | 06014L042-I64UN | | 6 | 1.40 | 57 | 4.2 | 3 | 3 | 1.5 |
| No.2~56 | No.3~56 | 56 | 06016L050-I56UN | | 6 | 1.65 | 57 | 5.0 | 3 | 3 | 1.8 |
| No.3~48 | No.4~48 | 48 | 06019L060-I48UN | | 6 | 1.90 | 57 | 6.0 | 3 | 3 | 2.1 |
| No.4, No.5~40 | No.6~40 | 40 | 06021L060-I40UN | | 6 | 2.10 | 57 | 6.0 | 3 | 3 | 2.3 |
| No.5~40 | No.6~40 | 40 | 06024L072-I40UN | | 6 | 2.45 | 57 | 7.2 | 3 | 3 | 2.6 |
| | No.8~36 | 36 | 06033L087-I36UN | | 6 | 3.30 | 57 | 8.7 | 3 | 3 | 3.5 |
| No.6, No.8~32 | No.10~32 | 32 | 06025L074-I32UN | | 6 | 2.55 | 57 | 7.4 | 3 | 3 | 2.8 |
| No.8~32 | No.10~32 | 32 | 06032L100-I32UN | | 6 | 3.20 | 57 | 10.0 | 3 | 3 | 3.5 |
| | 1/4" x28 | 28 | 06052L132-I28UN | | 6 | 5.25 | 57 | 13.2 | 3 | 3 | 5.5 |
| No.10~24 | 5/16" x24 | 24 | 06035L102-I24UN | | 6 | 3.58 | 57 | 10.2 | 3 | 3 | 3.9 |
| | 5/16" x24 | 24 | 08066L165-I24UN | | 8 | 6.68 | 63 | 16.5 | 3 | 3 | 6.9 |
| 1/4" x20 | 7/16" x20 | 20 | 06048L134-I20UN | | 6 | 4.88 | 57 | 13.4 | 3 | 3 | 5.2 |
| | 7/16" x20 | 20 | 010095L230-I20UN | | 10 | 9.55 | 73 | 23.0 | 3 | 3 | 9.9 |
| 3/8" x16 | | 16 | 08067L191-I16UN | | 8 | 6.70 | 63 | 19.1 | 3 | 3 | 8.0 |
| 7/16" x14 | | 14 | 10090L233-I14UN | | 10 | 9.00 | 73 | 23.3 | 3 | 3 | 9.4 |

($l_2 \leq 3 \times \text{Thread Diameter}$)

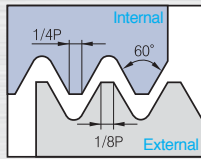
| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No. of Flute | Tooth | *Bore Dia. |
|---------------|-----------|-------|------------------------|---------|----------------|------|----|-------|--------------|-------|------------|
| UNC | UNF | (tpi) | Internal | PC9070M | Ød | D | L | l_2 | z | zt | mm |
| | No.1~72 | 72 | STMD3T 06014L057-I72UN | | 6 | 1.45 | 57 | 5.75 | 3 | 3 | 1.6 |
| No.4, No.5~40 | No.6~40 | 40 | 06021L090-I40UN | | 6 | 2.10 | 57 | 9.0 | 3 | 3 | 2.3 |
| No.5~40 | No.6~40 | 40 | 06024L100-I40UN | | 6 | 2.45 | 57 | 10.0 | 3 | 3 | 2.6 |
| No.6, No.8~32 | No.10~32 | 32 | 06025L110-I32UN | | 6 | 2.55 | 57 | 11.0 | 3 | 3 | 2.8 |
| No.8~32 | No.10~32 | 32 | 06032L130-I32UN | | 6 | 3.20 | 57 | 13.0 | 3 | 3 | 3.4 |
| | 1/4" 28 | 28 | 06052L196-I28UN | | 6 | 5.25 | 57 | 19.6 | 3 | 3 | 5.5 |
| | 5/16" x24 | 24 | 08066L245-I24UN | | 8 | 6.68 | 63 | 24.5 | 3 | 3 | 6.9 |
| 1/4" x20 | 7/16" x20 | 20 | 06048L198-I20UN | | 6 | 4.88 | 57 | 19.8 | 3 | 3 | 5.1 |



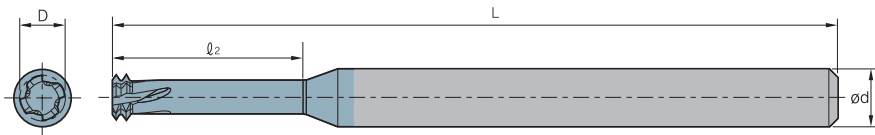
ISO Metric

Deep Threading for Hard Materials (~HRC62)

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



($l_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No. of Flute | Tooth | *Bore Dia. |
|-----------|--------------|-------|--------------------------|---------|----------------|------|-----|-------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | L | l_2 | z | zt | mm |
| M2x0.4 | | 0.4 | STMD2L 06015L042-I0.4ISO | | 6 | 1.55 | 76 | 4.60 | 4 | 2 | 1.6 |
| M2.2x0.45 | | 0.45 | 06016L046-I0.45ISO | | 6 | 1.65 | 76 | 5.05 | 4 | 2 | 1.8 |
| M2.5x0.45 | | 0.45 | 06019L052-I0.45ISO | | 6 | 1.95 | 76 | 5.65 | 4 | 2 | 2.05 |
| M3x0.5 | M3.5~M16x0.5 | 0.5 | 06024L062-I0.5ISO | | 6 | 2.40 | 76 | 6.75 | 4 | 2 | 2.55 |
| M3.5x0.6 | | 0.6 | 06027L073-I0.6ISO | | 6 | 2.75 | 76 | 7.90 | 4 | 2 | 2.95 |
| M4x0.7 | | 0.7 | 06031L083-I0.7ISO | | 6 | 3.15 | 76 | 9.05 | 4 | 2 | 3.35 |
| M5x0.8 | | 0.8 | 06040L104-I0.8ISO | | 6 | 4.05 | 76 | 11.20 | 4 | 2 | 4.3 |
| M6x1.0 | M8~M40x1.0 | 1.0 | 06048L125-I1.0ISO | | 6 | 4.80 | 76 | 13.50 | 4 | 2 | 5.1 |
| M8x1.25 | | 1.25 | 08065L166-I1.25ISO | | 8 | 6.50 | 80 | 17.85 | 4 | 2 | 6.8 |
| M10x1.5 | M12~M48x1.50 | 1.5 | 08079L208-I1.50ISO | | 8 | 7.90 | 80 | 22.30 | 4 | 2 | 8.6 |
| M12x1.75 | | 1.75 | 10099L250-I1.75ISO | | 10 | 9.90 | 101 | 26.75 | 4 | 2 | 10.4 |

($l_2 \leq 3 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No. of Flute | Tooth | *Bore Dia. |
|-----------|--------------|-------|--------------------------|---------|----------------|------|----|-------|--------------|-------|------------|
| M Coarse | M Fine | (mm) | Internal | PC9070M | Ød | D | L | l_2 | z | zt | mm |
| M2x0.4 | | 0.4 | STMD2L 06015L062-I0.4ISO | | 6 | 1.55 | 76 | 6.60 | 4 | 2 | 1.6 |
| M2.2x0.45 | | 0.45 | 06019L077-I0.45ISO | | 6 | 1.95 | 76 | 8.15 | 4 | 2 | 2.05 |
| M3x0.5 | M3.5~M16x0.5 | 0.5 | 06024L092-I0.5ISO | | 6 | 2.40 | 76 | 9.75 | 4 | 2 | 2.55 |
| M4x0.7 | | 0.7 | 06031L123-I0.7ISO | | 6 | 3.15 | 76 | 13.05 | 4 | 2 | 3.35 |
| M5x0.8 | | 0.8 | 06040L154-I0.8ISO | | 6 | 4.05 | 76 | 16.20 | 4 | 2 | 4.3 |
| M6x1.0 | M8~M40x1.0 | 1.0 | 06048L185-I1.0ISO | | 6 | 4.80 | 76 | 19.50 | 4 | 2 | 5.1 |
| M8x1.25 | | 1.25 | 08065L246-I1.25ISO | | 8 | 6.50 | 80 | 25.85 | 4 | 2 | 6.8 |

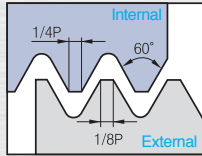


D Solid Threading Endmills

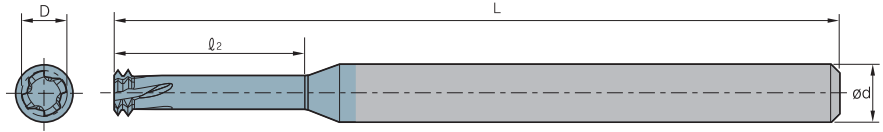
American UN

Deep Threading for Hard Materials(~HRc62)

Internal



Defined by : ANSI B1.1.74
Tolerance class : 2B



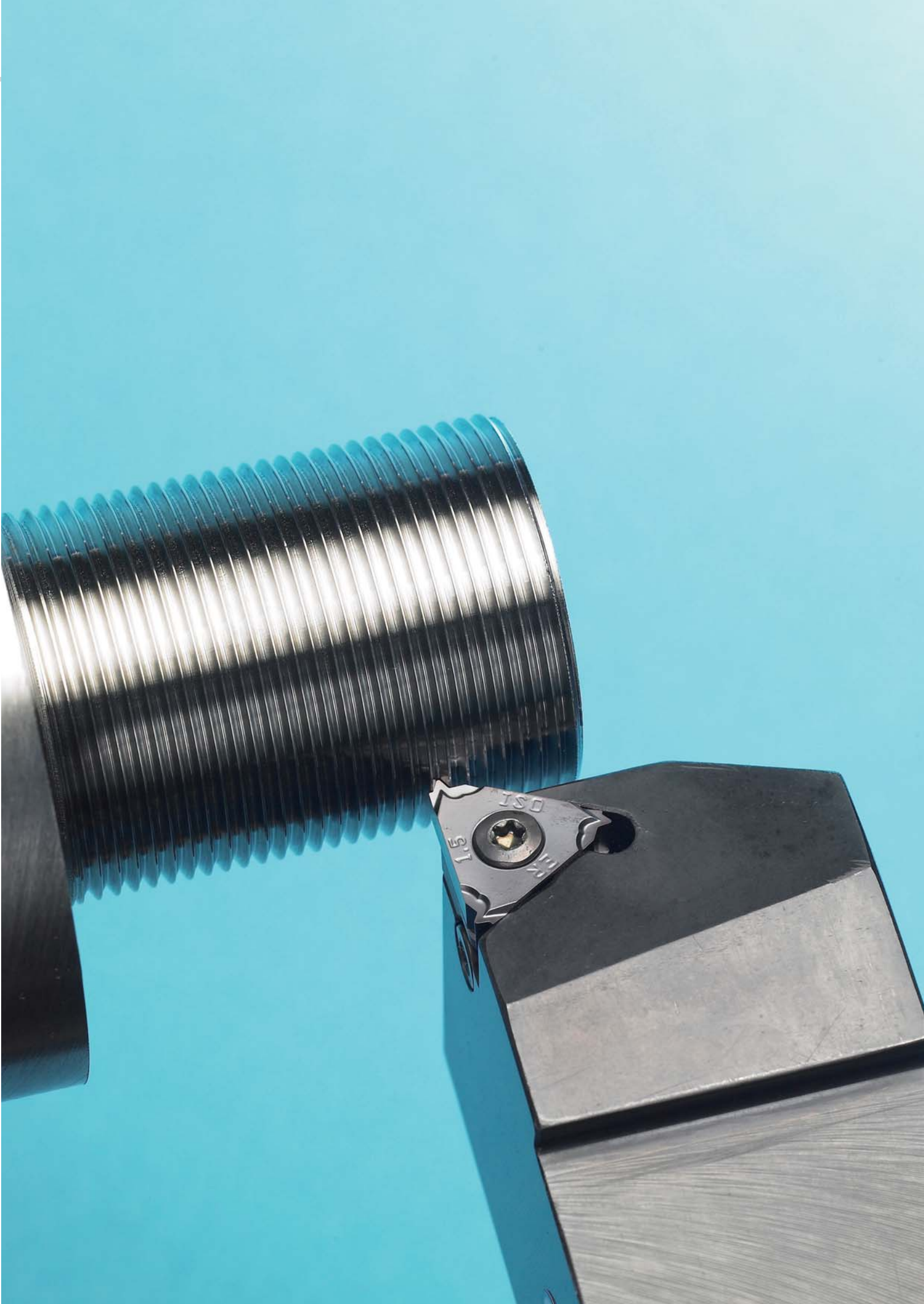
($l_2 \leq 2 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No.of Flute | Tooth | *Bore Dia. |
|-------------------|----------|-------|------------------------|---------|----------------|------|-----|-------|-------------|-------|------------|
| UNC | UNF | (tpi) | Internal | PC9070M | Ød | D | L | l2 | z | zt | mm |
| No.2~56 | No.3~56 | 56 | STMD2L 06016L050-156UN | | 6 | 1.65 | 76 | 5.45 | 4 | 2 | 1.80 |
| No.3~48 | No.4~48 | 48 | 06019L060-148UN | | 6 | 1.90 | 76 | 6.53 | 4 | 2 | 2.10 |
| No.4~40 ; No.5~40 | No.6~40 | 40 | 06021L060-140UN | | 6 | 2.10 | 76 | 6.64 | 4 | 2 | 2.35 |
| No.5~40 | No.6~40 | 40 | 06024L072-140UN | | 6 | 2.45 | 76 | 7.84 | 4 | 2 | 2.65 |
| | No.8~36 | 36 | 06033L087-136UN | | 6 | 3.30 | 76 | 9.41 | 4 | 2 | 3.55 |
| No.6~32 ; No.8~32 | No.10~32 | 32 | 06025L074-132UN | | 6 | 2.55 | 76 | 8.20 | 4 | 2 | 2.85 |
| No.8~32 | No.10~32 | 32 | 06032L100-132UN | | 6 | 3.20 | 76 | 10.79 | 4 | 2 | 3.50 |
| | 1/4"×28 | 28 | 06052L132-128UN | | 6 | 5.25 | 76 | 14.11 | 4 | 2 | 5.55 |
| No.10~24 | 5/16"×24 | 24 | 06035L102-124UN | | 6 | 3.58 | 76 | 11.26 | 4 | 2 | 3.90 |
| | 5/16"×24 | 24 | 08066L165-124UN | | 8 | 6.68 | 76 | 17.56 | 4 | 2 | 7.00 |
| 1/4"×20 | 7/16"×20 | 20 | 06048L134-120UN | | 6 | 4.88 | 76 | 14.67 | 4 | 2 | 5.20 |
| | 7/16"×20 | 20 | 10095L230-120UN | | 10 | 9.55 | 101 | 24.27 | 4 | 2 | 9.90 |
| 3/8"×16 | | 16 | 08076L197-116UN | | 8 | 7.65 | 80 | 21.29 | 4 | 2 | 8.00 |
| 7/16"×14 | | 14 | 10090L233-114UN | | 10 | 9.00 | 101 | 25.11 | 4 | 2 | 9.50 |
| 1/2"×13 | | 13 | 10099L256-113UN | | 10 | 9.90 | 101 | 27.55 | 4 | 2 | 10.90 |

($l_2 \leq 3 \times \text{Thread Diameter}$)

| Thread | | Pitch | Designation | | Dimensions(mm) | | | | No.of Flute | Tooth | *Bore Dia. |
|------------------|----------|-------|------------------------|---------|----------------|------|-----|-------|-------------|-------|------------|
| UNC | UNF | (tpi) | Internal | PC9070M | Ød | D | L | l2 | z | zt | mm |
| No.4~40, No.5~40 | No.6~40 | 40 | STMD2L 06021L090-140UN | | 6 | 2.10 | 76 | 9.64 | 4 | 2 | 2.35 |
| No.5~40 | No.6~40 | 40 | 06024L100-140UN | | 6 | 2.45 | 76 | 10.64 | 4 | 2 | 2.65 |
| No.6~32, No.8~32 | No.10~32 | 32 | 06025L110-132UN | | 6 | 2.55 | 76 | 11.79 | 4 | 2 | 2.85 |
| No.8~32 | No.10~32 | 32 | 06032L130-132UN | | 6 | 3.20 | 76 | 13.79 | 4 | 2 | 3.50 |
| | 1/4"×28 | 28 | 06052L196-128UN | | 6 | 5.25 | 76 | 20.51 | 4 | 2 | 5.55 |
| | 5/16"×24 | 24 | 08066L245-124UN | | 8 | 6.68 | 80 | 25.56 | 4 | 2 | 7.00 |
| 1/4"~20 | 7/16"×20 | 20 | 06048L198-120UN | | 6 | 4.88 | 76 | 21.07 | 4 | 2 | 5.20 |
| 7/16"×14 | | 14 | 10090L335-114UN | | 10 | 9.00 | 101 | 35.31 | 4 | 2 | 9.50 |





E

MILLING

Milling tools that provide the best quality for customers' needs and improve productivity.

C O N T E N T S



Milling Insert

- E 02** Milling Insert
Code System(ISO)
- E 04** Milling Insert
- E 25** KORLOY Cutters
- E 31** KORLOY Shanks
- E 33** KORLOY Modular Adaptors

Face Milling Cutters

- E 34** Mill-max(ISO)
Mill-max Plus (E35, E41)
- E 44** Turbo Mill
- E 47** Double Mill
- E 49** Technical Information
for Power Buster
- E 52** Power Buster
- E 54** Rich Mill
- E 97** Aero Mill
- E 102** PCD face cutter

Cutters for Molds

- E103** Alpha Mill
- E135** Technical Information for
BT / HSK Tooling System
- E136** BT Tooling System (Single edge)
- E139** HSK Tooling System (Single edge)
- E142** BT Tooling System (Multi edge)
- E146** HSK Tooling System (Multi edge)
- E150** BT Tooling System(Modular)
- E151** HSK Tooling System (Modular)
- E152** Technical Information for Future Mill
- E162** Future Mill
- E186** Technical Information for HRMDouble
- E191** HRMDouble
- E201** HRM
- E206** Tank Mill
- E207** Technical information for
Laser Mill / BFE / GBE / BRE
- E214** Laser Mill



MILLING

Cutters for Molds

- E219** BFE
- E220** GBE
- E222** BRE
- E223** O-Ring Cutter
- E225** Chamfer Tool
- E233** T-Cutter(TFE)

Milling cutter for Aluminum

- E234** Technical information for Pro-L Mill
- E237** Pro-L Mill
- E240** Technical information for Pro-A Mill / Pro-X Mill
- E244** Pro-A Mill
- E247** Pro-X Mill
- E252** HSK Tooling System (Single Edge)
- E253** Modular Adaptor (MAT)

Side Milling Cutters

- E254** Side milling cutter
- E257** Adjustable Side cutter
- E261** Side cutter
- E266** Wind Mill

Milling cutter for cast iron At high feed

- E270** Technical Information (High feed Cutter, Storm Mill Shave Mill Ultra, Cube Mill Couple Mill)
- E279** High feed Cutter
- E287** Shave Mill
- E288** Shave Mill Ultra

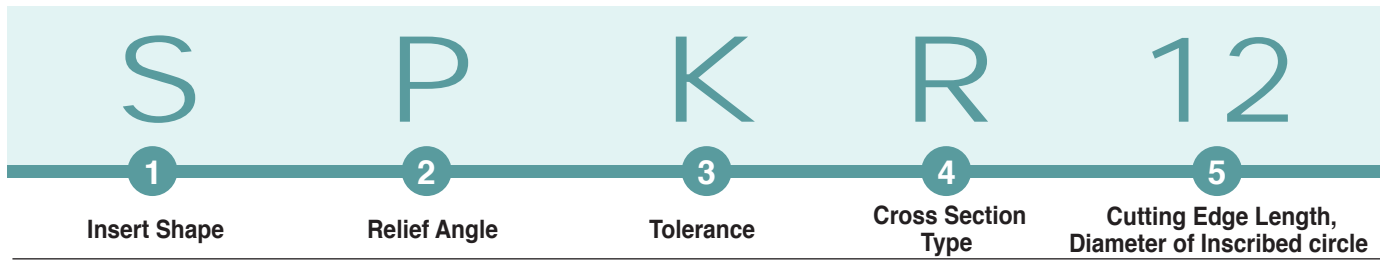
Detail Information of milling cutter and Arbor

- E290** Detail Spec. of application Arbor

Gear Tools

- E293** Technical information for gear cutter
- E294** Gear Cutter Index
- E295** Gear Cutter
- E303** Gear cutter Special Order Form
- E304** Indexable Hob
- E305** Indexable Hob Special Order Form

E Milling Insert Code System(ISO)



1 Insert Shape

S P K R 12 03 ^{ED} ₀₈ S R - M X

2 Relief Angle

S P K R 12 03 ^{ED} ₀₈ S R - M X

3 Tolerance

S P K R 12 03 ^{ED} ₀₈ S R - M X

d : Inscribed Circle
t : Thickness
m : refer to figure

■ Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (exceptional case)

| Class | d | m | t | Tolerance on d | | | Tolerance on m | | |
|-------|---------------|---------------|--------|--|----------------|-------|----------------|-------|--|
| | | | | J,K,L,M,N | U | M,N | U | | |
| A | ±0.025 | ±0.005 | ±0.025 | 6.35 | ±0.05 | ±0.08 | ±0.08 | ±0.13 | |
| C | ±0.025 | ±0.013 | ±0.025 | 9.525 | ±0.05 | ±0.08 | ±0.08 | ±0.13 | |
| H | ±0.013 | ±0.013 | ±0.025 | 12.7 | ±0.08 | ±0.13 | ±0.13 | ±0.20 | |
| E | ±0.025 | ±0.025 | ±0.025 | 15.875 | ±0.10 | ±0.18 | ±0.15 | ±0.27 | |
| G | ±0.025 | ±0.025 | ±0.13 | 19.05 | ±0.10 | ±0.18 | ±0.15 | ±0.27 | |
| J | ±0.05 ~ ±0.15 | ±0.005 | ±0.025 | 25.4 | ±0.13 | ±0.25 | ±0.18 | ±0.38 | |
| K | ±0.05 ~ ±0.15 | ±0.013 | ±0.025 | ■ Tolerance on D Insert Shape (exceptional case) | | | | | |
| L | ±0.05 ~ ±0.15 | ±0.025 | ±0.025 | d | Tolerance on d | | Tolerance on m | | |
| M | ±0.05 ~ ±0.15 | ±0.08 ~ ±0.20 | ±0.13 | 6.35 | ±0.05 | ±0.11 | | | |
| U | ±0.08 ~ ±0.25 | ±0.13 ~ ±0.38 | ±0.13 | 9.525 | ±0.05 | ±0.11 | | | |
| | | | | 12.7 | ±0.08 | ±0.15 | | | |
| | | | | 15.875 | ±0.10 | ±0.18 | | | |
| | | | | 19.05 | ±0.10 | ±0.18 | | | |

4 Cross Section Type

S P K R 12 03 ^{ED} ₀₈ S R - M X

5 Cutting Edge Length, Diameter of Inscribed circle

S P K R 12 03 ^{ED} ₀₈ S R - M X

■ Metric system * Decimal integer constant

■ Inch system

· Use 1/32" unit for a insert having smaller I.C under 1/4"
· Use 1/8" unit for a insert having larger I.C over 1/4"

* In case of rectangular and rhombic insert indicate cutting edge length instead of inscribed circle.

■ Cross over chart for "Metric" and "Inch" system

| Shape | 06 | 09 | 11 | 16 | 22 | 27 | 33 | 44 |
|------------------|-------|-------|------|------|------|------|------|----|
| Triangle | | | | | | | | |
| Circle | 03 | 05 | 06 | 09 | 12 | 15 | 19 | 25 |
| 55° | 04 | 06 | 07 | 11 | 15 | 19 | 23 | 31 |
| 80° | 03 | 05 | 06 | 09 | 12 | 16 | 19 | 25 |
| Inscribed circle | 5/32" | 7/32" | 1/4" | 3/8" | 1/2" | 5/8" | 3/4" | 1" |
| Inch system | 5 | 7 | 2(8) | 3 | 4 | 5 | 6 | 8 |



03

ED 08

S

R - MX

6

7

8

9

10

Height of Cutting Edge

Nose Radius (Nose R)

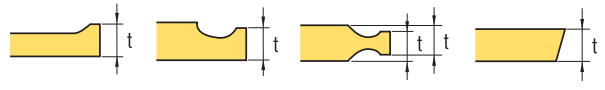
Edge Preparation

Hand

Chip Breaker for Milling

6 Height of Cutting Edge

S P K R 12 03 ^{ED} 08 S R - MX

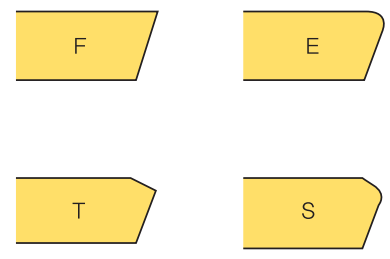


| Symbol | | Height of cutting edge(t) | |
|--------|--------|---------------------------|-------|
| Metric | Inch | mm | Inch |
| 01 | 1(2) | 1.59 | 1/16 |
| T0 | 1.125 | 1.79 | 9/128 |
| T1 | 1.2 | 1.98 | 5/64 |
| 02 | 1.5(3) | 2.38 | 3/32 |
| T2 | 1.75 | 2.78 | 7/64 |
| 03 | 2 | 3.18 | 1/8 |
| T3 | 2.5 | 3.97 | 5/32 |
| 04 | 3 | 4.76 | 3/16 |
| 05 | 3.5 | 5.56 | 7/32 |
| 06 | 4 | 6.35 | 1/4 |
| 07 | 5 | 7.94 | 5/16 |
| 09 | 6 | 9.52 | 3/8 |
| 11 | 7 | 11.11 | 7/16 |
| 12 | 8(16) | 12.70 | 1/2 |

() Symbol for small size insert

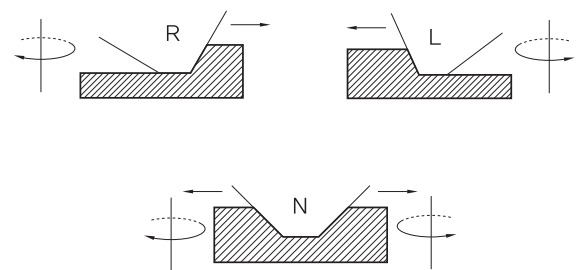
8 Edge Preparation

S P K R 12 03 ^{ED} 08 S R - MX



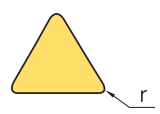
9 Hand

S P K R 12 03 ^{ED} 08 S R - MX

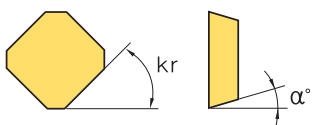


7 Nose Radius (Nose R)

S P K R 12 03 ^{ED} 08 S R - MX



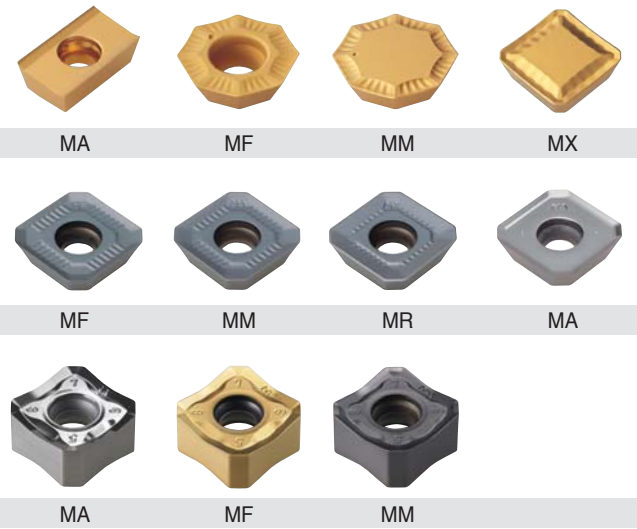
| r | | Symbol | | r | | Symbol | |
|----|------|--------|------|----|------|--------|------|
| mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| 00 | 0 | 0.0 | | 12 | 3 | 1.2 | 3/64 |
| 02 | | 0.2 | | 15 | | 1.5 | |
| 04 | 1 | 0.4 | 1/64 | 16 | 4 | 1.6 | 4/64 |
| 05 | | 0.5 | | 24 | 6 | 2.4 | 6/64 |
| 08 | 2 | 0.8 | 2/64 | 32 | 8 | 3.2 | 8/64 |
| 10 | | 1.0 | | 40 | | 4.0 | |


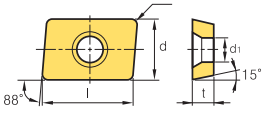

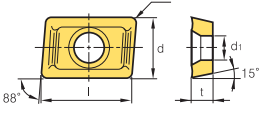

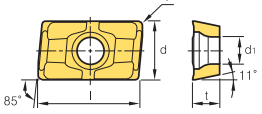

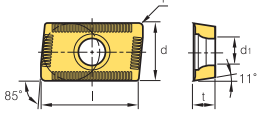

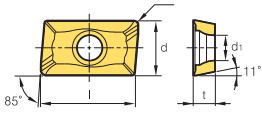

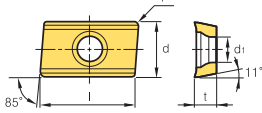

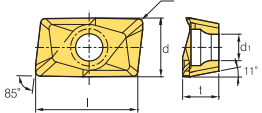

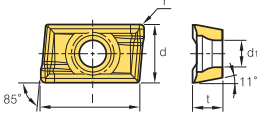

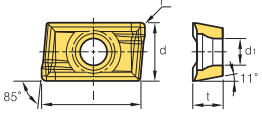

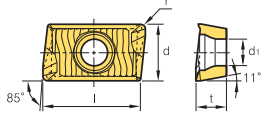

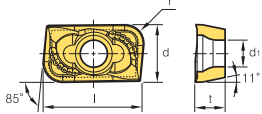

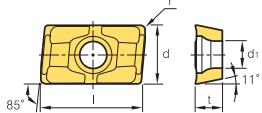


| Parallel Land kr | Relief Angle α° |
|---------------------|--------------------|
| A - 45° | A - 3° F - 25° |
| D - 60° | B - 5° G - 30° |
| E - 75° | C - 7° N - 0° |
| F - 85° | D - 15° P - 11° |
| P - 90° | E - 20° |
| Z - Special | |

10 Chip Breaker for Milling

S P K R 12 03 ^{ED} 08 S R - MX



| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | | | | | Available tools | | | | | | | |
|---|--------------------------------------|--------|--------|--------|--------|----------|--------|--------|--------|--------|--------|-----------------|------|------|-----|-----|-----------------|------|-------|------|-----|-----|---|----------------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | |
| | Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| Inserts | Designation | Coated | | | Cermet | Uncoated | | | | | | Dimensions (mm) | | | | | Geometries | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PD215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | | ST30A | ST20 | l | d | t | r |
|  | 150308R | ● | | | | | | | | | | | | | | | | 15.0 | 9.525 | 3.18 | 0.8 | 4.5 |  | |
| | 150308SR | | | | | | | | | | | | | | | | | 15.0 | 9.525 | 3.18 | 0.8 | 4.5 | | |
| | 150308TR | | | | | | | | | | | | ● | | | | | 15.0 | 9.525 | 3.18 | 0.8 | 4.5 | | |
|  | 150308R | ● | | | | | | | | | | | | | | | | 15.0 | 9.525 | 3.18 | 0.8 | 4.5 |  | E206 |
| | 150308SR | | | ● | | | | | | | | | | | | | | 15.0 | 9.525 | 3.18 | 0.8 | 4.5 | | |
| | 150308TR | | | | | | | | | | | | ● | | | | | 15.0 | 9.525 | 3.18 | 0.8 | 4.5 | | |
|  | 1604PDSR-X22 | | | | ● | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 |  | E112 E124 |
| | 1604PDTR-X22 | | | | | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 | | |
|  | 1604PDR-X28 | | | | | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 |  | E112 E124 |
| | 1604PDSR-X28 | | | | | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 | | |
| | 1604PDTR-X28 | | | | | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 | | |
|  | 1604PDSR | ● | | ● | | ● | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 |  | E112 E124 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1604PDR-MA | | | | | | | | | ● | | | ● | | | | | 16.4 | 9.525 | 4.76 | 0.2 | 4.4 |  | E112 E124 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1604PDR-MA2 | | | | | | | | | | | | | | | | | 16.5 | 9.56 | 5.76 | 0.8 | 4.5 |  | E112 E124 |
| | 160416FR-MA2 | | | | | | | | | | | | | | | | | 16.5 | 9.56 | 5.76 | 1.6 | 4.5 | | |
| | 160432FR-MA2 | | | | | | | | | | | | | | | | | 16.5 | 9.56 | 5.76 | 3.2 | 4.5 | | |
|  | 1604PDR-MA3 | | | | | | | | | | | | | | | | | 16.4 | 9.525 | 5.0 | 0.8 | 4.4 |  | E112 E124 |
| | 160420FR-MA3 | | | | | | | | | | | | | | | | | 16.0 | 9.525 | 5.0 | 2.0 | 4.4 | | |
|  | 1604PDSR-MF | ● | | | ● | | | | | | | | | | | | | 16.4 | 9.525 | 5.0 | 0.8 | 4.4 |  | E112 E124 E131 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1604PDSR-MM | ● | ● | ● | ● | ● | ● | | | | | | | | | | | 16.4 | 9.525 | 5.2 | 0.8 | 4.4 |  | E112 E124 E131 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 160432R-MM1 | ● | | | | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 3.2 | 4.4 |  | E112 E124 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1604PDSR-X22 | ● | | | | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 |  | E112 E124 |
| | 1604PDTR-X22 | | | | | | | | | | | | | | | | | 16.4 | 9.525 | 4.76 | 0.8 | 4.4 | | |


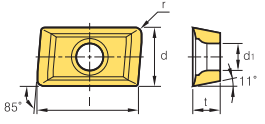

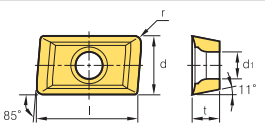

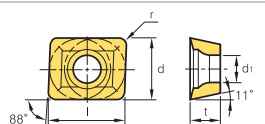
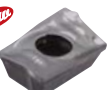
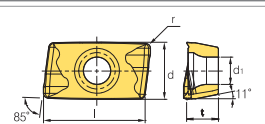

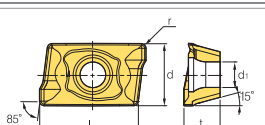

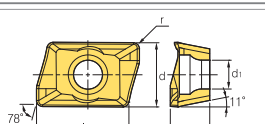

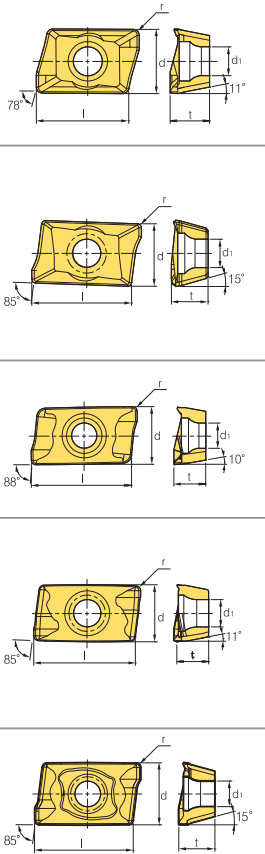
●: Stock item



| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
|-----------|--------------------------------------|--|---|---|---|---|---|---|---|---|---|---|
| | Stainless steel | M | | | ● | ● | ● | | | | | ● |
| | Cast iron | K | | ● | | ● | | ● | ● | | | |
| | Non-ferrous metal | N | | | | | | ● | | | | |
| | Heat resistant alloy, Titanium alloy | S | | | ● | ● | | | | | ● | |
| | Hardened steel | H | | ● | | | | | | | | |

Machining types


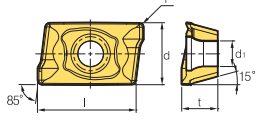

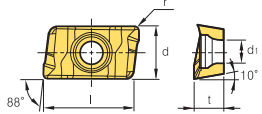

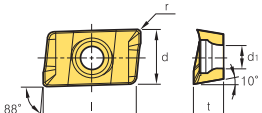

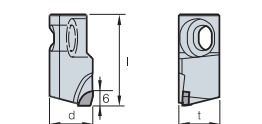

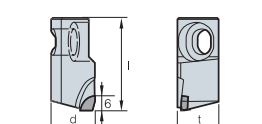
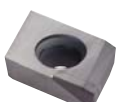
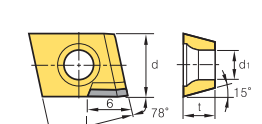

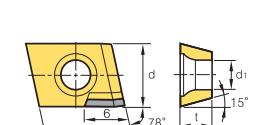

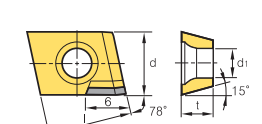

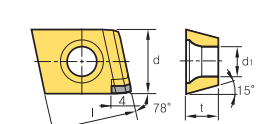
- Continuous cutting
- General cutting
- Interrupted cutting

| Inserts | Designation | Coated | | | Cermet | | Uncoated | | Dimensions (mm) | | | | | Geometries | Available tools | | | | | | |
|---|---------------|--------|--------|--------|--------|--------|----------|--------|-----------------|------|------|-----|------|------------|-----------------|-------|------|------|---|--|--|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC3545 | PC6510 | PC215K | PD2000 | CN20 | CN30 | H01 | G10 | | | ST30A | ST20 | l | d | t | r |
|  APKT-X23 | 1604PDR-X23 | | | | | | | | | | | | | | 16.3 | 9.525 | 4.76 | 1.0 | 4.4 |  | E112 E124 |
| | 1604PDTR-X23 | | | | | | | | | | | | | | 16.3 | 9.525 | 4.76 | 1.0 | 4.4 | | |
|  APKT-X24 | 1604PDR-X24 | | | | | | | | | | | | | | 16.3 | 9.525 | 4.76 | 1.0 | 4.4 |  | E112 E124 |
| | 1604PDFR-X24 | | | | | | | | | | | | | | 16.3 | 9.525 | 4.76 | 1.0 | 4.4 | | |
|  APLT | 070304R | | | | | | | | | | | | | | 7.5 | 6.35 | 3.18 | 0.4 | 2.8 |  | E206 |
|  APMT-MA | 0602PDFR-MA | | | | | | | | | | | | ● | | 6 | 4.24 | 2.6 | 0.4 | 2.0 |  | E108-E111 E113, E116-E123 E125-E126 E129-E134 E136-E138 E141-E144 E146-E149 |
| | 0903PDFR-MA | | | | | | | | | | | | ● | | 9.4 | 6.21 | 3.6 | 0.4 | 2.8 | | |
| | 11T3PDFR-MA | | | | | | | | | | | | ● | | 11.2 | 6.467 | 3.6 | 0.5 | 2.9 | | |
| | 1604PDFR-MA | | | | | | | | | | | | ● | | 16.4 | 9.41 | 5.76 | 0.8 | 4.5 | | |
| | 1806PDFR-MA | | | | | | | | | | | | ● | | 17.4 | 10.98 | 6.35 | 0.8 | 4.5 | | |
|  APMT-MF | 11T3PDSR-MF | ● | ● | ● | ● | ● | | | | | | | | 11.2 | 6.467 | 3.6 | 0.5 | 2.85 |  | E108-E134 E137, E138 E140, E141 E143, E144 E147, E148 E149 | |
| | 1604PDSR-MF | ● | ● | ● | ● | ● | | | | | | | | 16.4 | 9.41 | 5.76 | 0.8 | 4.5 | | | |
| | 1806PDSR-MF | ● | ● | ● | ● | ● | | | | | | | | 17.4 | 10.98 | 6.35 | 0.8 | 4.5 | | | |
| | 180612PDSR-MF | | | | | | | | | | | | | 17.4 | 10.98 | 6.35 | 1.2 | 4.5 | | | |
|  APMT-ML | 0903PDER-ML | | | | | ● | | | | | | | | 9.4 | 6.21 | 3.6 | 0.4 | 2.8 |  | E109-E111, E113 E116-E118 E120-E123 E125-E126 E129-E131 E133-E134 E136-E144 E146-E149 | |
| | 11T3PDER-ML | | | | | ● | | | | | | | | 11.2 | 6.467 | 3.6 | 0.5 | 2.9 | | | |
| | 1604PDER-ML | | | | | ● | | | | | | | | 16.4 | 9.41 | 5.76 | 0.8 | 4.5 | | | |
| | 1806PDER-ML | | | | | ● | | | | | | | | 17.4 | 10.98 | 6.35 | 0.8 | 4.5 | | | |
|  APMT-MM | 060202PDSR-MM | | ● | ● | ● | ● | | | | | | | | 6 | 4.24 | 2.6 | 0.2 | 2.0 |  | E108-E134 E136-E149 | |
| | 0602PDSR-MM | | ● | ● | ● | ● | ● | ● | | | | | | 6 | 4.24 | 2.6 | 0.4 | 2.0 | | | |
| | 060208PDSR-MM | | ● | ● | ● | ● | ● | | | | | | | 6 | 4.24 | 2.6 | 0.8 | 2.0 | | | |
| | 060212R-MM | | ● | ● | ● | | | | | | | | | 6 | 4.24 | 2.6 | 1.2 | 2.0 | | | |
| | 060216R-MM | | ● | | | | | | | | | | | 6 | 4.24 | 2.6 | 1.6 | 2.0 | | | |
| | 0903PDSR-MM | | ● | ● | ● | ● | | | | | | | | 9.4 | 6.21 | 3.6 | 0.4 | 2.8 | | | |
| | 090306PDSR-MM | | ● | ● | ● | ● | | | | | | | | 9.4 | 6.21 | 3.6 | 0.6 | 2.8 | | | |
| | 090308PDSR-MM | | ● | ● | ● | ● | | | | | | | | 9.4 | 6.21 | 3.6 | 0.8 | 2.8 | | | |
| | 090312R-MM | | | ● | ● | ● | | | | | | | | 9.4 | 6.21 | 3.6 | 1.2 | 2.8 | | | |
| | 090316R-MM | | | ● | ● | | | | | | | | | 9.4 | 6.21 | 3.6 | 1.6 | 2.8 | | | |
| | 090320R-MM | | | ● | ● | | | | | | | | | 9.2 | 6.21 | 3.6 | 2.0 | 2.8 | | | |
| | 090331R-MM | | | | | | | | | | | | | 9.2 | 6.21 | 3.6 | 3.1 | 2.8 | | | |
| | 090332R-MM | | | | | | | | | | | | | 9.2 | 6.21 | 3.6 | 3.2 | 2.8 | | | |
| | 11T3PDSR-MM | ● | ● | ● | ● | ● | ● | ● | | | | | | 11.2 | 6.467 | 3.6 | 0.5 | 2.85 | | | |
| | 11T308PDSR-MM | ● | ● | ● | ● | ● | ● | | | | | | | 11.2 | 6.467 | 3.6 | 0.8 | 2.85 | | | |
| | 11T312PDSR-MM | ● | ● | ● | ● | ● | | | | | | | | 11.2 | 6.467 | 3.6 | 1.2 | 2.85 | | | |
| | 11T316R-MM | ● | ● | ● | | | | | | | | | | 11 | 6.467 | 3.6 | 1.6 | 2.85 | | | |
| | 11T318R-MM | ● | ● | ● | | | | | | | | | | 11 | 6.467 | 3.6 | 1.8 | 2.85 | | | |
| | 11T324R-MM | | ● | ● | ● | | | | | | | | | 11 | 6.467 | 3.6 | 2.4 | 2.85 | | | |
| | 1604PDSR-MM | ● | ● | ● | ● | ● | ● | ● | | | | | | 16.4 | 9.41 | 5.76 | 0.8 | 4.5 | | | |
| | 160410PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | 16.4 | 9.41 | 5.76 | 1.0 | 4.5 | | | |
| | 160416PDSR-MM | ● | ● | ● | ● | ● | | | | | | | | 16.4 | 9.41 | 5.76 | 1.6 | 4.5 | | | |
| 160424R-MM | | ● | ● | ● | | | | | | | | | 16 | 9.41 | 5.76 | 2.4 | 4.5 | | | | |
| 160430R-MM | | ● | ● | ● | ● | | | | | | | | 16 | 9.41 | 5.76 | 3.0 | 4.5 | | | | |
| 160432R-MM | ● | ● | ● | ● | ● | | | | | | | | 16 | 9.41 | 5.76 | 3.2 | 4.5 | | | | |
| 160450R-MM | | | | ● | | | | | | | | | 16 | 9.41 | 5.76 | 5.0 | 4.5 | | | | |
| 160464R-MM | | | | ● | | | | | | | | | 16 | 9.41 | 5.76 | 6.4 | 4.5 | | | | |
| 1806PDSR-MM | ● | ● | ● | ● | ● | ● | ● | | | | | | 17.4 | 10.98 | 6.35 | 0.8 | 4.5 | | | | |
| 180612PDSR-MM | ● | ● | ● | ● | ● | | | | | | | | 17.4 | 10.98 | 6.35 | 1.2 | 4.5 | | | | |
| 180616PDSR-MM | ● | ● | | ● | ● | | | | | | | | 17.4 | 10.98 | 6.35 | 1.6 | 4.5 | | | | |
| 180620PDSR-MM | | | | | | | | | | | | | 17.4 | 10.98 | 6.35 | 2.0 | 4.5 | | | | |
| 180624PDSR-MM | ● | ● | | ● | | | | | | | | | 17.4 | 10.98 | 6.35 | 2.4 | 4.5 | | | | |

* Large R I/S : Not applicable to standard holder and cutter. Need special one.

● : Stock item


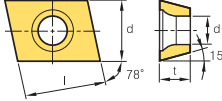

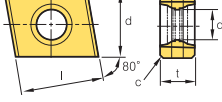
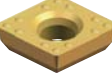
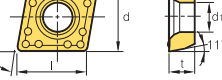
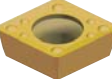
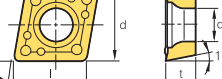

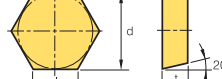

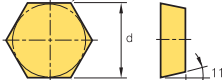

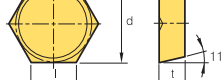
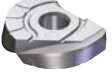


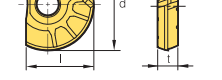


| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | ● Continuous cutting ● General cutting ● Interrupted cutting | | | | | | | |
|--|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|----------|-----|-----------------|--|-------|------|-----|------|------------|---|------------------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Uncoated | PCD | Dimensions (mm) | | | | | | Geometries | Available tools | |
| | | NCM625 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | DP200 | l | d | t | r | | | d ₁ |
|  | 180630R-MM | | | | | | | | | | | | | | | | 16.7 | 10.98 | 6.35 | 3.0 | 4.5 | - |  | E108-E134 E136-E149 |
| | 180632R-MM | ● | ● | | | | | | | | | | | | | | 16.7 | 10.98 | 6.35 | 3.2 | 4.5 | - | | |
| | 180640R-MM | | | | | ● | ● | | | | | | | | | | 16.7 | 10.98 | 6.35 | 4.0 | 4.5 | - | | |
| | 180648R-MM | | | | | ● | ● | | | | | | | | | | 16.7 | 10.98 | 6.35 | 4.8 | 4.5 | - | | |
| | 180650R-MM | | | | | | ● | | | | | | | | | | 16.7 | 10.98 | 6.35 | 5.0 | 4.5 | - | | |
| | 180660R-MM | | | | | | | | | | | | | | | | 16.7 | 10.98 | 6.35 | 6.0 | 4.5 | - | | |
| | 180664R-MM | | | | | | | | | | | | | | | | 16.7 | 10.98 | 6.35 | 6.4 | 4.5 | - | | |
|  | 11T3PDR-MA | | | | | | | | | | | | | | | ● | 11.3 | 6.594 | 3.6 | 0.5 | 2.85 | - |  | E122 E131 E134 |
| | 11T318R-MA | | | | | | | | | | | | | | | | 11.3 | 6.594 | 3.6 | 1.8 | 2.85 | - | | |
|  | 11T3PDSR-MR | | | | | | | | | | | | | | | | 11.3 | 6.594 | 3.6 | 0.5 | 2.85 | - |  | E127 |
| | 11T308PDR-MR | | | | | | | | | | | | | | | | 11.3 | 6.594 | 3.6 | 0.8 | 2.85 | - | | |
|  Sharpe Edge | BAPDR-XAF | | | | | | | | | | | | | | | | 31 | 14 | 13.8 | - | - | - |  | E101 |
| | BAPDL-XAF | | | | | | | | | | | | | | | | 31 | 14 | 13.8 | - | - | - | | |
|  Sharpe Edge Wiper Insert | BAPDR-XAW | | | | | | | | | | | | | | | | 31 | 13.8 | 13.8 | - | - | - |  | E101 |
| | BAPDL-XAW | | | | | | | | | | | | | | | | 31 | 13.8 | 13.8 | - | - | - | | |
|  strengthened Edge | 1204R-NAF | | | | | | | | | | | | | | | ● | 12.7 | 9.525 | 4.76 | - | 4.4 | - |  | E100 E101 |
| | 1204L-NAF | | | | | | | | | | | | | | | | 12.7 | 9.525 | 4.76 | - | 4.4 | - | | |
|  strengthened Edge Wiper Insert | 1204R-NAW | | | | | | | | | | | | | | | ● | 12.7 | 9.525 | 4.76 | - | 4.4 | - |  | E100 E101 |
| | 1204L-NAW | | | | | | | | | | | | | | | | 12.7 | 9.525 | 4.76 | - | 4.4 | - | | |
|  Sharpe Edge | 1204R-XAF | | | | | | | | | | | | | | | ● | 12.7 | 9.525 | 4.76 | - | 4.4 | - |  | E100 E101 |
| | 1204L-XAF | | | | | | | | | | | | | | | | 12.7 | 9.525 | 4.76 | - | 4.4 | - | | |
|  Sharpe Edge Wiper Insert | 1204R-XAW | | | | | | | | | | | | | | | ● | 12.7 | 9.525 | 4.76 | - | 4.4 | - |  | E100 E101 |
| | 1204L-XAW | | | | | | | | | | | | | | | | 12.7 | 9.525 | 4.76 | - | 4.4 | - | | |

※ Large R I/S : Not applicable to standard holder and cutter. Need special one.

● : Stock item



| Workpiece | Machining types | | | | | | | | | | Available tools | | | | | | | | | | | | | | | | |
|---|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|--------------------|-----------------|---------------------|-----------------|-----------------|--------|------|------------|-----------------|------|------|------|--------|------|------|------|-----|---|----------------|---|--|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | Continuous cutting | General cutting | Interrupted cutting | | | | | | | | | | | | | | | | | | |
| | P | M | K | N | S | H | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| Inserts | Designation | Coated | | | | | Cermet | Uncoated | | Dimensions (mm) | | | | Geometries | Available tools | | | | | | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC210F | PD2000 | CN2000 | CN20 | | | CN30 | H01 | G10 | ST30A | ST20 | l | d | t | r | d ₁ | C | |
|  | 1204R-XCF | | | | | | | | | | | | | | | | | 12.7 | 9.525 | 4.76 | - | 4.4 | - |  | E100 E101 | | |
| | 1204L-XCF | | | | | | | | | | | | | | | | | 12.7 | 9.525 | 4.76 | - | 4.4 | - | | | | |
| Sharpe Edge | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1005-C0.5 | | | | | | | | | | | | | | | | | 10 | 10 | 5.4 | - | 4.7 | 0.5 |  | E257 E258 | | |
| | 1305-C0.5 | | | | | | | | | | | | | | | | | 12.7 | 10 | 5.4 | - | 4.7 | 0.5 | | | | |
| | 1606-C0.5 | | | | | | | | | | | | | | | | | 16 | 12 | 6.4 | - | 5.9 | 0.5 | | | | |
|  | 120408-MM | | | | ● | | | | | | | | | | | | | 12.9 | 12.7 | 4.76 | 0.8 | 5.5 | - |  | E233 | | |
|  | 060204-MM | | | | ● | | | | | | | | | | | | | 6.4 | 6.35 | 2.38 | 0.4 | 2.75 | - |  | E233 | | |
| | 080308-MM | | | | ● | | | | | | | | | | | | | 8.1 | 7.938 | 3.40 | 0.8 | 3.18 | - | | | | |
| | 09T308-MM | | | | ● | | | | | | | | | | | | | 9.7 | 9.525 | 3.97 | 0.8 | 4.4 | - | | | | |
|  | 090408FN | | | | | | | | | | | | | | | | | 9.0 | 15.875 | 4.76 | 0.8 | - | - |  | E283 | | |
| | 090408SN | | | | | | | | | | | | | | | | | 9.0 | 15.875 | 4.76 | 0.8 | - | - | | | | |
| | 090408TN | | | | | | | | | | | | | | | | | 9.0 | 15.875 | 4.76 | 0.8 | - | - | | | | |
| | 110412FN | | | | | | | | | | | | | | | | | 11.0 | 19.05 | 4.76 | 1.2 | - | - | | | | |
| | 110412TN | | | | | | | | | | | | | | | | | 11.0 | 19.05 | 4.76 | 1.2 | - | - | | | | |
|  | 090408FN | | | | | | | | | | | | | | | | | 9.0 | 15.875 | 4.76 | 0.8 | - | - |  | E284 | | |
| | 090408SN | | | | | | | | | | | | | | | | | 9.0 | 15.875 | 4.76 | 0.8 | - | - | | | | |
| | 090408EN | | | | | | | | | | | | | | | | | 9.0 | 15.875 | 4.76 | 0.8 | - | - | | | | |
| | 110412FN | | | | | | | | | | | | | | | | | 11.0 | 19.05 | 4.76 | 1.2 | - | - | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 090408-WC | | | | | | | | | | | | | | | | | 9.0 | 15.875 | 4.76 | 0.8 | - | - |  | E284 | | |
| | 110412-WC | | | | | | | | | | | | | | | | | 11.0 | 19.05 | 4.76 | 1.2 | - | - | | | | |
|  | 080 | | | | | | | | | | | | | | | | | 7.0 | 8 | 2.4 | 4 | - | - |  | E214 | | |
| | 090 | | | | | | | | | | | | | | | | | 7.5 | 9 | 2.4 | 4.5 | - | - | | | | |
| | 100 | | | | | | | | | | | | | | | | | 8.5 | 10 | 2.6 | 5 | - | - | | | | |
| | 110 | | | | | | | | | | | | | | | | | 9.0 | 11 | 2.6 | 5.5 | - | - | | | | |
| | 120 | | | | | | | | | | | | | | | | | 10.0 | 12 | 3 | 6 | - | - | | | | |
| | 130 | | | | | | | | | | | | | | | | | 10.5 | 13 | 3 | 6.5 | - | - | | | | |
| | 160 | | | | | | | | | | | | | | | | | 12.0 | 16 | 4 | 8 | - | - | | | | |
| | 170 | | | | | | | | | | | | | | | | | 12.5 | 17 | 4 | 8.5 | - | - | | | | |
| | 200 | | | | | | | | | | | | | | | | | 15.0 | 20 | 5 | 10 | - | - | | | | |
| | 210 | | | | | | | | | | | | | | | | | 15.5 | 21 | 5 | 10.5 | - | - | | | | |
| | 250 | | | | | | | | | | | | | | | | | 18.5 | 25 | 6 | 12.5 | - | - | | | | |
| | 260 | | | | | | | | | | | | | | | | | 19.0 | 26 | 6 | 13 | - | - | | | | |
| | 300 | | | | | | | | | | | | | | | | | 22.5 | 30 | 7 | 15 | - | - | | | | |
| | 310 | | | | | | | | | | | | | | | | | 23.0 | 31 | 7 | 15.5 | - | - | | | | |
| 320 | | | | | | | | | | | | | | | | | 23.5 | 32 | 7 | 16 | - | - | | | | | |
|  | 080 | | | | | | | | | | | | | | | | | 7.0 | 8 | 2.4 | 4 | - | - |  | E214 | | |
| | 090 | | | | | | | | | | | | | | | | | 7.5 | 9 | 2.4 | 4.5 | - | - | | | | |
| | 100 | | | | | | | | | | | | | | | | | 8.5 | 10 | 2.6 | 5 | - | - | | | | |
| | 110 | | | | | | | | | | | | | | | | | 9.0 | 11 | 2.6 | 5.5 | - | - | | | | |
| | 120 | | | | | | | | | | | | | | | | | 10.0 | 12 | 3 | 6 | - | - | | | | |
| | 130 | | | | | | | | | | | | | | | | | 10.5 | 13 | 3 | 6.5 | - | - | | | | |
| | 160 | | | | | | | | | | | | | | | | | 12.0 | 16 | 4 | 8 | - | - | | | | |
| | 170 | | | | | | | | | | | | | | | | | 12.5 | 17 | 4 | 8.5 | - | - | | | | |
| | 200 | | | | | | | | | | | | | | | | | 15.0 | 20 | 5 | 10 | - | - | | | | |
| | 210 | | | | | | | | | | | | | | | | | 15.5 | 21 | 5 | 10.5 | - | - | | | | |

● : Stock item

| Workpiece | Steel | P | M | K | N | S | H | | | | | | | | | | | Machining types | ● Continuous cutting ● General cutting ✚ Interrupted cutting | | | | |
|--------------|-----------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|-----------------|-------|-------|-----------------|--|------------|-----------------|---|--------------|
| | Stainless steel | M | K | N | S | H | ● | ● | ✚ | ● | ● | ✚ | ● | ● | ✚ | | | | | | | | |
| Inserts | Designation | Coated | | | | | | | | | | Cermet | Uncoated | | Dimensions (mm) | | | | | Geometries | Available tools | | |
| | | NCM325 | NCM335 | NG5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PD210F | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | d | | | t | r |
| | 250 | | | | | | | | | | | | | | | | 18.5 | 25 | 6 | 12.5 | - | | E214 |
| | 260 | | | | | | | | | | | | | | | | 19.0 | 26 | 6 | 13 | - | | |
| | 300 | | | | | | | | | | | | | | | | 22.5 | 30 | 7 | 15 | - | | |
| | 310 | | | | | | | | | | | | | | | | 23.0 | 31 | 7 | 15.5 | - | | |
| | 320 | | | | | | | | | | | | | | | | 23.5 | 32 | 7 | 16 | - | | |
| | 160-D90 | | | | | | | | | | | | | | | | 13.7 | 16 | 4 | - | - | | E214 |
| | 200-D90 | | | | | | | | | | | | | | | | 17.0 | 20 | 5 | - | - | | |
| | 250-D90 | | | | | | | | | | | | | | | | 21.5 | 25 | 6 | - | - | | |
| | 100 | | | | | | | | | | | | | | | | 8.5 | 10 | 2.6 | 1.0 | - | | E214 |
| | 120 | | | | | | | | | | | | | | | | 10.0 | 12 | 3 | 1.0 | - | | |
| | 160 | | | | | | | | | | | | | | | | 12.0 | 16 | 4 | 1.5 | - | | |
| | 200 | | | | | | | | | | | | | | | | 15.0 | 20 | 5 | 1.5 | - | | |
| | 250 | | | | | | | | | | | | | | | | 18.5 | 25 | 6 | 2.0 | - | | |
| | 300 | | | | | | | | | | | | | | | | 22.5 | 30 | 7 | 2.0 | - | | |
| | 320 | | | | | | | | | | | | | | | | 23.5 | 32 | 7 | 2.0 | - | | |
| | 100-R05 | | | | | | | | | | | | | | | | 8.5 | 10 | 2.6 | 0.5 | - | | E214 |
| | 100-R10 | | | | | | | | | | | | | | | | 8.5 | 10 | 2.6 | 1.0 | - | | |
| | 100-R20 | | | | | | | | | | | | | | | | 8.5 | 10 | 2.6 | 2.0 | - | | |
| | 110-R05 | | | | | | | | | | | | | | | | 9.0 | 11 | 2.6 | 0.5 | - | | |
| | 120-R05 | | | | | | | | | | | | | | | | 10.0 | 12 | 3 | 0.5 | - | | |
| | 120-R10 | | | | | | | | | | | | | | | | 10.0 | 12 | 3 | 1.0 | - | | |
| | 120-R20 | | | | | | | | | | | | | | | | 10.0 | 12 | 3 | 2.0 | - | | |
| | 130-R05 | | | | | | | | | | | | | | | | 10.5 | 13 | 3 | 0.5 | - | | |
| | 160-R05 | | | | | | | | | | | | | | | | 12.0 | 16 | 4 | 0.5 | - | | |
| | 160-R10 | | | | | | | | | | | | | | | | 12.0 | 16 | 4 | 1.0 | - | | |
| | 160-R20 | | | | | | | | | | | | | | | | 12.0 | 16 | 4 | 2.0 | - | | |
| | 160-R30 | | | | | | | | | | | | | | | | 12.0 | 16 | 4 | 3.0 | - | | |
| | 170-R05 | | | | | | | | | | | | | | | | 12.5 | 17 | 4 | 0.5 | - | | |
| | 200-R05 | | | | | | | | | | | | | | | | 15.0 | 20 | 5 | 0.5 | - | | |
| | 200-R10 | | | | | | | | | | | | | | | | 15.0 | 20 | 5 | 1.0 | - | | |
| | 200-R20 | | | | | | | | | | | | | | | | 15.0 | 20 | 5 | 2.0 | - | | |
| | 200-R30 | | | | | | | | | | | | | | | | 15.0 | 20 | 5 | 3.0 | - | | |
| | | 210-R05 | | | | | | | | | | | | | | | | 15.5 | 21 | 5 | 0.5 | | |
| 250-R05 | | | | | | | | | | | | | | | | | 18.5 | 25 | 6 | 0.5 | - | | |
| 250-R10 | | | | | | | | | | | | | | | | | 18.5 | 25 | 6 | 1.0 | - | | |
| 250-R20 | | | | | | | | | | | | | | | | | 18.5 | 25 | 6 | 2.0 | - | | |
| Special type | | | | | | | | | | | | | | | | | 18.5 | 25 | 6 | 3.0 | - | | |
| 260-R05 | | | | | | | | | | | | | | | | | 19.0 | 26 | 6 | 0.5 | - | | |
| 300-R10 | | | | | | | | | | | | | | | | | 22.5 | 30 | 7 | 1.0 | - | | |
| 300-R20 | | | | | | | | | | | | | | | | | 22.5 | 30 | 7 | 2.0 | - | | |
| 300-R30 | | | | | | | | | | | | | | | | | 22.5 | 30 | 7 | 3.0 | - | | |
| 310-R05 | | | | | | | | | | | | | | | | | 23.0 | 31 | 7 | 0.5 | - | | |
| 320-R10 | | | | | | | | | | | | | | | | | 23.5 | 32 | 7 | 1.0 | - | | |
| 320-R20 | | | | | | | | | | | | | | | | | 23.5 | 32 | 7 | 2.0 | - | | |
| 320-R30 | | | | | | | | | | | | | | | | 23.5 | 32 | 7 | 3.0 | - | | | |
| | 1907-C1.5-WC | | | | | | | | | | | | | | | | 19.05 | 14.3 | 7 | - | 5.8 | | E288 E289 |
| | 1907-R3.0-WC | | | | | | | | | | | | | | | | 19.05 | 14.3 | 7 | - | 5.8 | | |

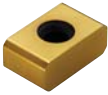
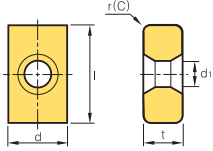
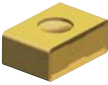
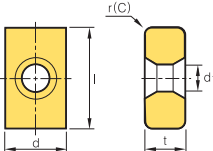
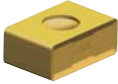
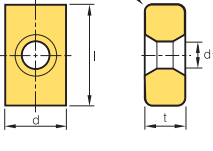



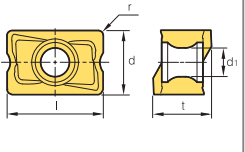

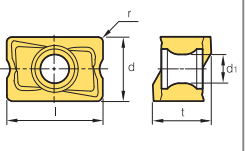

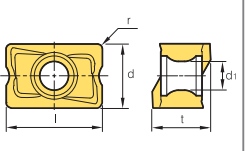

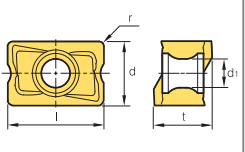

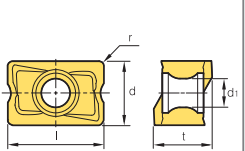
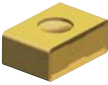
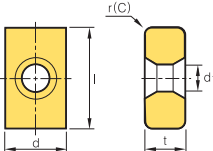
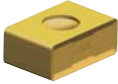
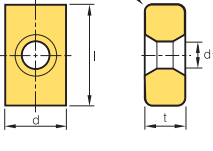



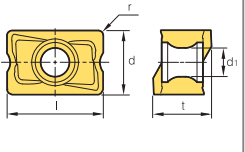

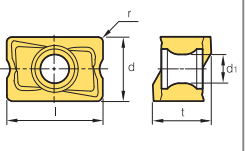

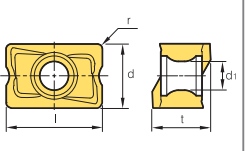

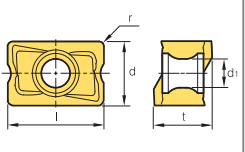

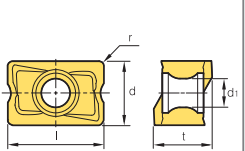
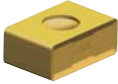
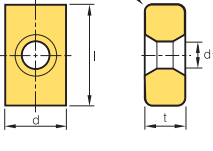



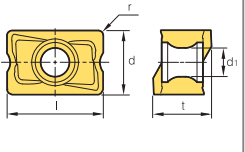

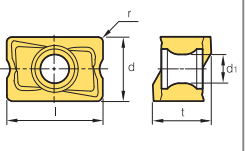

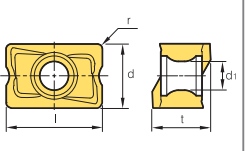

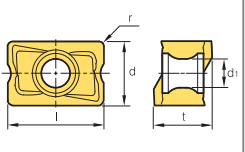

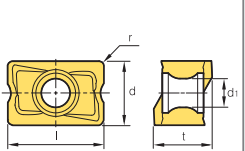



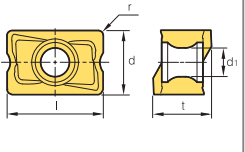

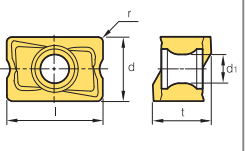

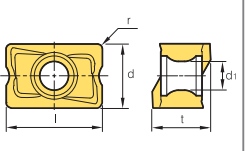

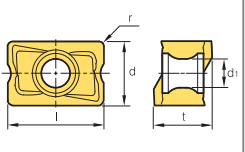

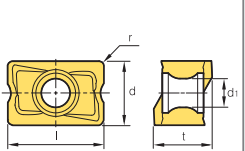

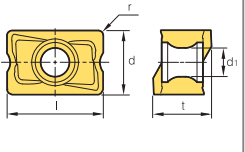

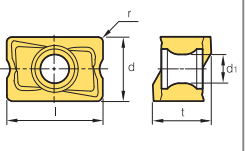

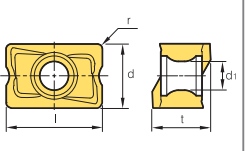

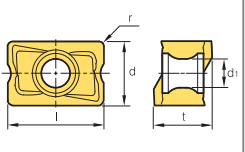

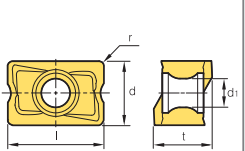

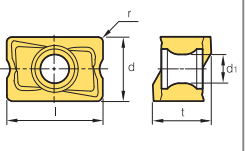

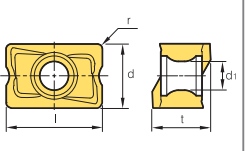

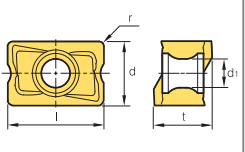

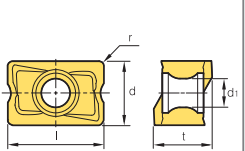

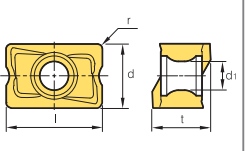

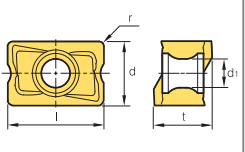

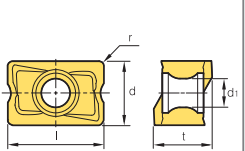

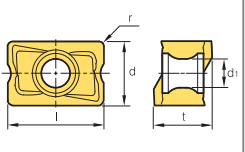

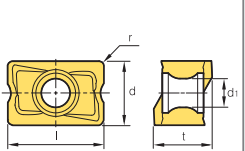

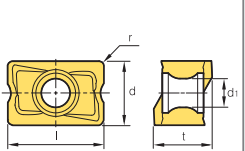
● : Stock item



| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
|-----------|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |


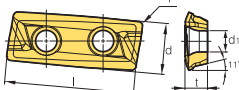

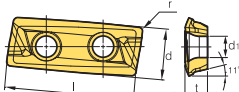

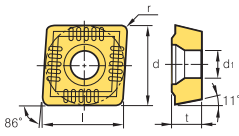

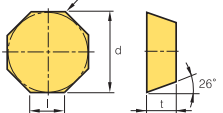

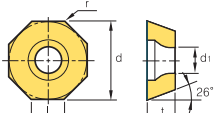
Machining types

- Continuous cutting
- General cutting
- Interrupted cutting


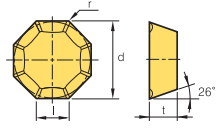

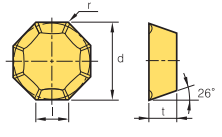

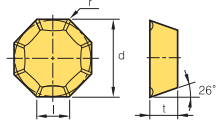

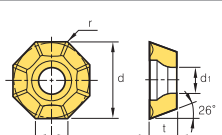

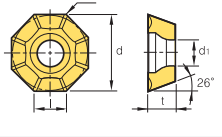

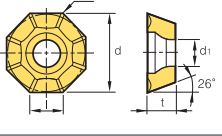

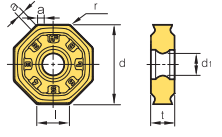

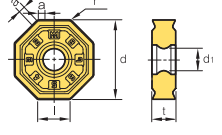

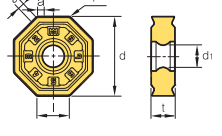

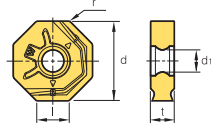

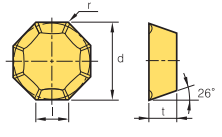

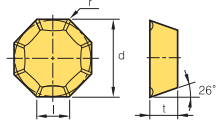

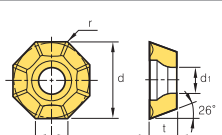

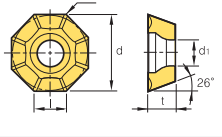

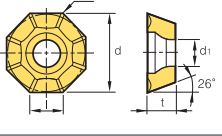

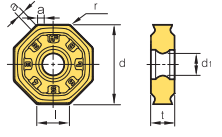

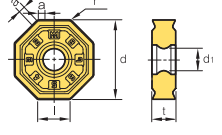

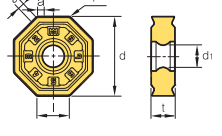

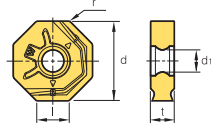

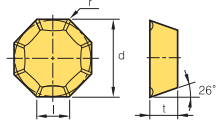

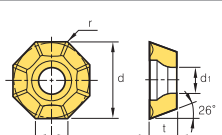

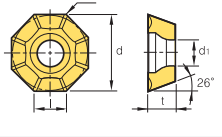

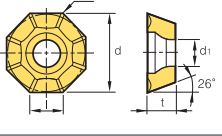

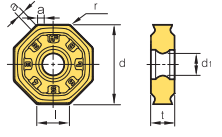

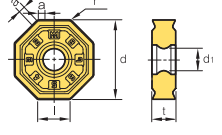

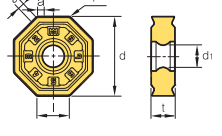

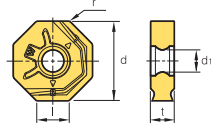

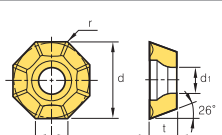

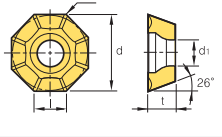

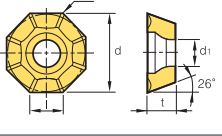

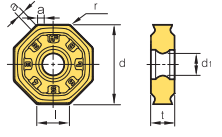

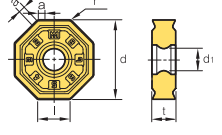

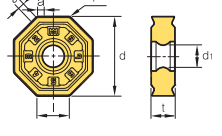

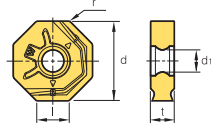

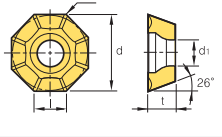

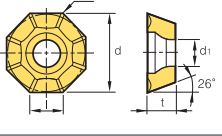

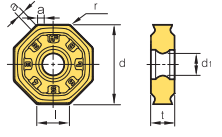

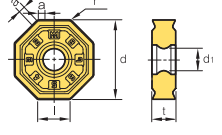

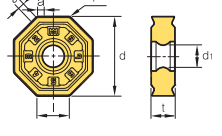

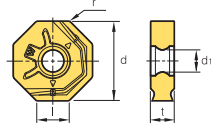

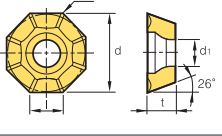

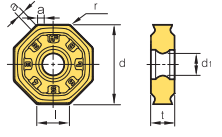

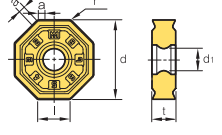

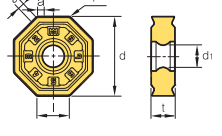

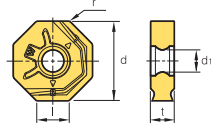

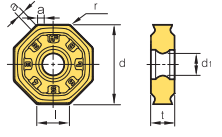

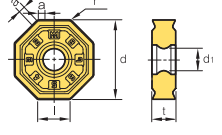

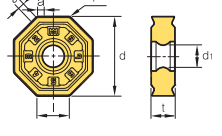

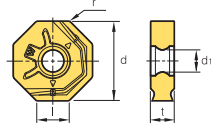

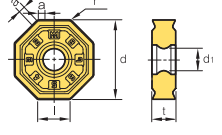

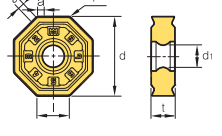

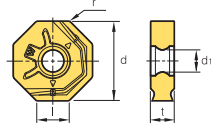

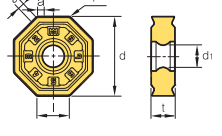

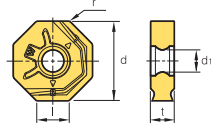

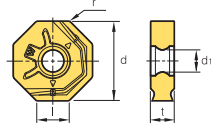
| Inserts | Designation | Coated | | | | | | | | | | | | Cermet | Uncoated | | Dimensions (mm) | | | | | Geometries | Available tools | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|----------|-----|-----------------|-------|-------|------|-----|------------|---|------------------------------------|---|--------------------------|--|--|---|---|---|---|---|--|--|--|--|--|--|--|--|--|-------|-------|------|-----|-----|---|------------------------------------|---------------------|--|--|---|---|---|---|---|--|--|--|--|--|--|--|--|--|-------|-------|------|-----|-----|---|--------------------------|--|---|---|---|---|---|---|--|--|--|--|--|--|--|--|------|-------|-------|------|-----|-------------------|---|------------------------------------|---------------------|---|--|--|---|--|--|---|--|--|--|--|--|--|------|------|------|-------|-------|-------------------|-----|-----|---|--------------------------|---|---|---|---|---|--|---|--|--|--|--|--|------|------|------|------|-------|---|---|-------------------|-----|---|------------------------------------|---------------------|---|---|---|---|---|--|---|--|--|--|--|------|------|------|------|-----|---|---------|--------------|---|---------|---|--------------------------|---|---|---|---|---|--|---|--|--|--|--|--|------|------|------|------|------|---|-------------------|-----|--------------|---|------------------------------------|---------------------|--|--|---|---|---|--|---|--|--|--|------|------|------|------|-----|--------------|---|--------------------|-------------------|-----|-----|---|-------------------|--|---|---|---|---|---|---|--|--|------|------|------|------|------|-------------------|------|------|--------------|------|-----|---------------------|---|------------------------------------|---|-------------------|---|---|---|---|---|---|------|------|------|------|------|--------------|------|-----|-----|---|-------------------|---|-------------------|-----|-----|---|---------|--------------|---|---|---|--|---|------|------|------|-----|-----|--------------|------|------|------|------|------|---|------------------------------------|--------------|-----|-----|---|-------------------|---|---|---|---|---|---|------|------|------|-----|-----|---|-------------------|------|------|------|------|--------------|-----|-----|--------------|---|---------|-------------------|---|---|---|---|--|------|-----|-----|-----|-----|---|--------------------|--------------|------|------|-------------------|------|-----|---|-------------------|-----|-----|--------------|---|---|---|---|--|--|------|------|------|------|------|--------------|-----|------|-------------------|-----|------|-----|---|---------|--------------|-----|-----|---|-------------------|--|---|---|------|------|------|------|------|------|------|-----|---|-------------------|------|-----|-----|------|------|--------------|-----|-----|---|---------|--------------|--|--|---|---|---|------|-----|------|------|------|---|---------|--------------|------|-----|-----|------|------|-------------------|-----|-----|---|-------------------|--|--|---|--|--|--|------|------|------|------|-----|--------------|---|-------------------|-----|-----|------|--------------|------|-----|-----|---|---------|--------------|---|--|---|---|------|-----|-----|-----|------|-------------------|------|-----|-----|---|--------------------|---|-------------------|------|------|------|-----|-----|-------------------|---|--|---|------|-----|-----|-----|-----|--------------|------|------|------|------|-----|--------------|---|---------|--------------|------|------|------|-----|-----|--------------|---|------|-----|-----|-----|-----|---|-------------------|------|------|-----|------|------|------|-----|-----|--------------|------|------|------|-----|-----|-------------------|--|------|------|------|-----|-----|---|---------|--------------|--|--|---|------|------|------|-----|-----|--------------|------|------|------|-----|-----|---|-------------------|------|------|------|-----|-----|--------------|--|--|---|------|------|------|-----|-----|-------------------|------|------|------|-----|-----|--------------|---|--------------------|--------------|------|-----|-----|--------------|--|--|--|------|------|------|-----|-----|--------------|------|------|------|------|------|---|-------------------|------|------|--------------|-----|-----|-------------------|--|--|--|------|------|------|-----|-----|--------------|--|------|-----|-----|------|------|---|--------------------|--------------|------|-----|-----|--------------|--|--|---|------|------|------|-----|-----|---|-------------------|--|--|--|------|------|------|------|------|--------------|-----|-----|--------------|--|--|--|--|------|-----|-----|-----|-----|---|--------------------|--------------|--|--|--|------|------|------|------|-----|-----|---|-------------------|--|--|--|--|--|--|------|------|------|-----|-----|--------------|--|--|--|--|------|-----|-----|-----|-----|---|--------------------|--------------|--|--|-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| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | d | t | | | r | d ₁ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 324-R0.8 | | | | | | | | | | | | | | | | | 15.9 | 9.525 | 6.35 | 0.8 | 4.4 |  | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 324-C1.0 | | | | | | | | | | | | | | | | | 15.9 | 9.525 | 6.35 | 1.0 | 4.4 | | |  | 150608-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | 150608-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | 1506QNN-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | 1506QNN-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | 1506ANN-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | 1506ANN-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | LNMX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75 E76 E79 E80 E83-87 | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | LNEX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75 E76 E79 E80 E83-87 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MF | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | LNEX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 |  | LNMX 100605PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E89 | 100608PNR-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | 100605PNL-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | 100608PNR-MM | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | ● | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | 151008PNL-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | LNEX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MM | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 |
|  | 150608-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 150608-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - | | |  | 1506QNN-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | 1506QNN-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | 1506ANN-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | 1506ANN-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | LNMX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75 E76 E79 E80 E83-87 | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | LNEX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | | | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75 E76 E79 E80 E83-87 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | | 10.0 | 0.8 | 4.5 | 151016PNR-MF | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | | | 10.0 | 1.6 | 4.5 | LNEX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 |  | LNMX 100605PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E89 | 100608PNR-MM | | | ● | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | 100605PNL-MM | | | ● | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | 100608PNR-MM | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | ● | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | 151008PNL-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | LNEX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MM | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1506QNN-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1506QNN-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - | | |  | 1506ANN-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | 1506ANN-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | LNMX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75 E76 E79 E80 E83-87 | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | LNEX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | | | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75 E76 E79 E80 E83-87 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | 151016PNR-MF | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | | | LNEX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | | 10.0 | 0.4 | 4.5 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | | | 10.0 | 0.8 | 4.5 |  | LNMX 100605PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E89 | 100608PNR-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | | 6.5 | 0.8 | 3.5 | 100605PNL-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | | | 6.5 | 0.5 | 3.5 | LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | 100608PNR-MM | | | | | | | ● | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | ● | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | 151008PNL-MM | | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | LNEX 151004PNR-MM | | | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MM | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1506ANN-MF | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - |  | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1506ANN-ML | | | | | | | | | | | | | | | | | 15.88 | 15.23 | 6.35 | 0.8 | - | | |  | LNMX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75 E76 E79 E80 E83-87 | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | LNEX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | | | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75 E76 E79 E80 E83-87 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | 151016PNR-MF | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | | | LNEX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | |  | LNMX 100605PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E89 | 100608PNR-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | 100605PNL-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | | | LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | | 10.0 | 6.5 | | 6.5 | 0.5 | 3.5 | 100608PNR-MM | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | | | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | 151016PNR-MM | | | ● | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | | | 151008PNL-MM | | | | | | | ● | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | LNEX 151004PNR-MM | | | | | | | ● | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MM | | | ● | ● | ● | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | | | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | LNMX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75 E76 E79 E80 E83-87 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LNEX 100605PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100608PNR-MF | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | |  | LNMX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75 E76 E79 E80 E83-87 | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MF | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | LNEX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MF | | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 |  | LNMX 100605PNR-MM | | | | | ● | ● | ● | ● | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E89 | 100608PNR-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | 100605PNL-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | 100608PNR-MM | | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MM | | | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | ● | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | 151008PNL-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | LNEX 151004PNR-MM | | | | | | | ● | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MM | | | ● | ● | ● | | ● | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | | | | | ● | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | LNMX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75 E76 E79 E80 E83-87 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151016PNR-MF | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LNEX 151004PNR-MF | | | ● | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151008PNR-MF | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | |  | LNMX 100605PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E89 | 100608PNR-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | 100605PNL-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | 100608PNR-MM | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 |  | LNMX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | ● | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | 151008PNL-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | LNEX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MM | | | ● | | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | LNMX 100605PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100608PNR-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100605PNL-MM | | | ● | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100608PNR-MM | | | | | | | ● | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.8 | 3.5 | | |  | LNMX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | 151016PNR-MM | | | ● | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | 151008PNL-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | LNEX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | | 151008PNR-MM | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | 151016PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | LNMX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 |  | E75-E89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151008PNR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151016PNR-MM | | | ● | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151008PNL-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LNEX 151004PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151008PNR-MM | | | ● | ● | ● | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151016PNR-MM | | | | | | | ● | | | | | | | | | | 15.0 | 10.0 | 10.0 | 1.6 | 4.5 | | |  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | 151004PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | 151008PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | LNEX 100605PNR-MA | | | | | | | | | | | | | | | | | 10.0 | 6.5 | 6.5 | 0.5 | 3.5 |  | E75-E80 E83-E87 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151004PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.4 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 151008PNR-MA | | | | | | | | | | | | | | | | | 15.0 | 10.0 | 10.0 | 0.8 | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

●: Stock item

E Milling Inserts


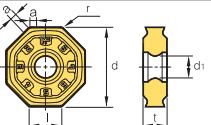

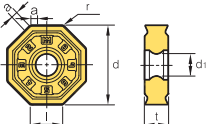
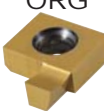
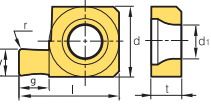

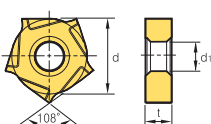
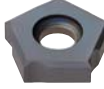
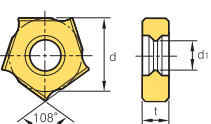

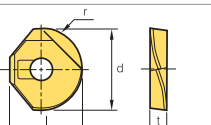

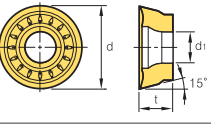

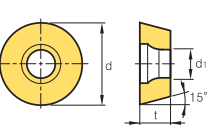
| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | ● Continuous cutting ● General cutting ● Interrupted cutting | | | | | | | | |
|--|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|--|--------|--------|--------|------------|-----------------|---|---|---------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Uncoated | Dimensions (mm) | | | | | Geometries | Available tools | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | | | d | t | r |
|  <p>LXET-MA</p> | 250404PEFR-32-MA | | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 0.4 | 4.5 |  | E237~ E239 |
| | 2504PEFR-32-MA | | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 0.8 | 4.5 | | |
| | 250412PEFR-32-MA | | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 1.2 | 4.5 | | |
| | 250416PEFR-32-MA | | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 1.6 | 4.5 | | |
| | 250404PEFR-40-MA | | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 0.4 | 4.5 | | |
| | 2504PEFR-40-MA | | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 0.8 | 4.5 | | |
| | 250412PEFR-40-MA | | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 1.2 | 4.5 | | |
| | 250416PEFR-40-MA | | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 1.6 | 4.5 | | |
| | 340504PEFR-50-MA | | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 0.4 | 5.56 | | |
| | 3405PEFR-50-MA | | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 0.8 | 5.56 | | |
| | 340512PEFR-50-MA | | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 1.2 | 5.56 | | |
| | 340516PEFR-50-MA | | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 1.6 | 5.56 | | |
| | 340504PEFR-63-MA | | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 0.4 | 5.56 | | |
| | 3405PEFR-63-MA | | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 0.8 | 5.56 | | |
| | 340512PEFR-63-MA | | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 1.2 | 5.56 | | |
| | 340516PEFR-63-MA | | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 1.6 | 5.56 | | |
|  <p>LXET-ML</p> | 250404PEER-32-ML | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 0.4 | 4.5 |  | E237~ E239 | |
| | 2504PEER-32-ML | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 0.8 | 4.5 | | | |
| | 250412PEER-32-ML | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 1.2 | 4.5 | | | |
| | 250416PEER-32-ML | | | | | | | | | | | | | | | | 25 | 10.775 | 4.76 | 1.6 | 4.5 | | | |
| | 250404PEER-40-ML | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 0.4 | 4.5 | | | |
| | 2504PEER-40-ML | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 0.8 | 4.5 | | | |
| | 250412PEER-40-ML | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 1.2 | 4.5 | | | |
| | 250416PEER-40-ML | | | | | | | | | | | | | | | | 25 | 10.618 | 4.76 | 1.6 | 4.5 | | | |
| | 340504PEER-50-ML | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 0.4 | 5.56 | | | |
| | 3405PEER-50-ML | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 0.8 | 5.56 | | | |
| | 340512PEER-50-ML | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 1.2 | 5.56 | | | |
| | 340516PEER-50-ML | | | | | | | | | | | | | | | | 34 | 13.765 | 5.56 | 1.6 | 5.56 | | | |
| | 340504PEER-63-ML | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 0.4 | 5.56 | | | |
| 340508PEER-63-ML | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 0.8 | 5.56 | | | | |
| 340512PEER-63-ML | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 1.2 | 5.56 | | | | |
| 340516PEER-63-ML | | | | | | | | | | | | | | | | 34 | 13.803 | 5.56 | 1.6 | 5.56 | | | | |
|  <p>MPMT</p> | 090308 | | | | | | | | | | | | | | | | 9.5 | 9.525 | 3.18 | 0.8 | 4.5 |  | - | |
| | 120408 | | | | | | | | | | | | | | | | 12.7 | 12.7 | 4.76 | 0.8 | 5.5 | | | |
|  <p>OFCN</p> | 0704SN | | | | | | | | | | | | | | | | 7.4 | 18 | 4.86 | 0.5 | - |  | E48 | |
| | 0704FN | | | | | | | | | | | | | | | | 7.4 | 18 | 4.86 | 0.5 | - | | | |
| | 070408SN | | | | | | | | | | | | | | | | 7.4 | 18 | 4.86 | 0.8 | - | | | |
| | 070408FN | | | | | | | | | | | | | | | | 7.4 | 18 | 4.86 | 0.8 | - | | | |
| | 070408TN | | | | | | | | | | | | | | | | 7.4 | 18 | 4.86 | 0.8 | - | | | |
|  <p>OFCW</p> | 05T3SN | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.85 | 0.5 | 4.4 |  | E48 | |
| | 05T3FN | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.85 | 0.5 | 4.4 | | | |
| | 05T308FN | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.85 | 0.8 | 4.4 | | | |

●: Stock item

| Workpiece | Machining types | | | | | | | | | | | Geometries | Available tools | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|--------------------|-----------------|---------------------|--------|--------|------------|-----------------|------|------|-----|-----|-------|------|-----|-----|------|---|----------------|--|-----------|---|---|---|---|--|---|---|---|--|--|--|--|---|--|--|-----|------|------|-----|-----|---|---|------------|-------------|---|--|---|--|--|--|---|--|--|--|--|--|---|--|--|-----|------|------|-----|-----|---|--|-----------|---|---|---|---|--|---|---|---|--|--|--|--|---|--|-----|------|------|------|-----|------|------------|---|------------|--|-----------|---|---|---|---|---|--|---|--|--|--|--|-----|------|------|-----|------|------|--|--|-----------|--|---|------------|-----------|---|--|--|--|---|--|---|---|--|--|-----|------|-----|-----|------|------|---|------------|--|---|------------|-------------|------------|--|---|--|---|--|---|---|--|---|--|--|-----|------|------|-----|------|------|---|---|------------|--|-----------|------|------------|--|---|--|---|---|--|--|---|--|---|-----|------|-----|------|------|------|---|------------|------------|---|------------|--|-----------|---|--|---|--|---|--|---|--|---|--|--|-----|------|------|-----|------|------|--|--|-----------|--|---|------------|-----------|--|---|---|--|---|--|---|--|--|-----|------|------|------|-----|------|--|---|------|-------------|---|------------|--|------------|---|--|---|--|--|--|---|--|--|-----|------|-----|------|------|-----|---|------------|--|-----------|-----|---|---|------------|------------|---|---|--|---|---|--|---|---|--|-----|------|------|------|-----|------|------------|---|------------|-------------|---|------------|--|------------|--|---|---|--|--|--|---|--|-----|------|-----|-----|------|------|------------|------|------|-----------|-----|-----|------|---|------------|------------|--|--|--|---|---|--|-----|------|-----|-----|-----|------|--|-----------|---|--|-----------|------|-----|-----|------|--|------------|---|--|---|---|--|--|-----|------|-----|-----|------|-----|---|------------|-----------|---|------------|-----------|------|-----|-----|---|------------|------------|---|--|---|---|---|--|-----|------|-----|-----|------|-----|---|----------|---|------------|------|-----|-----|-----|------|--|------------|--|--|---|--|--|--|-----|------|-----|------|-----|-----|---|------------|------------|-----|------|-----|-----|-----|------|---|------------|------------|--|--|---|---|--|--|-----|------|-----|-----|-----|------|--|-----------|--|-----|------|------|-----|-----|------|--|------------|--|--|--|--|--|--|-----|------|-----|-----|-----|---|---|------------|-----------|-----|------|-----|------|-----|-----|---|------------|------------|--|--|--|---|--|--|-----|------|-----|-----|-----|---|------------|--|--|-----|------|-----|-----|-----|------|--|-----------|--|--|---|---|--|-----|------|-----|-----|-----|------|------------|---|--|--|-----|------|-----|-----|-----|---|---|------------|-----------|--|--|---|-----|------|-----|-----|-----|------|--|-----------|--|---|--|--|-----|------|-----|-----|-----|---|---|----------|---|--|---|-----|------|-----|-----|-----|---|---|------------|-----------|--|--|--|-----|------|-----|-----|-----|---|---|------------|----------|---|--|---|-----|------|-----|-----|-----|---|---|----------|--|--|---|---|-----|------|-----|-----|-----|---|--|--|--|--|--|-----|------|-----|-----|-----|---|---|------------|----------|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|-----|------|-----|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | Continuous cutting | General cutting | Interrupted cutting | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | M | K | N | S | H | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inserts | Designation | Coated | | | Cermet | Uncoated | Dimensions (mm) | | | | | Geometries | Available tools | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PD2000 | CN2000 | | | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | d | t | r | d ₁ | a | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OFKR-MA  | 0704FN-MA | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | - | - |  | E48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0704EN-MA | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | - | - | | | OFKR-MF  | 0704SN-MF | ● | ● | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | - | - |  | E48 | 070408SN-MF | ● | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.8 | - | - | OFKR-MM  | 0704SN-MM | ● | ● | ● | | | ● | ● | ● | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | - | - |  | E48 | 070408SN-MM | ● | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.8 | - | - | OFKT-MA  | 05T3FN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T3EN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - | 0704FN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | 0704EN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | OFKT-MF  | 05T3SN-MF | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 | 05T308SN-MF | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 5.8 | - | OFKT-MM  | 05T3SN-MM | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T308SN-MM | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 4.4 | - | 0704SN-MM | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | 5.5 | - | ONHX-MF  | 060608-MF | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MF | | | | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MF | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MF | | | | ● | ● | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MM  | 060608-MM | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MM | | | ● | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MM | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MM | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 |
| OFKR-MF  | 0704SN-MF | ● | ● | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | - | - |  | E48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 070408SN-MF | ● | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.8 | - | - | | | OFKR-MM  | 0704SN-MM | ● | ● | ● | | | ● | ● | ● | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | - | - |  | E48 | 070408SN-MM | ● | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.8 | - | - | OFKT-MA  | 05T3FN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T3EN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - | | 0704FN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | | | 0704EN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | OFKT-MF  | 05T3SN-MF | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 | 05T308SN-MF | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 5.8 | - | OFKT-MM  | 05T3SN-MM | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T308SN-MM | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | | 0.8 | 4.4 | - | 0704SN-MM | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | | | 0.5 | 5.5 | - | ONHX-MF  | 060608-MF | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MF | | | | | | | ● | | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MF | | | | | | | ● | | | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MF | | | | ● | ● | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MM  | 060608-MM | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MM | | | ● | | | | ● | | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MM | | | | | | | ● | | | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MM | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OFKR-MM  | 0704SN-MM | ● | ● | ● | | | ● | ● | ● | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | - | - |  | E48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 070408SN-MM | ● | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.8 | - | - | | | OFKT-MA  | 05T3FN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T3EN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - | | 0704FN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | | | 0704EN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | OFKT-MF  | 05T3SN-MF | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 | 05T308SN-MF | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 5.8 | - | OFKT-MM  | 05T3SN-MM | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T308SN-MM | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 4.4 | - | | 0704SN-MM | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | 5.5 | - | | | ONHX-MF  | 060608-MF | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MF | | | | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | | 0606ANN-MF | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | | | 0806ANN-MF | | | | ● | ● | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MM  | 060608-MM | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MM | | | ● | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | | 0606ANN-MM | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | | | 0806ANN-MM | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OFKT-MA  | 05T3FN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 05T3EN-MA | | | | | | | | | | | | | ● | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0704FN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0704EN-MA | | | | | | | | | | | | | ● | | | 7.4 | 18 | 4.76 | 0.5 | 5.8 | - | | | OFKT-MF  | 05T3SN-MF | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 | 05T308SN-MF | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 5.8 | - | OFKT-MM  | 05T3SN-MM | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T308SN-MM | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 4.4 | - | 0704SN-MM | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | 5.5 | - | ONHX-MF  | 060608-MF | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MF | | | | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MF | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MF | | | | ● | ● | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MM  | 060608-MM | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MM | | | ● | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MM | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MM | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OFKT-MF  | 05T3SN-MF | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 05T308SN-MF | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 5.8 | - | | | OFKT-MM  | 05T3SN-MM | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | 05T308SN-MM | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 4.4 | - | | 0704SN-MM | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | 5.5 | - | | | ONHX-MF  | 060608-MF | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MF | | | | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | | 0.8 | 5.6 | - | 0606ANN-MF | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | | | 0.8 | 5.6 | 1.03 | 0806ANN-MF | | | | ● | ● | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MM  | 060608-MM | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MM | | | ● | | | | ● | | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MM | | | | | | | ● | | | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MM | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OFKT-MM  | 05T3SN-MM | ● | ● | | | | | ● | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.5 | 4.4 | - |  | E47 E48 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 05T308SN-MM | | | | | | | | | | | | | | | | 5.2 | 12.7 | 3.97 | 0.8 | 4.4 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0704SN-MM | | | | | | | | | | | | | | | | 7.4 | 18 | 4.76 | 0.5 | 5.5 | - | | | ONHX-MF  | 060608-MF | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MF | | | | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MF | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MF | | | | | ● | ● | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MM  | 060608-MM | | | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MM | | | ● | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MM | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MM | | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MA  | 060608-MA | | | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ONHX-MF  | 060608-MF | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 080608-MF | | | | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0606ANN-MF | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0806ANN-MF | | | | ● | ● | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | | | ONHX-MM  | 060608-MM | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MM | | | ● | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | 0606ANN-MM | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | 0806ANN-MM | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ONHX-MM  | 060608-MM | | | ● | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 080608-MM | | | ● | | | | ● | | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0606ANN-MM | | | | | | | ● | | | | | | | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | 1.03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0806ANN-MM | | | | ● | | | | ● | | | | | | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | 1.53 | | | ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ONHX-MA  | 060608-MA | | | | | | | | | | | | | ● | | | 6.6 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 080608-MA | | | | | | | | | | | | | ● | | | 8.4 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ONHX-W  | 060608-W | | | ● | ● | | | ● | | | | | | | | | 6.5 | 16.0 | 6.0 | 0.8 | 5.6 | - |  | E90 E91 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 080608-W | | | ● | | | | | | | | | | | | | 8.2 | 20.2 | 6.0 | 0.8 | 5.6 | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Stock item



| Workpiece | Machining types | | | | | | | | | | | Dimensions (mm) | | | | Geometries | Available tools | | | | | | |
|---|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|--------------------|-----------------|---------------------|--------|--------|-----------------|------|----------------|-----|------------|-----------------|--------------|---|---|--------------------------------------|--|--|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | Continuous cutting | General cutting | Interrupted cutting | l | d | t | r | d ₁ | a | | | Cutter width | W | g | | | |
| Inserts | Designation | Coated | | | | | Cermet | Uncoated | | | | | | | | | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC210F | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | | | | | | |
|  | 060608-MF | | | | ● | | | | | | | | | | | | | | |  | E90 E91 | | |
| | 080608-MF | | | | | | | | | | | | | | | | | | | | | | |
| | 0606ANN-MF | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | 0806ANN-MF | | | | ● | ● | | | | | | | | | | | | | | | | | |
|  | 060608-MM | | | | ● | | | | | | | | | | | | | | |  | E90 E91 | | |
| | 080608-MM | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | 0606ANN-MM | | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | 0806ANN-MM | | | | ● | ● | | | | | | | | | | | | | | | | | |
|  | 265 | | | | ● | | | | | | | | | | | | | | |  | E224 | | |
| | 325 | | | | ● | | | | | | | | | | | | | | | | | | |
| | 405 | | | | ● | | | | | | | | | | | | | | | | | | |
| | 470 | | | | ● | | | | | | | | | | | | | | | | | | |
|  | 1223N | | | | ● | | | | | | | | | | | | | | |  | E263 E264 | | |
| | 1225N | | | | | | | | | | | | | | | | | | | | | | |
| | 1230N | | | | | | | | | | | | | | | | | | | | | | |
| | 1235N | | | | ● | | | | | | | | | | | | | | | | | | |
| | 1240N | | | | ● | | | | | | | | | | | | | | | | | | |
| | 1245N | ● | | | ● | | | | | | | | | | | | | | | | | | |
| | 1250N | | | | | | | | | | | | | | | | | | | | | | |
| | 1255N | | | | ● | | | | | | | | | | | | | | | | | | |
| | 1260N | | | | | | | | | | | | | | | | | | | | | | |
| | 1265N | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | 1270N | | | | | | | | | | | | | | | | | | | | | | |
| 1275N | | | | ● | | | | | | | | | | | | | | | | | | | |
| 1285N | | | | | | | | | | | | | | | | | | | | | | | |
|  | 1223N-C03 | | | | | | | | | | | | | | | | | | |  | E263 E264 | | |
| | 1230N-C03 | | | | | | | | | | | | | | | | | | | | | | |
| | 1235N-C03 | | | | | | | | | | | | | | | | | | | | | | |
| | 1240N-C05 | | | | | | | | | | | | | | | | | | | | | | |
| | 1245N-C05 | | | | | | | | | | | | | | | | | | | | | | |
| | 1250N-C05 | | | | | | | | | | | | | | | | | | | | | | |
| | 1255N-C05 | | | | | | | | | | | | | | | | | | | | | | |
| | 1260N-C05 | | | | | | | | | | | | | | | | | | | | | | |
| | 1265N-C05 | | | | | | | | | | | | | | | | | | | | | | |
| 1270N-C05 | | | | | | | | | | | | | | | | | | | | | | | |
| 1275N-C05 | | | | | | | | | | | | | | | | | | | | | | | |
|  | 16 | | | | | | | | | | | | | | | | | | |  | E219 | | |
| | 20 | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | |
| | 30 | | | | | | | | | | | | | | | | | | | | | | |
| | 32 | | | | | | | | | | | | | | | | | | | | | | |
|  | 10T3M0-MA | | | | | | | | | | | | | | | | | | |  | E174 E175 E180 E181 E185 | | |
| | 1204M0-MA | | | | | | | | | | | | | | | | | | | | | | |
|  | 0501M0F | | | | | | | | | | | | | | | | | | |  | E178 E179 E184 E185 | | |
| | 0501M0E | | | | | ● | | | | | | | | | | | | | | | | | |
| | 0501M0S | | | | | | | | | | | | | | | | | | | | | | |
| | 06T1M0F | | | | | | | | | | | | | | | | | | | | | | |
| | 06T1M0E | | | | | ● | | | | | | | | | | | | | | | | | |
| | 06T1M0S | | | | | | | | | | | | | | | | | | | | | | |
| | 0702M0F | | | | | | | | | | | | | | | | | | | | | | |
| | 0702M0E | | | | | ● | | | | | | | | | | | | | | | | | |
| | 0702M0S | | | | | | | | | | | | | | | | | | | | | | |
| | 0803M0F | | | | | | | | | | | | | | | | | | | | | | |
| | 0803M0E | | | | | ● | | | | | | | | | | | | | | | | | |
| 0803M0S | | | | | | | | | | | | | | | | | | | | | | | |

● : Stock item

| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | ● | ● | ● | | | | |
|--------------------------------------|-----------------|--------|--------|--------|--------|----------|--------|-----------------|--------|--------|------|------|------------|-----------------|-----|-----------------|--------------------|-----------------|---------------------|------|------|---|----------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | Continuous cutting | General cutting | Interrupted cutting | | | | |
| Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| Inserts | Designation | Coated | | | Cermet | Uncoated | | Dimensions (mm) | | | | | Geometries | Available tools | | | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC215K | PD2000 | CN20 | CN30 | | | H01 | G10 | ST30A | ST20 | l | d | t | r | d ₁ |
| RDHW | 1605MOF | | | | | | | | | | | | | | | - | 16 | 5.56 | - | 5.5 | - | | E176 |
| | 1605MOE | | | | | | | | | | | | | | | - | 16 | 5.56 | - | 5.5 | - | | E178 |
| | 1605MOS | | | | | | | | | | | | | | | - | 16 | 5.56 | - | 5.5 | - | | E182 |
| | 2006MOF | | | | | | | | | | | | | | | - | 20 | 6.35 | - | 5.5 | - | | E183 |
| | 2006MOE | | | | | | | | | | | | | | | - | 20 | 6.35 | - | 5.5 | - | | |
| | 2006MOS | | | | | | | | | | | | | | | - | 20 | 6.35 | - | 5.5 | - | | |
| RDKT-MF | 10T3MO-MF | | | | ● | ● | ● | | | | | | | | | - | 10 | 3.97 | - | 3.85 | - | | E174 |
| | 1204MO-MF | | | | ● | ● | ● | | | | | | | | | - | 12 | 4.76 | - | 4.5 | - | | E175 |
| | 1605MO-MF | | | | ● | ● | ● | | | | | | | | | - | 16 | 5.56 | - | 5.5 | - | | E180 |
| RDKT-ML | 1605MO-ML | | | | | | | | | | | | | | | - | 16 | 5.56 | - | 5.5 | - | | E176 |
| RDKT-MM | 10T3MO-MM | ● | ● | ● | ● | ● | ● | | | | | | | | | - | 10 | 3.97 | - | 3.85 | - | | E174-E177 |
| | 1204MO-MM | ● | ● | ● | ● | ● | ● | | | | | | | | | - | 12 | 4.76 | - | 4.5 | - | | E180-E185 |
| | 1605MO-MM | | | ● | ● | | | | | | | | | | | - | 16 | 5.56 | - | 5.5 | - | | |
| | 2006MO-MM | | | ● | ● | | | | | | | | | | | - | 20 | 6.35 | - | 5.5 | - | | |
| RDKW | 0501MOE | | | ● | | | | | | | | | | | | - | 5 | 1.59 | - | 2.3 | - | | E178 |
| | 06T1MOE | | | ● | | | | | | | | | | | | - | 6 | 1.98 | - | 2.5 | - | | E179 |
| | 0702MOE | | | ● | | | | | | | | | | | | - | 7 | 2.38 | - | 2.8 | - | | E184 |
| | 0803MOE | | | ● | | | | | | | | | | | | - | 8 | 3.18 | - | 3.4 | - | | |
| REKR-MM | 170400-MM | | | | | | | | | | | | | | | - | 17.8 | 4.76 | - | - | - | | E48 |
| SDCN | 42R | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 3.5 | | E281 |
| | 42L | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 3.5 | | E282 |
| | 53R | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 5.0 | | |
| | 53L | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 5.0 | | |
| | 42M | | | | | | | | | | | | ● | | | - | 12.7 | 3.18 | - | - | 1.5 | | E34 |
| | 42M-G | | | | | | | | | | | ● | | | | - | 12.7 | 3.18 | - | - | 1.5 | | E35 |
| | 42MT | ● | | | | | | | ● | ● | | ● | ● | | | - | 12.7 | 3.18 | - | - | 1.5 | | E44 |
| | 42MT-RH | | | ● | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.5 | | E44 |
| | 42MT-S20 | | | | | ● | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.5 | | E281 |
| | 53M | | | | | | | | | | | | ● | | | - | 15.875 | 4.76 | - | - | 1.5 | | E282 |
| | 53M-G | | | | | | | | | | | | ● | | | - | 15.875 | 4.76 | - | - | 1.5 | | |
| | 53MT | ● | ● | | | | | | ● | ● | | ● | ● | | | - | 15.875 | 4.76 | - | - | 1.5 | | |
| | 53MT-RH | | | ● | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.5 | | |
| | 53MT-S20 | | | | | ● | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.5 | | |
| | 1203AEEN | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.5 | | |
| | 1203AEEN-RH | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.43 | | |
| | 1203AESN | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.5 | | |
| | 1203AESN-RH | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.43 | | |
| | 1504AEEN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.5 | | |
| | 1504AEEN-RH | | | | ● | ● | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.43 | | |
| 1504AESN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.5 | | | |
| 1504AESN-RH | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.43 | | | |
| SDET-MA | 09M402R-MA | | | | | | | | | | | | ● | | | - | 9.525 | 3.923 | 0.2 | 4.0 | 1.2 | | E168-E173 |
| | 09M404R-MA | | | | | | | | | | | | ● | | | - | 9.525 | 3.923 | 0.4 | 4.0 | 1.2 | | |
| | 09M405R-MA | | | | | | | | | | | | | | | - | 9.525 | 3.923 | 0.5 | 4.0 | 1.2 | | |
| | 130504R-MA | | | | | | | | | | | | | ● | | - | 13.5 | 5.56 | 0.4 | 5.56 | 2.2 | | |

● : Stock item

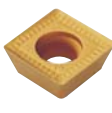
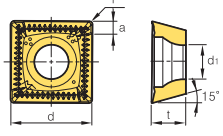

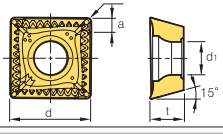

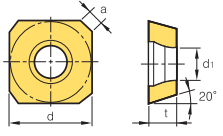

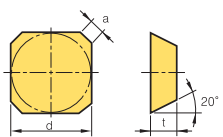

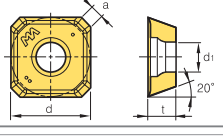

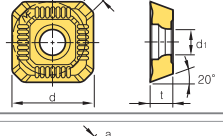

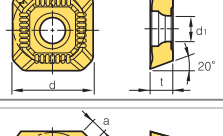

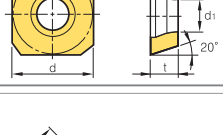

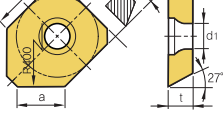


| Workpiece | Machining types | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|-----------------|--------|--------|--------|--------|------|------------|-----------------|------|-----|-----|-------|--------|--------|------|-----|------|----------------|------|------------------------------|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | P | M | K | N | S | H | ● | ⦿ | ⊗ | ● | ⦿ | ⊗ | | | | | | | | |
| Inserts | Designation | Coated | | | Cermet | Uncoated | Dimensions (mm) | | | | | | Geometries | Available tools | | | | | | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | | | CN30 | H01 | G10 | ST30A | ST20 | l | d | t | r | d _i | a | b |
| | 09M405R-MF | | | | | | | | | | | | | | | | | | - | 9.525 | 4 | 0.5 | 4 | 1.2 | - | E168 ~E173 |
| | 130508R-MF | | | | | | | | | | | | | | | | | | - | 13.5 | 5.56 | 0.8 | 5.56 | 2.2 | - | |
| | 09M405R-MM | | | | | | | | | | | | | | | | | | - | 9.525 | 4 | 0.5 | 4 | 1.2 | - | E168 ~E173 |
| | 130508R-MM | | | | | | | | | | | | | | | | | | - | 13.5 | 5.56 | 0.8 | 5.56 | 2.2 | - | |
| | 1203AESN-SM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.64 | 0.59 | E34 E35 E44 E45 |
| | 1203AEEN-SM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.64 | 0.59 | |
| | 1504AESN-SM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.64 | 0.58 | |
| | 1504AEEN-SM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.64 | 0.58 | |
| | 1203AESN-MU | | | | | ● | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 2.08 | - | E34 E35 E44 E45 |
| | 1504AESN-MU | | | | | ● | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.10 | - | |
| | 1203AESN-SU | | | | | ● | ● | ● | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 2.08 | - | E34 E35 E44 E45 |
| | 1504AESN-SU | | | | | ● | ● | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.10 | - | |
| | 1203AESN-MX | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.46 | - | E34 E35 E44 E45 |
| | 1203AETN-MX | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.46 | - | |
| | 1203AEN-MX | ● | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.46 | - | |
| | 1504AESN-MX | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.45 | - | |
| | 1504AETN-MX | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.45 | - | |
| 1504AEN-MX | ● | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.45 | - | | |
| | 1203AESN-SM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.43 | 0.71 | E34 E35 E44 E45 |
| | 1504AESN-SM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.64 | 0.58 | |
| | 090308-MM | | | | | | | | | | | | | | | | | | - | 9.525 | 3.18 | 0.8 | 4.4 | - | - | E206 E220 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1203AESN-FM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.43 | 0.71 | E34 E35 E44 E45 |
| | 1203AEEN-FM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.43 | 0.71 | |
| | 1504AESN-FM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.43 | 0.70 | |
| | 1504AEEN-FM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.43 | 0.70 | |
| | 1203AESN-FM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.43 | 0.71 | E34 E35 E44 E45 |
| | 1504AESN-FM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.43 | 0.70 | |
| | 09M405R-MA | | | | | | | | | | | | | | | | | | - | 9.525 | 4.0 | 0.5 | 4.0 | 1.2 | - | E168 ~E173 |
| | 130508R-MA | | | | | | | | | | | | | | | | | | - | 13.5 | 5.56 | 0.8 | 5.56 | 2.2 | - | |

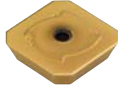
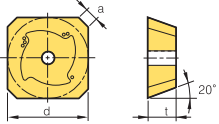
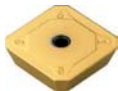
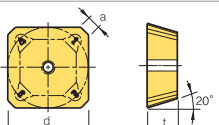

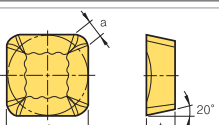

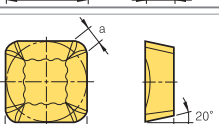

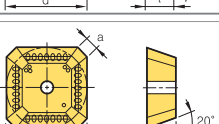

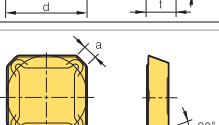

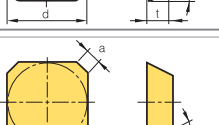

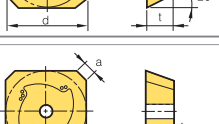

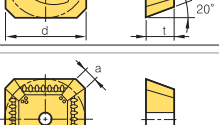

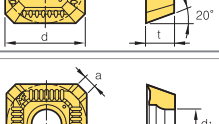

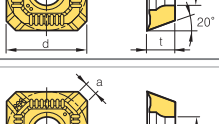

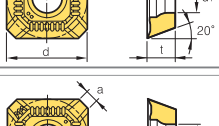
●: Stock item



| Workpiece | Machining types | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|
| | P | M | K | N | S | H | ● | ◐ | ◑ | ◒ | ◓ | ◔ |
| Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Stainless steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cast iron | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Non-ferrous metal | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Heat resistant alloy, Titanium alloy | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |


| Inserts | Designation | Coated | | | | | | | | | | | | Cermet | Uncoated | Dimensions (mm) | | | | | | Geometries | Available tools | |
|---|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|--------|----------|-----------------|--------|-------|-----|------|------|---|---|----------------|
| | | NCM325 | NCM335 | NCM330 | PC3500 | PC5400 | PC3545 | PC9530 | PD6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | d | t | r | | | d _i |
|  | 09M403R-MF | | | | | | | | | | | | | | | | - | 9.525 | 4.0 | 0.3 | 4.0 | 1.2 |  | E168 ~E173 |
| | 09M403L-MF | | | | | | | | | | | | | | | | - | 9.525 | 4.0 | 0.3 | 4.0 | 1.2 | | |
| | 09M404R-MF | | | | | | | | | | | | | | | | - | 9.525 | 4.0 | 0.4 | 4.0 | 1.2 | | |
| | 09M404L-MF | | | | | | | | | | | | | | | | - | 9.525 | 4.0 | 0.4 | 4.0 | 1.2 | | |
| | 09M405R-MF | ● | ● | | ● | ● | ● | ● | | | | | | | | | - | 9.525 | 4.0 | 0.5 | 4.0 | 1.2 | | |
| | 09M405L-MF | ● | ● | | ● | ● | ● | ● | | | | | | | | | - | 9.525 | 4.0 | 0.5 | 4.0 | 1.2 | | |
| 130508R-MF | ● | ● | | ● | ● | ● | ● | | | | | | | | | - | 13.5 | 5.56 | 0.8 | 5.56 | 2.2 | | | |
|  | 09M405R-MM | ● | ● | ● | ● | ● | ● | | | | | | | | | - | 9.525 | 4.0 | 0.5 | 4.0 | 1.2 |  | E168 ~E173 | |
| | 09M405L-MM | ● | ● | ● | ● | ● | ● | | | | | | | | | - | 9.525 | 4.0 | 0.5 | 4.0 | 1.2 | | | |
| | 130508R-MM | ● | ● | | ● | ● | ● | ● | | | | | | | | - | 13.5 | 5.56 | 0.8 | 5.56 | 2.2 | | | |
| | 130508L-MM | ● | ● | | ● | ● | ● | ● | | | | | | | | - | 13.5 | 5.56 | 0.8 | 5.56 | 2.2 | | | |
| 130538-MM | | | | | | | | | | | | | | | | - | 13.5 | 5.56 | 3.8 | 5.56 | 2.2 | | | |
|  | 1204AFSN | ● | ● | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 5.56 | 2.66 |  | - | |
| | 1204AFTN | | | ● | | | | | | | ● | | | | | - | 12.7 | 4.76 | - | 5.56 | 2.66 | | | |
| | 1204AFFN | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 5.56 | 2.66 | | | |
| | 1204AFEN | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 5.56 | 2.66 | | | |
| | 1504AFSN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | 5.5 | 2.8 | | | |
| | 1504AFTN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | 5.5 | 2.8 | | | |
| 1504AFFN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | 5.5 | 2.8 | | | | |
|  | 1203AFFN | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 2.36 |  | E36 E37 | |
| | 1203AFTN | | | | | | | | | | ● | ● | ● | | ● | - | 12.7 | 3.18 | - | - | 2.36 | | | |
| | 1203AFEN | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 2.36 | | | |
| | 1203AFSN | ● | ● | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 2.36 | | | |
| | 1203AFEN-RH | | | | ● | | | | | | ● | | | | | - | 12.7 | 3.18 | - | - | 2.36 | | | |
| | 1203AFSN-RH | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 2.36 | | | |
| | 1203AFTN-S20 | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 2.36 | | | |
| | 1504AFFN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.4 | | | |
| | 1504AFTN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.4 | | | |
| | 1504AFEN | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.4 | | | |
| | 1504AFSN | ● | ● | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.4 | | | |
| | 1504AFEN-RH | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.4 | | | |
| | 1504AFSN-RH | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.4 | | | |
| 1504AFTN-S20 | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 2.4 | | | | |
|  | 0903AGFN-MA | | | | | | | | | | | | | | | - | 9.525 | 3.18 | - | 3.4 | 2.11 |  | E162 ~E167 | |
| | 14M4AGFN-MA | | | | | | | | | | | | | | | - | 14.0 | 4.0 | - | 4.4 | 2.64 | | | |
|  | 0903AGSN-MF | ● | | | | | | | | | | | | | | - | 9.525 | 3.18 | - | 3.4 | 2.11 |  | E162 ~E167 | |
| | 14M4AGSN-MF | ● | ● | | ● | | ● | ● | | | | | | | | - | 14.0 | 4.0 | - | 4.4 | 2.64 | | | |
|  | 0903AGSN-MM | ● | | | | | | | | | | | | | | - | 9.525 | 3.18 | - | 3.4 | 2.11 |  | E162 ~E167 | |
| | 14M4AGSN-MM | ● | ● | | ● | | ● | ● | | | | | | | | - | 14.0 | 4.0 | - | 4.4 | 2.64 | | | |
|  | 0903AGTN | | | | | | | | | | | | | | | - | 9.525 | 3.18 | - | 3.4 | 2.11 |  | E162 ~E167 | |
| | 14M4AGTN | | | | | | | | | | | | | | | - | 14.0 | 4.0 | - | 4.4 | 2.64 | | | |
|  | 14M4AGFN-W | | | | | | | | | | | | | | | - | 14.0 | 4.0 | - | 4.4 | 8.5 |  | E162 E163 E165 E166 E167 | |
| | 14M4AGSN-W | | | | | | | | | | | | | | | - | 14.0 | 4.0 | - | 4.4 | 8.5 | | | |
| | 14M4AGTN-W | | | | | | | | | | | | | | | - | 14.0 | 4.0 | - | 4.4 | 8.5 | | | |

● : Stock item

| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | ● Continuous cutting ● General cutting ● Interrupted cutting | | | | | | |
|---|--------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------|----------|-----------------|-------|-----------------|--|------|------------|-----------------|----------------|---|---------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| Inserts | Designation | Coated | | | | | | | | | | | Cermet | Uncoated | Dimensions (mm) | | | | | Geometries | Available tools | | | |
| | | NCM325 | NCM335 | NC5330 | PC3600 | PC5300 | PC5400 | PC3545 | PC6510 | PC215K | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | l | d | t | | | d ₁ | a | b |
|  | 1203AFSN-SM | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.46 | - |  | E36 E37 |
| | 1203AFEN-SM | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.46 | - | | |
| | 1504AFSN-SM | | | | | | ● | | | | | | | | | | - | 15.875 | 4.76 | - | 2.50 | - | | |
| | 1504AFEN-SM | | | | | | ● | | | | | | | | | | - | 15.875 | 4.76 | - | 2.50 | - | | |
|  | 1203AFSN-SU | | | | ● | | ● | | | | | | | | | | - | 12.7 | 3.18 | - | 1.98 | - |  | E36 E37 |
| | 1504AFSN-SU | | | | ● | | ● | | | | | | | | | | - | 15.875 | 4.76 | - | 2.04 | - | | |
|  | 1203AFSN-MF1 | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.3 | - |  | E36 E37 |
|  | 1203AFSN-MX | ● | ● | | | | ● | | | | | ● | | | | | - | 12.7 | 3.18 | - | 2.3 | - |  | E36 E37 |
| | 1204AFSN-MX | ● | ● | | | | ● | | | | | ● | | | | | - | 12.7 | 4.76 | - | 2.3 | - | | |
| | 1504AFSN-MX | ● | ● | | | | ● | | | | | ● | | | | | - | 15.875 | 4.76 | - | 2.4 | - | | |
|  | 1203AFSN-SM | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.46 | - |  | E36 E37 |
| | 1504AFSN-SM | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | 2.50 | - | | |
|  | 1203AFSN-X35 | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.361 | - |  | E36 |
| | 1203AFFN-X35 | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.361 | - | | |
| | 1204AFFN-X35 | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 2.361 | - | | |
|  | 1204AZ | ● | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 2.0 | - |  | E36 |
|  | 1203AFSN-FM | | | | ● | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.36 | - |  | E36 E37 |
| | 1203AFEN-FM | | | | ● | | | | | | | | | | | | - | 12.7 | 3.18 | - | 2.36 | - | | |
| | 1504AFSN-FM | | | | ● | | | | | | | | | | | | - | 15.875 | 4.76 | - | 2.40 | - | | |
| | 1504AFEN-FM | | | | ● | | | | | | | | | | | | - | 15.875 | 4.76 | - | 2.40 | - | | |
|  | 1203AFSN-FM | | | | | | ● | | | | | | | | | | - | 12.7 | 3.18 | - | 2.36 | - |  | E36 E37 |
| | 1504AFSN-FM | | | | | | ● | | | | | | | | | | - | 15.875 | 4.76 | - | 2.40 | - | | |
|  | 0903AGSN-MF | | | | | ● | ● | | | | | | | | | | - | 9.525 | 3.18 | 3.4 | 2.11 | - |  | E162 ~E167 |
| | 14M4AGSN-MF | ● | | ● | ● | ● | | ● | | | | | | | | | - | 14.0 | 4.0 | 4.4 | 2.64 | - | | |
|  | 0903AGSN-MM | | | | ● | ● | ● | | ● | ● | | | | | | | - | 9.525 | 3.18 | 3.4 | 2.11 | - |  | E162 ~E167 |
| | 14M4AGSN-MM | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | - | 14.0 | 4.0 | 4.4 | 2.64 | - | | |
|  | 0903AGSN-MR | | | | | ● | ● | | | | | | | | | | - | 9.525 | 3.18 | 3.4 | 2.11 | - |  | E162 ~E167 |
| | 14M4AGSN-MR | ● | | ● | ● | ● | | ● | | | | | | | | | - | 14.0 | 4.0 | 4.4 | 2.64 | - | | |

●: Stock item




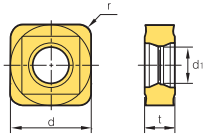

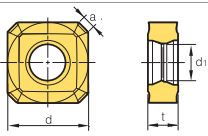
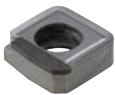
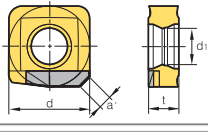

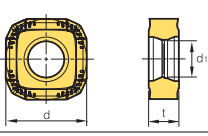

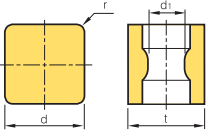
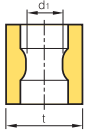

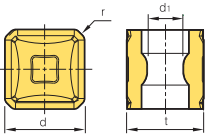
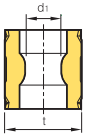
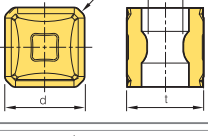
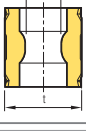

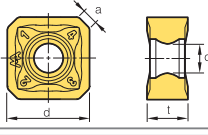
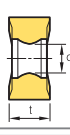
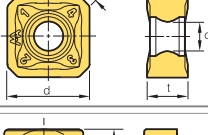
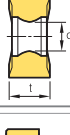
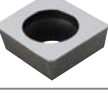
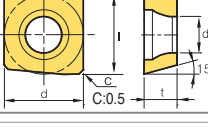
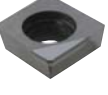
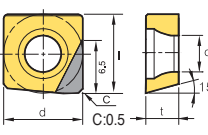


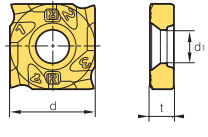
| Workpiece | Machining types | | | | | | | | | | | Dimensions (mm) | | Geometries | Available tools | | | | | | | | | | | |
|--------------------------------------|---|-----------------|-----------|-------------------|--------------------------------------|----------------|--------------------|-----------------|---------------------|--------|--------|-----------------|------|------------|-----------------|----------------|------------|-----------------|--------|------|-----|-----|-----|-----|----------------|---|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | Continuous cutting | General cutting | Interrupted cutting | l | d | t | r | | | d _i | a | b | | | | | | | | |
| Steel | P | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Stainless steel | M | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Cast iron | K | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Non-ferrous metal | N | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Heat resistant alloy, Titanium alloy | S | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Hardened steel | H | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | | |
| Inserts | Designation | Coated | | | Cermet | Uncoated | | Dimensions (mm) | | | | | | | | | Geometries | Available tools | | | | | | | | |
| | | NGM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | | ST30A | ST20 | l | d | t | r | d _i | a |
| SFCN | 1203EFR | | | | | | | | | | | | | | | | | | 12.7 | 3.18 | | | 2.5 | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| SNC(M)F-MF | SNCF 1206ANN-MF | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 2 | | | |
| | 1507ANN-MF | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 2.1 | | | |
| | SNMF 1206ANN-MF | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 2 | | | |
| | 1507ANN-MF | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 2.1 | | | |
| | SNCF 1206ENN-MF | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 1.8 | | | |
| | 1507ENN-MF | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 1.8 | | | |
| SNMF 1206ENN-MF | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 1.8 | | | | |
| 1507ENN-MF | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 1.8 | | | | |
| SNC(M)F-MF | SNCF 1206QNN-MF | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | 0.8 | | 1 | | | |
| | SNMF 1206QNN-MF | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | 0.8 | | 1 | | | |
| SNC(M)F-MM | SNCF 1206ANN-MM | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 2 | | | |
| | 1507ANN-MM | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 2.1 | | | |
| | SNMF 1206ANN-MM | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 2 | | | |
| | 1507ANN-MM | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 2.1 | | | |
| SNC(M)F-MM | SNCF 1206ENN-MM | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 1.8 | | | |
| | 1507ENN-MM | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 1.8 | | | |
| | SNMF 1206ENN-MM | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | | | 1.8 | | | |
| | 1507ENN-MM | | | | | | | | | | | | | | | | | | 15.875 | 7.35 | | | 1.8 | | | |
| SNC(M)F-MM | SNCF 1206QNN-MM | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | 0.8 | | 1 | | | |
| | SNMF 1206QNN-MM | | | | | | | | | | | | | | | | | | 12.7 | 6.6 | 0.8 | | 1 | | | |
| SNCN | 1204ENN | | | | | | | | | | | | | | | | | | 12.7 | 4.76 | | | 1.4 | 1.0 | | |
| | 1504ENN | | | | | | | | | | | | | | | | | | 15.875 | 4.76 | | | 1.4 | 1.0 | | |
| SNEF | 435 | | | | | | | | | | | | | | | | | | 12.7 | 4.76 | 2.0 | | | | | |
| | 535 | | | | | | | | | | | | | | | | | | 15.875 | 4.76 | 2.0 | | | | | |

●: Stock item



Milling

E

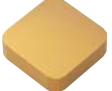
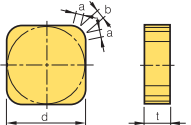

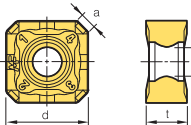

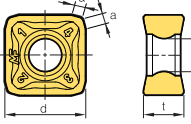

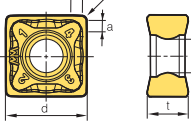

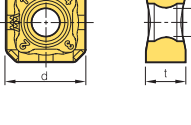

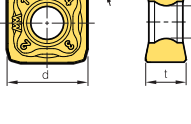

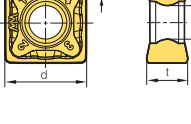

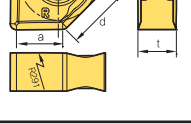
| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | ● Continuous cutting ● General cutting ● Interrupted cutting | | | | | | | | | | |
|---|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----------------|--|-----|-------|---------|---------|------------|-----------------|-------|-------|---|----------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | |
| Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | |
| Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | |
| Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | |
| Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | |
| Inserts | Designation | Coated | | | | | | | | | | Cermet | cBN | Uncoated | PCD | Dimensions (mm) | | | | | Geometries | Available tools | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | CN2000 | CN20 | CN30 | DBN700 | DBN920 | H01 | G10 | ST30A | DP200 | l | | | d | t | r | d ₁ |
|  | 120420-MF | | | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | 2.0 | 5.7 | (2.3) |  | E287 |
|  | 1204ANN-MF | | | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 5.7 | (2.0) |  | E287 |
|  | 1204-TBW | | | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 5.7 | (2.1) |  | E287 |
|  | 1204-WMF | | | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | 5.7 | 2.3 |  | E287 |
|  | 101010 | | | | | | | | | | | | | | | | | | - | 10 | 10 | 1.0 | 4.6 | - |  | E272 |
| | 1010ZNN | | | | | | | | | | | | | | | | | | - | 10 | 10 | (1.0) | 4.6 | - |  | E272 |
|  | 101010-CU1 | | | | | | | | | | | | | | | | | | - | 10 | 10 | 1.0 | 4.6 | - |  | E276 |
| | 1010ZNN-CU1 | | | | | | | | | | | | | | | | | | - | 10 | 10 | (1.0) | 4.6 | - |  | E276 |
| | 121212-CU1 | | | | | | | | | | | | | | | | | | - | 12.7 | 12.7 | 1.2 | 5.6 | - |  | E276 |
| | 1212ZNN-CU1 | | | | | | | | | | | | | | | | | | - | 12.7 | 12.7 | (1.2) | 5.6 | - |  | E276 |
|  | 1206ANN-MA | | | | | | | | | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 2.36 |  | E65~E74 |
| | 1206ENN-MA | | | | | | | | | | | | | | | | | | - | 12.7 | 6.35 | - | 5.2 | 1.82 |  | E65~E74 |
| | 1206QNN-MA | | | | | | | | | | | | | | | | | | - | 12.7 | 6.35 | - | 5.2 | 1.39 |  | E65~E74 |
| | 120612-MA | | | | | | | | | | | | | | | | | | - | 12.7 | 6.35 | 1.2 | 5.2 | - |  | E65~E74 |
|  | 09T3ADFR | | | | | | | | | | | | | | | | | | 9.525 | 9.525 | 3.97 | - | 4.4 | - |  | E101 |
|  | 09T3ADTR-XAF | | | | | | | | | | | | | | | | | | ● 9.525 | ● 9.525 | ● 3.97 | - | ● 4.4 | - |  | E101 |
| | 09T3ADTR-NAF | | | | | | | | | | | | | | | | | | ● - | ● - | ● - | - | ● - | - |  | E101 |
|  | 1102308R/L-WX | | | | | | | | | | | | | | | | | | - | 11 | 2.30 | - | 4 | - |  | E268 |
| | 110308R/L-WX | | | | | | | | | | | | | | | | | | - | 11 | 3.00 | - | 5 | - | | E269 |
| | 120308R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 3.25 | - | 5.5 | - | | |
| | 1203508R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 3.50 | - | 6 | - | | |
| | 120408R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 4.00 | - | 7 | - | | |
| | 1204508R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 4.54 | - | 8 | - | | |
| | 120508R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 5.00 | - | 9 | - | | |
| | 1205408R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 5.47 | - | 10 | - | | |
| | 120608R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 6.00 | - | 11 | - | | |
| | 1206508R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 6.50 | - | 12 | - | | |
| | 120708R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 7.00 | - | 13 | - | | |
| 1207508R/L-WX | | | | | | | | | | | | | | | | | | - | 12.7 | 7.5 | - | 14 | - | | | |

● : Stock item

| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
|----------------|--------------------------------------|----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Machining types

- Continuous cutting
- General cutting
- Interrupted cutting

| Inserts | Designation | Coated | | | | | | | | | | | | Cermet | Uncoated | | | | Dimensions (mm) | | | | Geometries | Available tools | | |
|---|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|--------|----------|-------|------|---|-----------------|------|-----|----------------|------------|-----------------|---|---------------------------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | CN2000 | CN20 | CN30 | HO1 | G10 | ST30A | ST20 | l | d | t | r | d ₁ | | | a | b |
| SNKN  | 1204ENN | ● | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | - | 1.4 | 1.0 |  | E39 E279 E280 |
| | 1504ENN | ● | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | |
| SNM(E)X-MF  | SNMX 1206ANN-MF | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 2.36 | - |  | E65 E66 E70 |
| | 1507ANN-MF | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 3.15 | - | | |
| | SNEX 1206ANN-MF | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 2.36 | - | | |
| | 1507ANN-MF | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 3.15 | - | | |
| SNM(E)X-MF  | SNMX 1206ENN-MF | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 1.82 | - |  | E65 ~E69 E71 E72 |
| | 1507ENN-MF | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 2.66 | - | | |
| | SNEX 1206ENN-MF | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 1.82 | - | | |
| | 1507ENN-MF | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 2.66 | - | | |
| SNM(E)X-MF  | SNMX 1206QNN-MF | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 5.2 | 2.36 | - |  | E73 E74 |
| | 120612-MF | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | 1.2 | 5.2 | - | - | | |
| | SNEX 1206QNN-MF | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 5.2 | 2.36 | - | | |
| SNM(E)X-MM  | SNMX 1206ANN-MM | ● | ● | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 2.36 | - |  | E65 ~E69 E71 E72 |
| | 1507ANN-MM | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 3.15 | - | | |
| | SNEX 1206ANN-MM | ● | ● | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 2.36 | - | | |
| | 1507ANN-MM | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 3.15 | - | | |
| SNM(E)X-MM  | SNMX 1206ENN-MM | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 5.2 | 1.82 | - |  | E70 |
| | 1507ENN-MM | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 2.66 | - | | |
| | SNEX 1206ENN-MM | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 5.2 | 1.82 | - | | |
| | 1507ENN-MM | | | ● | | | | ● | | | | | | | | | | - | 15.875 | 7.94 | - | 5.6 | 2.66 | - | | |
| SNM(E)X-MM  | SNMX 1206QNN-MM | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 2.36 | - |  | E73 E74 |
| | 120612-MM | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | 1.2 | 4.5 | - | - | | |
| | SNEX 1206QNN-MM | | | ● | ● | ● | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 2.36 | - | | |
| | 120612-MM | | | ● | | | | ● | | | | | | | | | | - | 12.7 | 6.35 | 1.2 | 4.5 | - | - | | |
| SNEX-W  | 1206ANN-W | | | ● | | | | ● | | | | | | | | | | - | 12.7 | 6.35 | - | 4.5 | 7.6 | - |  | E65 E66 |

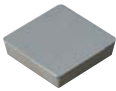
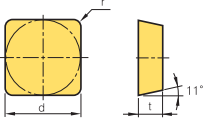

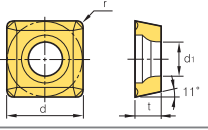

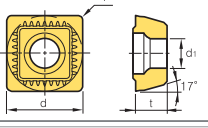

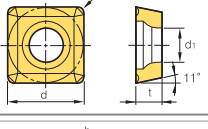
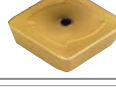
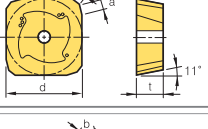

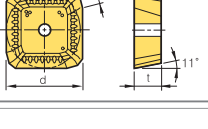

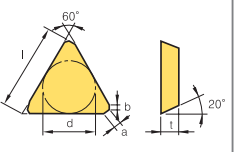

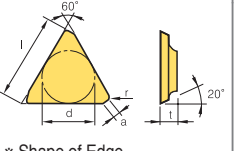

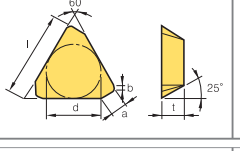

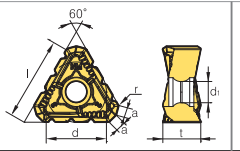
● : Stock item

| Workpiece | Steel | P | M | K | N | S | H | | | | | | | | | | | Machining types | | | |
|-----------|--------------------------------------|---|---|---|---|---|---|--------------------|-----------------|---------------------|--|--|--|--|--|--|--|-----------------|--|--|--|
| | Stainless steel | Y | | | | | | Continuous cutting | General cutting | Interrupted cutting | | | | | | | | | | | |
| | Cast iron | | | | | | | | | | | | | | | | | | | | |
| | Non-ferrous metal | | | | | | | | | | | | | | | | | | | | |
| | Heat resistant alloy, Titanium alloy | | | | | | | | | | | | | | | | | | | | |
| | Hardened steel | | | | | | | | | | | | | | | | | | | | |

| Inserts | Designation | Coated | | | | | | | | | | | | Cermet | Uncoated | Dimensions (mm) | | | | | | Geometries | Available tools | | | | | |
|-------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----------------|------|-----|-----|--------|--------|------------|-----------------|------|------|-----|---|----------------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | | | CN20 | CN30 | H01 | G10 | ST30A | ST20 | | | l | d | t | r | d _r |
| SPCN | 1203EDR | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | 1.0 | | E40 E41 |
| | 1203EDR-RH | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | 1.0 | | |
| | 1203EDL | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | 1.0 | | |
| | 1203EDR-G | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | 1.0 | | |
| | 1203EDR-RN | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | 1.0 | | |
| | 1203EDER-RH | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.63 | 0.8 | | |
| | 1203EDSR-RH | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.63 | 0.8 | | |
| | 1203EDTR-RH | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.63 | 0.8 | | |
| | 1203EDR-S20 | | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | 1.0 | | |
| | 1204EDR | | | | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | - | - | 1.4 | 1.0 | | |
| | 150412T | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | 1.2 | - | - | - | | |
| | 1504EDR | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | |
| | 1504EDR-RH | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | |
| | 1504EDSR | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | |
| | 1504EDL | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | |
| | 1504EDR-G | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | |
| | 1504EDR-RN | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | |
| 1504EDER-RH | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.64 | 0.8 | | | |
| 1504EDSR-RH | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.64 | 0.8 | | | |
| 1504EDTR-RH | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.64 | 0.8 | | | |
| 1504EDR-S20 | | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.4 | 1.0 | | | |
| SPEN-WC | 120416-WC | | | | | | | | | | | | | | | | | | - | 12.7 | 4.76 | 1.6 | - | - | - | | | |
| | 150412-WC | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | 1.2 | - | - | - | | | |
| | 150416-WC | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | 1.6 | - | - | - | | | |
| | 150420-WC | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | 2.0 | - | - | - | | | |
| | 190424-WC | | | | | | | | | | | | | | | | | | - | 19.05 | 4.76 | 2.4 | - | - | - | | | |
| SPEX | 1203EDR-1 | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 10.2 | - | | | |
| | 1203EDL-1 | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 10.2 | - | | | |
| | 1504EDR-1 | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 10.2 | - | | | |
| | 1504EDL-1 | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 10.2 | - | | | |
| SPFN | 200-N | | | | | | | | | | | | | | | | | | 8.8 | 2.2 | - | 0.2 | - | - | - | | | |
| | 300-N | | | | | | | | | | | | | | | | | | 9.8 | 3.0 | - | 0.2 | - | - | - | | | |
| | 400-N | | | | | | | | | | | | | | | | | | 9.8 | 4.0 | - | 0.25 | - | - | - | | | |
| SPKN-SM | 1203EDSR-SM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.66 | 0.92 | | | |
| | 1203EDER-SM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.66 | 0.92 | | | |
| | 1504EDSR-SM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.62 | 0.93 | | | |
| | 1504EDER-SM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.62 | 0.93 | | | |
| SPKN-MU | 1203EDSR-MU | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 0.86 | 1.87 | | | |
| | 1504EDSR-MU | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 0.84 | 1.92 | | | |
| SPKN-SU | 1203EDSR-SU | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.66 | 0.92 | | | |
| | 1203EDSL-SU | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.66 | 0.92 | | | |
| | 1504EDSR-SU | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.62 | 0.93 | | | |
| | 1504EDSL-SU | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.62 | 0.93 | | | |
| SPKR-MX | 1203EDSR-MX | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | - | | | |
| | 1203EDSL-MX | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.4 | - | | | |
| | 1504EDR-MX | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.45 | - | | | |
| | 1504EDSR-MX | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.45 | - | | | |
| SPKR-SM | 1203EDSR-SM | | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.66 | 0.92 | | | |
| | 1504EDSR-SM | | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.63 | 0.93 | | | |

●: Stock item


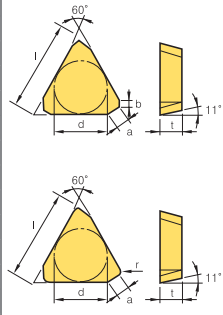

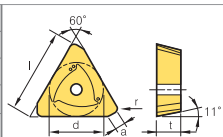
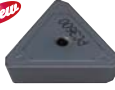
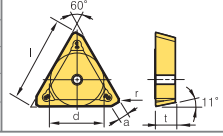

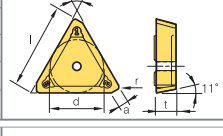

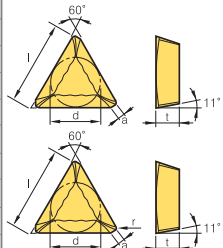

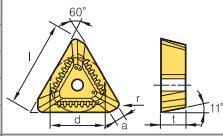

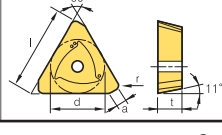
| Workpiece | Steel | P | | | | | | | | | | | Machining types | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|-----------------------|----------------------|---|---|---|---|---|---|
| | Stainless steel | M | | | | | | | | | | | ● Continuous cutting | | | | | | |
| Cast iron | K | | | | | | | | | | | ● General cutting | | | | | | | |
| Non-ferrous metal | N | | | | | | | | | | | ⦿ Interrupted cutting | | | | | | | |
| Heat resistant alloy, Titanium alloy | S | | | | | | | | | | | | | | | | | | |
| Hardened steel | H | | | | | | | | | | | | | | | | | | |
| | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

| Inserts | Designation | Coated | | | | | | | | | | Cermet | Uncoated | | Dimensions (mm) | | | | | Geometries | Available tools | | | | | | |
|---|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----------------|-----|-------|------|--------|------------|-----------------|-----|------|------|----------------|---|----------------------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3945 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | | | d | t | r | d _i | a | b |
|  | 120308 | | | | | | | | | | | | | | ● | | | - | 12.7 | 3.18 | 0.8 | - | - | - | |  | E228 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 060304 | ● | | | | | | | | | | | | | | | | - | 6.35 | 3.18 | 0.4 | 2.8 | - | - | |  | E202 E217 E218 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 110408-KC | | ● | | | | | | | | | | | | | ● | ● | - | 11.5 | 4.8 | 0.8 | 4.5 | - | - | |  | E228 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | 120408-MM | | ● | ● | | | | | | | | | | | | | | - | 12.7 | 4.76 | 0.8 | 5.6 | - | - | |  | E141 |
| | 120508-MMN | | | | | | | | | | | | | | | | | - | 12.7 | 5.56 | 0.8 | 5.6 | - | - | | | E202 E217 E218 |
|  | 1203EDSR-FM | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.41 | 1.00 | |  | E37 |
| | 1203EDER-FM | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.41 | 1.00 | | | E38 |
| | 1504EDSR-FM | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.38 | 1.01 | | | |
| | 1504EDER-FM | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.38 | 1.01 | | | |
|  | 1203EDSR-FM | | | | | | | | | | | | | | | | | - | 12.7 | 3.18 | - | - | 1.41 | 1.00 | |  | E37 |
| | 1504EDSR-FM | | | | | | | | | | | | | | | | | - | 15.875 | 4.76 | - | - | 1.38 | 1.01 | | | E38 |
|  | TECN 22R | | | | | | | | | | | | | | ● | ● | | 11.0 | 6.35 | 3.18 | - | - | 1.0 | 0.5 | |  | E43 |
| | 22TR | | | | | | | | | | | | | | ● | ● | | 11.0 | 6.35 | 3.18 | 0.8 | - | 0.5 | - | | | |
| | 32R | | | | | | | | | | | | | | ● | ● | | 16.5 | 9.525 | 3.18 | - | - | 1.0 | 0.5 | | | |
| | 32R-G | ● | | | | | | | | | | | | | ● | ● | | 16.5 | 9.525 | 3.18 | - | - | 1.0 | 0.5 | | | |
| | 32TR | | | | | | | | | | | | | | ● | ● | | 16.5 | 9.525 | 3.18 | 0.8 | - | 0.5 | - | | | |
| | 32TR-S20 | | | | | | ● | | | | | | | | ● | ● | | 16.5 | 9.525 | 3.18 | 0.8 | - | 0.5 | - | | | |
| | 43R-G | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | - | - | 2.0 | 0.5 | | | |
| | 43TR-Z | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | 0.8 | - | 1.5 | - | | | |
| 43TR | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | 0.8 | - | 1.5 | - | | | | |
|  | TEEN 32TR | | | | | | | | | | | | | | ● | ● | | 16.5 | 9.525 | 3.18 | 0.8 | - | 0.5 | - | |  | |
| | 43R-Z | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | - | - | 2.0 | 0.5 | | | |
| | 43TR-Z | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | 0.8 | - | 1.5 | - | | | |
| | 43TR-ZH | | | ● | | ● | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | 0.8 | - | 1.5 | - | | | |
| | 43R | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | - | - | 2.0 | 0.5 | | | |
| | 43R-G | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 4.76 | - | - | 2.0 | 0.5 | | | |
|  | TFCN 2203PFR | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 3.18 | - | - | 2.42 | 0.71 | |  | E39 |
| | 2203PFL | | | | | | | | | | | | | | ● | ● | | 22.0 | 12.7 | 3.18 | - | - | 2.42 | 0.71 | | | |
|  | TNMX 2710AZNR-NM | ● | ● | ● | ● | | | | | | | | | | | | | 27 | 15.875 | 10 | 0.8 | 5.6 | 2.63 | - | |  | E49 E50 |
| | 2710AZNL-NM | | | | | | | | | | | | | | | | | 27 | 15.875 | 10 | 0.8 | 5.6 | 2.63 | - | | | |

* Shape of Edge
 · G : Light side, Sharp edge
 · S20 : STS
 · ZH : Hole added

● : Stock item


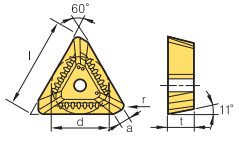

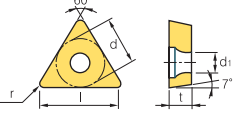

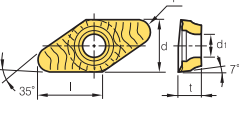

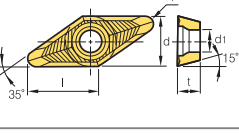

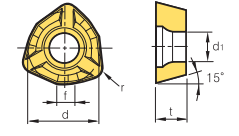

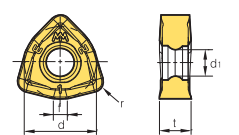

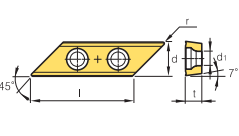

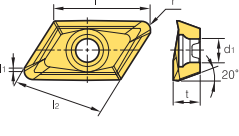
E Milling Inserts

| Workpiece | Material | | | | | | | | | | | Machining types | Geometries | Available tools | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|-----------------|-----------|-------------------|--------------------------------------|----------------|--------|--------|----------|-----------------|--------|-----------------|------------|-----------------|--------|--------|--------|--------|--------|--------|------|------|-----|-----|-------|------|------|------|---|---|----------------|-----|---|---|-----|--|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | Coated | Cermet | Uncoated | Dimensions (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P | M | K | N | S | H | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | | | | PC3500 | PC3545 | PC9630 | PC8110 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | d | t | r | d _r | a | b | | | |
| TPCN  | 1103PPN | | | | | | | | | | | | | | | | | | ● | | | | | | | 11.0 | 6.35 | 3.18 | - | - | 0.7 | 0.7 |  | E40 E255 E256 | | |
| | 1103PPTN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PDR | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPN | ● | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | 1603PPR | ● | | | | | | | | | | | | | | | | | | | ● | | ● | | | | | | | | | | | | | |
| | 1603PPR-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPR-G | | | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | 1603PPSR | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPTN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPTR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPR-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PDER-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PDSR-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PDR-S20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PDR-RN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDR | ● | | | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | | |
| | 2204PDR-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDR-RN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDR-G | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDL | | | | | | | | | | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| 2204PDSR | | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2204PDTR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2204PPN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2204PPTN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2204PDR-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2204PDER-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2204PDSR-RH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2204PDR-S20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPKN-SM  | 1603PDSR-SM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | E40 | |
| | 1603PDER-SM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDSR-SM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDER-SM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPKN-MU  | 2204PDSR-MU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | E40 | |
| TPKN-SU  | 1603PDSL-SU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | E40 | | |
| | 1603PDSR-SU | | | | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDSL-SU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDSR-SU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPKR-MX  | 1603PDSN-MX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | E40 | | |
| | 1603PDSR-MX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPR-MX | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPSN-MX | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1603PPSR-MX | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDR-MX | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDSR-MX | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PPR-MX | ● | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPKR-SM  | 1603PDSR-SM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | E40 | | |
| | 2204PDSR-SM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPXN-FM  | 1603PDSR-FM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |  | E40 | | |
| | 1603PDER-FM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDSR-FM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2204PDER-FM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



* TPC(K)N □□□□P-N → For FC-HC
□□□□P-R → For Cutter(face)

● : Stock item

| Workpiece | Machining types | | | | | | | | | | | Machining types | | | | | | | | | | | | | | | | |
|--|-----------------|-----------------|-----------|-------------------|--------------------------------------|----------------|--------|--------|--------|--------|--------|-----------------|------|----------|-----|-----------------|-------|------|------|----------------|----------------|------------|-----------------|------|------|-----|---|---------------|
| | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | P | M | K | N | S | H | ● | ● | ● | ● | | | | | | | | | | | | |
| Inserts | Designation | Coated | | | | | | | | | | Cermet | | Uncoated | | Dimensions (mm) | | | | | | Geometries | Available tools | | | | | |
| | | NCM325 | NCM335 | NCM330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6610 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | l | l ₂ | l ₁ | | | d | t | r | d ₁ | a |
| TPXR-FM  | 1603PDSR-FM | | | | | | | | | | | | | | | | | 16.5 | - | - | 9.525 | 3.18 | 1.0 | - | 1.30 | - |  | E43 |
| | 2204PDSR-FM | | | | | | | | | | | | | | | | | 22.0 | - | - | 12.7 | 4.76 | 1.0 | - | 1.51 | - | | |
| TWX-KC  | 16R-KC | | | | | | | | | | | | | | | | | 16.5 | - | - | 9.52 | 3.97 | 0.8 | 4.45 | - | - |  | E230 |
| | 22R-KC | | | | | | | | | | | | | | | | | 22.0 | - | - | 12.7 | 4.76 | 0.8 | 4.45 | - | - | | |
| VCKT-MA  | 220530N-MA | | | | | | | | | | | | | | | | | 15.6 | - | - | 12.7 | 5.56 | 3.0 | 5.6 | - | - |  | E244 E245 |
| VDKT-MA  | 11T210N-MA | | | | | | | | | | | | | | | | | 8.8 | - | - | 6.35 | 2.87 | 1.0 | 2.8 | - | - |  | E244 E245 |
| | 11T220N-MA | | | | | | | | | | | | | | | | | 6.7 | - | - | 6.35 | 2.87 | 2.0 | 2.8 | - | - | | |
| WDKT-MH  | 080316ZDSR-MH | | | | | | | | | | | | | | | | | - | - | - | 8.0 | 3.18 | 1.6 | 3.3 | - | 1.8 |  | E201 ~E205 |
| | 10T320ZDSR-MH | | | | | | | | | | | | | | | | | - | - | - | 10.0 | 3.97 | 2.0 | 4.3 | - | 2.3 | | |
| | 130520ZDSR-MH | | | | | | | | | | | | | | | | | - | - | - | 13.5 | 5.56 | 2.0 | 5.56 | - | 3.1 | | |
| | 150625ZDSR-MH | | | | | | | | | | | | | | | | | - | - | - | 15.0 | 6.35 | 2.5 | 5.56 | - | 3.4 | | |
| WNMX-MM  | 060312ZNN-MM | | | | | | | | | | | | | | | | | - | - | - | 6.35 | 3.18 | 1.2 | 2.86 | - | 1.2 |  | E191 ~E200 |
| | 09T316ZNN-MM | | | | | | | | | | | | | | | | | - | - | - | 9.525 | 3.97 | 1.6 | 3.6 | - | 1.7 | | |
| | 130520ZNN-MM | | | | | | | | | | | | | | | | | - | - | - | 12.7 | 5.56 | 2.0 | 4.7 | - | 2.5 | | |
| | 160720ZNN-MM | | | | | | | | | | | | | | | | | - | - | - | 16.0 | 7.0 | 2.0 | 5.8 | - | 3.0 | | |
| XCET-KC  | 310404ER-KC | | | | | | | | | | | | | | | | | 30.9 | - | - | 9.525 | 4.5 | 0.4 | 4.4 | - | - |  | E229 |
| XEKT-MA  | 19M504FR-MA | | | | | | | | | | | | | | | | | 18 | 16.4 | 1.4 | - | 5 | 0.4 | 4.4 | - | - |  | E247 ~E252 |
| | 19M508FR-MA | | | | | | | | | | | | | | | | | 18 | 16.4 | 1.0 | - | 5 | 0.8 | 4.4 | - | - | | |
| | 19M512FR-MA | | | | | | | | | | | | | | | | | 18 | 16.4 | 0.6 | - | 5 | 1.2 | 4.4 | - | - | | |
| | 19M516FR-MA | | | | | | | | | | | | | | | | | 17.5 | 16.4 | 0.5 | - | 5 | 1.6 | 4.4 | - | - | | |
| | 19M518FR-MA | | | | | | | | | | | | | | | | | 17.5 | 16.4 | 0.5 | - | 5 | 1.8 | 4.4 | - | - | | |
| | 19M520FR-MA | | | | | | | | | | | | | | | | | 17.5 | 16.4 | 0.5 | - | 5 | 2.0 | 4.4 | - | - | | |
| | 19M530FR-MA | | | | | | | | | | | | | | | | | 17 | 16.4 | 0.7 | - | 5 | 3.0 | 4.4 | - | - | | |
| | 19M532FR-MA | | | | | | | | | | | | | | | | | 17 | 16.4 | 0.5 | - | 5 | 3.2 | 4.4 | - | - | | |
| | 19M540FR-MA | | | | | | | | | | | | | | | | | 16.5 | 16.4 | 0.5 | - | 5 | 4.0 | 4.4 | - | - | | |
| | 19M550FR-MA | | | | | | | | | | | | | | | | | 16 | 16.4 | 0.4 | - | 5 | 5.0 | 4.4 | - | - | | |
| | 250604FR-MA | | | | | | | | | | | | | | | | | 24.5 | 21.9 | 1.5 | - | 6.35 | 0.4 | 6.0 | - | - | | |
| | 250608FR-MA | | | | | | | | | | | | | | | | | 24.5 | 21.9 | 1.2 | - | 6.35 | 0.8 | 6.0 | - | - | | |
| | 250612FR-MA | | | | | | | | | | | | | | | | | 24.5 | 21.9 | 0.8 | - | 6.35 | 1.2 | 6.0 | - | - | | |
| | 250616FR-MA | | | | | | | | | | | | | | | | | 24.5 | 21.9 | 0.4 | - | 6.35 | 1.6 | 6.0 | - | - | | |
| | 250620FR-MA | | | | | | | | | | | | | | | | | 24 | 21.9 | 0.5 | - | 6.35 | 2.0 | 6.0 | - | - | | |
| | 250630FR-MA | | | | | | | | | | | | | | | | | 23.7 | 21.9 | 0.6 | - | 6.35 | 3.0 | 6.0 | - | - | | |
| | 250632FR-MA | | | | | | | | | | | | | | | | | 23.7 | 21.9 | 0.4 | - | 6.35 | 3.2 | 6.0 | - | - | | |
| 250640FR-MA | | | | | | | | | | | | | | | | | 22.8 | 21.9 | 1.2 | - | 6.35 | 4.0 | 6.0 | - | - | | | |
| 250650FR-MA | | | | | | | | | | | | | | | | | 22.7 | 21.9 | 0.4 | - | 6.35 | 5.0 | 6.0 | - | - | | | |

● : Stock item






| Workpiece | Steel | P | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | Machining types | ● Continuous cutting ● General cutting ● Interrupted cutting | | | | | | | | | |
|---------------------|--------------------------------------|--------|--------|--------|--------|----------|--------|-----------------|--------|--------|--------|--------|------|------|------------|-----------------|-----------------|--|-------|------|------|----------------|----------------|-----|---|---|----------------|
| | Stainless steel | M | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | Cast iron | K | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | Non-ferrous metal | N | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | Heat resistant alloy, Titanium alloy | S | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | Hardened steel | H | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | |
| Inserts | Designation | Coated | | | Cermet | Uncoated | | Dimensions (mm) | | | | | | | Geometries | Available tools | | | | | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6610 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | | H01 | G10 | ST30A | ST20 | l | l ₂ | l ₁ | d | t | r | d ₁ |
| ZDMT-R-MM | 080310R-MM | | | | ● | | | | | | | | | | | | | 8.4 | - | - | 6.73 | 3.2 | 10 | 2.8 | - | | E222 |
| | 110312.5R-MM | | | | ● | | | | | | | | | | | | | 10.6 | - | - | 8.5 | 3.65 | 12.5 | 2.8 | - | | |
| | 130416R-MM | | | | ● | | | | | | | | | | | | | 13.2 | - | - | 10.5 | 4.76 | 16 | 4.4 | - | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ZPET-MM Internal | 080M-MM | | | | | | | | | | | | | | | | | 16 | - | - | 8.0 | 3.5 | 8 | 2.9 | - | | E220 E221 |
| | 100M-MM | | | | ● | | | | | | | | | | | | | 19 | - | - | 10.4 | 4.5 | 10 | 3.4 | - | | |
| | 125M-MM | | | | ● | | | | | | | | | | | | | 24 | - | - | 12.9 | 5.3 | 12.5 | 4.5 | - | | |
| | 150M-MM | | | | ● | | | | | | | | | | | | | 28 | - | - | 15.4 | 7 | 15 | 5.6 | - | | |
| | 160M-MM | | | | ● | | | | | | | | | | | | | 28.5 | - | - | 16.4 | 7 | 16 | 5.6 | - | | |
| | 200M-MM | | | | ● | | | | | | | | | | | | | 38 | - | - | 20.7 | 8 | 20 | 6.6 | - | | |
| | 250M-MM | | | | | | | | | | | | | | | | | 48 | - | - | 25.9 | 9.5 | 25 | 8.6 | - | | |
| ZPET-MM External | 080S-MM | | | | | | | | | | | | | | | | | 15 | - | - | 6.6 | 3.1 | 8 | 2.9 | - | | E220 E221 |
| | 100S-MM | | | | ● | | | | | | | | | | | | | 15.5 | - | - | 8.4 | 3.8 | 10 | 3.4 | - | | |
| | 125S-MM | | | | ● | | | | | | | | | | | | | 20.5 | - | - | 10.7 | 4.5 | 12.5 | 4.5 | - | | |
| | 150S-MM | | | | ● | | | | | | | | | | | | | 25 | - | - | 12.4 | 6.5 | 15 | 5.6 | - | | |
| | 160S-MM | | | | ● | | | | | | | | | | | | | 26 | - | - | 13.4 | 6.5 | 16 | 5.6 | - | | |
| | 200S-MM | | | | ● | | | | | | | | | | | | | 32 | - | - | 16.7 | 7 | 20 | 6.6 | - | | |
| | 250S-MM | | | | | | | | | | | | | | | | | 40 | - | - | 20.7 | 8.5 | 25 | 8.6 | - | | |
| ZPMT-MM | 1504PPSR-MM | | | | ● | ● | | | | | | | | | | | | 15.9 | - | - | 12.7 | 4.76 | - | 5.6 | - | | E145 E206 |
| | 1505PPSR-MMN | | | | | | | | | | | | | | | | | 15.9 | - | - | 12.7 | 5.76 | - | 5.6 | - | | |
| ZPMT-R-MM | 160520R-MM | | | | ● | | | | | | | | | | | | | 16.1 | - | - | 12.7 | 5.56 | 20 | 5.6 | - | | E222 |
| | 160525R-MM | | | | ● | | | | | | | | | | | | | 16.9 | - | - | 12.7 | 5.56 | 25 | 5.6 | - | | |
| | 160531.5R-MM | | | | ● | | | | | | | | | | | | | 17.6 | - | - | 12.7 | 5.56 | 31.5 | 5.6 | - | | |
| ZPMT-R-MR | 160525R-MR | | | | | | | | | | | | | | | | | 17.6 | - | - | 12.7 | 5.56 | 25 | 5.6 | - | | E222 |

● : Stock item

| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page |
|--------------------------|--------------------------|---|---|----------|---|--|-------------|-------------|----------|---------|------------------|------------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | |
| Cutters for face milling | Mill-max | ADN(M) 4000/5000+ |  | 45° | Ø80~Ø315 | Excellent cutting edge strength and chip flow | ● | | | | | E34 E35 |
| | | AE(M) 4000/5000 |  | 45° | Ø80~Ø315 | Low cutting load and good machinability | ● | | | | | E36 E37 |
| | | EF(M) 4000 |  A0 | 75° | Ø80~Ø315 | High rake angle to prevents welding | ● | | | | | E38 |
| | | EN(M) 4000 |  | 75° | Ø80~Ø315 | Economical because double sided inserts applied | ● | | | | | E39 |
| | | EPN(M) 4000/5000+ |  | 75° | Ø80~Ø315 | Double posi rake angle and low cutting force | ● | | | | | E40 E41 |
| | | PF(M) 4000 |  A0 | 90° | Ø80~Ø315 | High rake angle and good machinability | ● | ● | ● | | | E42 |
| | | PPN(M) 4000 |  | 90° | Ø80~Ø315 | Double posi rake angle and low cutting force | ● | ● | ● | | | E43 |
| | Turbo Mill | ADS 4000/5000 |  | 45° | Ø50~Ø63 | Anti-vibration | ● | | | | | E44 E45 |
| | | PES 2000/3000/ 4000 |  | 90° | Ø20~Ø63 | High rake angle, Cutting efficiency | ● | ● | ● | | | E46 |
| | Double Mill | AFO(M)4000 |  | 45° | Ø80~Ø125 | High rake angle low cutting force Economical (8 corners available) | ● | | | | | E47 E48 |
| AFO(M)5000 | | Ø80~Ø315 | | | | | | | | | | |
| Power Buster | PBAC(M)5000 |  | 45° | Ø80~Ø315 | Double sided Insert High depth High Feed Roughing | ● | | | | | E52 | |
| | PBZC(M)5000 |  | 80° | Ø80~Ø315 | | ● | | | | | E53 | |
| Aero Mill | APD(M) A Type, B Type |  A0 | 90° | Ø80~Ø315 | Aluminum cutter body suitable for high speed machining. Both cemented carbides and PCD inserts are available, G2.5 balance possible | ● | | | | | E99 E100 | |





| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page |
|-------------------------|--|---|--------------|---|---|----------|--|-------------|----------|---------|--------------------------|------------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | |
| Aero Mill Mini | MAPDS <i>New</i> |  | 90° | Ø40~Ø63 | Available with small Machining center-Carbide, PCD insert Application-Balancing class G2.5 | ● | | | | | E101 | |
| | MAPD <i>New</i> |  | 90° | Ø32~Ø40 | | ● | | | | | E101 | |
| Rich Mill | RM8AC(M)4000 RMH8AC(M)4000 <i>New</i> |  | 45° | Ø50~Ø400 | 8 corners available Double sided insert for steel, cast iron, stainless steel, aluminum | ● | | | | | E65 E66 E67 E68 | |
| | RM8AC(M)5000 RMH8AC(M)5000 <i>New</i> | | | Ø80~Ø400 | | | | | | | E69 E70 E71 E72 | |
| | RM8EC(M)4000 RMH8EC(M)4000 <i>New</i> |  | 75° | Ø50~Ø400 | 8 corners available Double sided insert for steel, cast iron | ● | | | | | E69 E70 E71 E72 | |
| | RM8EC(M)5000 RM8HEC(M)5000 <i>New</i> | | | Ø80~Ø400 | | | | | | | E73 E74 | |
| | RM8QC(M)4000 RMH8QC(M)4000 |  | 88° | Ø63~Ø200 | 8 corners available Reduced cutting interruption at cast Iron | ● | | | | | E73 E74 | |
| | RM16AC(M) 6000/8000 |  | 45° | Ø63~Ø400 | 16 corners available. Wiper inserts can be applied for good surface finish Strong insert and powerful clamping | ● | | | | | E90 E91 | |
| | RMT8A(M) 4000/5000 |  | 45° | Ø80~Ø315 | | ● | | | | | E92 E93 | |
| | RMT8E(M) 4000/5000 |  | 75° | Ø80~Ø315 | Easy insert change and good machinability due to latch clamping system 8 corners available Excellent surface finish | ● | | | | | E94 E95 | |
| | RMT8Q(M) |  | 88° | Ø80~Ø315 | | ● | | | | | E96 | |
| | Cutters for molds | Rich Mill | RM4PC(M)3000 |  | 90° | Ø40~Ø100 | 4corners available. High rake angle insert reduces cutting force. Excellent insert rigidity. | ● | ● | ● | ● | E75 E76 |
| RM4PC(M)4000 | | | Ø50~Ø160 | | | | | | | | | |
| RM4ZCM3000 <i>New</i> | |  | 90° | Ø40~Ø52 | In vertical machining, the maximum cutting depth for RM4Z3000: 9.00mm, RM4Z4000: 14.0mm | ● | ● | ● | ● | E88 | | |
| RM4ZC(M)4000 <i>New</i> | | | | Ø63~Ø100 | | | | | | | | |

Cutters for face milling










Cutters for molds

Milling














E

| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page |
|-------------------|---|---|---|---|-----------------------|--|-------------|-------------|----------|--------------|------------------|----------------------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | |
| Cutters for molds | Alpha Mill | AMC(M) 1000S/1500S/ 2000S |  | 90° | Ø32~Ø100 | | • | • | • | • | • | E108 ~E109 |
| | | AMC(M) 3000S/3000S-K/ 4000S |  | 90° | Ø40~Ø200 | 3 dimensional shape and high rake angle lowers cutting load and ensures better chip evacuation. Inner coolant system for better chip control increases tool life. | • | • | • | • | • | E111 ~E113 |
| | | AMC(M) 1000SE 2000SE 3000SE |  | 75° | Ø40~Ø100 | Wide size range of inserts enlarges application range. Various types of Alpha Mills available for high depth of cut and high feed machining. | • | | | | | E114 E115 |
| | | AMC(M) 2000M 3000M 4000M |  | 90° | Ø50~Ø125 | | • | • | • | • | • | E116 E117 E118 |
| | Future Mill | FMAC(M)3000 |  | 45° | Ø50~Ø125 | Accurate inserts and cutter, Excellent chip flow | • | | | | | E162 E163 |
| | | | | | Ø50~Ø200 | | | | | | | |
| | | FMAC(M)3000A |  | 45° | Ø63~Ø125 | Excellent in high speed cutting and tapping center, low power machine due to light aluminum body | • | | | | | E164 E165 |
| | | | | | Ø63~Ø315 | | | | | | | |
| | | FMPC(M)3000 |  | 90° | Ø50~Ø100 | 4 corners available various inserts can be applied to machine for different types of workpiece | • | • | • | | | E168 E169 |
| | | | | | Ø63~Ø125 | | | | | | | |
| | | FMPC(M)3000A |  | 90° | Ø63~Ø100 | Excellent in high speed cutting and tapping center, low power machine due to light aluminum body | • | • | • | | | E170 E171 |
| | | | | | Ø63~Ø315 | | | | | | | |
| | FMRC(M)3000 |  | - | Ø40~Ø100 | 4~8 corners available | • | | | | | E174 E175 | |
| | | | | Ø50~Ø125 | | | | | | | | |
| FMRC(M)5000 |  | - | Ø50~Ø125 | Double contact faces between insert & seat part of cutter for stable clamping | • | | | | | E176 E177 | | |
| | | | Ø63~Ø160 | | | | | | | | | |


















| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page | |
|-------------------|-----------------------|---|---|---|---|--|--|--|----------|---------|------------------|-------------------|--------------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | | |
| Cutters for molds | HRM | HRMC(M)13 |  | 15° | Ø50~Ø80 | Powerful clamping by double clamping system 3 corners available high feed cutting with low cutting load | ● | ● | ● | ● | ● | E201 | |
| | | HRMC(M)15 | | | Ø63~Ø160 | | | | | | | | |
| | HRMD | HRMDC(M)09 |  | 14° | Ø40~Ø100 | Double side insert with 6 corner High feed cutting with strong simple screw-on clamp | ● | ● | ● | ● | ● | E191 ~ E193 | |
| | | HRMDC(M)13 | | | Ø50~Ø125 | | | | | | | | |
| | | HRMDC(M)16 <i>New</i> | | | Ø80~Ø315 | | | | | | | | |
| | BT/HSK Tooling System | BT30/40/50 |  | 90° | Ø10~Ø50 | BT/HSK one solid type has been accepted to increase the precision Inner coolant system can also make it possible to evacuate the chip effectively High feed and high depth | ● | ● | ● | ● | ● | E137 ~E138 | |
| | | | | | | | | | | | | | HSK63 |
| | | BT30/40/50 |  | 90° | Ø16~Ø100 | Alpha Mill, Rich Mill, FMR, Laser Mill, HRM(D), Pro-A, Pro-X Modular head M06~M16 applicable | ● | ● | ● | ● | ● | E142 ~E144 | |
| | | | | | | | | | | | | | HSK63/100 |
| | | BT30/40/50-MAT |  | 90° | Ø12~Ø40 | Alpha Mill, Rich Mill, FMR, Laser Mill, HRM(D), Pro-A, Pro-X Modular head M06~M16 applicable | ● | ● | ● | ● | ● | ● | E150 |
| | | | | | | | | | | | | | |
| | BT50 HAT4000 |  | 90° | Ø50~Ø80 | Head only replacement possible and higher efficiency by self assembly head | ● | ● | ● | ● | ● | ● | E145 | |
| | Cutters for aluminum | Pro-L Mill | PALC(M) <i>New</i> |  | 90° | Ø63 | High helix and high depth of cut High perpendicularity Low cutting load | ● | ● | ● | ● | ● | E237 |
| | | | Pro-A Mill | PAC(M) 4000 |  | 90° | Ø40~Ø100 | Buffed insert controls chip flow without built-up edge | ● | ● | ● | ● | ● |
| | | Pro-X Mill | PAXC(M)5000 |  | 90° | Ø40~Ø125 | Powerful clamping Excellent body rigidity for rectangular and curve machining | ● | ● | ● | ● | ● | E247 E248 |
| | PAXC(M)6000 | | Ø50~Ø125 | | | | | | | | | | |


















| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page |
|--------------------------------|-----------------------|------------------|---|---|---|--|-------------|--|----------|---------|------------------|--------------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | |
| High feed cutter for cast iron | High feed cutter | ANH 4000/5000 |  | 45° | Ø100~Ø450 | Excellent cutting strength Good chip flow | ● | | | | | E279 E280 |
| | | CDH 4000/5000 |  | 65° | Ø100~Ø450 | Double positive rake angle Minimized cutting load | ● | | | | | E281 E282 |
| | | DEH 5000 |  | 60° | Ø100~Ø450 | For aluminum & aluminum alloy. Hexagonal insert available. | ● | | | | | E283 |
| | | DPH 5000 |  | 60° | Ø100~Ø450 | Hexagonal insert available Economical cutter | ● | | | | | E284 |
| | | PNH 4000/5000 |  | 90° | Ø125~Ø450 | Wiper insert available Double negative rake angle Excellent surface finish | ● | | | | | E285 |
| | | PPH 4000 |  | 90° | Ø125~Ø450 | Square insert and wiper insert available Excellent surface finish | ● | | | | | E286 |
| | Shave Mill | SVM(M)4000 |  | 90° | Ø80~Ø315 | Exclusive adjusting device of cutting edge adjusts run-out easily. | ● | | | | | E287 |
| | Shave Mill Ultra | SVUM6000 |  | 90° | Ø80~Ø315 | Good rigidity and economical due to Screw on Simple type | ● | | | | | E288 |
| | | SVUM6000-B |  | 90° | Ø80~Ø315 | Easy to handle the run-out due to Korloy exclusive high toughness cutting edge special parts | ● | | | | | E289 |
| | Indexable side cutter | Tangential type | Full-side cutter | TAFCP |  | - | Ø100~Ø315 | Various cutting depth can be possible because of adjustable length control.22 Medium to Roughing based on strengthened edge | | ● | ● | |
| TAFCB | | | |  | - | Ø100~Ø315 | ● | | ● | ● | | E257 |
| Half-side cutter | | TAHCP |  | - | Ø100~Ø315 | | ● | | ● | | | E258 |
| | | TAHCB |  | - | Ø100~Ø315 | ● | ● | | ● | | | E258 |



| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page | |
|-----------------------|------------------|---|---|---|---|--|---|-------------|----------|---------|------------------|------------|------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | | |
| Indexable side cutter | Radial type | Full-side cutter | RAFCP |  | - | Ø100~Ø315 | Wide range of machining width with only one side cutter due to adjustable cutting edge height | ● | ● | | | | E259 |
| | | RAFCB |  | - | Ø100~Ø315 | ● | | ● | ● | | | E259 | |
| | Half-side cutter | RAHCP |  | - | Ø100~Ø315 | Suitable for medium and finishing in narrow width side cutting due to good chip evacuation by 3-dimensional chip breaker | ● | ● | | | | E260 | |
| | | RAHCB |  | - | Ø100~Ø315 | ● | ● | ● | | | E260 | | |
| Side cutter | Full-side cutter | FC |  | - | Ø80~Ø315 | Good chip evacuation with low cutting load Effective cutting | ● | ● | | | | E261 | |
| | Half-side cutter | HC |  | - | Ø100~Ø315 | Good chip evacuation with low cutting load Effective cutting | ● | ● | | | | E262 | |
| | - | SPP(M) |  | - | Ø80~Ø200 | Economical by using pentagonal insert Suitable for narrow & deep grooving | | | ● | | | E263 | |
| | | SPB(M) |  | - | Ø80~Ø200 | Economical by using pentagonal insert Suitable for narrow & deep grooving | | | ● | | | E264 | |
| | | SPS |  | - | Ø50~Ø200 | For narrow and deep width grooving | | | ● | | | E265 | |
| | Full-side cutter | RM4PFCB |  | - | Ø80~Ø160 | 4 corner usage with double-sided insert can be economical | | | ● | | | E77 E78 | |
| | | RM4PFCP |  | - | Ø80~Ø160 | | | | ● | | | E81 E82 | |
| | Half-side cutter | RM4PHCB |  | - | Ø80~Ø160 | 4 corner usage with double-sided insert can be economical | | | ● | | | E79 E80 | |
| | | RM4PHCP |  | - | Ø80~Ø160 | | | | ● | | | E83 E84 | |
| | Wind Mill | WFSB(M) <i>New</i> |  | - | Ø80~Ø250 | The nose R shape of insert ensures long tool life. | ● | ● | ● | | | E268 | |
| WFSP(M) <i>New</i> | |  | - | Ø80~Ø250 | Wide applications with various widths and corner R sizes. | ● | ● | | | | E269 | | |



| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page |
|--------------------------|---------------------------------|---|---|---------|---|--|-------------|-------------|----------|---------|----------------------|---------------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | |
| Cutters for face milling | Turbo Mill | ADS 4000/5000 |  | 45° | Ø50~Ø63 | Uneven insert spacing prevents chattering | ● | | | | | E44 E45 |
| | | PES 2000/3000/4000 |  | 90° | Ø20~Ø63 | Good machinability due to the high rake angle | ● | | ● | | | E46 |
| Cutters for molds | Rich Mill | RM4PS3000 |  | 90° | Ø14~Ø50 | 4 corners available High rake angle insert reduces cutting force Excellent insert rigidity | ● | | ● | ● | | E85 |
| | | RM4PS4000 | | | Ø32~Ø63 | | ● | | ● | ● | | E86 |
| | | RM4ZS3000 <i>New</i> |  | 90° | Ø25~Ø40 | In vertical machining, the maximum cutting width : 9.0mm | ● | | ● | ● | | E89 |
| | Alpha Mill | AMS 1000S/1500S 2000S/3000S 3000S-K/4000S |  | 90° | Ø10~Ø63 | The combination of a 3 dimensional curve design & high rake angle helps chip-evacuation effectively with a low cutting force | ● | | ● | ● | | E119 ~E126 |
| | | AMS 1000SE/2000SE 3000SE |  | 75° | Ø25~Ø63 | | ● | | | | | E127 E128 |
| | | AMS 1000M/1500M 2000M/4000M |  | 90° | Ø16~Ø50 | Inner coolant system The various range of inserts can provide the widened choice | ● | | ● | ● | | E129 E130 |
| | | AMS 1000MH/1500MH 2000MH/3000MH |  | 90° | Ø14~Ø40 | High depth and high feed can be available during operation | ● | | ● | ● | | E131 |
| | Future Mill | FMAS3000 |  | 45° | Ø25~Ø63 | For precision machining Excellent chip evacuation | ● | | | | | E166 E167 |
| | | FMAS4000 | | | Ø50~Ø63 | | | | | | | |
| | | FMPS3000 |  | 90° | Ø25~Ø63 | 4 corners available Strong cutting edge with low cutting load | ● | | | | | E172 E173 |
| | | FMPS4000 | | | Ø40~Ø63 | | | | | | | |
| | | FMRS 1000/1500/2000 2500/3000/4000 5000/6000 |  | - | Ø8~Ø63 | 2 touch clamping system, convenient insert change | ● | | ● | ● | | E178 ~183 |
| HRM | HRMS 08/10/13/15 |  | 15° | Ø20~Ø63 | Powerful clamping by double clamping system 3 corners available High feed cutting with low cutting load | ● | | ● | ● | | E202 E203 E204 | |
| HRMD | HRMDS 06 <i>New</i> 09/13 |  | 14° | Ø16~Ø63 | 6 corners available, High feed, multi-function, Only one screw can show comfortable application | ● | | ● | ● | | E195 ~198 | |
| Tank Mill | THE |  | 90° | Ø25~Ø50 | Right-hand helix angle employed for good chip evacuation. Special surface treatment prevents body breaking and improves rigidity. Strong cutting edge | ● | | | | | E206 | |
| Laser Mill | LBE□□ LRE□□ |  | - | Ø8~Ø32 | Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available | ● | | ● | | | E215 ~218 | |



| Type | Cutter | Designation | Shape | A.A | Diameter range | Features | Application | | | | | Page | |
|----------------------|---|---|---|--------|---|---|---|-------------|----------|---------|------------------|--------------|------|
| | | | | | | | Facing | Shouldering | Slotting | Copying | Ramping, Helical | | |
| Cutters for molds | Laser Mill | LBE□□-C LRE□□-C |  | - | Ø8~Ø32 | Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available Carbide shank | ● | ● | ● | | | E215 E217 | |
| | Mach Mill | BFE |  | - | Ø16~Ø32 | Upgraded cutting performance with S type curve design V clamping application | ● | ● | ● | ● | | E219 | |
| | | GBE |  | - | Ø16~Ø50 | Helical design of edge can reduce the force during operation Safe application to prevent rotation guarantee the increased tool life | ● | ● | ● | ● | | E220 | |
| | | BRE |  | - | Ø20~Ø63 | Flute type chip-pocket can make chip-evacuation Customized edge design can prevent the breakage of holder's body | ● | ● | ● | ● | | E222 | |
| | O-Ring Cutter | ORC  |  | 90° | Ø11~Ø46 | For grooving the seat of an O-Ring in a plastic mold Superior surface roughness and cutting performance compared to HSS and brazed tool | - | - | - | - | - | E224 | |
| | Chamfer tool | CE |  | 75° | Ø25~Ø30 | For Back & Front high quality chamfering and various Chamfering angle machining | - | - | - | - | - | E228 | |
| | | | | 60° | Ø25~Ø35 | | - | - | - | - | - | E229 | |
| | | | | 45° | Ø7~Ø39 | | - | - | - | - | - | E230 | |
| | | | | 30° | Ø25~Ø42 | | - | - | - | - | - | E231 | |
| | | CCT  |  | 30° | Ø3~Ø16 | Centering, Countersinking, Chamfering | - | - | - | - | - | E232 | |
| | | | | 45° | | | Ø5~Ø48 | - | - | - | - | E233 | |
| | CET  |  | 45° | Ø4~Ø16 | Countersinking, Chamfering, Shouldering | - | - | - | - | - | E231 | | |
| | | | 60° | | | - | - | - | - | - | E233 | | |
| | T-Cutter | TFE |  | 90° | Ø21~Ø50 | For slotting | ● | ● | ● | ● | ● | E233 | |
| Cutters for aluminum | Pro-L Mill | PALS-HR  |  | Aℓ | 90° | Ø32~Ø63 | High helix and high depth of cut High perpendicularity Low cutting load | ● | ● | ● | ● | ● | E238 |
| | | PALS-HM  | | | | | | | | | | | Ø63 |
| | Pro-A Mill | PAS 2000/4000 |  | Aℓ | 90° | Ø12~Ø42 Ø32~Ø40 | Polished face increases chip flow and reduces built-up edge | ● | ● | ● | ● | ● | E245 |
| | | PAXS 5000/6000 |  | Aℓ | 90° | Ø20~Ø40 Ø25~Ø40 | Square shoulder and conter machining | ● | ● | ● | ● | ● | E249 |
| Thread milling | - | TM |  | - | Ø32~Ø50 | For internal and external threading | ● | | | | | D49 | |



FMRM type

 E184



LBE-MHD type

 E218



PAM type

 E246



AMM type

 E132



RM4PM type

 E87



RM4ZM type

 E89



HRMM type

 E205



HRMDM type

 E199



PAXM type

 E251



Steel Shank type

 E253



Carbide Shank type

 E254



BT Arbors type

 E150



HSK Arbors type

 E151



ADN(M) 4000

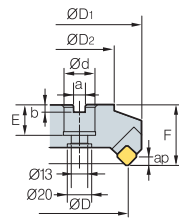


Fig. 1

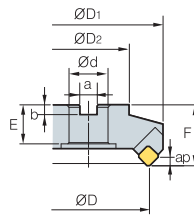


Fig. 2

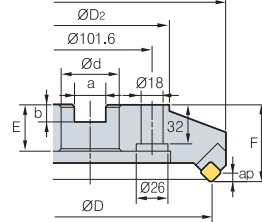


Fig. 3

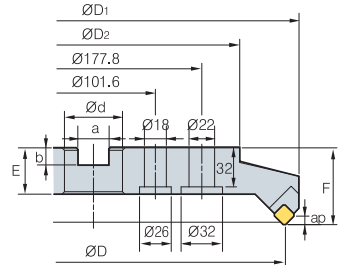


Fig. 4



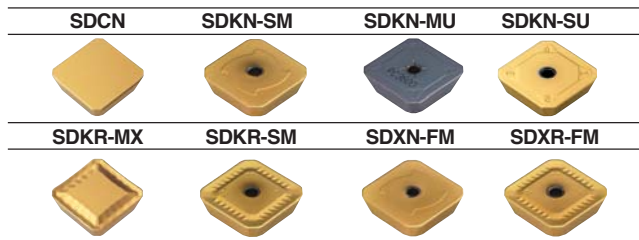
AA
45°
• AR : 15°
• RR : -4°

(mm)

| Designation | | øD | øD ₁ | øD ₂ | ød | a | b | E | F | ap | kg | Fig. |
|----------------|----|-----|-----------------|-----------------|------------|------------|--------|--------|----|----|------|------|
| ADN(M) 4080R/L | 4 | 80 | 105 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 6 | 1.9 | 1 |
| 4100R/L | 5 | 100 | 125 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 6 | 2.5 | 2 |
| 4125R/L | 6 | 125 | 149 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 6 | 4.3 | 2 |
| 4160R/L | 8 | 160 | 183 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 6 | 6.4 | 2 |
| 4200R/L | 10 | 200 | 223 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 8.7 | 3 |
| 4250R/L | 12 | 250 | 273 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 14.0 | 3 |
| 4315R/L | 14 | 315 | 338 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 21.0 | 4 |

() Metric Size

Available Inserts



| Designation | Coated | | | | | | | | Cermet | | Uncoated | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|-----|------|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC5300 | PC3545 | PC9530 | PC215K | PC2000 | CN20 | HN1 | | G10 | ST30A |
| SDCN 42M | | | | | | | | | | | | | | | |
| 42M-G | | | | | | | | | | | | | | | |
| 42MT | | | | | | | | | | | | | | | |
| 42MT-RH | | | | | | | | | | | | | | | |
| 42MT-S20 | | | | | | | | | | | | | | | |
| 1203AEEN | | | | | | | | | | | | | | | |
| 1203AEEN-RH | | | | | | | | | | | | | | | |
| 1203AESN | | | | | | | | | | | | | | | |
| 1203AESN-RH | | | | | | | | | | | | | | | |
| SDKN 1203AESN-SM | | | | | | | | | | | | | | | |
| 1203AEEN-SM | | | | | | | | | | | | | | | |
| 1203AESN-MU | | | | | | | | | | | | | | | |
| 1203AESN-SU | | | | | | | | | | | | | | | |
| SDKR 1203AESN-MX | | | | | | | | | | | | | | | |
| 1203AETN-MX | | | | | | | | | | | | | | | |
| 1203AEN-MX | | | | | | | | | | | | | | | |
| 1203AEN-SM | | | | | | | | | | | | | | | |
| SDXN 1203AESN-FM | | | | | | | | | | | | | | | |
| 1203AEEN-FM | | | | | | | | | | | | | | | |
| SDXR 1203AESN-FM | | | | | | | | | | | | | | | |

Available Arbors

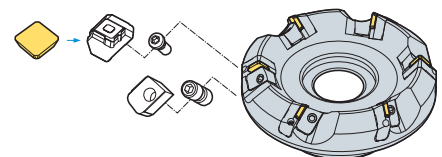
| Designation | General Arbor | NC Arbors | |
|---------------|------------------------------------|----------------------|-------|
| | | ADN | ADNM |
| ADN(M)4080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□-FMA25.4 -□□ | FMC27 |
| 4100R/L | NT*□□ (M/U)-FMA31.75 -□□ | BT**□□-FMA31.75 -□□ | FMC32 |
| 4125R/L | NT*□□ (M/U)-FMA38.1 -□□ | BT**□□-FMA38.1 -□□ | FMB40 |
| 4160R/L | NT*□□ (M/U)-FMA50.8 -□□ | BT**□□-FMA50.8 -□□ | FMB40 |
| 4200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625 -□□ | FMB60 |
| 4250R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625 -□□ | FMB60 |
| 4315R/L | KCP-8*** (Center Ring Plug) | | |

*□□-NT Number **□□-BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling



Parts



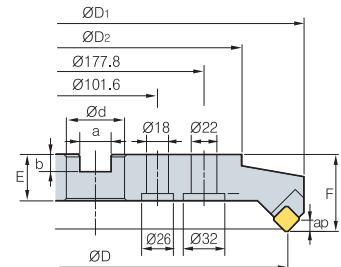
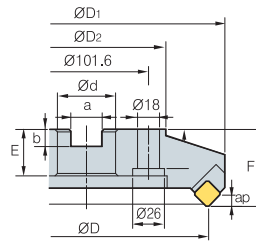
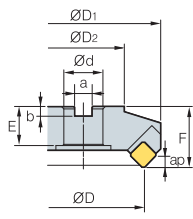
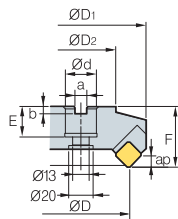
LADN4R/L WEPN4R/L DHA0821F LTX0514 HW40

Available Inserts E13, E14

Available Arbors and bolt E290~E292

• : Stock item

ADN(M) 5000+



AA
45°

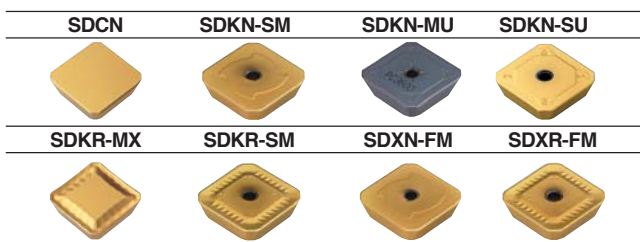
• AR : 15°
• RR : -4°

(mm)

| Designation | | ØD | ØD1 | ØD2 | Ød | a | b | E | F | ap | | Fig. |
|-----------------|----|-----|-----|-----|------------|------------|--------|--------|----|----|------|------|
| ADN(M) 5080R/L+ | 4 | 80 | 107 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 8 | 2.0 | 1 |
| 5100R/L+ | 5 | 100 | 126 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 8 | 2.7 | 2 |
| 5125R/L+ | 6 | 125 | 150 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 8 | 4.3 | 2 |
| 5160R/L+ | 8 | 160 | 185 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 8 | 6.5 | 2 |
| 5200R/L+ | 10 | 200 | 225 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 9.1 | 3 |
| 5250R/L+ | 12 | 250 | 275 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 14.5 | 3 |
| 5315R/L+ | 14 | 315 | 340 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 21.0 | 4 |

• () Metric Size

Available Inserts



| Designation | Coated | | | | | | | | | | Cermet | | Uncoated | | page | | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|
| | NCM325 | NCM635 | NC5330 | PC3500 | PC3600 | PC5300 | PC3545 | PC9530 | PC8510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A |
| SDCN 53M | | | | | | | | | | | | | | | | | | |
| 53M-G | | | | | | | | | | | | | | | | | | |
| 53MT | • | • | | | | | | | | | | • | • | | | | | • |
| 53MT-RH | | | • | | | | | | | | | | | | | | | |
| 53MT-S20 | | | | | | • | | | | | | | | | | | | |
| 1504AEEN | | | | | | | | | | | | | | | | | | |
| 1504AEEN-RH | | | | | | • | | | • | | | | | | | | | |
| 1504AESN | | | | | | | | | | | | | | | | | | |
| 1504AESN-RH | | | | | | | | | | | | | | | | | | |
| SDKN 1504AESN-SM | | | | | | | | | | | | | | | | | | |
| 1504AEEN-SM | | | | | | | | | | | | | | | | | | |
| 1504AESN-MU | | | | | | • | | | | | | | | | | | | |
| 1504AESN-SU | | | | | | • | • | | | | | | | | | | | |
| SDKR 1504AESN-MX | • | | | | | | | | | | | | | | | | | |
| 1504AETN-MX | | | | | | | | | | | | | | | | | | |
| 1504AEN-MX | • | | | | | | | | | | | | | | | | | |
| 1504AESN-SM | | | | | | | | | | | | | | | | | | |
| SDXN 1504AESN-FM | | | | | | | | | | | | | | | | | | |
| 1504AEEN-FM | | | | | | | | | | | | | | | | | | |
| SDXR 1504AESN-FM | | | | | | | | | | | | | | | | | | |

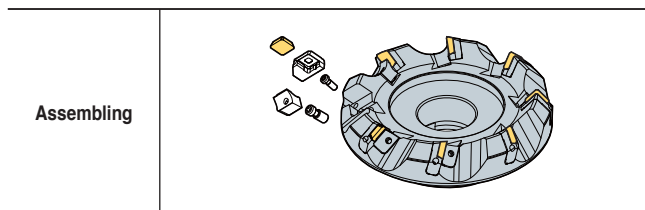
Available Arbors

| Designation | General Arbor | NC Arbors | |
|---------------|------------------------------------|-----------------------|-------|
| | | ADN | ADNM |
| ADN(M)5080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□ -FMA25.4 -□□ | FMC27 |
| 5100R/L | NT*□□ (M/U)-FMA31.75 -□□ | BT**□□ -FMA31.75 -□□ | FMC32 |
| 5125R/L | NT*□□ (M/U)-FMA38.1 -□□ | BT**□□ -FMA38.1 -□□ | FMB40 |
| 5160R/L | NT*□□ (M/U)-FMA50.8 -□□ | BT**□□ -FMA50.8 -□□ | FMB40 |
| 5200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 -□□ | FMB60 |
| 5250R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 -□□ | FMB60 |
| 5315R/L | KCP-8*** (Center Ring Plug) | | |

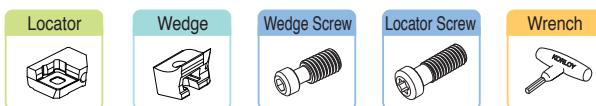
*□□ -NT Number **□□ -BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 |
| K | 50 ~ 120 | 0.05 ~ 0.20 | ST30A |
| | 150 ~ 250 | 0.05 ~ 0.30 | |
| | 100 ~ 200 | 0.05 ~ 0.30 | G10 |



Parts



LADN5R/L WHPS5R/L WHX0817 LTX0514 HW40

Available Inserts E13, E14 Available Arbors and bolt E290~E292

• : Stock item

AE(M) 4000

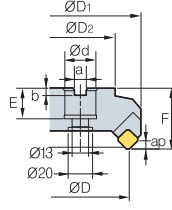


Fig. 1

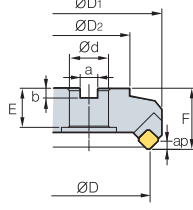


Fig. 2

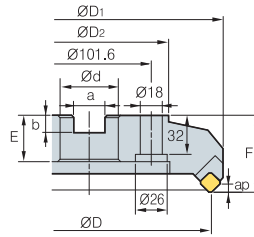


Fig. 3

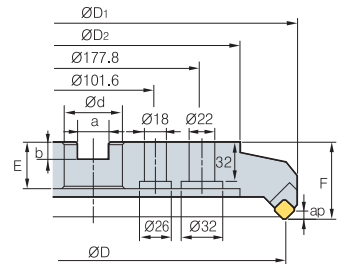


Fig. 4



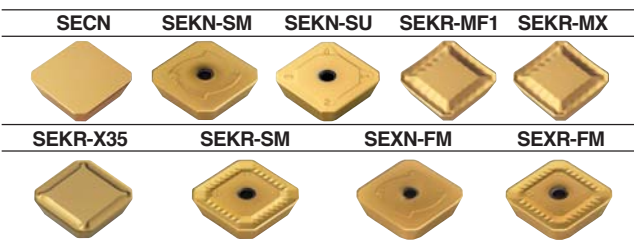
AA
45°
• AR : 20°
• RR : -3°

(mm)

| Designation | | ØD | ØD1 | ØD2 | Ød | a | b | E | F | ap | kg | Fig. | |
|-------------|---------|----|-----|-----|-----|------------|------------|----------|--------|----|-----|------|---|
| AE(M) | 4080R/L | 4 | 80 | 103 | 60 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 5.5 | 1.7 | 1 |
| | 4100R/L | 5 | 100 | 122 | 80 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 5.5 | 2.9 | 2 |
| | 4125R/L | 6 | 125 | 146 | 100 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 5.5 | 4.4 | 2 |
| | 4160R/L | 8 | 160 | 181 | 120 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 5.5 | 6.1 | 2 |
| | 4200R/L | 10 | 200 | 220 | 130 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 5.5 | 8.9 | 3 |
| | 4250R/L | 12 | 250 | 270 | 180 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 5.5 | 15.7 | 3 |
| | 4315R/L | 15 | 315 | 335 | 240 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 5.5 | 25.1 | 4 |

() Metric Size

Available Inserts



| Designation | Coated | | | | | | | | | | Cermet | | Uncoated | | page |
|-------------------|--------|-------|--------|--------|--------|--------|--------|--------|--------|------|--------|-----|----------|-------|------|
| | NCM25 | NCM35 | PC3500 | PC3500 | PC3545 | PC9530 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| SECN 1203AFFN | | | | | | | | | | | | | | | |
| 1203AFTN | | | | | | | | | | | | | | | |
| 1203AFEN | | | | | | | | | | | | | | | |
| 1203AFSN | • | • | | | | | | | | | | | | | |
| 1203AFEN-RH | | | | • | | | • | | | | | | | | |
| 1203AFSN-RH | | | | | | | | | | | | | | | |
| 1203AFTN-S20 | | | | | | | • | | | | | | | | |
| SEKN 1203AFSN-SM | | | | | | | | | | | | | | | |
| 1203AFEN-SM | | | | | | | | | | | | | | | |
| 1203AFSN-SU | | | | • | • | | | | | | | | | | |
| SEKR 1203AFSN-MF1 | | | | | | | | | | | | | | | |
| 1203AFSN-MX | • | • | | | | • | | | | | | • | | | |
| 1203AFSN-X35 | | | | | | | | | | | | | | | |
| 1203AFFN-X35 | | | | | | | | | | | | | | | |
| 1203AFSN-SM | | | | | | | | | | | | | | | |
| SEKN 1203AFSN-FM | | | | • | | | | | | | | | | | |
| 1203AFEN-FM | | | | | | | | | | | | | | | |
| SEXR 1203AFSN-FM | | | | | • | | | | | | | | | | |

Available Arbors

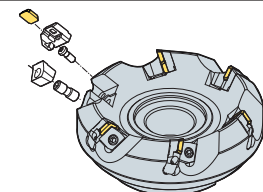
| Designation | General Arbor | NC Arbors | |
|--------------|------------------------------------|------------------------|-------|
| | | AE | AEM |
| AE(M)4080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□ -FMA25.4 - □□ | FMC27 |
| 4100R/L | NT*□□ (M/U)-FMA31.75 - □□ | BT**□□ -FMA31.75 - □□ | FMC32 |
| 4125R/L | NT*□□ (M/U)-FMA38.1 - □□ | BT**□□ -FMA38.1 - □□ | FMB40 |
| 4160R/L | NT*□□ (M/U)-FMA50.8 - □□ | BT**□□ -FMA50.8 - □□ | FMB40 |
| 4200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 - □□ | FMB60 |
| 4250R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 - □□ | FMB60 |
| 4315R/L | KCP-8*** (Center Ring Plug) | | |

*□□ -NT Number **□□ -BT Number ***Over Milling 5

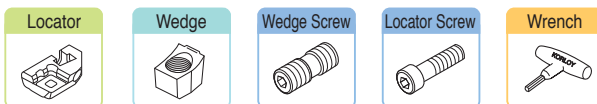
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling

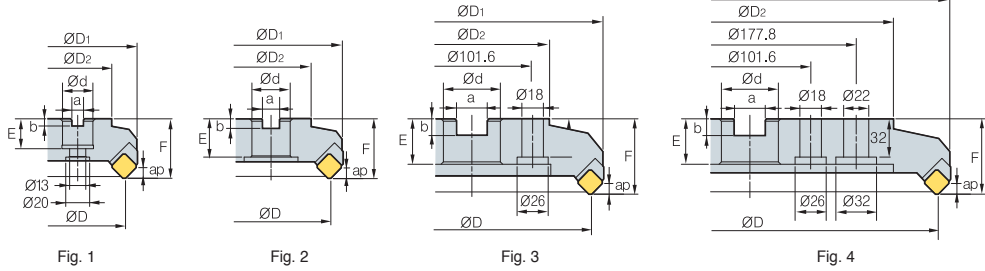


Parts



LAE4R/L WAE4R/L DHA0821F LTX0512 HW40

AE(M)5000

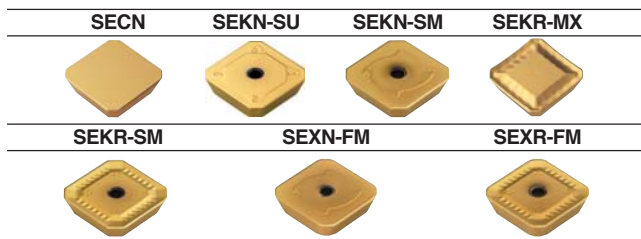


AA
45°
• AR : 20°
• RR : -3°

| Designation | | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | kg | Fig. | |
|-------------|---------|----|-----------------|-----------------|-----|------------|------------|----------|--------|----|-----|------|---|
| AE(M) | 5080R/L | 4 | 80 | 103 | 60 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 7.5 | 1.7 | 1 |
| | 5100R/L | 5 | 100 | 122 | 80 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 7.5 | 2.9 | 2 |
| | 5125R/L | 6 | 125 | 146 | 100 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 7.5 | 4.4 | 2 |
| | 5160R/L | 8 | 160 | 181 | 120 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 7.5 | 6.1 | 2 |
| | 5200R/L | 10 | 200 | 220 | 130 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 7.5 | 8.9 | 3 |
| | 5250R/L | 12 | 250 | 270 | 180 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 7.5 | 15.7 | 3 |
| | 5315R/L | 15 | 315 | 335 | 240 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 7.5 | 25.1 | 4 |

() Metric Size

Available Inserts



| Designation | Coated | | | | | | | Cermet | | Uncoated | | page | | | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|------|------|------|-----|-----|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5800 | PC5300 | PC3545 | PC9530 | PC215K | PD2000 | CN2000 | | CN20 | CN30 | H01 | G10 |
| SECN 1504AFFN | | | | | | | | | | | | | | | | |
| 1504AFTN | | | | | | | | | | | | | | | | |
| 1504AFEN | | | | | | | | | | | | | | | | |
| 1504AFSN | • | • | | | | | | | | | | | | | | |
| 1504AFEN-RH | | | | | | | | | | | | | | | | |
| 1504AFSN-RH | | | | | | | | | | | | | | | | |
| 1504AFTN-S20 | | | | | | | | | | | | | | | | |
| SEKN 1504AFSN-SM | | | | | | | | | | | | | | | | |
| 1504AFEN-SM | | | | | | | | | | | | | | | | |
| 1504AFSN-SU | | | | | | | | | | | | | | | | |
| SEKR 1504AFSN-MX | • | • | | | | | | | | | | | | | | |
| 1504AFSN-SM | | | | | | | | | | | | | | | | |
| SEKN 1504AFSN-FM | | | | | | | | | | | | | | | | |
| 1504AFEN-FM | | | | | | | | | | | | | | | | |
| SEXR 1504AFSN-FM | | | | | | | | | | | | | | | | |

Available Arbors

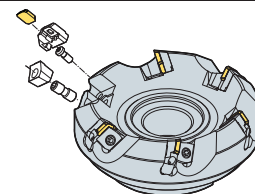
| Designation | General Arbor | NC Arbors | |
|--------------|-----------------------------------|---------------------|-------|
| | | AE | AEM |
| AE(M)5080R/L | NT*□□(M/U)-FMA25.4-25 | BT**□□-FMA25.4-□□ | FMC27 |
| 5100R/L | NT*□□(M/U)-FMA31.75-□□ | BT**□□-FMA31.75-□□ | FMC32 |
| 5125R/L | NT*□□(M/U)-FMA38.1-□□ | BT**□□-FMA38.1-□□ | FMB40 |
| 5160R/L | NT*□□(M/U)-FMA50.8-□□ | BT**□□-FMA50.8-□□ | FMB40 |
| 5200R/L | NT*□□(M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625-□□ | FMB60 |
| 5250R/L | NT*□□(M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625-□□ | FMB60 |
| 5315R/L | KCP-8*** (Center Ring Plug) | | |

*□□-NT Number **□□-BT Number ***Over Milling 5

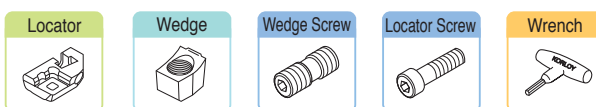
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|--------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 |
| | 120 ~ 230 | 0.05 ~ 0.20 | PC3500 |
| | 100 ~ 200 | 0.05 ~ 0.20 | ST30A |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 |
| | 50 ~ 120 | 0.05 ~ 0.20 | ST30A |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 |
| | 100 ~ 200 | 0.05 ~ 0.30 | G10 |

Assembling

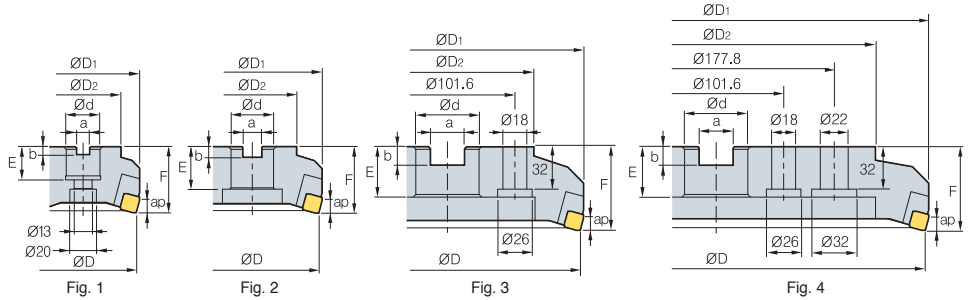


Parts



LAE5R/L WAE5R/L DHA0821F LTX0512 HW40

EF(M)4000



| Designation | | ⊙ | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | kg | Fig. |
|-------------|---------|----|-----|-----------------|-----------------|------------|------------|----------|--------|----|-----|------|------|
| EF(M) | 4080R/L | 4 | 80 | 89 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 8.0 | 1.5 | 1 |
| | 4100R/L | 5 | 100 | 108 | 70 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 8.0 | 2.1 | 2 |
| | 4125R/L | 6 | 125 | 133 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 8.0 | 3.8 | 2 |
| | 4160R/L | 8 | 160 | 168 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 8.0 | 5.5 | 2 |
| | 4200R/L | 10 | 200 | 208 | 130 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 8.0 | 8.2 | 3 |
| | 4250R/L | 12 | 250 | 257 | 180 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 8.0 | 13.4 | 3 |
| | 4315R/L | 16 | 315 | 322 | 240 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 8.0 | 21.2 | 4 |

() Metric Size

Available Inserts

| Designation | SFCN | | | | | | | | | | page | | | | | |
|--------------|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|------|-----|-----|-------|------|-----|
| | Coated | | | | | Cermet | Uncoated | | | | | | | | | |
| SFCN 1203EFR | NCM925 | NCM335 | NC5330 | PC3500 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN30 | H01 | G10 | ST30A | ST20 | E17 |

Available Arbors

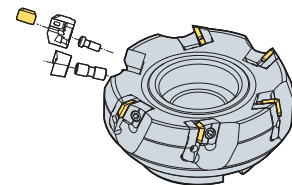
| Designation | General Arbor | NC Arbors | |
|--------------|------------------------------------|----------------------|-------|
| | | EF | EFM |
| EF(M)4080R/L | NT*□□ (M/U)-FMA25.4-25 -□□ | BT**□□-FMA25.4 -□□ | FMC27 |
| 4100R/L | NT*□□ (M/U)-FMA31.75 -□□ | BT**□□-FMA31.75 -□□ | FMC32 |
| 4125R/L | NT*□□ (M/U)-FMA38.1 -□□ | BT**□□-FMA38.1 -□□ | FMB40 |
| 4160R/L | NT*□□ (M/U)-FMA50.8 -□□ | BT**□□-FMA50.8 -□□ | FMB40 |
| 4200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625 -□□ | FMB60 |
| 4250R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625 -□□ | FMB60 |
| 4315R/L | KCP-8*** (Center Ring Plug) | | |

*□□-NT Number **□□-BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|--------|
| | vc(m/min) | fz(mm/t) | |
| K | 400 ~ 500 | 0.05 ~ 0.20 | H01 |

Assembling



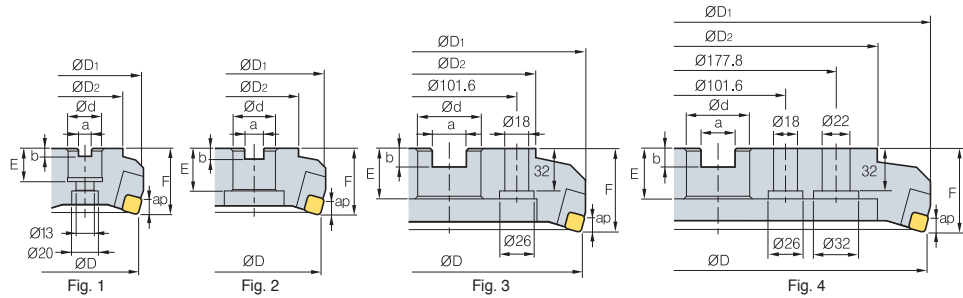
Parts



LEF4R/L
LEF4R1*L1* WEFR/L DHA0821F LTX0512 HW40

* : Ø80 ~ Ø125

EN(M) 4000



(mm)

| Designation | | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | | Fig. |
|---------------|----|-----|-----------------|-----------------|------------|------------|----------|--------|----|-----|------|------|
| EN(M) 4080R/L | 5 | 80 | 87 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 8.5 | 1.4 | 1 |
| 4100R/L | 6 | 100 | 107 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 8.5 | 2.1 | 2 |
| 4125R/L | 8 | 125 | 132 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 8.5 | 3.8 | 2 |
| 4160R/L | 10 | 160 | 167 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 8.5 | 5.7 | 2 |
| 4200R/L | 12 | 200 | 207 | 130 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 8.5 | 8.4 | 3 |
| 4250R/L | 16 | 250 | 257 | 180 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 8.5 | 13.8 | 3 |
| 4315R/L | 20 | 315 | 322 | 240 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 8.5 | 21.6 | 4 |

() Metric Size

Available Inserts

| Designation | SNCN | | | | SNKN | | | | page |
|--------------|--------|--|--|---|--------|----------|---|---|------|
| | Coated | | | | Cermet | Uncoated | | | |
| SNCN 1204ENN | ● | | | | | | ● | ● | E17 |
| SNKN 1204ENN | | | | ● | | | | | E19 |

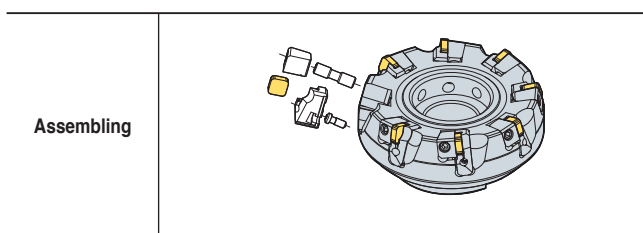
Available Arbors

| Designation | General Arbor | NC Arbors | |
|---------------|---|--|-------|
| | | EN | ENM |
| EN(M) 4080R/L | NT* <input type="checkbox"/> (M/U)-FMA25.4-25- <input type="checkbox"/> | BT** <input type="checkbox"/> -FMA25.4- <input type="checkbox"/> | FMC27 |
| 4100R/L | NT* <input type="checkbox"/> (M/U)-FMA31.75- <input type="checkbox"/> | BT** <input type="checkbox"/> -FMA31.75- <input type="checkbox"/> | FMC32 |
| 4125R/L | NT* <input type="checkbox"/> (M/U)-FMA38.1- <input type="checkbox"/> | BT** <input type="checkbox"/> -FMA38.1- <input type="checkbox"/> | FMB40 |
| 4160R/L | NT* <input type="checkbox"/> (M/U)-FMA50.8- <input type="checkbox"/> | BT** <input type="checkbox"/> -FMA50.8- <input type="checkbox"/> | FMB40 |
| 4200R/L | NT* <input type="checkbox"/> (M/U)-FMA47.625-25, KCP-8*** | BT** <input type="checkbox"/> -FMA47.625- <input type="checkbox"/> | FMB60 |
| 4250R/L | NT* <input type="checkbox"/> (M/U)-FMA47.625-25, KCP-8*** | BT** <input type="checkbox"/> -FMA47.625- <input type="checkbox"/> | FMB60 |
| 4315R/L | KCP-8*** (Center Ring Plug) | | |

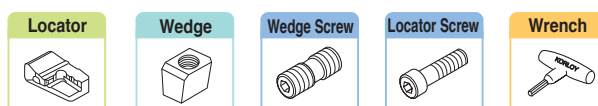
* -NT Number ** -BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |



Parts

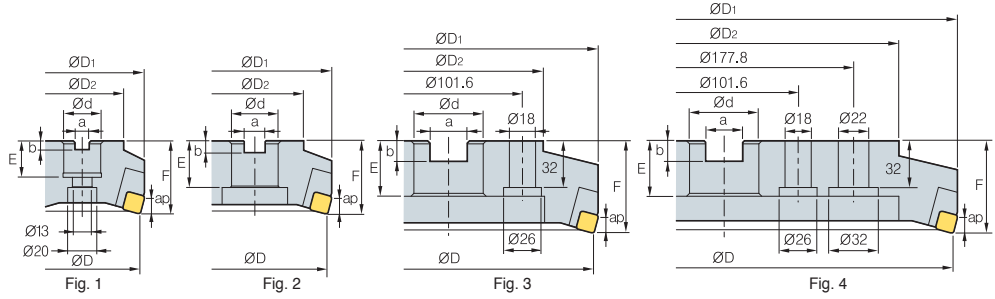


LEN4R/L WENR/L DHA0830 LTX0512 HW40
WENR1*/L1* DHA0825*

* : Ø80 ~ Ø100



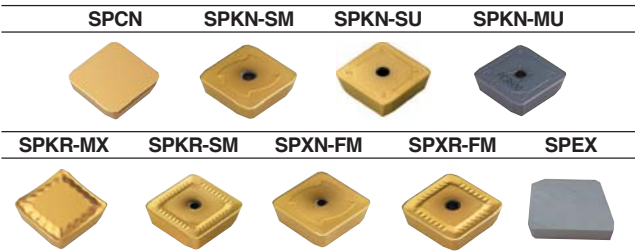
EPN(M)4000



| Designation | | | øD | øD ₁ | øD ₂ | ød | a | b | E | F | ap | | Fig. |
|-------------|---------|----|-----|-----------------|-----------------|------------|------------|--------|--------|----|----|------|------|
| EPN(M) | 4080R/L | 5 | 80 | 86 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 9 | 1.4 | 1 |
| | 4100R/L | 6 | 100 | 107 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 9 | 2.1 | 2 |
| | 4125R/L | 8 | 125 | 132 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 9 | 3.8 | 2 |
| | 4160R/L | 10 | 160 | 166 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 9 | 5.7 | 2 |
| | 4200R/L | 12 | 200 | 206 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 9 | 8.2 | 3 |
| | 4250R/L | 16 | 250 | 256 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 9 | 13.5 | 3 |
| | 4315R/L | 20 | 315 | 321 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 9 | 21.1 | 4 |

(mm)
• () Metric Size

Available Inserts



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|------|-------|
| | NCM325 | NCM335 | PC3500 | PC3600 | PC3530 | PC3545 | PC9530 | PC6510 | PC8110 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| SPCN 1203EDR | ● | ● | | | | | | | | | | | ● | ● | ● | ● | ● |
| 1203EDL | ● | ● | | | | | | | | | | | | | | | |
| 1203EDR-G | | | | | | | | | | | | | | | | | |
| 1203EDER-RH | | | | | | | ● | | | | | | | | | | |
| 1203EDSR-RH | | | | | | | | ● | | | | | | | | | |
| 1203EDTR-RH | | | | ● | | | | | | | | | | | | | |
| 1203EDR-S20 | | | | | | | | | | | | | | | | | |
| SPKN 1203EDSR-SM | | | | | | | | | | | | | | | | | |
| 1203EDER-SM | | | | | | | | | | | | | | | | | |
| 1203EDER-MU | | | | | | | | | | | | | | | | | |
| 1203EDSR-SU | | | | ● | ● | ● | | | | | | | | | | | |
| 1203EDSL-SU | | | | ● | | | | | | | | | | | | | |
| SPKR 1203EDSR-MX | ● | ● | | ● | | | | | | | | | | | | | |
| 1203EDSL-MX | ● | | | | | | | | | | | | | | | | |
| 1203EDSR-SM | | | | | | | | | | | | | | | | | |
| SPXN 1203EDSR-FM | | | | ● | | | ● | | | | | | | | | | |
| 1203EDER-FM | | | | | | | | | | | | | | | | | |
| SPXR 1203EDSR-FM | | | | | | | | | | | | | | | | | |
| SPEX 1203EDR/L-1 | | | | | | | | | | | | | | | | | |

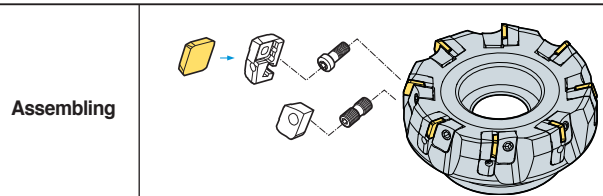
Available Arbors

| Designation | General Arbor | NC Arbors | |
|----------------|------------------------------------|-----------------------|-------|
| | | EPN | EPNM |
| EPN(M) 4080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□ -FMA25.4 -□□ | FMC27 |
| 4100R/L | NT*□□ (M/U)-FMA31.75 -□□ | BT**□□ -FMA31.75 -□□ | FMC32 |
| 4125R/L | NT*□□ (M/U)-FMA38.1 -□□ | BT**□□ -FMA38.1 -□□ | FMB40 |
| 4160R/L | NT*□□ (M/U)-FMA50.8 -□□ | BT**□□ -FMA50.8 -□□ | FMB40 |
| 4200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 -□□ | FMB60 |
| 4250R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 -□□ | FMB60 |
| 4315R/L | KCP-8*** (Center Ring Plug) | | |

*□□ -NT Number **□□ -BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |



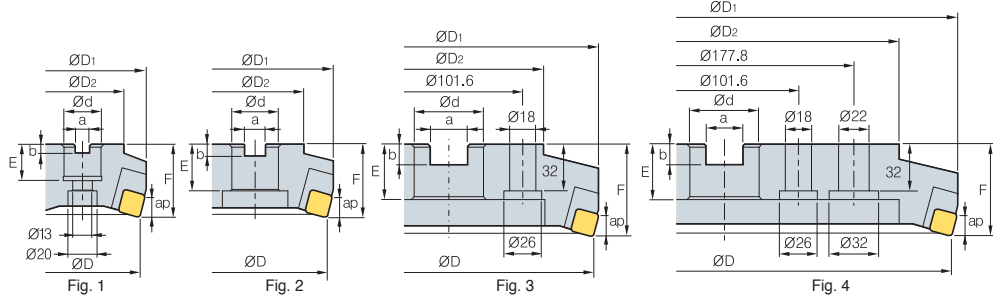
Parts



LEPN4R/L
LEPN4R1*/L1* WEPN4R/L DHA0821F
DHA0817F* LTX0514 HW40

* : ø80 ~ ø100

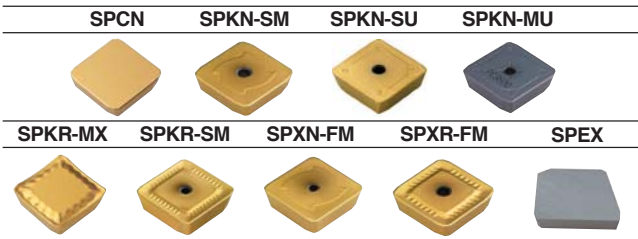
EPN(M)5000+



| Designation | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | kg | Fig. | |
|-----------------------------|----|-----------------|-----------------|-----|------------|------------|--------|--------|----|----|------|---|
| EPN(M) 5080R/L ⁺ | 5 | 80 | 91 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 12 | 1.5 | 1 |
| 5100R/L ⁺ | 6 | 100 | 110 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 12 | 2.1 | 2 |
| 5125R/L ⁺ | 8 | 125 | 134 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 12 | 3.9 | 2 |
| 5160R/L ⁺ | 10 | 160 | 169 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 12 | 5.7 | 2 |
| 5200R/L ⁺ | 12 | 200 | 209 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 8.4 | 3 |
| 5250R/L ⁺ | 16 | 250 | 259 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 13.6 | 3 |
| 5315R/L ⁺ | 20 | 315 | 324 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 21.6 | 4 |

() Metric Size

Available Inserts



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3800 | PC3945 | PC9530 | PC6510 | PC8110 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SPCN 150412T | | | | | | | | | | | | | | | | | | |
| 1504EDR | ● | | | | | | | | | | | | | | | | | |
| 1504EDSR | ● | | | | | | | | | | | | | | | | | |
| 1504EDL | | | | | | | | | | | | | | | | | | |
| 1504EDR-G | | | | | | | | | | | | | | | | | | |
| 1504EDER-RH | | | | | | | | | | | | | | | | | | |
| 1504EDSR-RH | | | | | | | | | | | | | | | | | | |
| 1504EDTR-RH | | | | | | | | | | | | | | | | | | |
| 1504EDR-S20 | | | | | | | | | | | | | | | | | | |
| SPKN 1504ESR-SM | | | | | | | | | | | | | | | | | | |
| 1504EDER-SM | | | | | | | | | | | | | | | | | | |
| 1504EDSR-MU | | | | | | | | | | | | | | | | | | |
| 1504EDSR-SU | | | | | | | | | | | | | | | | | | |
| 1504EDSL-SU | | | | | | | | | | | | | | | | | | |
| SPKR 1504EDR-MX | ● | | | | | | | | | | | | | | | | | |
| 1504EDSR-MX | ● | ● | | | | | | | | | | | | | | | | |
| 1504EDSR-SM | | | | | | | | | | | | | | | | | | |
| SPXN 1504EDSR-FM | | | | | | | | | | | | | | | | | | |
| 1504EDER-FM | | | | | | | | | | | | | | | | | | |
| SPXR 1504EDSR-FM | | | | | | | | | | | | | | | | | | |
| SPEX 1504EDR/L-1 | | | | | | | | | | | | | | | | | | |

Available Arbors

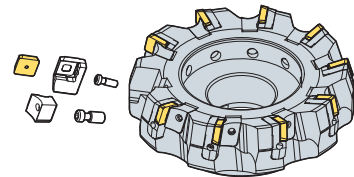
| Designation | General Arbor | NC Arbors | |
|----------------|------------------------------------|------------------------|-------|
| | | EPN | EPNM |
| EPN(M) 5080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□ -FMA25.4 - □□ | FMC27 |
| 5100R/L | NT*□□ (M/U)-FMA31.75 - □□ | BT**□□ -FMA31.75 - □□ | FMC32 |
| 5125R/L | NT*□□ (M/U)-FMA38.1 - □□ | BT**□□ -FMA38.1 - □□ | FMB40 |
| 5160R/L | NT*□□ (M/U)-FMA50.8 - □□ | BT**□□ -FMA50.8 - □□ | FMB40 |
| 5200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 - □□ | FMB60 |
| 5250R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 - □□ | FMB60 |
| 5315R/L | KCP-8*** (Center Ring Plug) | | |

*□□ -NT Number **□□ -BT Number ***Over Milling 5

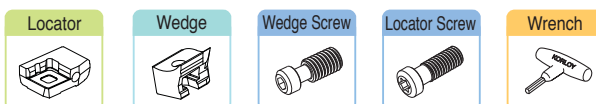
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling



Parts



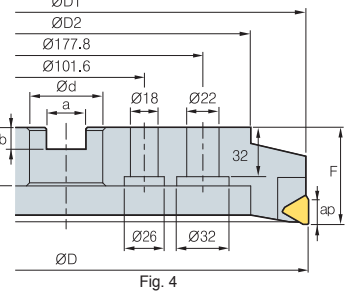
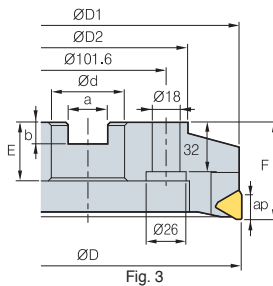
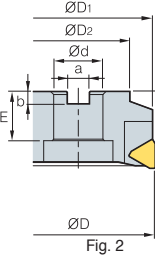
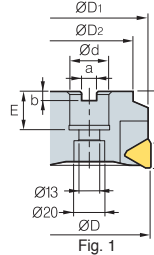
LEPN5R/L WHPS5R/L WHX0817 LTX0514 HW40
LEPN5R1*/L1* WHX0813*

*: Ø80

Available Inserts E20, E21 Available Arbors and bolt E290~E292

● : Stock item

PF(M)4000



AA
90°
• AR : 15°
• RR : 14°

| Designation | | ⊙ | øD | øD ₁ | øD ₂ | ød | a | b | E | F | ap | kg | Fig. |
|-------------|---------|----|-----|-----------------|-----------------|------------|------------|----------|--------|----|----|-----|------|
| PF(M) | 4080R/L | 4 | 80 | 79 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 16 | 1.2 | 1 |
| | 4100R/L | 4 | 100 | 97 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 16 | 1.8 | 2 |
| | 4125R/L | 7 | 125 | 122 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 16 | 3.1 | 2 |
| | 4160R/L | 9 | 160 | 158 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 16 | 5.6 | 2 |
| | 4200R/L | 11 | 200 | 197 | 130 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 16 | 8.8 | 3 |
| | 4250R/L | 15 | 250 | 247 | 180 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 16 | 16 | 3 |
| | 4315R/L | 19 | 315 | 311 | 240 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 16 | 22 | 4 |

() Metric Size

Available Inserts

TFCN



| Designation | Coated | | | | Cermet | Uncoated | | | page | | | | | |
|--------------|--------|--------|--------|--------|--------|----------|--------|--------|------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC9530 | PC6510 | PC215K | PD2000 | | CN20 | CN30 | H01 | G10 | ST30A |
| TFCN 2203PFR | | | | | | | | | | | • | | | |
| 2203PFL | | | | | | | | | | | | | | |

E21

Available Arbors

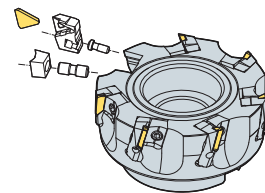
| Designation | General Arbor | NC Arbors | |
|---------------|-----------------------------------|----------------------|-------|
| | | PF | PFM |
| PF(M) 4080R/L | NT*□□(M/U)-FMA25.4-25 -□□ | BT**□□-FMA25.4 -□□ | FMC27 |
| 4100R/L | NT*□□(M/U)-FMA31.75 -□□ | BT**□□-FMA31.75 -□□ | FMC32 |
| 4125R/L | NT*□□(M/U)-FMA38.1 -□□ | BT**□□-FMA38.1 -□□ | FMB40 |
| 4160R/L | NT*□□(M/U)-FMA50.8 -□□ | BT**□□-FMA50.8 -□□ | FMB40 |
| 4200R/L | NT*□□(M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625 -□□ | FMB60 |
| 4250R/L | NT*□□(M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625 -□□ | FMB60 |
| 4315R/L | KCP-8*** (Center Ring Plug) | | |

*□□-NT Number **□□-BT Number ***Over Milling 5

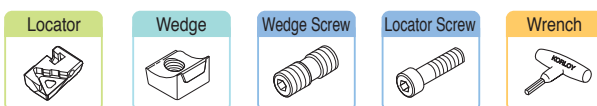
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling



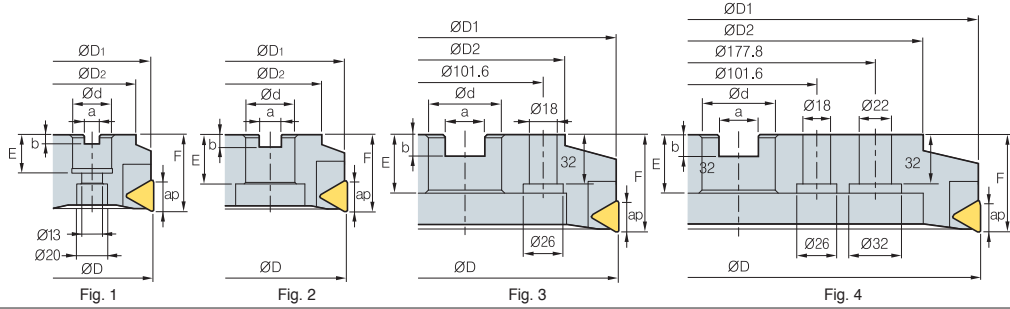
Parts



LPF4R/L
LPF4R1**/L1** WPF4R/L DHA0821F
DHA0817F* LTX0512 HW40

*: Ø80 ~ Ø100 / **: Ø80 ~ Ø125

PPN(M)4000



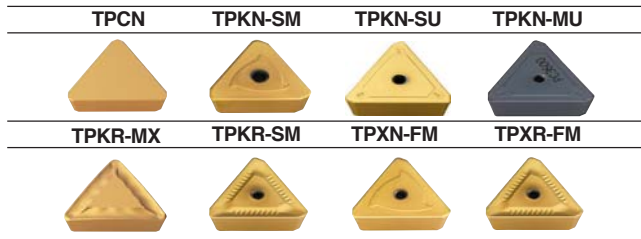
• AR : 7°
• RR : 0°

| Designation | | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | | Fig. |
|----------------|----|-----|-----------------|-----------------|------------|------------|--------|--------|----|----|------|------|
| PPN(M) 4080R/L | 5 | 80 | 79 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 18 | 1.3 | 1 |
| 4100R/L | 6 | 100 | 99 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 18 | 1.9 | 2 |
| 4125R/L | 8 | 125 | 124 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 18 | 3.5 | 2 |
| 4160R/L | 10 | 160 | 158 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 18 | 5.6 | 2 |
| 4200R/L | 12 | 200 | 198 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 8.1 | 3 |
| 4250R/L | 16 | 250 | 248 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 13.3 | 3 |
| 4315R/L | 20 | 315 | 313 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 21.4 | 4 |

(mm)

• () Metric Size

Available Inserts



| Designation | Coated | | | | | | | | | | Cermet | | Uncoated | | page | | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC5300 | PC3545 | PC9530 | PC6510 | PC8110 | PD2000 | CN20 | CN30 | H01 | | G10 | ST30A | ST20 |
| TPCN 2204PDR | ● | | | | | | | | | | | | | | | | | E22 |
| 2204PDR-G | | | | | | | | | | | | | | | | | | |
| 2204PDL | | | | | | | | | | | | | | | | | | |
| 2204PDSR | ● | | | | | | | | | | | | | | | | | |
| 2204PDTR | | | | | | | | | | | | | | | | | | |
| 2204PDR-RH | | | | | | | | | | | | | | | | | | |
| 2204PDER-RH | | | | | | | | ● | ● | ● | | | | | | | | |
| 2204PDSR-RH | | | | | | | | ● | ● | ● | | | | | | | | |
| 2204PDR-S20 | | | | | | | | ● | ● | ● | | | | | | | | |
| TPKCN 2204PDSR-SM | | | | | | | | | | | | | | | | | | |
| 2204PDER-SM | | | | | | | | | | | | | | | | | | |
| 2204PDSR-MU | | | | | | | | ● | ● | ● | | | | | | | | |
| 2204PDSR-SU | | | | | | | | ● | ● | ● | | | | | | | | |
| TPKR 2204PDR-MX | ● | | | | | | | | | | | | | | | | | E22 |
| 2204PDSR-MX | ● | ● | | | | | | | | | | | | | | | | |
| 2204PPR-MX | | | | | | | | | | | | | | | | | | |
| 2204PDSR-SM | | | | | | | | | | | | | | | | | | |
| TPXN 2204PDSR-FM | | | | | | | | | | | | | | | | | | E22 |
| 2204PDER-FM | | | | | | | | | | | | | | | | | | |
| TPXR 2204PDSR-FM | | | | | | | | | | | | | | | | | | E23 |

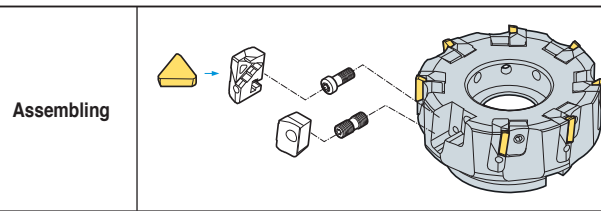
Available Arbors

| Designation | General Arbor | NC Arbors | |
|----------------|-----------------------------------|-----------------------|-------|
| | | PPN | PPNM |
| PPN(M) 4080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□ -FMA25.4 -□□ | FMC27 |
| 4100R/L | NT*□□ (M/U)-FMA31.75 -□□ | BT**□□ -FMA31.75 -□□ | FMC32 |
| 4125R/L | NT*□□ (M/U)-FMA38.1 -□□ | BT**□□ -FMA38.1 -□□ | FMB40 |
| 4160R/L | NT*□□ (M/U)-FMA50.8 -□□ | BT**□□ -FMA50.8 -□□ | FMB40 |
| 4200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8** | BT**□□ -FMA47.625 -□□ | FMB60 |
| 4250R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8** | BT**□□ -FMA47.625 -□□ | FMB60 |
| 4315R/L | KCP-8*** (Center Ring Plug) | | |

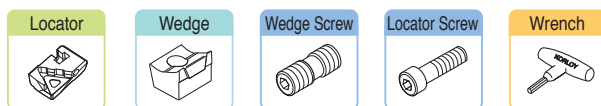
*□□ -NT Number **□□ -BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |



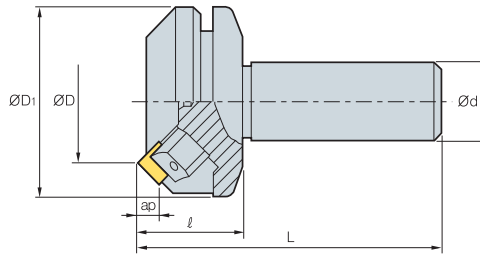
Parts



LPPN4R/L WPPN4R/L DHA0821F LTX0514 HW40
LPPN4R1*L1* DHA0817F*

* : Ø80 ~ Ø100

ADS4000



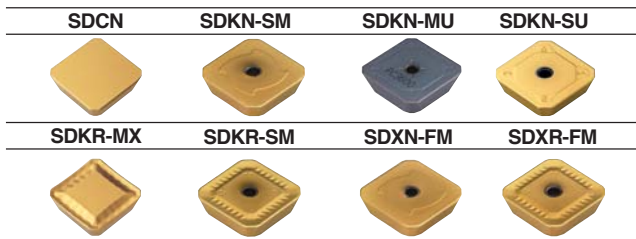
AA
45°
• AR : 15°
• RR : -3°

(mm)

| Designation | | ØD | ØD ₁ | ød | ℓ | L | ap | |
|-------------|---|----|-----------------|----|----|-----|-----|-----|
| ADS 4050R | 3 | 50 | 75 | 32 | 40 | 120 | 6.5 | 1.8 |
| 4050RS42 | 3 | 50 | 75 | 42 | 40 | 120 | 6.5 | 2.2 |
| 4063R | 4 | 63 | 87 | 32 | 40 | 120 | 6.5 | 2.3 |
| 4063RS42 | 4 | 63 | 87 | 42 | 40 | 120 | 6.5 | 2.7 |

• () Metric Size

Available Inserts

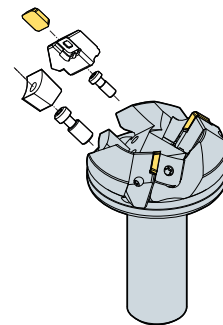


| Designation | Coated | | | | | | | | Cermet | | Uncoated | | page | | | | | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|------|------|------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC5300 | PC3545 | PC9530 | PC215K | PC6510 | PD2000 | CN2000 | | CN20 | CN30 | H01 | G10 | ST30A | ST20 |
| SDCN 42M | | | | | | | | | | | | | | | | | | | |
| 42M-G | | | | | | | | | | | | | | | | | | | |
| 42MT | | ● | | | | | | | | | | ● | ● | | | | ● | ● | |
| 42MT-RH | | | | | | | | | | | | | | | | | | | |
| 42MT-S20 | | | | | | | | | | | | | | | | | | | |
| 1203AEEN | | | | | | | | | | | | | | | | | | | |
| 1203AEEN-RH | | | | | | | | | | | | | | | | | | | |
| 1203AESN | | | | | | | | | | | | | | | | | | | |
| 1203AESN-RH | | | | | | | | | | | | | | | | | | | |
| SDKN 1203AESN-SM | | | | | | | | | | | | | | | | | | | |
| 1203AEEN-SM | | | | | | | | | | | | | | | | | | | |
| 1203AESN-MU | | | | | ● | | | | | | | | | | | | | | |
| 1203AESN-SU | | | | | ● | ● | ● | | | | | | | | | | | | |
| SDKR 1203AESN-MX | | | | | | | | | | | | | | | | | | | |
| 1203AETN-MX | | | | | | | | | | | | | | | | | | | |
| 1203AEN-MX | | ● | | | | | | | | | | | | | | | | | |
| 1203AESN-SM | | | | | | | | | | | | | | | | | | | |
| SDXN 1203AESN-FM | | | | | | | | | | | | | | | | | | | |
| 1203AEEN-FM | | | | | | | | | | | | | | | | | | | |
| SDXR 1203AESN-FM | | | | | | | | | | | | | | | | | | | |

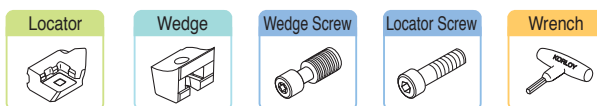
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|--|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling

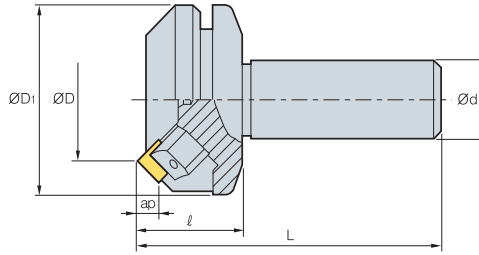


Parts



LASS4R/L WASR/L WTX0817 LTX0512 TW25

ADS5000



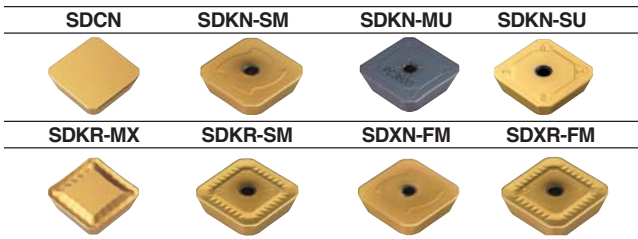
AA
45°
• AR : 15°
• RR : -3°

(mm)

| Designation | | ØD | ØD ₁ | Ød | l | L | ap | |
|-------------|---|----|-----------------|----|----|-----|-----|-----|
| ADS 5050R | 3 | 50 | 75 | 32 | 40 | 120 | 8.5 | 1.9 |
| 5050R-S42 | 3 | 50 | 75 | 42 | 40 | 120 | 8.5 | 2.3 |
| 5063R | 4 | 63 | 87 | 32 | 40 | 120 | 8.5 | 2.4 |
| 5063R-S42 | 4 | 63 | 87 | 42 | 40 | 120 | 8.5 | 2.8 |

• () Metric Size

Available Inserts

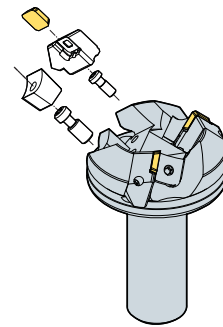


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN30 | | H01 | G10 | ST30A |
| SDCN 53M | | | | | | | | | | | | | | | | | |
| 53M-G | | | | | | | | | | | | | | | | | |
| 53MT | • | • | | | | | | | | | • | • | | | | • | |
| 53MT-RH | | | | • | | | | | | | | | | | | | |
| 53MT-S20 | | | | | | | | • | | | | | | | | | |
| 1504AEEN | | | | | | | | | | | | | | | | | |
| 1504AEEN-RH | | | | | | | • | | • | | | | | | | | |
| 1504AESN | | | | | | | | | | | | | | | | | |
| 1504AESN-RH | | | | | | | | | | | | | | | | | |
| SDKN 1504AESN-SM | | | | | | | | | | | | | | | | | |
| 1504AEEN-SM | | | | | | | | | | | | | | | | | |
| 1504AESN-MU | | | | | | | • | | | | | | | | | | |
| 1504AESN-SU | | | | | | | | • | • | | | | | | | | |
| SDKR 1504AESN-MX | • | | | | | | | | | | | | | | | | |
| 1504AETN-MX | | | | | | | | | | | | | | | | | |
| 1504AEN-MX | • | | | | | | | | | | | | | | | | |
| 1504AESN-SM | | | | | | | | | | | | | | | | | |
| SDXN 1504AESN-FM | | | | | | | | | | | | | | | | | |
| 1504AEEN-FM | | | | | | | | | | | | | | | | | |
| SDXR 1504AESN-FM | | | | | | | | | | | | | | | | | |

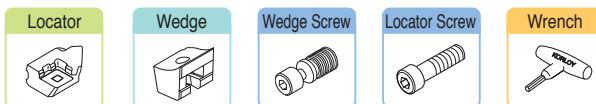
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|--|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling



Parts



LASS5R/L WASR/L WTX0817 LTX0512 TW25

PES2000/3000/4000



2000/3000 type

4000 type

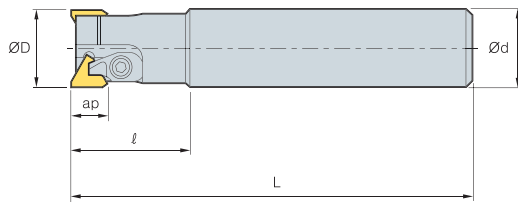


Fig. 1

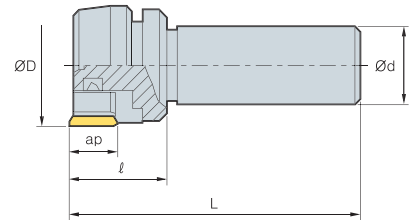


Fig. 2



• AR : 10°~15°
• RR : 2°~3°

(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | ℓ | L | a_p | | Fig. |
|-------------|---|-----------------|-----------------|--------|-----|-------|-----|------|
| PES 2020R | 2 | 20 | 20 | 30 | 110 | 8 | 0.3 | 1 |
| 2025R | 2 | 25 | 25 | 35 | 120 | 8 | 0.5 | 1 |
| PES 3030R | 2 | 30 | 32 | 45 | 160 | 13 | 0.9 | 1 |
| 3032R | 2 | 32 | 32 | 45 | 160 | 13 | 1.0 | 1 |
| 3033R | 2 | 33 | 32 | 45 | 160 | 13 | 1.1 | 1 |
| 3035R | 2 | 35 | 32 | 45 | 160 | 13 | 1.2 | 1 |
| 3036R | 2 | 36 | 32 | 45 | 160 | 13 | 1.3 | 1 |
| 3040R | 2 | 40 | 32 | 45 | 160 | 13 | 1.4 | 1 |
| PES 4050R | 3 | 50 | 32 | 40 | 120 | 16.5 | 1.2 | 2 |
| 4050R-S42 | 3 | 50 | 42 | 40 | 120 | 16.5 | 1.5 | 2 |
| 4063R | 4 | 63 | 32 | 40 | 120 | 16.5 | 1.5 | 2 |
| 4063R-S42 | 4 | 63 | 42 | 40 | 120 | 16.5 | 1.8 | 2 |

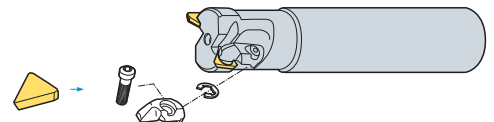
Available Inserts

| | | TECN | | | | | | | TEEN | | | | | | | | | |
|-----------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|------|-----|-------|
| Type | Designation | Coated | | | | | | | Cermet | | | Uncoated | | | | page | | |
| | | NCM825 | NCM335 | NC5330 | PC3500 | PC3500 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| 2000 type | TECN 22R | | | | | | | | | | | | | | | | | |
| | 22TR | | | | | | | | | | | | | | | | | |
| 3000 type | TECN 32R | | | | | | | | | | | | | | | | | |
| | 32TR | | | | | | | | | | | | | | | | | |
| | 32TR-S20 | | | | | | | | | | | | | | | | | |
| 4000 type | TEEN 43R | | | | | | | | | | | | | | | | | |
| | 43R-G | | | | | | | | | | | | | | | | | |
| | 43TR | | | | | | | | | | | | | | | | | |
| | 43TR-S20 | | | | | | | | | | | | | | | | | |
| | 43TR-Z | | | | | | | | | | | | | | | | | |
| | 43TR-ZH | | | | | | | | | | | | | | | | | |

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

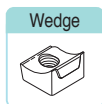
Assembling



Parts



Locator



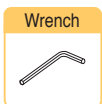
Wedge



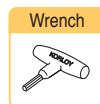
Wedge Screw



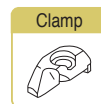
Locator Screw



Wrench



Wrench



Clamp



Ring

| | | | | | | | | |
|-----------|----------|-------|---------|---------|-------|------|-------|------|
| 2000 type | - | - | - | CHX0407 | HW25L | - | CH4R1 | ER03 |
| 3000 type | - | - | - | CHX0510 | HW30L | - | CH5R1 | ER04 |
| 4000 type | LPTS4R/L | WPTSR | DHA0815 | LTX0512 | - | HW40 | - | - |

AFO(M) 4000

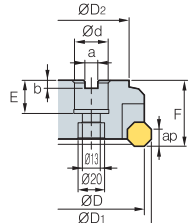


Fig. 1

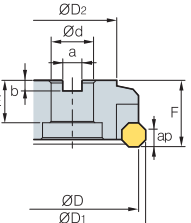


Fig. 2

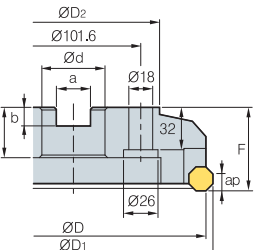


Fig. 3

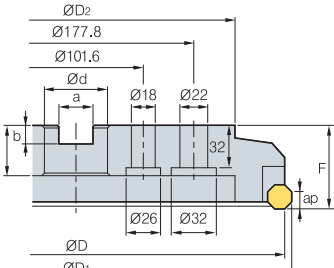


Fig. 4



AA
45°

• AR : 15°
• RR : 5°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_1$ | $\varnothing D_2$ | $\varnothing d$ | a | b | E | F | ap | | Fig. |
|----------------|---|-----------------|-------------------|-------------------|-----------------|------------|-------|--------|----|-----|-----|------|
| AFO(M) 4080R/L | 5 | 80 | 88 | 60 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 6.5 | 1.4 | 1 |
| 4100R/L | 6 | 100 | 108 | 80 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 6.5 | 2.0 | 1 |
| 4125R/L | 8 | 125 | 133 | 100 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 6.5 | 3.1 | 1 |

• () Metric Size

Available Inserts

| | OFCW | OFKT-MF | OFKT-MM | OFKT-MA | |
|----------------|--------|---------|---------|---------|------|
| | | | | | |
| Designation | Coated | | | | page |
| | NCM325 | NCM335 | NC5330 | PC3500 | |
| OFCW 05T3SN | | | | | E10 |
| 05T3FN | | | | | |
| 05T308FN | | | | | |
| OFKT 05T3SN-MF | ● | ● | | | E11 |
| 05T308SN-MF | | | ● | | |
| 05T3SN-MM | ● | ● | | | |
| 05T308SN-MM | | | ● | | |
| 05T3FN-MA | | | | ● | |
| 05T3EN-MA | | | | | |

Available Arbors

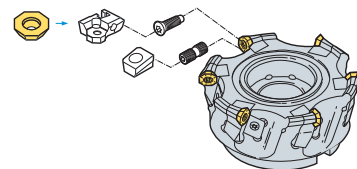
| Designation | General Arbor | NC Arbors | |
|----------------|--------------------------|----------------------|-------|
| | | AFO | AFOM |
| AFO(M) 4080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□ -FMA25.4 -□□ | FMC27 |
| 4100R/L | NT*□□ (M/U)-FMA31.75 -□□ | BT**□□ -FMA31.75 -□□ | FMC32 |
| 4125R/L | NT*□□ (M/U)-FMA38.1 -□□ | BT**□□ -FMA38.1 -□□ | FMB40 |

*□□ -NT Number **□□ -BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling



Parts



LAF04R/L WAFO4R/L DHA0815 FTKA0408 TW15S

Available Inserts E10, E11

Available Arbors and bolt E290~E292

● : Stock item

AFO(M)5000

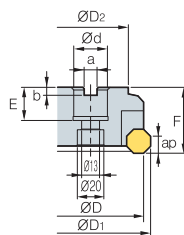


Fig. 1

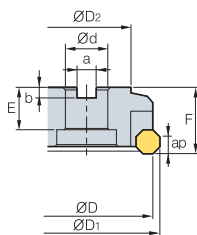


Fig. 2

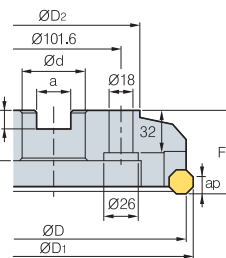


Fig. 3

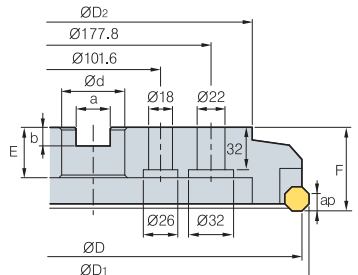


Fig. 4



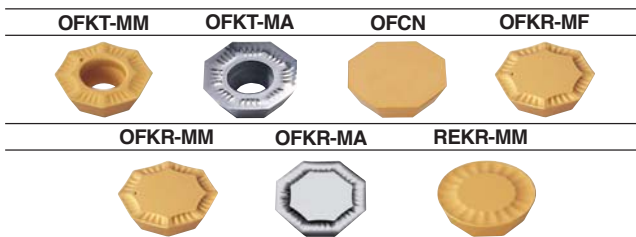
AA
45°
• AR : 15°
• RR : 5°

(mm)

| Designation | | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | $\frac{\sigma}{kg}$ | Fig. |
|----------------|----|-----|-----------------|-----------------|------------|------------|----------|--------|----|-----|---------------------|------|
| AFO(M) 5080R/L | 5 | 80 | 91 | 60 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 9.5 | 1.4 | 1 |
| 5100R/L | 6 | 100 | 111 | 80 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 9.5 | 2.0 | 2 |
| 5125R/L | 8 | 125 | 136 | 100 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 9.5 | 3.1 | 2 |
| 5160R/L | 10 | 160 | 171 | 120 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 9.5 | 5.2 | 2 |
| 5200R/L | 12 | 200 | 211 | 130 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 9.5 | 7.5 | 3 |
| 5250R/L | 16 | 250 | 261 | 180 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 9.5 | 16.1 | 3 |
| 5315R/L | 20 | 315 | 326 | 240 | 47.625(60) | 25.4(25.7) | 13.5(14) | 38(38) | 63 | 9.5 | 22.8 | 4 |

() Metric Size

Available Inserts



| Designation | Coated | | | | | | | Cermet | | Uncoated | | | page | | | | |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3500 | PC3545 | PC9530 | PC8510 | PC215K | PD2000 | CN20 | CN30 | | H01 | G10 | ST30A | ST20 |
| OFCN 0704SN | ● | | | | | | | | | | | | | | | | E10 |
| 0704FN | | | ● | | | | | | | | | | | | | | |
| 070408SN | | | ● | | | | | | | | | | | | | | |
| 070408FN | | | | | | | | | | | | | | | | | E11 |
| OFKR 0704SN-MF | ● | ● | | | | | | | | | | | | | | | |
| 070408SN-MF | ● | ● | | | | | | | | | | | | | | | |
| 070408SN-MM | ● | ● | ● | ● | ● | ● | | | | | | | | | | | E11 |
| 070408SN-MM | ● | | | | | | | | | | | | | | | | |
| 0704FN-MA | | | | | | | | | | | | | ● | | | | |
| 0704EN-MA | | | | | | | | | | | | | | | | | E11 |
| OFKT 0704SN-MM | ● | | | | | | | | | | | | | | | | |
| 0704FN-MA | | | | | | | | | | | | | | | | | |
| 0704EN-MA | | | | | | | | | | | | | | | | | E13 |
| REKR 170400-MM | | | | | | | | | | | | | | | | | |

Available Arbors

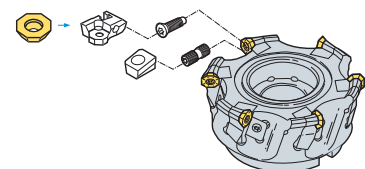
| Designation | General Arbor | NC Arbors | |
|---------------|-----------------------------------|---------------------|-------|
| | | AFO | AFOM |
| AFO(M)5080R/L | NT*□□(M/U)-FMA25.4-25 | BT**□□-FMA25.4-□□ | FMC27 |
| 5100R/L | NT*□□(M/U)-FMA31.75-□□ | BT**□□-FMA31.75-□□ | FMC32 |
| 5125R/L | NT*□□(M/U)-FMA38.1-□□ | BT**□□-FMA38.1-□□ | FMB40 |
| 5160R/L | NT*□□(M/U)-FMA50.8-□□ | BT**□□-FMA50.8-□□ | FMB40 |
| 5200R/L | NT*□□(M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625-□□ | FMB60 |
| 5250R/L | NT*□□(M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625-□□ | FMB60 |
| 5315R/L | KCP-8*** (Center Ring Plug) | | |

*□□-NT Number **□□-BT Number ***Over Milling 5

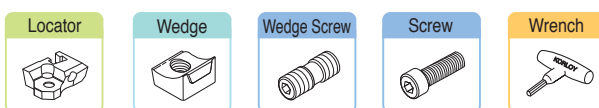
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 300 | 0.05 ~ 0.15 | NCM325 PC3500 ST30A |
| | 120 ~ 230 | 0.05 ~ 0.20 | |
| | 100 ~ 200 | 0.05 ~ 0.20 | |
| M | 50 ~ 200 | 0.05 ~ 0.20 | PC9530 ST30A |
| | 50 ~ 120 | 0.05 ~ 0.20 | |
| K | 150 ~ 250 | 0.05 ~ 0.30 | PC6510 G10 |
| | 100 ~ 200 | 0.05 ~ 0.30 | |

Assembling



Parts



LAF05R/L
LAF05R*/L-1* WEFR/L DHA0821F LTX0512 HW40

*: Ø80 ~ Ø100

New serrated edge design increases productivity by reducing insert cutting load

Power Buster

- New tooling utilizing a specially designed serrated edge to increase productivity by reducing the cutting load.
- Double-sided 6 corner insert geometry ensures high rigidity, long tool life and cost efficiency
- The serrated edge divide the chips into smaller pieces. This feature provides excellent chip control, reduces interference of the cutter and ensures good durability of the cutter body.
- AA (approach angle) : 45° and 80° available (same insert used)
- Application : High depth of cut and feed rate(Steel, Cast iron)

Code system

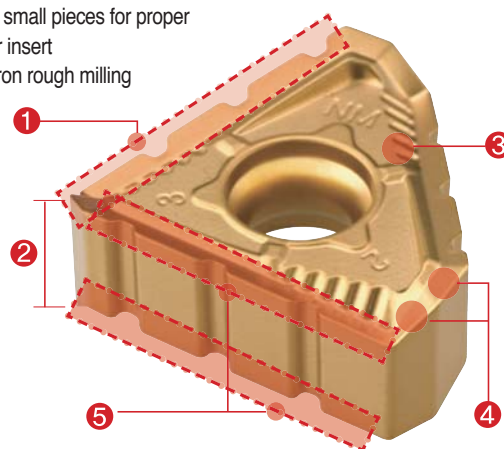
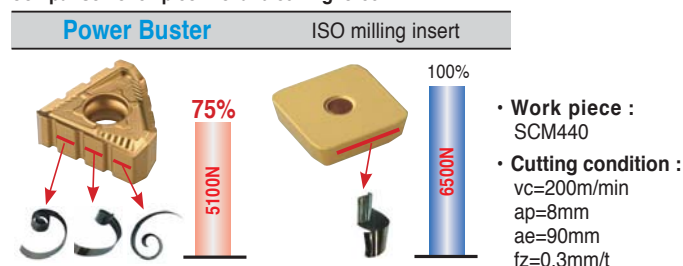
| | | | | | | | |
|---------------------|--------------------|-------------------------|------------------------|-----------------------------------|------------------|-----------------------|---|
| PB | A | C | M | 5 | 250 | R/L | - M |
| Power Buster | AA | Cutter type | Arbor type | Inscribed circle of insert | Tool Dia. | Hand | No. of tooth |
| Power buster | A : 45° Z : 80° | C : Cutter S : Shank | M : Metric I : Inch | 5 : 15.875 | ØD : 250 | R : Right L : Left | No code : Coarse pitch M : Close pitch |

Features of Insert

1 Major cutting edge(serrated edge)

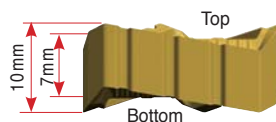
- Low cutting forces
- Ideal for chip control, divides chips into small pieces for proper chip evacuation. Double sided 6 corner insert
- Ideal edge design for Steel and Cast iron rough milling

Comparison of chip control and cutting force



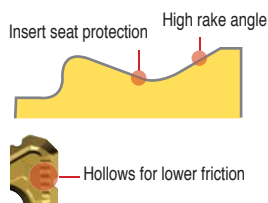
2 Thicker insert

- Thick insert guarantees high rigidity
- Balanced insert design for stable mounting



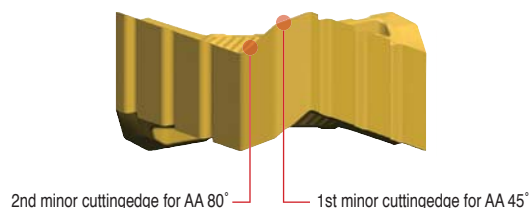
3 NM Chip breaker

- High rake angle for low cutting force
- Good chip flow at various feed and depth of cut
- Inserts are protected with seats for a precise mounting
- Low friction and good heat evacuation at high depth cut



4 Minor cutting edge

- High rake angle to avoid interference with chip
- Calculated minor cutting edge angle for both AA 45° & 80° cutter



5 Mirror system

Cutting edge on the both side of insert covers all overlapped cutting area



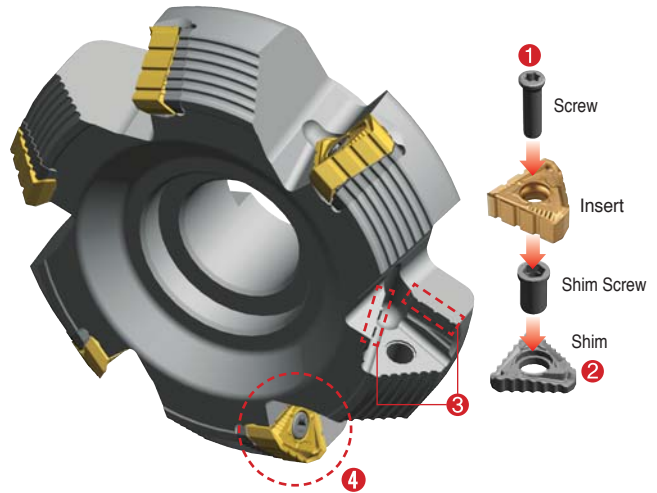
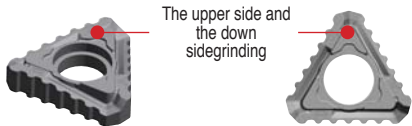
Perfected cutting edge by using 2 different side of cutting edge

Features of Cutter

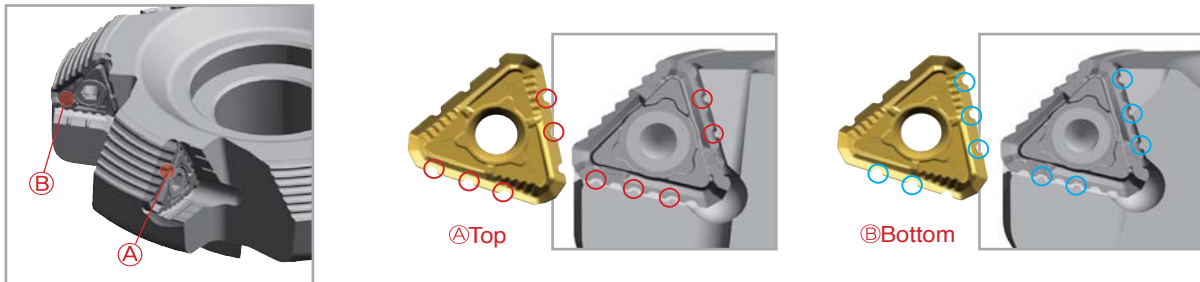
- 1 Screw on clamping system** • Simple and strong screw on clamping system

2 Better rigidity & Stable Assembly system

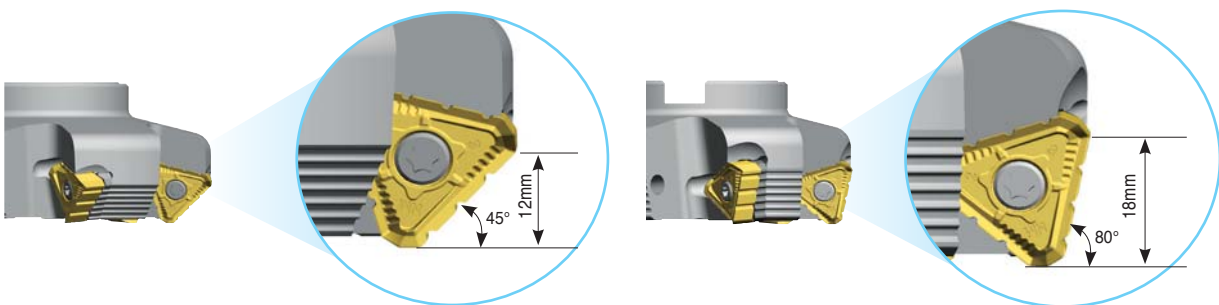
- The shim protects the cutter from insert damage
- High accuracy shim ensures tighter clamping



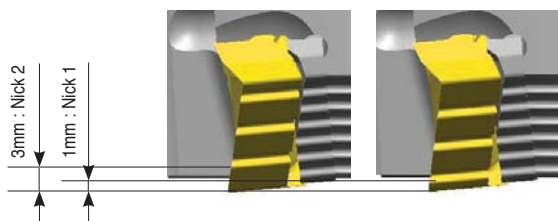
- 3 Foolproof System** • Insert serrations match pocket design to prevent improper seating and alignment



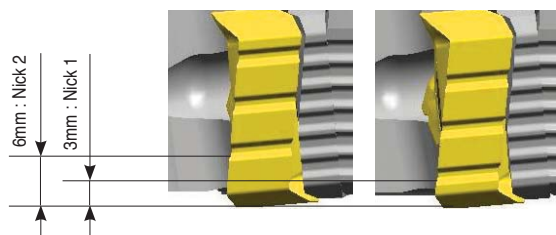
- 4 Multi-application system** • Same insert for multi use (45° and 10°)



The serrations are effective with a depth of cut larger than 1mm

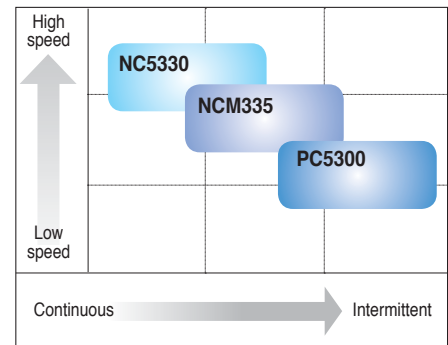


The serrations are effective with a depth of cut larger than 3mm



Recommended cutting condition

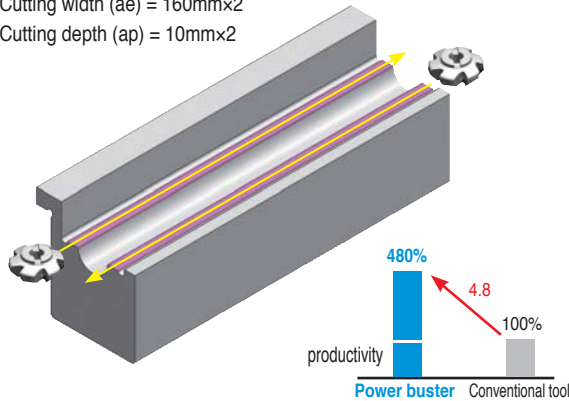
| ISO | Workpiece | NC5330 | NCM335 | PC5300 |
|-----|---------------------|-------------|-------------|-------------|
| | | mm/t | | |
| | | 0.1-0.2-0.3 | 0.1-0.2-0.3 | 0.1-0.2-0.3 |
| | | m/min | | |
| P | Carbon steel | 300-250-200 | 280-230-180 | 250-200-160 |
| | Alloy steel | 250-210-180 | 230-180-150 | 180-150-120 |
| | Die steel | 180-150-130 | 160-130-110 | 140-120-100 |
| K | Gray cast iron | 280-220-180 | 250-200-160 | 220-180-150 |
| | Malleable cast iron | 250-200-160 | 230-180-150 | 180-150-130 |
| | Nodular cast iron | 230-180-150 | 210-160-130 | 160-120-120 |



Power Buster Test

• Cylinder block for ship engine (Cast iron)

Cutting width (ae) = 160mm×2
Cutting depth (ap) = 10mm×2



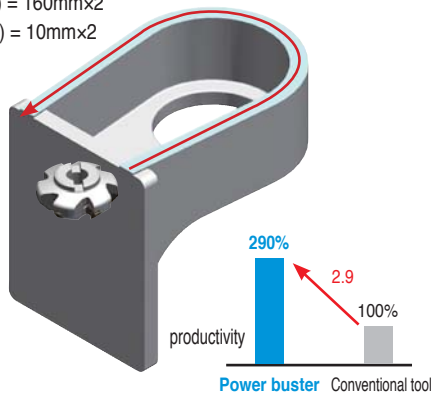
| Item | Power Buster | Conventional tool |
|--------------|-----------------|---------------------------|
| Diameter(ØD) | 200mm | 200mm |
| | 12 tooth | 12 tooth |
| Grade | NC9025 | PVD coating for Cast iron |
| vc | 170m/min | 130m/min |
| fz | 0.24mm/t | 0.16mm/t |
| ap | 10mm x 2 passes | 4mm x 5 passes |
| min | 28.2min/ea | 137.5min/ea |

4.8 times productivity increased

• One-sided 4 corner insert(Without nick) AA 45° cutter

• Heavy machinery part (Alloy steel)

Cutting width (ae) = 160mm×2
Cutting depth (ap) = 10mm×2



| Item | Power Buster | Conventional tool |
|--------------|----------------|---------------------------|
| Diameter(ØD) | 125mm | 100mm |
| | 8 tooth | 8 tooth |
| Grade | NCM335 | PVD coating for Cast iron |
| vc | 180m/min | 150m/min |
| fz | 0.15mm/t | 0.10mm/t |
| ap | 5mm x 2 passes | 2.5mm x 4 passes |
| min | 5min/ea | 14.7min/ea |

2.9 times productivity increased

• Double-sided 8 corner insert(Without nick)AA 45° cutter



PBAC(M)5000

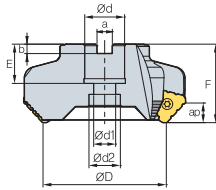


Fig. 1

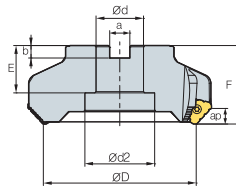


Fig. 2

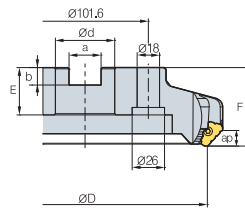


Fig. 3

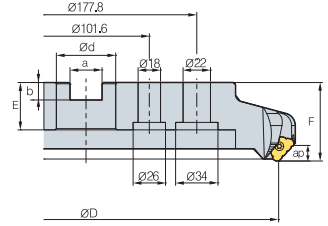


Fig. 4



AA
45°
• AR : -5°
• RR : -11°

(mm)

| Designation | | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ap | Fig. |
|--------------|-------------------|-----|------------|------------|------------|------------|------------|--------|--------|----|----|------|
| Coarse pitch | PBAC(M) 5080R/L | 4 | 80 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(22) | 50 | 12 | 1 |
| | 5100R/L | 4 | 100 | 31.75(32) | - | 45 | 12.7(14.4) | 8(8) | 32(28) | 50 | 12 | 2 |
| | 5125R/L | 6 | 125 | 38.1(40) | - | 56 | 15.9(16.4) | 10(9) | 38(32) | 63 | 12 | 2 |
| | 5160R/L | 8 | 160 | 50.8(40) | - | 100 | 19(16.4) | 11(9) | 38(32) | 63 | 12 | 2 |
| | 5200R/L | 10 | 200 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 3 |
| | 5250R/L | 12 | 250 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 3 |
| 5315R/L | 14 | 315 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 4 | |
| Close pitch | PBAC(M) 5080R/L-M | 6 | 80 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(22) | 50 | 12 | 1 |
| | 5100R/L-M | 6 | 100 | 31.75(32) | - | 45 | 12.7(14.4) | 8(8) | 32(28) | 50 | 12 | 2 |
| | 5125R/L-M | 8 | 125 | 38.1(40) | - | 56 | 15.9(16.4) | 10(9) | 38(32) | 63 | 12 | 2 |
| | 5160R/L-M | 10 | 160 | 50.8(40) | - | 100 | 19(16.4) | 11(9) | 38(32) | 63 | 12 | 2 |
| | 5200R/L-M | 12 | 200 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 3 |
| | 5250R/L-M | 14 | 250 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 3 |
| 5315R/L-M | 16 | 315 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 12 | 4 | |

• () Metric Size

Available Inserts

TNMX-NM

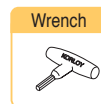


| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| TNMX 2710AZNR-NM 2710AZNL-NM | | ● | ● | ● | ● | | ● | | | | | | | | | | | E21 |

Available Arbors

| Designation | Available Arbors | |
|------------------|-------------------|---------------|
| | PBAC | PBACM |
| PBAC 5080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (PBACM) 5100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 5125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 5160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 5200R-□ | | |
| 5250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 5315R-□ | | |

Parts



FTGA0518

ST53AZR

SHXN0712F

TW20-100



Available Inserts E21



Available Arbors and bolt E290-E292

● : Stock item

PBZC(M)5000

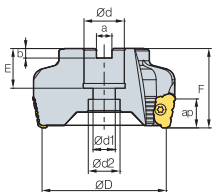


Fig. 1

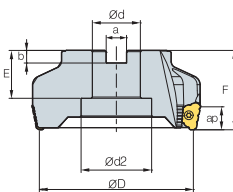


Fig. 2

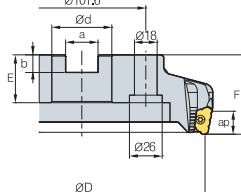


Fig. 3

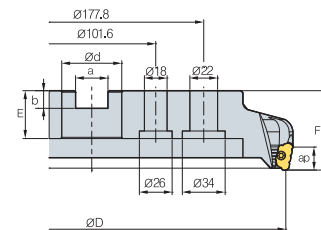


Fig. 4



AA
80°
• AR : -5°
• RR : -12°

(mm)

| Designation | | | øD | ød | ød1 | ød2 | a | b | E | F | ap | Fig. |
|--------------|-------------------|-----|------------|------------|-----|------------|------------|--------|--------|----|----|------|
| Coarse pitch | PBZC(M) 5080R/L | 4 | 80 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(22) | 50 | 18 | 1 |
| | 5100R/L | 4 | 100 | 31.75(32) | - | 45 | 12.7(14.4) | 8(8) | 32(28) | 50 | 18 | 2 |
| | 5125R/L | 6 | 125 | 38.1(40) | - | 56 | 15.9(16.4) | 10(9) | 38(32) | 63 | 18 | 2 |
| | 5160R/L | 8 | 160 | 50.8(40) | - | 100 | 19(16.4) | 11(9) | 38(32) | 63 | 18 | 2 |
| | 5200R/L | 10 | 200 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 3 |
| | 5250R/L | 12 | 250 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 3 |
| 5315R/L | 14 | 315 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 4 | |
| Close pitch | PBZC(M) 5080R/L-M | 6 | 80 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(22) | 50 | 18 | 1 |
| | 5100R/L-M | 6 | 100 | 31.75(32) | - | 45 | 12.7(14.4) | 8(8) | 32(28) | 50 | 18 | 2 |
| | 5125R/L-M | 8 | 125 | 38.1(40) | - | 56 | 15.9(16.4) | 10(9) | 38(32) | 63 | 18 | 2 |
| | 5160R/L-M | 10 | 160 | 50.8(40) | - | 100 | 19(16.4) | 11(9) | 38(32) | 63 | 18 | 2 |
| | 5200R/L-M | 12 | 200 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 3 |
| | 5250R/L-M | 14 | 250 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 3 |
| 5315R/L-M | 16 | 315 | 47.625(60) | - | - | 25.4(25.7) | 14(14) | 38(38) | 63 | 18 | 4 | |

• () Metric Size

Available Inserts

TNMX-NM



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| TNMX 2710AZNR-NM 2710AZNL-NM | | ● | ● | ● | ● | | ● | | | | | | | | | | | E21 |

Available Arbors

| Designation | Available Arbors | |
|-----------------------|-------------------|---------------|
| | PBZC | PBZCM |
| PBZC (PBZCM) 5080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| 5100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 5125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 5160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 5200R-□ | | |
| 5250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 5315R-□ | | |

Parts



FTGA0518 ST53AZR SHXN0712F TW20-100

Rich Mill series is one of innovations that provides more available cutting edges by double sided insert and longer tool life for our customers

Rich Mill Series

- Rich Mill series is one of the innovations that provides more available cutting edges with double sided inserts and longer tool life for our customers
- The unique geometry and special cutting edge guarantees low cutting loads and long tool life
- Rich Mill series has a wide application range from steel and stainless steel to cast iron and aluminum
- Applying negative inserts makes it even stronger and provides longer tool life
- Rich Mill series has both screw on clamping system and latch clamping system

Rich Mill Clamping bolt



Socket bolt
(Ø50~Ø125 - Hexagonal socket bolt)



Mounting bolt
(Ø160~Ø250 - Mounting bolt for general face milling)

Rich Mill Series



Code system

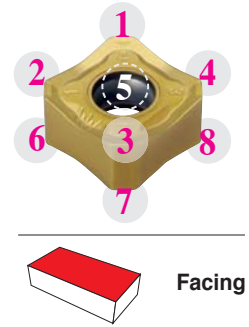
| | | | | | | | | |
|--|---|-------------------------|------------------------|-------------------------------------|------------------|---------------------------------|-----------------------|------------------------------|
| RM16 | A | C | M | 4 | 100 | H | R | M |
| Number of edges | Approach angle | Tool type | Arbors type | Inscribed circle of insert | Tool Dia. | Coolant type | Hand | Pitch type |
| RM4 : Number of edges-4 RM8 : Number of edges-8 RM16 : Number of edges-16 RMT8 : Number of edges-8 (Latch Clamp) RMH8 : Number of edges-8 (Shim) | A : 45° D : 30° E : 15° F : 5° P : 0° Q : 2° Z : Plunging | C : Cutter S : Shank | M : Metric A : Inch | 3 : 9.525 4 : 12.7 5 : 15.875 | Ø100 | H : Thru-Hole No code : None | R : Right L : Left | M : Close H : Extra Close |



Rich Mill RM8

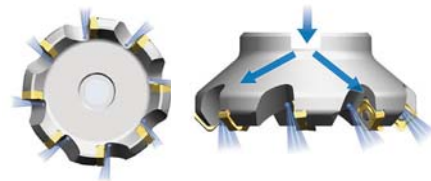
Double sided insert to use 8 cutting edges

- ▶ Innovative double sided insert makes it possible to use 8 cutting edges.
It is more economical than conventional single sided insert
- ▶ The unique geometry and high rake angle of cutting edge guarantees excellent surface finish. Applicable for various workpieces like steel, stainless steel, cast iron, aluminum
- ▶ Combined with the innovative geometry and various grades provided the tool offers durability and excellent tool life
- ▶ Various pitches and chip breakers can be applicable for diverse machining.
- ▶ Light Rich mill cutter can be useful for high speed machining and low power machine



Through coolant system

- ▶ Exclusive coolant bolt is adapted to get better chip evacuation and more powerful cooling. To get optimal chip evacuation, the direction of coolant injection has been designed to reach to each cutting edge directly. Through coolant arbor is required.



Through coolant system for decreasing cutting heat and good chip evacuation

Chip breaker

| Insert | Cutting edge | Features |
|---------------------|--------------|--|
| For aluminum MA | | Due to sharp cutting edge and buffed surface, it has good chip flow and welding resistance |
| Light cutting MF | | Due to low cutting load, it is good for light cutting and difficult-to-cut material |

| Insert | Cutting edge | Features |
|-----------------------|--------------|---|
| General cutting MM | | It is suitable design for general milling |
| Wiper W | | Specialized edge design can be suitable for excellent surface roughness operation |

Features of insert

| Insert | Cutting edge | Features |
|--------|------------------|--|
| | View-A | High rake chip breaker & positive setting angle for low cutting load |
| | View-B | Designed wiper technology in minor cutting edge for improved surface roughness |
| | Chip breaker | Low cutting load due to the positive setting and high rake angle chip breaker |

Features of cutter

| Shape | Cutting edge | Features |
|-------|--------------|--|
| | | High rake angle makes positive setting angle for low cutting load |
| | | Suitable for facing and chamfering • RM8A A=45° • RM8E A=75° • RM8Q A=88° |

Recommended cutting condition

| ISO | Grade | SNM(E)X1206A(E)NN-MF | | SNM(E)X1206A(E)NN-MM | | SNEX1206A(E)NN-MA | | Max-ap | SNM(E)X1507A(E)NN-MF | | SNM(E)X1507A(E)NN-MM | | Max-ap |
|-----|--------|----------------------|-----------|----------------------|-----------|-------------------|-----------|----------------|----------------------|-----------|----------------------|-----------|---------------|
| | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | |
| P | NC5330 | - | - | 150-300 | 0.10-0.35 | - | - | RM8A 6.0mm | - | - | 150-300 | 0.10-0.35 | RM8A 7.5mm |
| | NCM325 | 200-300 | 0.05-0.30 | 150-300 | 0.10-0.35 | 200-350 | 0.03-0.25 | | 200-300 | 0.05-0.30 | 150-300 | 0.10-0.35 | |
| | PC3500 | 200-300 | 0.05-0.30 | 150-300 | 0.10-0.35 | 200-350 | 0.03-0.25 | | 200-300 | 0.05-0.30 | 150-300 | 0.10-0.35 | |
| K | PC6510 | 150-300 | 0.08-0.35 | 150-300 | 0.10-0.40 | - | - | RM8E 9.0mm | 150-300 | 0.08-0.35 | 150-300 | 0.10-0.40 | RM8E 11mm |
| | PC5300 | 150-300 | 0.08-0.35 | 150-300 | 0.10-0.40 | - | - | | 150-300 | 0.08-0.35 | 150-300 | 0.10-0.40 | |
| M | PC9530 | 100-180 | 0.05-0.30 | 120-180 | 0.10-0.35 | 120-200 | 0.03-0.2 | RM8Q 11.5mm | - | - | - | - | RM8E 11mm |
| | PC5300 | - | - | - | - | - | - | | 100-180 | 0.05-0.30 | 120-180 | 0.10-0.35 | |



Rich Mill RMH8

🎯 Screw on clamping system

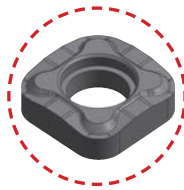
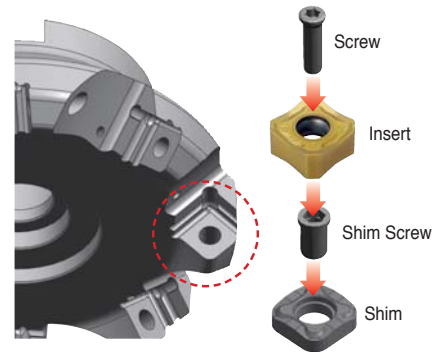
- ▶ Adopt and stable clamping system

🎯 Reinforced rigidity and enhanced clamping power

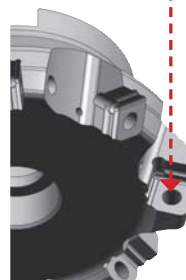
- ▶ Applying shim system, prevent cutter damage when insert breaks

🎯 Adopting exchangeable shim

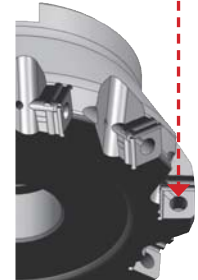
- ▶ Using various kinds of cutter (Approach angle 45°, 75°, 88°)
- ▶ Stable clamping power with insert



RMH8A
(AA 45°)



RMH8E
(AA 75°)



RMH8Q
(AA 88°)

Rich Mill RM4

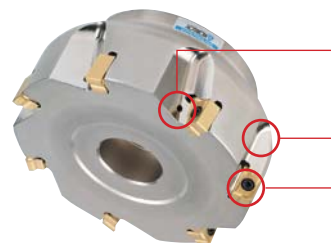
🎯 Economical 4 cutting edges by using double-sided insert

- ▶ RM4, as a multi functional milling tool, offers economical 4 cutting edges by using an innovative double-sided insert
- ▶ Special designed chip breaker consists of high rake angle and strong cutting edge to decrease the cutting load
- ▶ RM4 is multi functional tool that can cover facing, side cutting, shouldering, slotting, ramping & helical cutting
- ▶ Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool life of insert



🎯 Features

- ▶ 4 cutting edges can be used by using double-sided insert
- ▶ High rake angle chip breaker and cutting edge can make smooth cutting with low cutting load
- ▶ Strong negative insert
- ▶ High efficiency, economical, multi functional tool



- Through coolant system Longer tool life due to direct cooling injection into the cutting edge of insert

- Wide chip pocket for better chip evacuation

- Simple screw on system

🎯 Inserts

- ▶ Double-sided insert using 4cutting edges
- ▶ High rake angle chip breaker, cutting edge
- ▶ Flexibility of product
- ▶ High efficiency, economical, multi functional tool
- ▶ Negative insert has strong cutting edge

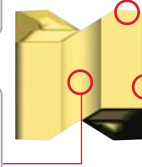
- Chip breaker High rake angle chip breaker / Improving chip control

- Major cutting edge High rake angle chip breaker / Better surface roughness



- Step design Improving chip control / Reducing cutting load

- Concave design 4 cutting edges / Minimize interference

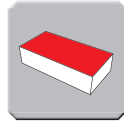


- Minor cutting edge Special design of cutting edge to improve surface roughness

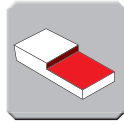
- Clearance face Strong negative face. Strong cutting edge

Rich Mill RM4

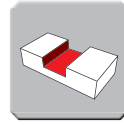
Uses



Facing



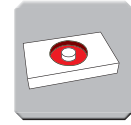
Shouldering



Slotting









Ramping


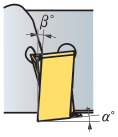
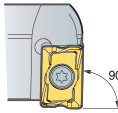


Helical cutting

Chip breaker

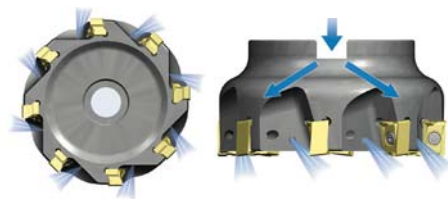
| Insert | Cutting edge | Features |
|--|---|---|
| Aluminum, Light machining MA  |  | With sharp edge application the better productivity has been accomplished ,especially for Aluminum or low force cut |
| Light cutting MF  |  | Due to low cutting load, it is good for light cutting and difficult-to-cut material. |
| General cutting MM  |  | It is suitable design for general milling. |

Setting configuration

| Insert | Setting angle of insert | Features |
|---|---|---|
|  |  | High rake chip breaker & positive setting angle for low cutting load - Improving machinability |
| |  | Multi applications for facing, shouldering, slotting, ramping, helical cutting, etc |

Through coolant system

► By using on exclusive coolant bolt(hexagonal socket bolt) powerful cooling & better chip evacuation can be acquired. To get optimal chip control, the direction of coolant injection has been designed to reach to each cutting edge directly. (through coolant arbor is required.)



Through coolant system for decreasing cutting heat and good chip evacuation

Recommended cutting condition

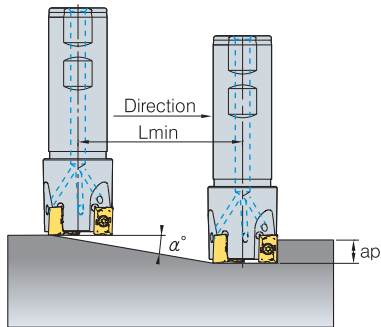
| ISO | Grade | LNM(E)X100605PNR-MF | | LNM(E)X100605PNR-MM | | LNEX100605PNR-MA | | Max-ap | LNM(E)X151008PNR-MF | | LNM(E)X151008PNR-MM | | LNEX151008PNR-MA | | Max-ap |
|-----|--------|---------------------|-----------|---------------------|-----------|------------------|-----------|--------|---------------------|-----------|---------------------|-----------|------------------|-----------|--------|
| | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | |
| P | NCM325 | - | - | - | - | - | - | 9.0mm | 150~300 | 0.05~0.30 | 120~300 | 0.05~0.35 | 150~300 | 0.03~0.20 | 14.0mm |
| | PC3500 | 150~300 | 0.05~0.25 | 120~300 | 0.05~0.30 | 150~300 | 0.03~0.20 | | 150~300 | 0.05~0.30 | 120~300 | 0.05~0.35 | 150~300 | 0.03~0.20 | |
| K | PC6510 | 150~300 | 0.08~0.30 | 120~300 | 0.08~0.35 | - | - | | 150~300 | 0.08~0.35 | 120~300 | 0.08~0.35 | - | - | |
| M | PC5300 | 120~180 | 0.05~0.25 | 100~180 | 0.05~0.30 | 120~200 | 0.03~0.20 | | 120~180 | 0.05~0.30 | 100~180 | 0.05~0.3 | 120~200 | 0.03~0.20 | |



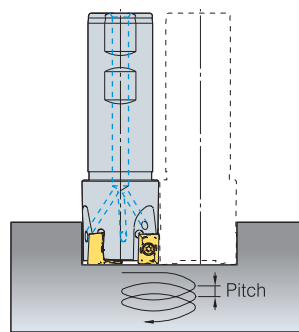
Rich Mill RM4

☉ Ramping and Helical cutting

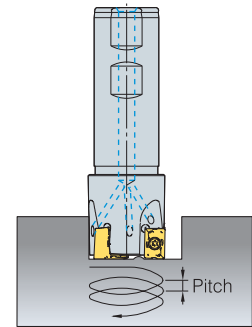
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



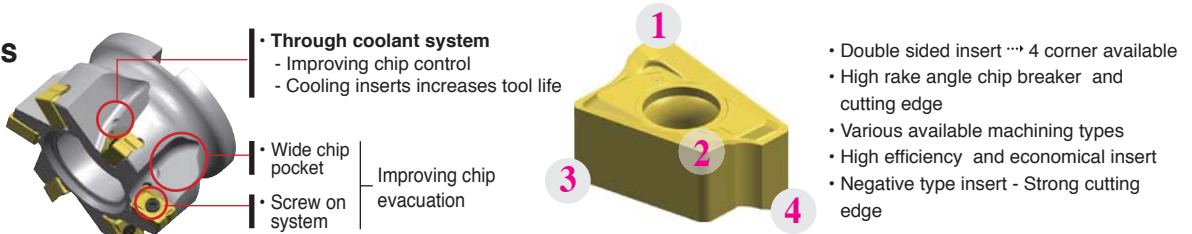
| Designation | 1. Ramping | | | 2. Helical cutting for blind hole | | | | 3. Helical cutting for through hole | |
|----------------|------------|----------------|------|-----------------------------------|---------------|-----------------------|---------------|-------------------------------------|---------------|
| | D | α° | Lmin | Maximum Hole Diameter | Maximum Pitch | Minimum Hole Diameter | Maximum Pitch | Minimum Hole Diameter | Minimum Pitch |
| RM4PS3014HR | 14 | 5 | 114 | 27 | 3 | 25 | 2.5 | 19 | 1.0 |
| RM4PS3016HR | 16 | 4 | 143 | 31 | 3 | 29 | 2.0 | 23 | 1.0 |
| RM4PS3018HR | 18 | 4 | 143 | 35 | 3 | 33 | 3.0 | 27 | 2.0 |
| RM4PS3020HR | 20 | 4 | 143 | 39 | 4 | 37 | 3.0 | 31 | 2.0 |
| RM4PS3025HR | 25 | 3.5 | 163 | 49 | 4 | 47 | 4.0 | 41 | 3.0 |
| RM4PS3032HR | 32 | 3 | 191 | 63 | 4.5 | 61 | 4.0 | 55 | 3.5 |
| RM4PS3040HR | 40 | 2 | 286 | 79 | 4 | 77 | 3.5 | 71 | 3.0 |
| RM4PS3050HR | 50 | 1.5 | 382 | 99 | 3.5 | 97 | 3.5 | 91 | 3.0 |
| RM4PC(M)3040HR | 40 | 2 | 286 | 79 | 4 | 77 | 4.0 | 71 | 3.0 |
| RM4PC(M)3050HR | 50 | 1.5 | 382 | 99 | 3.5 | 97 | 3.5 | 91 | 3.0 |
| RM4PC(M)3063HR | 63 | 1 | 573 | 125 | 3 | 123 | 3.0 | 117 | 2.5 |
| RM4PC(M)3080HR | 80 | 1 | 573 | 159 | 4 | 157 | 4.0 | 151 | 3.5 |
| RM4PCM3100HR | 100 | 0.5 | 1146 | 199 | 2 | 197 | 2.0 | 191 | 2.0 |
| RM4PS4032HR | 32 | 2.5 | 229 | 62 | 4 | 59.5 | 3.0 | 49 | 2.0 |
| RM4PS4040HR | 40 | 2.0 | 286 | 78 | 4 | 75.5 | 3.0 | 65 | 2.0 |
| RM4PS4050HR | 50 | 2.0 | 286 | 98 | 5 | 95.5 | 4.0 | 85 | 3.5 |
| RM4PS4063HR | 63 | 2.0 | 286 | 124 | 5 | 121.5 | 5.0 | 111 | 5.0 |
| RM4PC(M)4050HR | 50 | 2.0 | 286 | 98 | 5 | 95.5 | 4.0 | 85 | 3.5 |
| RM4PC(M)4063HR | 63 | 2.0 | 286 | 124 | 5 | 121.5 | 5.0 | 111 | 5.0 |
| RM4PC(M)4080HR | 80 | 1.5 | 382 | 158 | 5 | 155.5 | 5.0 | 145 | 5.0 |
| RM4PCM4100HR | 100 | 1.0 | 573 | 198 | 5 | 195.5 | 4.5 | 185 | 4.0 |
| RM4PC(M)4125HR | 125 | 1.0 | 573 | 248 | 5 | 245.5 | 5.0 | 235 | 5.0 |
| RM4PC(M)4160R | 160 | 0.5 | 1146 | 318 | 4 | 315.5 | 3.5 | 305 | 3.5 |

The Lmin is when depth of cut is 10.0mm ($L_{min} = 10/\tan \alpha$)

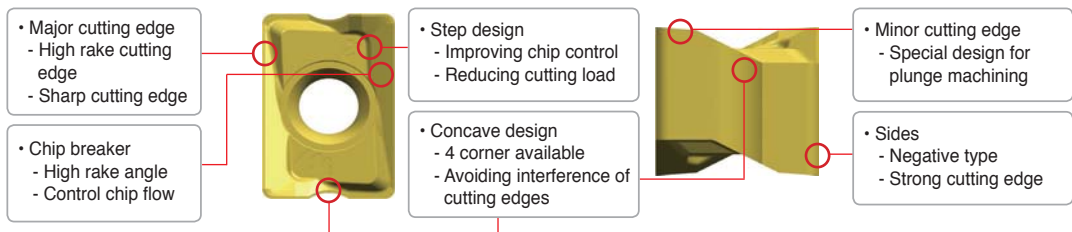
Rich Mill RM4Z

- Plunge Mill RM4Z** ▶ Rich mill series RM4Z is a plunge mill for high efficiency vertical machining such as slotting and pocketing in roughing applications.
- ▶ Rich mill series RM4Z is a highly efficient milling tool for plunging, shouldering and facing. It makes operations more economical with the use of its double-sided 4-corner insert
- ▶ Plunge machining reduces lead time for high productivity and precision machining.
- ▶ In plunging the max depth of RM4Z 3000 type is 9.0mm and that of RM4Z 4000 type is 14.0mm

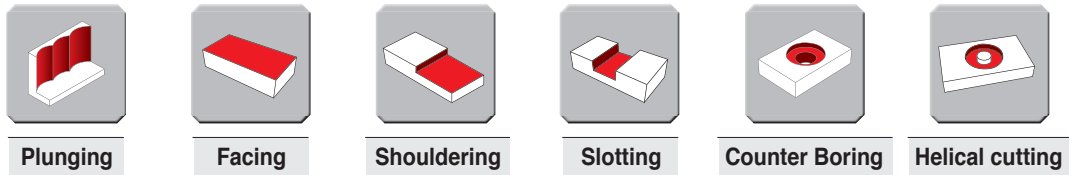
Features



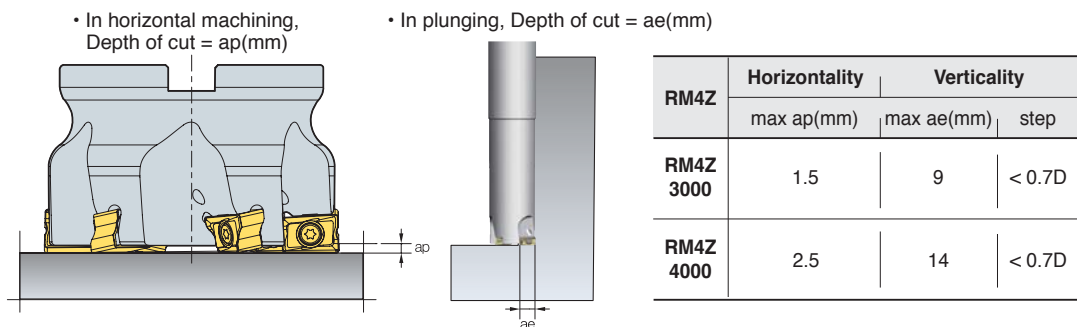
Inserts



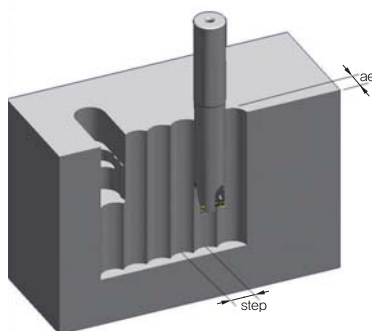
Uses



The depth of cut by machining type



Max Step in plunging



| ae | Cutter Diameter(mm) | | | | | | | | | |
|----|---------------------|------|------|------|------|------|------|------|------|--|
| | 25 | 32 | 40 | 50 | 52 | 63 | 66 | 80 | 100 | |
| | max step (mm) | | | | | | | | | |
| 1 | 9.7 | 11.1 | 12.4 | 14 | 14.2 | 15.7 | 16.1 | 17.7 | 19.9 | |
| 2 | 13.5 | 15.4 | 17.4 | 19.5 | 20 | 22 | 22.6 | 24.9 | 28 | |
| 3 | 16.2 | 18.6 | 21 | 23.7 | 24.2 | 26.8 | 27.4 | 30.3 | 34.1 | |
| 4 | 18.3 | 21.1 | 24 | 27.1 | 27.7 | 30.7 | 31.4 | 34.8 | 39.1 | |
| 5 | 20 | 23.2 | 26.4 | 30 | 30.6 | 34 | 34.9 | 38.7 | 43.5 | |
| 6 | 21.3 | 24.9 | 28.5 | 32.4 | 33.2 | 36.9 | 37.9 | 42.1 | 47.4 | |
| 7 | 22.4 | 26.4 | 30.3 | 34.6 | 35.4 | 39.5 | 40.6 | 45.2 | 51 | |
| 8 | 23.3 | 27.7 | 32 | 36.6 | 37.5 | 41.9 | 43 | 48 | 54.2 | |
| 9 | 24 | 28.7 | 33.4 | 38.4 | 39.3 | 44 | 45.2 | 50.5 | 57.2 | |
| 10 | - | - | - | - | - | 46 | 47.3 | 52.9 | 60 | |
| 11 | - | - | - | - | - | 47.8 | 49.1 | 55.1 | 62.5 | |
| 12 | - | - | - | - | - | 49.4 | 50.9 | 57.1 | 64.9 | |
| 13 | - | - | - | - | - | 50.9 | 52.4 | 59 | 67.2 | |
| 14 | - | - | - | - | - | 52.3 | 53.9 | 60.7 | 69.3 | |



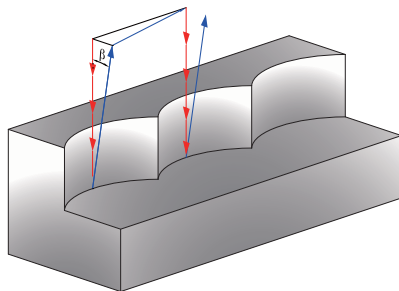
Rich Mill RM4Z

Inner coolant system

- ▶ Exclusive hexagonal coolant socket bolt provides excellent cooling and chip evacuation.
- ▶ Direct coolant injection to cutting edge improves cooling effectiveness
- ▶ Coolant type arbor should be used.

* Coolant bolt is not included, it is for sale

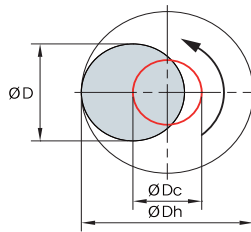
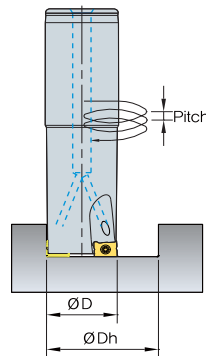
Programming tip



- Plunging feed direction
- Tool escape
- β Escape angle ($\beta \geq 1^\circ$)

• When your tool steps back after plunging, please get over 1° more escape angle

Helical machining



$$\varnothing D_c = \varnothing D_h - \varnothing D$$

$\varnothing D_c$ = Tool center path

$\varnothing D_h$ = Desired hole diameter

$\varnothing D$ = Tool Dia.

| Designation | Diameter $\varnothing D$ (mm) | Helical data | | | |
|-----------------|-------------------------------|----------------------------|-----------------|----------------------------|-----------------|
| | | $\varnothing D_h$ max (mm) | Max. Pitch (mm) | $\varnothing D_h$ min (mm) | Max. Pitch (mm) |
| RM4ZS3025HR-L25 | 25 | 48 | 1 | 30 | 0.4 |
| RM4ZS3032HR-L32 | 32 | 62 | 0 | 43 | 0.3 |
| RM4ZS3040HR-L32 | 40 | 78 | 0 | 59 | 0.3 |
| RM4ZCM3040HR | 40 | 78 | 0 | 59 | 0.3 |
| RM4ZCM3050HR | 50 | 98 | 0 | 79 | 0.3 |
| RM4ZCM3052HR | 52 | 102 | 0 | 83 | 0.3 |
| RM4ZM3025HR-M12 | 25 | 48 | 1 | 30 | 0.4 |
| RM4ZM3032HR-M16 | 32 | 62 | 0 | 43 | 0.3 |
| RM4ZM3040HR-M16 | 40 | 78 | 0 | 59 | 0.3 |
| RM4ZCM4063HR | 63 | 124 | 1 | 95 | 0.5 |
| RM4ZCM4066HR | 66 | 130 | 1 | 101 | 0.5 |
| RM4ZCM4080HR | 80 | 158 | 0 | 129 | 0.5 |
| RM4ZCM4100HR | 100 | 198 | 0 | 169 | 0.3 |

Recommended cutting condition

| ISO | Grade | LNM(E)X100605PNL-MM | | | | LNM(E)X151008PNL-MM | | | |
|-----|--------|---------------------|-----------|---------------|----------------|---------------------|-----------|---------------|----------------|
| | | vc(m/min) | fz(mm/t) | * max ae (mm) | ** max ap (mm) | vc(m/min) | fz(mm/t) | * max ae (mm) | ** max ap (mm) |
| P | PC3500 | 100~250 | 0.05~0.25 | 9 | 1.5 | 120~250 | 0.05~0.25 | 14 | 2.5 |
| K | PC6510 | 80~180 | 0.05~0.20 | | | 100~180 | 0.05~0.20 | | |
| M | PC5300 | 100~250 | 0.08~0.30 | | | 120~250 | 0.08~0.30 | | |

* max ae(mm) : (Plunging) max. radial depth of cut



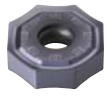





** max ap(mm) : (Shouldering / Facing) max depth of cut

Rich Mill RM16




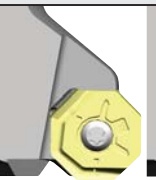

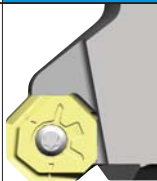




- Features**
- ▶ Economical 16 cutting edges
 - ▶ Reduces cost in medium cutting
 - ▶ Wiper insert can be used for good surface roughness
 - ▶ Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool
 - ▶ When it is used 16 corners, maximum cutting depth is 5.5mm, but it is used 8 corners, maximum cutting depth is 13mm
 - ▶ Wiper insert is placed 0.05mm lower than facing insert in cutter
 - ▶ When feed is bigger than wiper cutting edge length(7mm), 2 wiper inserts are placed in symmetrical position



Chip breaker

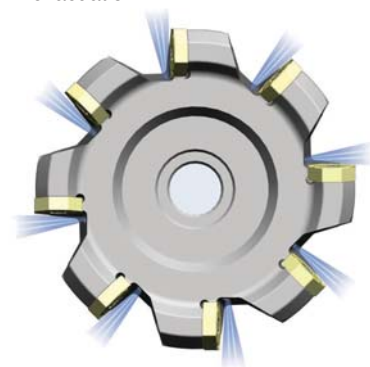
| Insert | Cutting edge | Features |
|---|---|--|
| Aluminum Cutting Light MA  |  | With sharp edge application the better productivity has been accomplished, especially for Aluminum cutting |
| Light cutting MF  |  | Due to low cutting load, it is good for light cutting and difficult-to-cut material |
| General cutting MM  |  | It is suitable design for general milling |
| Wiper W  |  | It has better surface roughness than MM, MF chip breaker |

Instruction for wiper insert

| Hand | Correct setting | Incorrect setting | | | |
|------------|---|---|---|---|--|
| Right hand |  |  |  |  |  |
| Decision | ○ | × | × | × | × |
| Left hand |  |  |  |  |  |
| Decision | ○ | × | × | × | × |

Through coolant system

- Well designed chip pocket for better chip flow
- Through coolant system reduces cutting heat and improves chip evacuation



Recommended cutting condition

| ISO | Grade | ONM(H)X060608-MM | ONM(H)X060608-MF | ONHX060608-W | ONM(H)X080608-MM | ONM(H)X080608-MF | ONHX080608-W |
|-----|--------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | | vc(m/min) fz(mm/t) | vc(m/min) fz(mm/t) | vc(m/min) fz(mm/t) | vc(m/min) fz(mm/t) | vc(m/min) fz(mm/t) | vc(m/min) fz(mm/t) |
| P | NCM325 | 150~300 0.10~0.35 | 200~300 0.05~0.30 | 200~300 0.05~0.20 | 150~300 0.10~0.40 | 200~300 0.05~0.35 | 200~300 0.05~0.25 |
| | PC3500 | 150~300 0.10~0.35 | 200~300 0.05~0.30 | 200~300 0.05~0.20 | 150~300 0.10~0.40 | 200~300 0.05~0.35 | 200~300 0.05~0.25 |
| M | PC9530 | 120~180 0.10~0.35 | 100~180 0.05~0.30 | 100~180 0.05~0.20 | 120~180 0.10~0.40 | 100~180 0.05~0.35 | 100~180 0.05~0.25 |
| K | PC6510 | 150~300 0.10~0.40 | 150~300 0.08~0.35 | 150~300 0.05~0.25 | 150~300 0.10~0.45 | 150~300 0.08~0.40 | 150~300 0.05~0.30 |

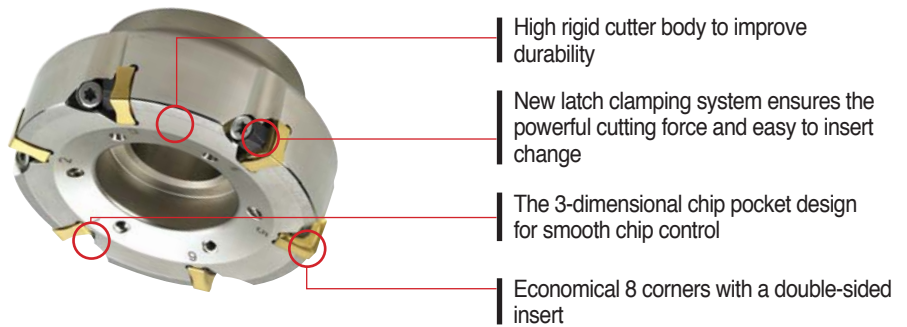


Rich Mill RMT8

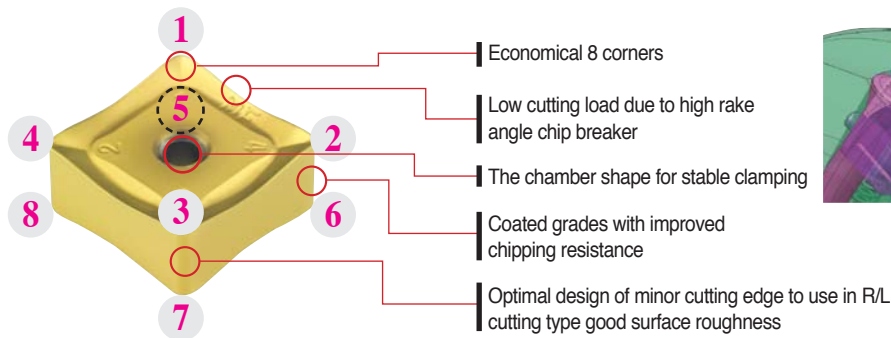
🎯 New generation clamping system

- ▶ New latch clamping system provides a powerful cutting force and an easy insert change
- ▶ New grades with chipping resistance provides good surface roughness and better tool life
- ▶ Due to the specially designed chip breaker, all operations are possible
- ▶ RMT with various pitches can replace conventional ISO milling tool

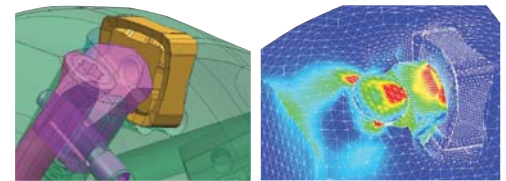
🎯 Features of RMT



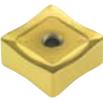
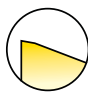
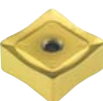
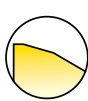
🎯 Features of RMT insert(using R/L)



🎯 Clamping force analysis



🎯 Clamping force analysis

| Insert | Cutting edge | Features |
|---|---|---|
| Fine finishing MF  |  | Our specialized insert design creates low cutting forces suitable for light cutting, HRSA |
| Strengthen MM  |  | Suitable geometry design for general milling has wider ranges of machining |




🎯 Recommended grades and chip breakers

| ISO | Grade | MM | MF |
|-----|--------|----|----|
| P | NCM325 | | ○ |
| | PC3500 | | ○ |
| | PC3545 | | ○ |
| M | PC9530 | | ◎ |
| K | PC6510 | | ◎ |

🎯 Recommended cutting condition

| ISO | Grade | MM | | MF | |
|-----|--------|-----------|-----------|-----------|-----------|
| | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) |
| P | NCM325 | 150~300 | 0.05~0.30 | 150~300 | 0.05~0.20 |
| | PC3500 | 150~300 | 0.05~0.30 | 150~300 | 0.05~0.20 |
| | PC3545 | 150~300 | 0.05~0.30 | 150~300 | 0.05~0.20 |
| M | PC9530 | 120~180 | 0.05~0.20 | 120~180 | 0.05~0.20 |
| K | PC6510 | 150~300 | 0.05~0.30 | 150~300 | 0.05~0.20 |

◎ : Optimum ○ : Proper

| Cutter type | Cutter diameter | AA | Application | | Features | Page |
|--|--------------------------|-----|--|---|---|--|
| RM8A RM8AC4000 (RM8ACM) RM8AC5000 (RM8ACM) RMH8A RMH8AC4000 (RMH8ACM) <i>New</i> RMH8AC5000 (RMH8ACM) | Ø50~Ø400 Ø80~Ø400 | 45° | SNEX1206ANN-MF SNMX1206ANN-MF SNEX1206ANN-MM SNMX1206ANN-MM SNEX1206ANN-MA | SNEX1206ANN-W SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-MM SNMX1507ANN-MM |  | E65 E66 E67 E68 |
| RM8E RM8EC4000 (RM8ECM) RM8EC5000 (RM8ECM) RMH8E RMH8EC4000 (RMH8ECM) <i>New</i> RMH8EC5000 (RMH8ECM) | Ø50~Ø400 Ø80~Ø400 | 75° | SNEX1206ENN-MF SNMX1206ENN-MF SNEX1206ENN-MM SNMX1206ENN-MM SNEX1206ENN-MA | SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-MM SNMX1507ENN-MM |  | <ul style="list-style-type: none"> Economical 8 corners. Low cutting load and excellent smooth cutting. E69 E70 E71 E72 |
| RM8Q RM8QC4000 (RM8QCM) RMH8Q RMH8QC4000 (RMH8QCM) | Ø63~Ø200 Ø80~Ø200 | 88° | SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-MM SNMX1206QNN-MM SNEX1206QNN-MA | SNEX120612-MF SNMX120612-MF SNEX120612-MM SNMX120612-MM SNEX120612-MA |  | E73 E74 |
| RM4P RM4PC3000 (RM4PCM) <i>New</i> RM4P RM4PC4000 (RM4PCM) | Ø40~Ø100 Ø50~Ø160 | 90° | LNX100605PNR-MF LNMX100605PNR-MF LNX100605PNR-MM LNMX100605PNR-MM LNX100608PNR-MF LNMX100608PNR-MF LNX100608PNR-MM LNMX100608PNR-MM | LNX100608PNR-MM LNMX100608PNR-MM LNX100605PNR-MA LNMX100605PNL-MM LNX100605PNR-MM LNMX100605PNL-MM LNX151004PNR-MF LNMX151004PNR-MF LNX151004PNR-MM LNMX151004PNR-MM LNX151008PNR-MF LNMX151008PNR-MF LNX151008PNR-MM LNMX151008PNR-MM LNX151016PNR-MF LNMX151016PNR-MF LNX151016PNR-MM LNMX151016PNR-MM LNX151004PNR-MA LNMX151004PNR-MA LNX151008PNR-MA LNMX151008PNL-MM LNX151008PNL-MM LNMX151008PNL-MM LNX151016PNR-MM LNMX151016PNR-MM LNX151016PNR-MM LNMX151016PNR-MM LNX151004PNR-MA LNMX151004PNR-MA LNX151008PNR-MA LNMX151008PNR-MA LNX151008PNL-MM LNMX151008PNL-MM |  | E75 E76 |
| RM4PS3000 RM4PS4000 | Ø14~Ø50 Ø32~Ø63 | 90° | LNX100605PNR-MF LNMX100605PNR-MF LNX100605PNR-MM LNMX100605PNR-MM LNX100608PNR-MF LNMX100608PNR-MF | LNX100608PNR-MM LNMX100608PNR-MM LNX100605PNR-MA LNMX100605PNL-MM LNX100605PNL-MM LNMX100605PNL-MM LNX151004PNR-MF LNMX151004PNR-MF LNX151004PNR-MM LNMX151004PNR-MM LNX151008PNR-MF LNMX151008PNR-MF LNX151008PNR-MM LNMX151008PNR-MM LNX151016PNR-MF LNMX151016PNR-MF LNX151016PNR-MM LNMX151016PNR-MM LNX151004PNR-MA LNMX151004PNR-MA LNX151008PNR-MA LNMX151008PNR-MA LNX151008PNL-MM LNMX151008PNL-MM |  | <ul style="list-style-type: none"> Economical 4 corners. Screw on type for slotting, facing. E85 |
| RM4PS4000 | Ø32~Ø63 | 90° | LNX151004PNR-MF LNMX151004PNR-MF LNX151004PNR-MM LNMX151004PNR-MM LNX151008PNR-MF LNMX151008PNR-MF LNX151008PNR-MM LNMX151008PNR-MM | LNX151016PNR-MF LNMX151016PNR-MF LNX151016PNR-MM LNMX151016PNR-MM LNX151004PNR-MA LNMX151004PNR-MA LNX151008PNR-MA LNMX151008PNR-MA LNX151008PNL-MM LNMX151008PNL-MM |  | E86 |



| Cutter type | Cutter diameter | AA | Application | | Features | Page |
|--|-----------------|-----|--|--|--|--------------------------|
| RM4PM3000  | Ø14~Ø50 | 90° | LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF | LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM |  <ul style="list-style-type: none"> Economical 4 corners. Screw on type for slotting, facing. | E87 |
| RM4ZC(M) RM4ZCM3000 <i>News</i> RM4ZC4000 (RM4ZCM)  | Ø40~Ø100 | 90° | LNEX100605PNL-MM LNMX100605PNL-MM LNEX151008PNL-MM LNMX151008PNL-MM | |   | E88 |
| RM4ZS3000 <i>News</i>  | Ø25~Ø40 | 90° | LNEX100605PNL-MM LNMX100605PNL-MM | |   <ul style="list-style-type: none"> Economical 4 corners. Optimal insert application for vertical machining | E89 |
| RM4ZM3000 <i>News</i>  | Ø25~Ø40 | 90° | LNEX100605PNL-MM LNMX100605PNL-MM | |  | E89 |
| RM16AC RM16AC6000 RM16AC8000 (RM16ACM)  | Ø63~Ø400 | 45° | ONHX060608-MF / MM ONMX060608-MF / MM ONHX0606ANN-MF / MM ONMX0606ANN-MF / MM ONHX080608-MF / MM ONMX080608-MF / MM | ONHX0806ANN-MF / MM ONMX0806ANN-MF / MM ONHX060608-MA ONHX060608-W ONHX080608-MA ONHX080608-W |  <ul style="list-style-type: none"> Economical 16 corners. Wiper insert for surface roughness. | E90 E91 |
| RMT8A RMT8A4000 RMT8A5000 (RMT8AM)  | Ø80~Ø315 | 45° | SNCF1206ANN-MF / MM SNCF1507ANN-MF / MM SNMF1206ANN-MF / MM SNMF1507ANN-MF / MM | |  | E92 E93 |
| RMT8E RMT8E4000 RMT8E5000 (RMT8EM)  | Ø80~Ø315 | 75° | SNCF1206ENN-MF / MM SNCF1507ENN-MF / MM SNMF1206ENN-MF / MM SNMF1507ENN-MF / MM | |  <ul style="list-style-type: none"> Excellent tool life and surface toughness due to low cutting resistance and high rake edge geometry. Good performance with increased chipping resistance and grade. | E94 E95 |
| RMT8Q (RMT8QM)  | Ø80~Ø315 | 88° | SNCF1206QNN-MF SNMF1206QNN-MF | |  | E96 |



RM8AC(M) 4000

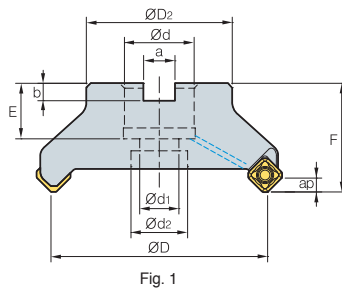


Fig. 1

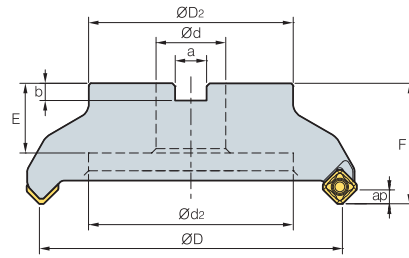


Fig. 2



• AR : -6°
• RR : -9°~6°

(mm)

| Designation | ⊙ | øD | øD ₂ | ød | ød ₁ | ød ₂ | a | b | E | F | ap | $\frac{\sigma}{kg}$ | Fig. | |
|-----------------------|---|----|-----------------|-----|-----------------|-----------------|-----|------------|-------|----------|--------|---------------------|------------|---|
| RM8ACM 4050HR-M | | 4 | 50 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 6.0 | 0.5 | 1 |
| 4050HR-H | | 6 | 50 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 6.0 | 0.5 | 1 |
| 4063HR-M | | 6 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 6.0 | 0.7 | 1 |
| 4063HR-H | | 8 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 6.0 | 0.7 | 1 |
| RM8AC (RM8ACM) 4080HR | | 5 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 6.0 | 1.2 | 1 |
| 4080HR-M | | 7 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 6.0 | 1.2 | 1 |
| 4080HR-H | | 10 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 6.0 | 1.3 | 1 |
| 4100HR | | 6 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 6.0 | 1.7 | 1 |
| 4100HR-M | | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 6.0 | 1.7 | 1 |
| 4100HR-H | | 12 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 6.0 | 1.7 | 1 |
| 4125HR | | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 6.0 | 3.6 | 1 |
| 4125HR-M | | 10 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 6.0 | 3.6 | 1 |
| 4125HR-H | | 16 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 6.0 | 3.7 | 1 |
| 4160R | | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 6.0 | 4.8 | 2 |
| 4160R-M | | 12 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 6.0 | 5.3 | 2 |
| 4160R-H | | 20 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 6.0 | 5.4 | 2 |
| 4200R-M | | 14 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 6.0 | 7.1 | 2 |
| 4200R-H | | 24 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 6.0 | 7.1 | 2 |
| 4250R-M | | 16 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14 | 38(32) | 63 | 6.0 | 11.9 | 2 |
| 4250R-H | | 30 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14 | 38(32) | 63 | 6.0 | 12.0 | 2 |
| 4315R | | 18 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 63 | 6.0 | 18.8(18.6) | 2 |
| 4315R-M | | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 63 | 6.0 | 18.8(18.6) | 2 |
| 4400R-M | | 28 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 80 | 6.0 | 37.7(37.4) | 2 |

• () Metric Size

Available Inserts

SNEX-MF SNEX-MM SNEX-MA SNEX-W SNMX-MF SNMX-MM

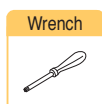


| Designation | Coated | | | | | | Cermet | | | Uncoated | | page | | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NCM350 | PC3500 | PC3500 | PC3545 | PC3550 | PC3550 | PD2000 | CN200 | CN30 | | H01 | G10 | ST30A |
| SNEX 1206ANN-MF | | | | ● | ● | ● | ● | | | | | | | | |
| 1206ANN-MM | ● | | | ● | ● | ● | ● | | | | | | | | |
| SNMX 1206ANN-MF | | | | ● | ● | ● | ● | | | | | | | | |
| 1206ANN-MM | ● | | | ● | ● | ● | ● | | | | | | | | |
| SNEX 1206ANN-MA | | | | | | | | | | | | ● | | | |
| 1206ANN-W | | | | ● | | | ● | | | | | | | | |

Available Arbors

| Designation | Available Arbors | |
|-----------------------------|-------------------|---------------|
| | RM8AC | RM8ACM |
| RM8ACM 4050HR-□ 4063HR-□ | - | BT□□-FMC22-□□ |
| RM8AC (RM8ACM) 4080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| 4100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 4125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 4160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 4200R-□ | | |
| 4250R-□ | | |
| 4315R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 4400R-□ | | |

Parts



FTKA0410

TW15S

RMH8AC(M)4000 *New*

Shim type

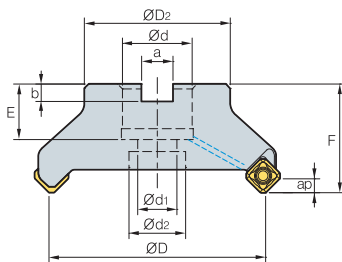


Fig. 1

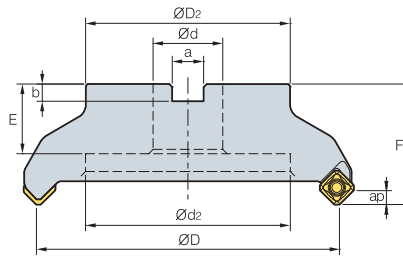


Fig. 2



• AR : -6°
• RR : -9°~6°

(mm)

| Designation | | øD | øD ₂ | ød | ød ₁ | ød ₂ | a | b | E | F | ap | | Fig. | | |
|-------------|--|----------|-----------------|-----|-----------------|-----------------|----|-----|------------|-------|----------|--------|------|------------|---|
| RMH8AC | | 4080HR-M | 7 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 6.0 | 1.2 | 1 |
| (RMH8ACM) | | 4100HR-M | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 6.0 | 1.7 | 1 |
| | | 4125HR-M | 10 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 6.0 | 3.6 | 1 |
| | | 4160R-M | 12 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 6.0 | 5.3 | 2 |
| | | 4200R-M | 14 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 6.0 | 7.1 | 2 |
| | | 4250R-M | 16 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14 | 38(32) | 63 | 6.0 | 11.9 | 2 |
| | | 4315R-M | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 63 | 6.0 | 18.8(18.6) | 2 |
| | | 4400R-M | 26 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 80 | 6.0 | 37.7(37.4) | 2 |

• () Metric Size

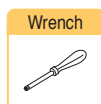
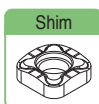
Available Inserts

| | SNEX-MF | SNEX-MM | SNEX-MA | SNEX-W | SNMX-MF | SNMX-MM | | | | | | | | | | | | |
|-----------------|---------|---------|---------|--------|---------|---------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SNEX 1206ANN-MF | | | | ● | ● | ● | | | | | | | | | | | | E19 |
| 1206ANN-MM | ● | | | ● | ● | ● | | | | | | | | | | | | |
| SNMX 1206ANN-MF | | | | ● | ● | | | | | | | | | | | | | |
| 1206ANN-MM | ● | | ● | ● | ● | | | | | | | | | | | | | |
| SNEX 1206ANN-MA | | | | | | | | | | | | | ● | | | | | |
| 1206ANN-W | | | | ● | | | | | | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | | |
|-------------|------------------|-------------------|---------------|
| | RMH8AC | RMH8ACM | |
| RMH8AC | 4080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RMH8ACM) | 4100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| | 4125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| | 4160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| | 4200R-□ | | |
| | 4250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| | 4315R-□ | | |
| | 4400R-□ | | |

Parts



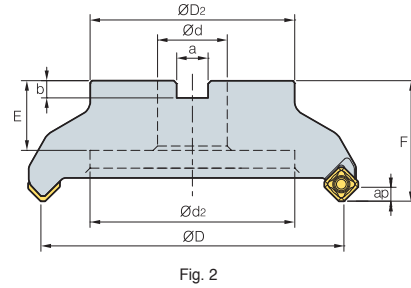
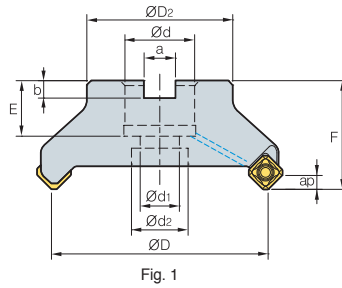
FTKA0412B

SS42RM8

SHXN0609F

TW15S

RM8AC(M)5000



• AR : -6°
• RR : -9°~6°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | $\varnothing d_1$ | $\varnothing d_2$ | a | b | E | F | ap | | Fig. | |
|-------------|----------|-----------------|-------------------|-----------------|-------------------|-------------------|-----|------------|-------|--------|--------|-----|------------|---|
| RM8AC | 5080HR-M | 6 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 7.5 | 1.2 | 1 |
| (RM8ACM) | 5100HR-M | 7 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0 | 33(25) | 63(50) | 7.5 | 2.5(1.8) | 1 |
| | 5125HR-M | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(30) | 63 | 7.5 | 3.6 | 1 |
| | 5160R-M | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 7.5 | 5(4.56) | 2 |
| | 5200R-M | 12 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14.0 | 38 | 63 | 7.5 | 7.1(6.8) | 2 |
| | 5250R-M | 15 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14.0 | 38 | 63 | 7.5 | 11.9(10.6) | 2 |
| | 5315R-M | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 63 | 7.5 | 19.1(18.9) | 2 |
| | 5400R-M | 28 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 80 | 7.5 | 37.7(37.5) | 2 |

• () Metric Size

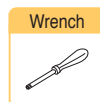
Available Inserts

| | SNEX-MF | SNEX-MM | SNEX-MA | SNMX-MF | SNMX-MM | | | | | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| SNEX 1507ANN-MF | | | | ● | | | | | | | | | | | | | | E19 |
| 1507ANN-MM | | | | ● | | | | | | | | | | | | | | |
| SNMX 1507ANN-MF | | | | ● | | | | | | | | | | | | | | |
| 1507ANN-MM | | | | ● | | | | | | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | | |
|-------------|------------------|-------------------|---------------|
| | RM8AC | RM8ACM | |
| RM8AC | 5080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RM8ACM) | 5100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| | 5125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| | 5160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| | 5200R-□ | | |
| | 5250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| | 5315R-□ | | |
| | 5400R-□ | | |

Parts



FTGA0513

TW20-100

RMH8AC(M)5000 *New*

Shim type

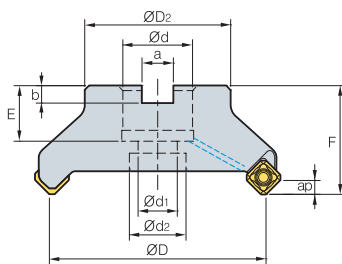


Fig. 1

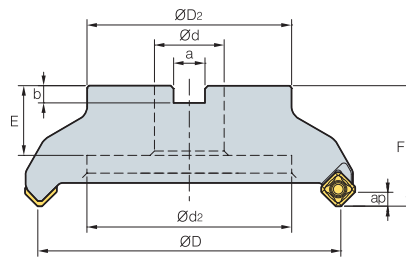


Fig. 2



• AR : -6°
• RR : -9°~6°

(mm)

| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | | Fig. |
|--------------------|----|-----|-----------------|------------|-----------------|-----------------|------------|-------|--------|--------|-----|------------|------|
| RMH8AC 5080HR-M | 6 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 7.5 | 1.2 | 1 |
| (RMH8ACM) 5100HR-M | 7 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0 | 33(25) | 63(50) | 7.5 | 2.5(1.8) | 1 |
| 5125HR-M | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 7.5 | 3.6 | 1 |
| 5160R-M | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 7.5 | 5(4.56) | 2 |
| 5200R-M | 12 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14.0 | 38(32) | 63 | 7.5 | 7.1(6.8) | 2 |
| 5250R-M | 15 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14.0 | 38(32) | 63 | 7.5 | 11.9(10.6) | 2 |
| 5315R-M | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 63 | 7.5 | 19.1(18.9) | 2 |
| 5400R-M | 22 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 80 | 7.5 | 37.7(37.5) | 2 |

• () Metric Size

Available Inserts

SNEX-MF

SNEX-MM

SNEX-MA

SNMX-MF

SNMX-MM

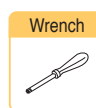
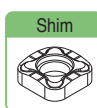


| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | page | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SNEX 1507ANN-MF | | | | | | | | ● | | | | | | | | | | E19 |
| 1507ANN-MM | | | | ● | | | | ● | | | | | | | | | | |
| SNMX 1507ANN-MF | | | | ● | | | | ● | | | | | | | | | | |
| 1507ANN-MM | | | | | | | | | | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | |
|--------------------|-------------------|---------------|
| | RMH8AC | RMH8ACM |
| RMH8AC 5080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RMH8ACM) 5100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 5125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 5160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 5200R-□ | | |
| 5250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 5315R-□ | | |
| 5400R-□ | | |

Parts



FTGA0513

SS53RM8

SHXN0712F

TW20-100

RM8EC(M)4000

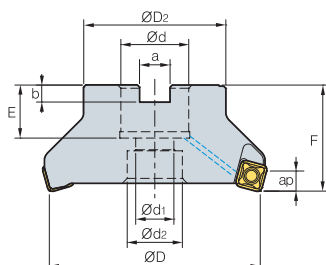


Fig. 1

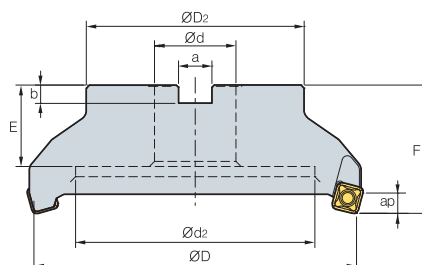


Fig. 2



• AR : -6°
• RR : -8°~-6°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | $\varnothing d_1$ | $\varnothing d_2$ | a | b | E | F | ap | $\frac{kg}{mm^3}$ | Fig. | |
|-------------|----------|-----------------|-------------------|-----------------|-------------------|-------------------|-----|------------|-------|--------|--------|-------------------|------------|---|
| RM8EC | 4050HR-M | 4 | 50 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 9.0 | 0.4 | 1 |
| (RM8ECM) | 4063HR-M | 6 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 9.0 | 0.6 | 1 |
| | 4080HR | 5 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 9.0 | 1.2 | 1 |
| | 4080HR-M | 7 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 9.0 | 1.1 | 1 |
| | 4100HR | 6 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25) | 63(50) | 9.0 | 1.6 | 1 |
| | 4100HR-M | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25) | 63(50) | 9.0 | 2.5 | 1 |
| | 4125HR | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(29) | 63 | 9.0 | 2.9(3.3) | 1 |
| | 4125HR-M | 10 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(29) | 63 | 9.0 | 3.0 | 1 |
| | 4160R | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 9.0 | 4.4 | 2 |
| | 4160R-M | 12 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 9.0 | 4.0 | 2 |
| | 4200R-M | 16 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 9.0 | 5.9 | 2 |
| | 4250R-M | 16 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14 | 38 | 63 | 9.0 | 10.9(10.6) | 2 |
| | 4315R-M | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 63 | 9.0 | 18.1(17.9) | 2 |
| | 4400R-M | 28 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 80 | 9.0 | 31.8(31.5) | 2 |

• () Metric Size

Available Inserts

SNEX-MF SNEX-MM SNEX-MA SNMX-MF SNMX-MM

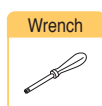
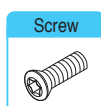


| Designation | Coated | | | | | | Cermet | | | Uncoated | | page | | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3500 | PC3545 | PC9530 | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A |
| SNEX 1206ENN-MF | | | | ● | ● | ● | | | | | | | | | |
| 1206ENN-MM | | | | ● | ● | ● | | | | | | | | | |
| SNMX 1206ENN-MF | | | | ● | ● | ● | | | | | | | | | |
| 1206ENN-MM | | | | ● | ● | ● | | | | | | | | | |
| SNEX 1206ENN-MA | | | | ● | | | | | | | | ● | | | |

Available Arbors

| Designation | Available Arbors | |
|-------------------|-------------------|---------------|
| | RM8EC | RM8ECM |
| RM8ECM 4050HR-□ | - | BT□□-FMC22-□□ |
| 4063HR-□ | | |
| RM8EC 4080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RM8ECM) 4100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 4125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 4160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 4200R-□ | | |
| 4250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 4315R-□ | | |
| 4400R-□ | | |

Parts



PTKA0411-R3

TW15S

RMH8EC(M)4000 *New*

Shim type

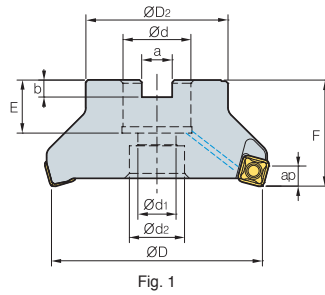


Fig. 1

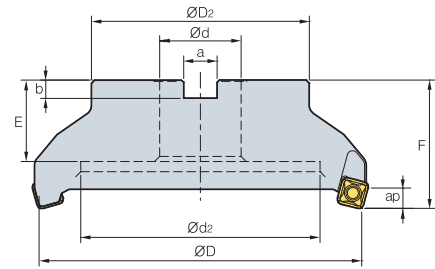


Fig. 2



• AR : -6°
• RR : -8°~6°

(mm)

| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | | Fig. | |
|-------------|----------|----|-----------------|-----|-----------------|-----------------|-----|------------|-------|----------|--------|-----|------------|---|
| RMH8EC | 4080HR-M | 7 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 9.0 | 1.1 | 1 |
| (RMH8ECM) | 4100HR-M | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 9.0 | 2.5 | 1 |
| | 4125HR-M | 10 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 9.0 | 3.0 | 1 |
| | 4160R-M | 12 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 9.0 | 4.0 | 2 |
| | 4200R-M | 16 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 9.0 | 5.9 | 2 |
| | 4250R-M | 16 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14 | 38(32) | 63 | 9.0 | 10.9(10.6) | 2 |
| | 4315R-M | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 63 | 9.0 | 18.1(17.9) | 2 |
| | 4400R-M | 24 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 80 | 9.0 | 31.8(31.5) | 2 |

• () Metric Size

Available Inserts

SNEX-MF

SNEX-MM

SNEX-MA

SNMX-MF

SNMX-MM



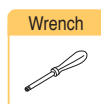
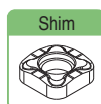
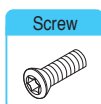
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | NCM225 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| SNEX 1206ENN-MF | | | | | ● | ● | | | | | | | | | | | |
| 1206ENN-MM | | | | | ● | ● | | | | | | | | | | | |
| SNMX 1206ENN-MF | | | | | ● | ● | ● | | | | | | | | | | |
| 1206ENN-MM | | | | | ● | ● | ● | | | | | | | | | | |
| SNEX 1206ENN-MA | | | | | ● | | | | | | | | ● | | | | |

E19

Available Arbors

| Designation | Available Arbors | | |
|-------------|------------------|-------------------|---------------|
| | RMH8EC | RMH8ECM | |
| RMH8AC | 4080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RMH8ACM) | 4100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| | 4125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMC40-□□ |
| | 4160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| | 4200R-□ | | |
| | 4250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| | 4315R-□ | | |
| | 4400R-□ | | |

Parts



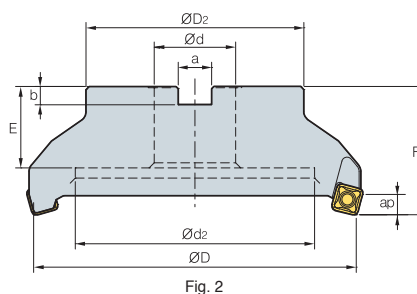
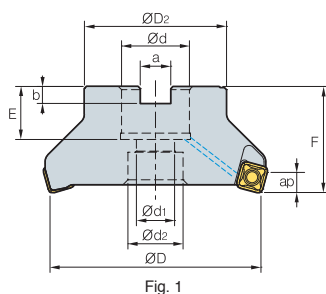
PTKA0411-R3

SS42RM8

SHXN0609F

TW15S

RM8EC(M)5000



• AR : -6°
• RR : -8°~6°

| Designation | | ⊗ | øD | øD ₂ | ød | ød ₁ | ød ₂ | a | b | E | F | ap | kg | Fig. |
|-------------|----------|----|-----|-----------------|------------|-----------------|-----------------|------------|-------|--------|--------|------|------------|------|
| RM8EC | 5080HR-M | 6 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 11.0 | 1.1 | 1 |
| (RM8ECM) | 5100HR-M | 7 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0 | 33(25) | 63(50) | 11.0 | 2.1(1.7) | 1 |
| | 5125HR-M | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(30) | 63 | 11.0 | 3.4(3.3) | 1 |
| | 5160R-M | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 11.0 | 4.4(4.1) | 2 |
| | 5200R-M | 12 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14.0 | 38 | 63 | 11.0 | 6.4(6.1) | 2 |
| | 5250R-M | 15 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14.0 | 38 | 63 | 11.0 | 11.0(10.7) | 2 |
| | 5315R-M | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 63 | 11.0 | 18.0(17.7) | 2 |
| | 5400R-M | 28 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 80 | 11.0 | 35.7(35.4) | 2 |

(mm)

• () Metric Size

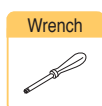
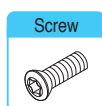
Available Inserts

| | SNEX-MF | SNEX-MM | SNEX-MA | SNMX-MF | SNMX-MM | | | | | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SNEX 1507ENN-MF | | | | ● | | | | | | | | | | | | | | E19 |
| 1507ENN-MM | | | | ● | | | | | | | | | | | | | | |
| SNMX 1507ENN-MF | | | | ● | | | | | | | | | | | | | | |
| 1507ENN-MM | | | | ● | | | | | | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | |
|-------------------|-------------------|---------------|
| | RM8EC | RM8ECM |
| RM8EC 5080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RM8ECM) 5100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 5125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 5160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 5200R-□ | | |
| 5250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 5315R-□ | | |
| 5400R-□ | | |

Parts



FTGA0513

TW20-100



RMH8EC(M)5000 *New*

Shim type

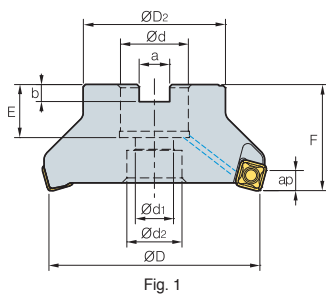


Fig. 1

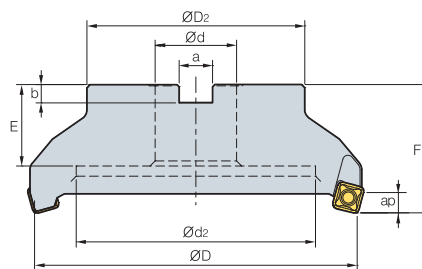


Fig. 2



• AR : -6°
• RR : -8°~6°

(mm)

| Designation | | øD | øD ₂ | ød | ød ₁ | ød ₂ | a | b | E | F | ap | | Fig. | |
|--------------------|--|----|-----------------|-----|-----------------|-----------------|-----|------------|-------|----------|--------|------|------------|---|
| RMH8EC 5080HR-M | | 6 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 11.0 | 1.1 | 1 |
| (RMH8ECM) 5100HR-M | | 7 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0 | 33(25.5) | 63(50) | 11.0 | 2.1(1.7) | 1 |
| 5125HR-M | | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 11.0 | 3.4(3.3) | 1 |
| 5160R-M | | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 11.0 | 4.4(4.1) | 2 |
| 5200R-M | | 12 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14.0 | 38(32) | 63 | 11.0 | 6.4(6.1) | 2 |
| 5250R-M | | 15 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14.0 | 38(32) | 63 | 11.0 | 11.0(10.7) | 2 |
| 5315R-M | | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 63 | 11.0 | 18.0(17.7) | 2 |
| 5400R-M | | 22 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14.0 | 38 | 80 | 11.0 | 35.7(35.4) | 2 |

• () Metric Size

Available Inserts

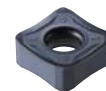
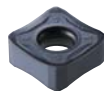
SNEX-MF

SNEX-MM

SNEX-MA

SNMX-MF

SNMX-MM

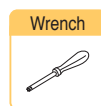
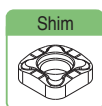


| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | page | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| SNEX 1507ENN-MF | | | | ● | | | | ● | | | | | | | | | |
| 1507ENN-MM | | | | ● | | | | ● | | | | | | | | | |
| SNMX 1507ENN-MF | | | | ● | | | | ● | | | | | | | | | |
| 1507ENN-MM | | | | ● | | | | ● | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | |
|--------------------|-------------------|---------------|
| | RMH8EC | RMH8ECM |
| RMH8EC 5080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RMH8ECM) 5100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 5125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 5160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 5200R-□ | | |
| 5250R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 5315R-□ | | |
| 5400R-□ | | |

Parts



FTGA0513

SS53RM8

SHXN0712F

TW20-100

RM8QC(M)4000

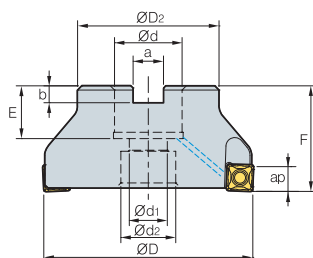


Fig. 1

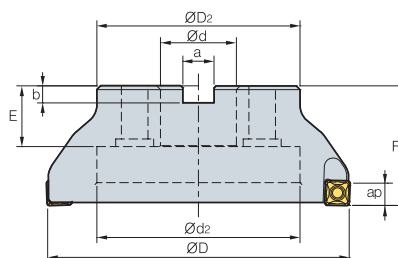


Fig. 2



• AR : -6°
• RR : -8°~6°

(mm)

| Designation | ⊗ | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | ⊗ _{kg} | Fig. | |
|-------------------|---|----|-----------------|-----|-----------------|-----------------|-----|------------|-------|----------|--------|-----------------|------|---|
| RM8QC 4063HR-M | | 6 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 11.5 | 0.6 | 1 |
| (RM8QCM) 4063HR-H | | 8 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 11.5 | 0.6 | 1 |
| 4080HR-M | | 7 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 11.5 | 1.1 | 1 |
| 4080HR-H | | 10 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 11.5 | 1.0 | 1 |
| 4100HR-M | | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 11.5 | 1.7 | 1 |
| 4100HR-H | | 12 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 11.5 | 1.6 | 1 |
| 4125HR-M | | 10 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 11.5 | 3.3 | 1 |
| 4125HR-H | | 14 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 11.5 | 3.3 | 1 |
| 4160R-M | | 12 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 11.5 | 3.9 | 2 |
| 4160R-H | | 20 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 11.5 | 3.9 | 2 |
| 4200R-M | | 14 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 11.5 | 6.4 | 2 |
| 4200R-H | | 22 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 11.5 | 6.4 | 2 |

• () Metric Size

Available Inserts



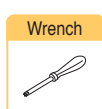
| Designation | Coated | | | | | Cermet | | | Uncoated | | page | | | | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|------|------|------|-----|-----|-------|
| | NCM325 | NCM355 | NC5330 | PC3500 | PC3000 | PC3545 | PC9530 | PC8510 | PD2000 | CN2000 | | CN20 | CN30 | H01 | G10 | ST30A |
| SNEX 1206QNN-MF | | | | ● | ● | ● | | | | | | | | | | |
| SNMX 1206QNN-MF | | | | ● | ● | ● | | | | | | | | | | |
| SNEX 1206QNN-MM | | | | ● | ● | ● | | | | | | | | | | |
| SNMX 1206QNN-MM | | | | ● | ● | ● | | | | | | | | | | |
| SNEX 1206QNN-MA | | | | | | | | | | | | | | | | |
| SNEX 120612-MF | | | | | | | | | | | | | | | | |
| SNMX 120612-MF | | | | | | | | | | | | | | | | |
| SNEX 120612-MM | | | | | | | | | | | | | | | | |
| SNMX 120612-MM | | | | ● | | ● | | | | | | | | | | |
| SNEX 120612-MA | | | | | | | | | | | | | | | | |

E19

Available Arbors

| Designation | Available Arbors | |
|-------------------|-------------------|---------------|
| | RM8QC | RM8QCM |
| RM8QCM 4063HR-□ | - | BT□□-FMC22-□□ |
| 4080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| RM8QC 4100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| (RM8QCM) 4125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 4160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 4200R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |

Parts



PTKA0411-R3

TW15S

RMH8QC(M) 4000 *New*

Shim type

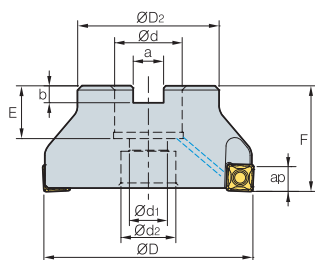


Fig. 1

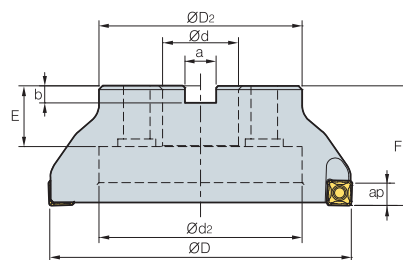


Fig. 2



• AR : -6°
• RR : -8°~6°

(mm)

| Designation | | ϕD | ϕD_2 | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ap | | Fig. | |
|--------------------|--|----------|------------|----------|------------|------------|-----|------------|-------|----------|--------|------|------|---|
| RMH8QC 4080HR-M | | 7 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 11.5 | 1.1 | 1 |
| (RMH8QCM) 4100HR-M | | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25.5) | 63(50) | 11.5 | 2.5 | 1 |
| 4125HR-M | | 10 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 36(30) | 63 | 11.5 | 3.0 | 1 |
| 4160R-M | | 12 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 11.5 | 4.0 | 2 |
| 4200R-M | | 16 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 11.5 | 5.9 | 2 |

• () Metric Size

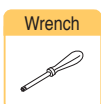
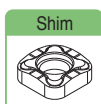
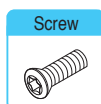
Available Inserts

| | SNEX-MF | SNEX-MM | SNEX-MA | SNMX-MF | SNMX-MM | | | | | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SNEX 1206QNN-MF | | | | ● | ● | ● | | | ● | | | | | | | | | E19 |
| SNMX 1206QNN-MF | | | | ● | | ● | | | ● | | | | | | | | | |
| SNEX 1206QNN-MM | | | | ● | | ● | | | ● | | | | | | | | | |
| SNMX 1206QNN-MM | | | | ● | | ● | | | ● | | | | | | | | | |
| SNEX 1206QNN-MA | | | | | | | | | | | | | | | | | | |
| SNEX 120612-MF | | | | | | | | | | | | | | | | | | |
| SNMX 120612-MF | | | | | | | | | | | | | | | | | | |
| SNEX 120612-MM | | | | | | | | | | | | | | | | | | |
| SNMX 120612-MM | | | | ● | | | | | ● | | | | | | | | | |
| SNEX 120612-MA | | | | | | | | | | | | | ● | | | | | |

Available Arbors

| Designation | Available Arbors | |
|--------------------|-------------------|---------------|
| | RMH8AC | RMH8ACM |
| RMH8QC 4080HR-□ | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| (RMH8QCM) 4100HR-□ | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 4125HR-□ | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 4160R-□ | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 4200R-□ | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |

Parts



PTKA0411-R3

SS42RM8

SHXN0609F

TW15S



Available Inserts E19



Available Arbors and bolt E290~E292

● : Stock item

RM4PC(M)3000

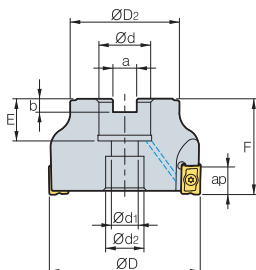
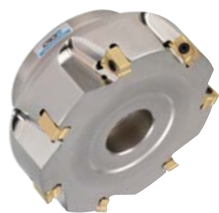


Fig. 1

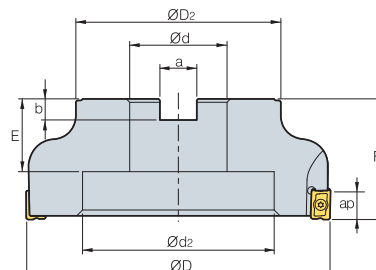


Fig. 2



(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | $\varnothing d_1$ | $\varnothing d_2$ | a | b | E | F | ap | | Bolt | Fig. |
|-----------------|----|-----------------|-------------------|-----------------|-------------------|-------------------|------------|----------|--------|--------|-----|------------|--------|------|
| RM4PC(M) 3040HR | 4 | 40 | 35 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 9.0 | 0.24 | SB0825 | 1 |
| 3040HR-M | 5 | 40 | 35 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 9.0 | 0.23 | SB0825 | 1 |
| 3050HR | 5 | 50 | 42 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 9.0 | 0.36 | SB1025 | 1 |
| 3050HR-M | 7 | 50 | 42 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 9.0 | 0.35 | SB1025 | 1 |
| 3063HR | 7 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 9.0 | 0.61 | SB1025 | 1 |
| 3063HR-M | 9 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 9.0 | 0.6 | SB1025 | 1 |
| 3080HR | 8 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6.0(7.0) | 25(23) | 50 | 9.0 | 1.25(1.24) | SB1230 | 1 |
| 3080HR-M | 10 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6.0(7.0) | 25(23) | 50 | 9.0 | 1.24(1.23) | SB1230 | 1 |
| 3100HR | 9 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0(8.0) | 33(25) | 63(50) | 9.0 | 2.46(1.94) | SB1630 | 1 |
| 3100HR-M | 12 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0(8.0) | 33(25) | 63(50) | 9.0 | 2.44(1.93) | SB1630 | 1 |

• () Metric Size

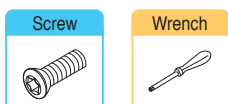
Available Inserts

| | LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM | | | | | | | | | | | |
|-------------------|---------|---------|---------|---------|---------|----------|------|--------|--------|--------|------|------|-----|-----|-------|------|
| | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | Cermet | Uncoated | page | | | | | | | | | |
| | NCM825 | NCM835 | NC5330 | PC3500 | PC3545 | PC9530 | | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 |
| LNEX 100605PNR-MF | | | ● | ● | | | | | | | | | | | | |
| LNMX 100605PNR-MF | | | ● | ● | | | | | | | | | | | | |
| LNEX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | |
| LNMX 100605PNR-MM | | | ● | ● | | | | | | | | | | | | |
| LNEX 100608PNR-MF | | | ● | ● | | | | | | | | | | | | |
| LNMX 100608PNR-MF | | | ● | ● | | | | | | | | | | | | |
| LNEX 100608PNR-MM | | | ● | ● | | | | | | | | | | | | |
| LNMX 100608PNR-MM | | | ● | ● | | | | | | | | | | | | |
| LNEX 100605PNR-MA | | | | | | | | | | | | | ● | | | |
| LNEX 100605PNL-MM | | | | | | | | | | | | | | | | |
| LNMX 100605PNL-MM | | | ● | | | | | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | |
|-----------------|------------------|---------------|
| | RM4PC | RM4PCM |
| RM4PC(M) 3040HR | - | BT□□-FMC16-□□ |
| 3040HR-M | - | |
| 3050HR | - | BT□□-FMC22-□□ |
| 3050HR-M | - | |
| 3063HR | - | |
| 3063HR-M | - | |
| 3080HR | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| 3080HR-M | | |
| 3100HR | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 3100HR-M | | |

Parts



FTKA0307

TW09S

RM4PC(M) 4000

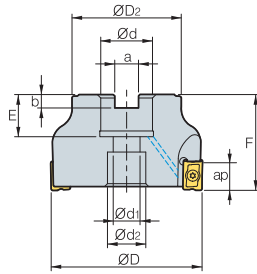
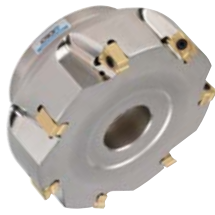


Fig. 1

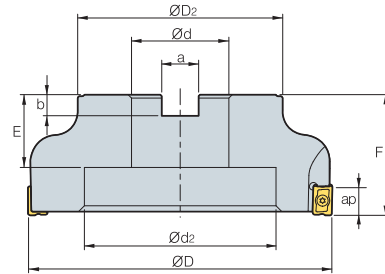


Fig. 2



AA 90°
 • AR : -6°
 • RR : -19°~ -13°

(mm)

| Designation | | øD | øD ₂ | ød | ød ₁ | ød ₂ | a | b | E | F | ap | $\frac{m}{kg}$ | Bolt | Fig. |
|-----------------|----|-----|-----------------|-----------|-----------------|-----------------|------------|----------|--------|--------|----|----------------|--------|------|
| RM4PC(M) 4050HR | 3 | 50 | 46 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 14 | 0.36 | SB1025 | 1 |
| 4050HR-M | 4 | 50 | 46 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 14 | 0.35 | SB1025 | 1 |
| 4063HR | 4 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 14 | 0.56 | SB1025 | 1 |
| 4063HR-M | 6 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 14 | 0.57 | SB1025 | 1 |
| 4080HR | 5 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6.0(7.0) | 25(23) | 50 | 14 | 1.18(1.16) | SB1230 | 1 |
| 4080HR-M | 7 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6.0(7.0) | 25(23) | 50 | 14 | 1.17(1.14) | SB1230 | 1 |
| 4100HR | 5 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0(8.0) | 33(25) | 63(50) | 14 | 2.35(1.84) | SB1630 | 1 |
| 4100HR-M | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0(8.0) | 33(25) | 63(50) | 14 | 2.31(1.82) | SB1630 | 1 |
| 4125HR | 7 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9.0) | 35(30) | 63 | 14 | 3.87(3.79) | SB2040 | 1 |
| 4125HR-M | 10 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9.0) | 35(30) | 63 | 14 | 3.82(3.70) | SB2040 | 1 |
| 4160R | 8 | 160 | 107 | 50.8(40) | - | 100 | 19(16.4) | 11(9.0) | 38(32) | 63 | 14 | 5.0(4.75) | MBA | 2 |
| 4160R-M | 12 | 160 | 107 | 50.8(40) | - | 100 | 19(16.4) | 11(9.0) | 38(32) | 63 | 14 | 4.97(4.71) | MBA | 2 |

() Metric Size

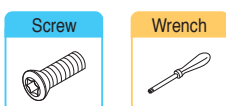
Available Inserts

| | | LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM | | | | | | | | | | | | |
|-------------------|------|---------|---------|---------|---------|----------|--------|--------|--------|--------|--------|--------|------|------|-----|-----|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | page | Coated | | | Cermet | Uncoated | | | | | | | | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9590 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 |
| LNEX 151004PNR-MF | | ● | | | | | | | | | | | | | | | | |
| LNMX 151004PNR-MF | | | ● | | | | | | | | | | | | | | | |
| LNEX 151004PNR-MM | | | | | | | | | | | | | | | | | | |
| LNMX 151004PNR-MM | | | | | | | | | | | | | | | | | | |
| LNEX 151008PNR-MF | | | ● | ● | | | | | | | | | | | | | | |
| LNMX 151008PNR-MF | | | ● | ● | ● | | | | | | | | | | | | | |
| LNEX 151008PNR-MM | | | ● | ● | ● | ● | | | | | | | | | | | | |
| LNMX 151008PNR-MM | | | ● | ● | ● | ● | | | | | | | | | | | | |
| LNEX 151016PNR-MF | | | | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MF | | | | | | | | | | | | | | | | | | |
| LNEX 151016PNR-MM | | | ● | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MM | | | | | | | | | | | | | | | | | | |
| LNEX 151004PNR-MA | | | | | | | | | | | | | | | ● | | | |
| LNEX 151008PNR-MA | | | | | | | | | | | | | | | ● | | | |
| LNEX 151008PNL-MM | | | | | | | | | | | | | | | | | | |
| LNMX 151008PNL-MM | | | | | | | | | | | | | | | | | | |

Available Arbors

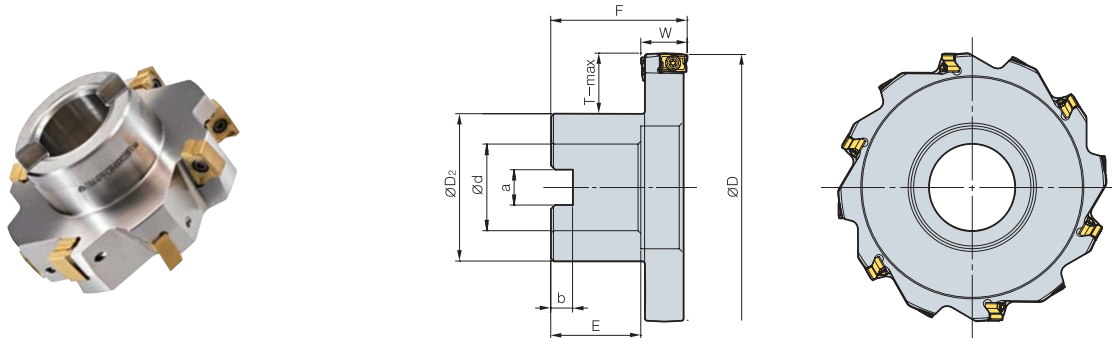
| Designation | Available Arbors | |
|-----------------|------------------|---------------|
| | RM4PC | RM4PCM |
| RM4PC(M) 4050HR | | |
| 4050HR-M | | BT□□-FMC22-□□ |
| 4063HR | | |
| 4063HR-M | | |
| 4080HR | BT□□-FMA 25.4-□□ | BT□□-FMC27-□□ |
| 4080HR-M | | |
| 4100HR | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 4100HR-M | | |
| 4125HR | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 4125HR-M | | BT□□-FMC40-□□ |
| 4160R | BT□□-FMA50.8-□□ | |
| 4160R-M | | |

Parts



FTKA0412B TW15S

RM4PFCB3000



| Designation | | | øD | øD ₂ | ød | a | b | E | F | W | T-max |
|-------------|---------|----|-----|-----------------|-------|------|----|----|----|----|-------|
| RM4PFCB | 308015R | 10 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 15 | 19 |
| | 308017R | 10 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 17 | 19 |
| | 310015R | 12 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 15 | 22 |
| | 310017R | 12 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 17 | 22 |
| | 312515R | 14 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 15 | 26 |
| | 312517R | 14 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 17 | 26 |
| | 316015R | 16 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 15 | 44 |
| | 316017R | 16 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 17 | 44 |

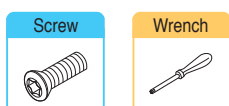
Available Inserts

| Designation | LNEX-MM | | | | | | | | | LNMX-MM | | | page | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | | CN30 | H01 | G10 | ST30A |
| LNEX 100605PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | |
| LNEX 100605PNL-MM | | | | | | | | | | | | | | | | | |
| LNMX 100605PNL-MM | | | | ● | | | | | | | | | | | | | |

Available Arbors

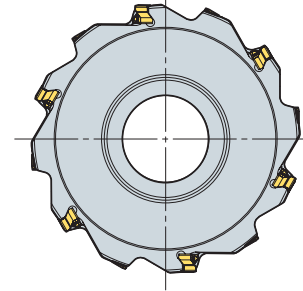
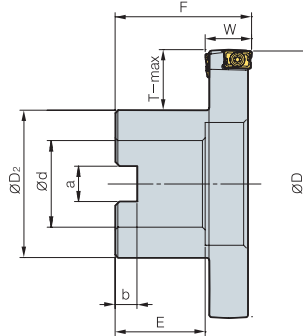
| Designation | Available Arbors | | Designation | Available Arbors | |
|--|-------------------|--|--|------------------|--|
| | RM4PC | | | RM4PC | |
| RM4PFCB 308011R 308013R 308015R 308017R | BT□□-FMA 25.4-□□ | | RM4PFCB 312511R 312513R 312515R 312517R | BT□□-FMA38.1-□□ | |
| 310011R 310013R 310015R 310017R | BT□□-FMA 31.75-□□ | | 316011R 316013R 316015R 316017R | | |

Parts



FTKA0307 TW09S

RM4PFCB4000



| Designation | | ⊙ | ØD | ØD ₂ | ød | a | b | E | F | W | T-max |
|-------------|---------|-----|-----|-----------------|-------|------|----|----|----|----|-------|
| RM4PFCB | 408022R | 6 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 22 | 19 |
| | 408024R | 6 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 24 | 19 |
| | 408026R | 6 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 26 | 19 |
| | 408028R | 6 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 28 | 19 |
| | 410022R | 8 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 22 | 22 |
| | 410024R | 8 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 24 | 22 |
| | 410026R | 8 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 26 | 22 |
| | 410028R | 8 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 28 | 22 |
| | 412522R | 10 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 22 | 26 |
| | 412524R | 10 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 24 | 26 |
| | 412526R | 10 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 26 | 26 |
| | 412528R | 10 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 28 | 26 |
| 416022R | 12 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 22 | 44 | |
| 416024R | 12 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 24 | 44 | |
| 416026R | 12 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 26 | 44 | |
| 416028R | 12 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 28 | 44 | |

Available Inserts

LNEX-MM

LNMX-MM



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| LNEX 151008PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 151008PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | |
| LNEX 151008PNL-MM | | | | | | | | | | | | | | | | | |
| LNMX 151008PNL-MM | | | | | | | | | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | | Designation | Available Arbors | |
|--|-------------------|--|--|------------------|--|
| | RM4PC | | | RM4PC | |
| RM4PFCB 408022R 408024R 408026R 408028R | BT□□-FMA 25.4-□□ | | RM4PFCB 412522R 412524R 412526R 412528R | BT□□-FMA38.1-□□ | |
| 410022R 410024R 410026R 410028R | BT□□-FMA 31.75-□□ | | 416022R 416024R 416026R 416028R | | |

Parts

Screw



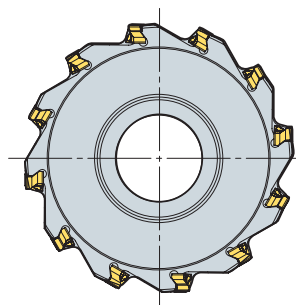
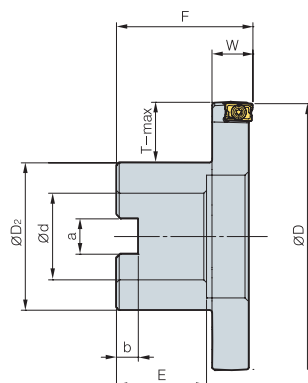
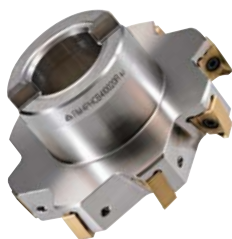
Wrench



FTKA0412B

TW15S

RM4PHCB3000



(mm)

| Designation | | ØD | ØD ₂ | ød | a | b | E | F | W | T-max |
|-----------------|----|-----|-----------------|-------|------|----|----|----|----|-------|
| RM4PHCB 308015R | 10 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 15 | 19 |
| 310015R | 12 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 15 | 22 |
| 312515R | 14 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 15 | 26 |
| 316015R | 16 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 15 | 44 |

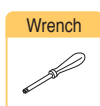
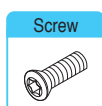
Available Inserts

| | LNEX-MF | | LNEX-MM | | LNEX-MA | | LNMX-MF | | | LNMX-MM | | | | | | | |
|-------------------|---------|--------|---------|--------|---------|--------|---------|--------|--------|---------|--------|----------|------|------|-----|-----|-------|
| | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | Uncoated | | page | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A |
| LNEX 100605PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNEX 100605PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | |
| LNEX 100608PNR-MF | | | | ● | | | | | ● | | | | | | | | |
| LNMX 100608PNR-MF | | | | ● | | | | | ● | | | | | | | | |
| LNEX 100608PNR-MM | | | | | | | | | ● | | | | | | | | |
| LNMX 100608PNR-MM | | | | ● | | | | | ● | | | | | | | | |
| LNEX 100605PNR-MA | | | | | | | | | | | | | ● | | | | |

Available Arbors

| Designation | Available Arbors | |
|-----------------|-------------------|--|
| | RM4PHCB | |
| RM4PHCB 308015R | BT□□-FMA25.4-□□ | |
| 310015R | BT□□-FMA 31.75-□□ | |
| 312515R | | |
| 316015R | BT□□-FMA38.1-□□ | |

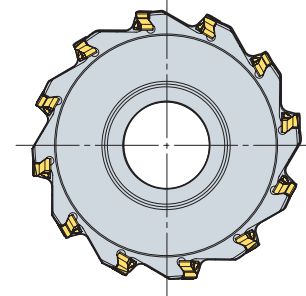
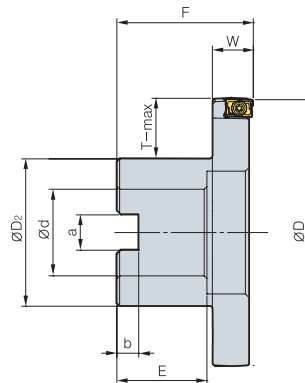
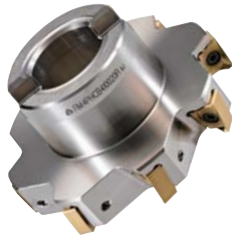
Parts



FTKA0307

TW09S

RM4PHCB4000



| Designation | | ØD | ØD ₂ | Ød | a | b | E | F | W | T-max |
|-----------------|----|-----|-----------------|-------|------|----|----|----|----|-------|
| RM4PHCB 408020R | 6 | 80 | 40 | 25.4 | 9.5 | 6 | 25 | 50 | 20 | 19 |
| 410020R | 8 | 100 | 54 | 31.75 | 12.7 | 8 | 32 | 50 | 20 | 22 |
| 412520R | 10 | 125 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 20 | 26 |
| 416020R | 12 | 160 | 70 | 38.1 | 15.9 | 10 | 38 | 60 | 20 | 44 |

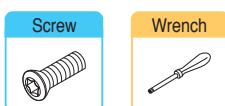
Available Inserts

| | LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM | | | | | | | | | | | | | |
|-------------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|----------|------|-----|------|-------|------|-----|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | page | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| LNEX 151004PNR-MF | | | | ● | | | | | ● | | | | | | | | | E09 |
| LNMX 151004PNR-MF | | | | | | | | | | | | | | | | | | |
| LNEX 151004PNR-MM | | | | | | | | | | | | | | | | | | |
| LNMX 151004PNR-MM | | | | | | | | | | | | | | | | | | |
| LNEX 151008PNR-MF | | | | ● | | ● | | | ● | | | | | | | | | |
| LNMX 151008PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | | |
| LNEX 151008PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | | |
| LNMX 151008PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| LNEX 151016PNR-MF | | | | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MF | | | | | | | | | | | | | | | | | | |
| LNEX 151016PNR-MM | | | | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MM | | | | ● | | | | | | | | | | | | | | |
| LNEX 151004PNR-MA | | | | | | | | | | | | | | ● | | | | |
| LNEX 151008PNR-MA | | | | | | | | | | | | | | ● | | | | |

Available Arbors

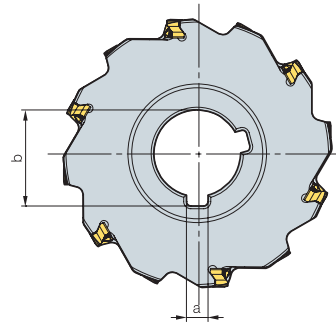
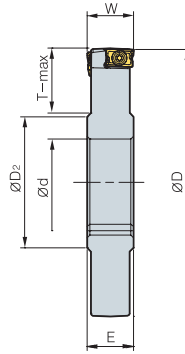
| Designation | Available Arbors |
|-----------------|-------------------|
| | RM4PHCB |
| RM4PHCB 408020R | BT□□-FMA25.4-□□ |
| 410020R | BT□□-FMA 31.75-□□ |
| 412520R | |
| 416020R | BT□□-FMA38.1-□□ |

Parts



FTKA0412B TW15S

RM4PFCP3000



| (mm) | | | | | | | | | | |
|-------------|---------|----|-----------------|------|-------|------|------|----|-------|----|
| Designation | | ØD | ØD ₂ | ød | a | b | E | W | T-max | |
| RM4PFCP | 308015R | 10 | 80 | 41.5 | 25.4 | 6.35 | 28 | 15 | 15 | 17 |
| | 308017R | 10 | 80 | 41.5 | 25.4 | 6.35 | 28 | 17 | 17 | 17 |
| | 310015R | 12 | 100 | 48 | 31.75 | 7.94 | 35.2 | 15 | 15 | 24 |
| | 310017R | 12 | 100 | 48 | 31.75 | 7.94 | 35.2 | 17 | 17 | 24 |
| | 312515R | 14 | 125 | 58 | 38.1 | 9.53 | 42.3 | 15 | 15 | 32 |
| | 312517R | 14 | 125 | 58 | 38.1 | 9.53 | 42.3 | 17 | 17 | 32 |
| | 316015R | 16 | 160 | 58 | 38.1 | 9.53 | 42.3 | 15 | 15 | 49 |
| | 316017R | 16 | 160 | 58 | 38.1 | 9.53 | 42.3 | 17 | 17 | 49 |

Available Inserts

LNEX-MM

LNMX-MM

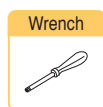


| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | page | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| LNEX 100605PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | |
| LNEX 100605PNL-MM | | | | | | | | | | | | | | | | | |
| LNMX 100605PNL-MM | | | | ● | | | | | | | | | | | | | |

Available Arbors

| Designation | Available Arbors | | Designation | Available Arbors | |
|-------------|------------------|-------------------|-------------|------------------|-----------------|
| | RM4PFCP | | | RM4PC | |
| RM4PFCP | 308011R | BT□□-SCA 25.4-□□ | RM4PFCP | 312511R | BT□□-SCA38.1-□□ |
| | 308013R | | | 312513R | |
| | 308015R | | | 312515R | |
| | 308017R | | | 312517R | |
| | 310011R | BT□□-SCA 31.75-□□ | | 316011R | |
| | 310013R | | | 316013R | |
| | 310015R | | | 316015R | |
| 310017R | | 316017R | | | |

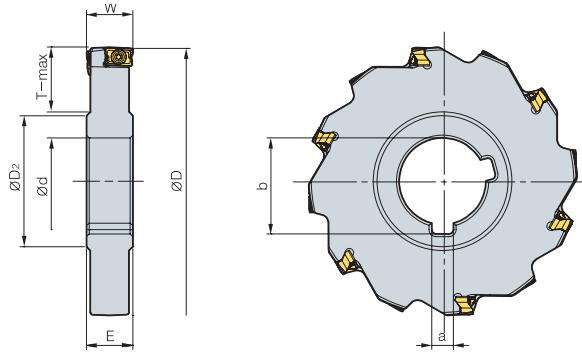
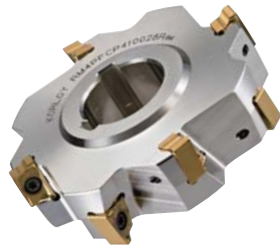
Parts



FTKA0307

TW09S

RM4PFCP4000



(mm)

| Designation | | øD | øD ₂ | ød | a | b | E | W | T-max |
|-----------------|----|-----|-----------------|-------|------|------|----|----|-------|
| RM4PFCP 408022R | 6 | 80 | 41.5 | 25.4 | 6.35 | 28 | 22 | 22 | 17 |
| 408024R | 6 | 80 | 41.5 | 25.4 | 6.35 | 28 | 24 | 24 | 17 |
| 408026R | 6 | 80 | 41.5 | 25.4 | 6.35 | 28 | 26 | 26 | 17 |
| 408028R | 6 | 80 | 41.5 | 25.4 | 6.35 | 28 | 28 | 28 | 17 |
| 410022R | 8 | 100 | 48 | 31.75 | 7.94 | 35.2 | 22 | 22 | 24 |
| 410024R | 8 | 100 | 48 | 31.75 | 7.94 | 35.2 | 24 | 24 | 24 |
| 410026R | 8 | 100 | 48 | 31.75 | 7.94 | 35.2 | 26 | 26 | 24 |
| 410028R | 8 | 100 | 48 | 31.75 | 7.94 | 35.2 | 28 | 28 | 24 |
| 412522R | 10 | 125 | 58 | 38.1 | 9.53 | 42.3 | 22 | 22 | 32 |
| 412524R | 10 | 125 | 58 | 38.1 | 9.53 | 42.3 | 24 | 24 | 32 |
| 412526R | 10 | 125 | 58 | 38.1 | 9.53 | 42.3 | 26 | 26 | 32 |
| 412528R | 10 | 125 | 58 | 38.1 | 9.53 | 42.3 | 28 | 28 | 32 |
| 416022R | 12 | 160 | 58 | 38.1 | 9.53 | 42.3 | 22 | 22 | 49 |
| 416024R | 12 | 160 | 58 | 38.1 | 9.53 | 42.3 | 24 | 24 | 49 |
| 416026R | 12 | 160 | 58 | 38.1 | 9.53 | 42.3 | 26 | 26 | 49 |
| 416028R | 12 | 160 | 58 | 38.1 | 9.53 | 42.3 | 28 | 28 | 49 |

Available Inserts

LNEX-MM

LNMX-MM



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| LNEX 151008PNR-MM | | | | ● | ● | ● | | | | | | | | | | | | |
| LNMX 151008PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| LNEX 151008PNL-MM | | | | | | | | | | | | | | | | | | |
| LNMX 151008PNL-MM | | | | | | | | | | | | | | | | | | |

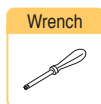
page

E09

Available Arbors

| Designation | Available Arbors | | Designation | Available Arbors | |
|--|-------------------|--|--|------------------|--|
| | RM4PFCP | | | RM4PC | |
| RM4PFCP 408022R 408024R 408026R 408028R | BT□□-SCA 25.4-□□ | | RM4PFCP 412522R 412524R 412526R 412528R 416022R 416024R 416026R 416028R | BT□□-SCA38.1-□□ | |
| 410022R 410024R 410026R 410028R | BT□□-SCA 31.75-□□ | | | | |

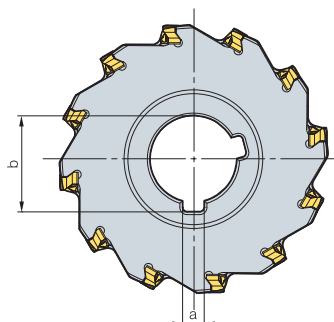
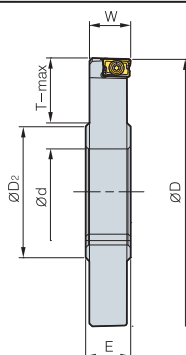
Parts



FTKA0412B

TW15S

RM4PHCP3000



(mm)

| Designation | | øD | øD ₂ | ød | a | b | E | W | T-max |
|-----------------|----|-----|-----------------|-------|------|------|------|------|-------|
| RM4PHCP 308015R | 10 | 80 | 41.5 | 25.4 | 6.35 | 28 | 16.5 | 15.1 | 17 |
| 310015R | 12 | 100 | 48 | 31.75 | 7.94 | 35.2 | 16.5 | 15.1 | 24 |
| 312515R | 14 | 125 | 58 | 38.1 | 9.53 | 42.3 | 16.5 | 15.1 | 32 |
| 316015R | 16 | 160 | 58 | 38.1 | 9.53 | 42.3 | 16.5 | 15.1 | 49 |

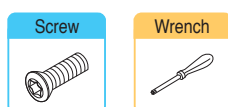
Available Inserts

| | LNEX-MF | | LNEX-MM | | LNEX-MA | | LNMX-MF | | LNMX-MM | | | | | | | | |
|-------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|--------|----------|------|------|-----|-----|-------|
| | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | Uncoated | | page | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A |
| LNEX 100605PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNEX 100605PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | |
| LNEX 100608PNR-MF | | | | ● | | | | | ● | | | | | | | | |
| LNMX 100608PNR-MF | | | | | | | | | ● | | | | | | | | |
| LNEX 100608PNR-MM | | | | | | | | | ● | | | | | | | | |
| LNMX 100608PNR-MM | | | | ● | | | | | | | | | | | | | |
| LNEX 100605PNR-MA | | | | | | | | | | | | | ● | | | | |

Available Arbors

| Designation | Available Arbors | |
|-----------------|------------------|--|
| | RM4PHCP | |
| RM4PHCP 308015R | BT□□-SCA25.4-□□ | |
| 310015R | BT□□-SCA31.75-□□ | |
| 312515R | | |
| 316015R | BT□□-SCA38.1-□□ | |

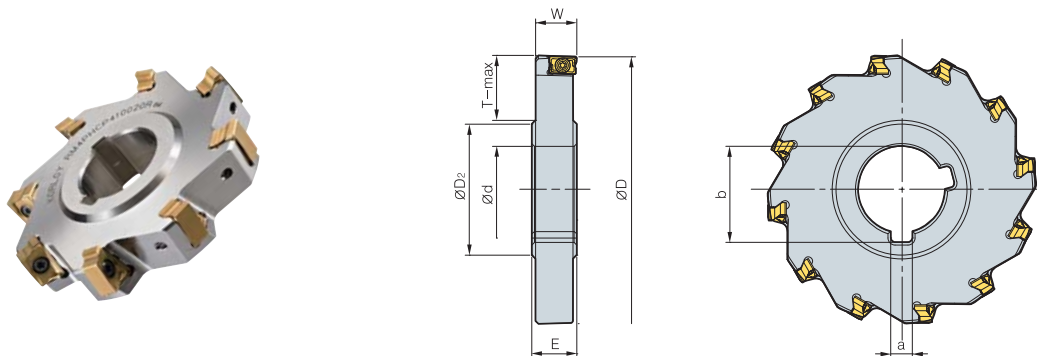
Parts



FTKA0307

TW09S

RM4PHCP4000



| Designation | | | øD | øD ₂ | ød | a | b | E | W | T-max |
|-------------|---------|----|-----|-----------------|-------|------|------|----|------|-------|
| RM4PHCP | 408020R | 6 | 80 | 41.5 | 25.4 | 6.35 | 28 | 22 | 19.8 | 17 |
| | 410020R | 8 | 100 | 48 | 31.75 | 7.94 | 35.2 | 22 | 19.8 | 24 |
| | 412520R | 10 | 125 | 58 | 38.1 | 9.53 | 42.3 | 22 | 19.8 | 32 |
| | 416020R | 12 | 160 | 58 | 38.1 | 9.53 | 42.3 | 22 | 19.8 | 49 |

(mm)

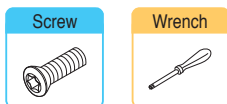
Available Inserts

| | LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM | | | | | | | | | | | | | |
|-------------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|------|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| LNEX 151004PNR-MF | | | | • | | | | | | | | | | | | | | E09 |
| LNMX 151004PNR-MF | | | | • | | | | | | | | | | | | | | |
| LNEX 151004PNR-MM | | | | | | | | | | | | | | | | | | |
| LNMX 151004PNR-MM | | | | | | | | | | | | | | | | | | |
| LNEX 151008PNR-MF | | | | • | | • | | | | | | | | | | | | |
| LNMX 151008PNR-MF | | | | • | • | • | | | | | | | | | | | | |
| LNEX 151008PNR-MM | | | | • | • | • | | | | | | | | | | | | |
| LNMX 151008PNR-MM | | | | • | • | • | • | • | | | | | | | | | | |
| LNEX 151016PNR-MF | | | | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MF | | | | | | | | | | | | | | | | | | |
| LNEX 151016PNR-MM | | | | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MM | | | | • | | | | | | | | | | | | | | |
| LNEX 151004PNR-MA | | | | | | | | | | | | | • | | | | | |
| LNEX 151008PNR-MA | | | | | | | | | | | | | • | | | | | |

Available Arbors

| Designation | Available Arbors | |
|-----------------|-------------------|--|
| | RM4PHCP | |
| RM4PHCP 408020R | BT□□-SCA25.4-□□ | |
| RM4PHCP 410020R | BT□□-SCA 31.75-□□ | |
| RM4PHCP 412520R | | |
| RM4PHCP 416020R | BT□□-SCA38.1-□□ | |

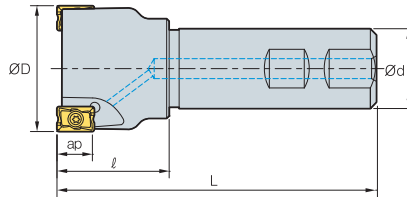
Parts



FTKA0412B TW15S



RM4PS3000



AA
90°

- AR : -6°
- RR : -39°~-16°

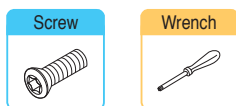
(mm)

| Designation | | ØD | ød | l | L | ap | |
|------------------|---|----|----|----|-----|-----|------|
| RM4PS 3014HR-S16 | 1 | 14 | 16 | 23 | 90 | 9.0 | 0.11 |
| 3016HR-S16 | 1 | 16 | 16 | 25 | 90 | 9.0 | 0.11 |
| 3018HR-S16 | 2 | 18 | 16 | 23 | 90 | 9.0 | 0.12 |
| 3020HR-S20 | 2 | 20 | 20 | 30 | 100 | 9.0 | 0.21 |
| 3020HR-S20M | 3 | 20 | 20 | 30 | 100 | 9.0 | 0.21 |
| 3025HR-S25 | 2 | 25 | 25 | 35 | 115 | 9.0 | 0.38 |
| 3025HR-S25M | 3 | 25 | 25 | 35 | 115 | 9.0 | 0.38 |
| 3032HR-S32 | 3 | 32 | 32 | 40 | 125 | 9.0 | 0.69 |
| 3032HR-S32M | 4 | 32 | 32 | 40 | 125 | 9.0 | 0.7 |
| 3040HR-S32 | 4 | 40 | 32 | 42 | 130 | 9.0 | 0.86 |
| 3040HR-S32M | 5 | 40 | 32 | 42 | 130 | 9.0 | 0.85 |
| 3040HR-S40 | 4 | 40 | 40 | 42 | 130 | 9.0 | 1.17 |
| 3040HR-S40M | 5 | 40 | 40 | 42 | 130 | 9.0 | 1.17 |
| 3040HR-S42 | 4 | 40 | 42 | 42 | 130 | 9.0 | 1.26 |
| 3040HR-S42M | 5 | 40 | 42 | 42 | 130 | 9.0 | 1.25 |
| 3050HR-S32 | 5 | 50 | 32 | 45 | 135 | 9.0 | 1.06 |
| 3050HR-S32M | 7 | 50 | 32 | 45 | 135 | 9.0 | 1.05 |
| 3050HR-S40 | 5 | 50 | 40 | 45 | 135 | 9.0 | 1.38 |
| 3050HR-S40M | 7 | 50 | 40 | 45 | 135 | 9.0 | 1.37 |
| 3050HR-S42 | 5 | 50 | 42 | 45 | 135 | 9.0 | 1.48 |
| 3050HR-S42M | 7 | 50 | 42 | 45 | 135 | 9.0 | 1.48 |

Available Inserts

| Designation | LNX-MF | | LNX-MM | | LNX-MA | | LNMX-MF | | LNMX-MM | | page | | | | | | | |
|-------------------|--------|--------|--------|--------|--------|--------|---------|--------|---------|--------|--------|------|------|----------|-----|-------|------|-----|
| | | | | | | | | | | | | | | | | | | |
| | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | |
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| LNX 100605PNR-MF | | | | • | • | • | | | • | | | | | | | | | E09 |
| LNMX 100605PNR-MF | | | | • | • | • | | | • | | | | | | | | | |
| LNX 100605PNR-MM | | | | • | • | • | | | • | | | | | | | | | |
| LNMX 100605PNR-MM | | | | • | • | • | • | • | • | | | | | | | | | |
| LNX 100608PNR-MF | | | | • | | | | | • | | | | | | | | | |
| LNMX 100608PNR-MF | | | | | | | | | • | | | | | | | | | |
| LNX 100608PNR-MM | | | | | | | | | • | | | | | | | | | |
| LNMX 100608PNR-MM | | | | • | | | | | | | | | | | | | | |
| LNX 100605PNR-MA | | | | | | | | | | | | | | • | | | | |
| LNX 100605PNL-MM | | | | | | | | | • | | | | | | | | | |
| LNMX 100605PNL-MM | | | | • | | | | | • | | | | | | | | | |

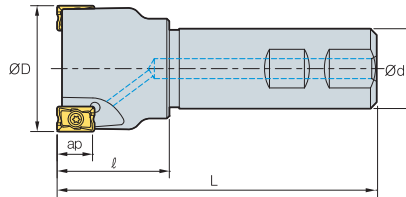
Parts



FTKA0307

TW09S

RM4PS4000



| Designation | | øD | ød | l | L | ap | $\frac{kg}{kg}$ |
|------------------|---|----|----|----|-----|----|-----------------|
| RM4PS 4032HR-S32 | 2 | 32 | 32 | 40 | 125 | 14 | 0.68 |
| 4040HR-S32 | 3 | 40 | 32 | 42 | 125 | 14 | 0.83 |
| 4040HR-S40 | 3 | 40 | 40 | 42 | 125 | 14 | 1.14 |
| 4040HR-S42 | 3 | 40 | 42 | 42 | 125 | 14 | 1.23 |
| 4050HR-S32 | 3 | 50 | 32 | 45 | 125 | 14 | 1.02 |
| 4050HR-S32M | 4 | 50 | 32 | 45 | 125 | 14 | 1.02 |
| 4050HR-S40 | 3 | 50 | 40 | 45 | 125 | 14 | 1.35 |
| 4050HR-S40M | 4 | 50 | 40 | 45 | 125 | 14 | 1.34 |
| 4050HR-S42 | 3 | 50 | 42 | 45 | 125 | 14 | 1.45 |
| 4050HR-S42M | 4 | 50 | 42 | 45 | 125 | 14 | 1.45 |
| 4063HR-S32 | 4 | 63 | 32 | 45 | 125 | 14 | 1.25 |
| 4063HR-S32M | 6 | 63 | 32 | 45 | 125 | 14 | 1.24 |
| 4063HR-S40 | 4 | 63 | 40 | 45 | 125 | 14 | 1.62 |
| 4063HR-S40M | 6 | 63 | 40 | 45 | 125 | 14 | 1.61 |
| 4063HR-S42 | 4 | 63 | 42 | 45 | 125 | 14 | 1.71 |
| 4063HR-S42M | 6 | 63 | 42 | 45 | 125 | 14 | 1.7 |

Available Inserts

LNEX-MF

LNEX-MM

LNEX-MA

LNMX-MF

LNMX-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| LNEX 151004PNR-MF | | | | ● | | | | | ● | | | | | | | | |
| LNMX 151004PNR-MF | | | | ● | | | | | ● | | | | | | | | |
| LNEX 151004PNR-MM | | | | | | | | | | | | | | | | | |
| LNMX 151004PNR-MM | | | | | | | | | | | | | | | | | |
| LNEX 151008PNR-MF | | | | ● | | ● | | | ● | | | | | | | | |
| LNMX 151008PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNEX 151008PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 151008PNR-MM | | | | ● | ● | ● | ● | | ● | | | | | | | | |
| LNEX 151016PNR-MF | | | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MF | | | | | | | | | | | | | | | | | |
| LNEX 151016PNR-MM | | | | | | | | | | | | | | | | | |
| LNMX 151016PNR-MM | | | | ● | | | | | | | | | | | | | |
| LNEX 151004PNR-MA | | | | | | | | | | | | | | ● | | | |
| LNEX 151008PNR-MA | | | | | | | | | | | | | | ● | | | |

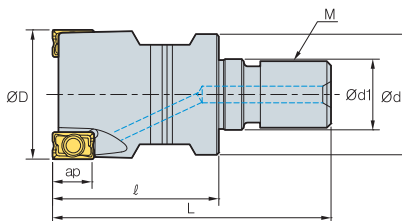
Parts



FTKA0412B

TW15S

RM4PM



(mm)

| Designation | | øD | ød | ød ₁ | ℓ | L | M | ap | |
|------------------|---|----|------|-----------------|----|----|-----|-----|------|
| RM4PM 3014HR-M06 | 1 | 14 | 12 | 6.5 | 25 | 40 | M06 | 9.0 | 0.02 |
| 3016HR-M08 | 1 | 16 | 14.5 | 8.5 | 25 | 42 | M08 | 9.0 | 0.02 |
| 3018HR-M08 | 2 | 18 | 14.5 | 8.5 | 25 | 42 | M08 | 9.0 | 0.03 |
| 3020HR-M10 | 2 | 20 | 18 | 10.5 | 30 | 51 | M10 | 9.0 | 0.06 |
| 3025HR-M12 | 2 | 25 | 23 | 12.5 | 35 | 59 | M12 | 9.0 | 0.11 |
| 3032HR-M16 | 3 | 32 | 28 | 17 | 40 | 67 | M16 | 9.0 | 0.21 |
| 3040HR-M16 | 4 | 40 | 28 | 17 | 40 | 67 | M16 | 9.0 | 0.26 |
| 3050HR-M16 | 5 | 50 | 30 | 17 | 45 | 72 | M16 | 9.0 | 0.41 |

Available Inserts

| Designation | LNEX-MF | | LNEX-MM | | LNEX-MA | | LNMX-MF | | LNMX-MM | | page | | | | | | |
|-------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|----------|--------|------|------|-----|-----|-------|------|
| | | | | | | Coated | | Cermet | | Uncoated | | | | | | | |
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 |
| LNEX 100605PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MF | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNEX 100605PNR-MM | | | | ● | ● | ● | | | ● | | | | | | | | |
| LNMX 100605PNR-MM | | | | ● | ● | ● | ● | ● | ● | | | | | | | | |
| LNEX 100608PNR-MF | | | | ● | | | | | ● | | | | | | | | |
| LNMX 100608PNR-MF | | | | | | | | | ● | | | | | | | | |
| LNEX 100608PNR-MM | | | | | | | | | ● | | | | | | | | |
| LNMX 100608PNR-MM | | | | ● | | | | | | | | | | | | | |
| LNEX 100605PNR-MA | | | | | | | | | | | | | | ● | | | |
| LNEX 100605PNL-MM | | | | | | | | | | | | | | | | | |
| LNMX 100605PNL-MM | | | | ● | | | | | ● | | | | | | | | |

Available Adoptor

| Designation | Available Adoptor |
|------------------|-------------------|
| RM4PM 3014HR-M06 | MAT - M06 |
| 3016HR-M08 | MAT - M08 |
| 3018HR-M08 | MAT - M08 |
| 3020HR-M10 | MAT - M10 |
| 3025HR-M12 | MAT - M12 |
| 3032HR-M16 | MAT - M16 |
| 3040HR-M16 | MAT - M16 |
| 3050HR-M16 | MAT - M16 |

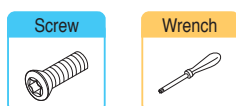
Designation : RM4PM3032HR-M16
Modular Head Threading Measure size(M16)

II

Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)



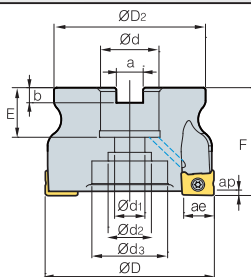
Parts



FTKA0307

TW09S

RM4ZC(M) 3000/4000 *New*



AA
90°
• AR : -11°
• RR : -12°~10°

(mm)

| Designation | ⊙ | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | Ød ₃ | a | b | E | F | ap | ae | |
|-----------------|---|-----|-----------------|-----------|-----------------|-----------------|-----------------|------------|------|--------|--------|-----|------|------|
| RM4ZCM 3040HR | 4 | 40 | 37 | 16 | 9 | 14 | - | 8.4 | 5.6 | 19 | 40 | 1.5 | 9.0 | 0.21 |
| | 5 | 50 | 47 | 22 | 11 | 18 | - | 10.4 | 6.3 | 20 | 40 | 1.5 | 9.0 | 0.33 |
| | 5 | 52 | 48 | 22 | 11 | 18 | - | 10.4 | 6.3 | 20 | 40 | 1.5 | 9.0 | 0.37 |
| RM4ZCM 4063HR | 5 | 63 | 58 | 22 | 11 | 18 | - | 10.4 | 6.3 | 20 | 40 | 2.5 | 14.0 | 0.56 |
| RM4ZC(M) 4066HR | 5 | 66 | 61 | 25.4(27) | 14 | 20 | - | 9.5(12.4) | 6(7) | 25 | 50 | 2.5 | 14.0 | 0.74 |
| | 6 | 80 | 70 | 25.4(27) | 14 | 20 | 35 | 9.5(12.4) | 6(7) | 25(23) | 50 | 2.5 | 14.0 | 1.09 |
| 4100HR | 7 | 100 | 80 | 31.75(32) | 18 | 26 | 42 | 12.7(14.4) | 8(8) | 25(33) | 63(50) | 2.5 | 14.0 | 1.71 |

Available Inserts

LNEX-MM

LNMX-MM



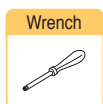
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9330 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 3000 type LNEX 100605PNL-MM | | | | | | | | | | | | | | | | | |
| 3000 type LNMX 100605PNL-MM | | | | ● | | | | | | | | | | | | | |
| 4000 type LNEX 151008PNL-MM | | | | | | | | | | | | | | | | | |
| 4000 type LNMX 151008PNL-MM | | | | | | | | | | | | | | | | | |

E09

Available Arbors

| Designation | Available Arbors | |
|-----------------|------------------|--------------------------------------|
| | RM4ZC | RM4ZCM |
| RM4ZCM 3040HR | | BT□□-FMC16-□□ BT□□-SCA16-□□ |
| | 3050HR | |
| | 3052HR | BT□□-FMC22-□□ |
| RM4ZCM 4063HR | | BT□□-FMC22-□□ |
| RM4ZC(M) 4066HR | | |
| | 4080HR | BT□□-FMA25.4-□□ |
| | 4100HR | BT□□-FMA31.75-□□ BT□□-SCA31.75-□□ |
| | | BT□□-FMC27-□□ BT□□-FMC32-□□ |

Parts



| | | |
|-----------|-----------|-------|
| 3000 type | FTKA0307 | TW09S |
| 4000 type | FTKA0412B | TW15S |



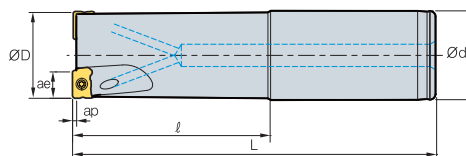
Available Inserts E09



Available Arbors and bolt E290~E292

● : Stock item

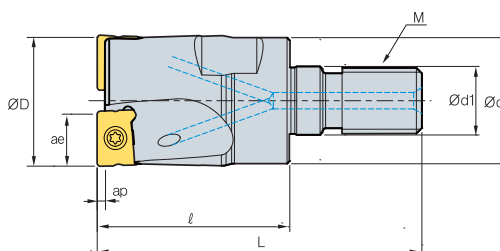
RM4ZS3000 *New*



| Designation | | | $\varnothing D$ | $\varnothing d$ | l | L | ap | ae | |
|-------------|------------|---|-----------------|-----------------|-----|-----|-----|-----|------|
| RM4ZS | 3025HR-L25 | 2 | 25 | 25 | 120 | 200 | 1.5 | 9.0 | 0.62 |
| | 3032HR-L32 | 3 | 32 | 32 | 120 | 210 | 1.5 | 9.0 | 1.13 |
| | 3040HR-L32 | 4 | 40 | 32 | 120 | 250 | 1.5 | 9.0 | 1.53 |

(mm)

RM4ZM3000 *New*



| Designation | | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | l | L | M | ap | ae | |
|-------------|------------|---|-----------------|-----------------|-------------------|-----|----|-----|-----|-----|------|
| RM4ZM | 3025HR-M12 | 2 | 25 | 23 | 12.5 | 35 | 59 | M12 | 1.5 | 9.0 | 0.11 |
| | 3032HR-M16 | 3 | 32 | 29 | 17 | 40 | 67 | M16 | 1.5 | 9.0 | 0.21 |
| | 3040HR-M16 | 4 | 40 | 29 | 17 | 40 | 67 | M16 | 1.5 | 9.0 | 0.28 |

(mm)

Available Inserts

LNEX-MM

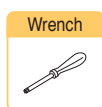


LNMX-MM



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A |
| LNEX 100605PNL-MM | | | | ● | | | | | | | | | | | | | |
| LNMX 100605PNL-MM | | | | ● | | | | | | | | | | | | | |

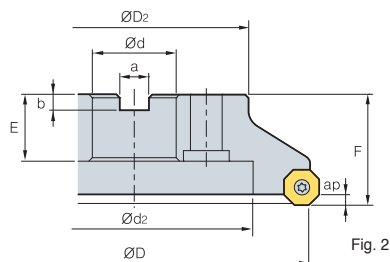
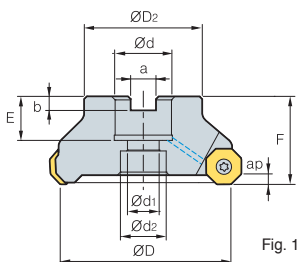
Parts



FTKA0307

TW09S

RM16AC(M)6000



• AR : -6°
• RR : -6°

(mm)

| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | | Fig. |
|--------------------|----|-----|-----------------|------------|-----------------|-----------------|------------|-------|--------|--------|-----|------|------|
| RM16AC(M) 6063HR-M | 5 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 4.0 | 0.7 | 1 |
| 6080HR-M | 6 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 4.0 | 1.2 | 1 |
| 6100HR-M | 7 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25) | 63(50) | 4.0 | 1.9 | 1 |
| 6125HR-M | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(29) | 63 | 4.0 | 3.5 | 1 |
| 6160R-M | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 4.0 | 4.1 | 2 |
| 6200R-M | 12 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14 | 38(32) | 63 | 4.0 | 6.1 | 2 |
| 6250R-M | 15 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14 | 38 | 63 | 4.0 | 11.5 | 2 |
| 6315R-M | 20 | 315 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 63 | 4.0 | 18.9 | 2 |
| 6400R-M | 26 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 80 | 4.0 | 32.7 | 2 |

• () Metric Size

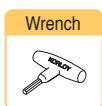
Available Inserts

| Designation | ONHX-MF | | ONHX-MM | | ONHX-W | | ONHX-MA | | ONMX-MF | | ONMX-MM | | page | | | | |
|-----------------|---------|--------|---------|--------|--------|--------|---------|--------|---------|--------|----------|------|------|-----|-----|-------|------|
| | | | | | | | Coated | | Cermet | | Uncoated | | | | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 |
| ONMX 060608-MM | | | | ● | | | | | ● | | | | | | | | |
| ONHX 060608-MM | | | | ● | | | | | ● | | | | | | | | |
| ONMX 060608-MF | | | | ● | | | | | ● | | | | | | | | |
| ONHX 060608-MF | | | | ● | | | | | ● | | | | | | | | |
| ONHX 060608-W | | | | ● | ● | | | ● | ● | | | | | | | | |
| ONMX 0606ANN-MM | | | | ● | ● | ● | | ● | ● | | | | | | | | |
| ONHX 0606ANN-MM | | | | ● | ● | ● | | ● | ● | | | | | | | | |
| ONMX 0606ANN-MF | | | | | ● | ● | | ● | ● | | | | | | | | |
| ONHX 0606ANN-MF | | | | | ● | ● | | ● | ● | | | | | | | | |
| ONHX 060608-MA | | | | | | | | | | | | | | ● | | | |

Available Arbors

| Designation | Available Arbors | |
|--------------------|-------------------|---------------|
| | RM16AC | RM16ACM |
| RM16AC(M) 6063HR-M | - | BT□□-FMC22-□□ |
| 6080HR-M | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| 6100HR-M | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 6125HR-M | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 6160R-M | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 6200R-M | | |
| 6250R-M | | |
| 6315R-M | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 6400R-M | | |

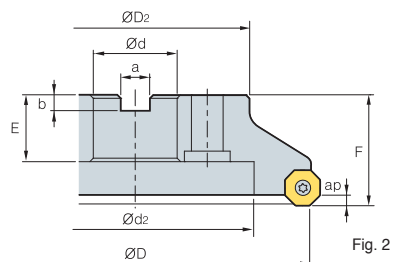
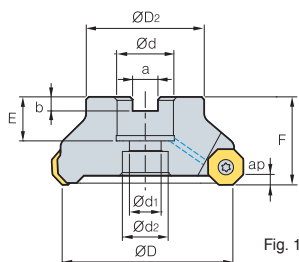
Parts



FTGA0513

TW20-100

RM16AC(M)8000



(mm)

| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | | Fig. |
|--------------------|----|-----|-----------------|------------|-----------------|-----------------|------------|--------|--------|--------|-----|------|------|
| RM16AC(M) 8063HR-M | 5 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 40 | 5.5 | 0.7 | 1 |
| 8080HR-M | 6 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 5.5 | 1.2 | 1 |
| 8100HR-M | 7 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8 | 33(25) | 63(50) | 5.5 | 1.8 | 1 |
| 8125HR-M | 8 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(29) | 63 | 5.5 | 3.5 | 1 |
| 8160R-M | 10 | 160 | 107 | 50.8(40) | - | 107 | 19(16.4) | 11(9) | 38(32) | 63 | 5.5 | 4.5 | 2 |
| 8200R-M | 12 | 200 | 130 | 47.625(60) | - | 135 | 25.4(25.7) | 14(14) | 38(32) | 63 | 5.5 | 5.8 | 2 |
| 8250R-M | 14 | 250 | 180 | 47.625(60) | - | 180 | 25.4(25.7) | 14 | 38 | 63 | 5.5 | 11.4 | 2 |
| 8315R-M | 18 | 215 | 240 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 63 | 5.5 | 18.8 | 2 |
| 8400R-M | 24 | 400 | 260 | 47.625(60) | - | 238 | 25.4(25.7) | 14 | 38 | 80 | 5.5 | 32.7 | 2 |

() Metric Size

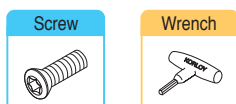
Available Inserts

| Designation | ONHX-MF | | ONHX-MM | | ONHX-W | | ONHX-MA | | ONMX-MF | | ONMX-MM | | page | | | | | |
|-----------------|---------|--------|---------|--------|--------|--------|---------|--------|---------|--------|---------|----------|------|-----|-----|-------|------|------------|
| | | | | | | | | | | | | | | | | | | |
| | Coated | | | | | | | | Cermet | | | Uncoated | | | | | | |
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN80 | H01 | G10 | ST30A | ST20 | |
| ONMX 080608-MM | | | | • | • | | | • | • | | | | | | | | | E11 E12 |
| ONHX 080608-MM | | | | • | | | | | | | | | | | | | | |
| ONMX 080608-MF | | | | | | | | | • | | | | | | | | | |
| ONHX 080608-MF | | | | | | | | | | | | | | | | | | |
| ONHX 080608-W | | | | • | | | | | | | | | | | | | | |
| ONMX 0806ANN-MM | | | | • | • | | | • | • | | | | | | | | | |
| ONHX 0806ANN-MM | | | | • | | • | | | | | | | | | | | | |
| ONMX 0806ANN-MF | | | | • | • | | | | • | | | | | | | | | |
| ONHX 0806ANN-MF | | | | • | • | | | | • | | | | | | | | | |
| ONHX 080608-MA | | | | | | | | | | | | | • | | | | | |

Available Arbors

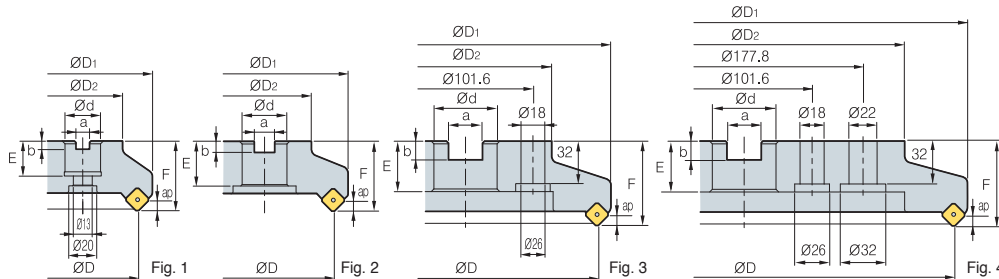
| Designation | Available Arbors | |
|--------------------|-------------------|---------------|
| | RM16AC | RM16ACM |
| RM16AC(M) 8063HR-M | - | BT□□-FMC22-□□ |
| 8080HR-M | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| 8100HR-M | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 8125HR-M | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 8160R-M | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 8200R-M | | |
| 8250R-M | | |
| 8315R-M | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 8400R-M | | |

Parts



FTGA0513 TW20-100

RMT8A(M) 4000



AA
45°
• AR : -6°
• RR : -6°

(mm)

| Designation | | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | kg | Fig. | |
|-------------|---------|----|-----------------|-----------------|-----|------------|------------|--------|--------|----|----|------|---|
| RMT8A(M) | 4080R | 5 | 80 | 100 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 4 | 1.6 | 1 |
| | 4080R-M | 6 | 80 | 100 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 4 | 1.6 | 1 |
| | 4100R | 6 | 100 | 120 | 70 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 4 | 2.3 | 2 |
| | 4100R-M | 8 | 100 | 120 | 70 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 4 | 2.3 | 2 |
| | 4125R | 8 | 125 | 144 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 4 | 4.3 | 2 |
| | 4125R-M | 10 | 125 | 144 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 4 | 4.3 | 2 |
| | 4160R | 10 | 160 | 179 | 110 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 4 | 6.5 | 2 |
| | 4160R-M | 14 | 160 | 179 | 110 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 4 | 6.5 | 2 |
| | 4200R | 12 | 200 | 219 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 4 | 8.8 | 3 |
| | 4200R-M | 18 | 200 | 219 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 4 | 8.8 | 3 |
| | 4250R | 16 | 250 | 269 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 4 | 14.1 | 3 |
| | 4250R-M | 22 | 250 | 269 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 4 | 14.1 | 3 |
| | 4315R | 20 | 315 | 334 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 4 | 22.3 | 4 |
| | 4315R-M | 28 | 315 | 334 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 4 | 22.3 | 4 |

() Metric Size

Available Inserts

SNC(M)F-MF

SNC(M)F-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | page | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| SNCF 1206ANN-MF | | | | | | | | | | | | | | | | | |
| 1206ANN-MM | | | | ● | | | | | | | | | | | | | |
| SNMF 1206ANN-MF | | | | | | | | | | | | | | | | | |
| 1206ANN-MM | | | | | | | | | | | | | | | | | |

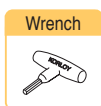
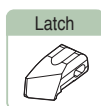
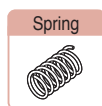
E17

Available Arbors

| Designation | General Arbor | NC Arbors | |
|--|--|---|--------|
| | | RMT8A | RMT8AM |
| RMT8A(M) <input type="checkbox"/> 080R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA25.4-25 | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA25.4 - <input type="checkbox"/> <input type="checkbox"/> | FMC27 |
| <input type="checkbox"/> 100R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | FMC32 |
| <input type="checkbox"/> 125R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | FMB40 |
| <input type="checkbox"/> 160R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | |
| <input type="checkbox"/> 200R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA47.625-25, KCP-8*** | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA47.625 - <input type="checkbox"/> <input type="checkbox"/> | FMB60 |
| <input type="checkbox"/> 250R | | | |
| <input type="checkbox"/> 315R | KCP-8*** (Center Ring Plug) | | |

* -NT Number ** -BT Number ***Over Milling 5

Parts



ETKA0523

KHB0417

SPR0315

LTC05SR-RM4

TW20-100



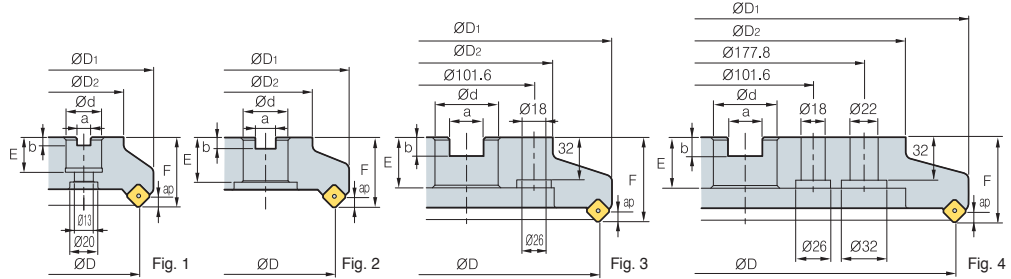
Available Inserts E17



Available Arbors and bolt E290-E292

● : Stock item

RMT8A(M)5000



• AR : -6°
• RR : -6°

(mm)

| Designation | | ØD | ØD1 | ØD2 | Ød | a | b | E | F | ap | | Fig. |
|----------------|----|-----|-----|-----|------------|------------|--------|--------|----|----|------|------|
| RMT8A(M) 5080R | 5 | 80 | 104 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 6 | 1.8 | 1 |
| 5080R-M | 6 | 80 | 104 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 6 | 1.8 | 1 |
| 5100R | 6 | 100 | 124 | 70 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 6 | 2.6 | 2 |
| 5100R-M | 8 | 100 | 124 | 70 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 6 | 2.6 | 2 |
| 5125R | 8 | 125 | 149 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 6 | 4.3 | 2 |
| 5125R-M | 10 | 125 | 149 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 6 | 4.3 | 2 |
| 5160R | 10 | 160 | 184 | 110 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 6 | 6.5 | 2 |
| 5160R-M | 14 | 160 | 184 | 110 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 6 | 6.5 | 2 |
| 5200R | 12 | 200 | 224 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 9.0 | 3 |
| 5200R-M | 18 | 200 | 224 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 9.0 | 3 |
| 5250R | 16 | 250 | 274 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 14.4 | 3 |
| 5250R-M | 22 | 250 | 274 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 14.4 | 3 |
| 5315R | 20 | 315 | 339 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 22.2 | 4 |
| 5315R-M | 28 | 315 | 339 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 22.2 | 4 |

• () Metric Size

Available Inserts

SNC(M)F-MF

SNC(M)F-MM



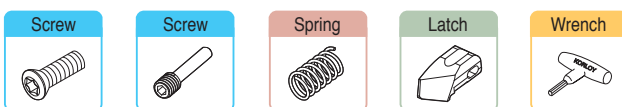
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|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| SNCF 1507ANN-MF | | | | | | | | | | | | | | | | | |
| 1507ANN-MM | | | | • | | • | | | | | | | | | | | |
| SNMF 1507ANN-MF | | | | | | | | | | | | | | | | | |
| 1507ANN-MM | | | | • | | | | | | | | | | | | | |

Available Arbors

| Designation | General Arbor | NC Arbors | |
|--|--|---|--------|
| | | RMT8A | RMT8AM |
| RMT8A(M) <input type="checkbox"/> 080R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA25.4-25 | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA25.4 - <input type="checkbox"/> <input type="checkbox"/> | FMC27 |
| <input type="checkbox"/> 100R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | FMC32 |
| <input type="checkbox"/> 125R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | FMB40 |
| <input type="checkbox"/> 160R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | FMB60 |
| <input type="checkbox"/> 200R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA47.625-25, KCP-8*** | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA47.625 - <input type="checkbox"/> <input type="checkbox"/> | FMB60 |
| <input type="checkbox"/> 250R | | | |
| <input type="checkbox"/> 315R | KCP-8*** (Center Ring Plug) | | |

* -NT Number ** -BT Number ***Over Milling 5

Parts

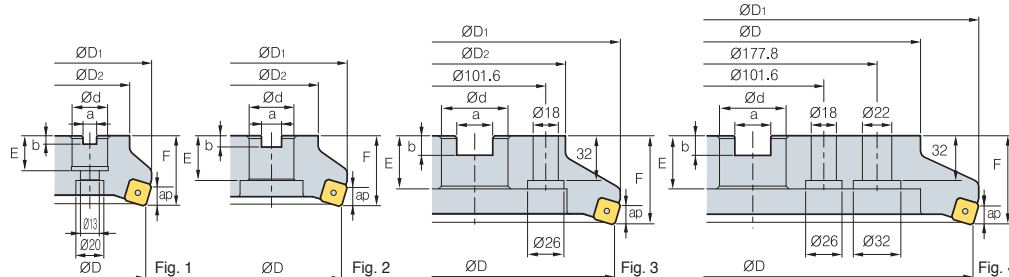


ETKA0625 KHB0417 SPR0415 LTC06SR-RM5 TW20-100

Available Inserts E17 Available Arbors and bolt E290~E292

• : Stock item

RMT8E(M)4000



• AR : -6°
• RR : -8°~-6°

(mm)

| Designation | ⊙ | ØD | ØD ₁ | ØD ₂ | Ød | a | b | E | F | ap | kg | Fig. |
|----------------|----|-----|-----------------|-----------------|------------|------------|--------|--------|----|----|------|------|
| RMT8E(M) 4080R | 5 | 80 | 100 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 5 | 1.5 | 1 |
| 4080R-M | 6 | 80 | 100 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 5 | 1.5 | 1 |
| 4100R | 6 | 100 | 120 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 5 | 2 | 2 |
| 4100R-M | 8 | 100 | 120 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 5 | 2 | 2 |
| 4125R | 8 | 125 | 144 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 5 | 3.8 | 2 |
| 4125R-M | 10 | 125 | 144 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 5 | 3.8 | 2 |
| 4160R | 10 | 160 | 179 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 5 | 5.8 | 2 |
| 4160R-M | 14 | 160 | 179 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 5 | 5.8 | 2 |
| 4200R | 12 | 200 | 219 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 7.9 | 3 |
| 4200R-M | 18 | 200 | 219 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 7.9 | 3 |
| 4250R | 16 | 250 | 269 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 13.0 | 3 |
| 4250R-M | 22 | 250 | 269 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 13.0 | 3 |
| 4315R | 20 | 315 | 334 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 20.5 | 4 |
| 4315R-M | 28 | 315 | 334 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 20.5 | 4 |

• () Metric Size

Available Inserts

SNC(M)F-MF

SNC(M)F-MM



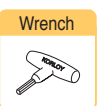
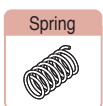
| Designation | Coated | | | | | | | Cermet | | | Uncoated | | page | | | | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|------|-----|-----|-------|------|
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | | CN30 | H01 | G10 | ST30A | ST20 |
| SNCF 1206ENN-MF | | | | | | | | | | | | | | | | | | E17 |
| 1206ENN-MM | | | | ● | | | | ● | | | | | | | | | | |
| SNMF 1206ENN-MF | | | | ● | | | | | | | | | | | | | | |
| 1206ENN-MM | | | | ● | | | | | | | | | | | | | | |

Available Arbors

| Designation | General Arbor | NC Arbors | |
|--|--|---|--------|
| | | RMT8E | RMT8EM |
| RMT8E(M) <input type="checkbox"/> 080R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA25.4-25 | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA25.4 - <input type="checkbox"/> <input type="checkbox"/> | FMC27 |
| <input type="checkbox"/> 100R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | FMC32 |
| <input type="checkbox"/> 125R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | FMB40 |
| <input type="checkbox"/> 160R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | |
| <input type="checkbox"/> 200R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA47.625-25, KCP-8*** | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA47.625 - <input type="checkbox"/> <input type="checkbox"/> | FMB60 |
| <input type="checkbox"/> 250R | | | |
| <input type="checkbox"/> 315R | | | |

* -NT Number ** -BT Number ***Over Milling 5

Parts



ETKA0523

KHB0417

SPR0315

LTC05SR-RM4

TW20-100



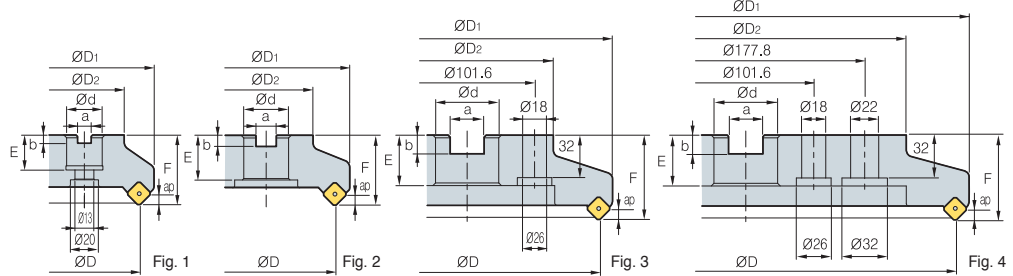
Available Inserts E17



Available Arbors and bolt E290~E292

● : Stock item

RMT8E(M)5000



• AR : -6°
• RR : -8°~-6°

(mm)

| Designation | | ϕD | ϕD_1 | ϕD_2 | ϕd | a | b | E | F | ap | $\frac{kg}{kg}$ | Fig. |
|----------------|----|----------|------------|------------|------------|------------|--------|--------|----|----|-----------------|------|
| RMT8E(M) 5080R | 5 | 80 | 88 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 8 | 1.4 | 1 |
| 5080R-M | 6 | 80 | 88 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 8 | 1.4 | 1 |
| 5100R | 6 | 100 | 108 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 8 | 1.9 | 2 |
| 5100R-M | 8 | 100 | 108 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 8 | 1.9 | 2 |
| 5125R | 8 | 125 | 133 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 8 | 3.7 | 2 |
| 5125R-M | 10 | 125 | 133 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 8 | 3.7 | 2 |
| 5160R | 10 | 160 | 168 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 8 | 5.7 | 2 |
| 5160R-M | 14 | 160 | 168 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 8 | 5.7 | 2 |
| 5200R | 12 | 200 | 208 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 7.5 | 3 |
| 5200R-M | 18 | 200 | 208 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 7.5 | 3 |
| 5250R | 16 | 250 | 258 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 12.4 | 3 |
| 5250R-M | 22 | 250 | 258 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 12.4 | 3 |
| 5315R | 20 | 315 | 323 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 19.9 | 4 |
| 5315R-M | 28 | 315 | 323 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 8 | 19.9 | 4 |

• () Metric Size

Available Inserts

SNC(M)F-MF

SNC(M)F-MM



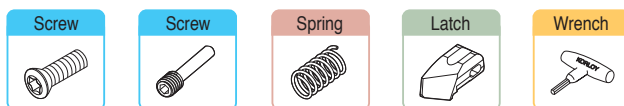
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|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SNCF 1507ENN-MM | | | | ● | | | | ● | | | | | | | | | | E17 |
| SNMF 1507ENN-MM | | | | | ● | | | | | | | | | | | | | |
| SNCF 1507ENN-MF | | | | | | | | | | | | | | | | | | |
| SNMF 1507ENN-MF | | | | ● | | | | | | | | | | | | | | |

Available Arbors

| Designation | General Arbor | NC Arbors | |
|-------------------------------|--|--|--|
| | | RMT8E | RMT8EM |
| | | RMT8E(M) <input type="checkbox"/> 080R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA25.4-25 |
| <input type="checkbox"/> 100R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | FMC32 |
| <input type="checkbox"/> 125R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | FMB40 |
| <input type="checkbox"/> 160R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | FMB60 |
| <input type="checkbox"/> 200R | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA47.625-25, KCP-8*** | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA47.625- <input type="checkbox"/> <input type="checkbox"/> | |
| <input type="checkbox"/> 250R | | | |
| <input type="checkbox"/> 315R | | | |
| | KCP-8*** (Center Ring Plug) | | |

* -NT Number ** -BT Number ***Over Milling 5

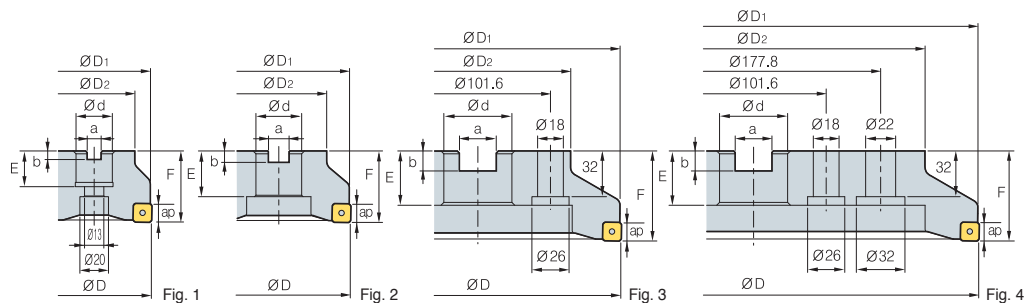
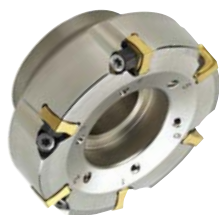
Parts



ETKA0625 KHB0417 SPR0415 LTC06SR-RM5 TW20-100



RMT8Q(M)



AA
88°

• AR : -6°
• RR : -11°~6°

(mm)

| Designation | ⊙ | ∅D | ∅D ₁ | ∅D ₂ | ∅d | a | b | E | F | ap | kg | Fig. |
|----------------|----|-----|-----------------|-----------------|------------|------------|--------|--------|----|----|------|------|
| RMT8Q(M) 4080R | 5 | 80 | 79 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 5 | 1.4 | 1 |
| 4080R-M | 6 | 80 | 79 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 5 | 1.4 | 1 |
| 4100R | 6 | 100 | 99 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 5 | 1.8 | 2 |
| 4100R-M | 8 | 100 | 99 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 5 | 1.8 | 2 |
| 4125R | 8 | 125 | 124 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 5 | 3.6 | 2 |
| 4125R-M | 10 | 125 | 124 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 5 | 3.6 | 2 |
| 4160R | 10 | 160 | 159 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 5 | 5.7 | 2 |
| 4160R-M | 14 | 160 | 159 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 5 | 5.7 | 2 |
| 4200R | 12 | 200 | 199 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 7.5 | 3 |
| 4200R-M | 18 | 200 | 199 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 7.5 | 3 |
| 4250R | 16 | 250 | 249 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 12.5 | 3 |
| 4250R-M | 22 | 250 | 249 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 12.5 | 3 |
| 4315R | 20 | 315 | 314 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 19.9 | 4 |
| 4315R-M | 28 | 315 | 314 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 5 | 19.9 | 4 |

() Metric Size

Available Inserts

SNMF-MF



SNMF-MM



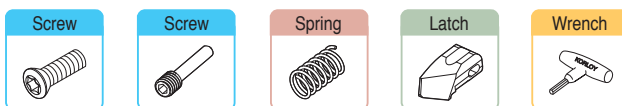
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | | |
|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|------|
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A | ST20 |
| SNMF 1206QNN-MF 1206QNN-MM | | | | ● | | | | | | | | | | | | | | E17 |

Available Arbors

| Designation | General Arbor | NC Arbors | |
|----------------|-----------------------------------|---------------------|--------|
| | | RMT8Q | RMT8QM |
| RMT8Q(M) □080R | NT*□□(M/U)-FMA25.4-25 | BT**□□-FMA25.4 -□□ | FMC27 |
| □100R | NT*□□(M/U)-FMA31.75 -□□ | BT**□□-FMA31.75 -□□ | FMC32 |
| □125R | NT*□□(M/U)-FMA38.1 -□□ | BT**□□-FMA38.1 -□□ | FMB40 |
| □160R | NT*□□(M/U)-FMA50.8 -□□ | BT**□□-FMA50.8 -□□ | |
| □200R | NT*□□(M/U)-FMA47.625-25, KCP-8*** | BT**□□-FMA47.625-□□ | FMB60 |
| □250R | | | |
| □315R | KCP-8*** (Center Ring Plug) | | |

*□□-NT Number **□□-BT Number ***Over Milling 5

Parts



ETKA0523 KHB0417 SPR0315 LTC05SR-RM4 TW20-100

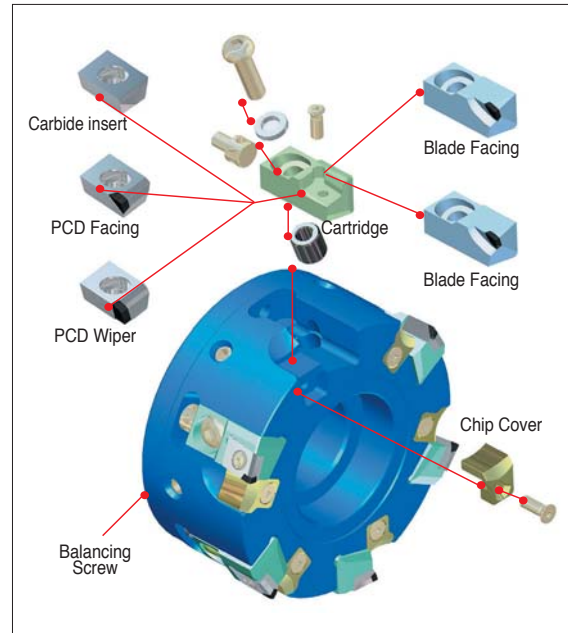
Lighter tool ensures excellent performance in high speed machining.

Aero Mill

- Excellent machining performance can be acquired especially at the high speeds due to the light aluminum cutter body that is 50% of the weight of a conventional steel cutter body
- High speed milling cutter for precise machining
- Special Aluminum material and high rake angle of insert provide rigid & stable machining
- High tolerance surface finishes can be acquired due to the low cutting load provided from the high rake angle
- Balanceable up to G2.5 level

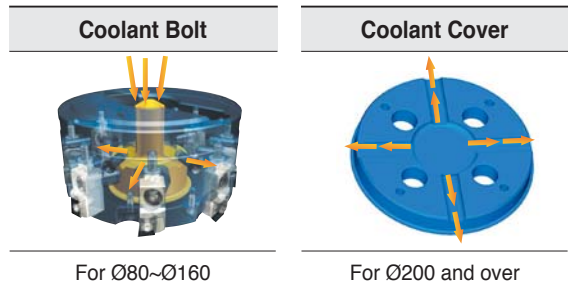
Assembly structure of cutter

- ▶ Increased stability based on cartridge type application
- ▶ Both insert and blade can be available in the same cutter
- ▶ Finishing to roughing can be possible because of wide chip pocket space
- ▶ Roughing and finishing available with carbide, PCD insert application
- ▶ Cutter breakage can be solved by making use of the chip cover

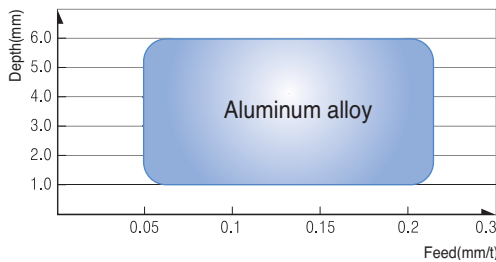


Coolant through system

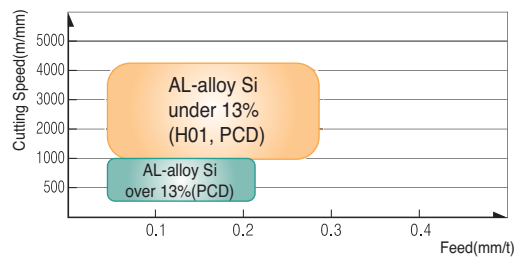
- ▶ Specially designed coolant through system provides coolant from the center of the cutter to the insert enhances the cooling rate and chip evacuation.
- ▶ Direction of coolant has designed to focus directly to the insert cutting edge to maximize chip evacuation and improve tool life
- ▶ Coolant bolt is applicable up to Ø160, coolant cover is applicable from Ø200 and over. Coolant devices are sold separately for through coolant system, through coolant arbor has to be used



Application range

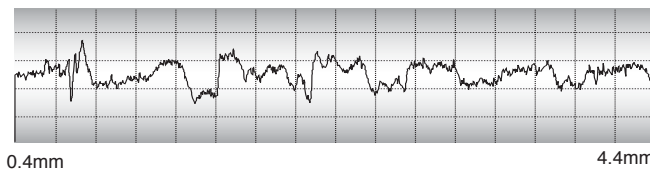


Recommended cutting condition



Surface finish

- Cutting condition: **vc** : 1570m/min **vf** : 3000mm/min
S : 5000 rpm **fz** : 0.1mm/t
ap : 0.5mm **Machine** : PCV620
- Workpiece: A6061
- Designation: **Cutter** : APD100R-A6Z (6Flutes)
Insert : CDEW1204R-XCF(H01)



- Rmax : 2.1µm
- Rz : 1.6µm
- Ra : 0.3µm

Max. revolution

| Diameter(mm) | Max. revolution(rpm) |
|--------------|----------------------|
| Ø80 | 16,000 |
| Ø100 | 15,000 |
| Ø125 | 12,500 |
| Ø160 | 10,000 |
| Ø200 | 8,000 |
| Ø250 | 6,500 |
| Ø315 | 5,000 |

Coolant parts

| Diameter(mm) | Type | Designation | Shape | Note |
|--------------|---------------|--------------------------|-------|--------------|
| Ø80 | Coolant Bolt | CBP080-IN/MM | | Extra charge |
| Ø100 | Coolant Bolt | CBP100-IN CBP100-MM-1 | | |
| Ø125 | Coolant Bolt | CBP125-IN CBP125-MM-1 | | |
| Ø160 | Coolant Bolt | CBP160-IN CBP160-MM | | |
| Ø200 | Coolant Cover | CCP200 | | Extra charge |
| Ø250 | Coolant Cover | CCP250 | | |
| Ø315 | Coolant Cover | CCP315 | | |

• Choice : CBP100-IN : APD type, General for unmarked item



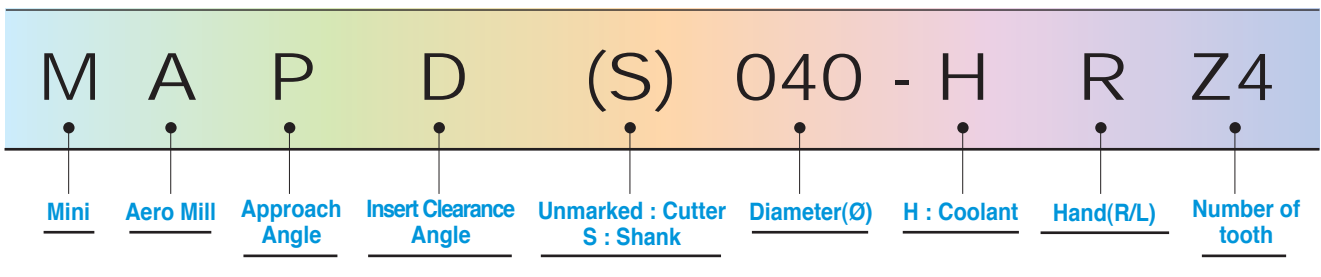
Good performance in small-medium size of operations

Aero Mill-Mini

- Good performance in small-medium size of operations
- Good duration of the steel body
- Choice of Uncoated carbide / PCD grades can be applied to various kind of work material
- Balance level : G25

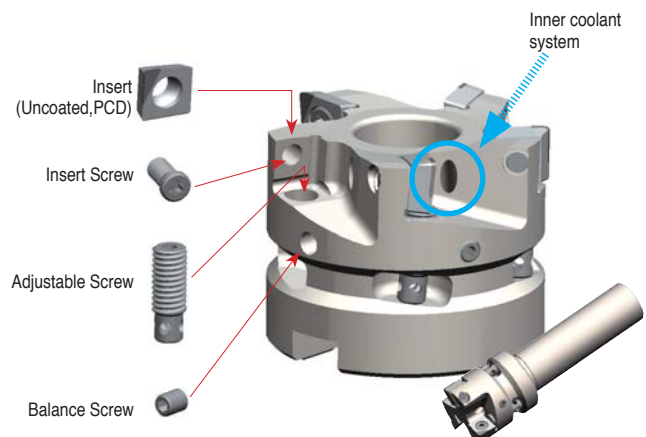


Code system

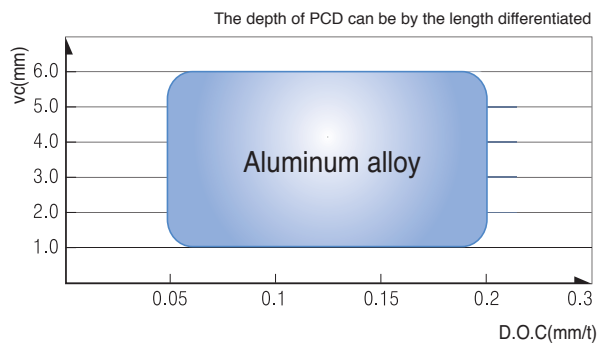


Structure of Aero Mill -Mini

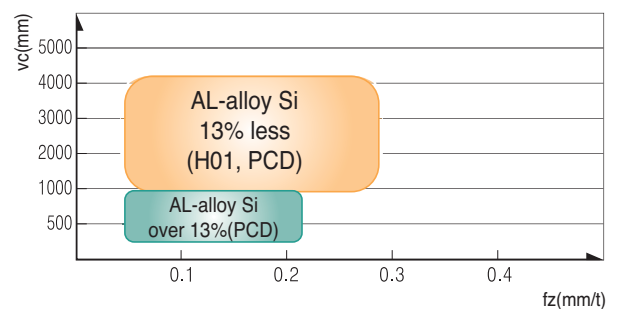
- ▶ Simple and strong design of Screw-on clamping.
- ▶ Adjustable range : ± 0.1 mm Max
- ▶ Adjustable step : Min. 2 micro meter
- ▶ Wide chip pocket area for Roughing and Aluminum machining.
- ▶ Inner coolant system



Application range



Recommended cutting condition



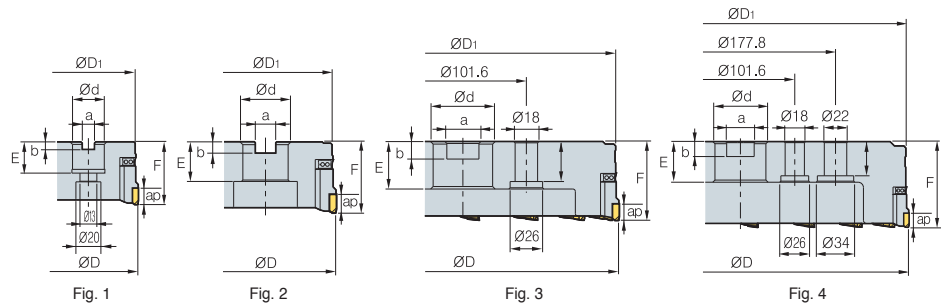
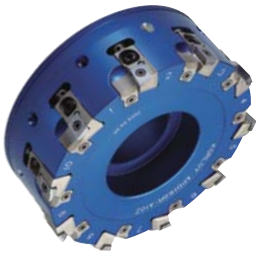
Max. RPM

| Diameter | Max. RPM(min ⁻¹) |
|----------|------------------------------|
| Ø32 | 26,000 |
| Ø40 | 24,500 |
| Ø50 | 22,000 |
| Ø63 | 20,000 |



APD(M)-A

Cartridge + Insert



AA
90°
• AR : 6°
• RR : 5°~9°

| Designation | | øD | øD ₁ | ød | a | b | E | F | ap | Max rpm | | Fig. |
|-------------------|----|-----|-----------------|------------|------------|--------|--------|----|----|---------|------|------|
| APD(M) 080R/L-A6Z | 6 | 80 | 76 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 10 | 16000 | 0.75 | 1 |
| 100R/L-A6Z | 6 | 100 | 95 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 10 | 15000 | 0.95 | 2 |
| 125R/L-A8Z | 8 | 125 | 120 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 10 | 12500 | 1.8 | 2 |
| 160R/L-A10Z | 10 | 160 | 155 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 10 | 10000 | 2.9 | 2 |
| 200R/L-A12Z | 12 | 200 | 195 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 10 | 8000 | 4.0 | 3 |
| 250R/L-A16Z | 16 | 250 | 245 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 10 | 6500 | 6.3 | 3 |
| 315R/L-A18Z | 18 | 315 | 310 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 80 | 10 | 5000 | 11.3 | 4 |

(mm)

• () Metric Size

Available Inserts

| Designation | CDEW-XCF | | | CDEW-XAF,NAF | | CDEW-XAW,NAW | | PCD | page |
|----------------|----------|------|------|--------------|-----|--------------|------|-----|------------|
| | CN2000 | CN20 | CN80 | H01 | G10 | ST30A | ST20 | | |
| CDEW 1204R-XCF | | | | ● | ● | | | | E06 E07 |
| 1204L-XCF | | | | | | | | | |
| 1204R-XAF | | | | | | | | ● | |
| 1204L-XAF | | | | | | | | ● | |
| 1204R-NAF | | | | | | | | ● | |
| 1204R-XAW | | | | | | | | ● | |
| 1204L-XAW | | | | | | | | ● | |
| 1204R-NAW | | | | | | | | ● | |

Available Arbors

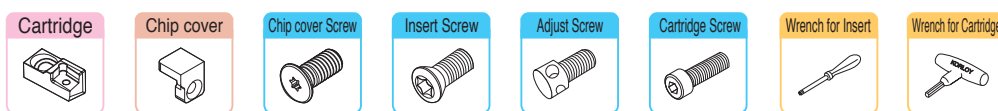
| Designation | General Arbor | NC Arbors |
|---------------|------------------------------------|-----------------------|
| APD(M) 080R/L | NT*□□ (M/U)-FMA25.4-25 | BT**□□ -FMA25.4 -□□ |
| 100R/L | NT*□□ (M/U)-FMA31.75 -□□ | BT**□□ -FMA31.75 -□□ |
| 125R/L | NT*□□ (M/U)-FMA38.1 -□□ | BT**□□ -FMA38.1 -□□ |
| 160R/L | NT*□□ (M/U)-FMA50.8 -□□ | BT**□□ -FMA50.8 -□□ |
| 200R/L | NT*□□ (M/U)-FMA47.625-25, KCP-8*** | BT**□□ -FMA47.625 -□□ |
| 250R/L | | |
| 315R/L | KCP-8*** (Center Ring Plug) | - |

*□□-NT Number **□□-BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|--------------|
| | vc(m/min) | fz(mm/t) | |
| Aluminum | 1,000 ~ 4,000 | 0.05 ~ 0.30 | DP200 H01 |
| | 500 ~ 2,500 | 0.05 ~ 0.20 | |

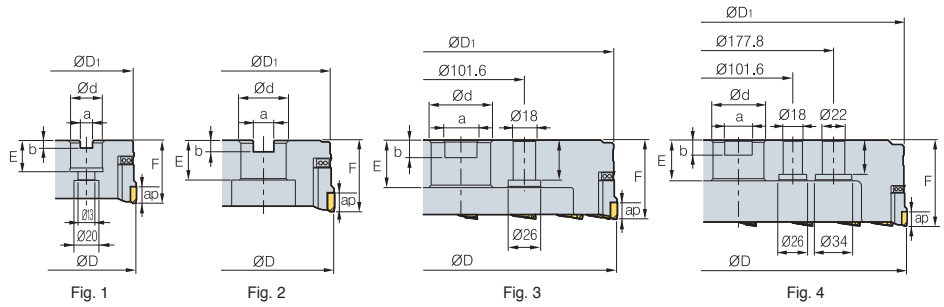
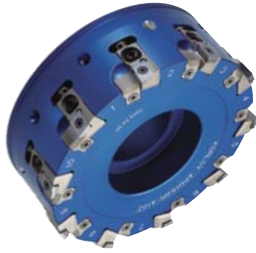
Parts



LAPDR/L-AJ CAPDR/L-AJ PTMA0411 FTNA0411 AZ0514 BHA0619-NYLOK TW15S HW50

APD(M)-B

Blade



AA
90°
• AR : 6°
• RR : 5°~9°

| | | | | | | | | | | | (mm) | |
|-------------------|----|-----|-----------------|------------|------------|--------|--------|----|----|---------|------|------|
| Designation | | øD | øD ₁ | ød | a | b | E | F | ap | Max rpm | | Fig. |
| APD(M) 080R/L-B6Z | 6 | 80 | 76 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 6 | 16000 | 0.75 | 1 |
| 100R/L-B6Z | 6 | 100 | 95 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 50 | 6 | 15000 | 0.95 | 2 |
| 125R/L-B8Z | 8 | 125 | 120 | 38.1(40) | 15.9(16.4) | 10(9) | 38(30) | 63 | 6 | 12500 | 1.8 | 2 |
| 160R/L-B10Z | 10 | 160 | 155 | 50.8(40) | 19.0(16.4) | 11(9) | 38(30) | 63 | 6 | 10000 | 2.9 | 2 |
| 200R/L-B12Z | 12 | 200 | 195 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 8000 | 4.0 | 3 |
| 250R/L-B16Z | 16 | 250 | 245 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 63 | 6 | 6500 | 6.3 | 3 |
| 315R/L-B18Z | 18 | 315 | 310 | 47.625(60) | 25.4(25.7) | 14(14) | 38(38) | 80 | 6 | 5000 | 11.3 | 4 |

• The ap of -B(blade) type means PCD size.

• () Metric Size

Available Blades

| | BAPDR-XAF | BAPDR-XAW |
|-------------|-----------|-----------|
| | | |
| Designation | PCD | |
| | DP200 | |
| | page | |
| BAPDR-XAF | E06 | |
| BAPDL-XAF | | |
| BAPDR-XAW | | |
| BAPDL-XAW | | |

Available Arbors

| Designation | General Arbor | NC Arbors |
|---------------|--|--|
| APD(M) 080R/L | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA25.4-25 | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA25.4 - <input type="checkbox"/> <input type="checkbox"/> |
| 100R/L | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA31.75 - <input type="checkbox"/> <input type="checkbox"/> |
| 125R/L | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA38.1 - <input type="checkbox"/> <input type="checkbox"/> |
| 160R/L | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA50.8 - <input type="checkbox"/> <input type="checkbox"/> |
| 200R/L | NT* <input type="checkbox"/> <input type="checkbox"/> (M/U)-FMA47.625-25, KCP-8*** | BT** <input type="checkbox"/> <input type="checkbox"/> -FMA47.625- <input type="checkbox"/> <input type="checkbox"/> |
| 250R/L | | |
| 315R/L | KCP-8*** (Center Ring Plug) | - |

* -NT Number ** -BT Number ***Over Milling 5

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|--------------|
| | vc(m/min) | fz(mm/t) | |
| Aluminum | 1,000 ~ 4,000 | 0.05 ~ 0.30 | DP200 H01 |
| | 500 ~ 2,500 | 0.05 ~ 0.20 | |

Parts



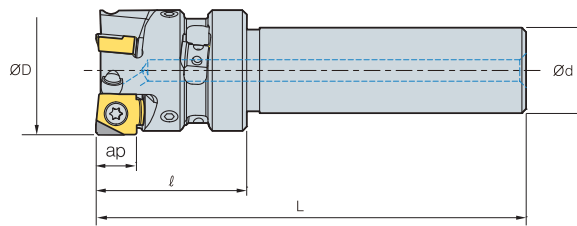
CAPDR/L-AJ PTMA0411 AZ0514 BHA0619-NYLOK HW50

Available Blades E06

Available Arbors and bolt E290~E292

• : Stock item

MAPDS000HR/L-Z0 *New*



* PCD ap:5mm

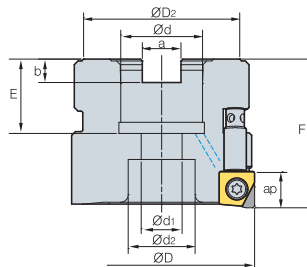


• AR : 6°
• RR : -4°~1°

(mm)

| Designation | | ØD | ød | ℓ | L | ap | Max rpm | |
|------------------|---|----|----|----|-----|-----|---------|------|
| MAPDS 032HR/L-Z3 | 3 | 32 | 20 | 35 | 100 | 9.5 | 26,000 | 0.35 |
| 040HR/L-Z4 | 4 | 40 | 20 | 35 | 100 | 9.5 | 24,500 | 0.42 |

MAPD000HR/L-Z0 *New*



* PCD ap:5mm



• AR : 6°
• RR : -1°~12°

(mm)

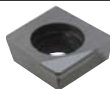
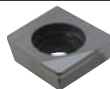
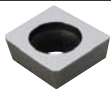
| Designation | | ØD | ØD ₂ | ød | a | b | E | F | ød ₁ | ød ₂ | ap | Max rpm | |
|-----------------|---|----|-----------------|----|------|-----|----|----|-----------------|-----------------|-----|---------|------|
| MAPD 040HR/L-Z4 | 4 | 40 | 34 | 16 | 8.4 | 5.6 | 18 | 40 | 9 | 14 | 9.5 | 24,000 | 0.24 |
| 050HR/L-Z5 | 5 | 50 | 42 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 9.5 | 22,000 | 0.35 |
| 063HR/L-Z6 | 6 | 63 | 42 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 9.5 | 20,000 | 0.65 |

Available Inserts

SNEW

SNEW-XAF

SNEW-NAF



| Designation | Cermet | | | | Uncoated | | PCD | page |
|---------------|--------|------|------|-----|----------|-------|------|------|
| | CN2000 | CN20 | CN80 | H01 | G10 | ST30A | ST20 | |
| SNEW 09T3ADFR | | | | ● | | | | E18 |
| 09T3ADTR-XAF | | | | | | | ● | |
| 09T3ADTR-NAF | | | | | | | ● | |

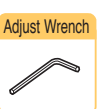
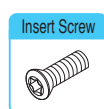
Available Arbors

| Designation | NC Arbors |
|-----------------|--|
| MAPD 040HR/L-Z4 | BT** <input type="checkbox"/> -FMC16- <input type="checkbox"/> |
| 050HR/L-Z5 | BT** <input type="checkbox"/> -FMC22- <input type="checkbox"/> |
| 063HR/L-Z6 | BT** <input type="checkbox"/> -FMC22- <input type="checkbox"/> |

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|--------------|
| | vc(m/min) | fz(mm/t) | |
| Aluminum | 1,000 ~ 4,000 | 0.05 ~ 0.30 | DP200 H01 |
| | 500 ~ 2,500 | 0.05 ~ 0.20 | |

Parts



FTKA0408 AHX0617F-NYLOK KHD0405 TW15S HW20L

Coolant Bolt (Not included)

| Designation | Applicable cutter | Available Cutters |
|-------------|-------------------|-------------------|
| CB0525 | MAPD040HR/L-Z4 | Ø40 |
| CB1025 | MAPD050HR/L-Z5 | Ø50 |
| | MAPD063HR/L-Z6 | Ø63 |

* Details for coolant bolt are on catalogue



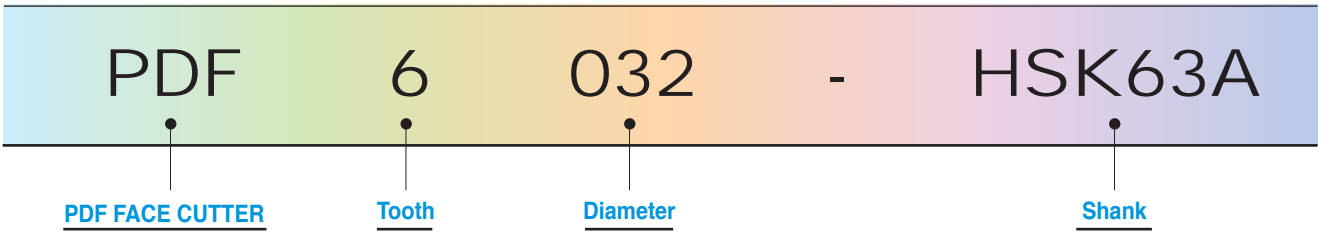
Available Inserts E18



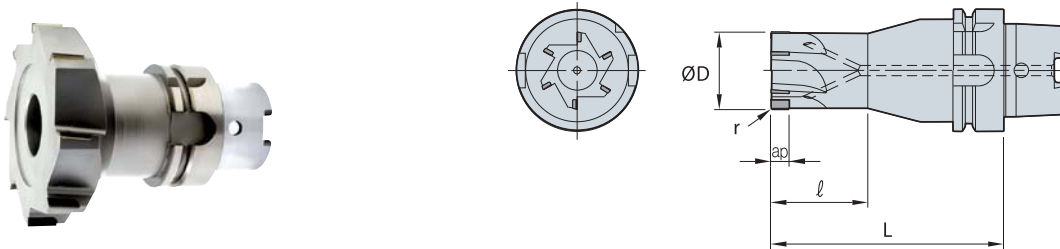
Available Arbors and bolt E290~E292

● : Stock item

Code system



PCD FACE CUTTER



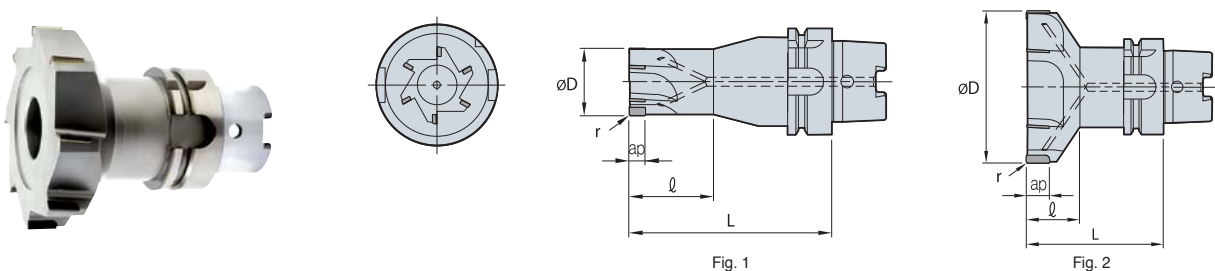
AA
90°
• AR : 6°
• RR : 5°~9°

| Designation | | | $\varnothing D$ | r | ap | ℓ | L |
|-------------|--------------|---|-----------------|-----|----|--------|-----|
| PDF | 4032-HSK50A | 4 | 32 | 0.5 | 8 | 50 | 120 |
| | 4040-HSK50A | 4 | 40 | 0.5 | 8 | 50 | 120 |
| | 4032-HSK63A | 4 | 32 | 0.5 | 8 | 50 | 120 |
| | 4040-HSK63A | 4 | 40 | 0.5 | 8 | 50 | 120 |
| | 4050-HSK63A | 4 | 50 | 0.5 | 8 | 50 | 120 |
| | 6063-HSK63A | 6 | 63 | 0.5 | 12 | - | 100 |
| | 6063-HSK100A | 6 | 63 | 0.5 | 12 | - | 100 |

Recommended cutting condition

| Workpiece | vc(m/min) | fz(mm/t) | ap(mm) |
|------------------|-----------|----------|----------|
| Al, Brass, Alloy | 200~2,000 | 0.02~0.1 | 0.05~4.0 |

Special PCD order sheet



| Designation | Fig | tooth | Dimensions(mm) | | | | | Shank spec. |
|-------------|-----|-------|-----------------|---|----|--------|---|-------------|
| | | | $\varnothing D$ | r | ap | ℓ | L | |
| PDF | | | | | | | | |

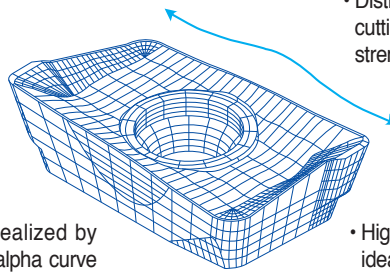
Various applications are available with multi-functional cutters

Alpha Mill

- Innovative curve cutting edge and chip-breaker design ensures ideal 90 degree cutting and lower cutting resistance
- Various applications are available with multi-functional cutters. (Facing, Slotting, Square shoulder milling and etc.)
- Improved insert life time with optimized with each application
- Excellent performance ensured at large depth of cut operations due to strong cutting edge and low cutting resistance

Alpha Mill Insert

- Long tool life at high speed, high feed and deeper cutting by low cutting resistance and strong cutting edge

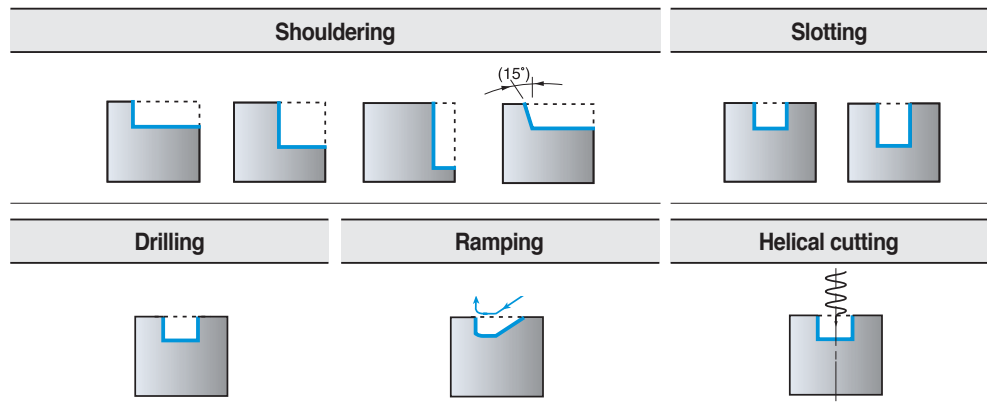


- Distinguished features of Alpha-Curve reduce cutting resistance and improve cutting edge strength and wear resistance


- Low cutting resistance is realized by KORLOY unique design i.e alpha curve cutting edge and optimal convex and concave design

- Highly efficient machining is available by the ideal application of the grade to material





Application example



Alpha Mill APMT-MA, ML

- 
Features
 - ▶ MA : Sharp edge and buffed surface for aluminum machining improve lubrication.
 - ▶ ML : Cutting edge and grades for hard-to-cut materials(Ti, STS, Inconel) ensure superb performance in machining.

Features of Chip breakers





| Type | Chip breaker | Cutting edge | Features |
|----------------------|--------------|---|--|
| Al | MA |  | Optimal cutting edge and buffed surface for aluminum machining ensure high performance in machining. |
| Hard-to-cut material | ML |  | Chip breaker with low cutting load is optimal for machining hard-to-cut materials. |
| Light cutting | MF |  | Chip breaker with low cutting load and harder cutting edge than ML's are optimal for light cutting. |
| General cutting | MM |  | Optimal for milling in general ranges |

Product constitution

| MA | ML |
|---|---|
| APMT0602PDRF-MA APMT0903PDRF-MA APMT11T3PDRF-MA APMT1604PDRF-MA APMT1806PDRF-MA | - APMT0903PDER-ML APMT11T3PDER-ML APMT1604PDER-ML APMT1806PDER-ML |

- The inserts can switch to the APMT type holders.

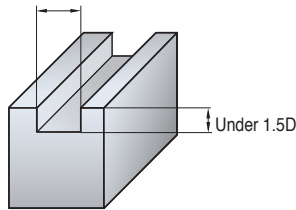
Recommended grades and chip breakers by workpiece

| Chip breaker | Cutter edge | Recommended C/B and grade as per workpiece(●: 1st) | | | | | | | | | | | |
|--------------|---|--|--|----------------------------------|--|-----------------|--|-----------|----------------------------------|----------------|--------|------------|----------------------------------|
| | | P | | | | M | | M | | N | | S | |
| | | Low carbon steel Mild steel | | High carbon steel Alloy steel | | Stainless steel | | Cast iron | | Aluminum alloy | | Ti/Inconel | |
| C/B | Grades | C/B | Grades | C/B | Grades | C/B | Grades | C/B | Grades | C/B | Grades | | |
| MA |  | - | - | - | - | - | - | - | - | ● | ● H01 | - | - |
| ML |  | - | - | - | - | ● | ● PC5300 ○ PC5400 ○ PC3545 ○ PC9530 | - | - | - | - | ● | ● PC5300 ○ PC5400 ○ PC3545 |
| MF |  | ● | ● PC3500 ○ PC5300 ○ PC5400 ○ NCM325 ○ NCM335 | - | ○ PC3500 ○ PC3545 ○ NCM325 ○ NCM335 | - | ● PC5300 ○ PC5400 ○ PC3545 ○ PC9530 | - | ● PC6510 ○ PC5300 ○ PC5400 | - | - | - | ● PC5300 ○ PC5400 ○ PC3545 |
| MM |  | - | ● PC3500 ○ PC5300 ○ PC5400 ○ NCM325 ○ NCM335 | ● | ● PC3500 ○ PC5400 ○ NCM325 ○ NCM335 | - | ● PC5300 ○ PC5400 ○ PC3545 ○ PC9530 | ● | ● PC6510 ○ PC5300 ○ PC5400 | - | - | - | ● PC5300 ○ PC5400 ○ PC3545 |

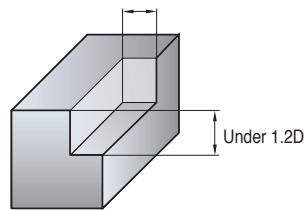


Recommended depth of cut

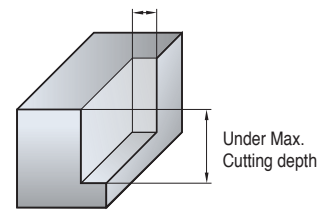
1. Slotting



2. Shouldering



3. Shouldering



Recommended cutting condition(for multi edge type)

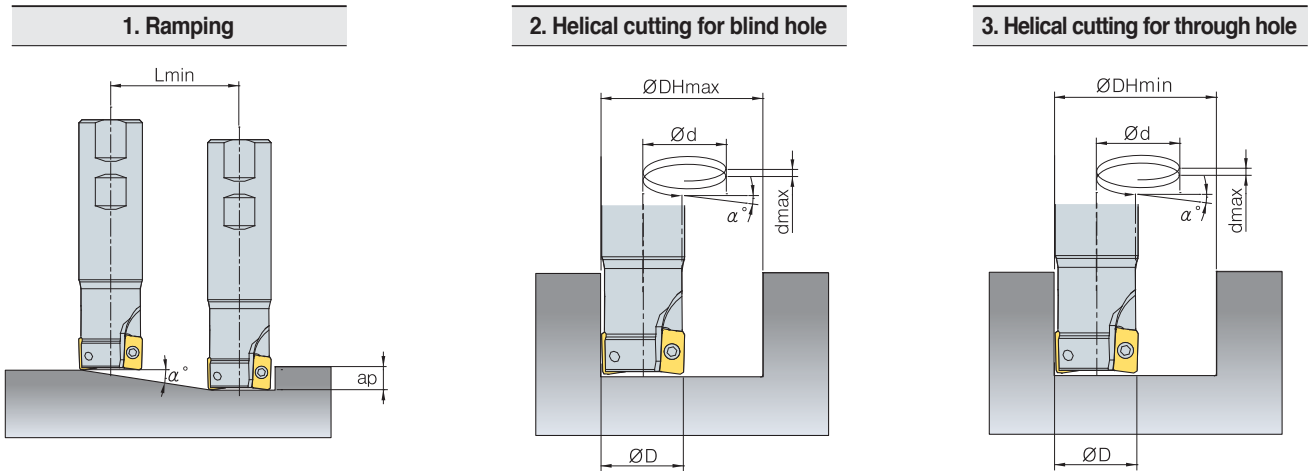
| Workpiece | Grades | Fig. | Tool Dia. | | | | | | | |
|-----------------------------------|------------------|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | Ø20, 25 | | Ø32, 40 | | Ø50, 63 | | Ø80, 100 | |
| | | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) |
| Mild steel, Low carbon steel | NCM325 PC3500 | ① | 80~100 | 0.05~0.08 | 100~120 | 0.05~0.08 | 100~120 | 0.05~0.08 | 100~120 | 0.05~0.08 |
| | | ② | 100~120 | 0.08~0.10 | 120~140 | 0.08~0.10 | 120~140 | 0.08~0.10 | 120~140 | 0.08~0.10 |
| | | ③ | 100~120 | 0.10~0.15 | 140~140 | 0.10~0.15 | 120~140 | 0.10~0.15 | 130~150 | 0.10~0.15 |
| High carbon steel, Alloy steel | NCM325 PC3500 | ① | 60~80 | 0.05 | 80~100 | 0.05 | 80~100 | 0.05 | 80~100 | 0.05 |
| | | ② | 80~100 | 0.05~0.08 | 100~120 | 0.08~0.10 | 100~120 | 0.08~0.10 | 100~120 | 0.08~0.10 |
| | | ③ | 80~100 | 0.10~0.15 | 110~130 | 0.10~0.15 | 100~120 | 0.10~0.15 | 110~130 | 0.10~0.15 |
| Alloy tool steel | NCM325 PC3500 | ① | 50~70 | 0.05 | 70~90 | 0.05 | 70~90 | 0.05 | 70~90 | 0.05 |
| | | ② | 60~80 | 0.05~0.08 | 90~120 | 0.05~0.08 | 100~120 | 0.05~0.08 | 100~120 | 0.05~0.08 |
| | | ③ | 90~110 | 0.12~0.18 | 100~130 | 0.10~0.15 | 100~120 | 0.10~0.15 | 110~130 | 0.10~0.15 |
| Stainless steel | PC5300 PC9530 | ① | 50~70 | 0.054 | 70~90 | 0.05 | 70~90 | 0.05 | 70~90 | 0.05 |
| | | ② | 60~80 | 0.05~0.08 | 90~120 | 0.05~0.08 | 100~120 | 0.05~0.08 | 100~120 | 0.05~0.08 |
| | | ③ | 90~110 | 0.10~0.15 | 100~130 | 0.10~0.15 | 110~130 | 0.10~0.15 | 110~130 | 0.10~0.15 |
| Cast iron | PC6510 PC5300 | ① | 70~90 | 0.10~0.12 | 70~90 | 0.10~0.12 | 90~120 | 0.10~0.12 | 90~120 | 0.10~0.12 |
| | | ② | 80~100 | 0.12 | 90~120 | 0.12 | 100~140 | 0.12 | 100~140 | 0.12 |
| | | ③ | 80~100 | 0.15~0.2 | 100~130 | 0.15~0.20 | 120~150 | 0.15~0.20 | 120~150 | 0.15~0.20 |
| Aluminum alloy | H01 | ① | 200~800 | 0.10~0.2 | 300~900 | 0.10~0.20 | 400~1,000 | 0.10~0.20 | 400~1,000 | 0.10~0.20 |
| | | ② | 250~900 | 0.15~0.3 | 300~950 | 0.15~0.3 | 400~1,000 | 0.10~0.40 | 400~1,000 | 0.10~0.40 |
| | | ③ | 250~900 | 0.15~0.3 | 300~950 | 0.15~0.3 | 400~1,000 | 0.10~0.40 | 400~1,000 | 0.10~0.40 |
| Hardened steel | PC3545 PC5300 | ① | 50~70 | 0.03 | 60~90 | 0.03 | 60~90 | 0.03 | 60~90 | 0.03 |
| | | ② | 60~80 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 |
| | | ③ | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 |

Recommended cutting condition(for single edge type)

| Workpiece | Grades | Fig. | Tool Dia. | | | | | | | |
|-----------------------------------|------------------|------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | | Ø20, 25 | | Ø32, 40 | | Ø50, 63 | | Ø80, 100 | |
| | | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) |
| Mild steel, Low carbon steel | NCM325 PC3500 | ① | 60~80 | 0.05~0.08 | 80~120 | 0.05~0.08 | 120~200 | 0.05~0.08 | 150~200 | 0.05~0.08 |
| | | ② | 80~120 | 0.08~0.10 | 120~180 | 0.08~0.10 | 180~250 | 0.08~0.10 | 200~250 | 0.08~0.10 |
| | | ③ | 80~120 | 0.10~0.15 | 120~180 | 0.10~0.15 | 180~250 | 0.10~0.15 | 200~250 | 0.10~0.15 |
| High carbon steel, Alloy steel | NCM325 PC3500 | ① | 50~80 | 0.05 | 80~110 | 0.05 | 100~150 | 0.05 | 100~150 | 0.05 |
| | | ② | 80~100 | 0.05~0.08 | 110~150 | 0.05~0.10 | 150~200 | 0.05~0.10 | 150~200 | 0.05~0.10 |
| | | ③ | 80~100 | 0.10~0.15 | 120~150 | 0.10~0.15 | 180~200 | 0.10~0.15 | 80~200 | 0.10~0.15 |
| Alloy tool steel | NCM325 PC3500 | ① | 50~70 | 0.05 | 80~100 | 0.05 | 100~130 | 0.05 | 100~130 | 0.05 |
| | | ② | 70~100 | 0.05~0.08 | 100~130 | 0.05~0.10 | 130~180 | 0.05~0.10 | 130~180 | 0.05~0.10 |
| | | ③ | 70~100 | 0.10~0.15 | 100~150 | 0.10~0.15 | 130~180 | 0.10~0.15 | 130~180 | 0.10~0.15 |
| Stainless steel | PC5300 PC9530 | ① | 50~70 | 0.05 | 80~100 | 0.05 | 100~130 | 0.05 | 100~130 | 0.05 |
| | | ② | 70~100 | 0.05~0.08 | 100~130 | 0.05~0.10 | 130~180 | 0.05~0.10 | 130~180 | 0.05~0.10 |
| | | ③ | 70~100 | 0.10~0.15 | 100~150 | 0.10~0.15 | 130~180 | 0.10~0.15 | 130~180 | 0.10~0.15 |
| Cast iron | PC6510 PC5300 | ① | 80~100 | 0.08~0.12 | 80~100 | 0.15 | 120~150 | 0.15 | 120~150 | 0.15 |
| | | ② | 100~120 | 0.12~0.15 | 100~130 | 0.15~0.18 | 150~200 | 0.15~0.18 | 150~200 | 0.15~0.18 |
| | | ③ | 100~120 | 0.15~0.20 | 100~130 | 0.15~0.20 | 150~200 | 0.15~0.20 | 150~200 | 0.15~0.20 |
| Aluminum alloy | H01 | ① | 250~800 | 0.15~0.20 | 300~900 | 0.15~0.20 | 400~1,000 | 0.10~0.20 | 400~1,000 | 0.10~0.20 |
| | | ② | 250~900 | 0.20~0.25 | 350~950 | 0.20~0.25 | 400~1,000 | 0.20~0.30 | 400~1,000 | 0.20~0.30 |
| | | ③ | 250~900 | 0.25~0.3 | 350~950 | 0.25~0.30 | 400~1,000 | 0.30~0.10 | 400~1,000 | 0.30~0.40 |
| Hardened steel | PC3545 PC5300 | ① | 50~70 | 0.03 | 60~90 | 0.03 | 60~90 | 0.03 | 60~90 | 0.03 |
| | | ② | 60~80 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 |
| | | ③ | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 | 80~100 | 0.05~0.08 |



🎯 Cutting condition for ramping and helical operation

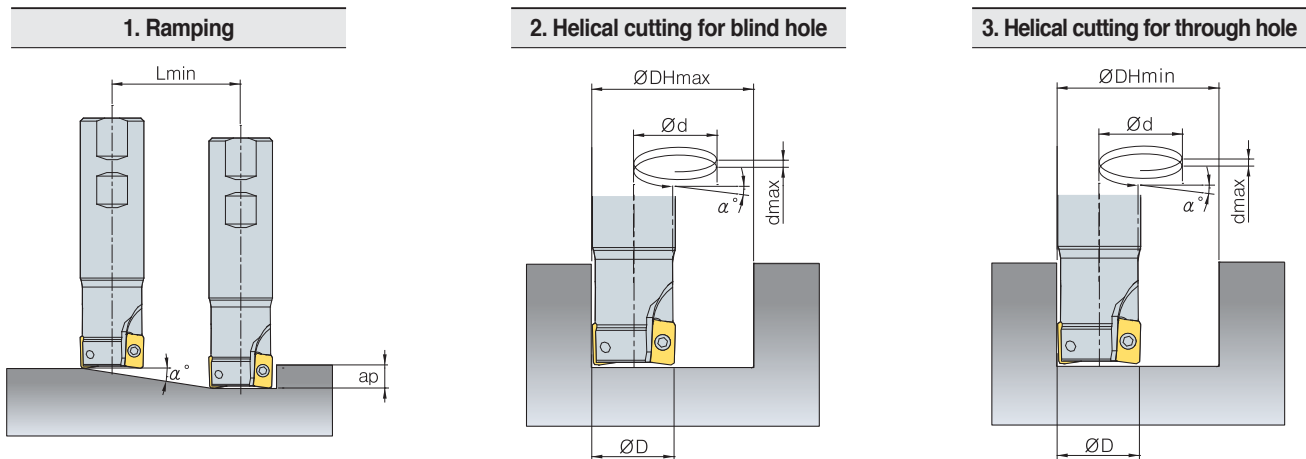


| Designation | Tool Dia. ØD(min) | Ramping | | Helical cutting for blind hole | | | | Helical cutting for through hole | | |
|-------------|-------------------|---------|----------------------------------|--------------------------------|-------------------------------------|---------------------|-------------------------------------|----------------------------------|-------------------------------------|---------------------|
| | | ap | Maximum angle $\alpha(^{\circ})$ | Lmin(mm) | Max. desirable hole Dia. ØDHmax(mm) | Max. pitch dmax(mm) | Min. desirable hole Dia. ØDHmin(mm) | Max. pitch dmax(mm) | Min. desirable hole Dia. ØDHmin(mm) | Max. pitch dmax(mm) |
| AMS1010HS | 10 | 5 | 6.5 | 44 | 18.8 | 2.1 | 17.6 | 2.0 | 13 | 1.5 |
| AMS1011HS | 11 | | 5.6 | 51 | 20.8 | 2.0 | 19.6 | 1.9 | 15 | 1.5 |
| AMS1012HS | 12 | | 4.9 | 58 | 22.8 | 2.0 | 21.6 | 1.9 | 17 | 1.5 |
| AMS1014HS | 14 | | 3.9 | 73 | 26.8 | 1.8 | 25.6 | 1.8 | 21 | 1.4 |
| AMS1015HS | 15 | | 3.6 | 80 | 28.8 | 1.8 | 27.6 | 1.7 | 23 | 1.4 |
| AMS1016HS | 16 | | 3.3 | 87 | 30.8 | 1.8 | 29.6 | 1.7 | 25 | 1.4 |
| AMS1017HS | 17 | | 3.0 | 94 | 32.8 | 1.7 | 31.6 | 1.7 | 27 | 1.4 |
| AMS1018HS | 18 | | 2.8 | 101 | 34.8 | 1.7 | 33.6 | 1.7 | 29 | 1.4 |
| AMS1020HS | 20 | | 2.5 | 115 | 38.8 | 1.7 | 37.6 | 1.6 | 33 | 1.4 |
| AMS1021HS | 21 | | 2.3 | 123 | 40.8 | 1.7 | 39.6 | 1.6 | 35 | 1.4 |
| AMS1022HS | 22 | | 2.2 | 130 | 42.8 | 1.6 | 41.6 | 1.6 | 37 | 1.4 |
| AMS1025HS | 25 | | 1.9 | 151 | 48.8 | 1.6 | 47.6 | 1.6 | 43 | 1.4 |
| AMS1026HS | 26 | | 1.8 | 158 | 50.8 | 1.6 | 49.6 | 1.6 | 45 | 1.4 |
| AMS1032HS | 32 | | 1.4 | 201 | 62.8 | 1.6 | 61.6 | 1.5 | 57 | 1.4 |
| AMS1033HS | 33 | | 1.4 | 208 | 64.8 | 1.6 | 63.6 | 1.5 | 59 | 1.4 |
| AMC1032HS | 32 | | 1.4 | 201 | 62.8 | 1.6 | 61.6 | 1.5 | 57 | 1.4 |
| AMC1040HS | 40 | | 1.1 | 258 | 78.8 | 1.5 | 77.6 | 1.5 | 73 | 1.4 |
| AMC1050HS | 50 | | 0.9 | 330 | 98.8 | 1.5 | 97.6 | 1.5 | 93 | 1.4 |
| AMC1063HS | 63 | | 0.7 | 423 | 124.8 | 1.5 | 123.6 | 1.5 | 119 | 1.4 |
| AMS1510HS | 10 | | 9 | 7.5 | 68 | 18.8 | 2.5 | 17.4 | 2.3 | 11 |
| AMS1512HS | 12 | 6.5 | | 79 | 22.8 | 2.6 | 21.4 | 2.4 | 15 | 1.7 |
| AMS1513HS | 13 | 5.7 | | 90 | 24.8 | 2.5 | 23.4 | 2.3 | 17 | 1.7 |
| AMS1514HS | 14 | 6.3 | | 82 | 26.8 | 2.9 | 25.4 | 2.8 | 19 | 2.1 |
| AMS1516HS | 16 | 5.0 | | 102 | 30.8 | 2.7 | 29.4 | 2.6 | 23 | 2.0 |
| AMS1517HS | 17 | 4.6 | | 112 | 32.8 | 2.6 | 31.4 | 2.5 | 25 | 2.0 |
| AMS1518HS | 18 | 4.2 | | 122 | 34.8 | 2.6 | 33.4 | 2.5 | 27 | 2.0 |
| AMS1519HS | 19 | 3.9 | | 132 | 36.8 | 2.5 | 35.4 | 2.4 | 29 | 2.0 |
| AMS1520HS | 20 | 3.6 | | 142 | 38.8 | 2.5 | 37.4 | 2.4 | 31 | 2.0 |
| AMS1521HS | 21 | 3.4 | | 152 | 40.8 | 2.4 | 39.4 | 2.3 | 33 | 2.0 |
| AMS1522HS | 22 | 3.2 | | 162 | 42.8 | 2.4 | 41.4 | 2.3 | 35 | 1.9 |
| AMS1524HS | 24 | 2.8 | | 182 | 46.8 | 2.3 | 45.4 | 2.2 | 39 | 1.9 |
| AMS1525HS | 25 | 2.7 | | 192 | 48.8 | 2.3 | 47.4 | 2.2 | 41 | 1.9 |
| AMS1528HS | 28 | 2.3 | | 222 | 54.8 | 2.2 | 53.4 | 2.2 | 47 | 1.9 |
| AMS1530HS | 30 | 2.1 | | 242 | 58.8 | 2.2 | 57.4 | 2.1 | 51 | 1.9 |
| AMS1532HS | 32 | 2.0 | | 262 | 62.8 | 2.2 | 61.4 | 2.1 | 55 | 1.9 |
| AMS1535HS | 35 | 1.8 | | 292 | 68.8 | 2.1 | 67.4 | 2.1 | 61 | 1.9 |
| AMS1540HS | 40 | 1.5 | | 342 | 78.8 | 2.1 | 77.4 | 2.0 | 71 | 1.9 |
| AMC15040HS | 40 | 1.5 | | 342 | 78.8 | 2.1 | 77.4 | 2.0 | 71 | 1.9 |
| AMC15050HS | 50 | 1.2 | | 442 | 98.8 | 2.0 | 97.4 | 2.0 | 91 | 1.9 |
| AMS15063HS | 63 | 0.9 | 572 | 124.8 | 2.0 | 123.4 | 1.9 | 117 | 1.8 | |
| AMC15080HS | 80 | 0.7 | 742 | 158.8 | 1.9 | 157.4 | 1.9 | 151 | 1.8 | |
| AMC15100HS | 100 | 0.5 | 942 | 198.8 | 1.9 | 197.4 | 1.9 | 191 | 1.8 | |

$$L_{min} = \frac{ap}{\tan \alpha} \text{ (mm)}$$



Cutting condition for ramping and helical operation

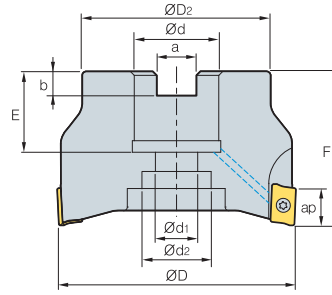
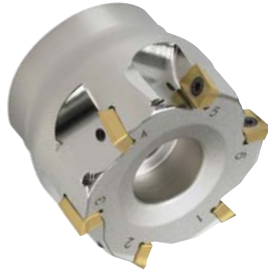


| Designation | Tool Dia. $\varnothing D$ (min) | Ramping | | Helical cutting for blind hole | | | | Helical cutting for through hole | | |
|-------------|---------------------------------|---------|----------------------------------|--------------------------------|--|---------------------------|--|----------------------------------|--|---------------------------|
| | | a_p | Maximum angle $\alpha(^{\circ})$ | L_{min} (mm) | Max. desirable hole Dia. $\varnothing DH_{max}$ (mm) | Max. pitch d_{max} (mm) | Min. desirable hole Dia. $\varnothing DH_{min}$ (mm) | Max. pitch d_{max} (mm) | Min. desirable hole Dia. $\varnothing DH_{min}$ (mm) | Max. pitch d_{max} (mm) |
| AMS2010HS | 10 | 10 | 16.82 | 33 | 18 | 5.4 | 16.4 | 5.0 | 11 | 3.3 |
| AMS2012HS | 12 | | 11.69 | 48 | 22 | 4.6 | 20.4 | 4.2 | 15 | 3.1 |
| AMS2014HS | 14 | | 7.55 | 75 | 26 | 3.4 | 24.4 | 3.2 | 19 | 2.5 |
| AMS2016HS | 16 | | 10.30 | 55 | 30 | 5.5 | 28 | 5.1 | 23 | 4.2 |
| AMS2018HS | 18 | | 8.23 | 69 | 34 | 4.9 | 32 | 4.6 | 27 | 3.9 |
| AMS2020HS | 20 | | 5.60 | 102 | 38 | 3.7 | 36 | 3.5 | 31 | 3.0 |
| AMS2022HS | 22 | | 5.15 | 111 | 42 | 3.8 | 40 | 3.6 | 35 | 3.2 |
| AMS2025HS | 25 | | 3.92 | 146 | 48 | 3.3 | 46 | 3.2 | 41 | 2.8 |
| AMS2032HS | 32 | | 2.70 | 212 | 62 | 2.9 | 60 | 2.8 | 55 | 2.6 |
| AMS2040HS | 40 | | 1.98 | 289 | 78 | 2.7 | 76 | 2.6 | 71 | 2.5 |
| AMS2050HS | 50 | | 1.48 | 386 | 98 | 2.5 | 96 | 2.5 | 91 | 2.4 |
| AMS2063HS | 63 | | 1.11 | 514 | 124 | 2.4 | 122 | 2.4 | 117 | 2.3 |
| AMC2050HS | 50 | | 0.36 | 1576 | 98 | 0.6 | 96 | 0.6 | 91 | 0.6 |
| AMC2063HS | 63 | | 0.27 | 2104 | 124 | 0.6 | 122 | 0.6 | 117 | 0.6 |
| AMC2080HS | 80 | | 0.21 | 2784 | 158 | 0.6 | 156 | 0.6 | 151 | 0.5 |
| AMC2100HS | 100 | | 0.16 | 3584 | 198 | 0.6 | 196 | 0.5 | 191 | 0.5 |
| AMS3025HS | 25 | | 10 | 4.72 | 121 | 48 | 4.0 | 46 | 3.8 | 36 |
| AMS3032HS | 32 | 3.00 | | 191 | 62 | 3.2 | 60 | 3.1 | 50 | 2.6 |
| AMS3040HS | 40 | 2.29 | | 250 | 78 | 3.1 | 76 | 3.0 | 66 | 2.6 |
| AMS3050HS | 50 | 1.64 | | 350 | 98 | 2.8 | 96 | 2.7 | 86 | 2.5 |
| AMS3063HS | 63 | 1.22 | | 470 | 124 | 2.6 | 122 | 2.6 | 112 | 2.4 |
| AMC3040HS | 40 | 1.99 | | 288 | 78 | 2.7 | 76 | 2.6 | 66 | 2.3 |
| AMC3050HS | 50 | 1.67 | | 343 | 98 | 2.9 | 96 | 2.8 | 86 | 2.5 |
| AMC3063HS | 63 | 1.22 | | 470 | 124 | 2.6 | 122 | 2.6 | 112 | 2.4 |
| AMC3080HS | 80 | 0.90 | | 636 | 158 | 2.5 | 156 | 2.5 | 146 | 2.3 |
| AMC3100HS | 100 | 0.69 | | 830 | 198 | 2.4 | 196 | 2.4 | 186 | 2.2 |
| AMS2025MH | 25 | 10 | | 1.50 | 764 | 48 | 1.3 | 46 | 1.2 | - |
| AMS2032MH | 32 | | 1.50 | 1146 | 62 | 1.6 | 60 | 1.6 | - | - |
| AMS3040MH | 40 | | 1.50 | 1528 | 78 | 2.0 | 76 | 2.0 | - | - |
| AMS4020HS | 20 | 16 | 9.5 | 98 | 38.8 | 6.5 | 37.4 | 6.2 | 31 | 5.2 |
| AMS4021HS | 21 | | 5.2 | 179 | 40.8 | 3.7 | 39.4 | 3.6 | 33 | 3.0 |
| AMS4025HS | 25 | | 7.6 | 122 | 48.8 | 6.5 | 47.4 | 6.3 | 41 | 5.5 |
| AMS4026HS | 26 | | 7.1 | 130 | 50.8 | 6.4 | 49.4 | 6.2 | 43 | 5.4 |
| AMS4032HS | 32 | | 3.4 | 276 | 62.8 | 3.7 | 61.4 | 3.6 | 55 | 3.3 |
| AMS4033HS | 33 | | 3.2 | 288 | 64.8 | 3.7 | 63.4 | 3.6 | 57 | 3.2 |
| AMS4040HS | 40 | | 2.5 | 376 | 78.8 | 3.4 | 77.4 | 3.4 | 71 | 3.1 |
| AMS4050HS | 50 | | 1.9 | 502 | 98.8 | 3.2 | 97.4 | 3.2 | 91 | 3.0 |
| AMS4063HS | 63 | | 1.4 | 665 | 124.8 | 3.1 | 123.4 | 3.0 | 117 | 2.9 |
| AMC4050HS | 50 | | 1.9 | 502 | 98.8 | 3.2 | 97.4 | 3.2 | 91 | 3.0 |
| AMC4063HS | 63 | | 1.4 | 665 | 124.8 | 3.1 | 123.4 | 3.0 | 117 | 2.9 |
| AMC4080HS | 80 | | 1.1 | 878 | 158.8 | 2.9 | 157.4 | 2.9 | 151 | 2.8 |
| AMC4100HS | 100 | | 0.8 | 1128 | 198.8 | 2.9 | 197.4 | 2.9 | 191 | 2.8 |
| AMC4125HS | 125 | | 0.6 | 1442 | 248.8 | 2.8 | 247.4 | 2.8 | 241 | 2.7 |

$$L_{min} = \frac{a_p}{\tan \alpha} \quad (\text{mm})$$



AMC(M) 1000S



(mm)

| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | |
|---------------|----|----|-----------------|----|-----------------|-----------------|------|-----|----|----|-----|------|
| AMC(M) 1032HS | 8 | 32 | 30 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 5.6 | 0.15 |
| 1040HS-16 | 10 | 40 | 34 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 5.6 | 0.24 |
| 1040HS-22 | 10 | 40 | 34 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 5.6 | 0.24 |
| 1050HS | 12 | 50 | 42 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 5.6 | 0.36 |
| 1063HS | 14 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 5.6 | 0.61 |

Available Inserts

APMT-MM

APMT-MF

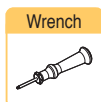
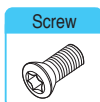


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 060208PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 060212R-MM | | | ● | ● | ● | | | | | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|-------------------------------|----|---------------|
| AMC(M) 1032HS 1040HS-16 | 16 | BT□□-FMC16-□□ |
| 1040HS-22 1050HS 1063HS | 22 | BT□□-FMC22-□□ |

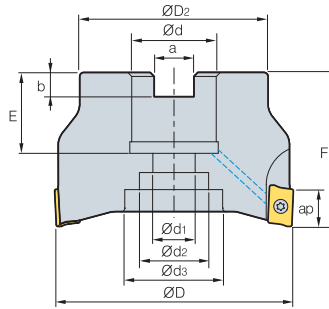
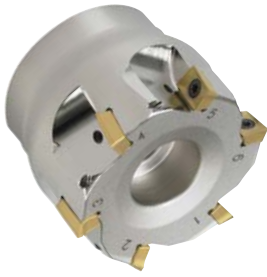
Parts



FTKA01842

TW06S-A

AMC(M)1500S



AA 90° • AR : 9°~13°
• RR : -14°~5°

(mm)

| Designation | ⊙ | øD | øD ₂ | ød | ød ₁ | ød ₂ | ød ₃ | a | b | E | F | ap | kg |
|----------------|----|-----|-----------------|-----------|-----------------|-----------------|-----------------|------------|------|--------|----|----|------|
| AMC(M) 15040HS | 5 | 40 | 34 | 16 | 9 | 14 | - | 8.4 | 5.6 | 19 | 40 | 9 | 0.22 |
| 15050HS | 6 | 50 | 42 | 22 | 11 | 18 | - | 10.4 | 6.3 | 21 | 40 | 9 | 0.34 |
| 15063HS | 8 | 63 | 49 | 22 | 11 | 18 | - | 10.4 | 6.3 | 21 | 40 | 9 | 0.57 |
| 15080HS | 10 | 80 | 57 | 25.4(27) | 14 | 25 | 35 | 9.5(12.4) | 6(7) | 24(23) | 50 | 9 | 1.10 |
| 15100HS | 12 | 100 | 67 | 31.75(32) | 18 | 26 | 42 | 12.7(14.4) | 8(8) | 32(26) | 63 | 9 | 2.10 |

• () Metric Size

Available Inserts

APMT-MA



APMT-ML



APMT-MM

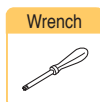
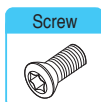


| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| APMT 0903PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 0903PDFR-ML | | | | | | ● | | | | | | | | | | | | |
| 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090312R-MM | | | | | | ● | ● | | | | | | | | | | | |
| 090316R-MM | | | | ● | ● | ● | ● | | | | | | | | | | | |
| 090320R-MM | | | | ● | ● | | | | | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|----------------|-------|-------------------|
| AMC(M) 15040HS | 16 | BT □□-FMC16-□□ |
| 15050HS | 22 | BT □□-FMC22-□□ |
| 15063HS | | BT □□-FMA25.4-□□ |
| 15080HS | 27 | BT □□-FMC27-□□ |
| 15100HS | 31.75 | BT □□-FMA31.75-□□ |
| | 32 | BT □□-FMC32-□□ |

Parts

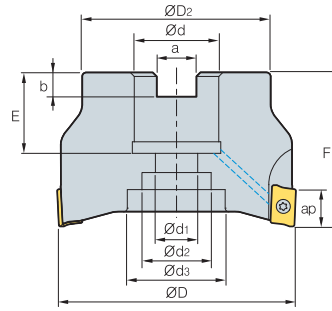
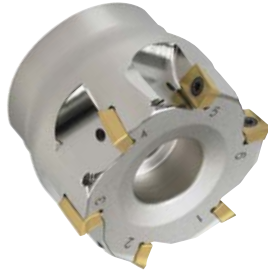


FTKA02565S

TW08S



AMC(M)2000S



AA 90°
 • AR : 9°~13°
 • RR : -14°~5°

(mm)

| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | Ød ₃ | a | b | E | F | ap | |
|---------------|----|-----|-----------------|-----------|-----------------|-----------------|-----------------|------------|------|--------|----|----|------|
| AMC(M) 2040HS | 5 | 40 | 34 | 16 | 9 | 14 | - | 8.4 | 5.6 | 18 | 40 | 11 | 0.22 |
| 2050HS | 6 | 50 | 42 | 22 | 11 | 18 | - | 10.4 | 6.3 | 20 | 40 | 11 | 0.34 |
| 2063HS | 8 | 63 | 49 | 22 | 11 | 18 | - | 10.4 | 6.3 | 20 | 40 | 11 | 0.57 |
| 2080HS | 8 | 80 | 57 | 25.4(27) | 14 | 25 | 35 | 9.5(12.4) | 6(7) | 25(22) | 50 | 11 | 1.10 |
| 2100HS | 10 | 100 | 67 | 31.75(32) | 18 | 26 | 42 | 12.7(14.4) | 8(8) | 32(28) | 63 | 11 | 2.10 |

• () Metric Size

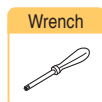
Available Inserts

| | APMT-MA | APMT-ML | APMT-MM | APMT-MF | | | | | | | | | | | | | | |
|------------------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|-------|------|-----|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| APMT 11T3PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 11T3PDER-ML | | | | | | • | | | | | | | | | | | | |
| 11T3PDSR-MM | • | | • | • | • | • | • | • | | | | | | | | | | |
| 11T3PDSR-MF | • | | • | • | • | • | • | • | | | | | | | | | | |
| 11T308PDSR-MM | • | | • | • | • | • | • | • | | | | | | | | | | |
| 11T312PDSR-MM | • | | • | • | • | • | • | • | | | | | | | | | | |
| 11T316R-MM | • | | • | • | • | | | | | | | | | | | | | |
| 11T318R-MM | | | | | | | | | | | | | | | | | | |
| 11T324R-MM | | | • | • | • | | • | | | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|---------------|-------|-----------------------|
| AMC(M) 2040HS | 16 | BT □□ - FMC16 - □□ |
| 2050HS | 22 | BT □□ - FMC22 - □□ |
| 2063HS | 22 | BT □□ - FMC22 - □□ |
| 2080HS | 25.4 | BT □□ - FMA25.4 - □□ |
| | 27 | BT □□ - FMC27 - □□ |
| 2100HS | 31.75 | BT □□ - FMA31.75 - □□ |
| | 32 | BT □□ - FMC32 - □□ |

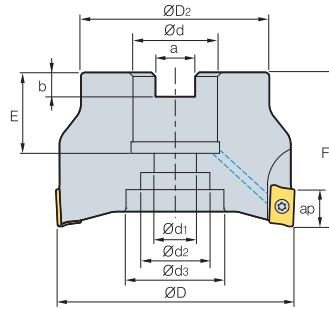
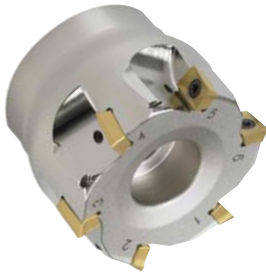
Parts



FTKA02565S

TW08S

AMC(M)3000S



• AR : 14°
• RR : -12°~8°

(mm)

| Designation | ⊗ | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | Ød ₃ | a | b | E | F | ap | kg |
|---------------|---|-----|-----------------|-----------|-----------------|-----------------|-----------------|------------|------|--------|----|----|------|
| AMC(M) 3040HS | 4 | 40 | 34 | 16 | 9 | 14 | - | 8.4 | 5.6 | 18 | 40 | 16 | 0.18 |
| 3050HS | 5 | 50 | 42 | 22 | 11 | 18 | - | 10.4 | 6.3 | 20 | 40 | 16 | 0.28 |
| 3063HS | 6 | 63 | 49 | 22 | 11 | 18 | - | 10.4 | 6.3 | 20 | 40 | 16 | 0.50 |
| 3080HS | 7 | 80 | 57 | 25.4(27) | 14 | 25 | 35 | 9.5(12.4) | 6(7) | 25(22) | 50 | 16 | 1.02 |
| 3100HS | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 42 | 12.7(14.4) | 8(8) | 32(28) | 63 | 16 | 2.05 |

• () Metric Size

Available Inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF

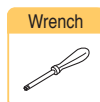
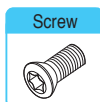


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 1604PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 1604PDER-ML | | | | | | ● | | | | | | | | | | | | |
| 1604PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 1604PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160410PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160416PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160424R-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160430R-MM | | | | | | ● | ● | ● | ● | | | | | | | | | |
| 160432R-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|---------------|-------|------------------|
| AMC(M) 3040HS | 16 | BT□□-FMC16-□□ |
| 3050HS | 22 | BT□□-FMC22-□□ |
| 3063HS | | BT□□-FMA25.4-□□ |
| 3080HS | 27 | BT□□-FMC27-□□ |
| 3100HS | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |

Parts

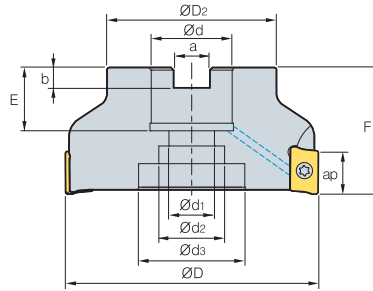


FTKA0410

TW15S



AMC(M)4000S



• AR : 13°~15°
• RR : -12°~7°

(mm)

| Designation | ⊗ | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | Ød ₃ | a | b | E | F | ap | kg |
|---------------|----|-----|-----------------|------------|-----------------|-----------------|-----------------|------------|--------|--------|--------|----|------|
| AMC(M) 4050HS | 5 | 50 | 42 | 22 | 11 | 18 | - | 10.4 | 6.3 | 21 | 40 | 17 | 0.28 |
| 4063HS | 6 | 63 | 49 | 22 | 11 | 18 | - | 10.4 | 6.3 | 21 | 40 | 17 | 0.50 |
| 4080HS | 7 | 80 | 57 | 25.4(27) | 14 | 25 | 35 | 9.5(12.4) | 6(7) | 24(23) | 50 | 17 | 1.00 |
| 4100HS | 8 | 100 | 67 | 31.75(32) | 18 | 26 | 42 | 12.7(14.4) | 8(8) | 32(25) | 63(50) | 17 | 2.10 |
| 4125HS | 9 | 125 | 87 | 38.1(40) | 22 | 32 | 52 | 15.9(16.4) | 10(9) | 35(29) | 63 | 17 | 3.30 |
| 4160S | 10 | 160 | 107 | 50.8(40) | - | - | 100 | 19(16.4) | 11(9) | 38(32) | 63 | 17 | 3.6 |
| 4200S | 10 | 200 | 108 | 47.625(60) | - | - | 132 | 25.4(25.7) | 14(14) | 40(38) | 63 | 17 | 6 |

• () Metric Size

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF



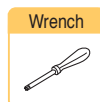
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|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| APMT 1806PDFR-MA | | | | | | | | | | | | | | | | | |
| 1806PDER-ML | | | | | | ● | | | | | | | | | | | |
| 1806PDSR-MM | ● | | ● | ● | ● | ● | | ● | ● | | | | | | | | |
| 1806PDSR-MF | | | ● | | ● | ● | ● | | | | | | | | | | |
| 180612PDSR-MM | ● | | ● | ● | ● | ● | ● | | | | | | | | | | |
| 180616PDSR-MM | | | ● | | ● | ● | | | | | | | | | | | |
| 180620PDSR-MM | | | | | | | | | | | | | | | | | |
| 180624PDSR-MM | | | ● | ● | | ● | | | | | | | | | | | |
| 180630R-MM | | | | | | | | | | | | | | | | | |
| 180632R-MM | | | ● | ● | | ● | ● | | | | | | | | | | |

E05

Available Arbors

| Designation | Ød | NC Arbors | Designation | Ød | NC Arbors |
|---------------|-------|------------------|---------------|--------|-------------------|
| AMC(M) 4050HS | | | AMC(M) 4125HS | 38.1 | BT□□-FMA38.1-□□ |
| 4063HS | 22 | BT□□-FMC22-□□ | | 40 | BT□□-FMC40-□□ |
| 4080HS | 25.4 | BT□□-FMA25.4-□□ | 4160S | 50.8 | BT□□-FMA50.8-□□ |
| | 27 | BT□□-FMC27-□□ | | 40 | BT□□-FMC40-□□ |
| 4100HS | 31.75 | BT□□-FMA31.75-□□ | 4200S | 47.625 | BT□□-FMA47.625-□□ |
| | 32 | BT□□-FMC32-□□ | | 60 | BT□□-FMB60-□□ |

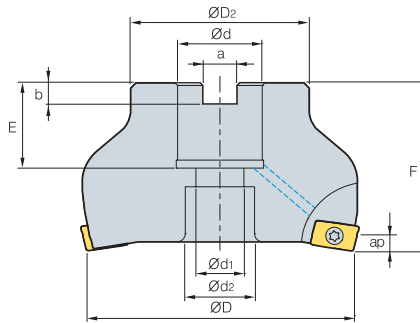
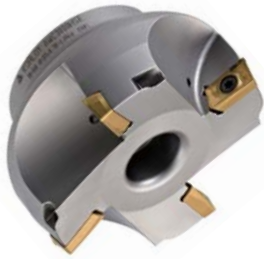
Parts



FTKA0410

TW15S

AMC(M) 1000SE/2000SE



• AR : 45°
• RR : 0°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | $\varnothing d_1$ | $\varnothing d_2$ | a | b | E | F | ap | |
|----------------|---|-----------------|-------------------|-----------------|-------------------|-------------------|------------|----------|--------|----|-----|------|
| AMC(M) 1040HSE | 4 | 40 | 34 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 2.5 | 0.26 |
| 1050HSE | 5 | 50 | 42 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 2.5 | 0.39 |
| AMC(M) 2080HSE | 5 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6.0(7.0) | 25(22) | 50 | 4 | 1.2 |
| 2100HSE | 6 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0(8.0) | 32(28) | 63 | 4 | 2.33 |

• () Metric Size

Available Inserts

APMT-MM



APMT-MF

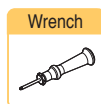
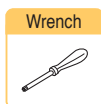


| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-----------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC3300 | PC3400 | PC3545 | PC3530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 1000 type | APMT 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 0602PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 060208PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 060212R-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| 2000 type | APMT 11T3PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T3PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T308PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T312PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T316R-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T318R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T324R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |

Available Arbors

| Type | Designation | $\varnothing d$ | NC Arbors |
|-----------|----------------|-----------------|------------------|
| 1000 type | AMC(M) 1040HSE | 16 | BT□□-FMC16-□□ |
| | 1050HSE | 22 | BT□□-FMC22-□□ |
| 2000 type | AMC(M) 2080HSE | 25.4 | BT□□-FMA25.4-□□ |
| | | 27 | BT□□-FMC27-□□ |
| | | 31.75 | BT□□-FMA31.75-□□ |
| | 2100HSE | 32 | BT□□-FMC32-□□ |

Parts



| | | | |
|-----------|------------|-------|---------|
| 1000 type | FTKA01842 | - | TW06S-A |
| 2000 type | FTKA02565S | TW08S | - |



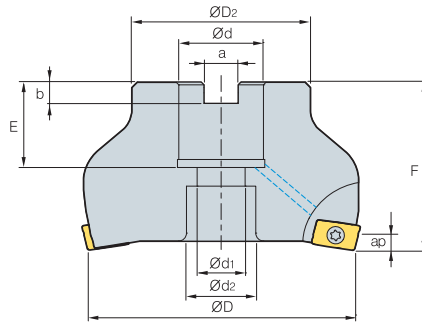
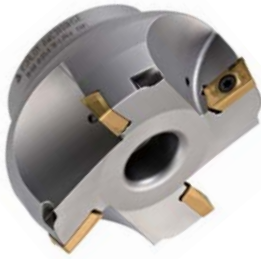
Available Inserts E05



Available Arbors and bolt E290~E292

● : Stock item

AMC(M)3000SE



AA
75°

• AR : 45°
• RR : 0°

(mm)

| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | |
|----------------|---|-----|-----------------|-----------|-----------------|-----------------|------------|----------|--------|----|----|-----|
| AMC(M) 3080HSE | 4 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6.0(7.0) | 25(22) | 50 | 6 | 1.3 |
| 3100HSE | 5 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8.0(8.0) | 32(28) | 63 | 6 | 2.3 |

• () Metric Size

Available Inserts

APMT-MM



APMT-MF

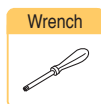
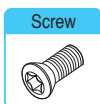


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 1604PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | E05 |
| 1604PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160410PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160416PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160424R-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160430R-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 160432R-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|----------------|-------|------------------|
| AMC(M) 3080HSE | 25.4 | BT□□-FMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ |
| 3100HSE | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |

Parts

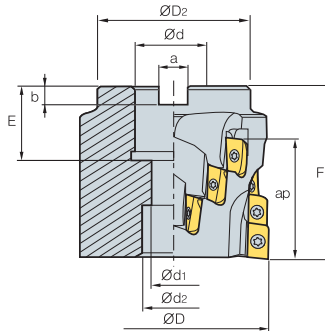


FTKA0410

TW08S



AMC(M)2000M



• AR : 9°
• RR : -9°~5°

(mm)

| Designation | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | No. of flute | ap | kg | |
|--------------|----|-----------------|----|-----------------|-----------------|----|------------|--------|--------|--------------|----|----|------|
| AMC(M) 2050M | 16 | 50 | 40 | 22.225(22) | 11 | 18 | 8(10.4) | 5(6.3) | 29(21) | 58 | 4 | 39 | 0.7 |
| 2063M | 16 | 63 | 50 | 25.4(27) | 13.5 | 20 | 9.5(12.4) | 6(7) | 25(25) | 58 | 4 | 39 | 0.8 |
| 2080M | 20 | 80 | 60 | 31.75(32) | - | 45 | 12.7(14.4) | 8(8) | 35(28) | 63 | 5 | 39 | 0.96 |
| 2100M | 24 | 100 | 80 | 38.1(40) | - | 56 | 15.9(16.4) | 10(9) | 38(30) | 63 | 6 | 39 | 1.2 |

• ()Metric Size

Available Inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|------|-------|------|
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 11T3PDFR-MA | | | | | | | | | | | | | | | | | | |
| 11T3PDER-ML | | | | | | | | | | | | | | | | | | |
| 11T3PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| 11T3PDSR-MF | • | | • | • | • | • | • | • | • | | | | | | | | | |
| 11T308PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| 11T312PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| 11T316R-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| 11T318R-MM | | | | | | | | | | | | | | | | | | |
| 11T324R-MM | | | • | • | • | | • | | | | | | | | | | | |

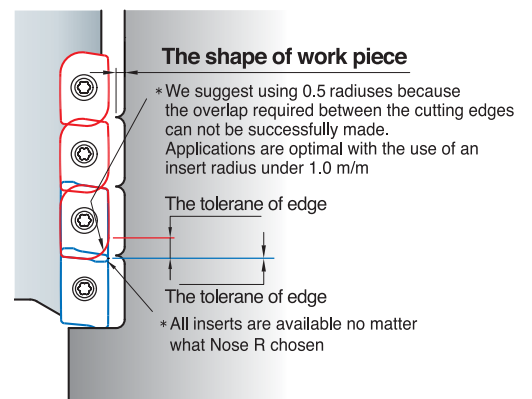
page

E05

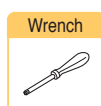
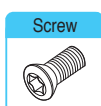
Available Arbors

| Designation | Ød | NC Arbors | |
|--------------|--------|-------------------|-------------------|
| AMC(M) 2050M | 22.225 | BT□□-FMA22.225-□□ | BT□□-SMA22.225-□□ |
| | 22 | BT□□-FMC22-□□ | BT□□-SMC22-□□ |
| 2063M | 25.4 | BT□□-FMA25.4-□□ | BT□□-SMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ | BT□□-SMC27-□□ |
| 2080M | 31.75 | BT□□-FMA31.75-□□ | BT□□-SMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ | BT□□-SMC32-□□ |
| 2100M | 38.1 | BT□□-FMA38.1-□□ | BT□□-SMA38.1-□□ |
| | 40 | BT□□-FMC40-□□ | BT□□-SMC40-□□ |

Caution when insert are screwed



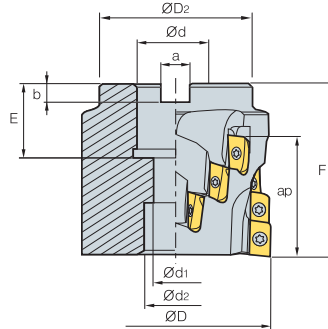
Parts



FTKA02565S

TW08S

AMC(M)3000M



AA
90°
• AR : 9°
• RR : -9°~5°

| Designation | | ⊗ | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | No. of flute | ap | kg |
|-------------|-------|----|-----|-----------------|-----------|-----------------|-----------------|------------|-------|--------|-----|--------------|----|------|
| AMC(M) | 3063M | 16 | 63 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 38(38) | 85 | 4 | 57 | 1.1 |
| | 3080M | 20 | 80 | 67 | 31.75(32) | 14 | 26 | 12.7(14.4) | 8(8) | 40(40) | 100 | 4 | 71 | 2.23 |
| | 3100M | 30 | 100 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 40(40) | 100 | 6 | 71 | 3.59 |

() Metric Size

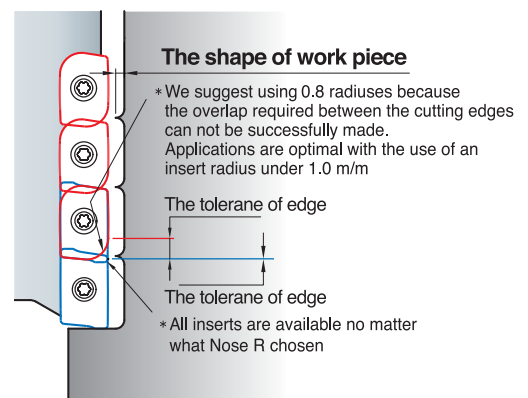
Available Inserts

| | APMT-MA | APMT-ML | APMT-MM | APMT-MF | | | | | | | | | | | | | | |
|------------------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | page | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A | ST20 |
| APMT 1604PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 1604PDER-ML | | | | | | ● | | | | | | | | | | | | |
| 1604PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 1604PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160410PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160416PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160424R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160430R-MM | | | | | ● | ● | ● | ● | | | | | | | | | | |
| 160432R-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |

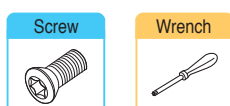
Available Arbors

| Designation | Ød | NC Arbors | |
|--------------|-------|------------------|------------------|
| AMC(M) 3063M | 25.4 | BT□□-FMA25.4-□□ | BT□□-SMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ | BT□□-SMC27-□□ |
| 3080M | 31.75 | BT□□-FMA31.75-□□ | BT□□-SMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ | BT□□-SMC32-□□ |
| 3100M | 38.1 | BT□□-FMA38.1-□□ | BT□□-SMA38.1-□□ |
| | 40 | BT□□-FMC40-□□ | BT□□-SMC40-□□ |

Caution when insert are screwed



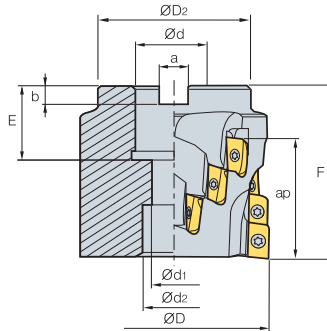
Parts



FTKA0410

TW15S

AMC(M)4000M



• AR : 9°
• RR : -9°~5°

| Designation | | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | $\varnothing d_1$ | $\varnothing d_2$ | $\varnothing d_3$ | a | b | E | F | No. of flute | ap | |
|-------------|-------|----|-----------------|-------------------|-----------------|-------------------|-------------------|-------------------|------------|-------|--------|-----|--------------|------|------|
| AMC(M) | 4063M | 16 | 63 | 57 | 25.4(27) | 14 | 20 | 28 | 9.5(12.4) | 6(7) | 38(38) | 85 | 4 | 61.1 | 1.1 |
| | 4080M | 20 | 80 | 67 | 31.75(32) | 14 | 26 | 40 | 12.7(14.4) | 8(8) | 40(40) | 100 | 4 | 76.1 | 2.23 |
| | 4100M | 30 | 100 | 87 | 38.1(40) | 22 | 32 | 60 | 15.9(16.4) | 10(9) | 40(40) | 100 | 6 | 76.1 | 3.59 |
| | 4125M | 18 | 125 | 87 | 38.1(40) | 22 | 32 | 52 | 15.9(16.4) | 10(9) | 36(29) | 68 | 6 | 46.1 | 4.0 |

(mm)
• () Metric Size

Available Inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF

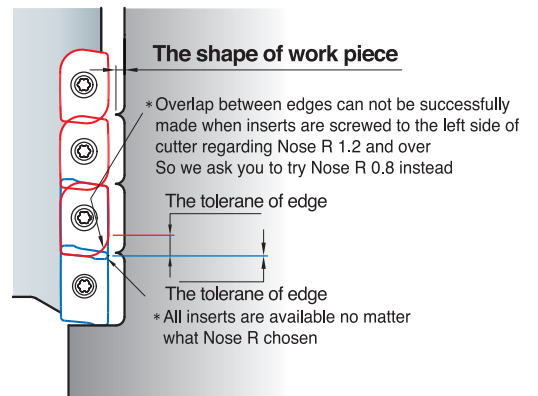


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9630 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 1806PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 1806PDER-ML | | | | | | | | | | | | | | | | | | |
| 1806PDSR-MM | • | | • | • | • | • | • | • | | | | | | | | | | |
| 1806PDSR-MF | | | • | | • | • | • | | | | | | | | | | | |
| 180612PDSR-MM | • | | • | • | • | • | • | | | | | | | | | | | |
| 180616PDSR-MM | | | • | | • | • | • | | | | | | | | | | | |
| 180620PDSR-MM | | | | | | | | | | | | | | | | | | |
| 180624PDSR-MM | | | • | • | | • | | | | | | | | | | | | |
| 180630R-MM | | | • | • | | • | • | | | | | | | | | | | |
| 180632R-MM | | | • | • | | • | • | | | | | | | | | | | |

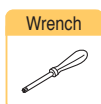
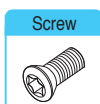
Available Arbors

| Designation | $\varnothing d$ | NC Arbors | | | |
|--------------|-----------------|------------------|------------------|--|--|
| AMC(M) 4063M | 25.4 | BT□□-FMA25.4-□□ | BT□□-SMA25.4-□□ | | |
| | 27 | BT□□-FMC27-□□ | BT□□-SMC27-□□ | | |
| 4080M | 31.75 | BT□□-FMA31.75-□□ | BT□□-SMA31.75-□□ | | |
| | 32 | BT□□-FMC32-□□ | BT□□-SMC32-□□ | | |
| 4100M | 38.1 | BT□□-FMA38.1-□□ | BT□□-SMA38.1-□□ | | |
| | 40 | BT□□-FMC40-□□ | BT□□-SMC40-□□ | | |
| 4125M | 38.1 | BT□□-FMA38.1-□□ | BT□□-SMA38.1-□□ | | |
| | 40 | BT□□-FMC40-□□ | BT□□-SMC40-□□ | | |

Caution when insert are screwed



Parts



FTKA0410

TW15S



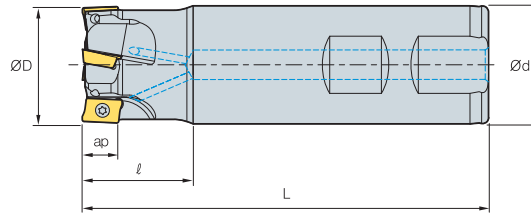
Available Inserts E05



Available Arbors and bolt E290~E292

• : Stock item

AMS1000S



AA 90°
 • AR : 7.5°~13°
 • RR : -17°~6°

(mm)

| Designation | | øD | ød | l | L | ap | |
|-------------|---|----|----|----|-----|-----|------|
| AMS 1010HS | 2 | 10 | 10 | 20 | 80 | 5.6 | 0.04 |
| 1011HS | 2 | 11 | 10 | 20 | 80 | 5.6 | 0.04 |
| 1012HS-2 | 2 | 12 | 12 | 25 | 80 | 5.6 | 0.06 |
| 1012HS-2L12 | 2 | 12 | 12 | 25 | 120 | 5.6 | 0.09 |
| 1012HS-3 | 3 | 12 | 12 | 25 | 80 | 5.6 | 0.06 |
| 1014HS-2 | 2 | 14 | 16 | 25 | 90 | 5.6 | 0.11 |
| 1014HS-2L16 | 2 | 14 | 16 | 25 | 140 | 5.6 | 0.18 |
| 1014HS-3 | 3 | 14 | 16 | 25 | 90 | 5.6 | 0.11 |
| 1015HS | 3 | 15 | 16 | 25 | 90 | 5.6 | 0.11 |
| 1015HS-3L16 | 3 | 15 | 16 | 25 | 140 | 5.6 | 0.18 |
| 1016HS-3 | 3 | 16 | 16 | 25 | 90 | 5.6 | 0.12 |
| 1016HS-3L16 | 3 | 16 | 16 | 25 | 160 | 5.6 | 0.22 |
| 1016HS-4 | 4 | 16 | 16 | 25 | 90 | 5.6 | 0.12 |
| 1017HS | 4 | 17 | 16 | 25 | 90 | 5.6 | 0.12 |
| 1017HS-3L16 | 3 | 17 | 16 | 25 | 160 | 5.6 | 0.22 |
| 1018HS | 4 | 18 | 16 | 25 | 90 | 5.6 | 0.12 |
| 1018HS-4L16 | 4 | 18 | 16 | 25 | 180 | 5.6 | 0.25 |
| 1020HS-4 | 4 | 20 | 20 | 30 | 110 | 5.6 | 0.23 |
| 1020HS-4L20 | 4 | 20 | 20 | 30 | 200 | 5.6 | 0.43 |
| 1020HS-5 | 5 | 20 | 20 | 30 | 110 | 5.6 | 0.23 |
| 1021HS | 5 | 21 | 20 | 30 | 110 | 5.6 | 0.24 |
| 1021HS-4L20 | 4 | 21 | 20 | 30 | 200 | 5.6 | 0.43 |
| 1022HS | 5 | 22 | 20 | 30 | 110 | 5.6 | 0.27 |
| 1025HS | 7 | 25 | 25 | 30 | 120 | 5.6 | 0.39 |
| 1026HS | 7 | 26 | 25 | 30 | 120 | 5.6 | 0.39 |
| 1032HS | 8 | 32 | 32 | 35 | 120 | 5.6 | 0.65 |
| 1033HS | 8 | 33 | 32 | 35 | 120 | 5.6 | 0.65 |

Available Inserts

• () Metric Size

APMT-MA

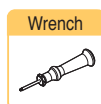
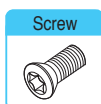


APMT-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 060202PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 060208PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 060212R-MM | | | ● | ● | ● | | ● | | | | | | | | | | | |
| 060216R-MM | | | | ● | | | | | | | | | | | | | | |

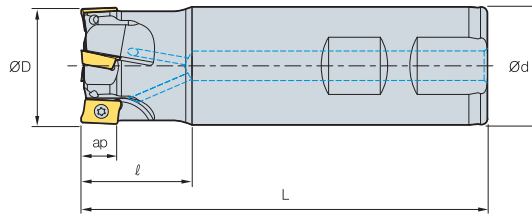
Parts



FTKA01842

TW06S-A

AMS1500S



AA
90°
• AR : 7.5°~12.5°
• RR : -28°~14°

(mm)

| Designation | | øD | ød | l | L | ap | |
|--------------|---|----|----|----|-----|----|------|
| AMS 15010HS | 1 | 10 | 10 | 25 | 80 | 9 | 0.04 |
| 15010HS-1L16 | 1 | 10 | 16 | 30 | 160 | 9 | 0.21 |
| 15012HS | 1 | 12 | 16 | 25 | 80 | 9 | 0.10 |
| 15012HS-1L16 | 1 | 12 | 16 | 30 | 160 | 9 | 0.21 |
| 15013HS | 1 | 13 | 16 | 25 | 80 | 9 | 0.10 |
| 15014HS | 1 | 14 | 16 | 25 | 80 | 9 | 0.10 |
| 15014HS-1L16 | 1 | 14 | 16 | 30 | 160 | 9 | 0.21 |
| 15016HS | 2 | 16 | 16 | 30 | 90 | 9 | 0.11 |
| 15016HS-2L16 | 2 | 16 | 16 | 30 | 160 | 9 | 0.21 |
| 15017HS | 2 | 17 | 16 | 30 | 90 | 9 | 0.12 |
| 15017HS-2L16 | 2 | 17 | 16 | 30 | 160 | 9 | 0.21 |
| 15018HS | 2 | 18 | 16 | 30 | 90 | 9 | 0.14 |
| 15018HS-2L16 | 2 | 18 | 16 | 30 | 160 | 9 | 0.21 |
| 15019HS | 2 | 19 | 16 | 30 | 90 | 9 | 0.16 |
| 15020HS | 2 | 20 | 20 | 30 | 90 | 9 | 0.18 |
| 15020HS-2L20 | 2 | 20 | 20 | 30 | 160 | 9 | 0.34 |
| 15020HS-3 | 3 | 20 | 20 | 30 | 90 | 9 | 0.18 |
| 15021HS | 2 | 21 | 20 | 30 | 90 | 9 | 0.20 |
| 15021HS-2L20 | 2 | 21 | 20 | 30 | 160 | 9 | 0.34 |
| 15021HS-3 | 3 | 21 | 20 | 30 | 90 | 9 | 0.2 |
| 15022HS | 3 | 22 | 20 | 30 | 110 | 9 | 0.23 |
| 15022HS-3L20 | 3 | 22 | 20 | 30 | 180 | 9 | 0.38 |
| 15024HS | 3 | 24 | 20 | 30 | 110 | 9 | 0.30 |
| 15024HS-4 | 4 | 24 | 20 | 30 | 110 | 9 | 0.3 |
| 15025HS-3S20 | 3 | 25 | 20 | 30 | 110 | 9 | 0.35 |
| 15025HS | 3 | 25 | 25 | 30 | 110 | 9 | 0.35 |
| 15025HS-3L25 | 3 | 25 | 25 | 30 | 180 | 9 | 0.59 |

Available Inserts

APMT-MA

APMT-ML

APMT-MM

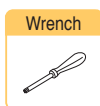


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC5530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 0903PDR-MA | | | | | | | | | | | | | | | | | | |
| 0903PDR-ML | | | | | | | | | | | | | | | | | | |
| 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090312R-MM | | | | | ● | ● | ● | | | | | | | | | | | |
| 090316R-MM | | | | | ● | ● | | | | | | | | | | | | |
| 090320R-MM | | | | | ● | ● | | | | | | | | | | | | |

Parts



FTKA02555S
FTKA02565S

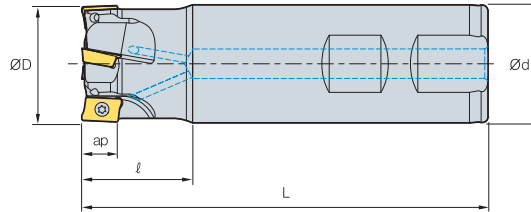


TW08S



Ø10~Ø14
Ø16~Ø100

AMS1500S



AA 90°
 • AR : 7.5°~12.5°
 • RR : -28°~-14°

(mm)

| Designation | | øD | ød | ℓ | L | ap | |
|------------------|---|----|----|----|-----|----|------|
| AMS 15025HS-4S20 | 4 | 25 | 20 | 30 | 110 | 9 | 0.25 |
| 15025HS-4S25 | 4 | 25 | 25 | 30 | 110 | 9 | 0.25 |
| 15028HS | 4 | 28 | 25 | 30 | 110 | 9 | 0.36 |
| 15028HS-4L25 | 4 | 28 | 25 | 30 | 180 | 9 | 0.61 |
| 15028HS-5 | 5 | 28 | 25 | 30 | 110 | 9 | 0.36 |
| 15030HS | 4 | 30 | 25 | 30 | 110 | 9 | 0.38 |
| 15030HS-4L25 | 4 | 30 | 25 | 30 | 180 | 9 | 0.62 |
| 15030HS-5 | 5 | 30 | 25 | 30 | 110 | 9 | 0.38 |
| 15032HS | 4 | 32 | 32 | 30 | 110 | 9 | 0.60 |
| 15032HS-4L32 | 4 | 32 | 32 | 30 | 180 | 9 | 1.00 |
| 15032HS-5 | 5 | 32 | 32 | 30 | 110 | 9 | 0.6 |
| 15035HS | 5 | 35 | 32 | 30 | 110 | 9 | 0.70 |
| 15035HS-6 | 6 | 35 | 32 | 30 | 110 | 9 | 0.7 |
| 15040HS-S32 | 5 | 40 | 32 | 35 | 130 | 9 | 0.80 |
| 15040HS-5L32 | 5 | 40 | 32 | 35 | 200 | 9 | 1.20 |
| 15040HS-6S32 | 6 | 40 | 32 | 35 | 130 | 9 | 0.8 |
| 15040HS-S40 | 5 | 40 | 40 | 35 | 130 | 9 | 1.13 |
| 15040HS-6S40 | 6 | 40 | 40 | 35 | 130 | 9 | 1.13 |
| 15040HS-S42 | 5 | 40 | 42 | 35 | 130 | 9 | 1.23 |
| 15040HS-6S42 | 6 | 40 | 42 | 35 | 130 | 9 | 1.23 |

Available Inserts

APMT-MA

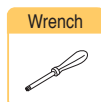
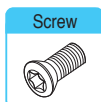
APMT-ML

APMT-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| APMT 0903PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 0903PDER-ML | | | | | | ● | | | | | | | | | | | | |
| 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090312R-MM | | | | ● | ● | ● | ● | | | | | | | | | | | |
| 090316R-MM | | | | ● | ● | ● | ● | | | | | | | | | | | |
| 090320R-MM | | | | ● | ● | | | | | | | | | | | | | |

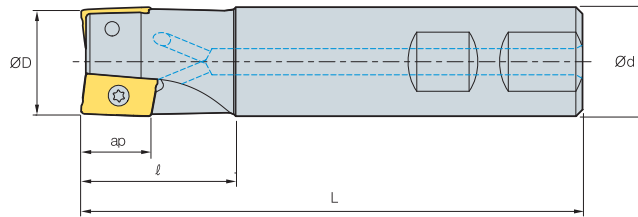
Parts



FTKA02565S TW08S



AMS2000S



AA
90°
• AR : 3°~14°
• RR : -25°~18°

(mm)

| Designation | | ØD | Ød | ℓ | L | ap | |
|-------------|---|----|----|----|-----|----|------|
| AMS 2010HS | 1 | 10 | 10 | 20 | 85 | 11 | 0.04 |
| 2010HS-1L16 | 1 | 10 | 16 | 30 | 160 | 11 | 0.21 |
| 2012HS | 1 | 12 | 16 | 25 | 85 | 11 | 0.10 |
| 2012HS-1L16 | 1 | 12 | 16 | 30 | 160 | 11 | 0.21 |
| 2014HS | 1 | 14 | 16 | 25 | 90 | 11 | 0.12 |
| 2014HS-1L16 | 1 | 14 | 16 | 30 | 160 | 11 | 0.21 |
| 2016HS | 2 | 16 | 16 | 25 | 90 | 11 | 0.12 |
| 2016HS-2L16 | 2 | 16 | 16 | 30 | 180 | 11 | 0.21 |
| 2018HS | 2 | 18 | 16 | 25 | 90 | 11 | 0.12 |
| 2018HS-2L16 | 2 | 18 | 16 | 30 | 180 | 11 | 0.21 |
| 2020HS | 2 | 20 | 20 | 30 | 100 | 11 | 0.21 |
| 2020HS-2L20 | 2 | 20 | 20 | 30 | 210 | 11 | 0.49 |
| 2022HS | 3 | 22 | 20 | 35 | 115 | 11 | 0.25 |
| 2022HS-3L20 | 3 | 22 | 20 | 35 | 180 | 11 | 0.38 |
| 2025HS | 3 | 25 | 25 | 35 | 115 | 11 | 0.40 |
| 2025HS-3L25 | 3 | 25 | 25 | 40 | 180 | 11 | 0.59 |
| 2032HS | 4 | 32 | 32 | 40 | 125 | 11 | 0.70 |
| 2032HS-4L32 | 4 | 32 | 32 | 50 | 180 | 11 | 1.00 |
| 2040HS | 5 | 40 | 32 | 42 | 130 | 11 | 0.84 |
| 2040HS-5L32 | 5 | 40 | 32 | 50 | 200 | 11 | 1.20 |
| 2040HS-S40 | 5 | 40 | 40 | 42 | 130 | 11 | 1.15 |
| 2040HS-S42 | 5 | 40 | 42 | 42 | 130 | 11 | 2.00 |
| 2050HS | 6 | 50 | 32 | 45 | 135 | 11 | 1.06 |
| 2050HS-S40 | 6 | 50 | 40 | 45 | 135 | 11 | 1.38 |
| 2050HS-S42 | 6 | 50 | 42 | 45 | 135 | 11 | 1.50 |
| 2063HS | 8 | 63 | 32 | 45 | 135 | 11 | 1.31 |
| 2063HS-S40 | 8 | 63 | 40 | 45 | 135 | 11 | 1.62 |
| 2063HS-S42 | 8 | 63 | 42 | 45 | 135 | 11 | 1.70 |

Available Inserts

APMT-MA

APMT-ML

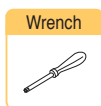
APMT-MF

APMT-MM



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|-----------------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC630 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 11T3PDR-MA | | | | | | | | | | | | | | | | | | |
| 11T3PDR-ML | | | | | | | | ● | | | | | | | | | | |
| 11T3PDR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T3PDR-MF | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T308PDR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T312PDR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T316R-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T318R-MM | | | | | | | | | | | | | | | | | | |
| 11T324R-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |

Parts

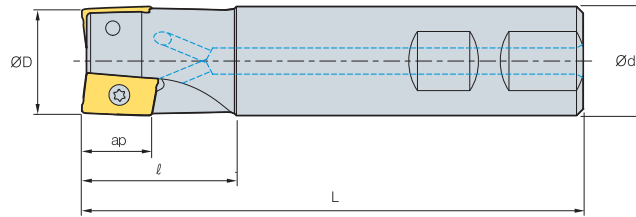


FTKA02555S
FTKA02565S

TW08S

Ø10~Ø14
Ø16~Ø100

AMS3000S



AA
90°
• AR : 3°~14°
• RR : -18°~10°

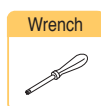
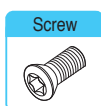
(mm)

| Designation | | ØD | Ød | ℓ | L | ap | |
|-------------|---|----|----|----|-----|----|------|
| AMS 3025HS | 2 | 25 | 25 | 35 | 115 | 16 | 0.40 |
| 3025HS-2M25 | 2 | 25 | 25 | 35 | 180 | 16 | 0.65 |
| 3025HS-2L25 | 2 | 25 | 25 | 60 | 220 | 16 | 0.75 |
| 3032HS | 3 | 32 | 32 | 40 | 125 | 16 | 0.69 |
| 3032HS-2M32 | 2 | 32 | 32 | 40 | 200 | 16 | 1.13 |
| 3032HS-2L32 | 2 | 32 | 32 | 65 | 260 | 16 | 1.52 |
| 3032HS-3M32 | 3 | 32 | 32 | 40 | 200 | 16 | 1.12 |
| 3032HS-3L32 | 3 | 32 | 32 | 65 | 260 | 16 | 1.48 |
| 3040HS | 4 | 40 | 32 | 42 | 130 | 16 | 0.80 |
| 3040HS-3M32 | 3 | 40 | 32 | 42 | 200 | 16 | 1.24 |
| 3040HS-3L32 | 3 | 40 | 32 | 42 | 260 | 16 | 1.61 |
| 3040HS-4M32 | 4 | 40 | 32 | 42 | 200 | 16 | 1.21 |
| 3040HS-4L32 | 4 | 40 | 32 | 42 | 260 | 16 | 1.58 |
| 3040HS-S40 | 4 | 40 | 40 | 42 | 130 | 16 | 1.10 |
| 3040HS-S42 | 4 | 40 | 42 | 42 | 130 | 16 | 1.20 |
| 3050HS | 5 | 50 | 32 | 45 | 135 | 16 | 1.00 |
| 3050HS-S40 | 5 | 50 | 40 | 45 | 135 | 16 | 1.30 |
| 3050HS-S42 | 5 | 50 | 42 | 45 | 135 | 16 | 1.40 |
| 3063HS | 6 | 63 | 32 | 45 | 135 | 16 | 1.25 |
| 3063HS-S40 | 6 | 63 | 40 | 45 | 135 | 16 | 1.50 |
| 3063HS-S42 | 6 | 63 | 42 | 45 | 135 | 16 | 1.54 |

Available Inserts

| | APMT-MA | APMT-ML | APMT-MF | APMT-MM | | | | | | | | | | | | | | |
|------------------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 1604PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 1604PDER-ML | | | | | | | | | | | | | | | | | | |
| 1604PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 1604PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160410PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160416PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160424R-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 160430R-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 160432R-MM | ● | | ● | ● | ● | ● | ● | | | | | | | | | | | |

Parts



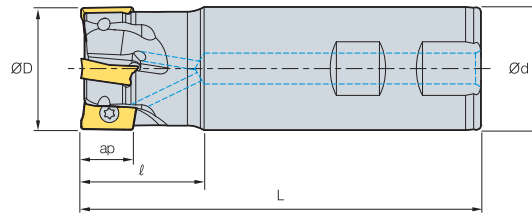
FTKA0408
FTKA0410

TW15S

Ø25
Ø32~Ø100



AMS3000S-K



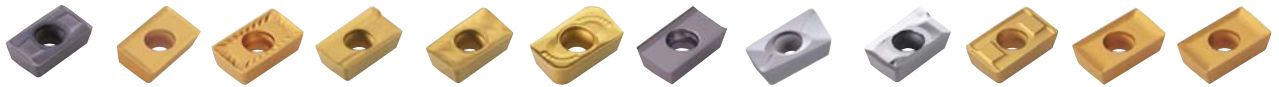
AA
90°

- AR : 14°
- RR : -18°~-10°

| Designation | | | øD | ød | ℓ | L | ap | |
|-------------|--------------|---|----|----|----|-----|----|------|
| AMS | 3025HS-K | 2 | 25 | 25 | 35 | 115 | 16 | 0.4 |
| | 3032HS-K | 3 | 32 | 32 | 40 | 125 | 16 | 0.69 |
| | 3040HS-K | 4 | 40 | 32 | 42 | 130 | 16 | 0.8 |
| | 3040HS-K-S40 | 4 | 40 | 40 | 42 | 130 | 16 | 1.1 |
| | 3040HS-K-S42 | 4 | 40 | 42 | 42 | 130 | 16 | 1.2 |
| | 3050HS-K | 5 | 50 | 32 | 45 | 135 | 16 | 1.0 |
| | 3050HS-K-S40 | 5 | 50 | 40 | 45 | 135 | 16 | 1.3 |
| | 3050HS-K-S42 | 5 | 50 | 42 | 45 | 135 | 16 | 1.4 |
| | 3063HS-K | 6 | 63 | 32 | 45 | 135 | 16 | 1.25 |
| | 3063HS-K-S40 | 6 | 63 | 40 | 45 | 135 | 16 | 1.5 |
| | 3063HS-K-S42 | 6 | 63 | 42 | 45 | 135 | 16 | 1.54 |

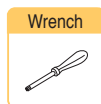
Available Inserts

APFT-X22 APFT-X28 APKT APKT-MF APKT-MM APKT-MM1 APKT-MA APKT-MA2 APKT-MA3 APKT-X22 APKT-X23 APKT-X24



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| APFT 1604PDSR-X22 | | | | ● | | | | | | | | | | | | | |
| 1604PDTR-X22 | | | | | | | | | | | | | | | | | |
| 1604PDR-X28 | | | | | | | | | | | | | | | | | |
| 1604PDSR-X28 | | | | | | | | | | | | | | | | | |
| 1604PDTR-X28 | | | | | | | | | | | | | | | | | |
| APKT 1604PDSR | ● | | | ● | | | | | ● | | | | | | | | |
| 1604PDSR-MF | ● | | | | ● | | | | | | | | | | | | |
| 1604PDSR-MM | ● | ● | | ● | ● | ● | ● | ● | | | | | | | | | |
| 160432R-MM1 | ● | | | | | | | | | | | | | | | | |
| 1604PDFR-MA | | | | | | | | | | | | | ● | | | | |
| 1604PDFR-MA2 | | | | | | | | | | | | | | | | | |
| 160416FR-MA2 | | | | | | | | | | | | | | | | | |
| 160432FR-MA2 | | | | | | | | | | | | | | | | | |
| 1604PDFR-MA3 | | | | | | | | | | | | | | ● | ● | | |
| 1604PDSR-X22 | ● | | | | | | | | | | | | | | | | |
| 1604PDTR-X22 | | | | | | | | | | | | | | | | | |
| 1604PDR-X23 | | | | | | | | | | | | | | | | | |
| 1604PDTR-X23 | | | | | | | | | | | | | | | | | |
| 1604PDR-X24 | | | | | | | | | | | | | | | | | |
| 1604PDTR-X24 | | | | | | | | | | | | | | | | | |

Parts

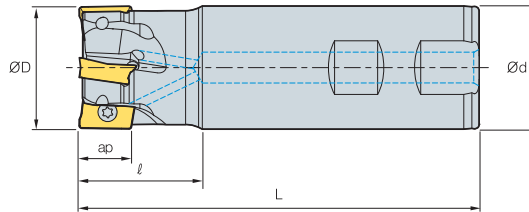


FTKA0408
FTKA0410

TW15S

Ø25
Ø32-Ø100

AMS4000S



AA 90°
 • AR : 7°~13°
 • RR : -20°~6°

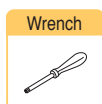
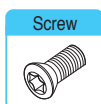
(mm)

| Designation | | øD | ød | ℓ | L | ap | |
|-------------|---|----|----|----|-----|----|------|
| AMS 4020HS | 1 | 20 | 20 | 30 | 90 | 17 | 0.18 |
| 4020HS-M | 1 | 20 | 20 | 30 | 160 | 17 | 0.17 |
| 4021HS | 1 | 21 | 20 | 30 | 90 | 17 | 0.19 |
| 4021HS-M | 1 | 21 | 20 | 30 | 160 | 17 | 0.34 |
| 4025HS | 2 | 25 | 25 | 40 | 110 | 17 | 0.35 |
| 4025HS-2M25 | 2 | 25 | 25 | 40 | 180 | 17 | 0.58 |
| 4025HS-2L25 | 2 | 25 | 25 | 40 | 230 | 17 | 0.8 |
| 4026HS | 2 | 26 | 25 | 40 | 110 | 17 | 0.37 |
| 4026HS-2M25 | 2 | 26 | 25 | 40 | 180 | 17 | 0.60 |
| 4026HS-2L25 | 2 | 26 | 25 | 40 | 230 | 17 | 0.82 |
| 4032HS | 3 | 32 | 32 | 40 | 125 | 17 | 0.65 |
| 4032HS-2M32 | 2 | 32 | 32 | 50 | 200 | 17 | 1.17 |
| 4032HS-2L32 | 2 | 32 | 32 | 50 | 260 | 17 | 1.5 |
| 4032HS-3M32 | 3 | 32 | 32 | 50 | 200 | 17 | 1.10 |
| 4032HS-3L32 | 3 | 32 | 32 | 50 | 260 | 17 | 1.48 |
| 4033HS | 3 | 33 | 32 | 40 | 125 | 17 | 0.68 |
| 4033HS-2M32 | 2 | 33 | 32 | 50 | 200 | 17 | 1.12 |
| 4033HS-2L32 | 2 | 33 | 32 | 50 | 260 | 17 | 1.55 |
| 4033HS-3M32 | 3 | 33 | 32 | 50 | 200 | 17 | 1.12 |
| 4033HS-3L32 | 3 | 33 | 32 | 50 | 260 | 17 | 1.55 |

Available Inserts

| | APMT-MA | | | | APMT-ML | | | | APMT-MM | | | | APMT-MF | | | | | |
|-----------------|---------|--------|--------|--------|---------|--------|--------|--------|---------|--------|--------|------|----------|-----|-----|-------|------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | | Cermet | | Uncoated | | | | page | |
| | NCM925 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| APMT 1806PDR-MA | | | | | | | | | | | | | | | | | | E05 |
| 1806PDR-ML | | | | | | ● | | | | | | | | | | | | |
| 1806PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 1806PDSR-MF | | | ● | | ● | ● | ● | | | | | | | | | | | |
| 180612PDSR-MM | ● | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 180616PDSR-MM | | | ● | | | ● | ● | | | | | | | | | | | |
| 180620PDSR-MM | | | | ● | | | | | | | | | | | | | | |
| 180624PDSR-MM | | | ● | ● | | ● | | | | | | | | | | | | |
| 180630R-MM | | | | | | | | | | | | | | | | | | |
| 180632R-MM | | | ● | ● | | ● | ● | | | | | | | | | | | |

Parts

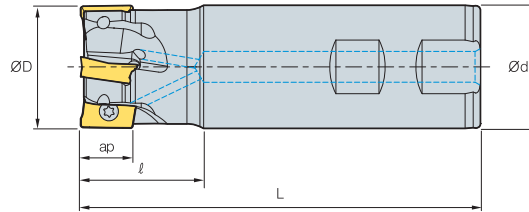


FTKA0408
FTKA0410

TW15S

Ø20~Ø25
Ø32~Ø100

AMS4000S



• AR : 7°~13°
• RR : -20°~-6°

(mm)

| Designation | | ØD | ød | ℓ | L | ap | |
|-------------|-------------|----|----|----|----|-----|------|
| AMS | 4040HS-3M32 | 3 | 40 | 32 | 50 | 200 | 1.20 |
| | 4040HS-3L32 | 3 | 40 | 32 | 50 | 260 | 1.60 |
| | 4040HS-4M32 | 4 | 40 | 32 | 50 | 200 | 1.20 |
| | 4040HS-4L32 | 4 | 40 | 32 | 50 | 260 | 1.60 |
| | 4040HS-S32 | 4 | 40 | 32 | 40 | 130 | 0.76 |
| | 4040HS-S40 | 4 | 40 | 40 | 40 | 130 | 1.10 |
| | 4040HS-S42 | 4 | 40 | 42 | 40 | 130 | 1.20 |
| | 4050HS-S32 | 5 | 50 | 32 | 40 | 135 | 0.95 |
| | 4050HS-S40 | 5 | 50 | 40 | 40 | 135 | 1.30 |
| | 4050HS-S42 | 5 | 50 | 42 | 40 | 135 | 1.40 |
| | 4063HS-S32 | 6 | 63 | 32 | 40 | 135 | 1.25 |
| | 4063HS-S40 | 6 | 63 | 40 | 40 | 135 | 1.60 |
| | 4063HS-S42 | 6 | 63 | 42 | 40 | 135 | 1.70 |

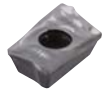
Available Inserts

APMT-MA

APMT-ML

APMT-MM

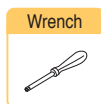
APMT-MF



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| APMT 1806PDR-MA | | | | | | | | | | | | | | | | | |
| 1806PDR-ML | | | | | | ● | | | | | | | | | | | |
| 1806PDR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 1806PDR-MF | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 180612PDR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 180616PDR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 180620PDR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 180624PDR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 180630R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 180632R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |

E05

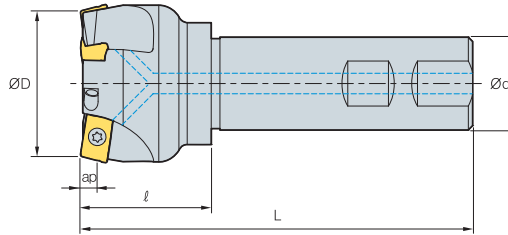
Parts



FTKA0410

TW15S

AMS1000SE/2000SE



• AR : -4.5°~1°
• RR : -3°~0°

(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | ℓ | L | ap | |
|-------------|---|-----------------|-----------------|--------|-----|-----|------|
| AMS 1025HSE | 3 | 25 | 25 | 30 | 115 | 2.5 | 0.41 |
| AMS 2025HSE | 2 | 25 | 25 | 30 | 115 | 4 | 0.4 |
| 2032HSE | 3 | 32 | 32 | 40 | 125 | 4 | 0.72 |
| 2040HSE | 3 | 40 | 32 | 40 | 130 | 4 | 0.86 |
| 2040HSE-S40 | 3 | 40 | 40 | 40 | 130 | 4 | 1.2 |
| 2040HSE-S42 | 3 | 40 | 42 | 40 | 130 | 4 | 1.3 |
| 2050HSE | 4 | 50 | 32 | 40 | 135 | 4 | 0.98 |
| 2050HSE-S40 | 4 | 50 | 40 | 40 | 135 | 4 | 1.3 |
| 2050HSE-S42 | 4 | 50 | 42 | 40 | 135 | 4 | 1.4 |
| 2063HSE | 5 | 63 | 32 | 40 | 135 | 4 | 1.24 |
| 2063HSE-S40 | 5 | 63 | 40 | 40 | 135 | 4 | 1.57 |
| 2063HSE-S42 | 5 | 63 | 42 | 40 | 135 | 4 | 1.62 |

Available Inserts

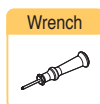
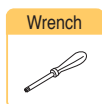
APMT-MF

APMT-MM



| Type | Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|------------|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| 1000 type | APMT 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 060208PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 060212R-MM | | | ● | ● | ● | | | | | | | | | | | | |
| | 060216R-MM | | | | ● | | | | | | | | | | | | | |
| 2000 type | APMT 11T3PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T3PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T308PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T312PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T316R-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T318R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T324R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | APXT 11T3PDSR-MR | | | | | | | | | | | | | | | | | |
| | 11T308PDR-MR | | | | | | | | | | | | | | | | | |
| | 11T3PDR-MA | | | | | | | | | | | | | | ● | | | |
| 11T318R-MA | | | | | | | | | | | | | | | | | | |

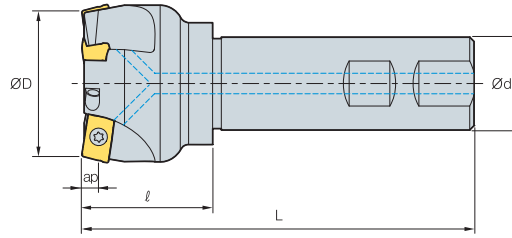
Parts



| | | | |
|-----------|------------|-------|---------|
| 1000 type | FTKA01842 | - | TW06S-A |
| 2000 type | FTKA02565S | TW08S | - |



AMS3000SE



• AR : -4.5°~1°
• RR : -3°~0°

(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | ℓ | L | ap | |
|-------------|---|-----------------|-----------------|--------|-----|----|-----|
| AMS 3050HSE | 3 | 50 | 32 | 45 | 135 | 6 | 1.0 |
| 3050HSE-S40 | 3 | 50 | 40 | 45 | 135 | 6 | 1.3 |
| 3050HSE-S42 | 3 | 50 | 42 | 45 | 135 | 6 | 1.4 |
| 3063HSE | 4 | 63 | 32 | 45 | 135 | 6 | 1.3 |
| 3063HSE-S40 | 4 | 63 | 40 | 45 | 135 | 6 | 1.6 |
| 3063HSE-S42 | 4 | 63 | 42 | 45 | 135 | 6 | 1.7 |

Available Inserts

APMT-MF

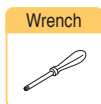


APMT-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9630 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | HD1 | G10 | ST30A | |
| APMT 1604PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 1604PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 160410PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 160416PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 160424R-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 160430R-MM | | | | | ● | ● | ● | ● | ● | | | | | | | | |
| 160432R-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |

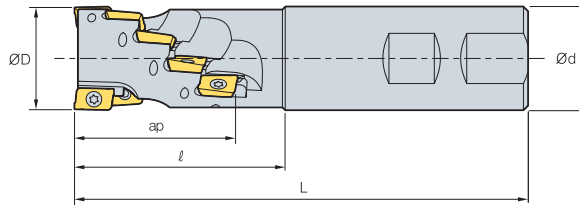
Parts



FTKA0410

TW15S

AMS1000M/1500M



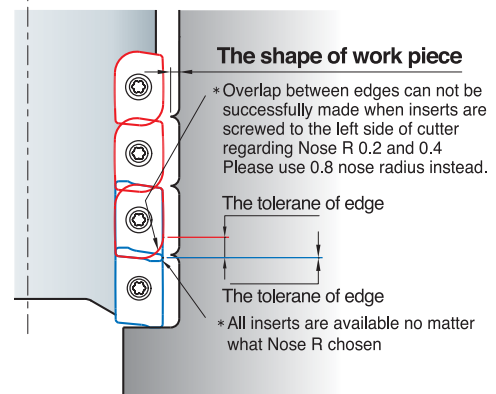
AA
90°
• AR : 7°~9°
• RR : -13°~-10°

| Designation | | | øD | ød | l | L | No. of flute | ap | |
|-------------|--------|----|----|----|----|-----|--------------|------|-----|
| AMS | 1016M | 6 | 16 | 16 | 30 | 80 | 2 | 15.5 | 0.3 |
| | 1020M | 12 | 20 | 20 | 32 | 85 | 3 | 20.5 | 0.3 |
| | 1025M | 20 | 25 | 25 | 39 | 95 | 4 | 25.5 | 0.3 |
| AMS | 15020M | 3 | 20 | 20 | 42 | 105 | 1 | 26.5 | 0.3 |
| | 15025M | 8 | 25 | 25 | 50 | 110 | 2 | 35 | 0.3 |
| | 15032M | 10 | 32 | 32 | 60 | 120 | 2 | 44 | 0.3 |

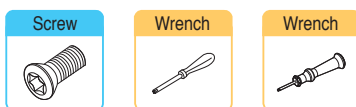
Available Inserts

| | | APMT-MA | | | APMT-ML | | | | | APMT-MM | | | | | | | | | |
|------------|------------------|---------|--------|--------|---------|--------|--------|--------|--------|---------|--------|--------|------|------|----------|-----|-------|------|-----|
| Type | Designation | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | Cermet | | | Uncoated | | page | | |
| | | | | | | | | | | | | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| 1000 type | APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| | 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 060208PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | 060212R-MM | | | ● | ● | ● | | | | | | | | | | | | | |
| 060216R-MM | | | | ● | | | | | | | | | | | | | | | |
| 1500 type | APMT 0903PDFR-MA | | | | | | | | | | | | | | | | | | |
| | 0903PDER-ML | | | | | | ● | | | | | | | | | | | | |
| | 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | 090312R-MM | | | | | ● | ● | ● | | | | | | | | | | | |
| | 090316R-MM | | | | | ● | ● | | | | | | | | | | | | |
| 090320R-MM | | | | | ● | ● | | | | | | | | | | | | | |

Caution when insert are screwed

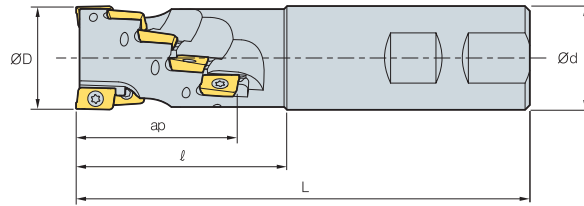


Parts



| | | | |
|-----------|------------|-------|---------|
| 1000 type | FTKA01842 | - | TW06S-A |
| 1500type | FTKA02565S | TW08S | - |

AMS2000M/4000M



AA
90°
• AR : 7°~9°
• RR : -13°~10°

(mm)

| Designation | | ØD | Ød | l | L | No. of flute | ap | |
|-------------|-----------|----|----|----|----|--------------|----|------|
| AMS | 2020M | 3 | 20 | 20 | 45 | 120 | 1 | 0.32 |
| | 2025M | 8 | 25 | 25 | 55 | 130 | 2 | 0.40 |
| | 2032M | 10 | 32 | 32 | 65 | 140 | 2 | 0.65 |
| | 2040M | 14 | 40 | 40 | 75 | 150 | 2 | 0.75 |
| AMS | 4032M | 4 | 32 | 32 | 60 | 130 | 2 | 0.65 |
| | 4040M | 6 | 40 | 40 | 70 | 140 | 2 | 1.11 |
| | 4050M-S40 | 6 | 50 | 40 | 55 | 125 | 2 | 1.22 |
| | 4050M | 8 | 50 | 40 | 70 | 140 | 2 | 1.37 |

Available Inserts

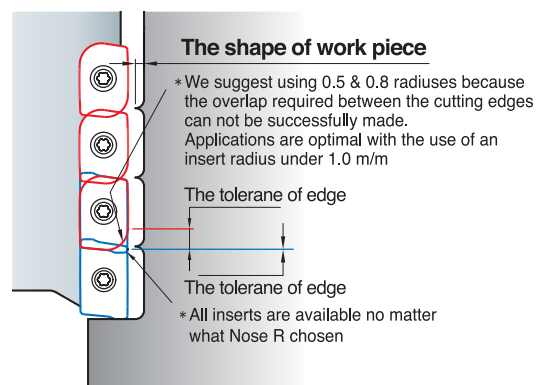
APMT-MF

APMT-MM

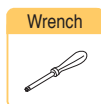


| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|------------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 2000 type | APMT 11T3PDFR-MA | | | | | | | | | | | | | | | | | |
| | 11T3PDER-ML | | | | | | | | | | | | | | | | | |
| | 11T3PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T3PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T308PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T312PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T316R-MM | ● | | ● | ● | ● | | | | | | | | | | | | |
| | 11T318R-MM | | | | | | | | | | | | | | | | | |
| 4000 type | APMT 1806PDFR-MA | | | | | | | | | | | | | | | | | |
| | 1806PDER-ML | | | | | | | | | | | | | | | | | |
| | 1806PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 1806PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 180612PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 180616PDSR-MM | | | ● | | | | | | | | | | | | | | |
| | 180620PDSR-MM | | | | | | | | | | | | | | | | | |
| | 180624PDSR-MM | | | ● | ● | | | | | | | | | | | | | |
| | 180630R-MM | | | | | | | | | | | | | | | | | |
| 180632R-MM | | | ● | ● | | | ● | ● | | | | | | | | | | |

Caution when insert are screwed



Parts



| | | |
|-----------|------------|-------|
| 2000 type | FTKA02565S | TW08S |
| 4000 type | FTKA0410 | TW15S |

Available Inserts E05

● : Stock item

AMS1000MH/1500MH/2000MH/3000MH

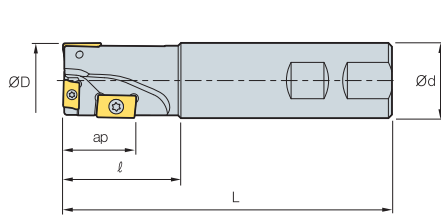


Fig. 1

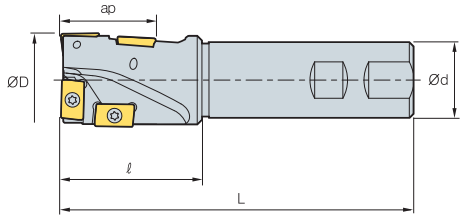


Fig. 2



AA 90°
• AR : 9°~12°
• RR : -12°~10°

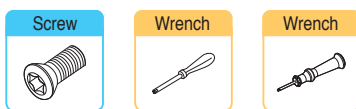
(mm)

| Designation | | | ØD | Ød | l | L | ap | | APMT 0602- | APMT 0903- | APMT 11T3- | APMT 1604- | APKT 1604- | Fig. |
|-------------|----------|---|----|----|----|-----|----|------|------------|------------|------------|------------|------------|------|
| AMS | 1014MH | 3 | 14 | 12 | 30 | 120 | 11 | 0.16 | 3 | - | - | - | - | 1 |
| | 1016MH | 3 | 16 | 14 | 30 | 140 | 11 | 0.20 | 3 | - | - | - | - | 1 |
| | 1018MH | 3 | 18 | 16 | 30 | 140 | 11 | 0.21 | 3 | - | - | - | - | 1 |
| AMS | 15020MH | 3 | 20 | 20 | 35 | 140 | 17 | 0.31 | 1 | 2 | - | - | - | 1 |
| AMS | 2025MH | 3 | 25 | 25 | 40 | 130 | 20 | 0.45 | - | - | 3 | - | - | 1 |
| AMS | 2032MH | 3 | 32 | 32 | 50 | 140 | 30 | 0.75 | - | - | 1 | 2 | - | 1 |
| AMS | 3040MH-K | 4 | 40 | 32 | 60 | 150 | 40 | 0.90 | - | - | - | - | 4 | 2 |

Available Inserts

| | | APKT-MF | APKT-MM | APMT-MA | APMT-ML | APMT-MF | APMT-MM | APXT-MA | | | | | | | | | | | |
|---------------|------------------|------------------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|----------|------|------|-----|-------|------|-----|
| | | | | | | | | | | | | | | | | | | | |
| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | | |
| | | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| 1000 Type | APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| | 060202PDSR-MM | | | • | • | • | • | • | • | | | | | | | | | | |
| | 0602PDSR-MM | | | • | • | • | • | • | • | • | | | | | | | | | |
| 060208PDSR-MM | | | • | • | • | • | • | • | | | | | | | | | | | |
| 1500 Type | APMT 0903PDFR-MA | | | | | | | | | | | | | | | | | | |
| | 0903PDER-ML | | | | | | • | | | | | | | | | | | | |
| | 0903PDSR-MM | | | • | • | • | • | • | | | | | | | | | | | |
| 2000 Type | APMT 11T3PDSR-MM | | | • | • | • | • | • | • | | | | | | | | | | |
| | 11T308PDSR-MM | | | • | • | • | • | • | • | | | | | | | | | | |
| | 11T312PDSR-MM | | | • | • | • | • | • | • | | | | | | | | | | |
| | 11T316R-MM | | | • | • | • | | | | | | | | | | | | | |
| | 11T318R-MM | | | • | • | • | | | | | | | | | | | | | |
| | 11T324R-MM | | | • | • | • | | • | | | | | | | | | | | |
| | 3000 Type | APMT 1604PDSR-MM | | | • | • | • | • | • | • | | | | | | | | | |
| 1604PDSR-MM | | | | • | • | • | • | • | • | | | | | | | | | | |
| 3000-K Type | APKT 1604PDSR-MM | | • | | • | • | • | • | • | | | | | | | | | | |
| | 1604PDSR-MM | | • | | • | • | • | • | • | | | | | | | | | | |

Parts



| | | | |
|-----------|------------|-------|---------|
| 1000 type | FTKA01842 | - | TW06S-A |
| 1500 type | FTKA02565S | TW08S | - |
| 2000 type | FTKA02565S | TW08S | - |
| 3000 type | FTKA0410 | TW15S | - |

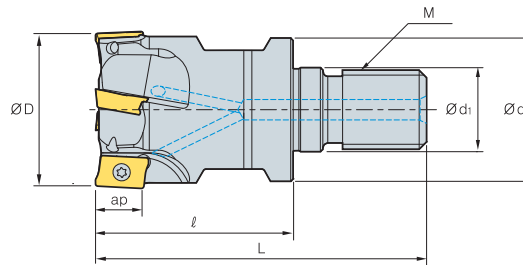
Recommended cutting condition



| | | | |
|-----------|-----------|-----------|-----------|
| vc(m/min) | 80~200 | 80~200 | 80~200 |
| fz(mm/t) | 0.03~0.06 | 0.05~0.25 | 0.05~0.20 |

• Please keep the drill depth under 0.25D when you're drilling
• Please keep the step depth from 0.2 to 0.3mm

AMM1000



AA
90°

- AR : 7.5°~12.5°
- RR : -28°~6°

(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | a_p | |
|----------------|---|-----------------|-----------------|-------------------|--------|----|-----|-------|------|
| AMM 1012HR-M06 | 3 | 12 | 11 | 6.5 | 25 | 40 | M06 | 5.6 | 0.02 |
| 1016HR-M08 | 4 | 16 | 14.5 | 8.5 | 25 | 42 | M08 | 5.6 | 0.03 |
| 1020HR-M10 | 5 | 20 | 18 | 10.5 | 30 | 51 | M10 | 5.6 | 0.07 |
| 1025HR-M12 | 7 | 25 | 23 | 12.5 | 35 | 59 | M12 | 5.6 | 0.12 |
| 1032HR-M16 | 8 | 32 | 29 | 17 | 40 | 67 | M16 | 5.6 | 0.23 |

Available Inserts

APMT-MA



APMT-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 060208PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 060212R-MM | | | ● | ● | ● | | | | | | | | | | | | | |
| 060216R-MM | | | | ● | | | | | | | | | | | | | | |

Available Adoptor

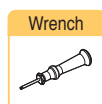
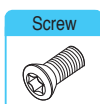
| Designation | Available Adoptor |
|----------------|-------------------|
| AMM 1012HR-M06 | MAT - M06 |
| 1016HR-M08 | MAT - M08 |
| 1020HR-M10 | MAT - M10 |
| 1025HR-M12 | MAT - M12 |
| 1032HR-M16 | MAT - M16 |

Designation : AMM1032HR-M16
Modular Head Threading Measure size(M16)

II

Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

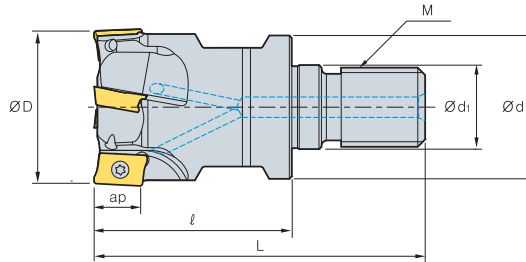
Parts



FTKA01842

TW06S-A

AMM1500



AA 90°
 • AR : 7.5°~12.5°
 • RR : -28°~6°

| Designation | | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | ap | |
|-------------|-------------|---|-----------------|-----------------|-------------------|--------|----|-----|----|------|
| AMM | 15010HR-M06 | 1 | 10 | 9.5 | 6.5 | 25 | 40 | M06 | 9 | 0.01 |
| | 15012HR-M06 | 1 | 12 | 11 | 6.5 | 25 | 40 | M06 | 9 | 0.02 |
| | 15016HR-M08 | 2 | 16 | 14.5 | 8.5 | 25 | 42 | M08 | 9 | 0.03 |
| | 15020HR-M10 | 2 | 20 | 18 | 10.5 | 30 | 51 | M10 | 9 | 0.06 |
| | 15025HR-M12 | 3 | 25 | 23 | 12.5 | 35 | 59 | M12 | 9 | 0.12 |
| | 15032HR-M16 | 4 | 32 | 29 | 17 | 40 | 67 | M16 | 9 | 0.22 |

Available Inserts

| Designation | APMT-MA | | | | APMT-ML | | | | APMT-MM | | | | page | | | | | |
|-----------------|---------|--------|--------|--------|---------|--------|--------|--------|---------|--------|--------|------|------|------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | | CN30 | H01 | G10 | ST30A | ST20 |
| APMT 0903PDR-MA | | | | | | | | | | | | | | | | | | E05 |
| 0903PDR-ML | | | | | | ● | | | | | | | | | | | | |
| 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 090312R-MM | | | | | ● | ● | ● | | | | | | | | | | | |
| 090316R-MM | | | | ● | ● | | | | | | | | | | | | | |
| 090320R-MM | | | | ● | ● | | | | | | | | | | | | | |

Available Adoptor

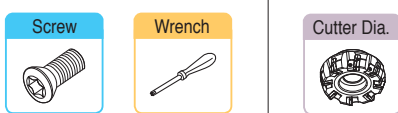
| Designation | Available Adoptor |
|-----------------|-------------------|
| AMM 15010HR-M06 | MAT - M06 |
| 15012HR-M06 | MAT - M06 |
| 15016HR-M08 | MAT - M08 |
| 15020HR-M10 | MAT - M10 |
| 15025HR-M12 | MAT - M12 |
| 15032HR-M16 | MAT - M16 |

Designation : AMM1032HR-M16
 Modular Head Threading Measure size(M16)

||

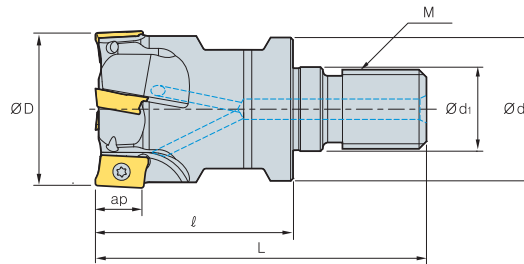
Adaptor Spec. : MAT-M16-035-S32S
 Adaptor Threading Measure(M16)

Parts



| | | |
|--------------------------|-------|---|
| FTKA02555S FTKA02565S | TW08S | $\varnothing 10\sim\varnothing 14$ $\varnothing 16\sim\varnothing 100$ |
|--------------------------|-------|---|

AMM2000



AA 90°
 • AR : 7.5°~12.5°
 • RR : -28°~6°

| Designation | | ⊙ | ØD | Ød | Ødi | ℓ | L | M | ap | Ⓚ kg |
|-------------|------------|---|----|------|------|----|----|-----|----|---------|
| AMM | 2016HR-M08 | 2 | 16 | 14.5 | 8.5 | 25 | 42 | M08 | 11 | 0.04 |
| | 2020HR-M10 | 2 | 20 | 18 | 10.5 | 30 | 51 | M10 | 11 | 0.07 |
| | 2025HR-M12 | 3 | 25 | 23 | 12.5 | 35 | 59 | M12 | 11 | 0.04 |
| | 2032HR-M16 | 4 | 32 | 29 | 17 | 40 | 67 | M16 | 11 | 0.23 |
| | 2040HR-M16 | 5 | 40 | 29 | 17 | 40 | 67 | M16 | 11 | 0.25 |

Available Inserts

| | | APMT-MA | APMT-ML | APMT-MM | APMT-MF | APXT-MA | | | | | | | | | | | | |
|-------------|---------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | | | | | | | | | | | | | | | | | |
| Designation | | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| APMT | 11T3PDFR-MA | | | | | | | | | | | | | | | | | |
| | 11T3PDER-ML | | | | | | | | | | | | | | | | | |
| | 11T3PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T3PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T308PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T312PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 11T316R-MM | ● | | ● | ● | ● | | | | | | | | | | | | |
| | 11T318R-MM | | | | | | | | | | | | | | | | | |
| | 11T324R-MM | | | ● | ● | ● | | ● | | | | | | | | | | |
| APXT | 11T3PDR-MA | | | | | | | | | | | | | ● | | | | |

Available Adaptor

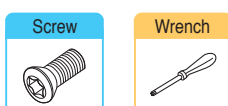
| Designation | Available Adaptor |
|----------------|-------------------|
| AMM 2016HR-M08 | MAT - M08 |
| 2020HR-M10 | MAT - M10 |
| 2025HR-M12 | MAT - M12 |
| 2032HR-M16 | MAT - M16 |
| 2040HR-M16 | |

Designation : AMM1032HR-M16
 Modular Head Threading Measure size(M16)

II

Adaptor Spec. : MAT-M16-035-S32S
 Adaptor Threading Measure(M16)

Parts



FTKA02565S TW08S

Guarantee strong constrain force by 2 side constrain

BT/HSK Tooling System

Code System(Single, Multi edge type)

| | | | | | | |
|-------------------------------|------------------|---|-----------------|---------------------------------------|--------------------------------------|--|
| BT50 HAT 4 063 114 - 4 F | | | | | | |
| Arbor type | Item Name | Series | Diameter | Length(ap) | No. of flute | Front piece or Total length |
| BT30/40/50 HSK40/50/63/100 | AM HAT RM | 1000 Type 1500 Type 2000 Type 3000 Type 4000 Type | 063 : Ø63 | Length : 114 HS : Coolant + Single | No. of flute : 4 No. of tooth : 4 | Front Piece(Y/N) Y : F No code : No L : Long type |


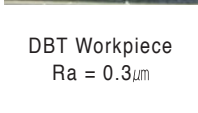
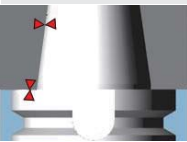

Code System(Modular type)

| | | | |
|-------------------------------|----------------------|---------------------|------------------------|
| BT50 MAT M16 092 | | | |
| Arbor type | Item category | M Dimensions | Total length(L) |
| BT30/40/50 HSK40/50/63/100 | MAT | M16 | 092 : 92 |

DBT system

(D)BT Arbor Feature

- ▶ Guaranteed strong force by 2 side constrain
- ▶ Guarantee strengthen cutting at high speed
- ▶ Guaranteed superior surface roughness

| DBT | Constrain, Increased Surface roughness | | BT |
|---|---|---|--|
| 2 side constrain (Taper, 1side) |  |  | 1 side constrain (Taper) |
|  | DBT Workpiece Ra = 0.3µm | |  |
| | | | BT Workpiece Ra = 0.5µm |

HSK system

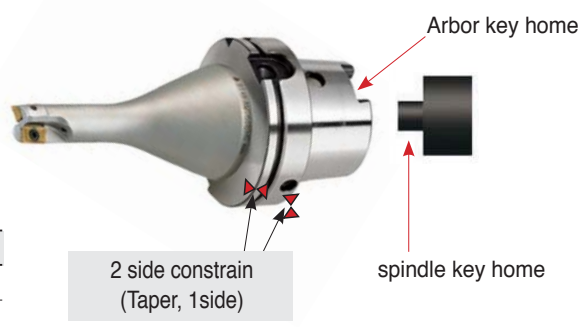
HSK Arbor Feature

- ▶ Guaranteed strong constrain force by 2 side constrain
- ▶ Guaranteed strengthened cutting at high speeds
- ▶ Guaranteed superior surface roughness
- ▶ Guaranteed exactness at axle direction and repeated direction

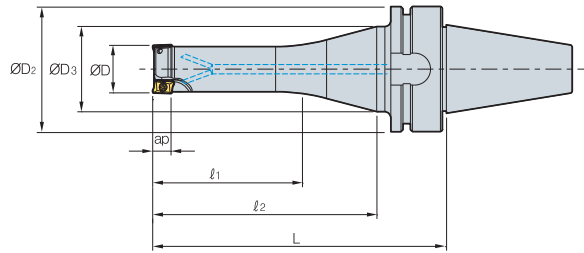
HSK Tolerance comparison

| Arbor type | Max. Tolerance | Min. Tolerance | Available facility |
|------------|----------------|----------------|-----------------------|
| HSK-T | 0.075 | 0.035 | Multi-Tasking Machine |
| HSK-A | 0.33 | 0.08 general | MCT |

HSK A : HSK T key Tolerance comparison



BT30 AM1000HS / BT40 AM1500HS



AA
90°

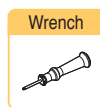
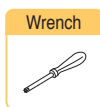
- AR : 7.5°~13°
- RR : -28°~-7°

| Designation | | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | ℓ_1 | ℓ_2 | L | ap |
|-------------|--------------|---|-----------------|-------------------|-------------------|----------|----------|-----|-----|
| BT30 | AM1010HS-2 | 2 | 10 | 46 | 41 | 35 | 83 | 112 | 5.6 |
| | AM1012HS-2 | 2 | 12 | 46 | 41 | 35 | 83 | 112 | 5.6 |
| | AM1012HS-3 | 3 | 12 | 46 | 41 | 35 | 83 | 112 | 5.6 |
| | AM1016HS-3 | 3 | 16 | 46 | 41 | 35 | 83 | 112 | 5.6 |
| | AM1016HS-4 | 4 | 16 | 46 | 41 | 35 | 83 | 112 | 5.6 |
| | AM1020HS-4 | 4 | 20 | 46 | 41 | 45 | 98 | 127 | 5.6 |
| BT40 | AM1020HS-5 | 5 | 20 | 46 | 41 | 45 | 98 | 127 | 5.6 |
| | AM15016HS-2 | 2 | 16 | 63 | 50 | 45 | 83 | 117 | 9 |
| | AM15016HS-2L | 2 | 16 | 63 | 50 | 35 | 118 | 152 | 9 |
| | AM15020HS-2 | 2 | 20 | 63 | 50 | 60 | 98 | 132 | 9 |
| | AM15020HS-3 | 3 | 20 | 63 | 50 | 60 | 98 | 132 | 9 |
| | AM15020HS-2L | 2 | 20 | 63 | 50 | 50 | 118 | 152 | 9 |
| | AM15025HS-3 | 3 | 25 | 63 | 50 | 75 | 113 | 147 | 9 |
| | AM15025HS-4 | 4 | 25 | 63 | 50 | 75 | 113 | 147 | 9 |
| | AM15025HS-3L | 3 | 25 | 63 | 50 | 65 | 133 | 167 | 9 |
| | AM15032HS-4 | 4 | 32 | 63 | 50 | 80 | 113 | 147 | 9 |
| | AM15032HS-5 | 5 | 32 | 63 | 50 | 80 | 113 | 147 | 9 |
| | AM15032HS-4L | 4 | 32 | 63 | 50 | 70 | 133 | 167 | 9 |
| | AM15040HS-5 | 5 | 40 | 63 | 50 | 60 | 98 | 132 | 9 |
| | AM15040HS-6 | 6 | 40 | 63 | 50 | 60 | 98 | 132 | 9 |
| | AM15040HS-5L | 5 | 40 | 63 | 50 | 50 | 118 | 152 | 9 |

Available Inserts

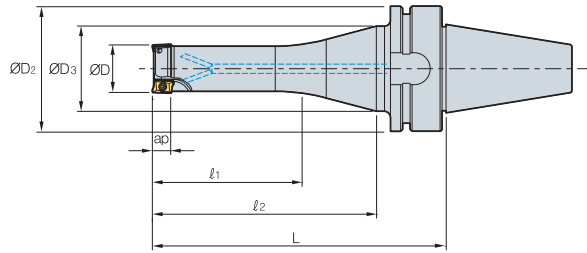
| | | APMT-MA | | | APMT-ML | | | | | APMT-MM | | | | | | | | |
|-----------|------------------|---------|--------|--------|---------|--------|--------|--------|--------|---------|--------|--------|------|----------|-----|------|-----|-------|
| | | | | | | | | | | | | | | | | | | |
| Type | Designation | Coated | | | | | | | | | | Cermet | | Uncoated | | page | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| 1000 type | APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | |
| | 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 060208PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 060212R-MM | | | ● | ● | ● | | | | | | | | | | | | |
| 1500 type | 060216R-MM | | | | ● | | | | | | | | | | | | | |
| | APMT 0903PDFR-MA | | | | | | | | | | | | | | | | | |
| | 0903PDER-ML | | | | | | ● | | | | | | | | | | | |
| | 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 090312R-MM | | | | | | ● | ● | | | | | | | | | | |
| | 090316R-MM | | | | ● | ● | | | | | | | | | | | | |
| | 090320R-MM | | | | ● | ● | | | | | | | | | | | | |

Parts



| | | | | |
|-----------|------------|-------|---------|-------------------------------------|
| 1000 type | FTKA01842 | - | TW06S-A | $\varnothing 10\sim\varnothing 63$ |
| 1500 type | FTKA02565S | TW08S | - | $\varnothing 16\sim\varnothing 100$ |

BT40 AM2000HS



AA
90°
• AR : 7°~10°
• RR : -20°~-7°

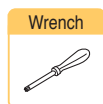
(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | ℓ_1 | ℓ_2 | L | ap |
|-----------------|---|-----------------|-------------------|-------------------|----------|----------|-----|----|
| BT40 AM2016HS-2 | 2 | 16 | 63 | 50 | 45 | 83 | 117 | 11 |
| AM2016HS-2L | 2 | 16 | 63 | 50 | 35 | 118 | 152 | 11 |
| AM2020HS-2 | 2 | 20 | 63 | 50 | 60 | 98 | 132 | 11 |
| AM2020HS-2L | 2 | 20 | 63 | 50 | 50 | 118 | 152 | 11 |
| AM2025HS-3 | 3 | 25 | 63 | 50 | 75 | 113 | 147 | 11 |
| AM2025HS-3L | 3 | 25 | 63 | 50 | 65 | 113 | 147 | 11 |
| AM2032HS-4 | 4 | 32 | 63 | 50 | 80 | 113 | 147 | 11 |
| AM2032HS-4L | 4 | 32 | 63 | 50 | 70 | 133 | 167 | 11 |
| AM2040HS-5 | 5 | 40 | 63 | 50 | 60 | 98 | 132 | 11 |
| AM2040HS-5L | 5 | 40 | 63 | 50 | 50 | 118 | 152 | 11 |
| AM2050HS-6 | 6 | 50 | 63 | 50 | 60 | 98 | 132 | 11 |
| AM2050HS-6L | 6 | 50 | 63 | 50 | 50 | 118 | 152 | 11 |

Available Inserts

| Designation | APMT-MA | | APMT-ML | | | | APMT-MM | | | | APMT-MF | | | | page | | | |
|------------------|---------|--------|---------|--------|--------|--------|---------|--------|--------|--------|---------|------|------|-----|------|-----|-------|------|
| | NCM625 | NCM635 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A | ST20 |
| APMT 11T3PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 11T3PDER-ML | | | | | | ● | | | | | | | | | | | | |
| 11T3PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T3PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T308PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T312PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T316R-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T318R-MM | | | | | | | | | | | | | | | | | | |
| 11T324R-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |

Parts

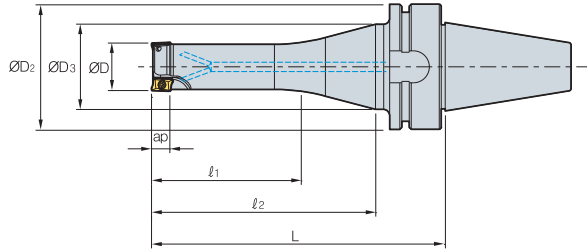


FTKA02565S

TW08S



BT50 AM3000HS / AM4000HS



(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | ℓ_1 | ℓ_2 | L | ap | |
|-------------|-------------|-----------------|-------------------|-------------------|----------|----------|-----|-----|----|
| BT50 | AM3025HS-2 | 2 | 25 | 100 | 80 | 65 | 113 | 158 | 16 |
| | AM3025HS-2L | 2 | 25 | 100 | 80 | 55 | 123 | 168 | 16 |
| | AM3032HS-3 | 3 | 32 | 100 | 80 | 70 | 113 | 158 | 16 |
| | AM3032HS-3L | 3 | 32 | 100 | 80 | 60 | 123 | 168 | 16 |
| | AM3040HS-4 | 4 | 40 | 100 | 80 | 50 | 98 | 143 | 16 |
| | AM3040HS-4L | 4 | 40 | 100 | 80 | 40 | 108 | 153 | 16 |
| | AM3050HS-5 | 5 | 50 | 100 | 80 | 50 | 98 | 143 | 16 |
| AM3050HS-5L | 5 | 50 | 100 | 80 | 40 | 108 | 153 | 16 | |
| BT50 | AM4020HS-1 | 1 | 20 | 100 | 80 | 50 | 98 | 143 | 17 |
| | AM4025HS-2 | 2 | 25 | 100 | 80 | 65 | 113 | 158 | 17 |
| | AM4032HS-3 | 3 | 32 | 100 | 80 | 70 | 113 | 158 | 17 |
| | AM4032HS-3L | 3 | 32 | 100 | 80 | 60 | 123 | 168 | 17 |
| | AM4040HS-4 | 4 | 40 | 100 | 80 | 50 | 98 | 143 | 17 |
| | AM4040HS-4L | 4 | 40 | 100 | 80 | 40 | 108 | 153 | 17 |
| | AM4050HS-5 | 5 | 50 | 100 | 80 | 50 | 98 | 143 | 17 |
| AM4050HS-5L | 5 | 50 | 100 | 80 | 40 | 108 | 153 | 17 | |

Available Inserts

APMT-MA

APMT-ML

APMT-MM

APMT-MF



| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-----------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 3000 type | APMT 1604PDR-MA | | | | | | | | | | | | | | | | | |
| | 1604PDR-ML | | | | | | | | | | | | | | | | | |
| | 1604PDR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 1604PDR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 160410PDR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 160416PDR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 160424R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 4000 type | APMT 1806PDR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 1806PDR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 180612PDR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 180616PDR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 180620PDR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 180624PDR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 180630R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |

Parts

Screw



Wrench

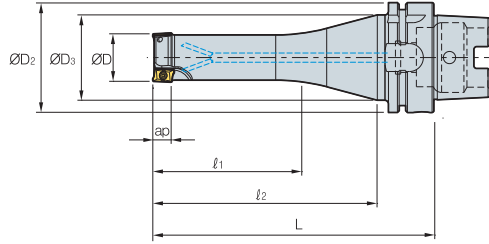


Cutter Dia.



| | | | |
|-----------|----------------------|-------|---|
| 3000 type | FTKA0408 FTKA0410 | TW15S | $\varnothing 25$ $\varnothing 32 \sim \varnothing 100$ |
| 4000 type | FTKA0408 FTKA0410 | TW15S | $\varnothing 20 \sim \varnothing 25$ $\varnothing 32 \sim \varnothing 200$ |

HSK63A AM1000HS/1500HS



AA
90°
• AR : 7.5°~13°
• RR : -28°~-7°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | ℓ_1 | ℓ_2 | L | ap |
|--------------------|---|-----------------|-------------------|-------------------|----------|----------|-----|-----|
| HSK63A AM1010HS-2 | 2 | 10 | 63 | 53 | 35 | 83 | 116 | 5.6 |
| | 2 | 12 | 63 | 53 | 35 | 83 | 116 | 5.6 |
| | 3 | 12 | 63 | 53 | 35 | 83 | 116 | 5.6 |
| | 3 | 16 | 63 | 53 | 35 | 83 | 116 | 5.6 |
| | 4 | 16 | 63 | 53 | 35 | 83 | 116 | 5.6 |
| | 4 | 20 | 63 | 53 | 45 | 98 | 131 | 5.6 |
| HSK63A AM1020HS-4 | 4 | 20 | 63 | 53 | 45 | 98 | 131 | 5.6 |
| | 5 | 20 | 63 | 53 | 45 | 98 | 131 | 5.6 |
| HSK63A AM15016HS-2 | 2 | 16 | 63 | 53 | 45 | 83 | 116 | 9 |
| | 2 | 16 | 63 | 53 | 35 | 118 | 151 | 9 |
| | 2 | 20 | 63 | 53 | 60 | 98 | 131 | 9 |
| | 3 | 20 | 63 | 53 | 60 | 98 | 131 | 9 |
| | 2 | 20 | 63 | 53 | 50 | 118 | 151 | 9 |
| | 3 | 25 | 63 | 53 | 75 | 113 | 146 | 9 |
| | 4 | 25 | 63 | 53 | 75 | 113 | 146 | 9 |
| | 3 | 25 | 63 | 53 | 65 | 133 | 166 | 9 |
| | 4 | 32 | 63 | 53 | 80 | 113 | 146 | 9 |
| | 5 | 32 | 63 | 53 | 80 | 113 | 146 | 9 |
| | 4 | 32 | 63 | 53 | 70 | 133 | 166 | 9 |
| | 5 | 40 | 63 | 53 | 60 | 98 | 131 | 9 |
| | 6 | 40 | 63 | 53 | 60 | 98 | 131 | 9 |
| | 5 | 40 | 63 | 53 | 50 | 118 | 151 | 9 |

Available Inserts

APMT-MA

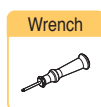
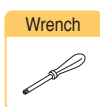
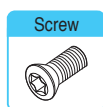
APMT-ML

APMT-MM



| Type | Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-----------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| 1000 type | APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | |
| | 060202PDSR-MM | | | • | • | • | • | • | | | | | | | | | | |
| | 0602PDSR-MM | | | • | • | • | • | • | • | | | | | | | | | |
| | 060208PDSR-MM | | | • | • | • | • | • | | | | | | | | | | |
| | 060212R-MM | | | • | • | • | | | | | | | | | | | | |
| | 060216R-MM | | | | • | | | | | | | | | | | | | |
| 1500 type | APMT 0903PDFR-MA | | | | | | | | | | | | | | | | | |
| | 0903PDER-ML | | | | | | • | | | | | | | | | | | |
| | 0903PDSR-MM | | | • | • | • | • | • | | | | | | | | | | |
| | 090308PDSR-MM | | | • | • | • | • | • | | | | | | | | | | |
| | 090312R-MM | | | | • | • | • | | | | | | | | | | | |
| | 090316R-MM | | | | • | • | • | | | | | | | | | | | |
| | 090320R-MM | | | | • | • | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

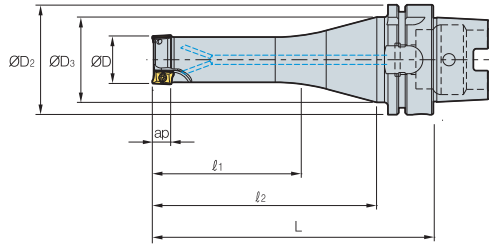
Parts



| | | | | |
|-----------|------------|-------|---------|---------------------------------------|
| 1000 type | FTKA01842 | - | TW06S-A | $\varnothing 10 \sim \varnothing 63$ |
| 1500 type | FTKA02565S | TW08S | - | $\varnothing 16 \sim \varnothing 100$ |



HSK63A AM2000HS



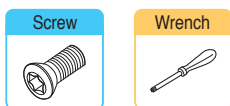
(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | ℓ_1 | ℓ_2 | L | ap |
|-------------------|---|-----------------|-------------------|-------------------|----------|----------|-----|----|
| HSK63A AM2016HS-2 | 2 | 16 | 63 | 53 | 45 | 83 | 116 | 11 |
| AM2016HS-2L | 2 | 16 | 63 | 53 | 35 | 118 | 151 | 11 |
| AM2020HS-2 | 2 | 20 | 63 | 53 | 60 | 98 | 131 | 11 |
| AM2020HS-2L | 2 | 20 | 63 | 53 | 50 | 118 | 151 | 11 |
| AM2025HS-3 | 3 | 25 | 63 | 53 | 75 | 113 | 146 | 11 |
| AM2025HS-3L | 3 | 25 | 63 | 53 | 65 | 113 | 146 | 11 |
| AM2032HS-4 | 4 | 32 | 63 | 53 | 80 | 113 | 146 | 11 |
| AM2032HS-4L | 4 | 32 | 63 | 53 | 70 | 133 | 166 | 11 |
| AM2040HS-5 | 5 | 40 | 63 | 53 | 60 | 98 | 131 | 11 |
| AM2040HS-5L | 5 | 40 | 63 | 53 | 50 | 118 | 151 | 11 |
| AM2050HS-6 | 6 | 50 | 63 | 53 | 60 | 98 | 131 | 11 |
| AM2050HS-6L | 6 | 50 | 63 | 53 | 50 | 118 | 151 | 11 |

Available Inserts

| | APMT-MA | | APMT-ML | | APMT-MM | | APMT-MF | | | | | | | | | | | |
|------------------|---------|--------|---------|--------|---------|--------|---------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A | ST20 |
| APMT 11T3PDFR-MA | | | | | | | | | | | | | | | | | | |
| 11T3PDER-ML | | | | | | • | | | | | | | | | | | | |
| 11T3PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| 11T3PDSR-MF | • | | • | • | • | • | • | • | | | | | | | | | | |
| 11T308PDSR-MM | • | | • | • | • | • | • | • | | | | | | | | | | |
| 11T312PDSR-MM | • | | • | • | • | • | • | • | | | | | | | | | | |
| 11T316R-MM | • | | • | • | • | | | | | | | | | | | | | |
| 11T318R-MM | | | • | • | • | | | | | | | | | | | | | |
| 11T324R-MM | | | • | • | • | | • | | | | | | | | | | | |

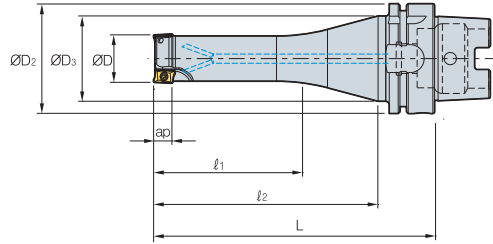
Parts



FTKA02565S

TW08S

HSK63A AM3000HS / 4000HS



• AR : 7°~10°
• RR : -20°~7°

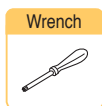
(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | ℓ_1 | ℓ_2 | L | ap |
|-------------------|---|-----------------|-------------------|-------------------|----------|----------|-----|----|
| HSK63A AM3025HS-2 | 2 | 25 | 63 | 53 | 65 | 113 | 146 | 16 |
| AM3025HS-2L | 2 | 25 | 63 | 53 | 55 | 123 | 156 | 16 |
| AM3032HS-3 | 3 | 32 | 63 | 53 | 70 | 113 | 146 | 16 |
| AM3032HS-3L | 3 | 32 | 63 | 53 | 60 | 123 | 156 | 16 |
| AM3040HS-4 | 4 | 40 | 63 | 53 | 50 | 98 | 131 | 16 |
| AM3040HS-4L | 4 | 40 | 63 | 53 | 40 | 108 | 141 | 16 |
| AM3050HS-5 | 5 | 50 | 63 | 53 | 50 | 98 | 131 | 16 |
| AM3050HS-5L | 5 | 50 | 63 | 53 | 40 | 108 | 141 | 16 |
| HSK63A AM4020HS-1 | 1 | 20 | 63 | 53 | 50 | 98 | 131 | 17 |
| AM4025HS-2 | 2 | 25 | 63 | 53 | 65 | 113 | 146 | 17 |
| AM4032HS-3 | 3 | 32 | 63 | 53 | 70 | 113 | 146 | 17 |
| AM4032HS-3L | 3 | 32 | 63 | 53 | 60 | 123 | 156 | 17 |
| AM4040HS-4 | 4 | 40 | 63 | 53 | 50 | 98 | 131 | 17 |
| AM4040HS-4L | 4 | 40 | 63 | 53 | 40 | 108 | 141 | 17 |
| AM4050HS-5 | 5 | 50 | 63 | 53 | 50 | 98 | 131 | 17 |
| AM4050HS-5L | 5 | 50 | 63 | 53 | 40 | 108 | 141 | 17 |

Available Inserts

| Type | Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-----------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC3300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| 3000 type | APMT 1604PDFR-MA | | | | | | | | | | | | | | | | | | |
| | 1604PDER-ML | | | | | | | | | | | | | | | | | | |
| | 1604PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 1604PDSR-MF | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 160410PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 160416PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 160424R-MM | | | • | • | • | • | • | • | • | | | | | | | | | |
| 4000 type | 160430R-MM | | | • | • | • | • | • | • | | | | | | | | | | |
| | 160432R-MM | • | | • | • | • | • | • | • | | | | | | | | | | |
| | APMT 1806PDFR-MA | | | | | | | | | | | | | | | | | | |
| | 1806PDER-ML | | | | | | | | | | | | | | | | | | |
| | 1806PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 1806PDSR-MF | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 1806PDSR-ML | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 180612PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | | |
| | 180616PDSR-MM | | | • | • | • | • | • | • | • | | | | | | | | | |
| | 180620PDSR-MM | | | • | • | • | • | • | • | • | | | | | | | | | |
| | 180624PDSR-MM | | | • | • | • | • | • | • | • | | | | | | | | | |
| | 180630R-MM | | | • | • | • | • | • | • | • | | | | | | | | | |
| | 180632R-MM | | | • | • | • | • | • | • | • | | | | | | | | | |

Parts



| | | | |
|-----------|----------------------|-------|---|
| 3000 type | FTKA0408 FTKA0410 | TW15S | $\varnothing 25$ $\varnothing 32\sim\varnothing 100$ |
| 4000 type | FTKA0408 FTKA0410 | TW15S | $\varnothing 20\sim\varnothing 25$ $\varnothing 32\sim\varnothing 200$ |

Available Inserts E05

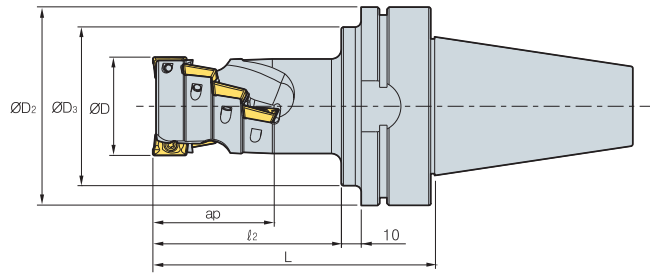
• : Stock item



Milling

E

BT30/40 AM1000/1500



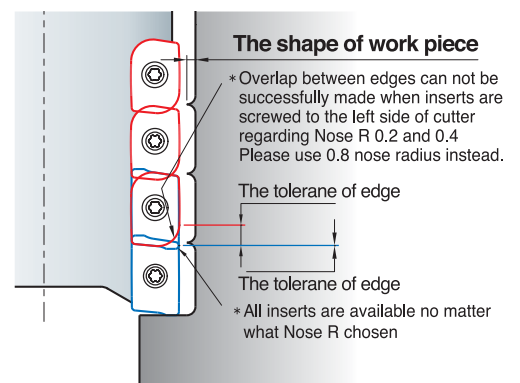
• AR : -12.5°~13°
• RR : -17°~6°

| Designation | | ⊙ | ØD | ØD ₂ | ØD ₃ | l ₂ | L | No. of flute | ap |
|-------------|--------------|----|----|-----------------|-----------------|----------------|----|--------------|------|
| BT30 | AM1016015-2 | 6 | 16 | 46 | 41 | 30 | 62 | 2 | 15.5 |
| | AM1020020-3 | 12 | 20 | 46 | 41 | 32 | 64 | 3 | 20.5 |
| | AM1025025-4 | 20 | 25 | 46 | 41 | 39 | 71 | 4 | 25.5 |
| BT40 | AM1016015-2 | 6 | 16 | 63 | 50 | 30 | 67 | 2 | 15.5 |
| | AM1020020-3 | 12 | 20 | 63 | 50 | 32 | 69 | 3 | 20.5 |
| | AM1025025-4 | 20 | 25 | 63 | 50 | 39 | 76 | 4 | 25.5 |
| BT30 | AM15020026-1 | 3 | 20 | 46 | 41 | 42 | 74 | 1 | 26.5 |
| | AM15025035-2 | 8 | 25 | 46 | 41 | 50 | 62 | 2 | 35 |
| | AM15032044-2 | 10 | 32 | 46 | 41 | 60 | 92 | 2 | 44 |
| BT40 | AM15020026-1 | 3 | 20 | 63 | 50 | 42 | 79 | 1 | 26.5 |
| | AM15025035-2 | 8 | 25 | 63 | 50 | 50 | 87 | 2 | 35 |
| | AM15032044-2 | 10 | 32 | 63 | 50 | 60 | 97 | 2 | 44 |

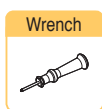
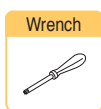
Available Inserts

| Type | Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-----------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| 1000 type | APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | |
| | 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 060208PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 060212R-MM | | | ● | ● | ● | | | | | | | | | | | | |
| | 060216R-MM | | | | ● | | | | | | | | | | | | | |
| 1500 type | APMT 0903PDER-MA | | | | | | | | | | | | | | | | | |
| | 0903PDER-ML | | | | | | | ● | | | | | | | | | | |
| | 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 090312R-MM | | | | ● | ● | ● | ● | | | | | | | | | | |
| | 090316R-MM | | | | ● | ● | | | | | | | | | | | | |
| | 090320R-MM | | | | ● | ● | | | | | | | | | | | | |

Caution when insert are screwed



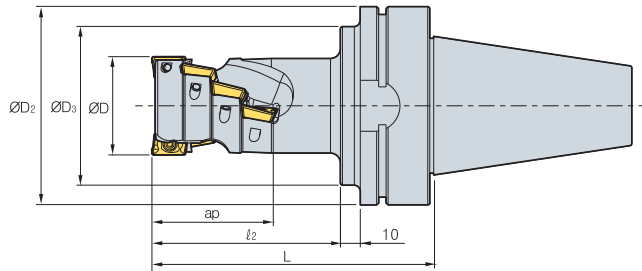
Parts



| Type | Screw | Wrench | Wrench | Cutter Dia. |
|-----------|------------|--------|---------|-------------|
| 1000 type | FTKA01842 | - | TW06S-A | Ø10~Ø63 |
| 1500 type | FTKA02565S | TW08S | - | Ø16~Ø100 |



BT30/40 AM2000



• AR : -9°
• RR : -13°~8°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | l_2 | L | No. of flute | ap | |
|-------------|-------------|-----------------|-------------------|-------------------|-------|----|--------------|----|------|
| BT30 | AM2020029-1 | 3 | 20 | 46 | 41 | 45 | 77 | 1 | 29.4 |
| | AM2025038-2 | 8 | 25 | 46 | 45 | 55 | 87 | 2 | 38.9 |
| | AM2032048-2 | 10 | 32 | 46 | 45 | 65 | 97 | 2 | 48.5 |
| | AM2040058-2 | 14 | 40 | 46 | 45 | 75 | 107 | 2 | 58 |
| | AM2050039-4 | 16 | 50 | 46 | 45 | 58 | 90 | 4 | 39 |
| | AM2063039-4 | 16 | 63 | 46 | 45 | 58 | 90 | 4 | 39 |
| | AM2080039-5 | 20 | 80 | 46 | 45 | 63 | 95 | 5 | 39 |
| | AM2100039-6 | 24 | 100 | 46 | 45 | 63 | 95 | 6 | 39 |
| BT40 | AM2020029-1 | 3 | 20 | 63 | 50 | 45 | 82 | 1 | 29.4 |
| | AM2025038-2 | 8 | 25 | 63 | 50 | 55 | 92 | 2 | 38.9 |
| | AM2032048-2 | 10 | 32 | 63 | 50 | 65 | 102 | 2 | 48.5 |
| | AM2040058-2 | 14 | 40 | 63 | 50 | 75 | 112 | 2 | 58 |
| | AM2050039-4 | 16 | 50 | 63 | 50 | 58 | 95 | 4 | 39 |
| | AM2063039-4 | 16 | 63 | 63 | 50 | 58 | 95 | 4 | 39 |
| | AM2080039-5 | 20 | 80 | 63 | 50 | 63 | 100 | 5 | 39 |
| | AM2100039-6 | 24 | 100 | 63 | 50 | 63 | 100 | 6 | 39 |

Available Inserts

APMT-MA



APMT-ML



APMT-MM



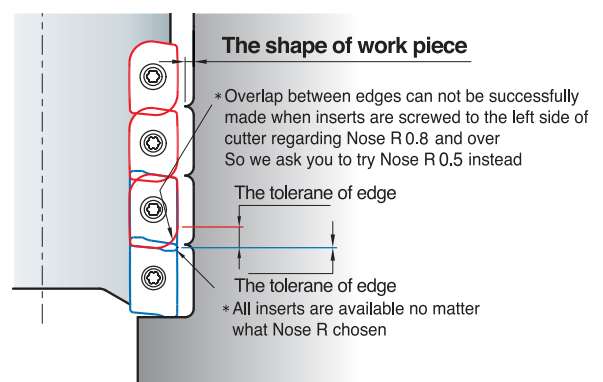
APMT-MF



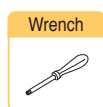
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| APMT 11T3PDFR-MA | | | | | | | | | | | | | | | | | |
| 11T3PDER-ML | | | | | | | | | | | | | | | | | |
| 11T3PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T3PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T308PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T312PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T316R-MM | ● | | ● | ● | ● | | | | | | | | | | | | |
| 11T318R-MM | | | | | | | | | | | | | | | | | |
| 11T324R-MM | | | ● | ● | ● | | ● | | | | | | | | | | |

E05

Caution when insert are screwed



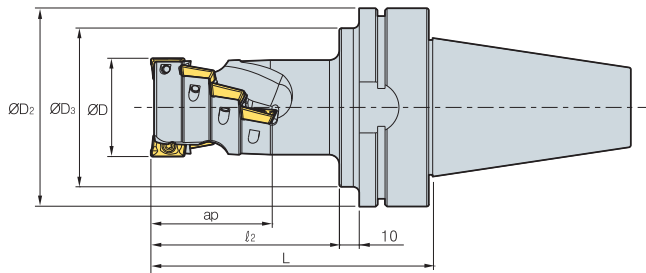
Parts



FTKA02565S

TW08S

BT50 AM3000/4000



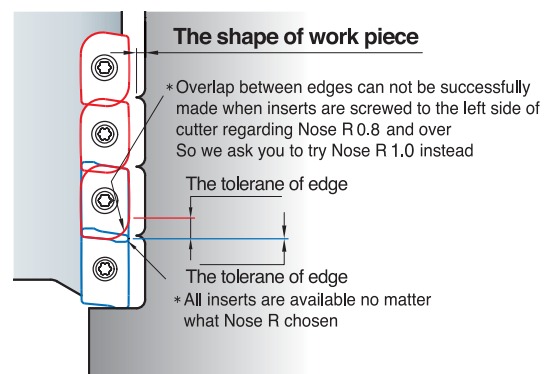
• AR : 13°~15°
• RR : -11°~4°

| Designation | | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | l_2 | L | No. of flute | ap |
|-------------|-------------|----|-----------------|-------------------|-------------------|-------|-----|--------------|----|
| BT50 | AM3050043-2 | 6 | 50 | 100 | 80 | 72 | 120 | 2 | 43 |
| | AM3063057-4 | 16 | 63 | 100 | 80 | 86 | 134 | 4 | 57 |
| | AM3080071-4 | 20 | 80 | 100 | 80 | 100 | 148 | 4 | 71 |
| | AM3100071-6 | 30 | 100 | 100 | 80 | 100 | 148 | 6 | 71 |
| BT50 | AM4040046-2 | 6 | 40 | 100 | 80 | 75 | 123 | 2 | 46 |
| | AM4050061-2 | 8 | 50 | 100 | 80 | 95 | 143 | 2 | 61 |
| | AM4063061-4 | 16 | 63 | 100 | 80 | 90 | 138 | 4 | 61 |
| | AM4080076-4 | 20 | 80 | 100 | 80 | 105 | 153 | 4 | 76 |
| | AM4100076-6 | 30 | 100 | 100 | 80 | 105 | 153 | 6 | 76 |

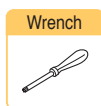
Available Inserts

| | | APMT-MA | APMT-ML | APMT-MM | APMT-MF | | | | | | | | | | | | | |
|-----------|------------------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|
| | | | | | | | | | | | | | | | | | | |
| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A |
| 3000 type | APMT 1604PDFR-MA | | | | | | | | | | | | | | | | | |
| | 1604PDER-ML | | | | | | | | | | | | | | | | | |
| | 1604PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | |
| | 1604PDSR-MF | • | | • | • | • | • | • | • | • | | | | | | | | |
| | 160410PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | |
| | 160416PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | |
| | 160424R-MM | | | • | • | • | • | • | • | • | | | | | | | | |
| 4000 type | APMT 1806PDFR-MA | | | | | | | | | | | | | | | | | |
| | 1806PDER-ML | | | | | | | | | | | | | | | | | |
| | 1806PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | |
| | 1806PDSR-MF | • | | • | • | • | • | • | • | • | | | | | | | | |
| | 180612PDSR-MM | • | | • | • | • | • | • | • | • | | | | | | | | |
| | 180616PDSR-MM | | | • | • | • | • | • | • | • | | | | | | | | |
| | 180620PDSR-MM | | | • | • | • | • | • | • | • | | | | | | | | |
| | 180624PDSR-MM | | | • | • | • | • | • | • | • | | | | | | | | |
| | 180630R-MM | | | • | • | • | • | • | • | • | | | | | | | | |
| | 180632R-MM | | | • | • | • | • | • | • | • | | | | | | | | |

Caution when insert are screwed

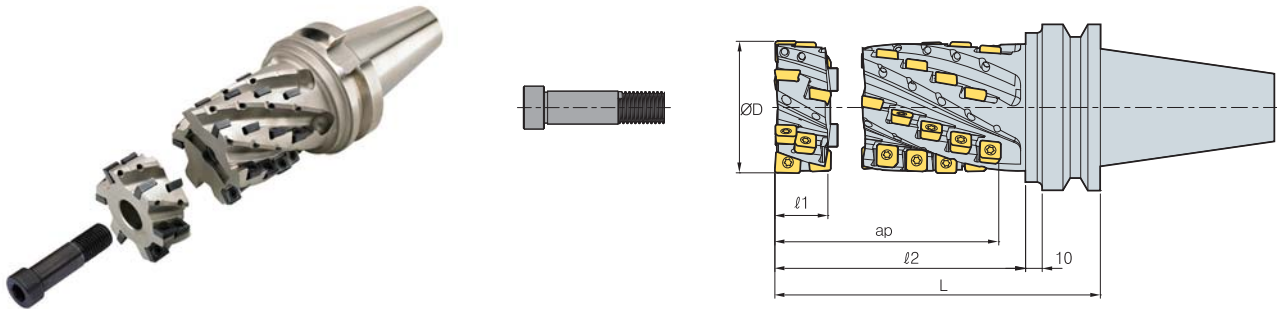


Parts



| | | |
|-----------|----------|-------|
| 3000 type | FTKA0410 | TW15S |
| 4000type | FTKA0410 | TW15S |

BT50 HAT4000



(mm)

| Designation | SPMT | | $\varnothing D$ | l_1 | l_2 | L | No. of flute | ap | Application | |
|---------------|---------------|------|-----------------|-------|-------|-----|--------------|----|-------------|---------------|
| | SPMT | ZPMT | | | | | | | | |
| BT50- (Set) | HAT4050094-2F | 10 | 1 | 50 | 32 | 119 | 160 | 2 | 94 | HAT4050032-2F |
| | HAT4050104-2F | 11 | 1 | 50 | 32 | 129 | 170 | 2 | 104 | |
| | HAT4050114-2F | 12 | 1 | 50 | 32 | 139 | 180 | 2 | 114 | |
| | HAT4063094-4F | 20 | 2 | 63 | 32 | 119 | 160 | 4 | 94 | HAT4063032-4F |
| | HAT4063104-4F | 22 | 2 | 63 | 32 | 129 | 170 | 4 | 104 | |
| | HAT4063114-4F | 24 | 2 | 63 | 32 | 139 | 180 | 4 | 114 | |
| | HAT4080094-4F | 20 | 2 | 80 | 33 | 119 | 160 | 4 | 94 | HAT4080033-4F |
| | HAT4080104-4F | 22 | 2 | 80 | 33 | 129 | 170 | 4 | 104 | |
| | HAT4080114-4F | 24 | 2 | 80 | 33 | 139 | 180 | 4 | 114 | |
| (Front Piece) | HAT4050032-2F | 3 | 1 | 50 | 32 | - | - | 2 | - | - |
| | HAT4063032-4F | 6 | 2 | 63 | 32 | - | - | 4 | - | |
| | HAT4080033-4F | 6 | 2 | 80 | 33 | - | - | 4 | - | |

Available Inserts

SPMT-MM

ZPMT-MM

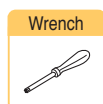


| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9330 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| SPMT 120508-MMN | | | | | | | | | | | | | | | | | | E21 |
| ZPMT 1505PPSR-MMN | | | | | | | | | | | | | | | | | | E24 |

Set specification

| Set Designation | Designation | Front Piece | Clamping Bolt |
|-----------------|---------------|---------------|---------------|
| HAT4050094-2F | HAT4050062-2F | | |
| HAT4050104-2F | HAT4050072-2F | HAT4050032-2F | HSB1255 |
| HAT4050114-2F | HAT4050082-2F | | |
| HAT4063094-4F | HAT4063062-4F | | |
| HAT4063104-4F | HAT4063072-4F | HAT4063032-4F | HSB1670 |
| HAT4063114-4F | HAT4063082-4F | | |
| HAT4080094-4F | HAT4080061-4F | | |
| HAT4080104-4F | HAT4080071-4F | HAT4080033-4F | HSB1682 |
| HAT4080114-4F | HAT4080081-4F | | |

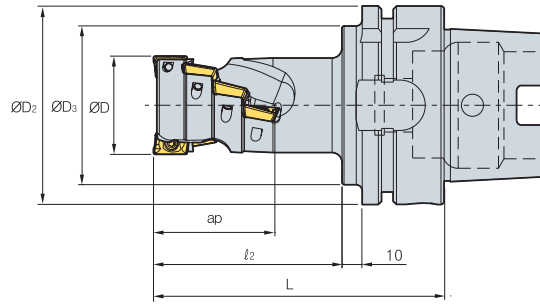
Parts



ETNA0511

TW20

HSK63A AM1000/1500



• AR : -12.5°~13°
• RR : -17°~6°

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | l_2 | L | No. of flute | ap |
|---------------------|----|-----------------|-------------------|-------------------|-------|----|--------------|------|
| HSK63A AM1016015-2 | 6 | 16 | 63 | 53 | 30 | 66 | 2 | 15.5 |
| AM1020020-3 | 12 | 20 | 63 | 53 | 32 | 68 | 3 | 20.5 |
| AM1025025-4 | 20 | 25 | 63 | 53 | 39 | 75 | 4 | 25.5 |
| HSK63A AM15020026-1 | 3 | 20 | 63 | 53 | 42 | 78 | 1 | 26.5 |
| AM15025035-2 | 8 | 25 | 63 | 53 | 50 | 86 | 2 | 35 |
| AM15032044-2 | 10 | 32 | 63 | 53 | 60 | 96 | 2 | 44 |

Available Inserts

APMT-MA

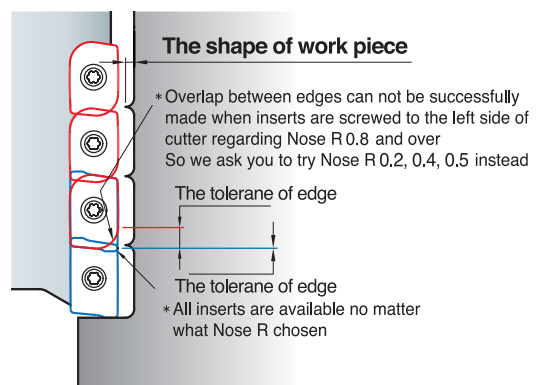
APMT-ML

APMT-MM

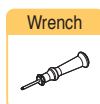
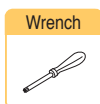


| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-----------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 1000 type | APMT 0602PDFR-MA | | | | | | | | | | | | | | | | | |
| | 060202PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 0602PDSR-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 060208PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 060212R-MM | | | ● | ● | ● | | | | | | | | | | | | |
| | 060216R-MM | | | | ● | | | | | | | | | | | | | |
| 1500 type | APMT 0903PDFR-MA | | | | | | | | | | | | | | | | | |
| | 0903PDER-ML | | | | | | | ● | | | | | | | | | | |
| | 0903PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 090308PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 090312R-MM | | | | | ● | ● | ● | | | | | | | | | | |
| | 090316R-MM | | | | | ● | ● | | | | | | | | | | | |
| | 090320R-MM | | | | ● | ● | | | | | | | | | | | | |

Caution when insert are screwed

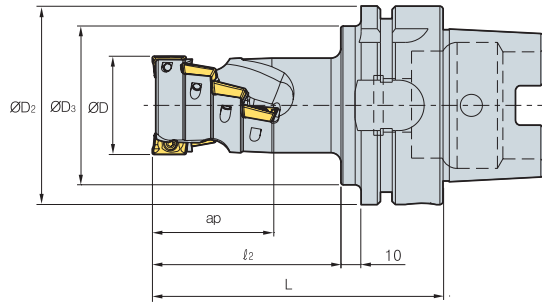


Parts



| | | | |
|-----------|------------|-------|---------|
| 1000 type | FTKA01842 | - | TW06S-A |
| 1500 type | FTKA02565S | TW08S | - |

HSK63A AM2000



• AR : -12.5°~13°
• RR : -17°~6°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | l_2 | L | No. of flute | ap |
|--------------------|----|-----------------|-------------------|-------------------|-------|-----|--------------|------|
| HSK63A AM2020029-1 | 3 | 20 | 63 | 53 | 45 | 81 | 1 | 29.4 |
| AM2025038-2 | 8 | 25 | 63 | 53 | 55 | 91 | 2 | 38.9 |
| AM2032048-2 | 10 | 32 | 63 | 53 | 65 | 101 | 2 | 48.5 |
| AM2040058-2 | 14 | 40 | 63 | 53 | 75 | 111 | 2 | 58 |
| AM2050039-4 | 16 | 50 | 63 | 53 | 58 | 94 | 4 | 39 |
| AM2063039-4 | 16 | 63 | 63 | 53 | 58 | 94 | 4 | 39 |
| AM2080039-5 | 20 | 80 | 63 | 53 | 63 | 99 | 5 | 39 |
| AM2100039-6 | 24 | 100 | 63 | 53 | 63 | 99 | 6 | 39 |

Available Inserts

APMT-MA

APMT-ML

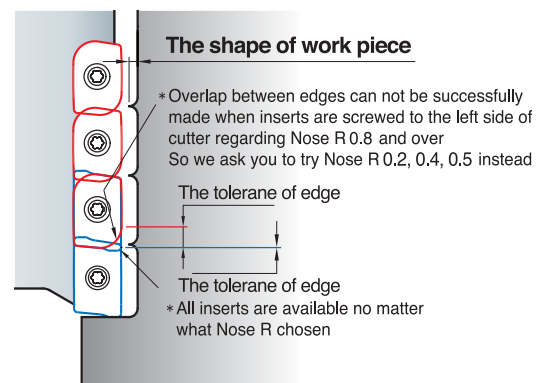
APMT-MM

APMT-MF

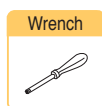
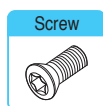


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC8510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| APMT 11T3PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 11T3PDER-ML | | | | | | | | | | | | | | | | | | |
| 11T3PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T3PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T308PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T312PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T316R-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 11T318R-MM | | | | | | | | | | | | | | | | | | |
| 11T324R-MM | | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |

Caution when insert are screwed



Parts

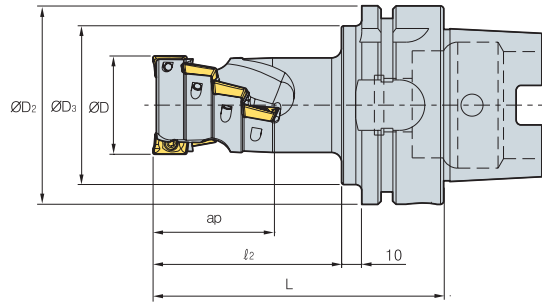


FTKA02565S

TW08S



HSK 100A AM3000



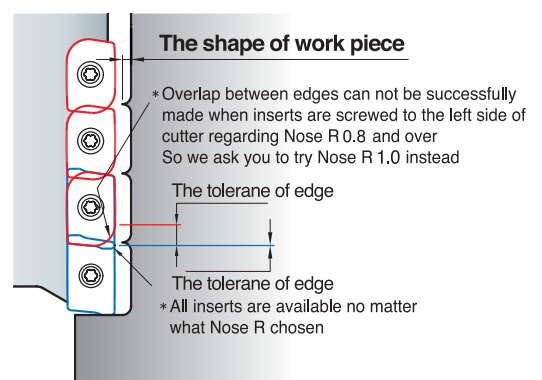
• AR : $-13^{\circ} \sim 15^{\circ}$
• RR : $-11^{\circ} \sim 4^{\circ}$

| Designation | | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | l_2 | L | No. of flute | a_p |
|-------------|-------------|----|-----------------|-------------------|-------------------|-------|-----|--------------|-------|
| HSK100A | AM3050043-2 | 6 | 50 | 100 | 88 | 72 | 111 | 2 | 43 |
| | AM3063057-4 | 16 | 63 | 100 | 88 | 86 | 125 | 4 | 57 |
| | AM3080071-4 | 20 | 80 | 100 | 88 | 100 | 139 | 4 | 71 |
| | AM3100071-6 | 30 | 100 | 100 | 88 | 100 | 139 | 6 | 71 |

Available Inserts

| Designation | APMT-MA | | APMT-ML | | | | APMT-MM | | | APMT-MF | | | | page | | | | |
|------------------|---------|--------|---------|--------|--------|--------|---------|--------|--------|---------|--------|----------|------|------|-----|-------|------|-----|
| | | | | | | | | | | | | | | | | | | |
| | Coated | | | | | | | | Cermet | | | Uncoated | | | | | | |
| | NCM325 | NCM335 | NCS330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| APMT 1604PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 1604PDER-ML | | | | | | | | | | | | | | | | | | |
| 1604PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 1604PDSR-MF | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160410PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160416PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160424R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160430R-MM | | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| 160432R-MM | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | |

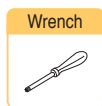
Caution when insert are screwed



Parts

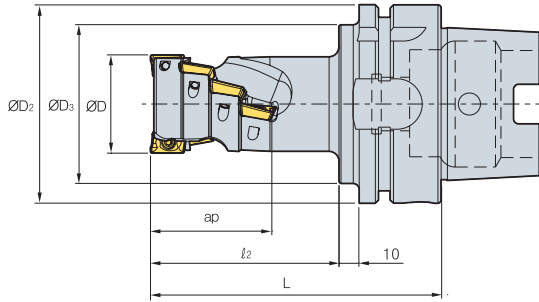


FTKA0410



TW15S

HSK100A AM4000



• AR : -13°~15°
• RR : -11°~4°

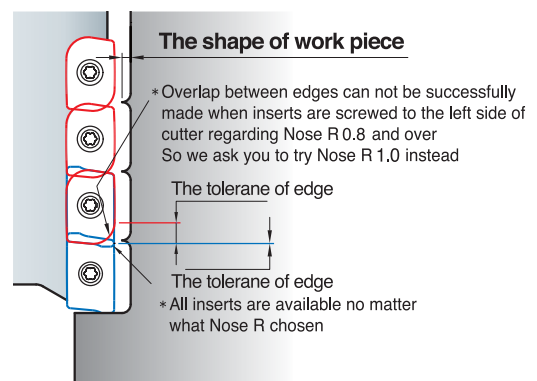
(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing D_3$ | l_2 | L | No. of flute | ap |
|---------------------|----|-----------------|-------------------|-------------------|-------|-----|--------------|----|
| HSK100A AM4040046-2 | 6 | 40 | 100 | 88 | 75 | 114 | 2 | 46 |
| AM4050061-2 | 8 | 50 | 100 | 88 | 95 | 134 | 2 | 61 |
| AM4063061-4 | 16 | 63 | 100 | 88 | 90 | 129 | 4 | 61 |
| AM4080076-4 | 20 | 80 | 100 | 88 | 105 | 144 | 4 | 76 |
| AM4100076-6 | 30 | 100 | 100 | 88 | 105 | 144 | 6 | 76 |

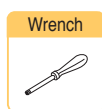
Available Inserts

| Designation | APMT-MA | | APMT-ML | | APMT-MM | | APMT-MF | | page | | | | | | | | | |
|------------------|---------|--------|---------|--------|---------|--------|---------|--------|--------|----------|--------|------|------|-----|-----|-------|------|-----|
| | | | | | Coated | | Cermet | | | Uncoated | | | | | | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC8510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| APMT 1806PDFR-MA | | | | | | | | | | | | | | | | | | E05 |
| 1806PDER-ML | | | | | | ● | | | | | | | | | | | | |
| 1806PDSR-MM | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 1806PDSR-MF | | | ● | | ● | ● | ● | | | | | | | | | | | |
| 180612PDSR-MM | ● | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 180616PDSR-MM | | | ● | | ● | ● | ● | | | | | | | | | | | |
| 180620PDSR-MM | | | ● | | ● | ● | ● | | | | | | | | | | | |
| 180624PDSR-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |
| 180630R-MM | | | ● | | ● | ● | ● | | | | | | | | | | | |
| 180632R-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |

Caution when insert are screwed



Parts

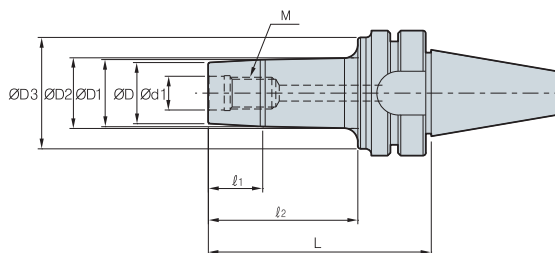


FTKA0410

TW15S



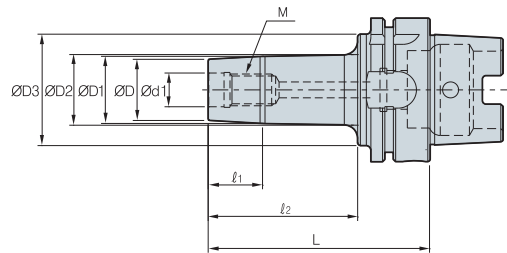
BT30/BT40/BT50



| | | (mm) | | | | | | | | |
|-------------|-------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|----|-----|---------|
| Designation | ØD | ØD ₁ | ØD ₂ | ØD ₃ | Ød ₁ | ℓ ₁ | ℓ ₂ | L | M | |
| BT30 | MAT-M06-053 | 11 | 11.7 | 13 | 30 | 6.5 | 5 | 21 | 53 | 06×1.0 |
| | MAT-M08-057 | 14.5 | 15.7 | 17.5 | 35 | 8.5 | 7 | 25 | 57 | 08×1.25 |
| | MAT-M10-062 | 18 | 19.7 | 24 | 38 | 10.5 | 7 | 30 | 62 | 10×1.5 |
| | MAT-M12-067 | 23 | 24.7 | 27.5 | 41 | 12.5 | 10 | 35 | 67 | 12×1.75 |
| | MAT-M16-067 | 29 | 31.7 | 33.5 | 41 | 17 | 10 | 35 | 67 | 16×2.0 |
| BT40 | MAT-M06-062 | 11 | 11.7 | 14 | 40 | 6.5 | 5 | 25 | 62 | 08×1.0 |
| | MAT-M06-077 | 11 | 11.7 | 14 | 40 | 6.5 | 5 | 40 | 77 | 06×1.0 |
| | MAT-M06-092 | 11 | 11.7 | 14 | 40 | 6.5 | 5 | 55 | 92 | 06×1.0 |
| | MAT-M08-067 | 14.5 | 15.7 | 19 | 44 | 8.5 | 7 | 30 | 67 | 08×1.25 |
| | MAT-M08-082 | 14.5 | 15.7 | 19 | 44 | 8.5 | 7 | 45 | 82 | 08×1.25 |
| | MAT-M08-097 | 14.5 | 15.7 | 19 | 44 | 8.5 | 7 | 60 | 97 | 08×1.25 |
| | MAT-M10-072 | 18 | 19.7 | 23 | 50 | 10.5 | 10 | 35 | 72 | 10×1.5 |
| | MAT-M10-087 | 18 | 19.7 | 23 | 50 | 10.5 | 10 | 50 | 87 | 10×1.5 |
| | MAT-M10-102 | 18 | 19.7 | 23 | 50 | 10.5 | 10 | 65 | 102 | 10×1.5 |
| | MAT-M12-077 | 23 | 24.7 | 30 | 55 | 12.5 | 10 | 40 | 77 | 12×1.75 |
| | MAT-M12-092 | 23 | 24.7 | 30 | 55 | 12.5 | 13 | 55 | 92 | 12×1.75 |
| | MAT-M12-107 | 23 | 24.7 | 30 | 55 | 12.5 | 13 | 70 | 107 | 12×1.75 |
| | MAT-M16-077 | 29 | 31.7 | 37 | 55 | 17 | 13 | 40 | 77 | 16×2.0 |
| | MAT-M16-092 | 29 | 31.7 | 37 | 55 | 17 | 13 | 55 | 92 | 16×2.0 |
| | MAT-M16-107 | 29 | 31.7 | 37 | 55 | 17 | 13 | 70 | 107 | 16×2.0 |
| BT50 | MAT-M06-083 | 11 | 11.7 | 15 | 40 | 6.5 | 5 | 35 | 83 | 06×1.0 |
| | MAT-M06-098 | 11 | 11.7 | 15 | 40 | 6.5 | 5 | 50 | 98 | 06×1.0 |
| | MAT-M06-113 | 11 | 11.7 | 15 | 40 | 6.5 | 5 | 65 | 113 | 06×1.0 |
| | MAT-M08-088 | 14.5 | 15.7 | 20 | 45 | 8.5 | 7 | 40 | 88 | 08×1.25 |
| | MAT-M08-103 | 14.5 | 15.7 | 20 | 45 | 8.5 | 7 | 55 | 103 | 08×1.25 |
| | MAT-M08-118 | 14.5 | 15.7 | 20 | 45 | 8.5 | 7 | 70 | 118 | 08×1.25 |
| | MAT-M10-093 | 18 | 19.7 | 25 | 55 | 10.5 | 10 | 45 | 93 | 10×1.5 |
| | MAT-M10-113 | 18 | 19.7 | 25 | 55 | 10.5 | 10 | 65 | 113 | 10×1.5 |
| | MAT-M10-128 | 18 | 19.7 | 25 | 55 | 10.5 | 10 | 80 | 128 | 10×1.5 |
| | MAT-M12-103 | 23 | 24.7 | 33 | 65 | 12.5 | 10 | 55 | 103 | 12×1.75 |
| | MAT-M12-118 | 23 | 24.7 | 33 | 65 | 12.5 | 13 | 70 | 118 | 12×1.75 |
| | MAT-M12-133 | 23 | 24.7 | 33 | 65 | 12.5 | 13 | 85 | 133 | 12×1.75 |
| | MAT-M16-103 | 29 | 31.7 | 41 | 85 | 17 | 13 | 55 | 103 | 16×2.0 |
| | MAT-M16-118 | 29 | 31.7 | 41 | 85 | 17 | 13 | 70 | 118 | 16×2.0 |
| | MAT-M16-133 | 29 | 31.7 | 41 | 85 | 17 | 13 | 85 | 133 | 16×2.0 |



HSK63A/HSK100A



| Designation | | ØD | ØD ₁ | ØD ₂ | ØD ₃ | Ød ₁ | l ₁ | l ₂ | L | M |
|-------------|-------------|-------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|---------|---------|
| HSK63A | MAT-M06-061 | 11 | 11.7 | 27 | 40 | 6.5 | 5 | 25 | 61 | 06*1.0 |
| | MAT-M06-076 | 11 | 11.7 | 27 | 40 | 6.5 | 5 | 40 | 76 | 06*1.0 |
| | MAT-M06-091 | 11 | 11.7 | 27 | 40 | 6.5 | 5 | 55 | 91 | 06*1.0 |
| | MAT-M08-066 | 14.5 | 15.7 | 30.5 | 44 | 8.5 | 7 | 30 | 66 | 08*1.25 |
| | MAT-M08-081 | 14.5 | 15.7 | 30.5 | 44 | 8.5 | 7 | 45 | 81 | 08*1.25 |
| | MAT-M08-096 | 14.5 | 15.7 | 30.5 | 44 | 8.5 | 7 | 60 | 96 | 08*1.25 |
| | MAT-M10-071 | 18 | 19.7 | 34 | 50 | 10.5 | 10 | 35 | 71 | 10*1.5 |
| | MAT-M10-086 | 18 | 19.7 | 34 | 50 | 10.5 | 10 | 50 | 86 | 10*1.5 |
| | MAT-M10-101 | 18 | 19.7 | 34 | 50 | 10.5 | 10 | 65 | 101 | 10*1.5 |
| | MAT-M12-076 | 23 | 24.7 | 36.5 | 55 | 12.5 | 10 | 40 | 76 | 12*1.75 |
| | MAT-M12-091 | 23 | 24.7 | 36.5 | 55 | 12.5 | 13 | 55 | 91 | 12*1.75 |
| | MAT-M12-106 | 23 | 24.7 | 36.5 | 55 | 12.5 | 13 | 70 | 106 | 12*1.75 |
| | HSK100A | MAT-M16-076 | 29 | 31.7 | 38.5 | 55 | 17 | 13 | 40 | 76 |
| MAT-M16-091 | | 29 | 31.7 | 38.5 | 55 | 17 | 13 | 55 | 91 | 16*2.0 |
| MAT-M16-106 | | 29 | 31.7 | 38.5 | 55 | 17 | 13 | 70 | 106 | 16*2.0 |
| MAT-M06-074 | | 11 | 11.7 | 15 | 40 | 6.5 | 5 | 35 | 74 | 06*1.0 |
| MAT-M06-089 | | 11 | 11.7 | 15 | 40 | 6.5 | 5 | 50 | 89 | 06*1.0 |
| MAT-M06-104 | | 11 | 11.7 | 15 | 40 | 6.5 | 5 | 65 | 104 | 06*1.0 |
| MAT-M08-079 | | 14.5 | 15.7 | 20 | 45 | 8.5 | 7 | 40 | 79 | 08*1.25 |
| MAT-M08-094 | | 14.5 | 15.7 | 20 | 45 | 8.5 | 7 | 55 | 94 | 08*1.25 |
| MAT-M08-109 | | 14.5 | 15.7 | 20 | 45 | 8.5 | 7 | 70 | 109 | 08*1.25 |
| MAT-M10-084 | | 18 | 19.7 | 25 | 55 | 10.5 | 10 | 45 | 84 | 10*1.5 |
| MAT-M10-104 | | 18 | 19.7 | 25 | 55 | 10.5 | 10 | 65 | 104 | 10*1.5 |
| MAT-M10-119 | | 18 | 19.7 | 25 | 55 | 10.5 | 10 | 80 | 119 | 10*1.5 |
| MAT-M12-094 | | 23 | 24.7 | 33 | 65 | 12.5 | 10 | 55 | 94 | 12*1.75 |
| MAT-M12-109 | 23 | 24.7 | 33 | 65 | 12.5 | 13 | 70 | 109 | 12*1.75 | |
| MAT-M12-124 | 23 | 24.7 | 33 | 65 | 12.5 | 13 | 85 | 124 | 12*1.75 | |
| MAT-M16-094 | 29 | 31.7 | 41 | 85 | 17 | 13 | 55 | 94 | 16*2.0 | |
| MAT-M16-109 | 29 | 31.7 | 41 | 85 | 17 | 13 | 70 | 109 | 16*2.0 | |
| MAT-M16-124 | 29 | 31.7 | 41 | 85 | 17 | 13 | 85 | 124 | 16*2.0 | |



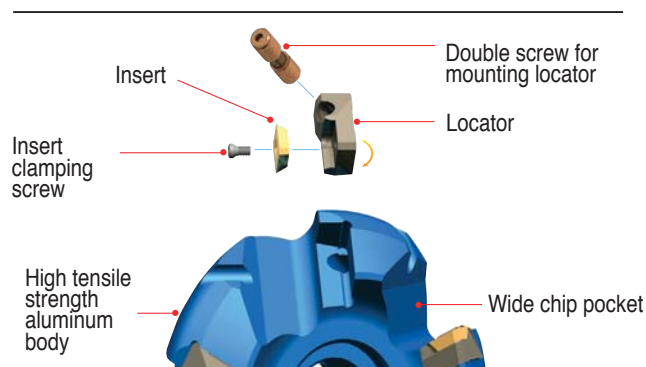
Rigid body employs high tensile aluminum

Future Mill

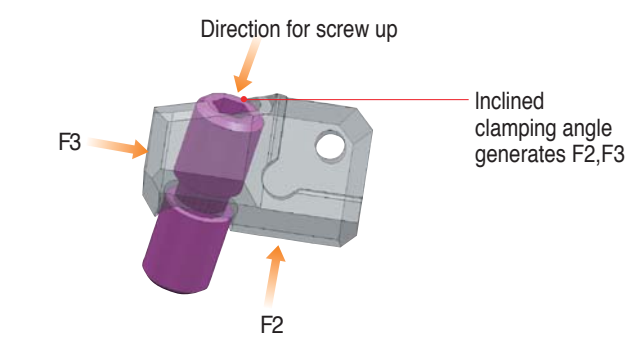
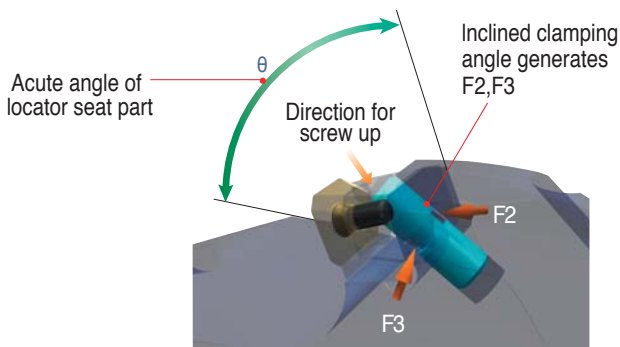
- Light aluminum body(50% of steel body) can be used for high speed cutting, tapping center, and on low power machines
- Easy handling
- It can be used for aluminum alloys, medium cutting of steel, and cast iron
- Rigid body employs high tensile aluminum
- Locators for excellent durability
- Various kinds of chip breaker are available
- Due to the high rake angle, it provides low cutting loads and good surface roughness

🎯 Cutter

- ▶ Strong clamping between aluminum body and locator with double screw provides high efficiency
- ▶ Acute angle of locator seat provides strong clamping
- ▶ Wide chip pocket area provides good chip evacuation
- ▶ High tensile strength aluminum body



🎯 Locator

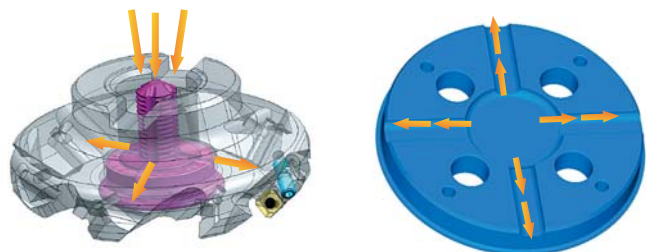


🎯 Through coolant system

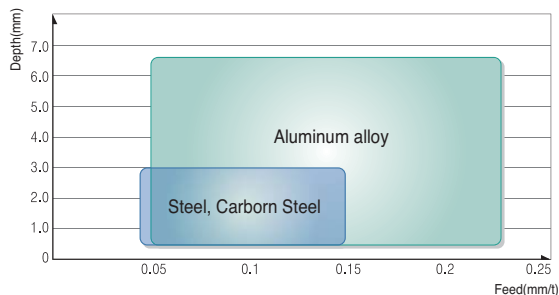
- ▶ Exclusively designed coolant bolt and cover provide excellent coolant action and chip evacuation for improved tool life
- ▶ Exact coolant direction to cutting area
- ▶ Exclusive coolant bolt and cover are sold separately. Through coolant arbor is required

• Bolt : Ø63 ~ Ø160

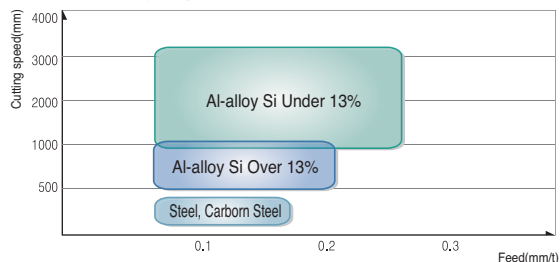
• Cover : Over Ø200



Application range as per workpiece



Cutting speed

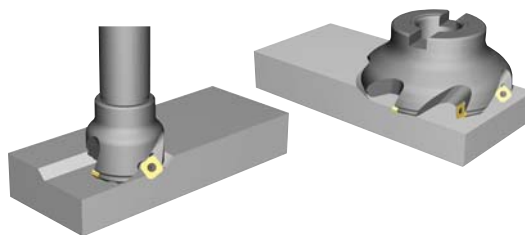


Max. available revolution

| Cutter diameter | Max. revolution |
|-----------------|-----------------|
| Ø63 | 20,000 |
| Ø80 | 16,000 |
| Ø100 | 13,000 |
| Ø125 | 10,000 |
| Ø160 | 8,000 |
| Ø200 | 6,500 |
| Ø250 | 5,000 |
| Ø315 | 4,000 |

Future Mill(FMA)

- ▶ General milling cutter for high productivity
- ▶ Adjustable pitch of cutter and various chip breaker offer wide application range.
- ▶ Light cutter body allows high speed cutting and can be used in low horse power machine
- ▶ Smooth cutting with low cutting load is accomplished with high rake angle



Chip breaker

| Type | Chip breaker | Cutting edge | Features of chip breaker |
|-----------------|--------------|--------------|--|
| Light cutting | Non C/B | | Superior surface roughness at finishing due to ground type cermet insert |
| | MF | | Superior cutting quality for light and difficult-to-cut material machining through the low cutting load of chip breaker |
| General cutting | MM | | Suitable for various cutting due to special shape design for general cutting |
| Roughing | MR | | Tough cutting edge provides stable cutting performance in severe interruption |
| For aluminum | MA | | Superior cutting quality for aluminum due to sharp cutting edge and buffed surface • SDET-MA: Sharp cutting edge due to high accurate grinding • SDXT-MA: Suitable cutting edge for roughing |

Recommended cutting condition

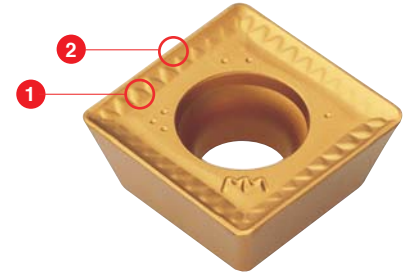
| ISO | C/B Grade | MF | | MM | | MR | | MA | |
|----------|-----------|-----------|-------------|-----------|-------------|-----------|-------------|-------------|-------------|
| | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) |
| P | NC5330 | 200 ~ 300 | 0.05 ~ 0.20 | 150 ~ 300 | 0.10 ~ 0.30 | 150 ~ 250 | 0.10 ~ 0.30 | - | - |
| | NCM325 | 200 ~ 300 | 0.05 ~ 0.20 | 150 ~ 300 | 0.10 ~ 0.30 | 150 ~ 250 | 0.10 ~ 0.30 | - | - |
| | PC3500 | 200 ~ 300 | 0.05 ~ 0.20 | 150 ~ 300 | 0.10 ~ 0.30 | 100 ~ 250 | 0.10 ~ 0.30 | - | - |
| M | PC9530 | 100 ~ 180 | 0.05 ~ 0.15 | 120 ~ 180 | 0.10 ~ 0.30 | - | - | - | - |
| | NCM335 | 120 ~ 200 | 0.05 ~ 0.15 | 120 ~ 200 | 0.10 ~ 0.30 | - | - | - | - |
| K | PC5300 | 150 ~ 250 | 0.05 ~ 0.20 | 150 ~ 250 | 0.10 ~ 0.30 | - | - | - | - |
| Aluminum | H01 | - | - | - | - | - | - | 350 ~ 1,000 | 0.10 ~ 0.35 |



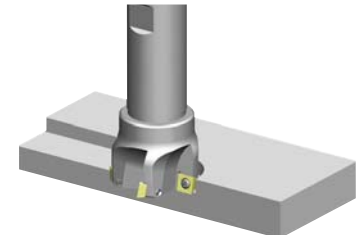
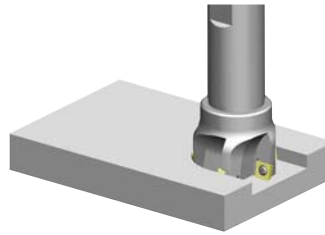
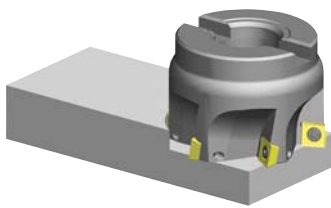
Future Mill(FMP)

Features

- ▶ The strong cutting edge ensures excellent tool life in high feed and high speed, deep depth of cut, with low cutting loads
- ▶ Optimal grades for most workpieces make high efficiency cutting possible
- ▶ Unique chip breaker makes good chip evacuation and lower cutting loads (①)
- ▶ Innovative curve cutting edge lowers cutting load and provides a stronger cutting edge (②)



Machining examples



Features of chip breaker

- ▶ Innovative special cutting edge and chip breaker design ensures ideal 90° cutting and low cutting load
- ▶ Various applications are available with multi functional cutters (Facing, Slotting, Shouldering)
- ▶ Improved tool life due to special coated grades
- ▶ Superior cutting quality at deep cutting depth through the low cutting load and strong cutting edge

| Chip breaker | Cutter edge | Recommended C/B and grade as per workpiece (●:1st) | | | | | | | | | |
|------------------------------|-------------|--|----------------------------------|-------------------------------|----------------------------------|-----------------|----------------------------------|-----------|----------------------|----------------|----------------|
| | | Low carbon steel Mild steel | | High carbon steel Alloy steel | | Stainless steel | | Cast iron | | Aluminum alloy | |
| | | C/B | Grade | C/B | Grade | C/B | Grade | C/B | Grade | C/B | Grade |
| Low cutting load type | MF | ● | ○ NCM325 ○ NC5330 ● NCM335 | | ● NCM325 ○ NC5330 ○ NCM335 | ● | ○ NCM325 ○ NC5330 ● NCM335 | ● | ● PC6510 ○ PC215K | - | - |
| Reinforced cutting edge type | MM | | ○ NCM325 ○ NC5330 ● NCM335 | | ● NCM325 ○ NC5330 ○ NCM335 | | ○ NCM325 ○ NC5330 ● NCM335 | | ● PC6510 ○ PC215K | - | - |
| Sharp cutting edge type | MA | - | - | - | - | - | - | - | - | ● | ● H01 ○ G10 |

Recommended cutting condition

| Workpiece | Feed (mm/t) | Cutting Speed vc(m/min) | | | | | | | |
|----------------------|-------------|-------------------------|---------|------------|---------|---------|---------|---------|-----------|
| | | CVD Coated | | PVD Coated | | | | Carbide | |
| | | NCM325 | NCM335 | PC3535 | PC3545 | PC6510 | PC8520 | | PC9530 |
| SM□□C | ~0.3 | 100~250 | 100~220 | 100~250 | 100~220 | - | 100~250 | 100~250 | - |
| SCM | | | | | | | | | |
| STD | ~0.25 | 100~220 | 100~200 | 100~220 | 100~200 | - | 100~220 | 100~220 | - |
| KP | | | | | | | | | |
| NAK | ~0.2 | 100~220 | 100~180 | 100~200 | 100~180 | - | 100~200 | 100~200 | - |
| STS | ~0.2 | - | - | - | 80~200 | - | 80~200 | 80~200 | - |
| GC/GCD | ~0.25 | - | - | - | - | 100~200 | - | - | - |
| Non-ferrous Aluminum | ~0.4 | - | - | - | - | - | - | - | 400~1,000 |



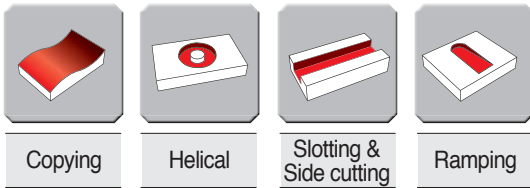
Future Mill(FMR)

Features

- ▶ Wide coverage for medium to roughing, general steel to high hardness mold materials.
- ▶ 2 step shape of insert provides strong clamping and can minimize components to replace the shim.
- ▶ 4-8 cutting edge available per insert. (Inscribed circle 05, 06, 07, 08, 10, 12, 16, 20).
- ▶ Uneven flute spacing prevents vibration on high speed applications and provides more stable machining.
- ▶ Precise design of the insert seat prevents insert from chattering.
- ▶ Special design of the insert bottom prevents movement and chatter of insert.
- ▶ Easy to change cutting edge due to the rotation prevention design of the insert.

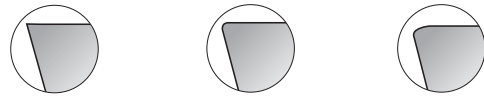


Machining examples



FMR Insert cutting edge shape







Cutting edge shape (G calss)



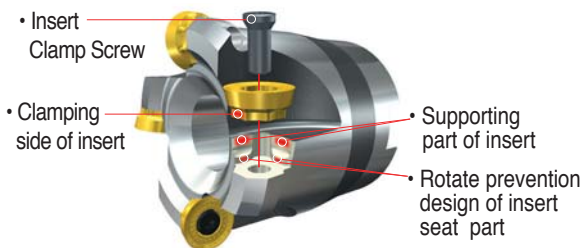
Designation

RDHW□□□□M0F RDHW□□□□M0E RDHW□□□□M0S

Chip breakers

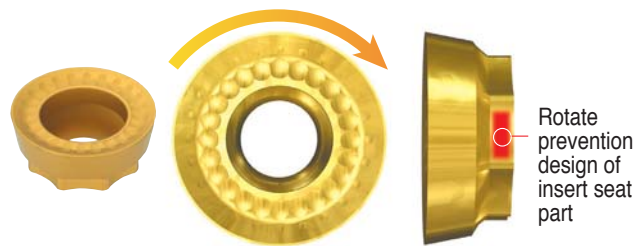
| Chip breakers | Cutter edge | Features |
|--|---|--|
| Finishing MF  |  | Low cutting resistance chip breaker design guarantees long tool life good performance at finishing and difficult-to-cut material machining |
| Medium MM  |  | Suitable for general milling at wide application range |
| Aluminum MA  |  | Sharp cutting edge and buffed top face for aluminum machining prevent welding and control chip flow |

Clamping system



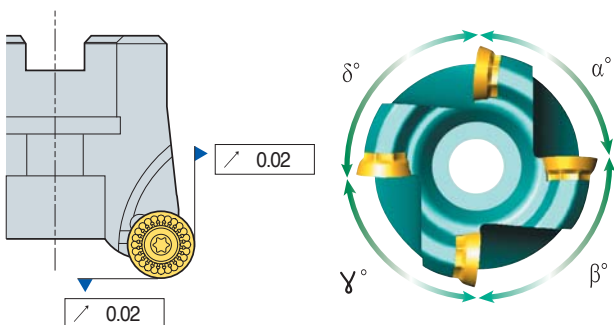
FMR□ 3000 type
FMR□ 4000 type

FMR□ 5000 type
FMR□ 6000 type



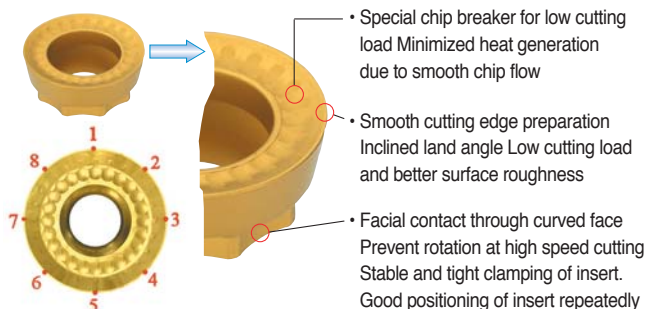
RDKT10T3M0-□□
RDKT1204M0-□□

RDKT1605M0-MM
RDKT2006M0-MM



Good surface finish due to the precise design of insert seat part of cutter

Uneven flute spacing prevents vibration at high speed application and provides stable machining



4-8 cutting edge available per insert



Future Mill(FMR)

Chip removal rate (cm³/min)

| Workpiece | Grades | Ø8 | Ø10 | Ø12 | Ø15 | Ø16 | Ø20 | Ø21 | Ø25 | Ø26 | Ø32 | Ø33 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Ø125 | Ø160 | |
|--|--|---------------------------------|---------------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| P | General structure steel (under 200HB) | 4.97 | 9.94 | 9.94 | 14.92 | 31.83 | 31.83 | 47.74 | 47.74 | 47.74 | 71.61 | 38.19 | 95.49 | 119.36 | 143.23 | 167.11 | 190.98 | 133.69 | 509.29 | |
| | | V=250, fz=0.25, ap=0.5, ae=0.5D | | | | | | | | | | | | | | | | | | |
| | General carbon steel (under 30 Hrc) | 3.97 | 7.95 | 7.95 | 11.93 | 25.46 | 25.46 | 38.19 | 38.19 | 38.19 | 57.29 | 38.19 | 76.39 | 95.49 | 114.59 | 133.69 | 152.78 | 133.69 | 458.36 | |
| | | V=200, fz=0.25, ap=0.5, ae=0.5D | | | | | | | | | | | | | | | | | | |
| | High carbon steel, Alloy steel (30~40 Hrc) | PC3500 PC3545 PC5300 | 2.86 | 5.72 | 5.72 | 8.59 | 22.91 | 22.91 | 34.37 | 34.37 | 34.37 | 51.56 | 34.37 | 68.75 | 85.94 | 103.13 | 120.32 | 137.5 | 120.32 | 407.43 |
| | | | V=180, fz=0.20, ap=0.5, ae=0.5D | | | | | | | | | | | | | | | | | |
| High carbon steel, Alloy steel (40~50 Hrc) | PC3500 PC3545 PC5300 | 1.24 | 2.48 | 2.48 | 3.72 | 11.45 | 11.45 | 14.32 | 17.18 | 14.32 | 21.48 | 14.32 | 28.64 | 35.8 | 42.97 | 50.13 | 57.29 | 50.13 | 249.55 | |
| | | V=130, fz=0.15, ap=0.4, ae=0.5D | | | | | | | | | | | | | | | | | | |
| Alloy steel (over 50 Hrc) | PC3500 PC3545 PC5300 | 0.95 | 1.9 | 1.9 | 2.86 | 7.63 | 7.63 | 9.54 | 11.45 | 9.54 | 14.32 | 9.54 | 19.09 | 23.87 | 28.64 | 33.42 | 38.19 | 33.42 | 152.78 | |
| | | V=100, fz=0.15, ap=0.4, ae=0.5D | | | | | | | | | | | | | | | | | | |
| M | Stainless steel | PC5300 | 2.06 | 4.13 | 4.13 | 6.2 | 16.55 | 16.55 | 12.41 | 24.82 | 12.41 | 18.62 | 12.41 | 24.82 | 31.03 | 37.24 | 43.44 | 49.65 | 43.44 | 331.04 |
| V=130, fz=0.20, ap=0.5, ae=0.5D | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | PC5300 | 2.86 | 5.72 | 5.72 | 8.59 | 14.32 | 14.32 | 21.48 | 21.48 | 32.22 | 21.48 | 42.97 | 53.71 | 64.45 | 75.2 | 85.94 | 75.2 | 366.69 | |
| V=180, fz=0.20, ap=0.5, ae=0.5D | | | | | | | | | | | | | | | | | | | | |

Required machine power (P_{KW} = 0.75 x P_{HP})

• RDKT10

| Workpiece | Grades | Ø21 | Ø25 | Ø26 | Ø32 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Cutting condition | | | | |
|-----------|--|--------|-----|-----|-----|-----|-----|-----|-----|------|-------------------|-----|-----|------|------|
| | | | | | | | | | | | vc | fz | ap | ae | |
| P | General structure steel (under 200HB) | 2.2 | 2.2 | 2.2 | 3.3 | 4.4 | 5.5 | 6.6 | 7.7 | 8.8 | 250 | 0.4 | 1.5 | 0.5D | |
| | General carbon steel (under 30 Hrc) | 2.1 | 2.1 | 2.1 | 3.1 | 4.1 | 5.2 | 6.2 | 7.3 | 8.3 | 200 | 0.4 | 1.5 | 0.5D | |
| | High carbon steel, Alloy steel (30~40 Hrc) | 2.2 | 2.2 | 2.2 | 3.3 | 4.5 | 5.6 | 6.7 | 7.9 | 9 | 180 | 0.4 | 1.5 | 0.5D | |
| | High carbon steel, Alloy steel (40~50 Hrc) | 1.1 | 1.1 | 1.1 | 1.6 | 2.1 | 2.6 | 3.2 | 3.7 | 4.2 | 150 | 0.3 | 1.0 | 0.5D | |
| | Alloy steel (over 50 Hrc) | 0.7 | 0.7 | 0.7 | 1.1 | 1.4 | 1.7 | 2.1 | 2.4 | 2.8 | 100 | 0.3 | 1.0 | 0.5D | |
| M | Stainless steel | PC5300 | 0.6 | 0.6 | 0.6 | 0.8 | 1.2 | 1.5 | 1.7 | 2 | 2.3 | 130 | 0.2 | 1.5 | 0.5D |
| K | Cast iron | PC5300 | 0.6 | 0.6 | 0.6 | 0.9 | 1.2 | 1.5 | 1.8 | 2.1 | 2.4 | 180 | 0.2 | 1.5 | 0.5D |

• The figures in the above chart means P_{HP} value.

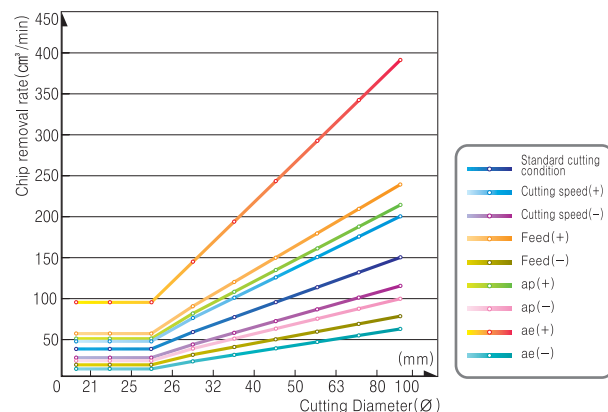
• RDKT12

| Workpiece | Grades | Ø32 | Ø33 | Ø40 | Ø50 | Ø63 | Ø80 | Ø100 | Ø125 | Cutting condition | | | | |
|-----------|--|--------|-----|-----|-----|-----|-----|------|------|-------------------|-----|-----|------|------|
| | | | | | | | | | | vc | fz | ap | ae | |
| P | General structure steel (under 200HB) | 1.7 | 1.7 | 2.6 | 3.5 | 3.5 | 4.4 | 5.3 | 6.1 | 200 | 0.4 | 1.5 | 0.5D | |
| | General carbon steel (under 30 Hrc) | 2 | 2 | 3.1 | 4.1 | 2.6 | 5.2 | 6.2 | 7.2 | 180 | 0.4 | 1.5 | 0.5D | |
| | High carbon steel, Alloy steel (30~40 Hrc) | 2.2 | 2.2 | 3.3 | 4.4 | 2.8 | 5.6 | 6.7 | 7.8 | 160 | 0.4 | 1.5 | 0.5D | |
| | High carbon steel, Alloy steel (40~50 Hrc) | 1 | 1 | 1.5 | 1.6 | 2.1 | 2.6 | 3.1 | 3.6 | 140 | 0.3 | 1.0 | 0.5D | |
| | Alloy steel (over 50 Hrc) | 0.7 | 0.7 | 1 | 1.4 | 0.8 | 1.7 | 2.1 | 2.4 | 100 | 0.3 | 1.0 | 0.5D | |
| M | Stainless steel | PC5300 | 0.5 | 0.5 | 0.8 | 1.1 | 0.7 | 1.4 | 1.7 | 2 | 130 | 0.2 | 1.5 | 0.5D |
| K | Cast iron | PC5300 | 0.6 | 0.6 | 0.9 | 1.2 | 0.7 | 1.5 | 1.8 | 2.1 | 180 | 0.2 | 1.5 | 0.5D |

• The figures in the above chart means P_{HP} value.

Chip removal rate by cutting condition

• Used insert : RDKT10



• Variation of cutting condition

| Standard | ISO | | | |
|-----------|--------|--------|--------|---------|
| | vc=200 | fz=0.4 | ap=1.5 | ae=0.5D |
| Speed (+) | 250 | | | |
| Speed (-) | 150 | | | |
| Feed (+) | 0.6 | | | |
| Feed (-) | 0.2 | | | |
| ap (+) | 2 | | | |
| ap (-) | 1 | | | |
| ae (+) | D | | | |
| ae (-) | 0.2D | | | |



Recommended cutting condition

- Side milling, Slotting, Ramping, Copying

| Workpiece | Hardness | Grades | Cutting speed (m/min) | FMR1000 | | FMR1500 | | FMR2000 | | FMR2500 | | FMR3000 | | FMR4000 | | FMR5000 | | FMR6000 | |
|--|-----------------------------------|-----------------|-----------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | | | | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) |
| General structure steel General carbon steel | 200HBS 30HRCs | PC3500 PC5300 | 100-250 100-220 | ≤1.0 | ≤0.4 | ≤1.2 | ≤0.4 | ≤1.5 | ≤0.4 | ≤1.7 | ≤0.4 | ≤2.0 | ≤0.5 | ≤2.4 | ≤0.6 | ≤3.0 | ≤0.7 | ≤4.0 | ≤0.8 |
| | | | | ≤0.7 | ≤0.4 | ≤1.2 | ≤0.4 | ≤1.5 | ≤0.4 | ≤2.0 | ≤0.5 | ≤2.4 | ≤0.6 | ≤3.0 | ≤0.7 | ≤4.0 | ≤0.8 | | |
| High carbon steel, Alloy steel High carbon steel, Alloy steel | 30-40HRC 40-50HRC | PC3545 PC5345 | 100-200 90-150 | ≤0.7 | ≤0.2 | ≤0.9 | ≤0.2 | ≤1.2 | ≤0.2 | ≤1.5 | ≤0.2 | ≤1.7 | ≤0.3 | ≤2.0 | ≤0.4 | ≤2.7 | ≤0.5 | ≤3.7 | ≤0.6 |
| | | | | ≤0.7 | ≤0.2 | ≤0.9 | ≤0.2 | ≤1.2 | ≤0.2 | ≤1.5 | ≤0.2 | ≤1.7 | ≤0.3 | ≤2.0 | ≤0.4 | ≤2.7 | ≤0.5 | ≤3.7 | ≤0.6 |
| Alloy steel Stainless steel | 50HRCz 270HBS | PC3545 PC5300 | 90-150 50-200 | ≤0.7 | ≤0.2 | ≤0.9 | ≤0.2 | ≤1.2 | ≤0.2 | ≤1.5 | ≤0.2 | ≤1.7 | ≤0.3 | ≤2.0 | ≤0.4 | ≤2.7 | ≤0.5 | ≤3.7 | ≤0.6 |
| | | | | ≤0.7 | ≤0.2 | ≤0.9 | ≤0.2 | ≤1.2 | ≤0.2 | ≤1.5 | ≤0.2 | ≤1.7 | ≤0.3 | ≤2.0 | ≤0.4 | ≤2.7 | ≤0.5 | ≤3.7 | ≤0.6 |
| Cast iron, Ductile cast iron | Tensile strength 350Mpas PC5300 | | 150-250 | ≤1.0 | ≤0.4 | ≤1.2 | ≤0.4 | ≤1.5 | ≤0.4 | ≤1.7 | ≤0.4 | ≤2.0 | ≤0.5 | ≤2.4 | ≤0.6 | ≤3.0 | ≤0.7 | ≤4.0 | ≤0.8 |

- Pocketing

| Workpiece | Hardness | Grades | Cutting speed (m/min) | FMR1000 | | FMR1500 | | FMR2000 | | FMR2500 | | FMR3000 | | FMR4000 | | FMR5000 | | FMR6000 | |
|--|-----------------------------------|-----------------|-----------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | | | | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) |
| General structure steel General carbon steel | 200HBS 30HRCs | PC3500 PC5300 | 100-250 100-220 | ≤1.0 | ≤0.3 | ≤1.2 | ≤0.3 | ≤1.5 | ≤0.3 | ≤1.7 | ≤0.3 | ≤2.0 | ≤0.4 | ≤2.4 | ≤0.5 | ≤3.0 | ≤0.6 | ≤4.0 | ≤0.7 |
| | | | | ≤0.7 | ≤0.3 | ≤1.2 | ≤0.3 | ≤1.5 | ≤0.3 | ≤1.7 | ≤0.4 | ≤2.0 | ≤0.5 | ≤3.0 | ≤0.6 | ≤4.0 | ≤0.7 | | |
| High carbon steel, Alloy steel High carbon steel, Alloy steel | 30-40HRC 40-50HRC | PC3545 PC5345 | 100-200 90-150 | ≤0.7 | ≤0.1 | ≤0.9 | ≤0.1 | ≤1.2 | ≤0.1 | ≤1.5 | ≤0.1 | ≤1.7 | ≤0.2 | ≤2.0 | ≤0.3 | ≤2.7 | ≤0.4 | ≤3.7 | ≤0.5 |
| | | | | ≤0.7 | ≤0.1 | ≤0.9 | ≤0.1 | ≤1.2 | ≤0.1 | ≤1.5 | ≤0.1 | ≤1.7 | ≤0.2 | ≤2.0 | ≤0.3 | ≤2.7 | ≤0.4 | ≤3.7 | ≤0.5 |
| Alloy steel Stainless steel | 50HRCz 270HBS | PC3545 PC5300 | 90-150 50-200 | ≤0.7 | ≤0.1 | ≤0.9 | ≤0.1 | ≤1.2 | ≤0.1 | ≤1.5 | ≤0.1 | ≤1.7 | ≤0.2 | ≤2.0 | ≤0.3 | ≤2.7 | ≤0.4 | ≤3.7 | ≤0.5 |
| | | | | ≤0.7 | ≤0.1 | ≤0.9 | ≤0.1 | ≤1.2 | ≤0.1 | ≤1.5 | ≤0.1 | ≤1.7 | ≤0.2 | ≤2.0 | ≤0.3 | ≤2.7 | ≤0.4 | ≤3.7 | ≤0.5 |
| Cast iron, Ductile cast iron | Tensile strength 350Mpas PC5300 | | 150-250 | ≤1.0 | ≤0.3 | ≤1.2 | ≤0.3 | ≤1.5 | ≤0.3 | ≤1.7 | ≤0.4 | ≤2.0 | ≤0.4 | ≤2.4 | ≤0.5 | ≤3.0 | ≤0.6 | ≤4.0 | ≤0.7 |

- Plunging

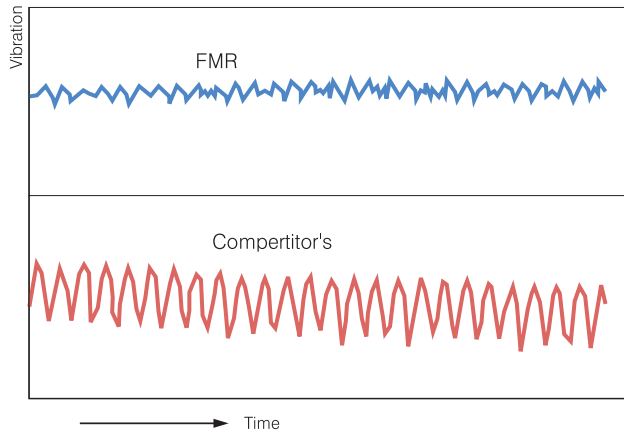
| Workpiece | Hardness | Grades | Cutting speed (m/min) | FMR1000 | | FMR1500 | | FMR2000 | | FMR2500 | | FMR3000 | | FMR4000 | | FMR5000 | | FMR6000 | |
|--|-----------------------------------|-----------------|-----------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | | | | ae (mm) | fz (mm/t) | ae (mm) | fz (mm/t) | ae (mm) | fz (mm/t) | ae (mm) | fz (mm/t) | ae (mm) | fz (mm/t) | ae (mm) | fz (mm/t) | ae (mm) | fz (mm/t) | ae (mm) | fz (mm/t) |
| General structure steel General carbon steel | 200HBS 30HRCs | PC3500 PC5300 | 100-250 100-220 | ≤2.5 | ≤0.2 | ≤3.0 | ≤0.2 | ≤3.5 | ≤0.2 | ≤4.0 | ≤0.2 | ≤5.0 | ≤0.3 | ≤6.0 | ≤0.4 | ≤8.0 | ≤0.5 | ≤10.0 | ≤0.6 |
| | | | | ≤2.5 | ≤0.2 | ≤3.0 | ≤0.2 | ≤3.5 | ≤0.2 | ≤4.0 | ≤0.3 | ≤6.0 | ≤0.4 | ≤8.0 | ≤0.5 | ≤10.0 | ≤0.6 | | |
| High carbon steel, Alloy steel High carbon steel, Alloy steel | 30-40HRC 40-50HRC | PC3545 PC5345 | 100-200 90-150 | ≤2.5 | ≤0.1 | ≤3.0 | ≤0.1 | ≤3.5 | ≤0.1 | ≤4.0 | ≤0.1 | ≤5.0 | ≤0.2 | ≤6.0 | ≤0.3 | ≤8.0 | ≤0.4 | ≤10.0 | ≤0.5 |
| | | | | ≤2.5 | ≤0.1 | ≤3.0 | ≤0.1 | ≤3.5 | ≤0.1 | ≤4.0 | ≤0.2 | ≤6.0 | ≤0.3 | ≤8.0 | ≤0.4 | ≤10.0 | ≤0.5 | | |
| Alloy steel Stainless steel | 50HRCz 270HBS | PC3545 PC5300 | 90-150 50-200 | ≤2.5 | ≤0.1 | ≤3.0 | ≤0.1 | ≤3.5 | ≤0.1 | ≤4.0 | ≤0.1 | ≤5.0 | ≤0.2 | ≤6.0 | ≤0.3 | ≤8.0 | ≤0.4 | ≤10.0 | ≤0.5 |
| | | | | ≤2.5 | ≤0.1 | ≤3.0 | ≤0.1 | ≤3.5 | ≤0.1 | ≤4.0 | ≤0.2 | ≤6.0 | ≤0.3 | ≤8.0 | ≤0.4 | ≤10.0 | ≤0.5 | | |
| Cast iron, Ductile cast iron | Tensile strength 350Mpas PC5300 | | 150-250 | ≤2.5 | ≤0.2 | ≤3.0 | ≤0.2 | ≤3.5 | ≤0.2 | ≤4.0 | ≤0.2 | ≤5.0 | ≤0.3 | ≤6.0 | ≤0.4 | ≤8.0 | ≤0.5 | ≤10.0 | ≤0.6 |

- Helical cutting

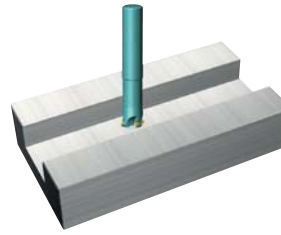
| Workpiece | Hardness | Grades | Cutting speed (m/min) | FMR1000 | | FMR1500 | | FMR2000 | | FMR2500 | | FMR3000 | | FMR4000 | | FMR5000 | | FMR6000 | |
|--|-----------------------------------|-----------------|-----------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | | | | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) | ap (mm) | fz (mm/t) |
| General structure steel General carbon steel | 200HBS 30HRCs | PC3500 PC5300 | 100-250 100-220 | ≤1.0 | ≤0.2 | ≤1.0 | ≤0.2 | ≤1.0 | ≤0.2 | ≤1.0 | ≤0.2 | ≤2.0 | ≤0.3 | ≤2.0 | ≤0.4 | ≤4.0 | ≤0.5 | ≤4.0 | ≤0.6 |
| | | | | ≤0.7 | ≤0.2 | ≤0.7 | ≤0.2 | ≤0.7 | ≤0.2 | ≤1.0 | ≤0.3 | ≤2.0 | ≤0.4 | ≤4.0 | ≤0.5 | ≤4.0 | ≤0.6 | | |
| High carbon steel, Alloy steel High carbon steel, Alloy steel | 30-40HRC 40-50HRC | PC3545 PC5345 | 100-200 90-150 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤1.7 | ≤0.2 | ≤1.7 | ≤0.3 | ≤3.7 | ≤0.4 | ≤3.7 | ≤0.5 |
| | | | | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤1.7 | ≤0.2 | ≤1.7 | ≤0.3 | ≤3.7 | ≤0.4 | ≤3.7 | ≤0.5 | | |
| Alloy steel Stainless steel | 50HRCz 270HBS | PC3545 PC5300 | 90-150 50-200 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤1.7 | ≤0.2 | ≤1.7 | ≤0.3 | ≤3.7 | ≤0.4 | ≤3.7 | ≤0.5 |
| | | | | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤0.7 | ≤0.1 | ≤1.7 | ≤0.2 | ≤1.7 | ≤0.3 | ≤3.7 | ≤0.4 | ≤3.7 | ≤0.5 | | |
| Cast iron, Ductile cast iron | Tensile strength 350Mpas PC5300 | | 150-250 | ≤1.0 | ≤0.2 | ≤1.0 | ≤0.2 | ≤1.0 | ≤0.2 | ≤1.0 | ≤0.2 | ≤2.0 | ≤0.3 | ≤2.0 | ≤0.4 | ≤4.0 | ≤0.5 | ≤4.0 | ≤0.6 |



FMR Vibration test



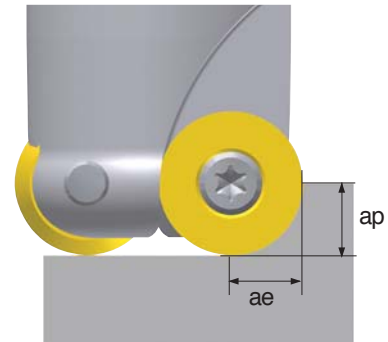
Machining example



- **Workpiece** STD11
- **Cutting condition** $vc = 200\text{m/min}$
 $fz = 0.40\text{mm/t}$
 $ap = 2.0\text{mm}$
 $ae = 4.0\text{mm}$
- **Designation** FMRS3032RD-S
RDKT10T3M0-MM
(PC3500)

Cutting condition formulas for milling

| Cutting speed | RPM |
|--|---|
| $vc = \frac{\pi \times D \times n}{1000}$ (m/min) | $n = \frac{vc \times 1000}{\pi \times D}$ (min^{-1}) |
| Feed(per tooth) | Feed(per minute) |
| $fz = \frac{vf}{n \times z}$ (mm/t) | $vf = fz \times n \times z$ (mm/min) |
| Chip removal rate | Required machine power |
| $Q = \frac{ap \times ae \times vf}{1000}$ (cm^3/min) | $P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta}$ (kW) |
| | $Php = \frac{P_{kw}}{0.75}$ (hp) |



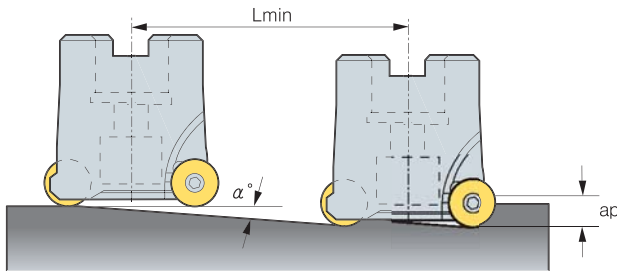
| | |
|--|---|
| vc = Cutting speed(m/min) | H = Horsepower requirement(Hp) |
| n = Revolution per a minute(min^{-1}) | Q = Chip removal amount(cm^3/min) |
| D = Cutting diameter(mm) | ap = Depth of cut(mm) |
| vf = Feed per a minute(mm/min) | ae = Width of cut(mm) |
| fz = Feed per tooth(mm/t) | Kc = Specific cutting resistance(MPa) |
| z = Number of tooth | η = Mechanical efficiency(%) |
| Pc = Power requirement(kW) | |

Feed as per cutting depth

| Designation | Chip breaker | Depth of cut (mm) | | | | | | | | | |
|--------------|--------------|-------------------|---------|------|------|------|------|------|------|------|---|
| | | 0.2-0.5 | 0.5~1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | |
| RDHW0501M0 | - | 0.25 | 0.15 | - | - | - | - | - | - | - | - |
| RDHW06T1M0 | - | 0.30 | 0.20 | 0.10 | - | - | - | - | - | - | - |
| RDHW0702M0 | - | 0.35 | 0.25 | 0.10 | 0.07 | - | - | - | - | - | - |
| RDHW0803M0 | - | 0.40 | 0.30 | 0.15 | 0.01 | - | - | - | - | - | - |
| RDKT10T3M0 - | MF/MM | - | 0.40 | 0.35 | 0.30 | 0.20 | - | - | - | - | - |
| RDKT1204M0 - | MF/MM | - | 0.50 | 0.45 | 0.30 | 0.25 | 0.22 | - | - | - | - |
| RDHW1605M0 | - | - | 0.60 | 0.50 | 0.45 | 0.35 | 0.30 | 0.20 | 0.10 | - | |
| RDHW2006M0 | - | - | - | 0.60 | 0.50 | 0.40 | 0.30 | 0.25 | 0.15 | 0.10 | |
| RDKT1605M0 - | MM | - | 0.60 | 0.50 | 0.45 | 0.35 | 0.30 | 0.20 | 0.10 | - | |
| RDKT2006M0 - | MM | - | - | 0.60 | 0.50 | 0.40 | 0.30 | 0.25 | 0.15 | 0.10 | |



Ramping technical data



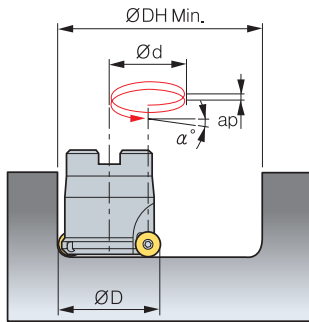
$$L_{min} = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

* Lmin : Min. inclination cutting length
 α° : Max. ramping angle
 ap : Depth of cut

| Section | Tool Dia. | Ramping angle α° (Max) | Cutting length L(mm) by ramping angle | | | | | | | | | |
|---------|-----------|---------------------------|---------------------------------------|--------|----------|--------|----------|--------|--------|--------|--------|---------|
| | | | ap=1mm | ap=2mm | ap=2.5mm | ap=3mm | ap=3.5mm | ap=4mm | ap=5mm | ap=6mm | ap=8mm | ap=10mm |
| FMR1000 | 08 | 18.14 | 3 | 6 | 8 | - | - | - | - | - | - | - |
| | 10 | 11.7 | 5 | 10 | 12 | - | - | - | - | - | - | - |
| | 12 | 8.43 | 7 | 13 | 17 | - | - | - | - | - | - | - |
| | 15 | 5.93 | 10 | 19 | 24 | - | - | - | - | - | - | - |
| FMR1500 | 10 | 20.67 | 21 | 5 | 7 | 8 | - | - | - | - | - | - |
| | 12 | 10.05 | 10 | 11 | 14 | 17 | - | - | - | - | - | - |
| | 16 | 6.12 | 6 | 19 | 23 | 28 | - | - | - | - | - | - |
| FMR2000 | 20 | 4.36 | 4 | 26 | 33 | 39 | - | - | - | - | - | - |
| | 15 | 9.42 | 6 | 12 | 15 | 18 | 21 | - | - | - | - | - |
| FMR2500 | 20 | 5.85 | 10 | 20 | 24 | 29 | 34 | - | - | - | - | - |
| | 16 | 13.7 | 4 | 8 | 10 | 12 | 14 | 16 | - | - | - | - |
| FMR3000 | 20 | 9.29 | 6 | 12 | 15 | 18 | 21 | 24 | - | - | - | - |
| | 25 | 6.56 | 9 | 17 | 22 | 26 | 30 | 35 | - | - | - | - |
| | 25 | 21.8 | 3 | 5 | 6 | 8 | 9 | 10 | 13 | - | - | - |
| | 32 | 13.24 | 4 | 9 | 11 | 13 | 15 | 17 | 21 | - | - | - |
| | 40 | 9.09 | 6 | 13 | 16 | 19 | 22 | 25 | 31 | - | - | - |
| | 50 | 6.52 | 9 | 17 | 22 | 26 | 31 | 35 | 44 | - | - | - |
| FMR4000 | 63 | 4.76 | 12 | 24 | 30 | 36 | 42 | 48 | 60 | - | - | - |
| | 80 | 3.52 | 16 | 33 | 41 | 49 | 57 | 65 | 81 | - | - | - |
| | 100 | 2.69 | 21 | 43 | 53 | 64 | 74 | 85 | 106 | - | - | - |
| | 32 | 15.95 | 3 | 7 | 9 | 10 | 12 | 14 | 17 | 21 | - | - |
| | 40 | 10.3 | 6 | 11 | 14 | 17 | 19 | 22 | 28 | 33 | - | - |
| | 50 | 7.13 | 8 | 16 | 20 | 24 | 28 | 32 | 40 | 48 | - | - |
| FMR5000 | 63 | 5.08 | 11 | 22 | 28 | 34 | 39 | 45 | 56 | 67 | - | - |
| | 80 | 3.69 | 16 | 31 | 39 | 47 | 54 | 62 | 78 | 93 | - | - |
| | 100 | 2.79 | 21 | 41 | 51 | 62 | 72 | 82 | 103 | 123 | - | - |
| | 125 | 2.14 | 27 | 54 | 67 | 80 | 94 | 107 | 134 | 161 | - | - |
| | 40 | 7.4 | 8 | 15 | 19 | 23 | 27 | 31 | 38 | 46 | 62 | - |
| FMR6000 | 50 | 5.22 | 11 | 22 | 27 | 33 | 38 | 44 | 55 | 66 | 88 | - |
| | 63 | 3.79 | 15 | 30 | 38 | 45 | 53 | 60 | 75 | 91 | 121 | - |
| | 80 | 2.97 | 19 | 39 | 48 | 58 | 67 | 77 | 96 | 116 | 154 | - |
| | 100 | 2.09 | 27 | 55 | 69 | 82 | 96 | 110 | 137 | 164 | 219 | - |
| | 125 | 1.63 | 35 | 70 | 88 | 105 | 123 | 141 | 176 | 211 | 281 | - |
| FMR6000 | 40 | 7.44 | 8 | 15 | 19 | 23 | 27 | 31 | 38 | 46 | 61 | 77 |
| | 50 | 4.97 | 11 | 23 | 29 | 34 | 40 | 46 | 57 | 69 | 92 | 46 |
| | 63 | 3.69 | 16 | 31 | 39 | 47 | 54 | 62 | 78 | 93 | 124 | 62 |
| | 80 | 2.72 | 21 | 42 | 53 | 63 | 74 | 84 | 105 | 126 | 168 | 84 |
| | 100 | 2.12 | 27 | 54 | 68 | 81 | 95 | 108 | 135 | 162 | 216 | 108 |
| | 125 | 1.57 | 36 | 73 | 91 | 109 | 128 | 146 | 182 | 219 | 292 | 146 |



Helical cutting technical data - ØDH Min

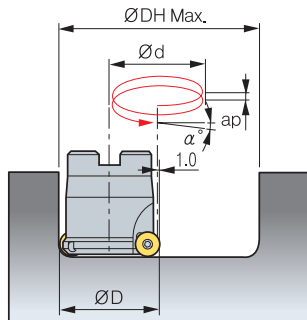


- ϕD = Tool Dia.(mm), ϕDH Min, Max = Min, Max diameter(mm)
- ϕd = Tool Path (mm)
- ϕDH Min(Min diameter) = $\phi D \times 2$ - Insert size, ϕDH Max(Max diameter) = $\phi D \times 2 - 2$
- ϕd (tool path) = ϕDH Min, Max - ϕD

| Section | Insert | Tool Dia. | ØDH Min | Ød | Ramping angle (α°) | | | | | | | | | | |
|----------|--------|-----------|---------|-----|--------------------|-------|-------|-------|------|------|------|------|------|------|--|
| | | | | | ap | | | | | | | | | | |
| | | | | | 1 | 2 | 2.5 | 3 | 3.5 | 4 | 5 | 6 | 8 | | |
| FMR 1000 | 5 | 08 | 11 | 3 | 6.11 | 12.35 | 15.57 | - | - | - | - | - | - | - | |
| | 5 | 10 | 15 | 5 | 3.65 | 7.34 | 7.34 | - | - | - | - | - | - | - | |
| | 5 | 12 | 19 | 7 | 2.61 | 5.23 | 5.23 | - | - | - | - | - | - | - | |
| | 5 | 15 | 25 | 10 | 1.83 | 3.65 | 3.65 | - | - | - | - | - | - | - | |
| FMR 1500 | 6 | 10 | 14 | 4 | 4.57 | 9.20 | 9.20 | 13.95 | - | - | - | - | - | - | |
| | 6 | 12 | 18 | 6 | 3.04 | 6.11 | 6.11 | 9.20 | - | - | - | - | - | - | |
| | 6 | 16 | 26 | 10 | 1.83 | 3.65 | 3.65 | 5.49 | - | - | - | - | - | - | |
| | 6 | 20 | 34 | 14 | 1.30 | 2.61 | 2.61 | 3.92 | - | - | - | - | - | - | |
| FMR 2000 | 7 | 15 | 23 | 8 | 2.28 | 4.57 | 4.57 | 6.88 | 8.04 | - | - | - | - | - | |
| | 7 | 20 | 33 | 13 | 1.40 | 2.81 | 2.81 | 4.22 | 4.92 | - | - | - | - | - | |
| FMR 2500 | 8 | 16 | 24 | 8 | 2.28 | 4.57 | 4.57 | 6.88 | 8.04 | 9.20 | - | - | - | - | |
| | 8 | 20 | 32 | 12 | 1.52 | 3.04 | 3.04 | 4.57 | 5.34 | 6.11 | - | - | - | - | |
| | 8 | 25 | 42 | 17 | 1.07 | 2.15 | 2.15 | 3.22 | 3.76 | 4.30 | - | - | - | - | |
| FMR 3000 | 10 | 25 | 40 | 15 | 1.22 | 2.43 | 2.43 | 3.65 | 4.27 | 4.88 | 6.11 | - | - | - | |
| | 10 | 32 | 54 | 22 | 0.83 | 1.66 | 1.66 | 2.49 | 2.91 | 3.32 | 4.15 | - | - | - | |
| | 10 | 40 | 70 | 30 | 0.61 | 1.22 | 1.22 | 1.83 | 2.13 | 2.43 | 3.04 | - | - | - | |
| | 10 | 50 | 90 | 40 | 0.46 | 0.91 | 0.91 | 1.37 | 1.60 | 1.83 | 2.28 | - | - | - | |
| | 10 | 63 | 116 | 53 | 0.34 | 0.69 | 0.69 | 1.03 | 1.21 | 1.38 | 1.72 | - | - | - | |
| | 10 | 80 | 150 | 70 | 0.26 | 0.52 | 0.52 | 0.78 | 0.91 | 1.04 | 1.30 | - | - | - | |
| | 10 | 100 | 190 | 90 | 0.20 | 0.41 | 0.41 | 0.61 | 0.71 | 0.81 | 1.01 | - | - | - | |
| FMR 4000 | 12 | 32 | 52 | 20 | 0.91 | 1.83 | 1.83 | 2.74 | 3.20 | 3.65 | 4.57 | 5.49 | - | - | |
| | 12 | 40 | 68 | 28 | 0.65 | 1.30 | 1.30 | 1.96 | 2.28 | 2.61 | 3.26 | 3.92 | - | - | |
| | 12 | 50 | 88 | 38 | 0.48 | 0.96 | 0.96 | 1.44 | 1.68 | 1.92 | 2.40 | 2.88 | - | - | |
| | 12 | 63 | 114 | 51 | 0.36 | 0.72 | 0.72 | 1.07 | 1.25 | 1.43 | 1.79 | 2.15 | - | - | |
| | 12 | 80 | 148 | 68 | 0.27 | 0.54 | 0.54 | 0.81 | 0.94 | 1.07 | 1.34 | 1.61 | - | - | |
| | 12 | 100 | 188 | 88 | 0.21 | 0.41 | 0.41 | 0.62 | 0.73 | 0.83 | 1.04 | 1.24 | - | - | |
| FMR 5000 | 16 | 40 | 64 | 24 | 0.76 | 1.52 | 1.52 | 2.28 | 2.66 | 3.04 | 3.81 | 4.57 | 6.11 | - | |
| | 16 | 50 | 84 | 34 | 0.54 | 1.07 | 1.07 | 1.61 | 1.88 | 2.15 | 2.69 | 3.22 | 4.30 | - | |
| | 16 | 63 | 110 | 47 | 0.39 | 0.78 | 0.78 | 1.16 | 1.36 | 1.55 | 1.94 | 2.33 | 3.11 | - | |
| | 16 | 80 | 144 | 64 | 0.29 | 0.57 | 0.57 | 0.86 | 1.00 | 1.14 | 1.43 | 1.71 | 2.28 | - | |
| | 16 | 100 | 184 | 84 | 0.22 | 0.43 | 0.43 | 0.65 | 0.76 | 0.87 | 1.09 | 1.30 | 1.74 | - | |
| | 16 | 125 | 234 | 109 | 0.17 | 0.33 | 0.33 | 0.50 | 0.59 | 0.67 | 0.84 | 1.00 | 1.34 | - | |
| FMR 6000 | 20 | 50 | 80 | 30 | 0.61 | 1.22 | 1.22 | 1.83 | 2.13 | 2.43 | 3.04 | 3.65 | 4.88 | 6.11 | |
| | 20 | 63 | 106 | 43 | 0.42 | 0.85 | 0.85 | 1.27 | 1.49 | 1.70 | 2.12 | 2.55 | 3.40 | 4.25 | |
| | 20 | 80 | 140 | 60 | 0.30 | 0.61 | 0.61 | 0.91 | 1.06 | 1.22 | 1.52 | 1.83 | 2.43 | 3.04 | |
| | 20 | 100 | 180 | 80 | 0.23 | 0.46 | 0.46 | 0.68 | 0.80 | 0.91 | 1.14 | 1.37 | 1.83 | 2.28 | |
| | 20 | 125 | 230 | 105 | 0.17 | 0.35 | 0.35 | 0.52 | 0.61 | 0.70 | 0.87 | 1.04 | 1.39 | 1.74 | |
| | 20 | 160 | 300 | 140 | 0.13 | 0.26 | 0.26 | 0.39 | 0.46 | 0.52 | 0.65 | 0.78 | 1.04 | 1.30 | |



Helical cutting technical data - ØDH Max

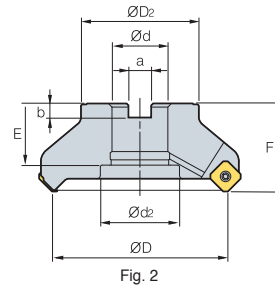
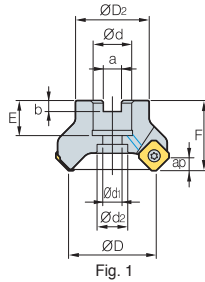


- ϕD = Tool Dia.(mm), ϕDH Min, Max = Min, Max diameter(mm)
- ϕd = Tool Path (mm)
- ϕDH Min(Min diameter) = $\phi D \times 2$ - Insert size, ϕDH Max(Max diameter) = $\phi D \times 2 - 2$
- ϕd (tool path) = ϕDH Min, Max - ϕD

| Section | Insert | Tool Dia. | ØDH Max | Ød | Ramping angle (α°) | | | | | | | | | | |
|----------|--------|-----------|---------|-----|----------------------------------|------|------|------|------|------|------|------|------|------|--|
| | | | | | ap | | | | | | | | | | |
| | | | | | 1 | 2 | 2.5 | 3 | 3.5 | 4 | 5 | 6 | 8 | | |
| FMR 1000 | 5 | 08 | 14 | 6 | 3.04 | 6.11 | 7.65 | - | - | - | - | - | - | - | |
| | 5 | 10 | 18 | 8 | 2.28 | 4.57 | 5.72 | - | - | - | - | - | - | - | |
| | 5 | 12 | 22 | 10 | 1.83 | 3.65 | 4.57 | - | - | - | - | - | - | - | |
| | 5 | 15 | 28 | 13 | 1.40 | 2.81 | 3.51 | - | - | - | - | - | - | - | |
| FMR 1500 | 6 | 10 | 18 | 8 | 2.28 | 4.57 | 5.72 | 6.88 | - | - | - | - | - | - | |
| | 6 | 12 | 22 | 10 | 1.83 | 3.65 | 4.57 | 5.49 | - | - | - | - | - | - | |
| | 6 | 16 | 30 | 14 | 1.30 | 2.61 | 3.26 | 3.92 | - | - | - | - | - | - | |
| | 6 | 20 | 38 | 18 | 1.01 | 2.03 | 2.54 | 3.04 | - | - | - | - | - | - | |
| FMR 2000 | 7 | 15 | 28 | 13 | 1.40 | 2.81 | 3.51 | 4.22 | 4.92 | - | - | - | - | - | |
| | 7 | 20 | 38 | 18 | 1.01 | 2.03 | 2.54 | 3.04 | 3.55 | - | - | - | - | - | |
| FMR 2500 | 8 | 16 | 30 | 14 | 1.30 | 2.61 | 3.26 | 3.92 | 4.57 | 5.23 | - | - | - | - | |
| | 8 | 20 | 38 | 18 | 1.01 | 2.03 | 2.54 | 3.04 | 3.55 | 4.06 | - | - | - | - | |
| | 8 | 25 | 48 | 23 | 0.79 | 1.59 | 1.98 | 2.38 | 2.78 | 3.18 | - | - | - | - | |
| FMR 3000 | 10 | 25 | 48 | 23 | 0.79 | 1.59 | 1.98 | 2.38 | 2.78 | 3.18 | 3.97 | - | - | - | |
| | 10 | 32 | 62 | 30 | 0.61 | 1.22 | 1.52 | 1.83 | 2.13 | 2.43 | 3.04 | - | - | - | |
| | 10 | 40 | 78 | 38 | 0.48 | 0.96 | 1.20 | 1.44 | 1.68 | 1.92 | 2.40 | - | - | - | |
| | 10 | 50 | 98 | 48 | 0.38 | 0.76 | 0.95 | 1.14 | 1.33 | 1.52 | 1.90 | - | - | - | |
| | 10 | 63 | 124 | 61 | 0.30 | 0.60 | 0.75 | 0.90 | 1.05 | 1.20 | 1.50 | - | - | - | |
| | 10 | 80 | 158 | 78 | 0.23 | 0.47 | 0.58 | 0.70 | 0.82 | 0.94 | 1.17 | - | - | - | |
| | 10 | 100 | 198 | 98 | 0.19 | 0.37 | 0.47 | 0.56 | 0.65 | 0.74 | 0.93 | - | - | - | |
| FMR 4000 | 12 | 32 | 62 | 30 | 0.61 | 1.22 | 1.52 | 1.83 | 2.13 | 2.43 | 3.04 | 3.65 | - | - | |
| | 12 | 40 | 78 | 38 | 0.48 | 0.96 | 1.20 | 1.44 | 1.68 | 1.92 | 2.40 | 2.88 | - | - | |
| | 12 | 50 | 98 | 48 | 0.38 | 0.76 | 0.95 | 1.14 | 1.33 | 1.52 | 1.90 | 2.28 | - | - | |
| | 12 | 63 | 124 | 61 | 0.30 | 0.60 | 0.75 | 0.90 | 1.05 | 1.20 | 1.50 | 1.80 | - | - | |
| | 12 | 80 | 158 | 78 | 0.23 | 0.47 | 0.58 | 0.70 | 0.82 | 0.94 | 1.17 | 1.40 | - | - | |
| | 12 | 100 | 198 | 98 | 0.19 | 0.37 | 0.47 | 0.56 | 0.65 | 0.74 | 0.93 | 1.12 | - | - | |
| | 12 | 125 | 248 | 123 | 0.15 | 0.30 | 0.37 | 0.45 | 0.52 | 0.59 | 0.74 | 0.89 | - | - | |
| FMR 5000 | 16 | 40 | 78 | 38 | 0.48 | 0.96 | 1.20 | 1.44 | 1.68 | 1.92 | 2.40 | 2.88 | 3.85 | - | |
| | 16 | 50 | 98 | 48 | 0.38 | 0.76 | 0.95 | 1.14 | 1.33 | 1.52 | 1.90 | 2.28 | 3.04 | - | |
| | 16 | 63 | 124 | 61 | 0.30 | 0.60 | 0.75 | 0.90 | 1.05 | 1.20 | 1.50 | 1.80 | 2.39 | - | |
| | 16 | 80 | 158 | 78 | 0.23 | 0.47 | 0.58 | 0.70 | 0.82 | 0.94 | 1.17 | 1.40 | 1.87 | - | |
| | 16 | 100 | 198 | 98 | 0.19 | 0.37 | 0.47 | 0.56 | 0.65 | 0.74 | 0.93 | 1.12 | 1.49 | - | |
| | 16 | 125 | 248 | 123 | 0.15 | 0.30 | 0.37 | 0.45 | 0.52 | 0.59 | 0.74 | 0.89 | 1.19 | - | |
| FMR 6000 | 20 | 50 | 98 | 48 | 0.38 | 0.76 | 0.95 | 1.14 | 1.33 | 1.52 | 1.90 | 2.28 | 3.04 | 3.81 | |
| | 20 | 63 | 124 | 61 | 0.30 | 0.60 | 0.75 | 0.90 | 1.05 | 1.20 | 1.50 | 1.80 | 2.39 | 2.99 | |
| | 20 | 80 | 158 | 78 | 0.23 | 0.47 | 0.58 | 0.70 | 0.82 | 0.94 | 1.17 | 1.40 | 1.87 | 2.34 | |
| | 20 | 100 | 198 | 98 | 0.19 | 0.37 | 0.47 | 0.56 | 0.65 | 0.74 | 0.93 | 1.12 | 1.49 | 1.86 | |
| | 20 | 125 | 248 | 123 | 0.15 | 0.30 | 0.37 | 0.45 | 0.52 | 0.59 | 0.74 | 0.89 | 1.19 | 1.48 | |
| | 20 | 160 | 318 | 158 | 0.12 | 0.23 | 0.29 | 0.35 | 0.40 | 0.46 | 0.58 | 0.69 | 0.92 | 1.16 | |



FMAC(M)3000



• AR : 21°
• RR : -17°~12°

| Designation | | ⊙ | øD | øD ₂ | ød | a | b | E | F | ød ₁ | ød ₂ | ap | kg | Fig. |
|-------------|----------|----|-----|-----------------|-----------|------------|-------|----------|----|-----------------|-----------------|-----|----------|------|
| FMAC(M) | 3050HR | 4 | 50 | 42 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 17.5 | 4.0 | 0.4 | 1 |
| | 3050HR-H | 6 | 50 | 42 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 17.5 | 4.0 | 0.4 | 1 |
| | 3063HR | 5 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 17.5 | 4.0 | 0.5 | 1 |
| | 3063HR-H | 8 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 17.5 | 4.0 | 0.6 | 1 |
| | 3080HR | 6 | 80 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(23) | 50 | 14 | 20 | 4.0 | 1.1 | 1 |
| | 3080HR-H | 10 | 80 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(23) | 50 | 14 | 20 | 4.0 | 1.2 | 1 |
| | 3100HR | 7 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 35(25.5) | 50 | (18) | 45(26) | 4.0 | 1.7 | 2(1) |
| | 3100HR-H | 12 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 35(25.5) | 50 | (18) | 45(26) | 4.0 | 1.7 | 2(1) |
| | 3125HR | 8 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 42(29) | 63 | (22) | 55(32) | 4.0 | 3.3(3.5) | 2(1) |
| | 3125HR-H | 14 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 42(29) | 63 | (22) | 55(32) | 4.0 | 3.3(3.5) | 2(1) |

(mm)

• () Metric Size

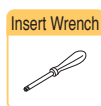
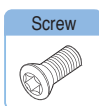
Available Inserts

| SEET-MF | SEET-MM | SEET-MA | SEXT-MF | SEXT-MM | SEXT-MR | SEEW | SEEW-W | | | | | | | | | | | |
|------------------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|--------|------|----------|-----|------|-----|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | page | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A | ST20 |
| SEET 0903AGFN-MA | | | | | | | | | | | | | | | | | | |
| SEET 0903AGSN-MF | ● | | | | | | ● | | | | | | | ● | | | | |
| SEET 0903AGSN-MM | ● | | | | ● | | | | | | | | | | | | | |
| SEXT 0903AGSN-MF | | | | | ● | ● | | | | | | | | | | | | |
| SEXT 0903AGSN-MM | | | | ● | ● | ● | | | | | | | | | | | | |
| SEXT 0903AGSN-MR | | | | | | | | | | | | | | | | | | |
| SEEW 0903AGTN | | | | | | | | | | | | | ● | | | | | |

Available Arbors

| Designation | ød | NC Arbors |
|------------------|-------|---------------------|
| FMAC(M) 3050HR-□ | 22 | BT□□-FMC22-□□ |
| 3063HR-□ | | |
| 3080HR-□ | 25.4 | BT□□-FMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ |
| 3100HR-□ | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |
| 3125HR-□ | 38.1 | BT□□-FMA38.1-□□ |
| | 40 | BT□□-FMB / FMC40-□□ |

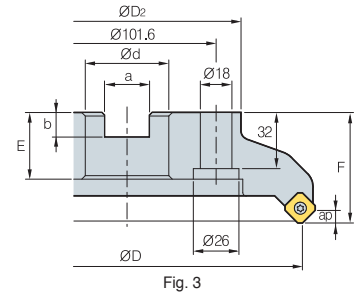
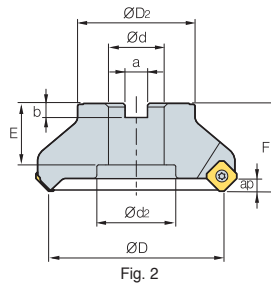
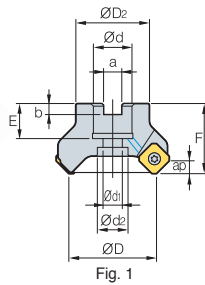
Parts



FTKA0307

TW09S

FMAC(M) 4000



• AR : 21°
• RR : -17°~12°

(mm)

| Designation | | ØD | ØD ₂ | Ød | a | b | E | F | Ød ₁ | Ød ₂ | ap | | Fig. |
|----------------|----|-----|-----------------|------------|------------|-------|--------|--------|-----------------|-----------------|-----|--------|------|
| FMAC(M) 4050HR | 3 | 50 | 42 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 6.5 | 0.4 | 1 |
| 4063HR | 4 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 6.5 | 0.6 | 1 |
| 4063HR-M | 5 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 6.5 | 0.6 | 1 |
| 4063HR-H | 6 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 6.5 | 0.6 | 1 |
| 4080HR | 5 | 80 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(23) | 50 | 14 | 20 | 6.5 | 1.1 | 1 |
| 4080HR-M | 6 | 80 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(23) | 50 | 14 | 20 | 6.5 | 1.1 | 1 |
| 4080HR-H | 8 | 80 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(23) | 50 | 18 | 20 | 6.5 | 1.1 | 1 |
| 4100HR | 5 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 33(25) | 63(50) | 18 | 26 | 6.5 | 2(1.6) | 1 |
| 4100HR-M | 7 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 33(25) | 63(50) | 18 | 26 | 6.5 | 2(1.6) | 1 |
| 4100HR-H | 10 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 33(25) | 63(50) | 18 | 26 | 6.5 | 2(1.6) | 1 |
| 4125HR | 6 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 35(29) | 63 | 22 | 32 | 6.5 | 3.1 | 1 |
| 4125HR-M | 8 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 35(29) | 63 | 22 | 32 | 6.5 | 3.1 | 1 |
| 4125HR-H | 12 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 35(29) | 63 | 22 | 32 | 6.5 | 3.1 | 1 |
| 4160R | 7 | 160 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(35) | 63 | - | - | 6.5 | 4.8 | 2 |
| 4160R-M | 10 | 160 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(35) | 63 | - | - | 6.5 | 4.8 | 2 |
| 4160R-H | 16 | 160 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(35) | 63 | - | - | 6.5 | 4.8 | 2 |
| 4200R | 8 | 200 | 130 | 47.625(60) | 25.4(25.7) | 14 | 38(32) | 63 | - | - | 6.5 | 6.1 | 3 |
| 4200R-M | 12 | 200 | 130 | 47.625(60) | 25.4(25.7) | 14 | 38(32) | 63 | - | - | 6.5 | 6.1 | 3 |
| 4200R-H | 18 | 200 | 130 | 47.625(60) | 25.4(25.7) | 14 | 38(32) | 63 | - | - | 6.5 | 6.1 | 3 |

• () Metric Size

Available Inserts



| Designation | Coated | | | | | | Cermet | | Uncoated | | | page | | | | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|--------|------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC9330 | PC6510 | PC215K | PD2000 | CN2000 | | CN30 | CN30 | H01 | G10 | ST30A |
| SEET 14M4AGFN-MA | | | | | | | | | | | | | | | | | |
| 14M4AGSN-MF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 14M4AGSN-MM | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| SEXT 14M4AGSN-MF | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 14M4AGSN-MM | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| 14M4AGSN-MR | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • | • |
| SEEW 14M4AGTN | | | | | | | | | | | | | | | | | |
| 14M4AGFN-W | | | | | | | | | | | | | | | | | |
| 14M4AGSN-W | | | | | | | | | | | | | | | | | |
| 14M4AGTN-W | | | | | | | | | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|------------------|--------|---------------------|
| FMAC(M) 4050HR-□ | 22 | BT□□-FMC22-□□ |
| 4063HR-□ | 22 | BT□□-FMC22-□□ |
| 4080HR-□ | 25.4 | BT□□-FMA25.4-□□ |
| 4100HR-□ | 27 | BT□□-FMC27-□□ |
| 4100HR-□ | 31.75 | BT□□-FMA31.75-□□ |
| 4125HR-□ | 32 | BT□□-FMC32-□□ |
| 4125HR-□ | 38.1 | BT□□-FMA38.1-□□ |
| 4125HR-□ | 40 | BT□□-FMB40-□□ |
| 4160R-□ | 50.8 | BT□□-FMA50.8-□□ |
| 4160R-□ | 40 | BT□□-FMB / FMC40-□□ |
| 4200R-□ | 47.625 | BT□□-FMA47.625-□□ |
| 4200R-□ | 60 | BT□□-FMB60-□□ |

Parts



FTGA03512 SS42SAF SHXN0509F TW15S HW35L

Available Inserts E15, E16

Available Arbors and bolt E290~E292

• Stock item

FMAC(M) 3000-A

(Aluminum body)

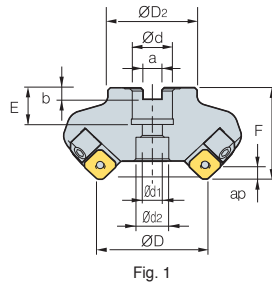


Fig. 1

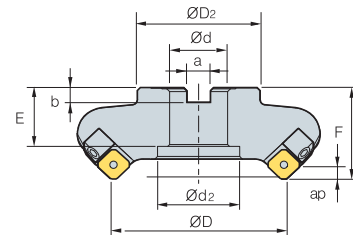


Fig. 2



AA
45°

• AR : 21°
• RR : -16°~12°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | a | b | E | F | $\varnothing d_1$ | $\varnothing d_2$ | ap | | Fig. |
|-----------------|---|-----------------|-------------------|-----------------|------------|-------|----|----|-------------------|-------------------|----|-----|------|
| FMAC(M) 3063R-A | 3 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 4 | 0.5 | 1 |
| 3080R-A | 4 | 80 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25 | 50 | 13.5 | 20 | 4 | 0.6 | 1 |
| 3100R-A | 5 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32 | 50 | - | 45 | 4 | 0.8 | 2 |
| 3100R-25.4-A | 5 | 100 | 67 | 25.4 | 9.5 | 6 | 25 | 50 | - | 38 | 4 | 0.9 | 2 |
| 3125R-A | 6 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38 | 63 | - | 56 | 4 | 1.6 | 2 |
| 3125R-25.4-A | 6 | 125 | 70 | 25.4 | 9.5 | 6 | 25 | 63 | - | 38 | 4 | 1.7 | 2 |

• () Metric Size

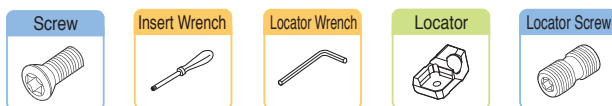
Available Inserts

| | SEET-MF | SEET-MM | SEET-MA | SEXT-MF | SEXT-MM | SEXT-MR | SEEW | | | | | | | | | | | |
|------------------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|----------|------|------|-----|-------|------|------------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| SEET 0903AGFN-MA | | | | | | | | | | | | | | ● | | | | E15 E16 |
| 0903AGSN-MF | ● | | | | | | ● | | | | | | | | | | | |
| 0903AGSN-MM | ● | | | | ● | | | | | | | | | | | | | |
| SEXT 0903AGSN-MF | | | | | ● | ● | | | | | | | | | | | | |
| 0903AGSN-MM | | | | ● | ● | ● | | ● | ● | | | | | | | | | |
| 0903AGSN-MR | | | | | | | | | | | | | | | | | | |
| SEEW 0903AGTN | | | | | | | | | | | | | ● | | | | | |

Available Arbors

| Designation | $\varnothing d$ | NC Arbors |
|-----------------|-----------------|------------------|
| FMAC(M) 3063R-□ | 22 | BT□□-FMC22-□□ |
| 3080R-□ | 25.4 | BT□□-FMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ |
| 3100R-□ | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |
| 3125R-□ | 38.1 | BT□□-FMA38.1-□□ |
| | 40 | BT□□-FMB40-□□ |

Parts



FTKA0307

TW09S

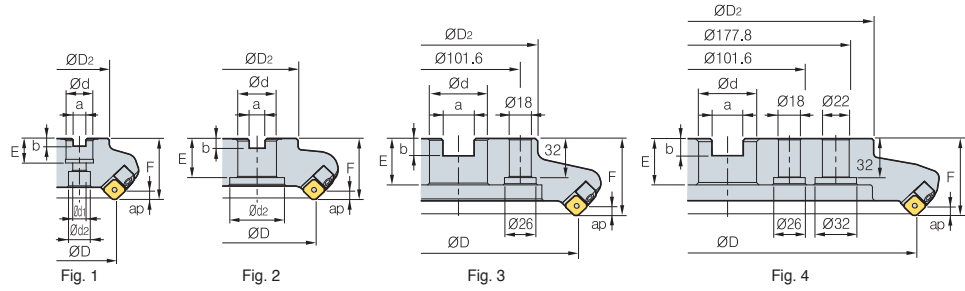
HW30L

LFMA3R-A

DHA620

FMAC(M)4000-A

(Aluminum body)



AA
45°
• AR : 21°
• RR : -16°~12°

| Designation | | ØD | ØD ₂ | Ød | a | b | E | F | Ød ₁ | Ød ₂ | ap | | Fig. |
|-----------------|----|-----|-----------------|------------|------------|--------|--------|----|-----------------|-----------------|-----|-----|------|
| FMAC(M) 4063R-A | 3 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 18 | 6.5 | 0.6 | 1 |
| 4080R-A | 4 | 80 | 67 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 13.5 | 20 | 6.5 | 0.8 | 1 |
| 4100R-A | 5 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32 | 50 | - | 45 | 6.5 | 1.1 | 2 |
| 4100R-25.4-A | 5 | 100 | 67 | 25.4 | 9.5 | 6 | 25 | 50 | - | 38 | 6.5 | 1.2 | 2 |
| 4125R-A | 6 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(35) | 63 | - | 56 | 6.5 | 1.7 | 2 |
| 4125R-25.4-A | 6 | 125 | 70 | 25.4 | 9.5 | 6 | 25 | 63 | - | 38 | 6.5 | 1.8 | 2 |
| 4160R-A | 7 | 160 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(35) | 63 | - | 75 | 6.5 | 2.5 | 2 |
| 4200R-A | 8 | 200 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(32) | 63 | - | - | 6.5 | 3.2 | 3 |
| 4250R-A | 10 | 250 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38 | 63 | - | - | 6.5 | 4.1 | 3 |
| 4315R-A | 12 | 315 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38 | 63 | - | - | 6.5 | 6.7 | 4 |

Note) Through coolant type between Ø50~Ø125

() Metric Size

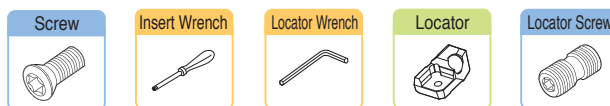
Available Inserts

| SEET-MF | SEET-MM | SEET-MA | SEXT-MF | | | | | | | | | | | | | | | | |
|------------------|---------|---------|---------|--------|--------|--------|----------|--------|--------|--------|--------|------|------|-----|-----|-------|------|--|--|
| | | | | | | | | | | | | | | | | | | | |
| SEXT-MM | SEXT-MR | SEEW | SEEW-W | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | Cermet | | Uncoated | | page | | | | | | | | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC9530 | PC6510 | PD215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | SI30A | ST20 | | |
| SEET 14M4AGFN-MA | | | | | | | | | | | | | | | | | | | |
| 14M4AGSN-MF | ● | ● | | ● | ● | | | | | | | | | | | | | | |
| 14M4AGSN-MM | ● | ● | | ● | ● | | | | | | | | | | | | | | |
| SEXT 14M4AGSN-MF | ● | | | ● | ● | | | | | | | | | | | | | | |
| 14M4AGSN-MM | ● | | | ● | ● | | | | | | | | | | | | | | |
| 14M4AGSN-MR | ● | | ● | ● | ● | | | | | | | | | | | | | | |
| SEEW 14M4AGTN | | | | | | | | | | | | | ● | | | | | | |
| 14M4AGFN-W | | | | | | | | | | | | | | | | | | | |
| 14M4AGSN-W | | | | | | | | | | | | | | | | | | | |
| 14M4AGTN-W | | | | | | | | | | | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|-----------------|--------|---------------------|
| FMAC(M) 4063R-□ | 22 | BT□□-FMC22-□□ |
| 4080R-□ | 25.4 | BT□□-FMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ |
| 4100R-□ | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |
| 4125R-□ | 38.1 | BT□□-FMA38.1-□□ |
| | 40 | BT□□-FMB40-□□ |
| 4160R-□ | 50.8 | BT□□-FMA50.8-□□ |
| | 40 | BT□□-FMB / FMC40-□□ |
| 4200R-□ | 47.625 | BT□□-FMA47.625-□□ |
| 4250R-□ | 60 | BT□□-FMB60-□□ |
| 4315R-□ | 60 | BT□□-FMB60-□□ |

Parts



FTGA03512 TW15S HW40L LFMA4R-A DHA0830

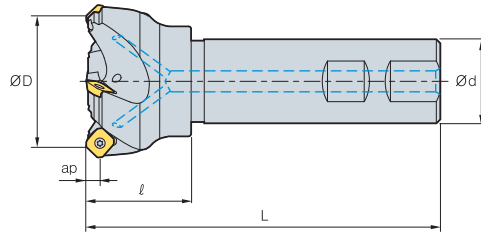
Available Inserts E15, E16

Available Arbors and bolt E290~E292

● : Stock item



FMAS3000



• AR : 23°
• RR : -17°~13°

| Designation | | | ØD | Ød | l | L | ap | |
|-------------|------------|---|----|----|----|-----|----|-----|
| FMAS | 3025HR | 2 | 25 | 25 | 35 | 115 | 4 | 0.4 |
| | 3032HR | 3 | 32 | 25 | 40 | 125 | 4 | 0.5 |
| | 3032HR-S32 | 3 | 32 | 32 | 40 | 130 | 4 | 0.8 |
| | 3040HR | 3 | 40 | 32 | 40 | 130 | 4 | 0.9 |
| | 3040HR-S40 | 3 | 40 | 40 | 40 | 140 | 4 | 1.3 |
| | 3040HR-S42 | 3 | 40 | 42 | 40 | 140 | 4 | 1.4 |
| | 3050HR | 4 | 50 | 32 | 40 | 135 | 4 | 1 |
| | 3050HR-S40 | 4 | 50 | 40 | 40 | 140 | 4 | 1.3 |
| | 3050HR-S42 | 4 | 50 | 42 | 40 | 140 | 4 | 1.5 |
| | 3063HR | 5 | 63 | 32 | 45 | 135 | 4 | 1.2 |
| | 3063HR-S40 | 5 | 63 | 40 | 45 | 145 | 4 | 1.6 |
| | 3063HR-S42 | 5 | 63 | 42 | 45 | 145 | 4 | 1.7 |

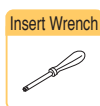
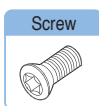
(mm)

• () Metric Size

Available Inserts

| | SEET-MF | SEET-MM | SEET-MA | SEXT-MF | SEXT-MM | SEXT-MR | SEEW | SEEW-W | | | | | | | | | | |
|------------------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|------|----------|-----|-----|------|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5345 | PC9530 | PC6510 | PC215K | Pd2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SEET 0903AGFN-MA | | | | | | | | | | | | | | | | | | |
| SEET 0903AGSN-MF | ● | | | | | | | | | | | | | | | | | |
| SEET 0903AGSN-MM | ● | | | | ● | | | | | | | | | | | | | |
| SEXT 0903AGSN-MF | | | | | ● | ● | | | | | | | | | | | | |
| SEXT 0903AGSN-MM | | | | ● | ● | ● | | ● | ● | | | | | | | | | |
| SEXT 0903AGSN-MR | | | | | | | | | | | | | | | | | | |
| SEEW 0903AGTN | | | | | | | | | | | | ● | | | | | | |

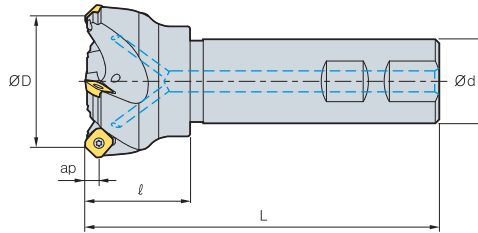
Parts



FTKA0307

TW09S

FMAS4000



• AR : 23°
• RR : -17°~13°

(mm)

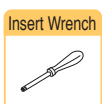
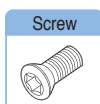
| Designation | | ØD | Ød | ℓ | L | ap | |
|-------------|---|----|----|----|-----|-----|------|
| FMAS 4050HR | 3 | 50 | 32 | 45 | 135 | 6.5 | 1 |
| 4050HR-S40 | 3 | 50 | 40 | 45 | 135 | 6.5 | 1.3 |
| 4050HR-S42 | 3 | 50 | 42 | 45 | 135 | 6.5 | 1.45 |
| 4063HR | 4 | 63 | 32 | 45 | 135 | 6.5 | 1.2 |
| 4063HR-S40 | 4 | 63 | 40 | 45 | 135 | 6.5 | 1.5 |
| 4063HR-S42 | 4 | 63 | 42 | 45 | 135 | 6.5 | 1.6 |

• () Metric Size

Available Inserts

| | SEET-MF | SEET-MM | SEET-MA | SEXT-MF | SEXT-MM | SEXT-MR | SEEW | SEEW-W | | | |
|-------------|-------------|---------|---------|----------|---------|---------|--------|--------|--------|------|--------|
| | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | page | |
| | NCM625 | NCM635 | NC5330 | PC3500 | PC5300 | PC5445 | PC9530 | PC6510 | PC215K | | PD2000 |
| SEET | Cermet | | | | | | | | | E15 | |
| | CN2000 | CN20 | CN30 | Uncoated | | | H01 | G10 | ST30A | | ST20 |
| 14M4AGFN-MA | | | | | | | | | | | |
| 14M4AGSN-MF | ● | ● | | | ● | | | | | ● | |
| 14M4AGSN-MM | ● | ● | | ● | ● | | | | | | |
| SEXT | 14M4AGSN-MF | ● | | ● | ● | ● | | | | | |
| 14M4AGSN-MM | ● | ● | | ● | ● | ● | | | | | |
| 14M4AGSN-MR | ● | | | ● | ● | | | | | | |
| SEEW | 14M4AGTN | | | | | ● | | | | ● | |
| 14M4AGFN-W | | | | | | | | | | | |
| 14M4AGSN-W | | | | | | | | | | | |
| 14M4AGTN-W | | | | | | | | | | | |

Parts



FTGA03512

SS42SAF

SHXN0509F

TW15S

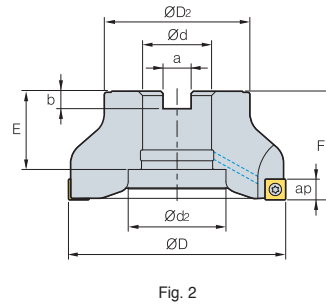
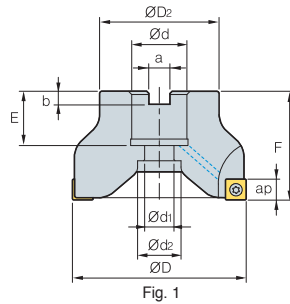
HW35L

Available Inserts E15, E16

● : Stock item



FMPC(M) 3000



• AR : 10°
• RR : -9°~8°

(mm)

| Designation | | ØD | ØD ₂ | Ød | a | b | E | F | Ød ₁ | Ød ₂ | ap | | Fig. |
|----------------|---|-----|-----------------|-----------|------------|------|--------|----|-----------------|-----------------|----|-----|------|
| FMPC(M) 3050HS | 5 | 50 | 40 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 7 | 0.3 | 1 |
| 3063HS | 6 | 63 | 40 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 18 | 7 | 0.5 | 1 |
| 3080HS | 7 | 80 | 55 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 14 | 20 | 7 | 1.0 | 1 |
| 3100HS | 8 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 36(26) | 50 | 18 | 45(26) | 7 | 1.5 | 2(1) |

• () Metric Size

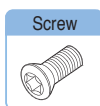
Available Inserts

| | SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA | | | | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SDET 09M402R-MA | | | | | | | | | | ● | | | | | | | | |
| 09M405R-MF | | | | | | | | | | | | | | | | | | |
| 09M405R-MM | | | | | | | | | | | | | | | | | | |
| SDXT 09M405R-MF | ● | ● | | | ● | ● | | | | | | | | | | | | |
| 09M405L-MF | | | | | | | | | | | | | | | | | | |
| 09M405R-MM | ● | ● | | | ● | ● | | | | | | | | | | | | |
| 09M405L-MM | | | | | | | | | | | | | | | | | | |
| 09M405R-MA | | | | | | | | | | | | | | ● | | | | |

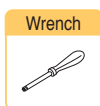
Available Arbors

| Designation | Ød | NC Arbors |
|----------------|-------|------------------|
| FMPC(M) 3050HS | 22 | BT□□-FMC22-□□ |
| 3063HS | | BT□□-FMA25.4-□□ |
| 3080HS | 25.4 | BT□□-FMC27-□□ |
| 3100HS | 27 | BT□□-FMA31.75-□□ |
| | 31.75 | BT□□-FMC32-□□ |
| | 32 | |

Parts

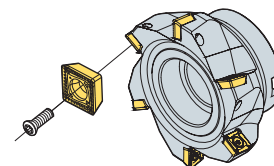


FTGA03508



TW15S

Assembling



FMPC(M) 4000

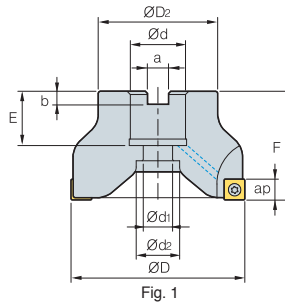


Fig. 1



AA 90°
 • AR : 10°
 • RR : -9°~8°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | a | b | E | F | $\varnothing d_1$ | $\varnothing d_2$ | ap | | Fig. |
|----------------|---|-----------------|-------------------|-----------------|------------|-------|--------|--------|-------------------|-------------------|----|----------|------|
| FMPC(M) 4063HS | 5 | 63 | 49 | 22 | 10.4 | 6.3 | 20(20) | 50(50) | 11 | 18 | 11 | 0.4 | 1 |
| 4080HS | 6 | 80 | 57 | 25.4(27) | 9.5(12.4) | 6(7) | 25(23) | 50(50) | 14 | 20 | 11 | 0.9 | 1 |
| 4100HS | 7 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 33(25) | 63(50) | 18 | 26 | 11 | 1.9(1.5) | 1 |
| 4125HS | 8 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 35(29) | 63 | 22 | 32 | 11 | 3.1 | 1 |

• () Metric Size

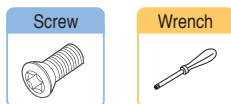
Available Inserts

| | SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA | | | | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | page | | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A | ST20 |
| SDET 130504R-MA | | | | | | | | | | | | | | | | | | |
| 130508R-MF | | | | | | | | | | | | | | ● | | | | |
| 130508R-MM | | | | | | | | | | | | | | | | | | |
| SDXT 130508R-MF | ● | ● | | | ● | ● | | | ● | ● | | | | | | | | |
| 130508R-MM | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 130538-MM | | | | | | | | | | | | | | | | | | |
| 130508R-MA | | | | | | | | | | | | | | ● | | | | |

Available Arbors

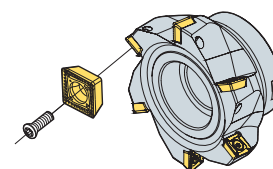
| Designation | $\varnothing d$ | NC Arbors |
|----------------|-----------------|----------------------|
| FMPC(M) 4063HS | 22 | BT □□-FMC22-□□ |
| 4080HS | 25.4 | BT □□-FMA25.4-□□ |
| | 27 | BT □□-FMC27-□□ |
| 4100HS | 31.75 | BT □□-FMA31.75-□□ |
| | 32 | BT □□-FMC32-□□ |
| 4125HS | 38.1 | BT □□-FMA38.1-□□ |
| | 40 | BT □□-FMB / FMC40-□□ |

Parts



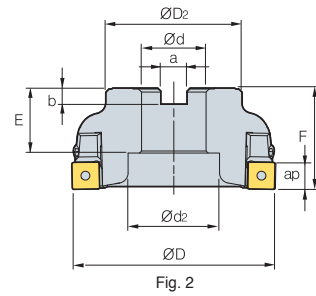
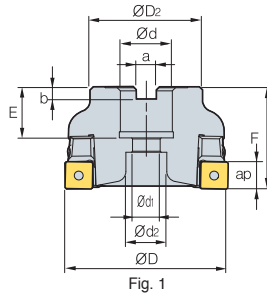
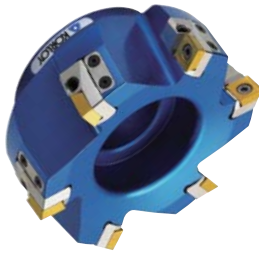
FTNC04511 TW20S

Assembling



FMPC(M)3000-A

(Aluminum Body)



• AR : 10°
• RR : -9°~-7.3°

(mm)

| Designation | | øD | øD ₂ | ød | a | b | E | F | ød ₁ | ød ₂ | ap | | Fig. |
|-----------------|---|-----|-----------------|-----------|------------|------|--------|----|-----------------|-----------------|----|-----|------|
| FMPC(M) 3063S-A | 3 | 63 | 40 | 22 | 10.4 | 6.3 | 20 | 40 | 11.0 | 18 | 4 | 0.2 | 1 |
| 3080S-A | 4 | 80 | 55 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 13.5 | 20 | 4 | 0.4 | 1 |
| 3100S-A | 5 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32 | 50 | - | 45 | 4 | 0.6 | 2 |
| 3100S-25.4-A | 5 | 100 | 67 | 25.4 | 9.5 | 6 | 25 | 50 | - | 38 | 4 | 0.7 | 2 |

• () Metric Size

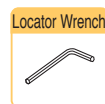
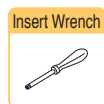
Available Inserts

| | SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA | | | | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|----------|--------|--------|--------|--------|------|------|-----|-----|-------|------|--|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | Cermet | | | Uncoated | | | | page | | | | | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| SDET 09M402R-MA | | | | | | | | | | ● | | | | ● | | | | |
| 09M405R-MF | | | | | | | | | | | | | | | | | | |
| 09M405R-MM | | | | | | | | | | | | | | | | | | |
| SDXT 09M405R-MF | ● | ● | | | ● | ● | | ● | ● | | | | | | | | | |
| 09M405L-MF | | | | | | | | | | | | | | | | | | |
| 09M405R-MM | ● | ● | | ● | ● | ● | | ● | ● | | | | | | | | | |
| 09M405L-MM | | | | | | | | | | | | | | | | | | |
| 09M405R-MA | | | | | | | | | | | | | | | | | | |

Available Arbors

| Designation | ød | NC Arbors |
|-----------------|-------|---------------------|
| FMPC(M) 3063S-□ | 22 | BT□□-FMC22-□□ |
| 3080S-□ | 25.4 | BT□□-FMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ |
| 3100S-□ | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |
| 3125S-□ | 38.1 | BT□□-FMA38.1-□□ |
| | 40 | BT□□-FMB / FMC40-□□ |

Parts



| | | | | | | | |
|-------------------|-----------|-------|-------|----------|---------|--------------|----------|
| 3063S-A | FTGA03508 | TW15S | HW30L | LFMP3R-A | DHA0624 | CFMP3R14R1-A | PXMA0306 |
| 3080S-A ~ 3100S-A | FTGA03508 | TW15S | HW30L | LFMP3R-A | DHA0624 | CFMP3R-A | PXMA0306 |

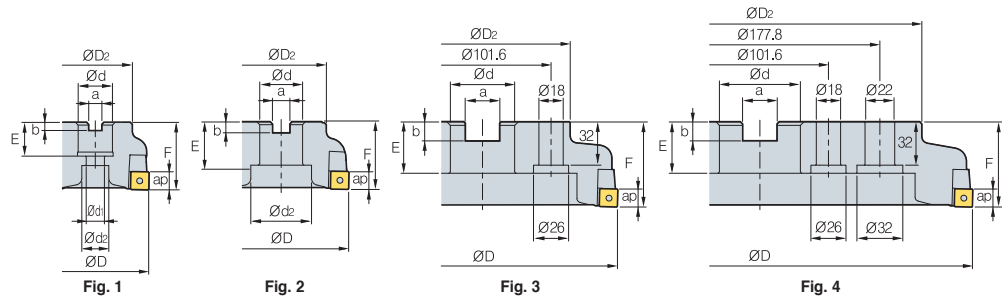
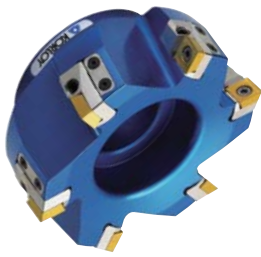
Available Inserts E13, E14, E15

Available Arbors and bolt E290~E292

● : Stock item

FMPC(M) 4000-A

(Aluminum Body)



• AR : 10°
• RR : -9°~7.3°

(mm)

| Designation | | øD | øD ₂ | ød | a | b | E | F | ød ₁ | ød ₂ | ap | | Fig. |
|-----------------|----|-----|-----------------|------------|------------|--------|--------|----|-----------------|-----------------|-----|-----|------|
| FMPC(M) 4063S-A | 3 | 63 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 18 | 6.5 | 0.6 | 1 |
| 4080S-A | 4 | 80 | 67 | 25.4(27) | 9.5(12.4) | 6(7) | 25(22) | 50 | 13.5 | 20 | 6.5 | 0.8 | 1 |
| 4100S-A | 5 | 100 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32 | 50 | - | 45 | 6.5 | 1.1 | 2 |
| 4100S-25.4-A | 5 | 100 | 67 | 25.4 | 9.5 | 6 | 25 | 50 | - | 38 | 6.5 | 1.2 | 2 |
| 4125S-A | 6 | 125 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 38(35) | 63 | - | 56 | 6.5 | 1.7 | 2 |
| 4125S-25.4-A | 6 | 125 | 70 | 25.4 | 9.5 | 6 | 25 | 63 | - | 38 | 6.5 | 1.8 | 2 |
| 4160S-A | 8 | 160 | 107 | 50.8(40) | 19.0(16.4) | 11(9) | 38(35) | 63 | - | 75 | 6.5 | 2.5 | 2 |
| 4200S-A | 10 | 200 | 130 | 47.625(60) | 25.4(25.7) | 14(14) | 38(32) | 63 | - | - | 6.5 | 3.2 | 3 |
| 4250S-A | 12 | 250 | 180 | 47.625(60) | 25.4(25.7) | 14(14) | 38 | 63 | - | - | 6.5 | 4.1 | 3 |
| 4315S-A | 15 | 315 | 240 | 47.625(60) | 25.4(25.7) | 14(14) | 38 | 63 | - | - | 6.5 | 6.7 | 4 |

• () Metric Size

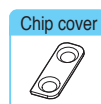
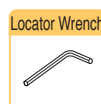
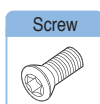
Available Inserts

| | | SDET-MF | SDET-MM | SDET-MA | | | | | | | | | | | | | |
|-------------|------------|---------|---------|---------|--------|--------|--------|--------|--------|----------|--------|------|------|------|-----|-----|-------|
| | | | | | | | | | | | | | | | | | |
| | | SDXT-MF | SDXT-MM | SDXT-MA | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| Designation | | Coated | | | | | | Cermet | | Uncoated | | page | | | | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9550 | PC6510 | PD2000 | CN2000 | | CN20 | CN30 | H01 | G10 | ST30A |
| SDET | 130504R-MA | | | | | | | | | | | | | | | | |
| | 130508R-MF | | | | | | | | | | | | | | | | |
| | 130508R-MM | | | | | | | | | | | | | | | | |
| SDXT | 130508R-MF | ● | ● | | ● | ● | | | | | | | | | | | |
| | 130508R-MM | ● | ● | | ● | ● | ● | ● | | | | | | | | | |
| | 130538-MM | | | | | | | | | | | | | | | | |
| | 130508R-MA | | | | | | | | | | | | | | | | |

Available Arbors

| Designation | ød | NC Arbors |
|-----------------|--------|---------------------|
| FMPC(M) 4063S-□ | 22 | BT□□-FMC22-□□ |
| 4080S-□ | 25.4 | BT□□-FMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ |
| 4100S-□ | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |
| 4125S-□ | 38.1 | BT□□-FMA38.1-□□ |
| | 40 | BT□□-FMB40-□□ |
| 4160S-□ | 50.8 | BT□□-FMA50.8-□□ |
| | 40 | BT□□-FMB / FMC40-□□ |
| 4200S-□ | 47.625 | BT□□-FMA47.625-□□ |
| 4250S-□ | 60 | BT□□-FMB60-□□ |
| 4315S-□ | 60 | BT□□-FMB60-□□ |

Parts



| | | | | | | | |
|-------------------|-----------|-------|-------|-----------|---------|--------------|----------|
| 4063S-A ~ 4080S-A | FTNC04509 | TW20S | HW40L | LFMP4R1-A | DHA0825 | CFMP3R14R1-A | PXMA0306 |
| 4100S-A ~ 4315S-A | FTNC04509 | TW20S | HW40L | LFMP4R-A | DHA0830 | CFMP4R-A | PXMA0306 |

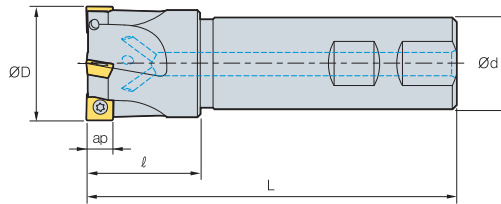
Available Inserts E13, E14, E15

Available Arbors and bolt E290~E292

● : Stock item



FMPS3000

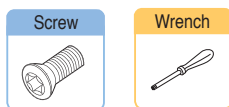


| Designation | | | ØD | ød | ℓ | L | ap | |
|-------------|------------|---|----|----|----|-----|----|-----|
| FMPS | 3025HS | 2 | 25 | 25 | 35 | 115 | 7 | 0.4 |
| | 3032HS | 3 | 32 | 25 | 40 | 125 | 7 | 0.5 |
| | 3040HS | 4 | 40 | 32 | 40 | 130 | 7 | 0.8 |
| | 3040HS-S40 | 4 | 40 | 40 | 45 | 140 | 7 | 1.2 |
| | 3040HS-S42 | 4 | 40 | 42 | 45 | 140 | 7 | 1.3 |
| | 3050HS | 5 | 50 | 32 | 40 | 135 | 7 | 1 |
| | 3050HS-S40 | 5 | 50 | 40 | 40 | 140 | 7 | 1.3 |
| | 3050HS-S42 | 5 | 50 | 42 | 40 | 140 | 7 | 1.4 |
| | 3063HS | 6 | 63 | 32 | 45 | 135 | 7 | 1.2 |
| | 3063HS-S40 | 6 | 63 | 40 | 45 | 145 | 7 | 1.6 |
| | 3063HS-S42 | 6 | 63 | 42 | 45 | 145 | 7 | 1.7 |

Available Inserts

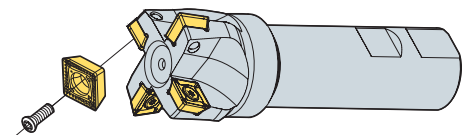
| | | SDET-MF | | SDET-MM | | SDET-MA | | SDXT-MF | | SDXT-MM | | SDXT-MA | | | | | | |
|-------------|------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|----------|------|-----|------|-----|-------------------|
| | | | | | | | | | | | | | | | | | | |
| Designation | | Coated | | | | | | | | Cermet | | | Uncoated | | | page | | |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| SDET | 09M402R-MA | | | | | | | | | ● | | | | ● | | | | E13 E14 E15 |
| | 09M405R-MF | | | | | | | | | | | | | | | | | |
| | 09M405R-MM | | | | | | | | | | | | | | | | | |
| SDXT | 09M405R-MF | ● | ● | | | ● | ● | | ● | ● | | | | | | | | |
| | 09M405L-MF | | | | | | | | | | | | | | | | | |
| | 09M405R-MM | ● | ● | | ● | ● | | | ● | ● | | | | | | | | |
| | 09M405L-MM | | | | | | | | | | | | | | | | | |
| 09M405R-MA | | | | | | | | | | | | | | | | | | |

Parts

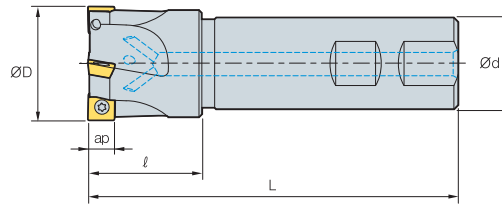


FTGA03508 TW15S

Assembling



FMPS4000

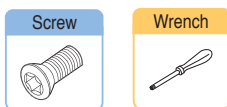


| Designation | | | øD | ød | l | L | ap | |
|-------------|------------|----|----|----|-----|-----|-----|-----|
| FMPS | 4040HS | 3 | 40 | 32 | 40 | 130 | 11 | 1 |
| | 4040HS-S40 | 3 | 40 | 40 | 40 | 140 | 11 | 1.3 |
| | 4040HS-S42 | 3 | 40 | 42 | 40 | 140 | 11 | 1.4 |
| | 4050HS | 4 | 50 | 32 | 45 | 135 | 11 | 1.5 |
| | 4050HS-S40 | 4 | 50 | 40 | 45 | 145 | 11 | 1.7 |
| | 4050HS-S42 | 4 | 50 | 42 | 45 | 145 | 11 | 1.6 |
| | 4063HS | 5 | 63 | 32 | 45 | 135 | 11 | 2.1 |
| | 4063HS-S40 | 5 | 63 | 40 | 45 | 145 | 11 | 2.4 |
| 4063HS-S42 | 5 | 63 | 42 | 45 | 145 | 11 | 2.6 | |

Available Inserts

| | SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA | | | | | | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|-------------------|
| | | | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| SDET 130504R-MA | | | | | | | | | | | | | | ● | | | | E13 E14 E15 |
| 130508R-MF | | | | | | | | | | | | | | | | | | |
| 130508R-MM | | | | | | | | | | | | | | | | | | |
| SDXT 130508R-MF | ● | ● | | | ● | ● | | ● | ● | | | | | | | | | |
| 130508R-MM | ● | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| 130538-MM | | | | | | | | | | | | | | | | | | |
| 130508R-MA | | | | | | | | | | | | | | ● | | | | |

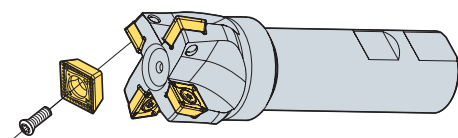
Parts



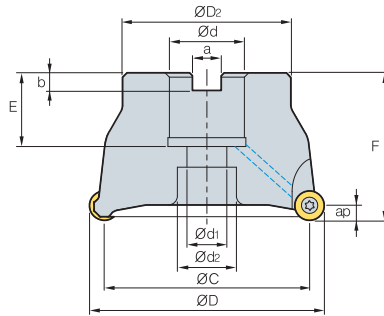
FTNC04511

TW20S

Assembling



FMRC(M)3000



• AR : 5°
• RR : -5°

(mm)

| Designation | | øD | øC | øD2 | ød | a | b | E | F | ød1 | ød2 | ap | |
|-----------------|---|-----|----|-----|-----------|------------|--------|--------|--------|-----|------|-----|------|
| FMRC(M) 3040HRD | 3 | 40 | 30 | 36 | 16 | 8.4 | 5.6 | 18 | 40 | 9 | 14 | 5.0 | 0.2 |
| 3040HRD-H | 4 | 40 | 30 | 36 | 16 | 8.4 | 5.6 | 18 | 40 | 9 | 14 | 5.0 | 0.2 |
| 3050HRD | 4 | 50 | 40 | 42 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 16.5 | 5.0 | 0.3 |
| 3050HRD-H | 5 | 50 | 40 | 42 | 22 | 10.4 | 6.3 | 20 | 40 | 11 | 16.5 | 5.0 | 0.3 |
| 3063HRD | 5 | 63 | 53 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 16.5 | 5.0 | 0.64 |
| 3063HRD-H | 6 | 63 | 53 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 16.5 | 5.0 | 0.64 |
| 3080HRD | 6 | 80 | 70 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(22) | 50(50) | 14 | 19 | 5.0 | 1.1 |
| 3080HRD-H | 7 | 80 | 70 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(22) | 50(50) | 14 | 19 | 5.0 | 1.1 |
| 3100HRD | 7 | 100 | 90 | 67 | 31.75(32) | 12.7(14.4) | 8(8.0) | 32(28) | 63(63) | 18 | 26 | 5.0 | 2.1 |
| 3100HRD-H | 8 | 100 | 90 | 67 | 31.75(32) | 12.7(14.4) | 8(8.0) | 32(28) | 63(63) | 18 | 26 | 5.0 | 2.1 |

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63

• () Metric Size

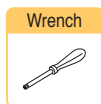
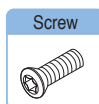
Available Inserts

| Designation | RDKT-MF | | | RDKT-MM | | | | | | RDCT-MA | | | | page | | | | |
|----------------|---------|--------|--------|---------|--------|--------|--------|--------|--------|---------|--------|------|------|------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A | ST20 |
| RDCT 10T3M0-MA | | | | | | | | | | | | | | | | | | E12 |
| RDCT 10T3M0-MF | | | | | | | | | | | | | | | | | | E13 |
| 10T3M0-MM | | | | | | | | | | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|-----------------|-------|-----------------------|
| FMRC(M) 3040HRD | 16 | BT□□-FMC16-□□ |
| 3040HRD-H | | |
| 3050HRD | | |
| 3050HRD-H | 22 | BT□□-FMC22-□□ |
| 3063HRD | | |
| 3063HRD-H | | |
| 3080HRD | 25.4 | BT□□-FMA / FMB25.4-□□ |
| 3080HRD-H | 27 | BT□□-FMB / FMC27-□□ |
| 3100HRD | 31.75 | BT□□-FMA31.75-□□ |
| 3100HRD-H | 32 | BT□□-FMC32-□□ |

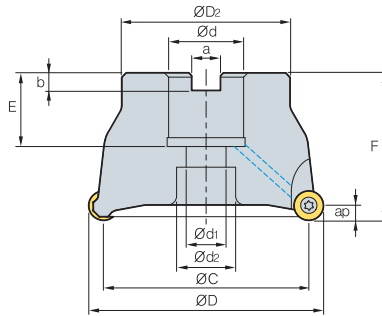
Parts



FTGA03508

TW15S

FMRC(M)4000



• AR : 5°
• RR : -5°

(mm)

| Designation | | ØD | ØC | ØD2 | Ød | a | b | E | F | Ød1 | Ød2 | ap | |
|-----------------|---|-----|-----|-----|-----------|------------|---------|--------|--------|-----|-----|-----|----------|
| FMRC(M) 4050HRD | 4 | 50 | 38 | 42 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 18 | 6.0 | 0.4 |
| 4063HRD | 4 | 63 | 51 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 18 | 6.0 | 0.6 |
| 4063HRD-M | 5 | 63 | 51 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 18 | 6.0 | 0.6 |
| 4080HRD | 5 | 80 | 68 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(23) | 50(50) | 14 | 20 | 6.0 | 1.0 |
| 4080HRD-M | 6 | 80 | 68 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(23) | 50(50) | 14 | 20 | 6.0 | 1.0 |
| 4100HRD | 6 | 100 | 88 | 67 | 31.75(32) | 12.7(14.4) | 8(8.0) | 33(25) | 63(50) | 18 | 26 | 6.0 | 1.9(1.5) |
| 4100HRD-M | 7 | 100 | 88 | 67 | 31.75(32) | 12.7(14.4) | 8(8.0) | 33(25) | 63(50) | 18 | 26 | 6.0 | 1.9(1.5) |
| 4125HRD | 7 | 125 | 113 | 87 | 38.1(40) | 15.9(16.4) | 10(9.0) | 35(29) | 63(63) | 22 | 32 | 6.0 | 3.0 |
| 4125HRD-M | 8 | 125 | 113 | 87 | 38.1(40) | 15.9(16.4) | 10(9.0) | 35(29) | 63(63) | 22 | 32 | 6.0 | 3.0 |

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63

• () Metric Size

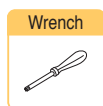
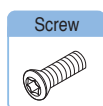
Available Inserts

| Designation | RDKT-MF | | | RDKT-MM | | | | | | RDCT-MA | | | | page | | | | |
|----------------|---------|--------|--------|---------|--------|--------|--------|--------|--------|---------|--------|------|------|------|-----|-----|-------|------|
| | NCM925 | NCM835 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A | ST20 |
| RDCT 1204M0-MA | | | | | | | | | | | | | | ● | | | | E12 |
| RDKT 1204M0-MF | | | | ● | ● | ● | ● | | | | | | | | | | | E13 |
| 1204M0-MM | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | |

Available Arbors

| Designation | Ød | NC Arbors |
|-----------------|-------|-----------------------|
| FMRC(M) 4050HRD | | |
| 4063HRD | 22 | BT□□-FMC22-□□ |
| 4063HRD-M | | |
| 4080HRD | 25.4 | BT□□-FMA / FMB25.4-□□ |
| 4080HRD-M | 27 | BT□□-FMB / FMC27-□□ |
| 4100HRD | 31.75 | BT□□-FMA31.75-□□ |
| 4100HRD-M | 32 | BT□□-FMC32-□□ |
| 4125HRD | 38.1 | BT□□-FMA / FMB38.1-□□ |
| 4125HRD-M | 40 | BT□□-FMB / FMC40-□□ |

Parts



FTKA0410

TW15S

Available Inserts E12, E13

Available Arbors and bolt E290~E292

• : Stock item

Milling

E

FMRC(M)5000

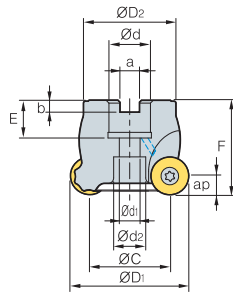


Fig. 1

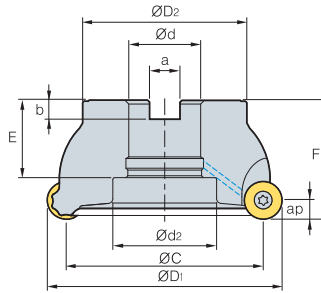


Fig. 2

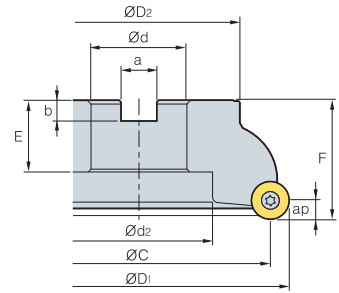


Fig. 3



- AR : 5°
- RR : -5°

(mm)

| Designation | ØD | ØC | ØD2 | Ød | a | b | E | F | Ød1 | Ød2 | ap | kg | Fig. | |
|-----------------|----|-----|-----|----|-----------|------------|--------|--------|--------|-----|------|-----|----------|---|
| FMRC(M) 5050HRD | 3 | 50 | 34 | 42 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 16.5 | 8.0 | 0.4 | 1 |
| 5063HRD | 4 | 63 | 47 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 18 | 8.0 | 0.6 | 1 |
| 5063HRD-H | 5 | 63 | 47 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 18 | 8.0 | 0.6 | 1 |
| 5080HRD | 5 | 80 | 64 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(23) | 50(50) | 14 | 20 | 8.0 | 0.9 | 1 |
| 5080HRD-H | 6 | 80 | 64 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(23) | 50(50) | 14 | 20 | 8.0 | 0.9 | 1 |
| 5100HRD | 6 | 100 | 84 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 33(25) | 63(50) | 18 | 26 | 8.0 | 1.9(1.4) | 1 |
| 5100HRD-H | 7 | 100 | 84 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 33(25) | 63(50) | 18 | 26 | 8.0 | 1.9(1.4) | 1 |
| 5125HRD | 7 | 125 | 109 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 35(29) | 63(63) | 22 | 32 | 8.0 | 3 | 1 |
| 5125HRD-H | 8 | 125 | 109 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 35(29) | 63(63) | 22 | 32 | 8.0 | 3 | 1 |

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40-Ø63 - Ø160 is not inner coolant

• () Metric Size

Available Inserts

RDHW-E,F,S

RDKT-MM



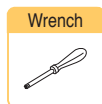
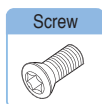
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| RDHW 1605M0E | | | | | | | | | | | | | | | | | |
| 1605M0F | | | | | | | | | | | | | | | | | |
| 1605M0S | | | | | | | | | | | | | | | | | |
| RDKT 1605M0-MM | | | | • | | • | | | | | | | | | | | |
| 1605M0-ML | | | | | | | | | | | | | | | | | |

E13

Available Arbors

| Designation | Ød | NC Arbors |
|-----------------|-------|-----------------------|
| FMRC(M) 5050HRD | 22 | BT□□-FMC22-□□ |
| 5063HRD | | |
| 5063HRD-H | | |
| 5080HRD | 25.4 | BT□□-FMA / FMB25.4-□□ |
| 5080HRD-H | 27 | BT□□-FMB / FMC27-□□ |
| 5100HRD | 31.75 | BT□□-FMA31.75-□□ |
| 5100HRD-H | 32 | BT□□-FMC32-□□ |
| 5125HRD | 38.1 | BT□□-FMA / FMB38.1-□□ |
| 5125HRD-H | 40 | BT□□-FMB / FMC40-□□ |

Parts



FTGA0513-P

TW20-100

FMRC(M)6000

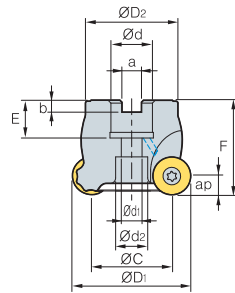


Fig. 1

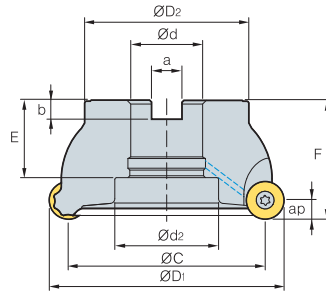


Fig. 2

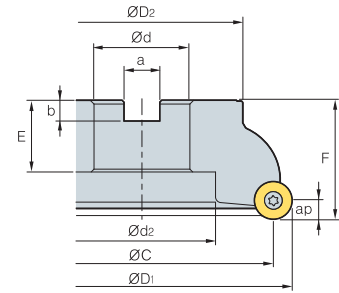


Fig. 3



• AR : 5°
• RR : -5°

(mm)

| Designation | | ØD | ØC | ØD2 | Ød | a | b | E | F | Ød1 | Ød2 | ap | | Fig. |
|-----------------|---|-----|-----|-----|-----------|------------|--------|--------|----|-------|--------|------|----------|------|
| FMRC(M) 6063HRD | 3 | 63 | 43 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 17 | 10.0 | 0.5 | 1 |
| 6063HRD-M | 4 | 63 | 43 | 49 | 22 | 10.4 | 6.3 | 20 | 50 | 11 | 17 | 10.0 | 0.5 | 1 |
| 6080HRD | 4 | 80 | 60 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(22) | 50 | 14 | 20 | 10.0 | 0.8 | 1 |
| 6080HRD-M | 5 | 80 | 60 | 57 | 25.4(27) | 9.5(12.4) | 6(7.0) | 25(22) | 50 | 14 | 20 | 10.0 | 0.8 | 1 |
| 6100HRD | 5 | 100 | 80 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 63 | 18 | 26 | 10.0 | 1.6 | 1 |
| 6100HRD-M | 6 | 100 | 80 | 67 | 31.75(32) | 12.7(14.4) | 8(8) | 32(28) | 63 | 18 | 26 | 10.0 | 1.6 | 1 |
| 6125HRD | 6 | 125 | 105 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 41(29) | 63 | -(22) | 55(32) | 10.0 | 2.7(2.9) | 2(1) |
| 6125HRD-M | 7 | 125 | 105 | 87 | 38.1(40) | 15.9(16.4) | 10(9) | 41(29) | 63 | -(22) | 55(32) | 10.0 | 2.7(2.9) | 2(1) |
| 6160RD | 7 | 160 | 140 | 107 | 50.8(40) | 19(16.4) | 11(9) | 38(35) | 63 | - | 78 | 10.0 | 4.4 | 3 |
| 6160RD-M | 8 | 160 | 140 | 107 | 50.8(40) | 19(16.4) | 11(9) | 38(35) | 63 | - | 78 | 10.0 | 4.4 | 3 |

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63 - Ø160 is not inner coolant

• () Metric Size

Available Inserts

RDHW-E,F,S

RDKT-MM



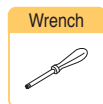
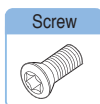
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|----------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|-------|--------|----------|------|-----|-----|------|-------|
| | NCM25 | NCM35 | NC530 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD200 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| RDHW 2006MOE | | | | | | | | | | | | | | | | | |
| 2006MOF | | | | | | | | | | | | | | | | | |
| 2006MOS | | | | | | | | | | | | | | | | | |
| RDKT 2006MO-MM | | | | ● | | ● | | | | | | | | | | | |

E13

Available Arbors

| Designation | Ød | NC Arbors |
|-----------------|-------|-----------------------|
| FMRC(M) 6063HRD | 22 | BT□□-FMC22-□□ |
| 6063HRD-M | | |
| 6080HRD | 25.4 | BT□□-FMA / FMB25.4-□□ |
| 6080HRD-M | 27 | BT□□-FMB / FMC27-□□ |
| 6100HRD | 31.75 | BT□□-FMA31.75-□□ |
| 6100HRD-M | 32 | BT□□-FMC32-□□ |
| 6125HRD | 38.1 | BT□□-FMA / FMB38.1-□□ |
| 6125HRD-M | 40 | BT□□-FMB / FMC40-□□ |
| 6160RD | 50.8 | BT□□-FMA50.8-□□ |
| 6160RD-M | 40 | BT□□-FMB / FMC40-□□ |

Parts



FTGA0515-P

TW20-100

FMRS1000/1500

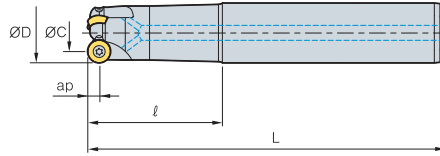


Fig. 1

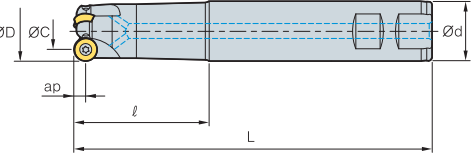


Fig. 2



- AR : 5°
- RR : -5°~1°

(mm)

| Designation | | $\varnothing D$ | $\varnothing C$ | $\varnothing d$ | ℓ | L | a_p | | Fig. | |
|-------------|-----------|-----------------|-----------------|-----------------|--------|-----|-------|-----|------|---|
| FMRS | 1008HRD-M | 1 | 8 | 5.5 | 10 | 30 | 80 | 2.5 | 0.2 | 1 |
| | 1008HRD-L | 1 | 8 | 5.5 | 10 | 50 | 100 | 2.5 | 0.2 | 1 |
| | 1010HRD-M | 2 | 10 | 5 | 12 | 44 | 100 | 2.5 | 0.2 | 1 |
| | 1010HRD-L | 2 | 10 | 5 | 12 | 64 | 120 | 2.5 | 0.2 | 1 |
| | 1012HRD-M | 2 | 12 | 7 | 12 | 44 | 100 | 2.5 | 0.3 | 1 |
| | 1012HRD-L | 2 | 12 | 7 | 16 | 80 | 160 | 2.5 | 0.3 | 1 |
| | 1015HRD-M | 3 | 15 | 10 | 16 | 80 | 160 | 2.5 | 0.3 | 1 |
| | 1015HRD-L | 3 | 15 | 10 | 16 | 100 | 200 | 2.5 | 0.4 | 1 |
| FMRS | 1510HRD-M | 1 | 10 | 6 | 12 | 44 | 100 | 3.0 | 0.2 | 1 |
| | 1510HRD-L | 1 | 10 | 6 | 12 | 64 | 120 | 3.0 | 0.2 | 1 |
| | 1512HRD-M | 2 | 12 | 6 | 12 | 54 | 110 | 3.0 | 0.3 | 1 |
| | 1512HRD-L | 2 | 12 | 6 | 16 | 80 | 160 | 3.0 | 0.3 | 1 |
| | 1516HRD-M | 3 | 16 | 10 | 16 | 60 | 130 | 3.0 | 0.3 | 1 |
| | 1516HRD-L | 3 | 16 | 10 | 20 | 90 | 180 | 3.0 | 0.4 | 1 |
| | 1520HRD-M | 3 | 20 | 14 | 20 | 80 | 150 | 3.0 | 0.4 | 1 |
| | 1520HRD-L | 3 | 20 | 14 | 20 | 90 | 200 | 3.0 | 0.5 | 1 |

Available Inserts

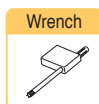
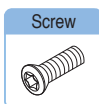
RDHW-E,F,S

RDKW



| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-----------|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 1000 type | RDHW 0501M0E | | | | | | | | | | | | | | | | | |
| | 0501M0F | | | | | | | | | | | | | | | | | |
| | 0501M0S | | | | | | | | | | | | | | | | | |
| 1500 type | RDKW 0501M0E | | | | | | | | | | | | | | | | | |
| | RDHW 06T1M0E | | | | | | | | | | | | | | | | | |
| | 06T1M0F | | | | | | | | | | | | | | | | | |
| | 06T1M0S | | | | | | | | | | | | | | | | | |
| | RDKW 06T1M0E | | | | | | | | | | | | | | | | | |

Parts



| | | |
|-----------|-----------|-------|
| 1000 type | FTNA0203 | TW06P |
| 1500 type | FTNA02205 | TW06P |

FMRS2000/2500

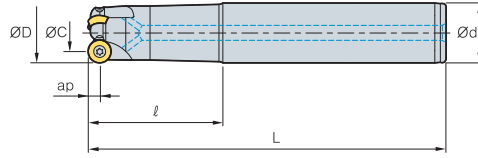


Fig. 1

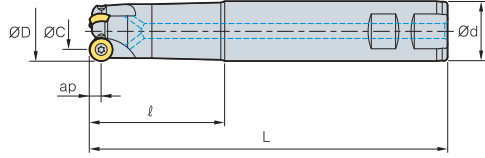


Fig. 2



• AR : 5°
• RR : -5°~1°

(mm)

| Designation | | | $\varnothing D$ | $\varnothing C$ | $\varnothing d$ | ℓ | L | ap | | Fig. |
|-------------|-----------|---|-----------------|-----------------|-----------------|--------|-----|-----|-----|------|
| FMRS | 2015HRD-S | 2 | 15 | 8 | 16 | 55 | 115 | 3.5 | 0.3 | 2 |
| | 2015HRD-M | 2 | 15 | 8 | 20 | 80 | 150 | 3.5 | 0.4 | 2 |
| | 2015HRD-L | 2 | 15 | 8 | 20 | 90 | 200 | 3.5 | 0.5 | 2 |
| | 2020HRD-S | 3 | 20 | 14 | 20 | 65 | 125 | 3.5 | 0.3 | 2 |
| | 2020HRD-M | 3 | 20 | 14 | 20 | 80 | 150 | 3.5 | 0.4 | 2 |
| | 2020HRD-L | 3 | 20 | 14 | 25 | 90 | 200 | 3.5 | 0.5 | 2 |
| FMRS | 2516HRD-S | 2 | 16 | 8 | 16 | 65 | 125 | 4.0 | 0.3 | 2 |
| | 2516HRD-M | 2 | 16 | 8 | 16 | 80 | 150 | 4.0 | 0.4 | 2 |
| | 2516HRD-L | 2 | 16 | 8 | 20 | 90 | 200 | 4.0 | 0.5 | 2 |
| | 2520HRD-S | 2 | 20 | 12 | 20 | 65 | 125 | 4.0 | 0.4 | 2 |
| | 2520HRD-M | 2 | 20 | 12 | 20 | 80 | 150 | 4.0 | 0.5 | 2 |
| | 2520HRD-L | 2 | 20 | 12 | 25 | 90 | 200 | 4.0 | 0.6 | 2 |
| | 2525HRD-S | 3 | 25 | 17 | 25 | 55 | 125 | 4.0 | 0.5 | 2 |
| | 2525HRD-M | 3 | 25 | 17 | 25 | 90 | 200 | 4.0 | 0.6 | 2 |
| | 2525HRD-L | 3 | 25 | 17 | 32 | 110 | 250 | 4.0 | 0.7 | 2 |

Available Inserts

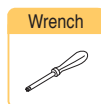
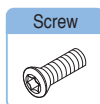
RDHW-E,F,S

RDKW



| Type | Designation | Coated | | | | | | | Cermet | | | Uncoated | | | | page | | |
|-----------|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|------|-----|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PB2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A |
| 2000 type | RDHW 0702M0E | | | | | | | ● | | | | | | | | | | |
| | 0702M0F | | | | | | | | | | | | | | | | | |
| | 0702M0S | | | | | | | | | | | | | | | | | |
| 2500 type | RDKW 0702M0E | | | | ● | | | ● | | | | | | | | | | |
| | RDHW 0803M0E | | | | | | | ● | | | | | | | | | | |
| | 0803M0F | | | | | | | | | | | | | | | | | |
| | 0803M0S | | | | | | | | | | | | | | | | | |
| | RDKW 0803M0E | | | | ● | | | | | | | | | | | | | |

Parts



| | | |
|-----------|---------------------|-------|
| 2000 type | FTNA02555 | TW07S |
| 2500 type | FTNA0305 | TW09S |
| | FTNA0306 (Ø20 Over) | |

FMRS3000

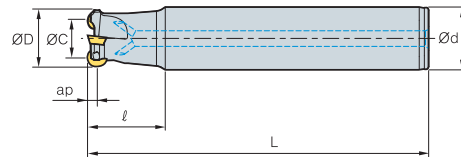


Fig. 1

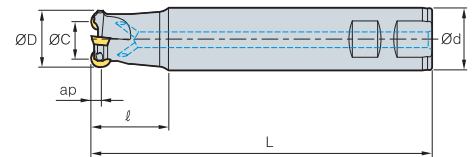


Fig. 2



- AR : 5°
- RR : -8°~5°

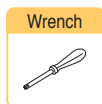
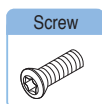
(mm)

| Designation | | $\varnothing D$ | $\varnothing C$ | $\varnothing d$ | ℓ | L | ap | | Fig. |
|----------------|---|-----------------|-----------------|-----------------|--------|-----|----|------|------|
| FMRS 3021HRD-M | 1 | 21 | 11 | 20 | 40 | 150 | 5 | 0.4 | 1 |
| 3021HRD-M2 | 2 | 21 | 11 | 20 | 40 | 150 | 5 | 0.4 | 1 |
| 3021HRD-L | 1 | 21 | 11 | 20 | 50 | 200 | 5 | 0.6 | 1 |
| 3021HRD-L2 | 2 | 21 | 11 | 20 | 50 | 200 | 5 | 0.6 | 1 |
| 3025HRD-S | 2 | 25 | 15 | 25 | 35 | 115 | 5 | 0.5 | 2 |
| 3025HRD-M | 2 | 25 | 15 | 25 | 70 | 200 | 5 | 0.7 | 1 |
| 3025HRD-L | 2 | 25 | 15 | 25 | 100 | 250 | 5 | 1 | 1 |
| 3026HRD-M | 2 | 26 | 16 | 25 | 70 | 200 | 5 | 0.65 | 1 |
| 3026HRD-L | 2 | 26 | 16 | 25 | 100 | 250 | 5 | 0.7 | 1 |
| 3032HRD-S | 3 | 32 | 22 | 32 | 40 | 125 | 5 | 1 | 2 |
| 3032HRD-M | 3 | 32 | 22 | 32 | 70 | 200 | 5 | 1.3 | 1 |
| 3032HRD-L | 3 | 32 | 22 | 32 | 150 | 300 | 5 | 1.6 | 1 |
| 3040HRD-S | 4 | 40 | 30 | 32 | 40 | 125 | 5 | 1.3 | 2 |
| 3040HRD-M | 4 | 40 | 30 | 32 | 70 | 200 | 5 | 1.5 | 1 |
| 3040HRD-L | 4 | 40 | 30 | 32 | 150 | 300 | 5 | 1.8 | 1 |

Available Inserts

| Designation | RDKT-MF | | | | RDKT-MM | | | | | RDCT-MA | | | | page | | | | |
|----------------|---------|--------|--------|--------|---------|--------|--------|--------|--------|---------|--------|--------|----------|------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | Coated | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | Cermet | Uncoated | | | | | |
| | | | | | | | | | | | | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 |
| RDCT 10T3M0-MA | | | | | | | | | | | | | | | ● | | | |
| RDKT 10T3M0-MF | | | | | ● | ● | ● | ● | | | | | | | | | | |
| 10T3M0-MM | ● | ● | | ● | ● | ● | ● | ● | | | | | | | | | | |

Parts



FTGA03508(07)

TW15S

FMRS4000

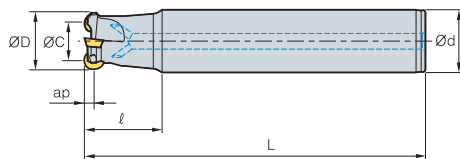


Fig. 1

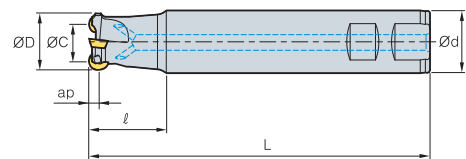


Fig. 2



• AR : 5°
• RR : -8°~5°

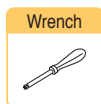
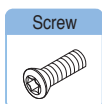
(mm)

| Designation | | ØD | ØC | Ød | ℓ | L | ap | | Fig. |
|----------------|---|----|----|----|-----|-----|----|-----|------|
| FMRS 4032HRD-S | 2 | 32 | 20 | 32 | 40 | 125 | 6 | 0.8 | 2 |
| 4032HRD-M | 2 | 32 | 20 | 32 | 70 | 200 | 6 | 1.1 | 1 |
| 4032HRD-L | 2 | 32 | 20 | 32 | 150 | 300 | 6 | 1.6 | 1 |
| 4033HRD-S | 2 | 33 | 21 | 32 | 40 | 125 | 6 | 0.9 | 2 |
| 4033HRD-M | 2 | 33 | 21 | 32 | 70 | 200 | 6 | 1.1 | 1 |
| 4033HRD-L | 2 | 33 | 21 | 32 | 150 | 300 | 6 | 1.7 | 1 |
| 4040HRD-S | 3 | 40 | 28 | 32 | 40 | 125 | 6 | 1 | 2 |
| 4040HRD-M | 3 | 40 | 28 | 32 | 70 | 200 | 6 | 1.6 | 1 |
| 4040HRD-L | 3 | 40 | 28 | 32 | 150 | 300 | 6 | 1.8 | 1 |
| 4040HRD-S40 | 3 | 40 | 28 | 40 | 40 | 125 | 6 | 1.3 | 2 |
| 4040HRD-M40 | 3 | 40 | 28 | 40 | 70 | 200 | 6 | 2 | 1 |
| 4040HRD-L40 | 3 | 40 | 28 | 40 | 150 | 300 | 6 | 2.4 | 1 |
| 4040HRD-S42 | 3 | 40 | 28 | 42 | 40 | 125 | 6 | 1.6 | 2 |
| 4040HRD-M42 | 3 | 40 | 28 | 42 | 70 | 200 | 6 | 2.4 | 1 |
| 4040HRD-L42 | 3 | 40 | 28 | 42 | 150 | 300 | 6 | 2.8 | 1 |
| 4050HRD-S | 4 | 50 | 38 | 42 | 50 | 125 | 6 | 1.5 | 2 |
| 4050HRD-M | 4 | 50 | 38 | 42 | 50 | 250 | 6 | 2.1 | 1 |
| 4050HRD-L | 4 | 50 | 38 | 42 | 50 | 300 | 6 | 2.7 | 1 |
| 4050HRD-S40 | 4 | 50 | 38 | 40 | 50 | 150 | 6 | 2 | 2 |
| 4050HRD-M40 | 4 | 50 | 38 | 40 | 50 | 250 | 6 | 2.6 | 1 |
| 4050HRD-L40 | 4 | 50 | 38 | 40 | 50 | 300 | 6 | 3.2 | 1 |

Available Inserts

| Designation | RDKT-MF | | | | RDKT-MM | | | | RDCT-MA | | | | page | | | | |
|----------------|---------|--------|--------|--------|---------|--------|--------|--------|---------|--------|--------|------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | | CN30 | H01 | G10 | ST30A |
| RDCT 1204M0-MA | | | | ● | ● | ● | ● | | | | | | | ● | | | |
| RDKT 1204M0-MF | | | | ● | ● | ● | ● | | | | | | | | | | |
| RDCT 1204M0-MM | ● | ● | | ● | ● | ● | ● | ● | | | | | | | | | |

Parts



FTKA0410

TW15S



FMRS5000

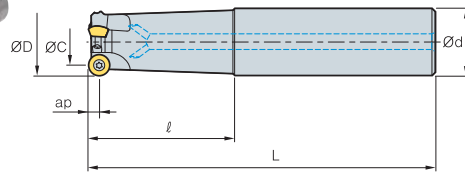


Fig. 1

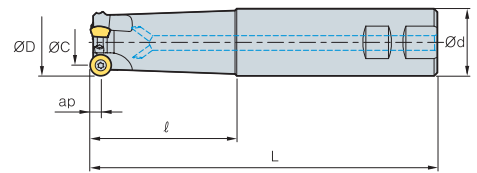


Fig. 2



- AR : 5°
- RR : -8°~5°

(mm)

| Designation | | $\varnothing D$ | $\varnothing C$ | $\varnothing d$ | ℓ | L | ap | | Fig. |
|----------------|---|-----------------|-----------------|-----------------|--------|-----|----|-----|------|
| FMRS 5040HRD-S | 2 | 40 | 24 | 32 | 40 | 125 | 8 | 1.4 | 2 |
| 5040HRD-M | 2 | 40 | 24 | 32 | 70 | 200 | 8 | 1.8 | 1 |
| 5040HRD-L | 2 | 40 | 24 | 32 | 150 | 300 | 8 | 2.0 | 1 |
| 5040HRD-S40 | 2 | 40 | 24 | 40 | 40 | 125 | 8 | 1.6 | 2 |
| 5040HRD-M40 | 2 | 40 | 24 | 40 | 70 | 200 | 8 | 2.0 | 1 |
| 5040HRD-L40 | 2 | 40 | 24 | 40 | 150 | 300 | 8 | 2.4 | 1 |
| 5040HRD-S42 | 2 | 40 | 24 | 42 | 40 | 125 | 8 | 2.0 | 2 |
| 5040HRD-M42 | 2 | 40 | 24 | 42 | 70 | 200 | 8 | 2.4 | 1 |
| 5040HRD-L42 | 2 | 40 | 24 | 42 | 150 | 300 | 8 | 2.8 | 1 |
| 5050HRD-S40 | 3 | 50 | 34 | 40 | 50 | 150 | 8 | 2.0 | 2 |
| 5050HRD-M40 | 3 | 50 | 34 | 40 | 50 | 250 | 8 | 2.4 | 1 |
| 5050HRD-L40 | 3 | 50 | 34 | 40 | 50 | 300 | 8 | 2.6 | 1 |
| 5050HRD-S | 3 | 50 | 34 | 42 | 50 | 150 | 8 | 1.5 | 2 |
| 5050HRD-M | 3 | 50 | 34 | 42 | 50 | 250 | 8 | 1.8 | 1 |
| 5050HRD-L | 3 | 50 | 34 | 42 | 50 | 300 | 8 | 2.0 | 1 |
| 5063HRD-S40 | 4 | 63 | 47 | 40 | 50 | 150 | 8 | 1.7 | 2 |
| 5063HRD-M40 | 4 | 63 | 47 | 40 | 50 | 250 | 8 | 2.0 | 1 |
| 5063HRD-L40 | 4 | 63 | 47 | 40 | 50 | 300 | 8 | 2.3 | 1 |
| 5063HRD-S | 4 | 63 | 47 | 42 | 50 | 150 | 8 | 1.6 | 2 |
| 5063HRD-M | 4 | 63 | 47 | 42 | 50 | 250 | 8 | 1.8 | 1 |
| 5063HRD-L | 4 | 63 | 47 | 42 | 50 | 300 | 8 | 2.0 | 1 |

Available Inserts

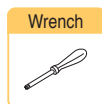
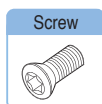
RDHW-E,F,S

RDKT-MM



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | page |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| RDHW 1605MOE | | | | | | | | | | | | | | | | | | |
| 1605MOF | | | | | | | | | | | | | | | | | | |
| 1605MOS | | | | | | | | | | | | | | | | | | |
| RDKT 1605M0-MM | | | | ● | | ● | | | | | | | | | | | | |
| 1605M0-ML | | | | | | | | | | | | | | | | | | |

Parts



FTGA0513-P

TW20-100

FMRS6000

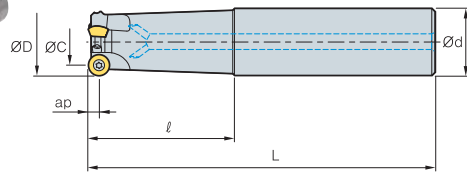


Fig. 1

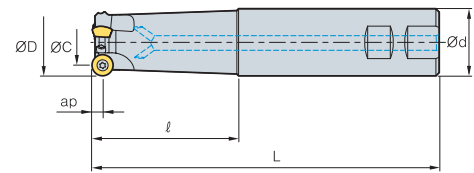


Fig. 2



• AR : 5°
• RR : -8°~-5°

(mm)

| Designation | | ØD | ØC | Ød | ℓ | L | ap | | Fig. | |
|-------------|-------------|----|----|----|----|----|-----|----|------|---|
| FMRS | 6050HRD-S40 | 3 | 50 | 31 | 40 | 50 | 150 | 10 | 1.3 | 2 |
| | 6050HRD-S42 | 3 | 50 | 31 | 42 | 50 | 150 | 10 | 1.4 | 2 |
| | 6050HRD-M40 | 3 | 50 | 31 | 40 | 50 | 250 | 10 | 2.2 | 1 |
| | 6050HRD-M42 | 3 | 50 | 31 | 42 | 50 | 250 | 10 | 2.4 | 1 |
| | 6050HRD-L40 | 3 | 50 | 31 | 40 | 50 | 300 | 10 | 2.7 | 1 |
| | 6050HRD-L42 | 3 | 50 | 31 | 42 | 50 | 300 | 10 | 3.0 | 1 |
| | 6063HRD-S40 | 4 | 63 | 44 | 40 | 50 | 150 | 10 | 1.5 | 2 |
| | 6063HRD-S42 | 4 | 63 | 44 | 42 | 50 | 150 | 10 | 1.6 | 2 |
| | 6063HRD-M40 | 4 | 63 | 44 | 40 | 50 | 250 | 10 | 2.5 | 1 |
| | 6063HRD-M42 | 4 | 63 | 44 | 42 | 50 | 250 | 10 | 2.7 | 1 |
| | 6063HRD-L40 | 4 | 63 | 44 | 40 | 50 | 300 | 10 | 3.0 | 1 |
| | 6063HRD-L42 | 4 | 63 | 44 | 42 | 50 | 300 | 10 | 3.2 | 1 |

Available Inserts

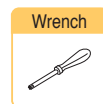
RDHW-E,F,S

RDKT-MM



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | page |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| RDHW 2006M0E | | | | | | | | | | | | | | | | | | E13 |
| 2006M0F | | | | | | | | | | | | | | | | | | |
| 2006M0S | | | | | | | | | | | | | | | | | | |
| RDKT 2006M0-MM | | | | ● | | ● | | | | | | | | | | | | |

Parts

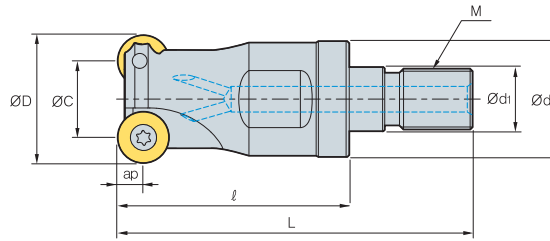


FTGA0515-P

TW20-100



FMRM1000/1500/2000/2500



• AR : 0°~5°
• RR : -5°~ -1°

(mm)

| Designation | | $\varnothing D$ | $\varnothing C$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | ap | |
|------------------|---|-----------------|-----------------|-----------------|-------------------|--------|----|-----|-----|------|
| FMRM 1008HRD-M06 | 1 | 8 | 5.5 | 9.5 | 6.5 | 25 | 40 | M06 | 2.5 | 0.02 |
| 1010HRD-M06 | 2 | 10 | 5 | 9.5 | 6.5 | 25 | 40 | M06 | 2.5 | 0.02 |
| 1012HRD-M06 | 2 | 12 | 7 | 11 | 6.5 | 25 | 40 | M06 | 2.5 | 0.02 |
| 1015HRD-M08 | 3 | 15 | 10 | 14.5 | 8.5 | 30 | 47 | M08 | 2.5 | 0.04 |
| FMRM 1510HRD-M06 | 1 | 10 | 7 | 9.5 | 6.5 | 25 | 40 | M06 | 3.0 | 0.02 |
| 1512HRD-M06 | 2 | 12 | 6 | 11 | 6.5 | 25 | 40 | M06 | 3.0 | 0.02 |
| 1516HRD-M08 | 3 | 16 | 10 | 14.5 | 8.5 | 30 | 47 | M08 | 3.0 | 0.02 |
| 1520HRD-M10 | 3 | 20 | 14 | 18 | 10.5 | 35 | 56 | M10 | 3.0 | 0.07 |
| FMRM 2015HRD-M08 | 2 | 15 | 8 | 14.5 | 8.5 | 30 | 47 | M08 | 3.5 | 0.04 |
| 2020HRD-M10 | 3 | 20 | 13 | 18 | 10.5 | 35 | 56 | M10 | 3.5 | 0.07 |
| FMRM 2516HRD-M08 | 2 | 16 | 8 | 14.5 | 8.5 | 30 | 47 | M08 | 4.0 | 0.04 |
| 2520HRD-M10 | 2 | 20 | 12 | 18 | 10.5 | 35 | 56 | M10 | 4.0 | 0.07 |
| 2525HRD-M12 | 3 | 25 | 17 | 22.5 | 12.5 | 45 | 69 | M12 | 4.0 | 0.13 |

Available Inserts

RDHW-E,F,S

RDKW



| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-----------|----------------------------------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM025 | NCM035 | NC630 | PC3500 | PC3300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 1000 type | RDHW 0501M0E,F,S RDKW 0501M0E | | | | | | | ● | | | | | | | | | | |
| 1500 type | RDHW 06T1M0E,F,S RDKW 06T1M0E | | | | | | | ● | | | | | | | | | | |
| 2000 type | RDHW 0702M0E.F.S RDKW 0702M0E | | | | | | | ● | | | | | | | | | | |
| 2500 type | RDHW 0803M0E,F,S RDKW 0803M0E | | | | | | | ● | | | | | | | | | | |

Available Adaptor

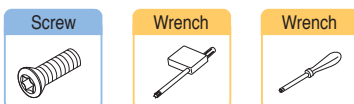
| Designation | Available Adaptor | Designation | Available Adaptor |
|------------------|-------------------|------------------|-------------------|
| FMRM 1008HRD-M06 | MAT - M06 | FMRM 1520HRD-M10 | MAT - M10 |
| 1010HRD-M06 | | FMRM 2015HRD-M08 | MAT - M08 |
| 1012HRD-M06 | | 2020HRD-M10 | MAT - M10 |
| 1015HRD-M08 | | FMRM 2516HRD-M08 | MAT - M08 |
| FMRM 1510HRD-M06 | MAT - M06 | 2520HRD-M10 | MAT - M10 |
| 1512HRD-M06 | | 2525HRD-M12 | MAT - M12 |
| 1515HRD-M08 | | | |

Designation : FMRM1008HRD-M06
Modular Head Threading Measure size(M06)

II

Adaptor Spec. : MAT-M06-020-S10S
Adaptor Threading Measure(M06)

Parts



| | | | |
|-----------|-----------|-------|-------|
| 1000 type | FTNA0203 | TW06P | - |
| 1500 type | FTNA02205 | TW06P | - |
| 2000 type | FTNA02555 | - | TW07S |
| 2500 type | FTNA0305 | - | TW09S |

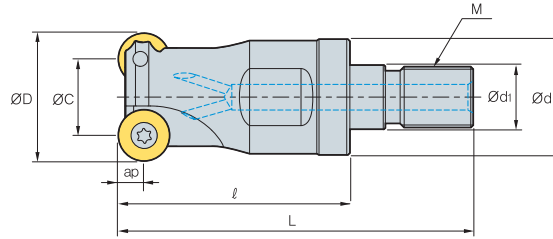
Available Inserts E12, E13

Available Adaptor E253~E254

● : Stock item



FMRM3000/4000/5000



• AR : 0°~5°
• RR : -8°~5°

(mm)

| Designation | | $\varnothing D$ | $\varnothing C$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | ap | |
|------------------|---|-----------------|-----------------|-----------------|-------------------|--------|----|-----|-----|------|
| FMRM 3021HRD-M10 | 2 | 21 | 11 | 18 | 10.5 | 35 | 56 | M10 | 5.0 | 0.1 |
| 3025HRD-M12 | 2 | 25 | 15 | 22.5 | 12.5 | 45 | 69 | M12 | 5.0 | 0.15 |
| 3032HRD-M16 | 3 | 32 | 22 | 29 | 17 | 50 | 77 | M16 | 5.0 | 0.2 |
| 3042HRD-M16 | 4 | 42 | 32 | 29 | 17 | 50 | 77 | M16 | 5.0 | 0.24 |
| FMRM 4025HRD-M12 | 2 | 25 | 13 | 22.5 | 12.5 | 45 | 69 | M12 | 6.0 | 0.12 |
| 4032HRD-M16 | 2 | 32 | 20 | 29 | 17 | 50 | 77 | M16 | 6.0 | 0.22 |
| 4040HRD-M16 | 3 | 40 | 28 | 29 | 17 | 50 | 77 | M16 | 6.0 | 0.23 |
| 4042HRD-M16 | 4 | 42 | 28 | 29 | 17 | 50 | 77 | M16 | 6.0 | 0.25 |
| FMRM 5040HRD-M16 | 2 | 40 | 24 | 29 | 17 | 50 | 77 | M16 | 8.0 | 0.25 |

Available Inserts

| | | RDHW-E,F,S | RDCT-MA | RDKT-MF | RDKT-MM | | | | | | | | | | | | |
|-----------|------------------|------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|
| | | | | | | | | | | | | | | | | | |
| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page |
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9630 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | |
| 3000 type | RDCT 10T3M0-MA | | | | | | | | | | | | | | | | |
| | RDKT 10T3M0-MF | | | | | • | • | • | | | | | | | | | |
| | 10T3M0-MM | • | • | | • | • | • | • | • | | | | | | | | |
| 4000 type | RDCT 1204M0-MA | | | | | | | | | | | | | | | | |
| | RDKT 1204M0-MF | | | | | • | • | • | • | | | | | | | | |
| | 1204M0-MM | • | • | • | • | • | • | • | • | | | | | | | | |
| 5000 type | RDHW 1605M0E,F,S | | | | | | | | | | | | | | | | |
| | RDKT 1605M0-MM | | | | | • | | • | | | | | | | | | |
| | 1605M0-ML | | | | | | | | | | | | | | | | |

Available Adoptor

| Designation | Available Adoptor | Designation | Available Adoptor |
|------------------|-------------------|------------------|-------------------|
| FMRM 3021HRD-M10 | MAT - M10 | FMRM 4025HRD-M12 | MAT - M12 |
| 3025HRD-M12 | MAT - M12 | 4032HRD-M16 | MAT - M16 |
| 3032HRD-M16 | MAT - M16 | 4040HRD-M16 | |
| 3042HRD-M16 | | 4042HRD-M16 | |
| | | FMRM 5040HRD-M16 | MAT - M16 |

Designation : FMRM1008HRD-M06
Modular Head Threading Measure size(M06)

||

Adaptor Spec. : MAT-M06-020-S10S
Adaptor Threading Measure(M06)



Parts



| | | |
|-----------|---------------|----------|
| 3000 type | FTGA03508(07) | TW15S |
| 4000 type | FTKA0410 | TW15S |
| 5000 type | FTGA0513-P | TW20-100 |

Available Inserts E12, E13 Available Adoptor E253~E254

• : Stock item

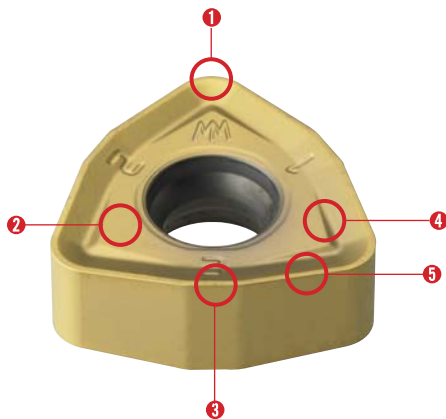
HRMD is more economical due to the use of 6 cutting edges compared to HRM tool with a 3 edge positive insert

HRMDouble

- HRMD is more economical due to the use of 6 cutting edges compared to HRM tool with a 3 edge positive insert
- High rake angle cutting edge and chip breaker reduces cutting load
- Negative geometry has been designed for rigidity of cutting edge and double sided function
- Simple screw on system and stable support achieves strong clamping force
- Unique insert design for high feed and multifunctional machining
- HRMD insert with symmetrical cutting edge is applicable for both R and L type machining



Features of Insert



1 Nose-R

- Security of rigid edge in ramping Pocket machining
- Round edge suitable for high feed rates
- Insert geometry
- Possible to use R/L type machining

2 Clamping surface

- Design for stable clamping
- Prevention of friction by chip

3 Minor cutting edge

- Improvement of surface roughness in high feed machining
- Special design for decreasing thrust force
- Symmetrical insert design for R/L type tool

4 Chip breaker

- Reduction of cutting load due to high rake angle
- Improvement of chip flow and evacuation in various applications
- Prevention of damage on clamping face of insert

5 Major cutting edge

- Symmetrical design insert for R/L type tool
- Superior cutting performance due to high rake angle cutting edge
- Low cutting resistance in high feed
- Special design for decreasing thrust force

Features of Cutter



Inner coolant system

- Improvement of chip control and evacuation
- Longer tool life due to reduced cutting temperature

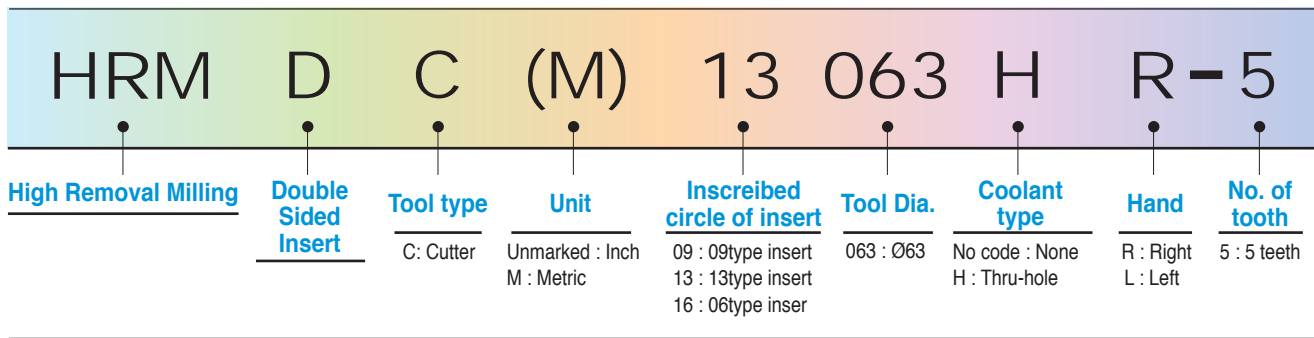
Simple screw on system

- Strong clamping of screw on system
- Convenient clamping system
- Wide chip pocket for better chip evacuation

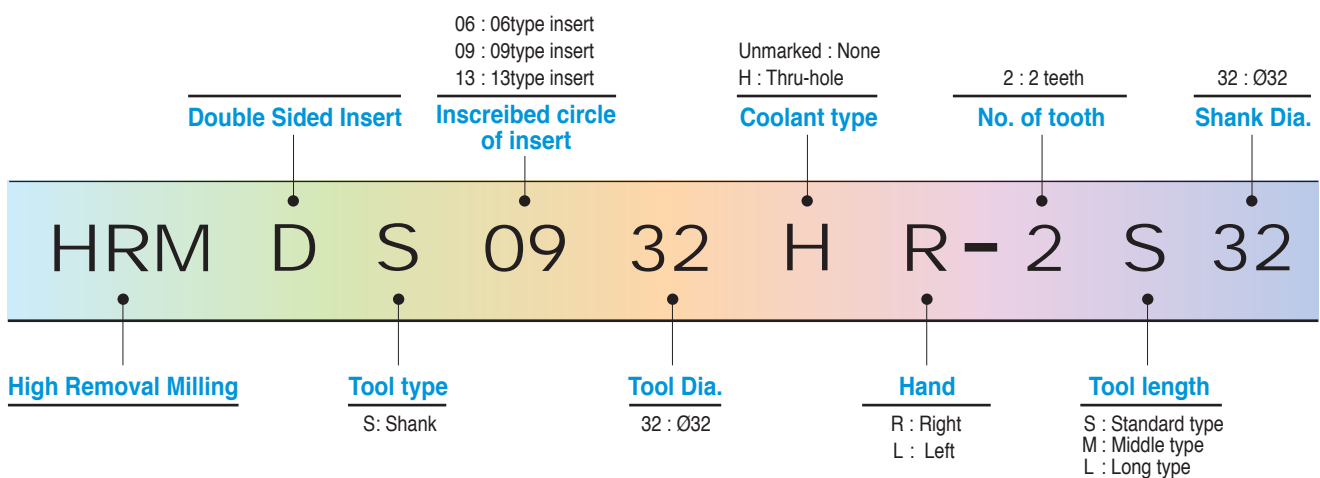
3-surface constrained system

- Strong clamping system
- Stable clamping system against different cutting resistances in various machining applications

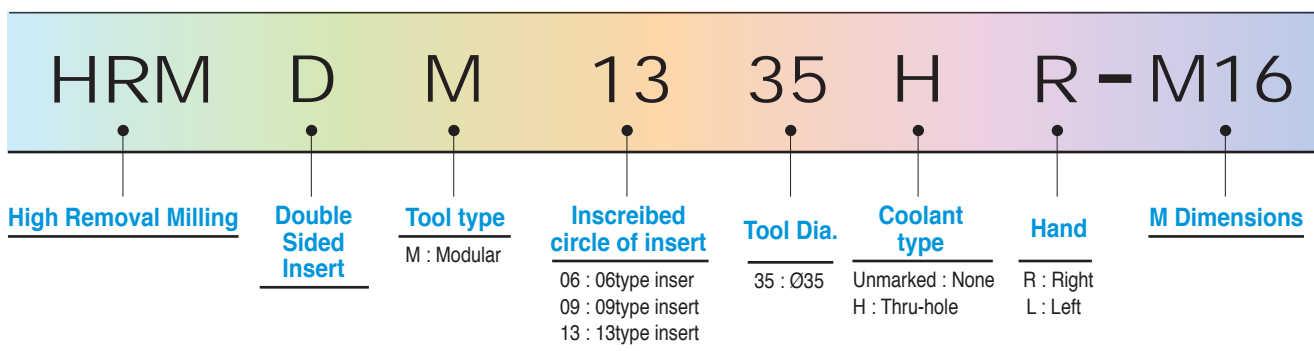
Cutter type Code system



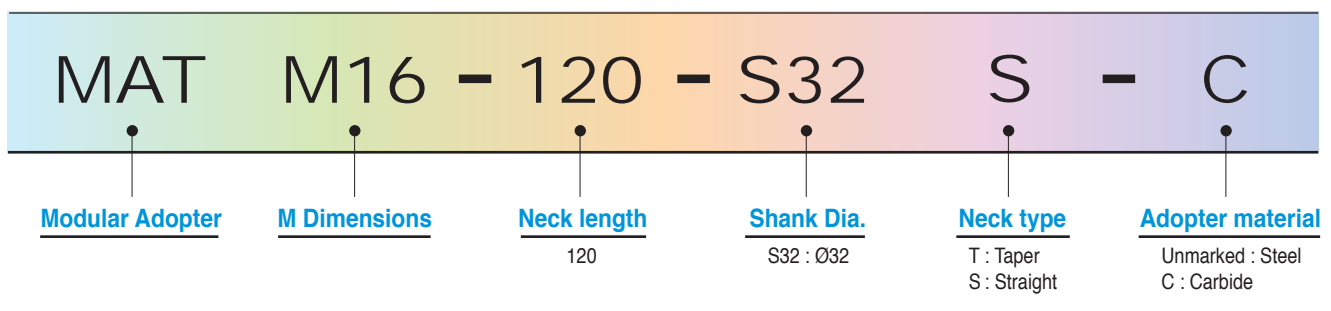
Shank type Code system



Modular Head Code system

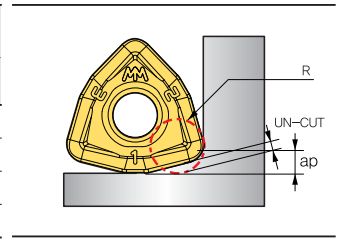


Modular Adopter Code system



Corner R programming

| Designation | Cutting condition | | Approx. R (mm) | |
|------------------|-------------------|--------------|----------------|-------|
| | Max.ap(mm) | Max.fz(mm/t) | Input. R | Uncut |
| WNMX060312ZNN-MM | 1.0 | 1.2 | 1.8 | 0.4 |
| WNMX09T316ZNN-MM | 1.5 | 2.0 | 2.5 | 0.6 |
| WNMX130520ZNN-MM | 2.0 | 3.0 | 3.0 | 0.8 |
| WNMX160720ZNN-MM | 2.5 | 3.5 | 3.5 | 1.2 |

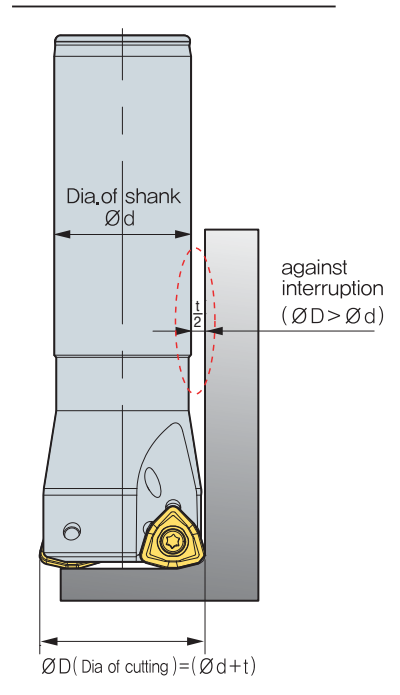


Information for uncut part by using "Input.R" for CAM program

Uncut part can be changed by poor machine condition or weak clamp of workpiece, etc

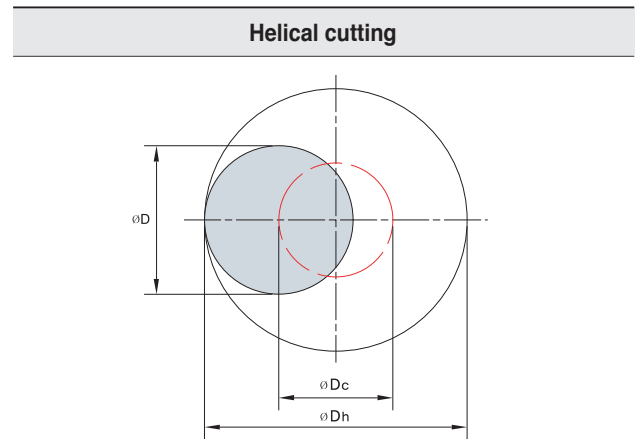
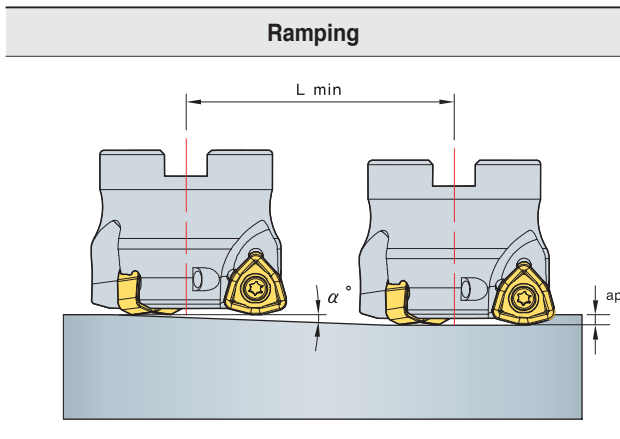
Interference prevent system

| Designation | ØD(mm) | Ød(mm) | t(mm) |
|------------------|--------|--------|-------|
| HRMDS0617HR-2□16 | 17 | 16 | 1 |
| HRMDS0618HR-2□16 | 18 | 16 | 2 |
| HRMDS0621HR-2□20 | 21 | 20 | 1 |
| HRMDS0626HR-3□25 | 26 | 25 | 1 |
| HRMDS0633HR-4□32 | 33 | 32 | 1 |
| HRMDS0926HR-2□25 | 26 | 25 | 1 |
| HRMDS0933HR-3□32 | 33 | 32 | 1 |
| HRMDS0935HR-4□32 | 35 | 32 | 3 |
| HRMDS0940HR-4□32 | 40 | 32 | 8 |
| HRMDS0950HR-5□32 | 50 | 32 | 18 |
| HRMDS0950HR-5□40 | 50 | 40 | 10 |
| HRMDS0950HR-5□42 | 50 | 42 | 8 |
| HRMDS1333HR-3□32 | 33 | 32 | 1 |
| HRMDS1335HR-4□32 | 35 | 32 | 3 |
| HRMDS1340HR-4□30 | 40 | 32 | 8 |
| HRMDS1350HR-4□32 | 50 | 32 | 18 |
| HRMDS1350HR-4□40 | 50 | 40 | 10 |
| HRMDS1350HR-4□42 | 50 | 42 | 8 |
| HRMDS1363HR-5□32 | 63 | 32 | 31 |
| HRMDS1363HR-5□40 | 63 | 40 | 23 |
| HRMDS1363HR-5□42 | 63 | 42 | 21 |



The side clearance prevents to interference between tool and workpiece even in deep hole machining

Ramping & Helical cutting technical data



$$L_{min} = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

$$\varnothing D_c = \varnothing D_h - \varnothing D$$

$\varnothing D_c$ = Tool pass of tool center

$\varnothing D_h$ = Desirable hole diameter on workpiece

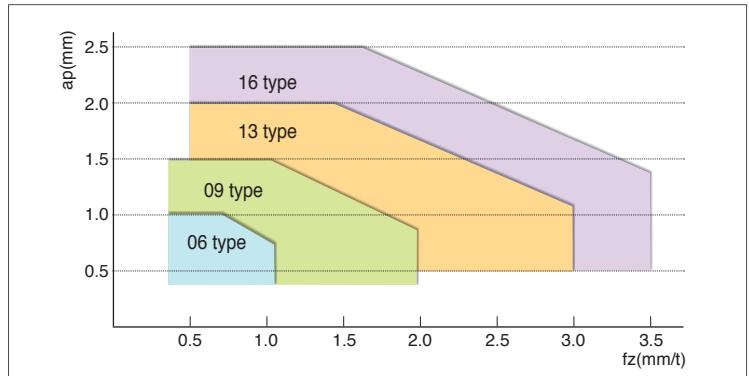
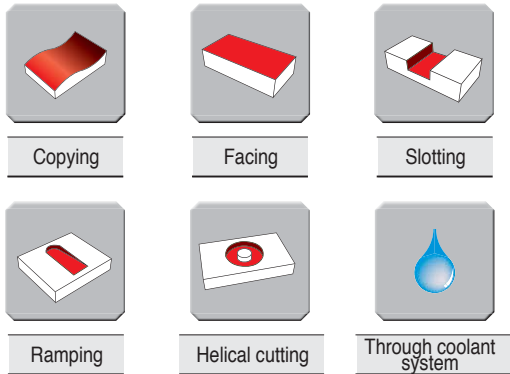
$\varnothing D$ = Tool Dia.

- Adjust feed to under 70% of Recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- in ramping, max. cutting depth for 1 ramping process should not exceed max. depth of cut as per used insert size

| Designation | Tool Dia. ØD(mm) | Efficient cutting diameter ØDe(mm) | Ramping | | | Helical ramping | |
|-----------------|---------------------|--|-------------|---------------|-----------------------------|---------------------------------|---------------------------------|
| | | | Max. ap(mm) | Max. angle α° | Cutting Length Lmin (mm) | Dh Min. Cutting diameter(mm) | Dh Max. Cutting diameter(mm) |
| HRMDS0616HR | 16 | 9.5 | 1 | 4.8 | 11 | 23.8 | 29.6 |
| HRMDS0617HR | 17 | 10.5 | 1 | 4.1 | 13 | 25.8 | 31.6 |
| HRMDS0618HR | 18 | 11.5 | 1 | 3.5 | 16 | 27.8 | 33.6 |
| HRMDS0620HR | 20 | 13.5 | 1 | 2.5 | 22 | 31.8 | 37.6 |
| HRMDS0621HR | 21 | 14.5 | 1 | 2.2 | 26 | 33.8 | 39.6 |
| HRMDS0625HR | 25 | 18.5 | 1 | 1.3 | 44 | 41.8 | 47.6 |
| HRMDS0626HR | 26 | 19.5 | 1 | 1.2 | 47 | 43.8 | 49.6 |
| HRMDS0632HR | 32 | 25.5 | 1 | 0.6 | 95 | 55.8 | 61.6 |
| HRMDS0633HR | 33 | 26.5 | 1 | 0.5 | 114 | 57.8 | 63.6 |
| HRMDS0925HR | 25 | 15.4 | 1.5 | 5.4 | 15.8 | 37.6 | 46.8 |
| HRMDS0926HR | 26 | 16.4 | 1.5 | 5.0 | 17.0 | 39.6 | 48.8 |
| HRMDS0930HR | 30 | 20.4 | 1.5 | 3.9 | 22.0 | 47.6 | 56.8 |
| HRMDS0932HR | 32 | 22.3 | 1.5 | 3.5 | 24.5 | 51.6 | 60.8 |
| HRMDS0933HR | 33 | 23.3 | 1.5 | 3.3 | 25.8 | 53.6 | 62.8 |
| HRMDS0935HR | 35 | 25.4 | 1.5 | 3.0 | 28.3 | 57.6 | 66.8 |
| HRMDS0940HR | 40 | 30.2 | 1.5 | 2.5 | 34.5 | 67.6 | 76.8 |
| HRMDS0950HR | 50 | 40.2 | 1.5 | 1.8 | 47.0 | 87.6 | 96.8 |
| HRMDS1332HR | 32 | 19.3 | 2 | 5.7 | 20.0 | 47 | 60 |
| HRMDS1333HR | 33 | 20.3 | 2 | 5.4 | 21.3 | 49 | 62 |
| HRMDS1335HR | 35 | 22.3 | 2 | 4.8 | 24.0 | 53 | 66 |
| HRMDS1340HR | 40 | 27.2 | 2 | 3.7 | 30.7 | 63 | 76 |
| HRMDS1350HR | 50 | 37 | 2 | 2.6 | 44.0 | 83 | 96 |
| HRMDS1363HR | 63 | 50 | 2 | 1.9 | 61.3 | 109 | 122 |
| HRMDCM09040HR | 40 | 30.2 | 1.5 | 2.5 | 34.5 | 67.6 | 76.8 |
| HRMDCM09050HR | 50 | 40.2 | 1.5 | 1.8 | 47.0 | 87.6 | 96.8 |
| HRMDCM09063HR | 63 | 53.1 | 1.5 | 1.4 | 63.3 | 113.6 | 122.8 |
| HRMDC(M)09080HR | 80 | 70.1 | 1.5 | 1.0 | 84.5 | 147.6 | 156.8 |
| HRMDC(M)09100HR | 100 | 90 | 1.5 | 0.8 | 109.5 | 187.6 | 196.8 |
| HRMDCM13050HR | 50 | 37 | 2 | 2.6 | 44.0 | 83 | 96 |
| HRMDCM13063HR | 63 | 50 | 2 | 1.9 | 61.3 | 109 | 122 |
| HRMDC(M)13080HR | 80 | 66.9 | 2 | 1.4 | 84.0 | 143 | 156 |
| HRMDC(M)13100HR | 100 | 86.9 | 2 | 1.0 | 110.7 | 183 | 196 |
| HRMDC(M)13125HR | 125 | 111.9 | 2 | 0.8 | 144.0 | 233 | 246 |
| HRMDC(M)16080HR | 80 | 63.3 | 2.5 | 1.4 | 102 | 138 | 156 |
| HRMDC(M)16100HR | 100 | 83.3 | 2.5 | 1 | 143 | 178 | 196 |
| HRMDC(M)16125HR | 125 | 108.3 | 2.5 | 0.7 | 204 | 228 | 246 |
| HRMDC(M)16160R | 160 | 143.3 | 2.5 | 0.5 | 286 | 298 | 316 |
| HRMDC(M)16200R | 200 | 183.3 | 2.5 | 0.3 | 477 | 378 | 396 |
| HRMDC(M)16250R | 250 | 233.3 | 2.5 | 0.2 | 716 | 478 | 496 |
| HRMDC(M)16315R | 315 | 298.3 | 2.5 | 0.1 | 1432 | 608 | 626 |



Application area



Recommended cutting condition

| | Workpiece | Hardness | Grades | vc (m/min) | fz (mm/t) |
|---|--------------------------------------|----------------------------|------------------|--------------------|-----------|
| P | General structural steel, Mild steel | Under 200HB | PC3500 PC3545 | 200 (100~230) | 1.0 ~ 2.0 |
| | Carbon steel, Alloy steel | Under 30HRC | PC3500 PC3545 | 180 (100 ~ 220) | 1.0 ~ 1.5 |
| | High Carbon steel, Alloy steel | 30~40 HRC | PC3500 PC3545 | 160 (100~200) | 0.8 ~ 1.3 |
| | Pre-hardened steel | 40~50 HRC | PC3500 PC5300 | 120 (80~180) | 0.6 ~ 1.2 |
| M | Stainless steel | Under 270HB | PC5300 PC3545 | 120 (80~150) | 0.8 ~ 1.3 |
| K | Cast iron | Under 350N/mm ² | PC5300 | 180(100~220) | 1.2 ~ 1.8 |

Machining Example - I



Working condition

Work piece : SM45C(HrC22) **Tool information** : HRMDCM13050HR-4
Cutting speed : vc = 283m/min (1,803⁻¹) WNMX130520ZNN-MM(PC3500)
 fz = 1.4mm/tooth
 vf = 10,097mm/min
 ap = 0.8mm
 ae = 35mm
 Coolant : Dry, Machining: Copying
 Machine : Horizontal MCT
 Overhang of tool : 250mm

Productivity : 40%
increased Tool cost : 80%
decreased

※**Test result** - In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 40% and the tool life was increased to over 60%. HRMD is economically more efficient due to the use of 6 cutting edges compared to EDNW type with positive insert

Machining Example - II



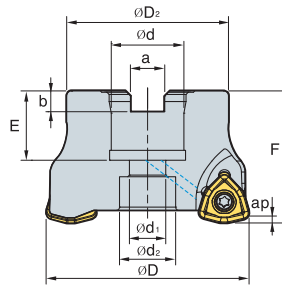
Working condition

Work piece : STS304 **Tool information** : HRMDCM13100HR-6
Cutting speed : vc = 130m/min (414-1) WNMX130520ZNN-MM(PC3545)
 fz = 1.2mm/tooth
 vf = 2,981mm/min
 ap = 1.0mm
 ae = 80mm
 Coolant : Wet, Machining : Facing and Slotting
 Machine : Vertical MCT
 Overhang of tool : 250mm

Productivity : 80%
increased Tool cost : 25%
decreased

※**Test result** - In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 80% and the tool life was same, but HRMD is economically more efficient due to the use of 6 cutting edges compared to SDKN type with positive insert

HRMDC(M)09



• AR : -7°
• RR : -12°~18°

(mm)

| Designation | | ϕD | ϕD_2 | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ap | | Bolt | |
|-------------|-----------------|----------|------------|----------|------------|------------|------|------|-----|----|-----|-----|--------|--------|
| HRMDCM | 09040HR-3 | 3 | 40 | 34 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 1.5 | 0.2 | SB0825 |
| | 09040HR-4 | 4 | 40 | 34 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 1.5 | 0.2 | |
| | 09050HR-4 | 4 | 50 | 42 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 1.5 | 0.3 | SB1025 |
| | 09050HR-5 | 5 | 50 | 42 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 1.5 | 0.3 | |
| | 09063HR-5 | 5 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 1.5 | 0.5 | SB1025 |
| | 09063HR-6 | 6 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 40 | 1.5 | 0.5 | |
| | 09080HR-6 | 6 | 80 | 57 | 27 | 14 | 20 | 12.4 | 7 | 23 | 50 | 1.5 | 1.1 | SB1230 |
| | 09080HR-7 | 7 | 80 | 57 | 27 | 14 | 20 | 12.4 | 7 | 23 | 50 | 1.5 | 1.1 | |
| 09100HR-7 | 7 | 100 | 67 | 32 | 18 | 26 | 14.4 | 8 | 25 | 50 | 1.5 | 1.7 | SB1630 | |
| 09100HR-8 | 8 | 100 | 67 | 32 | 18 | 26 | 14.4 | 8 | 25 | 50 | 1.5 | 1.7 | | |
| HRMDC | 09080HR-6 | 6 | 80 | 57 | 25.4 | 14 | 20 | 9.5 | 6 | 24 | 50 | 1.5 | 1.1 | SB1230 |
| | 09080HR-7 | 7 | 80 | 57 | 25.4 | 14 | 20 | 9.5 | 6 | 24 | 50 | 1.5 | 1.1 | |
| | 09080HR-31.75-6 | 6 | 80 | 67 | 31.75 | 18 | 26 | 12.7 | 8 | 32 | 63 | 1.5 | 1.5 | SB1630 |
| | 09080HR-31.75-7 | 7 | 80 | 67 | 31.75 | 18 | 26 | 12.7 | 8 | 32 | 63 | 1.5 | 1.5 | |
| | 09100HR-7 | 7 | 100 | 67 | 31.75 | 18 | 26 | 12.7 | 8 | 32 | 63 | 1.5 | 2.1 | SB1630 |
| 09100HR-8 | 8 | 100 | 67 | 31.75 | 18 | 26 | 12.7 | 8 | 32 | 63 | 1.5 | 2.1 | | |

Available Inserts

WNMX-MM

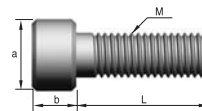


| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| WNMX 09T316ZNN-MM | | | | ● | ● | ● | ● | ● | | | | | | | | | | E23 |

Available Arbors

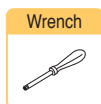
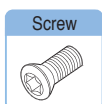
| Designation | NC Arbors | |
|-----------------|--------------------------------|--------------------------------|
| HRMDCM | 09040HR-□ | BT□□-FMC16-□□ SK□□-FMC16-□□ |
| | 09050HR-□ | BT□□-FMC22-□□ |
| | 09063HR-□ | SK□□-FMC22-□□ |
| | 09080HR-□ | BT□□-FMC27-□□ SK□□-FMC27-□□ |
| 09100HR-□ | BT□□-FMC32-□□ SK□□-FMC32-□□ | |
| | HRMDC | 09080HR-□ |
| 09080HR-31.75-□ | | BT□□-FMA31.75-□□ |
| 09100HR-□ | | SK□□-FMA31.75-□□ |

Bolt



| Designation | Dimensions(mm) | | | | |
|-------------|----------------|----|----|----|-------|
| | M | a | b | L | pitch |
| SB0825 | M08 | 13 | 8 | 25 | 1.25 |
| SB1025 | M10 | 16 | 10 | 25 | 1.5 |
| SB1230 | M12 | 18 | 12 | 30 | 1.75 |
| SB1630 | M16 | 24 | 16 | 30 | 2.0 |

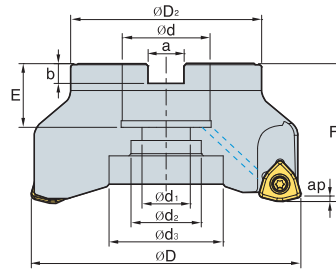
Parts



FTKA0307

TW09S

HRMDC(M)13



AA 14°
 • AR : -7°
 • RR : -12°~4°

| Designation | | $\varnothing D$ | $\varnothing D_2$ | $\varnothing d$ | $\varnothing d_1$ | $\varnothing d_2$ | $\varnothing d_3$ | a | b | E | F | ap | | Bolt | |
|-------------|-----------------|-----------------|-------------------|-----------------|-------------------|-------------------|-------------------|------|------|-----|----|----|-----|---------|---------|
| HRMDCM | 13050HR-3 | 3 | 50 | 42 | 22 | 11 | 17 | - | 10.4 | 6.3 | 21 | 40 | 2 | 0.3 | SB1025 |
| | 13050HR-4 | 4 | 50 | 42 | 22 | 11 | 17 | - | 10.4 | 6.3 | 21 | 40 | 2 | 0.3 | |
| | 13063HR-4 | 4 | 63 | 49 | 22 | 11 | 18 | - | 10.4 | 6.3 | 21 | 40 | 2 | 0.5 | SB1025 |
| | 13063HR-5 | 5 | 63 | 49 | 22 | 11 | 18 | - | 10.4 | 6.3 | 21 | 40 | 2 | 0.5 | |
| | 13080HR-5 | 5 | 80 | 57 | 27 | 14 | 20 | - | 12.4 | 7 | 23 | 50 | 2 | 1 | SB1230 |
| | 13080HR-6 | 6 | 80 | 57 | 27 | 14 | 20 | - | 12.4 | 7 | 23 | 50 | 2 | 1 | |
| | 13100HR-6 | 6 | 100 | 67 | 32 | 18 | 26 | - | 14.4 | 8 | 25 | 50 | 2 | 1.6 | SB1630 |
| | 13100HR-7 | 7 | 100 | 67 | 32 | 18 | 26 | - | 14.4 | 8 | 25 | 50 | 2 | 1.6 | |
| HRMDC | 13125HR-7 | 7 | 125 | 87 | 40 | 22 | 32 | 52 | 16.4 | 9 | 29 | 63 | 2 | 3.2 | SB2040 |
| | 13125HR-8 | 8 | 125 | 87 | 40 | 22 | 32 | 52 | 16.4 | 9 | 29 | 63 | 2 | 3.2 | MBA-M20 |
| | 13080HR-5 | 5 | 80 | 57 | 25.4 | 14 | 20 | - | 9.5 | 6 | 24 | 50 | 2 | 1 | SB1230 |
| | 13080HR-6 | 6 | 80 | 57 | 25.4 | 14 | 20 | - | 9.5 | 6 | 24 | 50 | 2 | 1 | |
| | 13080HR-31.75-5 | 5 | 80 | 67 | 31.75 | 18 | 26 | - | 12.7 | 8 | 32 | 63 | 2 | 1.4 | SB1630 |
| | 13080HR-31.75-6 | 6 | 80 | 67 | 31.75 | 18 | 26 | - | 12.7 | 8 | 32 | 63 | 2 | 1.4 | |
| | 13100HR-6 | 6 | 100 | 67 | 31.75 | 18 | 26 | - | 12.7 | 8 | 32 | 63 | 2 | 2.1 | SB1630 |
| | 13100HR-7 | 7 | 100 | 67 | 31.75 | 18 | 26 | - | 12.7 | 8 | 32 | 63 | 2 | 2.1 | |
| 13125HR-7 | 7 | 125 | 87 | 38.1 | 22 | 32 | 52 | 15.9 | 10 | 35 | 63 | 2 | 3.3 | SB2040 | |
| 13125HR-8 | 8 | 125 | 87 | 38.1 | 22 | 32 | 52 | 15.9 | 10 | 35 | 63 | 2 | 3.3 | MBA-M20 | |

Available Inserts

WNMX-MM



| Designation | Coated | | | | | | | Cermet | | | Uncoated | | | | page | | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|------|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A | ST20 |
| WNMX 130520ZNN-MM | | | | ● | ● | ● | ● | ● | | | | | | | | | | E23 |

Available Arbors

| Designation | NC Arbors | |
|-------------|-----------------|------------------|
| HRMDCM | 13050HR-□ | BT□□-FMC22-□□ |
| | 13063HR-□ | SK□□-FMC22-□□ |
| | 13080HR-□ | BT□□-FMC27-□□ |
| 13100HR-□ | SK□□-FMC27-□□ | BT□□-FMC32-□□ |
| | SK□□-FMC32-□□ | BT□□-FMC40-□□ |
| | SK□□-FMC40-□□ | SK□□-FMC40-□□ |
| HRMDC | 13080HR-□ | BT□□-FMA25.4-□□ |
| | 13080HR-31.75-□ | SK□□-FMA25.4-□□ |
| | 13100HR-□ | BT□□-FMA31.75-□□ |
| | | SK□□-FMA31.75-□□ |
| | 13125HR-□ | BT□□-FMA38.1-□□ |
| | | SK□□-FMA38.1-□□ |

Bolt

Fig. 1

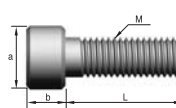
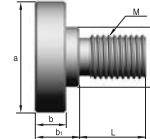
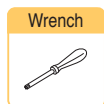
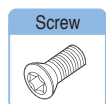


Fig. 2



| Designation | Dimensions(mm) | | | | | | | Fig. |
|-------------|----------------|----|----|----|----|----|-------|------|
| | M | a | b | b1 | C | L | pitch | |
| SB1025 | M10 | 16 | 10 | - | - | 25 | 1.5 | 1 |
| SB1230 | M12 | 18 | 12 | - | - | 30 | 1.75 | 1 |
| SB1630 | M16 | 24 | 16 | - | - | 30 | 2.0 | 1 |
| SB2040 | M20 | 30 | 20 | - | - | 40 | 2.5 | 1 |
| MBA-M20 | M20 | 50 | 14 | 20 | 27 | 30 | 2.5 | 2 |

Parts



FTKA0412B

TW15S

HRMDC(M)16 *New*

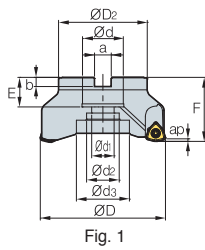


Fig. 1

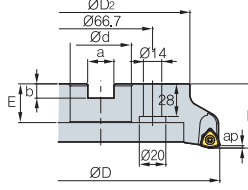


Fig. 2

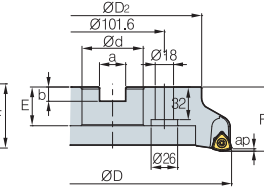


Fig. 3

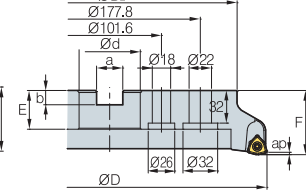


Fig. 4



AA 14°
 • AR : -7°
 • RR : -12°~4°

| Designation | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | Ød ₃ | a | b | E | F | ap | kg | Bolt | Fig. | |
|--------------------|----|-----------------|-----|-----------------|-----------------|-----------------|----|------------|-------|--------|--------|-----|-------|-------------------|---|
| HRMDC(M) 16080HR-4 | 4 | 80 | 65 | 25.4(27) | 14 | 20 | - | 9.5(12.4) | 6(7) | 25(23) | 50 | 2.5 | 0.99 | SB1230 | 1 |
| 16080HR-5 | 5 | 80 | 65 | 25.4(27) | 14 | 20 | - | 9.5(12.4) | 6(7) | 25(23) | 50 | 2.5 | 0.91 | | |
| 16100HR-5 | 5 | 100 | 85 | 31.75(32) | 18 | 26 | - | 12.7(14.4) | 8 | 33(25) | 63(50) | 2.5 | 1.68 | SB1630 | 1 |
| 16100HR-6 | 6 | 100 | 85 | 31.75(32) | 18 | 26 | - | 12.7(14.4) | 8 | 33(25) | 63(50) | 2.5 | 1.64 | | |
| 16125HR-6 | 6 | 125 | 100 | 38.1(40) | 22 | 32 | 52 | 15.9(16.4) | 10(9) | 36(29) | 63 | 2.5 | 3.23 | SB2040 MBA-M20 | 1 |
| 16125HR-7 | 7 | 125 | 100 | 38.1(40) | 22 | 32 | 52 | 15.9(16.4) | 10(9) | 36(29) | 63 | 2.5 | 3.24 | | |
| 16160R-7 | 7 | 160 | 107 | 50.8(40) | - | 90 | - | 19(16.4) | 11(9) | 38(32) | 63 | 2.5 | 3.73 | MBA-M24 | 2 |
| 16160R-8 | 8 | 160 | 107 | 50.8(40) | - | 90 | - | 19(16.4) | 11(9) | 38(32) | 63 | 2.5 | 3.77 | | |
| 16200R-8 | 8 | 200 | 145 | 47.625(60) | - | 132 | - | 25.4(25.7) | 14 | 38 | 63 | 2.5 | 6.48 | - | 3 |
| 16200R-10 | 10 | 200 | 145 | 47.625(60) | - | 132 | - | 25.4(25.7) | 14 | 38 | 63 | 2.5 | 6.61 | | |
| 16250R-10 | 10 | 250 | 190 | 47.625(60) | - | 190 | - | 25.4(25.7) | 14 | 38 | 63 | 2.5 | 11.01 | - | 3 |
| 16250R-12 | 12 | 250 | 190 | 47.625(60) | - | 190 | - | 25.4(25.7) | 14 | 38 | 63 | 2.5 | 11.04 | | |
| 16315R-12 | 12 | 315 | 250 | 47.625(60) | - | 238 | - | 25.4(25.7) | 14 | 38 | 63 | 2.5 | 18.34 | - | 4 |
| 16315R-14 | 14 | 315 | 250 | 47.625(60) | - | 238 | - | 25.4(25.7) | 14 | 38 | 63 | 2.5 | 18.35 | | |

Available Inserts

WNMX-MM



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| WNMX160720ZNN-MM | | | | | ● | ● | | | | | | | | | | | | E23 |

Available Arbors

| Designation | HRMDC | HRMDCM |
|--------------------|-------------------|---------------|
| HRMDC(M) 16080HR-4 | BT□□-FMA25.4-□□ | BT□□-FMC27-□□ |
| 16080HR-5 | | |
| 16100HR-5 | BT□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 16100HR-6 | | |
| 16125HR-6 | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| 16125HR-7 | | |
| 16160R-7 | BT□□-FMA50.8-□□ | BT□□-FMC40-□□ |
| 16160R-8 | | |
| 16200R-8 | | |
| 16200R-10 | | |
| 16250R-10 | BT□□-FMA47.625-□□ | BT□□-FMB60-□□ |
| 16250R-12 | | |
| 16315R-12 | | |
| 16315R-14 | | |

Bolt

Fig. 1

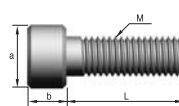
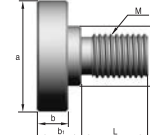
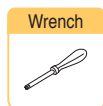
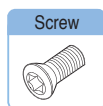


Fig. 2



| Designation | Dimensions(mm) | | | | | | | Fig. |
|-------------|----------------|----|----|----|----|----|-------|------|
| | M | a | b | b1 | C | L | pitch | |
| SB1025 | M10 | 16 | 10 | - | - | 25 | 1.5 | 1 |
| SB1230 | M12 | 18 | 12 | - | - | 30 | 1.75 | 1 |
| SB1630 | M16 | 24 | 16 | - | - | 30 | 2.0 | 1 |
| SB2040 | M20 | 30 | 20 | - | - | 40 | 2.5 | 1 |
| MBA-M20 | M20 | 50 | 14 | 20 | 27 | 30 | 2.5 | 2 |
| MBA-M24 | M24 | 65 | 14 | 24 | 37 | 36 | 3.0 | 2 |

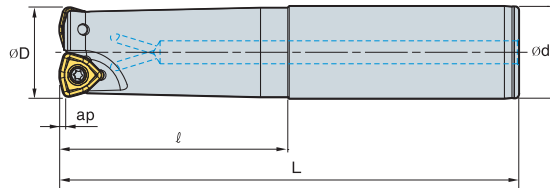
Parts



FTGA0513-P

TW20-100

HRMDS06 *New*



• AR : -7°
• RR : -17°~25°

(mm)

| Designation | | øD | ød | l | L | ap | |
|-------------------|---|----|----|-----|-----|-----|------|
| HRMDS 0616HR-2S16 | 2 | 16 | 16 | 30 | 110 | 1.0 | 0.15 |
| 0616HR-2M16 | 2 | 16 | 16 | 70 | 150 | 1.0 | 0.20 |
| 0616HR-2L16 | 2 | 16 | 16 | 100 | 200 | 1.0 | 0.26 |
| 0617HR-2S16 | 2 | 17 | 16 | 20 | 110 | 1.0 | 0.15 |
| 0617HR-2M16 | 2 | 17 | 16 | 20 | 150 | 1.0 | 0.21 |
| 0617HR-2L16 | 2 | 17 | 16 | 20 | 200 | 1.0 | 0.28 |
| 0618HR-2S16 | 2 | 18 | 16 | 20 | 110 | 1.0 | 0.15 |
| 0618HR-2M16 | 2 | 18 | 16 | 20 | 150 | 1.0 | 0.21 |
| 0618HR-2L16 | 2 | 18 | 16 | 20 | 200 | 1.0 | 0.28 |
| 0620HR-2S20 | 2 | 20 | 20 | 50 | 130 | 1.0 | 0.28 |
| 0620HR-2M20 | 2 | 20 | 20 | 100 | 180 | 1.0 | 0.38 |
| 0620HR-2L20 | 2 | 20 | 20 | 130 | 250 | 1.0 | 0.53 |
| 0621HR-2S20 | 2 | 21 | 20 | 20 | 130 | 1.0 | 0.29 |
| 0621HR-2M20 | 2 | 21 | 20 | 20 | 180 | 1.0 | 0.40 |
| 0621HR-2L20 | 2 | 21 | 20 | 20 | 250 | 1.0 | 0.57 |
| 0625HR-3S25 | 3 | 25 | 25 | 60 | 140 | 1.0 | 0.44 |
| 0625HR-3M25 | 3 | 25 | 25 | 80 | 180 | 1.0 | 0.57 |
| 0625HR-3L25 | 3 | 25 | 25 | 120 | 250 | 1.0 | 0.80 |
| 0626HR-3S25 | 3 | 26 | 25 | 30 | 140 | 1.0 | 0.46 |
| 0626HR-3M25 | 3 | 26 | 25 | 30 | 180 | 1.0 | 0.50 |
| 0626HR-3L25 | 3 | 26 | 25 | 30 | 250 | 1.0 | 0.84 |
| 0632HR-4S32 | 4 | 32 | 32 | 70 | 150 | 1.0 | 0.82 |
| 0632HR-4M32 | 4 | 32 | 32 | 100 | 200 | 1.0 | 1.10 |
| 0632HR-4L32 | 4 | 32 | 32 | 180 | 300 | 1.0 | 1.66 |
| 0633HR-4S32 | 4 | 33 | 32 | 40 | 200 | 1.0 | 1.14 |
| 0633HR-4M32 | 4 | 33 | 32 | 40 | 250 | 1.0 | 1.43 |
| 0633HR-4L32 | 4 | 33 | 32 | 40 | 300 | 1.0 | 1.73 |

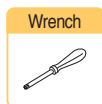
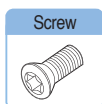
Available Inserts

WNMX-MM



| Designation | Coated | | | | | | | Cermet | | | Uncoated | | | | page | | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|------|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | | G10 | ST30A | ST20 |
| WNMX 060312ZNN-MM | | | | | ● | ● | | | | | | | | | | | | E23 |

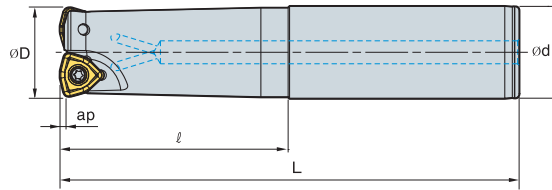
Parts



ETNA02506

TW07S

HRMDS09



• AR : -7°
• RR : -17°~25°

(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | ℓ | L | ap | |
|-------------------|---|-----------------|-----------------|--------|-----|-----|-----|
| HRMDS 0925HR-2S25 | 2 | 25 | 25 | 60 | 140 | 1.5 | 0.5 |
| 0925HR-2M25 | 2 | 25 | 25 | 120 | 200 | 1.5 | 0.6 |
| 0925HR-2L25 | 2 | 25 | 25 | 180 | 300 | 1.5 | 1 |
| 0926HR-2S25 | 2 | 26 | 25 | 60 | 140 | 1.5 | 0.5 |
| 0926HR-2M25 | 2 | 26 | 25 | 60 | 200 | 1.5 | 0.7 |
| 0926HR-2L25 | 2 | 26 | 25 | 60 | 300 | 1.5 | 1 |
| 0930HR-3S32 | 3 | 30 | 32 | 70 | 150 | 1.5 | 0.8 |
| 0930HR-3M32 | 3 | 30 | 32 | 120 | 200 | 1.5 | 1 |
| 0930HR-3L32 | 3 | 30 | 32 | 180 | 300 | 1.5 | 1.5 |
| 0932HR-3S32 | 3 | 32 | 32 | 70 | 150 | 1.5 | 0.8 |
| 0932HR-3M32 | 3 | 32 | 32 | 120 | 200 | 1.5 | 1.1 |
| 0932HR-3L32 | 3 | 32 | 32 | 180 | 300 | 1.5 | 1.7 |
| 0933HR-3S32 | 3 | 33 | 32 | 70 | 150 | 1.5 | 0.8 |
| 0933HR-3M32 | 3 | 33 | 32 | 70 | 200 | 1.5 | 1.1 |
| 0933HR-3L32 | 3 | 33 | 32 | 70 | 300 | 1.5 | 1.7 |
| 0935HR-4S32 | 4 | 35 | 32 | 50 | 150 | 1.5 | 0.9 |
| 0935HR-4M32 | 4 | 35 | 32 | 50 | 200 | 1.5 | 1.1 |
| 0935HR-4L32 | 4 | 35 | 32 | 50 | 300 | 1.5 | 1.7 |
| 0940HR-4S32 | 4 | 40 | 32 | 50 | 150 | 1.5 | 0.9 |
| 0940HR-4M32 | 4 | 40 | 32 | 50 | 250 | 1.5 | 1.5 |
| 0940HR-4L32 | 4 | 40 | 32 | 50 | 300 | 1.5 | 1.8 |
| 0940HR-4S40 | 4 | 40 | 40 | 60 | 150 | 1.5 | 1.3 |

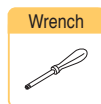
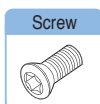
Available Inserts

WNMX-MM



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| WNMX 09T316ZNN-MM | | | | ● | ● | ● | ● | ● | | | | | | | | | | E23 |

Parts

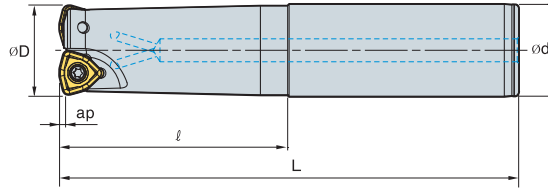


FTKA0307

TW09S



HRMDS09



| Designation | | | ϕD | ϕd | l | L | ap | |
|-------------|-------------|----|----------|----------|-----|-----|------|-----|
| HRMDS | 0940HR-4M40 | 4 | 40 | 40 | 130 | 250 | 1.5 | 2.2 |
| | 0940HR-4L40 | 4 | 40 | 40 | 180 | 300 | 1.5 | 2.7 |
| | 0940HR-4S42 | 4 | 40 | 42 | 60 | 150 | 1.5 | 1.4 |
| | 0940HR-4M42 | 4 | 40 | 42 | 130 | 250 | 1.5 | 2.3 |
| | 0940HR-4L42 | 4 | 40 | 42 | 180 | 300 | 1.5 | 2.8 |
| | 0950HR-4S32 | 4 | 50 | 32 | 40 | 150 | 1.5 | 1.1 |
| | 0950HR-4M32 | 4 | 50 | 32 | 40 | 250 | 1.5 | 1.6 |
| | 0950HR-4L32 | 4 | 50 | 32 | 40 | 300 | 1.5 | 2 |
| | 0950HR-4S40 | 4 | 50 | 40 | 40 | 150 | 1.5 | 1.4 |
| | 0950HR-4M40 | 4 | 50 | 40 | 40 | 250 | 1.5 | 2.4 |
| | 0950HR-4L40 | 4 | 50 | 40 | 40 | 300 | 1.5 | 2.9 |
| | 0950HR-4S42 | 4 | 50 | 42 | 40 | 150 | 1.5 | 1.6 |
| | 0950HR-4M42 | 4 | 50 | 42 | 40 | 250 | 1.5 | 2.6 |
| | 0950HR-4L42 | 4 | 50 | 42 | 40 | 300 | 1.5 | 3.1 |
| | 0950HR-5S32 | 5 | 50 | 32 | 40 | 150 | 1.5 | 1.1 |
| | 0950HR-5M32 | 5 | 50 | 32 | 40 | 250 | 1.5 | 1.6 |
| | 0950HR-5L32 | 5 | 50 | 32 | 40 | 300 | 1.5 | 2 |
| | 0950HR-5S40 | 5 | 50 | 40 | 40 | 150 | 1.5 | 1.4 |
| | 0950HR-5M40 | 5 | 50 | 40 | 40 | 250 | 1.5 | 2.4 |
| | 0950HR-5L40 | 5 | 50 | 40 | 40 | 300 | 1.5 | 2.9 |
| 0950HR-5S42 | 5 | 50 | 42 | 40 | 150 | 1.5 | 1.6 | |
| 0950HR-5M42 | 5 | 50 | 42 | 40 | 250 | 1.5 | 2.6 | |
| 0950HR-5L42 | 5 | 50 | 42 | 40 | 300 | 1.5 | 3.1 | |

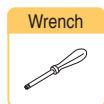
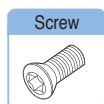
Available Inserts

WNMX-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC3530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| WNMX 09T316ZNN-MM | | | | ● | ● | ● | ● | ● | | | | | | | | | E23 |

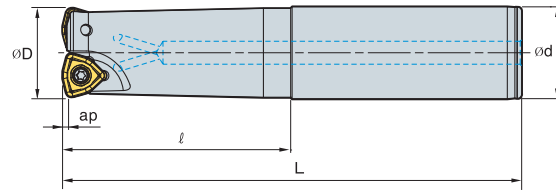
Parts



FTKA0307

TW09S

HRMDS13



• AR : -7°
• RR : -14°~16°

(mm)

| Designation | | ϕD | ϕd | l | L | ap | |
|-------------------|---|----------|----------|-----|-----|------|-----|
| HRMDS 1332HR-2S32 | 2 | 32 | 32 | 70 | 150 | 2 | 0.8 |
| 1332HR-2M32 | 2 | 32 | 32 | 120 | 200 | 2 | 1 |
| 1332HR-2L32 | 2 | 32 | 32 | 180 | 300 | 2 | 1.6 |
| 1333HR-2S32 | 2 | 33 | 32 | 70 | 150 | 2 | 0.8 |
| 1333HR-2M32 | 2 | 33 | 32 | 70 | 200 | 2 | 1.1 |
| 1333HR-2L32 | 2 | 33 | 32 | 70 | 300 | 2 | 1.7 |
| 1335HR-2S32 | 2 | 35 | 32 | 50 | 150 | 2 | 0.8 |
| 1335HR-2M32 | 2 | 35 | 32 | 50 | 200 | 2 | 1.1 |
| 1335HR-2L32 | 2 | 35 | 32 | 50 | 300 | 2 | 1.7 |
| 1340HR-3S32 | 3 | 40 | 32 | 50 | 150 | 2 | 0.8 |
| 1340HR-3M32 | 3 | 40 | 32 | 50 | 250 | 2 | 1.4 |
| 1340HR-3L32 | 3 | 40 | 32 | 50 | 300 | 2 | 1.7 |
| 1340HR-3S40 | 3 | 40 | 40 | 60 | 150 | 2 | 1.2 |
| 1340HR-3M40 | 3 | 40 | 40 | 130 | 250 | 2 | 2.1 |
| 1340HR-3L40 | 3 | 40 | 40 | 180 | 300 | 2 | 2.6 |
| 1340HR-3S42 | 3 | 40 | 42 | 60 | 150 | 2 | 1.4 |
| 1340HR-3M42 | 3 | 40 | 42 | 130 | 250 | 2 | 2.3 |
| 1340HR-3L42 | 3 | 40 | 42 | 180 | 300 | 2 | 2.7 |
| 1350HR-3S32 | 3 | 50 | 32 | 50 | 150 | 2 | 1.1 |
| 1350HR-3M32 | 3 | 50 | 32 | 50 | 250 | 2 | 1.7 |
| 1350HR-3L32 | 3 | 50 | 32 | 50 | 300 | 2 | 2 |
| 1350HR-3S40 | 3 | 50 | 40 | 50 | 150 | 2 | 1.5 |
| 1350HR-3M40 | 3 | 50 | 40 | 50 | 250 | 2 | 2.4 |
| 1350HR-3L40 | 3 | 50 | 40 | 50 | 300 | 2 | 2.9 |
| 1350HR-3S42 | 3 | 50 | 42 | 50 | 150 | 2 | 1.6 |
| 1350HR-3M42 | 3 | 50 | 42 | 50 | 250 | 2 | 2.6 |
| 1350HR-3L42 | 3 | 50 | 42 | 50 | 300 | 2 | 3.1 |

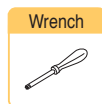
Available Inserts

WNMX-MM



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| WNMX 130520ZNN-MM | | | | ● | ● | ● | ● | ● | | | | | | | | | | E23 |

Parts

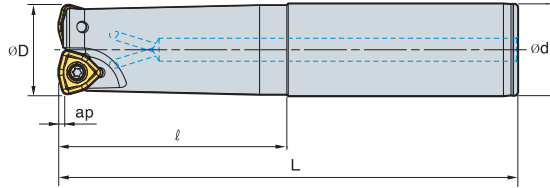


FTKA0412B

TW15S



HRMDS13



| Designation | | | ϕD | ϕd | l | L | ap | |
|-------------|-------------|---|----------|----------|-----|-----|------|-----|
| HRMDS | 1350HR-4S32 | 4 | 50 | 32 | 50 | 150 | 2 | 1.1 |
| | 1350HR-4M32 | 4 | 50 | 32 | 50 | 250 | 2 | 1.7 |
| | 1350HR-4L32 | 4 | 50 | 32 | 50 | 300 | 2 | 2 |
| | 1350HR-4S40 | 4 | 50 | 40 | 50 | 150 | 2 | 1.5 |
| | 1350HR-4M40 | 4 | 50 | 40 | 50 | 250 | 2 | 2.4 |
| | 1350HR-4L40 | 4 | 50 | 40 | 50 | 300 | 2 | 2.9 |
| | 1350HR-4S42 | 4 | 50 | 42 | 50 | 150 | 2 | 1.6 |
| | 1350HR-4M42 | 4 | 50 | 42 | 50 | 250 | 2 | 2.6 |
| | 1350HR-4L42 | 4 | 50 | 42 | 50 | 300 | 2 | 3.1 |
| | 1363HR-4S32 | 4 | 63 | 32 | 50 | 150 | 2 | 1.4 |
| | 1363HR-4M32 | 4 | 63 | 32 | 50 | 250 | 2 | 2.1 |
| | 1363HR-4L32 | 4 | 63 | 32 | 50 | 300 | 2 | 2.4 |
| | 1363HR-4S40 | 4 | 63 | 40 | 50 | 150 | 2 | 1.8 |
| | 1363HR-4M40 | 4 | 63 | 40 | 50 | 250 | 2 | 2.8 |
| | 1363HR-4L40 | 4 | 63 | 40 | 50 | 300 | 2 | 3.2 |
| | 1363HR-4S42 | 4 | 63 | 42 | 50 | 150 | 2 | 1.9 |
| | 1363HR-4M42 | 4 | 63 | 42 | 50 | 250 | 2 | 3 |
| | 1363HR-4L42 | 4 | 63 | 42 | 50 | 300 | 2 | 3.5 |
| | 1363HR-5S32 | 5 | 63 | 32 | 50 | 150 | 2 | 1.5 |
| | 1363HR-5M32 | 5 | 63 | 32 | 50 | 250 | 2 | 2 |
| | 1363HR-5L32 | 5 | 63 | 32 | 50 | 300 | 2 | 2.3 |
| | 1363HR-5S40 | 5 | 63 | 40 | 50 | 150 | 2 | 1.8 |
| | 1363HR-5M40 | 5 | 63 | 40 | 50 | 250 | 2 | 2.8 |
| | 1363HR-5L40 | 5 | 63 | 40 | 50 | 300 | 2 | 3.2 |
| | 1363HR-5S42 | 5 | 63 | 42 | 50 | 150 | 2 | 1.9 |
| | 1363HR-5M42 | 5 | 63 | 42 | 50 | 250 | 2 | 3 |
| | 1363HR-5L42 | 5 | 63 | 42 | 50 | 300 | 2 | 3.5 |

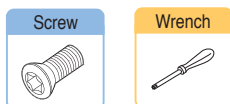
Available Inserts

WNMX-MM



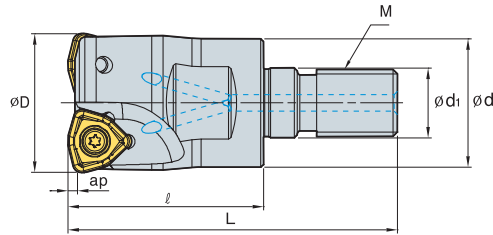
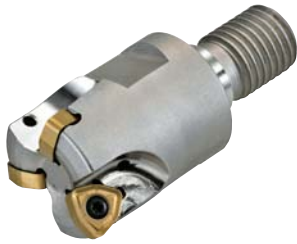
| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC5545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| WNMX 130520ZNN-MM | | | | ● | ● | ● | ● | ● | | | | | | | | | E23 |

Parts



FTKA0412B TW15S

HRMDM 06 *New*



AA 14°
 • AR : -7°
 • RR : -18°~-25°

(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | ap | |
|------------------|---|-----------------|-----------------|-------------------|--------|----|-----|-----|------|
| HRMDM 0616HR-M08 | 2 | 16 | 14.5 | 8.5 | 25 | 42 | M08 | 1.0 | 0.03 |
| 0617HR-M08 | 2 | 17 | 14.5 | 8.5 | 25 | 42 | M08 | 1.0 | 0.03 |
| 0618HR-M08 | 2 | 18 | 14.5 | 8.5 | 25 | 42 | M08 | 1.0 | 0.03 |
| 0620HR-M10 | 2 | 20 | 18 | 10.5 | 30 | 51 | M10 | 1.0 | 0.06 |
| 0621HR-M10 | 2 | 21 | 18 | 10.5 | 30 | 51 | M10 | 1.0 | 0.07 |
| 0625HR-M12 | 3 | 25 | 23 | 12.5 | 35 | 59 | M12 | 1.0 | 0.10 |
| 0626HR-M12 | 3 | 26 | 23 | 12.5 | 35 | 59 | M12 | 1.0 | 0.11 |
| 0632HR-M16 | 4 | 32 | 29 | 17 | 40 | 67 | M16 | 1.0 | 0.21 |
| 0633HR-M16 | 4 | 33 | 29 | 17 | 40 | 67 | M16 | 1.0 | 0.22 |

Available Inserts

WNMX-MM



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| WNMX060312ZNN-MM | | | | | ● | ● | | | | | | | | | | | E23 |

Available Adoptor

| Designation | Available Adoptor | Designation | Available Adoptor |
|------------------|-------------------|--|-------------------|
| HRMDM 0616HR-M08 | MAT- M08 | HRMDM 0625HR-M12 0626HR-M12 0632HR-M16 0633HR-M16 | MAT- M12 |
| 0617HR-M08 | MAT- M08 | | MAT- M12 |
| 0618HR-M08 | MAT- M08 | | MAT- M16 |
| 0620HR-M10 | MAT- M10 | | MAT- M16 |
| 0621HR-M10 | MAT- M10 | | |
| | | | |

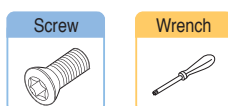
Designation : HRMDM0932HR-M16
 Modular Head Threading Measure size(M16)

||

Adaptor Spec. : MAT-M16-035-S32S
 Adaptor Threading Measure(M16)

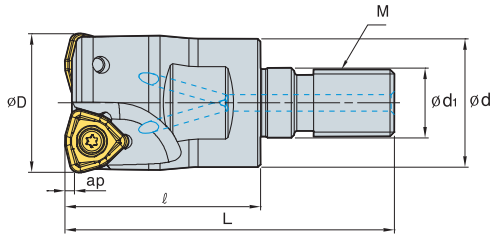
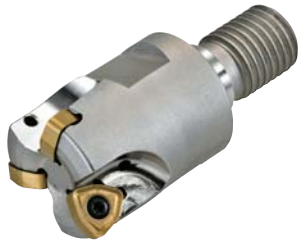


Parts



ETNA02506 TW07S

HRMDM09/13



AA
14°
• AR : -7°
• RR : -18°~25°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ℓ | L | M | ap | |
|-------------|------------|----------|----------|------------|--------|----|-----|-----|------|
| HRMDM | 0925HR-M12 | 2 | 25 | 23 | 12.5 | 35 | M12 | 1.5 | 0.10 |
| | 0926HR-M12 | 2 | 26 | 23 | 12.5 | 35 | M12 | 1.5 | 0.11 |
| | 0930HR-M16 | 3 | 30 | 29 | 17 | 40 | M16 | 1.5 | 0.19 |
| | 0932HR-M16 | 3 | 32 | 29 | 17 | 40 | M16 | 1.5 | 0.20 |
| | 0933HR-M16 | 3 | 33 | 29 | 17 | 40 | M16 | 1.5 | 0.21 |
| | 0935HR-M16 | 4 | 35 | 29 | 17 | 40 | M16 | 1.5 | 0.22 |
| | 0940HR-M16 | 4 | 40 | 29 | 17 | 40 | M16 | 1.5 | 0.25 |
| HRMDM | 1332HR-M16 | 2 | 32 | 29 | 17 | 40 | M16 | 2 | 0.20 |
| | 1333HR-M16 | 2 | 33 | 29 | 17 | 40 | M16 | 2 | 0.20 |
| | 1335HR-M16 | 2 | 35 | 29 | 17 | 40 | M16 | 2 | 0.22 |
| | 1340HR-M16 | 3 | 40 | 29 | 17 | 45 | M16 | 2 | 0.26 |

Available Inserts

WNMX-MM



| Type | Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | page |
|---------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| 09 type | WNMX09T316ZNN-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | E23 |
| 13 type | WNMX130520ZNN-MM | | | ● | ● | ● | ● | ● | | | | | | | | | | | |

Available Adaptor

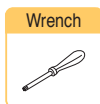
| Designation | Available Adaptor | Designation | Available Adaptor |
|-------------|-------------------|-------------|-------------------|
| HRMDM | MAT- M12 | 0925HR-M12 | MAT- M16 |
| | | 0926HR-M12 | |
| | | 0930HR-M16 | |
| | MAT- M16 | 0932HR-M16 | |
| | | 0933HR-M16 | |
| | | 0935HR-M16 | |

Designation : HRMDM0932HR-M16
Modular Head Threading Measure size(M16)

II

Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

Parts



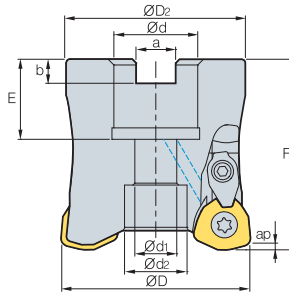
| | | |
|---------|-----------|-------|
| 09 type | FTKA0307 | TW09S |
| 13 type | FTKA0412B | TW15S |

Available Inserts E23

Available Adaptor E253-E254

● : Stock item

HRMC(M) 13/15



(mm)

| Designation | | øD | øD ₂ | ød | ød ₁ | ød ₂ | a | b | E | F | ap | | Bolt | |
|-------------|-----------|----|-----------------|-----|-----------------|-----------------|--------|------------|--------|--------|----|-----|------|--------------|
| HRMC(M) | 13050HR-3 | 3 | 50 | 47 | 22.225(22) | 11 | 16.4 | 8.0(10.4) | 5(6.3) | 20(21) | 50 | 2.0 | 0.4 | SB1035 |
| | 13050HR-4 | 4 | 50 | 47 | 22.225(22) | 11 | 16.4 | 8.0(10.4) | 5(6.3) | 20(21) | 50 | 2.0 | 0.4 | SB1035 |
| | 13063HR-4 | 4 | 63 | 60 | 22.225(22) | 11 | 17 | 8.0(10.4) | 5(6.3) | 20(21) | 50 | 2.0 | 0.7 | SB1035 |
| | 13080HR-5 | 5 | 80 | 76 | 31.75(27) | 18(13) | 26(20) | 12.7(12.4) | 8(7) | 32(23) | 70 | 2.0 | 1.6 | SB16(12)45 |
| HRMC(M) | 15063HR-3 | 3 | 63 | 60 | 22.225(22) | 11 | 17 | 8.0(10.4) | 5(6.3) | 20(21) | 50 | 2.5 | 0.7 | SB1035 |
| | 15080HR-4 | 4 | 80 | 76 | 31.75(27) | 18(13) | 26(20) | 12.7(12.4) | 8(7) | 32(23) | 70 | 2.5 | 1.7 | SB16(12)45 |
| | 15100HR-5 | 5 | 100 | 96 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8(8) | 32(26) | 70 | 2.5 | 2.8 | SB1645 |
| | 15100HR-6 | 6 | 100 | 96 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8(8) | 32(26) | 70 | 2.5 | 3.2 | SB1645 |
| | 15125HR-6 | 6 | 125 | 98 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(29) | 63 | 2.5 | 3.3 | SB2040 |
| | 15160R-7 | 7 | 160 | 100 | 50.8(40) | - | 72 | 19.0(16.4) | 11(9) | 38(35) | 63 | 2.5 | 4.3 | MBA-M24(M20) |

Note) Through coolant type between Ø50~Ø125

() Metric Size

Available Inserts

WDKT-MH

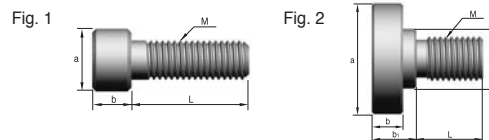


| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|---------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC3330 | PC3500 | PC3300 | PC5400 | PC3545 | PC9530 | PC8510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 13 type | WDKT130520ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | |
| 15 type | WDKT150625ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | |

Available Arbors

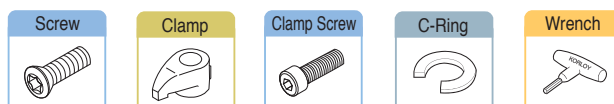
| Designation | Available Arbors | |
|-------------|-------------------|-------------------|
| | HRMC | HRMCM |
| HRMC(M) | 13050HR-3 | BT□□-FMA22.225-□□ |
| | 13050HR-4 | SK□□-FMC22-□□ |
| | 13063HR-4 | BT□□-FMA31.75-□□ |
| 13080HR-5 | SK□□-FMA31.75-□□ | BT□□-FMC27-□□ |
| | | SK□□-FMC27-□□ |
| 15063HR-3 | BT□□-FMA22.225-□□ | BT□□-FMC22-□□ |
| 15080HR-4 | | SK□□-FMC22-□□ |
| | 15080HR-4 | BT□□-FMA31.75-□□ |
| 15100HR-5 | SK□□-FMA31.75-□□ | BT□□-FMC32-□□ |
| 15100HR-6 | | SK□□-FMC32-□□ |
| 15125HR-6 | BT□□-FMA38.1-□□ | BT□□-FMB40-□□ |
| | SK□□-FMA38.1-□□ | BT□□-FMC40-□□ |
| 15160R-7 | BT□□-FMA50.8-□□ | SK□□-FMC40-□□ |

Bolt



| Designation | Dimensions(mm) | | | | | | | Fig. |
|-------------|----------------|----|----|----|----|----|-------|------|
| | M | a | b | b1 | C | L | pitch | |
| SB1035 | M10 | 16 | 10 | - | - | 35 | 1.5 | 1 |
| SB1245 | M12 | 18 | 12 | - | - | 45 | 1.75 | 1 |
| SB1645 | M16 | 24 | 16 | - | - | 45 | 2.0 | 1 |
| SB2040 | M20 | 30 | 20 | - | - | 40 | 2.5 | 1 |
| MBA-M20 | M20 | 50 | 14 | 20 | 27 | 30 | 2.5 | 2 |
| MBA-M24 | M24 | 65 | 14 | 24 | 37 | 36 | 3.0 | 2 |

Parts



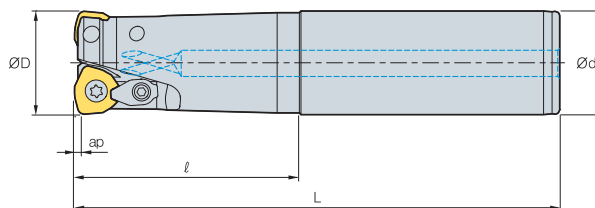
| | | | | | |
|-------------------------------|------------|----------|-----------|------|----------|
| 13 type (Ø50,63,80) | FTGA0513-P | CHH4.5R1 | CTX04513H | CR03 | TW20-100 |
| 15 type (Ø63,80,100,125, 160) | FTGA0513-P | CHH5.5R1 | CTX0515 | CR04 | TW20-100 |

Available Inserts E23

Available Arbors and bolt E290~E292

● : Stock item

HRMS 08/10



(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | ℓ | L | ap | |
|-------------|-------------|-----------------|-----------------|--------|-----|-----|-----|
| HRMS | 0820HR-2S20 | 2 | 20 | 20 | 50 | 130 | 0.3 |
| | 0820HR-2M20 | 2 | 20 | 20 | 100 | 180 | 0.4 |
| | 0820HR-2L20 | 2 | 20 | 20 | 130 | 250 | 0.5 |
| | 0821HR-2S20 | 2 | 21 | 20 | 50 | 130 | 0.3 |
| | 0821HR-2M20 | 2 | 21 | 20 | 50 | 180 | 0.4 |
| | 0821HR-2L20 | 2 | 21 | 20 | 50 | 250 | 0.5 |
| HRMS | 1025HR-2S25 | 2 | 25 | 25 | 60 | 140 | 0.4 |
| | 1025HR-2M25 | 2 | 25 | 25 | 120 | 200 | 0.6 |
| | 1025HR-2L25 | 2 | 25 | 25 | 180 | 300 | 0.9 |
| | 1026HR-2S25 | 2 | 26 | 25 | 60 | 140 | 0.4 |
| | 1026HR-2M25 | 2 | 26 | 25 | 60 | 200 | 0.6 |
| | 1026HR-2L25 | 2 | 26 | 25 | 60 | 300 | 1.0 |
| | 1030HR-2S32 | 2 | 30 | 32 | 70 | 150 | 0.8 |
| | 1030HR-2M32 | 2 | 30 | 32 | 120 | 200 | 1.0 |
| | 1030HR-2L32 | 2 | 30 | 32 | 180 | 300 | 1.5 |

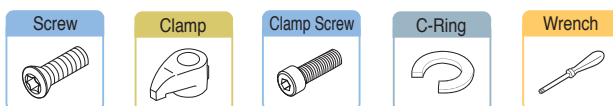
Available Inserts

WDKT-MH



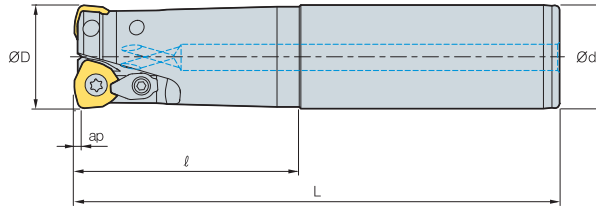
| Type | Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|---------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| 08 type | WDKT080316ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | |
| 10 type | WDKT10T320ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | |

Parts



| | | | | | |
|---------|----------|----------|----------|------|-------|
| 08 type | FTNA0306 | - | - | - | TW09P |
| 10 type | FTKA0408 | CHH3.5R1 | CTX03510 | CR03 | TW15S |

HRMS 13



| Designation | | | ØD | Ød | ℓ | L | ap | |
|-------------|-------------|----|----|-----|-----|-----|-----|-----|
| HRMS | 1332HR-2S32 | 2 | 32 | 32 | 70 | 150 | 2.0 | 0.8 |
| | 1332HR-2M32 | 2 | 32 | 32 | 120 | 200 | 2.0 | 1.0 |
| | 1332HR-2L32 | 2 | 32 | 32 | 180 | 300 | 2.0 | 1.6 |
| | 1333HR-2S32 | 2 | 33 | 32 | 70 | 150 | 2.0 | 0.8 |
| | 1333HR-2M32 | 2 | 33 | 32 | 70 | 200 | 2.0 | 1.1 |
| | 1333HR-2L32 | 2 | 33 | 32 | 70 | 300 | 2.0 | 1.7 |
| | 1335HR-2S32 | 2 | 35 | 32 | 50 | 150 | 2.0 | 0.8 |
| | 1335HR-2M32 | 2 | 35 | 32 | 50 | 200 | 2.0 | 1.1 |
| | 1335HR-2L32 | 2 | 35 | 32 | 50 | 300 | 2.0 | 1.7 |
| | 1340HR-3S32 | 3 | 40 | 32 | 50 | 150 | 2.0 | 0.8 |
| | 1340HR-3M32 | 3 | 40 | 32 | 50 | 250 | 2.0 | 1.4 |
| | 1340HR-3L32 | 3 | 40 | 32 | 50 | 300 | 2.0 | 1.7 |
| | 1340HR-3S40 | 3 | 40 | 40 | 60 | 150 | 2.0 | 1.2 |
| | 1340HR-3M40 | 3 | 40 | 40 | 130 | 250 | 2.0 | 2.1 |
| | 1340HR-3L40 | 3 | 40 | 40 | 180 | 300 | 2.0 | 2.6 |
| | 1340HR-3S42 | 3 | 40 | 42 | 60 | 150 | 2.0 | 1.4 |
| 1340HR-3M42 | 3 | 40 | 42 | 130 | 250 | 2.0 | 2.3 | |
| 1340HR-3L42 | 3 | 40 | 42 | 180 | 300 | 2.0 | 2.7 | |

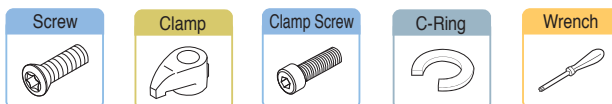
Available Inserts

WDKT-MH



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page | |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| WDKT130520ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | | E23 |

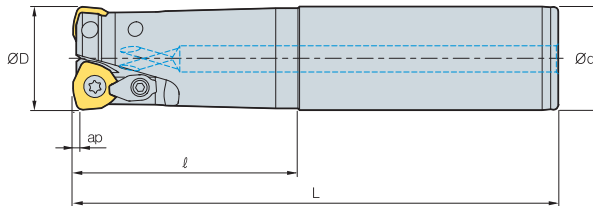
Parts



| | | | | | |
|-----------|------------|----------|-----------|------|------|
| Ø32,33,35 | FTGA0510-P | CHH4.5R1 | CTX04513H | CR03 | TW20 |
| Ø40 | FTGA0512-P | CHH5.5R1 | CTX04513H | CR03 | TW20 |



HRMS 15



| Designation | | ØD | Ød | ℓ | L | ap | |
|------------------|---|----|----|----|-----|-----|-----|
| HRMS 1550HR-3S32 | 3 | 50 | 32 | 50 | 150 | 2.5 | 1.0 |
| 1550HR-3M32 | 3 | 50 | 32 | 50 | 250 | 2.5 | 1.6 |
| 1550HR-3L32 | 3 | 50 | 32 | 50 | 300 | 2.5 | 1.9 |
| 1550HR-3S40 | 3 | 50 | 40 | 50 | 150 | 2.5 | 1.4 |
| 1550HR-3M40 | 3 | 50 | 40 | 50 | 250 | 2.5 | 2.3 |
| 1550HR-3L40 | 3 | 50 | 40 | 50 | 300 | 2.5 | 2.8 |
| 1550HR-3S42 | 3 | 50 | 42 | 50 | 150 | 2.5 | 1.5 |
| 1550HR-3M42 | 3 | 50 | 42 | 50 | 250 | 2.5 | 2.5 |
| 1550HR-3L42 | 3 | 50 | 42 | 50 | 300 | 2.5 | 3.0 |
| 1563HR-4S32 | 4 | 63 | 32 | 50 | 150 | 2.5 | 1.3 |
| 1563HR-4M32 | 4 | 63 | 32 | 50 | 250 | 2.5 | 1.9 |
| 1563HR-4L32 | 4 | 63 | 32 | 50 | 300 | 2.5 | 2.2 |
| 1563HR-4S40 | 4 | 63 | 40 | 50 | 150 | 2.5 | 1.7 |
| 1563HR-4M40 | 4 | 63 | 40 | 50 | 250 | 2.5 | 2.6 |
| 1563HR-4L40 | 4 | 63 | 40 | 50 | 300 | 2.5 | 3.1 |
| 1563HR-4S42 | 4 | 63 | 42 | 50 | 150 | 2.5 | 1.8 |
| 1563HR-4M42 | 4 | 63 | 42 | 50 | 250 | 2.5 | 2.8 |
| 1563HR-4L42 | 4 | 63 | 42 | 50 | 300 | 2.5 | 3.3 |

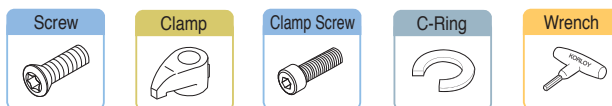
Available Inserts

WDKT-MH



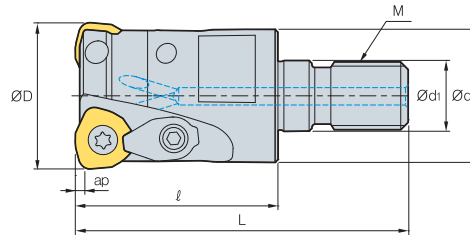
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | page |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| WDKT 150625ZDSR-MH | | | | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

Parts



FTGA0513-P CHH5.5R1 CTX0515 CR04 TW20

HRMM08/10/13



(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | ap | |
|-----------------|---|-----------------|-----------------|-------------------|--------|----|-----|-----|------|
| HRMM 0820HR-M10 | 2 | 20 | 18 | 10.5 | 30 | 51 | M10 | 1 | 0.06 |
| 0821HR-M10 | 2 | 21 | 18 | 10.5 | 30 | 51 | M10 | 1 | 0.06 |
| 0825HR-M12 | 3 | 25 | 23 | 12.5 | 35 | 59 | M12 | 1 | 0.11 |
| 0826HR-M12 | 3 | 26 | 23 | 12.5 | 35 | 59 | M12 | 1 | 0.11 |
| 0828HR-M12 | 3 | 28 | 23 | 12.5 | 35 | 59 | M12 | 1 | 0.12 |
| 0832HR-M16 | 4 | 32 | 29 | 17 | 40 | 67 | M16 | 1 | 0.21 |
| 0833HR-M16 | 4 | 33 | 29 | 17 | 40 | 67 | M16 | 1 | 0.21 |
| 0835HR-M16 | 4 | 35 | 29 | 17 | 40 | 67 | M16 | 1 | 0.23 |
| 0840HR-M16 | 5 | 40 | 29 | 17 | 40 | 67 | M16 | 1 | 0.25 |
| HRMM 1025HR-M12 | 2 | 25 | 23 | 12.5 | 35 | 59 | M12 | 1.5 | 0.1 |
| 1026HR-M12 | 2 | 26 | 23 | 12.5 | 35 | 59 | M12 | 1.5 | 0.1 |
| 1030HR-M16 | 2 | 30 | 29 | 17 | 40 | 67 | M16 | 1.5 | 0.2 |
| 1032HR-M16 | 3 | 32 | 29 | 17 | 45 | 72 | M16 | 1.5 | 0.26 |
| 1035HR-M16 | 3 | 35 | 29 | 17 | 45 | 72 | M16 | 1.5 | 0.23 |
| 1040HR-M16 | 4 | 40 | 29 | 17 | 45 | 72 | M16 | 1.5 | 0.27 |
| HRMM 1332HR-M16 | 2 | 32 | 29 | 17 | 40 | 67 | M16 | 2 | 0.17 |
| 1333HR-M16 | 2 | 33 | 29 | 17 | 40 | 67 | M16 | 2 | 0.17 |
| 1335HR-M16 | 2 | 35 | 29 | 17 | 40 | 67 | M16 | 2 | 0.19 |
| 1340HR-M16 | 3 | 40 | 29 | 17 | 45 | 72 | M16 | 2 | 0.24 |

Available Inserts

WDKT-MH



| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | page | |
|---------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC3630 | PC6510 | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 08 type | WDKT080316ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | |
| 10 type | WDKT10T320ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | |
| 13 type | WDKT130520ZDSR-MH | | | | ● | ● | ● | ● | ● | | | | | | | | | |

E23

Available Adoptor

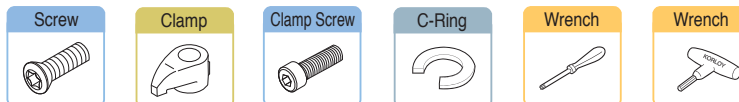
| Designation | Adaptor | Designation | Adaptor | Designation | Adaptor |
|-----------------|---------|-----------------|---------|-----------------|---------|
| HRMM 0820HR-M10 | MAT-M10 | HRMM 0835HR-M16 | MAT-M16 | HRMM 1040HR-M16 | MAT-M16 |
| 0821HR-M10 | | 0840HR-M16 | | HRMM 1332HR-M16 | |
| 0825HR-M12 | MAT-M12 | HRMM 1025HR-M12 | MAT-M12 | 1333HR-M16 | MAT-M16 |
| 0826HR-M12 | | 1026HR-M12 | | 1335HR-M16 | |
| 0828HR-M12 | | 1030HR-M16 | | 1340HR-M16 | |
| 0832HR-M16 | | 1032HR-M16 | | | |
| 0833HR-M16 | MAT-M16 | 1035HR-M16 | MAT-M16 | | |

Designation : HRMM0820HR-M10
Modular Head Threading Measure size(M10)

||

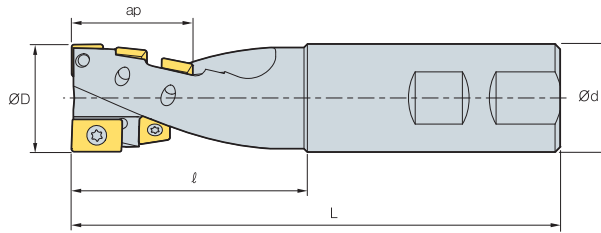
Adaptor Spec. : MAT-M10-030-S20S
Adaptor Threading Measure(M10)

Parts



| | | | | | |
|---------|------------------------|------------|----------|-----------|-------|
| 08 type | FTNA0306 | - | - | - | - |
| 10 type | FTKA0408 | CHH3.5R1 | CTX03510 | CR03 | TW15S |
| 13 type | $\varnothing 32,33,35$ | FTGA0510-P | CHH4.5R1 | CTX04513H | CR03 |
| | $\varnothing 40$ | FTGA0512-P | CHH5.5R1 | CTX04513H | CR03 |

THE



AA
90°
• AR : 5°, 10°
• RR : -5°

| Designation | ØD | ød | ℓ | L | ap | No. of flute | | Available Inserts | |
|-------------|----|----|----|-----|----|--------------|-----|--------------------|-----------------------|
| | | | | | | | | Lower cutting edge | External cutting edge |
| THE 25R | 25 | 25 | 55 | 120 | 25 | 2 | 0.4 | APLT070304R 1z | SPMT060304 4z |
| 32R | 32 | 32 | 70 | 145 | 40 | 2 | 0.5 | ADLT150308R 1z | SDMT090308-MM 5z |
| 40R | 40 | 42 | 88 | 175 | 54 | 2 | 1.3 | ZPMT1504PPSR-MM 1z | SPMT120408-MM 5z |
| 50R | 50 | 42 | 85 | 175 | 54 | 4 | 1.4 | ZPMT1504PPSR-MM 2z | SPMT120408-MM 10z |

Available Inserts

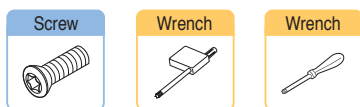
| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | page |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC8510 | PC219K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| SPMT060304 | ● | | | | | | | | | | | | | | | | | E04 |
| SDMT090308-MM | | | | ● | | | | | | | | | | | | | | E05 |
| SPMT120408-MM | | | | ● | | ● | | | | | | | | | | | | E14 |
| APLT070304R | | | | | | | | | | | | | | | | | | E21 |
| ADLT150308R | ● | | | | | | | | | | | | | | | | | E21 |
| ZPMT1504PPSR-MM | | | | ● | | ● | | | | | | | | | | | | E24 |

Recommended cutting condition

| • Grooving | | | |
|------------|-------------------|-----------|--------|
| Workpiece | Cutting Condition | | Grades |
| | vc(m/min) | fz(mm/t) | |
| P | 60~120 | 0.06~0.20 | NCM325 |
| M | 50 ~ 120 | 0.06~0.15 | NCM325 |
| K | 60~120 | 0.10~0.20 | NCM325 |

| • Side cutting | | | |
|----------------|-------------------|-------------|--------|
| Workpiece | Cutting Condition | | Grades |
| | vc(m/min) | fz(mm/t) | |
| P | 100 ~180 | 0.10 ~ 0.35 | NCM325 |
| M | 80 ~ 180 | 0.10 ~ 0.30 | NCM325 |
| K | 80 ~150 | 0.15~ 0.35 | NCM325 |

Parts

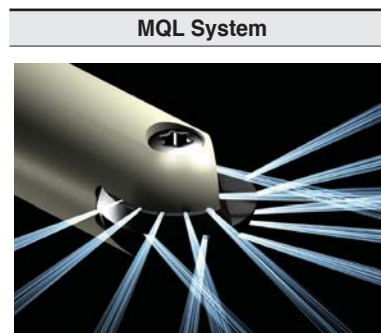


| THE | 25R | ETNA02506 | TW07P | - |
|-----|-----|-----------|-------|-------|
| | 32R | ETNA0408 | - | TW15S |
| | 40R | ETNA0511 | - | TW20S |
| | 50R | ETNA0511 | - | TW20S |

Longer tool life is achieved due to the excellent cutting performance of the insert grade

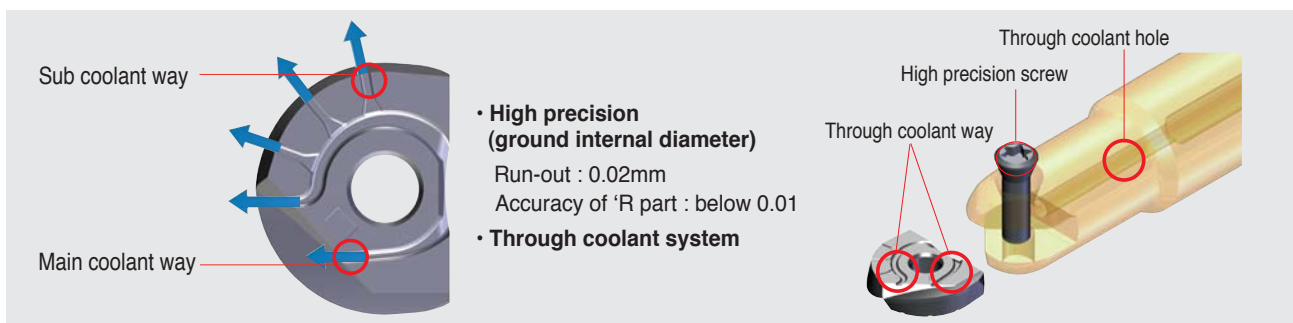
Laser Mill

- Long tool life has been achieved due to the excellent cutting performance of the insert grade
- Optimum machining of molds has been achieved with the MQL available system
- Easy clamping with simple screw on system
- Various holder line up: steel shank, carbide shank, modular type
- High accuracy indexable endmills for mold finishing



- Environmental friendly system
- Decreased coolant cost
- Lubrication of cutting edge
- Improved chip control property
- Increased tool life & improved surface quality

Clamping system



- High precision (ground internal diameter)
Run-out : 0.02mm
Accuracy of 'R part' : below 0.01
- Through coolant system

Features

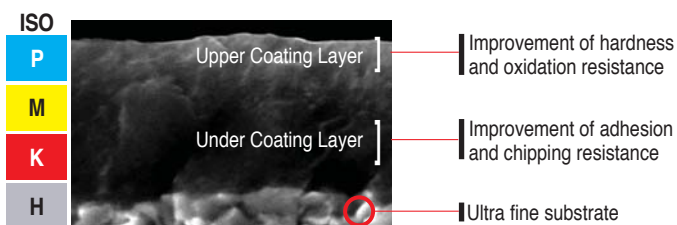


- Six types of inserts are available with one holder
- Single screw for clamping of insert : Easy clamping system
- Various types of holders (Steel shank, Carbide shank, Modular type)
- MQL applicable - environmentally responsible with longer tool life & improved surface quality.

LBS, LR Order-made items

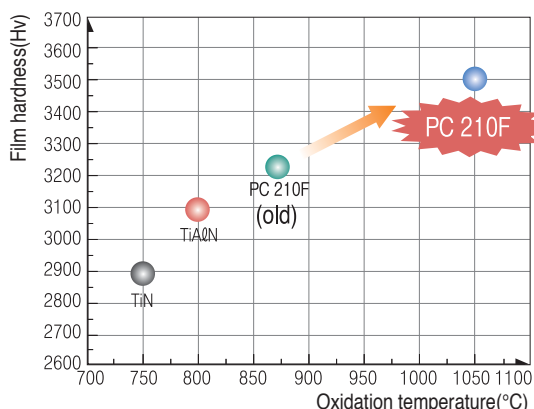
| LBH-Ball | LRH-Corner radius | LFH-High feed | LCF-Chamfer | LBS-Ball type | LR-Corner R type |
|---|--|--|---|---|--|
| | | | | | |
| <ul style="list-style-type: none"> • Helical cutting edge • Suitable for harder material with high feed | <ul style="list-style-type: none"> • Helical cutting edge • Variety of nose -R | <ul style="list-style-type: none"> • Helical cutting edge • Suitable for high feed | <ul style="list-style-type: none"> • Straight cutting edge • Center drilling and chamfering | <ul style="list-style-type: none"> • Straight cutting edge • Suitable for precise | <ul style="list-style-type: none"> • Straight cutting edge • Variety of nose-R |

New PC210F Features



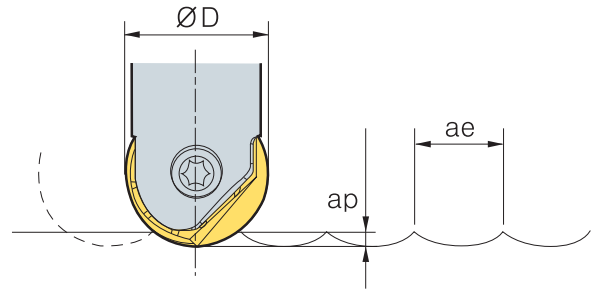
- Due to the ultra fine carbide, toughness of cutting edge has been increased
- Special coating has been applied for high-speed machining & hardened workpiece
- High quality of machined surface due to the excellent lubrication property of the film

Film hardness & Oxidation temperature



🔴 Cutting condition formula for milling

| Cutting speed | RPM |
|---|--|
| $vc = \frac{\pi \times D_e \times n}{1000} \text{ (m/min)}$ | $n = \frac{vc_e \times 1000}{\pi \times D_e} \text{ (rev/min)}$ |
| Feed per tooth | Feed per minute |
| $fz = \frac{vf}{n \times z} \text{ (mm/t)}$ | $vf = fz \times n \times z \text{ (mm/min)}$ |
| Chip removal amount | Power requirement |
| $Q = \frac{ap \times ae \times vf}{1000} \text{ (cm}^3\text{/min)}$ | $P_{kw} = \frac{Q \times kc}{60 \times 1000 \times \eta} \text{ (kW)}$ |
| | $H = \frac{P_c}{0.75} \text{ (kw)}$ |



| | |
|--|--|
| vc = Cutting speed(m/min) | Pkw = Power Requirement (kW) |
| vc_e = Practical cutting speed(m/min) | Php = Horsepower requirement(hp) |
| n = Revolution per Minute(min ⁻¹) | Q = Chip removal amount(cm ³ /min) |
| D_c = Cutting diameter(mm) | ap = Depth of cut(mm) |
| D_e = Actual diameter(mm) | ae = Width of cut(mm) |
| vf = Feed per minute(mm/min) | kc = Specific cutting resistance(kg/mm ²) |
| fz = Feed per tooth(mm/t) | η = Mechanical efficiency(%) |
| z = Number of tooth | |

🔴 Recommended cutting condition

| Workpiece | Recommended grade | Hardness | vc(m/min) | fz(mm/t) | ap | ae |
|---------------------------|-------------------|------------|-----------|------------|--------|--------|
| | | | | | ap(mm) | ae(mm) |
| Carbon steel, Alloy steel | PC210F | ~ HRC30 | 100 ~ 250 | 0.2 ~ 0.3 | 0.07D | 0.07D |
| Carbon steel, Alloy steel | PC210F | HRC30 ~ 40 | 80 ~ 150 | 0.1 ~ 0.3 | 0.07D | 0.07D |
| Die steel | PC210F | HRC30 ~ 40 | 80 ~ 150 | 0.1 ~ 0.2 | 0.05D | 0.05D |
| Cast iron | PC210F | - | 100 ~ 200 | 0.3 ~ 0.35 | 0.07D | 0.07D |
| Hardened steel | PC210F | HRC50 ~ 60 | 100 ~ 150 | 0.1 ~ 0.3 | 0.03D | 0.03D |
| Stainless steel | PC210F | - | 80 ~ 150 | 0.1 ~ 0.3 | 0.05D | 0.05D |
| Aluminum alloy | PC210F | - | 200 ~ 300 | 0.15 ~ 0.4 | 0.15D | 0.15D |

🔴 Practical cutting speed calculation formulas

1. θ° Using : Calculating cutting speed at P point (Cutting speed according to depth of cut when ramping)

• Formula : Practical cutting speed

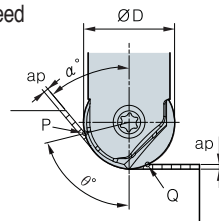
$$vc = \frac{\pi \times D_e \sin \theta \times n}{1000} \text{ (m/min)}$$

$$\theta = \cos^{-1} \left(\frac{D_e - 2ap}{D_e} \right) + 90 - \alpha^\circ$$

2. In case of using ap : Calculating cutting speed at Q point

• Formula : Practical cutting speed

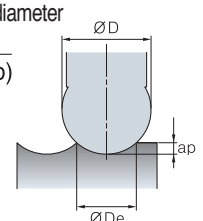
$$vc_e = \frac{2\pi n \sqrt{ap(D_e - ap)}}{1000}$$



3. Formula of actual diameter

• Formula of actual diameter

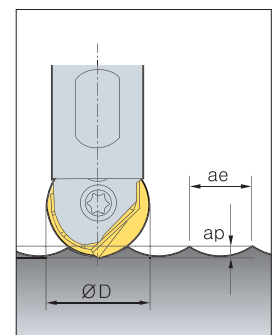
$$D_e = 2\sqrt{ap(D - ap)}$$



🔴 Practical cutting speed calculation formulas

| ae(mm) | h(surface roughness) (μm) | | | | | | | | | | |
|--------|---------------------------|-----|-----|-----|-----|-----|------|------|------|------|--|
| | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | |
| 5 | 0.3 | 1.0 | 2.3 | 4.0 | 6.3 | 9.0 | 12.3 | 16.0 | 20.3 | 25.0 | |
| 6 | 0.2 | 0.8 | 1.9 | 3.3 | 5.2 | 7.5 | 10.2 | 13.3 | 16.9 | 20.8 | |
| 8 | 0.2 | 0.6 | 1.4 | 2.5 | 3.9 | 5.6 | 7.7 | 10.0 | 12.7 | 15.6 | |
| 10 | 0.1 | 0.5 | 1.1 | 2.0 | 3.1 | 4.5 | 6.1 | 8.0 | 10.1 | 12.5 | |
| 12.5 | 0.1 | 0.4 | 0.9 | 1.6 | 2.5 | 3.6 | 4.9 | 6.4 | 8.1 | 10.0 | |
| 15 | 0.1 | 0.3 | 0.8 | 1.3 | 2.1 | 3.0 | 4.1 | 5.3 | 6.8 | 8.3 | |
| 16 | 0.1 | 0.3 | 0.7 | 1.3 | 2.0 | 2.8 | 3.8 | 5.0 | 6.3 | 7.8 | |

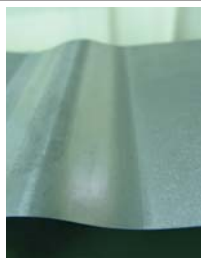

• Formula of surface roughness : $h(\text{surface finish}) = \frac{(ae)^2}{8R} \times 1000 (\mu\text{m})$



Actual diameter data

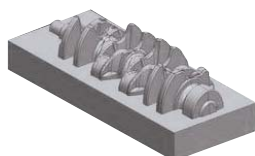
| ap \ ØD | Ø08 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø30 | Ø32 |
|---------|-----|-----|------|------|------|------|------|------|
| 0.1 | 1.8 | 2.0 | 2.2 | 2.5 | 2.8 | 3.2 | 3.5 | 3.6 |
| 0.2 | 2.5 | 2.8 | 3.1 | 3.6 | 4.0 | 4.5 | 4.9 | 5.0 |
| 0.3 | 3.0 | 3.4 | 3.7 | 4.3 | 4.9 | 5.4 | 6.0 | 6.2 |
| 0.5 | 3.9 | 4.4 | 4.8 | 5.6 | 6.2 | 7.0 | 7.7 | 7.9 |
| 1.0 | 5.3 | 6.0 | 6.6 | 7.7 | 8.7 | 9.8 | 10.8 | 11.1 |
| 1.5 | 6.2 | 7.1 | 7.9 | 9.3 | 10.5 | 11.9 | 13.1 | 13.5 |
| 2.0 | 6.9 | 8.0 | 8.9 | 10.6 | 12.0 | 13.6 | 15.0 | 15.5 |
| 2.5 | 7.4 | 8.7 | 9.7 | 11.6 | 13.2 | 15.0 | 16.6 | 17.2 |
| 3.0 | 7.7 | 9.2 | 10.4 | 12.5 | 14.3 | 16.2 | 18.0 | 18.7 |
| 3.5 | 7.9 | 9.5 | 10.9 | 13.2 | 15.2 | 17.3 | 19.3 | 20.0 |
| 4.0 | 8.0 | 9.8 | 11.3 | 13.9 | 16.0 | 18.3 | 20.4 | 21.2 |
| 5.0 | | | 11.8 | 14.8 | 17.3 | 20.0 | 22.4 | 23.2 |
| 6.0 | | | 12.0 | 15.5 | 18.3 | 21.4 | 24.0 | 25.0 |
| 7.0 | | | | 15.9 | 19.1 | 22.4 | 25.4 | 26.5 |
| 8.0 | | | | 16.0 | 19.6 | 23.3 | 26.5 | 27.7 |
| 10.0 | | | | | 20.0 | 24.5 | 28.3 | 29.7 |

Wear resistance test

| Cutting condition | | Pictures | | | |
|---|--|------------------|--------|-----|--------|
|  Cutting time : 15 hours | NAK80(HrC30), Air $vc(m/min) = 376$ $fz(mm/t) = 0.33$ $ap(mm) = 0.5$ $ae(mm) = 0.5$ $vf(mm/min) = 4,000$ $n(min^{-1}) = 6,000$ | Front, back view | PC210F | Old | Comp.A |
| | | | PC210F | Old | Comp.A |
| | | Top view | PC210F | Old | Comp.A |
| | | | PC210F | Old | Comp.A |
|  Cutting time : 8 hours | STD11(HrC50~65), Air $vc(m/min) = 251$ $fz(mm/t) = 0.38$ $ap(mm) = 0.5$ $ae(mm) = 0.3$ $vf(m/min) = 3,000$ $n(min^{-1}) = 4,000$ | Front, back view | PC210F | Old | Comp.A |
| | | | PC210F | Old | Comp.A |
| | | Top view | PC210F | Old | Comp.A |
| | | | PC210F | Old | Comp.A |

Machining example

| Crank Shaft | | CV-Joint | | Car Bumper Mold | |
|-------------------|---|-------------------|---|-------------------|---|
| Workpiece | SCM440 (HrC40) | Workpiece | SM53C Forged steel (HrC35) | Workpiece | KP4MA (HrC30~35) |
| cutting condition | $vc(m/min) = 376 / fz(mm/t) = 0.25$ $ap(mm) = 0.5 / ae(mm) = 0.2$ $n(min^{-1}) = 6000$ $vf(mm/min) = 3000 / MQL$ | cutting condition | $vc(m/min) = 200 / fz(mm/t) = 0.25$ $ap(mm) = 0.5\sim 2.0 / ae(mm) = 0.5\sim 1.0$ $n(min^{-1}) = 3000$ $vf(mm/min) = 1500 / Air$ | cutting condition | $vc(m/min) = 700 / fz(mm/t) = 0.25$ $ap(mm) = 0.5 / ae(mm) = 0.2$ $n(min^{-1}) = 9000$ $vf(mm/min) = 4500 / Air$ |
| Tools | Holder : LBE200115T-S25 Insert : LBH200 (PC210F) | Tools | Holder : LBE230-HSKC63 Insert : LBH230 (PC210F) | Tools | Holder : LBE250170S-S25C Insert : LBH250 (PC210F) |



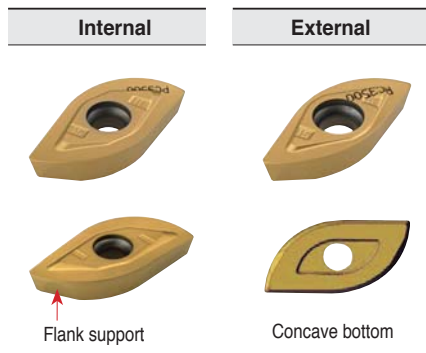
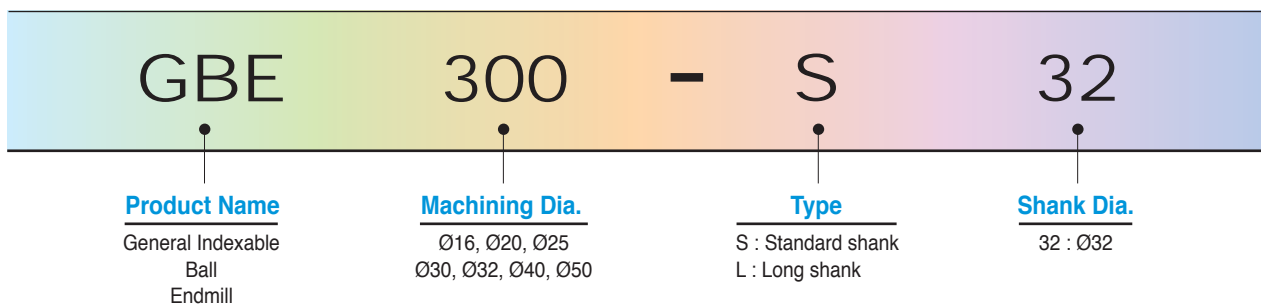
Long tool life due to high hardness grade

GBE

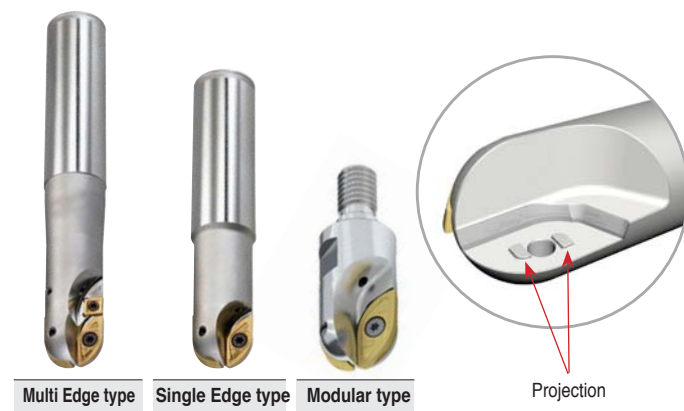
- Indexable Ballnose Endmill for Molds in medium & roughing applications
- Long tool life with high hardness grade
- Helical high accuracy cutting edge
- Optimized mold machining process with our internal coolant system
- Able to adjust to medium processing in middle & big roughing mold process
- Various holders in normal & long style holders



Holder Code System



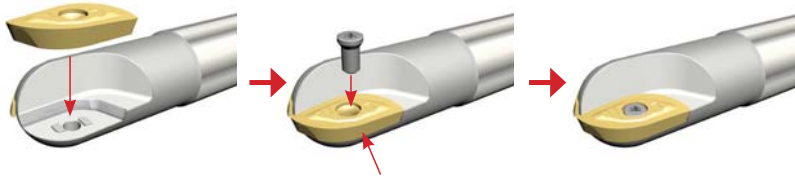
- ▶ Ability to handle high accuracy & large depth of cut applications.
 - Run-out : within 0.05mm
 - R accuracy : within 0.05mm
- ▶ Various diameters (Ø16,20,25,30,32,40,50)
- ▶ Minimal cutting resistance due to Helical cutting edge
- ▶ Anti-rotation of insert due to concave bottom & stable setting by flank support
- ▶ Long tool life & better processing due to 2 cutting inserts
- ▶ Better tool life with new grade



- ▶ Various diameters (Ø16,20,25,30,32,40,50)
- ▶ Improved chip treatment with internal coolant(cutting edge portion)
- ▶ Long tool life & better processing
- ▶ Easy insert setting with projection part to prevent vibration during processing

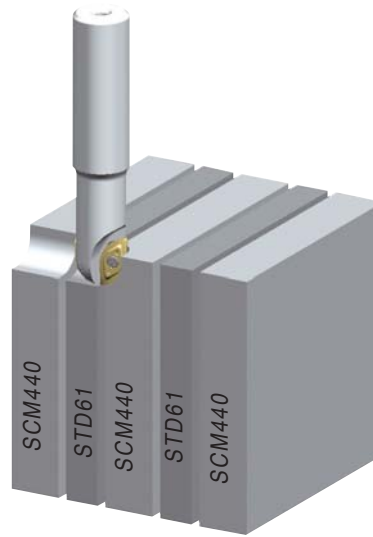
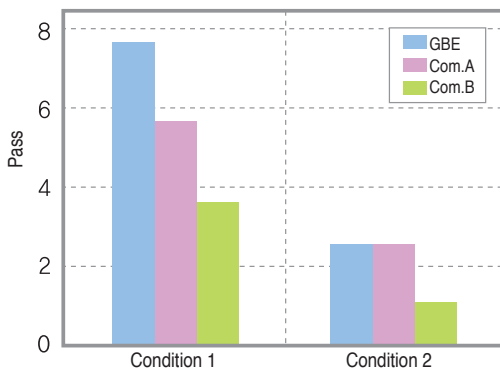


How to set insert



1. Set the insert to the holder projection seat
2. Push the insert into the pocket as shown by red arrows and screw down with wrench

Cutting Performance Test



Cutting condition

| Class. | Cutting speed(vc) | Feed(fz) | Depth of cut(ap) | Depth of cut(ae) | Workpiece | Etc. |
|-------------|-------------------|----------|------------------|------------------|------------------------------------|------|
| Condition 1 | 150m/min | 0.15mm/t | 5mm | 8mm | STD61(HrC50) + SCM440(HrC20) | Dry |
| Condition 2 | 100m/min | 0.1mm/t | 8mm | 8mm | | |

Inserts / Parts

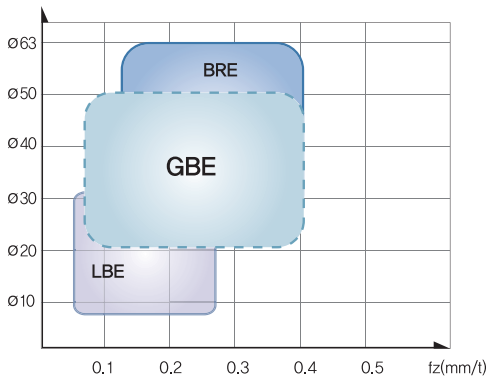
| Type | Insert | | | Parts | | | |
|------|--------------|--------------|-------------------|----------------|----------------|----------------|----------------|
| | Internal I/S | External I/S | External main I/S | Screw | | Wrench | |
| Dia. | Internal I/S | External I/S | External main I/S | Int./Ext. type | Ext. main type | Int./Ext. type | Ext. main type |
| Ø16 | ZPET080M-MM | ZPET080S-MM | - | FTKA02555S | - | TW08S | - |
| Ø20 | ZPET100M-MM | ZPET100S-MM | SPMT060304 | FTKA0307 | ETNA02506 | TW09S | TW07P |
| Ø25 | ZPET125M-MM | ZPET125S-MM | SPMT060304 | FTKA0409 | ETNA02506 | TW15S | TW07P |
| Ø30 | ZPET150M-MM | ZPET150S-MM | SDMT090308-MM | FTGA0511-P | ETNA0408 | TW20-100 | TW15S |
| Ø32 | ZPET160M-MM | ZPET160S-MM | SDMT090308-MM | FTGA0511-P | ETNA0408 | TW20-100 | TW15S |
| Ø40 | ZPET200M-MM | ZPET200S-MM | SDMT120408-MM | FTGA0614 | ETNA0511 | TW20-100 | TW25S |
| Ø50 | ZPET250M-MM | ZPET250S-MM | SDMT120408-MM | FTGA0818 | ETNA0511 | TW25S | TW25S |



Recommended cutting condition

| Workpiece | Machining type | Hardness (HRC) | vc(m/min) | fz(mm/t) | ap(mm) | ae(mm) |
|----------------------|----------------|----------------|-----------|----------|----------|----------|
| Carbon, Alloy steel | Flank | Under 25 | 160~250 | 0.1~0.5 | 0.3~0.5D | 0.2~0.3D |
| | Groove | | 120~200 | 0.1~0.5 | 0.3~0.5D | - |
| | Deep flank | | 160~250 | 0.1~0.5 | 1.0~1.5D | 0.1~0.2D |
| Carbon, Alloy steel | Flank | Under 45 | 120~200 | 0.1~0.5 | 0.3~0.5D | 0.2~0.3D |
| | Groove | | 120~160 | 0.1~0.5 | 0.3~0.5D | - |
| | Deep flank | | 120~200 | 0.1~0.5 | 1.0~1.5D | 0.1~0.2D |
| Mold Alloy steel | Flank | 30~40 | 120~200 | 0.1~0.3 | 0.3~0.5D | 0.2~0.3D |
| | Groove | | 120~160 | 0.1~0.3 | 0.3~0.5D | - |
| | Deep flank | | 120~200 | 0.1~0.3 | 1.0~1.5D | 0.1~0.2D |
| Cast iron(GC, GCD) | Flank | 20~30 | 150~300 | 0.2~0.7 | 0.3~0.5D | 0.2~0.3D |
| | Groove | | 150~300 | 0.2~0.7 | 0.3~0.5D | - |
| | Deep flank | | 150~300 | 0.2~0.7 | 1.0~1.5D | 0.1~0.2D |
| Heat treatment steel | Flank | 50~60 | 40~100 | 0.1~0.3 | 0.3~0.5D | 0.2~0.3D |
| | Groove | | 40~100 | 0.1~0.3 | 0.3~0.5D | - |
| | Deep flank | | 40~100 | 0.1~0.3 | 1.0~1.5D | 0.1~0.2D |

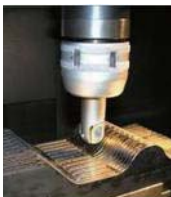

Line-up for Indexable ball Endmill



| Type | Application | | | | |
|------------|-------------------|----------------------|----------------------------|------------|-------------------------------|
| | Machining Dignity | Machining Efficiency | Machining Dia. Equivalence | Economical | Flank Machining with LongEdge |
| Laser Mill | ● | ○ | ◐ | ○ | ○ |
| GBE | ◐ | ● | ◐ | ◐ | ● |
| BRE | ○ | ● | ● | ● | ● |

● : Very Good ◐ : Good ○ : Normal

Test Result for wear resistance

| Cutting condition | | Wear resistance photos | | | | |
|---|--|------------------------|----------|-------|--|--|
| | | GBE | Com.A | Com.B | | |
|  <p>Cutting time : 4 Pass</p> | <ul style="list-style-type: none"> Workpiece: KP4M(HrC33), Dry Condition: vc = 280m/min, fz = 0.25mm/t, ap = 5~10mm, ae = 5~10mm, vf = 1,486mm/min, n = 2,971rpm Tool: Holder : GBE300-S32, Insert : ZPET150M-MM(PC3500), ZPET150S-MM(PC3500) | Top | Internal | | | |
| | | | External | | | |
| | | Flank | Internal | | | |
| | | | External | | | |
|  <p>Cutting time : 4 Pass</p> | <ul style="list-style-type: none"> Workpiece: STD11(HrC20), Dry Condition: vc = 250m/min, fz = 0.2mm/t, ap = 5mm, ae = 5mm, vf = 1,062mm/min, n = 2,653rpm Tool: Holder : GBE300-S32, Insert : ZPET150M-MM(PC3500), ZPET150S-MM(PC3500) | Top | Internal | | | |
| | | | External | | | |
| | | Flank | Internal | | | |
| | | | External | | | |

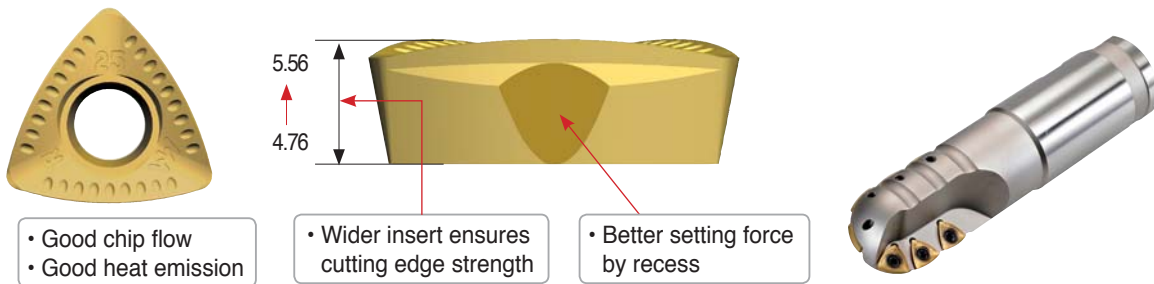


Better tool life and anti-breakage with special surface treatment on the holder

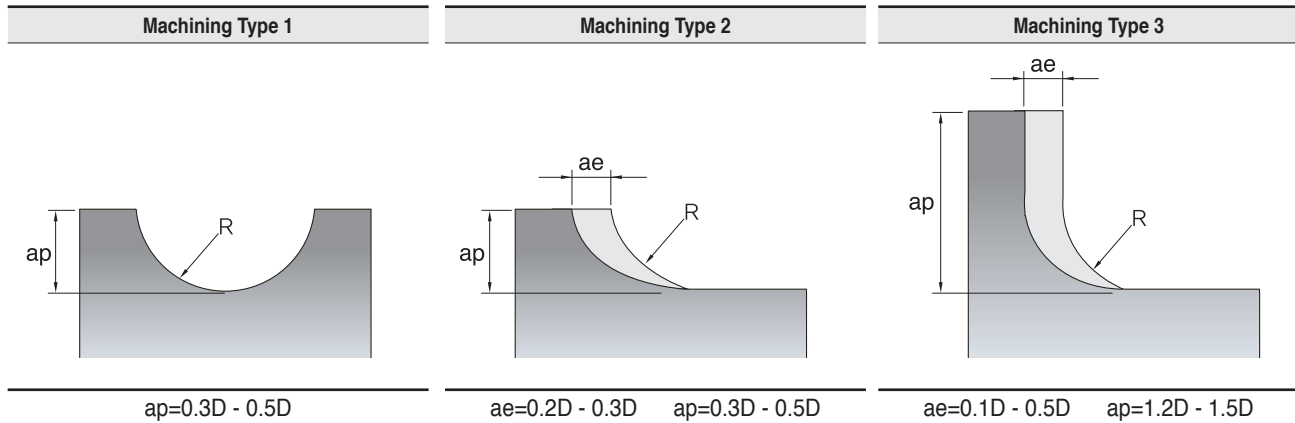
BRE

- **Cutting Performance** : Good chip control & Superior cutting performance with optimal cutting edge line
- **High rigidity body** : Better tool life and special surface treatment to strengthen the holder
 Easy to set and good durability with TCRX screw
 Good chip control with our 3D flute design & improved external quality
- **Insert** : Able to apply in high speed & feed applications due to special grade which has wear & breakage resistance and stable cutting performance with high cutting edge toughness & high rake angle chip breaker

Multi edge holder ISO View



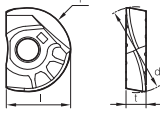
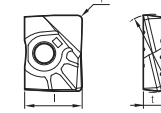
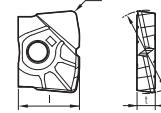
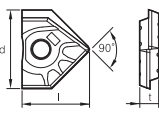
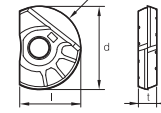
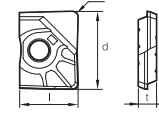
☑ BRE machining type for roughing & Recommended cutting condition




| Workpiece | Machining Type | Velocity(m/min) | Feed(mm/t) | Grade |
|----------------------------------|----------------|-----------------|------------|---------|
| Carbon / Alloy steel | 1 | 120~220 | 0.1~0.4 | NCM325 |
| | 2 | 120~220 | 0.2~0.4 | NCM325 |
| | 3 | 100~180 | 0.1~0.3 | NCM325 |
| Alloy steel | 1 | 100~200 | 0.1~0.4 | NCM325 |
| | 2 | 100~200 | 0.2~0.4 | NCM325 |
| | 3 | 80~160 | 0.1~0.3 | NCM325 |
| Tool steel | 1 | 80~150 | 0.1~0.3 | NCM325 |
| | 2 | 80~150 | 0.15~0.35 | NCM325 |
| | 3 | 60~120 | 0.1~0.3 | NCM325 |
| High hardness material (Hr35-45) | 1 | 60~120 | 0.1~0.3 | NCM325 |
| | 2 | 60~120 | 0.1~0.3 | NCM325 |
| | 3 | 50~80 | 0.1~0.2 | NCM325 |
| Cast iron | 1 | 100~180 | 0.2~0.5 | NCM320K |
| | 2 | 100~180 | 0.2~0.5 | NCM320K |
| | 3 | 80~160 | 0.15~0.4 | NCM320K |



Available Inserts

| Holders | LBH (Ball type) | LRH (Corner radius type) | LFH (High feed type) | LCF (Chamfer type) | LBS (Ball type) | LR (Corner radius type) |
|--------------------------------|---|---|---|--|---|---|
| |  R accuracy ± 0.005 |  Corner R ± 0.015 |  |  |  R accuracy ± 0.005 |  Corner R ± 0.015 |
| LBE080 | LBH080 LBH090 | | | | LBS080 LBS090 | |
| LBE100 LRE100 | LBH100 LBH110 | LRH100-R05 LRH100-R20 LRH100-R10 LRH110-R05 | LFH100 | | LBS100 LBS110 | LR100-R05 LR100-R20 LR100-R10 LR110-R05 |
| LBE120 LRE120 | LBH120 LBH130 | LRH120-R05 LRH120-R20 LRH120-R10 LRH130-R05 | LFH120 | | LBS120 LBS130 | LR120-R05 LR120-R20 LR120-R10 LR130-R05 |
| LBE160 LRE160 | LBH160 LBH170 | LRH160-R05 LRH160-R30 LRH160-R10 LRH170-R05 LRH160-R20 | LFH160 | LCF160-D90 | LBS160 LBS170 | LR160-R05 LR160-R30 LR160-R10 LR170-R05 LR160-R20 |
| LBE200 LRE200 | LBH200 LBH210 | LRH200-R05 LRH200-R30 LRH200-R10 LRH210-R05 LRH200-R20 | LFH200 | LCF200-D90 | LBS200 LBS210 | LR200-R05 LR200-R30 LR200-R10 LR210-R05 LR200-R20 |
| LBE250 LRE250 | LBH250 LBH260 | LRH250-R05 LRH250-R30 LRH250-R10 LRH260-R05 LRH250-R20 | LFH250 | LCF250-D90 | LBS250 LBS260 | LR250-R05 LR250-R30 LR250-R10 LR260-R05 LR250-R20 |
| LBE300 LRE300 | LBH300 LBH310 | LRH300-R10 LRH300-R30 LRH300-R20 LRH310-R05 | LFH300 | | LBS300 LBS310 | LR300-R10 LR300-R30 LR300-R20 LR310-R05 |
| LBE320 LRE320 | LBH320 | LRH320-R10 LRH320-R30 LRH320-R20 | LFH320 | | LBS320 | LR320-R10 LR320-R30 LR320-R20 |

 Available Inserts E07, E08



Carbide Shank-Ball, Corner R type

LBE 08/10/12/16/20/25/30/32

Straight type

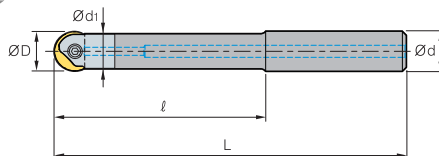


Fig. 1

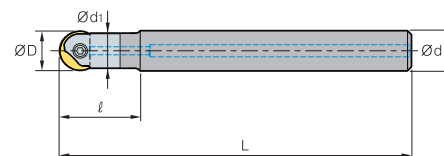


Fig. 2



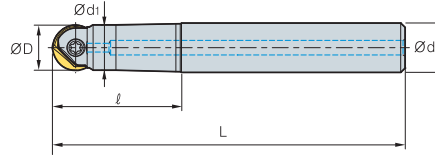
| Designation | | øD | ød | ød1 | ℓ | L | Parts | | Available Inserts(Ø) | Fig. |
|-------------|------------------|-------|----|------|-----|-----|-------------|--------|----------------------|------|
| | | | | | | | Clamp Screw | Wrench | | |
| LBE | 080080S-S08C | 8,9 | 8 | 7.5 | 80 | 136 | ETND02506F | TWP07S | 8,9 | 1 |
| | 080100S-S08C | 8,9 | 8 | 7.5 | 100 | 156 | | | | |
| | 080020S-S08C-130 | 8,9 | 8 | 7.5 | 20 | 130 | | | | |
| | 080020S-S08C-150 | 8,9 | 8 | 7.5 | 20 | 150 | ETND02506F | TWP07S | 8,9 | 2 |
| | 100080S-S10C | 10,11 | 10 | 9.5 | 80 | 136 | | | | |
| | 100120S-S10C | 10,11 | 10 | 9.5 | 120 | 176 | ETND0307F | TWP08S | 10,11 | 1 |
| | 100023S-S10C-130 | 10,11 | 10 | 9.5 | 23 | 130 | | | | |
| | 100023S-S10C-170 | 10,11 | 10 | 9.5 | 23 | 170 | | | | |
| | 120100S-S12C | 12,13 | 12 | 11.5 | 100 | 156 | ETND03509 | TWP10S | 12,13 | 1 |
| | 120150S-S12C | 12,13 | 12 | 11.5 | 150 | 206 | | | | |
| | 120025S-S12C-150 | 12,13 | 12 | 11.5 | 25 | 150 | ETND03509 | TWP10S | 12,13 | 2 |
| | 120025S-S12C-200 | 12,13 | 12 | 11.5 | 25 | 200 | | | | |
| | 160100S-S16C | 16,17 | 16 | 15.5 | 100 | 160 | | | | |
| | 160150S-S16C | 16,17 | 16 | 15.5 | 150 | 210 | | | | |
| | 160030S-S16C-160 | 16,17 | 16 | 15.5 | 30 | 160 | ETND0413 | TWP15S | 16,17 | 2 |
| | 160030S-S16C-210 | 16,17 | 16 | 15.5 | 30 | 210 | | | | |
| | 200120S-S20C | 20,21 | 20 | 19.5 | 120 | 190 | | | | |
| | 200170S-S20C | 20,21 | 20 | 19.5 | 170 | 240 | | | | |
| | 200035S-S20C-190 | 20,21 | 20 | 19.5 | 35 | 190 | ETKD0516 | TWP20 | 20,21 | 2 |
| | 200035S-S20C-240 | 20,21 | 20 | 19.5 | 35 | 240 | | | | |
| | 250140S-S25C | 25,26 | 25 | 24.5 | 140 | 220 | | | | |
| | 250170S-S25C | 25,26 | 25 | 24.5 | 170 | 250 | | | | |
| | 250040S-S25C-220 | 25,26 | 25 | 24.5 | 40 | 220 | ETKD0620 | TWP25 | 25,26 | 2 |
| | 250040S-S25C-250 | 25,26 | 25 | 24.5 | 40 | 250 | | | | |
| | 300140S-S32C | 30,31 | 32 | 29.5 | 140 | 230 | | | | |
| | 300170S-S32C | 30,31 | 32 | 29.5 | 170 | 260 | | | | |
| | 300050S-S32C-230 | 30,31 | 32 | 29.5 | 50 | 230 | ETGD0825 | TWP40 | 30,31 | 2 |
| | 300050S-S32C-260 | 30,31 | 32 | 29.5 | 50 | 260 | | | | |
| | 320140S-S32C | 32 | 32 | 31.5 | 140 | 230 | | | | |
| | 320170S-S32C | 32 | 32 | 31.5 | 170 | 260 | | | | |
| | 320050S-S32C-230 | 32 | 32 | 31.5 | 50 | 230 | ETGD0825 | TWP40 | 32 | 2 |
| | 320050S-S32C-260 | 32 | 32 | 31.5 | 50 | 260 | | | | |



Steel Shank-Ball, Corner R type

LBE08/10/12/16/20/25/30/32

Taper type

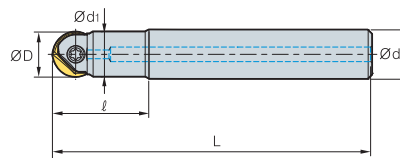


| Designation | ØD | Ød | Ød1 | ℓ | L | Parts | | Available Inserts(Ø) |
|-----------------|--------|----|------|-----|-----|-------------|--------|----------------------|
| | | | | | | Clamp Screw | Wrench | |
| LBE 080035T-S12 | 8, 9 | 12 | 7.5 | 35 | 91 | ETND02506F | TWP07S | 8, 9 |
| 080055T-S12 | 8, 9 | 12 | 7.5 | 55 | 111 | | | |
| 080075T-S12 | 8, 9 | 12 | 7.5 | 75 | 131 | | | |
| 100035T-S12 | 10, 11 | 12 | 9.5 | 35 | 91 | ETND0307F | TWP08S | 10, 11 |
| 100055T-S12 | 10, 11 | 12 | 9.5 | 55 | 111 | | | |
| 100075T-S12 | 10, 11 | 12 | 9.5 | 75 | 131 | | | |
| 120055T-S12 | 12, 13 | 12 | 10.4 | 55 | 111 | ETND03509 | TWP10S | 12, 13 |
| 120085T-S16 | 12, 13 | 16 | 11.5 | 85 | 145 | | | |
| 160065T-S16 | 16, 17 | 16 | 14 | 65 | 125 | | | |
| 160100T-S20 | 16, 17 | 20 | 15.5 | 100 | 170 | ETND0413 | TWP15S | 16, 17 |
| 200075T-S20 | 20, 21 | 20 | 17.5 | 75 | 145 | | | |
| 200115T-S25 | 20, 21 | 25 | 19.5 | 115 | 195 | | | |
| 250090T-S25 | 25, 26 | 25 | 22 | 90 | 170 | ETKD0620 | TWP25 | 25, 26 |
| 250135T-S32 | 25, 26 | 32 | 24.5 | 135 | 225 | | | |
| 300105T-S32 | 30, 31 | 32 | 29.5 | 105 | 195 | | | |
| 300160T-S32 | 30, 31 | 32 | 29.5 | 160 | 250 | ETGD0825 | TWP40 | 30, 31 |
| 320105T-S32 | 32 | 32 | 29 | 105 | 195 | | | |
| 320160T-S32 | 32 | 32 | 29 | 160 | 250 | | | |

Steel Shank-Ball, Corner R type

LBE12/16/20/25/30/32

Straight type



| Designation | ØD | Ød | Ød1 | ℓ | L | Parts | | Available Inserts(Ø) |
|-----------------|--------|----|------|----|-----|-------------|--------|----------------------|
| | | | | | | Clamp Screw | Wrench | |
| LBE 120035S-S12 | 12, 13 | 12 | 11.5 | 35 | 91 | ETND03509 | TWP10S | 12, 13 |
| 160035S-S16 | 16, 17 | 16 | 15.5 | 35 | 95 | | | |
| 200040S-S20 | 22, 21 | 20 | 19.5 | 40 | 110 | | | |
| 250045S-S25 | 25, 26 | 25 | 24.5 | 40 | 125 | ETKD0620 | TWP25 | 25, 26 |
| 300055S-S32 | 30, 31 | 32 | 29.5 | 55 | 145 | | | |
| 320055S-S32 | 32 | 32 | 31.5 | 55 | 145 | | | |
| | | | | | | ETGD0825 | TWP40 | 32 |



Carbide Shank-Ball, Corner R type LRE10/12/16/20/25/30/32

Straight type

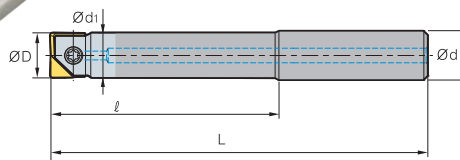


Fig. 1

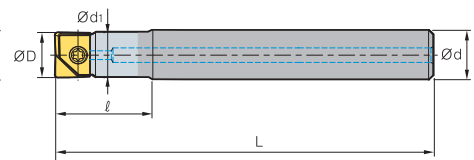


Fig. 2

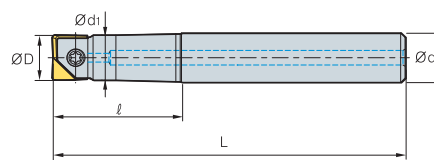


(mm)

| Designation | øD | ød | ød1 | l | L | Parts | | Available Inserts(Ø) | Fig. |
|------------------|--------|----|------|-----|-----|-------------|--------|----------------------|------|
| | | | | | | Clamp Screw | Wrench | | |
| LRE 100080S-S10C | 10, 11 | 10 | 9.5 | 80 | 136 | ETND0307F | TWP08S | 10, 11 | 1 |
| 100120S-S10C | 10, 11 | 10 | 9.5 | 120 | 176 | | | | 1 |
| 100023S-S10C-130 | 10, 11 | 10 | 9.5 | 23 | 130 | ETND0307F | TWP08S | 10, 11 | 2 |
| 100023S-S10C-170 | 10, 11 | 10 | 9.5 | 23 | 170 | | | | 2 |
| 120100S-S12C | 12, 13 | 12 | 11.5 | 100 | 156 | ETND03509 | TWP10S | 12, 13 | 1 |
| 120150S-S12C | 12, 13 | 12 | 11.5 | 150 | 206 | | | | 1 |
| 120025S-S12C-150 | 12, 13 | 12 | 11.5 | 25 | 150 | ETND03509 | TWP10S | 12, 13 | 2 |
| 120025S-S12C-200 | 12, 13 | 12 | 11.5 | 25 | 200 | | | | 2 |
| 160100S-S16C | 16, 17 | 16 | 15.5 | 100 | 160 | ETND0413 | TWP15S | 16, 17 | 1 |
| 160150S-S16C | 16, 17 | 16 | 15.5 | 150 | 210 | | | | 1 |
| 160030S-S16C-160 | 16, 17 | 16 | 15.5 | 30 | 160 | ETND0413 | TWP15S | 16, 17 | 2 |
| 160030S-S16C-210 | 16, 17 | 16 | 15.5 | 30 | 210 | | | | 2 |
| 200120S-S20C | 20, 21 | 20 | 19.5 | 120 | 190 | ETKD0516 | TWP20 | 20, 21 | 1 |
| 200170S-S20C | 20, 21 | 20 | 19.5 | 170 | 240 | | | | 1 |
| 200035S-S20C-190 | 20, 21 | 20 | 19.5 | 35 | 190 | ETKD0516 | TWP20 | 20, 21 | 2 |
| 200035S-S20C-240 | 20, 21 | 20 | 19.5 | 35 | 240 | | | | 2 |
| 250140S-S25C | 25, 26 | 25 | 24.5 | 140 | 220 | ETKD0620 | TWP25 | 25, 26 | 1 |
| 250170S-S25C | 25, 26 | 25 | 24.5 | 170 | 250 | | | | 1 |
| 250040S-S25C-220 | 25, 26 | 25 | 24.5 | 40 | 220 | ETKD0620 | TWP25 | 25, 26 | 2 |
| 250040S-S25C-250 | 25, 26 | 25 | 24.5 | 40 | 250 | | | | 2 |
| 300140S-S32C | 30, 31 | 32 | 29.5 | 140 | 230 | ETGD0825 | TWP40 | 30, 31 | 1 |
| 300170S-S32C | 30, 31 | 32 | 29.5 | 170 | 260 | | | | 1 |
| 300050S-S32C-230 | 30, 31 | 32 | 29.5 | 50 | 230 | ETGD0825 | TWP40 | 30, 31 | 2 |
| 300050S-S32C-260 | 30, 31 | 32 | 29.5 | 50 | 260 | | | | 2 |
| 320140S-S32C | 32 | 32 | 31.5 | 140 | 230 | ETGD0825 | TWP40 | 32 | 1 |
| 320170S-S32C | 32 | 32 | 31.5 | 170 | 260 | | | | 1 |
| 320050S-S32C-230 | 32 | 32 | 31.5 | 50 | 230 | ETGD0825 | TWP40 | 32 | 2 |
| 320050S-S32C-260 | 32 | 32 | 31.5 | 50 | 260 | | | | 2 |

Steel Shank-Corner R type LRE10/12

Taper type

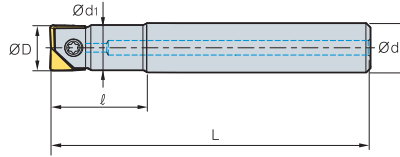


(mm)

| Designation | øD | ød | ød1 | l | L | Parts | | Available Inserts(Ø) |
|-----------------|--------|----|------|----|-----|-------------|--------|----------------------|
| | | | | | | Clamp Screw | Wrench | |
| LRE 100025T-S12 | 10, 11 | 12 | 9.5 | 25 | 111 | ETND0307F | TWP08S | 10, 11 |
| 100050T-S12 | 10, 11 | 12 | 9.5 | 50 | 150 | | | |
| 120060T-S16 | 12, 13 | 16 | 11.5 | 60 | 160 | ETND03509 | TWP10S | 12, 13 |

Steel Shank, Corner R type LRE12/16/25/30/32

Straight type

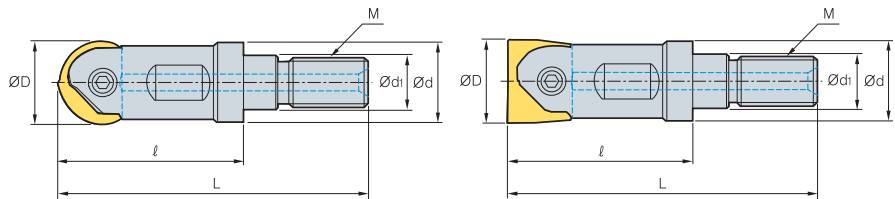


| Designation | øD | ød | ød ₁ | l | L | Parts | | Available Inserts(Ø) |
|-----------------|--------|----|-----------------|-----|-----|-------------|--------|----------------------|
| | | | | | | Clamp Screw | Wrench | |
| LRE 120030S-S12 | 12, 13 | 12 | 11.5 | 30 | 111 | ETND03509 | TWP10S | 12, 13 |
| 160050S-S16 | 16, 17 | 16 | 15.5 | 50 | 131 | ETND0413 | TWP15S | 16, 17 |
| 160060S-S16 | 16, 17 | 16 | 15.5 | 60 | 160 | | | |
| 200060S-S20 | 20, 21 | 20 | 19.5 | 60 | 145 | ETKD0516 | TWP20 | 20, 21 |
| 200080S-S20 | 20, 21 | 20 | 19.5 | 80 | 180 | | | |
| 250070S-S25 | 25, 26 | 25 | 24.5 | 70 | 145 | ETKD0620 | TWP25 | 25, 26 |
| 250100S-S25 | 25, 26 | 25 | 24.5 | 100 | 225 | | | |
| 300070S-S32 | 30, 31 | 32 | 29.5 | 70 | 160 | ETGD0825 | TWP40 | 30, 31 |
| 300100S-S32 | 30, 31 | 32 | 29.5 | 100 | 225 | | | |
| 320080S-S32 | 32 | 32 | 31.5 | 80 | 160 | ETGD0825 | TWP40 | 32 |
| 320100S-S32 | 32 | 32 | 31.5 | 100 | 225 | | | |

Available Inserts E07, E08

• T stands for taper type, S stands for straight type

LBE-MHD



| Designation | M | øD | L | l | ød | ød ₁ | Parts | | Available Inserts(Ø) |
|-----------------|-----|--------|----|----|------|-----------------|-------------|--------|----------------------|
| | | | | | | | Clamp Screw | Wrench | |
| LBE 100-MHD-M06 | M06 | 10, 11 | 40 | 25 | 9.5 | 6.5 | ETND0307F | TWP08S | 10, 11 |
| 120-MHD-M06 | M06 | 12, 13 | 40 | 25 | 11 | 6.5 | ETND03509 | TWP10S | 12, 13 |
| 160-MHD-M08 | M08 | 16, 17 | 47 | 30 | 14.5 | 8.5 | ETND0413 | TWP15S | 16, 17 |
| 200-MHD-M10 | M10 | 20, 21 | 56 | 35 | 18 | 10.5 | ETKD0516 | TWP20 | 20, 21 |
| 250-MHD-M12 | M12 | 25, 26 | 69 | 45 | 22.5 | 12.5 | ETKD0620 | TWP25 | 25, 26 |
| 300-MHD-M16 | M16 | 30, 31 | 77 | 50 | 28 | 17 | ETGD0825 | TWP40 | 30, 31 |
| 320-MHD-M16 | M16 | 32 | 77 | 50 | 29 | 17 | ETGD0825 | TWP40 | 32 |

Designation : LBE320-MHD-M16
Modular Head Threading Measure size(M16)

= Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

Available Inserts E07, E08

Available Adaptors E253~E254

BFE

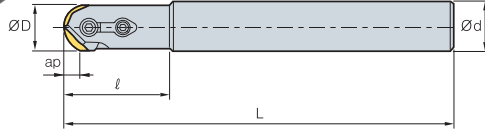


Fig. 1

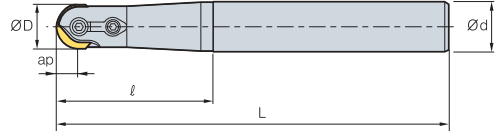


Fig. 2



| | | | | | | | | (mm) | |
|-------------|------|----|----|-----|------|------|------|-------------------|---|
| Designation | ØD | ød | ℓ | L | ap | | Fig. | Available Inserts | |
| BFE 16-S | 16 | 16 | 36 | 140 | 8.0 | 0.2 | 1 | RC16 | |
| | 16-M | 16 | 20 | 65 | 8.0 | 0.3 | 2 | | |
| | 16-L | 16 | 25 | 65 | 8.0 | 0.5 | 2 | | |
| 20-S | 20 | 20 | 45 | 160 | 10.0 | 0.4 | 1 | RC20 | |
| | 20-M | 20 | 25 | 80 | 10.0 | 0.6 | 2 | | |
| | 20-L | 20 | 25 | 80 | 250 | 10.0 | 0.8 | | 2 |
| 25-S | 25 | 25 | 45 | 160 | 12.5 | 0.7 | 1 | RC25 | |
| | 25-M | 25 | 32 | 90 | 12.5 | 1.1 | 2 | | |
| | 25-L | 25 | 32 | 90 | 300 | 12.5 | 1.7 | | 2 |
| 30-S | 30 | 32 | 65 | 175 | 15.0 | 0.9 | 2 | RC30 | |
| | 30-M | 30 | 32 | 100 | 250 | 15.0 | 1.4 | | 2 |
| | 30-L | 30 | 32 | 100 | 350 | 15.0 | 2.0 | | 2 |
| 32-S | 32 | 32 | 56 | 175 | 16.0 | 0.9 | 1 | RC32 | |
| | 32-M | 32 | 32 | 100 | 250 | 16.0 | 1.4 | | 1 |
| | 32-L | 32 | 32 | 100 | 350 | 16.0 | 2.0 | | 1 |

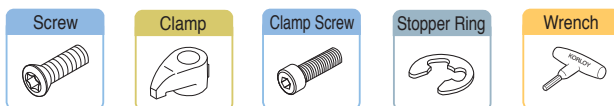
Available Inserts

| RC | | | |
|-------------|----|--------|------|
| | | | |
| Designation | | Coated | Page |
| RC | 16 | PC210F | E12 |
| | 20 | ● | |
| | 25 | ● | |
| | 30 | ● | |
| | 32 | ● | |

Recommended cutting condition

| Workpiece | Cutting Condition | |
|--|-------------------|-------------|
| | vc(m/min) | fz(mm/t) |
| General steel(SS41, SM25C) Over HB180 | 150 ~ 250 | 0.10 ~ 0.30 |
| Alloy steel(SM55C, SCM) Under HB300 | 100 ~ 200 | 0.10 ~ 0.20 |
| Cast iron Under HB300 | 100 ~ 200 | 0.10~ 0.30 |

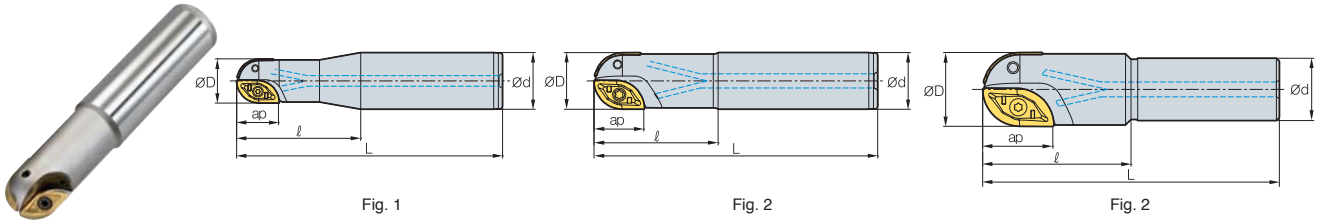
Parts



| | | | | | |
|---------|----------|----------|----------|------|------|
| Ø16 | FTGA0513 | CBH4.5R1 | CTX04513 | ER03 | TW20 |
| Ø20 | FTGA0517 | CBH4.5R2 | CTX04513 | ER03 | TW20 |
| Ø25 | FTGA0621 | CBH5R1 | CTX0517 | ER04 | TW20 |
| Ø30, 32 | FTGA0826 | CBH6R1 | CTX0621 | ER05 | TW25 |

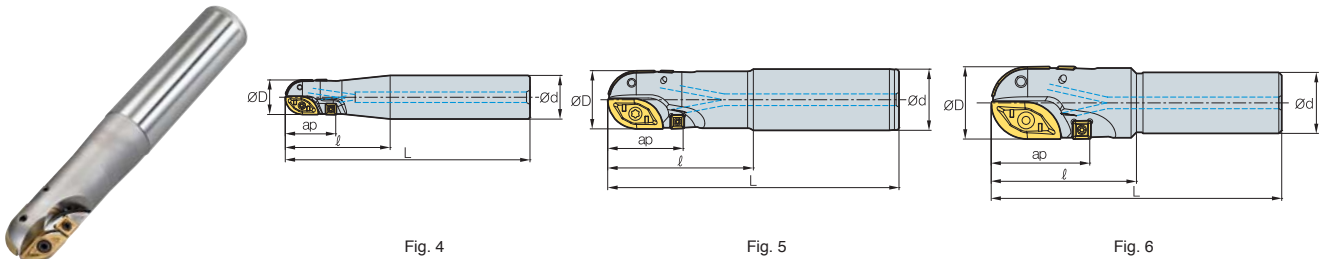


GBE(Single Edge)



| Designation | Dimensions | | | | | Available Inserts | | | Parts | | | | Fig. |
|-------------|-----------------|-----------------|--------|-----|----|-------------------|-------------|-----------|----------------|----------------|----------------|----------------|------|
| | $\varnothing D$ | $\varnothing d$ | ℓ | L | ap | Internal | External | Ext. main | Screw | | Wrench | | |
| | | | | | | | | | Int./Ext. type | Ext. main type | Int./Ext. type | Ext. main type | |
| GBE 160-S20 | 16 | 20 | 50 | 130 | 15 | ZPET080M-MM | ZPET080S-MM | - | FTKA02555S | - | TW08S | - | 1 |
| 160-L20 | 16 | 20 | 90 | 200 | 15 | ZPET080M-MM | ZPET080S-MM | - | FTKA02555S | - | TW08S | - | 1 |
| 200-S25 | 20 | 25 | 60 | 140 | 18 | ZPET100M-MM | ZPET100S-MM | - | FTKA0307 | - | TW09S | - | 1 |
| 200-L25 | 20 | 25 | 80 | 250 | 18 | ZPET100M-MM | ZPET100S-MM | - | FTKA0307 | - | TW09S | - | 1 |
| 250-S32 | 25 | 32 | 70 | 150 | 23 | ZPET125M-MM | ZPET125S-MM | - | FTKA0409 | - | TW15S | - | 1 |
| 250-L32 | 25 | 32 | 100 | 300 | 23 | ZPET125M-MM | ZPET125S-MM | - | FTKA0409 | - | TW15S | - | 1 |
| 300-S32 | 30 | 32 | 70 | 160 | 27 | ZPET150M-MM | ZPET150S-MM | - | FTGA0511-P | - | TW20-100 | - | 2 |
| 300-L32 | 30 | 32 | 120 | 350 | 27 | ZPET150M-MM | ZPET150S-MM | - | FTGA0511-P | - | TW20-100 | - | 2 |
| 320-S32 | 32 | 32 | 70 | 160 | 28 | ZPET160M-MM | ZPET160S-MM | - | FTGA0511-P | - | TW20-100 | - | 2 |
| 320-L32 | 32 | 32 | 120 | 350 | 28 | ZPET160M-MM | ZPET160S-MM | - | FTGA0511-P | - | TW20-100 | - | 2 |
| 400-S42 | 40 | 42 | 100 | 200 | 37 | ZPET200M-MM | ZPET200S-MM | - | FTGA0614 | - | TW20-100 | - | 2 |
| 400-L42 | 40 | 42 | 150 | 350 | 37 | ZPET200M-MM | ZPET200S-MM | - | FTGA0614 | - | TW20-100 | - | 2 |
| 500-S42 | 50 | 42 | 100 | 200 | 47 | ZPET250M-MM | ZPET250S-MM | - | FTGA0818 | - | TW25-100 | - | 3 |
| 500-L42 | 50 | 42 | 100 | 350 | 47 | ZPET250M-MM | ZPET250S-MM | - | FTGA0818 | - | TW25-100 | - | 3 |

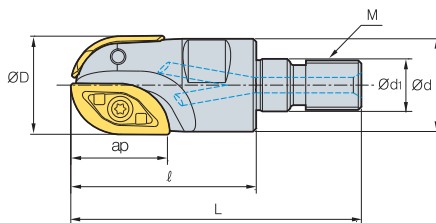
GBE-M(Multi Edge)



| Designation | Dimensions | | | | | Available Inserts | | | Parts | | | | Fig. |
|--------------|-----------------|-----------------|--------|-----|----|-------------------|-------------|---------------|----------------|----------------|----------------|----------------|------|
| | $\varnothing D$ | $\varnothing d$ | ℓ | L | ap | Internal | External | Ext. main | Screw | | Wrench | | |
| | | | | | | | | | Int./Ext. type | Ext. main type | Int./Ext. type | Ext. main type | |
| GBE 200M-S25 | 20 | 25 | 70 | 150 | 28 | ZPET100M-MM | ZPET100S-MM | SPMT060304 | FTKA0307 | ETNA02506 | TW09S | TW07P | 4 |
| 200M-L25 | 20 | 25 | 70 | 250 | 28 | ZPET100M-MM | ZPET100S-MM | SPMT060304 | FTKA0307 | ETNA02506 | TW09S | TW07P | 4 |
| 250M-S32 | 25 | 32 | 80 | 180 | 33 | ZPET125M-MM | ZPET125S-MM | SPMT060304 | FTKA0409 | ETNA02506 | TW15S | TW07P | 4 |
| 250M-L32 | 25 | 32 | 80 | 300 | 33 | ZPET125M-MM | ZPET125S-MM | SPMT060304 | FTKA0409 | ETNA02506 | TW15S | TW07P | 4 |
| 300M-S32 | 30 | 32 | 100 | 200 | 41 | ZPET150M-MM | ZPET150S-MM | SDMT090308-MM | FTGA0511-P | ETNA0408 | TW20-100 | TW15S | 4 |
| 300M-L32 | 30 | 32 | 100 | 350 | 41 | ZPET150M-MM | ZPET150S-MM | SDMT090308-MM | FTGA0511-P | ETNA0408 | TW20-100 | TW15S | 4 |
| 320M-S32 | 32 | 32 | 100 | 200 | 42 | ZPET160M-MM | ZPET160S-MM | SDMT090308-MM | FTGA0511-P | ETNA0408 | TW20-100 | TW15S | 5 |
| 320M-L32 | 32 | 32 | 100 | 350 | 42 | ZPET160M-MM | ZPET160S-MM | SDMT090308-MM | FTGA0511-P | ETNA0408 | TW20-100 | TW15S | 5 |
| 400M-S42 | 40 | 42 | 100 | 200 | 56 | ZPET200M-MM | ZPET200S-MM | SPMT120408-MM | FTGA0614 | ETNA0511 | TW20-100 | TW20S | 5 |
| 400M-L42 | 40 | 42 | 100 | 350 | 56 | ZPET200M-MM | ZPET200S-MM | SPMT120408-MM | FTGA0614 | ETNA0511 | TW20-100 | TW20S | 5 |
| 500M-S42 | 50 | 42 | 100 | 200 | 67 | ZPET250M-MM | ZPET250S-MM | SPMT120408-MM | FTGA0818 | ETNA0511 | TW25-100 | TW20S | 6 |
| 500M-L42 | 50 | 42 | 100 | 350 | 67 | ZPET250M-MM | ZPET250S-MM | SPMT120408-MM | FTGA0818 | ETNA0511 | TW25-100 | TW20S | 6 |



GBEM



(mm)

| Designation | Dimensions | | | | | | | Available Inserts | |
|--------------|------------|------|------|----|----|-----|----|-------------------|-------------|
| | ØD | Ød | Ød1 | l | L | M | ap | Internal | External |
| GBEM 160-M08 | 16 | 15 | 8.5 | 30 | 47 | M08 | 15 | ZPET080M-MM | ZPET080S-MM |
| 200-M10 | 20 | 18.6 | 10.5 | 35 | 56 | M10 | 18 | ZPET100M-MM | ZPET100S-MM |
| 250-M12 | 25 | 23.2 | 12.5 | 45 | 69 | M12 | 23 | ZPET125M-MM | ZPET125S-MM |
| 300-M16 | 30 | 27.8 | 17 | 50 | 77 | M16 | 27 | ZPET150M-MM | ZPET150S-MM |
| 320-M16 | 32 | 29.8 | 17 | 50 | 77 | M16 | 28 | ZPET160M-MM | ZPET160S-MM |

Available Inserts

ZPET-M

ZPET-S

SPMT

SPMT-MM



Internal



External



Ext. main



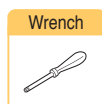
Ext. main

| Designation | Coated | | | | Page |
|----------------|--------|--------|--------|--------|------|
| | NCM325 | PC3500 | PC5300 | PC3545 | |
| ZPET 080M-MM | | | | | E24 |
| 100M-MM | | ● | | | |
| 125M-MM | | ● | | | |
| 150M-MM | | ● | | | |
| 160M-MM | | ● | | | |
| 200M-MM | | ● | | | |
| 250M-MM | | | | | |
| ZPET 080S-MM | | | | | |
| 100S-MM | | ● | | | |
| 125S-MM | | ● | | | |
| 150S-MM | | ● | | | |
| 160S-MM | | ● | | | |
| 200S-MM | | ● | | | |
| 250S-MM | | | | | |
| SPMT 060304 | ● | | | | E21 |
| SDMT 090308-MM | | ● | | | E14 |
| SPMT 120408-MM | | ● | | ● | E21 |

Parts



Screw



Wrench



Cutter Dia.

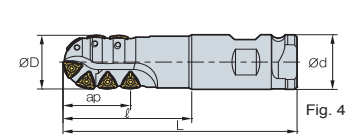
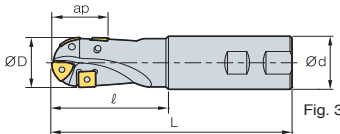
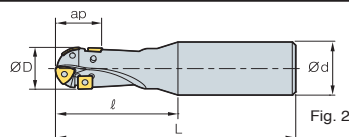
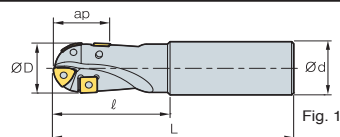
| Int./Ext. type | Ext. main type | Int./Ext. type | Ext. main type | |
|----------------|----------------|----------------|----------------|-----|
| FTKA02555 | - | TW08S | - | Ø16 |
| FTKA0307 | ETNA02506 | TW09S | TW07P | Ø20 |
| FTKA0409 | ETNA02506 | TW15S | TW07P | Ø25 |
| FTGA0511-P | ETNA0408 | TW20-100 | TW15S | Ø30 |
| FTGA0511-P | ETNA0408 | TW20-100 | TW15S | Ø32 |

Designation : GBEM320-M16
Modular Head Threading Measure size(M16)

||

Adaptor Spec. : MAT-M16-035-S32S
Adaptor Threading Measure(M16)

BRE



• AR : 0°~10°
• RR : -3°~0°

| Designation | øD | ød | ℓ | L | ap | Available Inserts | | Parts | | Fig. | | | |
|-------------|----|------|-----|-----|----|----------------------------------|---------------------------------|-----------|----------------|----------------|----------|----------|-----|
| | | | | | | Main | Ext. main | Screw | Wrench | | | | |
| BRE 20R-S | 20 | 20 | 50 | 125 | 20 | ZDMT080310R-MM | SPMT060304 | ETNA02506 | TW07P | 0.3 | 1 | | |
| 20R-M | 20 | 20 | 75 | 150 | 20 | | | | | 0.3 | 1 | | |
| 20R-L | 20 | 25 | 100 | 200 | 20 | | | | | 0.3 | 2 | | |
| 20R-SL | 20 | 25 | 65 | 125 | 20 | ZDMT110312.5R-MM | SPMT060304 | ETNA02506 | TW07P | 0.3 | 3 | | |
| 25R-S | 25 | 25 | 70 | 150 | 23 | | | | | 0.5 | 1 | | |
| 25R-M | 25 | 25 | 95 | 175 | 23 | | | | | 0.5 | 1 | | |
| 25R-L | 25 | 32 | 100 | 200 | 23 | ZDMT130416R-MM | SDMT090308-MM | ETNA0408 | TW15S | 0.4 | 2 | | |
| 25R-SL | 25 | 25 | 75 | 135 | 23 | | | | | 0.4 | 3 | | |
| 32R-S | 32 | 32 | 85 | 175 | 31 | | | | | 0.9 | 1 | | |
| 32R-M | 32 | 32 | 100 | 200 | 31 | ZDMT130416R-MM | SDMT090308-MM | ETNA0408 | TW15S | 0.9 | 1 | | |
| 32R-L | 32 | 32 | 150 | 250 | 31 | | | | | 0.7 | 1 | | |
| 32R-SL | 32 | 32 | 75 | 150 | 31 | | | | | 0.7 | 3 | | |
| 40R-S | 40 | 42 | 85 | 175 | 41 | ZPMT160520R-MM | SPMT120408-MM SPMT120508-MMN | ETNA0511 | TW20-100 | 1.3 | 1 | | |
| 40R-S-40 | 40 | 42 | 85 | 175 | 41 | | | | | 1.3 | 1 | | |
| 40R-M | 40 | 42 | 100 | 200 | 41 | | | | | 1.3 | 1 | | |
| 40R-M-40 | 40 | 42 | 100 | 200 | 41 | ZPMT160520R-MM | SPMT120408-MM SPMT120508-MMN | ETNA0511 | TW20-100 | 1.3 | 1 | | |
| 40R-L | 40 | 42 | 150 | 250 | 41 | | | | | 1.3 | 1 | | |
| 40R-L-40 | 40 | 42 | 150 | 250 | 41 | | | | | 1.3 | 1 | | |
| 40R-SL | 40 | 42 | 80 | 160 | 41 | ZPMT160525R-MM | SPMT120408-MM SPMT120508-MMN | ETNA0511 | TW20-100 | 1.3 | 3 | | |
| 40R-SL-40 | 40 | 42 | 80 | 160 | 41 | | | | | 1.3 | 3 | | |
| 50R-S | 50 | 42 | 100 | 200 | 45 | | | | | 2.6 | 1 | | |
| 50R-S-40 | 50 | 42 | 100 | 200 | 45 | ZPMT160525R-MM | SPMT120408-MM SPMT120508-MMN | ETNA0511 | TW20-100 | 2.6 | 1 | | |
| 50R-L | 50 | 42 | 100 | 300 | 45 | | | | | 2.6 | 1 | | |
| 50R-L-40 | 50 | 42 | 100 | 300 | 45 | | | | | 2.6 | 1 | | |
| 50R-SL | 50 | 42 | 100 | 250 | 45 | ZPMT160531.5R-MM | SPMT120408-MM SPMT120508-MMN | ETNA0511 | TW20-100 | 2.6 | 3 | | |
| 50R-SL-40 | 50 | 42 | 100 | 250 | 45 | | | | | 2.6 | 3 | | |
| 63R-S | 63 | 42 | 100 | 200 | 52 | | | | | 3.0 | 1 | | |
| 63R-S-40 | 63 | 42 | 100 | 200 | 52 | ZPMT160531.5R-MM | SPMT120408-MM SPMT120508-MMN | ETNA0511 | TW20-100 | 3.0 | 1 | | |
| 63R-L | 63 | 42 | 100 | 300 | 52 | | | | | 3.0 | 1 | | |
| 63R-L-40 | 63 | 42 | 100 | 300 | 52 | | | | | 3.0 | 1 | | |
| 63R-SL | 63 | 42 | 100 | 250 | 52 | ZPMT160531.5R-MM | SPMT120408-MM SPMT120508-MMN | ETNA0511 | TW20-100 | 3.0 | 3 | | |
| 63R-SL-40 | 63 | 42 | 100 | 250 | 52 | | | | | 3.0 | 3 | | |
| 40XR-SC40 | 40 | 40 | 110 | 200 | 54 | | | | | ZPMT160520R-MM | ETNA0511 | TW20-100 | 1.4 |
| 40XR-LC40 | 40 | 40 | 150 | 250 | 54 | ZPMT160525R-MM ZPMT160525R-MR | ETNA0511 | TW20-100 | 1.9 | 4 | | | |
| 50XR-SC50.8 | 50 | 50.8 | 110 | 200 | 57 | | | | ZPMT160525R-MM | ETNA0511 | TW20-100 | 2.3 | 4 |
| 50XR-LC50.8 | 50 | 50.8 | 150 | 250 | 57 | | | | ZPMT160525R-MR | ETNA0511 | TW20-100 | 3.0 | 4 |

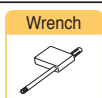
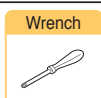
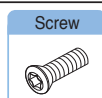
Available Inserts

SDMT-MM SPMT SPMT-MM ZDMT-R-MM ZPMT-R-MM ZPMT-R-MM



| Designation | Coated | | | | | | Page |
|-----------------|--------|--------|--------|--------|--------|--------|------|
| | NCM325 | PC3500 | PC3000 | PC3525 | PC3545 | PC3510 | |
| SDMT 090308-MM | | ● | | | | | E14 |
| SPMT 060304 | ● | | | | | | E21 |
| 120408-MM | | ● | | | ● | | |
| 120508-MMN | | | | | | | E24 |
| ZDMT 080310R-MM | | ● | | | | | |
| 110312.5R-MM | | ● | | | | | |
| 130416R-MM | | ● | | | | | |
| ZPMT 160520R-MM | | ● | | | | | |
| 160525R-MM | | ● | | | | | |
| 160525R-MR | | ● | | | | | |
| 160531.5R-MM | | ● | | | | | |

Parts



ETNA02506* TW15S**
ETNA0408** TW20-100
ETNA0511 TW07P*

*BRE 20, BRE 25 **BRE 32

Recommended cutting condition

Machining · Slotting-A · Shouldering(general cutting edge)-B · Shouldering(long cutting edge)-C

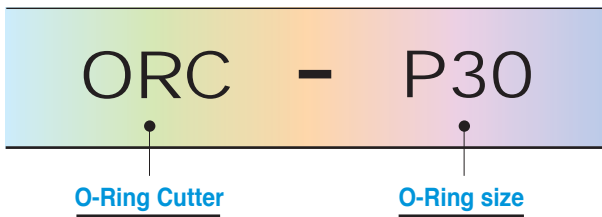
| Workpiece | Hardness | Cutting Condition | | Machining | |
|---|-----------------------------|-----------------------------|--------------------|-------------------|---|
| | | vc(m/min) | fz(mm/t) | | |
| Carbon steel, Alloy steel (S50, SCM440) | 180 ~ 280HB | 260(180 ~ 310) | 0.125(0.10 ~ 0.15) | A | |
| | | 240(160 ~ 290) | 0.15(0.10 ~ 0.20) | B | |
| | 280 ~ 380HB | 190(130 ~ 230) | 0.10(0.05 ~ 0.15) | A | |
| | | 170(120 ~ 200) | 0.15(0.10 ~ 0.20) | B | |
| | Pre-Hardened (NAK55) | 35 ~ 45HrC | 170(110 ~ 190) | 0.10(0.05 ~ 0.15) | A |
| | | | 160(110 ~ 180) | 0.15(0.10 ~ 0.20) | B |
| High alloy steel (STD, STT) | ≤300HB | 190(130 ~ 230) | 0.10(0.05 ~ 0.15) | A | |
| | | 170(120 ~ 200) | 0.15(0.10 ~ 0.20) | B | |
| | | 170(120 ~ 200) | 0.10(0.05 ~ 0.15) | C | |
| Stainless steel (STS420J) | ≤260HB | 260(180 ~ 310) | 0.10(0.05 ~ 0.15) | A | |
| | | 240(160 ~ 290) | 0.15(0.10 ~ 0.20) | B | |
| | | 240(160 ~ 290) | 0.10(0.05 ~ 0.15) | C | |
| General cast iron (GC250) | Tensile strength ≤350MPa | 260(180 ~ 310) | 0.15(0.10 ~ 0.20) | A | |
| | | 240(160 ~ 290) | 0.15(0.10 ~ 0.20) | B | |
| | | 240(160 ~ 290) | 0.10(0.05 ~ 0.15) | C | |
| | Ductile cast iron (GCD450) | Tensile strength 360~500MPa | 200(140 ~ 240) | 0.10(0.05 ~ 0.15) | A |
| | | | 190(130 ~ 230) | 0.15(0.10 ~ 0.20) | B |
| | | | 190(130 ~ 230) | 0.10(0.05 ~ 0.15) | C |
| Ductile cast iron (GCD450) | Tensile strength 500~800MPa | 170(100 ~ 200) | 0.10(0.05 ~ 0.15) | A | |
| | | 150(110 ~ 180) | 0.15(0.10 ~ 0.20) | B | |
| | | 150(110 ~ 180) | 0.10(0.05 ~ 0.15) | C | |
| Hardened steel (STD, STT) | 45 ~ 60HrC | 110(70 ~ 130) | 0.15(0.10 ~ 0.20) | A | |
| | | 100(60 ~ 120) | 0.15(0.10 ~ 0.20) | B | |
| | | 100(60 ~ 120) | 0.10(0.05 ~ 0.15) | C | |

High productivity with optimized grade for high speed machining

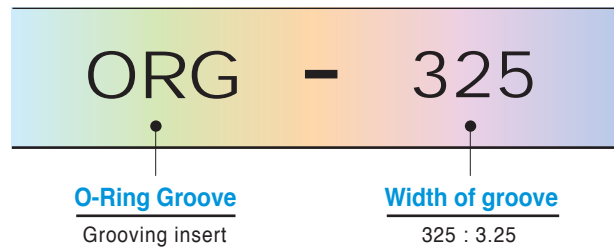
O-Ring Cutter *New*

- Optimized for grooving the seat of an O-Ring in a plastic mold.
- Guarantees superior surface roughness compared to HSS and brazed tool.
- High productivity with optimized grade for high speed machining.
- Reduced time for regrinding and tool alignment.
- Special types are available for quotation.

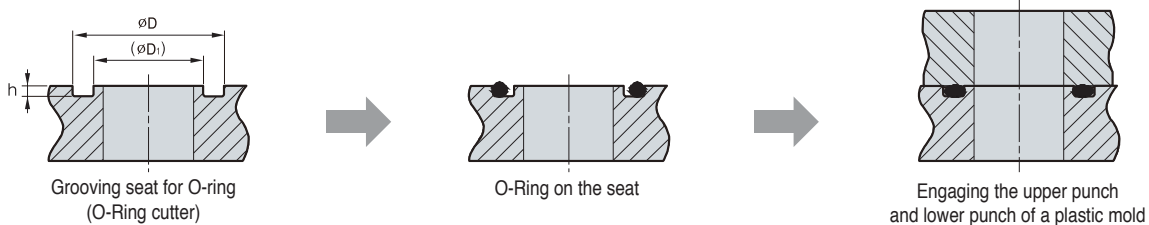
Holder Code System



Insert Code System



Grooving and assembly of O-Ring



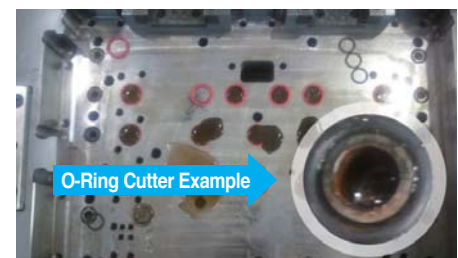
| O-ring size | ϕD | (ϕD_1) | $h \pm 0.05$ |
|-------------|----------|--------------|--------------|
| P08 | 11.0 | 5.8 | 1.40 |
| P09 | 12.0 | 6.8 | |
| P10 | 13.0 | 7.8 | |
| P11 | 15.0 | 8.5 | |
| P12 | 16.0 | 9.5 | 1.80 |
| P14 | 18.0 | 11.5 | |
| P15 | 19.0 | 12.5 | |
| P16 | 20.0 | 13.5 | |
| P18 | 22.0 | 15.5 | |
| P20 | 24.0 | 17.5 | |
| P21 | 25.0 | 18.5 | 2.70 |
| P22 | 26.0 | 19.5 | |
| P24 | 30.0 | 20.6 | |
| P25 | 31.0 | 21.6 | |

| O-ring size | ϕD | (ϕD_1) | $h \pm 0.05$ |
|-------------|----------|--------------|--------------|
| P26 | 32.0 | 22.6 | 2.70 |
| P28 | 34.0 | 24.6 | |
| P29 | 35.0 | 25.6 | |
| P30 | 36.0 | 26.6 | |
| P31 | 37.0 | 27.6 | |
| P32 | 38.0 | 28.6 | |
| P34 | 40.0 | 30.6 | |
| P35 | 41.0 | 31.6 | |
| P38 | 44.0 | 34.6 | |
| P40 | 46.0 | 36.6 | |
| G25 | 30.0 | 21.8 | 2.40 |
| G30 | 35.0 | 26.8 | |
| G35 | 40.0 | 31.8 | |
| G40 | 45.0 | 36.8 | |

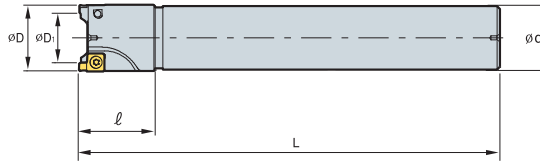
Recommended cutting condition

| Workpiece | fz (mm/t) | vc(m/min) |
|---------------------------|-----------|-----------|
| | | Coating |
| | | PC3500 |
| Stainless Steel (STS304) | 0.03~0.12 | 60~130 |
| Carbon Steel (SM□□C) | 0.05~0.15 | 80~150 |
| Alloy Steel (SCM) | 0.05~0.15 | 80~150 |
| Hardened Steel (STD, NAK) | 0.03~0.12 | 60~130 |

Machining Example



ORC *New*



| Designation | | øD | øD1 | ød | l | L | Available Inserts | O-Ring size |
|-------------|---|------|------|----|----|-----|-------------------|-------------|
| ORC - P08 | 1 | 11.0 | 5.7 | 16 | 30 | 150 | ORG265 | P08 |
| P09 | 1 | 12.0 | 6.7 | 16 | 30 | 150 | ORG265 | P09 |
| P10 | 1 | 13.0 | 7.7 | 16 | 30 | 150 | ORG265 | P10 |
| P11 | 1 | 15.0 | 8.5 | 16 | 30 | 150 | ORG325 | P11 |
| P12 | 2 | 16.0 | 9.5 | 16 | 30 | 200 | ORG325 | P12 |
| P14 | 2 | 18.0 | 11.5 | 20 | 30 | 200 | ORG325 | P14 |
| P15 | 2 | 19.0 | 12.5 | 20 | 30 | 200 | ORG325 | P15 |
| P16 | 2 | 20.0 | 13.5 | 20 | 30 | 200 | ORG325 | P16 |
| P18 | 2 | 22.0 | 15.5 | 20 | 30 | 200 | ORG325 | P18 |
| P20 | 2 | 24.0 | 17.5 | 25 | 30 | 200 | ORG325 | P20 |
| P21 | 2 | 25.0 | 18.5 | 25 | 30 | 200 | ORG325 | P21 |
| P22 | 2 | 26.0 | 19.5 | 25 | 30 | 200 | ORG325 | P22 |
| P24 | 2 | 30.0 | 20.6 | 32 | 40 | 250 | ORG470 | P24 |
| P25 | 2 | 31.0 | 21.6 | 32 | 40 | 250 | ORG470 | P25 |
| P26 | 2 | 32.0 | 22.6 | 32 | 40 | 250 | ORG470 | P26 |
| P28 | 2 | 34.0 | 24.6 | 32 | 40 | 250 | ORG470 | P28 |
| P29 | 2 | 35.0 | 25.6 | 32 | 40 | 250 | ORG470 | P29 |
| P30 | 2 | 36.0 | 26.6 | 32 | 40 | 250 | ORG470 | P30 |
| P31 | 2 | 37.0 | 27.6 | 32 | 40 | 250 | ORG470 | P31 |
| P32 | 2 | 38.0 | 28.6 | 32 | 40 | 250 | ORG470 | P32 |
| P34 | 2 | 40.0 | 30.6 | 42 | 40 | 250 | ORG470 | P34 |
| P35 | 2 | 41.0 | 31.6 | 42 | 40 | 250 | ORG470 | P35 |
| P38 | 2 | 44.0 | 34.6 | 42 | 40 | 250 | ORG470 | P38 |
| P40 | 2 | 46.0 | 36.6 | 42 | 40 | 250 | ORG470 | P40 |
| ORC - G25 | 2 | 30.0 | 21.9 | 32 | 40 | 250 | ORG405 | G25 |
| G30 | 2 | 35.0 | 26.9 | 32 | 40 | 250 | ORG405 | G30 |
| G35 | 2 | 40.0 | 31.9 | 42 | 40 | 250 | ORG405 | G35 |
| G40 | 2 | 45.0 | 36.9 | 42 | 40 | 250 | ORG405 | G40 |

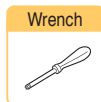
Available Inserts

ORG



| Cutter Designation | Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|--------------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC3600 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| ORC-P08~P10 | ORG 265 | | | | ● | | | | | | | | | | | | | |
| ORC-P11~P22 | 325 | | | | ● | | | | | | | | | | | | | |
| ORC-P24~P40 | 470 | | | | ● | | | | | | | | | | | | | |
| ORC-G25~G40 | 405 | | | | ● | | | | | | | | | | | | | |

Parts



| | | |
|-------------|-----------|-------|
| ORC-P08~P22 | FTKA0307 | TW09S |
| ORC-P24~P40 | FTGA03508 | TW15S |
| ORC-G25~G40 | | |



All applications for chamfers

Chamfer Tool

- All chamfer applications
- Chamfer angles 15°, 30°, 45°, 60° for various customer's needs
- The long cutting edge provides a wide chamfering range



Back & Front Chamfer Tools



Long Chamfer Tools

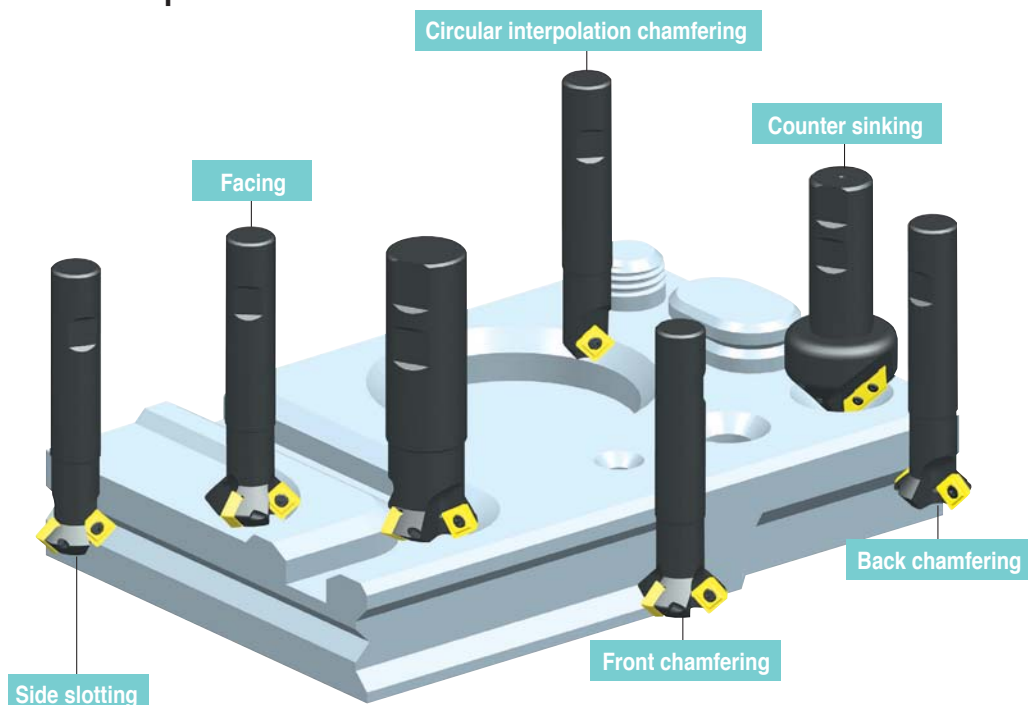
Code System

| | | | | | | |
|------------------------|-----------------------------|--|---------------------------------|------------------------------------|--|--------------------------|
| CE | 45 | - 11 | 25 | R | - S | 20 |
| Chamfer Endmill | Chamfer angle 45° | Inscribed circle of insert 11 : SPMT110408-KC 12 : SPMN120308 31 : XCET310404ER-KC | Min. Cutting Dia. Ø25 | Hand R: Right L: Left | Overall length S: Standard M: Middle L: Long | Shank Dia. Ø20 |

Recommended cutting condition

| Workpiece | Grades | ØD(Ø5 ~Ø20) | | ØD(Ø25 ~Ø35) | |
|-----------|---------------------------|-------------|-----------|--------------|-----------|
| | | vc (m/min) | fz (mm/t) | vc (m/min) | fz (mm/t) |
| P | PC3500 PC5300 ST30A | 100~160 | 0.05~0.25 | 100~160 | 0.05~0.25 |
| M | PC5300 PC3545 | 90~120 | 0.05~0.20 | 90~120 | 0.10~0.30 |
| K | PC5300 G10 | 100~160 | 0.10~0.30 | 100~160 | 0.30~0.50 |

Application example

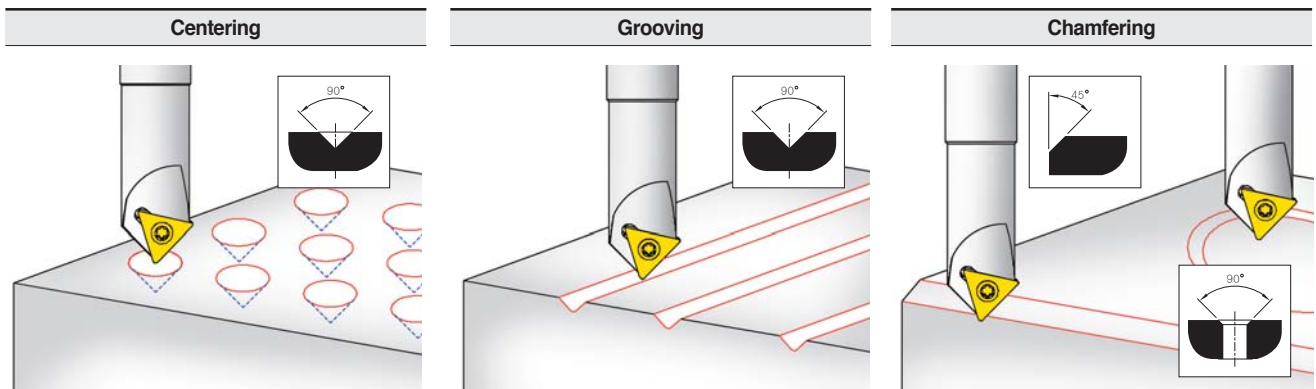


Multi-functional Chamfer Tool

Code System

| | | | | | | |
|------------------------|-----------------------------|---|--------------------------------|--------------------------------------|--|--|
| CE | 45 | - 16 | 00 | R | - S | 20 |
| Chamfer Endmill | Chamfer angle 45° | Inscribed circle of insert 16 : TWX16R-KC 22 : TWX22R-KC | Min. Cutting Dia. Ø0 | Hand R : Right L : Left | Overall length S : 90,110 L : 200 | Shank Dia. Ø12 Ø20 Ø25 |

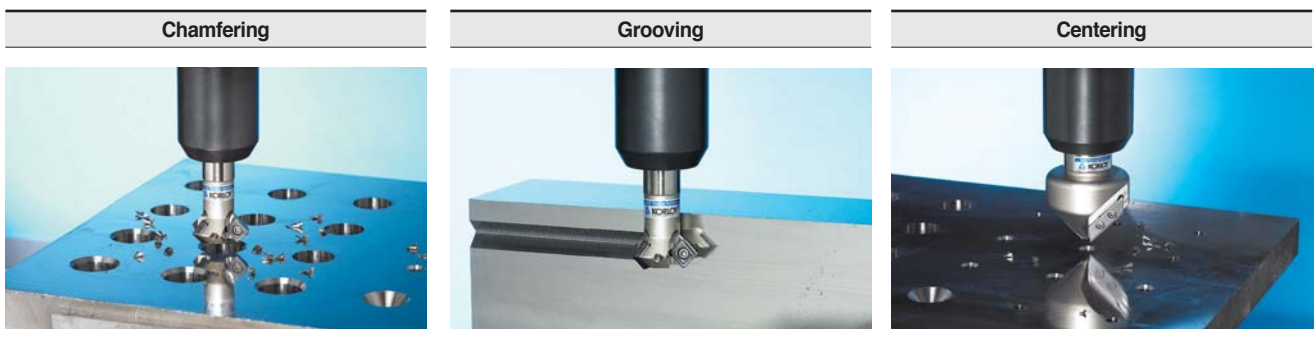
Application area and Recommended cutting condition



| Workpiece | Hardness (HrC) | Centering, Grooving | | Chamfering | |
|---------------------------------------|----------------|---------------------|-------------|------------|-------------|
| | | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) |
| Mild steel, Carbon steel, Alloy steel | Under HrC 30 | 80 ~ 200 | 0.01 ~ 0.04 | 100 ~ 250 | 0.04 ~ 0.06 |
| High Carbon steel, Alloy steel | HrC 30~40 | 150 ~ 250 | 0.02 ~ 0.06 | 150 ~ 300 | 0.05 ~ 0.10 |
| Aluminum, Copper | - | 150 ~ 300 | 0.04 ~ 0.08 | 150 ~ 350 | 0.05 ~ 0.10 |
| Cast iron | - | 80 ~ 150 | 0.02 ~ 0.06 | 100 ~ 250 | 0.05 ~ 0.10 |
| Stainless steel | - | 60 ~ 120 | 0.01 ~ 0.03 | 60 ~ 150 | 0.03 ~ 0.06 |
| HRSA | - | 60 ~ 80 | 0.01 ~ 0.03 | 60 ~ 100 | 0.03 ~ 0.06 |

Note) Please keep fz. Backtouch & Chipping one caused by wrong fz

Machining Example



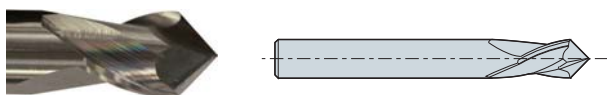
Solid Chamfer Tool *New*

Code System

| | | | | | |
|--|--------------------------------------|---------------------------|---|------------|-----------------------------|
| CCT | 090 | T | - | 080 | L |
| Type | Chamfer angle | Cutting Edge | | Diameter | Tool length |
| CCT : Centering & Chamfering Tool CET : Centering & Chamfering Endmill Tool | 060 : 60° 090 : 90° 120 : 120° | None : Singel T : Twin | | 080 : Ø8.0 | None : Standard L : Long |

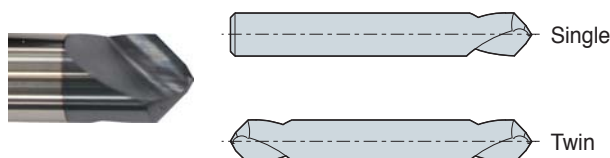
Features

CET(Centering & Chamfering Endmill Tool)



- ▶ For internal chamfering up to 0.5mm
- ▶ Can be applied to side milling and easy to regrinding

CCT(Centering & Chamfering Tool)



- ▶ Chipping resistance realizes machining in high speed due to double point angle
- ▶ Lowers cutting load due to web thinning

CET / CCT Application example

| | Centering | Hole Chamfering | Chamfering (External) | Chamfering (Internal) | Side milling | Slot milling |
|--------------------|-----------|-----------------|-----------------------|-----------------------|--------------|--------------|
| Applications (CET) | | | | | | |
| 60° | × | ● | ● | ●~▲ | ● | × |
| 90° | ▲ | ● | ● | ● | ● | ●~▲ |
| 120° | ● | ● | ● | ● | ● | ● |
| Applications (CCT) | | | | | | |
| 60° | ● | ● | ●~▲ | ▲~× | × | × |
| 90° | ● | ● | ●~▲ | ▲~× | × | × |
| 120° | ● | ● | ● | ● | × | ● |



CE (Back & Front)

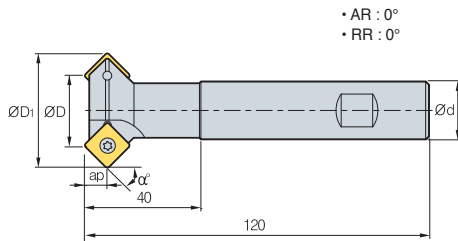


Fig. 1

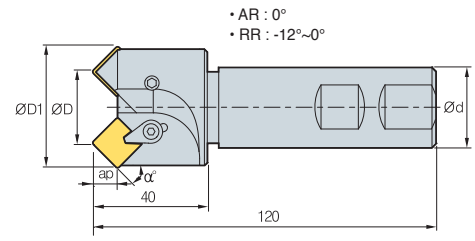


Fig. 2



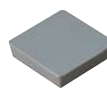
| Designation | ⊙ | ØD | ØD ₁ | Ød | ap | Fig. | Available Inserts | α°(Chamfer angle) | | Machining range (Min~Max) | Uses |
|-----------------|---|----|-----------------|----|-----|------|-------------------|-------------------|------|---------------------------|------------------------|
| | | | | | | | | Front | Back | | |
| CE 15-1125R-S20 | 2 | 25 | 30.5 | 20 | 9.5 | 1 | SPMT110408 - KC | 15° | - | Ø25~Ø30 | Front chamfering |
| | 2 | 25 | 35.5 | 20 | 8.5 | 1 | | 30° | 60° | Ø25~Ø35 | Front, Back chamfering |
| | 1 | 7 | 21.9 | 20 | 7.0 | 1 | | 45° | - | Ø7~Ø21 | Front chamfering |
| | 2 | 19 | 33.9 | 20 | 7.0 | 1 | | 45° | 45° | Ø19~Ø33 | Front, Back chamfering |
| | 3 | 25 | 39.9 | 20 | 7.0 | 1 | | 45° | 45° | Ø25~Ø39 | Front, Back chamfering |
| | 3 | 25 | 43.3 | 32 | 5.0 | 1 | | 60° | 30° | Ø25~Ø42 | Front, Back chamfering |
| CE 45-1207R-S32 | 1 | 7 | 23.3 | 32 | 7.8 | 2 | SPMN120308 | 45° | - | Ø7~Ø22 | Front chamfering |
| | 2 | 20 | 37.3 | 32 | 7.8 | 2 | | 45° | - | Ø21~Ø36 | Front chamfering |
| | 2 | 25 | 42.3 | 32 | 7.8 | 2 | | 45° | - | Ø26~Ø41 | Front chamfering |
| | 2 | 35 | 52.3 | 32 | 7.8 | 2 | | 45° | - | Ø36~Ø51 | Front chamfering |

Available Inserts

SPMT-KC

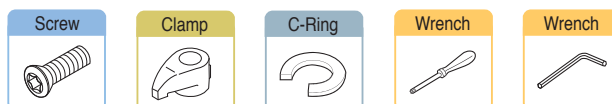


SPMN



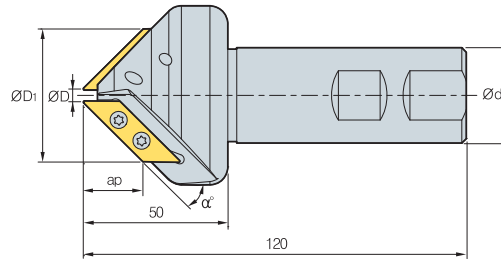
| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | |
| SPMT 110408-KC | | | | ● | | | | | | | | | | | ● | ● | |
| SPMN 120308 | | | | | | | | | | | | | | | ● | | |

Parts



| | | | | | |
|--------------|----------|-------|------|-------|-------|
| CE□□-11□□R-S | FTKA0408 | - | - | TW15S | - |
| CE□□-12□□R-S | CHX0617L | CH6R2 | CR05 | - | HW30L |

CE (Long Chamferer)



- AR : $-5^{\circ}\sim 1^{\circ}$
- RR : 0°

(mm)

| Designation | | $\varnothing D$ | $\varnothing D_1$ | $\varnothing d$ | ap | α° (Chamfer angle) | Machining range (Min~Max) | Uses |
|-----------------|---|-----------------|-------------------|-----------------|------|----------------------------------|-----------------------------------|------------------|
| CE 30-3105R-S32 | 1 | 5 | 35 | 32 | 26 | 30° | $\varnothing 5\sim\varnothing 35$ | Front Chamfering |
| 45-3105R-S32 | 2 | 5 | 48 | 32 | 21 | 45° | $\varnothing 5\sim\varnothing 48$ | Front Chamfering |
| 60-3105R-S32 | 2 | 5 | 57 | 32 | 15 | 60° | $\varnothing 5\sim\varnothing 57$ | Front Chamfering |

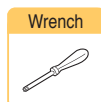
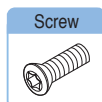
Available Inserts

XCET-KC



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| XCET 310404ER-KC | | | | ● | | | | | | | | | | | ● | ● | | E23 |

Parts



CE□□-31□□R-S FTKA03510 TW15S



CE (Multi-functional)

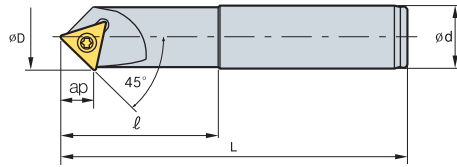


Fig. 1

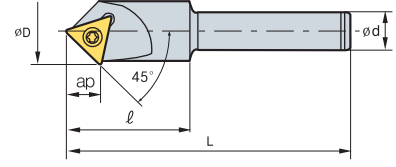


Fig. 2



- AR : -12°~15°
- RR : 0°

| | | | | | | | | | | (mm) |
|-------------|--------------|----------|--------|----|-------|------|-------------------|---------------------------|-----------------------|-------------------------------------|
| Designation | ϕD | ϕd | ℓ | L | a_p | Fig. | Available Inserts | Machining range (Min~Max) | Uses | |
| CE | 45-1600R-S12 | 22 | 12 | 40 | 90 | 10 | 2 | TWX16R-KC | $\phi 0 \sim \phi 20$ | Centering Grooving Chamfering |
| | 45-1600R-S20 | 22 | 20 | 50 | 110 | 10 | 1 | TWX16R-KC | $\phi 0 \sim \phi 20$ | |
| | 45-1600R-L20 | 22 | 20 | 60 | 200 | 10 | 1 | TWX16R-KC | $\phi 0 \sim \phi 20$ | |
| | 45-2200R-S12 | 29 | 12 | 40 | 90 | 14 | 2 | TWX22R-KC | $\phi 0 \sim \phi 27$ | |
| | 45-2200R-S25 | 29 | 25 | 50 | 110 | 14 | 1 | TWX22R-KC | $\phi 0 \sim \phi 27$ | |
| | 45-2200R-L25 | 29 | 25 | 60 | 200 | 14 | 1 | TWX22R-KC | $\phi 0 \sim \phi 27$ | |

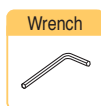
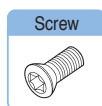
Available Inserts

TWX-KC



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| TWX 16R-KC | | | | ● | | | | | | | | | | | | | | E23 |
| 22R-KC | | | | ● | | | | | | | | | | | | | | |

Parts

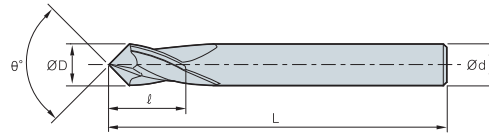


CE45-□□□□R-□□

FTNA0408

TW15L

CET *New*



(mm)

| Designation | $\varnothing D$ | $\varnothing d$ | l | L | θ° |
|-------------|-----------------|-----------------|-----|-----|----------------|
| CET060 - | 030 | 3 | 3 | 5.5 | 60° |
| | 040 | 4 | 4 | 7 | |
| | 060 | 6 | 6 | 10 | |
| | 080 | 8 | 8 | 13 | |
| | 100 | 10 | 10 | 16 | |
| | 120 | 12 | 12 | 18 | |
| | 160 | 16 | 16 | 24 | |
| CET090 - | 030 | 3 | 3 | 5.5 | 90° |
| | 040 | 4 | 4 | 7 | |
| | 060 | 6 | 6 | 10 | |
| | 080 | 8 | 8 | 13 | |
| | 100 | 10 | 10 | 16 | |
| | 120 | 12 | 12 | 18 | |
| | 160 | 16 | 16 | 24 | |
| CET120 - | 030 | 3 | 3 | 5.5 | 120° |
| | 040 | 4 | 4 | 7 | |
| | 060 | 6 | 6 | 10 | |
| | 080 | 8 | 8 | 13 | |
| | 100 | 10 | 10 | 16 | |
| | 120 | 12 | 12 | 18 | |
| | 160 | 16 | 16 | 24 | |



CCT *New*

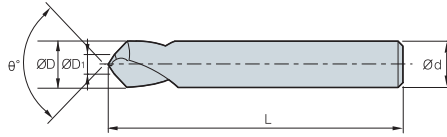


Fig. 1

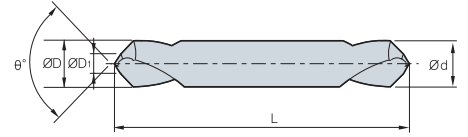
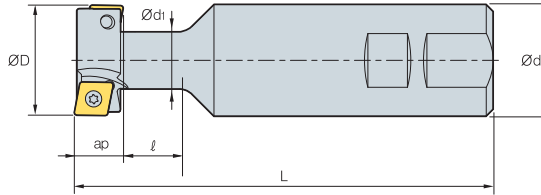


Fig. 2

| | | | | | (mm) | | |
|-------------|-------------------|------------|-----|----------------|------|------|---|
| Designation | $\phi D = \phi d$ | ϕD_1 | L | θ° | Fig. | | |
| CCT060 - | 030 | 3 | 1.0 | 40 | 60° | 1 | |
| | 040 | 4 | 1.5 | 40 | | | |
| | 060 | 6 | 2.0 | 50 | | | |
| | 080 | 8 | 2.5 | 60 | | | |
| | 100 | 10 | 3.0 | 70 | | | |
| | 120 | 12 | 4.0 | 80 | | | |
| | 160 | 16 | 5.0 | 100 | | | |
| CCT060T - | 030 | 3 | 1.0 | 40 | | 60° | 2 |
| | 040 | 4 | 1.5 | 40 | | | |
| | 060 | 6 | 2.0 | 50 | | | |
| | 080 | 8 | 2.5 | 60 | | | |
| | 100 | 10 | 3.0 | 70 | | | |
| | 120 | 12 | 4.0 | 80 | | | |
| | 160 | 16 | 5.0 | 100 | | | |
| CCT060T - | 030L | 3 | 1.0 | 100 | 90° | | 1 |
| | 040L | 4 | 1.5 | 100 | | | |
| | 060L | 6 | 2.0 | 100 | | | |
| | 080L | 8 | 2.5 | 120 | | | |
| | 100L | 10 | 3.0 | 120 | | | |
| | 120L | 12 | 4.0 | 150 | | | |
| | 160L | 16 | 5.0 | 100 | | | |
| CCT090 - | 030 | 3 | 1.0 | 40 | | 90° | 1 |
| | 040 | 4 | 1.5 | 40 | | | |
| | 060 | 6 | 2.0 | 50 | | | |
| | 080 | 8 | 2.5 | 60 | | | |
| | 100 | 10 | 3.0 | 70 | | | |
| | 120 | 12 | 4.0 | 80 | | | |
| | 160 | 16 | 5.0 | 100 | | | |
| CCT090T - | 030 | 3 | 1.0 | 40 | 90° | | 2 |
| | 040 | 4 | 1.5 | 40 | | | |
| | 060 | 6 | 2.0 | 50 | | | |
| | 080 | 8 | 2.5 | 60 | | | |
| | 100 | 10 | 3.0 | 70 | | | |
| | 120 | 12 | 4.0 | 80 | | | |
| | 160 | 16 | 5.0 | 100 | | | |
| CCT090T - | 030L | 3 | 1.0 | 100 | | 120° | 1 |
| | 040L | 4 | 1.5 | 100 | | | |
| | 060L | 6 | 2.0 | 100 | | | |
| | 080L | 8 | 2.5 | 120 | | | |
| | 100L | 10 | 3.0 | 120 | | | |
| | 120L | 12 | 4.0 | 150 | | | |
| | 160L | 16 | 5.0 | 100 | | | |
| CCT120 - | 030 | 3 | 1.0 | 40 | 120° | | 1 |
| | 040 | 4 | 1.5 | 40 | | | |
| | 060 | 6 | 2.0 | 50 | | | |
| | 080 | 8 | 2.5 | 60 | | | |
| | 100 | 10 | 3.0 | 70 | | | |
| | 120 | 12 | 4.0 | 80 | | | |
| | 160 | 16 | 5.0 | 100 | | | |
| CCT120T - | 030 | 3 | 1.0 | 40 | | 120° | 2 |
| | 040 | 4 | 1.5 | 40 | | | |
| | 060 | 6 | 2.0 | 50 | | | |
| | 080 | 8 | 2.5 | 60 | | | |
| | 100 | 10 | 3.0 | 70 | | | |
| | 120 | 12 | 4.0 | 80 | | | |
| | 160 | 16 | 5.0 | 100 | | | |
| CCT120T - | 030L | 3 | 1.0 | 100 | 120° | | 1 |
| | 040L | 4 | 1.5 | 100 | | | |
| | 060L | 6 | 2.0 | 100 | | | |
| | 080L | 8 | 2.5 | 120 | | | |
| | 100L | 10 | 3.0 | 120 | | | |
| | 120L | 12 | 4.0 | 150 | | | |
| | 160L | 16 | 5.0 | 100 | | | |



TFE



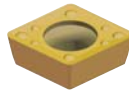
AA
90°
• AR : 5°
• RR : -5°

(mm)

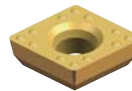
| Designation | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | ap | Available Inserts |
|-------------|---|-----------------|-----------------|-------------------|--------|-----|----|-------------------|
| TFE | 2 | 21 | 25 | 10.5 | 20 | 109 | 9 | CPMT06 |
| | 2 | 25 | 25 | 12.5 | 21 | 112 | 11 | CPMT08 |
| | 2 | 32 | 32 | 16.5 | 26 | 120 | 14 | CPMT09 |
| | 2 | 40 | 32 | 20.5 | 32 | 130 | 18 | CPMH12 |
| | 4 | 50 | 32 | 26.5 | 38 | 140 | 22 | CPMH12 |

Available Inserts

CPMT

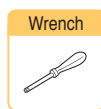


CPMH



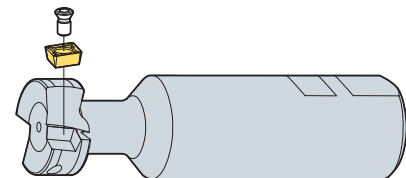
| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| CPMT 060204-MM | | | | ● | | | | | | | | | | | | | | |
| 080308-MM | | | | ● | | | | | | | | | | | | | | |
| 09T308-MM | | | | ● | | | | | | | | | | | | | | |
| CPMH 120408-MM | | | | ● | | | | | | | | | | | | | | |

Parts



| | | |
|---------|-----------|-------|
| 2125R/L | FTNA02555 | TW08S |
| 2525R/L | FTNA0306 | TW09S |
| 3232R/L | FTNA0407 | TW15S |
| 4032R/L | PTMA0511A | TW15S |
| 5032R/L | | |

Assembling



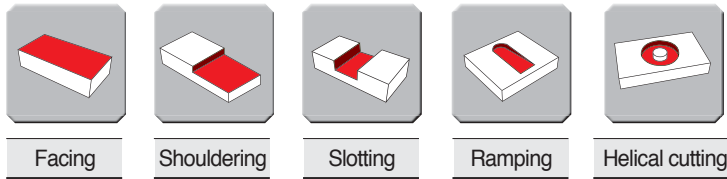
New indexable milling tool for the machining of high quality workpieces

Pro-L Mill *New*

- Improved perpendicularity and lower cutting resistance by composition of clearance face and High Helix edge
- Productivity increase due to more than half as much of Depth of Cut comparing to existing product
- Strong clamping design by adaption of double screw on system
- Improved chip flow due to helical type design of chip pocket and application of coolant system



Uses



Features



Shank type Code system





| | | | | | | | | |
|-------------------|------------------|------------------|----------------------------------|-----------------------|---|---------------------|---|-------------------|
| PAL | S | 050 | H | R | - | 3 | S | 40 |
| <u>Pro-L Mill</u> | <u>Tool type</u> | <u>Tool Dia.</u> | <u>Coolant type</u> | <u>Hand</u> | | <u>No. of tooth</u> | <u>Tool length</u> | <u>Shank Dia.</u> |
| | S: Shank | 050 : Ø50 | Unmarked : None H : Thru-hole | R : Right L : Left | | 3 : 3 teeth | S : Standard type M : Middle type L : Long type | 40 : Ø40 |

Cutter type Code system

| | | | | | |
|-------------------|------------------|-------------|------------------|----------------------------------|-----------------------------|
| PAL | C | M | 063 | H | R |
| <u>Pro-L Mill</u> | <u>Tool type</u> | <u>Unit</u> | <u>Tool Dia.</u> | <u>Coolant type</u> | <u>Hand</u> |
| | C: Cutter | M : Metric | 063 : Ø63 | Unmarked : None H : Thru-hole | R : Right M : Multi edge |



🎯 Chip breakers

| Usage | Insert's type | Edge type | Features |
|----------------------|--|---|--|
| Al | MA  |  | Application of the edge optimized for Aluminum machining and buffed finish ensure excellent machining quality |
| Hard-to-cut material | ML  |  | Design of Low cutting resistance Chip Breaker ensures excellent machining quality for light cutting and Hard-to-cut material |

🎯 Selection of Grade and Chip Breaker

| Category | M (Stainless steel) | N (Aluminum alloy) | S (HRSA) |
|----------|---------------------|--------------------|-----------------|
| Grade | PC5300 / PC5400 | H01 | PC5300 / PC5400 |
| MA | — | ○ | — |
| ML | ○ | — | ○ |

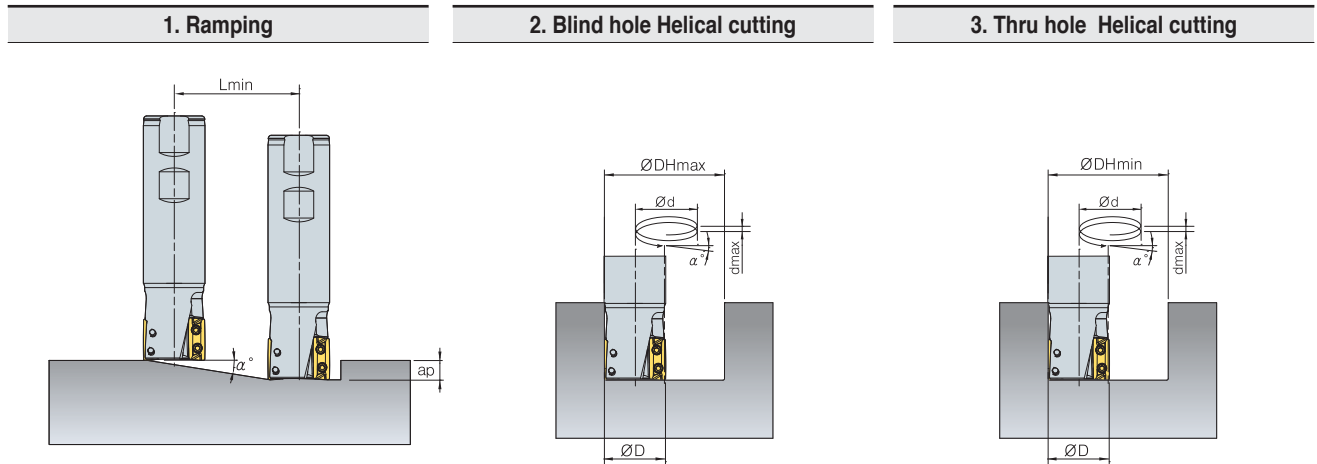
🎯 Cutting Performance

N Al6061 (HRC30)

- Cutting condition
 - $vc = 500\text{m/min}$
 - $fz = 0.2\text{mm/t}$
 - $ap = 30 \sim 60\text{mm}$
 - $ae = 1 \sim 5\text{mm}$ (finishing : 1mm, roughing : 5mm)
 - $z = 3$



Pro-L Mill Ramping & Helical cutting technical data

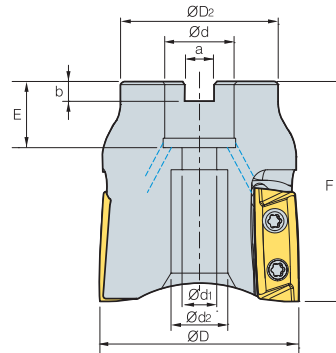


| Designation | ØD(mm) | Ramping | | Blind hole Helical cutting | | | | Thru hole Helical cutting | |
|----------------|--------|---------|----------|----------------------------|-----------|-------------|-----------|---------------------------|-----------|
| | | α°(max) | Lmin(mm) | ØDHmax (mm) | dmax (mm) | ØDHmin (mm) | dmax (mm) | ØDHmin (mm) | dmax (mm) |
| PALS032HR-2S20 | 32 | 3.37 | 170 | 62 | 3.6 | 60 | 3.5 | 55 | 3.2 |
| PALS032HR-2S25 | 32 | 3.37 | 170 | 62 | 3.6 | 60 | 3.5 | 55 | 3.2 |
| PALS032HR-2S32 | 32 | 3.37 | 170 | 62 | 3.6 | 60 | 3.5 | 55 | 3.2 |
| PALS040HR-2S32 | 40 | 2.12 | 270 | 78 | 2.9 | 76 | 2.8 | 71 | 2.6 |
| PALS040HR-2S40 | 40 | 2.12 | 270 | 78 | 2.9 | 76 | 2.8 | 71 | 2.6 |
| PALS040HR-2S42 | 40 | 2.12 | 270 | 78 | 2.9 | 76 | 2.8 | 71 | 2.6 |
| PALS040HR-3S32 | 40 | 2.12 | 270 | 78 | 2.9 | 76 | 2.8 | 71 | 2.6 |
| PALS040HR-3S40 | 40 | 2.12 | 270 | 78 | 2.9 | 76 | 2.8 | 71 | 2.6 |
| PALS040HR-3S42 | 40 | 2.12 | 270 | 78 | 2.9 | 76 | 2.8 | 71 | 2.6 |
| PALS050HR-3S32 | 50 | 2.08 | 275 | 98 | 3.6 | 96 | 3.5 | 91 | 3.3 |
| PALS050HR-3S40 | 50 | 2.08 | 275 | 98 | 3.6 | 96 | 3.5 | 91 | 3.3 |
| PALS050HR-3S42 | 50 | 2.08 | 275 | 98 | 3.6 | 96 | 3.5 | 91 | 3.3 |
| PALS063HR-4S32 | 63 | 1.76 | 325 | 124 | 3.8 | 122 | 3.8 | 117 | 3.6 |
| PALS063HR-4S40 | 63 | 1.76 | 325 | 124 | 3.8 | 122 | 3.8 | 117 | 3.6 |
| PALS063HR-4S42 | 63 | 1.76 | 325 | 124 | 3.8 | 122 | 3.8 | 117 | 3.6 |
| PALS063HM-4S32 | 63 | 1.76 | 325 | 124 | 3.8 | 122 | 3.8 | 117 | 3.6 |
| PALS063HM-4S40 | 63 | 1.76 | 325 | 124 | 3.8 | 122 | 3.8 | 117 | 3.6 |
| PALS063HM-4S42 | 63 | 1.76 | 325 | 124 | 3.8 | 122 | 3.8 | 117 | 3.6 |
| PALCM063HR | 63 | 1.76 | 325 | 124 | 3.8 | 122 | 3.8 | 117 | 3.6 |

- Lmin : when ap=10mm
- Lmin : Minimum inclination cutting length $L_{min} = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$
- α° : Max. rampig angle
- ap : Depth of cut



PALCM *New*



| | | | | | | | | | | | | | | (mm) | |
|-------------|---|----|-----------------|----|-----------------|-----------------|-----------------|----|-----|----|----------------|----|----|------|--|
| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | Ød ₃ | a | b | E | E ₁ | F | ap | | |
| PALCM 063HR | 4 | 63 | 50 | 22 | 11 | 18 | - | 10 | 6.3 | 21 | 28 | 70 | 34 | 0.57 | |

Available Inserts

LXET



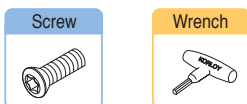
| Type | Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | |
|------------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|------|-----|-------|--|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PC215K | CN2000 | CN20 | CN30 | H01 | G10E | A30 | ST20E | |
| Ø63 | LXET 340504PEFR-63-MA | | | | | | | | | | | | | | | | | | |
| | 3405PEFR-63-MA | | | | | | | | | | | | | | | | | | |
| | 340512PEFR-63-MA | | | | | | | | | | | | | | | | | | |
| | 340516PEFR-63-MA | | | | | | | | | | | | | | | | | | |
| | 340504PEER-63-ML | | | | | | | | | | | | | | | | | | |
| | 340508PEER-63-ML | | | | | | | | | | | | | | | | | | |
| | 340512PEER-63-ML | | | | | | | | | | | | | | | | | | |
| 340516PEER-63-ML | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

E10

Available Arbors

| Designation | Ød | Available Arbors |
|---------------|----|------------------|
| PALC(M) 063HR | 22 | BT □□-FMC22-□□ |

Parts

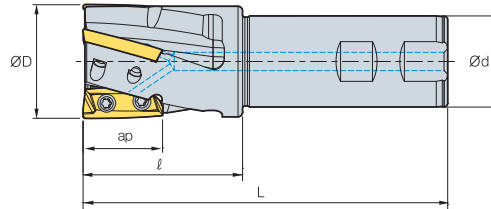


| | | |
|-----|------------|----------|
| Ø63 | FTGA0511-P | TW20-100 |
|-----|------------|----------|

Available Inserts E10

● : Stock item

PALS(Single Edge) New



| Designation | | | | | | | | | (mm) |
|-------------|------------|----|----|----|-----|-----|------|------|------|
| | | 齒 | øD | ød | l | L | ap | kg | |
| PALS | 032HR-2S20 | 2 | 32 | 20 | 50 | 140 | 25 | 0.36 | |
| | 032HR-2S25 | 2 | 32 | 25 | 50 | 140 | 25 | 0.48 | |
| | 032HR-2S32 | 2 | 32 | 32 | 50 | 140 | 25 | 0.71 | |
| | 040HR-2S32 | 2 | 40 | 32 | 50 | 140 | 25 | 0.85 | |
| | 040HR-2S40 | 2 | 40 | 40 | 50 | 140 | 25 | 1.16 | |
| | 040HR-2S42 | 2 | 40 | 42 | 50 | 140 | 25 | 1.26 | |
| | 040HR-3S32 | 3 | 40 | 32 | 50 | 140 | 25 | 0.80 | |
| | 040HR-3S40 | 3 | 40 | 40 | 50 | 140 | 25 | 1.10 | |
| | 040HR-3S42 | 3 | 40 | 42 | 50 | 140 | 25 | 1.20 | |
| | 050HR-3S32 | 3 | 50 | 32 | 70 | 160 | 34 | 1.10 | |
| | 050HR-3S40 | 3 | 50 | 40 | 70 | 160 | 34 | 1.40 | |
| | 050HR-3S42 | 3 | 50 | 42 | 70 | 160 | 34 | 1.50 | |
| | 063HR-4S32 | 4 | 63 | 32 | 70 | 160 | 34 | 1.60 | |
| | 063HR-4S40 | 4 | 63 | 40 | 70 | 160 | 34 | 1.92 | |
| 063HR-4S42 | 4 | 63 | 42 | 70 | 160 | 34 | 2.00 | | |

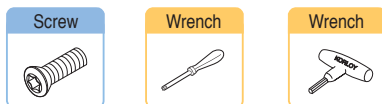
Available Inserts

LXET



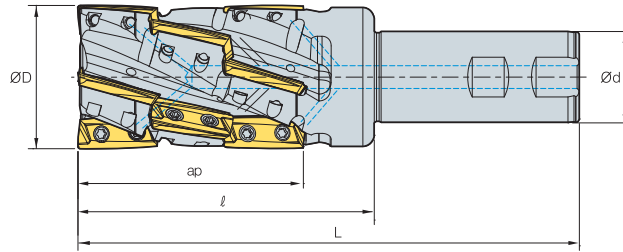
| Type | Designation | Coated | | | | | | | | | | Cermet | Uncoated | Type | Designation | Coated | | | | | | | | | | Cermet | Uncoated | Page | | | | | | | | | | | | | | | | |
|------------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----------------------|--------|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|--------|--------|--|--|-----|--|--|--|--|--|--|--|--|--|--|--|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC5445 | PC9530 | PC6510 | PC215K | | | | | CN2000 | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC5400 | PC5445 | PC9530 | PC6510 | | | | PC215K | CN2000 | | | | | | | | | | | | | | |
| Ø32 | LXET 250404PEFR-32-MA | | | | | | | | | | | | | | | Ø50 | LXET 340504PEFR-50-MA | | | | | | | | | | | | | | | | E10 | | | | | | | | | | | |
| | 2504PEFR-32-MA | | | | | | | | | | | | | | | | LXET 340512PEFR-50-MA | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250412PEFR-32-MA | | | | | | | | | | | | | | | | LXET 340516PEFR-50-MA | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250416PEFR-32-MA | | | | | | | | | | | | | | | | LXET 340504PEER-50-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250404PEER-32-ML | | | | | | | | | | | | | | | | LXET 3405PEER-50-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2504PEER-32-ML | | | | | | | | | | | | | | | | LXET 340512PEER-50-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250412PEER-32-ML | | | | | | | | | | | | | | | | LXET 340516PEER-50-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ø40 | LXET 250404PEFR-40-MA | | | | | | | | | | | | | | | Ø63 | LXET 340504PEFR-63-MA | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2504PEFR-40-MA | | | | | | | | | | | | | | | | LXET 3405PEFR-63-MA | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250412PEFR-40-MA | | | | | | | | | | | | | | | | LXET 340512PEFR-63-MA | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250416PEFR-40-MA | | | | | | | | | | | | | | | | LXET 340516PEFR-63-MA | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250404PEER-40-ML | | | | | | | | | | | | | | | | LXET 340504PEER-63-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2504PEER-40-ML | | | | | | | | | | | | | | | | LXET 340508PEER-63-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250412PEER-40-ML | | | | | | | | | | | | | | | | LXET 340512PEER-63-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 250416PEER-40-ML | | | | | | | | | | | | | | | LXET 340516PEER-63-ML | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Parts



| | | | |
|-----|------------|-------|----------|
| Ø32 | FTKA0408 | TW15S | - |
| Ø40 | FTKA0410 | TW15S | - |
| Ø50 | FTGA0510-P | - | TW20-100 |
| Ø63 | FTGA0511-P | - | TW20-100 |

PALS(Multi Edge) *New*



| Designation | | | øD | ød | l | L | ap | |
|-------------|------------|----|----|----|-----|-----|----|------|
| (mm) | | | | | | | | |
| PALS | 063HM-4S32 | 12 | 63 | 32 | 130 | 220 | 96 | 1.60 |
| | 063HM-4S40 | 12 | 63 | 40 | 130 | 220 | 96 | 1.92 |
| | 063HM-4S42 | 12 | 63 | 42 | 130 | 220 | 96 | 2.00 |

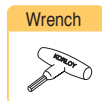
Available Inserts

LXET



| Type | Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | Page | |
|------------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|------|-----|------|-------|
| | | NCM825 | NCM835 | NC5330 | PC3500 | PC5300 | PC5400 | PC3545 | PC9530 | PC6510 | PC215K | CN2000 | CN20 | CN30 | H01 | G10E | A30 | | ST20E |
| Ø63 | LXET 340504PEFR-63-MA | | | | | | | | | | | | | | | | | | E10 |
| | 3405PEFR-63-MA | | | | | | | | | | | | | | | | | | |
| | 340512PEFR-63-MA | | | | | | | | | | | | | | | | | | |
| | 340516PEFR-63-MA | | | | | | | | | | | | | | | | | | |
| | 340504PEER-63-ML | | | | | | | | | | | | | | | | | | |
| | 340508PEER-63-ML | | | | | | | | | | | | | | | | | | |
| | 340512PEER-63-ML | | | | | | | | | | | | | | | | | | |
| 340516PEER-63-ML | | | | | | | | | | | | | | | | | | | |

Parts



| | | |
|-----|------------|----------|
| Ø63 | FTGA0511-P | TW20-100 |
|-----|------------|----------|



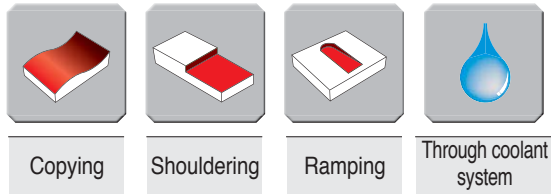
Buffed on top face of insert ensure good chip control and reduces built-up edge

Pro-A Mill

- Buffed top face of insert ensures good chip control and reduces built-up edge
- Small size modular type for aluminum machining
- Various line up of modular system for aluminum machining
- For shouldering, curved surface and ramping
- High rake angle chip breaker ensures excellent surface roughness improved cooling effect, and chip control by through coolant system, even in deep pocket machining



Uses



Copying

Shouldering

Ramping

Through coolant system

Pro-A Mill series

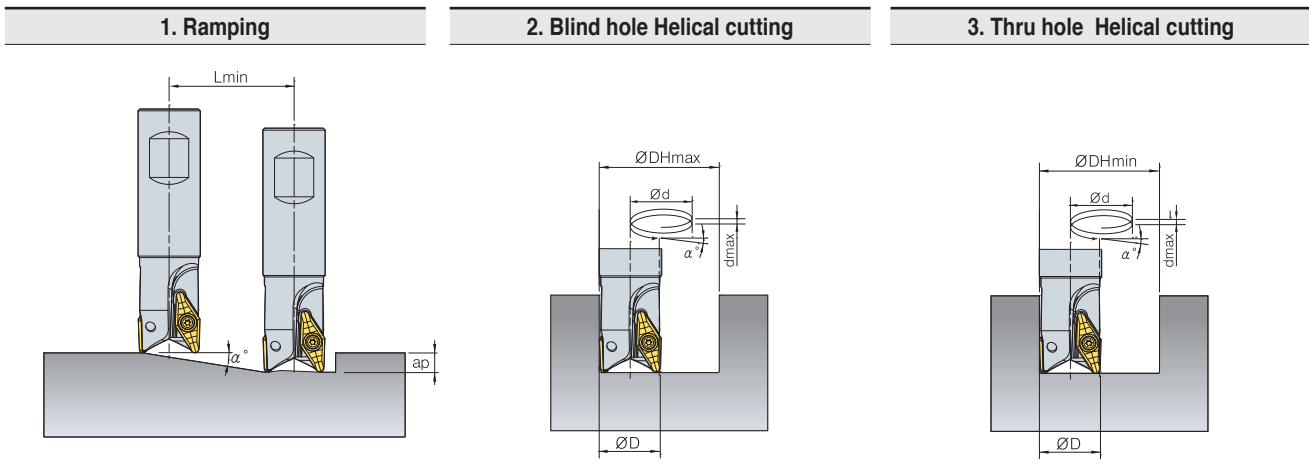
| Type | Series | Pro-A mill | Through coolant system |
|---|------------|--|------------------------|
| Application of small-sized Aluminum machining | Pro-A 2000 | <ul style="list-style-type: none"> • Modular : $\varnothing 12 \sim \varnothing 42$ • Shank : $\varnothing 12 \sim \varnothing 42$ • Insert : VDKT11T210N-MA VDKT11T220N-MA | ○ |
| General application of Aluminum machining | Pro-A 4000 | <ul style="list-style-type: none"> • cutter : $\varnothing 40 \sim \varnothing 100$ • Shank : $\varnothing 32 \sim \varnothing 40$ • Insert : VCKT220530N-MA | ○ |

Recommended cutting condition

| Workpiece | | Cutting speed vc(m/min) |
|-----------------|--------------|-------------------------|
| Aluminum alloy | Rm < 280 MPa | 1000 |
| | Rm > 280 MPa | 800 |
| Copper alloy | Long chip | 250 |
| Thermo plastic | - | 300 |
| Aluminum alloy | Si < 12% | 800 |
| Copper alloy | Short chip | 400 |
| Magnesium alloy | - | 400 |
| Duroplastics | - | 150 |



Pro-A Mill Ramping & Helical cutting technical data



| Designation | ØD(mm) | Ramping | | Blind hole Helical cutting | | | | Thru hole Helical cutting | |
|--------------|--------|---------|----------|----------------------------|----------|------------|----------|---------------------------|----------|
| | | α°(max) | Lmin(mm) | ØDHmax(mm) | dmax(mm) | ØDHmin(mm) | dmax(mm) | ØDHmin(mm) | dmax(mm) |
| PAS2012HR | 12 | 11.9 | 38 | 23 | 4.8 | 21 | 4.4 | 19 | 4.0 |
| PAS2016HR | 16 | 12.5 | 36 | 31 | 6.9 | 29 | 6.4 | 27 | 6.0 |
| PAS2020HR | 20 | 9.7 | 47 | 39 | 6.7 | 37 | 6.3 | 35 | 6.0 |
| PAS2025HR | 25 | 7.6 | 60 | 49 | 6.5 | 47 | 6.3 | 45 | 6.0 |
| PAS2032HR | 32 | 5.8 | 79 | 63 | 6.4 | 61 | 6.2 | 59 | 6.0 |
| PAS2042HR | 42 | 4.3 | 105 | 83 | 6.3 | 81 | 6.2 | 79 | 6.0 |
| PAS4032HR | 32 | 24.4 | 22 | 59 | 26.8 | 54 | 24.5 | 40 | 18.2 |
| PAS4040HR | 40 | 18.4 | 30 | 75 | 25.0 | 70 | 23.3 | 56 | 18.7 |
| PAS4050HR | 50 | 14.0 | 40 | 95 | 23.8 | 90 | 22.5 | 76 | 19.0 |
| PAS4063HR | 63 | 10.7 | 53 | 121 | 22.8 | 116 | 21.9 | 102 | 19.2 |
| PAC(M)4080HR | 80 | 8.1 | 70 | 155 | 22.1 | 150 | 21.4 | 136 | 19.4 |
| PAC(M)4100HR | 100 | 6.3 | 90 | 195 | 21.7 | 190 | 21.1 | 176 | 19.6 |

- Lmin : When ap=8mm
- Lmin : Minimum inclination cutting length
- $L_{min} = \frac{ap}{\tan \alpha^\circ}$ (mm)
- α° : Max. ramping angle
- ap : Depth of cut



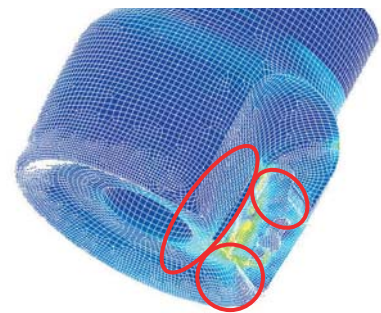
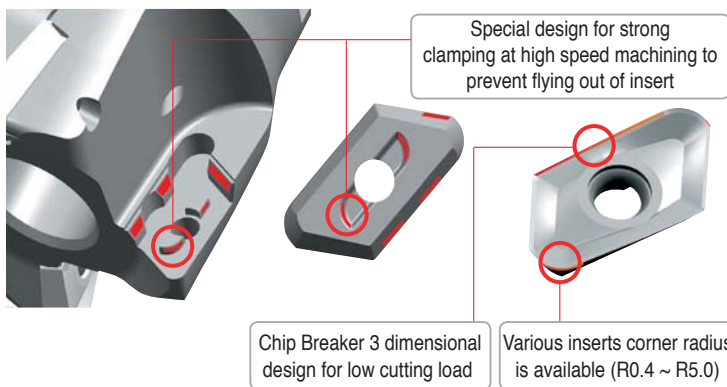
Strong clamping due to the concave design of insert bottom

Pro-X Mill

- Strong clamping due to the concave design of insert bottom
- Good chip flow and less build up edge achieved with the buffed surface of insert
- High rake angle of insert provides good surface finish and low cutting load
- Specially designed for high speed machining of aluminum
- Suitable for square shouldering and curved surface machining

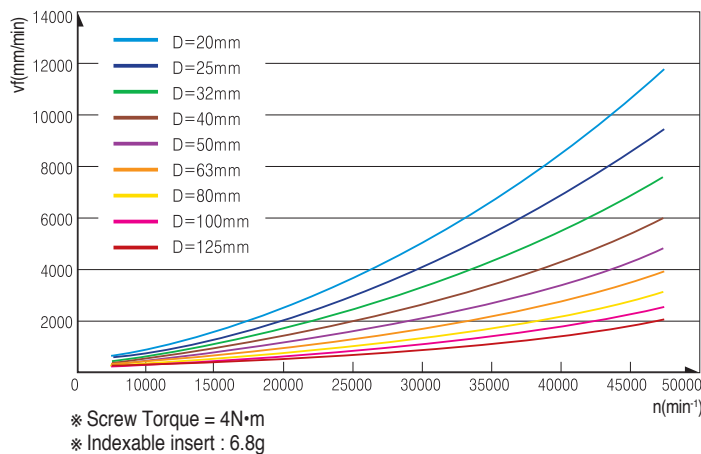


Clamping system for high speed



- Clamping design as per FEM analysis
- Strong clamping of insert

Centrifugal force as per RPM



Marking [• Designation • Max. RPM]



Max. RPM as per cutting diameter

| Cutting diameter ØD(mm) | | Max. RPM | |
|-------------------------|-----------|-----------------------|-----------|
| 5000 type | 6000 type | n(min ⁻¹) | vc(m/min) |
| 20 | - | 15,000 | 940 |
| 25 | 25 | 32,600 | 2,559 |
| 32 | 32 | 28,800 | 2,894 |
| 40 | 40 | 25,800 | 3,240 |
| 50 | 50 | 23,000 | 3,611 |
| 63 | 63 | 20,500 | 4,055 |
| 80 | 80 | 18,200 | 4,572 |
| 100 | 100 | 16,300 | 5,118 |
| 125 | 125 | 14,600 | 5,731 |

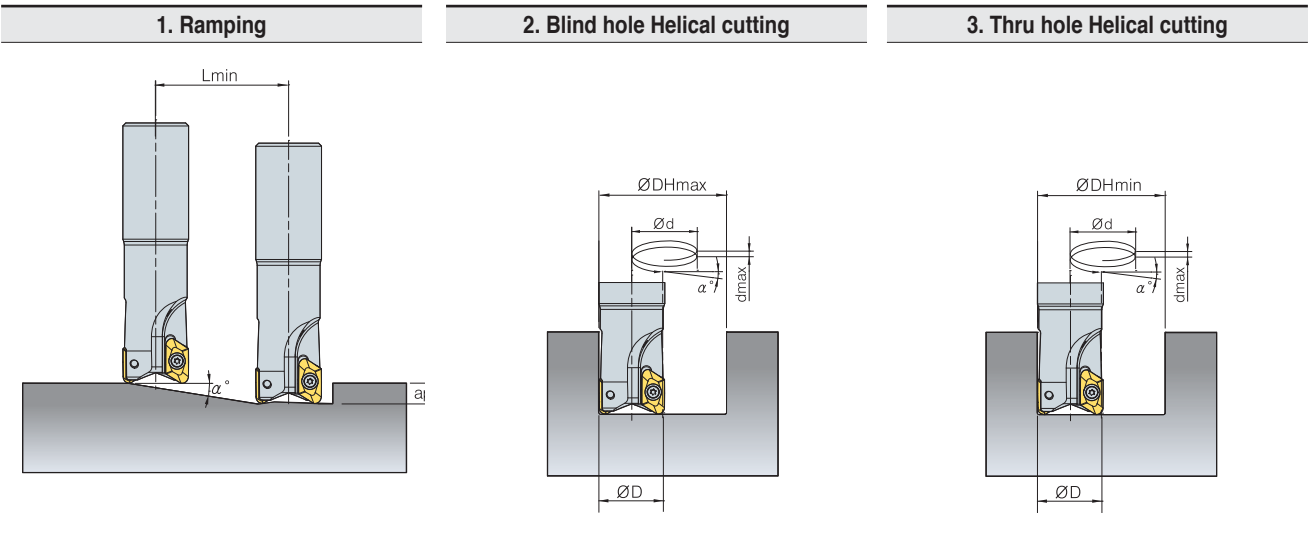
Recommended cutting condition

| Workpiece | | Cutting Speed vc(m/min) | Feed fz(mm/t) |
|--------------------------------|----------------|-------------------------|---------------|
| Aluminum alloy | Rm280 < MPa | 1200 | 0.30 |
| | Rm280 > MPa | 1000 | 0.25 |
| Copper alloy Thermo plastic | Long chipping | 400 | 0.20 |
| | - | 350 | 0.15 |
| Aluminum alloy | Si <12% | 1000 | 0.25 |
| | Si ≥12% | - | - |
| Copper alloy | Short chipping | 500 | 0.20 |
| Magnesium alloy | - | 450 | 0.20 |
| Duroplastics | - | 200 | 0.15 |

* In case of actual machining accidental breakage of insert or tool could happen even under the written RPM special cover or door is necessary to prevent damage from broken insert or broken tool



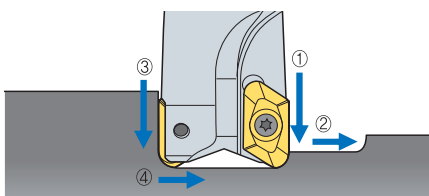
Pro-X Mill Ramping & Helical cutting technical data



| Designation | ØD(mm) | Ramping | | Blind hole Helical cutting | | | | Thru hole Helical cutting | |
|---------------|--------|---------|----------|----------------------------|----------|------------|----------|---------------------------|----------|
| | | α°(max) | Lmin(mm) | ØDHmax(mm) | dmax(mm) | ØDHmin(mm) | dmax(mm) | ØDHmin(mm) | dmax(mm) |
| PAXS5020HR | 20 | 8.4 | 68 | 34 | 5.0 | 32 | 4.7 | 27 | 4.0 |
| PAXS5025HR | 25 | 13.2 | 43 | 44 | 10.4 | 42 | 9.9 | 34 | 8.0 |
| PAXS5032HR | 32 | 9.5 | 60 | 58 | 9.7 | 56 | 9.3 | 48 | 8.0 |
| PAXS5040HR | 40 | 7.1 | 80 | 74 | 9.3 | 72 | 9.0 | 64 | 8.0 |
| PAXCM5050HR | 50 | 5.4 | 105 | 94 | 9.0 | 92 | 8.8 | 84 | 8.0 |
| PAXCM5063HR | 63 | 4.2 | 138 | 120 | 8.7 | 118 | 8.6 | 110 | 8.0 |
| PAXC(M)5080HR | 80 | 3.2 | 180 | 154 | 8.6 | 152 | 8.4 | 144 | 8.0 |
| PAXC(M)5100HR | 100 | 2.5 | 230 | 194 | 8.4 | 192 | 8.3 | 184 | 8.0 |
| PAXC(M)5125HR | 125 | 2.0 | 293 | 244 | 8.3 | 242 | 8.3 | 234 | 8.0 |
| PAXS6025HR | 25 | 9.0 | 63 | 44 | 6.9 | 42 | 6.6 | 38 | 6.0 |
| PAXS6032HR | 32 | 6.6 | 87 | 58 | 6.7 | 56 | 6.5 | 52 | 6.0 |
| PAXS6040HR | 40 | 12.1 | 47 | 74 | 15.9 | 72 | 15.4 | 56 | 12.0 |
| PAXCM6050HR | 50 | 9.0 | 63 | 94 | 14.8 | 92 | 14.5 | 76 | 12.0 |
| PAXCM6063HR | 63 | 6.7 | 85 | 120 | 14.1 | 118 | 13.9 | 102 | 12.0 |
| PAXC(M)6080HR | 80 | 5.0 | 113 | 154 | 13.6 | 152 | 13.4 | 136 | 12.0 |
| PAXC(M)6100HR | 100 | 3.9 | 147 | 194 | 13.2 | 192 | 13.1 | 176 | 12.0 |
| PAXC(M)6125HR | 125 | 3.0 | 188 | 244 | 13.0 | 242 | 12.8 | 226 | 12.0 |

- Lmin : When ap=10mm
- Lmin : Minimum inclination cutting length
- $Lmin = \frac{ap}{\tan \alpha^\circ}$ (mm)
- α° : Max. rampig angle
- ap : Depth of cut

Plunging, Slotting, Drilling technical data



1. When drilling, grooving machining sequence is ① → ② → ③ → ④
2. When drilling, grooving, decrease the feed and cutting speed 30%~50% from the recommended data

Cutting condition for drilling

| Holder | ap(mm) | |
|---------|-----------|-----------|
| | 5000 Type | 6000 Type |
| Ø20 | 8 | - |
| Ø25 | 4 | 11 |
| Ø32 | 4 | 6 |
| Ø40~125 | 4 | 6 |

| Insert | ap(mm) |
|--------|--------|
| | XETK19 |
| XETK25 | 6 |

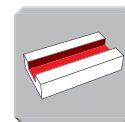
Uses



Copying



Helical cutting



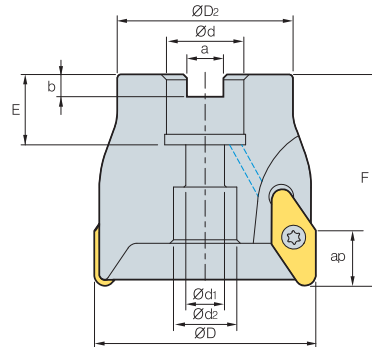
Slotting & Shouldering



Ramping



PAC(M)4000



• AR : 0°
• RR : -3°

| | | | | | | | | | | | | | (mm) |
|-------------|--------|----|-----------------|----|-----------------|-----------------|--------|------------|----------|--------|----|----|------|
| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | ap | | |
| PAC(M) | 4040HR | 3 | 40 | 32 | 16 | 9 | 11.5 | 8.4 | 5.6 | 20 | 55 | 15 | 0.2 |
| | 4050HR | 3 | 50 | 40 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 55 | 15 | 0.3 |
| | 4063HR | 4 | 63 | 50 | 22 | 11 | 18 | 10.4 | 6.3 | 20 | 60 | 15 | 0.6 |
| | 4080HR | 4 | 80 | 60 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6.0(7.0) | 25(25) | 60 | 15 | 1.0 |
| | 4100HR | 5 | 100 | 80 | 31.75(32) | - (18) | 44(26) | 12.7(14.4) | 8.0 | 37(26) | 60 | 15 | 1.6 |

• () Metric Size

Available Inserts

VCKT-MA

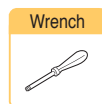
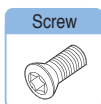


| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| VCKT 220530N-MA | | | | | | | | | | | | | | ● | | | | E23 |

Available Arbors

| Designation | Ød | Available Arbors |
|---------------|-------|------------------|
| PAC(M) 4040HR | 16 | BT□□-FMC16-□□ |
| | 22 | BT□□-FMC22-□□ |
| | | 25.4 |
| 4080HR | 27 | BT□□-FMC27-□□ |
| | 31.75 | BT□□-FMA31.75-□□ |
| 4100HR | 32 | BT□□-FMC32-□□ |

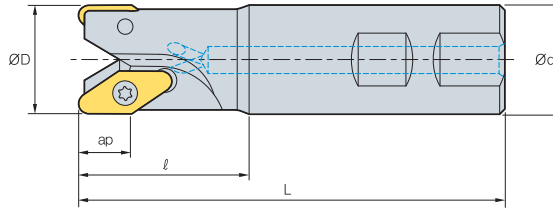
Parts



FTNC04509 (Ø40)
FTNC04511

TW 20S

PAS2000/4000



| Designation | | | øD | ød | l | L | ap | |
|-------------|------------|---|----|----|----|-----|----|------|
| PAS | 2012HR | 1 | 12 | 16 | 25 | 85 | 8 | 0.1 |
| | 2016HR | 2 | 16 | 16 | 25 | 90 | 8 | 0.11 |
| | 2020HR | 2 | 20 | 20 | 30 | 100 | 8 | 0.2 |
| | 2025HR | 3 | 25 | 25 | 35 | 115 | 8 | 0.36 |
| | 2032HR | 4 | 32 | 32 | 40 | 125 | 8 | 0.66 |
| PAS | 2042HR | 5 | 42 | 32 | 42 | 130 | 8 | 0.84 |
| | 4032HR | 2 | 32 | 32 | 50 | 125 | 15 | 0.6 |
| | 4040HR | 3 | 40 | 32 | 50 | 140 | 15 | 0.8 |
| | 4040HR-S40 | 3 | 40 | 40 | 60 | 150 | 15 | 1.2 |
| | 4040HR-S42 | 3 | 40 | 42 | 60 | 150 | 15 | 1.2 |

Available Inserts

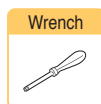
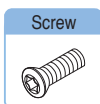
VDKT-MA

VCKT-MA



| Type | Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|-----------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| 2000 type | VDKT 11T210N-MA | | | | | | | | | | | | | ● | | | | |
| 4000 type | VCKT 220530N-MA | | | | | | | | | | | | | ● | | | | |

Parts

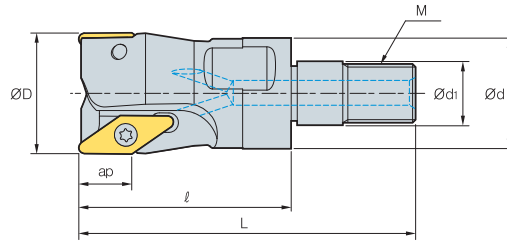


| | | |
|-----------|------------|--------|
| 2000 type | ETNA02505* | TW 07S |
| | ETNA02506 | |
| 4000 type | FTNC04509 | TW 20S |

* PAS2012 · 2016



PAM2000



AA
90° • AR : 7°~10°
• RR : -21°~9°

| Designation | | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | ap | |
|-------------|------------|---|-----------------|-----------------|-------------------|--------|----|-----|----|------|
| PAM | 2012HR-M06 | 1 | 12 | 11.0 | 6.5 | 33 | 48 | M06 | 8 | 0.02 |
| | 2016HR-M08 | 2 | 16 | 14.5 | 8.5 | 36 | 53 | M08 | 8 | 0.04 |
| | 2020HR-M10 | 2 | 20 | 18.0 | 10.5 | 36 | 57 | M10 | 8 | 0.06 |
| | 2025HR-M12 | 3 | 25 | 22.5 | 12.5 | 41 | 65 | M12 | 8 | 0.1 |
| | 2032HR-M16 | 4 | 32 | 28.5 | 17.0 | 45 | 72 | M16 | 8 | 0.18 |
| | 2042HR-M16 | 5 | 42 | 28.5 | 17.0 | 45 | 72 | M16 | 8 | 0.27 |

Available Inserts

VDKT-MA



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| VDKT 11T210N-MA | | | | | | | | | | | | | | ● | | | | E23 |

Available Adaptors

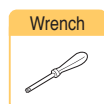
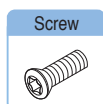
| Designation | Available Adaptors |
|----------------|--------------------|
| PAM 2012HR-M06 | MAT - M06 |
| 2016HR-M08 | MAT - M08 |
| 2020HR-M10 | MAT - M10 |
| 2025HR-M12 | MAT - M12 |
| 2032HR-M16 | MAT - M16 |
| 2042HR-M16 | MAT - M16 |

Designation : PAM2012HR-M06
Modular Head Threading Measure size(M06)

||

Adaptor Spec. : MAT-M06-030-S20S
Adaptor Threading Measure(M06)

Parts

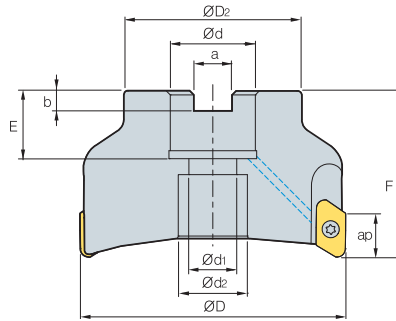


ETNA02505*
ETNA02506

TW 07S

* PAM2012-2016

PAXC(M)5000



| Designation | | ⊙ | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | Max rpm | ap | kg |
|-------------|------------|------|-----|-----------------|-----------|-----------------|-----------------|------------|-------|--------|----|---------|----|------|
| PAXC(M) | 5040HR-A,B | 3 | 40 | 34 | 16 | 9 | 14 | 8.4 | 5.6 | 19 | 40 | 25,800 | 17 | 0.15 |
| | 5050HR-A,B | 4 | 50 | 42 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 50 | 23,000 | 17 | 0.3 |
| | 5063HR-A,B | 5(4) | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 50 | 20,500 | 17 | 0.56 |
| | 5080HR-A,B | 5 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 24(23) | 50 | 18,200 | 17 | 1.0 |
| | 5100HR-A,B | 6 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8(8) | 32(26) | 63 | 16,300 | 17 | 2.3 |
| | 5125HR-A,B | 7 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(29) | 63 | 14,600 | 17 | 3.2 |

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0

• () Metric Size

Available Inserts

XEKT-MA

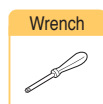
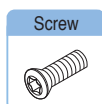


| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| XEKT 19M504FR-MA | | | | | | | | | | ● | | | | ● | | | | E23 |
| 19M508FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M512FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M516FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M518FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M520FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M530FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M532FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M540FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M550FR-MA | | | | | | | | | | ● | | | | ● | | | | |

Available Arbors

| Designation | Ød | Available Arbors |
|--------------------|-------|------------------|
| PAXC(M) 5040HR-A,B | 16 | BT□□-FMC16-□□ |
| 5050HR-A,B | 22 | BT□□-FMC22-□□ |
| 5063HR-A,B | | |
| 5080HR-A,B | 25.4 | BT□□-FMA25.4-□□ |
| | 27 | BT□□-FMC27-□□ |
| 5100HR-A,B | 31.75 | BT□□-FMA31.75-□□ |
| | 32 | BT□□-FMC32-□□ |
| 5125HR-A,B | 38.1 | BT□□-FMA38.1-□□ |
| | 40 | BT□□-FMC40-□□ |

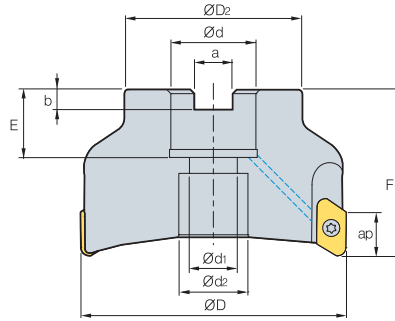
Parts



PTKA0408

TW 15S

PAXC(M)6000



| | | | | | | | | | | | | | (mm) | |
|--------------------|---|-----|-----------------|-----------|-----------------|-----------------|------------|-------|----------|----|---------|----|------|--|
| Designation | | ØD | ØD ₂ | Ød | Ød ₁ | Ød ₂ | a | b | E | F | Max rpm | ap | | |
| PAXC(M) 6050HR-A,B | 2 | 50 | 42 | 16 | 9 | 14 | 8.4 | 5.6 | 18 | 50 | 23,000 | 23 | 0.32 | |
| 6063HR-A,B | 3 | 63 | 49 | 22 | 11 | 18 | 10.4 | 6.3 | 21 | 50 | 20,500 | 23 | 0.53 | |
| 6080HR-A,B | 4 | 80 | 57 | 25.4(27) | 14 | 20 | 9.5(12.4) | 6(7) | 25(23) | 50 | 18,200 | 23 | 0.73 | |
| 6100HR-A,B | 5 | 100 | 67 | 31.75(32) | 18 | 26 | 12.7(14.4) | 8(8) | 32.5(26) | 63 | 16,300 | 23 | 1.7 | |
| 6125HR-A,B | 6 | 125 | 87 | 38.1(40) | 22 | 32 | 15.9(16.4) | 10(9) | 35(29) | 63 | 14,600 | 23 | 3.06 | |

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0

• () Metric Size

Available Inserts

XEKT-MA



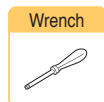
| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| XEKT 250604FR-MA | | | | | | | | | | | | | | ● | | | | |
| 250608FR-MA | | | | | | | | | | | | | | ● | | | | |
| 250612FR-MA | | | | | | | | | | | | | | ● | | | | |
| 250616FR-MA | | | | | | | | | | | | | | | | | | |
| 250620FR-MA | | | | | | | | | | | | | | | | | | |
| 250630FR-MA | | | | | | | | | | | | | | | | | | |
| 250632FR-MA | | | | | | | | | | | | | | | | | | |
| 250640FR-MA | | | | | | | | | | | | | | | | | | |
| 250650FR-MA | | | | | | | | | | | | | | ● | | | | |

E23

Available Arbors

| Designation | Ød | Available Arbors |
|--------------------|-------|---------------------|
| PAXC(M) 6050HR-A,B | 16 | BT □□ -FMC16- □□ |
| 6063HR-A,B | 22 | BT □□ -FMC22- □□ |
| 6080HR-A,B | 25.4 | BT □□ -FMA25.4- □□ |
| | 27 | BT □□ -FMC27- □□ |
| 6100HR-A,B | 31.75 | BT □□ -FMA31.75- □□ |
| | 32 | BT □□ -FMC32- □□ |
| 6125HR-A,B | 38.1 | BT □□ -FMA38.1- □□ |
| | 40 | BT □□ -FMC40- □□ |

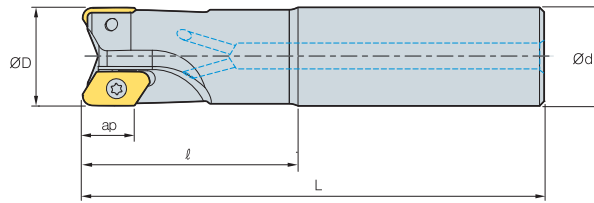
Parts



FTGA0513-P

TW 20-100

PAXS5000



(mm)

| Designation | | $\varnothing D$ | $\varnothing d$ | l | L | Max rpm | ap | |
|-----------------|---|-----------------|-----------------|-----|-----|---------|------|------|
| PAXS 5020HR-A,B | 1 | 20 | 20 | 60 | 130 | 15,000 | 17 | 0.24 |
| 5025HR-A,B | 2 | 25 | 25 | 60 | 140 | 32,600 | 17 | 0.4 |
| 5025HR-A,B-L200 | 2 | 25 | 25 | 60 | 200 | 32,600 | 17 | 0.63 |
| 5032HR-A,B | 2 | 32 | 32 | 70 | 150 | 28,800 | 17 | 0.74 |
| 5032HR-A,B-L220 | 2 | 32 | 32 | 70 | 220 | 28,800 | 17 | 1.2 |
| 5040HR-A,B-S32 | 3 | 32 | 32 | 70 | 160 | 25,800 | 17 | 1.0 |
| 5040HR-A,B-L220 | 3 | 40 | 32 | 70 | 220 | 25,800 | 17 | 1.4 |
| 5040HR-A,B-S40 | 3 | 40 | 40 | 70 | 160 | 25,800 | 17 | 1.3 |
| 5040HR-A,B-S42 | 3 | 40 | 42 | 70 | 160 | 25,800 | 17 | 1.4 |

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0

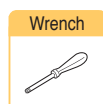
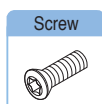
Available Inserts

XEKT-MA



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| XEKT 19M504FR-MA | | | | | | | | | | ● | | | | ● | | | | E23 |
| 19M508FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M512FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M516FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M518FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M520FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M530FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M532FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M540FR-MA | | | | | | | | | | ● | | | | ● | | | | |
| 19M550FR-MA | | | | | | | | | | ● | | | | ● | | | | |

Parts

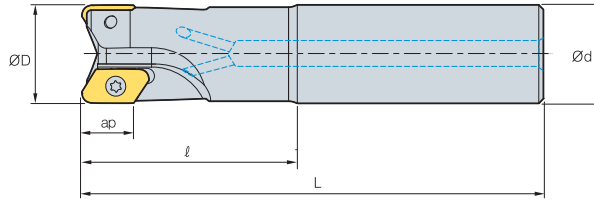


PTKA0408

TW 15S



PAXS6000



| Designation | | ⊙ | øD | ød | l | L | Max rpm | ap | kg |
|-------------|-----------------|---|----|----|----|-----|---------|----|------|
| PAXS | 6025HR-A,B | 1 | 25 | 25 | 60 | 140 | 32,600 | 23 | 0.42 |
| | 6025HR-A,B-L200 | 1 | 25 | 25 | 60 | 200 | 32,600 | 23 | 0.63 |
| | 6032HR-A,B | 1 | 32 | 32 | 70 | 150 | 28,800 | 23 | 0.72 |
| | 6032HR-A,B-L220 | 1 | 32 | 32 | 70 | 220 | 28,800 | 23 | 1.14 |
| | 6040HR-A,B-S32 | 2 | 40 | 32 | 70 | 160 | 25,800 | 23 | 0.88 |
| | 6040HR-A,B-L220 | 2 | 40 | 32 | 70 | 220 | 25,800 | 23 | 1.23 |
| | 6040HR-A,B-S40 | 2 | 40 | 40 | 70 | 160 | 25,800 | 23 | 1.2 |
| | 6040HR-A,B-S42 | 2 | 40 | 42 | 70 | 160 | 25,800 | 23 | 1.3 |

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0

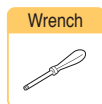
Available Inserts

XEKT-MA



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC6330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| XEKT 250604FR-MA | | | | | | | | | | | | | | ● | | | | E23 |
| 250608FR-MA | | | | | | | | | | | | | | ● | | | | |
| 250612FR-MA | | | | | | | | | | | | | | ● | | | | |
| 250616FR-MA | | | | | | | | | | | | | | | | | | |
| 250620FR-MA | | | | | | | | | | | | | | | | | | |
| 250630FR-MA | | | | | | | | | | | | | | | | | | |
| 250632FR-MA | | | | | | | | | | | | | | | | | | |
| 250640FR-MA | | | | | | | | | | | | | | | | | | |
| 250650FR-MA | | | | | | | | | | | | | | ● | | | | |

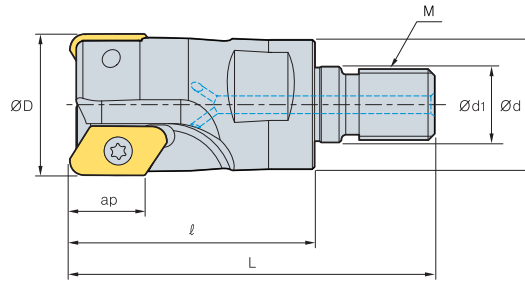
Parts



FTGA0510-P (Ø25~Ø32)
 FTGA0513-P (Ø40)

TW 20-100

PAXM5000



• AR : 6°~8°
• RR : -7°~5°

| Designation | | | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ | L | M | ap | |
|-------------|----------------|---|-----------------|-----------------|-------------------|--------|----|-----|----|------|
| PAXM | 5025HR-A,B-M12 | 2 | 25 | 23 | 12.5 | 55 | 79 | M12 | 17 | 0.12 |
| | 5032HR-A,B-M16 | 2 | 32 | 29 | 17.0 | 55 | 82 | M16 | 17 | 0.2 |
| | 5040HR-A,B-M16 | 3 | 40 | 29 | 17.0 | 55 | 82 | M16 | 17 | 0.4 |

• A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0

Available Inserts

XEKT-MA



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | Page | | |
|-------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| XEKT | 19M504FR-MA | | | | | | | | | ● | | | | ● | | | | E23 |
| | 19M508FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M512FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M516FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M518FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M520FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M530FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M532FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M540FR-MA | | | | | | | | | ● | | | | ● | | | | |
| | 19M550FR-MA | | | | | | | | | ● | | | | ● | | | | |

Available Adaptors

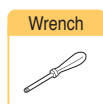
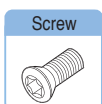
| Designation | Available Adaptors | |
|-------------|--------------------|-----------|
| PAXM | 5025HR-A,B-M12 | MAT - M12 |
| | 5032HR-A,B-M16 | MAT - M16 |
| | 5040HR-A,B-M16 | |

Designation : PAXM5025HR-M12
Modular Head Threading Measure size(M12)

II

Adaptor Spec. : MAT-M12-030-S25S
Adaptor Threading Measure(M12)

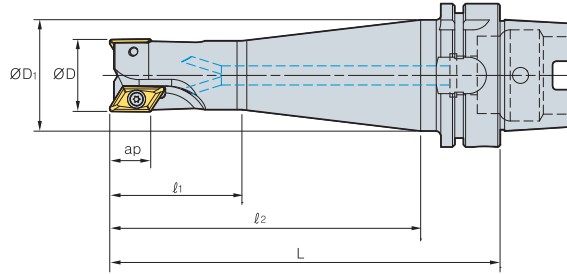
Parts



PTKA0407
PTKA0408

TW 15S

HSK63A/100A PAX5000



AA
90° • AR : 5°~17.5°
• RR : -14°~-5°

(mm)

| Designation | | | $\varnothing D$ | $\varnothing D_1$ | l_1 | l_2 | L | a_p | |
|-------------|------------------|---|-----------------|-------------------|-------|-------|-----|-------|------|
| HSK63T | PAX5032HR-A, B | 2 | 32 | 53 | 58 | 137 | 163 | 17 | 1.14 |
| HSK100T | PAXCM5080HR-A, B | 5 | 80 | - | - | 66 | 95 | 17 | 4 |
| | PAXCM5100HR-A, B | 6 | 100 | - | - | 66 | 95 | 17 | 4.6 |

- A type : Insert NoseR 0.4~3.2, B type : Insert NoseR 4.0~5.0
- Max Rake Angle & Max rpm can be referred to E242~E243

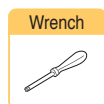
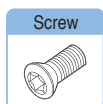
Available Inserts

XEKT-MA



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| XEKT 19M504FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M508FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M512FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M516FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M518FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M520FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M530FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M532FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M540FR-MA | | | | | | | | | | ● | | | | ● | | | |
| 19M550FR-MA | | | | | | | | | | ● | | | | ● | | | |

Parts



PTKA0407
PTKA0408

TW 15S

MAT(Steel Shank type)

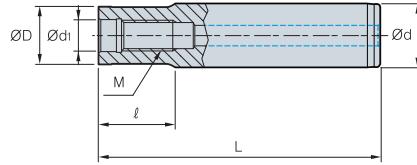


Fig. 1

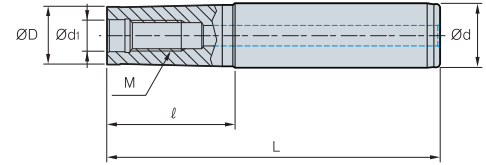


Fig. 2

(mm)

| Designation | øD | ød | ød ₁ | ℓ | L | M | Fig. | |
|-------------|--------------|------|-----------------|------|-----|-----|------|---|
| MAT | M06-020-S10S | 9.5 | 10 | 6.5 | 20 | 70 | M06 | 1 |
| | M6B-020-S12S | 11.0 | 12 | 6.5 | 20 | 76 | M06 | 1 |
| | M6B-040-S12S | 11.0 | 12 | 6.5 | 40 | 96 | M06 | 1 |
| | M08-020-S16S | 14.5 | 16 | 8.5 | 20 | 80 | M08 | 1 |
| | M10-030-S20S | 18.0 | 20 | 10.5 | 30 | 100 | M10 | 1 |
| | M12-030-S25S | 22.5 | 25 | 12.5 | 29 | 110 | M12 | 1 |
| | M16-035-S32S | 28.5 | 32 | 17.0 | 35 | 125 | M16 | 1 |
| | M06-040-S12T | 9.5 | 12 | 6.5 | 40 | 96 | M06 | 2 |
| | M06-065-S16T | 9.5 | 16 | 6.5 | 65 | 125 | M06 | 2 |
| | M6B-065-S16T | 11.0 | 16 | 6.5 | 65 | 125 | M06 | 2 |
| | M6B-080-S16T | 11.0 | 16 | 6.5 | 80 | 140 | M06 | 2 |
| | M08-040-S16T | 14.5 | 16 | 8.5 | 40 | 100 | M08 | 2 |
| | M08-065-S16T | 14.5 | 16 | 8.5 | 65 | 125 | M08 | 2 |
| | M08-080-S20T | 14.5 | 20 | 8.5 | 80 | 150 | M08 | 2 |
| | M08-110-S25T | 14.5 | 25 | 8.5 | 110 | 190 | M08 | 2 |
| | M10-050-S20T | 18.0 | 20 | 10.5 | 50 | 120 | M10 | 2 |
| | M10-070-S20T | 18.0 | 20 | 10.5 | 70 | 140 | M10 | 2 |
| | M10-090-S25T | 18.0 | 25 | 10.5 | 90 | 170 | M10 | 2 |
| | M10-110-S25T | 18.0 | 25 | 10.5 | 110 | 190 | M10 | 2 |
| | M10-130-S32T | 18.0 | 32 | 10.5 | 130 | 220 | M10 | 2 |
| | M12-050-S25T | 22.5 | 25 | 12.5 | 50 | 130 | M12 | 2 |
| | M12-070-S25T | 22.5 | 25 | 12.5 | 70 | 150 | M12 | 2 |
| | M12-090-S25T | 22.5 | 25 | 12.5 | 90 | 170 | M12 | 2 |
| | M12-110-S32T | 22.5 | 32 | 12.5 | 110 | 200 | M12 | 2 |
| | M12-175-S40T | 22.5 | 40 | 12.5 | 175 | 300 | M12 | 2 |
| | M16-055-S32T | 28.5 | 32 | 17.0 | 55 | 145 | M16 | 2 |
| | M16-080-S32T | 28.5 | 32 | 17.0 | 80 | 170 | M16 | 2 |
| | M16-120-S32T | 28.5 | 32 | 17.0 | 120 | 210 | M16 | 2 |
| | M16-175-S40T | 28.5 | 40 | 17.0 | 175 | 300 | M16 | 2 |

• S : Straight Neck Adaptor • T : Taper Neck Adaptor

Available Modulares

FMRM type



E184

LBE-MHD type



E218

PAM type



E246

AMM type



E132

RM4PM type



E87

RM4ZM type



E89

HRMM type



E205

HRMDM type



E199

PAXM type



E251

Applicable Modular E33 (FMRM, LBE, PAM, AMM, RM4PM, RM4ZM, HRMM, PAXM)



MAT-C(Carbide Shank type)

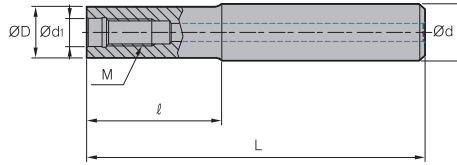


Fig. 1

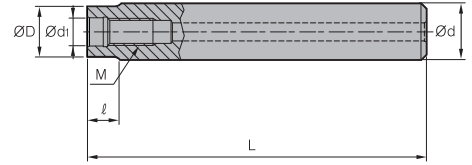


Fig. 2

| | | (mm) | | | | | | |
|--------------------|--------------------|------|------|-----------------|-----|-----|-----|------|
| | Designation | ØD | Ød | Ød ₁ | ℓ | L | M | Fig. |
| MAT | M08-080-S16S-C | 14.5 | 16 | 8.5 | 80 | 150 | M08 | 1 |
| | M08-110-S16S-C | 14.5 | 16 | 8.5 | 110 | 180 | M08 | 1 |
| | M08-150-S16S-C | 14.5 | 16 | 8.5 | 150 | 250 | M08 | 1 |
| | M08-010-S16S-C-150 | 14.5 | 16 | 8.5 | 10 | 150 | M08 | 2 |
| | M08-010-S16S-C-180 | 14.5 | 16 | 8.5 | 10 | 180 | M08 | 2 |
| | M08-010-S16S-C-250 | 14.5 | 16 | 8.5 | 10 | 250 | M08 | 2 |
| | M10-090-S20S-C | 18.0 | 20 | 10.5 | 90 | 170 | M10 | 1 |
| | M10-110-S20S-C | 18.0 | 20 | 10.5 | 110 | 200 | M10 | 1 |
| | M10-175-S20S-C | 18.0 | 20 | 10.5 | 175 | 300 | M10 | 1 |
| | M10-010-S20S-C-170 | 18.0 | 20 | 10.5 | 10 | 170 | M10 | 2 |
| | M10-010-S20S-C-200 | 18.0 | 20 | 10.5 | 10 | 200 | M10 | 2 |
| | M10-010-S20S-C-300 | 18.0 | 20 | 10.5 | 10 | 300 | M10 | 2 |
| | M12-090-S25S-C | 22.5 | 25 | 12.5 | 90 | 170 | M12 | 1 |
| | M12-110-S25S-C | 22.5 | 25 | 12.5 | 110 | 200 | M12 | 1 |
| | M12-175-S25S-C | 22.5 | 25 | 12.5 | 175 | 300 | M12 | 1 |
| | M12-015-S25S-C-170 | 22.5 | 25 | 12.5 | 15 | 170 | M12 | 2 |
| | M12-015-S25S-C-200 | 22.5 | 25 | 12.5 | 15 | 200 | M12 | 2 |
| | M12-015-S25S-C-300 | 22.5 | 25 | 12.5 | 15 | 300 | M12 | 2 |
| | M16-090-S32S-C | 28.5 | 32 | 17.0 | 90 | 180 | M16 | 1 |
| | M16-120-S32S-C | 28.5 | 32 | 17.0 | 120 | 210 | M16 | 1 |
| M16-175-S32S-C | 28.5 | 32 | 17.0 | 175 | 300 | M16 | 1 | |
| M16-020-S32S-C-180 | 28.5 | 32 | 17.0 | 20 | 180 | M16 | 2 | |
| M16-020-S32S-C-210 | 28.5 | 32 | 17.0 | 20 | 210 | M16 | 2 | |
| M16-020-S32S-C-300 | 28.5 | 32 | 17.0 | 20 | 300 | M16 | 2 | |

Available Modulares

FMRM type



E184

LBE-MHD type



E218

PAM type



E246

AMM type



E132

RM4PM type



E87

RM4ZM type



E89

HRMM type



E205

HRMDM type



E199

PAXM type



E251

Adjusting side cutter

Code System

A : Adjusting side cutter
P : Plane type
B : Boss type

For half side cutter, minimum width of the cutter will be written only.

Adjusting **Cutter type** **Max. width of cutter**

R A FC B 125 14 18 - R

Insert clamping way **Insert configuration** **Cutter Dia.** **Min. width of cutter** **Hand**

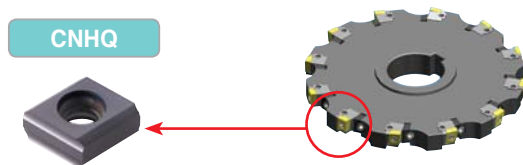
R : Radial type (Using SDXT)
T : Tangential type (Using CNHQ)

FC
Full side cutter

HC
Half side cutter

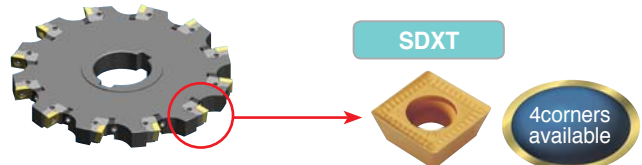
| | R | L |
|-------------------------------|------------------------------|------|
| Unmarked | Right | Left |
| Full side cutter (Plane type) | Half side cutter (Boss type) | |

Tangential Type (High rigidity)



- Medium/Roughing
- Excellent performance at medium to roughing range (14~30mm) table operation due to the strong rigidity of the cutter
- Good performance in heavy interruption and deep depth of cut application

Radial Type (Low cutting load)



- Medium/Finishing
- Suitable for small width cutting operation (12~24mm)
- 3 dimensional chip breaker provides smooth cutting operation.
- Several chip breakers as per applications are available (MF, MM, FA)
- Economical insert using 4 cutting edges per insert

Insert Features

- ▶ Precise adjustable side cutter can control the width of the cutter by 5 μ m unit
- ▶ Since the width of the cutter is adjustable up to ± 1.5 mm, single cutter can cover various cutting width
- ▶ Specially designed clamping system of the locator provides excellent rigidity by using elastic deformation of the locator
- ▶ Tangential type clamping system of insert provides enough strength can withstand large width cutting operations
- ▶ 3-dimensional chip breaker of insert provides smooth cutting with low cutting load at medium to finishing range

Operating manual

How to assemble the adjusting side cutter

1. Clamp ① wedge slightly on ⑦ locator-wedge pocket by using ② wedge screw
2. Put ③ locator on ⑦ locator-wedge pocket along with the ⑧ key-way
3. Tighten the ⑥ taper screw little bit to set proper position of locator
4. Tighten the ② wedge screw tightly by using 70~80N.m torque
5. After put the ④ insert on insert pocket of ③ locator, clamp it with ⑤ insert screw by using 40~50N.m torque

How to adjust Run-out & Cutting width

1. Settle the adjusting side cutter after cleaning to the jig for measurement
2. Un-screw the ② Wedge screw first, then tighten ① wedge slightly again by using 8N.m torque
3. Adjusting the height of cutting edge by using a dial gauge to set the width of the cutter
4. Tighten the ② wedge screw tightly by using 70~80N.m torque
5. To finish the setting, tighten the ⑥ taper screw for strong clamp



Tangential type

Cutting width as per insert & type of cutter



| Designation | Coated | | Cutting width for half side cutter (ap) | Cutting width for full side cutter (ap) | |
|----------------|--------|--------|---|---|-------------|
| | NCM325 | PC6510 | | | |
| CNHQ1005 -C0.5 | | | 9.0 | 14~18 | 10 10 5.4 |
| -R0.5 | | | | | |
| -C1.0 | | | | | |
| -R1.0 | | | 8.5 | 14~17 | |
| CNHQ1305 -C0.5 | | | 12 | 18~21 / 21~24 | 12.7 10 5.4 |
| -R0.5 | | | | | |
| -C1.0 | | | 11.5 | 18~21 / 21~23 | |
| -R1.0 | | | | | |
| -C1.5 | | | 11 | 18~21 / 21~22 | |
| -R1.5 | | | | | |
| CNHQ1606 -C0.5 | | | 15 | 24~27 / 27~30 | 16 12 6.4 |
| -R0.5 | | | | | |
| -C1.0 | | | 14.5 | 24~27 / 27~29 | |
| -R1.0 | | | | | |
| -C1.5 | | | 14 | 24~27 / 27~28 | |
| -R1.5 | | | | | |
| -C2.0 | | | 13.5 | 24~27 | |
| -R2.0 | | | | | |

Applicable holder E253, E254 Available Arbors and bolt E290~E292

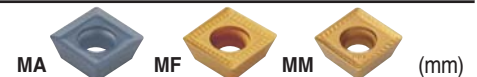
● : Stock item

Recommended cutting condition

| ISO | Grades | vc(m/min) | fz(mm/t) |
|-----|--------|-----------|-----------|
| P | NCM325 | 150~300 | 0.10~0.30 |
| | PC3500 | 100~300 | |
| M | PC5300 | 100~180 | 0.10~0.30 |
| | NCM335 | 120~200 | |
| K | PC215K | 150~250 | 0.10~0.30 |
| | PC6510 | 150~300 | |

Radial type

Cutting width as per insert & type of cutter



| Designation | Coated | | | | | | | Uncoated | Cutting width for half side cutter (ap) | Cutting width for full side cutter (ap) | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|----------|---|---|-------|------|
| | NCM325 | NCM335 | PC3500 | PC3545 | PC9530 | PC6510 | PC5300 | H01 | | | | |
| SDXT 09M405R-MA | | | | | | | | ● | 8 | 12~14 14~16 | 9.525 | 4 |
| 09M405L-MA | | | | | | | | | | | | |
| 09M405R-MF | ● | ● | | | ● | ● | ● | | | | | |
| 09M405L-MF | | | | | | | | | | | | |
| 09M405R-MM | ● | ● | ● | | ● | ● | ● | | | | | |
| 09M405L-MM | | | | | | | | | | | | |
| SDXT 130508R-MA | | | | | | | | ● | 10.5 | 16~18 18~20 20~22 22~24 | 13.5 | 5.56 |
| 130508L-MA | | | | | | | | | | | | |
| 130508R-MF | ● | ● | | | ● | ● | ● | | | | | |
| 130508L-MF | | | | | | | | | | | | |
| 130508R-MM | ● | ● | ● | ● | ● | ● | ● | | | | | |
| 130508L-MM | | | | | | | | | | | | |

Applicable holder E259, E260 Available Arbors and bolt E290~E292

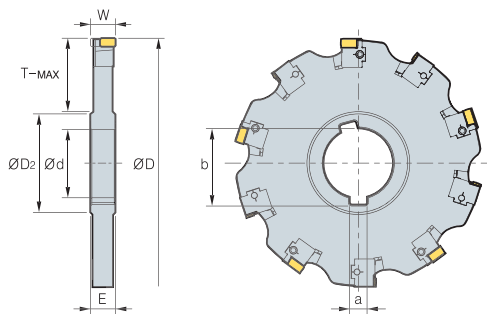
● : Stock item

Recommended cutting condition

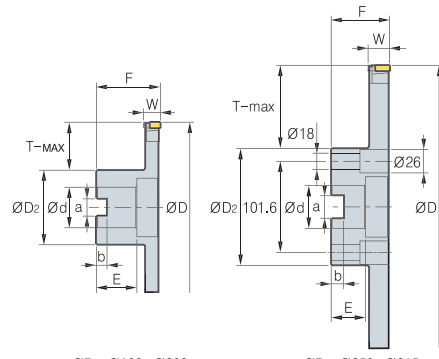
| ISO | Grades | vc(m/min) | fz(mm/t) |
|-----|--------|-----------|-----------|
| P | NCM325 | 120~250 | 0.08~0.30 |
| | NCM335 | 120~220 | 0.08~0.25 |
| | PC3500 | 100~220 | 0.10~0.25 |
| M | PC9530 | 80~180 | 0.10~0.25 |
| | PC5300 | | |
| K | PC8110 | 150~230 | 0.10~0.25 |
| | PC6510 | 180~250 | |



Tangential type (Full side cutter)



•TAFCP(M)



•TAFCB(M)

(mm)

| Designation | ød | E | øD ₂ | a | b | T-MAX | Designation | ød | F | øD ₂ | a | b | E | T-MAX | Designation | | |
|-------------------|-----------|----|-----------------|----------|------|-------|----------------------|------------|----|-----------------|------------|----|----|-------|-------------|-------|--------------|
| | | | | | | | | | | | | | | | øD | W | No. of tooth |
| TAFCP (M) 1001418 | 31.75(32) | 14 | 48 | 7.92(8) | 35.2 | 24 | TAFCB (M) 1001418R/L | 31.75(32) | 50 | 54 | 12.7(14.4) | 8 | 28 | 21 | 100 | 14-18 | 6 |
| TAFCP (M) 1251418 | 38.1(40) | 14 | 56 | 9.52(10) | 42.3 | 32 | TAFCB (M) 1251418R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 25 | 125 | 14-18 | 8 |
| TAFCP (M) 1601418 | 38.1(40) | 14 | 56 | 9.52(10) | 42.3 | 50 | TAFCB (M) 1601418R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 43 | 160 | 14-18 | 10 |
| TAFCP (M) 2001418 | 50.8(50) | 14 | 72 | 12.7(12) | 55.8 | 61 | TAFCB (M) 2001418R/L | 50.8(40) | 65 | 90 | 19.0(16.4) | 11 | 30 | 53 | 200 | 14-18 | 12 |
| TAFCP (M) 2501418 | 50.8(50) | 14 | 72 | 12.7(12) | 55.8 | 86 | TAFCB (M) 2501418R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 58 | 250 | 14-18 | 16 |
| TAFCP (M) 3151418 | 50.8(50) | 14 | 72 | 12.7(12) | 55.8 | 118 | TAFCB (M) 3151418R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 90 | 315 | 14-18 | 20 |
| TAFCP (M) 1001821 | 31.75(32) | 18 | 48 | 7.92(8) | 35.2 | 24 | TAFCB (M) 1001821R/L | 31.75(32) | 50 | 50 | 12.7(14.4) | 8 | 28 | 21 | 100 | 18-21 | 6 |
| TAFCP (M) 1251821 | 38.1(40) | 18 | 56 | 9.52(10) | 42.3 | 32 | TAFCB (M) 1251821R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 25 | 125 | 18-21 | 8 |
| TAFCP (M) 1601821 | 38.1(40) | 18 | 56 | 9.52(10) | 42.3 | 50 | TAFCB (M) 1601821R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 43 | 160 | 18-21 | 10 |
| TAFCP (M) 2001821 | 50.8(50) | 18 | 72 | 12.7(12) | 55.8 | 61 | TAFCB (M) 2001821R/L | 50.8(40) | 65 | 90 | 19.0(16.4) | 11 | 30 | 53 | 200 | 18-21 | 12 |
| TAFCP (M) 2501821 | 50.8(50) | 18 | 72 | 12.7(12) | 55.8 | 86 | TAFCB (M) 2501821R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 58 | 250 | 18-21 | 16 |
| TAFCP (M) 3151821 | 50.8(50) | 18 | 72 | 12.7(12) | 55.8 | 118 | TAFCB (M) 3151821R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 90 | 315 | 18-21 | 20 |
| TAFCP (M) 1002124 | 31.75(32) | 21 | 48 | 7.92(8) | 35.2 | 24 | TAFCB (M) 1002124R/L | 31.75(32) | 50 | 54 | 12.7(14.4) | 8 | 28 | 21 | 100 | 21-24 | 6 |
| TAFCP (M) 1252124 | 38.1(40) | 21 | 56 | 9.52(10) | 42.3 | 32 | TAFCB (M) 1252124R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 25 | 125 | 21-24 | 8 |
| TAFCP (M) 1602124 | 38.1(40) | 21 | 56 | 9.52(10) | 42.3 | 50 | TAFCB (M) 1602124R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 43 | 160 | 21-24 | 10 |
| TAFCP (M) 2002124 | 50.8(50) | 21 | 72 | 12.7(12) | 55.8 | 61 | TAFCB (M) 2002124R/L | 50.8(40) | 65 | 90 | 19.0(16.4) | 11 | 30 | 53 | 200 | 21-24 | 12 |
| TAFCP (M) 2502124 | 50.8(50) | 21 | 72 | 12.7(12) | 55.8 | 86 | TAFCB (M) 2502124R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 58 | 250 | 21-24 | 16 |
| TAFCP (M) 3152124 | 50.8(50) | 21 | 72 | 12.7(12) | 55.8 | 118 | TAFCB (M) 3152124R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 90 | 315 | 21-24 | 20 |
| TAFCP (M) 1252427 | 38.1(40) | 24 | 56 | 9.52(10) | 42.3 | 32 | TAFCB (M) 1252427R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 25 | 125 | 24-27 | 8 |
| TAFCP (M) 1602427 | 38.1(40) | 24 | 56 | 9.52(10) | 42.3 | 50 | TAFCB (M) 1602427R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 43 | 160 | 24-27 | 10 |
| TAFCP (M) 2002427 | 50.8(50) | 24 | 72 | 12.7(12) | 55.8 | 61 | TAFCB (M) 2002427R/L | 50.8(40) | 65 | 90 | 19.0(16.4) | 11 | 30 | 53 | 200 | 24-27 | 12 |
| TAFCP (M) 2502427 | 50.8(50) | 24 | 72 | 12.7(12) | 55.8 | 86 | TAFCB (M) 2502427R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 58 | 250 | 24-27 | 16 |
| TAFCP (M) 3152427 | 50.8(50) | 24 | 72 | 12.7(12) | 55.8 | 118 | TAFCB (M) 3152427R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 90 | 315 | 24-27 | 20 |
| TAFCP (M) 1252730 | 38.1(40) | 27 | 56 | 9.52(10) | 42.3 | 32 | TAFCB (M) 1252730R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 25 | 125 | 27-30 | 8 |
| TAFCP (M) 1602730 | 38.1(40) | 27 | 56 | 9.52(10) | 42.3 | 50 | TAFCB (M) 1602730R/L | 38.1(40) | 60 | 70 | 15.9(16.4) | 10 | 30 | 43 | 160 | 27-30 | 10 |
| TAFCP (M) 2002730 | 50.8(50) | 27 | 72 | 12.7(12) | 55.8 | 61 | TAFCB (M) 2002730R/L | 50.8(40) | 65 | 90 | 19.0(16.4) | 11 | 30 | 53 | 200 | 27-30 | 12 |
| TAFCP (M) 2502730 | 50.8(50) | 27 | 72 | 12.7(12) | 55.8 | 86 | TAFCB (M) 2502730R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 58 | 250 | 27-30 | 16 |
| TAFCP (M) 3152730 | 50.8(50) | 27 | 72 | 12.7(12) | 55.8 | 118 | TAFCB (M) 3152730R/L | 47.625(60) | 65 | 130 | 25.4(25.7) | 14 | 38 | 90 | 315 | 27-30 | 20 |

Available Inserts and Recommended cutting condition E256

• The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

• () Metric Size

Parts



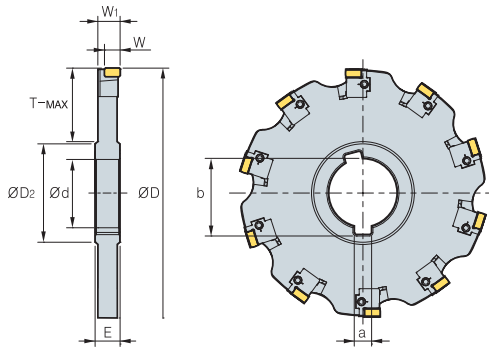
Edge width(TAFCP/B)

| | | | | | | | | | |
|-------------|--------------|-------------|--------|------------|----------|----------|-------|------|-------|
| □□□ 1418R/L | CNHQ1005-□□□ | LSA-CH10R/L | WSA10N | FTKA0410 | DHA0617 | SHGA0411 | TW15S | HW30 | - |
| □□□ 1821R/L | CNHQ1305-□□□ | LSA-CH13R/L | WSA13N | FTKA0410 | DHA0821F | SHGA0411 | TW15S | HW40 | HW30L |
| □□□ 2124R/L | CNHQ1305-□□□ | LSA-CH13R/L | WSA13N | FTKA0410 | DHA0821F | SHGA0411 | TW15S | HW40 | HW30L |
| □□□ 2427R/L | CNHQ1606-□□□ | LSA-CH16R/L | WSA13N | FTGA0513-P | DHA0821F | SHGA0411 | TW20S | HW40 | HW30L |
| □□□ 2730R/L | CNHQ1606-□□□ | LSA-CH16R/L | WSA13N | FTGA0513-P | DHA0821F | SHGA0411 | TW20S | HW40 | HW30L |

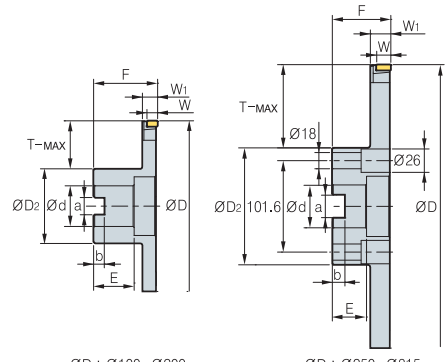
• Note) The Wedge screw for 1001821, 1002124 cutter is DHA0818F



Tangential type (Half side cutter)



•TAHC(M)



ØD : Ø100~Ø200

ØD : Ø250~Ø315

•TAHC(B)(M)

(mm)

| Designation | Ød | E | ØD ₂ | a | b | T-MAX | Designation | Ød | F | ØD ₂ | a | b | E | T-MAX | Dimensions | | | | | |
|-------------|-----------|------------|-----------------|----|-----------|-----------|-------------|-----------|-------------|-----------------|-----------|-------------|-------------|-------------|------------|-----|----------------|--------------|-------|-------|
| | | | | | | | | | | | | | | | ØD | W | W ₁ | No. of tooth | | |
| TAHCP (M) | 10014R/L | 31.75 (32) | 14 | 48 | 7.92 (8) | 35.2 | 24 | TAHCB (M) | 10014R/L | 31.75 (32) | 50 | 54 | 12.7 (14.4) | 8 | 28 | 21 | 100 | 9 | 13.25 | 6 |
| | 12514R/L | 38.1 (40) | 14 | 56 | 9.52 (10) | 42.3 | 32 | 12514R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 9 | 13.25 | 8 | |
| | 16014R/L | 38.1 (40) | 14 | 56 | 9.52 (10) | 42.3 | 50 | 16014R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 9 | 13.25 | 10 | |
| | 20014R/L | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 61 | 20014R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 9 | 13.25 | 12 | |
| | 25014R/L | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 86 | 25014R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 9 | 13.25 | 16 | |
| | 31514R/L | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 118 | 31514R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 9 | 13.25 | 20 | |
| TAHCP (M) | 10018R/L | 31.75 (32) | 18 | 48 | 7.92 (8) | 35.2 | 24 | TAHCB (M) | 10018R/L | 31.75 (32) | 50 | 50 | 12.7 (14.4) | 8 | 28 | 21 | 100 | 12 | 16.75 | 6 |
| | 12518R/L | 38.1 (40) | 18 | 56 | 9.52 (10) | 42.3 | 32 | 12518R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 12 | 16.75 | 8 | |
| | 16018R/L | 38.1 (40) | 18 | 56 | 9.52 (10) | 42.3 | 50 | 16018R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 12 | 16.75 | 10 | |
| | 20018R/L | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 61 | 20018R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 12 | 16.75 | 12 | |
| | 25018R/L | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 86 | 25018R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 12 | 16.75 | 16 | |
| | 31518R/L | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 118 | 31518R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 12 | 16.75 | 20 | |
| TAHCP (M) | 10021R/L | 31.75 (32) | 21 | 48 | 7.92 (8) | 35.2 | 24 | TAHCB (M) | 10021R/L | 31.75 (32) | 50 | 54 | 12.7 (14.4) | 8 | 28 | 21 | 100 | 12 | 19.75 | 6 |
| | 12521R/L | 38.1 (40) | 21 | 56 | 9.52 (10) | 42.3 | 32 | 12521R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 12 | 19.75 | 8 | |
| | 16021R/L | 38.1 (40) | 21 | 56 | 9.52 (10) | 42.3 | 50 | 16021R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 12 | 19.75 | 10 | |
| | 20021R/L | 50.8 (50) | 21 | 72 | 12.7 (12) | 55.8 | 61 | 20021R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 12 | 19.75 | 12 | |
| | 25021R/L | 50.8 (50) | 21 | 72 | 12.7 (12) | 55.8 | 86 | 25021R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 12 | 19.75 | 16 | |
| | 31521R/L | 50.8 (50) | 21 | 72 | 12.7 (12) | 55.8 | 118 | 31521R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 12 | 19.75 | 20 | |
| TAHCP (M) | 12524R/L | 38.1 (40) | 24 | 56 | 9.52 (10) | 42.3 | 32 | TAHCB (M) | 12524R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 15 | 22.75 | 8 |
| | 16024R/L | 38.1 (40) | 24 | 56 | 9.52 (10) | 42.3 | 50 | 16024R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 15 | 22.75 | 10 | |
| | 20024R/L | 50.8 (50) | 24 | 72 | 12.7 (12) | 55.8 | 61 | 20024R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 15 | 22.75 | 12 | |
| | 25024R/L | 50.8 (50) | 24 | 72 | 12.7 (12) | 55.8 | 86 | 25024R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 15 | 22.75 | 16 | |
| | 31524R/L | 50.8 (50) | 24 | 72 | 12.7 (12) | 55.8 | 118 | 31524R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 15 | 22.75 | 20 | |
| | TAHCP (M) | 12527R/L | 38.1 (40) | 27 | 56 | 9.52 (10) | 42.3 | 32 | TAHCB (M) | 12527R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 15 | 25.75 |
| 16027R/L | | 38.1 (40) | 27 | 56 | 9.52 (10) | 42.3 | 50 | 16027R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 15 | 25.75 | 10 | |
| 20027R/L | | 50.8 (50) | 27 | 72 | 12.7 (12) | 55.8 | 61 | 20027R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 15 | 25.75 | 12 | |
| 25027R/L | | 50.8 (50) | 27 | 72 | 12.7 (12) | 55.8 | 86 | 25027R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 15 | 25.75 | 16 | |
| 31527R/L | | 50.8 (50) | 27 | 72 | 12.7 (12) | 55.8 | 118 | 31527R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 15 | 25.75 | 20 | |

Available Inserts and Recommended cutting condition E256

• The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

• () Metric Size

Parts

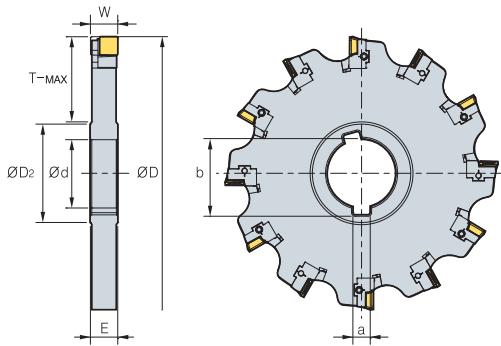


Edge width(TAHC(B))

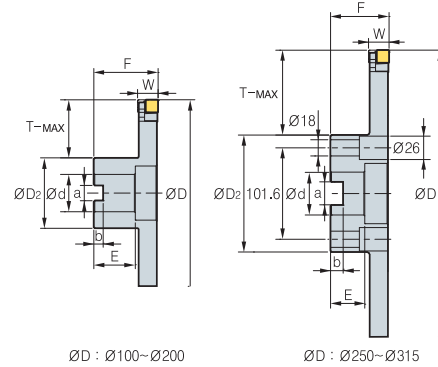
| | | | | | | | | | |
|------------|--------------|-------------|--------|------------|----------|----------|-------|------|-------|
| □□□1418R/L | CNHQ1005-□□□ | LSA-CH10R/L | WSA10N | FTKA0410 | DHA0617 | SHGA0411 | TW15S | HW30 | - |
| □□□1821R/L | CNHQ1305-□□□ | LSA-CH13R/L | WSA13N | FTKA0410 | DHA0821F | SHGA0411 | TW15S | HW40 | HW30L |
| □□□2124R/L | CNHQ1305-□□□ | LSA-CH13R/L | WSA13N | FTKA0410 | DHA0821F | SHGA0411 | TW15S | HW40 | HW30L |
| □□□2427R/L | CNHQ1606-□□□ | LSA-CH16R/L | WSA13N | FTGA0513-P | DHA0821F | SHGA0411 | TW20S | HW40 | HW30L |
| □□□2730R/L | CNHQ1606-□□□ | LSA-CH16R/L | WSA13N | FTGA0513-P | DHA0821F | SHGA0411 | TW20S | HW40 | HW30L |

• Note) The Wedge screw for 10018, 10021 cutter is DHA0818F

Radial type (Full side cutter)



• RAFCP(M)



• RAFCB(M)

ØD : Ø100-Ø200

ØD : Ø250-Ø315

(mm)

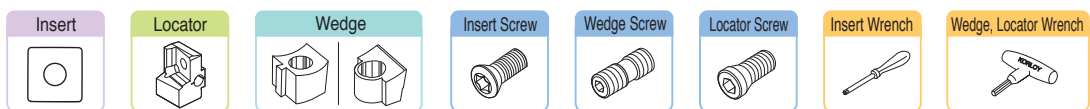
| Designation | Ød | E | ØD ₂ | a | b | T-MAX | Designation | Ød | F | ØD ₂ | a | b | E | T-MAX | Dimensions | | |
|-------------------|------------|----|-----------------|-----------|------|-------|----------------------|-------------|----|-----------------|-------------|----|----|-------|------------|-------|--------------|
| | | | | | | | | | | | | | | | ØD | W | No. of tooth |
| RAFCP 1001214 (M) | 31.75 (32) | 12 | 48 | 7.92 (8) | 35.2 | 24 | RAFCB 1001214R/L (M) | 31.75 (32) | 50 | 54 | 12.7 (14.4) | 8 | 28 | 21 | 100 | 12-14 | 6 |
| 1251214 | 38.1 (40) | 12 | 56 | 9.52 (10) | 42.3 | 32 | 1251214R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 12-14 | 8 |
| 1601214 | 38.1 (40) | 12 | 56 | 9.52 (10) | 42.3 | 50 | 1601214R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 12-14 | 10 |
| 2001214 | 50.8 (50) | 12 | 72 | 12.7 (12) | 55.8 | 61 | 2001214R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 12-14 | 12 |
| 2501214 | 50.8 (50) | 12 | 72 | 12.7 (12) | 55.8 | 86 | 2501214R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 12-14 | 16 |
| 3151214 | 50.8 (50) | 12 | 72 | 12.7 (12) | 55.8 | 118 | 3151214R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 12-14 | 20 |
| RAFCP 1001416 (M) | 31.75 (32) | 14 | 48 | 7.92 (8) | 35.2 | 24 | RAFCB 1001416R/L (M) | 31.75 (32) | 50 | 50 | 12.7 (14.4) | 8 | 28 | 21 | 100 | 14-16 | 6 |
| 1251416 | 38.1 (40) | 14 | 56 | 9.52 (10) | 42.3 | 32 | 1251416R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 14-16 | 8 |
| 1601416 | 38.1 (40) | 14 | 56 | 9.52 (10) | 42.3 | 50 | 1601416R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 14-16 | 10 |
| 2001416 | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 61 | 2001416R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 14-16 | 12 |
| 2501416 | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 86 | 2501416R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 14-16 | 16 |
| 3151416 | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 118 | 3151416R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 14-16 | 20 |
| RAFCP 1251618 (M) | 38.1 (40) | 16 | 56 | 9.52 (10) | 42.3 | 32 | RAFCB 1251618R/L (M) | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 16-18 | 8 |
| 1601618 | 38.1 (40) | 16 | 56 | 9.52 (10) | 42.3 | 50 | 1601618R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 16-18 | 10 |
| 2001618 | 50.8 (50) | 16 | 72 | 12.7 (12) | 55.8 | 61 | 2001618R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 16-18 | 12 |
| 2501618 | 50.8 (50) | 16 | 72 | 12.7 (12) | 55.8 | 86 | 2501618R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 16-18 | 16 |
| 3151618 | 50.8 (50) | 16 | 72 | 12.7 (12) | 55.8 | 118 | 3151618R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 16-18 | 20 |
| RAFCP 1251820 (M) | 38.1 (40) | 18 | 56 | 9.52 (10) | 42.3 | 32 | RAFCB 1251820R/L (M) | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 18-20 | 8 |
| 1601820 | 38.1 (40) | 18 | 56 | 9.52 (10) | 42.3 | 50 | 1601820R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 18-20 | 10 |
| 2001820 | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 61 | 2001820R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 18-20 | 12 |
| 2501820 | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 86 | 2501820R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 18-20 | 16 |
| 3151820 | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 118 | 3151820R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 18-20 | 20 |
| RAFCP 1252022 (M) | 38.1 (40) | 20 | 56 | 9.52 (10) | 42.3 | 32 | RAFCB 1252022R/L (M) | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 20-22 | 8 |
| 1602022 | 38.1 (40) | 20 | 56 | 9.52 (10) | 42.3 | 50 | 1602022R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 20-22 | 10 |
| 2002022 | 50.8 (50) | 20 | 72 | 12.7 (12) | 55.8 | 61 | 2002022R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 20-22 | 12 |
| 2502022 | 50.8 (50) | 20 | 72 | 12.7 (12) | 55.8 | 86 | 2502022R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 20-22 | 16 |
| 3152022 | 50.8 (50) | 20 | 72 | 12.7 (12) | 55.8 | 118 | 3152022R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 20-22 | 20 |
| RAFCP 1252224 (M) | 38.1 (40) | 22 | 56 | 9.52 (10) | 42.3 | 32 | RAFCB 1252224R/L (M) | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 22-24 | 8 |
| 1602224 | 38.1 (40) | 22 | 56 | 9.52 (10) | 42.3 | 50 | 1602224R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 22-24 | 10 |
| 2002224 | 50.8 (50) | 22 | 72 | 12.7 (12) | 55.8 | 61 | 2002224R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 22-24 | 12 |
| 2502224 | 50.8 (50) | 22 | 72 | 12.7 (12) | 55.8 | 86 | 2502224R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 22-24 | 16 |
| 3152224 | 50.8 (50) | 22 | 72 | 12.7 (12) | 55.8 | 118 | 3152224R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 22-24 | 20 |

Available Inserts and Recommended cutting condition E256

The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

() Metric Size

Parts

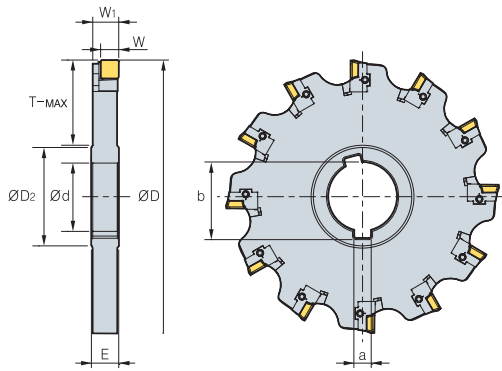


Edge width(RAFCP/B)

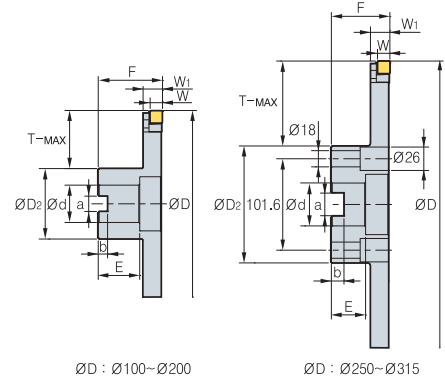
| Edge width | Insert | Locator | Wedge | Insert Screw | Wedge Screw | Locator Screw | Insert Wrench | Wedge, Locator Wrench |
|------------|---------------|----------|---------------|--------------|-------------|---------------|---------------|-----------------------|
| 1214R/L | SDXT09M40□R/L | LSD09R/L | WSD09N WSA10N | FTGA03508 | DHA0617 | SHGA0409 | TW15S | HW30 |
| 1416R/L | SDXT09M40□R/L | LSD09R/L | WSD09N | FTGA03508 | DHA0617 | SHGA0409 | TW15S | HW30 |
| 1618R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |
| 1820R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |
| 2022R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |
| 2224R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |



Radial type (Half side cutter)



• RAHCP(M)



ØD : Ø100~Ø200

ØD : Ø250~Ø315

• RAHCB(M)

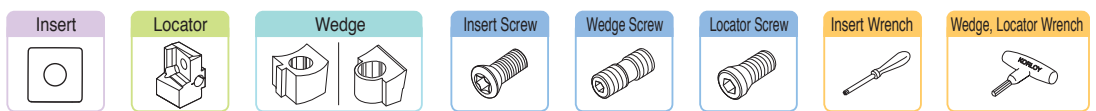
| | | | | | | | | | | | | (mm) | | | | | | |
|----------------|------------|----|-----------------|-----------|------|-------|----------------|-------------|----|-----------------|-------------|------|----|-------|------------|------|------|--------------|
| Designation | ød | E | øD ₂ | a | b | T-MAX | Designation | ød | F | øD ₂ | a | b | E | T-MAX | Dimensions | | | |
| | | | | | | | | | | | | | | | øD | W | W | No. of tooth |
| RAHCP 10012R/L | 31.75 (32) | 12 | 48 | 7.92 (8) | 35.2 | 24 | RAHCB 10012R/L | 31.75 (32) | 50 | 54 | 12.7 (14.4) | 8 | 28 | 21 | 100 | 8 | 11.1 | 6 |
| (M) 12512R/L | 38.1 (40) | 12 | 56 | 9.52 (10) | 42.3 | 32 | (M) 12512R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 8 | 11.1 | 8 |
| 16012R/L | 38.1 (40) | 12 | 56 | 9.52 (10) | 42.3 | 50 | 16012R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 8 | 11.1 | 10 |
| 20012R/L | 50.8 (50) | 12 | 72 | 12.7 (12) | 55.8 | 61 | 20012R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 8 | 11.1 | 12 |
| 25012R/L | 50.8 (50) | 12 | 72 | 12.7 (12) | 55.8 | 86 | 25012R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 8 | 11.1 | 16 |
| 31512R/L | 50.8 (50) | 12 | 72 | 12.7 (12) | 55.8 | 118 | 31512R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 8 | 11.1 | 20 |
| RAHCP 10014R/L | 31.75 (32) | 14 | 48 | 7.92 (8) | 35.2 | 24 | RAHCB 10014R/L | 31.75 (32) | 50 | 50 | 12.7 (14.4) | 8 | 28 | 21 | 100 | 8 | 13.1 | 6 |
| (M) 12514R/L | 38.1 (40) | 14 | 56 | 9.52 (10) | 42.3 | 32 | (M) 12514R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 8 | 13.1 | 8 |
| 16014R/L | 38.1 (40) | 14 | 56 | 9.52 (10) | 42.3 | 50 | 16014R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 8 | 13.1 | 10 |
| 20014R/L | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 61 | 20014R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 8 | 13.1 | 12 |
| 25014R/L | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 86 | 25014R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 8 | 13.1 | 16 |
| 31514R/L | 50.8 (50) | 14 | 72 | 12.7 (12) | 55.8 | 118 | 31514R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 8 | 13.1 | 20 |
| RAHCP 12516R/L | 38.1 (40) | 16 | 56 | 9.52 (10) | 42.3 | 32 | RAHCB 12516R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 10.5 | 15 | 8 |
| (M) 16016R/L | 38.1 (40) | 16 | 56 | 9.52 (10) | 42.3 | 50 | (M) 16016R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 10.5 | 15 | 10 |
| 20016R/L | 50.8 (50) | 16 | 72 | 12.7 (12) | 55.8 | 61 | 20016R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 10.5 | 15 | 12 |
| 25016R/L | 50.8 (50) | 16 | 72 | 12.7 (12) | 55.8 | 86 | 25016R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 10.5 | 15 | 16 |
| 31516R/L | 50.8 (50) | 16 | 72 | 12.7 (12) | 55.8 | 118 | 31516R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 10.5 | 15 | 20 |
| RAHCP 12518R/L | 38.1 (40) | 18 | 56 | 9.52 (10) | 42.3 | 32 | RAHCB 12518R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 10.5 | 17 | 8 |
| (M) 16018R/L | 38.1 (40) | 18 | 56 | 9.52 (10) | 42.3 | 50 | (M) 16018R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 10.5 | 17 | 10 |
| 20018R/L | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 61 | 20018R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 10.5 | 17 | 12 |
| 25018R/L | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 86 | 25018R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 10.5 | 17 | 16 |
| 31518R/L | 50.8 (50) | 18 | 72 | 12.7 (12) | 55.8 | 118 | 31518R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 10.5 | 17 | 20 |
| RAHCP 12520R/L | 38.1 (40) | 20 | 56 | 9.52 (10) | 42.3 | 32 | RAHCB 12520R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 10.5 | 19 | 8 |
| (M) 16020R/L | 38.1 (40) | 20 | 56 | 9.52 (10) | 42.3 | 50 | (M) 16020R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 10.5 | 19 | 10 |
| 20020R/L | 50.8 (50) | 20 | 72 | 12.7 (12) | 55.8 | 61 | 20020R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 10.5 | 19 | 12 |
| 25020R/L | 50.8 (50) | 20 | 72 | 12.7 (12) | 55.8 | 86 | 25020R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 10.5 | 19 | 16 |
| 31520R/L | 50.8 (50) | 20 | 72 | 12.7 (12) | 55.8 | 118 | 31520R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 10.5 | 19 | 20 |
| RAHCP 12522R/L | 38.1 (40) | 22 | 56 | 9.52 (10) | 42.3 | 32 | RAHCB 12522R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 25 | 125 | 10.5 | 21 | 8 |
| (M) 16022R/L | 38.1 (40) | 22 | 56 | 9.52 (10) | 42.3 | 50 | (M) 16022R/L | 38.1 (40) | 60 | 70 | 15.9 (16.4) | 10 | 30 | 43 | 160 | 10.5 | 21 | 10 |
| 20022R/L | 50.8 (50) | 22 | 72 | 12.7 (12) | 55.8 | 61 | 20022R/L | 50.8 (40) | 65 | 90 | 19.0 (16.4) | 11 | 30 | 53 | 200 | 10.5 | 21 | 12 |
| 25022R/L | 50.8 (50) | 22 | 72 | 12.7 (12) | 55.8 | 86 | 25022R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 58 | 250 | 10.5 | 21 | 16 |
| 31522R/L | 50.8 (50) | 22 | 72 | 12.7 (12) | 55.8 | 118 | 31522R/L | 47.625 (60) | 65 | 130 | 25.4 (25.7) | 14 | 38 | 90 | 315 | 10.5 | 21 | 20 |

Available Inserts and Recommended cutting condition E256

- The ap (Maximum width of cutter) size written above is the number when using insert having corner size R0.5. The ap is subject to change as per insert corner size
- The ap (Maximum width of cutter) size written above is the number when using SDXT09M405R-MM. The ap is subject to change as per insert corner size

() Metric Size

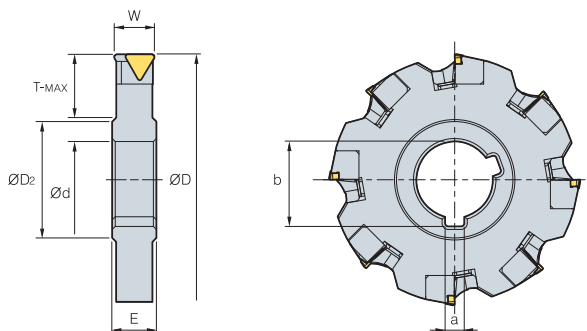
Parts



Edge width(TAHCP/B)

| | | | | | | | | |
|-------------|---------------|----------|--------|-----------|---------|----------|-------|------|
| □□□ 1214R/L | SDXT09M40□R/L | LSD09R/L | WSD09N | FTGA03508 | DHA0617 | SHGA0409 | TW15S | HW30 |
| □□□ 1416R/L | SDXT09M40□R/L | LSD09R/L | WSD09N | FTGA03508 | DHA0617 | SHGA0409 | TW15S | HW30 |
| □□□ 1618R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |
| □□□ 1820R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |
| □□□ 2022R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |
| □□□ 2224R/L | SDXT13050□R/L | LSD13R/L | WSA10N | FTNC04509 | DHA0617 | SHGA0411 | TW20S | HW30 |

FC(M) (Full side cutter)



(mm)

| Designation | | øD | W | T-MAX | ød | E | a | b | øD ₂ | Insert |
|-------------|----|-----|----|-------|------------|----|-----------|------|-----------------|-------------|
| FC(M) 08010 | 6 | 80 | 10 | 17.0 | 25.4 (27) | 12 | 6.35 (7) | 28 | 41.5 | TPCN1103PPN |
| 10012 | 8 | 100 | 12 | 24.0 | 31.75 (32) | 14 | 7.92 (8) | 35.2 | 48 | TPCN1103PPN |
| 12512 | 10 | 125 | 12 | 31.5 | 38.1 (40) | 14 | 9.52 (10) | 42.3 | 58 | TPCN1103PPN |
| 12520 | 8 | 125 | 20 | 31.5 | 38.1 (40) | 22 | 9.52 (10) | 42.3 | 58 | TPCN1103PPN |
| 16012 | 12 | 160 | 12 | 49.0 | 38.1 (40) | 14 | 9.52 (10) | 42.3 | 58 | TPCN1103PPN |
| 16016 | 12 | 160 | 16 | 49.0 | 38.1 (40) | 18 | 9.52 (10) | 42.3 | 58 | TPCN1103PPN |
| 16018 | 10 | 10 | 18 | 49.0 | 38.1 (40) | 20 | 9.52 (10) | 42.3 | 58 | TPCN1603PPN |
| 16020 | 10 | 10 | 20 | 49.0 | 38.1 (40) | 22 | 9.52 (10) | 42.3 | 58 | TPCN1603PPN |
| 20022 | 12 | 200 | 22 | 61.0 | 50.8 (50) | 24 | 12.7 (12) | 55.8 | 72 | TPCN1603PPN |
| 25024 | 16 | 250 | 24 | 81.0 | 50.8 (50) | 26 | 12.7 (12) | 55.8 | 84 | TPCN1603PPN |
| 31524 | 16 | 315 | 24 | 113.5 | 50.8 (50) | 26 | 12.7 (12) | 55.8 | 84 | TPCN1603PPN |

• () Metric Size

Available Inserts

TPCN



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | Page | |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| TPCN 1103PPN | | | | | | | | | | | | | | | | | |
| 1603PPN | ● | | | | | | | ● | | | | ● | | ● | ● | | |

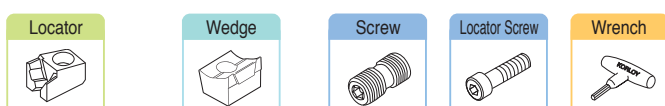
Available Arbors

| Designation | Arbors | |
|-------------|-------------------|-------------------|
| FC(M) 08010 | BT40-SCA27-75/120 | BT50-SCA27-90/135 |
| 10012 | BT40-SCA32-105 | BT50-SCA32-90/135 |
| 12512 | - | BT50-SCA40-90/135 |
| 12520 | - | BT50-SCA40-90/135 |
| 16012 | - | BT50-SCA40-90/135 |
| 16018 | - | BT50-SCA40-90/135 |
| 16020 | - | BT50-SCA40-90/135 |
| 20022 | - | - |
| 25024 | - | - |
| 31524 | - | - |

Recommended cutting condition

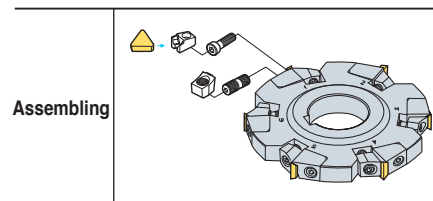
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 250 | 0.10 ~ 0.25 | NCM325 PC3500 ST30A |
| | 120 ~ 200 | 0.10 ~ 0.30 | |
| | 100 ~ 150 | 0.10 ~ 0.30 | |
| M | 80 ~ 180 | 0.10 ~ 0.25 | PC9530 ST30A |
| | 80 ~ 150 | 0.10 ~ 0.30 | |
| K | 130 ~ 200 | 0.10 ~ 0.35 | PC6510 G10 |
| | 100 ~ 150 | 0.10 ~ 0.40 | |

Parts

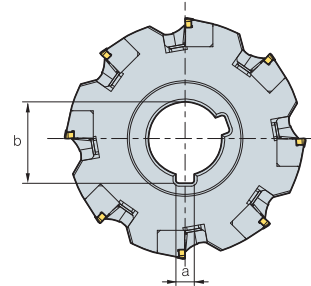
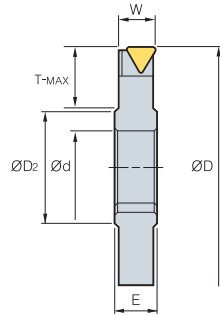


| | | | | |
|-------------------|---------------|---------|---------|-------|
| LFC2R/L · LFC3R/L | WFC2N · WFC3N | DHA0617 | MHB0310 | HW30L |
| LFC2R/L-1* | WFC2N-1* | DHA0815 | MHB0410 | HW40L |

* FC08010



HC(M) (Half side cutter)



- AR : 5°
- RR : 0°

| Designation | | øD | W | T-MAX | ød | E | a | b | øD ₂ | Insert |
|----------------|----|-----|----|-------|------------|----|-----------|------|-----------------|-------------|
| HC(M) 10024R/L | 6 | 100 | 24 | 24.0 | 31.75 (32) | 27 | 7.92 (8) | 35.2 | 48 | TPCN1603PPN |
| 12524R/L | 8 | 125 | 24 | 31.5 | 38.1 (40) | 27 | 9.52 (10) | 42.3 | 58 | TPCN1603PPN |
| 16024R/L | 10 | 160 | 24 | 49.0 | 38.1 (40) | 27 | 9.52 (10) | 42.3 | 58 | TPCN1603PPN |
| 20024R/L | 12 | 200 | 24 | 62.0 | 50.8 (50) | 27 | 12.7 (12) | 55.8 | 72 | TPCN1603PPN |
| 25024R/L | 16 | 250 | 24 | 81.0 | 50.8 (50) | 27 | 12.7 (12) | 55.8 | 84 | TPCN1603PPN |
| 31524R/L | 20 | 315 | 24 | 113.5 | 50.8 (50) | 27 | 12.7 (12) | 55.8 | 84 | TPCN1603PPN |

(mm)

Available Inserts

TPCN



| Designation | Coated | | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|----------|-----|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| TPCN 1603PPN | ● | | | | | | | ● | | | | | ● | | ● | | | E22 |

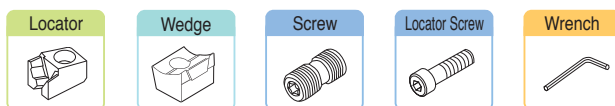
Available Arbors

| Designation | Arbors | |
|----------------|-------------------|----------------------|
| HC(M) 10024R/L | BT40-SCA31.75-105 | BT50-SCA31.75-90/135 |
| 12524R/L | - | BT50-SCA38.1-90/135 |
| 16024R/L | - | BT50-SCA38.1-90/135 |
| 20024R/L | - | - |
| 25024R/L | - | - |
| 31524R/L | - | - |

Recommended cutting condition

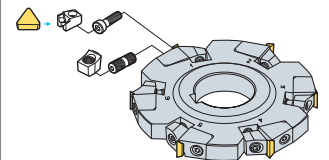
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 250 | 0.10 ~ 0.25 | NCM325 PC3500 ST30A |
| | 120 ~ 200 | 0.10 ~ 0.30 | |
| | 100 ~ 150 | 0.10 ~ 0.30 | |
| M | 80 ~ 180 | 0.10 ~ 0.25 | PC9530 ST30A |
| | 80 ~ 150 | 0.10 ~ 0.30 | |
| K | 130 ~ 200 | 0.10 ~ 0.35 | PC6510 G10 |
| | 100 ~ 150 | 0.10 ~ 0.40 | |

Parts

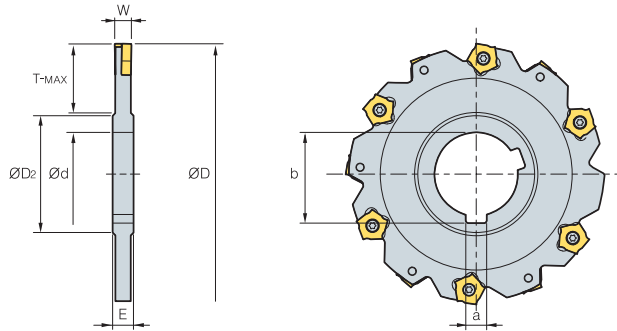


LFC3R/L WFC3N DHA0815 MHB0410 HW40L

Assembling



SPP(M)



- AR : -2°
- RR : -28°

(mm)

| Designation | ØD | W | T-MAX | Ød | a | b | E | ØD2 | Insert | Screw | Wrench | |
|---------------|----|-----|-------|----|-----------|----------|-------------|-----|--------|-----------|-----------|-------|
| SPP(M) 080-04 | 8 | 80 | 4 | 20 | 25.4(27) | 6.35(7) | 28.04(29.8) | 8 | 40 | PNEJ1223N | PTMA0403F | TW15S |
| 080-05 | 8 | 80 | 5 | 20 | 25.4(27) | 6.35(7) | 28.04(29.8) | 8 | 40 | PNEJ1230N | PTMA0404F | TW15S |
| 080-06 | 8 | 80 | 6 | 20 | 25.4(27) | 6.35(7) | 28.04(29.8) | 8 | 40 | PNEJ1235N | PTMA0405F | TW15S |
| 100-04 | 10 | 100 | 4 | 24 | 31.75(32) | 7.94(8) | 35.18(34.8) | 8 | 47 | PNEJ1223N | PTMA0403F | TW15S |
| 100-05 | 10 | 100 | 5 | 24 | 31.75(32) | 7.94(8) | 35.18(34.8) | 8 | 47 | PNEJ1230N | PTMA0404F | TW15S |
| 100-06 | 10 | 100 | 6 | 25 | 31.75(32) | 7.94(8) | 35.18(34.8) | 8 | 47 | PNEJ1235N | PTMA0405F | TW15S |
| 100-07 | 10 | 100 | 7 | 25 | 31.75(32) | 7.94(8) | 35.18(34.8) | 10 | 47 | PNEJ1240N | PTMA0406F | TW15S |
| 100-08 | 10 | 100 | 8 | 25 | 31.75(32) | 7.94(8) | 35.18(34.8) | 10 | 47 | PNEJ1245N | PTKA0407F | TW15S |
| 100-09 | 10 | 100 | 9 | 25 | 31.75(32) | 7.94(8) | 35.18(34.8) | 12 | 47 | PNEJ1250N | PTKA0408F | TW15S |
| 100-10 | 10 | 100 | 10 | 25 | 31.75(32) | 7.94(8) | 35.18(34.8) | 12 | 47 | PNEJ1255N | PTKA0409F | TW15S |
| 125-04 | 12 | 125 | 4 | 30 | 38.1(40) | 9.53(10) | 42.32(43.5) | 8 | 56 | PNEJ1223N | PTMA0403F | TW15S |
| 125-05 | 12 | 125 | 5 | 32 | 38.1(40) | 9.53(10) | 42.32(43.5) | 8 | 56 | PNEJ1230N | PTMA0404F | TW15S |
| 125-06 | 12 | 125 | 6 | 32 | 38.1(40) | 9.53(10) | 42.32(43.5) | 8 | 56 | PNEJ1235N | PTMA0405F | TW15S |
| 125-07 | 12 | 125 | 7 | 32 | 38.1(40) | 9.53(10) | 42.32(43.5) | 10 | 56 | PNEJ1240N | PTMA0406F | TW15S |
| 125-08 | 12 | 125 | 8 | 32 | 38.1(40) | 9.53(10) | 42.32(43.5) | 10 | 56 | PNEJ1245N | PTKA0407F | TW15S |
| 125-09 | 12 | 125 | 9 | 32 | 38.1(40) | 9.53(10) | 42.32(43.5) | 12 | 56 | PNEJ1250N | PTKA0408F | TW15S |
| 125-10 | 12 | 125 | 10 | 32 | 38.1(40) | 9.53(10) | 42.32(43.5) | 12 | 56 | PNEJ1255N | PTKA0409F | TW15S |
| 160-04 | 16 | 160 | 4 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 8 | 66 | PNEJ1223N | PTMA0403F | TW15S |
| 160-05 | 16 | 160 | 5 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 8 | 66 | PNEJ1230N | PTMA0404F | TW15S |
| 160-06 | 16 | 160 | 6 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 8 | 66 | PNEJ1235N | PTMA0405F | TW15S |
| 160-07 | 16 | 160 | 7 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 10 | 66 | PNEJ1240N | PTMA0406F | TW15S |
| 160-08 | 16 | 160 | 8 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 10 | 66 | PNEJ1245N | PTKA0407F | TW15S |
| 160-09 | 16 | 160 | 9 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 12 | 66 | PNEJ1250N | PTKA0408F | TW15S |
| 160-10 | 16 | 160 | 10 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 12 | 66 | PNEJ1255N | PTKA0409F | TW15S |
| 160-11 | 16 | 160 | 11 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 14 | 66 | PNEJ1260N | PTKA0410F | TW15S |
| 160-12 | 16 | 160 | 12 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 14 | 66 | PNEJ1265N | PTKA0411F | TW15S |
| 160-13 | 16 | 160 | 13 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 16 | 66 | PNEJ1270N | PTKA0412F | TW15S |
| 160-14 | 16 | 160 | 14 | 45 | 38.1(40) | 9.53(10) | 42.32(43.5) | 16 | 66 | PNEJ1275N | PTKA0413F | TW15S |
| 200-06 | 18 | 200 | 6 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 8 | 70 | PNEJ1235N | PTMA0405F | TW15S |
| 200-07 | 18 | 200 | 7 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 10 | 70 | PNEJ1240N | PTMA0406F | TW15S |
| 200-08 | 18 | 200 | 8 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 10 | 70 | PNEJ1245N | PTKA0407F | TW15S |
| 200-09 | 18 | 200 | 9 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 12 | 70 | PNEJ1250N | PTKA0408F | TW15S |
| 200-10 | 18 | 200 | 10 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 12 | 70 | PNEJ1255N | PTKA0409F | TW15S |
| 200-11 | 18 | 200 | 11 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 14 | 70 | PNEJ1260N | PTKA0410F | TW15S |
| 200-12 | 18 | 200 | 12 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 14 | 70 | PNEJ1265N | PTKA0411F | TW15S |
| 200-13 | 18 | 200 | 13 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 16 | 70 | PNEJ1270N | PTKA0412F | TW15S |
| 200-14 | 18 | 200 | 14 | 60 | 50.8(50) | 12.7(12) | 55.83(53.5) | 16 | 70 | PNEJ1275N | PTKA0413F | TW15S |

() Metric Size

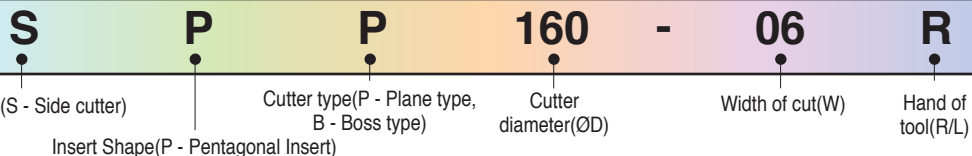
Available Arbors

| Designation | Arbors | | |
|----------------|-----------------|---------------------|----------------------|
| | BT30 | BT40 | BT50 |
| SPP 080-04~06 | BT30-SCA25.4-60 | BT40-SCA25.4-75/120 | BT50-SCA25.4-90/135 |
| 100-04~10 | - | BT40-SCA31.75-105 | BT50-SCA31.75-90/135 |
| 125-04~09 | - | - | BT50-SCA38.1-90/135 |
| 160-04~14 | - | - | BT50-SCA38.1-90/135 |
| 200-06~14 | - | - | - |
| SPPM 080-04~06 | - | BT40-SCA27-75/120 | BT50-SCA27-90/135 |
| 100-04~10 | - | BT40-SCA32-105 | BT50-SCA32-90/135 |
| 125-04~09 | - | - | BT50-SCA40-90/135 |
| 160-04~14 | - | - | BT50-SCA40-90/135 |
| 200-06~14 | - | - | - |

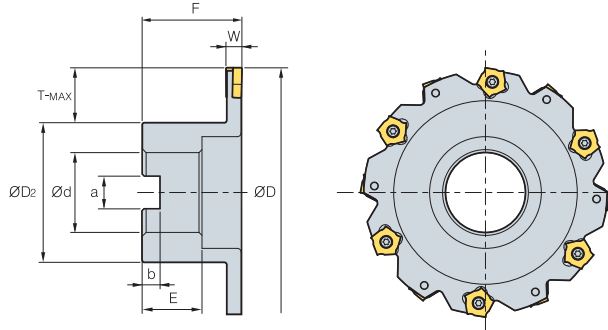
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|---------------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 250 | 0.10 ~ 0.25 | NCM325 PC3500 ST30A |
| | 120 ~ 200 | 0.10 ~ 0.30 | |
| | 100 ~ 150 | 0.10 ~ 0.30 | |
| M | 80 ~ 180 | 0.10 ~ 0.25 | PC9530 ST30A |
| | 80 ~ 150 | 0.10 ~ 0.30 | |
| K | 130 ~ 200 | 0.10 ~ 0.35 | PC6510 G10 |
| | 100 ~ 150 | 0.10 ~ 0.40 | |

Code system



SPB(M)



- AR : -10°
- RR : 0°

(mm)

| Designation | ØD | W | T-MAX | ØD ₂ | ød | a | b | F | E | Insert | Screw | Wrench | |
|------------------|----|-----|-------|-----------------|----|-----------|------------|-------|--------|--------|-----------|-----------|-------|
| SPB(M) 080-04R/L | 8 | 80 | 4 | 18 | 40 | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25(22) | PNEJ1223N | PTMA0403F | TW15S |
| 080-05R/L | 8 | 80 | 5 | 18 | 40 | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25(22) | PNEJ1230N | PTMA0404F | TW15S |
| 080-06R/L | 8 | 80 | 6 | 18 | 40 | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25(22) | PNEJ1235N | PTMA0405F | TW15S |
| 100-04R/L | 10 | 100 | 4 | 21 | 54 | 31.75(32) | 12.7(14.4) | 8(8) | 50 | 32(28) | PNEJ1223N | PTMA0403F | TW15S |
| 100-05R/L | 10 | 100 | 5 | 21 | 54 | 31.75(32) | 12.7(14.4) | 8(8) | 50 | 32(28) | PNEJ1230N | PTMA0404F | TW15S |
| 100-06R/L | 10 | 100 | 6 | 21 | 54 | 31.75(32) | 12.7(14.4) | 8(8) | 50 | 32(28) | PNEJ1235N | PTMA0405F | TW15S |
| 100-07R/L | 10 | 100 | 7 | 21 | 54 | 31.75(32) | 12.7(14.4) | 8(8) | 50 | 32(28) | PNEJ1240N | PTMA0406F | TW15S |
| 100-08R/L | 10 | 100 | 8 | 21 | 54 | 31.75(32) | 12.7(14.4) | 8(8) | 50 | 32(28) | PNEJ1245N | PTMA0407F | TW15S |
| 100-09R/L | 10 | 100 | 9 | 21 | 54 | 31.75(32) | 12.7(14.4) | 8(8) | 50 | 32(28) | PNEJ1250N | PTMA0408F | TW15S |
| 100-10R/L | 10 | 100 | 10 | 21 | 54 | 31.75(32) | 12.7(14.4) | 8(8) | 50 | 32(28) | PNEJ1255N | PTMA0409F | TW15S |
| 125-04R/L | 12 | 125 | 4 | 25 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1223N | PTMA0403F | TW15S |
| 125-05R/L | 12 | 125 | 5 | 25 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1230N | PTMA0404F | TW15S |
| 125-06R/L | 12 | 125 | 6 | 25 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1235N | PTMA0405F | TW15S |
| 125-07R/L | 12 | 125 | 7 | 25 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1240N | PTMA0406F | TW15S |
| 125-08R/L | 12 | 125 | 8 | 25 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1245N | PTKA0407F | TW15S |
| 125-09R/L | 12 | 125 | 9 | 25 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1250N | PTKA0408F | TW15S |
| 125-10R/L | 12 | 125 | 10 | 25 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1255N | PTKA0409F | TW15S |
| 160-04R/L | 16 | 160 | 4 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1223N | PTMA0403F | TW15S |
| 160-05R/L | 16 | 160 | 5 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1230N | PTMA0404F | TW15S |
| 160-06R/L | 16 | 160 | 6 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1235N | PTMA0405F | TW15S |
| 160-07R/L | 16 | 160 | 7 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1240N | PTMA0406F | TW15S |
| 160-08R/L | 16 | 160 | 8 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1245N | PTKA0407F | TW15S |
| 160-09R/L | 16 | 160 | 9 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1250N | PTKA0408F | TW15S |
| 160-10R/L | 16 | 160 | 10 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1255N | PTKA0409F | TW15S |
| 160-11R/L | 16 | 160 | 11 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1260N | PTKA0410F | TW15S |
| 160-12R/L | 16 | 160 | 12 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1265N | PTKA0411F | TW15S |
| 160-13R/L | 16 | 160 | 13 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1270N | PTKA0412F | TW15S |
| 160-14R/L | 16 | 160 | 14 | 43 | 70 | 38.1(40) | 15.9(16.4) | 10(9) | 60(50) | 38(30) | PNEJ1275N | PTKA0413F | TW15S |
| 200-06R/L | 18 | 200 | 6 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1235N | PTMA0405F | TW15S |
| 200-07R/L | 18 | 200 | 7 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1240N | PTMA0406F | TW15S |
| 200-08R/L | 18 | 200 | 8 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1245N | PTKA0407F | TW15S |
| 200-09R/L | 18 | 200 | 9 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1250N | PTKA0408F | TW15S |
| 200-10R/L | 18 | 200 | 10 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1255N | PTKA0409F | TW15S |
| 200-11R/L | 18 | 200 | 11 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1260N | PTKA0410F | TW15S |
| 200-12R/L | 18 | 200 | 12 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1265N | PTKA0411F | TW15S |
| 200-13R/L | 18 | 200 | 13 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1270N | PTKA0412F | TW15S |
| 200-14R/L | 18 | 200 | 14 | 53 | 90 | 50.8(40) | 19(16.4) | 11(9) | 65 | 38(30) | PNEJ1275N | PTKA0413F | TW15S |

() Metric Size

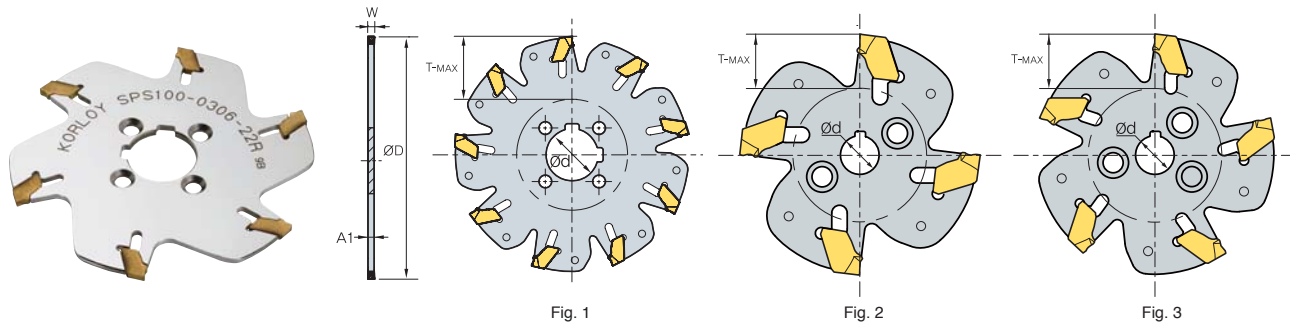
Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------------------------|---|--|
| | vc(m/min) | fz(mm/t) | |
| P | 150 ~ 250 120 ~ 200 100 ~ 150 | 0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30 | NCM325 PC3500 ST30A |
| M | 80 ~ 180 80 ~ 150 | 0.10 ~ 0.25 0.10 ~ 0.30 | PC9530 ST30A |
| K | 130 ~ 200 100 ~ 150 | 0.10 ~ 0.35 0.10 ~ 0.40 | PC6510 G10 |

Notice(When mounting inserts)

- Insert chip breaker should face chip pocket of the cutter
- Fasten screw after insert contacts securely on its seat
- If there is a gap between insert and its seat after mounting it may cause tool troubles

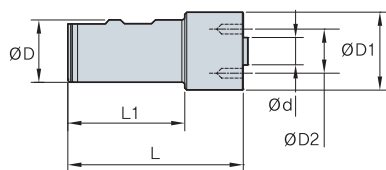
SPS



(mm)

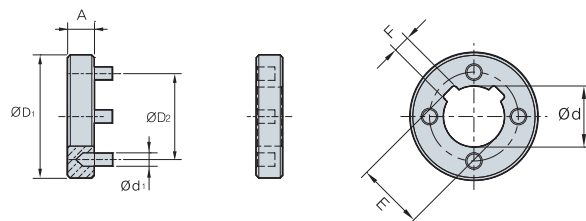
| Designation | Symbol | ØD | W | T-MAX | Ød | A1 | Fig. | Insert | Adaptor | |
|------------------|--------|-----|-----|---------|----|------|------|-------------|-----------|---------|
| | | | | | | | | | WS | DF |
| SPS 050-0204-08R | 4 | 50 | 2.2 | 11 | 8 | 1.8 | 2 | SPFN 200 | WS2528-M4 | - |
| 063-0205-10R | 5 | 63 | 2.2 | 15.5 | 10 | 1.8 | 3 | | WS2532-M5 | - |
| 080-0207-22R/F | 7 | 80 | 2.2 | 20 / 17 | 22 | 1.8 | 1 | | WS3240-M5 | DF22-46 |
| 100-0209-22R/F | 9 | 100 | 2.2 | 30 / 27 | 22 | 1.8 | 1 | - | WS3240-M5 | DF22-46 |
| 125-0211-32F | 11 | 125 | 2.2 | 35 | 32 | 1.8 | 1 | () | - | DF32-55 |
| 160-0214-32F | 14 | 160 | 2.2 | 52.5 | 32 | 1.8 | 1 | - | - | DF32-55 |
| 063-0305-10R | 5 | 63 | 3 | 15.5 | 10 | 2.55 | 3 | SPFN 300 | WS2532-M5 | - |
| 080-0307-22R/F | 7 | 80 | 3 | 20 / 17 | 22 | 2.55 | 1 | | WS3240-M5 | DF22-46 |
| 100-0309-22R/F | 9 | 100 | 3 | 30 / 27 | 22 | 2.55 | 1 | | WS3240-M5 | DF22-46 |
| 125-0311-32F | 11 | 125 | 3 | 35 | 32 | 2.55 | 1 | () | - | DF32-55 |
| 160-0314-32F | 14 | 160 | 3 | 52.5 | 32 | 2.55 | 1 | - | - | DF32-55 |
| 200-0318-40F | 18 | 200 | 3 | 60 | 40 | 2.55 | 1 | - | - | DF40-80 |
| 080-0406-22R/F | 6 | 80 | 4 | 20 / 17 | 22 | 3.4 | 1 | SPFN 400 | WS3240-M5 | DF22-46 |
| 100-0408-22R/F | 8 | 100 | 4 | 30 / 27 | 22 | 3.4 | 1 | | WS3240-M5 | DF22-46 |
| 125-0410-32F | 10 | 125 | 4 | 35 | 32 | 3.4 | 1 | | - | DF32-55 |
| 160-0413-32F | 13 | 160 | 4 | 52.5 | 32 | 3.4 | 1 | () | - | DF32-55 |
| 200-0417-40F | 17 | 200 | 4 | 60 | 40 | 3.4 | 1 | - | - | DF40-80 |

WS()-() (Weldon Shank)



| Designation | L | L1 | D | D1 | D2 | d | Screw |
|-------------|-----|----|----|----|----|----|----------|
| WS2528-M4 | 110 | 85 | 25 | 28 | 18 | 8 | PTKA0408 |
| WS2532-M5 | 110 | 85 | 25 | 32 | 22 | 10 | PTKA0515 |
| WS3240-M5 | 120 | 90 | 32 | 40 | 32 | 22 | PTKA0515 |

DF()-() (Drive Flange set)



| Designation | D1 | D2 | d | d1 | A | E | F |
|-------------|-----|----|----|----|----|------|----|
| DF22-46 | 46 | 32 | 22 | 5 | 10 | 24.1 | 6 |
| DF32-55 | 55 | 45 | 32 | 6 | 10 | 34.8 | 8 |
| DF40-80 | 80 | 63 | 40 | 11 | 12 | 43.5 | 10 |
| DF50-110 | 110 | 80 | 50 | 14 | 14 | 53.6 | 12 |

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-----------------------------|------------------------|------------------|
| | vc(m/min) | fz(mm/t) | |
| P | 150(100~200) 120(80~170) | 0.13~0.25 0.10~0.17 | PC3500 PC3545 |
| M | 160(120~200) | 0.10~0.22 | PC5300 |
| K | 110(70~150) | 0.10~0.25 | PC215K |



For slotting workpieces with corner radii of varying size and width

Wind Mill *New*

- Optimal machining for slotting applications
- A unique recess design on the minor cutting edge reduces cutting load and improves tool life
- Special clamping system prevents incorrect clamping and fracture



• Insert



• Cutter

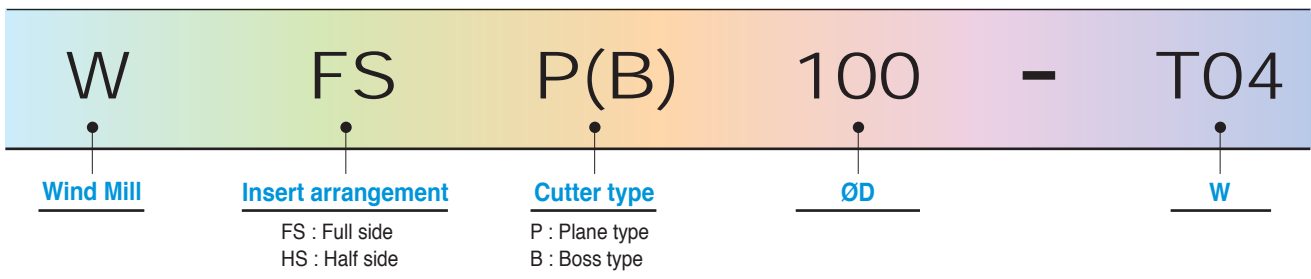
WFSP(M) - Plane type



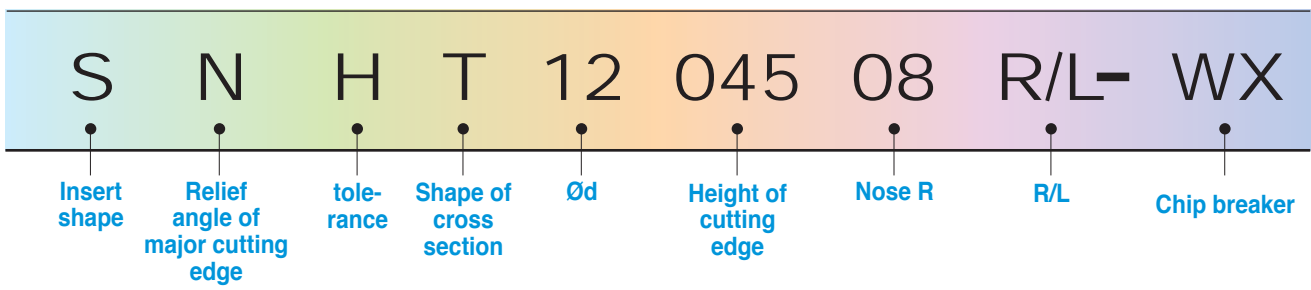
WFSB(M) - Boss type



🎯 Cutter Code system



🎯 Insert Code system

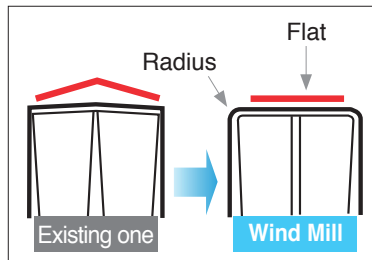


🎯 Features

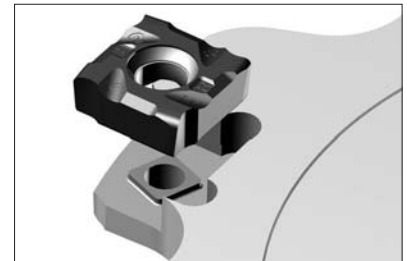
- Ideal geometry for superior surface roughness and extended tool life



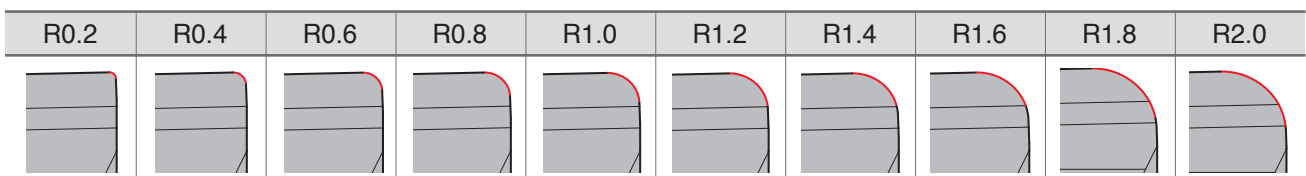
- Perpendicular slot



- Protruded part on tip seat prevents wrong clamping and fracture

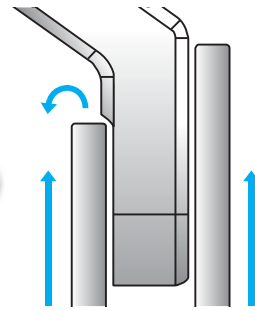
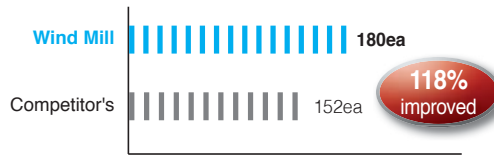


- Workpieces with corner radii of varying size and width (R0.2~R2.0)

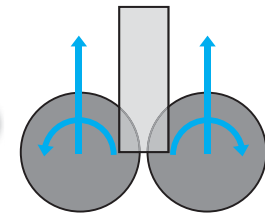
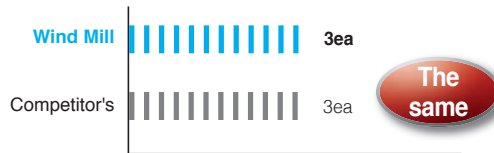


Application Example

- **Workpiece** FCD500K
- **Cutting conditions**
 - vc(m/min) = 200
 - fz(mm/t) = 0.2
 - vf(mm/min) = 600
 - ap(mm) = 2~3
- **Tool** KSF140R-T14-HM-2
SNHT1205408R/L-WX (PC5300)

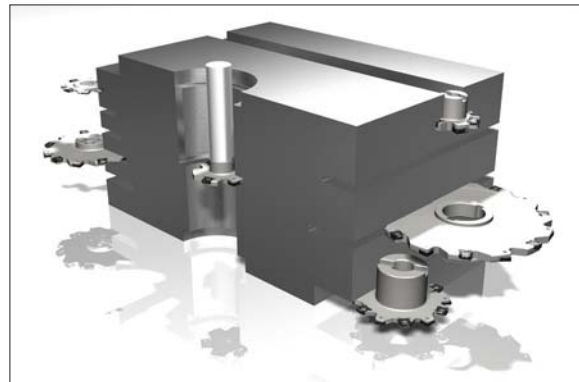


- **Workpiece** Mild steel (Lug for Vessel)
- **Cutting conditions**
 - vc(m/min) = 560
 - fz(mm/t) = 0.09
 - vf(mm/min) = 750
 - ap(mm) = 6
- **Tool** WFSP178R/L-T06
SNHT1203508R/L-WX (PC5300)



Recommended cutting conditions

| Workpiece | Cutting conditions | | Grade |
|-----------|--------------------|-------------|--------|
| | vc (m/min) | fz (mm/t) | |
| P | 150 ~ 250 | 0.10 ~ 0.25 | PC5300 |
| | 120 ~ 200 | 0.10 ~ 0.30 | PC5300 |
| | 100 ~ 150 | 0.10 ~ 0.30 | PC5300 |
| M | 100 ~ 180 | 0.10 ~ 0.25 | PC5300 |
| | 80 ~ 150 | 0.10 ~ 0.30 | PC5300 |
| K | 150 ~ 250 | 0.10 ~ 0.35 | PC5300 |
| | 130 ~ 200 | 0.10 ~ 0.40 | PC5300 |

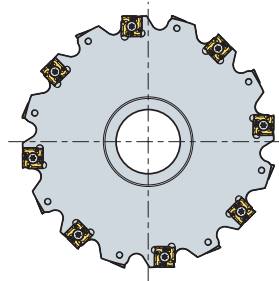
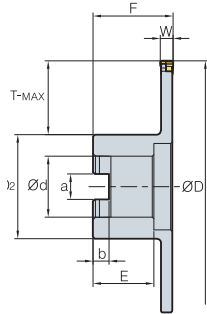


List of inserts

| Designation | Coated | Dimensions (mm) | | | | | Configuration |
|--------------------|--------|-----------------|-----|------|------|---|---------------|
| | PC5300 | Ød | Ød1 | t | w | Nose R | |
| SNHT 11023□□R/L-WX | ● | 11.0 | 4 | 2.30 | 4.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6 | |
| 1103□□R/L-WX | ● | 11.0 | 4 | 3.00 | 5.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6 | |
| 1203□□R/L-WX | | 12.7 | 5 | 3.25 | 5.5 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 12035□□R/L-WX | ● | 12.7 | 5 | 3.54 | 6.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 1204□□R/L-WX | | 12.7 | 5 | 4.00 | 7.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 12045□□R/L-WX | ● | 12.7 | 5 | 4.54 | 8.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 1205□□R/L-WX | | 12.7 | 5 | 5.00 | 9.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 12054□□R/L-WX | ● | 12.7 | 5 | 5.47 | 10.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 1206□□R/L-WX | | 12.7 | 5 | 6.00 | 11.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 12065□□R/L-WX | | 12.7 | 5 | 6.50 | 12.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 1207□□R/L-WX | | 12.7 | 5 | 7.00 | 13.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |
| 12075□□R/L-WX | | 12.7 | 5 | 7.50 | 14.0 | 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 | |

- Inserts with various nose R sizes can be supplied in 2~3 weeks
- Please refer to stock management of cutters and detail dimensions in the 2014 catalogue

WFSB(M) - Boss type New



- AR : -2°
- RR :-12°

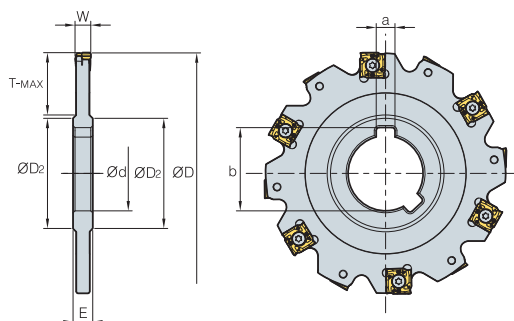
(mm)

| Designation | | ØD | W | T-MAX | ØD ₂ | Ød | a | b | F | E | Insert | Screw | Wrench |
|--------------------|----|-----|----|--------|-----------------|-----------|------------|-------|----|--------|-----------------|-----------|--------|
| WFSB(M) 080R/L-T04 | 8 | 80 | 4 | 17 | 40 | 22 | 10.4 | 6.3 | 50 | 21 | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 080R/L-T05 | 8 | 80 | 5 | 17 | 40 | 22 | 10.4 | 6.3 | 50 | 21 | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 080R/L-T06 | 8 | 80 | 6 | 17 | 40 | 22 | 10.4 | 6.3 | 50 | 21 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 100R/L-T04 | 10 | 100 | 4 | 21 | 50(48) | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25 | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 100R/L-T05 | 10 | 100 | 5 | 21 | 50(48) | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25 | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 100R/L-T06 | 10 | 100 | 6 | 21 | 50(48) | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 100R/L-T07 | 10 | 100 | 7 | 21 | 50(48) | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25 | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 100R/L-T08 | 10 | 100 | 8 | 21 | 50(48) | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25 | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 100R/L-T09 | 10 | 100 | 9 | 21 | 50(48) | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25 | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 100R/L-T10 | 10 | 100 | 10 | 21 | 50(48) | 25.4(27) | 9.5(12.4) | 6(7) | 50 | 25 | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 125R/L-T04 | 12 | 125 | 4 | 30 | 60(58) | 31.75(32) | 12.7(14.4) | 8 | 50 | 32(30) | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 125R/L-T05 | 12 | 125 | 5 | 30 | 60(58) | 31.75(32) | 12.7(14.4) | 8 | 50 | 32(30) | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 125R/L-T06 | 12 | 125 | 6 | 30 | 60(58) | 31.75(32) | 12.7(14.4) | 8 | 50 | 32(30) | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 125R/L-T07 | 12 | 125 | 7 | 30 | 60(58) | 31.75(32) | 12.7(14.4) | 8 | 50 | 32(30) | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 125R/L-T08 | 12 | 125 | 8 | 30 | 60(58) | 31.75(32) | 12.7(14.4) | 8 | 50 | 32(30) | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 125R/L-T09 | 12 | 125 | 9 | 30 | 60(58) | 31.75(32) | 12.7(14.4) | 8 | 50 | 32(30) | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 125R/L-T10 | 12 | 125 | 10 | 30 | 60(58) | 31.75(32) | 12.7(14.4) | 8 | 50 | 32(30) | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 160R/L-T04 | 16 | 160 | 4 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 160R/L-T05 | 16 | 160 | 5 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 160R/L-T06 | 16 | 160 | 6 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 160R/L-T07 | 16 | 160 | 7 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 160R/L-T08 | 16 | 160 | 8 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 160R/L-T09 | 16 | 160 | 9 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 160R/L-T10 | 16 | 160 | 10 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 160R/L-T11 | 16 | 160 | 11 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT1206R/L-WX | PTKA0409F | TW15S |
| 160R/L-T12 | 16 | 160 | 12 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT12065R/L-WX | PTKA0410F | TW15S |
| 160R/L-T13 | 16 | 160 | 13 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT1207R/L-WX | PTKA0411F | TW15S |
| 160R/L-T14 | 16 | 160 | 14 | 43 | 80(70) | 38.1(40) | 15.9(16.4) | 10(9) | 60 | 38(32) | SNHT12075R/L-WX | PTKA0412F | TW15S |
| 200R/L-T06 | 18 | 200 | 6 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 200R/L-T07 | 18 | 200 | 7 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 200R/L-T08 | 18 | 200 | 8 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 200R/L-T09 | 18 | 200 | 9 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 200R/L-T10 | 18 | 200 | 10 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 200R/L-T11 | 18 | 200 | 11 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT1206R/L-WX | PTKA0409F | TW15S |
| 200R/L-T12 | 18 | 200 | 12 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT12065R/L-WX | PTKA0410F | TW15S |
| 200R/L-T13 | 18 | 200 | 13 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT1207R/L-WX | PTKA0411F | TW15S |
| 200R/L-T14 | 18 | 200 | 14 | 53 | 90 | 38.1(40) | 15.9(16.4) | 10(9) | 65 | 38(32) | SNHT12075R/L-WX | PTKA0412F | TW15S |
| 250R/L-T06 | 20 | 250 | 6 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 250R/L-T07 | 20 | 250 | 7 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 250R/L-T08 | 20 | 250 | 8 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 250R/L-T09 | 20 | 250 | 9 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 250R/L-T10 | 20 | 250 | 10 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 250R/L-T11 | 20 | 250 | 11 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT1206R/L-WX | PTKA0409F | TW15S |
| 250R/L-T12 | 20 | 250 | 12 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT12065R/L-WX | PTKA0410F | TW15S |
| 250R/L-T13 | 20 | 250 | 13 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT1207R/L-WX | PTKA0411F | TW15S |
| 250R/L-T14 | 20 | 250 | 14 | 73(78) | 100(90) | 50.8(40) | 19.1(16.4) | 11(9) | 65 | 38(32) | SNHT12075R/L-WX | PTKA0412F | TW15S |

• () Metric Size



WFSP(M) - Plane type *New*



- AR : -2°
- RR : -12°

(mm)

| Designation | | øD | W | T-MAX | øD ₂ | ød | a | b | E | Insert | Screw | Wrench |
|-----------------|----|-----|----|-------|-----------------|-----------|----------|------------|----|-----------------|-----------|--------|
| WFSP(M) 080-T04 | 8 | 80 | 4 | 20 | 40 | 25.4(27) | 6.35(7) | 28(29.8) | 8 | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 080-T05 | 8 | 80 | 5 | 20 | 40 | 25.4(27) | 6.35(7) | 28(29.8) | 8 | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 080-T06 | 8 | 80 | 6 | 20 | 40 | 25.4(27) | 6.35(7) | 28(29.8) | 8 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 100-T04 | 10 | 100 | 4 | 24 | 47 | 31.75(32) | 7.92(8) | 35.2(34.8) | 8 | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 100-T05 | 10 | 100 | 5 | 24 | 47 | 31.75(32) | 7.92(8) | 35.2(34.8) | 8 | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 100-T06 | 10 | 100 | 6 | 24 | 47 | 31.75(32) | 7.92(8) | 35.2(34.8) | 8 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 100-T07 | 10 | 100 | 7 | 24 | 47 | 31.75(32) | 7.92(8) | 35.2(34.8) | 10 | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 100-T08 | 10 | 100 | 8 | 24 | 47 | 31.75(32) | 7.92(8) | 35.2(34.8) | 10 | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 100-T09 | 10 | 100 | 9 | 24 | 47 | 31.75(32) | 7.92(8) | 35.2(34.8) | 12 | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 100-T10 | 10 | 100 | 10 | 24 | 47 | 31.75(32) | 7.92(8) | 35.2(34.8) | 12 | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 125-T04 | 12 | 125 | 4 | 32 | 56 | 38.1(40) | 9.52(10) | 42.3(43.5) | 8 | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 125-T05 | 12 | 125 | 5 | 32 | 56 | 38.1(40) | 9.52(10) | 42.3(43.5) | 8 | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 125-T06 | 12 | 125 | 6 | 32 | 56 | 38.1(40) | 9.52(10) | 42.3(43.5) | 8 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 125-T07 | 12 | 125 | 7 | 32 | 56 | 38.1(40) | 9.52(10) | 42.3(43.5) | 10 | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 125-T08 | 12 | 125 | 8 | 32 | 56 | 38.1(40) | 9.52(10) | 42.3(43.5) | 10 | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 125-T09 | 12 | 125 | 9 | 32 | 56 | 38.1(40) | 9.52(10) | 42.3(43.5) | 12 | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 125-T10 | 12 | 125 | 10 | 32 | 56 | 38.1(40) | 9.52(10) | 42.3(43.5) | 12 | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 160-T04 | 16 | 160 | 4 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 8 | SNHT11023R/L-WX | PTMA03503 | TW09S |
| 160-T05 | 16 | 160 | 5 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 8 | SNHT1103R/L-WX | PTMA03504 | TW09S |
| 160-T06 | 16 | 160 | 6 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 8 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 160-T07 | 16 | 160 | 7 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 10 | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 160-T08 | 16 | 160 | 8 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 10 | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 160-T09 | 16 | 160 | 9 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 12 | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 160-T10 | 16 | 160 | 10 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 12 | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 160-T11 | 16 | 160 | 11 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 14 | SNHT1206R/L-WX | PTKA0409F | TW15S |
| 160-T12 | 16 | 160 | 12 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 14 | SNHT12065R/L-WX | PTKA0410F | TW15S |
| 160-T13 | 16 | 160 | 13 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 16 | SNHT1207R/L-WX | PTKA0411F | TW15S |
| 160-T14 | 16 | 160 | 14 | 45 | 66 | 38.1(40) | 9.52(10) | 42.3(43.5) | 16 | SNHT12075R/L-WX | PTKA0412F | TW15S |
| 200-T06 | 18 | 200 | 6 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 8 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 200-T07 | 18 | 200 | 7 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 10 | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 200-T08 | 18 | 200 | 8 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 10 | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 200-T09 | 18 | 200 | 9 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 12 | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 200-T10 | 18 | 200 | 10 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 12 | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 200-T11 | 18 | 200 | 11 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 14 | SNHT1206R/L-WX | PTKA0409F | TW15S |
| 200-T12 | 18 | 200 | 12 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 14 | SNHT12065R/L-WX | PTKA0410F | TW15S |
| 200-T13 | 18 | 200 | 13 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 16 | SNHT1207R/L-WX | PTKA0411F | TW15S |
| 200-T14 | 18 | 200 | 14 | 60 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 16 | SNHT12075R/L-WX | PTKA0412F | TW15S |
| 250-T06 | 20 | 250 | 6 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 8 | SNHT12035R/L-WX | PTMA0405F | TW15S |
| 250-T07 | 20 | 250 | 7 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 10 | SNHT1204R/L-WX | PTMA0405F | TW15S |
| 250-T08 | 20 | 250 | 8 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 10 | SNHT12045R/L-WX | PTMA0406F | TW15S |
| 250-T09 | 20 | 250 | 9 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 12 | SNHT1205R/L-WX | PTMA0407F | TW15S |
| 250-T10 | 20 | 250 | 10 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 12 | SNHT12054R/L-WX | PTMA0408F | TW15S |
| 250-T11 | 20 | 250 | 11 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 14 | SNHT1206R/L-WX | PTKA0409F | TW15S |
| 250-T12 | 20 | 250 | 12 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 14 | SNHT12065R/L-WX | PTKA0410F | TW15S |
| 250-T13 | 20 | 250 | 13 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 16 | SNHT1207R/L-WX | PTKA0411F | TW15S |
| 250-T14 | 20 | 250 | 14 | 88 | 70 | 50.8(50) | 12.7(12) | 55.8(53.5) | 16 | SNHT12075R/L-WX | PTKA0412F | TW15S |

() Metric Size



Milling

E

High feed cutter with extra pitch for cast iron and light alloy steels

High feed Cutter



- High feed cutter employs extra pitch for cast iron and light alloy steels
- Quick change type for reduction of cutter change time
- Cutting edge chatter is controlled
- Quick change type for cutter size under $\phi 160$, 2piece types for cutter size over $\phi 200$

🎯 Guide of insert setting

▶ Special equipment has to be used to get precise run out with high feed cutter.

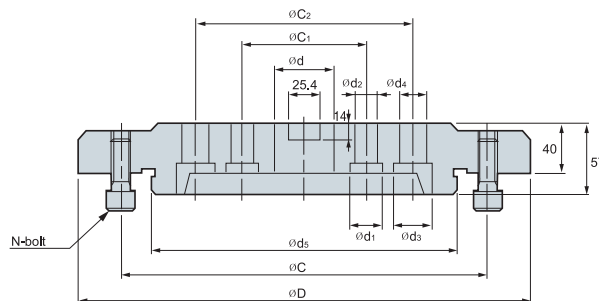
| Adaptor type | Roller type | Plate type |
|---|--|--|
| | | |
| <ul style="list-style-type: none"> - Mainly under $\phi 160$ diameter is used in 1piece type - Available for fixed size of cutter and assembling & checking can be done at the same time | <ul style="list-style-type: none"> - Mainly over $\phi 200$ diameter is used in 2piece type - Due to 3 adjustable guide roller, variety size of cutter can be assembled | <ul style="list-style-type: none"> - Suitable for small size cutter due to the simple structure - It is unnecessary to unclamp the cutter from the machine, it's possible to reassemble the cutter as it mounted on the machine - You should make plate by yourself |

Guide of insert setting in adaptor/roller type

1. Clean the cutter and equipment
2. Pointer should be assembled with same height with cutter
3. Move to each insert on tip seat to end of pointer and tighten(torque 2N.m) wedge.
4. Exchange pointer to dial gauge
5. Measure the run-out totally
6. When a insert over run-out, loosen wedge and adjust run-out. (for roughing 10~20 μ , for finishing 5~10 μ)
7. Tighten(torque 7-8N.m) wedge
8. Measure the final run-out by dial gauge

Notice) When you clamp wedge too tighten, run-out is getting worse to cutter distortion
When you clamp wedge, you should use torque wrench to set more precisely

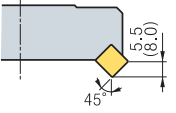
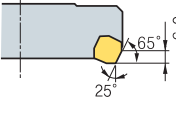
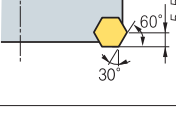
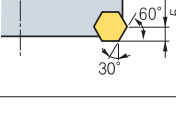

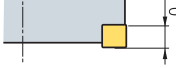
🎯 Adaptor($\phi 200$ - $\phi 450$)



| Designation | ϕD | ϕd | ϕd_1 | ϕd_2 | ϕd_3 | ϕd_4 | ϕd_5 | ϕC | ϕC_1 | ϕC_2 | N | Cutter |
|-------------|----------|----------|------------|------------|------------|------------|------------|----------|------------|------------|---|------------|
| APR 200 | 180 | 47.625 | 26 | 18 | - | - | 80 | 120 | 101.6 | - | 4 | $\phi 200$ |
| 250 | 230 | 47.625 | 26 | 18 | - | - | 120 | 170 | 101.6 | - | 4 | $\phi 250$ |
| 315 | 295 | 47.625 | 26 | 18 | 32 | 22 | 180 | 230 | 101.6 | 177.8 | 6 | $\phi 315$ |
| 355 | 335 | 63.50 | 26 | 18 | 32 | 22 | 220 | 270 | 101.6 | 177.8 | 6 | $\phi 355$ |
| 400 | 370 | 63.50 | 26 | 18 | 32 | 22 | 250 | 300 | 101.6 | 177.8 | 8 | $\phi 400$ |
| 450 | 420 | 63.50 | 26 | 18 | 32 | 22 | 300 | 350 | 101.6 | 177.8 | 8 | $\phi 450$ |



High feed cutters type and features

| Designation | Cutter diameter | Workpiece, Application range | Min. surface roughness | Approach angle and Max. cutting depth is for 5000 type | Axial rake angle | Radial rake angle | Available insert |
|--------------------|-----------------|------------------------------------|------------------------|---|------------------|-------------------|-----------------------------|
| ANH4000 ANH5000 | Ø100~Ø450 | Cast iron Roughing | 25Z |  | -5° | -6° | SNCN1204ENN SNCN1504ENN |
| CDH4000 CDH5000 | Ø100~Ø450 | Cast iron Roughing Finishing | 18Z |  | +10° | +5° | SDCN42R SDCN53R |
| DEH5000 | Ø100~Ø450 | Al alloy Roughing | 20Z |  | +14° | +6° | HECN090408FN |
| DPH5000 | Ø100~Ø450 | Cast iron Roughing Finishing | 12Z |  | +5° | -3° | HPEN090408 HPEN090408-WC |
| PNH4000 PNH5000 | Ø125~Ø450 | Cast iron Finishing | 12Z |  | -5° | -6° | SNEF435 SNEF535 |
| PPH4000 | Ø125~Ø450 | Cast iron Finishing | 12Z |  | +5° | -5° | SPEN120416-WC |

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades | Remark |
|-----------|-------------------|-----------|---------|------------|
| | vc(m/min) | fz(mm/t) | | |
| Cast iron | 100~230 | 0.05~0.20 | PC6510 | PVD Coated |
| | 80~150 | 0.05~0.20 | H01,G10 | Uncoated |
| Al alloy | 400 | 0.10~0.30 | PC6510 | PVD Coated |
| | 400 | 0.05~0.20 | H01,G10 | Uncoated |



Excellent tool life achieved by the wide variety of grades to match work conditions

Storm Mill

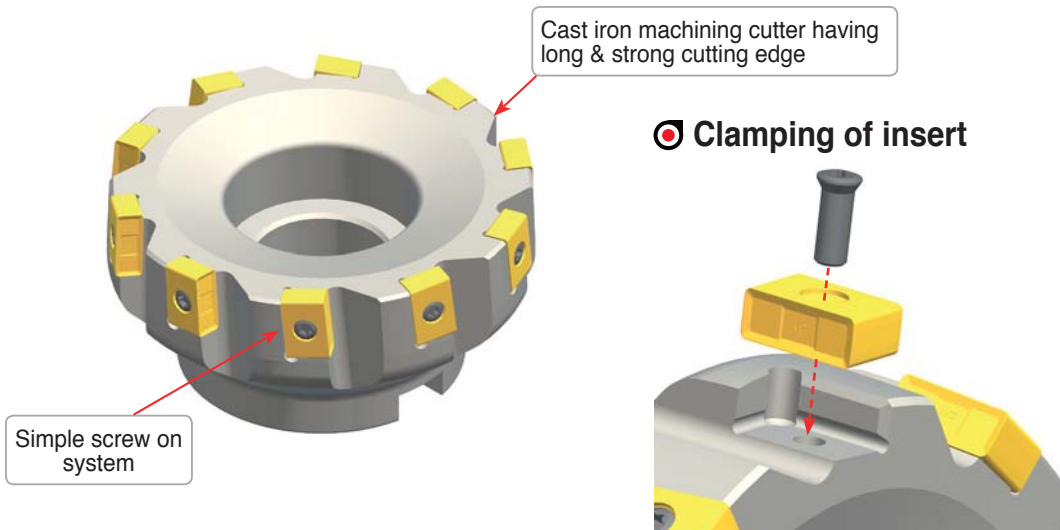
- Conventional cutter with wide coverage
- Using 4 corners (Maximum 8 corner available with R/L type cutter)
- Effective on large depth of cut applications due to the long cutting edge
- Excellent tool life guaranteed by wide variety of grades to suit any working conditions
- 2 different types of inserts(chamfer / nose R) are available with 1 type of cutter



Code System

| | | | | | | | |
|----------------|--|-------------------------------|---------------------------|--------------------|-----------------------|---|---------------------|
| S | Q | N | 3 | 250 | R | (2) | - 28Z |
| Cutter | Approach angle | Relief angle of insert | Insert | Cutter Dia. | Hand | Cutter shape | No. of tooth |
| S : Storm Mill | Q : 88° F : 85° A : 45° E : 75° | N : Negative (0°) | 3 : 9.525mm 4 : 12.7mm | MM | R : Right L : Left | No code : Normal type 2 : Quick change type (2 pieces type) | |

Cutter



Recommended cutting condition

| Grades \ Designation | Gray cast iron | | Ductile cast iron | |
|----------------------|----------------|-----------|-------------------|-----------|
| | GC | | GCD | |
| | vc(m/min) | fz(mm/t) | vc(m/min) | fz(mm/t) |
| PC3500 | 150~250 | 0.08~0.28 | 100~180 | 0.08~0.28 |
| PC6510 | 150~300 | 0.10~0.28 | 100~200 | 0.10~0.28 |
| PC3545 | 150~250 | 0.08~0.22 | 100~180 | 0.08~0.22 |
| H01 | 100~200 | 0.08~0.22 | 70~140 | 0.08~0.22 |
| G10 | 90~120 | 0.08~0.28 | 60~130 | 0.08~0.28 |

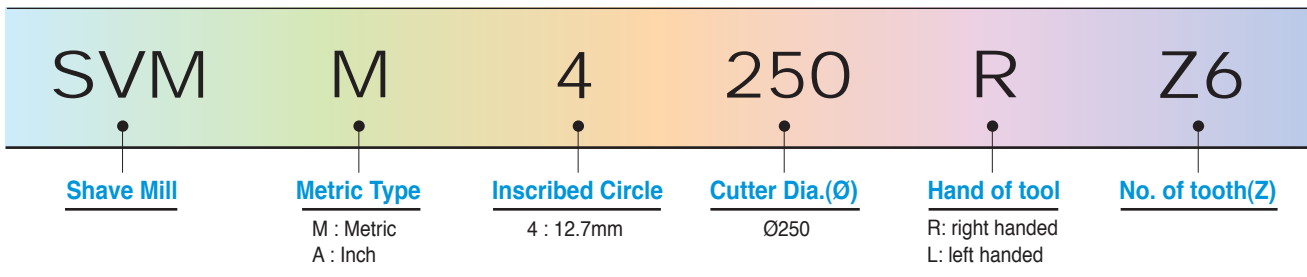


Optimal cutter for steel and cast iron machining with easily adjustable run-out

Shave Mill

- Adjustable Range (Adjustable range: 0.1mm, Adjustable allowance: within 2 μ m)
- Wiper crown type 8-cornered insert reduces machining cost and realizes excellent surface roughness
- Grade with high toughness and wear resistance ensures long tool life
- The cBN grade achieves superior surface finish

🎯 Cutter Code System



🎯 Insert Code System

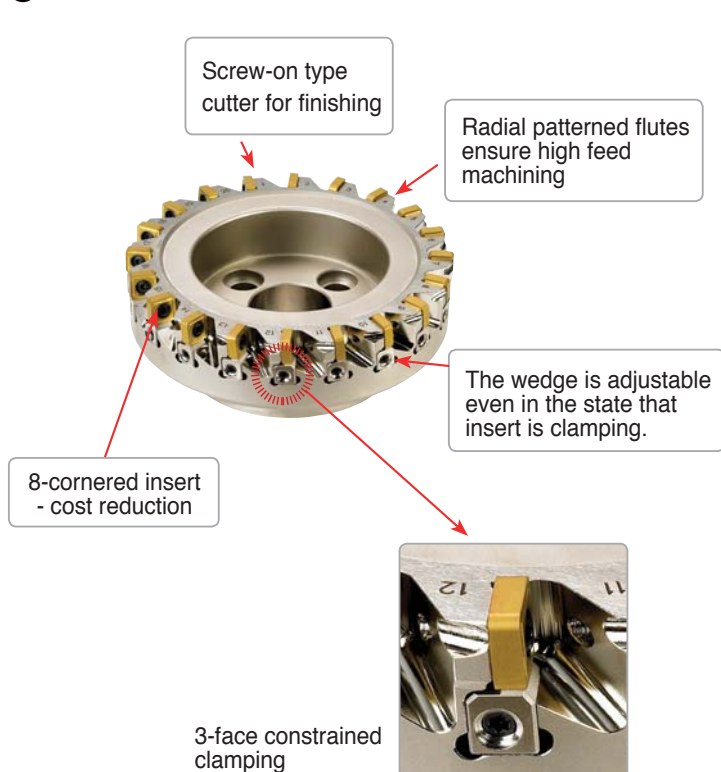
■ Carbide

| | |
|------------------|----------------|
| Nose R type | SNEU120420-MF |
| Chamfer type | SNEU1204ANN-MF |
| Low cutting type | SNEU1204-WMF |

■ cBN

| |
|--------------------------------------|
| SNEU1204-TBW |
| T : Nagaland B : cBN W : Wiper |

🎯 Features

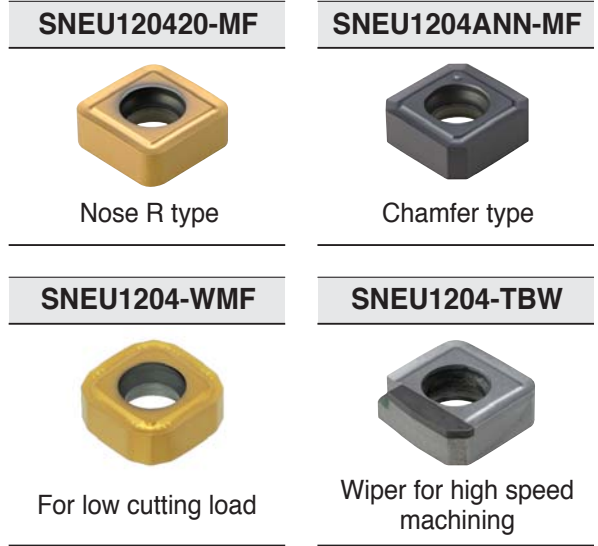
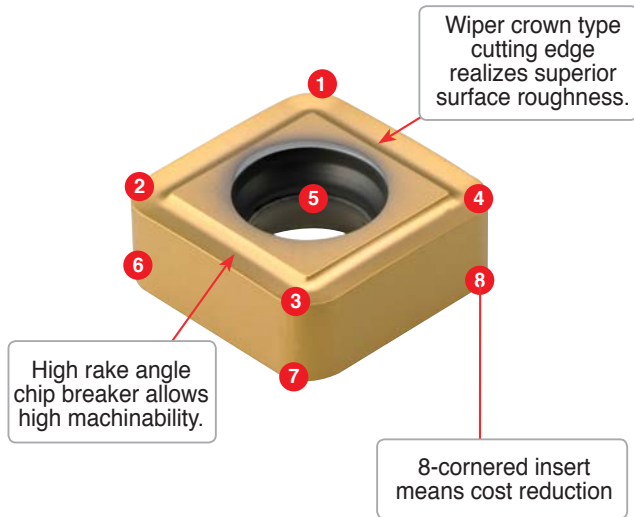


🎯 Adjustment

- Adjustable range: 0.1mm
- Adjustability: below 2 μ
- Operation: easy and simple



Features of insert



Recommended cutting conditions

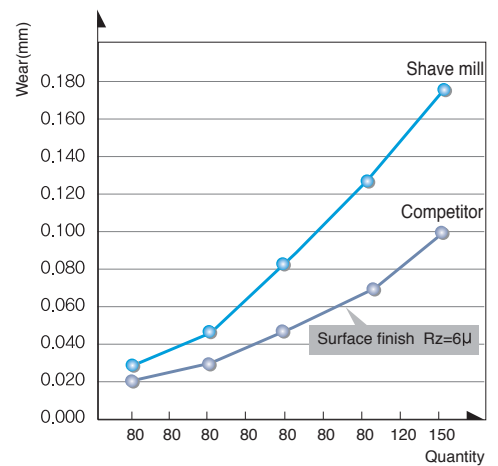
| Workpiece | Cutting conditions | | | Grade |
|-----------|--------------------|------------|--------|--------|
| | vc(m/min) | fz(mm/t) | ap(mm) | |
| P | 150~250 | 0.05 ~ 0.2 | ~ 0.5 | PC3500 |
| K | 150~300 | 0.05 ~ 0.3 | ~ 0.5 | PC6510 |
| | 600~1000 | 0.05 ~ 0.2 | ~ 0.5 | DBN920 |

Application example 1

- Work piece : Cylinder head (facing)
- Cutting conditions : vc=200, fz=0.15, ap=0.5, Dry
- Tools : Shave Mill - SVM4250R
Insert - PC6510 SNEU120420-MF

Application example 2

- Work piece : FC25(HB250) Cylinder head (facing)
- Cutting conditions : vc=700, fz=0.1, ap=0.5, Dry
- Tools : Shave Mill - SVM4160R
Insert - DBN920 SNEU1204-cBN



Results

| | Tool life | Surface finish | Machinability |
|------------|-----------|----------------|---------------|
| Shave mill | 250pcs | Rz=3 μ | High |
| Competitor | 180pcs | Rz=3.5 μ | Normal |

▶ Korloy's shave mills ensure twice the machinability, adjustability, and surface roughness than competitor's, along with twice the tool life.

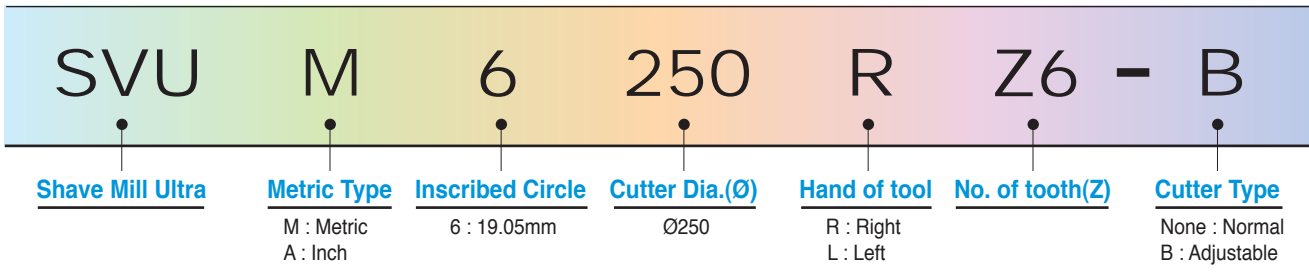


Better tool life with special grade which has both toughness and wear resistance

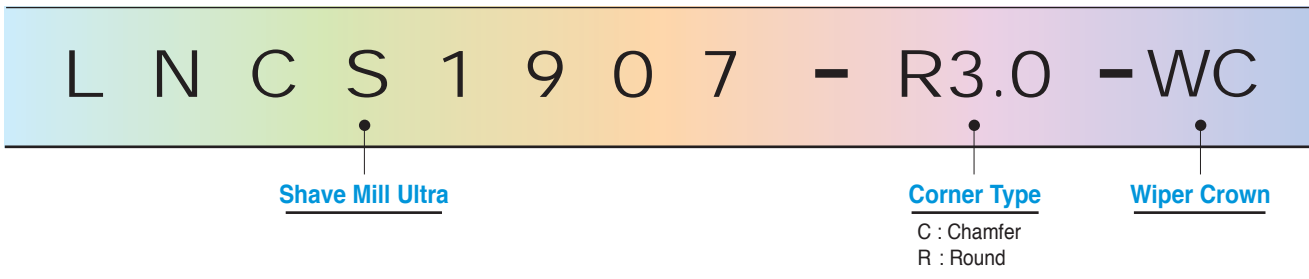
Shave Mill Ultra

- Superior surface roughness for this Finishing cutter when applied to heavy work pieces
- Easy to handle and good rigidity with simple screw on system
- Superior surface finishes due to the wiper crown cutting edge
- Better tool life with special grade which has both toughness and wear resistance
- Two different types: economical normal type and adjustable run-out type 'B'

Cutter Code System




Insert Code System

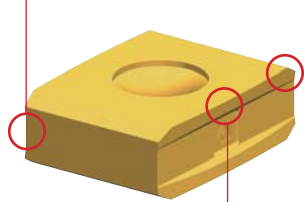


Features

Normal type




- Good rigidity and economical due to simple screw on type
- Better surface roughness when you use only 1 insert but adjust the 'ap' under 0.03mm



- Good cutting performance & chip flow due to positive rake angle chip breaker
- Economical 4 corner use insert
- Good surface roughness by wiper crown cutting edge design

Adjustable cutting edge(Type B)



- Easy to handle the run-out due to Korloy exclusive high toughness cutting edge special parts

Adjustable Range

- Range : 1.0mm
- Allowance : Within 2µ

Recommended cutting condition

| Workpiece | Cutting Condition | | | Tooth | Grade |
|-----------|-------------------|-----------|--------|----------|--------|
| | vc(m/min) | fz(mm/t) | ap(mm) | | |
| P | 150~250 | 0.05~0.20 | ~0.50 | Full use | PC3500 |
| | 150~250 | 2~5 | ~0.03 | 1use | |
| K | 150~300 | 0.05~0.20 | ~0.50 | Full use | PC6510 |
| | 150~300 | 2~5 | ~0.03 | 1use | |



Special Korloy cutter for cast iron roughing

Cube Mill

- Special Korloy cutter for cast iron roughing
- 8 corner using insert (maximum 16 corner available with 2 cutter, R/L cutter)
- Excellent cutting performance with positive rake angle made by 3 dimensional chip breaker
- Excellent tool life by combination of the variety of grades and chip breakers to match most working conditions
- 2 different type of inserts(chamfer / nose R) are available with 1 type cutter



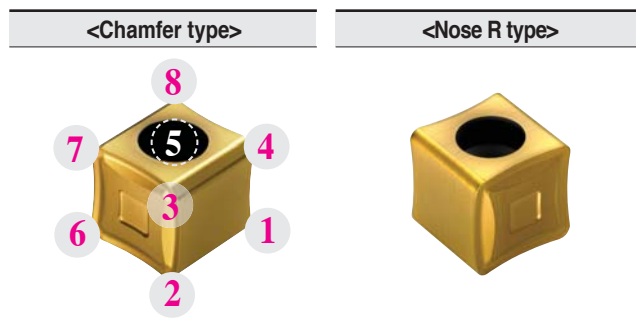
Roughing for cast iron

Code System

| | | | | | | |
|-----------------|---|-----------------------------------|-------------------|-----------------------|--|------------------------|
| CBM | E | 3 | 250 | R | (2) - | 28Z |
| Cutter | AA | Inscribed circle of Insert | Cutter Dia | Hand | Cutter shape | No. of tooth(Z) |
| CBM : CUBE MILL | Q : 88° C : 65° F : 85° A : 45° E : 75° | 3 : 9.525 4 : 12.7 | Ø250 | R : Right L : Left | Unmarked : Normal type 2 : Quick change type (2 pieces type) | |

Cube Mill and Cube Mill Couple are available by order made.

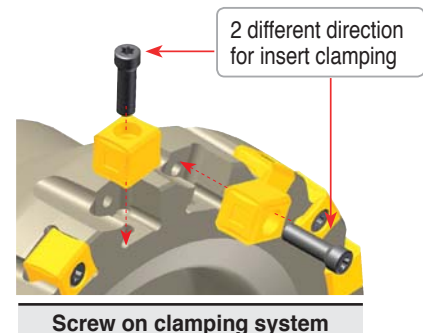
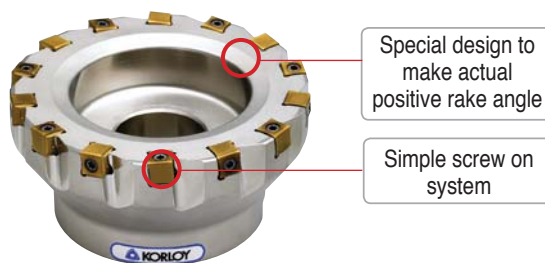
Insert (R/L type)



Cutter body

| | General | Quick change |
|------------------------------|-------------------|--------------|
| Cutter diameter(Ø) | Ø80~315 mm | Ø200~450 mm |
| | 3 1/4~12 1/2 Inch | 8~18 Inch |
| AA : 88°, 85°, 75°, 65°, 45° | | |

Cutter



Parts

| | Screw | Wrench |
|---------------------------|-------------|------------|
| Cube mill 3000 | | |
| | FTGA0417CBM | TW15 - 100 |
| | ETGA0520CBM | TW20 - 100 |



Ideal combination of Aluminum body with cast iron high feed cutter

Couple Mill

- Ideal combination of Aluminum body with cast iron high feed cutter
- Since the weight of the cutter has been reduced 50% of a steel cutter it is very easy to handle and very effective in preventing loading accidents
- Applicable for Cube Mill, Storm Mill

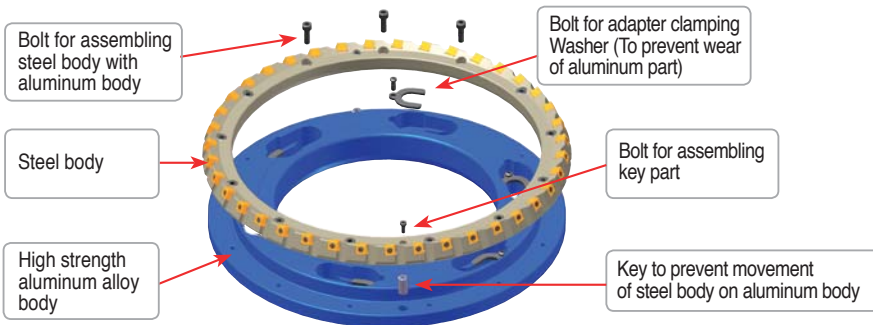
☑ CUBE-COUPLE Code system

| | | | | | | |
|-----------------|---|-----------------------------------|-------------------|-----------------------|------------------------|--------------------|
| CBM | E | 3 | 355 | R | 28Z | - CP |
| Cutter | AA | Inscribed circle of Insert | Cutter Dia | Hand | No. of tooth(Z) | Couple Mill |
| CBM : CUBE MILL | Q : 88° C : 65° F : 85° A : 45° E : 75° | 3 : 9.525 4 : 12.7 | Ø355 | R : Right L : Left | 28Z : 28 | |

☑ STORM-COUPLE Code system

| | | | | | | | |
|----------------|--|-------------------------------|-----------------------------------|-------------------|-----------------------|------------------------|--------------------|
| S | Q | N | 3 | 355 | R | 28Z | - CP |
| Cutter | AA | Relief angle of insert | Inscribed circle of Insert | Cutter Dia | Hand | No. of tooth(Z) | Couple Mill |
| S : STORM MILL | Q : 88° E : 75° F : 85° A : 45° | N : Negative(0°) | 3 : 9.525 4 : 12.7 | Ø355 | R : Right L : Left | 28Z : 28 | |

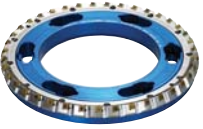





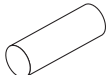
☑ Assembling structure



☑ Cutter body

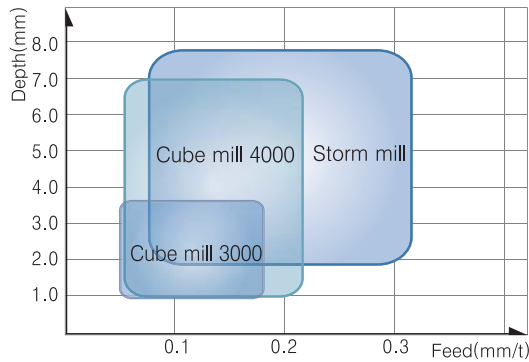
| Cutter diameter(Ø) | Quick change | |
|--------------------|----------------|------------|
| | Metric | Ø355~450mm |
| Inch | 14 1/4~18 Inch | |

☑ Parts

| | Screw | Wrench | Wrench | Bolt for body | Bolt for key | Key for body |
|---|---|---|---|--|---|---|
|  |  |  |  |  |  |  |
| CUBE-COUPLE 3000 Type | FTGA0417CBM | TW15-100 | - | BHA0616 | MHBO410 | PN1019-DRV |
| 4000 Type | ETGA0520CBM | TW20-100 | - | BHA0620 | - | - |
| STORM-COUPLE 3000Type | FTNA0513 | - | TW15S | - | - | - |



Application range of High feed Cutters for Cast iron



Recommended cutting condition

| CUBE MILL | | Gray cast iron | | Ductile cast iron | |
|-----------|--------|----------------|-------------|-------------------|-------------|
| | | vc (m/min) | fz (mm/t) | vc (m/min) | fz (mm/t) |
| PVD | PC6510 | 150 ~ 300 | 0.08 ~ 0.18 | 100 ~ 200 | 0.08 ~ 0.18 |
| | PC215K | 120 ~ 210 | 0.05 ~ 0.18 | 80 ~ 150 | 0.05 ~ 0.18 |
| Uncoated | G10 | 90 ~ 120 | 0.05 ~ 0.18 | 60 ~ 130 | 0.05 ~ 0.18 |

Available Arbors and Adaptors

| Designation | | Available Arbors and Adaptors | | |
|-------------|---------------|-------------------------------|------------------------------------|---------|
| | | Arbors | General Arbor | Adaptor |
| CBMQ | 3080R/L -00Z | BT□□-FMA25.4-□□ | NT*□□(M/U)-FMA25.4-25 | |
| (CBMF) | 3100R/L -00Z | BT□□-FMA31.75-□□ | NT*□□(M/U)-FMA31.75-□□ | |
| (CBME) | 3125R/L -00Z | BT□□-FMA38.1-□□ | NT*□□(M/U)-FMA38.1-□□ | |
| (CBMC) | 3160R/L -00Z | BT□□-FMA50.8-□□ | NT*□□(M/U)-FMA50.8-□□ | |
| (CBMA) | 3200R/L -00Z | BT□□-FMA47.625-□□ | NT*□□(M/U)-FMA47.625-25, KCP-8*** | |
| | 3250R/L -00Z | BT□□-FMA47.625-□□ | KNT*□□(M/U)-FMA47.625-25, KCP-8*** | |
| | 3315R/L -00Z | | KCP-8*** (Centering Plug) | |
| | 3200R/L2 -00Z | | | APR200 |
| | 3250R/L2 -00Z | | | APR250 |
| | 3315R/L2 -00Z | | | APR315 |
| | 3355R/L2 -00Z | | | APR355 |
| | 3400R/L2 -00Z | | | APR400 |
| | 3450R/L2 -00Z | | | APR450 |
| SQN | 3080R/L -00Z | BT□□-FMA25.4-□□ | NT*□□(M/U)-FMA25.4-25 | |
| (SFN) | 3100R/L -00Z | BT□□-FMA31.75-□□ | NT*□□(M/U)-FMA31.75-□□ | |
| (SEN) | 3125R/L -00Z | BT□□-FMA38.1-□□ | NT*□□(M/U)-FMA38.1-□□ | |
| (SAN) | 3160R/L -00Z | BT□□-FMA50.8-□□ | NT*□□(M/U)-FMA50.8-□□ | |
| | 3200R/L -00Z | BT□□-FMA47.625-□□ | NT*□□(M/U)-FMA47.625-25, KCP-8*** | |
| | 3250R/L -00Z | BT□□-FMA47.625-□□ | NT*□□(M/U)-FMA47.625-25, KCP-8*** | |
| | 3315R/L -00Z | | KCP-8*** (Centering Plug) | |
| | 3200R/L2 -00Z | | | APR200 |
| | 3250R/L2 -00Z | | | APR250 |
| | 3315R/L2 -00Z | | | APR315 |
| | 3355R/L2 -00Z | | | APR355 |
| | 3400R/L2 -00Z | | | APR400 |
| | 3450R/L2 -00Z | | | APR450 |

*□□-NT number / **□□-BT number / ***Milling over 5
 (Arbors **add)
 ex) BT**□□



ANH4000

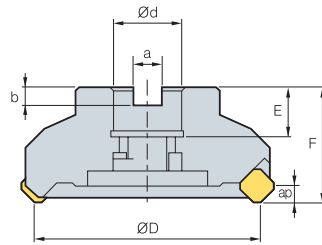


Fig. 1

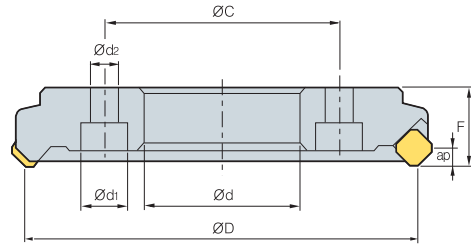


Fig. 2



AA
45°
• AR : 5°
• RR : -6°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | | Fig. |
|-------------|----|----------|----------|------------|------------|------|----|----|----|----------|-----|------|------|
| ANH 4100R/L | 8 | 100 | 31.75 | - | - | 12.7 | 8 | 22 | 50 | - | 5.5 | 2.5 | 1 |
| 4125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | 5.5 | 4.7 | 1 |
| 4160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | 5.5 | 7.3 | 1 |
| 4200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | 5.5 | 7 | 2 |
| 4250R/L | 24 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | 5.5 | 9.6 | 2 |
| 4315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | 5.5 | 12.9 | 2 |
| 4355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | 5.5 | 15.5 | 2 |
| 4400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | 5.5 | 18.8 | 2 |
| 4450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | 5.5 | 22.2 | 2 |

Available Inserts

SNCN

SNKN



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | Page | |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | | ST20 |
| SNCN 1204ENN | ● | | | | | | | | | | | | | | ● | ● | ● | E17 |
| SNKN 1204ENN | | | | | | | | ● | | | | | | | | | | E19 |

Available Arbors

| Designation | Arbors | |
|-------------|-------------------------|--------|
| ANH 100R/L | NT*□□ (M/U)-FMA31.75-□□ | - |
| 125R/L | NT*□□ (M/U)-FMA38.1-□□ | - |
| 160R/L | NT*□□ (M/U)-FMA50.8-□□ | - |
| 200R/L | - | APR200 |
| 250R/L | - | APR250 |
| 315R/L | - | APR315 |
| 355R/L | - | APR355 |
| 400R/L | - | APR400 |
| 450R/L | - | APR450 |

Recommended cutting condition

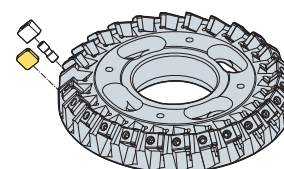
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts



WANH4N DHA0821F HW40

Assembling



ANH5000

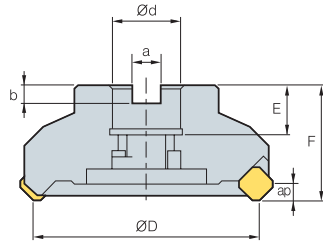


Fig. 1

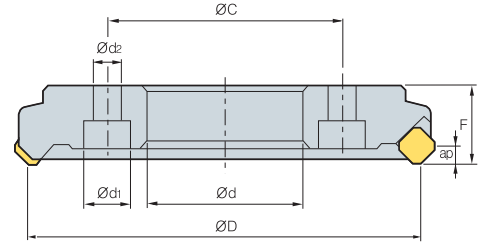


Fig. 2



AA
45°

• AR : 5°
• RR : -6°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | | Fig. |
|-------------|----|----------|----------|------------|------------|------|----|----|----|----------|----|------|------|
| ANH 5100R/L | 8 | 100 | 31.75 | - | - | 12.7 | 8 | 22 | 50 | - | 8 | 2.6 | 1 |
| 5125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | 8 | 5 | 1 |
| 5160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | 8 | 7.5 | 1 |
| 5200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | 8 | 7 | 2 |
| 5250R/L | 24 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | 8 | 9.6 | 2 |
| 5315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | 8 | 12.9 | 2 |
| 5355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | 8 | 15.5 | 2 |
| 5400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | 8 | 18.8 | 2 |
| 5450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | 8 | 22.2 | 2 |

Available Inserts

SNCN



SNKN



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| SNCN 1504ENN | | | | | | | | | | | | | | | | | | E17 |
| SNKN 1504ENN | ● | | | | | | | | | | | | | | | | | E19 |

Available Arbors

| Designation | Arbors |
|-------------|------------------------|
| ANH 100R/L | NT*□□(M/U)-FMA31.75-□□ |
| 125R/L | NT*□□(M/U)-FMA38.1-□□ |
| 160R/L | NT*□□(M/U)-FMA50.8-□□ |
| 200R/L | - APR200 |
| 250R/L | - APR250 |
| 315R/L | - APR315 |
| 355R/L | - APR355 |
| 400R/L | - APR400 |
| 450R/L | - APR450 |

Recommended cutting condition

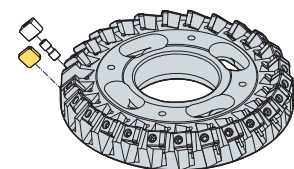
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts



WANH5N DHA0821F HW40

Assembling



CDH4000

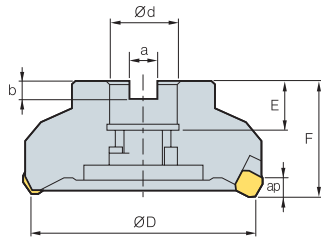


Fig. 1

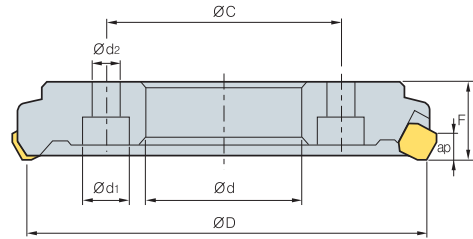


Fig. 2



AA
65°
• AR : 10°
• RR : 5°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | | Fig. |
|-------------|----|----------|----------|------------|------------|------|----|----|----|----------|----|------|------|
| CDH 4100R/L | 8 | 100 | 31.75 | - | - | 12.7 | 8 | 22 | 50 | - | 6 | 2.3 | 1 |
| 4125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | 6 | 4.4 | 1 |
| 4160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | 6 | 6.8 | 1 |
| 4200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | 6 | 6.7 | 2 |
| 4250R/L | 24 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | 6 | 9.1 | 2 |
| 4315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | 6 | 12.3 | 2 |
| 4355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | 6 | 14.8 | 2 |
| 4400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | 6 | 18.1 | 2 |
| 4450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | 6 | 21.3 | 2 |

Available Inserts

SDCN



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | Page | | | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A | ST20 |
| SDCN 42R 42L | | | | | | | | | | | | | | ● | | | | E13 |

Available Arbors

| Designation | Arbors | |
|-------------|------------------------|--------|
| CDH 100R/L | NT*□□(M/U)-FMA31.75-□□ | - |
| 125R/L | NT*□□(M/U)-FMA38.1-□□ | - |
| 160R/L | NT*□□(M/U)-FMA50.8-□□ | - |
| 200R/L | - | APR200 |
| 250R/L | - | APR250 |
| 315R/L | - | APR315 |
| 355R/L | - | APR355 |
| 400R/L | - | APR400 |
| 450R/L | - | APR450 |

Recommended cutting condition

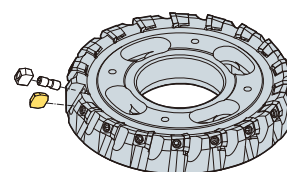
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts



| | | | |
|-----------|-----------|----------|------|
| ∅100-∅160 | WCDH4R1L1 | DHA0821F | HW40 |
| ∅200-∅450 | WCDH4R/L | | |

Assembling



CDH5000

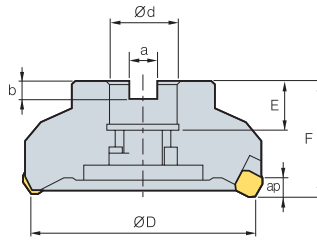


Fig. 1

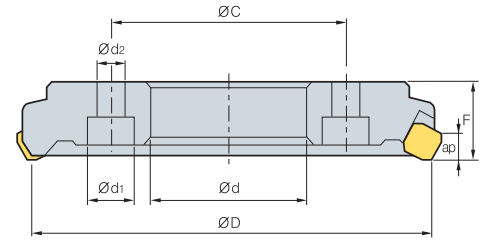


Fig. 2



AA
65°

• AR : 10°
• RR : 5°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | | Fig. |
|-------------|----|----------|----------|------------|------------|------|----|----|----|----------|----|------|------|
| CDH 5100R/L | 08 | 100 | 31.75 | - | - | 12.7 | 8 | 22 | 50 | - | 7 | 2.3 | 1 |
| 5125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | 7 | 4.4 | 1 |
| 5160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | 7 | 6.8 | 1 |
| 5200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | 7 | 6.6 | 2 |
| 5250R/L | 24 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | 7 | 9.1 | 2 |
| 5315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | 7 | 12.2 | 2 |
| 5355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | 7 | 14.7 | 2 |
| 5400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | 7 | 18 | 2 |
| 5450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | 7 | 21.2 | 2 |

Available Inserts

SDCN



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | Page | | |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SDCN 53R 53L | | | | | | | | | | | | | | | | | | E12 |

Available Arbors

| Designation | Arbors | |
|-------------|------------------------|--------|
| CDH 100R/L | NT*□□(M/U)-FMA31.75-□□ | - |
| 125R/L | NT*□□(M/U)-FMA38.1-□□ | - |
| 160R/L | NT*□□(M/U)-FMA50.8-□□ | - |
| 200R/L | - | APR200 |
| 250R/L | - | APR250 |
| 315R/L | - | APR315 |
| 355R/L | - | APR355 |
| 400R/L | - | APR400 |
| 450R/L | - | APR450 |

Recommended cutting condition

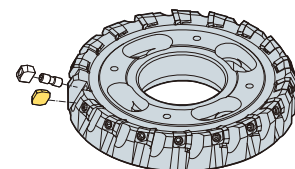
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts



| | | | |
|-----------|-----------|----------|------|
| ∅100-∅160 | WCDH5R1L1 | DHA0821F | HW40 |
| ∅200-∅450 | WCDH5R/L | | |

Assembling



DEH5000

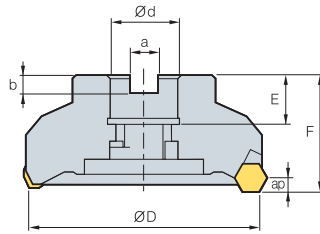


Fig. 1

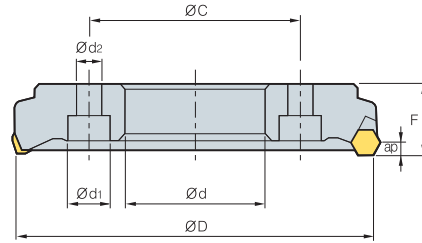


Fig. 2



AA
60°

• AR : 14°
• RR : 6°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | | Fig. |
|-------------|----|----------|----------|------------|------------|------|----|----|----|----------|----|------|------|
| DEH 5100R/L | 6 | 100 | 31.75 | - | - | 12.7 | 8 | 22 | 50 | - | 7 | 2.3 | 1 |
| 5125R/L | 7 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | 7 | 4.4 | 1 |
| 5160R/L | 8 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | 7 | 6.3 | 1 |
| 5200R/L | 12 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | 7 | 6.5 | 2 |
| 5250R/L | 14 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | 7 | 9.1 | 2 |
| 5315R/L | 18 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | 7 | 12.1 | 2 |
| 5355R/L | 20 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | 7 | 14.8 | 2 |
| 5400R/L | 24 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | 7 | 17.8 | 2 |
| 5450R/L | 28 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | 7 | 21 | 2 |

Available Inserts

HECN



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | Page | |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| HECN 090408FN | | | | | | | | | | | | | | | | | |
| 090408SN | | | | | | | | | | | | | | | | | |
| 090408TN | | | | | | | | | | | | | | | | | |

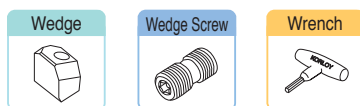
Available Arbors

| Designation | Arbors | |
|-------------|------------------------|--------|
| DEH 5100R/L | NT*□□(M/U)-FMA31.75-□□ | - |
| 5125R/L | NT*□□(M/U)-FMA38.1-□□ | - |
| 5160R/L | NT*□□(M/U)-FMA50.8-□□ | - |
| 5200R/L | - | APR200 |
| 5250R/L | - | APR250 |
| 5315R/L | - | APR315 |
| 5355R/L | - | APR355 |
| 5400R/L | - | APR400 |
| 5450R/L | - | APR450 |

Recommended cutting condition

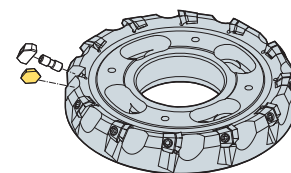
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts



| | | | |
|-----------|-------------|----------|------|
| Ø100-Ø200 | WDEHR-1/L-1 | DHA0821F | HW40 |
| Ø250-Ø450 | WDEHR/L | | |

Assembling



DPH5000

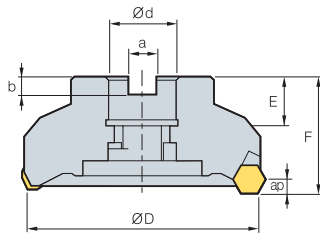


Fig. 1

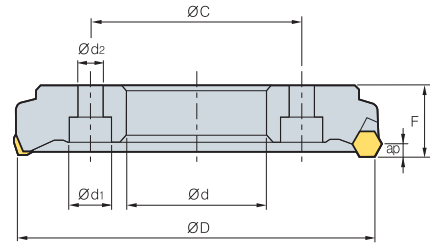


Fig. 2



AA
60°

• AR : 5°
• RR : -3°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | | Fig. |
|-------------|----|----------|----------|------------|------------|------|----|----|----|----------|----|------|------|
| DPH 5100R/L | 8 | 100 | 31.75 | - | - | 12.7 | 8 | 22 | 50 | - | 7 | 2.3 | 1 |
| 5125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | 7 | 4.4 | 1 |
| 5160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | 7 | 6.7 | 1 |
| 5200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | 7 | 6.5 | 2 |
| 5250R/L | 24 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | 7 | 9 | 2 |
| 5315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | 7 | 12 | 2 |
| 5355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | 7 | 14.5 | 2 |
| 5400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | 7 | 17.7 | 2 |
| 5450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | 7 | 21 | 2 |

Available Inserts

HPEN

HPEN-WC



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | Page | | | |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|------|-----|-----|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC3300 | PC3545 | PC3530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | | H01 | G10 | ST30A |
| HPEN 090408FN | | | | | | | | | | | | | | | | | |
| 090408SN | | | | | | | | | | | | | | | | | |
| 090408EN | | | | | | | | | | | | | | | | | |
| 090408-WC | | | | | | | | | | | | | | | | | |

E07

Available Arbors

| Designation | Arbors |
|-------------|------------------------|
| DPH 5100R/L | NT*□□(M/U)-FMA31.75-□□ |
| 5125R/L | NT*□□(M/U)-FMA38.1-□□ |
| 5160R/L | NT*□□(M/U)-FMA50.8-□□ |
| 5200R/L | - APR200 |
| 5250R/L | - APR250 |
| 5315R/L | - APR315 |
| 5355R/L | - APR355 |
| 5400R/L | - APR400 |
| 5450R/L | - APR450 |

Recommended cutting condition

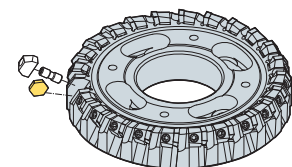
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts



WDPH5R/L DHA0821F HW40

Assembling



PNH4000/5000

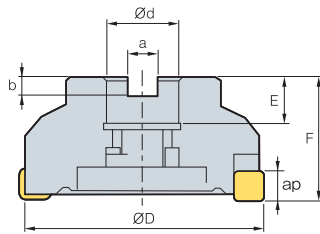


Fig. 1

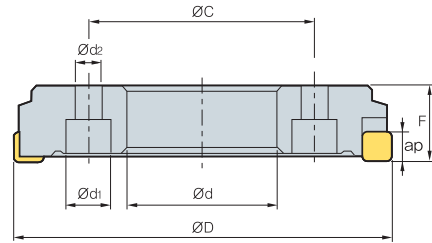


Fig. 2



AA
90°
• AR : -5°
• RR : -6°

(mm)

| Designation | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | $\frac{m}{kg}$ | Fig. | |
|-------------|---------|----------|----------|------------|------------|----|------|----|----|----------|-----|----------------|------|---|
| PNH | 4125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | Max 0.5 | 3.4 | 1 |
| | 4160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | Max 0.5 | 5.5 | 1 |
| | 4200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | Max 0.5 | 5.5 | 2 |
| | 4250R/L | 24 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | Max 0.5 | 7.7 | 2 |
| | 4315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | Max 0.5 | 10.5 | 2 |
| | 4355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | Max 0.5 | 12.9 | 2 |
| | 4400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | Max 0.5 | 16.1 | 2 |
| | 4450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | Max 0.5 | 19.1 | 2 |
| PNH | 5125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | Max 0.5 | 3.4 | 1 |
| | 5160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | Max 0.5 | 5.3 | 1 |
| | 5200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | Max 0.5 | 5.4 | 2 |
| | 5250R/L | 24 | 250 | 120 | 30 | 18 | - | - | - | 40 | 170 | Max 0.5 | 7.6 | 2 |
| | 5315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | Max 0.5 | 10.4 | 2 |
| | 5355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | Max 0.5 | 12.8 | 2 |
| | 5400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | Max 0.5 | 15.9 | 2 |
| | 5450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | Max 0.5 | 18.9 | 2 |

Available Inserts

SNEF



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | Page | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SNEF 435 | | | | | | | | ● | | | | | | | | | | E17 |

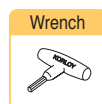
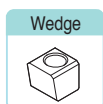
Available Arbors

| Designation | Arbors | |
|-------------|-----------------------|--------|
| PNH 125R/L | NT*□□(M/U)-FMA38.1-□□ | - |
| 160R/L | NT*□□(M/U)-FMA50.8-□□ | - |
| 200R/L | - | APR200 |
| 250R/L | - | APR250 |
| 315R/L | - | APR315 |
| 355R/L | - | APR355 |
| 400R/L | - | APR400 |
| 450R/L | - | APR450 |

Recommended cutting condition

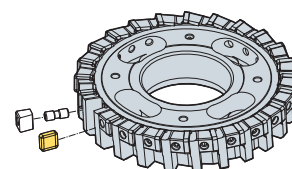
| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts



| | | | |
|-----------|--------|----------|------|
| 4000 type | WPNH4N | DHA0821F | HW40 |
| 5000 type | WPNH5N | | |

Assembling



PPH4000

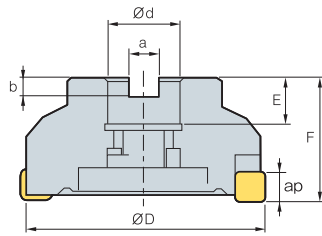


Fig. 1

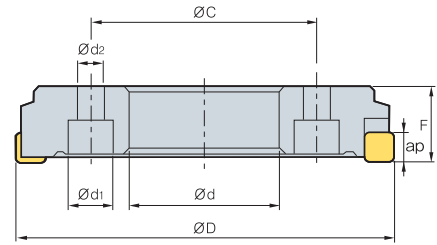


Fig. 2



AA
90°

- AR : 5°
- RR : -6°

| Designation | | | ϕD | ϕd | ϕd_1 | ϕd_2 | a | b | E | F | ϕC | ap | | Fig. | (mm) |
|-------------|---------|----|----------|----------|------------|------------|------|----|----|----|----------|---------|------|------|------|
| PPH | 4125R/L | 10 | 125 | 38.1 | - | - | 15.9 | 10 | 27 | 63 | - | Max 0.5 | 3.4 | 1 | |
| | 4160R/L | 14 | 160 | 50.8 | - | - | 19.0 | 11 | 27 | 63 | - | Max 0.5 | 5.3 | 1 | |
| | 4200R/L | 18 | 200 | 80 | 24 | 14 | - | - | - | 40 | 120 | Max 0.5 | 5.5 | 2 | |
| | 4250R/L | 24 | 250 | 120 | 24 | 14 | - | - | - | 40 | 170 | Max 0.5 | 7.7 | 2 | |
| | 4315R/L | 30 | 315 | 180 | 30 | 18 | - | - | - | 40 | 230 | Max 0.5 | 10.5 | 2 | |
| | 4355R/L | 34 | 355 | 220 | 30 | 18 | - | - | - | 40 | 270 | Max 0.5 | 13 | 2 | |
| | 4400R/L | 38 | 400 | 250 | 30 | 18 | - | - | - | 40 | 300 | Max 0.5 | 16 | 2 | |
| | 4450R/L | 44 | 450 | 300 | 30 | 18 | - | - | - | 40 | 350 | Max 0.5 | 19 | 2 | |

Available Inserts

SPEN-WC



| Designation | Coated | | | | | | | | Cermet | | | Uncoated | | | | Page | | |
|----------------|--------|--------|--------|---------|---------|---------|---------|---------|--------|--------|--------|----------|------|-----|-----|------|-------|------|
| | NCM325 | NCM335 | NC5330 | PC-3500 | PC-5300 | PC-3545 | PC-9530 | PC-6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A | ST20 |
| SPEN 120416-WC | | | | | | | | | | | | | | | | | | E20 |

Available Arbors

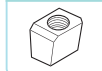
| Designation | Arbors | |
|-------------|-----------------------|--------|
| PPH 4125R/L | NT*□□(M/U)-FMA38.1-□□ | - |
| 4160R/L | NT*□□(M/U)-FMA50.8-□□ | - |
| 4200R/L | - | APR200 |
| 4250R/L | - | APR250 |
| 4315R/L | - | APR315 |
| 4355R/L | - | APR355 |
| 4400R/L | - | APR400 |
| 4450R/L | - | APR450 |

Recommended cutting condition

| Workpiece | Cutting Condition | | Grades |
|-----------|-------------------|-------------|-------------------|
| | vc(m/min) | fz(mm/t) | |
| K | 100 ~ 200 | 0.05 ~ 0.30 | PC6510 H01,G10 |
| | 80 ~ 150 | 0.10 ~ 0.30 | |

Parts

Wedge



Wedge Screw



Wrench

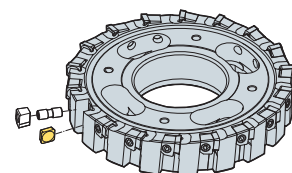


WPPH4R/L

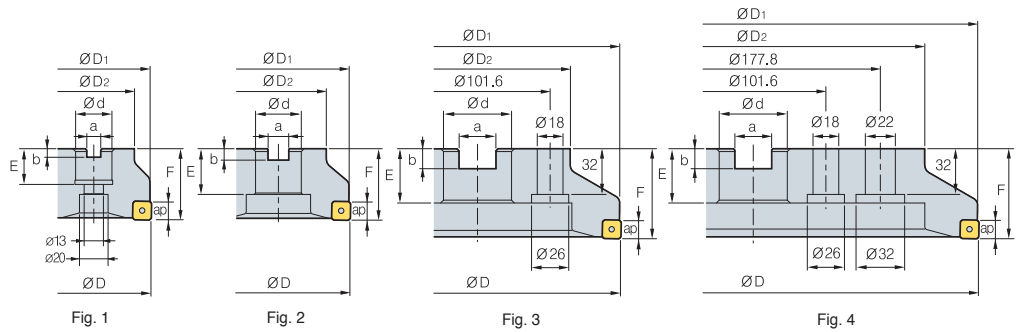
DHA0821F

HW40

Assembling



SVM(M)4000



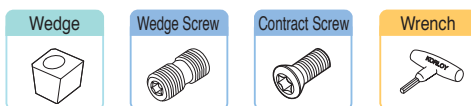
(mm)

| Designation | | $\varnothing D$ | $\varnothing D1$ | $\varnothing D2$ | $\varnothing d$ | a | b | E | F | ap | | Fig | |
|-------------|-------------|-----------------|------------------|------------------|-----------------|--------|------|----|----|-----|------|-----|---|
| SVM | 4080R/L-Z8 | 8 | 80 | 79 | 57 | 25.4 | 12.4 | 6 | 25 | 50 | 1.0 | 1.2 | 1 |
| | 4100R/L-Z12 | 12 | 100 | 99 | 67 | 31.75 | 14.4 | 8 | 32 | 63 | 1.0 | 2.3 | 1 |
| | 4125R/L-Z16 | 16 | 125 | 124 | 87 | 38.1 | 16.4 | 10 | 38 | 63 | 1.0 | 3.5 | 2 |
| | 4160R/L-Z20 | 20 | 160 | 159 | 107 | 50.8 | 16.4 | 11 | 38 | 63 | 1.0 | 5 | 2 |
| | 4200R/L-Z24 | 24 | 200 | 199 | 130 | 47.625 | 25.7 | 14 | 38 | 63 | 1.0 | 7.2 | 3 |
| | 4250R/L-Z30 | 30 | 250 | 249 | 180 | 47.625 | 25.7 | 14 | 38 | 63 | 1.0 | 12 | 3 |
| 4315R/L-Z36 | 36 | 315 | 314 | 240 | 47.625 | 25.7 | 14 | 38 | 63 | 1.0 | 19.5 | 4 | |
| SVMM | 4080R/L-Z8 | 8 | 80 | 79 | 57 | 27 | 12.4 | 7 | 22 | 50 | 1.0 | 1.2 | 1 |
| | 4100R/L-Z12 | 12 | 100 | 99 | 67 | 32 | 14.4 | 8 | 28 | 63 | 1.0 | 2.3 | 1 |
| | 4125R/L-Z16 | 16 | 125 | 124 | 87 | 40 | 16.4 | 9 | 30 | 63 | 1.0 | 3.5 | 2 |
| | 4160R/L-Z20 | 20 | 160 | 159 | 107 | 40 | 16.4 | 9 | 30 | 63 | 1.0 | 5 | 3 |
| | 4200R/L-Z24 | 24 | 200 | 199 | 130 | 60 | 25.7 | 14 | 38 | 63 | 1.0 | 7.2 | 3 |
| | 4250R/L-Z30 | 30 | 250 | 249 | 180 | 60 | 25.7 | 14 | 38 | 63 | 1.0 | 12 | 3 |
| 4315R/L-Z36 | 36 | 315 | 314 | 240 | 60 | 25.7 | 14 | 38 | 63 | 1.0 | 19.5 | 4 | |

Available Inserts

| | SNEU-MF | | SNEU1204ANN-MF | | | | SNEU-WMF | | SNEU-TBW | | | | | | | |
|----------------|---------|--------|----------------|--------|--------|--------|----------|--------|----------|--------|----------|--------|------|-----|-----|-------|
| | | | | | | | | | | | | | | | | |
| Designation | Coated | | | | | | | | cBN | | Uncoated | | Page | | | |
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | DBN700 | DBN920 | | H01 | G10 | ST30A |
| SNEU 120420-MF | | | | | | | | | | | | | | | | |
| 1204ANN-MF | | | | | | | | | | | | | | | | |
| 1204-WMF | | | | | | | | | | | | | | | | |
| 1204-TBW | | | | | | | | | | | | | | | | |

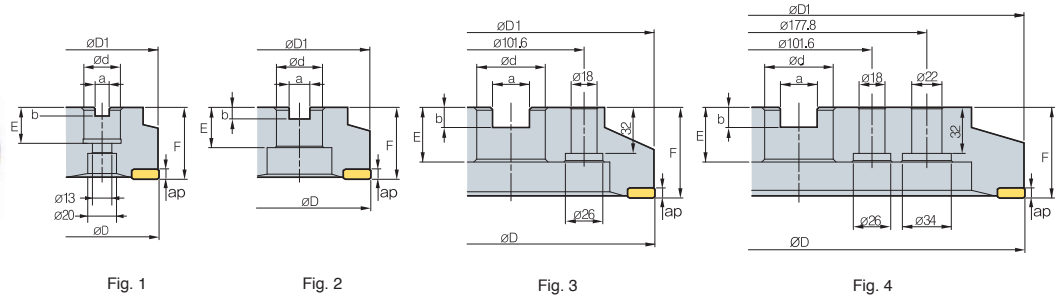
Parts



WKAJ3 DTA0619 XTKA0412 TW15-100



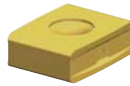
SVUM6000



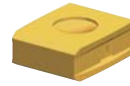
| | | | | | | | | | | | | (mm) |
|-----------------|---|-----|-----|-----|----|------|----|----|----|-----|------|------|
| Designation | | øD | øD1 | øD2 | ød | a | b | E | F | ap | | Fig. |
| SVUM 6080R/L-Z4 | 4 | 80 | 79 | 57 | 27 | 12.4 | 7 | 22 | 50 | 0.5 | 1.2 | 1 |
| 6100R/L-Z4 | 4 | 100 | 100 | 67 | 32 | 14.4 | 8 | 28 | 63 | 0.5 | 2.3 | 1 |
| 6125R/L-Z4 | 4 | 125 | 125 | 87 | 40 | 16.4 | 9 | 30 | 63 | 0.5 | 3.5 | 2 |
| 6160R/L-Z4 | 4 | 160 | 160 | 107 | 40 | 16.4 | 9 | 30 | 63 | 0.5 | 5 | 3 |
| 6200R/L-Z6 | 6 | 200 | 200 | 130 | 60 | 25.7 | 14 | 38 | 63 | 0.5 | 7.2 | 3 |
| 6250R/L-Z6 | 6 | 250 | 250 | 180 | 60 | 25.7 | 14 | 38 | 63 | 0.5 | 12 | 3 |
| 6315R/L-Z8 | 8 | 315 | 315 | 240 | 60 | 25.7 | 14 | 38 | 63 | 0.5 | 19.5 | 4 |

Available Inserts

LNCS(R3.0)

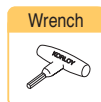
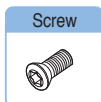


LNCS(C1.5)



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | Page | |
|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|------|-------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | | ST30A |
| LNCS 1907-R3.0-WC 1907-C1.5-WC | | | | | | | | | | | | | | | | | |

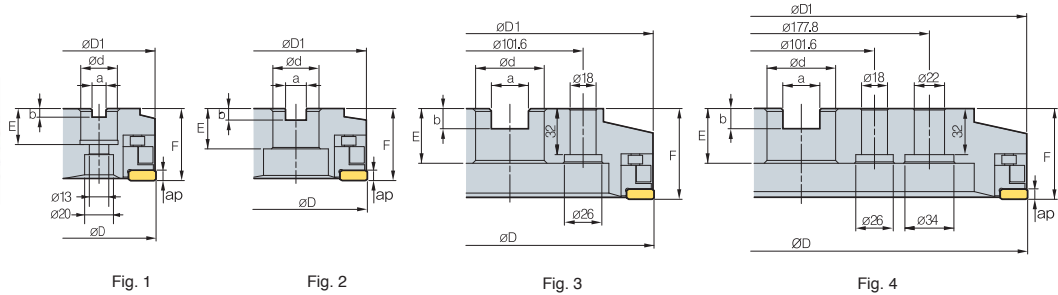
Parts



FTNA0513

TW20-100

SVUM6000-B



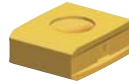
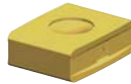
(mm)

| Designation | | øD | øD1 | øD2 | ød | a | b | E | F | ap | | Fig. |
|-------------------|---|-----|-----|-----|----|------|----|----|----|-----|------|------|
| SVUM 6080R/L-Z4-B | 4 | 80 | 79 | 57 | 27 | 12.4 | 7 | 22 | 50 | 0.5 | 1.2 | 1 |
| 6100R/L-Z4-B | 4 | 100 | 99 | 67 | 32 | 14.4 | 8 | 28 | 63 | 0.5 | 2.3 | 1 |
| 6125R/L-Z4-B | 4 | 125 | 124 | 87 | 40 | 16.4 | 9 | 30 | 63 | 0.5 | 3.5 | 2 |
| 6160R/L-Z4-B | 4 | 160 | 160 | 107 | 40 | 16.4 | 9 | 30 | 63 | 0.5 | 5 | 3 |
| 6200R/L-Z6-B | 6 | 200 | 200 | 130 | 60 | 25.7 | 14 | 38 | 63 | 0.5 | 7.2 | 3 |
| 6250R/L-Z6-B | 6 | 250 | 250 | 180 | 60 | 25.7 | 14 | 38 | 63 | 0.5 | 12 | 3 |
| 6315R/L-Z8-B | 8 | 315 | 315 | 240 | 60 | 25.7 | 14 | 38 | 63 | 0.5 | 19.5 | 4 |

Available Inserts

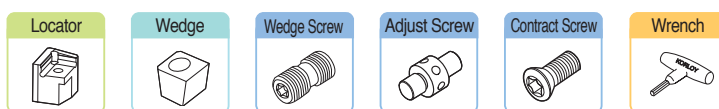
LNCS(R3.0)

LNCS(C1.5)



| Designation | Coated | | | | | | | | | | Cermet | | | Uncoated | | | | Page |
|-----------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|----------|-----|-------|------|------|
| | NCM325 | NCM335 | NC5330 | PC3500 | PC5300 | PC3545 | PC9530 | PC6510 | PC215K | PD2000 | CN2000 | CN20 | CN30 | H01 | G10 | ST30A | ST20 | |
| LNCS 1907-R3.0-WC 1907-C1.5-WC | | | | | | | | | | | | | | | | | | E08 |

Parts

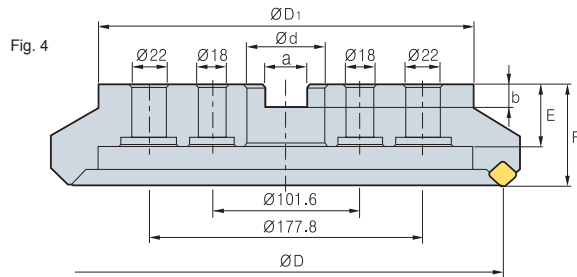
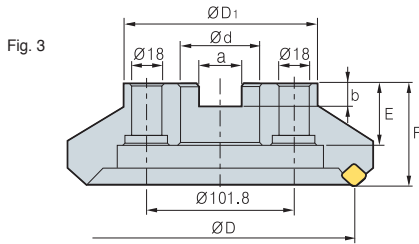
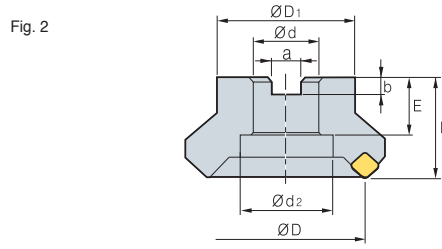
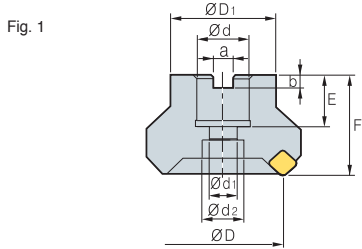


LSH4R WSH4 DHA0724F AZ0619F-D FTNA0512 TW20-100



Inch

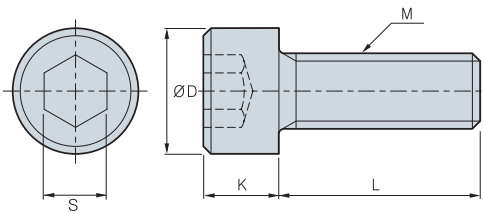
Actual designations of milling cutter



Inch type

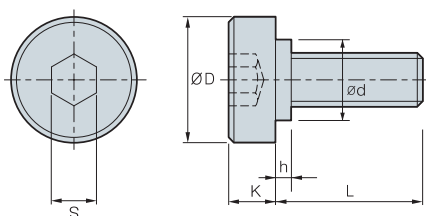
| Dimensions (inch) | | | | | | | | | | Fig. | Available Arbors |
|-------------------|--------|------|-----|----|----|-----------------|-----------------|-----------------|---|--------------------|------------------|
| ØD | Ød | a | b | E | F | ØD ₁ | Ød ₁ | Ød ₂ | | | |
| 40 | 16 | 8.4 | 5.6 | 18 | 40 | 34 | 9 | 14 | 1 | FMC16, SMA16 | |
| 50 | 22 | 10.4 | 6.3 | 20 | 40 | 42 | 11 | 18 | 1 | FMC22 | |
| 63 | 22 | 10.4 | 6.3 | 20 | 40 | 49 | 11 | 18 | 1 | FMC22 | |
| 80 | 25.4 | 9.5 | 6 | 25 | 50 | 57 | 14 | 20 | 1 | FMA25.4 | |
| 100 | 31.75 | 12.7 | 8 | 32 | 50 | 67 | - | 45 | 2 | FMA31.75, SMB31.75 | |
| 125 | 38.1 | 15.9 | 10 | 38 | 63 | 87 | - | 56 | 2 | FMA38.1 | |
| 160 | 50.8 | 19 | 11 | 38 | 63 | 107 | - | - | 2 | FMA50.8 | |
| 200 | 47.625 | 25.4 | 14 | 38 | 63 | 130 | - | - | 3 | FMA47.625 | |
| 250 | 47.625 | 25.4 | 14 | 38 | 63 | 180 | - | - | 3 | FMA47.625 | |
| 315 | 47.625 | 25.4 | 14 | 38 | 63 | 240 | - | - | 4 | - | |

Wrench bolt



| Designation | ØD | S | K | L | M | Cutter size |
|-------------|----|----|----|----|------------|----------------|
| SB0825 | 13 | 6 | 8 | 25 | M08 x 1.25 | Ø40 |
| SB1025 | 16 | 8 | 10 | 25 | M10 x 1.50 | Ø50, Ø63 |
| SB1035 | 16 | 8 | 10 | 35 | M10 x 1.50 | Ø50, Ø63(HRM) |
| SB1230 | 18 | 10 | 12 | 30 | M12 x 1.75 | Ø80 |
| SB1630 | 24 | 14 | 16 | 30 | M16 x 2.0 | Ø100 |
| SB1645 | 24 | 14 | 16 | 45 | M16 x 2.0 | Ø80, Ø100(HRM) |
| SB2040 | 30 | 17 | 20 | 40 | M20 x 2.5 | Ø125 |

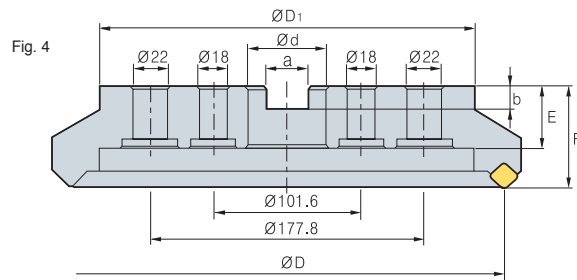
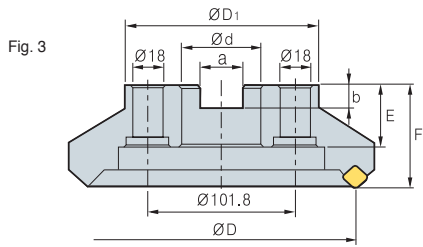
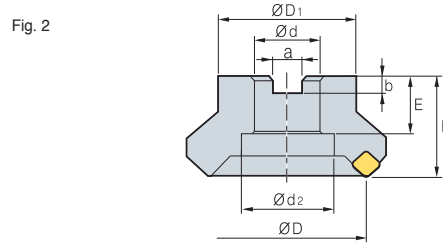
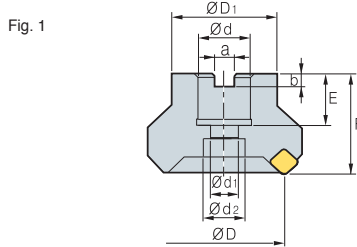
Clamp bolt



| Specifications | Dimensions (mm) | | | | | | Cutter size |
|----------------|-----------------|----|----|----|---|----|-------------|
| | D | L | K | S | h | d | |
| M8 X 1.25 | 20 | 20 | 7 | 6 | - | - | Ø40 |
| M10 X 1.5 | 28 | 24 | 9 | 8 | - | - | Ø50, Ø63 |
| M12 X 1.75 | 33 | 28 | 10 | 10 | 2 | 23 | Ø80 |
| M16 X 2 | 40 | 32 | 10 | 14 | 5 | 23 | Ø100 |
| M20 X 2.5 | 50 | 40 | 14 | 17 | 5 | 27 | Ø125 |
| M24 X 3 | 64 | 46 | 14 | 19 | 9 | 37 | Ø160 |

Metric

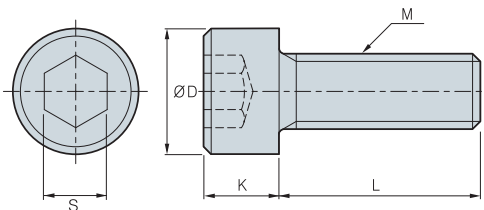
Clamping part of milling cutter



Metric type(mm)

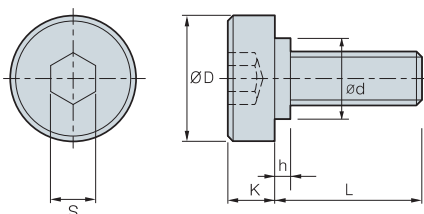
| Dimensions (mm) | | | | | | | | | | Fig. | Available Arbors |
|-----------------|----|------|-----|----|----|-----------------|-----------------|-----------------|---|--------------|------------------|
| ØD | Ød | a | b | E | F | ØD ₁ | Ød ₁ | Ød ₂ | | | |
| 40 | 16 | 8.4 | 5.6 | 18 | 40 | 34 | 9 | 14 | 1 | FMC16, SMA16 | |
| 50 | 22 | 10.4 | 6.3 | 20 | 40 | 42 | 11 | 18 | 1 | FMC22 | |
| 63 | 22 | 10.4 | 6.3 | 20 | 40 | 49 | 11 | 18 | 1 | FMC22 | |
| 80 | 27 | 12.4 | 7 | 22 | 50 | 57 | 14 | 20 | 1 | FMC27 | |
| 100 | 32 | 14.4 | 8 | 28 | 50 | 67 | - | 45 | 2 | FMC32 | |
| 125 | 40 | 16.4 | 9 | 32 | 63 | 87 | - | 56 | 2 | FMB40 | |
| 160 | 40 | 16.4 | 9 | 32 | 63 | 107 | - | - | 2 | FMB40 | |
| 200 | 60 | 25.7 | 14 | 38 | 63 | 130 | - | - | 3 | FMB60 | |
| 250 | 60 | 25.7 | 14 | 38 | 63 | 180 | - | - | 3 | FMB60 | |
| 315 | 60 | 25.7 | 14 | 38 | 63 | 240 | - | - | 4 | - | |

Wrench bolt



| Designation | ØD | S | K | L | M | Cutter size |
|-------------|----|----|----|----|------------|---------------|
| SB0825 | 13 | 6 | 8 | 25 | M08 × 1.25 | Ø40 |
| SB1025 | 16 | 8 | 10 | 25 | M10 × 1.50 | Ø50, Ø63 |
| SB1035 | 16 | 8 | 10 | 35 | M10 × 1.50 | Ø50, Ø63(HRM) |
| SB1230 | 18 | 10 | 12 | 30 | M12 × 1.75 | Ø80 |
| SB1245 | 18 | 10 | 12 | 45 | M12 × 1.75 | Ø80(HRM) |
| SB1630 | 24 | 14 | 16 | 30 | M16 × 2.0 | Ø100 |
| SB1645 | 24 | 14 | 16 | 45 | M16 × 2.0 | Ø100(HRM) |
| SB2040 | 30 | 17 | 20 | 40 | M20 × 2.5 | Ø125 |

Clamp bolt

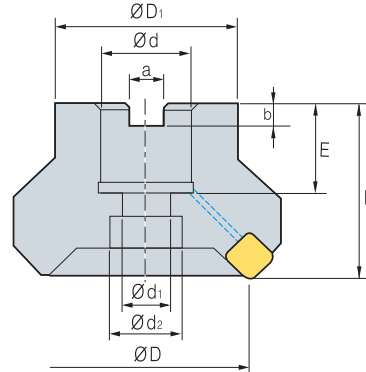


| Specifications | Dimensions (mm) | | | | | | Cutter size |
|----------------|-----------------|----|----|----|---|----|-------------|
| | D | L | K | S | h | d | |
| M12 X 1.75 | 33 | 28 | 10 | 10 | 2 | 23 | Ø80 |
| M16 X 2 | 40 | 32 | 10 | 14 | 5 | 23 | Ø100 |
| M20 X 2.5 | 50 | 40 | 14 | 17 | 5 | 27 | Ø125, Ø160 |



Clamping part of milling cutter(Oil-Hole)

Clamping part of milling cutter



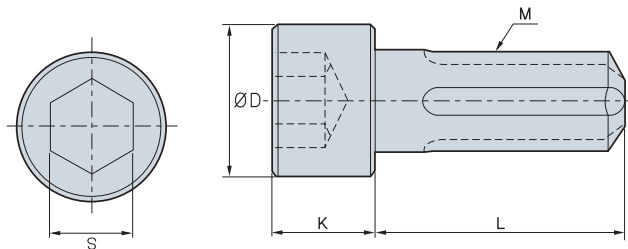
Inch type

| Dimensions (inch) | | | | | | | | | Available Arbors |
|-------------------|-----------------|------|-----|----|----|-------------------|-------------------|-------------------|-------------------------|
| $\varnothing D$ | $\varnothing d$ | a | b | E | F | $\varnothing D_1$ | $\varnothing d_1$ | $\varnothing d_2$ | |
| 40 | 16 | 8.4 | 5.6 | 19 | 40 | 34 | 9 | 14 | FMC16,SMA16 |
| 50 | 22 | 10.4 | 6.3 | 21 | 40 | 42 | 11 | 18 | FMC22 |
| 63 | 22 | 10.4 | 6.3 | 21 | 40 | 49 | 11 | 18 | FMC22 |
| 80 | 25.4 | 9.5 | 6 | 24 | 50 | 57 | 14 | 20 | FMA25.4,FMB25.4 |
| 100 | 31.75 | 12.7 | 8 | 32 | 63 | 67 | 18 | 26 | FMA31.75, SMB31.75 |
| 125 | 38.1 | 15.9 | 10 | 35 | 63 | 87 | 22 | 32 | FMA38.1,FMB38.1,FMC38.1 |

Metric type

| Dimensions (mm) | | | | | | | | | Available Arbors |
|-----------------|-----------------|------|-----|----|----|-------------------|-------------------|-------------------|------------------|
| $\varnothing D$ | $\varnothing d$ | a | b | E | F | $\varnothing D_1$ | $\varnothing d_1$ | $\varnothing d_2$ | |
| 40 | 16 | 8.4 | 5.6 | 19 | 40 | 34 | 9 | 14 | FMC16,SMA16 |
| 50 | 22 | 10.4 | 6.3 | 21 | 40 | 42 | 11 | 18 | FMC22 |
| 63 | 22 | 10.4 | 6.3 | 21 | 40 | 49 | 11 | 18 | FMC22 |
| 80 | 27 | 12.4 | 7.0 | 23 | 50 | 57 | 14 | 20 | FMC27 |
| 100 | 32 | 14.4 | 8.0 | 25 | 50 | 67 | 18 | 26 | FMC32 |
| 125 | 40 | 16.4 | 9.0 | 29 | 63 | 87 | 22 | 32 | FMB40 / FMC40 |






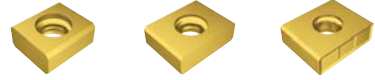
Wrench bolt









| Designation | D | S | K | L | M | Cutter size |
|-------------|----|----|----|----|----------|--|
| CB0825 | 13 | 6 | 8 | 25 | M08x1.25 | $\varnothing 40$ |
| CB1025 | 16 | 8 | 10 | 25 | M10x1.50 | $\varnothing 50, \varnothing 63$ |
| CB1035 | 16 | 8 | 10 | 35 | M10x1.50 | $\varnothing 50, \varnothing 63$ (HRM) |
| CB1230 | 18 | 10 | 12 | 30 | M12x1.75 | $\varnothing 80$ |
| CB1245 | 18 | 10 | 12 | 45 | M12x1.75 | $\varnothing 80$ (HRM) |
| CB1630 | 24 | 14 | 16 | 30 | M16x2.0 | $\varnothing 100$ |
| CB1645 | 24 | 14 | 16 | 45 | M16x2.0 | $\varnothing 100$ (HRM) |
| CB2040 | 30 | 17 | 20 | 40 | M20x2.5 | $\varnothing 125$ |

Gear Cutter Applicable Example

Applicable Example-External tooth Gear

| Finishing : M20 | Semi-finishing | Roughing |
|--|--|--|
|  <ul style="list-style-type: none"> • Cutter Dia : $\varnothing 400$ • Tooth No : 20Tooth • External tooth gear : Formal cutter for gear processing which can be expected to KS 4 level accuracy • Cutter can simultaneously chamfer while milling. |  <ul style="list-style-type: none"> • Cutter Dia : $\varnothing 280$ • Tooth No : 48Tooth • Designed for processing of external gear involute curve line shape • Possible to work for gear root portion R with optimal insert R design |  <ul style="list-style-type: none"> • Cutter Dia : $\varnothing 300$ • Tooth No : 60Tooth • High feed rate with low cutting resistance due to V shape insert setting design |
|  <p>M20XZ130-EX</p> |  <p>M20-M22-ROU</p> |  <p>LNE333-02-1 LNE434-02-1 KEL1906-C0.6-MF</p> |

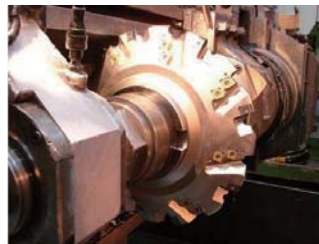
Applicable Example-Internal tooth Gear

| Finishing : M16 | Semi-finishing | Roughing |
|---|--|---|
|  <ul style="list-style-type: none"> • Cutter Dia : $\varnothing 400$ • Tooth No : 20Tooth • Internal tooth gear : Formal cutter for gear processing which can be expected to KS 4 level accuracy • Cutter can simultaneously chamfer while milling. |  <ul style="list-style-type: none"> • Cutter Dia : $\varnothing 280$ • Tooth No : 48Tooth • The semi-finishing cutter was designed for processing of external gear involute curb line shape. |  <ul style="list-style-type: none"> • Cutter Dia : $\varnothing 560$ • Tooth No : 40Tooth • Possible to use for gear processing of all module due to step type of insert setting design |
|  <p>M16XZ130</p> |  <p>M16-M18-ROU LNE433-R60</p> |  <p>KEL1906-C0.6-MF LNE434-02-1</p> |

Gear Cutter Machining Example



- **Machine**
Gleason-PFAUTER CNC Hobbing Machine (Power : 52kW)
- **Cutting condition**
vc = 119.98 m/min (n=86.8 rpm)
fz = 0.518 mm/t (vf=450 mm/min)
ae = 36mm
Dry
- **Tools**
M16-PT-RACK-KOR03 ($\varnothing 440 \times W90$)
- **Semi-finishing cutter**
(low cut, low resistance)


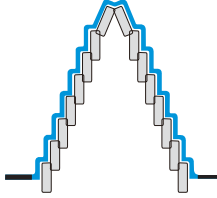

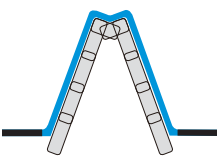

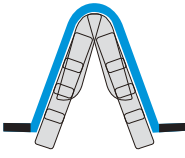

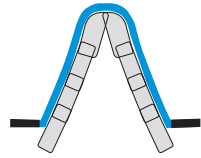

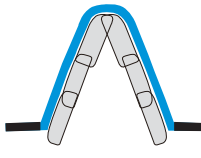

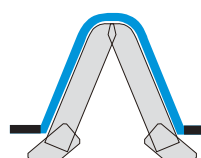

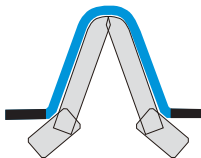

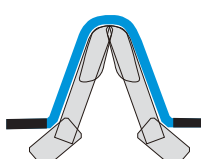


- **Machine**
KARATS (30kW)
- **Cutting condition**
vc = 150 m/min, n=119rpm
fz = 0.09mm/t, vf=81.6mm/min
ae = 45mm
Dry



- **Tools**
M24 Semi-finishing External type
Applicable Insert
M40-ROU(Main),
CPE424-01(Flank)

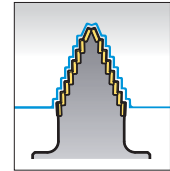
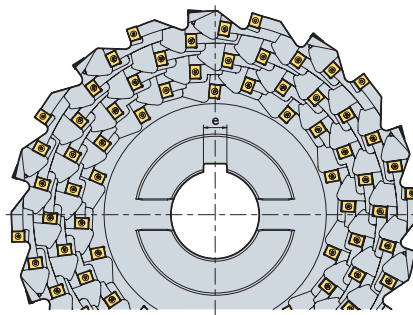
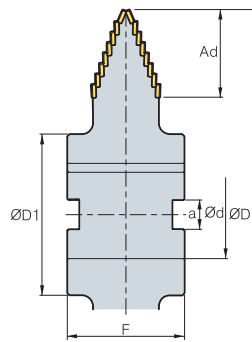


| Type | Cutter Shape | Cutting edge Shape | Type | Figure |
|----------------|---|---|----------------------------------|---|
| Roughing |  |  | Step Type | <ol style="list-style-type: none"> 1. Working for big sized gear tooth 2. Low cutting resistance with step type insert setting |
| |  |  | V shape Type | <ol style="list-style-type: none"> 1. Low cutting resistance with V shape cutting insert setting 2. Optimal cutting edge line setting according to Rach type & cutting edge shape |
| Semi-finishing |  |  | Low cutting resistance Type | <ol style="list-style-type: none"> 1. 4 Corner insert on Root portion 2. 3D chip breaker shape on flank 3. Optimal cutting edge line setting for low cutting resistance |
| |  |  | External gear high rigidity Type | <ol style="list-style-type: none"> 1. Optimal R type insert setting on Root portion 2. Superior Semi-finishing cutting with high rigidity shape of cutter & insert |
| |  |  | Internal gear high rigidity Type | <ol style="list-style-type: none"> 1. Exclusive semi-finishing Internal Gear insert 2. Optimal cutting edge line setting with Internal tooth shape |
| Finishing |  |  | External gear | <ol style="list-style-type: none"> 1. Concave shape of cutting edge line according to External gear type 2. Optimal cutting insert setting design according to a customer conditions |
| |  |  | Internal gear | <ol style="list-style-type: none"> 1. 2 corner insert setting on right & left side and chamfering insert setting 2. Adjustable chamfering cartridge use for chamfering control |
| |  |  | 2STEP type | <ol style="list-style-type: none"> 1. Exclusive insert for machining the root part 2. 4-cornered insert |

• Optimal cutting insert setting design according to customer condition



Gear Roughing Cutter (Step Type)



| | | | | | | | | | (mm) |
|-----------|-----|-----|-----|-----|-----|----|----|-----|------|
| m | | ØD | Ad | Ød | ØD1 | a | e | F | |
| 30 | 96 | 450 | 90 | 100 | 180 | 25 | 14 | 140 | |
| | 108 | 500 | 90 | 100 | 180 | 25 | 14 | 140 | |
| | 120 | 560 | 90 | 120 | 220 | 40 | 32 | 160 | |
| 40 | 112 | 450 | 105 | 100 | 180 | 25 | 14 | 140 | |
| | 126 | 500 | 105 | 100 | 180 | 25 | 14 | 140 | |
| | 140 | 560 | 105 | 120 | 220 | 40 | 32 | 160 | |
| 50 | 160 | 560 | 119 | 120 | 220 | 40 | 32 | 160 | |

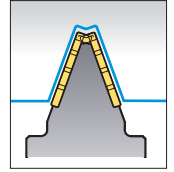
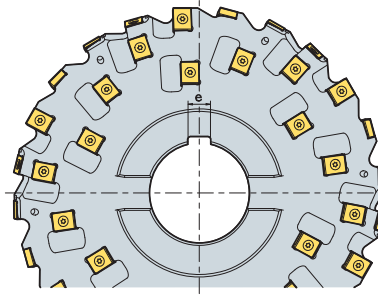
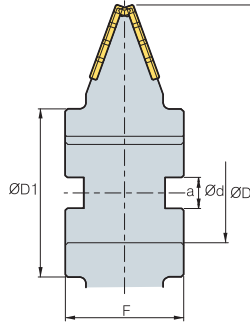
Available Inserts

| | | Coated | | | | Uncoated | | Dimensions (mm) | | | | | Configuration | | |
|-----------------------------|-------------------------------|--------|--------|--------|--------|----------|-----|-----------------|-------|------|----------------|-----|---------------|--|--|
| Picture | Designation | NC5330 | PC9530 | PC3500 | PC5300 | H01 | G10 | l | d | t | d ₁ | c | | | |
| Reinforced cutting Edge | LNE 434-02-1 | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | 0.6 | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| Low cutting Resistance | KEL 1906-C0.6-MF 190610-MR | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | 0.6 | | | |
| | | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | - | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

* The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

Gear Roughing Cutter (V shape Type)



| | | | | | | | | | (mm) |
|----|------|-----|-----|-----|-----|----|----|-----|------|
| m | Type | | ØD | Ød | ØD1 | a | e | F | |
| 20 | rack | 48 | 280 | 80 | 135 | 25 | 18 | 95 | |
| 22 | rack | 48 | 280 | 80 | 135 | 25 | 18 | 95 | |
| 24 | rack | 48 | 320 | 80 | 145 | 25 | 18 | 105 | |
| 26 | rack | 60 | 320 | 80 | 145 | 25 | 18 | 105 | |
| 28 | rack | 96 | 400 | 100 | 180 | 25 | 24 | 130 | |
| 30 | rack | 96 | 400 | 100 | 180 | 25 | 24 | 130 | |
| 32 | rack | 96 | 400 | 100 | 180 | 25 | 24 | 130 | |
| 34 | rack | 112 | 400 | 100 | 180 | 25 | 24 | 130 | |
| 36 | rack | 112 | 450 | 100 | 180 | 25 | 24 | 130 | |
| 38 | rack | 112 | 450 | 100 | 180 | 25 | 24 | 130 | |
| 40 | rack | 128 | 450 | 100 | 180 | 25 | 24 | 160 | |
| 42 | rack | 128 | 450 | 100 | 180 | 25 | 24 | 160 | |
| 44 | rack | 128 | 560 | 120 | 220 | 32 | 32 | 160 | |
| 46 | rack | 144 | 560 | 120 | 220 | 32 | 32 | 160 | |
| 48 | rack | 144 | 560 | 120 | 220 | 32 | 32 | 160 | |
| 50 | rack | 144 | 560 | 120 | 220 | 32 | 32 | 160 | |

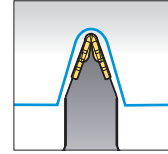
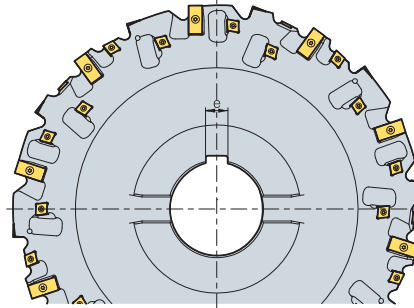
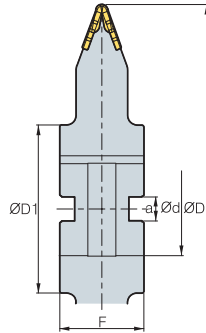
Available Inserts

| Picture | Designation | Coated | | | | | | Uncoated | | Dimensions (mm) | | | | | Configuration |
|---------|-------------------------------|--------|--------|--------|--------|--------|--------|----------|-----|-----------------|-------|------|----------------|-----|---------------|
| | | NC5330 | PC9530 | PC3500 | PC5300 | NCM325 | PC6510 | H01 | G10 | l | d | t | d _i | c | |
| | LNE 434-O2-1 | | | ○ | ◎ | | | | | 19.05 | 14.29 | 6.35 | 5.4 | 0.6 | |
| | KEL 1906-C0.6-MF 190610-MR | | | ○ | ◎ | | | | | 19.05 | 14.29 | 6.35 | 5.4 | 0.6 | |
| | | | | ○ | ◎ | | | | | 19.05 | 14.29 | 6.35 | 5.4 | - | |
| | | | | ○ | ◎ | | | | | | | | | | |
| | LNE 333-O2-1 | | | ○ | ◎ | | | | | 14.3 | 12.7 | 6.35 | 5.8 | 0.8 | |
| | CNHQ 1005-C0.5 | | | | | | | | | 10 | 10 | 5.4 | - | - | |

* The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

Gear Semi-finishing Cutter (Low cutting resistance Type)



| | | | | | | | | | (mm) |
|----|--------------|----|-----------------|-----------------|-------------------|----|----|-----|------|
| m | No. of teeth | | $\varnothing D$ | $\varnothing d$ | $\varnothing D_1$ | a | e | F | |
| 6 | 30,60,120 | 18 | 250 | 60 | 100 | 25 | 14 | 70 | |
| 8 | 30,60,120 | 18 | 250 | 60 | 100 | 25 | 14 | 80 | |
| 10 | 30,60,120 | 24 | 250 | 60 | 100 | 25 | 14 | 80 | |
| 12 | 30,60,120 | 24 | 250 | 60 | 100 | 25 | 14 | 90 | |
| 14 | 30,60,120 | 24 | 280 | 80 | 135 | 25 | 18 | 95 | |
| 16 | 30,60,120 | 32 | 280 | 80 | 135 | 25 | 18 | 100 | |
| 18 | 30,60,120 | 32 | 320 | 80 | 145 | 25 | 18 | 105 | |
| 20 | 30,60,120 | 64 | 400 | 100 | 180 | 25 | 24 | 110 | |
| 22 | 30,60,120 | 64 | 400 | 100 | 180 | 25 | 24 | 110 | |
| 24 | 30,60,120 | 64 | 400 | 100 | 180 | 25 | 24 | 120 | |

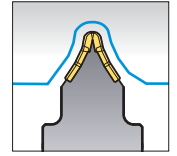
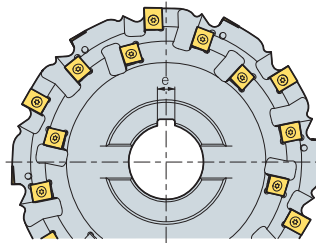
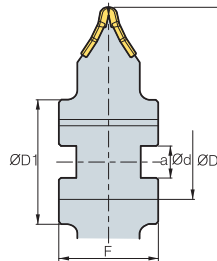
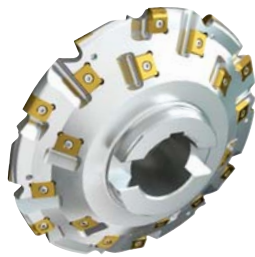
Available Inserts

| Picture | Designation | Coated | | | | Uncoated | | Dimensions (mm) | | | | | Configuration |
|---------|---------------|--------|--------|--------|--------|----------|------|-----------------|------|------|----------------|------|---------------|
| | | NC5330 | PC9530 | PC3500 | PC5300 | H01 | G10 | l | d | t | d ₁ | R | |
| | M6-2ST | | | ○ | ◎ | | | 19.05 | 11.6 | 3.8 | 4.4 | 2.25 | |
| | M8-2ST | | | ○ | ◎ | | | 19.05 | 11.6 | 4 | 4.4 | 3 | |
| | M10-2ST | | | ○ | ◎ | | | 19.05 | 11.6 | 4.76 | 4.4 | 3.75 | |
| | M12-2ST | | | ○ | ◎ | | | 19.05 | 14.3 | 6.35 | 5.5 | 4.5 | |
| | M14-2ST | | | ○ | ◎ | | | 25.4 | 14.3 | 6.35 | 5.5 | 5.25 | |
| | M16-2ST | | | ○ | ◎ | | | 31.8 | 14.3 | 7.14 | 5.5 | 6 | |
| | M18-2ST | | | ○ | ◎ | | | 31.8 | 14.3 | 7.14 | 5.5 | 6.75 | |
| | M20-2ST | | | ○ | ◎ | | | 31.8 | 14.3 | 9.52 | 5.5 | 7.5 | |
| | M22-2ST | | | ○ | ◎ | | | 31.8 | 14.3 | 9.52 | 5.5 | 8.25 | |
| M24-2ST | | | ○ | ◎ | | | 31.8 | 14.3 | 9.52 | 5.5 | 9 | | |
| | KEC 120606-MX | | | ○ | ◎ | | | 12 | 12.7 | 6.35 | 4.5 | - | |
| | 150708-MX | | | ○ | ◎ | | | 15.15 | 15 | 7.6 | 5.8 | - | |

※ The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

Gear Semi-finishing Cutter (High rigid edge Type, External Gear)



| (mm) | | | | | | | | |
|------|--------------|----|-----------------|-----------------|-------------------|----|----|-----|
| m | No. of teeth | | $\varnothing D$ | $\varnothing d$ | $\varnothing D_1$ | a | e | F |
| 12 | 30,60,120 | 24 | 250 | 60 | 100 | 25 | 14 | 70 |
| 14 | 30,60,120 | 36 | 250 | 60 | 100 | 25 | 14 | 80 |
| 16 | 30,60,120 | 36 | 250 | 60 | 100 | 25 | 14 | 80 |
| 18 | 30,60,120 | 36 | 250 | 60 | 100 | 25 | 14 | 90 |
| 20 | 30,60,120 | 48 | 280 | 80 | 135 | 25 | 18 | 95 |
| 22 | 30,60,120 | 48 | 280 | 80 | 135 | 25 | 18 | 100 |
| 24 | 30,60,120 | 48 | 320 | 80 | 145 | 25 | 18 | 105 |
| 26 | 30,60,120 | 72 | 400 | 100 | 180 | 25 | 24 | 110 |
| 28 | 30,60,120 | 72 | 400 | 100 | 180 | 25 | 24 | 110 |
| 30 | 30,60,120 | 72 | 400 | 100 | 180 | 25 | 24 | 120 |
| 32 | 30,60,120 | 84 | 400 | 100 | 180 | 25 | 24 | 130 |
| 34 | 30,60,120 | 84 | 400 | 100 | 180 | 25 | 24 | 130 |

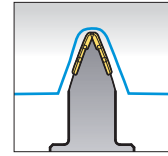
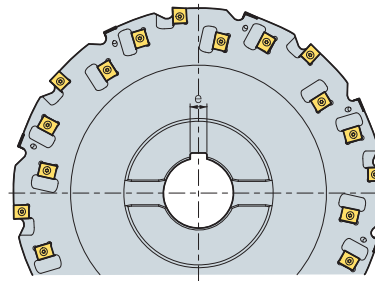
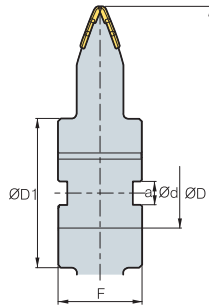
Available Inserts

| Picture | Designation | Coated | | | | Uncoated | | Dimensions (mm) | | | | | | Configuration |
|---------|------------------|--------|--------|--------|--------|----------|-----|-----------------|-------|------|----------------|-----|-----|---------------|
| | | NC5330 | PC9530 | PC3500 | PC5300 | H01 | G10 | l | d | t | d ₁ | R | c | |
| | M8-ROU | | | ○ | ◎ | | | 15.875 | 11 | 4.76 | 4.6 | 4.6 | - | |
| | M12-M14-ROU | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | 5.4 | - | |
| | M16-M18-ROU | | | ○ | ◎ | | | 19.05 | 14.29 | 7 | 5.4 | 5.4 | - | |
| | M20-M22-ROU | | | ○ | ◎ | | | 19.05 | 14.29 | 7.94 | 5.4 | 5.4 | - | |
| | M40-ROU | | | ○ | ◎ | | | 25.4 | 14.29 | 9.52 | 5.4 | 5.4 | - | |
| | LNE434-O2-1 | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | - | 0.6 | |
| | KEL 1906-C0.6-MF | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | - | 0.6 | |
| | 190610-MR | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | - | - | |

* The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

Gear Semi-finishing Cutter (High rigid edge Type, Internal Gear)



| | | | | | | | | | (mm) |
|----|--------------|----|-----------------|-----------------|-------------------|----|----|-----|------|
| m | No. of teeth | | $\varnothing D$ | $\varnothing d$ | $\varnothing D_1$ | a | e | F | |
| 12 | 30,60,120 | 24 | 250 | 60 | 100 | 25 | 14 | 70 | |
| 14 | 30,60,120 | 36 | 250 | 60 | 100 | 25 | 14 | 80 | |
| 16 | 30,60,120 | 36 | 250 | 60 | 100 | 25 | 14 | 80 | |
| 18 | 30,60,120 | 36 | 250 | 60 | 100 | 25 | 14 | 90 | |
| 20 | 30,60,120 | 48 | 280 | 80 | 135 | 25 | 18 | 95 | |
| 22 | 30,60,120 | 48 | 280 | 80 | 135 | 25 | 18 | 100 | |
| 24 | 30,60,120 | 48 | 320 | 80 | 145 | 25 | 18 | 105 | |
| 26 | 30,60,120 | 72 | 400 | 100 | 180 | 25 | 24 | 110 | |
| 28 | 30,60,120 | 72 | 400 | 100 | 180 | 25 | 24 | 110 | |
| 30 | 30,60,120 | 72 | 400 | 100 | 180 | 25 | 24 | 120 | |
| 32 | 30,60,120 | 84 | 400 | 100 | 180 | 25 | 24 | 130 | |
| 34 | 30,60,120 | 84 | 400 | 100 | 180 | 25 | 24 | 130 | |

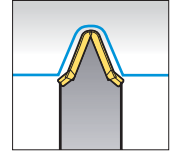
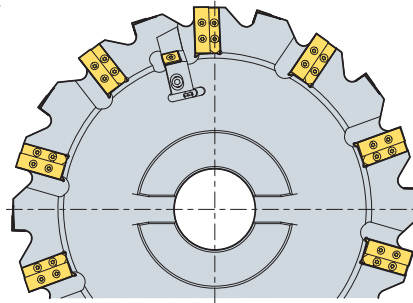
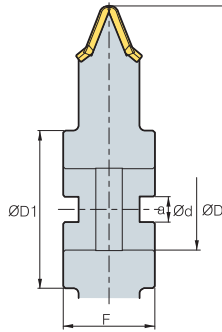
Available Inserts

| | | | | | | | | | | | | | (mm) |
|---------|-------------|--------|--------|--------|--------|----------|-----|------------|-------|------|----------------|-----|---------------|
| Picture | Designation | Coated | | | | Uncoated | | Dimensions | | | | | Configuration |
| | | NC5330 | PC9530 | PC3500 | PC5300 | H01 | G10 | l | d | t | d ₁ | R | |
| | M8-ROU | | | ○ | ◎ | | | 15.875 | 11 | 4.76 | 4.6 | 2 | |
| | M12-M14-ROU | | | ○ | ◎ | | | 19.05 | 14.29 | 6.35 | 5.4 | 3 | |
| | M16-M18-ROU | | | ○ | ◎ | | | 19.05 | 14.29 | 7 | 5.4 | 5 | |
| | M20-M22-ROU | | | ○ | ◎ | | | 19.05 | 14.29 | 7.94 | 5.4 | 7 | |
| | M40-ROU | | | ○ | ◎ | | | 25.4 | 14.29 | 9.52 | 5.4 | 10 | |
| | LNE433-R80 | | | ○ | ◎ | | | 19.05 | 14.29 | 5.56 | 5.4 | 2.5 | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

* The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

Gear Finishing Cutter (1 Step Type, External Gear)



| | | | | | | | | (mm) |
|----|----|-----------------|-----------------|-------------------|----|----|--|------|
| m | | $\varnothing D$ | $\varnothing d$ | $\varnothing D_1$ | a | F | | |
| 6 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 8 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 10 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 12 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 14 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 16 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 18 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 20 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 22 | 20 | 400 | 80 | 155 | 25 | 90 | | |
| 24 | 20 | 400 | 80 | 155 | 25 | 90 | | |

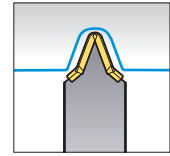
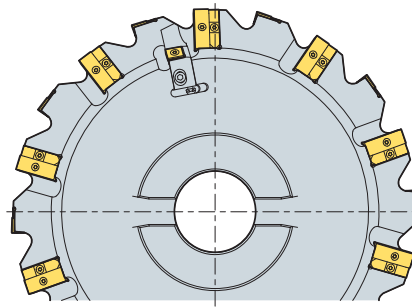
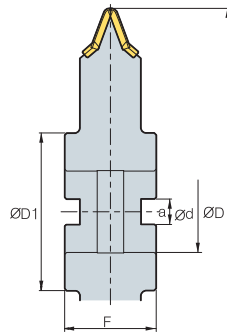
Available Inserts

| Picture | Designation | Coated | | | | Uncoated | | Dimensions (mm) | | | | | Configuration |
|---------|---------------|--------|--------|--------|--------|----------|-----|-----------------|--------|------|----------------|------|---------------|
| | | NC5330 | PC9530 | PC3500 | PC5300 | H01 | G10 | l | d | t | d ₁ | R | |
| | M6 | | | ○ | ◎ | | | 19 | 14.3 | 5 | 5.5 | 2.25 | |
| | M8 | | | ○ | ◎ | | | 27 | 14.3 | 5.4 | 5.5 | 3 | |
| | M10 | | | ○ | ◎ | | | 29 | 14.3 | 6.35 | 5.5 | 3.75 | |
| | M12 | | | ○ | ◎ | | | 33 | 14.3 | 6.35 | 5.5 | 4.5 | |
| | M14 | | | ○ | ◎ | | | 39 | 14.3 | 6.35 | 5.5 | 5.25 | |
| | M16 | | | ○ | ◎ | | | 43 | 14.3 | 7.94 | 5.5 | 6 | |
| | M18 | | | ○ | ◎ | | | 50 | 14.3 | 7.94 | 5.5 | 6.75 | |
| | M20 | | | ○ | ◎ | | | 54 | 14.3 | 9.53 | 5.5 | 7.5 | |
| | M22 | | | ○ | ◎ | | | 57 | 14.3 | 9.53 | 5.5 | 8.25 | |
| | M24 | | | ○ | ◎ | | | 64 | 14.3 | 9.53 | 5.5 | 9 | |
| | SNEQ1507-C0.8 | | | ○ | ◎ | | | 15.875 | 15.875 | 7.94 | - | - | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

* The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

Gear Finishing Cutter (1 Step Type, Internal Gear)



(mm)

| m | | øD | ød | øD ₁ | a | F |
|----|----|-----|----|-----------------|----|----|
| 6 | 20 | 400 | 80 | 155 | 25 | 90 |
| 8 | 20 | 400 | 80 | 155 | 25 | 90 |
| 10 | 20 | 400 | 80 | 155 | 25 | 90 |
| 12 | 20 | 400 | 80 | 155 | 25 | 90 |
| 14 | 20 | 400 | 80 | 155 | 25 | 90 |
| 16 | 20 | 400 | 80 | 155 | 25 | 90 |
| 18 | 20 | 400 | 80 | 155 | 25 | 90 |
| 20 | 20 | 400 | 80 | 155 | 25 | 90 |
| 22 | 20 | 400 | 80 | 155 | 25 | 90 |
| 24 | 20 | 400 | 80 | 155 | 25 | 90 |

Available Inserts

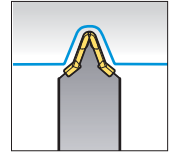
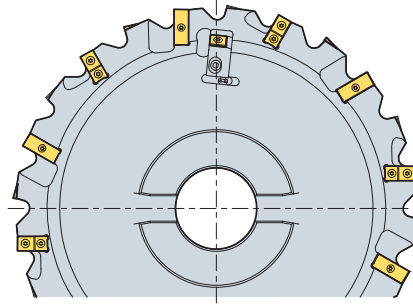
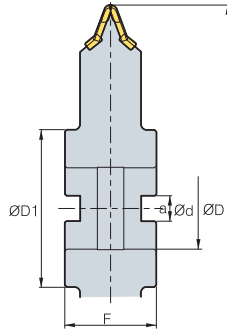
(mm)

| Picture | Designation | Coated | | | | Uncoated | | Dimensions (mm) | | | | | Configuration |
|---------|---------------|--------|--------|--------|--------|----------|-----|-----------------|--------|------|----------------|------|---------------|
| | | NC5330 | PC9530 | PC3500 | PC5300 | H01 | G10 | l | d | t | d _i | R | |
| | M6 | | | ○ | ◎ | | | 19 | 14.3 | 5 | 5.5 | 2.25 | |
| | M8 | | | ○ | ◎ | | | 27 | 14.3 | 5.4 | 5.5 | 3 | |
| | M10 | | | ○ | ◎ | | | 29 | 14.3 | 6.35 | 5.5 | 3.75 | |
| | M12 | | | ○ | ◎ | | | 33 | 14.3 | 6.35 | 5.5 | 4.5 | |
| | M14 | | | ○ | ◎ | | | 39 | 14.3 | 6.35 | 5.5 | 5.25 | |
| | M16 | | | ○ | ◎ | | | 43 | 14.3 | 7.94 | 5.5 | 6 | |
| | M18 | | | ○ | ◎ | | | 50 | 14.3 | 7.94 | 5.5 | 6.75 | |
| | M20 | | | ○ | ◎ | | | 54 | 14.3 | 9.53 | 5.5 | 7.5 | |
| | M22 | | | ○ | ◎ | | | 57 | 14.3 | 9.53 | 5.5 | 8.25 | |
| M24 | | | ○ | ◎ | | | 64 | 14.3 | 9.53 | 5.5 | 9 | | |
| | SNEQ1507-C0.8 | | | ○ | ◎ | | | 15.875 | 15.875 | 7.94 | - | - | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

* The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

Gear Finishing Cutter (2 Step Type, Internal / External Gear)



| | | | | | | | | (mm) |
|----|----|----------|----------|------------|----|----|--|------|
| m | | ϕD | ϕd | ϕD_1 | a | F | | |
| 6 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 8 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 10 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 12 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 14 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 16 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 18 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 20 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 22 | 24 | 400 | 80 | 155 | 25 | 90 | | |
| 24 | 24 | 400 | 80 | 155 | 25 | 90 | | |

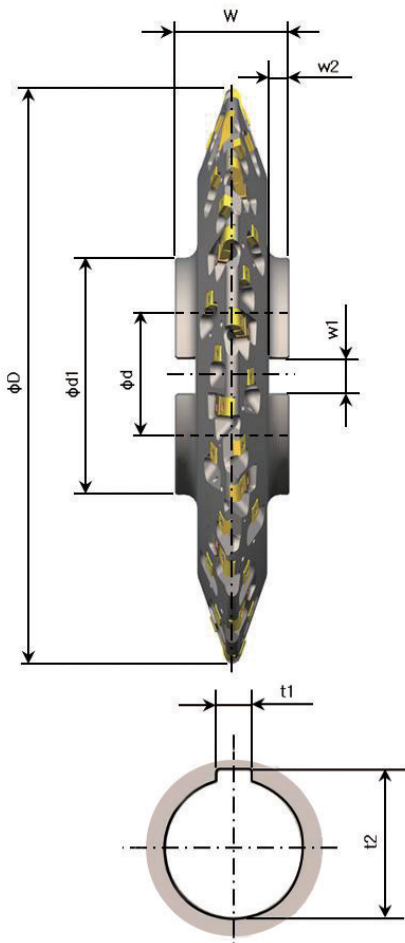
Available Inserts

| Picture | Designation | Coated | | | | Uncoated | | Dimensions (mm) | | | | | Configuration |
|---------|---------------|--------|--------|--------|--------|----------|------|-----------------|--------|------|----------------|------|---------------|
| | | NC5330 | PC9530 | PC3500 | PC5300 | H01 | G10 | l | d | t | d ₁ | R | |
| | M6 | | ○ | | ◎ | | | 19 | 14.3 | 5 | 5.5 | 2.25 | |
| | M8 | | ○ | | ◎ | | | 27 | 14.3 | 5.4 | 5.5 | 3 | |
| | M10 | | ○ | | ◎ | | | 29 | 14.3 | 6.35 | 5.5 | 3.75 | |
| | M12 | | ○ | | ◎ | | | 33 | 14.3 | 6.35 | 5.5 | 4.5 | |
| | M14 | | ○ | | ◎ | | | 39 | 14.3 | 6.35 | 5.5 | 5.25 | |
| | M16 | | ○ | | ◎ | | | 43 | 14.3 | 7.94 | 5.5 | 6 | |
| | M18 | | ○ | | ◎ | | | 50 | 14.3 | 7.94 | 5.5 | 6.75 | |
| | M20 | | ○ | | ◎ | | | 54 | 14.3 | 9.53 | 5.5 | 7.5 | |
| | M22 | | ○ | | ◎ | | | 57 | 14.3 | 9.53 | 5.5 | 8.25 | |
| M24 | | ○ | | ◎ | | | 64 | 14.3 | 9.53 | 5.5 | 9 | | |
| | SNEQ1507-C0.8 | | ○ | | ◎ | | | 15.875 | 15.875 | 7.94 | - | - | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | M6-2ST | | | | | | | 19.05 | 11.6 | 3.8 | 4.4 | 2.25 | |
| | M8-2ST | | | | | | | 19.05 | 11.6 | 4 | 4.4 | 3 | |
| | M10-2ST | | | | | | | 19.05 | 11.6 | 4.76 | 4.4 | 3.75 | |
| | M12-2ST | | | | | | | 19.05 | 14.3 | 6.35 | 5.5 | 4.5 | |
| | M14-2ST | | | | | | | 25.4 | 14.3 | 6.35 | 5.5 | 5.25 | |
| | M16-2ST | | | | | | | 31.8 | 14.3 | 7.14 | 5.5 | 6 | |
| | M18-2ST | | | | | | | 31.8 | 14.3 | 7.14 | 5.5 | 6.75 | |
| | M20-2ST | | | | | | | 31.8 | 14.3 | 9.52 | 5.5 | 7.5 | |
| | M22-2ST | | | | | | | 31.8 | 14.3 | 9.52 | 5.5 | 8.25 | |
| M24-2ST | | | | | | | 31.8 | 14.3 | 9.52 | 5.5 | 9 | | |

* The above specification is subject to change according to customer related condition & Korloy technical condition

◎ : 1st Rec ○ : 2nd Rec

⊗ Gear Cutter Order Form



Cutter Type

- | | | |
|--|---|---|
| <input type="checkbox"/> Roughing | <input type="checkbox"/> Semi-finishing | <input type="checkbox"/> Finishing |
| <input type="checkbox"/> Step | <input type="checkbox"/> Low cutting resistance | <input type="checkbox"/> 1 Step |
| <input type="checkbox"/> V shape | <input type="checkbox"/> High rigid edge | <input type="checkbox"/> 2 Step |

• Stock for finishing(one side) (mm) : _____

• Outside diameter D(mm) : _____

• Bore diameter d(mm) : _____

• Hub diameter d1(mm) : _____

• Cutter width W(mm) : _____

• Radial keyway w1(mm) : _____

• Radial keyway w2(mm) : _____

• Axial keyway t1(mm) : _____

• Axial keyway t2(mm) : _____

⊗ Involute Gear Data

- External Gear
 Internal Gear
 Rack Gear

• Module M(mm) : _____

• Root diameter d_f (mm) : _____

• No.of teeth Z(mm) : _____

• Root radius ρ_f (mm) : _____

• Pressure angle α (°) : _____

• Base tangent length W_k (mm) : _____

• Helix angle β (°) : _____

• No. of measuring teeth K : _____

• Addendum modification coefficient x : _____

• Dimensions / Dimension over balls M_d (mm) : _____

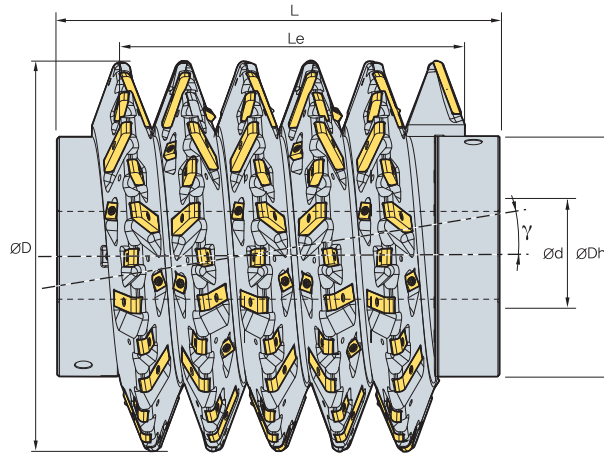
• Tip diameter d_a (mm) : _____

• Ball diameter D_M (mm) : _____

• Gear quality (DIN, JIS) : _____



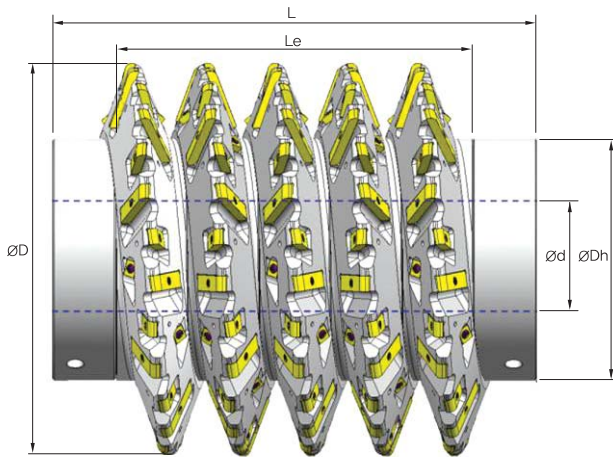
Indexable HOB *New*



| (mm) | | | | | | | | |
|-------------|-----|-----|-----|------------------|-------|----------------|--------------|---------------|
| Gear Module | øD | øDh | ød | No.Segm. (Pitch) | Le | Segment insert | Total insert | γ (Lead Ang.) |
| 6 | 180 | 125 | 40 | 6 | (113) | 15 | 90 | 2.084 |
| | 210 | 125 | 50 | 6 | (113) | 17 | 102 | 1.763 |
| | 240 | 160 | 60 | 6 | (113) | 19 | 114 | 1.528 |
| 7 | 180 | 125 | 40 | 6 | (132) | 15 | 90 | 2.469 |
| | 210 | 125 | 50 | 6 | (132) | 17 | 102 | 2.084 |
| | 240 | 160 | 60 | 6 | (132) | 19 | 114 | 1.803 |
| 8 | 210 | 125 | 50 | 6 | (151) | 17 | 102 | 2.413 |
| | 240 | 160 | 60 | 6 | (151) | 19 | 114 | 2.084 |
| | 270 | 180 | 80 | 6 | (151) | 21 | 126 | 1.834 |
| 9 | 210 | 125 | 50 | 6 | (169) | 17 | 102 | 2.751 |
| | 240 | 160 | 60 | 6 | (169) | 19 | 114 | 2.372 |
| | 270 | 180 | 80 | 6 | (169) | 21 | 126 | 2.084 |
| 10 | 210 | 125 | 50 | 6 | (189) | 17 | 102 | 3.099 |
| | 240 | 160 | 60 | 6 | (189) | 19 | 114 | 2.666 |
| | 270 | 180 | 80 | 6 | (189) | 21 | 126 | 2.339 |
| 12 | 240 | 140 | 60 | 6 | (226) | 18 | 108 | 3.276 |
| | 270 | 180 | 80 | 6 | (226) | 22 | 132 | 2.866 |
| | 350 | 215 | 80 | 6 | (226) | 26 | 156 | 2.149 |
| 14 | 270 | 180 | 80 | 6 | (264) | 22 | 132 | 3.415 |
| | 350 | 215 | 80 | 6 | (264) | 26 | 156 | 2.547 |
| 16 | 270 | 160 | 80 | 6 | (302) | 22 | 132 | 3.989 |
| | 350 | 215 | 80 | 6 | (302) | 26 | 156 | 2.959 |
| 18 | 270 | 145 | 80 | 5 | (283) | 22 | 110 | 4.589 |
| | 350 | 215 | 80 | 5 | (283) | 26 | 130 | 3.383 |
| 20 | 350 | 215 | 80 | 5 | (314) | 26 | 130 | 3.823 |
| | 450 | 265 | 100 | 5 | (314) | 34 | 170 | 2.866 |



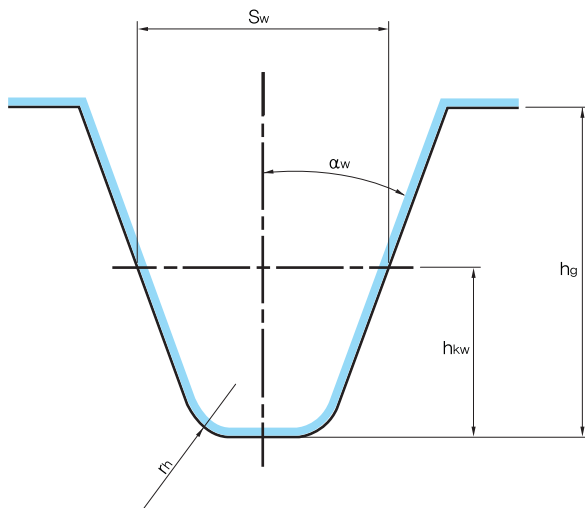
Indexable HOB



Tool SPEC.

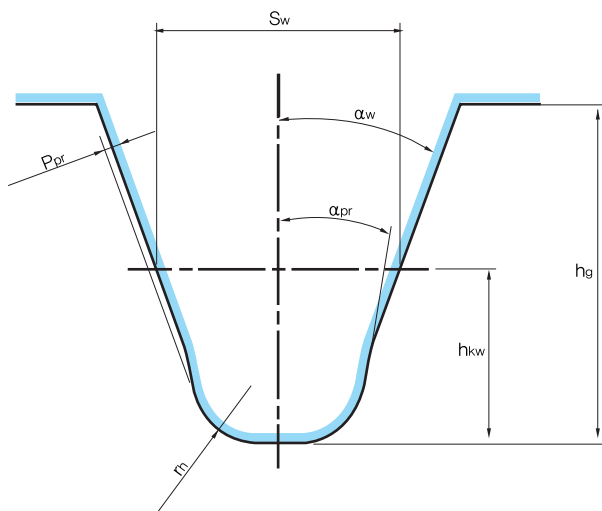
- Outside diameter $\text{ØD}(\text{mm})$: _____
- Bore diameter $\text{Ød}(\text{mm})$: _____
- Hub diameter $\text{ØDh}(\text{mm})$: _____
- Hob length $L(\text{mm})$: _____
- Cutting length $L_e(\text{mm})$: _____
- Spiral direction RH/LH : _____
- Quality class acc. to DIN 3968 : _____

Profile of Hob [Module m6 ~]



- Module $M(\text{mm})$: _____
- Addendum $h_{kw}(\text{mm})$: _____
- Tooth thickness $S_w(\text{mm})$: _____
- Tooth depth $h_g(\text{mm})$: _____

Profile of Roughing hob [Module m8 ~]



- Pressure angle $\alpha_w(\text{mm})$: _____
- Protuberance amount $P_{pr}(\text{mm})$: _____
- Protuberance angle $\alpha_{pr}(\text{mm})$: _____
- Tip radius $r_h(\text{mm})$: _____



F

ENDMILLS

Korloy Endmills, New technology and technical know-how, the best qualified for increasing productivity and machinability.

C O N T E N T S

END

Technical Information for Endmills

- F02** Endmill Code System
- F04** KORLOY Endmills

Solid Endmills

- F07** Technical Information for H-MAX
- F10** H-MAX
- F12** Technical Information for V-Endmill
- F14** V-Endmill
- F15** Technical Information for I-MAX
- F20** I-MAX
- F38** Technical Information for I+ Endmill
- F41** I+ Endmill
- F53** Technical Information for F-Endmill
- F55** F-Endmill
- F56** Technical Information for Micro Endmill
- F57** Micro Endmill



MILLS

Solid Endmills

- F58** Technical Information for Endmill for Hard to cut material
- F60** Endmills for Hard to cut material
- F61** Technical Information for Aluminum machining Endmill
- F62** Aluminum machining Endmill
- F64** Technical Information for C-Max
- F65** C-Max
- F68** Technical Information for D-Max
- F70** D-Max
- F71** Technical Information for PCD Endmill
- F72** PCD Endmill

Brazed Endmills

- F73** Technical Information for Brazed Endmill
- F74** Brazed Endmill

Special Endmills order Form

- F79** Special Endmill Order Form

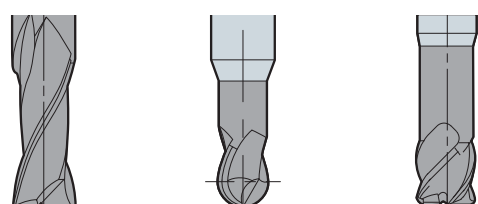
I B E 2 040 - 050 -

1 Series 2 Type 3 Endmill 4 No. of Flutes 5 Cutting Dia. 6 Overall Length

1 Series
I B E 2 040 - 050 - R T - V N S

I : Infinity-Max Endmill
 HP : High performance-Max Endmill
 C : Copper-Max Endmill
 D : Dia coated-Max Endmill
 V : Variable Endmill
 FM : Feed-up Endmill

2 Type
 I **B** E 2 040 - 050 - R T - V N S

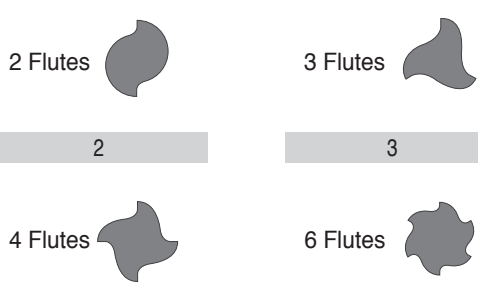


Flat type Ball type Radius type

F B R

3 Endmill
 I B **E** 2 040 - 050 - R T - V N S

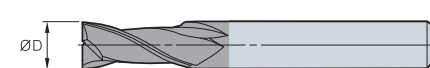
4 No. of Flutes
 I B E **2** 040 - 050 - R T - V N S



2 Flutes 3 Flutes
 4 Flutes 6 Flutes

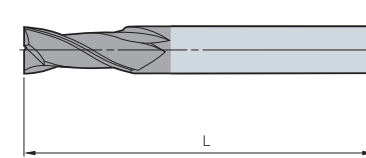
2 3
 4 6

5 Cutting Dia
 I B E 2 **040** - 050 - R T - V N S



| Notation | ØD |
|----------|-------|
| 040 | Ø4.0 |
| 060 | Ø6.0 |
| 080 | Ø8.0 |
| 100 | Ø10.0 |

6 Overall Length
 I B E 2 040 - **050** - R T - V N S



| Overall Length | |
|----------------|-------|
| Notation | L(mm) |
| 050 | 50 |
| 080 | 80 |
| 100 | 100 |

* The above code system is not applied for SSEA and ZSE.

R02 T000 - V05 N12 S06

7

Corner Radius

8

Taper Angle

9

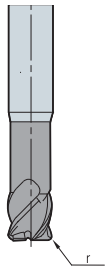
Taper Length

10

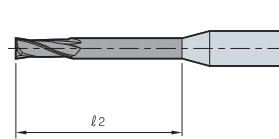
Neck Length

11

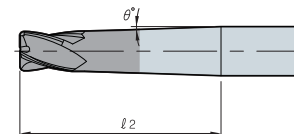
Shank Diameter

7 Corner RadiusI B E 2 040 - 050 - **R** T - V N S

| Corner Radius | |
|---------------|-------|
| Notation | R(mm) |
| R02 | r 0.2 |
| R05 | r 0.5 |
| R10 | r 1.0 |
| R15 | r 1.5 |

10 Neck LengthI B E 2 040 - 050 - R T - V **N** S

Long Neck



Taper Long Neck

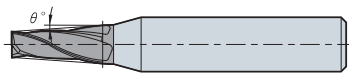
 l_2 (mm) : Neck Length $T(\theta^\circ)$: Taper Angle

Long Neck

| Notation | l_2 (mm) |
|----------|------------|
| N05 | 5 |
| N08 | 8 |
| N10 | 10 |
| N12 | 12 |

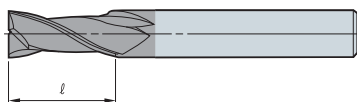
Taper Long Neck

| Notation | $l_2 + T(\theta^\circ)$ |
|----------|-------------------------|
| N0510 | 5+1° |
| N0815 | 8+1.5° |
| N1020 | 10+2° |
| N1225 | 12+2.5° |

8 Taper AngleI B E 2 040 - 050 - R **T** - V N S $T(\theta^\circ)$: Taper Angle

Taper Angle

| Notation | $T(\theta^\circ)$ |
|----------|-------------------|
| T10 | 1° |
| T15 | 1.5° |
| T20 | 2° |

9 Taper LengthI B E 2 040 - 050 - R T - **V** N S

Taper Length

| Notation | l (mm) |
|----------|----------|
| V05 | 5 |
| V10 | 10 |
| V15 | 15 |

11 Shank DiameterI B E 2 040 - 050 - R T - V N **S**









Shank Diameter

| Notation | ϕd |
|----------|-----------|
| S06 | $\phi 6$ |
| S08 | $\phi 8$ |
| S10 | $\phi 10$ |
| S12 | $\phi 12$ |
| S16 | $\phi 16$ |

* This code system is also for special endmills.

| Type | Shape | Designation | Sub- strate | Figure | Coated | Used | No. of flute | Size | | Workpiece | | | | | | page |
|------------|------------|-------------|---|---|---------------------|-----------------------------|--------------------|------|-----|-----------|-----------------|-----------|------------------|----------------------|----------------|------------|
| | | | | | | | | Min | Max | P | M | K | N | S | H | |
| | | | | | | | | | | Steel | Stainless steel | Cast iron | Nonferrous metal | Heat resistant alloy | Titanium alloy | |
| H-Max | Ball | HPBE2000 | PC203F |  | ○ | High speed High hardness | 2 | 0.6 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F10 |
| | | HPBE2000T | PC203F |  | ○ | High speed High hardness | 2 | 1 | 12 | ○ | ○ | ○ | ○ | ○ | ○ | F10 |
| | Radius | HPRE2000 | PC203F |  | ○ | High speed High hardness | 2 | 2 | 2 | ○ | ○ | ○ | ○ | ○ | ○ | F11 |
| | | HPRE4000 | PC203F |  | ○ | High speed High hardness | 4 | 3 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F11 |
| | | HPRE2000T | PC203F |  | ○ | High speed High hardness | 2 | 2 | 2 | ○ | ○ | ○ | ○ | ○ | ○ | F11 |
| | | HPRE4000T | PC203F |  | ○ | High speed High hardness | 4 | 2 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F11 |
| V-Endmill | Flat | VFE4000 | PC203F |  | ○ | General | 4 | 2.5 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F14 |
| I-Max | Ball | IBE2000 | PC220 |  | ○ | General | 2 | 1 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F25 |
| | | IBE4000 | PC220 |  | ○ | General | 2 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F25 |
| | Long Ball | IBE2000 | PC220 |  | ○ | General | 2 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F26 |
| | Taper Ball | IBE2000-T | PC220 |  | ○ | General | 2 | 3 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F26 F27 |
| | Flat | IFE2000 | PC220 |  | ○ | General | 2 | 1 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F20 |
| | | IFE3000 | PC220 |  | ○ | General | 3 | 2 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F20 |
| | | IFE4000 | PC220 |  | ○ | General | 4 | 2.5 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F21 |
| | Long Flat | IFE2000 | PC220 |  | ○ | General | 2 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F22 |
| | | IFE4000 | PC220 |  | ○ | General | 4 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F22 |
| | Taper Flat | IFE2000-T | PC220 |  | ○ | General | 2 | 3 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F23 F24 |
| | Radius | IRE2000 | PC220 |  | ○ | General | 2 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F28 |
| | | IRE4000 | PC220 |  | ○ | General | 4 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F29 |
| | Ball | BE2000 | FA2 |  | — | Cast iron, Steel | 2 | 1 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F35 |
| | | BE4000 | FA2 |  | — | Cast iron, Steel | 4 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F35 |
| | Long Ball | BE2000 | FA2 |  | — | Cast iron, Steel | 2 | 3 | 20 | ○ | ○ | ○ | ○ | ○ | ○ | F36 |
| Taper Ball | BE2000-T | FA2 |  | — | Cast iron, Steel | 2 | 3 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F36 F37 | |
| Flat | FE2000 | FA2 |  | — | Cast iron, Steel | 2 | 1 | 16 | ○ | ○ | ○ | ○ | ○ | ○ | F30 | |

○ : Excellent ○ : Good

| Type | Shape | Designation | Substrate | Figure | Coated | Used | No. of flute | Size | | Workpiece | | | | | | page |
|--|-------------|-------------|------------|---|---|------------------|--------------|------|-----|-----------|-----------------|-----------|-------------------|----------------------|----------------|------------|
| | | | | | | | | | | P | M | K | N | S | H | |
| | | | | | | | | Min | Max | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy | Titanium alloy | |
| I-Max | Flat | FE3000 | FA2 |  | — | Cast iron, Steel | 3 | 2 | 16 | ○ | ○ | ◎ | ◎ | | | F30 |
| | | FE4000 | FA2 |  | — | Cast iron, Steel | 4 | 2.5 | 20 | ○ | ○ | ◎ | ◎ | | | F31 |
| | Long Flat | FE2000 | FA2 |  | — | Cast iron, Steel | 2 | 3 | 20 | ○ | ○ | ◎ | ◎ | | | F32 |
| | | FE4000 | FA2 |  | — | Cast iron, Steel | 4 | 3 | 20 | ○ | ○ | ◎ | ◎ | | | F32 |
| | Taper Flat | FE2000-T | FA2 |  | — | Cast iron, Steel | 2 | 3 | 16 | ○ | ○ | ◎ | ◎ | | | F33 F34 |
| I+ Endmill | Flat | IPFE2000 | PC320 |  | ○ | General | 2 | 1 | 20 | ◎ | ○ | ◎ | ○ | | | F41 |
| | | IPFE4000 | PC320 |  | ○ | General | 4 | 1 | 20 | ◎ | ○ | ◎ | ○ | | | F43 |
| | Long Flat | IPLFE2000 | PC320 |  | ○ | General | 2 | 1 | 20 | ◎ | ○ | ◎ | ○ | | | F42 |
| | | IPLFE4000 | PC320 |  | ○ | General | 4 | 1 | 20 | ◎ | ○ | ◎ | ○ | | | F44 |
| | Ball | IPBE2000 | PC320 |  | ○ | General | 2 | 1 | 20 | ◎ | ○ | ◎ | ○ | | | F45 |
| | | IPBE4000 | PC320 |  | ○ | General | 4 | 1 | 20 | ◎ | ○ | ◎ | ○ | | | F47 |
| | Long Ball | IPLBE2000 | PC320 |  | ○ | General | 2 | 1 | 16 | ◎ | ○ | ◎ | ○ | | | F46 |
| | Radius | IPRE2000 | PC320 |  | ○ | General | 2 | 1 | 12 | ◎ | ○ | ◎ | ○ | | | F48 F49 |
| | | IPRE4000 | PC320 |  | ○ | General | 4 | 2 | 12 | ◎ | ○ | ◎ | ○ | | | F51 |
| | Long Radius | IPLRE2000 | PC320 |  | ○ | General | 2 | 3 | 12 | ◎ | ○ | ◎ | ○ | | | F50 |
| | | IPLRE4000 | PC320 |  | ○ | General | 4 | 3 | 12 | ◎ | ○ | ◎ | ○ | | | F52 |
| | F-Endmill | Standard | FME4000 | PC203F |  | ○ | High speed | 4 | 6 | 12 | ○ | ○ | ○ | ◎ | ◎ | |
| Long | | FMLE4000 | PC203F |  | ○ | High speed | 4 | 6 | 12 | ○ | ○ | ○ | ◎ | ◎ | | F55 |
| Micro Endmills | Flat | MSE2000 | PC215F |  | ○ | High speed | 2 | 0.2 | 1 | ○ | ○ | ○ | ◎ | ○ | | F57 |
| | Ball | MSBE2000 | PC215F |  | ○ | High speed | 2 | 0.2 | 1 | ○ | ○ | ○ | ◎ | ○ | | F57 |
| Solid Endmills for difficult to cut material | Flat | IFSE3000 | PC210 |  | ○ | STS | 3 | 3 | 20 | ○ | ◎ | ○ | ◎ | | | F60 |
| Solid Endmills for aluminum | Flat | SSEA2000 | H01 PD3000 |  | — (○) | Aluminum | 2 | 1 | 20 | ○ | ○ | ○ | ◎ | | | F62 |
| | | SSEA3000 | H01 PD3000 |  | — (○) | Aluminum | 3 | 2 | 16 | ○ | ○ | ○ | ◎ | | | F62 |
| | Ball | SSBEA2000 | H01 PD3000 |  | — (○) | Aluminum | 2 | 1 | 20 | ○ | ○ | ○ | ◎ | | | F63 |

◎ : Excellent ○ : Good

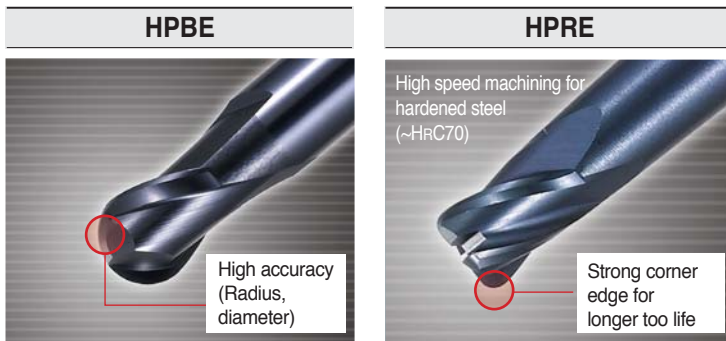
| Type | Shape | Designation | Substrate | Figure | Coated | Used | No. of flute | Size | | Workpiece | | | | | | page |
|-----------------|------------------|-------------|---------------|---|---|------------------------|------------------|------|-----|-----------|-----------------|-----------|-------------------|--------------------------------------|----------------|------------|
| | | | | | | | | Min | Max | P | M | K | N | S | H | |
| | | | | | | | | | | Steel | Stainless steel | Cast iron | Non-ferrous metal | Heat resistant alloy, Titanium alloy | Hardened steel | |
| C-Max Copper | Flat | CFE2000 | PC210C |  | ○ | Copper, Copper alloy | 2 | 1.0 | 12 | ○ | ○ | ◎ | | | | F65 |
| | Long Neck Flat | CFNE2000 | PC210C |  | ○ | Copper, Copper alloy | 2 | 0.5 | 4 | ○ | ○ | ◎ | | | | F65 |
| | Ball | CBE2000 | PC210C |  | ○ | Copper, Copper alloy | 2 | 1.0 | 12 | ○ | ○ | ◎ | | | | F66 |
| | Long Neck Ball | CBNE2000 | PC210C |  | ○ | Copper, Copper alloy | 2 | 0.5 | 4 | ○ | ○ | ◎ | | | | F66 |
| | Radius | CRE2000 | PC210C |  | ○ | Copper, Copper alloy | 2 | 2.0 | 12 | ○ | ○ | ◎ | | | | F67 |
| | Long Neck Radius | CRNE2000 | PC210C |  | ○ | Copper, Copper alloy | 2 | 1.0 | 4 | ○ | ○ | ◎ | | | | F67 |
| D-Max | Ball | DBE2000 | ND3000 |  | ○ | Graphite, Aluminum | 2 | 4 | 8 | | | ◎ | | | | F70 |
| | Flat | DFE2000 | ND3000 |  | ○ | Graphite, Aluminum | 2 | 3 | 8 | | | ◎ | | | | F70 |
| | Radius | DRE2000 | ND3000 |  | ○ | Graphite, Aluminum | 2 | 4 | 8 | | | ◎ | | | | F70 |
| PCD Endmill | Flat | PDE1000 | DP200 |  | — | Nonferrous, High speed | 1 | 4.6 | 6 | | | ◎ | | | | F72 |
| | | PDE2000 | DP200 |  | — | Nonferrous, High speed | 2 | 6.0 | 12 | | | ◎ | | | | F72 |
| Braze Endmill | Flat | ZSE200 | FCC PC221F |  | — (○) | Cast iron, Steel | 2 | 14 | 50 | ○ | ○ | ◎ | ○ | | | F74 |
| | | ZSE300 | FCC PC221F |  | — (○) | Cast iron, Steel | 3 | 14 | 50 | ○ | ○ | ◎ | ○ | | | F74 F75 |
| | | ZSE400 | FCC PC221F |  | — (○) | Cast iron, Steel | 4 | 14 | 50 | ○ | ○ | ◎ | ○ | | | F75 |
| | | ZSE600 | FCC PC221F |  | — (○) | Cast iron, Steel | 6 | 34 | 50 | ○ | ○ | ◎ | ○ | | | F75 |
| | | ZSEA200 | FCC |  | — (○) | Aluminum, Copper | 2 | 15 | 50 | | | ◎ | | | | F76 |
| | Long Flat | ZSEL200 | FCC PC221F |  | — (○) | Cast iron, Steel | 2 | 14 | 50 | ○ | ○ | ◎ | ○ | | | F77 |
| | | ZSEL400 | FCC PC221F |  | — (○) | Cast iron, Steel | 4 | 16 | 40 | ○ | ○ | ◎ | ○ | | | F77 |
| | | ZSEXL200 | FCC PC221F |  | — (○) | Cast iron, Steel | 2 | 20 | 25 | ○ | ○ | ◎ | ○ | | | F77 |
| | | Ball | ZSBE200 | FCC PC221F |  | — (○) | Cast iron, Steel | 2 | 13 | 50 | ○ | ○ | ◎ | ○ | | |

◎ : Excellent ○ : Good

New PVD coating technology for anti-corrosion and wear resistance

H-Max

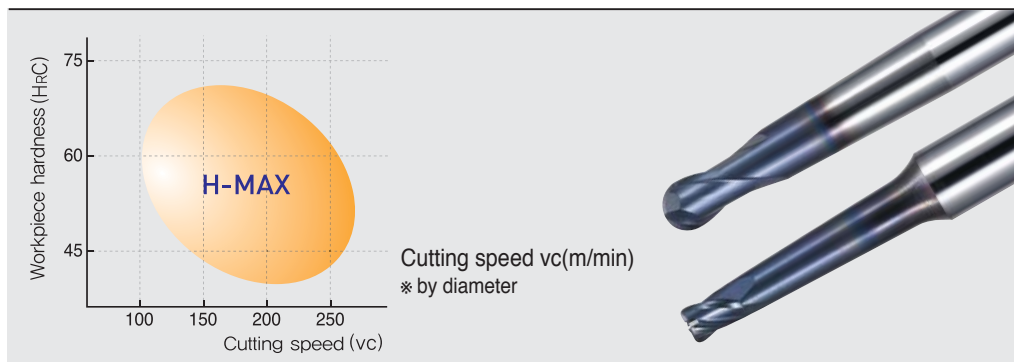
- H-max can be used for pre-hardened steel and heat-treated steel
- H-max guarantees highly accurate machining (diameter and radius)
- New PVD coating technology improves anti-corrosion and wear resistance



• **Tolerance**
Diameter : 0~-0.015 Radius : 0~-0.005

- ▶ Ultra fine grade for tougher edge and less chipping
- ▶ Combination of the new PVD coating and the hardened anti corrosion substrate guarantees excellent performance

Application area (Ball. Radius type)



Test examples

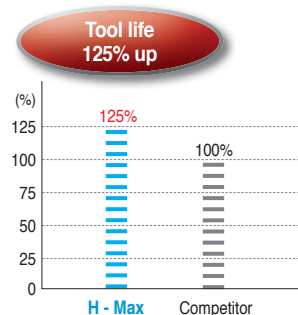


• Joint mold core machining (STD11 HRC54~59)

- Workpiece : STD11 HRC54~59
- Cutting condition : $v_c = 170$ (m/min), $v_f = 800$ (mm/min)
 $a_p = 0.2$ $a_e = 0.5$, oil mist
- Tool : HPBE2080 PC203F
- Result : 130min cutting time (Roughing), long tool life, wear resistance, no chipping found

Test Result

| | Point | Edge | Edge |
|------------|-------|------|------|
| H - Max | | | |
| Competitor | | | |



Recommended Cutting Condition (HPBE)

| Workpiece Condition Diameter(Ø) | NAK80, STD61 (~ HRC 50) | | | STD11, STS420 (HRC 50~60) | | | SKH (HRC 60~65) | | |
|---------------------------------------|--------------------------------|--------------------|-----------------------|--------------------------------|--------------------|-----------------------|--------------------------------|--------------------|-----------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Axial depth ap(mm) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Axial depth ap(mm) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Axial depth ap(mm) |
| 1 | 40,000 | 4,800 | 0.06 | 40,000 | 3,360 | 0.05 | 40,000 | 3,160 | 0.04 |
| 2 | 40,000 | 5,760 | 0.11 | 40,000 | 4,800 | 0.10 | 24,000 | 2,280 | 0.07 |
| 3 | 40,000 | 7,200 | 0.13 | 32,000 | 4,620 | 0.12 | 16,000 | 1,020 | 0.09 |
| 4 | 32,000 | 6,528 | 0.15 | 24,000 | 1,920 | 0.13 | 12,000 | 1,440 | 0.10 |
| 6 | 21,000 | 5,040 | 0.20 | 10,000 | 2,000 | 0.20 | 8,000 | 1,020 | 0.11 |
| 8 | 16,000 | 3,840 | 0.30 | 12,000 | 2,160 | 0.20 | 6,000 | 840 | 0.11 |
| 10 | 13,000 | 3,120 | 0.50 | 10,000 | 1,920 | 0.20 | 4,800 | 660 | 0.12 |
| 12 | 9,000 | 2,160 | 0.50 | 7,000 | 1,320 | 0.30 | 3,600 | 516 | 0.12 |
| 16 | 6,000 | 1,440 | 0.50 | 5,000 | 960 | 0.30 | 2,500 | 390 | 0.15 |

Recommended Cutting Condition (HPRE)

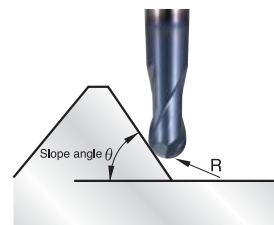
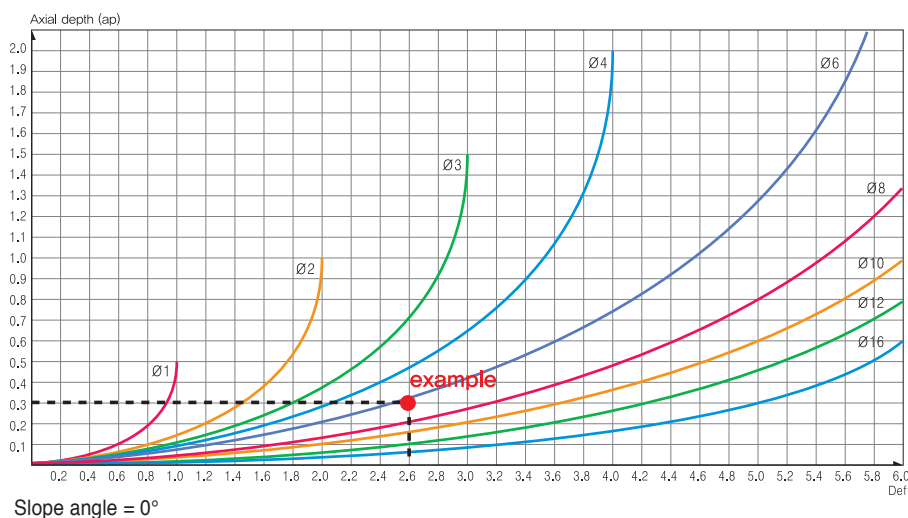
| Workpiece Condition Diameter(Ø) | NAK80, STD61 (~ HRC 50) | | | STD11, STS420 (HRC 50~60) | | | SKH (HRC 60~65) | | |
|---------------------------------------|--------------------------------|--------------------|-----------------------|--------------------------------|--------------------|-----------------------|--------------------------------|--------------------|-----------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Axial depth ap(mm) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Axial depth ap(mm) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Axial depth ap(mm) |
| 1 | 40,000 | 720 | 0.10 | 40,000 | 480 | 0.03 | 32,000 | 300 | 0.02 |
| 2 | 40,000 | 1,200 | 0.10 | 24,000 | 600 | 0.05 | 16,000 | 380 | 0.05 |
| 3 | 32,000 | 2,280 | 0.20 | 16,000 | 1,140 | 0.10 | 11,000 | 720 | 0.05 |
| 4 | 24,000 | 2,640 | 0.30 | 12,000 | 1,320 | 0.10 | 8,000 | 480 | 0.05 |
| 6 | 16,000 | 3,480 | 0.40 | 8,000 | 1,740 | 0.20 | 5,300 | 1,080 | 0.10 |
| 8 | 12,000 | 3,480 | 0.50 | 6,000 | 1,740 | 0.20 | 4,000 | 1,080 | 0.10 |
| 10 | 9,600 | 3,480 | 0.60 | 4,800 | 1,740 | 0.30 | 3,200 | 1,080 | 0.20 |
| 12 | 8,000 | 2,880 | 0.80 | 4,000 | 1,440 | 0.30 | 2,700 | 900 | 0.20 |
| 16 | 6,000 | 2,160 | 1.00 | 3,000 | 1,080 | 0.50 | 2,000 | 680 | 0.30 |
| 20 | 4,800 | 1,740 | 1.00 | 2,400 | 840 | 0.50 | 1,600 | 528 | 0.30 |

Cutting speed formulas (Ball Endmills)

- Efficient cutting speed $V_{eff} = \pi \times Deff \times n/1000$ (n=min⁻¹)
- Efficient diameter $Deff$ calculation formula : $Deff = (2/\sqrt{ap(D-ap)}) \times \alpha$
D=Ø (Tool diameter), Deff=Efficient diameter
- Efficient cutting speed formulas : When slope Ø is 0° $V_{eff} = \pi \times Deff \times n/1000$,
Deff = Efficient, diameter Calculate Deff as ap with various ball endmills

| | | |
|-----|----------|---------------------|
| Q : | α = 1 | Slope angle θ = 0° |
| | α = 1.2 | Slope angle θ = 7° |
| | α = 1.5 | Slope angle θ = 15° |
| | α = 1.7 | Slope angle θ = 30° |
| | α = 2.17 | Slope angle θ = 45° |
| | α = 2.3 | Slope angle θ = 60° |

Cutting speed formulas (Ball Endmills, Slope angle = 0°)



Ex) Diameter : 6mm, ap=0.3mm,
Deff=2.6mm, N=14,000(min⁻¹)
Slope angle 0° : $V_{eff} = 113.7$ (m/min)
Slope angle 15° :
 $V_{eff} = 113.7 \times 1.5 = 170.6$ (m/min)

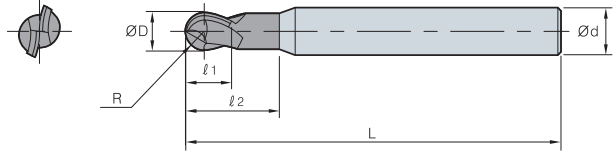
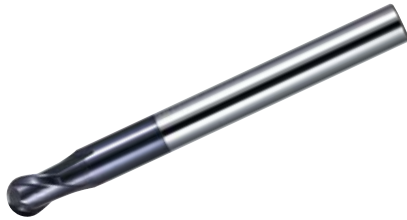
⊙ Veff (efficient cutting speed) technical data as per depth and workpiece hardness (H-max, Ball Endmills)

| Dimensions | | H _R C45~55 | | vc | Efficient cutting speed by depth (z-step=ap) | | | | | | | | | | | | | | |
|---------------|--------|-----------------------|-----|----|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tool diameter | Ball R | RPM | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 |
| 0.6 | 0.3 | 40,000 | 75 | 56 | 71 | 75 | 71 | 56 | | | | | | | | | | | |
| 0.8 | 0.4 | 37,000 | 93 | 61 | 80 | 90 | 93 | 90 | 80 | 61 | | | | | | | | | |
| 1 | 0.5 | 35,000 | 110 | 66 | 88 | 101 | 108 | 110 | 108 | 101 | 88 | 66 | | | | | | | |
| 1.5 | 0.75 | 32,000 | 151 | 75 | 102 | 121 | 133 | 142 | 148 | 150 | 150 | 148 | 142 | 133 | 121 | 102 | 75 | 0 | |
| 2 | 1 | 30,000 | 188 | 82 | 113 | 135 | 151 | 163 | 173 | 180 | 185 | 187 | 188 | 187 | 285 | 180 | 173 | 163 | |
| 2.5 | 1.25 | 28,000 | 220 | 86 | 119 | 143 | 161 | 176 | 188 | 197 | 205 | 211 | 215 | 218 | 220 | 220 | 218 | 215 | |
| 3 | 1.5 | 26,000 | 245 | 88 | 122 | 147 | 167 | 183 | 196 | 207 | 217 | 224 | 231 | 236 | 240 | 243 | 244 | 245 | |
| 4 | 2 | 22,000 | 276 | 86 | 120 | 146 | 166 | 183 | 197 | 210 | 221 | 231 | 239 | 247 | 253 | 259 | 264 | 268 | |
| 5 | 2.5 | 20,000 | 314 | 88 | 123 | 149 | 170 | 188 | 204 | 218 | 230 | 241 | 251 | 260 | 268 | 275 | 282 | 288 | |
| 6 | 3 | 18,000 | 339 | 87 | 122 | 148 | 169 | 187 | 203 | 218 | 231 | 242 | 253 | 262 | 271 | 279 | 287 | 294 | |
| 7 | 3.5 | 15,000 | 330 | 78 | 110 | 134 | 153 | 170 | 185 | 198 | 210 | 221 | 231 | 240 | 249 | 256 | 264 | 271 | |
| 8 | 4 | 13,500 | 339 | 75 | 106 | 129 | 148 | 164 | 179 | 192 | 203 | 214 | 224 | 234 | 242 | 250 | 258 | 265 | |
| 9 | 4.5 | 12,000 | 339 | 71 | 100 | 122 | 140 | 155 | 169 | 182 | 193 | 203 | 213 | 222 | 231 | 238 | 246 | 253 | |
| 10 | 5 | 11,000 | 345 | 69 | 97 | 118 | 135 | 151 | 164 | 176 | 187 | 198 | 207 | 216 | 224 | 232 | 240 | 247 | |
| 11 | 5.5 | 10,000 | 345 | 66 | 92 | 113 | 129 | 144 | 157 | 169 | 179 | 189 | 199 | 207 | 215 | 223 | 230 | 237 | |
| 12 | 6 | 9,200 | 347 | 63 | 89 | 108 | 124 | 139 | 151 | 162 | 173 | 183 | 192 | 200 | 208 | 215 | 223 | 229 | |
| 13 | 6.5 | 8,500 | 347 | 61 | 85 | 104 | 120 | 133 | 146 | 157 | 167 | 176 | 185 | 193 | 201 | 208 | 215 | 222 | |
| 14 | 7 | 7,900 | 347 | 58 | 82 | 101 | 116 | 129 | 141 | 151 | 161 | 170 | 179 | 187 | 194 | 202 | 208 | 215 | |
| 15 | 7.5 | 7,400 | 349 | 57 | 80 | 98 | 112 | 125 | 137 | 147 | 157 | 166 | 174 | 182 | 189 | 196 | 203 | 209 | |
| 16 | 8 | 6,900 | 347 | 55 | 77 | 94 | 108 | 121 | 132 | 142 | 151 | 160 | 168 | 175 | 183 | 189 | 196 | 202 | |
| 17 | 8.5 | 6,500 | 347 | 53 | 75 | 91 | 105 | 117 | 128 | 138 | 147 | 155 | 163 | 171 | 178 | 184 | 191 | 197 | |
| 18 | 9 | 6,100 | 345 | 51 | 72 | 88 | 102 | 113 | 124 | 133 | 142 | 150 | 158 | 165 | 172 | 178 | 185 | 191 | |
| 19 | 9.5 | 5,800 | 346 | 50 | 71 | 86 | 99 | 111 | 121 | 130 | 139 | 147 | 155 | 162 | 168 | 175 | 181 | 187 | |
| 20 | 10 | 5,500 | 345 | 49 | 69 | 84 | 97 | 108 | 118 | 127 | 135 | 143 | 151 | 157 | 164 | 170 | 176 | 182 | |

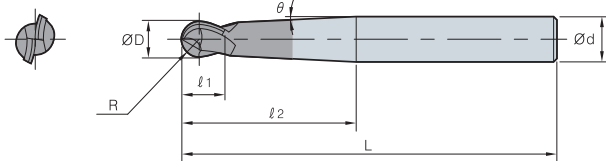
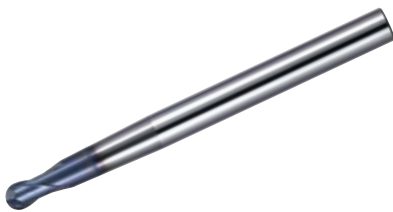
| Dimensions | | H _R C55~60 | | vc | Efficient cutting speed by depth (z-step=ap) | | | | | | | | | | | | | | |
|---------------|--------|-----------------------|-----|----|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tool diameter | Ball R | RPM | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 |
| 0.6 | 0.3 | 40,000 | 75 | 56 | 71 | 75 | 71 | 56 | | | | | | | | | | | |
| 0.8 | 0.4 | 37,000 | 93 | 61 | 80 | 90 | 93 | 90 | 80 | 61 | | | | | | | | | |
| 1 | 0.5 | 35,000 | 110 | 66 | 88 | 101 | 108 | 110 | 108 | 101 | 88 | 66 | | | | | | | |
| 1.5 | 0.75 | 28,000 | 132 | 66 | 90 | 106 | 117 | 124 | 129 | 132 | 132 | 129 | 124 | 117 | 106 | 90 | 66 | | |
| 2 | 1 | 26,000 | 163 | 71 | 98 | 117 | 131 | 141 | 150 | 156 | 160 | 162 | 163 | 162 | 160 | 156 | 150 | 141 | |
| 2.5 | 1.25 | 24,000 | 188 | 74 | 102 | 122 | 138 | 151 | 161 | 169 | 176 | 181 | 185 | 187 | 188 | 188 | 187 | 185 | |
| 3 | 1.5 | 22,000 | 207 | 74 | 103 | 124 | 141 | 154 | 166 | 175 | 183 | 190 | 195 | 200 | 203 | 205 | 207 | 207 | |
| 4 | 2 | 18,500 | 232 | 73 | 101 | 122 | 139 | 154 | 166 | 177 | 186 | 194 | 201 | 208 | 213 | 218 | 222 | 225 | |
| 5 | 2.5 | 16,500 | 259 | 73 | 102 | 123 | 141 | 155 | 168 | 180 | 190 | 199 | 207 | 215 | 221 | 227 | 233 | 237 | |
| 6 | 3 | 15,000 | 283 | 72 | 101 | 123 | 141 | 156 | 170 | 181 | 192 | 202 | 211 | 219 | 226 | 233 | 239 | 245 | |
| 7 | 3.5 | 15,000 | 330 | 78 | 110 | 134 | 153 | 170 | 185 | 198 | 210 | 221 | 231 | 240 | 249 | 256 | 264 | 271 | |
| 8 | 4 | 12,000 | 301 | 67 | 94 | 115 | 131 | 146 | 159 | 170 | 181 | 190 | 199 | 208 | 215 | 222 | 229 | 235 | |
| 9 | 4.5 | 10,650 | 301 | 63 | 89 | 108 | 124 | 138 | 150 | 161 | 171 | 181 | 189 | 197 | 205 | 212 | 218 | 224 | |
| 10 | 5 | 9,600 | 301 | 30 | 84 | 103 | 118 | 131 | 143 | 154 | 164 | 173 | 181 | 189 | 196 | 203 | 209 | 215 | |
| 11 | 5.5 | 8,700 | 300 | 57 | 80 | 98 | 113 | 125 | 136 | 147 | 156 | 165 | 173 | 180 | 187 | 194 | 200 | 206 | |
| 12 | 6 | 8,000 | 301 | 55 | 77 | 94 | 108 | 120 | 131 | 141 | 150 | 159 | 167 | 174 | 181 | 187 | 194 | 199 | |
| 13 | 6.5 | 7,373 | 301 | 53 | 74 | 90 | 104 | 116 | 126 | 136 | 145 | 153 | 160 | 168 | 174 | 181 | 187 | 192 | |
| 14 | 7 | 6,800 | 299 | 50 | 71 | 87 | 110 | 111 | 121 | 130 | 139 | 147 | 154 | 161 | 167 | 174 | 179 | 185 | |
| 15 | 7.5 | 6,300 | 297 | 48 | 68 | 83 | 96 | 107 | 116 | 125 | 133 | 141 | 148 | 155 | 161 | 167 | 173 | 178 | |
| 16 | 8 | 5,900 | 296 | 47 | 66 | 80 | 93 | 103 | 113 | 121 | 129 | 137 | 144 | 150 | 156 | 162 | 168 | 173 | |
| 17 | 8.5 | 5,600 | 299 | 46 | 64 | 79 | 91 | 101 | 110 | 119 | 127 | 134 | 141 | 147 | 153 | 159 | 164 | 170 | |
| 18 | 9 | 5,300 | 300 | 45 | 63 | 77 | 88 | 98 | 108 | 116 | 123 | 131 | 137 | 144 | 149 | 155 | 160 | 166 | |
| 19 | 9.5 | 5,000 | 298 | 43 | 61 | 74 | 86 | 95 | 104 | 112 | 120 | 127 | 133 | 139 | 145 | 151 | 156 | 161 | |
| 20 | 10 | 4,700 | 295 | 42 | 59 | 72 | 83 | 92 | 101 | 108 | 116 | 122 | 129 | 135 | 140 | 146 | 151 | 155 | |



HPBE2000 (Ball) / 2000L (Long Ball)



HPBE2000T (Taper Ball)

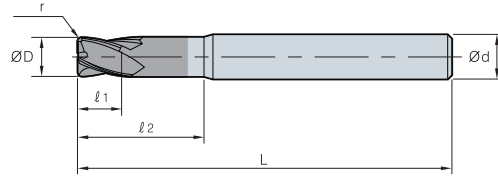
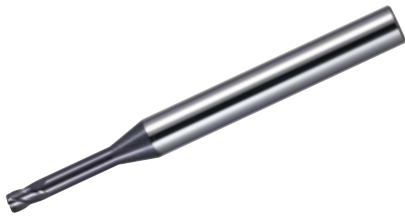


| ØD | Tolerance | R Tolerance |
|-----------|------------|-------------|
| Ø0.6 ~ Ø6 | 0 ~ -0.02 | ±0.005 |
| Ø7 ~ Ø16 | 0 ~ -0.025 | ±0.010 |

(mm)

| Designation | R | ØD | Ød | ℓ ₁ | ℓ ₂ | L | θ° |
|-----------------|-----|-----|----|----------------|----------------|-----|----|
| HPBE 2006 | 0.3 | 0.6 | 6 | 1.2 | 4 | 50 | |
| 2008 | 0.4 | 0.8 | 6 | 1.6 | 4 | 50 | |
| 2010 | 0.5 | 1 | 6 | 2 | 4 | 50 | |
| 2020 | 1 | 2 | 6 | 3 | 6 | 50 | |
| 2030 | 1.5 | 3 | 6 | 4 | 8 | 50 | |
| 2040 | 2 | 4 | 6 | 5 | 10 | 60 | |
| 2050 | 2.5 | 5 | 6 | 6 | 12 | 60 | |
| 2060 | 3 | 6 | 6 | 7 | 14 | 60 | |
| 2070 | 3.5 | 7 | 8 | 8 | 16 | 80 | |
| 2080 | 4 | 8 | 8 | 9 | 18 | 80 | |
| 2090 | 4.5 | 9 | 10 | 10 | 20 | 80 | |
| 2100 | 5 | 10 | 10 | 11 | 22 | 80 | |
| 2110 | 5.5 | 11 | 12 | 12 | 24 | 90 | |
| 2120 | 6 | 12 | 12 | 13 | 26 | 90 | |
| 2140 | 7 | 14 | 16 | 15 | 30 | 100 | |
| 2160 | 8 | 16 | 16 | 17 | 34 | 100 | |
| HPBE 2060L | 3 | 6 | 6 | 7 | 14 | 90 | |
| 2070L | 3.5 | 7 | 8 | 8 | 16 | 90 | |
| 2080L | 4 | 8 | 8 | 9 | 18 | 100 | |
| 2090L | 4.5 | 9 | 10 | 10 | 20 | 100 | |
| 2100L | 5 | 10 | 10 | 11 | 22 | 100 | |
| HPBE 2010-T2-26 | 0.5 | 1 | 6 | 2 | 26 | 55 | 1 |
| 2010-T4-16 | 0.5 | 1 | 6 | 2 | 16 | 50 | 2 |
| 2020-T2-41 | 1 | 2 | 6 | 3 | 41 | 70 | 1 |
| 2020-T4-29 | 1 | 2 | 6 | 3 | 29 | 60 | 2 |
| 2030-T2-51 | 1.5 | 3 | 6 | 4 | 51 | 80 | 1 |
| 2030-T4-29 | 1.5 | 3 | 6 | 4 | 29 | 60 | 2 |
| 2040-T2-61 | 2 | 4 | 6 | 5 | 61 | 90 | 1 |
| 2040-T4-34 | 2 | 4 | 6 | 5 | 34 | 70 | 2 |
| 2060-T2-63 | 3 | 6 | 6 | 7 | 63 | 90 | 1 |
| 2060-T4-35 | 3 | 6 | 6 | 7 | 35 | 90 | 2 |
| 2080-T2-67 | 4 | 8 | 8 | 11 | 67 | 100 | 1 |
| 2080-T4-39 | 4 | 8 | 8 | 11 | 39 | 100 | 2 |
| 2100-T2-69 | 5 | 10 | 10 | 13 | 69 | 120 | 1 |
| 2100-T4-41 | 5 | 10 | 10 | 13 | 41 | 120 | 2 |
| 2120-T2-71 | 6 | 12 | 12 | 15 | 71 | 130 | 1 |
| 2120-T4-43 | 6 | 12 | 12 | 15 | 43 | 130 | 2 |

HPRE2000 / 4000 (Radius)

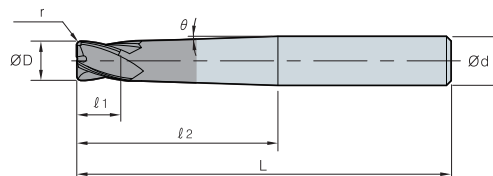


| ØD | Tolerance | R Tolerance |
|-----------|------------|-------------|
| Ø0.6 ~ Ø6 | 0 ~ -0.02 | ±0.005 |
| Ø7 ~ Ø16 | 0 ~ -0.025 | ±0.010 |

(mm)

| Designation | | ØD | Ød | ℓ ₁ | ℓ ₂ | L | r |
|-------------|-----------|----|----|----------------|----------------|-----|-----|
| HPRE 2 | 2020-R0.5 | 2 | 6 | 3 | 12 | 60 | 0.5 |
| | 4030-R0.5 | 3 | 6 | 4 | 16 | 60 | 0.5 |
| HPRE 4 | 4040-R0.5 | 4 | 6 | 5 | 20 | 60 | 0.5 |
| | 4060-R1.0 | 6 | 6 | 7 | 28 | 60 | 1 |
| | 4080-R2.0 | 8 | 8 | 9 | 31 | 80 | 2 |
| | 4100-R2.0 | 10 | 10 | 11 | 33 | 90 | 2 |
| | 4120-R2.0 | 12 | 12 | 13 | 39 | 100 | 2 |
| | 4160-R2.0 | 16 | 16 | 17 | 51 | 120 | 2 |

HPRE2000T / 4000T (Taper Radius)



| ØD | Tolerance | R Tolerance |
|-----------|------------|-------------|
| Ø0.6 ~ Ø6 | 0 ~ -0.02 | ±0.005 |
| Ø7 ~ Ø16 | 0 ~ -0.025 | ±0.010 |

(mm)

| Designation | | ØD | Ød | ℓ ₁ | ℓ ₂ | L | r | θ° |
|-----------------|-----------------|----|----|----------------|----------------|-----|-----|----|
| HPRE 2 | 2020-R0.5-T4-13 | 2 | 6 | 3 | 13 | 70 | 0.3 | 2 |
| | 2020-R0.5-T2-18 | 2 | 6 | 3 | 18 | 70 | 0.5 | 1 |
| HPRE 4 | 4020-R0.5-T2-23 | 2 | 6 | 3 | 23 | 70 | 0.5 | 1 |
| | 4020-R0.5-T4-18 | 2 | 6 | 3 | 18 | 70 | 0.5 | 2 |
| | 4030-R0.5-T2-24 | 3 | 6 | 4 | 24 | 90 | 0.5 | 1 |
| | 4030-R0.5-T4-19 | 3 | 6 | 4 | 19 | 90 | 0.5 | 2 |
| | 4040-R0.5-T2-61 | 4 | 8 | 5 | 61 | 100 | 0.5 | 1 |
| | 4040-R0.5-T4-34 | 4 | 8 | 5 | 34 | 70 | 0.5 | 2 |
| | 4060-R1.0-T2-63 | 6 | 10 | 7 | 63 | 100 | 1 | 1 |
| | 4060-R1.0-T4-36 | 6 | 10 | 7 | 36 | 70 | 1 | 2 |
| | 4080-R2.0-T2-65 | 8 | 12 | 9 | 65 | 110 | 2 | 1 |
| | 4080-R2.0-T4-37 | 8 | 12 | 9 | 37 | 90 | 2 | 2 |
| | 4100-R2.0-T2-69 | 10 | 14 | 11 | 69 | 110 | 2 | 1 |
| | 4100-R2.0-T4-40 | 10 | 14 | 11 | 40 | 100 | 2 | 2 |
| | 4120-R2.0-T2-71 | 12 | 16 | 13 | 71 | 110 | 2 | 1 |
| | 4120-R2.0-T4-42 | 12 | 16 | 13 | 42 | 110 | 2 | 2 |
| | 4160-R2.0-T2-73 | 16 | 20 | 17 | 73 | 130 | 2 | 1 |
| 4160-R2.0-T4-45 | 16 | 20 | 17 | 45 | 130 | 2 | 2 | |

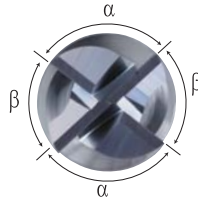


Improved productivity with effective machining due to less vibration

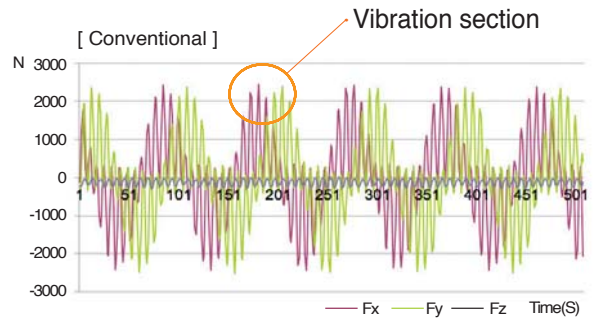
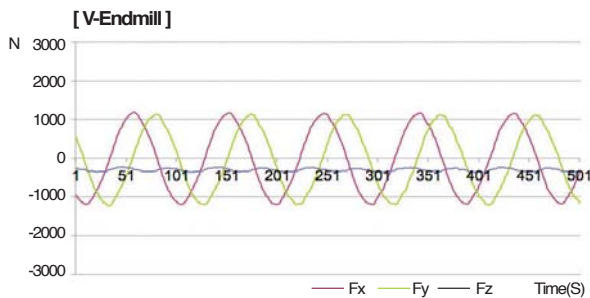
V-Endmill Variable Endmill

- Irregular helix angle
- Irregular indexing angle

* Irregular flute spacing : Decreased vibration



Performance(Vibration test)



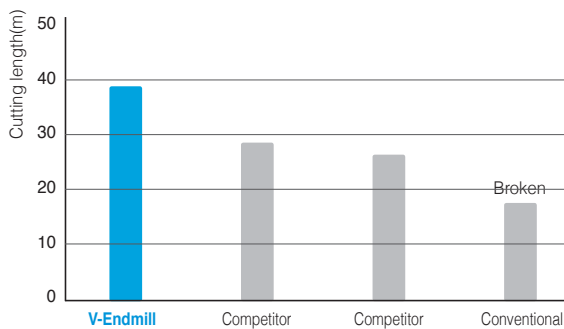
- **Workpiece** Alloy steel
- **Cutting condition** D=Ø8.0, n(min-1)=3183, vc(m/min)=80, vf(mm/min)=713, fz(mm/t)=0.055, ap(mm)=8.0, ae(mm)=8.0, Dry
- **Tools** V-Endmill VFE4080-060 · Conventional endmill

Advantage of V-Endmill

| Type | Cutting speed(vc) | Feed(vf) | Vibration | Quality |
|-----------|-------------------|----------|-----------|-----------|
| V-Endmill | 30% up | 30% up | Minimize | Excellent |

- Higher cutting speed and feed rate increase productivity.
- Less vibration realizes excellent surface finish and higher quality machining.

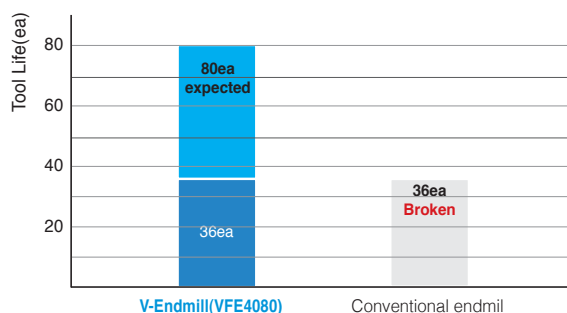
Performance(Surface finish)



| | | | |
|----------------|-----------|---|---|
| Edge | | | |
| Surface finish | | | |
| | V-Endmill | • Competitor A Irregular flute spacing endmill | • Competitor B Irregular flute spacing endmill |

- **Workpiece** Stainless steel
- **Cutting condition** D=Ø8.0, n(min-1)=3979, vc(m/min)=100, vf(mm/min)=796, fz(mm/t)=0.05, ap(mm)=12, ae(mm)=0.8, Dry
- **Tools** VFE4080-060

Machining example



V-Endmill



Conventional endmill

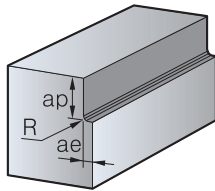
- **Workpiece** Alloy steel
- **Cutting condition** D=Ø8.0, n(m/min)=6000, vc(m/min)=150, vf(mm/min)=600, fz(mm/t)=0.025, ap(mm)=7, ae(mm)=0.8, Wet(Water-soluble)
- **Tools** VFE4080-060

🎯 Cutting condition

■ Shouldering

| Diameter (ØD) | Alloy & Carbon steel, HRC25 or less(SM, SCM) | | | | Mold steel, HRC35~45(STS, KP4M) | | | |
|---------------|--|--------------|--------|--------|---------------------------------|--------------|--------|--------|
| | R.P.M(min ⁻¹) | Feed(mm/min) | ap(mm) | ae(mm) | R.P.M(min ⁻¹) | Feed(mm/min) | ap(mm) | ae(mm) |
| 2.5 | 15,915 | 1,241 | 3.8 | 0.7 | 12,732 | 891 | 3.8 | 0.3 |
| 3.0 | 13,263 | 1,241 | 4.5 | 0.8 | 10,610 | 891 | 4.5 | 0.3 |
| 3.5 | 11,368 | 1,241 | 5.3 | 0.9 | 9,095 | 891 | 5.3 | 0.4 |
| 4.0 | 9,947 | 1,241 | 6.0 | 1.1 | 7,958 | 891 | 6.0 | 0.4 |
| 5.0 | 7,958 | 1,241 | 7.5 | 1.4 | 6,366 | 891 | 7.5 | 0.5 |
| 6.0 | 6,631 | 1,241 | 9.0 | 1.6 | 5,305 | 891 | 9.0 | 0.6 |
| 7.0 | 5,684 | 1,241 | 10.5 | 1.9 | 4,547 | 891 | 10.5 | 0.7 |
| 8.0 | 4,974 | 1,194 | 12.0 | 2.2 | 3,979 | 891 | 12.0 | 0.8 |
| 9.0 | 4,421 | 1,194 | 13.5 | 2.4 | 3,537 | 891 | 13.5 | 0.9 |
| 10.0 | 3,979 | 1,194 | 15.0 | 2.7 | 3,183 | 891 | 15.0 | 1.0 |
| 12.0 | 3,316 | 1,194 | 18.0 | 3.2 | 2,653 | 891 | 18.0 | 1.2 |
| 14.0 | 2,842 | 1,194 | 21.0 | 3.8 | 2,274 | 891 | 21.0 | 1.4 |
| 16.0 | 2,487 | 1,194 | 24.0 | 4.3 | 1,989 | 891 | 24.0 | 1.6 |

● Application tip



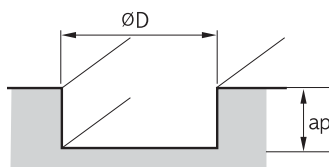
※ Cutting condition by overhang

1. Standard overhang : Follow cutting condition above.
2. Long overhang : When the overhang is increased by 10mm, decrease feed 5% & ae 5%.

■ Slotting

| Diameter (ØD) | Alloy & Carbon steel, HRC25 or less(SM, SCM) | | | Mold steel, HRC35~45(STS, KP4M) | | |
|---------------|--|--------------|--------|---------------------------------|--------------|--------|
| | R.P.M(min ⁻¹) | Feed(mm/min) | ap(mm) | R.P.M(min ⁻¹) | Feed(mm/min) | ap(mm) |
| 2.5 | 15,915 | 1,035 | 2.8 | 12,732 | 700 | 2.5 |
| 3.0 | 13,263 | 1,035 | 3.3 | 10,610 | 700 | 3.0 |
| 3.5 | 11,368 | 1,035 | 3.9 | 9,095 | 700 | 3.5 |
| 4.0 | 9,947 | 1,035 | 4.4 | 7,958 | 700 | 4.0 |
| 5.0 | 7,958 | 1,035 | 5.5 | 6,366 | 700 | 5.0 |
| 6.0 | 6,631 | 1,035 | 6.6 | 5,305 | 700 | 6.0 |
| 7.0 | 5,687 | 1,035 | 7.7 | 4,549 | 700 | 7.0 |
| 8.0 | 4,974 | 1,035 | 8.8 | 3,979 | 700 | 8.0 |
| 9.0 | 4,421 | 1,035 | 9.9 | 3,537 | 700 | 9.0 |
| 10.0 | 3,979 | 1,035 | 11.0 | 3,183 | 700 | 10.0 |
| 12.0 | 3,316 | 1,035 | 13.2 | 2,653 | 700 | 12.0 |
| 14.0 | 2,842 | 1,035 | 15.4 | 2,274 | 700 | 14.0 |
| 16.0 | 2,487 | 1,035 | 17.6 | 1,989 | 700 | 16.0 |

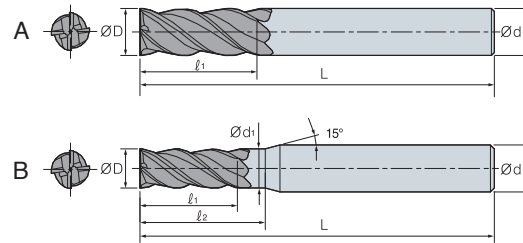
● Application tip



※ Cutting condition by overhang

1. Standard overhang : Follow cutting condition above.
2. Long overhang : When the overhang is increased by 10mm, decrease feed 5% & ae 5%.

VFE 4000 (Flat)



| ØD | Tolerance |
|---------|--------------|
| Ø3~Ø9 | 0.00 ~ -0.02 |
| Ø10~Ø16 | 0.00 ~ -0.03 |



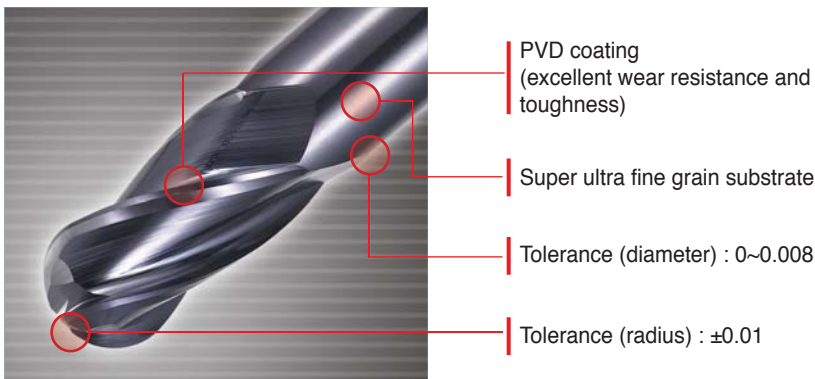
(mm)

| Designation | ØD | Ød | d1 | l1 | l2 | L | Type |
|--------------|------|------|------|------|------|----|------|
| VFE 4025-045 | 2.5 | 6.0 | 2.48 | 6.0 | 8.0 | 45 | B |
| 4030-050 | 3.0 | 6.0 | 2.98 | 7.0 | 9.5 | 50 | B |
| 4035-050 | 3.5 | 6.0 | 3.48 | 8.0 | 11.0 | 50 | B |
| 4040-050 | 4.0 | 6.0 | 3.98 | 9.0 | 12.0 | 50 | B |
| 4050-050 | 5.0 | 6.0 | 4.98 | 12.0 | 16.0 | 50 | B |
| 4060-050 | 6.0 | 6.0 | - | 14.0 | - | 50 | A |
| 4070-060 | 7.0 | 8.0 | 6.97 | 16.0 | 21.0 | 60 | B |
| 4080-060 | 8.0 | 8.0 | - | 19.0 | - | 60 | A |
| 4090-070 | 9.0 | 10.0 | 8.97 | 20.0 | 27.0 | 70 | B |
| 4100-075 | 10.0 | 10.0 | - | 23.0 | - | 75 | A |
| 4120-080 | 12.0 | 12.0 | - | 27.0 | - | 80 | A |
| 4140-085 | 14.0 | 14.0 | - | 31.0 | - | 85 | A |
| 4160-090 | 16.0 | 16.0 | - | 36.0 | - | 90 | A |

I-Max is ideal for all kinds of milling operations due to the variety of available choices

I-Max

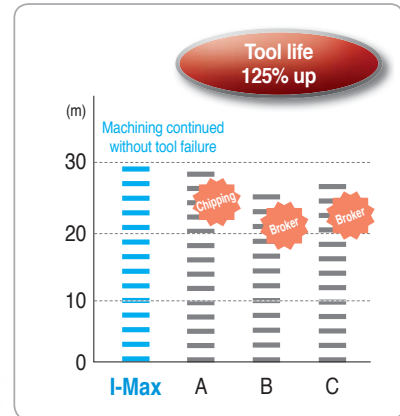
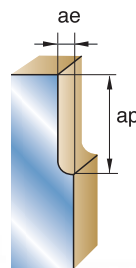
- Excellent wear resistance and anti chipping due to super ultra fine grain substrate and PVD coating
- Wide application from roughing to finishing
- Various workpieces can be machined (steel, alloy steel, cast iron, stainless steel, and aluminum)
- Long tool life under 150m/min(vc), CNC milling machine
- I-Max is ideal for various kinds of milling operations due to the variety of choices
- Multi-purpose machining (shouldering, grooving, ramping, etc.)



Comparison

- Workpiece : NAK80(HrC40) Hexahedron, Climb milling-Air
- Cutting condition : $vc=70\text{m/min}$, $fz=0.04\text{mm/t}$, $n=3,700\text{min}^{-1}$, $vf=590\text{m/min}$, $ap=10\text{mm}$, $ae=1.0\text{mm}$
- Tool : IFE4060-050

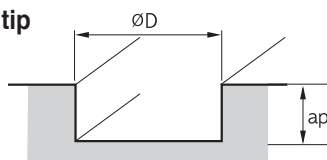
| I - Max | Competitor A | Competitor B | Competitor C |
|-------------------------------|---------------------------|-------------------------|-------------------------|
| | | | |
| 30m machining Edge is good | 30m machining Chipping | 24m machining Broken | 28m machining Broken |



Recommended Cutting Condition (IFE2000, Slotting)

| Workpiece Condition Diameter(Ø) | Steel, Alloy steel (~ Hrc20) | | Steel, Alloy steel (Hrc30~40) | | Steel, Alloy steel (Hrc40~) | | Cast iron Graphite cast iron | | Stainless steel Titanium alloy | |
|------------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|--------------------|---------------------------------|--------------------|-----------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 1 | 37,500 | 185 | 25,400 | 130 | 19,500 | 80 | 39,700 | 370 | 16,000 | 45 |
| 2 | 18,800 | 190 | 12,700 | 180 | 9,700 | 80 | 19,800 | 450 | 8,000 | 65 |
| 3 | 12,600 | 310 | 8,200 | 190 | 6,400 | 80 | 12,900 | 450 | 5,300 | 65 |
| 4 | 9,500 | 310 | 6,400 | 190 | 4,800 | 80 | 9,800 | 450 | 4,000 | 65 |
| 5 | 7,500 | 310 | 5,400 | 190 | 3,900 | 80 | 7,600 | 450 | 3,200 | 65 |
| 6 | 6,500 | 310 | 4,100 | 190 | 3,000 | 80 | 7,800 | 660 | 2,600 | 65 |
| 8 | 4,800 | 310 | 3,200 | 190 | 2,500 | 80 | 6,000 | 710 | 2,000 | 65 |
| 10 | 3,700 | 310 | 2,600 | 190 | 1,900 | 80 | 4,800 | 740 | 1,600 | 65 |
| 12 | 3,100 | 310 | 2,100 | 190 | 1,600 | 80 | 3,700 | 780 | 1,300 | 65 |
| 14 | 2,700 | 310 | 1,800 | 190 | 1,400 | 80 | 3,400 | 820 | 1,100 | 65 |
| 16 | 2,400 | 340 | 1,500 | 240 | 1,200 | 90 | 3,000 | 830 | 1,000 | 75 |
| 18 | 2,000 | 340 | 1,400 | 240 | 1,000 | 100 | 2,600 | 890 | 880 | 80 |
| 20 | 1,900 | 340 | 1,300 | 240 | 900 | 100 | 2,400 | 890 | 800 | 80 |

Application tip

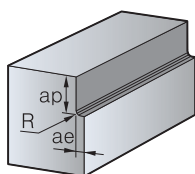


- Slotting depth(ap)
- $ap \leq 1.5D$
- Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

Recommended Cutting Condition (IFE4000, Shouldering)

| Workpiece Condition Diameter(Ø) | Steel, Alloy steel (~ Hrc20) | | Steel, Alloy steel (Hrc30~40) | | Steel, Alloy steel (Hrc40~) | | Cast iron Graphite cast iron | | Stainless steel Titanium alloy | |
|------------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|--------------------|---------------------------------|--------------------|-----------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 3 | 12,600 | 920 | 8,200 | 580 | 6,400 | 220 | 12,900 | 1,370 | 5,300 | 200 |
| 4 | 9,500 | 920 | 6,400 | 580 | 4,800 | 220 | 9,800 | 1,370 | 4,000 | 200 |
| 5 | 7,500 | 920 | 5,400 | 580 | 3,900 | 220 | 7,600 | 1,370 | 3,200 | 200 |
| 6 | 6,500 | 920 | 4,100 | 580 | 3,000 | 220 | 7,800 | 2,000 | 2,600 | 200 |
| 8 | 4,800 | 920 | 3,200 | 580 | 2,500 | 220 | 6,000 | 2,120 | 2,000 | 200 |
| 10 | 3,700 | 920 | 2,600 | 580 | 1,900 | 220 | 4,800 | 2,230 | 1,600 | 200 |
| 12 | 3,100 | 920 | 2,100 | 580 | 1,600 | 220 | 3,700 | 2,340 | 1,300 | 200 |
| 14 | 2,700 | 920 | 1,800 | 580 | 1,400 | 220 | 3,400 | 2,450 | 1,100 | 200 |
| 16 | 2,400 | 1020 | 1,500 | 690 | 1,200 | 270 | 3,000 | 2,520 | 1,000 | 225 |
| 18 | 2,000 | 1020 | 1,400 | 690 | 1,000 | 340 | 2,600 | 2,680 | 880 | 240 |
| 20 | 1,900 | 1020 | 1,300 | 690 | 900 | 340 | 2,400 | 2,680 | 800 | 240 |

Application tip

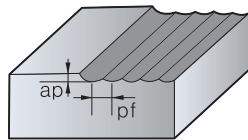


- Shouldering depth (ap) and radial depth (ae)
- $ap = 1.5D$
- $ae = 0.1D$
- Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

Recommended Cutting Condition (IBE2000 Ball)

| Workpiece Condition Diameter(Ø) | Steel, Alloy steel (~ HRC30) | | Steel, Alloy steel (HRC30 ~) | |
|---------------------------------------|---------------------------------|--------------------|---------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 1 | 15,760 | 250 | 5,800 | 90 |
| 2 | 14,400 | 750 | 4,680 | 150 |
| 3 | 13,100 | 680 | 4,520 | 150 |
| 4 | 10,500 | 740 | 4,200 | 180 |
| 5 | 9,140 | 820 | 3,680 | 180 |
| 6 | 7,780 | 840 | 3,160 | 190 |
| 8 | 5,260 | 950 | 2,100 | 190 |
| 10 | 4,620 | 1,020 | 1,780 | 190 |
| 12 | 3,780 | 900 | 1,360 | 190 |
| 16 | 2,740 | 920 | 1,160 | 190 |
| 20 | 2,100 | 840 | 840 | 190 |

Application tip

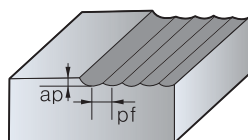


- $ap=0.3D$ • $pf=0.7D$
- Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

Recommended Cutting Condition (IBE4000 Ball)

| Workpiece Condition Diameter(Ø) | Steel, Alloy steel (~ HRC30) | | Steel, Alloy steel (HRC30 ~) | |
|---------------------------------------|---------------------------------|--------------------|---------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 1 | 15,760 | 380 | 5,800 | 130 |
| 2 | 15,760 | 800 | 4,840 | 160 |
| 3 | 13,100 | 1,020 | 4,520 | 220 |
| 4 | 10,500 | 1,110 | 4,200 | 270 |
| 5 | 9,140 | 1,230 | 3,680 | 270 |
| 6 | 7,780 | 1,260 | 3,160 | 280 |
| 8 | 5,260 | 1,430 | 2,100 | 280 |
| 10 | 4,620 | 1,530 | 1,780 | 280 |
| 12 | 3,780 | 1,350 | 1,360 | 280 |
| 16 | 2,740 | 1,380 | 1,160 | 280 |
| 20 | 2,100 | 1,260 | 840 | 280 |

Application tip



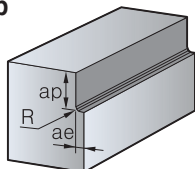
- $ap=0.3D$ • $pf=0.7D$
- Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio



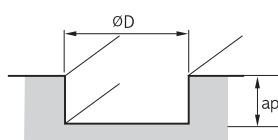
Recommended Cutting Condition (IRE2000 Radius)

| Workpiece Condition Diameter(\varnothing) | Steel, Alloy steel (~ HRC30) | | Steel, Alloy steel (HRC30 ~) | |
|---|---------------------------------|--------------------|---------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 3 | 4,410 | 70 | 2,200 | 30 |
| 4 | 3,570 | 85 | 1,790 | 35 |
| 5 | 3,050 | 105 | 1,580 | 40 |
| 6 | 2,630 | 125 | 1,370 | 50 |
| 8 | 2,000 | 135 | 1,050 | 50 |
| 10 | 1,680 | 135 | 840 | 50 |
| 12 | 1,370 | 105 | 700 | 40 |
| 16 | 1,160 | 95 | 560 | 35 |
| 20 | 840 | 70 | 420 | 25 |

Application tip



- Shouldering depth (ap) and radial depth (ae)
- ap=1.5D ae=0.1D



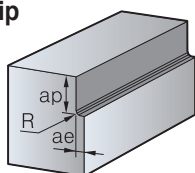
- Slotting depth(ap)
- ap≤1.5D

• Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

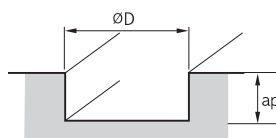
Recommended Cutting Condition (IRE4000 Radius)

| Workpiece Condition Diameter(\varnothing) | Steel, Alloy steel (~ HRC30) | | Steel, Alloy steel (HRC30 ~) | |
|---|---------------------------------|--------------------|---------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 3 | 4,410 | 115 | 2,200 | 55 |
| 4 | 3,570 | 140 | 1,790 | 60 |
| 5 | 3,050 | 180 | 1,580 | 70 |
| 6 | 2,630 | 215 | 1,370 | 85 |
| 8 | 2,000 | 230 | 1,050 | 85 |
| 10 | 1,680 | 230 | 840 | 85 |
| 12 | 1,370 | 180 | 700 | 70 |
| 16 | 1,160 | 160 | 560 | 60 |
| 20 | 840 | 115 | 420 | 45 |

Application tip



- Shouldering depth (ap) and radial depth (ae)
- ap=1.5D ae=0.1D



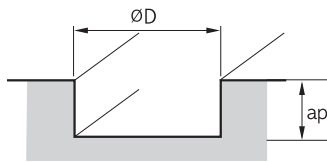
- Slotting depth(ap)
- ap≤1.5D

• Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

Recommended Cutting Condition (FE2000, Slotting)

| Workpiece Condition Diameter(Ø) | Steel, Alloy steel (HRC20 ~) | | Steel, Alloy steel (HRC30~40) | | Stainless steel Titanium alloy | | Cast iron Graphite cast iron | | Aluminum alloy | | Copper Non-ferrous metal | |
|---------------------------------------|---------------------------------|------------|----------------------------------|------------|-----------------------------------|------------|---------------------------------|------------|-----------------------|------------|-----------------------------|------------|
| | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed |
| | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) |
| 1 | 11,000 | 55 | 8,000 | 40 | 16,000 | 45 | 13,000 | 120 | 32,000 | 300 | 24,000 | 240 |
| 2 | 5,500 | 80 | 4,000 | 55 | 8,000 | 65 | 6,500 | 150 | 16,000 | 320 | 12,000 | 240 |
| 3 | 3,700 | 90 | 2,600 | 60 | 5,300 | 65 | 4,200 | 150 | 11,000 | 320 | 8,000 | 240 |
| 4 | 2,800 | 90 | 2,000 | 60 | 4,000 | 65 | 3,200 | 150 | 8,000 | 320 | 6,000 | 240 |
| 5 | 2,200 | 90 | 1,600 | 60 | 3,200 | 65 | 2,500 | 150 | 6,400 | 320 | 4,800 | 240 |
| 6 | 1,800 | 90 | 1,000 | 60 | 2,600 | 65 | 2,100 | 180 | 5,300 | 340 | 4,000 | 260 |
| 8 | 1,400 | 90 | 1,000 | 60 | 1,300 | 65 | 1,600 | 190 | 4,000 | 340 | 3,000 | 260 |
| 10 | 1,100 | 90 | 800 | 60 | 2,000 | 65 | 1,300 | 200 | 3,200 | 340 | 2,400 | 260 |
| 12 | 900 | 90 | 660 | 60 | 1,600 | 65 | 1,000 | 210 | 2,600 | 340 | 2,000 | 260 |
| 14 | 800 | 90 | 570 | 60 | 1,100 | 65 | 900 | 220 | 2,300 | 340 | 1,700 | 260 |
| 16 | 700 | 100 | 500 | 75 | 1,000 | 75 | 800 | 225 | 2,000 | 340 | 1,500 | 260 |
| 18 | 600 | 100 | 440 | 75 | 880 | 80 | 700 | 240 | 1,800 | 340 | 1,300 | 260 |
| 20 | 550 | 100 | 400 | 75 | 800 | 80 | 640 | 240 | 1,600 | 340 | 1,200 | 260 |

Application tip

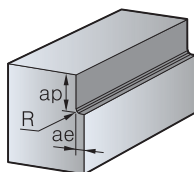


- Slotting depth (ap)
 - $ap \leq 0.5D$ ($D > \varnothing 3$)
 - $ap \leq 1.0D$ ($D < \varnothing 3$)
- Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

Recommended Cutting Condition (FE4000, Shouldering)

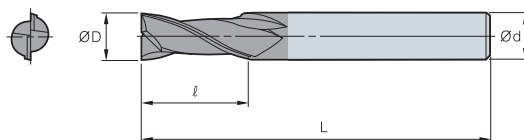
| Workpiece Condition Diameter(Ø) | Steel, Alloy steel (HRC20 ~) | | Steel, Alloy steel (HRC30~40) | | Stainless steel Titanium alloy | | Cast iron Graphite cast iron | | Aluminum alloy | | Copper Non-ferrous metal | |
|---------------------------------------|---------------------------------|------------|----------------------------------|------------|-----------------------------------|------------|---------------------------------|------------|-----------------------|------------|-----------------------------|------------|
| | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed | R.P.M | Feed |
| | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) | n(min ⁻¹) | vf(mm/min) |
| 3 | 3,700 | 270 | 2,600 | 180 | 5,300 | 200 | 4,200 | 450 | 11,000 | 960 | 8,000 | 720 |
| 4 | 2,800 | 270 | 2,000 | 180 | 4,000 | 200 | 3,200 | 450 | 8,000 | 960 | 6,000 | 720 |
| 5 | 2,200 | 270 | 1,600 | 180 | 3,200 | 200 | 2,500 | 450 | 6,400 | 960 | 4,800 | 720 |
| 6 | 1,800 | 270 | 1,000 | 180 | 2,600 | 200 | 2,100 | 540 | 5,300 | 1,020 | 4,000 | 780 |
| 8 | 1,400 | 270 | 1,000 | 180 | 1,300 | 200 | 1,600 | 570 | 4,000 | 1,020 | 3,000 | 780 |
| 10 | 1,100 | 270 | 800 | 180 | 2,000 | 200 | 1,300 | 600 | 3,200 | 1,020 | 2,400 | 780 |
| 12 | 900 | 270 | 660 | 180 | 1,600 | 200 | 1,000 | 630 | 2,600 | 1,020 | 2,000 | 780 |
| 14 | 800 | 270 | 570 | 180 | 1,100 | 200 | 900 | 660 | 2,300 | 1,020 | 1,700 | 780 |
| 16 | 700 | 300 | 500 | 220 | 1,000 | 225 | 800 | 680 | 2,000 | 1,020 | 1,500 | 780 |
| 18 | 600 | 300 | 440 | 220 | 880 | 240 | 700 | 720 | 1,800 | 1,020 | 1,300 | 780 |
| 20 | 550 | 300 | 400 | 220 | 800 | 240 | 640 | 720 | 1,600 | 1,020 | 1,200 | 780 |

Application tip



- Shouldering depth (ap) and radial depth (ae)
 - $ap = 1.5D$
 - $ae = 0.1D$
- Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

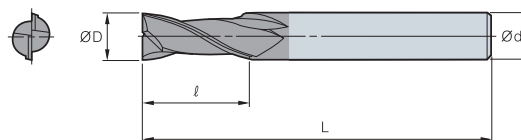
IFE2000 / 3000 (Flat)Standard



| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

| Designation | | ØD | Ød | ℓ | L |
|--------------|--------------|------|----|-----|-----|
| IFE | 2010-040 | 1 | 6 | 2.5 | 40 |
| | 2015-040 | 1.5 | 6 | 4 | 40 |
| | 2020-040 | 2 | 6 | 6 | 40 |
| | 2025-040 | 2.5 | 6 | 8 | 40 |
| | 2030-045 | 3 | 6 | 8 | 45 |
| | 2035-045 | 3.5 | 6 | 10 | 45 |
| | 2040-045 | 4 | 6 | 11 | 45 |
| | 2045-045 | 4.5 | 6 | 11 | 45 |
| | 2050-050 | 5 | 6 | 13 | 50 |
| | 2055-050 | 5.5 | 6 | 13 | 50 |
| | 2060-050 | 6 | 6 | 13 | 50 |
| | 2065-060 | 6.5 | 8 | 16 | 60 |
| | 2070-060 | 7 | 8 | 16 | 60 |
| | 2075-060 | 7.5 | 8 | 16 | 60 |
| | 2080-060 | 8 | 8 | 19 | 60 |
| | 2085-070 | 8.5 | 10 | 19 | 70 |
| | 2090-070 | 9 | 10 | 19 | 70 |
| | 2095-070 | 9.5 | 10 | 19 | 70 |
| | 2100-070 | 10 | 10 | 22 | 70 |
| | 2105-075 | 10.5 | 12 | 22 | 75 |
| | 2110-075 | 11 | 12 | 22 | 75 |
| | 2115-075 | 11.5 | 12 | 22 | 75 |
| 2120-075 | 12 | 12 | 26 | 75 | |
| 2130-085 | 13 | 16 | 26 | 85 | |
| 2140-085-S14 | 14 | 14 | 26 | 85 | |
| 2140-085 | 14 | 16 | 26 | 85 | |
| 2150-090 | 15 | 16 | 26 | 90 | |
| 2160-100 | 16 | 16 | 32 | 100 | |
| 2180-100-S18 | 18 | 18 | 32 | 100 | |
| 2180-100 | 18 | 20 | 32 | 100 | |
| 2200-105 | 20 | 20 | 38 | 105 | |
| IFE | 3020-040 | 2 | 6 | 6 | 40 |
| | 3030-045 | 3 | 6 | 8 | 45 |
| | 3040-045 | 4 | 6 | 11 | 45 |
| | 3050-050 | 5 | 6 | 13 | 50 |
| | 3060-050 | 6 | 6 | 13 | 50 |
| | 3070-060 | 7 | 8 | 16 | 60 |
| | 3080-060 | 8 | 8 | 19 | 60 |
| | 3090-070 | 9 | 10 | 19 | 70 |
| | 3100-070 | 10 | 10 | 22 | 70 |
| | 3110-075 | 11 | 12 | 22 | 75 |
| | 3120-075 | 12 | 12 | 26 | 75 |
| | 3130-085 | 13 | 16 | 26 | 85 |
| | 3140-085-S14 | 14 | 14 | 26 | 85 |
| | 3140-085 | 14 | 16 | 26 | 85 |
| | 3150-090 | 15 | 16 | 26 | 90 |
| | 3160-100 | 16 | 16 | 32 | 100 |

IFE 4000 (Flat)Standard



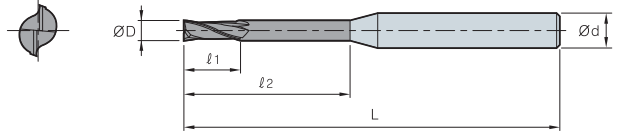
| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

(mm)

| Designation | ØD | Ød | ℓ | L |
|--------------|------|----|----|-----|
| IFE 4025-040 | 2.5 | 6 | 8 | 40 |
| 4030-045 | 3 | 6 | 8 | 45 |
| 4035-045 | 3.5 | 6 | 10 | 45 |
| 4040-045 | 4 | 6 | 11 | 45 |
| 4045-045 | 4.5 | 6 | 11 | 45 |
| 4050-050 | 5 | 6 | 13 | 50 |
| 4055-050 | 5.5 | 6 | 13 | 50 |
| 4060-050 | 6 | 6 | 13 | 50 |
| 4065-060 | 6.5 | 8 | 16 | 60 |
| 4070-060 | 7 | 8 | 16 | 60 |
| 4075-060 | 7.5 | 8 | 16 | 60 |
| 4080-060 | 8 | 8 | 19 | 60 |
| 4085-070 | 8.5 | 10 | 19 | 70 |
| 4090-070 | 9 | 10 | 19 | 70 |
| 4095-070 | 9.5 | 10 | 19 | 70 |
| 4100-070 | 10 | 10 | 22 | 70 |
| 4105-075 | 10.5 | 12 | 22 | 75 |
| 4110-075 | 11 | 12 | 22 | 75 |
| 4115-075 | 11.5 | 12 | 22 | 75 |
| 4120-075 | 12 | 12 | 26 | 75 |
| 4130-085 | 13 | 16 | 26 | 85 |
| 4140-085-S14 | 14 | 14 | 26 | 85 |
| 4140-085 | 14 | 16 | 26 | 85 |
| 4150-090 | 15 | 16 | 26 | 90 |
| 4160-100 | 16 | 16 | 32 | 100 |
| 4180-100-S18 | 18 | 18 | 32 | 100 |
| 4180-100 | 18 | 20 | 32 | 100 |
| 4200-105 | 20 | 20 | 38 | 105 |



IFE2000/4000 (Long Flat)



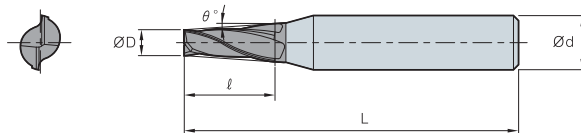
| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

(mm)

| Designation | ØD | Ød | l ₁ | l ₂ | L | |
|-------------|--------------|----|----------------|----------------|----|-----|
| IFE 2 | 2030-050 | 3 | 6 | 12 | 15 | 50 |
| | 2040-050 | 4 | 6 | 15 | 20 | 50 |
| | 2050-060 | 5 | 6 | 20 | 25 | 60 |
| | 2060-060 | 6 | 6 | 20 | - | 60 |
| | 2080-070 | 8 | 8 | 25 | - | 70 |
| | 2100-090 | 10 | 10 | 30 | - | 90 |
| | 2120-090 | 12 | 12 | 30 | - | 90 |
| | 2140-110-S14 | 14 | 14 | 40 | - | 110 |
| | 2140-110 | 14 | 16 | 40 | 45 | 110 |
| | 2160-110 | 16 | 16 | 50 | - | 110 |
| | 2180-110-S18 | 18 | 18 | 50 | - | 110 |
| | 2180-110 | 18 | 20 | 50 | 55 | 110 |
| | 2200-110 | 20 | 20 | 55 | - | 110 |
| IFE 4 | 4030-050 | 3 | 6 | 12 | 15 | 50 |
| | 4040-050 | 4 | 6 | 15 | 20 | 50 |
| | 4050-060 | 5 | 6 | 20 | 25 | 60 |
| | 4060-060 | 6 | 6 | 20 | - | 60 |
| | 4080-070 | 8 | 8 | 25 | - | 70 |
| | 4100-090 | 10 | 10 | 30 | - | 90 |
| | 4120-090 | 12 | 12 | 30 | - | 90 |
| | 4140-110-S14 | 14 | 14 | 40 | - | 110 |
| | 4140-110 | 14 | 16 | 40 | 45 | 110 |
| | 4160-110 | 16 | 16 | 50 | - | 110 |
| | 4180-110-S18 | 18 | 18 | 50 | - | 110 |
| | 4180-110 | 18 | 20 | 50 | 55 | 110 |
| | 4200-110 | 20 | 20 | 55 | - | 110 |



IFE2000-T (Taper Flat)



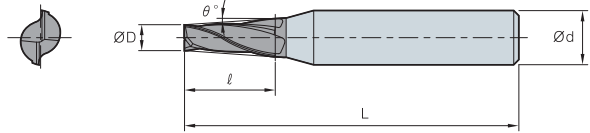
| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

| Designation | | ØD | Ød | L | ℓ | θ° |
|--------------|--------------|----|----|----|------|------|
| IFE | 2030-045-T05 | 3 | 6 | 45 | 10 | 0.5° |
| | 2030-045-T10 | 3 | 6 | 45 | 10 | 1° |
| | 2030-045-T15 | 3 | 6 | 45 | 10 | 1.5° |
| | 2030-045-T20 | 3 | 6 | 45 | 10 | 2° |
| | 2030-045-T25 | 3 | 6 | 45 | 10 | 2.5° |
| | 2030-045-T30 | 3 | 6 | 45 | 10 | 3° |
| | 2040-045-T05 | 4 | 6 | 45 | 12 | 0.5° |
| | 2040-045-T10 | 4 | 6 | 45 | 12 | 1° |
| | 2040-045-T15 | 4 | 6 | 45 | 12 | 1.5° |
| | 2040-045-T20 | 4 | 6 | 45 | 12 | 2° |
| | 2040-045-T25 | 4 | 6 | 45 | 12 | 2.5° |
| | 2040-045-T30 | 4 | 6 | 45 | 12 | 3° |
| | 2050-050-T05 | 5 | 6 | 50 | 15 | 0.5° |
| | 2050-050-T10 | 5 | 6 | 50 | 15 | 1° |
| | 2050-050-T15 | 5 | 6 | 50 | 15 | 1.5° |
| | 2050-050-T20 | 5 | 8 | 50 | 15 | 2° |
| | 2050-050-T25 | 5 | 8 | 50 | 15 | 2.5° |
| | 2050-050-T30 | 5 | 8 | 50 | 15 | 3° |
| | 2060-050-T05 | 6 | 8 | 50 | 15 | 0.5° |
| | 2060-050-T10 | 6 | 8 | 50 | 15 | 1° |
| | 2060-050-T15 | 6 | 8 | 50 | 15 | 1.5° |
| | 2060-050-T20 | 6 | 8 | 50 | 15 | 2° |
| | 2060-050-T25 | 6 | 8 | 50 | 15 | 2.5° |
| | 2060-050-T30 | 6 | 8 | 50 | 15 | 3° |
| | 2080-060-T05 | 8 | 10 | 60 | 20 | 0.5° |
| | 2080-060-T10 | 8 | 10 | 60 | 20 | 1° |
| | 2080-060-T15 | 8 | 10 | 60 | 20 | 1.5° |
| | 2080-060-T20 | 8 | 10 | 60 | 20 | 2° |
| 2080-060-T25 | 8 | 10 | 60 | 20 | 2.5° | |
| 2080-060-T30 | 8 | 12 | 60 | 20 | 3° | |
| 2100-070-T05 | 10 | 12 | 70 | 25 | 0.5° | |
| 2100-070-T10 | 10 | 12 | 70 | 25 | 1° | |
| 2100-070-T15 | 10 | 12 | 70 | 25 | 1.5° | |
| 2100-070-T20 | 10 | 12 | 70 | 25 | 2° | |
| 2100-070-T25 | 10 | 14 | 70 | 25 | 2.5° | |
| 2100-070-T30 | 10 | 14 | 70 | 25 | 3° | |
| 2110-070-T05 | 11 | 12 | 70 | 25 | 0.5° | |
| 2110-070-T10 | 11 | 12 | 70 | 25 | 1° | |
| 2110-070-T15 | 11 | 14 | 70 | 25 | 1.5° | |
| 2110-070-T20 | 11 | 14 | 70 | 25 | 2° | |
| 2110-070-T25 | 11 | 14 | 70 | 25 | 2.5° | |
| 2110-070-T30 | 11 | 14 | 70 | 25 | 3° | |
| 2120-075-T05 | 12 | 14 | 75 | 30 | 0.5° | |
| 2120-075-T10 | 12 | 14 | 75 | 30 | 1° | |
| 2120-075-T15 | 12 | 14 | 75 | 30 | 1.5° | |
| 2120-075-T20 | 12 | 16 | 75 | 30 | 2° | |
| 2120-075-T25 | 12 | 16 | 75 | 30 | 2.5° | |

(mm)



IFE2000-T (Taper Flat)

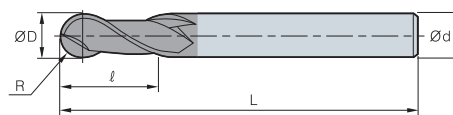


| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

(mm)

| Designation | ØD | Ød | L | ℓ | θ° |
|------------------|----|----|----|----|------|
| IFE 2120-075-T30 | 12 | 16 | 75 | 30 | 3° |
| 2130-075-T05 | 13 | 14 | 75 | 30 | 0.5° |
| 2130-075-T10 | 13 | 14 | 75 | 30 | 1° |
| 2130-075-T15 | 13 | 16 | 75 | 30 | 1.5° |
| 2130-075-T20 | 13 | 16 | 75 | 30 | 2° |
| 2130-075-T25 | 13 | 16 | 75 | 30 | 2.5° |
| 2130-075-T30 | 13 | 18 | 75 | 30 | 3° |
| 2140-080-T05 | 14 | 16 | 80 | 35 | 0.5° |
| 2140-080-T10 | 14 | 16 | 80 | 35 | 1° |
| 2140-080-T15 | 14 | 16 | 80 | 35 | 1.5° |
| 2140-080-T20 | 14 | 18 | 80 | 35 | 2° |
| 2140-080-T25 | 14 | 18 | 80 | 35 | 2.5° |
| 2140-080-T30 | 14 | 18 | 80 | 35 | 3° |
| 2150-080-T05 | 15 | 18 | 80 | 35 | 0.5° |
| 2150-080-T10 | 15 | 18 | 80 | 35 | 1° |
| 2150-080-T15 | 15 | 18 | 80 | 35 | 1.5° |
| 2150-080-T20 | 15 | 18 | 80 | 35 | 2° |
| 2150-080-T25 | 15 | 20 | 80 | 35 | 2.5° |
| 2150-080-T30 | 15 | 20 | 80 | 35 | 3° |
| 2160-090-T05 | 16 | 20 | 90 | 40 | 0.5° |
| 2160-090-T10 | 16 | 20 | 90 | 40 | 1° |
| 2160-090-T15 | 16 | 20 | 90 | 40 | 1.5° |
| 2160-090-T20 | 16 | 20 | 90 | 40 | 2° |
| 2160-090-T25 | 16 | 20 | 90 | 40 | 2.5° |
| 2160-090-T30 | 16 | 22 | 90 | 40 | 3° |

IBE2000 / 4000 (Ball) Standard



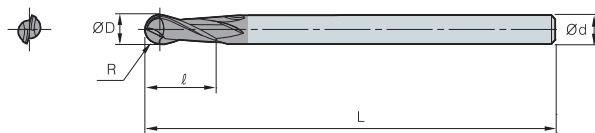
| ØD | Tolerance | R Tolerance |
|---------------|------------|-------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 | ±0.01 |
| Ø9.0 ~ Ø10.0 | 0 ~ -0.025 | ±0.01 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 | ±0.01 |

| Designation | | R | ØD | Ød | ℓ | L |
|-------------|--------------|------|-----|----|-----|-----|
| IBE | 2010-050 | 0.5 | 1 | 6 | 2.5 | 50 |
| | 2015-050 | 0.75 | 1.5 | 6 | 4 | 50 |
| | 2020-050 | 1 | 2 | 6 | 5 | 50 |
| | 2025-060 | 1.25 | 2.5 | 6 | 6 | 60 |
| | 2030-060 | 1.5 | 3 | 6 | 8 | 60 |
| | 2035-070 | 1.75 | 3.5 | 6 | 8 | 70 |
| | 2040-070 | 2 | 4 | 6 | 8 | 70 |
| | 2050-080 | 2.5 | 5 | 6 | 10 | 80 |
| | 2060-090 | 3 | 6 | 6 | 12 | 90 |
| | 2070-090 | 3.5 | 7 | 8 | 14 | 90 |
| | 2080-100 | 4 | 8 | 8 | 14 | 100 |
| | 2090-100 | 4.5 | 9 | 10 | 18 | 100 |
| | 2100-100 | 5 | 10 | 10 | 18 | 100 |
| | 2120-110 | 6 | 12 | 12 | 22 | 110 |
| | 2140-110-S14 | 7 | 14 | 14 | 26 | 110 |
| | 2140-110 | 7 | 14 | 16 | 26 | 110 |
| | 2160-140 | 8 | 16 | 16 | 30 | 140 |
| | 2180-140-S18 | 9 | 18 | 18 | 34 | 140 |
| 2180-140 | 9 | 18 | 20 | 34 | 140 | |
| 2200-160 | 10 | 20 | 20 | 38 | 160 | |
| IBE | 4030-060 | 1.5 | 3 | 6 | 8 | 60 |
| | 4040-070 | 2 | 4 | 6 | 8 | 70 |
| | 4050-080 | 2.5 | 5 | 6 | 10 | 80 |
| | 4060-090 | 3 | 6 | 6 | 12 | 90 |
| | 4070-090 | 3.5 | 7 | 8 | 14 | 90 |
| | 4080-100 | 4 | 8 | 8 | 14 | 100 |
| | 4100-100 | 5 | 10 | 10 | 18 | 100 |
| | 4120-110 | 6 | 12 | 12 | 22 | 110 |
| | 4160-140 | 8 | 16 | 16 | 30 | 140 |
| | 4200-160 | 10 | 20 | 20 | 38 | 160 |

(mm)



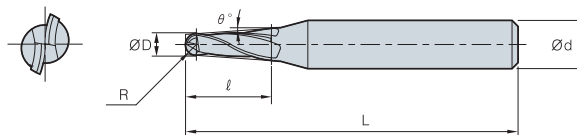
IBE2000 (Long Ball)



| ØD | Tolerance | R Tolerance |
|-------------|------------|-------------|
| 1.0 ~ 8.0 | 0 ~ -0.020 | ±0.01 |
| 9.0 ~ 10.0 | 0 ~ -0.025 | ±0.01 |
| 12.0 ~ 20.0 | 0 ~ -0.030 | ±0.01 |

| Designation | | R | ØD | Ød | ℓ | L |
|-------------|----------|-----|----|----|----|-----|
| IBE | 2030-100 | 1.5 | 3 | 3 | 7 | 100 |
| | 2040-100 | 2 | 4 | 6 | 9 | 100 |
| | 2060-115 | 3 | 6 | 6 | 12 | 115 |
| | 2080-140 | 4 | 8 | 8 | 16 | 140 |
| | 2100-180 | 5 | 10 | 10 | 20 | 180 |
| | 2120-200 | 6 | 12 | 12 | 23 | 200 |
| | 2160-250 | 8 | 16 | 16 | 30 | 250 |
| | 2200-250 | 10 | 20 | 20 | 38 | 250 |

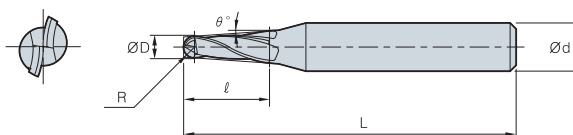
IBE2000-T (Taper Ball)



| ØD | Tolerance | R Tolerance |
|---------------|------------|-------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 | ±0.01 |
| Ø9.0 ~ Ø10.0 | 0 ~ -0.025 | ±0.01 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 | ±0.01 |

| Designation | | R | ØD | Ød | ℓ | L | θ° |
|-------------|--------------|-----|----|----|----|----|------|
| IBE | 2030-045-T05 | 1.5 | 3 | 6 | 10 | 45 | 0.5° |
| | 2030-045-T10 | 1.5 | 3 | 6 | 10 | 45 | 1° |
| | 2030-045-T15 | 1.5 | 3 | 6 | 10 | 45 | 1.5° |
| | 2030-045-T20 | 1.5 | 3 | 6 | 10 | 45 | 2° |
| | 2030-045-T25 | 1.5 | 3 | 6 | 10 | 45 | 2.5° |
| | 2030-045-T30 | 1.5 | 3 | 6 | 10 | 45 | 3° |
| | 2040-045-T05 | 2 | 4 | 6 | 12 | 45 | 0.5° |
| | 2040-045-T10 | 2 | 4 | 6 | 12 | 45 | 1° |
| | 2040-045-T15 | 2 | 4 | 6 | 12 | 45 | 1.5° |
| | 2040-045-T20 | 2 | 4 | 6 | 12 | 45 | 2° |
| | 2040-045-T25 | 2 | 4 | 6 | 12 | 45 | 2.5° |
| | 2040-045-T30 | 2 | 4 | 6 | 12 | 45 | 3° |
| | 2050-050-T05 | 2.5 | 5 | 6 | 15 | 50 | 0.5° |
| | 2050-050-T10 | 2.5 | 5 | 6 | 15 | 50 | 1° |
| | 2050-050-T15 | 2.5 | 5 | 6 | 15 | 50 | 1.5° |
| | 2050-050-T20 | 2.5 | 5 | 6 | 15 | 50 | 2° |
| | 2050-050-T25 | 2.5 | 5 | 8 | 15 | 50 | 2.5° |
| | 2050-050-T30 | 2.5 | 5 | 8 | 15 | 50 | 3° |
| | 2060-050-T05 | 3 | 6 | 8 | 15 | 50 | 0.5° |
| | 2060-050-T10 | 3 | 6 | 8 | 15 | 50 | 1° |
| | 2060-050-T15 | 3 | 6 | 8 | 15 | 50 | 1.5° |
| | 2060-050-T20 | 3 | 6 | 8 | 15 | 50 | 2° |

IBE2000-T (Taper Ball)



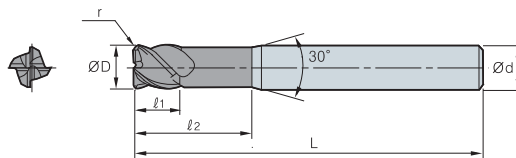
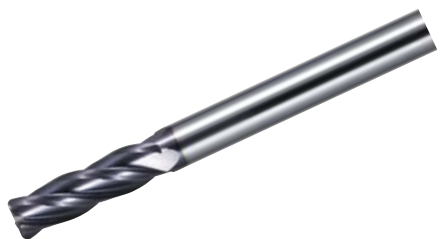
| ØD | Tolerance | R Tolerance |
|---------------|------------|-------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 | ±0.01 |
| Ø9.0 ~ Ø10.0 | 0 ~ -0.025 | ±0.01 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 | ±0.01 |

| Designation | | R | ØD | Ød | ℓ | L | θ° |
|-------------|--------------|-----|----|----|----|----|------|
| IBE | 2060-050-T25 | 3 | 6 | 8 | 15 | 50 | 2.5° |
| | 2060-050-T30 | 3 | 6 | 8 | 15 | 50 | 3° |
| | 2080-060-T05 | 4 | 8 | 10 | 20 | 60 | 0.5° |
| | 2080-060-T10 | 4 | 8 | 10 | 20 | 60 | 1° |
| | 2080-060-T15 | 4 | 8 | 10 | 20 | 60 | 1.5° |
| | 2080-060-T20 | 4 | 8 | 10 | 20 | 60 | 2° |
| | 2080-060-T25 | 4 | 8 | 10 | 20 | 60 | 2.5° |
| | 2080-060-T30 | 4 | 8 | 10 | 20 | 60 | 3° |
| | 2100-070-T05 | 5 | 10 | 12 | 25 | 70 | 0.5° |
| | 2100-070-T10 | 5 | 10 | 12 | 25 | 70 | 1° |
| | 2100-070-T15 | 5 | 10 | 12 | 25 | 70 | 1.5° |
| | 2100-070-T20 | 5 | 10 | 12 | 25 | 70 | 2° |
| | 2100-070-T25 | 5 | 10 | 12 | 25 | 70 | 2.5° |
| | 2100-070-T30 | 5 | 10 | 14 | 25 | 70 | 3° |
| | 2110-070-T05 | 5.5 | 11 | 12 | 25 | 70 | 0.5° |
| | 2110-070-T10 | 5.5 | 11 | 12 | 25 | 70 | 1° |
| | 2110-070-T15 | 5.5 | 11 | 14 | 25 | 70 | 1.5° |
| | 2110-070-T20 | 5.5 | 11 | 14 | 25 | 70 | 2° |
| | 2110-070-T25 | 5.5 | 11 | 14 | 25 | 70 | 2.5° |
| | 2110-070-T30 | 5.5 | 11 | 14 | 25 | 70 | 3° |
| | 2120-075-T05 | 6 | 12 | 14 | 30 | 75 | 0.5° |
| | 2120-075-T10 | 6 | 12 | 14 | 30 | 75 | 1° |
| | 2120-075-T15 | 6 | 12 | 14 | 30 | 75 | 1.5° |
| | 2120-075-T20 | 6 | 12 | 14 | 30 | 75 | 2° |
| | 2120-075-T25 | 6 | 12 | 16 | 30 | 75 | 2.5° |
| | 2120-075-T30 | 6 | 12 | 16 | 30 | 75 | 3° |
| | 2130-075-T05 | 6.5 | 13 | 14 | 30 | 75 | 0.5° |
| | 2130-075-T10 | 6.5 | 13 | 14 | 30 | 75 | 1° |
| | 2130-075-T15 | 6.5 | 13 | 16 | 30 | 75 | 1.5° |
| | 2130-075-T20 | 6.5 | 13 | 16 | 30 | 75 | 2° |
| | 2130-075-T25 | 6.5 | 13 | 16 | 30 | 75 | 2.5° |
| | 2130-075-T30 | 6.5 | 13 | 16 | 30 | 75 | 3° |
| | 2140-080-T05 | 7 | 14 | 16 | 35 | 80 | 0.5° |
| | 2140-080-T10 | 7 | 14 | 16 | 35 | 80 | 1° |
| | 2140-080-T15 | 7 | 14 | 16 | 35 | 80 | 1.5° |
| | 2140-080-T20 | 7 | 14 | 18 | 35 | 80 | 2° |
| | 2140-080-T25 | 7 | 14 | 18 | 35 | 80 | 2.5° |
| | 2140-080-T30 | 7 | 14 | 18 | 35 | 80 | 3° |
| | 2150-080-T05 | 7.5 | 15 | 18 | 35 | 80 | 0.5° |
| | 2150-080-T10 | 7.5 | 15 | 18 | 35 | 80 | 1° |
| | 2150-080-T15 | 7.5 | 15 | 18 | 35 | 80 | 1.5° |
| | 2150-080-T20 | 7.5 | 15 | 18 | 35 | 80 | 2° |
| | 2150-080-T25 | 7.5 | 15 | 20 | 35 | 80 | 2.5° |
| | 2150-080-T30 | 7.5 | 15 | 20 | 35 | 80 | 3° |
| | 2160-090-T05 | 8 | 16 | 20 | 40 | 90 | 0.5° |
| | 2160-090-T10 | 8 | 16 | 20 | 40 | 90 | 1° |
| | 2160-090-T15 | 8 | 16 | 20 | 40 | 90 | 1.5° |
| | 2160-090-T20 | 8 | 16 | 20 | 40 | 90 | 2° |
| | 2160-090-T25 | 8 | 16 | 20 | 40 | 90 | 2.5° |
| | 2160-090-T30 | 8 | 16 | 20 | 40 | 90 | 3° |

(mm)



IRE 2000 (Radius)



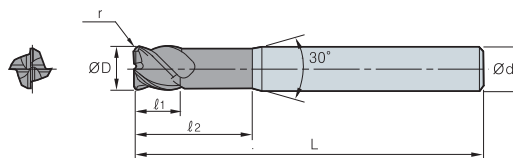
| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø0.5 ~ Ø10.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

(mm)

| Designation | ØD | Ød | l ₁ | l ₂ | L | r |
|------------------|----|----|----------------|----------------|-----|-----|
| IRE 2030-050-R03 | 3 | 6 | 12 | 14 | 50 | 0.3 |
| 2040-050-R03 | 4 | 6 | 15 | 16 | 50 | 0.3 |
| 2040-050-R05 | 4 | 6 | 15 | 16 | 50 | 0.5 |
| 2050-060-R03 | 5 | 6 | 15 | 16 | 60 | 0.3 |
| 2050-060-R05 | 5 | 6 | 15 | 16 | 60 | 0.5 |
| 2060-060-R03 | 6 | 6 | 20 | - | 60 | 0.3 |
| 2060-060-R05 | 6 | 6 | 20 | - | 60 | 0.5 |
| 2060-060-R10 | 6 | 6 | 20 | - | 60 | 1 |
| 2080-070-R03 | 8 | 8 | 25 | - | 70 | 0.3 |
| 2080-070-R05 | 8 | 8 | 25 | - | 70 | 0.5 |
| 2080-070-R10 | 8 | 8 | 25 | - | 70 | 1 |
| 2080-070-R15 | 8 | 8 | 25 | - | 70 | 1.5 |
| 2080-070-R20 | 8 | 8 | 25 | - | 70 | 2 |
| 2100-090-R03 | 10 | 10 | 30 | - | 90 | 0.3 |
| 2100-090-R05 | 10 | 10 | 30 | - | 90 | 0.5 |
| 2100-090-R10 | 10 | 10 | 30 | - | 90 | 1 |
| 2100-090-R15 | 10 | 10 | 30 | - | 90 | 1.5 |
| 2100-090-R20 | 10 | 10 | 30 | - | 90 | 2 |
| 2120-090-R05 | 12 | 12 | 30 | - | 90 | 0.5 |
| 2120-090-R10 | 12 | 12 | 30 | - | 90 | 1 |
| 2120-090-R15 | 12 | 12 | 30 | - | 90 | 1.5 |
| 2120-090-R20 | 12 | 12 | 30 | - | 90 | 2 |
| 2160-110-R05 | 16 | 16 | 50 | - | 110 | 0.5 |
| 2160-110-R10 | 16 | 16 | 50 | - | 110 | 1 |
| 2160-110-R15 | 16 | 16 | 50 | - | 110 | 1.5 |
| 2160-110-R20 | 16 | 16 | 50 | - | 110 | 2 |
| 2200-110-R05 | 20 | 20 | 55 | - | 110 | 0.5 |
| 2200-110-R10 | 20 | 20 | 55 | - | 110 | 1 |
| 2200-110-R15 | 20 | 20 | 55 | - | 110 | 1.5 |
| 2200-110-R20 | 20 | 20 | 55 | - | 110 | 2 |



IRE4000 (Radius)



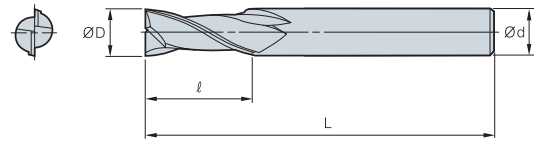
| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø0.5 ~ Ø10.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

| Designation | | ØD | Ød | l ₁ | l ₂ | L | r |
|--------------|--------------|----|----|----------------|----------------|-----|-----|
| IRE 4 | 4030-050-R03 | 3 | 6 | 12 | 14 | 50 | 0.3 |
| | 4040-050-R03 | 4 | 6 | 15 | 16 | 50 | 0.3 |
| | 4040-050-R05 | 4 | 6 | 15 | 16 | 50 | 0.5 |
| | 4050-060-R03 | 5 | 6 | 15 | 16 | 60 | 0.3 |
| | 4050-060-R05 | 5 | 6 | 15 | 16 | 60 | 0.5 |
| | 4060-060-R03 | 6 | 6 | 20 | - | 60 | 0.3 |
| | 4060-060-R05 | 6 | 6 | 20 | - | 60 | 0.5 |
| | 4060-060-R10 | 6 | 6 | 20 | - | 60 | 1 |
| | 4080-070-R03 | 8 | 8 | 25 | - | 70 | 0.3 |
| | 4080-070-R05 | 8 | 8 | 25 | - | 70 | 0.5 |
| | 4080-070-R10 | 8 | 8 | 25 | - | 70 | 1 |
| | 4080-070-R15 | 8 | 8 | 25 | - | 70 | 1.5 |
| | 4080-070-R20 | 8 | 8 | 25 | - | 70 | 2 |
| | 4100-090-R03 | 10 | 10 | 30 | - | 90 | 0.3 |
| | 4100-090-R05 | 10 | 10 | 30 | - | 90 | 0.5 |
| | 4100-090-R10 | 10 | 10 | 30 | - | 90 | 1 |
| | 4100-090-R15 | 10 | 10 | 30 | - | 90 | 1.5 |
| | 4100-090-R20 | 10 | 10 | 30 | - | 90 | 2 |
| | 4120-090-R05 | 12 | 12 | 30 | - | 90 | 0.5 |
| | 4120-090-R10 | 12 | 12 | 30 | - | 90 | 1 |
| 4120-090-R15 | 12 | 12 | 30 | - | 90 | 1.5 | |
| 4120-090-R20 | 12 | 12 | 30 | - | 90 | 2 | |
| 4160-110-R05 | 16 | 16 | 50 | - | 110 | 0.5 | |
| 4160-110-R10 | 16 | 16 | 50 | - | 110 | 1 | |
| 4160-110-R15 | 16 | 16 | 50 | - | 110 | 1.5 | |
| 4160-110-R20 | 16 | 16 | 50 | - | 110 | 2 | |
| 4200-110-R05 | 20 | 20 | 55 | - | 110 | 0.5 | |
| 4200-110-R10 | 20 | 20 | 55 | - | 110 | 1 | |
| 4200-110-R15 | 20 | 20 | 55 | - | 110 | 1.5 | |
| 4200-110-R20 | 20 | 20 | 55 | - | 110 | 2 | |

(mm)





FE2000 / 3000 (Flat) Standard

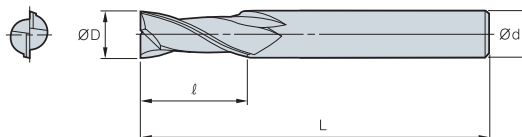


| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

(mm)

| Designation | ØD | Ød | ℓ | L | |
|---|--------------|------|----|-----|-----|
| FE  | 2010-040 | 1 | 6 | 2.5 | 40 |
| | 2015-040 | 1.5 | 6 | 4 | 40 |
| | 2020-040 | 2 | 6 | 6 | 40 |
| | 2025-040 | 2.5 | 6 | 8 | 40 |
| | 2030-045 | 3 | 6 | 8 | 45 |
| | 2035-045 | 3.5 | 6 | 10 | 45 |
| | 2040-045 | 4 | 6 | 11 | 45 |
| | 2045-045 | 4.5 | 6 | 11 | 45 |
| | 2050-050 | 5 | 6 | 13 | 50 |
| | 2055-050 | 5.5 | 6 | 13 | 50 |
| | 2060-050 | 6 | 6 | 13 | 50 |
| | 2065-060 | 6.5 | 8 | 16 | 60 |
| | 2070-060 | 7 | 8 | 16 | 60 |
| | 2075-060 | 7.5 | 8 | 16 | 60 |
| | 2080-060 | 8 | 8 | 19 | 60 |
| | 2085-070 | 8.5 | 10 | 19 | 70 |
| | 2090-070 | 9 | 10 | 19 | 70 |
| | 2095-070 | 9.5 | 10 | 19 | 70 |
| | 2100-070 | 10 | 10 | 22 | 70 |
| | 2105-075 | 10.5 | 12 | 22 | 75 |
| | 2110-075 | 11 | 12 | 22 | 75 |
| | 2115-075 | 11.5 | 12 | 22 | 75 |
| | 2120-075 | 12 | 12 | 26 | 75 |
| | 2130-085 | 13 | 16 | 26 | 85 |
| | 2140-085-S14 | 14 | 14 | 26 | 85 |
| | 2140-085 | 14 | 16 | 26 | 85 |
| | 2150-090 | 15 | 16 | 26 | 90 |
| 2160-100 | 16 | 16 | 32 | 100 | |
| 2180-100-S18 | 18 | 18 | 32 | 100 | |
| 2180-100 | 18 | 20 | 32 | 100 | |
| 2200-105 | 20 | 20 | 38 | 105 | |
| FE  | 3020-040 | 2 | 6 | 6 | 40 |
| | 3030-045 | 3 | 6 | 8 | 45 |
| | 3040-045 | 4 | 6 | 11 | 45 |
| | 3050-050 | 5 | 6 | 13 | 50 |
| | 3060-050 | 6 | 6 | 13 | 50 |
| | 3070-060 | 7 | 8 | 16 | 60 |
| | 3080-060 | 8 | 8 | 19 | 60 |
| | 3090-070 | 9 | 10 | 19 | 70 |
| | 3100-070 | 10 | 10 | 22 | 70 |
| | 3110-075 | 11 | 12 | 22 | 75 |
| | 3120-075 | 12 | 12 | 26 | 75 |
| | 3130-085 | 13 | 16 | 26 | 85 |
| | 3140-085-S14 | 14 | 14 | 26 | 85 |
| | 3140-085 | 14 | 16 | 26 | 85 |
| | 3150-090 | 15 | 16 | 26 | 90 |
| | 3160-100 | 16 | 16 | 32 | 100 |

FE 4000 (Flat) Standard

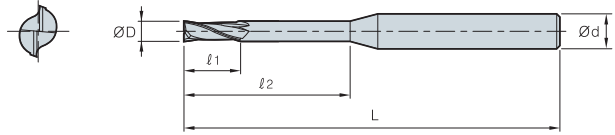


| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

| Designation | | ØD | Ød | l | L |
|-------------|--------------|------|----|----|-----|
| FE | 4025-040 | 2.5 | 6 | 8 | 40 |
| | 4030-045 | 3 | 6 | 8 | 45 |
| | 4035-045 | 3.5 | 6 | 10 | 45 |
| | 4040-045 | 4 | 6 | 11 | 45 |
| | 4045-045 | 4.5 | 6 | 11 | 45 |
| | 4050-050 | 5 | 6 | 13 | 50 |
| | 4055-050 | 5.5 | 6 | 13 | 50 |
| | 4060-050 | 6 | 6 | 13 | 50 |
| | 4065-060 | 6.5 | 8 | 16 | 60 |
| | 4070-060 | 7 | 8 | 16 | 60 |
| | 4075-060 | 7.5 | 8 | 16 | 60 |
| | 4080-060 | 8 | 8 | 19 | 60 |
| | 4085-070 | 8.5 | 10 | 19 | 70 |
| | 4090-070 | 9 | 10 | 19 | 70 |
| | 4095-070 | 9.5 | 10 | 19 | 70 |
| | 4100-070 | 10 | 10 | 22 | 70 |
| | 4105-075 | 10.5 | 12 | 22 | 75 |
| | 4110-075 | 11 | 12 | 22 | 75 |
| | 4115-075 | 11.5 | 12 | 22 | 75 |
| | 4120-075 | 12 | 12 | 26 | 75 |
| | 4130-085 | 13 | 16 | 26 | 85 |
| | 4140-085-S14 | 14 | 14 | 26 | 85 |
| | 4140-085 | 14 | 16 | 26 | 85 |
| | 4150-090 | 15 | 16 | 26 | 90 |
| | 4160-100 | 16 | 16 | 32 | 100 |
| | 4180-100-S18 | 18 | 18 | 32 | 100 |
| | 4180-100 | 18 | 20 | 32 | 100 |
| | 4200-105 | 20 | 20 | 38 | 105 |

(mm)

FE2000 / 4000 (Long Flat)

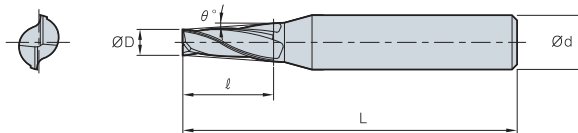


| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

(mm)

| Designation | ØD | Ød | ℓ1 | ℓ2 | L | |
|-------------|--------------|----|----|----|----|-----|
| FE | 2030-050 | 3 | 6 | 12 | 15 | 50 |
| | 2040-050 | 4 | 6 | 15 | 20 | 50 |
| | 2050-060 | 5 | 6 | 20 | 25 | 60 |
| | 2060-060 | 6 | 6 | 20 | - | 60 |
| | 2080-070 | 8 | 8 | 25 | - | 70 |
| | 2100-090 | 10 | 10 | 30 | - | 90 |
| | 2120-090 | 12 | 12 | 30 | - | 90 |
| | 2140-110-S14 | 14 | 14 | 40 | - | 110 |
| | 2140-110 | 14 | 16 | 40 | 45 | 110 |
| | 2160-110 | 16 | 16 | 50 | - | 110 |
| | 2180-110-S18 | 18 | 18 | 50 | - | 110 |
| | 2180-110 | 18 | 20 | 50 | 55 | 110 |
| | 2200-110 | 20 | 20 | 55 | - | 110 |
| FE | 4030-050 | 3 | 6 | 12 | 15 | 50 |
| | 4040-050 | 4 | 6 | 15 | 20 | 50 |
| | 4050-060 | 5 | 6 | 20 | 25 | 60 |
| | 4060-060 | 6 | 6 | 20 | - | 60 |
| | 4080-070 | 8 | 8 | 25 | - | 70 |
| | 4100-090 | 10 | 10 | 30 | - | 90 |
| | 4120-090 | 12 | 12 | 30 | - | 90 |
| | 4140-110-S14 | 14 | 14 | 40 | - | 110 |
| | 4140-110 | 14 | 16 | 40 | 45 | 110 |
| | 4160-110 | 16 | 16 | 50 | - | 110 |
| | 4180-110-S18 | 18 | 18 | 50 | - | 110 |
| | 4180-110 | 18 | 20 | 50 | 55 | 110 |
| | 4200-110 | 20 | 20 | 55 | - | 110 |

FE2000-T (Taper Flat)



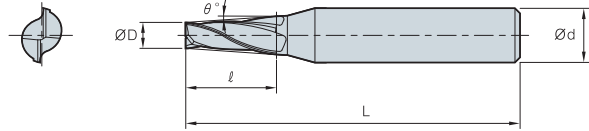
| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

| Designation | | ØD | Ød | l | L | θ° |
|--------------|--------------|----|----|----|------|------|
| FE | 2030-045-T05 | 3 | 6 | 10 | 45 | 0.5° |
| | 2030-045-T10 | 3 | 6 | 10 | 45 | 1° |
| | 2030-045-T15 | 3 | 6 | 10 | 45 | 1.5° |
| | 2030-045-T20 | 3 | 6 | 10 | 45 | 2° |
| | 2030-045-T25 | 3 | 6 | 10 | 45 | 2.5° |
| | 2030-045-T30 | 3 | 6 | 10 | 45 | 3° |
| | 2040-045-T05 | 4 | 6 | 12 | 45 | 0.5° |
| | 2040-045-T10 | 4 | 6 | 12 | 45 | 1° |
| | 2040-045-T15 | 4 | 6 | 12 | 45 | 1.5° |
| | 2040-045-T20 | 4 | 6 | 12 | 45 | 2° |
| | 2040-045-T25 | 4 | 6 | 12 | 45 | 2.5° |
| | 2040-045-T30 | 4 | 6 | 12 | 45 | 3° |
| | 2050-050-T05 | 5 | 6 | 15 | 50 | 0.5° |
| | 2050-050-T10 | 5 | 6 | 15 | 50 | 1° |
| | 2050-050-T15 | 5 | 6 | 15 | 50 | 1.5° |
| | 2050-050-T20 | 5 | 8 | 15 | 50 | 2° |
| | 2050-050-T25 | 5 | 8 | 15 | 50 | 2.5° |
| | 2050-050-T30 | 5 | 8 | 15 | 50 | 3° |
| | 2060-050-T05 | 6 | 8 | 15 | 50 | 0.5° |
| | 2060-050-T10 | 6 | 8 | 15 | 50 | 1° |
| 2060-050-T15 | 6 | 8 | 15 | 50 | 1.5° | |
| 2060-050-T20 | 6 | 8 | 15 | 50 | 2° | |
| 2060-050-T25 | 6 | 8 | 15 | 50 | 2.5° | |
| 2060-050-T30 | 6 | 8 | 15 | 50 | 3° | |
| 2080-060-T05 | 8 | 10 | 20 | 60 | 0.5° | |
| 2080-060-T10 | 8 | 10 | 20 | 60 | 1° | |
| 2080-060-T15 | 8 | 10 | 20 | 60 | 1.5° | |
| 2080-060-T20 | 8 | 10 | 20 | 60 | 2° | |
| 2080-060-T25 | 8 | 10 | 20 | 60 | 2.5° | |
| 2080-060-T30 | 8 | 12 | 20 | 60 | 3° | |
| 2100-070-T05 | 10 | 12 | 25 | 70 | 0.5° | |
| 2100-070-T10 | 10 | 12 | 25 | 70 | 1° | |
| 2100-070-T15 | 10 | 12 | 25 | 70 | 1.5° | |
| 2100-070-T20 | 10 | 12 | 25 | 70 | 2° | |
| 2100-070-T25 | 10 | 14 | 25 | 70 | 2.5° | |
| 2100-070-T30 | 10 | 14 | 25 | 70 | 3° | |

(mm)



FE2000-T (Taper Flat)

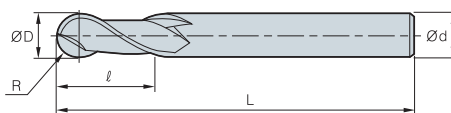


| ØD | Tolerance |
|---------------|------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 |
| Ø8.5 ~ Ø11.5 | 0 ~ -0.025 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 |

(mm)

| Designation | ØD | Ød | l | L | θ° |
|-----------------|----|----|----|----|------|
| FE 2110-070-T05 | 11 | 12 | 25 | 70 | 0.5° |
| 2110-070-T10 | 11 | 12 | 25 | 70 | 1° |
| 2110-070-T15 | 11 | 14 | 25 | 70 | 1.5° |
| 2110-070-T20 | 11 | 14 | 25 | 70 | 2° |
| 2110-070-T25 | 11 | 14 | 25 | 70 | 2.5° |
| 2110-070-T30 | 11 | 14 | 25 | 70 | 3° |
| 2120-075-T05 | 12 | 14 | 30 | 75 | 0.5° |
| 2120-075-T10 | 12 | 14 | 30 | 75 | 1° |
| 2120-075-T15 | 12 | 14 | 30 | 75 | 1.5° |
| 2120-075-T20 | 12 | 16 | 30 | 75 | 2° |
| 2120-075-T25 | 12 | 16 | 30 | 75 | 2.5° |
| 2120-075-T30 | 12 | 16 | 30 | 75 | 3° |
| 2130-075-T05 | 13 | 14 | 30 | 75 | 0.5° |
| 2130-075-T10 | 13 | 14 | 30 | 75 | 1° |
| 2130-075-T15 | 13 | 16 | 30 | 75 | 1.5° |
| 2130-075-T20 | 13 | 16 | 30 | 75 | 2° |
| 2130-075-T25 | 13 | 16 | 30 | 75 | 2.5° |
| 2130-075-T30 | 13 | 18 | 30 | 75 | 3° |
| 2140-080-T05 | 14 | 16 | 35 | 80 | 0.5° |
| 2140-080-T10 | 14 | 16 | 35 | 80 | 1° |
| 2140-080-T15 | 14 | 16 | 35 | 80 | 1.5° |
| 2140-080-T20 | 14 | 18 | 35 | 80 | 2° |
| 2140-080-T25 | 14 | 18 | 35 | 80 | 2.5° |
| 2140-080-T30 | 14 | 18 | 35 | 80 | 3° |
| 2150-080-T05 | 15 | 18 | 35 | 80 | 0.5° |
| 2150-080-T10 | 15 | 18 | 35 | 80 | 1° |
| 2150-080-T15 | 15 | 18 | 35 | 80 | 1.5° |
| 2150-080-T20 | 15 | 18 | 35 | 80 | 2° |
| 2150-080-T25 | 15 | 20 | 35 | 80 | 2.5° |
| 2150-080-T30 | 15 | 20 | 35 | 80 | 3° |
| 2160-090-T05 | 16 | 20 | 40 | 90 | 0.5° |
| 2160-090-T10 | 16 | 20 | 40 | 90 | 1° |
| 2160-090-T15 | 16 | 20 | 40 | 90 | 1.5° |
| 2160-090-T20 | 16 | 20 | 40 | 90 | 2° |
| 2160-090-T25 | 16 | 20 | 40 | 90 | 2.5° |
| 2160-090-T30 | 16 | 22 | 40 | 90 | 3° |

BE2000 / 4000 (Ball)



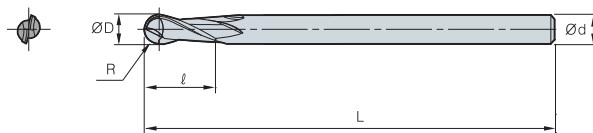
| ØD | Tolerance | R Tolerance |
|---------------|------------|-------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 | ±0.01 |
| Ø9.0 ~ Ø10.0 | 0 ~ -0.025 | ±0.01 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 | ±0.01 |

(mm)

| Designation | R | ØD | Ød | l | L | |
|-------------|--------------|------|-----|----|-----|-----|
| BE 2 | 2010-050 | 0.5 | 1 | 6 | 2.5 | 50 |
| | 2015-050 | 0.75 | 1.5 | 6 | 4 | 50 |
| | 2020-050 | 1 | 2 | 6 | 5 | 50 |
| | 2025-060 | 1.25 | 2.5 | 6 | 6 | 60 |
| | 2030-060 | 1.5 | 3 | 6 | 8 | 60 |
| | 2035-070 | 1.75 | 3.5 | 6 | 8 | 70 |
| | 2040-070 | 2 | 4 | 6 | 8 | 70 |
| | 2050-080 | 2.5 | 5 | 6 | 10 | 80 |
| | 2060-090 | 3 | 6 | 6 | 12 | 90 |
| | 2070-090 | 3.5 | 7 | 8 | 14 | 90 |
| | 2080-100 | 4 | 8 | 8 | 14 | 100 |
| | 2090-100 | 4.5 | 9 | 10 | 18 | 100 |
| | 2100-100 | 5 | 10 | 10 | 18 | 100 |
| | 2120-110 | 6 | 12 | 12 | 22 | 110 |
| | 2140-110-S14 | 7 | 14 | 14 | 26 | 110 |
| | 2140-110 | 7 | 14 | 16 | 26 | 110 |
| | 2160-140 | 8 | 16 | 16 | 30 | 140 |
| | 2180-140-S18 | 9 | 18 | 18 | 34 | 140 |
| | 2180-140 | 9 | 18 | 20 | 34 | 140 |
| | 2200-160 | 10 | 20 | 20 | 38 | 160 |
| BE 4 | 4030-060 | 1.5 | 3 | 6 | 8 | 60 |
| | 4040-070 | 2 | 4 | 6 | 8 | 70 |
| | 4050-080 | 2.5 | 5 | 6 | 10 | 80 |
| | 4060-090 | 3 | 6 | 6 | 12 | 90 |
| | 4070-090 | 3.5 | 7 | 8 | 14 | 90 |
| | 4080-100 | 4 | 8 | 8 | 14 | 100 |
| | 4100-100 | 5 | 10 | 10 | 18 | 100 |
| | 4120-110 | 6 | 12 | 12 | 22 | 110 |
| | 4160-140 | 8 | 16 | 16 | 30 | 140 |
| | 4200-160 | 10 | 20 | 20 | 38 | 160 |



BE2000 (Long Ball)

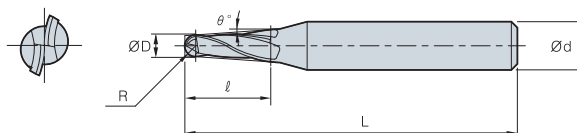


| ØD | Tolerance | R Tolerance |
|---------------|------------|-------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 | ±0.01 |
| Ø9.0 ~ Ø10.0 | 0 ~ -0.025 | ±0.01 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 | ±0.01 |

(mm)

| Designation | R | ØD | Ød | ℓ | L |
|-------------|-----|----|----|----|-----|
| BE 2030-100 | 1.5 | 3 | 3 | 7 | 100 |
| 2040-100 | 2 | 4 | 4 | 9 | 100 |
| 2060-115 | 3 | 6 | 6 | 12 | 115 |
| 2080-140 | 4 | 8 | 8 | 16 | 140 |
| 2100-180 | 5 | 10 | 10 | 20 | 180 |
| 2120-200 | 6 | 12 | 12 | 23 | 200 |
| 2160-250 | 8 | 16 | 16 | 30 | 250 |
| 2200-250 | 10 | 20 | 20 | 38 | 250 |

BE2000-T (Taper Ball)

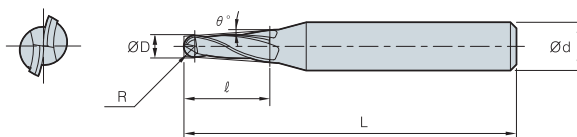


| ØD | Tolerance | R Tolerance |
|---------------|------------|-------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 | ±0.01 |
| Ø9.0 ~ Ø10.0 | 0 ~ -0.025 | ±0.01 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 | ±0.01 |

(mm)

| Designation | R | ØD | Ød | ℓ | L | θ° |
|-----------------|-----|----|----|----|----|------|
| BE 2030-045-T05 | 1.5 | 3 | 6 | 10 | 45 | 0.5° |
| 2030-045-T10 | 1.5 | 3 | 6 | 10 | 45 | 1° |
| 2030-045-T15 | 1.5 | 3 | 6 | 10 | 45 | 1.5° |
| 2030-045-T20 | 1.5 | 3 | 6 | 10 | 45 | 2° |
| 2030-045-T25 | 1.5 | 3 | 6 | 10 | 45 | 2.5° |
| 2030-045-T30 | 1.5 | 3 | 6 | 10 | 45 | 3° |
| 2040-045-T05 | 2 | 4 | 6 | 12 | 45 | 0.5° |
| 2040-045-T10 | 2 | 4 | 6 | 12 | 45 | 1° |
| 2040-045-T15 | 2 | 4 | 6 | 12 | 45 | 1.5° |
| 2040-045-T20 | 2 | 4 | 6 | 12 | 45 | 2° |
| 2040-045-T25 | 2 | 4 | 6 | 12 | 45 | 2.5° |
| 2040-045-T30 | 2 | 4 | 6 | 12 | 45 | 3° |
| 2050-050-T05 | 2.5 | 5 | 6 | 15 | 50 | 0.5° |
| 2050-050-T10 | 2.5 | 5 | 6 | 15 | 50 | 1° |
| 2050-050-T15 | 2.5 | 5 | 6 | 15 | 50 | 1.5° |
| 2050-050-T20 | 2.5 | 5 | 6 | 15 | 50 | 2° |
| 2050-050-T25 | 2.5 | 5 | 8 | 15 | 50 | 2.5° |
| 2050-050-T30 | 2.5 | 5 | 8 | 15 | 50 | 3° |

BE2000-T (Taper Ball)



| ØD | Tolerance | R Tolerance |
|---------------|------------|-------------|
| Ø1.0 ~ Ø8.0 | 0 ~ -0.020 | ±0.01 |
| Ø9.0 ~ Ø10.0 | 0 ~ -0.025 | ±0.01 |
| Ø12.0 ~ Ø20.0 | 0 ~ -0.030 | ±0.01 |

(mm)

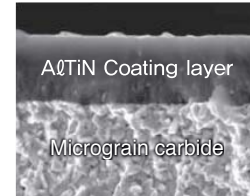
| Designation | R | ØD | Ød | l | L | θ° |
|-----------------|-----|----|----|----|----|------|
| BE 2060-050-T05 | 3 | 6 | 8 | 15 | 50 | 0.5° |
| 2060-050-T10 | 3 | 6 | 8 | 15 | 50 | 1° |
| 2060-050-T15 | 3 | 6 | 8 | 15 | 50 | 1.5° |
| 2060-050-T20 | 3 | 6 | 8 | 15 | 50 | 2° |
| 2060-050-T25 | 3 | 6 | 8 | 15 | 50 | 2.5° |
| 2060-050-T30 | 3 | 6 | 8 | 15 | 50 | 3° |
| 2080-060-T05 | 4 | 8 | 10 | 20 | 60 | 0.5° |
| 2080-060-T10 | 4 | 8 | 10 | 20 | 60 | 1° |
| 2080-060-T15 | 4 | 8 | 10 | 20 | 60 | 1.5° |
| 2080-060-T20 | 4 | 8 | 10 | 20 | 60 | 2° |
| 2080-060-T25 | 4 | 8 | 10 | 20 | 60 | 2.5° |
| 2080-060-T30 | 4 | 8 | 10 | 20 | 60 | 3° |
| 2100-070-T05 | 5 | 10 | 12 | 25 | 70 | 0.5° |
| 2100-070-T10 | 5 | 10 | 12 | 25 | 70 | 1° |
| 2100-070-T15 | 5 | 10 | 12 | 25 | 70 | 1.5° |
| 2100-070-T20 | 5 | 10 | 12 | 25 | 70 | 2° |
| 2100-070-T25 | 5 | 10 | 12 | 25 | 70 | 2.5° |
| 2100-070-T30 | 5 | 10 | 14 | 25 | 70 | 3° |
| 2110-070-T05 | 5.5 | 11 | 12 | 25 | 70 | 0.5° |
| 2110-070-T10 | 5.5 | 11 | 12 | 25 | 70 | 1° |
| 2110-070-T15 | 5.5 | 11 | 14 | 25 | 70 | 1.5° |
| 2110-070-T20 | 5.5 | 11 | 14 | 25 | 70 | 2° |
| 2110-070-T25 | 5.5 | 11 | 14 | 25 | 70 | 2.5° |
| 2110-070-T30 | 5.5 | 11 | 14 | 25 | 70 | 3° |
| 2120-075-T05 | 6 | 12 | 14 | 30 | 75 | 0.5° |
| 2120-075-T10 | 6 | 12 | 14 | 30 | 75 | 1° |
| 2120-075-T15 | 6 | 12 | 14 | 30 | 75 | 1.5° |
| 2120-075-T20 | 6 | 12 | 14 | 30 | 75 | 2° |
| 2120-075-T25 | 6 | 12 | 16 | 30 | 75 | 2.5° |
| 2120-075-T30 | 6 | 12 | 16 | 30 | 75 | 3° |
| 2130-075-T05 | 6.5 | 13 | 14 | 30 | 75 | 0.5° |
| 2130-075-T10 | 6.5 | 13 | 14 | 30 | 75 | 1° |
| 2130-075-T15 | 6.5 | 13 | 16 | 30 | 75 | 1.5° |
| 2130-075-T20 | 6.5 | 13 | 16 | 30 | 75 | 2° |
| 2130-075-T25 | 6.5 | 13 | 16 | 30 | 75 | 2.5° |
| 2130-075-T30 | 6.5 | 13 | 16 | 30 | 75 | 3° |
| 2140-080-T05 | 7 | 14 | 16 | 35 | 80 | 0.5° |
| 2140-080-T10 | 7 | 14 | 16 | 35 | 80 | 1° |
| 2140-080-T15 | 7 | 14 | 16 | 35 | 80 | 1.5° |
| 2140-080-T20 | 7 | 14 | 18 | 35 | 80 | 2° |
| 2140-080-T25 | 7 | 14 | 18 | 35 | 80 | 2.5° |
| 2140-080-T30 | 7 | 14 | 18 | 35 | 80 | 3° |
| 2150-080-T05 | 7.5 | 15 | 18 | 35 | 80 | 0.5° |
| 2150-080-T10 | 7.5 | 15 | 18 | 35 | 80 | 1° |
| 2150-080-T15 | 7.5 | 15 | 18 | 35 | 80 | 1.5° |
| 2150-080-T20 | 7.5 | 15 | 18 | 35 | 80 | 2° |
| 2150-080-T25 | 7.5 | 15 | 20 | 35 | 80 | 2.5° |
| 2150-080-T30 | 7.5 | 15 | 20 | 35 | 80 | 3° |
| 2160-090-T05 | 8 | 16 | 20 | 40 | 90 | 0.5° |
| 2160-090-T10 | 8 | 16 | 20 | 40 | 90 | 1° |
| 2160-090-T15 | 8 | 16 | 20 | 40 | 90 | 1.5° |
| 2160-090-T20 | 8 | 16 | 20 | 40 | 90 | 2° |
| 2160-090-T25 | 8 | 16 | 20 | 40 | 90 | 2.5° |
| 2160-090-T30 | 8 | 16 | 20 | 40 | 90 | 3° |



Stable performance guaranteed for workpiece which is under 45 HRC

I⁺ Endmill

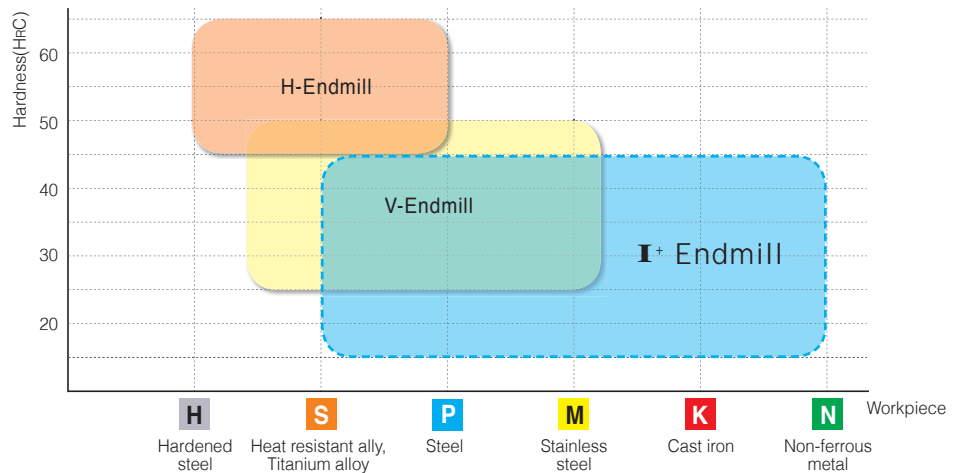
- Tough substrate & wear-resisting coating technology applied
- Wide application range in general use
 - Stable performance guaranteed for workpiece which is under 45 HRC
- Saving cost by higher productivity



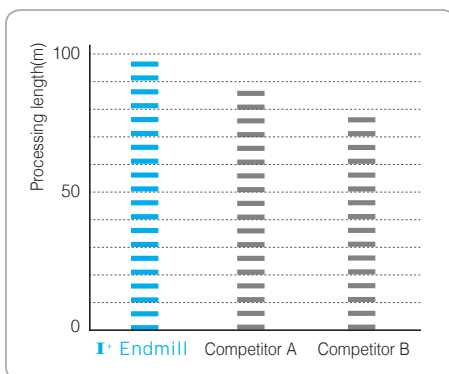
PC320

- Product line-up**
- IPBE : I Plus Ball Endmill (Ø1~Ø20)
 - IPFE : I Plus Flat Endmill (Ø1~Ø20)
 - IPRE : I Plus Radius Endmill (Ø1~Ø12)

Application area



Comparison



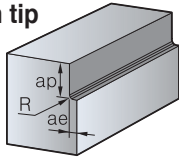
- **Workpiece** : SM45C
- **Curring condition** : Cutting Diameter=Ø8.0 n(min-1)=5173 vc(m/min)=130.0 vf(mm/min)=1034 fz(mm/t)=0.1
ap(mm)=0.5 ae(mm)=1.6 Dry
- **Tool** : I Plus Ball Endmill / Designation IPBE2080-060 2flute

Recommended Cutting Condition (Flat)

■ IPFE2000

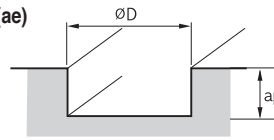
| Diameter (ØD) | Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron) | | | Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK) | | | Stainless steel (STS304, STS316) | | |
|---------------|--|---------------|----------|--|---------------|----------|----------------------------------|---------------|----------|
| | R.P.M (min ⁻¹) | Feed (mm/min) | | R.P.M (min ⁻¹) | Feed (mm/min) | | R.P.M (min ⁻¹) | Feed (mm/min) | |
| | | Shouldering | Slotting | | Shouldering | Slotting | | Shouldering | Slotting |
| 1.0 | 30,000 | 600 | 480 | 20,000 | 400 | 320 | 12,600 | 300 | 180 |
| 1.5 | 20,000 | 600 | 480 | 14,000 | 400 | 320 | 8,400 | 300 | 180 |
| 2.0 | 15,000 | 600 | 480 | 10,000 | 400 | 400 | 6,300 | 300 | 180 |
| 2.5 | 12,000 | 600 | 480 | 8,200 | 400 | 320 | 5,100 | 300 | 180 |
| 3.0 | 10,000 | 600 | 480 | 7,000 | 400 | 320 | 4,200 | 300 | 180 |
| 4.0 | 7,500 | 600 | 480 | 5,200 | 400 | 320 | 3,100 | 300 | 180 |
| 5.0 | 6,000 | 600 | 480 | 4,200 | 400 | 320 | 2,500 | 300 | 180 |
| 6.0 | 5,000 | 600 | 480 | 3,500 | 400 | 320 | 2,100 | 300 | 180 |
| 8.0 | 4,000 | 520 | 410 | 2,800 | 350 | 280 | 1,600 | 260 | 150 |
| 10.0 | 3,200 | 450 | 360 | 2,200 | 300 | 240 | 1,300 | 230 | 130 |
| 12.0 | 2,700 | 410 | 320 | 1,900 | 270 | 210 | 1,100 | 210 | 120 |
| 16.0 | 2,000 | 240 | 190 | 1,400 | 210 | 160 | 840 | 160 | 100 |
| 20.0 | 1,600 | 200 | 160 | 1,100 | 170 | 130 | 680 | 140 | 80 |

● Application tip



■ Shouldering depth (ap) and radial depth (ae)

- ap : ≤0.1D (D≤Ø3)
≤0.2D (D>Ø3)
- ae : ≤0.1D (D≤Ø2)
≤0.2D (D>Ø2)



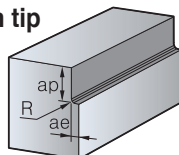
■ Slotting depth(ap)

- ap : ≤0.1D (D≤Ø2)
≤0.2D (D>Ø2)

■ IPFE4000

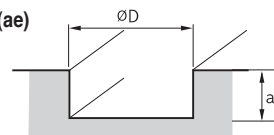
| Diameter (ØD) | Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron) | | | Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK) | | | Stainless steel (STS304, STS316) | | |
|---------------|--|---------------|----------|--|---------------|----------|----------------------------------|---------------|----------|
| | R.P.M (min ⁻¹) | Feed (mm/min) | | R.P.M (min ⁻¹) | Feed (mm/min) | | R.P.M (min ⁻¹) | Feed (mm/min) | |
| | | Shouldering | Slotting | | Shouldering | Slotting | | Shouldering | Slotting |
| 1.0 | 30,000 | 900 | 720 | 20,000 | 600 | 480 | 12,600 | 450 | 270 |
| 1.5 | 20,000 | 900 | 720 | 14,000 | 600 | 480 | 8,400 | 450 | 270 |
| 2.0 | 15,000 | 900 | 720 | 10,000 | 600 | 480 | 6,300 | 450 | 270 |
| 2.5 | 12,000 | 900 | 720 | 8,200 | 600 | 480 | 5,100 | 450 | 270 |
| 3.0 | 10,000 | 900 | 720 | 7,000 | 600 | 480 | 4,200 | 450 | 270 |
| 4.0 | 7,500 | 900 | 720 | 5,200 | 600 | 480 | 3,100 | 450 | 270 |
| 5.0 | 6,000 | 900 | 720 | 4,200 | 600 | 480 | 2,500 | 450 | 270 |
| 6.0 | 5,000 | 900 | 720 | 3,500 | 600 | 480 | 2,100 | 450 | 270 |
| 8.0 | 4,000 | 780 | 620 | 2,800 | 520 | 410 | 1,600 | 390 | 230 |
| 10.0 | 3,200 | 680 | 540 | 2,200 | 450 | 360 | 1,300 | 340 | 200 |
| 12.0 | 2,700 | 620 | 490 | 1,900 | 410 | 320 | 1,100 | 310 | 180 |
| 16.0 | 2,000 | 360 | 280 | 1,400 | 310 | 240 | 840 | 240 | 140 |
| 20.0 | 1,600 | 300 | 240 | 1,100 | 250 | 200 | 680 | 210 | 120 |

● Application tip



■ Shouldering depth (ap) and radial depth (ae)

- ap : ≤1.5D (All diameter)
- ae : ≤0.1D (D≤Ø3)
≤0.2D (D>Ø3)



■ Slotting depth(ap)

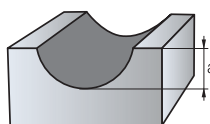
- ap : ≤0.1D (D≤Ø2)
≤0.2D (D>Ø2)

Recommended Cutting Condition (Ball)

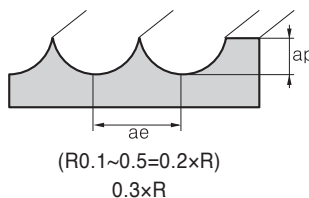
■ IPBE2000

| Diameter (ØD) | Carbon steel (SM50C) | | Alloy steel (SCM, STD, STS, KP4M, NAK) | | Mold steel ~HrC45 (STD61) | | Non-ferrous metal (Aluminum) | |
|---------------|----------------------------|---------------|--|---------------|----------------------------|---------------|------------------------------|---------------|
| | R.P.M (min ⁻¹) | Feed (mm/min) | R.P.M (min ⁻¹) | Feed (mm/min) | R.P.M (min ⁻¹) | Feed (mm/min) | R.P.M (min ⁻¹) | Feed (mm/min) |
| 1.0 | 40000 | 1200 | 38000 | 1200 | 29000 | 900 | 40000 | 1000 |
| 1.5 | 30000 | 1270 | 25500 | 1100 | 19000 | 700 | 40000 | 1360 |
| 2.0 | 24000 | 1,160 | 19,000 | 800 | 14,300 | 600 | 40000 | 2,000 |
| 2.5 | 19000 | 1,000 | 15,300 | 670 | 11,500 | 510 | 38,000 | 2,400 |
| 3.0 | 16,000 | 930 | 13,000 | 600 | 9,600 | 460 | 32,000 | 2,400 |
| 3.5 | 13,700 | 930 | 11,400 | 580 | 8,200 | 450 | 27,300 | 2,400 |
| 4.0 | 12,000 | 930 | 10,000 | 570 | 7,200 | 450 | 24,000 | 2,400 |
| 5.0 | 9,600 | 930 | 8,000 | 560 | 5,700 | 450 | 19,000 | 2,400 |
| 6.0 | 8,000 | 930 | 6,400 | 540 | 4,800 | 450 | 16,000 | 2,400 |
| 8.0 | 6,000 | 900 | 4,800 | 540 | 3,600 | 450 | 12,000 | 2,400 |
| 10.0 | 4,800 | 900 | 3,800 | 540 | 2,900 | 450 | 9,600 | 2,300 |
| 12.0 | 4,000 | 900 | 3,200 | 540 | 2,400 | 450 | 8,000 | 2,100 |
| 14.0 | 3,400 | 900 | 2,750 | 540 | 2,050 | 450 | 6,800 | 2,000 |
| 16.0 | 3,000 | 900 | 2,400 | 540 | 1,800 | 450 | 6,000 | 2,000 |
| 20.0 | 2,400 | 900 | 1,900 | 520 | 1,450 | 450 | 4,800 | 2,000 |

● Application tip



■ Slotting depth (ap)
 • ap : 0.1×R (~45HRC)
 0.08×R (~50HRC)



■ Shouldering depth (ap) and radial depth (ae)

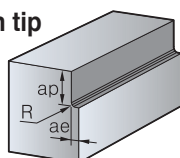
~0.16×R R≤0.3 (~45HRC)
 ~0.25×R R≤3 (~45HRC)
 ~0.17×R R≤4 (~45HRC)
 ~0.05×R (~50HRC)

Recommended Cutting Condition (Radius)

■ IPRE2000

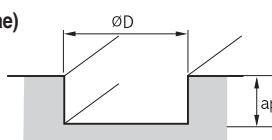
| Diameter (ØD) | Carbon steel, Alloy steel ~ HRC30 (SM50C, SCM, GC250, Cast iron) | | | Alloy steel, High speed steel HRC30~45 (Pre hardened steels, STD61, NAK) | | | Stainless steel (STS304, STS316) | | |
|---------------|--|---------------|----------|--|---------------|----------|----------------------------------|---------------|----------|
| | R.P.M (min ⁻¹) | Feed (mm/min) | | R.P.M (min ⁻¹) | Feed (mm/min) | | R.P.M (min ⁻¹) | Feed (mm/min) | |
| | | Shouldering | Slotting | | Shouldering | Slotting | | Shouldering | Slotting |
| 2.0 | 11,000 | 180 | 180 | 7,200 | 110 | 110 | 6,000 | 90 | 90 |
| 3.0 | 8,500 | 200 | 160 | 5,300 | 130 | 100 | 4,400 | 110 | 66 |
| 4.0 | 7,200 | 360 | 290 | 4,400 | 220 | 180 | 3,000 | 180 | 110 |
| 5.0 | 6,000 | 380 | 300 | 3,600 | 230 | 180 | 2,400 | 190 | 110 |
| 6.0 | 5,300 | 420 | 340 | 3,200 | 240 | 190 | 2,200 | 210 | 130 |
| 8.0 | 4,000 | 450 | 360 | 2,400 | 240 | 190 | 1,600 | 220 | 130 |
| 10.0 | 3,200 | 390 | 310 | 1,900 | 190 | 150 | 1,300 | 190 | 110 |
| 12.0 | 2,700 | 330 | 260 | 1,600 | 160 | 130 | 1,000 | 150 | 90 |

● Application tip



■ Shouldering depth (ap) and radial depth (ae)

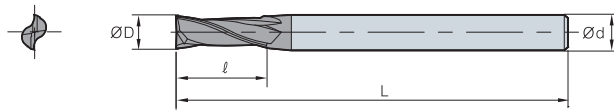
• ap : ≤1.5D
 • ap : ≤0.1D



■ Slotting depth (ap)

• ap : ≤0.3D

IPFE2000(Standard Flat)



| ØD | Tolerance |
|-----------|--------------|
| Ø1~Ø12 | 0.00 ~ -0.02 |
| Ø12.1~Ø20 | 0.00 ~ -0.03 |

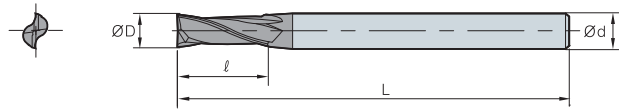


(mm)

| Designation | ØD | Ød | ℓ | L |
|-------------|-------------|------|----|----|
| IPFE | 2010-050-S3 | 1 | 3 | 50 |
| | 2010-050-S4 | 1 | 4 | 50 |
| 2 | 2010-050 | 1 | 6 | 50 |
| | 2015-050-S3 | 1.5 | 3 | 50 |
| | 2015-050-S4 | 1.5 | 4 | 50 |
| | 2015-050 | 1.5 | 6 | 50 |
| | 2020-050-S3 | 2 | 3 | 50 |
| | 2020-050-S4 | 2 | 4 | 50 |
| | 2020-050 | 2 | 6 | 50 |
| | 2025-050-S3 | 2.5 | 3 | 50 |
| | 2025-050-S4 | 2.5 | 4 | 50 |
| | 2025-050 | 2.5 | 6 | 50 |
| | 2030-050-S3 | 3 | 3 | 50 |
| | 2030-050-S4 | 3 | 4 | 50 |
| | 2030-050 | 3 | 6 | 50 |
| | 2035-050-S4 | 3.5 | 4 | 10 |
| | 2035-050 | 3.5 | 6 | 10 |
| | 2040-050-S4 | 4 | 4 | 11 |
| | 2040-050 | 4 | 6 | 11 |
| | 2045-050 | 4.5 | 6 | 13 |
| | 2050-050 | 5 | 6 | 13 |
| | 2055-050 | 5.5a | 6 | 13 |
| | 2060-050 | 6 | 6 | 16 |
| | 2065-060 | 6.5 | 8 | 16 |
| | 2070-060 | 7 | 8 | 16 |
| | 2075-060 | 7.5 | 8 | 19 |
| | 2080-060 | 8 | 8 | 20 |
| | 2085-075 | 8.5 | 10 | 20 |
| | 2090-075 | 9 | 10 | 20 |
| | 2095-075 | 9.5 | 10 | 25 |
| | 2100-075 | 10 | 10 | 25 |
| | 2105-075 | 10.5 | 12 | 25 |
| | 2110-075 | 11 | 12 | 30 |
| | 2115-075 | 11.5 | 12 | 30 |
| | 2120-075 | 12 | 12 | 32 |
| | 2140-100 | 14 | 16 | 40 |
| | 2160-100 | 16 | 16 | 40 |
| | 2180-100 | 18 | 20 | 45 |
| | 2200-100 | 20 | 20 | 45 |



IPLFE2000(Long Flat)



| ØD | Tolerance |
|-----------|--------------|
| Ø1~Ø12 | 0.00 ~ -0.02 |
| Ø12.1~Ø20 | 0.00 ~ -0.03 |



• Long Shank Type

(mm)

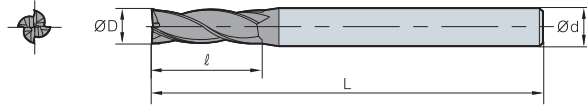
| Designation | ØD | Ød | l | L | |
|-------------|----------|----|----|----|-----|
| IPLFE 2 | 2060-075 | 6 | 6 | 16 | 75 |
| | 2060-100 | 6 | 6 | 16 | 100 |
| | 2080-075 | 8 | 8 | 20 | 75 |
| | 2080-100 | 8 | 8 | 20 | 100 |
| | 2100-100 | 10 | 10 | 25 | 100 |
| | 2100-150 | 10 | 10 | 25 | 150 |
| | 2120-100 | 12 | 12 | 32 | 100 |
| | 2120-150 | 12 | 12 | 32 | 150 |

• Long Flute Type

(mm)

| Designation | ØD | Ød | l | L | |
|-------------|-----------------|-----|----|----|-----|
| IPLFE 2 | 2010-050-V7S4 | 1 | 4 | 7 | 50 |
| | 2015-050-V9S4 | 1.5 | 4 | 9 | 50 |
| | 2020-050-V12S4 | 2 | 4 | 12 | 50 |
| | 2025-050-V12S4 | 2.5 | 4 | 12 | 50 |
| | 2030-060-V15S6 | 3 | 6 | 15 | 60 |
| | 2035-060-V15S6 | 3.5 | 6 | 15 | 60 |
| | 2040-075-V20S6 | 4 | 6 | 20 | 75 |
| | 2045-075-V20S6 | 4.5 | 6 | 20 | 75 |
| | 2050-075-V25S6 | 5 | 6 | 25 | 75 |
| | 2055-075-V25S6 | 5.5 | 6 | 25 | 75 |
| | 2060-075-V30S6 | 6 | 6 | 30 | 75 |
| | 2070-100-V30S8 | 7 | 8 | 30 | 100 |
| | 2080-100-V40S8 | 8 | 8 | 40 | 100 |
| | 2090-100-V40S10 | 9 | 10 | 40 | 100 |
| | 2100-100-V40S10 | 10 | 10 | 40 | 100 |
| | 2110-100-V40S12 | 11 | 12 | 40 | 100 |
| | 2120-100-V50S12 | 12 | 12 | 50 | 100 |
| | 2140-150-V50S16 | 14 | 16 | 50 | 150 |
| | 2160-150-V60S16 | 16 | 16 | 60 | 150 |
| | 2200-200-V90S20 | 20 | 20 | 90 | 200 |

IPFE 4000(Standard Flat)



| ØD | Tolerance |
|-----------|--------------|
| Ø1~Ø12 | 0.00 ~ -0.02 |
| Ø12.1~Ø20 | 0.00 ~ -0.03 |

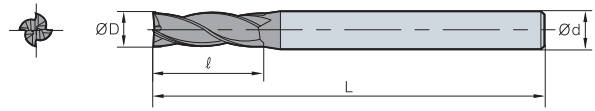


(mm)

| Designation | ØD | Ød | ℓ | L |
|-------------|-------------|-----|----|-----|
| IPFE 4 | 4010-050-S3 | 1 | 3 | 50 |
| | 4010-050-S4 | 1 | 4 | 50 |
| | 4010-050 | 1 | 6 | 50 |
| | 4015-050-S3 | 1.5 | 3 | 50 |
| 4015-050-S4 | 1.5 | 4 | 50 | |
| 4015-050 | 1.5 | 6 | 50 | |
| 4020-050-S3 | 2 | 3 | 6 | 50 |
| 4020-050-S4 | 2 | 4 | 6 | 50 |
| 4020-050 | 2 | 6 | 6 | 50 |
| 4025-050-S3 | 2.5 | 3 | 8 | 50 |
| 4025-050-S4 | 2.5 | 4 | 8 | 50 |
| 4025-050 | 2.5 | 6 | 8 | 50 |
| 4030-050-S3 | 3 | 3 | 8 | 50 |
| 4030-050-S4 | 3 | 4 | 8 | 50 |
| 4030-050 | 3 | 6 | 8 | 50 |
| 4035-050-S4 | 3.5 | 4 | 10 | 50 |
| 4035-050 | 3.5 | 6 | 10 | 50 |
| 4040-050-S4 | 4 | 4 | 11 | 50 |
| 4040-050 | 4 | 6 | 11 | 50 |
| 4045-050 | 4.5 | 6 | 13 | 50 |
| 4050-050 | 5 | 6 | 13 | 50 |
| 4055-050 | 5.5a | 6 | 13 | 50 |
| 4060-050 | 6 | 6 | 16 | 50 |
| 4065-060 | 6.5 | 8 | 16 | 60 |
| 4070-060 | 7 | 8 | 16 | 60 |
| 4075-060 | 7.5 | 8 | 19 | 60 |
| 4080-060 | 8 | 8 | 20 | 60 |
| 4085-075 | 8.5 | 10 | 20 | 75 |
| 4090-075 | 9 | 10 | 20 | 75 |
| 4095-075 | 9.5 | 10 | 30 | 75 |
| 4100-075 | 10 | 10 | 30 | 75 |
| 4105-075 | 10.5 | 12 | 30 | 75 |
| 4110-075 | 11 | 12 | 30 | 75 |
| 4115-075 | 11.5 | 12 | 30 | 75 |
| 4120-075 | 12 | 12 | 32 | 75 |
| 4140-100 | 14 | 16 | 40 | 100 |
| 4160-100 | 16 | 16 | 40 | 100 |
| 4180-100 | 18 | 20 | 45 | 100 |
| 4200-100 | 20 | 20 | 45 | 100 |



IPLFE4000(Long Flat)



| ØD | Tolerance |
|-----------|--------------|
| Ø1~Ø12 | 0.00 ~ -0.02 |
| Ø12.1~Ø20 | 0.00 ~ -0.03 |



• Long Shank Type

(mm)

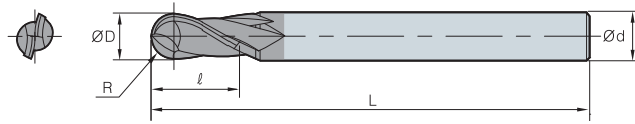
| Designation | ØD | Ød | ℓ | L |
|-------------|----------|----|----|-----|
| IPLFE 4 | 4060-075 | 6 | 6 | 75 |
| | 4060-100 | 6 | 6 | 100 |
| | 4080-075 | 8 | 8 | 75 |
| | 4080-100 | 8 | 8 | 100 |
| | 4100-100 | 10 | 10 | 100 |
| | 4100-150 | 10 | 10 | 150 |
| | 4120-100 | 12 | 12 | 100 |
| | 4120-150 | 12 | 12 | 150 |

• Long Flute Type

(mm)

| Designation | ØD | Ød | ℓ | L | |
|-------------|-----------------|-----|----|----|-----|
| IPLFE 4 | 4010-050-V6S4 | 1 | 4 | 6 | 50 |
| | 4015-050-V9S4 | 1.5 | 4 | 9 | 50 |
| | 4020-050-V12S4 | 2 | 4 | 12 | 50 |
| | 4025-050-V12S4 | 2.5 | 4 | 12 | 50 |
| | 4030-060-V15S6 | 3 | 6 | 15 | 60 |
| | 4035-060-V15S6 | 3.5 | 6 | 15 | 60 |
| | 4040-075-V20S6 | 4 | 6 | 20 | 75 |
| | 4045-075-V20S6 | 4.5 | 6 | 20 | 75 |
| | 4050-075-V25S6 | 5 | 6 | 25 | 75 |
| | 4055-075-V25S6 | 5.5 | 6 | 25 | 75 |
| | 4060-075-V30S6 | 6 | 6 | 30 | 75 |
| | 4070-100-V30S8 | 7 | 8 | 30 | 100 |
| | 4080-100-V40S8 | 8 | 8 | 40 | 100 |
| | 4090-100-V40S10 | 9 | 10 | 40 | 100 |
| | 4100-100-V40S10 | 10 | 10 | 40 | 100 |
| | 4110-100-V40S12 | 11 | 12 | 40 | 100 |
| | 4120-100-V50S12 | 12 | 12 | 50 | 100 |
| | 4140-150-V50S16 | 14 | 16 | 50 | 150 |
| | 4160-150-V60S16 | 16 | 16 | 60 | 150 |
| | 4200-200-V90S20 | 20 | 20 | 90 | 200 |

IPBE2000(Standard Ball)



| ØD | Tolerance |
|-----------|--------------|
| Ø1~Ø12 | 0.00 ~ -0.02 |
| Ø12.1~Ø20 | 0.00 ~ -0.03 |

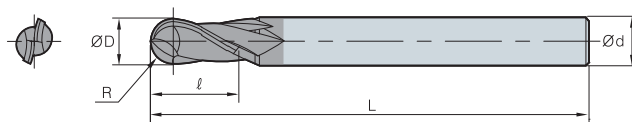


(mm)

| Designation | R | ØD | Ød | ℓ | L | |
|-------------|-------------|------|-----|----|----|-----|
| IPBE | 2010-050-S3 | 0.5 | 1 | 3 | 2 | 50 |
| | 2010-050-S4 | 0.5 | 1 | 4 | 2 | 50 |
| 2 | 2010-050 | 0.5 | 1 | 6 | 2 | 50 |
| | 2015-050-S3 | 0.75 | 1.5 | 3 | 3 | 50 |
| | 2015-050-S4 | 0.75 | 1.5 | 4 | 3 | 50 |
| | 2015-050 | 0.75 | 1.5 | 6 | 3 | 50 |
| | 2020-050-S3 | 1 | 2 | 3 | 4 | 50 |
| | 2020-050-S4 | 1 | 2 | 4 | 4 | 50 |
| | 2020-050 | 1 | 2 | 6 | 4 | 50 |
| | 2025-050-S3 | 1.25 | 2.5 | 3 | 5 | 50 |
| | 2025-050-S4 | 1.25 | 2.5 | 4 | 5 | 50 |
| | 2025-050 | 1.25 | 2.5 | 6 | 5 | 50 |
| | 2030-050-S3 | 1.5 | 3 | 3 | 6 | 50 |
| | 2030-050-S4 | 1.5 | 3 | 4 | 6 | 50 |
| | 2030-050 | 1.5 | 3 | 6 | 6 | 50 |
| | 2035-050-S4 | 1.75 | 3.5 | 4 | 7 | 50 |
| | 2035-050 | 1.75 | 3.5 | 6 | 7 | 50 |
| | 2040-050-S4 | 2 | 4 | 4 | 8 | 50 |
| | 2040-050 | 2 | 4 | 6 | 8 | 50 |
| | 2045-050 | 2.25 | 4.5 | 6 | 9 | 50 |
| | 2050-050 | 2.5 | 5 | 6 | 10 | 50 |
| | 2060-050 | 3 | 6 | 6 | 12 | 50 |
| | 2070-060 | 3.5 | 7 | 8 | 14 | 60 |
| | 2080-060 | 4 | 8 | 8 | 16 | 60 |
| | 2090-075 | 4.5 | 9 | 10 | 18 | 75 |
| | 2100-075 | 5 | 10 | 10 | 20 | 75 |
| | 2120-075 | 6 | 12 | 12 | 24 | 75 |
| | 2140-100 | 7 | 14 | 16 | 28 | 100 |
| | 2160-100 | 8 | 16 | 16 | 32 | 100 |
| | 2180-100 | 9 | 18 | 20 | 36 | 100 |
| | 2200-100 | 10 | 20 | 20 | 40 | 100 |



IPLBE2000(Long Ball)



| ØD | Tolerance |
|-----------|--------------|
| Ø1~Ø12 | 0.00 ~ -0.02 |
| Ø12.1~Ø16 | 0.00 ~ -0.03 |

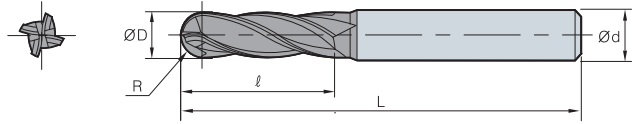


(mm)

| Designation | R | ØD | Ød | ℓ | L | |
|-------------|----------|------|-----|----|----|-----|
| IPLBE | 2010-075 | 0.5 | 1 | 6 | 2 | 75 |
| | 2010-100 | 0.5 | 1 | 6 | 2 | 100 |
| 2 | 2015-075 | 0.75 | 1.5 | 6 | 3 | 75 |
| | 2015-100 | 0.75 | 1.5 | 6 | 3 | 100 |
| | 2020-075 | 1 | 2 | 6 | 4 | 75 |
| | 2020-100 | 1 | 2 | 6 | 4 | 100 |
| | 2025-075 | 1.25 | 2.5 | 6 | 5 | 75 |
| | 2025-100 | 1.25 | 2.5 | 6 | 5 | 100 |
| | 2030-075 | 1.5 | 3 | 6 | 6 | 75 |
| | 2030-100 | 1.5 | 3 | 6 | 6 | 100 |
| | 2035-100 | 1.75 | 3.5 | 6 | 7 | 100 |
| | 2040-075 | 2 | 4 | 6 | 8 | 75 |
| | 2040-100 | 2 | 4 | 6 | 8 | 100 |
| | 2050-075 | 2.5 | 5 | 6 | 10 | 75 |
| | 2050-100 | 2.5 | 5 | 6 | 10 | 100 |
| | 2060-075 | 3 | 6 | 6 | 12 | 75 |
| | 2060-100 | 3 | 6 | 6 | 12 | 100 |
| | 2060-150 | 3 | 6 | 6 | 12 | 150 |
| | 2080-075 | 4 | 8 | 8 | 16 | 75 |
| | 2080-100 | 4 | 8 | 8 | 16 | 100 |
| | 2080-150 | 4 | 8 | 8 | 16 | 150 |
| | 2100-100 | 5 | 10 | 10 | 20 | 100 |
| | 2100-150 | 5 | 10 | 10 | 20 | 150 |
| | 2100-200 | 5 | 10 | 10 | 20 | 200 |
| | 2120-100 | 6 | 12 | 12 | 24 | 100 |
| | 2120-150 | 6 | 12 | 12 | 24 | 150 |
| | 2120-200 | 6 | 12 | 12 | 24 | 200 |
| | 2160-150 | 8 | 16 | 16 | 32 | 150 |
| | 2160-200 | 8 | 16 | 16 | 32 | 200 |



IPBE4000(Standard Ball)



| ØD | Tolerance |
|-----------|--------------|
| Ø1~Ø12 | 0.00 ~ -0.02 |
| Ø12.1~Ø20 | 0.00 ~ -0.03 |

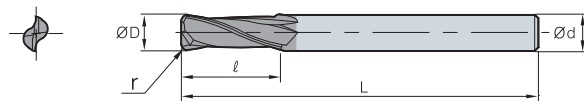


(mm)

| Designation | R | ØD | Ød | ℓ | L |
|------------------|------|-----|----|----|-----|
| IPBE 4010-050-S4 | 0.5 | 1 | 4 | 2 | 50 |
| 4010-050 | 0.5 | 1 | 6 | 2 | 50 |
| 4015-050-S4 | 0.75 | 1.5 | 4 | 3 | 50 |
| 4015-050 | 0.75 | 1.5 | 6 | 3 | 50 |
| 4020-050-S4 | 1 | 2 | 4 | 4 | 50 |
| 4020-050 | 1 | 2 | 6 | 4 | 50 |
| 4025-050-S4 | 1.25 | 2.5 | 4 | 5 | 50 |
| 4025-050 | 1.25 | 2.5 | 6 | 5 | 50 |
| 4030-050-S3 | 1.5 | 3 | 3 | 6 | 50 |
| 4030-050-S4 | 1.5 | 3 | 4 | 6 | 50 |
| 4030-050 | 1.5 | 3 | 6 | 6 | 50 |
| 4035-050-S4 | 1.75 | 3.5 | 4 | 7 | 50 |
| 4035-050 | 1.75 | 3.5 | 6 | 7 | 50 |
| 4040-050-S4 | 2 | 4 | 4 | 8 | 50 |
| 4040-050 | 2 | 4 | 6 | 8 | 50 |
| 4045-050 | 2.25 | 4.5 | 6 | 9 | 50 |
| 4050-050 | 2.5 | 5 | 6 | 10 | 50 |
| 4060-050 | 3 | 6 | 6 | 12 | 50 |
| 4070-060 | 3.5 | 7 | 8 | 14 | 60 |
| 4080-060 | 4 | 8 | 8 | 16 | 60 |
| 4090-075 | 4.5 | 9 | 10 | 18 | 75 |
| 4100-075 | 5 | 10 | 10 | 20 | 75 |
| 4120-075 | 6 | 12 | 12 | 24 | 75 |
| 4140-100 | 7 | 14 | 16 | 28 | 100 |
| 4160-100 | 8 | 16 | 16 | 32 | 100 |
| 4180-100 | 9 | 18 | 20 | 36 | 100 |
| 4200-100 | 10 | 20 | 20 | 40 | 100 |



IPRE2000(Standard Radius)



| ØD | Tolerance |
|--------|--------------|
| Ø1-Ø12 | 0.00 ~ -0.02 |

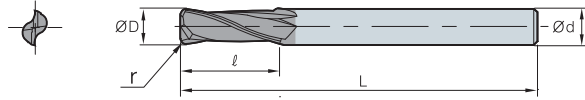


(mm)

| Designation | ØD | Ød | ℓ | L | r | |
|--------------|-----------------|-----|----|----|-----|-----|
| IPRE 2 | 2010-050-R01 | 1 | 4 | 3 | 50 | 0.1 |
| | 2010-050-R02 | 1 | 4 | 3 | 50 | 0.2 |
| | 2010-050-R03 | 1 | 4 | 3 | 50 | 0.3 |
| | 2015-050-R02 | 1.5 | 4 | 4 | 50 | 0.2 |
| | 2015-050-R03 | 1.5 | 4 | 4 | 50 | 0.3 |
| | 2020-050-R02 | 2 | 4 | 6 | 50 | 0.2 |
| | 2020-050-R03 | 2 | 4 | 6 | 50 | 0.3 |
| | 2020-050-R05 | 2 | 4 | 6 | 50 | 0.5 |
| | 2025-050-R02 | 2.5 | 4 | 8 | 50 | 0.2 |
| | 2030-050-R02-S3 | 3 | 3 | 8 | 50 | 0.2 |
| | 2030-050-R03-S3 | 3 | 3 | 8 | 50 | 0.3 |
| | 2030-050-R05-S3 | 3 | 3 | 8 | 50 | 0.5 |
| | 2030-050-R10-S3 | 3 | 3 | 8 | 50 | 1 |
| | 2030-050-R02 | 3 | 4 | 8 | 50 | 0.2 |
| | 2030-050-R03 | 3 | 4 | 8 | 50 | 0.3 |
| | 2030-050-R05 | 3 | 4 | 8 | 50 | 0.5 |
| | 2030-050-R10 | 3 | 4 | 8 | 50 | 1 |
| | 2040-050-R02 | 4 | 4 | 10 | 50 | 0.2 |
| | 2040-050-R03 | 4 | 4 | 10 | 50 | 0.3 |
| | 2040-050-R05 | 4 | 4 | 10 | 50 | 0.5 |
| | 2040-050-R10 | 4 | 4 | 10 | 50 | 1 |
| | 2040-050-R15 | 4 | 4 | 10 | 50 | 1.5 |
| | 2050-050-R02 | 5 | 6 | 13 | 50 | 0.2 |
| | 2050-050-R03 | 5 | 6 | 13 | 50 | 0.3 |
| | 2050-050-R05 | 5 | 6 | 13 | 50 | 0.5 |
| | 2050-050-R10 | 5 | 6 | 13 | 50 | 1 |
| | 2060-050-R02 | 6 | 6 | 15 | 50 | 0.2 |
| | 2060-050-R03 | 6 | 6 | 15 | 50 | 0.3 |
| 2060-050-R05 | 6 | 6 | 15 | 50 | 0.5 | |
| 2060-050-R10 | 6 | 6 | 15 | 50 | 1 | |
| 2060-050-R15 | 6 | 6 | 15 | 50 | 1.5 | |
| 2060-050-R20 | 6 | 6 | 15 | 50 | 2 | |



IPRE2000(Standard Radius)



| ØD | Tolerance |
|--------|--------------|
| Ø1-Ø12 | 0.00 ~ -0.02 |

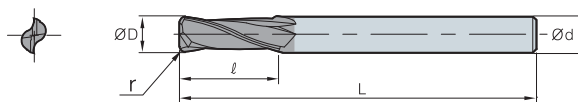


(mm)

| Designation | ØD | Ød | ℓ | L | r | |
|--------------|--------------|----|----|----|----|-----|
| IPRE 2 | 2080-060-R03 | 8 | 8 | 20 | 60 | 0.3 |
| | 2080-060-R05 | 8 | 8 | 20 | 60 | 0.5 |
| | 2080-060-R10 | 8 | 8 | 20 | 60 | 1 |
| | 2080-060-R15 | 8 | 8 | 20 | 60 | 1.5 |
| | 2080-060-R20 | 8 | 8 | 20 | 60 | 2 |
| | 2080-060-R25 | 8 | 8 | 20 | 60 | 2.5 |
| | 2080-060-R30 | 8 | 8 | 20 | 60 | 3 |
| | 2100-075-R03 | 10 | 10 | 25 | 75 | 0.3 |
| | 2100-075-R05 | 10 | 10 | 25 | 75 | 0.5 |
| | 2100-075-R10 | 10 | 10 | 25 | 75 | 1 |
| | 2100-075-R15 | 10 | 10 | 25 | 75 | 1.5 |
| | 2100-075-R20 | 10 | 10 | 25 | 75 | 2 |
| | 2100-075-R25 | 10 | 10 | 25 | 75 | 2.5 |
| | 2100-075-R30 | 10 | 10 | 25 | 75 | 3 |
| | 2120-075-R03 | 12 | 12 | 30 | 75 | 0.3 |
| | 2120-075-R05 | 12 | 12 | 30 | 75 | 0.5 |
| | 2120-075-R10 | 12 | 12 | 30 | 75 | 1 |
| | 2120-075-R15 | 12 | 12 | 30 | 75 | 1.5 |
| | 2120-075-R20 | 12 | 12 | 30 | 75 | 2 |
| | 2120-075-R25 | 12 | 12 | 30 | 75 | 2.5 |
| 2120-075-R30 | 12 | 12 | 30 | 75 | 3 | |



IPLRE2000(Long Radius)



| ØD | Tolerance |
|--------|--------------|
| Ø3-Ø12 | 0.00 ~ -0.02 |

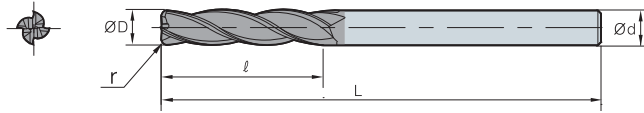


(mm)

| Designation | ØD | Ød | ℓ | L | r | |
|-------------|--------------|----|----|----|-----|-----|
| IPLRE | 2030-075-R03 | 3 | 3 | 8 | 75 | 0.3 |
| | 2030-075-R05 | 3 | 3 | 8 | 75 | 0.5 |
| 2 | 2030-075-R10 | 3 | 3 | 8 | 75 | 1 |
| | 2040-075-R03 | 4 | 4 | 10 | 75 | 0.3 |
| | 2040-075-R05 | 4 | 4 | 10 | 75 | 0.5 |
| | 2040-075-R10 | 4 | 4 | 10 | 75 | 1 |
| | 2040-075-R15 | 4 | 4 | 10 | 75 | 1.5 |
| | 2060-100-R03 | 6 | 6 | 15 | 100 | 0.3 |
| | 2060-100-R05 | 6 | 6 | 15 | 100 | 0.5 |
| | 2060-100-R10 | 6 | 6 | 15 | 100 | 1 |
| | 2060-100-R15 | 6 | 6 | 15 | 100 | 1.5 |
| | 2060-100-R20 | 6 | 6 | 15 | 100 | 2 |
| | 2080-100-R03 | 8 | 8 | 20 | 100 | 0.3 |
| | 2080-100-R05 | 8 | 8 | 20 | 100 | 0.5 |
| | 2080-100-R10 | 8 | 8 | 20 | 100 | 1 |
| | 2080-100-R15 | 8 | 8 | 20 | 100 | 1.5 |
| | 2080-100-R20 | 8 | 8 | 20 | 100 | 2 |
| | 2080-100-R25 | 8 | 8 | 20 | 100 | 2.5 |
| | 2080-100-R30 | 8 | 8 | 20 | 100 | 3 |
| | 2100-100-R03 | 10 | 10 | 25 | 100 | 0.3 |
| | 2100-100-R05 | 10 | 10 | 25 | 100 | 0.5 |
| | 2100-100-R10 | 10 | 10 | 25 | 100 | 1 |
| | 2100-100-R15 | 10 | 10 | 25 | 100 | 1.5 |
| | 2100-100-R20 | 10 | 10 | 25 | 100 | 2 |
| | 2100-100-R25 | 10 | 10 | 25 | 100 | 2.5 |
| | 2100-100-R30 | 10 | 10 | 25 | 100 | 3 |
| | 2120-100-R03 | 12 | 12 | 30 | 100 | 0.3 |
| | 2120-100-R05 | 12 | 12 | 30 | 100 | 0.5 |
| | 2120-100-R10 | 12 | 12 | 30 | 100 | 1 |
| | 2120-100-R15 | 12 | 12 | 30 | 100 | 1.5 |
| | 2120-100-R20 | 12 | 12 | 30 | 100 | 2 |
| | 2120-100-R25 | 12 | 12 | 30 | 100 | 2.5 |
| | 2120-100-R30 | 12 | 12 | 30 | 100 | 3 |



IPRE 4000(Standard Radius)



| ØD | Tolerance |
|--------|--------------|
| Ø2-Ø12 | 0.00 ~ -0.02 |

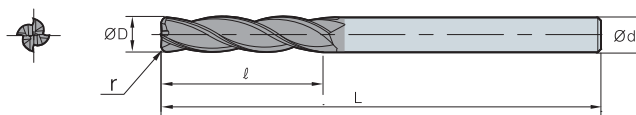


(mm)

| Designation | ØD | Ød | ℓ | L | r |
|-------------------|-----|----|----|----|-----|
| IPRE 4020-050-R02 | 2 | 4 | 6 | 50 | 0.2 |
| 4020-050-R03 | 2 | 4 | 6 | 50 | 0.3 |
| 4020-050-R05 | 2 | 4 | 6 | 50 | 0.5 |
| 4025-050-R02 | 2.5 | 4 | 8 | 50 | 0.2 |
| 4030-050-R02-S3 | 3 | 3 | 8 | 50 | 0.2 |
| 4030-050-R03-S3 | 3 | 3 | 8 | 50 | 0.3 |
| 4030-050-R05-S3 | 3 | 3 | 8 | 50 | 0.5 |
| 4030-050-R10-S3 | 3 | 3 | 8 | 50 | 1 |
| 4030-050-R02 | 3 | 4 | 8 | 50 | 0.2 |
| 4030-050-R03 | 3 | 4 | 8 | 50 | 0.3 |
| 4030-050-R05 | 3 | 4 | 8 | 50 | 0.5 |
| 4030-050-R10 | 3 | 4 | 8 | 50 | 1 |
| 4040-050-R02 | 4 | 4 | 10 | 50 | 0.2 |
| 4040-050-R03 | 4 | 4 | 10 | 50 | 0.3 |
| 4040-050-R05 | 4 | 4 | 10 | 50 | 0.5 |
| 4040-050-R10 | 4 | 4 | 10 | 50 | 1 |
| 4040-050-R15 | 4 | 4 | 10 | 50 | 1.5 |
| 4050-050-R02 | 5 | 6 | 13 | 50 | 0.2 |
| 4050-050-R03 | 5 | 6 | 13 | 50 | 0.3 |
| 4050-050-R05 | 5 | 6 | 13 | 50 | 0.5 |
| 4050-050-R10 | 5 | 6 | 13 | 50 | 1 |
| 4060-050-R02 | 6 | 6 | 15 | 50 | 0.2 |
| 4060-050-R03 | 6 | 6 | 15 | 50 | 0.3 |
| 4060-050-R05 | 6 | 6 | 15 | 50 | 0.5 |
| 4060-050-R10 | 6 | 6 | 15 | 50 | 1 |
| 4060-050-R15 | 6 | 6 | 15 | 50 | 1.5 |
| 4060-050-R20 | 6 | 6 | 15 | 50 | 2 |
| 4080-060-R03 | 8 | 8 | 20 | 60 | 0.3 |
| 4080-060-R05 | 8 | 8 | 20 | 60 | 0.5 |
| 4080-060-R10 | 8 | 8 | 20 | 60 | 1 |
| 4080-060-R15 | 8 | 8 | 20 | 60 | 1.5 |
| 4080-060-R20 | 8 | 8 | 20 | 60 | 2 |
| 4080-060-R25 | 8 | 8 | 20 | 60 | 2.5 |
| 4080-060-R30 | 8 | 8 | 20 | 60 | 3 |
| 4100-075-R03 | 10 | 10 | 25 | 75 | 0.3 |
| 4100-075-R05 | 10 | 10 | 25 | 75 | 0.5 |
| 4100-075-R10 | 10 | 10 | 25 | 75 | 1 |
| 4100-075-R15 | 10 | 10 | 25 | 75 | 1.5 |
| 4100-075-R20 | 10 | 10 | 25 | 75 | 2 |
| 4100-075-R25 | 10 | 10 | 25 | 75 | 2.5 |
| 4100-075-R30 | 10 | 10 | 25 | 75 | 3 |
| 4120-075-R03 | 12 | 12 | 30 | 75 | 0.3 |
| 4120-075-R05 | 12 | 12 | 30 | 75 | 0.5 |
| 4120-075-R10 | 12 | 12 | 30 | 75 | 1 |
| 4120-075-R15 | 12 | 12 | 30 | 75 | 1.5 |
| 4120-075-R20 | 12 | 12 | 30 | 75 | 2 |
| 4120-075-R25 | 12 | 12 | 30 | 75 | 2.5 |
| 4120-075-R30 | 12 | 12 | 30 | 75 | 3 |



IPLRE4000(Long Radius)



| ØD | Tolerance |
|--------|--------------|
| Ø3-Ø12 | 0.00 ~ -0.02 |



(mm)

| Designation | ØD | Ød | ℓ | L | r | |
|--------------|--------------|----|----|-----|-----|-----|
| IPLRE 4 | 4030-075-R03 | 3 | 3 | 8 | 75 | 0.3 |
| | 4030-075-R05 | 3 | 3 | 8 | 75 | 0.5 |
| | 4030-075-R10 | 3 | 3 | 8 | 75 | 1 |
| | 4040-075-R03 | 4 | 4 | 10 | 75 | 0.3 |
| | 4040-075-R05 | 4 | 4 | 10 | 75 | 0.5 |
| | 4040-075-R10 | 4 | 4 | 10 | 75 | 1 |
| | 4040-075-R15 | 4 | 4 | 10 | 75 | 1.5 |
| | 4060-100-R03 | 6 | 6 | 15 | 100 | 0.3 |
| | 4060-100-R05 | 6 | 6 | 15 | 100 | 0.5 |
| | 4060-100-R10 | 6 | 6 | 15 | 100 | 1 |
| | 4060-100-R15 | 6 | 6 | 15 | 100 | 1.5 |
| | 4060-100-R20 | 6 | 6 | 15 | 100 | 2 |
| | 4080-100-R03 | 8 | 8 | 20 | 100 | 0.3 |
| | 4080-100-R05 | 8 | 8 | 20 | 100 | 0.5 |
| | 4080-100-R10 | 8 | 8 | 20 | 100 | 1 |
| | 4080-100-R15 | 8 | 8 | 20 | 100 | 1.5 |
| | 4080-100-R20 | 8 | 8 | 20 | 100 | 2 |
| | 4080-100-R25 | 8 | 8 | 20 | 100 | 2.5 |
| | 4080-100-R30 | 8 | 8 | 20 | 100 | 3 |
| | 4100-100-R03 | 10 | 10 | 25 | 100 | 0.3 |
| | 4100-100-R05 | 10 | 10 | 25 | 100 | 0.5 |
| | 4100-100-R10 | 10 | 10 | 25 | 100 | 1 |
| | 4100-100-R15 | 10 | 10 | 25 | 100 | 1.5 |
| | 4100-100-R20 | 10 | 10 | 25 | 100 | 2 |
| | 4100-100-R25 | 10 | 10 | 25 | 100 | 2.5 |
| | 4100-100-R30 | 10 | 10 | 25 | 100 | 3 |
| | 4120-100-R03 | 12 | 12 | 30 | 100 | 0.3 |
| | 4120-100-R05 | 12 | 12 | 30 | 100 | 0.5 |
| | 4120-100-R10 | 12 | 12 | 30 | 100 | 1 |
| | 4120-100-R15 | 12 | 12 | 30 | 100 | 1.5 |
| 4120-100-R20 | 12 | 12 | 30 | 100 | 2 | |
| 4120-100-R25 | 12 | 12 | 30 | 100 | 2.5 | |
| 4120-100-R30 | 12 | 12 | 30 | 100 | 3 | |



High efficiency and high feed in machining

F-Endmill

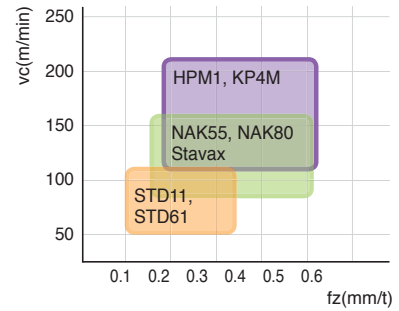
Feed-up Endmill

Feature



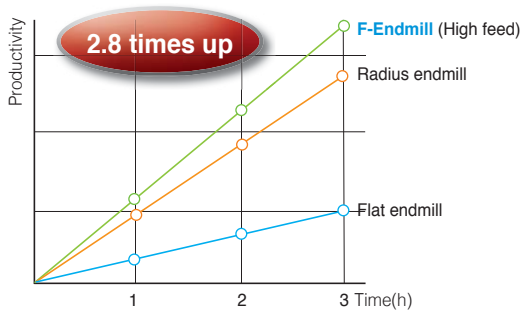
- Wider chip pocket area Highly efficient operation
- High feed machining possible by dispersing cutting forces

Application by workpiece



Productivity example

Productivity comparison

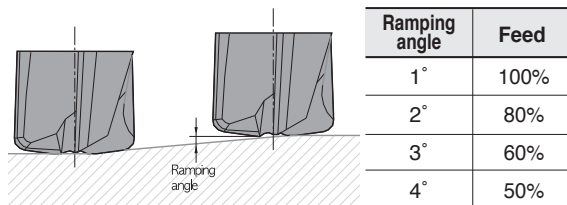


| Type | Speed (vc) | Feed (fz) | D.O.C | | Machining volume (mm ² /min) |
|------------------------------|------------|-------------|-------|-----|---|
| | | | ap | ae | |
| F-Endmill (High feed) | 180 | 0.30 | 0.5 | 5.0 | 135,000 |
| Radius Endmill | 200 | 0.09 | 1.0 | 5.0 | 90,000 |
| Flat Endmill | 120 | 0.05 | 8.0 | 0.2 | 48,000 |

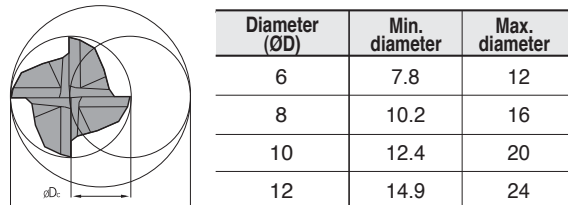
Higher productivity by feed increase. **2.8 times**

Programing information

Ramping



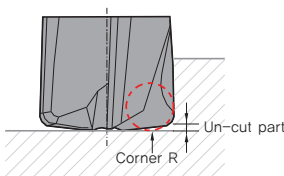
Helical ramping



*ØDc : Feed (Tool center)

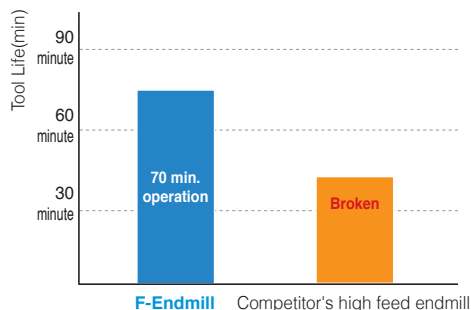
*ØDh : Machining area

CAM program information



| Diameter(ØD) | Endmill-R | CAM-Radius | Un-cut part |
|--------------|-----------|------------|-------------|
| 6 | 0.5 | 0.7 | 0.21 |
| 8 | 0.5 | 0.8 | 0.32 |
| 10 | 1.0 | 1.3 | 0.36 |
| 12 | 1.2 | 1.6 | 1.45 |

Machining example

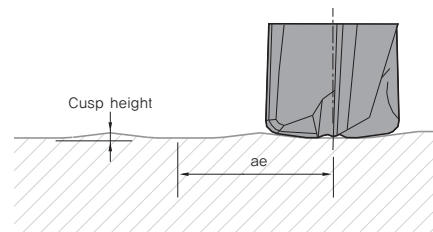


- **Workpiece** STD61+SKT4(HRC 45~50)
- **Cutting condition** D=Ø12, n(min-1)=4,000, vc(m/min)=150.8, vf(mm/min)=4,000, fz(mm/t)=0.25, ap(mm)=3.6, ae(mm)=6.0, Dry
- **Tools** FME4120-075-R12

Cutting condition

Cusp height by radial depth of cut

| Diameter (ØD) | Radial depth ae(mm) | | | | | |
|---------------|---------------------|-------|-------|-------|-------|-------|
| | 0.1XD | 0.2XD | 0.3XD | 0.4XD | 0.5XD | 0.6XD |
| 6 | 0 | 0 | 0 | 0.02 | 0.06 | 0.11 |
| 8 | 0 | 0 | 0 | 0.04 | 0.10 | 0.15 |
| 10 | 0 | 0 | 0.01 | 0.07 | 0.14 | 0.21 |
| 12 | 0 | 0 | 0.01 | 0.08 | 0.17 | 0.25 |



Medium cut

| Diameter (ØD) | Mold steel HRC35~45(HPM1, KP4M) | | | | Mold steel HRC45~55(NAK55, NAK80, STAVAX) | | | | Heat treated HRC55(SKD11, STD61) | | | |
|---------------|---------------------------------|---------------|--------|--------|---|---------------|--------|---------------------------|----------------------------------|---------------------------|--------|--------|
| | RPM n(min ⁻¹) | Feed (mm/min) | ap(mm) | ae(mm) | RPM n(min ⁻¹) | Feed (mm/min) | ap(mm) | RPM n(min ⁻¹) | Feed (mm/min) | RPM n(min ⁻¹) | ap(mm) | ae(mm) |
| 6 | 11,600 | 11,200 | 0.24 | 1.6 | 9,000 | 7,570 | 0.21 | 1.6 | 5,800 | 3,500 | 0.18 | 1.6 |
| 8 | 8,700 | | 0.32 | 2.2 | 6,700 | | 0.28 | 2.2 | 4,300 | | 0.24 | 2.2 |
| 10 | 7,000 | | 0.40 | 2.7 | 5,400 | | 0.35 | 2.7 | 3,500 | | 0.30 | 2.7 |
| 12 | 5,800 | | 0.48 | 3.3 | 4,500 | | 0.42 | 3.3 | 2,900 | | 0.36 | 3.3 |

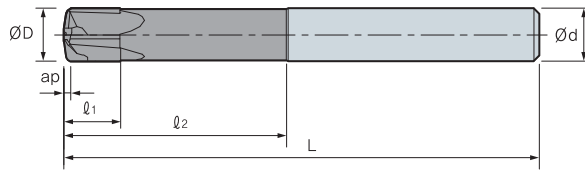
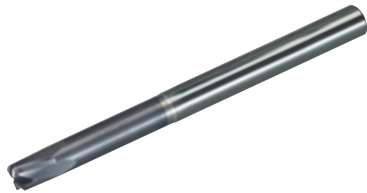
Roughing cut

| Diameter (ØD) | Mold steel HRC35~45(HPM1, KP4M) | | | | Mold steel HRC45~55(NAK55, NAK80, STAVAX) | | | | Heat treated HRC55(SKD11, STD61) | | | |
|---------------|---------------------------------|---------------|--------|--------|---|---------------|--------|---------------------------|----------------------------------|---------------------------|--------|--------|
| | RPM n(min ⁻¹) | Feed (mm/min) | ap(mm) | ae(mm) | RPM n(min ⁻¹) | Feed (mm/min) | ap(mm) | RPM n(min ⁻¹) | Feed (mm/min) | RPM n(min ⁻¹) | ap(mm) | ae(mm) |
| 6 | 8,488 | 9,167 | 0.27 | 3.0 | 6,366 | 6,112 | 0.24 | 3.0 | 4,244 | 2,546 | 0.21 | 3.0 |
| 8 | 6,366 | | 0.36 | 4.0 | 4,775 | | 0.32 | 4.0 | 3,183 | | 0.28 | 4.0 |
| 10 | 5,093 | | 0.45 | 5.0 | 3,820 | | 0.40 | 5.0 | 2,546 | | 0.35 | 5.0 |
| 12 | 4,244 | | 0.54 | 6.0 | 3,183 | | 0.48 | 6.0 | 2,122 | | 0.42 | 6.0 |

* Cutting condition by overhang

1. Standard overhang : Follow cutting conditions above.
2. Long type : Apply 80% feed & 80% ae.
3. Long overhang : When the overhang is increased by 10mm, decrease feed 5% & ae 5%.

FME 4000 (Standard)



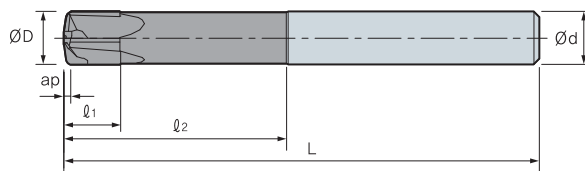
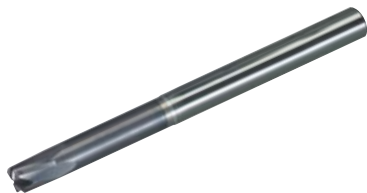
| ØD | Tolerance |
|--------|---------------|
| Ø6-Ø12 | -0.01 ~ -0.03 |



(mm)

| Designation | R | ØD | Ød | l ₁ | l ₂ | L | Max. ap (mm) | CAM-Radius |
|---|-----|----|----|----------------|----------------|----|--------------|------------|
| FME 4060-050-R05 4080-060-R05 4100-070-R10 4120-075-R12 | 0.5 | 6 | 6 | 4.5 | 18 | 50 | 0.35 | 0.7 |
| | 0.5 | 8 | 8 | 6 | 24 | 60 | 0.45 | 0.8 |
| | 1.0 | 10 | 10 | 7.5 | 30 | 70 | 0.65 | 1.3 |
| | 1.2 | 12 | 12 | 9 | 36 | 75 | 0.78 | 1.6 |

FMLE 4000 (Long)



| ØD | Tolerance |
|--------|---------------|
| Ø6-Ø12 | -0.01 ~ -0.03 |



(mm)

| Designation | R | ØD | Ød | l ₁ | l ₂ | L | Max. ap (mm) | CAM-Radius |
|--|-----|----|----|----------------|----------------|-----|--------------|------------|
| FMLE 4060-090-R05 4080-090-R05 4100-100-R10 4120-110-R12 | 0.5 | 6 | 6 | 4.5 | 30 | 90 | 0.35 | 0.7 |
| | 0.5 | 8 | 8 | 6 | 40 | 90 | 0.45 | 0.8 |
| | 1.0 | 10 | 10 | 7.5 | 50 | 100 | 0.65 | 1.3 |
| | 1.2 | 12 | 12 | 9 | 60 | 110 | 0.78 | 1.6 |



Ideal Endmill for ultra precision geometry machining

Micro Endmill

- Enhanced rigidity of neck eliminates braking of the tool
- It is ideal for ultra precision geometry machining
- Slotting, Die-sinking, Profiling, Miniature, Finishing
- Camera, Watch, Precision mold



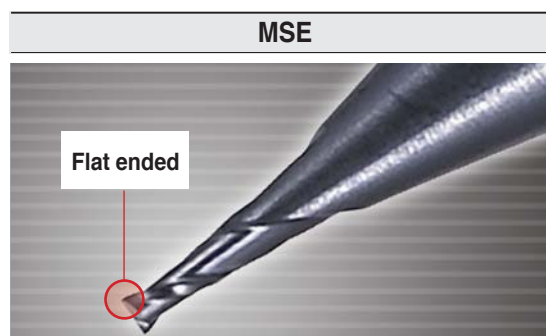
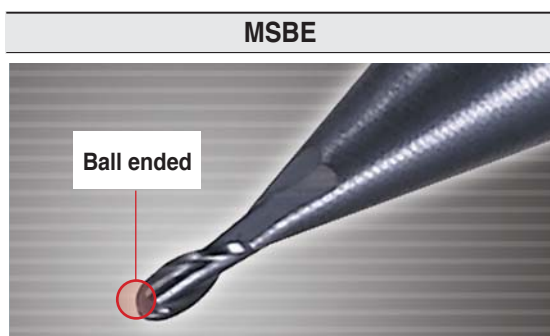
※ Notice

Users should operate high precision machine and clamp tool with its' best rigidity and accuracy
Anti vibration system is required for stable cutting. Watch operation for chip evacuation

Micro Endmills Code System

| | | | | | |
|----------------------|-----------------------|--------------------|-----------------|---|---|
| MS | E | 2 | 004 | - | S |
| ● | ● | ● | ● | | ● |
| <u>Solid Endmill</u> | <u>Type</u> | <u>No. of edge</u> | <u>Diameter</u> | | <u>Shank diameter</u> |
| Micro Solid | E : Flat BE : Ball | 2 Edges | Ø0.4 | | S : Ø3.0mm No code : Ø4.0mm (Diameter Ø2, Ø3) Ø6.0mm (Others) |

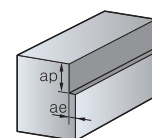
Product shape



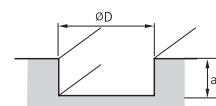
Recommended Cutting Condition - MSE2000

| Workpiece | Carbon steel, Alloy steel, Cast iron | | | Alloy steel, High speed steel | | |
|-------------|--------------------------------------|--------------------|------------------------|--------------------------------|--------------------|------------------------|
| | HrC45 ~ | | | HrC45~55 | | |
| Condition | SM50C,SCM,STD | | | STD61,STAVAX | | |
| Diameter(Ø) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Radial depth ae(mm) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | Radial depth ae(mm) |
| 0.4 | 40,000 | 640 | 0.01 | 40,000 | 640 | 0.01 |
| 0.5 | 40,000 | 800 | 0.015 | 40,000 | 800 | 0.02 |
| 0.6 | 40,000 | 960 | 0.02 | 40,000 | 960 | 0.02 |
| 0.7 | 40,000 | 1,120 | 0.02 | 40,000 | 1,120 | 0.02 |
| 0.8 | 40,000 | 1,280 | 0.03 | 40,000 | 1,280 | 0.03 |
| 0.9 | 40,000 | 1,440 | 0.04 | 40,000 | 1,280 | 0.04 |
| 1 | 40,000 | 1,600 | 0.06 | 40,000 | 1,280 | 0.06 |

Application tip



• $ap \leq ae$

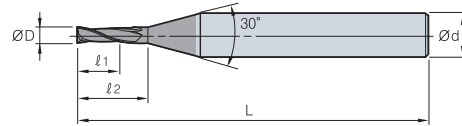


- $D \geq 3$: increase RPM 50~70%
reduce feed rate 40~60%
- Slotting : $ap \leq ae$

• Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

1. Workpiece should be clamped rigidly. In case of vibration, reduce RPM and feed rate by the same ratio
2. In case of shouldering, reduce feed rate to 1/3

MSE2000 (Flat)

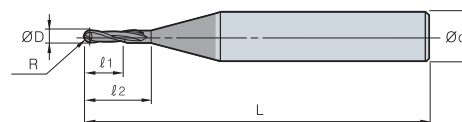


| ØD | Tolerance |
|-----------|-----------|
| Ø0.2-Ø1.0 | 0 ~ -0.02 |

(mm)

| Designation | ØD | Ød | l ₁ | l ₂ | L |
|-------------|-----|----|----------------|----------------|----|
| MSE 2002 | 0.2 | 4 | 0.4 | 0.6 | 40 |
| 2003 | 0.3 | 4 | 0.6 | 0.9 | 40 |
| 2004 | 0.4 | 6 | 0.8 | 1.2 | 50 |
| 2004-S | 0.4 | 3 | 0.8 | 1.2 | 45 |
| 2005 | 0.5 | 6 | 1 | 1.5 | 50 |
| 2005-S | 0.5 | 3 | 1 | 1.5 | 45 |
| 2006 | 0.6 | 6 | 1.2 | 1.8 | 50 |
| 2006-S | 0.6 | 3 | 1.2 | 1.8 | 45 |
| 2007 | 0.7 | 6 | 1.4 | 2.1 | 50 |
| 2007-S | 0.7 | 3 | 1.4 | 2.1 | 45 |
| 2008 | 0.8 | 6 | 1.6 | 2.4 | 50 |
| 2008-S | 0.8 | 3 | 1.6 | 2.4 | 45 |
| 2009 | 0.9 | 6 | 1.8 | 2.7 | 50 |
| 2009-S | 0.9 | 3 | 1.8 | 2.7 | 45 |
| 2010 | 1 | 6 | 2 | 3 | 50 |
| 2010-S | 1 | 3 | 2 | 3 | 45 |

MSBE2000 (Ball)



| ØD | Tolerance |
|-----------|-----------|
| Ø0.2-Ø1.0 | 0 ~ -0.02 |

(mm)

| Designation | R | ØD | Ød | l ₁ | l ₂ | L |
|-------------|------|-----|----|----------------|----------------|----|
| MSBE 2002 | 0.1 | 0.2 | 4 | 0.2 | 0.4 | 40 |
| 2003 | 0.15 | 0.3 | 4 | 0.3 | 0.6 | 40 |
| 2004 | 0.2 | 0.4 | 6 | 0.8 | 1.2 | 50 |
| 2004-S | 0.2 | 0.4 | 3 | 0.8 | 1.2 | 45 |
| 2005 | 0.25 | 0.5 | 6 | 1 | 1.5 | 50 |
| 2005-S | 0.25 | 0.5 | 3 | 1 | 1.5 | 45 |
| 2006 | 0.3 | 0.6 | 6 | 1.2 | 1.8 | 50 |
| 2006-S | 0.3 | 0.6 | 3 | 1.2 | 1.8 | 45 |
| 2007 | 0.35 | 0.7 | 6 | 1.4 | 2.1 | 50 |
| 2007-S | 0.35 | 0.7 | 3 | 1.4 | 2.1 | 45 |
| 2008 | 0.4 | 0.8 | 6 | 1.6 | 2.4 | 50 |
| 2008-S | 0.4 | 0.8 | 3 | 1.6 | 2.4 | 45 |
| 2009 | 0.45 | 0.9 | 6 | 1.8 | 2.7 | 50 |
| 2009-S | 0.45 | 0.9 | 3 | 1.8 | 2.7 | 45 |
| 2010 | 0.5 | 1 | 6 | 2 | 3 | 50 |
| 2010-S | 0.5 | 1 | 3 | 2 | 3 | 45 |

Special endmills order - MSE : MSE2000-I-L / MSBE : MSBE2000-I-L

EX.1) Diameter : 0.45, l : 1.2, L : 50 MSE20045 1.2-55L

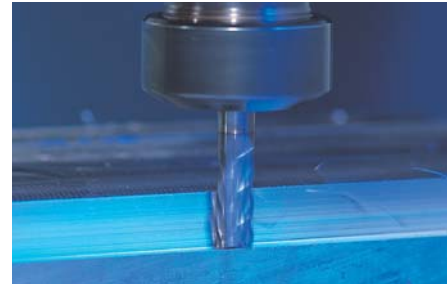
EX.2) Ball R0.225(Ø0.45), l : 1.2, L : 55 MSBE0045 1.2-55L

The diameter should be smaller than Ø1.0 for MSE, MSBE. In case of above Ø1.0, please refer to SSE-Q and SSBE-Q.

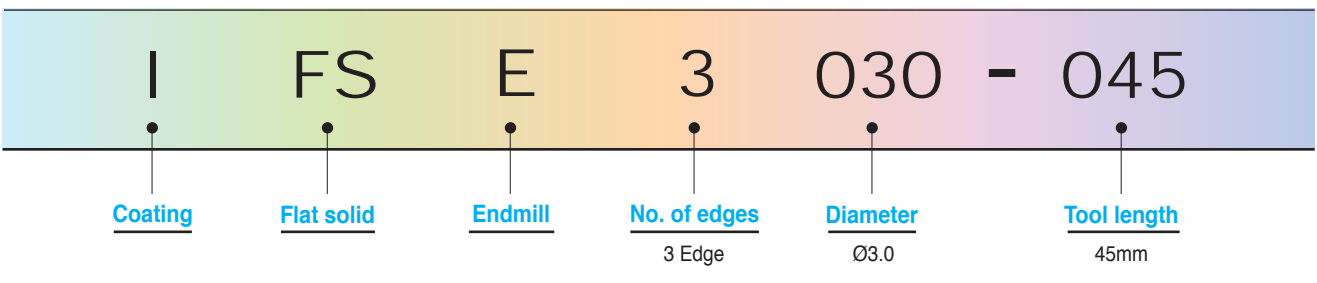
Optimal design for stainless steel machining

Solid Endmill for Hard-to-cut material

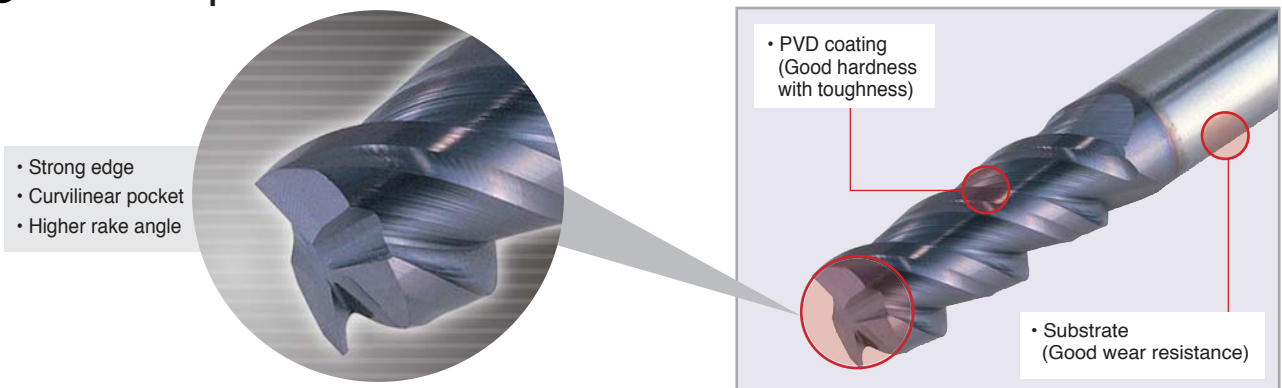
- High rake angle and curvilinear designed pocket for improved chip evacuation.
- Special edge for work hardening
- Optimized for stainless steel machining (Stainless steel, Titanium alloy, Inconel, Steel, Alloy steel)
- Multi applications (Shouldering, Slotting, Ramping)



Endmills for Hard-to-cut materials Code System



Product shape



Trouble shooting for Stainless steel machining

Stainless steel machining Work hardening

- Poor surface finish
- High temperature on cutting edge
- Built-up edge
- Shear strength in high temperature
- Difficult chip breaking and controlling

Stainless steel machining Trouble shooting

- Low cutting speed
- Sharp cutting edge
- Coolant for low temperature
- Air blow or coolant for better chip evacuation
- Higher harness of substrates and coating

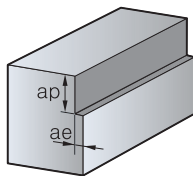
Comparison Stainless steel to Carbon steel

| Classifications | KS grade | Tensile strength (kgf/mm ²) | Thermal expansion coefficient (10 ⁻⁶ /°C) | Thermal expansion Rate (10 ⁻² cal/cm.s.°C) | Magnetic | Annealing hardening | Hardness (HB) | Machine Ability rate (%) | |
|-----------------|-------------------|---|--|---|----------|---------------------|---------------|--------------------------|-------|
| Carbon steel | SS34 SS41 | | | | | | | | |
| | SM10C | 38~65 | 11.4 | 11.2 | ○ | ○ | 110~180 | 50~70 | |
| | SM15C | | | | | | | | |
| Stainless steel | Martensite series | STS403 | | | | | | | |
| | | STS410 | ~55 | 9.9~11.7 | 5.9 | ○ | ○ | 215 | 50~60 |
| | | STS431 | | | | | | | |
| | Ferrite series | STS405 | 50~60 | 10.4 | 6.4 | ○ | × | 183 | 50~60 |
| | | STS430 | | | | | | | |
| | Austenite series | STS301 | | | | | | | |
| STS304 | | 55~65 | 14.4~16.9 | 3.8 | × | × | 187 | 35~45 | |
| STS316 | | | | | | | | | |

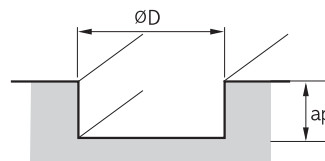
Recommended Cutting Condition

| Workpiece Condition Diameter(Ø) | Stainless steel STS | | Titanium alloy / Inconel | | Normal steel (SS, SM) (Under H _R C25) | | Alloy steel (SCM) (H _R C25~35) | | Hardened steel (STD) (H _R C40~50) | |
|------------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|---|--------------------|--|--------------------|---|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 2 | 5,500 | 240 | 2,600 | 90 | 9,000 | 540 | 6,000 | 3,200 | 4,000 | 240 |
| 4 | 4,000 | 260 | 2,000 | 90 | 6,600 | 600 | 4,500 | 340 | 3,000 | 280 |
| 6 | 3,000 | 360 | 1,200 | 90 | 4,800 | 720 | 3,000 | 360 | 2,500 | 280 |
| 8 | 2,000 | 390 | 1,000 | 100 | 3,600 | 750 | 2,200 | 460 | 2,000 | 300 |
| 10 | 1,700 | 410 | 800 | 120 | 2,800 | 750 | 1,800 | 460 | 1,500 | 300 |
| 12 | 1,500 | 380 | 700 | 100 | 2,400 | 710 | 1,500 | 410 | 1,200 | 280 |
| 14 | 1,200 | 320 | 600 | 95 | 2,200 | 660 | 1,300 | 370 | 1,000 | 270 |
| 16 | 1,000 | 270 | 500 | 90 | 1,800 | 490 | 1,100 | 320 | 800 | 230 |
| 20 | 750 | 250 | 400 | 85 | 900 | 270 | 900 | 270 | 600 | 200 |

Application tip



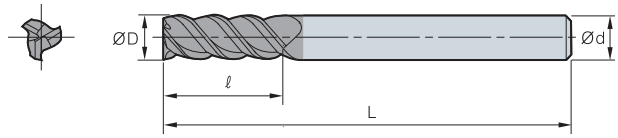
- Shouldering depth (ap) and radial depth (ae)
- Normal steel, Alloy steel, Stainless steel
- Titanium alloy, Inconel, Hardened steel



- Slotting depth(ap)
- Normal steel, Alloy steel
- Stainless steel
- Titanium alloy, Inconel, Hardened steel



IFSE3000 (Flat)



| ØD | Tolerance |
|-----------|-----------------|
| Ø1 ~ Ø6 | -0.01 ~ -0.030 |
| Ø7 ~ Ø10 | -0.015 ~ -0.040 |
| Ø11 ~ Ø20 | -0.020 ~ -0.050 |

(mm)

| Designation | ØD | Ød | ℓ | L |
|---------------|-----|----|----|-----|
| IFSE 3030-045 | 3 | 6 | 10 | 45 |
| 3035-045 | 3.5 | 6 | 10 | 45 |
| 3040-045 | 4 | 6 | 12 | 45 |
| 3045-045 | 4.5 | 6 | 12 | 45 |
| 3050-050 | 5 | 6 | 15 | 50 |
| 3055-050 | 5.5 | 6 | 15 | 50 |
| 3060-050 | 6 | 6 | 15 | 50 |
| 3065-060 | 6.5 | 8 | 20 | 60 |
| 3070-060 | 7 | 8 | 20 | 60 |
| 3075-060 | 7.5 | 8 | 20 | 60 |
| 3080-060 | 8 | 8 | 20 | 60 |
| 3085-070 | 8.5 | 10 | 20 | 70 |
| 3090-070 | 9 | 10 | 20 | 70 |
| 3095-070 | 9.5 | 10 | 20 | 70 |
| 3100-070 | 10 | 10 | 25 | 70 |
| 3110-075 | 11 | 12 | 25 | 75 |
| 3120-075 | 12 | 12 | 30 | 75 |
| 3130-090 | 13 | 16 | 30 | 90 |
| 3140-090 | 14 | 16 | 35 | 90 |
| 3150-090 | 15 | 16 | 40 | 90 |
| 3160-090 | 16 | 16 | 40 | 90 |
| 3170-100 | 17 | 20 | 40 | 100 |
| 3180-100 | 18 | 20 | 45 | 100 |
| 3190-110 | 19 | 20 | 45 | 110 |
| 3200-110 | 20 | 20 | 45 | 110 |

IFSE3000-L-I(V00)

Ex.1) 3 flutes, diameter : 6.3.l : 17, L : 60 - IFSE3063-060-V17

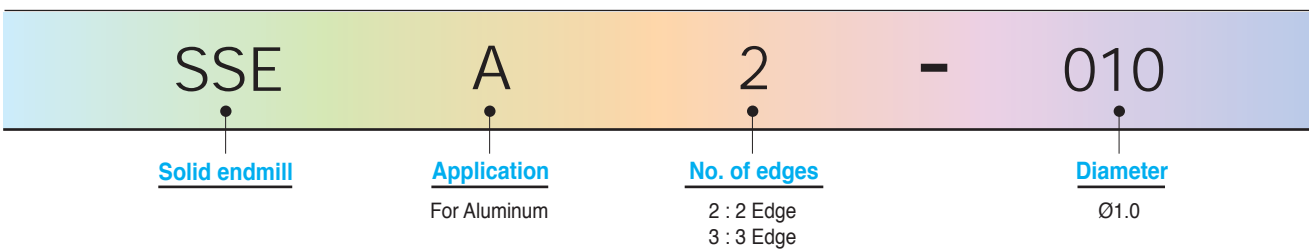
Good chip evacuation

Solid Endmill for Aluminum

- Minimum cutting load and built-up edge
- Good surface finish
- DLC coating
 - Higher hardness(Hv3000-7000), longer tool life comparing uncoated endmill
 - Excellent lubrication by low friction co-efficient ($\mu < 0.1$),
 - Good chip evacuation
- Superior in Aluminum, Aluminum alloys, Copper and Copper alloys



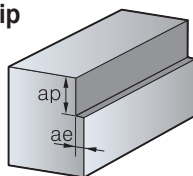
Endmills for Aluminum Code System



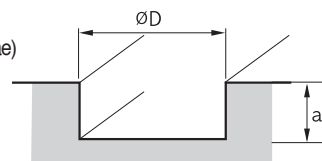
Recommended Cutting Condition (SSEA2000)

| Workpiece Condition Diameter(Ø) | Shouldering | | | | Slotting | | | |
|---------------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|--------------------|
| | Aluminum alloy (A7075) | | Aluminum alloy (cast) (AC4B) | | Aluminum alloy (A7075) | | Aluminum alloy (cast) (AC4B) | |
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 1 | 40,000 | 480 | 40,000 | 368 | 40,000 | 368 | 40,000 | 280 |
| 2 | 40,000 | 880 | 38,000 | 680 | 38,000 | 680 | 32,000 | 440 |
| 3 | 32,000 | 1,120 | 25,000 | 760 | 25,000 | 760 | 21,000 | 480 |
| 4 | 24,000 | 1,200 | 19,000 | 800 | 19,000 | 800 | 13,000 | 520 |
| 5 | 19,000 | 1,280 | 15,000 | 880 | 15,000 | 800 | 13,000 | 560 |
| 6 | 16,000 | 1,520 | 13,000 | 960 | 13,000 | 880 | 11,000 | 600 |
| 8 | 12,000 | 1,520 | 9,500 | 960 | 9,500 | 960 | 8,000 | 640 |
| 10 | 9,500 | 1,520 | 7,600 | 960 | 7,600 | 960 | 6,400 | 640 |
| 12 | 8,000 | 1,520 | 6,400 | 960 | 6,400 | 960 | 5,300 | 640 |
| 16 | 6,000 | 1,520 | 4,800 | 960 | 4,800 | 800 | 4,000 | 576 |
| 20 | 4,800 | 1,200 | 3,800 | 800 | 3,800 | 776 | 3,200 | 528 |

Application tip



- Shouldering depth (ap) and radial depth (ae)
 - $ae \leq 0.2D (D < 3)$
 - $ae \leq 0.5D (D \geq 3)$



- Slotting depth(ap)
 - $ap \leq D (\text{max.: } 12\text{mm})$

1. Workpiece should be clamped rigidly In case of vibration, reduce RPM and feed rate by the same ratio

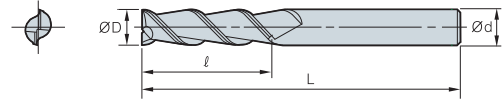
Copper & Aluminum machining

1. Built-up edge
2. Low heat resistance could create unnecessary stress or accuracy problem after machining
3. Scratch due to low hardness
4. Low tool life due to flank wear

Trouble shooting for Copper & Aluminum machining

1. Use a higher rake, sharp edge, oil (MQL) mist to decrease cutting load and built-up edge
2. Increase Vc and reduce the depth of cut for a better surface finish

SSEA2000 / 3000 (Flat)



| ØD | Tolerance |
|----------|-------------------|
| Ø1~Ø6 | - 0.010 ~ - 0.030 |
| Ø7 ~Ø10 | - 0.015 ~ - 0.040 |
| Ø11 ~Ø20 | - 0.020 ~ - 0.050 |

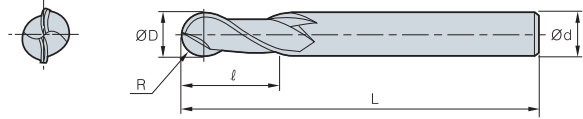
| Designation | | ØD | Ød | ℓ | L |
|-------------|------|-----|----|-----|----|
| SSEA 2 | 2010 | 1 | 6 | 3 | 40 |
| | 2015 | 1.5 | 6 | 4 | 40 |
| | 2020 | 2 | 6 | 6 | 40 |
| | 2025 | 2.5 | 6 | 7 | 40 |
| | 2030 | 3 | 6 | 10 | 45 |
| | 2035 | 3.5 | 6 | 10 | 45 |
| | 2040 | 4 | 6 | 12 | 45 |
| | 2050 | 5 | 6 | 15 | 50 |
| | 2060 | 6 | 6 | 15 | 50 |
| | 2070 | 7 | 8 | 20 | 60 |
| | 2080 | 8 | 8 | 20 | 60 |
| | 2090 | 9 | 10 | 20 | 70 |
| | 2100 | 10 | 10 | 25 | 70 |
| | 2110 | 11 | 12 | 25 | 75 |
| | 2120 | 12 | 12 | 30 | 75 |
| | 2130 | 13 | 16 | 30 | 90 |
| | 2140 | 14 | 16 | 35 | 90 |
| | 2150 | 15 | 16 | 40 | 90 |
| | 2160 | 16 | 16 | 40 | 90 |
| 2180 | 18 | 18 | 45 | 100 | |
| 2200 | 20 | 20 | 45 | 100 | |
| SSEA 3 | 3020 | 2 | 6 | 6 | 40 |
| | 3030 | 3 | 6 | 10 | 45 |
| | 3035 | 3.5 | 6 | 10 | 45 |
| | 3040 | 4 | 6 | 12 | 45 |
| | 3050 | 5 | 6 | 15 | 50 |
| | 3060 | 6 | 6 | 15 | 50 |
| | 3070 | 7 | 8 | 20 | 60 |
| | 3080 | 8 | 8 | 20 | 60 |
| | 3090 | 9 | 10 | 20 | 70 |
| | 3100 | 10 | 10 | 25 | 70 |
| | 3110 | 11 | 12 | 25 | 75 |
| | 3120 | 12 | 12 | 30 | 75 |
| | 3130 | 13 | 16 | 30 | 90 |
| | 3140 | 14 | 16 | 35 | 90 |
| | 3150 | 15 | 16 | 40 | 90 |
| | 3160 | 16 | 16 | 40 | 90 |

Special endmills order : SSEA○○○○○I-L

Ex.1) 3 flutes, diameter : 6.3.I:17, L : 60 SSEA3063 17-60L

Ex.2) 3 flutes, diameter : 6.3.standard type SSEA3063

SSBEA2000 (Ball)



| ØD | Tolerance |
|-----|-----------|
| All | 0 ~ -0.03 |

| Designation | | R | ØD | Ød | ℓ | L |
|-------------|------|------|-----|----|-----|-----|
| SSBEA | 2010 | 0.5 | 1 | 6 | 3 | 70 |
| | 2015 | 0.75 | 1.5 | 6 | 4 | 70 |
| | 2020 | 1 | 2 | 6 | 6 | 70 |
| | 2025 | 1.25 | 2.5 | 6 | 8 | 70 |
| | 2030 | 1.5 | 3 | 6 | 10 | 70 |
| | 2035 | 1.75 | 3.5 | 6 | 10 | 70 |
| | 2040 | 2 | 4 | 6 | 12 | 70 |
| | 2045 | 2.25 | 4.5 | 6 | 15 | 80 |
| | 2050 | 2.5 | 5 | 6 | 15 | 80 |
| | 2055 | 2.75 | 5.5 | 6 | 15 | 80 |
| | 2060 | 3 | 6 | 6 | 15 | 80 |
| | 2065 | 3.25 | 6.5 | 8 | 20 | 90 |
| | 2070 | 3.5 | 7 | 8 | 20 | 90 |
| | 2075 | 3.75 | 7.5 | 8 | 20 | 90 |
| | 2080 | 4 | 8 | 8 | 20 | 90 |
| | 2085 | 4.25 | 8.5 | 10 | 25 | 100 |
| | 2090 | 4.5 | 9 | 10 | 25 | 100 |
| | 2100 | 5 | 10 | 10 | 25 | 100 |
| | 2110 | 5.5 | 11 | 12 | 30 | 110 |
| | 2120 | 6 | 12 | 12 | 30 | 110 |
| 2130 | 6.5 | 13 | 16 | 35 | 120 | |
| 2140 | 7 | 14 | 16 | 35 | 120 | |
| 2150 | 7.5 | 15 | 16 | 40 | 120 | |
| 2160 | 8 | 16 | 16 | 40 | 120 | |
| 2170 | 8.5 | 17 | 20 | 40 | 130 | |
| 2180 | 9 | 18 | 20 | 45 | 130 | |
| 2190 | 9.5 | 19 | 20 | 45 | 130 | |
| 2200 | 10 | 20 | 20 | 45 | 130 | |

Special endmills order : SSBEA2000-I-L

Ex.1) 2 flutes, diameter : 6.3.I :17, L : 60 SSBEA3063 17-60L

Ex.2) 2 flutes, diameter : 6.3.standard type SSBEA3063



• Technique of machining Copper/Aluminum steel

1. With high rake angle cutting edge, sharp tools and oil mist, able to minimize cutting load and built-up-edge
2. Applying higher cutting speed and shallower depth, able to make surface finishing and productivity improved

Long tool life and good surface roughness for electrode machining

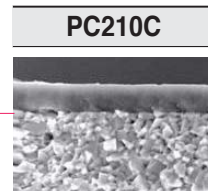
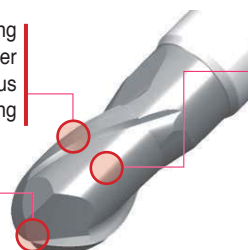
C-Max

(Copper)

- Superior lubricity, wear resistance & chipping resistance due to the K-Silver coating layer and optimal substrate
- Optimal for copper and nonferrous metal machining
- Various line up (ball, flat, radius & long neck type)
- Long tool life and good surface roughness for electrode machining

Optimal cutting edge for copper and nonferrous metals machining

Good quality due to high precision cutting edge



Coating layer(K-Silver)
: Enhancing wear resistance and lubrication

Substrate
: Optimal for wear and chipping resistance

Machining example

• Electrode machining

Workpiece : Cu

Cutting condition : $vc=70(m/min)$, $fz=0.083(mm/t)$, $ae=3.0$, $ap=0.6$,

Designation : CRE4100-070-R10

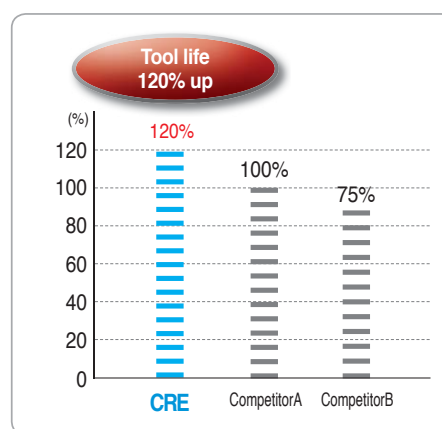
• Test result



CRE

CompetitorA

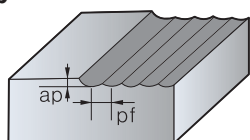
CompetitorB



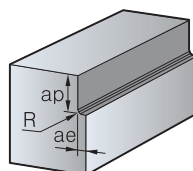
Recommended Cutting Condition

| Workpiece | CBE/CBNE | | CFE/CFNE | | CRE/CRNE | |
|-----------------------|-----------------------------|-----------------|-----------------------------|-----------------|-----------------------------|-----------------|
| | Copper Alloys | | | | | |
| Condition Diameter(Ø) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 0.5 | 40,000 | 2,600 | 40,000 | 1,800 | | |
| 1 | 40,000 | 2,800 | 40,000 | 2,000 | 40,000 | 2,000 |
| 1.5 | 40,000 | 3,200 | 40,000 | 2,400 | 30,000 | 2,400 |
| 2 | 40,000 | 3,600 | 30,000 | 1,800 | 30,000 | 1,800 |
| 3 | 40,000 | 4,000 | 23,000 | 1,380 | 20,000 | 1,380 |
| 4 | 32,000 | 3,200 | 15,000 | 900 | 15,000 | 900 |
| 5 | 25,000 | 2,500 | 12,000 | 750 | 12,000 | 750 |
| 6 | 21,000 | 2,100 | 10,000 | 600 | 10,000 | 600 |
| 8 | 16,000 | 1,600 | 8,000 | 480 | 8,000 | 480 |
| 10 | 13,000 | 1,300 | 6,400 | 384 | 6,400 | 384 |
| 12 | 9,000 | 900 | 5,400 | 324 | 5,400 | 324 |

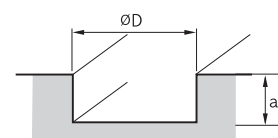
• Application tip



• $ap=0.1D$, $pf=0.2D$



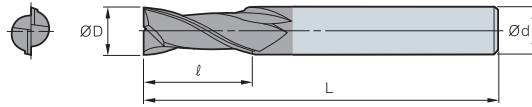
• $ap=1.5D$, $ae=0.1D$



• $ap \leq 1.5D$

• If vibration occurs, please reduce R.P.M and feed rate at the same rate

CFE2000 (Flat)

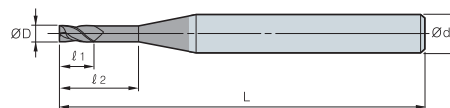


| ØD | Tolerance | R Tolerance |
|-----------|-----------|-------------|
| Ø0.5 ~ Ø6 | 0 ~ 0.01 | ± 0.005 |
| Ø8 ~ Ø12 | 0 ~ 0.02 | ± 0.005 |

(mm)

| Designation | | ØD | Ød | ℓ | L |
|-------------|----------|-----|----|-----|----|
| CFE | 2010-040 | 1 | 4 | 2.5 | 40 |
| | 2015-040 | 1.5 | 4 | 4 | 40 |
| | 2020-045 | 2 | 4 | 5 | 45 |
| | 2030-045 | 3 | 6 | 8 | 45 |
| | 2040-050 | 4 | 6 | 11 | 50 |
| | 2050-060 | 5 | 6 | 13 | 60 |
| | 2060-060 | 6 | 6 | 13 | 60 |
| | 2080-060 | 8 | 8 | 19 | 60 |
| | 2100-070 | 10 | 10 | 22 | 70 |
| | 2120-075 | 12 | 12 | 26 | 75 |

CFNE2000 (Long Neck Flat)



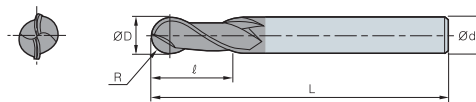
| ØD | Tolerance | R Tolerance |
|-----------|-----------|-------------|
| Ø0.5 ~ Ø6 | 0 ~ 0.01 | ± 0.005 |
| Ø8 ~ Ø12 | 0 ~ 0.02 | ± 0.005 |

(mm)

| Designation | | ØD | Ød | ℓ1 | ℓ2 | L |
|-------------|--------------|-----|----|-----|----|----|
| CFNE | 2005-045-N2 | 0.5 | 4 | 0.8 | 2 | 45 |
| | 2005-045-N4 | 0.5 | 4 | 0.8 | 4 | 45 |
| | 2005-045-N6 | 0.5 | 4 | 0.8 | 6 | 45 |
| | 2005-050-N8 | 0.5 | 4 | 0.8 | 8 | 50 |
| | 2010-045-N4 | 1 | 4 | 1.5 | 4 | 45 |
| | 2010-045-N6 | 1 | 4 | 1.5 | 6 | 45 |
| | 2010-050-N8 | 1 | 4 | 1.5 | 8 | 50 |
| | 2010-050-N10 | 1 | 4 | 1.5 | 10 | 50 |
| | 2015-045-N6 | 1.5 | 4 | 2.3 | 6 | 45 |
| | 2015-050-N8 | 1.5 | 4 | 2.3 | 8 | 50 |
| | 2015-050-N10 | 1.5 | 4 | 2.3 | 10 | 50 |
| | 2015-050-N12 | 1.5 | 4 | 2.3 | 12 | 50 |
| | 2020-045-N6 | 2 | 4 | 3 | 6 | 45 |
| | 2020-050-N8 | 2 | 4 | 3 | 8 | 50 |
| | 2020-050-N10 | 2 | 4 | 3 | 10 | 50 |
| | 2020-055-N12 | 2 | 4 | 3 | 12 | 50 |
| | 2030-050-N10 | 3 | 4 | 4.5 | 10 | 50 |
| | 2030-050-N12 | 3 | 4 | 4.5 | 12 | 50 |
| | 2030-060-N14 | 3 | 4 | 4.5 | 14 | 60 |
| | 2030-060-N16 | 3 | 4 | 4.5 | 16 | 60 |
| | 2040-050-N12 | 4 | 6 | 6 | 12 | 50 |
| | 2040-050-N16 | 4 | 6 | 6 | 16 | 50 |
| | 2040-060-N20 | 4 | 6 | 6 | 20 | 60 |



CBE2000 (Ball)

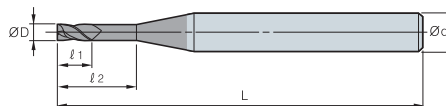


| ØD | Tolerance | R Tolerance |
|-----------|-----------|-------------|
| Ø0.5 ~ Ø6 | 0 ~ 0.01 | ± 0.005 |
| Ø8 ~ Ø12 | 0 ~ 0.02 | ± 0.005 |

(mm)

| Designation | R | ØD | Ød | ℓ | L | |
|-------------|----------|------|-----|-----|----|-----|
| CBE 2 | 2010-050 | 0.5 | 1 | 1 | 4 | 50 |
| | 2015-050 | 0.75 | 1.5 | 1.5 | 4 | 50 |
| | 2020-050 | 1 | 2 | 2 | 4 | 50 |
| | 2030-060 | 1.2 | 3 | 3 | 6 | 60 |
| | 2040-070 | 2 | 4 | 4 | 6 | 70 |
| | 2050-080 | 2.5 | 5 | 5 | 6 | 80 |
| | 2060-080 | 3 | 6 | 6 | 6 | 80 |
| | 2080-090 | 4 | 8 | 8 | 8 | 90 |
| | 2100-100 | 5 | 10 | 10 | 10 | 100 |
| | 2120-110 | 6 | 12 | 12 | 12 | 110 |

CBNE2000 (Long Neck Ball)

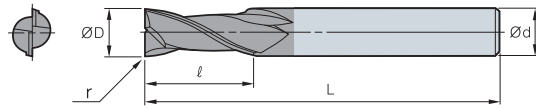


| ØD | Tolerance | R Tolerance |
|-----------|-----------|-------------|
| Ø0.5 ~ Ø6 | 0 ~ 0.01 | ± 0.005 |
| Ø8 ~ Ø12 | 0 ~ 0.02 | ± 0.005 |

(mm)

| Designation | R | ØD | Ød | ℓ1 | ℓ2 | L | |
|-------------|--------------|------|-----|----|-----|----|----|
| CBNE 2 | 2005-045-N2 | 0.25 | 0.5 | 4 | 0.5 | 2 | 45 |
| | 2005-045-N4 | 0.25 | 0.5 | 4 | 0.5 | 4 | 45 |
| | 2005-045-N6 | 0.25 | 0.5 | 4 | 0.5 | 6 | 45 |
| | 2005-050-N8 | 0.25 | 0.5 | 4 | 0.5 | 8 | 50 |
| | 2010-045-N4 | 0.5 | 1 | 4 | 1 | 4 | 45 |
| | 2010-045-N6 | 0.5 | 1 | 4 | 1 | 6 | 45 |
| | 2010-050-N8 | 0.5 | 1 | 4 | 1 | 8 | 50 |
| | 2010-050-N10 | 0.5 | 1 | 4 | 1 | 10 | 50 |
| | 2015-050-N8 | 0.75 | 1.5 | 4 | 1.5 | 8 | 50 |
| | 2015-050-N10 | 0.75 | 1.5 | 4 | 1.5 | 10 | 50 |
| | 2015-050-N12 | 0.75 | 1.5 | 4 | 1.5 | 12 | 50 |
| | 2015-055-N14 | 0.75 | 1.5 | 4 | 1.5 | 14 | 55 |
| | 2020-050-N8 | 1 | 2 | 4 | 2 | 8 | 50 |
| | 2020-050-N10 | 1 | 2 | 4 | 2 | 10 | 50 |
| | 2020-050-N12 | 1 | 2 | 4 | 2 | 12 | 50 |
| | 2020-055-N14 | 1 | 2 | 4 | 2 | 14 | 55 |
| | 2030-050-N10 | 1.5 | 3 | 4 | 3 | 10 | 50 |
| | 2030-050-N12 | 1.5 | 3 | 4 | 3 | 12 | 50 |
| | 2030-055-N14 | 1.5 | 3 | 4 | 3 | 14 | 55 |
| | 2030-055-N16 | 1.5 | 3 | 4 | 3 | 16 | 60 |
| | 2040-060-N16 | 2 | 4 | 6 | 4 | 16 | 60 |
| | 2040-060-N20 | 2 | 4 | 6 | 4 | 20 | 60 |
| | 2040-070-N25 | 2 | 4 | 6 | 4 | 25 | 70 |
| | 2040-070-N30 | 2 | 4 | 6 | 4 | 30 | 70 |

CRE2000 (Radius)

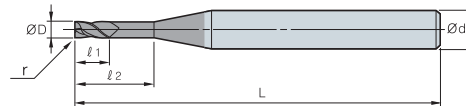


| ØD | Tolerance | R Tolerance |
|-----------|-----------|-------------|
| Ø0.5 ~ Ø6 | 0 ~ 0.01 | ±0.005 |
| Ø8 ~ Ø12 | 0 ~ 0.02 | ±0.005 |

(mm)

| Designation | r | ØD | Ød | ℓ | L | |
|-------------|--------------|-----|----|----|----|----|
| CRE | 2020-045-R05 | 0.5 | 2 | 4 | 5 | 45 |
| | 2030-045-R05 | 0.5 | 3 | 6 | 8 | 45 |
| | 2040-050-R05 | 0.5 | 4 | 6 | 11 | 50 |
| | 2050-060-R05 | 0.5 | 5 | 6 | 13 | 60 |
| | 2060-060-R05 | 0.5 | 6 | 6 | 13 | 60 |
| | 2080-060-R10 | 1 | 8 | 8 | 19 | 60 |
| | 2100-070-R10 | 1 | 10 | 10 | 22 | 70 |
| | 2120-075-R10 | 1 | 12 | 12 | 26 | 75 |

CRNE2000 (Long Neck Radius)



| ØD | Tolerance | R Tolerance |
|-----------|-----------|-------------|
| Ø0.5 ~ Ø6 | 0 ~ 0.01 | ±0.005 |
| Ø8 ~ Ø12 | 0 ~ 0.02 | ±0.005 |

(mm)

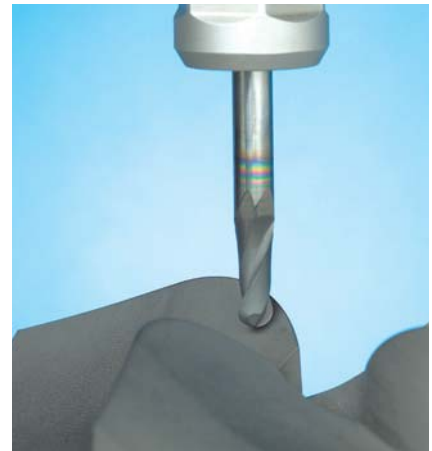
| Designation | R | ØD | Ød | ℓ1 | ℓ2 | L | |
|-------------|-----------------|-----|-----|----|-----|----|----|
| CRNE | 2010-045-R02N4 | 0.2 | 1 | 4 | 1.5 | 4 | 45 |
| | 2010-045-R02N6 | 0.2 | 1 | 4 | 1.5 | 6 | 45 |
| | 2010-050-R02N8 | 0.2 | 1 | 4 | 1.5 | 8 | 50 |
| | 2010-050-R02N10 | 0.2 | 1 | 4 | 1.5 | 10 | 50 |
| | 2015-045-R02N6 | 0.2 | 1.5 | 4 | 2.3 | 6 | 45 |
| | 2015-050-R02N8 | 0.2 | 1.5 | 4 | 2.3 | 8 | 50 |
| | 2015-050-R02N10 | 0.2 | 1.5 | 4 | 2.3 | 10 | 50 |
| | 2015-050-R02N12 | 0.2 | 1.5 | 4 | 2.3 | 12 | 50 |
| | 2020-045-R05N6 | 0.5 | 2 | 4 | 3 | 6 | 45 |
| | 2020-050-R05N8 | 0.5 | 2 | 4 | 3 | 8 | 50 |
| | 2020-050-R05N10 | 0.5 | 2 | 4 | 3 | 10 | 50 |
| | 2020-055-R05N12 | 0.5 | 2 | 4 | 3 | 12 | 50 |
| | 2030-050-R05N10 | 0.5 | 3 | 4 | 4.5 | 10 | 50 |
| | 2030-050-R05N12 | 0.5 | 3 | 4 | 4.5 | 12 | 50 |
| | 2030-060-R05N14 | 0.5 | 3 | 4 | 4.5 | 14 | 60 |
| | 2030-060-R05N16 | 0.5 | 3 | 4 | 4.5 | 16 | 60 |
| | 2040-050-R05N12 | 0.5 | 4 | 6 | 6 | 12 | 50 |
| | 2040-050-R05N16 | 0.5 | 4 | 6 | 6 | 16 | 50 |
| | 2040-060-R05N20 | 0.5 | 4 | 6 | 6 | 20 | 60 |



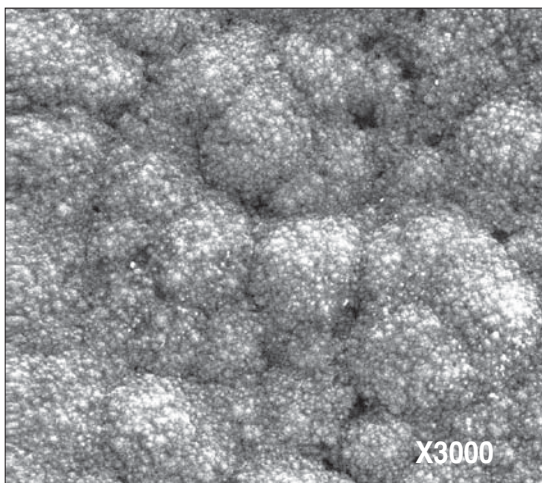
Unique diamond coating technology

D-Max

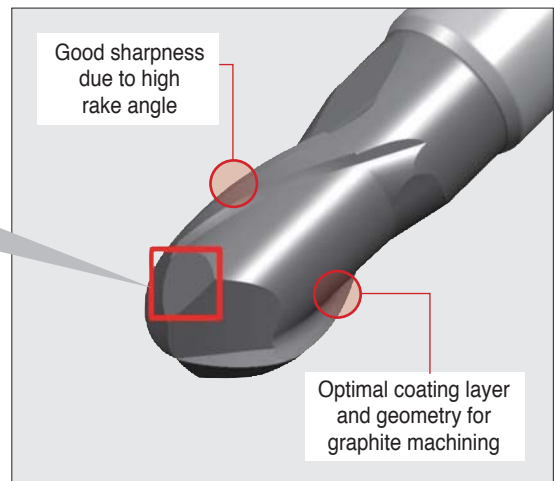
- Unique diamond coating technology
- Good surface roughness through improved endmill geometry and ultra fine substrate
- Wide cutting area from intermittent cutting to high precision cutting
- 10~20 times longer tool life than uncoated carbide endmill



Coating and Endmill geometry



ND3000 Coated

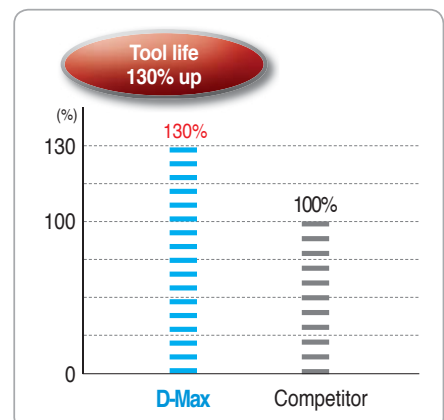
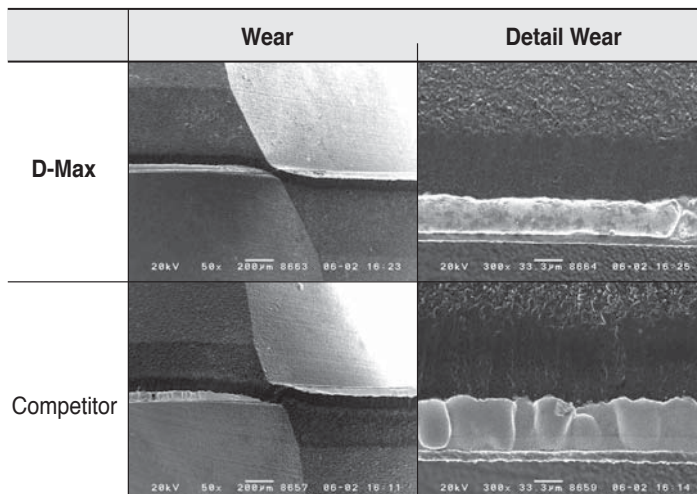


Machining example

• Test result

Workpiece: graphite

Cutting condition : $n=16,000(\text{mim}^{-1})$ $vf=2,6000(\text{mm}/\text{min})$ $ap=1.5\text{mm}$ $ae=0.6\text{mm}$



Recommended Cutting Condition (DFE2000 Flat)

| Workpiece Condition Diameter(Ø) | Graphite | | Aluminum alloys | | Copper alloys | |
|---------------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 3 | 21,000 | 1,280 | 21,000 | 670 | 21,000 | 640 |
| 4 | 16,000 | 1,180 | 16,000 | 670 | 16,000 | 640 |
| 6 | 10,500 | 1,180 | 10,500 | 670 | 10,500 | 560 |
| 8 | 8,000 | 1,080 | 8,000 | 600 | 8,000 | 540 |

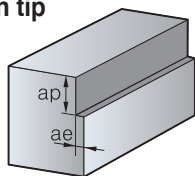
Recommended Cutting Condition (DBE2000 Ball)

| Workpiece Condition Diameter(Ø) | Graphite | | Aluminum alloys | | Copper alloys | |
|---------------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 4 | 15,000 | 1,900 | 15,900 | 1,550 | 11,900 | 1,150 |
| 6 | 15,000 | 1,900 | 10,500 | 1,550 | 7,950 | 1,150 |
| 8 | 13,900 | 1,900 | 7,950 | 1,550 | 5,950 | 1,150 |

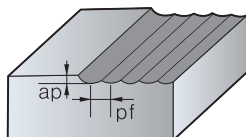
Recommended Cutting Condition (DRE2000 Radius)

| Workpiece Condition Diameter(Ø) | Graphite | | Aluminum alloys | | Copper alloys | |
|---------------------------------------|--------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|--------------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| 4 | 13,990 | 1,180 | 15,900 | 670 | 11,990 | 640 |
| 6 | 13,900 | 1,180 | 10,500 | 670 | 7,950 | 560 |
| 8 | 10,000 | 1,080 | 7,950 | 600 | 5,950 | 540 |

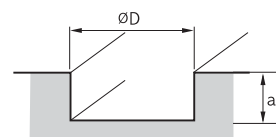
Application tip



- Graphite
ap=1.5D, ae=0.1D
- Aluminum alloys
ap=1.5D, pf=0.1D
- Copper alloys
ap=1.5D, pf=0.1D

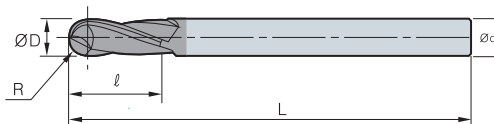


- Graphite
ap=0.5D, pf=0.1D
- Aluminum alloys
ap=0.5D, pf=0.1D
- Copper alloys
ap=0.5D, pf=0.1D



- Graphite
ap=0.1D
- Aluminum alloys
ap=0.1D
- Copper alloys
ap=0.1D

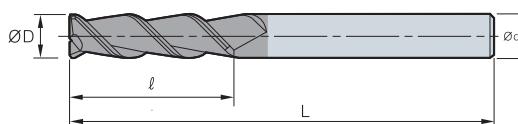
DBE2000 (Ball)



(mm)

| Designation | R | ØD | Ød | ℓ | L |
|----------------|---|----|----|----|----|
| 2 DBE 2040-070 | 2 | 4 | 6 | 12 | 70 |
| | 3 | 6 | 6 | 15 | 80 |
| | 4 | 8 | 8 | 20 | 90 |

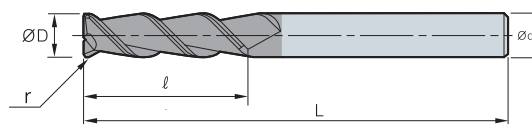
DFE2000 (Flat)



(mm)

| Designation | ØD | Ød | ℓ | L |
|----------------|----|----|----|----|
| 2 DFE 2030-045 | 3 | 6 | 10 | 45 |
| | 4 | 6 | 12 | 45 |
| | 6 | 6 | 15 | 50 |
| | 8 | 8 | 20 | 60 |

DRE2000 (Radius)



(mm)

| Designation | r | ØD | Ød | ℓ | L |
|--------------------|-----|----|----|---|----|
| 2 DRE 2040-045-R05 | 0.5 | 4 | 6 | 5 | 45 |
| | 0.5 | 6 | 6 | 7 | 50 |
| | 1 | 8 | 8 | 9 | 60 |

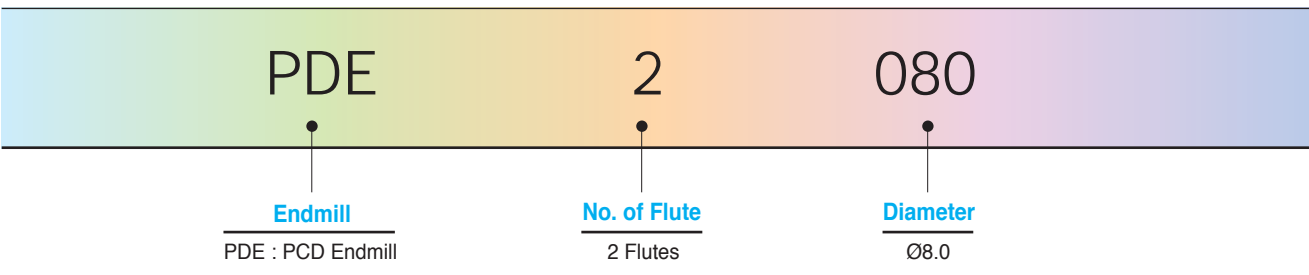
Longer tool life and good surface finishes

PCD Endmill

- Longer tool life and good surface roughness
- Reducing burrs at nonferrous metals machining
- 1000 series : Ultra finishing for nonferrous metals
- 2000 series : Optimal for aluminum alloy, carbon steel, graphite and reinforced Plastic machining



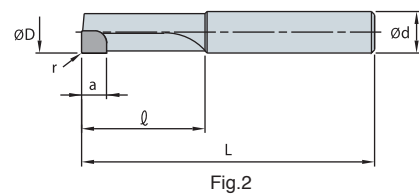
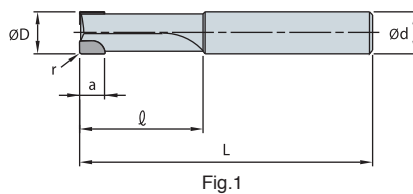
PCD Endmill Code System



Recommended Cutting Condition

| Work piece | vc(m/min) | n(min ⁻¹) | fz(mm/t) |
|------------------------|-----------|-----------------------|-----------|
| Aluminum Alloy, Copper | 30~300 | 2,000~12,000 | 0.02~0.07 |
| Reinforced Plastic | 35~300 | 2,800~16,000 | 0.04~0.12 |
| Carbon steel, Graphite | 10~100 | 5,300~16,000 | 0.04~0.2 |

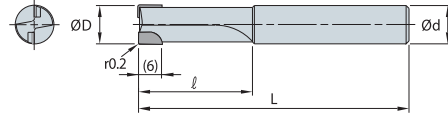
Special Endmill Order Form



| Designation | Fig. | No. of Flute | Dimension (mm) | | | | | | |
|-------------|------|--------------|----------------|----|---|---|---|---|--|
| | | | øD | ød | r | a | l | L | |
| PDES | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

* Depending on customer requests, we can make special Endmill

PDE 1000/2000 (Flat)



| Designation | | ØD | Ød | l | L |
|-------------|------|----|----|----|----|
| PDE | 1040 | 4 | 6 | 15 | 45 |
| | 1050 | 5 | 6 | 15 | 50 |
| 1 | 1060 | 6 | 6 | 20 | 60 |
| | 2060 | 6 | 8 | 20 | 60 |
| 2 | 2070 | 7 | 8 | 20 | 60 |
| | 2080 | 8 | 8 | 20 | 60 |
| | 2090 | 9 | 10 | 25 | 70 |
| | 2100 | 10 | 10 | 25 | 70 |
| | 2120 | 12 | 12 | 25 | 75 |

(mm)

High precision machining with our high stiffness design

Brazed Endmill

- Possible to machine with high precision due to high stiffness design
- High speed cutting by increasing wear resistance, decreasing frictional resistance through PVD coating and substrate
- Long tool life due to absorbing impact through brazed body in heavy interruption
- General steel, Alloy steel, mild steel, dice steel, stainless steel, cast iron, ductile cast iron
- ZSEA: Aluminum, Aluminum alloy, Cooper, Cooper alloy, Non-ferrous materials
- Coating brazed endmills (special)
Guaranteed long tool life due to high new-concept hardness and oxidation resistant coating

PC221F Coating

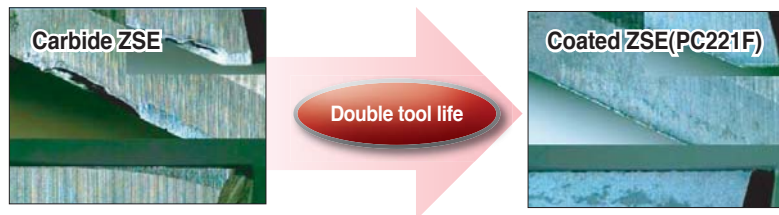


New PVD films
New hardness and oxidation resistance coating

Brazed Endmills Code System

| | | | | | | |
|---------------|---------------|--|------------------------------|-----------------|---|--|
| Z | S | E | 2 | 14 | - | S |
| Brazed | Spiral | Endmill | No. of Flutes | Diameter | | Shank Dia. |
| | | E : Flat (Steel) EA : Flat (Al, Cu) EL : Flat Long (Steel) EXL : Flat Long (Steel) BE : Ball (Steel) | 2 : 2 Flutes 3 : 3 Flutes | Ø14 | | S : Ø42.0 Q : Coated SQ : Ø42.0 Coated Standard Shank Diameter : none |

Wear resistance test (W.P:STD61)



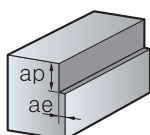
Recommended Cutting Condition (ZSE200 Flat)

| Workpiece Condition | SM50C,SCM,GC (~HrC30) | | STD61,STD11 (HrC30~45) | | STD61 (HrC45~55) | |
|---------------------|-----------------------------|-----------------|-----------------------------|-----------------|-----------------------------|-----------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| Diameter(Ø) | | | | | | |
| 20 | 1,600 | 152 | 950 | 88 | 560 | 44 |
| 25 | 1,300 | 136 | 750 | 72 | 450 | 36 |
| 30 | 1,100 | 120 | 650 | 64 | 370 | 32 |
| 40 | 800 | 96 | 500 | 56 | 280 | 24 |
| 50 | 650 | 88 | 400 | 48 | 220 | 20 |

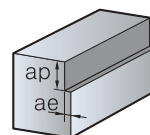
Recommended Cutting Condition (ZSE400 Flat)

| Workpiece Condition | SM50C,SCM,GC (~HrC30) | | STD61,STD11 (HrC30~45) | | STD61 (HrC45~55) | |
|---------------------|-----------------------------|-----------------|-----------------------------|-----------------|-----------------------------|-----------------|
| | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) | R.P.M n(min ⁻¹) | Feed vf(mm/min) |
| Diameter(Ø) | | | | | | |
| 20 | 1,600 | 230 | 950 | 133 | 560 | 66 |
| 25 | 1,300 | 205 | 750 | 109 | 450 | 54 |
| 30 | 1,100 | 180 | 650 | 96 | 370 | 48 |
| 40 | 800 | 145 | 500 | 85 | 280 | 36 |
| 50 | 650 | 135 | 400 | 72 | 220 | 30 |

Application tip



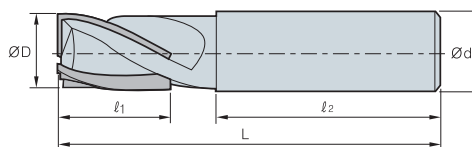
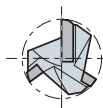
- Side milling (under HrC45)
- $ap \leq 1.5D$ · $ae \leq 0.1D$



- Side milling (over HrC45)
- $ap \leq 1D$ (Max : 1mm)

1. Above table based on side milling, when it enters to ae direction, you should apply reduced cutting condition
2. When it enters to ae direction, for finishing you should increase revolution speed and feed in the table

ZSE200 / 300 (Flat)



| ØD | Tolerance |
|-----|-------------|
| All | 0 ~ - 0.050 |

(mm)

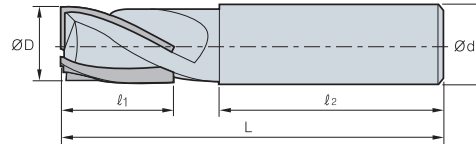
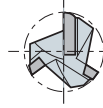
| Designation | ØD | Ød | l ₁ | l ₂ | L |
|-------------|----|----|----------------|----------------|-----|
| ZSE 214 | 14 | 16 | 28 | 57 | 95 |
| 215 | 15 | 16 | 28 | 57 | 95 |
| 216(Q) | 16 | 16 | 28 | 55 | 95 |
| 217 | 17 | 20 | 30 | 70 | 115 |
| 218 | 18 | 20 | 30 | 70 | 115 |
| 219 | 19 | 20 | 30 | 70 | 115 |
| 220(Q) | 20 | 20 | 30 | 70 | 115 |
| 221 | 21 | 20 | 35 | 65 | 115 |
| 222 | 22 | 20 | 35 | 65 | 115 |
| 223 | 23 | 25 | 35 | 75 | 125 |
| 224 | 24 | 25 | 35 | 75 | 125 |
| 225 | 25 | 25 | 35 | 75 | 125 |
| 226(Q) | 26 | 25 | 35 | 75 | 125 |
| 227 | 27 | 25 | 35 | 75 | 125 |
| 228 | 28 | 25 | 35 | 75 | 125 |
| 229 | 29 | 32 | 40 | 95 | 150 |
| 230(Q) | 30 | 32 | 40 | 95 | 150 |
| 231 | 31 | 32 | 40 | 95 | 150 |
| 232 | 32 | 32 | 45 | 90 | 150 |
| 233 | 33 | 32 | 45 | 90 | 150 |
| 234 | 34 | 32 | 50 | 85 | 150 |
| 235 | 35 | 32 | 50 | 85 | 150 |
| 236 | 36 | 32 | 50 | 85 | 150 |
| 237 | 37 | 32 | 55 | 80 | 150 |
| 238 | 38 | 32 | 55 | 80 | 150 |
| 238S | 38 | 42 | 55 | 80 | 150 |
| 240(Q) | 40 | 32 | 60 | 75 | 150 |
| 240S | 40 | 42 | 60 | 75 | 150 |
| 242 | 42 | 32 | 60 | 75 | 150 |
| 244 | 44 | 32 | 65 | 80 | 160 |
| 245 | 45 | 32 | 65 | 80 | 160 |
| 245S | 45 | 42 | 65 | 80 | 160 |
| 247 | 47 | 32 | 65 | 80 | 160 |
| 248 | 48 | 32 | 65 | 80 | 160 |
| 248S | 48 | 42 | 65 | 80 | 160 |
| 250 | 50 | 32 | 65 | 80 | 160 |
| 250S | 50 | 42 | 65 | 80 | 160 |
| ZSE 314 | 14 | 16 | 28 | 57 | 95 |
| 315 | 15 | 16 | 28 | 57 | 95 |
| 316 | 16 | 16 | 28 | 55 | 95 |
| 317 | 17 | 20 | 30 | 70 | 115 |
| 318 | 18 | 20 | 30 | 70 | 115 |
| 319 | 19 | 20 | 30 | 70 | 115 |
| 320 | 20 | 20 | 30 | 70 | 115 |
| 322 | 22 | 20 | 35 | 65 | 115 |
| 325 | 25 | 25 | 35 | 75 | 125 |
| 326 | 26 | 25 | 35 | 75 | 125 |
| 328 | 28 | 25 | 35 | 75 | 125 |
| 330 | 30 | 32 | 40 | 95 | 150 |
| 331 | 31 | 32 | 40 | 95 | 150 |

Special Endmills order : ZSE②②②②I-L

Ex.1) 2 flutes, diameter : 6.3, l : 10, L : 60 ZSBE2063 10-60L

Ex.2) 2 flutes, diameter : 6.3, standard type ZSE2063

ZSE 300 / 400 / 600 (Flat)



| ØD | Tolerance |
|-----|------------|
| All | 0 ~ -0.050 |

| Designation | | ØD | Ød | ℓ ₁ | ℓ ₂ | L | |
|-------------|---------|---------|----|----------------|----------------|-----|----|
| 3 | ZSE 332 | 32 | 32 | 45 | 90 | 150 | |
| | 333 | 33 | 32 | 45 | 90 | 150 | |
| | 334 | 34 | 32 | 50 | 85 | 150 | |
| | 335 | 35 | 32 | 50 | 85 | 150 | |
| | 338 | 38 | 32 | 55 | 80 | 150 | |
| | 338S | 38 | 42 | 55 | 80 | 150 | |
| | 340 | 40 | 32 | 60 | 75 | 150 | |
| | 340S | 40 | 42 | 60 | 75 | 150 | |
| | 342 | 42 | 32 | 60 | 75 | 150 | |
| | 345 | 45 | 32 | 65 | 80 | 160 | |
| | 345S | 45 | 42 | 65 | 80 | 160 | |
| | 350 | 50 | 32 | 65 | 80 | 160 | |
| | 350S | 50 | 42 | 65 | 80 | 160 | |
| | 4 | ZSE 414 | 14 | 16 | 28 | 57 | 95 |
| | | 415 | 15 | 16 | 28 | 57 | 95 |
| | | 416(Q) | 16 | 16 | 28 | 55 | 95 |
| 417 | | 17 | 20 | 30 | 70 | 115 | |
| 418 | | 18 | 20 | 30 | 70 | 115 | |
| 419 | | 19 | 20 | 30 | 70 | 115 | |
| 420(Q) | | 20 | 20 | 30 | 70 | 115 | |
| 421 | | 21 | 20 | 35 | 65 | 115 | |
| 422 | | 22 | 20 | 35 | 65 | 115 | |
| 423 | | 23 | 25 | 35 | 75 | 125 | |
| 424 | | 24 | 25 | 35 | 75 | 125 | |
| 425(Q) | | 25 | 25 | 35 | 75 | 125 | |
| 426 | | 26 | 25 | 35 | 75 | 125 | |
| 427 | | 27 | 25 | 35 | 75 | 125 | |
| 428 | | 28 | 25 | 35 | 75 | 125 | |
| 429 | | 29 | 32 | 40 | 95 | 150 | |
| 430 | | 30 | 32 | 40 | 95 | 150 | |
| 432(Q) | | 32 | 32 | 45 | 90 | 150 | |
| 435 | | 35 | 32 | 50 | 80 | 150 | |
| 438 | | 38 | 32 | 55 | 85 | 150 | |
| 438S | | 38 | 42 | 55 | 85 | 150 | |
| 440(Q) | | 40 | 32 | 60 | 75 | 150 | |
| 440S | | 40 | 42 | 60 | 75 | 150 | |
| 445 | | 45 | 32 | 65 | 80 | 160 | |
| 445S | 45 | 42 | 65 | 80 | 160 | | |
| 450 | 50 | 32 | 65 | 80 | 160 | | |
| 450S | 50 | 42 | 65 | 80 | 160 | | |
| 6 | ZSE 634 | 34 | 32 | 50 | 85 | 150 | |
| | 635 | 35 | 32 | 50 | 85 | 150 | |
| | 638 | 38 | 32 | 55 | 80 | 150 | |
| | 638S | 38 | 42 | 55 | 80 | 150 | |
| | 640 | 40 | 32 | 60 | 75 | 150 | |
| | 640S | 40 | 42 | 60 | 75 | 150 | |
| | 645 | 45 | 32 | 65 | 80 | 160 | |
| | 645S | 45 | 42 | 65 | 80 | 160 | |
| | 650 | 50 | 32 | 65 | 80 | 160 | |
| | 650S | 50 | 42 | 65 | 80 | 160 | |

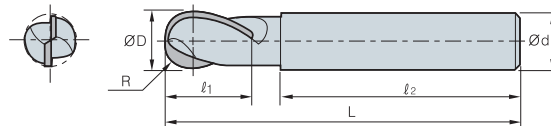
Special Endmills order : ZSE③③③③I-L

Ex.1) 2 flutes, diameter : 6.3, l : 10, L : 60 ZSBE2063 10-60L

Ex.2) 2 flutes, diameter : 6.3, standard type ZSE2063



ZSEA200 (Flat)

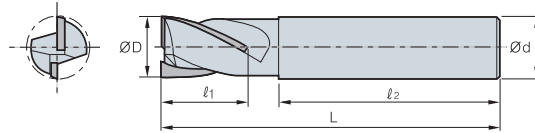


| ØD | Tolerance |
|-----|-------------|
| All | 0 ~ - 0.050 |

(mm)

| Designation | ØD | Ød | l ₁ | l ₂ | L |
|-------------|----|----|----------------|----------------|-----|
| ZSEA 215 | 15 | 16 | 28 | 57 | 95 |
| 216 | 16 | 16 | 28 | 55 | 95 |
| 218 | 18 | 20 | 30 | 70 | 115 |
| 219 | 19 | 20 | 30 | 70 | 115 |
| 220 | 20 | 20 | 30 | 70 | 115 |
| 221 | 21 | 20 | 35 | 65 | 115 |
| 222 | 22 | 20 | 35 | 65 | 115 |
| 223 | 23 | 25 | 35 | 75 | 125 |
| 224 | 24 | 25 | 35 | 75 | 125 |
| 225 | 25 | 25 | 35 | 75 | 125 |
| 228 | 28 | 25 | 35 | 75 | 125 |
| 230 | 30 | 32 | 40 | 95 | 150 |
| 232 | 32 | 32 | 45 | 90 | 150 |
| 238 | 38 | 32 | 55 | 80 | 150 |
| 240 | 40 | 32 | 60 | 75 | 150 |
| 250 | 50 | 32 | 65 | 80 | 160 |

ZSEL, ZSEXL (Flat)

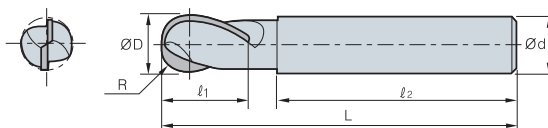


| ØD | Tolerance |
|-----|------------|
| All | 0 ~ -0.050 |

| Designation | | ØD | Ød | l ₁ | l ₂ | L |
|-------------|-----------|----|----|----------------|----------------|-----|
| (mm) | | | | | | |
| 2 | ZSEL 214 | 14 | 16 | 50 | 55 | 120 |
| | 216 | 16 | 16 | 50 | 55 | 120 |
| | 218 | 18 | 20 | 60 | 65 | 140 |
| | 220 | 20 | 20 | 60 | 65 | 140 |
| | 222 | 22 | 20 | 60 | 65 | 140 |
| | 225 | 25 | 25 | 70 | 65 | 150 |
| | 230 | 30 | 32 | 80 | 85 | 180 |
| | 232 | 32 | 32 | 90 | 85 | 190 |
| | 235 | 35 | 32 | 100 | 85 | 200 |
| | 240 | 40 | 42 | 100 | 105 | 220 |
| | 245 | 45 | 42 | 120 | 95 | 230 |
| 4 | ZSEL 416 | 16 | 16 | 50 | 55 | 120 |
| | 420 | 20 | 20 | 60 | 65 | 140 |
| | 425 | 25 | 25 | 70 | 65 | 150 |
| | 430 | 30 | 32 | 80 | 85 | 180 |
| | 435 | 35 | 32 | 100 | 85 | 200 |
| | 440 | 40 | 42 | 100 | 105 | 220 |
| 2 | ZSEXL 220 | 20 | 20 | 120 | 65 | 200 |
| | 222 | 22 | 20 | 120 | 65 | 200 |
| | 225 | 25 | 25 | 140 | 65 | 220 |



ZSBE200 (Ball)



| ØD | Tolerance |
|-----|-------------|
| All | 0 ~ - 0.050 |

(mm)

| Designation | R | ØD | Ød | l ₁ | l ₂ | L |
|-------------|------|----|----|----------------|----------------|-----|
| ZSBE 213 | 6.5 | 13 | 16 | 30 | 60 | 100 |
| 214 | 7 | 14 | 16 | 30 | 65 | 100 |
| 215 | 7.5 | 15 | 16 | 35 | 55 | 100 |
| 216Q | 8 | 16 | 16 | 35 | 55 | 100 |
| 217 | 8.5 | 17 | 20 | 35 | 65 | 110 |
| 218 | 9 | 18 | 20 | 35 | 65 | 110 |
| 219 | 9.5 | 19 | 20 | 35 | 65 | 110 |
| 220Q | 10 | 20 | 20 | 35 | 65 | 110 |
| 221 | 10.5 | 21 | 20 | 35 | 65 | 110 |
| 222 | 11 | 22 | 20 | 35 | 65 | 110 |
| 223 | 11.5 | 23 | 25 | 40 | 65 | 120 |
| 224 | 12 | 24 | 25 | 40 | 70 | 120 |
| 225 | 12.5 | 25 | 25 | 40 | 70 | 120 |
| 230 | 15 | 30 | 32 | 40 | 70 | 130 |
| 231 | 15.5 | 31 | 32 | 40 | 80 | 130 |
| 232 | 16 | 32 | 32 | 50 | 75 | 140 |
| 233 | 16.5 | 33 | 32 | 50 | 75 | 140 |
| 234 | 17 | 34 | 32 | 50 | 85 | 150 |
| 235 | 17.5 | 35 | 32 | 50 | 85 | 150 |
| 235S | 17.5 | 35 | 42 | 50 | 85 | 150 |
| 236 | 18 | 36 | 32 | 50 | 85 | 150 |
| 236S | 18 | 36 | 42 | 50 | 85 | 150 |
| 237 | 18.5 | 37 | 32 | 50 | 95 | 160 |
| 237S | 18.5 | 37 | 42 | 50 | 95 | 160 |
| 238 | 19 | 38 | 32 | 50 | 95 | 160 |
| 238S | 19 | 38 | 42 | 50 | 95 | 160 |
| 239 | 19.5 | 39 | 32 | 50 | 95 | 160 |
| 239S | 19.5 | 39 | 42 | 50 | 95 | 160 |
| 240 | 20 | 40 | 32 | 50 | 95 | 160 |
| 240S | 20 | 40 | 42 | 50 | 95 | 160 |
| 245 | 22.5 | 45 | 32 | 50 | 105 | 170 |
| 245S | 22.5 | 45 | 42 | 50 | 105 | 170 |
| 250 | 25 | 50 | 32 | 50 | 105 | 170 |
| 250S | 25 | 50 | 42 | 50 | 105 | 170 |

• ZSBE200

Special Endmills order : ZSBE200-I-L

Ex.1) 2 flutes diameter : 6.3 l: 10 L: 60 ZSBE 206310-60L

Ex.2) 2 flutes, diameter : 6.3, standard type ZSBE2063

• ZSEA200

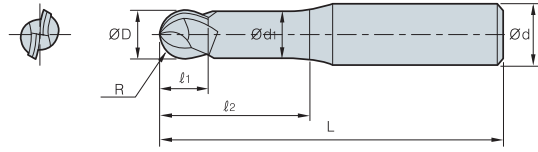
Special Endmills order : ZSEA200-I-L

Ex.1) 2 flutes, diameter : 16.3, l:28, L:95 ZSEA2163 28-95L

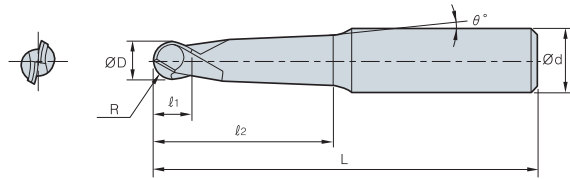
Ex.2) 2 flutes, diameter : 17.0, standard type ZSEA2170

• ZSEL200/400, ZSEXL200

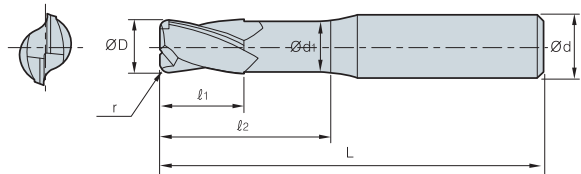
Special Endmills order : ZSEL200-I-L



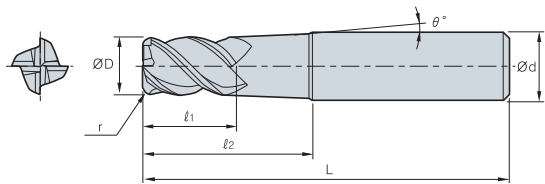
| Designation | Flute | R | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ_1 | ℓ_2 | L |
|-------------|-------|---|-----------------|-----------------|-------------------|----------|----------|---|
| | | | | | | | | |



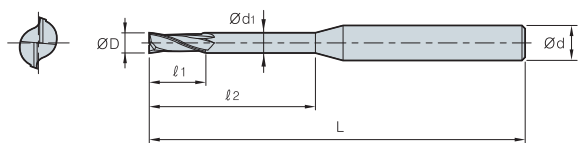
| Designation | Flute | R | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ_1 | ℓ_2 | L | θ° |
|-------------|-------|---|-----------------|-----------------|-------------------|----------|----------|---|----------------|
| | | | | | | | | | |



| Designation | Flute | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | r | ℓ_1 | ℓ_2 | L |
|-------------|-------|-----------------|-----------------|-------------------|---|----------|----------|---|
| | | | | | | | | |



| Designation | Flute | $\varnothing D$ | r | $\varnothing d$ | $\varnothing d_1$ | ℓ_1 | ℓ_2 | L | θ° |
|-------------|-------|-----------------|---|-----------------|-------------------|----------|----------|---|----------------|
| | | | | | | | | | |



| Designation | Flute | $\varnothing D$ | $\varnothing d$ | $\varnothing d_1$ | ℓ_1 | ℓ_2 | L |
|-------------|-------|-----------------|-----------------|-------------------|----------|----------|---|
| | | | | | | | |





DRILL

Korloy drills provides total solutions in hole making based on development, research and tooling know-how.

C O N T E N T S

Technical Information for Drills

- G02** KORLOY Drills
- G04** Available Insert

Indexable Drills

- G06** Technical Information for KING DRILL
- G12** KING DRILL
- G21** Technical information of KING DRILL
(for through coolant system in the lathe)
- G22** King drill(for through coolant system in the lathe)
- G25** Technical Information for KING DRILL
(for large diameter drilling)
- G26** King Drill for large diameter drilling
- G27** Technical Information for TPDB
- G30** Available Insert for TPDB
- G31** TPDB
- G34** Technical Information for WPDC
- G37** Center Drill
- G38** WPDC



DRILL

Solid Drills

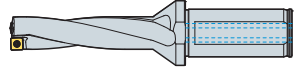
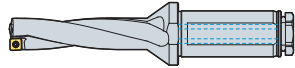

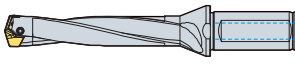
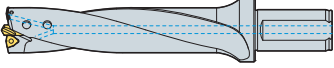
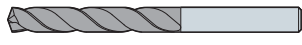
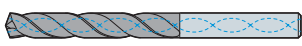


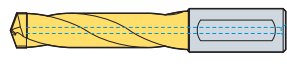
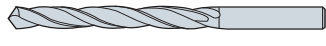
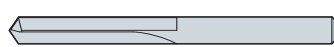

- G40** Technical Information for Mach Drill
- G44** Mach Drill
- G52** Technical Information for Mach long Drill
- G54** Mach long Drill
- G56** Technical Information for Vulcan Drill
- G57** Vulcan Drill
- G59** Technical Information for Carbide Drill
- G60** Carbide Drill



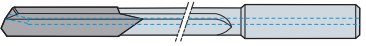
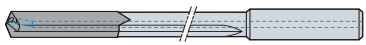





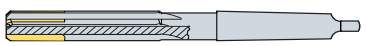
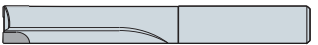


Solid Drills

- G62** Burnishing Drill
- G63** Top solid Drill
- G64** PCD Drill
- G66** Technical Information for Gun Drill
- G69** Gun Drill

Reamer


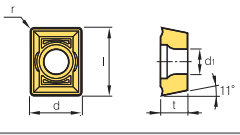

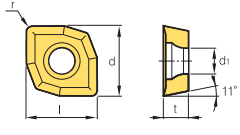

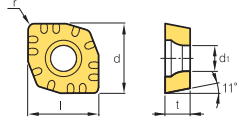

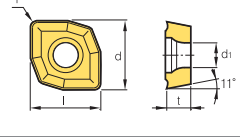

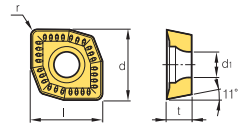

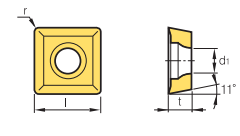

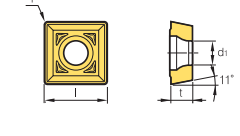

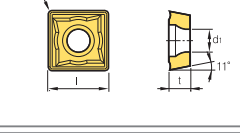

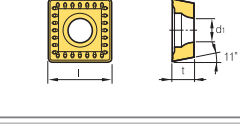

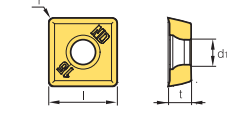
- G71** Technical Information for Indexable Reamer
- G74** Available Insert for Indexable Reamer
- G75** Indexable Reamer
- G77** Chucking / Machine Reamer
- G80** PCD Reamer
- G81** Cermet Reamer
- G82** Broach Reamer

| Type | Designation | Shape | Drills Dia. | Aspect ratio | Page | |
|------------------|---|---|--|--------------|-----------|-----------|
| Indexable Drills | KING-DRILL ^{New} K□D |  Available Insert : SP□T, XO□T | Ø12.0~Ø60.5 | 2D~5D | G11 ~ G19 | |
| | KING-DRILL ^{New} HP K□D..HP |  Available Insert : SP□T, XO□T | Ø12.0~Ø60.5 | 2D~5D | G22 ~ G24 | |
| | KING-DRILL ^{New} (for large diameter drilling) K□D |  Available Insert : SP□T, XO□T | Ø61.0~Ø100.0 | 2D~4D | G26 | |
| | TPDB ^{New} TPDB |  Available Insert : TP□□□B | Ø10.0~Ø32.9 | 3D~8D | G31 ~ G33 | |
| | Indexable Drills & Drill with center WPDC |  Available Insert : WC□T | Ø25.0~Ø80.0 | 5D~8D | G38 ~ G39 | |
| Solid Drills | Mach Drill | MSD |  | Ø2.5~Ø20.0 | 3D~7D | G44 ~ G47 |
| | | MSDH |  | Ø2.5~Ø20.0 | 3D~7D | G48 ~ G51 |
| | Mach long Drill | MLDP |  | Ø2.5~Ø20.0 | - | G54 |
| | | MLD |  | Ø2.5~Ø20.0 | 7D~25D | G54 |
| | Vulcan Drill | VZD |  | Ø12.6~Ø40.5 | 2.5D, 5D | G57 ~ G58 |
| | Carbide Drill | SSD |  | Ø1.0~Ø15.0 | - | G60 ~ G61 |
| | Burnishing Drill | BDS |  | Ø4.0~Ø16.0 | 5D~7D | G62 |
| | | BDT |  | Ø4.2~Ø10.3 | 2D~4D | G62 |

| Type | Designation | | Shape | Drills Dia. | Aspect ratio | Page |
|--------------|------------------------------|------|---|-------------|--------------|------|
| Solid Drills | Top solid Drill | TSDM |  | Ø8.0~Ø25.0 | 5D~8D | G63 |
| | PCD Drill | PDD |  | Ø5.0~Ø12.0 | 5D | G64 |
| | Gun Drill | KGDS |  | Ø2.0~Ø33.0 | 50D~100D | G69 |
| | | KGDT |  | Ø6.0~Ø26.5 | 50D~100D | G70 |
| Reamer | Indexable Reamer | IRT |  Available Insert : RI | Ø10.0~Ø31.0 | 3D~5D | G75 |
| | | IRB |  Available Insert : RI | Ø10.0~Ø31.0 | 3D~5D | G76 |
| | Chucking / Machine Reamer | SCRS |  | Ø5.0~Ø20.0 | 2D~3D | G78 |
| | | SCRH |  | Ø5.0~Ø20.0 | 2D~3D | G78 |
| | | TCRS |  | Ø7.0~Ø30.0 | 2D~3D | G79 |
| | | TMRS |  | Ø7.0~Ø30.0 | 3D~5D | G79 |
| | PCD Reamer | PDR |  | Ø5.0~Ø20.0 | 3D~5D | G80 |
| | Cermet Reamer ^{New} | KCR |  | Ø6.0~Ø30.0 | 3D~7D | G81 |
| | Broach Reamer ^{New} | HBRE |  | Ø3.0~Ø25.0 | 3D~7D | G82 |


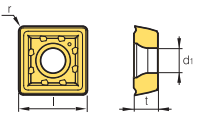

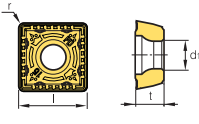

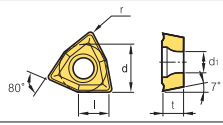

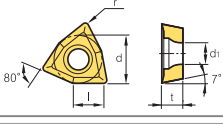

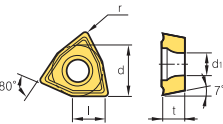

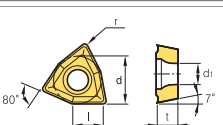

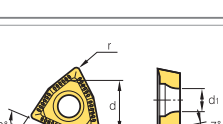

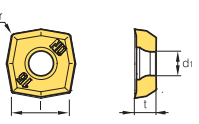

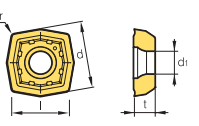

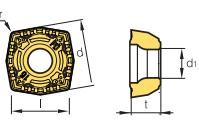


Available Insert

| Picture | Designation | Coated | | | | | | | | | | Uncoated | | Dimensions (mm) | | | | | Geometry | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|-----------------|------|------|------|-----|----------|---|
| | | NC3120 | NC3220 | NC3030 | NC5330 | PC5300 | PC3530 | PC3535 | PC3500 | NCM325 | PC9530 | NCM335 | PC6510 | H01 | G10 | l | d | t | | r |
|  | 040203-DF | | | | | | | | | | | | | | 6.2 | 4.7 | 2.4 | 0.3 | 2.3 |  |
|  | 222408-DA | | | | | | | | | | | | | | 8.3 | 8.2 | 2.5 | 0.8 | 2.8 |  |
| | 252808-DA | | | | | | | | | | | | | | 9.3 | 9.2 | 3.3 | 0.8 | 3.4 | |
| | 293208-DA | | | | | | | | | | | | | | 10.3 | 10.2 | 3.3 | 0.8 | 3.4 | |
| | 334008-DA | | | | | | | | | | | | | | 13 | 12.9 | 3.97 | 0.8 | 4.0 | |
| | 415008-DA | | | | | | | | | | | | | | 15.3 | 15.2 | 4.76 | 0.8 | 4.5 | |
| | 516012-DA | | | | | | | | | | | | | | 18.3 | 18.2 | 5.18 | 1.2 | 5.5 | |
|  | 222408-DR | | | | | | | | | | | | | | 8.3 | 8.2 | 2.5 | 0.8 | 2.8 |  |
| | 252808-DR | | | | | | | | | | | | | | 9.3 | 9.2 | 3.3 | 0.8 | 3.4 | |
| | 293208-DR | | | | | | | | | | | | | | 10.3 | 10.2 | 3.3 | 0.8 | 3.4 | |
| | 334008-DR | | | | | | | | | | | | | | 13 | 12.9 | 3.97 | 0.8 | 4.0 | |
| | 415008-DR | | | | | | | | | | | | | | 15.3 | 15.2 | 4.76 | 0.8 | 4.5 | |
| | 516012-DR | | | | | | | | | | | | | | 18.3 | 18.2 | 5.18 | 1.2 | 5.5 | |
|  | 222408-DM | | | | | | | | | | | | | | 8.3 | 8.2 | 2.5 | 0.8 | 2.8 |  |
| | 252808-DM | | | | | | | | | | | | | | 9.3 | 9.2 | 3.3 | 0.8 | 3.4 | |
| | 293208-DM | | | | | | | | | | | | | | 10.3 | 10.2 | 3.3 | 0.8 | 3.4 | |
| | 334008-DM | | | | | | | | | | | | | | 13 | 12.9 | 3.97 | 0.8 | 4.0 | |
| | 415008-DM | | | | | | | | | | | | | | 15.3 | 15.2 | 4.76 | 0.8 | 4.5 | |
| | 516012-DM | | | | | | | | | | | | | | 18.3 | 18.2 | 5.18 | 1.2 | 5.5 | |
|  | 222408-DS | | | | | | | | | | | | | | 8.3 | 8.2 | 2.5 | 0.8 | 2.8 |  |
| | 252808-DS | | | | | | | | | | | | | | 9.3 | 9.2 | 3.3 | 0.8 | 3.4 | |
| | 293208-DS | | | | | | | | | | | | | | 10.3 | 10.2 | 3.3 | 0.8 | 3.4 | |
| | 334008-DS | | | | | | | | | | | | | | 13 | 12.9 | 3.97 | 0.8 | 4.0 | |
| | 415008-DS | | | | | | | | | | | | | | 15.3 | 15.2 | 4.76 | 0.8 | 4.5 | |
| | 516012-DS | | | | | | | | | | | | | | 18.3 | 18.2 | 5.18 | 1.2 | 5.5 | |
|  | 050203-DA | | | | | | | | | | | | | | 5.3 | - | 2.4 | 0.3 | 2.3 |  |
| | 060204-DA | | | | | | | | | | | | | | 6.2 | - | 2.5 | 0.4 | 2.5 | |
| | 070204-DA | | | | | | | | | | | | | | 7.2 | - | 2.5 | 0.4 | 2.8 | |
| | | | | | | | | | | | | | | | | | | | | |
|  | 050203-DF | | | | | | | | | | | | | | 5.3 | - | 2.4 | 0.3 | 2.3 |  |
| | 060204-DF | | | | | | | | | | | | | | 6.2 | - | 2.5 | 0.4 | 2.5 | |
| | 070204-DF | | | | | | | | | | | | | | 7.2 | - | 2.5 | 0.4 | 2.8 | |
| | | | | | | | | | | | | | | | | | | | | |
|  | 050203-DM | | | | | | | | | | | | | | 5.3 | - | 2.4 | 0.3 | 2.3 |  |
| | 060204-DM | | | | | | | | | | | | | | 6.2 | - | 2.5 | 0.4 | 2.5 | |
| | 070204-DM | | | | | | | | | | | | | | 7.2 | - | 2.5 | 0.4 | 2.8 | |
| | | | | | | | | | | | | | | | | | | | | |
|  | 050203-DS | | | | | | | | | | | | | | 5.3 | - | 2.4 | 0.3 | 2.3 |  |
| | 060204-DS | | | | | | | | | | | | | | 6.2 | - | 2.5 | 0.4 | 2.5 | |
| | 070204-DS | | | | | | | | | | | | | | 7.2 | - | 2.5 | 0.4 | 2.8 | |
| | | | | | | | | | | | | | | | | | | | | |
|  | 040204-ND | | | | | | | | | | | | | | 4.7 | - | 2.4 | 0.4 | 2.3 |  |
| | 050204-ND | | | | | | | | | | | | | | 5.1 | - | 2.4 | 0.4 | 2.3 | |
| | 060205-ND | | | | | | | | | | | | | | 6.2 | - | 2.5 | 0.5 | 2.5 | |
| | 07T208-ND | | | | | | | | | | | | | | 7.5 | - | 2.8 | 0.7 | 2.8 | |
| | 090308-ND | | | | | | | | | | | | | | 9.2 | - | 3.3 | 0.8 | 3.4 | |
| | 11T308-ND | | | | | | | | | | | | | | 11.0 | - | 4.0 | 0.8 | 4.0 | |
| | 130410-ND | | | | | | | | | | | | | | 13.0 | - | 4.5 | 1.0 | 4.5 | |
| | 15M510-ND | | | | | | | | | | | | | | 15.2 | - | 5.0 | 1.0 | 5.5 | |
| | 180510-ND | | | | | | | | | | | | | | 18.2 | - | 5.5 | 1.0 | 6.0 | |

● : Stock item

Available Insert

| Picture | Designation | Coated | | | | | | | | | | Uncoated | | Dimensions (mm) | | | | | Geometry | |
|---|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|--------|-----------------|-------|------|-----|-----|---|---|
| | | NC3120 | NC3220 | NC3030 | NC5330 | PC5300 | PC3530 | PC3535 | PC3500 | NCM325 | PC9530 | NCM335 | PC6510 | H01 | G10 | l | d | t | | r |
|  | 060205-LD | | | | | | | | | | | | | | 6.2 | - | 2.5 | 0.5 | 2.5 |  |
| | 07T208-LD | | | | | | | | | | | | | | 7.5 | - | 2.8 | 0.7 | 2.8 | |
| | 090308-LD | | | | | | | | | | | | | | 9.2 | - | 3.3 | 0.8 | 3.4 | |
| | 11T308-LD | | | | | | | | | | | | | | 11.0 | - | 4.0 | 0.8 | 4.0 | |
| | 130410-LD | | | | | | | | | | | | | | 13.0 | - | 4.5 | 1.0 | 4.5 | |
| | 15M510-LD | | | | | | | | | | | | | | 15.2 | - | 5.0 | 1.0 | 5.5 | |
| | 180510-LD | | | | | | | | | | | | | | 18.2 | - | 5.5 | 1.0 | 6.0 | |
|  | 040204-PD | | | | ● | | | ● | | | | | | 4.7 | - | 2.4 | 0.4 | 2.3 |  | |
| | 050204-PD | | | | ● | | | ● | | | | | | 5.1 | - | 2.4 | 0.4 | 2.3 | | |
| | 060205-PD | | | | ● | | | ● | | | | | | 6.2 | - | 2.5 | 0.5 | 2.5 | | |
| | 07T208-PD | | | | ● | | | ● | | | | | | 7.5 | - | 2.8 | 0.7 | 2.8 | | |
| | 090308-PD | | | | ● | | | ● | | | | | | 9.2 | - | 3.3 | 0.8 | 3.4 | | |
| | 11T308-PD | | | | ● | | | ● | | | | | | 11.0 | - | 4.0 | 0.8 | 4.0 | | |
| | 130410-PD | | | | ● | | | ● | | | | | | 13.0 | - | 4.5 | 1.0 | 4.5 | | |
|  | 030204-C21 | | | | | | | | | | | | | 3.8 | 5.56 | 2.38 | 0.4 | 2.5 |  | |
| | 040204-C21 | | | | | | | | | | | | | 4.3 | 6.35 | 2.38 | 0.4 | 2.8 | | |
| | 050308-C21 | | | | | | | | | | | | | 5.4 | 7.94 | 3.18 | 0.8 | 3.4 | | |
| | 06T308-C21 | | | | | | | | | | | | | 6.5 | 9.525 | 3.97 | 0.8 | 4.4 | | |
| | 080408-C21 | | | | | | | | | | | | | 8.7 | 12.7 | 4.76 | 0.8 | 5.5 | | |
|  | 030208-DA | | | | | | | | | | | | | 3.8 | 5.56 | 2.38 | 0.8 | 2.8 |  | |
| | 040208-DA | | | | | | | | | | | | | 4.3 | 6.35 | 2.38 | 0.8 | 3.0 | | |
| | 050308-DA | | | | | | | | | | | | | 5.4 | 7.94 | 3.18 | 0.8 | 3.4 | | |
| | 06T308-DA | | | | | | | | | | | | | 6.5 | 9.525 | 3.97 | 0.8 | 4.0 | | |
| | 080408-DA | | | | | | | | | | | | | 8.7 | 12.7 | 4.76 | 0.8 | 4.3 | | |
|  | 030208-C20 | | | | | | | | | | | | | 3.8 | 5.56 | 2.38 | 0.8 | 2.8 |  | |
| | 040208-C20 | | | ● | | | | ● | | | | | | 4.3 | 6.35 | 2.38 | 0.8 | 3.0 | | |
| | 050308-C20 | | | | | | | ● | ● | | ● | | | 5.4 | 7.94 | 3.18 | 0.8 | 3.4 | | |
| | 06T308-C20 | | | ● | | | | ● | ● | | ● | | | 6.5 | 9.525 | 3.97 | 0.8 | 4.0 | | |
| | 080408-C20 | | | ● | | | | ● | ● | | ● | | | 8.7 | 12.7 | 4.76 | 0.8 | 4.3 | | |
| | 080412-C20 | | | | | | | | ● | | | | | 8.7 | 12.7 | 4.76 | 1.2 | 4.3 | | |
|  | 030204-C21 | | | | ● | | | ● | ● | | | | | 3.8 | 5.56 | 2.38 | 0.4 | 2.5 |  | |
| | 040204-C21 | | | | | | | ● | ● | | | | | 4.3 | 6.35 | 2.38 | 0.4 | 2.8 | | |
| | 040208-C21 | | | | | | | | ● | | | | | 4.3 | 6.35 | 2.38 | 0.8 | 2.8 | | |
| | 050308-C21 | | | | | | | | | | | | | 5.4 | 7.94 | 3.18 | 0.8 | 3.4 | | |
| | 06T308-C21 | | | | | | | | | | | | | 6.5 | 9.525 | 3.97 | 0.8 | 4.4 | | |
| | 080408-C21 | | | | | | | | ● | ● | | | | 8.7 | 12.7 | 4.76 | 0.8 | 5.5 | | |
|  | 030204-DSP | | | | | | | | | | | | | 3.8 | 5.56 | 2.38 | 0.4 | 2.5 |  | |
| | 040204-DSP | | | | | | | | | | | | | 4.3 | 6.35 | 2.38 | 0.4 | 2.8 | | |
| | 050308-DS | | | | | | | | | | | | | 5.4 | 7.94 | 3.18 | 0.8 | 3.4 | | |
| | 06T308-DS | | | | | | | | | | | | | 6.5 | 9.525 | 3.97 | 0.8 | 4.0 | | |
| | 080408-DS | | | | | | | | | | | | | 8.7 | 12.7 | 4.76 | 0.8 | 4.3 | | |
| | 080412-DS | | | | | | | | | | | | | 8.7 | 12.7 | 4.76 | 1.2 | 4.3 | | |
|  | 040204-ND | | | | | | | | | | | | | 4.3 | 4.9 | 2.4 | 0.4 | 2.3 |  | |
| | 050204-ND | | | | | | | | | | | | | 4.8 | 5.4 | 2.4 | 0.4 | 2.3 | | |
| | 060204-ND | | | | | | | | | | | | | 5.8 | 6.6 | 2.5 | 0.4 | 2.5 | | |
| | 07T205-ND | | | | | | | | | | | | | 6.9 | 7.8 | 2.8 | 0.5 | 2.8 | | |
| | 090305-ND | | | | | | | | | | | | | 8.4 | 9.6 | 3.3 | 0.5 | 3.4 | | |
| | 11T306-ND | | | | | | | | | | | | | 10.0 | 11.4 | 4.0 | 0.6 | 4.0 | | |
| | 130406-ND | | | | | | | | | | | | | 11.9 | 13.6 | 4.5 | 0.6 | 4.5 | | |
| | 15M508-ND | | | | | | | | | | | | | 13.9 | 15.9 | 5.0 | 0.8 | 5.5 | | |
|  | 060204-LD | | | | | | | | | | | | | 5.8 | 6.6 | 2.5 | 0.4 | 2.5 |  | |
| | 07T205-LD | | | | | | | | | | | | | 6.9 | 7.8 | 2.8 | 0.5 | 2.8 | | |
| | 090305-LD | | | | | | | | | | | | | 8.4 | 9.6 | 3.3 | 0.5 | 3.4 | | |
| | 11T306-LD | | | | | | | | | | | | | 10.0 | 11.4 | 4.0 | 0.6 | 4.0 | | |
| | 130406-LD | | | | | | | | | | | | | 11.9 | 13.6 | 4.5 | 0.6 | 4.5 | | |
| | 15M508-LD | | | | | | | | | | | | | 13.9 | 15.9 | 5.0 | 0.8 | 5.5 | | |
| | 180508-LD | | | | | | | | | | | | | 16.5 | 18.9 | 5.5 | 0.8 | 6.0 | | |
|  | 040204-PD | | | | ● | | | | | | | | | 4.3 | 4.9 | 2.4 | 0.4 | 2.3 |  | |
| | 050204-PD | | | | ● | | | | | | | | | 4.8 | 5.4 | 2.4 | 0.4 | 2.3 | | |
| | 060204-PD | | | | ● | | | | | | | | | 5.8 | 6.6 | 2.5 | 0.4 | 2.5 | | |
| | 07T205-PD | | | | ● | | | | | | | | | 6.9 | 7.8 | 2.8 | 0.5 | 2.8 | | |
| | 090305-PD | | | | ● | | | | | | | | | 8.4 | 9.6 | 3.3 | 0.5 | 3.4 | | |
| | 11T306-PD | | | | ● | | | | | | | | | 10.0 | 11.4 | 4.0 | 0.6 | 4.0 | | |
| | 130406-PD | | | | ● | | | | | | | | | 11.9 | 13.6 | 4.5 | 0.6 | 4.5 | | |
| | 15M508-PD | | | | ● | | | | | | | | | 13.9 | 15.9 | 5.0 | 0.8 | 5.5 | | |

● : Stock item

Optimized insert design for maximum drilling efficiency

KING DRILL *New*

Code system of holder

| | | | | | | |
|----------------------|----------------------------------|-------------------------------------|---------------------------------|---|---|-----------------------------------|
| K | 5D | 200 | 25 | □ | - | 07 |
| KING / KORLOY | Aspect ratio(L/D) | Drill Dia. | One decimal place marked | Shank shape | | Inscribed circle of insert |
| | 2D, 2.5D, 3D, 3.5D, 4D, 4.5D, 5D | Ø20.0 (One decimal place marked) | Ø20, Ø25 Ø32, Ø40 | No mark : Flange Shank, Weldone HP : Flange Shank, Weldon, PT Tap F1 : Flange Shank, Whistle Notch F2 : Flange Shank, Without Side Lock S : Straight Shank, Weldone S1 : Straight Shank, Whistle Notch S2 : Straight Shank, Without Side Lock M0, M1, M2, M3 --- : MT0, MT1, MT2, MT3 --- H63, H100 : HSK63, HSK100 B30, B40, B50 : BT30, BT40, BT50 | | 05, 06, 07, 09 11 13, 15, 18 |

Features of Insert

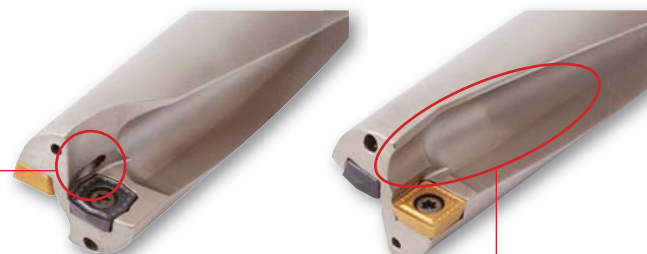
Optimized design of inserts for maximum drilling efficiency

- ▶ Excellent cutting performance and chip control due to the optimized geometry and chip breaker of both inserts, central & peripheral.
- ▶ Different inserts, optimized for the central and peripheral insert locations in order to maximize cutting tool life.

| Chip breaker | PD | | LD | |
|----------------------|--|---------------------|---|----------------|
| Features | - Universal - At medium speed and medium feed | | - Superior chip control for machining mild steel and stainless steel - Light cutting(at low ~ medium speed and low feed) | |
| Insert | Peripheral insert | Central insert | Peripheral insert | Central insert |
| Shape | | | | |
| Grades for workpiece | PC3500 : P PC5300 : P, M, K, S PC6510 : K | PC5300 : P, M, K, S | PC5335 : P, M | PC5335 : P, M |

3 Coolant hole system

The center coolant hole system helps prevent wear on the chip pocket of the central insert and improves chip control

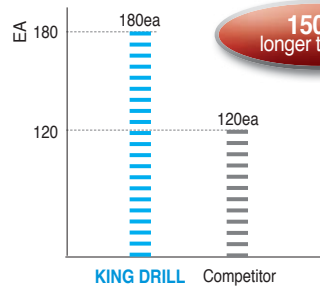


The optimized shape of the flute increases the rigidity of the drill body and improves chip evacuation

Application examples

longer tool life

- **Workpiece** : Track link bush
- **Cutting condition** : vc(m/min)=120, fn(mm/rev)=0.1
Through coolant system
- **Tools : Applicable inserts** SPMT07T208-PD(PC3500)
XOMT07T205-PD(PC5300)
Holder K5D20025-07
- **Machine** : drilling machine



150% longer tool life

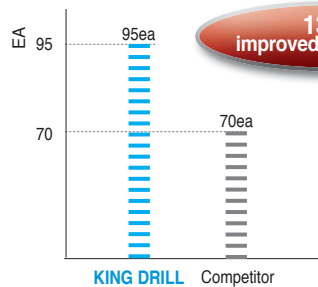


workpiece

- Superior surface finish and chip evacuation.
- KING DRILL: 180ea, Competitor:120ea
- 150% longer tool life.

Example of improved product

- **Workpiece** : Track link bush
- **Cutting condition** : Competitor's vc(m/min)=125 fn(mm/rev)=0.1
Korloy's vc(m/min)=140 fn(mm/rev)=0.12
- **Tools : Applicable inserts** SPMT090308-PD(PC3500)
XOMT090305-PD(PC5300)
Holder K3D27032-09
- **Machine** : MCT



135% improved productivity



workpiece

- KING DRILL : 95 Holes, Competitor : 70 Holes, 135% longer tool life.
- U135% improved productivity.

Recommended cutting condition

| Workpiece | | | Grade | vc | Feed(aspect ratio=2D, 3D, 4D) | | | | | | |
|--------------------------|---------------------------|-------------------------------------|---------|---|---|---|-----------|-----------|-----------|-----------|-----------|
| ISO | Workpiece | Hardness(HB) | | | m/min | Feed (mm/rev) depending on drill Dia.(mm) | | | | | |
| | | | | | | 12~16 | 17~23 | 24~29 | 30~42 | 43~60 | |
| P | Carbon steel | Low carbon steel | 80~180 | LD | Central insert PC5335 | 150(60~180) | 0.04~0.08 | 0.04~0.08 | 0.04~0.08 | 0.04~0.08 | 0.04~0.08 |
| | | | | PD | Central insert PC5300 Peripheral insert PC3500 | 190(130~250) | | | | | |
| | | High carbon | 180~280 | PD | Central insert PC5300 Peripheral insert PC3500 | 140(80~200) | 0.04~0.10 | 0.04~0.12 | 0.05~0.16 | 0.08~0.18 | 0.10~0.22 |
| | Alloy steel | Low alloy steel | 140~260 | LD | Central insert PC5335 | 150(60~180) | 0.04~0.10 | 0.04~0.10 | 0.04~0.12 | 0.04~0.14 | 0.04~0.14 |
| | | | | PD | Central insert PC5300 Peripheral insert PC3500 | 150(90~200) | 0.06~0.12 | 0.06~0.12 | 0.06~0.14 | 0.06~0.16 | 0.06~0.16 |
| Hardened low alloy steel | | 200~400 | PD | Central insert PC5300 Peripheral insert PC5300 | 100(50~150) | 0.04~0.10 | 0.06~0.12 | 0.08~0.16 | 0.08~0.18 | 0.08~0.22 | |
| | High alloy steel | 50~260 | PD | Central insert PC5300 Peripheral insert PC3500 | 100(50~160) | 0.04~0.18 | 0.06~0.12 | 0.08~0.16 | 0.08~0.18 | 0.08~0.22 | |
| | Hardened high alloy steel | 220~450 | PD | Central insert PC5300 Peripheral insert PC5300 | 70(30~120) | 0.04~0.12 | 0.06~0.14 | 0.08~0.17 | 0.08~0.17 | 0.08~0.20 | |
| M | Stainless steel | Austenite series | 135-275 | LD | Central insert PC5335 | 90(40~150) | 0.04~0.10 | 0.04~0.12 | 0.04~0.12 | 0.04~0.12 | 0.04~0.12 |
| | | | | PD | Central insert PC5300 Peripheral insert PC5300 | | 0.04~0.10 | 0.06~0.12 | 0.06~0.14 | 0.06~0.16 | 0.06~0.20 |
| | | Ferrite series Martensite series | 135~275 | LD | Central insert PC5335 | 100(60~160) | 0.04~0.10 | 0.04~0.12 | 0.04~0.12 | 0.04~0.12 | 0.04~0.12 |
| | | | PD | Central insert PC5300 Peripheral insert PC5300 | 0.04~0.10 | | 0.04~0.12 | 0.06~0.14 | 0.06~0.14 | 0.06~0.14 | |
| K | Cast iron | Gray cast iron | 150~230 | PD | Central insert PC5300 Peripheral insert PC6510 | 190(150~250) | 0.04~0.10 | 0.05~0.14 | 0.06~0.18 | 0.10~0.22 | 0.10~0.26 |
| | | Ductile cast iron | 150~230 | PD | Central insert PC5300 Peripheral insert PC6510 | 150(100~200) | 0.04~0.10 | 0.04~0.12 | 0.04~0.14 | 0.05~0.16 | 0.05~0.18 |
| S | Heat resisting alloy | Ni-heat resisting alloy | 130~400 | PD | PC5300 | 50(30~100) | 0.04~0.06 | 0.04~0.08 | 0.04~0.10 | 0.06~0.12 | 0.06~0.12 |
| | | Ti-heat resisting alloy | 130~400 | PD | PC5300 | 40(30~90) | 0.04~0.08 | 0.04~0.10 | 0.06~0.12 | 0.08~0.14 | 0.08~0.16 |
| | | High hardened steel | 400~ | PD | PC5300 | 40(20~80) | 0.04~0.08 | 0.06~0.12 | 40(20~80) | 0.08~0.14 | 0.08~0.16 |

- In case of 5D, reduce 30~40% of cutting condition from the above.
- In interrupted machining part, reduce 30~50% of feed from the above machining around interrupted part.



Required machine power

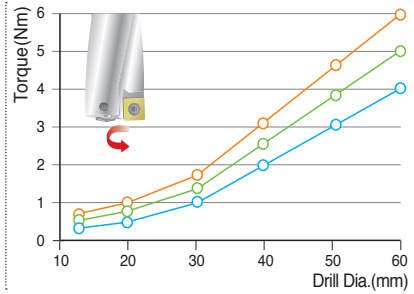
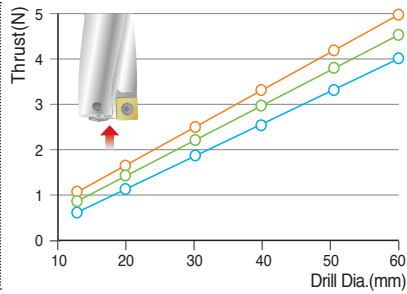
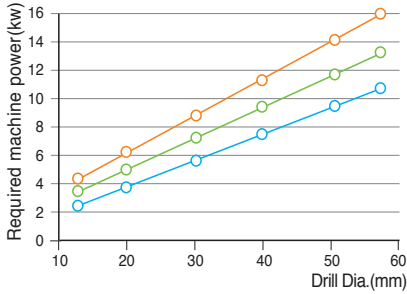
- The graphs below show the cutting force required in drilling.
- Machining with the KING DRILL and a machine with high rigidity and power.

• Workpiece : SCM440(240HB) • Cutting condition : $vc(m/min)=100$
 • Through coolant system

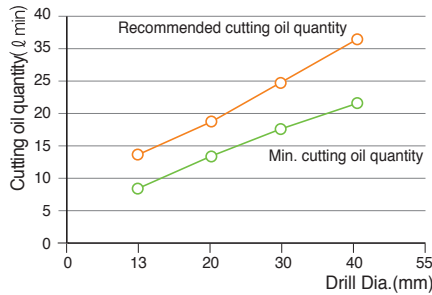
$fn(mm/rev)=0.13$

$fn(mm/rev)=0.10$

$fn(mm/rev)=0.07$



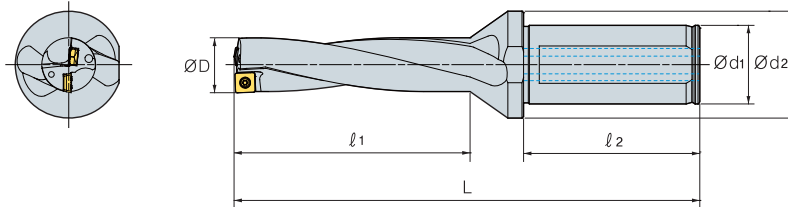
Cutting oil quantity



• Workpiece : SCM440(240HB)
 • Cutting condition : $vc(m/min)=100$
 • Through coolant system

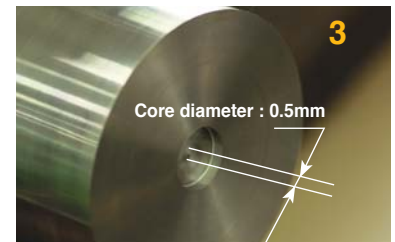
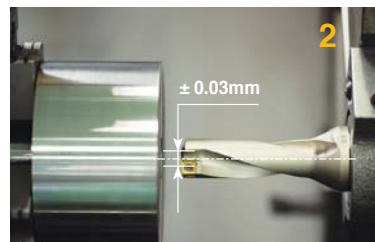
• The data of the graph above could be changed depending on workpiece and cutting condition.

Drill tolerance and hole tolerance



| Drill Dia. | | (mm) | | |
|------------|---------------------|---------------|--------------|---------------|
| | | Ø12 ~ Ø29 | Ø30 ~ Ø45 | Ø46 ~ Ø60 |
| 2D~3D | Drill tolerance(ØD) | 0 ~ -0.15 | 0 ~ -0.15 | 0 ~ -0.15 |
| | Hole tolerance | +0.2 ~ -0.1 | +0.25 ~ -0.1 | +0.28 ~ -0.1 |
| 4D~5D | Drill tolerance(ØD) | 0 ~ -0.15 | 0 ~ -0.15 | 0 ~ -0.15 |
| | Hole tolerance | +0.25 ~ -0.05 | +0.3 ~ -0.05 | +0.33 ~ -0.05 |

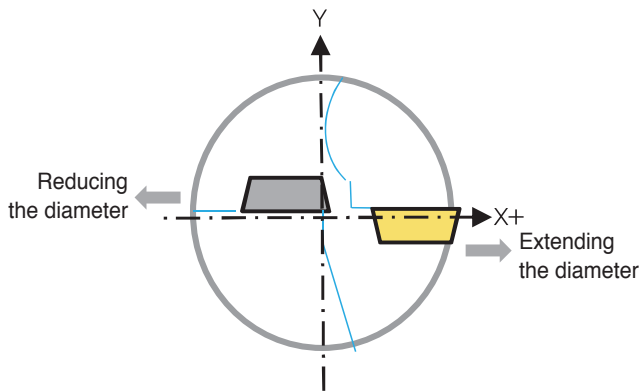
Notice for setting the drill in the lathe



- Set the peripheral insert parallel to the X axis. (based on the side lock)
- If the machined core is 0.5mm after machining 5mm, that is the proper setting.

※ Please make sure that the location of the side lock could be different depending on manufacturers of machine.

Range of adjusting machining diameter in the lathe



- In machining in the lathe, the King Drill can extend and reduce the machining diameter with moving to the x axis. Please refer to the table showing the range of adjusting drilling diameter below.
- The more the drilling diameter is extended or reduced, the more the drill loses drilling balance. In this case, reduce the feed or cutting speed in machining.
- Reducing the machining diameter excessively could damage the holder.

(mm)

| Drill dia. | Range of adjusting drilling diameter(Ø) | Drill dia. | Range of adjusting drilling diameter(Ø) | Drill dia. | Range of adjusting drilling diameter(Ø) | Drill dia. | Range of adjusting drilling diameter(Ø) |
|------------|---|------------|---|------------|---|------------|---|
| 12.0 | 11.7 ~12.4 | 24.5 | 23.9 ~25.1 | 37.0 | 36.3 ~37.7 | 49.5 | 48.7 ~50.2 |
| 12.5 | 12.2 ~12.9 | 25.0 | 24.4 ~25.6 | 37.5 | 36.8 ~38.2 | 50.0 | 49.2 ~50.7 |
| 13.0 | 12.7 ~13.4 | 25.5 | 24.9 ~26.1 | 38.0 | 37.3 ~38.7 | 50.5 | 49.7 ~51.2 |
| 13.5 | 13.2 ~13.9 | 26.0 | 25.4 ~26.6 | 38.5 | 37.8 ~39.2 | 51.0 | 50.2 ~51.7 |
| 14.0 | 13.6 ~14.5 | 26.5 | 25.9 ~27.1 | 39.0 | 38.3 ~39.7 | 51.5 | 50.7 ~52.2 |
| 14.5 | 14.1 ~15.0 | 27.0 | 26.4 ~27.6 | 39.5 | 38.8 ~40.2 | 52.0 | 51.2 ~52.7 |
| 15.0 | 14.6 ~15.5 | 27.5 | 26.9 ~28.1 | 40.0 | 39.3 ~40.7 | 52.5 | 51.7 ~53.2 |
| 15.5 | 15.1 ~16.0 | 27.8 | 27.4 ~28.6 | 40.5 | 39.8 ~41.2 | 53.0 | 52.2 ~53.7 |
| 16.0 | 15.6 ~16.5 | 28.5 | 27.9 ~29.1 | 41.0 | 40.3 ~41.7 | 53.5 | 52.7 ~54.2 |
| 16.5 | 16.0 ~17.0 | 29.0 | 28.4 ~29.6 | 41.5 | 40.8 ~42.2 | 54.0 | 53.2 ~54.7 |
| 17.0 | 16.5 ~17.5 | 29.5 | 28.9 ~30.1 | 42.0 | 41.3 ~42.7 | 54.5 | 53.7 ~55.2 |
| 17.5 | 17.0 ~18.0 | 30.0 | 29.3 ~30.7 | 42.5 | 41.8 ~43.2 | 55.0 | 54.2 ~55.7 |
| 18.0 | 17.5 ~18.5 | 30.5 | 29.8 ~31.2 | 43.0 | 42.2 ~43.7 | 55.5 | 54.7 ~56.2 |
| 18.5 | 18.0 ~19.0 | 31.0 | 30.3 ~31.7 | 43.5 | 42.7 ~44.2 | 56.0 | 55.2 ~56.7 |
| 19.0 | 18.5 ~19.5 | 31.5 | 30.8 ~32.2 | 44.0 | 43.2 ~44.7 | 56.5 | 55.7 ~57.2 |
| 19.5 | 19.0 ~20.0 | 32.0 | 31.3 ~32.7 | 44.5 | 43.7 ~45.2 | 57.0 | 56.2 ~57.7 |
| 20.0 | 19.4 ~20.6 | 32.5 | 31.8 ~33.2 | 45.0 | 44.2 ~45.7 | 57.5 | 56.7 ~58.2 |
| 20.5 | 19.9 ~21.1 | 33.0 | 32.3 ~33.7 | 45.5 | 44.7 ~46.2 | 58.0 | 57.2 ~58.7 |
| 21.0 | 20.4 ~21.6 | 33.5 | 32.8 ~34.2 | 46.0 | 45.2 ~46.7 | 58.5 | 57.7 ~59.2 |
| 21.5 | 20.9 ~22.1 | 34.0 | 33.3 ~34.7 | 46.5 | 45.7 ~47.2 | 59.0 | 58.2 ~59.7 |
| 22.0 | 21.4 ~22.6 | 34.5 | 33.8 ~35.2 | 47.0 | 46.2 ~47.7 | 59.5 | 58.7 ~60.2 |
| 22.5 | 21.9 ~23.1 | 35.0 | 34.3 ~35.7 | 47.5 | 46.7 ~48.2 | 60.0 | 59.2 ~60.7 |
| 23.0 | 22.4 ~23.6 | 35.5 | 34.8 ~36.2 | 48.0 | 47.2 ~48.7 | 60.5 | 59.7 ~61.2 |
| 23.5 | 22.9 ~24.1 | 36.0 | 35.3 ~36.7 | 48.5 | 47.7 ~49.2 | | |
| 24.0 | 23.4 ~24.6 | 36.5 | 35.8 ~37.2 | 49.0 | 48.2 ~49.7 | | |

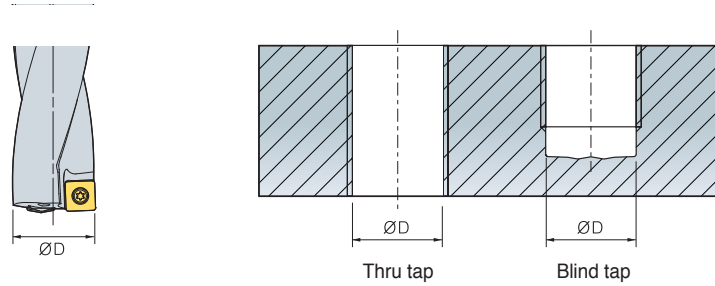
Insert and parts

| Drill dia. | Peripheral insert | Central insert | Screw | Wrench | Torque(Nm) |
|-------------|-------------------|----------------|------------|----------|------------|
| Ø12.0~Ø13.5 | SPMT040204-□□ | XOMT040204-□□ | FTNA0204 | TW06P | 0.4 |
| Ø13.6~Ø16.0 | SPMT050204-□□ | XOMT050204-□□ | FTNA0204 | TW06P | 0.4 |
| Ø16.1~Ø19.5 | SPMT060205-□□ | XOMT060204-□□ | FTKA02206S | TW07P | 0.8 |
| Ø19.6~Ø23.5 | SPMT07T208-□□ | XOMT07T205-□□ | FTKA02565 | TW07S | 0.8 |
| Ø23.6~Ø29.5 | SPMT090308-□□ | XOMT090305-□□ | FTKA0307 | TW09S | 1.2 |
| Ø29.6~Ø35.5 | SPMT11T308-□□ | XOMT11T306-□□ | FTKA03508 | TW15S | 3 |
| Ø35.6~Ø42.5 | SPMT130410-□□ | XOMT130406-□□ | FTKA0410 | TW15S | 3 |
| Ø42.6~Ø50.5 | SPMT15M510-□□ | XOMT15M508-□□ | FTNC04511 | TW20S | 5 |
| Ø50.6~Ø60.5 | SPMT180510-□□ | XOMT180508-□□ | FTNA0511 | TW20-100 | 5 |

- In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw.
- Please make sure to use a Korloy-produced wrench and screw only.

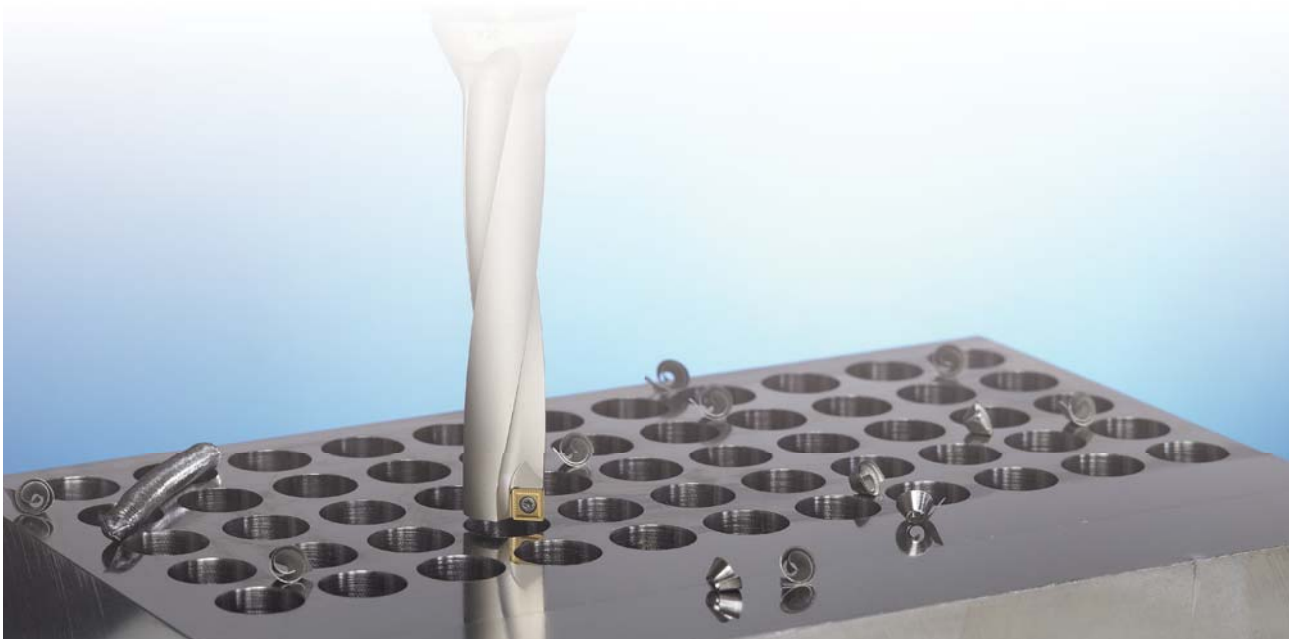
● KING DRILL - for machining a tap foundation hole

• There are two types of specifications of tap, metric and inch. The King drill is available for machining both thru tap and blind tap.

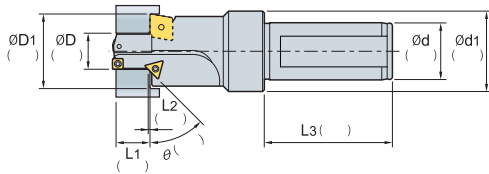


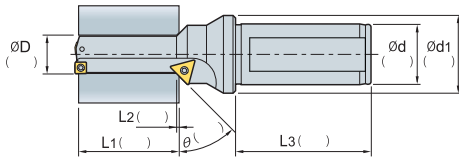
(mm)

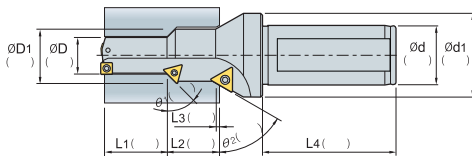
| Tap type | Thread | ØD | Designation | Reference |
|-----------|-------------|-------------|-------------|-----------|
| Metric | M14 x 2.0 | 12.0 | K3D12020-04 | G12 |
| | M16 x 2.0 | 14.0 | K3D14020-05 | G12 |
| | M18 x 2.5 | 15.5 | K3D15520-05 | G12 |
| | M20 x 2.5 | 17.5 | K3D17525-06 | G12 |
| | M22 x 2.5 | 19.5 | K3D19525-06 | G12 |
| | M24 x 3.0 | 21.0 | K3D21025-07 | G12 |
| | M27 x 3.0 | 24.0 | K3D24032-09 | G12 |
| | M30 x 3.5 | 26.5 | K3D26532-09 | G12 |
| | M33 x 4.0 | 29.0 | K3D29032-09 | G12 |
| | M36 x 4.0 | 32.0 | K3D32032-11 | G12 |
| | M39 x 4.0 | 35.0 | K3D35032-11 | G12 |
| M42 x 4.5 | 37.5 | K3D37540-13 | G12 | |
| Inch | 9/16-12 UNC | 12.2 | K3D12220-04 | G12 |
| | 5/8-11 UNC | 13.5 | K3D13520-04 | G12 |
| | 3/4-10 UNC | 16.5 | K3D16525-06 | G12 |
| | 7/8-9 UNC | 19.5 | K3D19525-06 | G12 |
| | 9/16-18 UNF | 12.9 | K3D12920-04 | G12 |
| | 5/8-18 UNF | 14.5 | K3D14520-05 | G12 |
| | 3/4-16 UNF | 17.5 | K3D17525-06 | G12 |

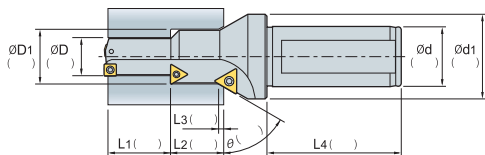


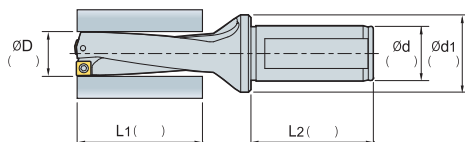
Special drill order form





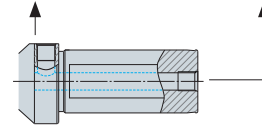






• Coolant type




- Oil hole on the plunge part Oil hole on the shank



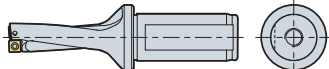
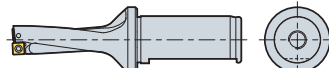


• Hole type

- Blind hole Thru hole

• Types of shank

-  Flat Type
-  Weldon Type
-  Whistle Notch Type

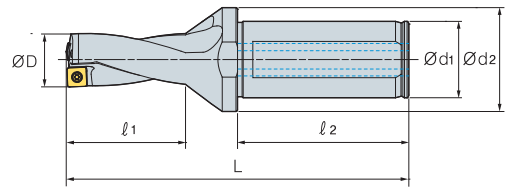
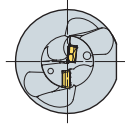
• Location of side lock

- Parallel to peripheral insert (standard) 
- 90° angle to peripheral insert 
- 150° angle to peripheral insert 
- 180° angle to peripheral insert 

• Note

- Currently using tool :
- Current cutting condition
 - RPM or vc(m/min) :
 - vf(mm/min) or fn(mm/rev) :
 - Depth of cut(mm) :
- Standard of measuring tool life :
- Currently using machine
 - Machining center :
 - General lathe :
 - CNC lathe :

KING DRILL-2D *New*

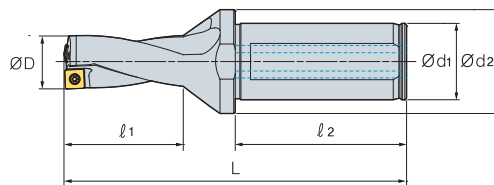
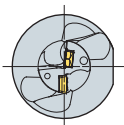


(mm)



| Designation | ØD | Ød ₁ | Ød ₂ | l ₁ | l ₂ | L | Insert | Screw | Wrench |
|-------------|----------|-----------------|-----------------|----------------|----------------|-----|--------------------------------|------------|--------|
| | | | | | | | | | |
| K2D | 12020-04 | 12.0 | 20 | 25 | 27 | 50 | SPMT040204-PD XOMT040204-PD | FTNA0204 | TW06P |
| | 12520-04 | 12.5 | 20 | 25 | 27 | 50 | | | |
| | 13020-04 | 13.0 | 20 | 25 | 29 | 50 | | | |
| | 13520-04 | 13.5 | 20 | 25 | 29 | 50 | | | |
| 14020-05 | 14.0 | 20 | 25 | 31 | 50 | 96 | SPMT050204-PD XOMT050204-PD | FTNA0204 | TW06P |
| 14520-05 | 14.5 | 20 | 25 | 31 | 50 | 96 | | | |
| 15020-05 | 15.0 | 20 | 25 | 33 | 50 | 99 | | | |
| 15520-05 | 15.5 | 20 | 25 | 33 | 50 | 99 | | | |
| 16020-05 | 16.0 | 20 | 25 | 35 | 50 | 101 | SPMT060205-PD XOMT060204-PD | FTKA02206S | TW07P |
| 16525-06 | 16.5 | 25 | 34 | 35 | 56 | 107 | | | |
| 17025-06 | 17.0 | 25 | 34 | 37 | 56 | 109 | | | |
| 17525-06 | 17.5 | 25 | 34 | 37 | 56 | 109 | | | |
| 18025-06 | 18.0 | 25 | 34 | 39 | 56 | 112 | | | |
| 18525-06 | 18.5 | 25 | 34 | 39 | 56 | 112 | | | |
| 19025-06 | 19.0 | 25 | 34 | 41 | 56 | 114 | | | |
| 19525-06 | 19.5 | 25 | 34 | 41 | 56 | 114 | | | |
| 20025-07 | 20.0 | 25 | 34 | 43 | 56 | 118 | | | |
| 20525-07 | 20.5 | 25 | 34 | 43 | 56 | 118 | | | |
| 21025-07 | 21.0 | 25 | 34 | 45 | 56 | 120 | SPMT07T208-PD XOMT07T205-PD | FTKA02565 | TW07S |
| 21525-07 | 21.5 | 25 | 34 | 45 | 56 | 120 | | | |
| 22025-07 | 22.0 | 25 | 34 | 47 | 56 | 122 | | | |
| 22525-07 | 22.5 | 25 | 34 | 47 | 56 | 122 | | | |
| 23025-07 | 23.0 | 25 | 34 | 49 | 56 | 126 | | | |
| 23525-07 | 23.5 | 25 | 34 | 49 | 56 | 126 | | | |
| 24032-09 | 24.0 | 32 | 44 | 51 | 60 | 133 | | | |
| 24532-09 | 24.5 | 32 | 44 | 51 | 60 | 133 | | | |
| 25032-09 | 25.0 | 32 | 44 | 53 | 60 | 135 | | | |
| 25532-09 | 25.5 | 32 | 44 | 53 | 60 | 135 | | | |
| 26032-09 | 26.0 | 32 | 44 | 55 | 60 | 137 | SPMT090308-PD XOMT090305-PD | FTKA0307 | TW09S |
| 26532-09 | 26.5 | 32 | 44 | 55 | 60 | 137 | | | |
| 27032-09 | 27.0 | 32 | 44 | 57 | 60 | 140 | | | |
| 27532-09 | 27.5 | 32 | 44 | 57 | 60 | 140 | | | |
| 28032-09 | 28.0 | 32 | 44 | 59 | 60 | 143 | | | |
| 28532-09 | 28.5 | 32 | 44 | 59 | 60 | 143 | | | |
| 29032-09 | 29.0 | 32 | 44 | 61 | 60 | 145 | | | |
| 29532-09 | 29.5 | 32 | 44 | 61 | 60 | 145 | | | |
| 30032-11 | 30.0 | 32 | 44 | 63 | 60 | 150 | | | |
| 30532-11 | 30.5 | 32 | 44 | 63 | 60 | 150 | | | |
| 31032-11 | 31.0 | 32 | 44 | 65 | 60 | 152 | SPMT11T308-PD XOMT11T306-PD | FTKA03508 | TW15S |
| 31532-11 | 31.5 | 32 | 44 | 65 | 60 | 152 | | | |
| 32032-11 | 32.0 | 32 | 44 | 67 | 60 | 154 | | | |
| 32532-11 | 32.5 | 32 | 44 | 67 | 60 | 154 | | | |
| 33032-11 | 33.0 | 32 | 44 | 69 | 60 | 157 | | | |
| 33532-11 | 33.5 | 32 | 44 | 69 | 60 | 157 | | | |
| 34032-11 | 34.0 | 32 | 44 | 71 | 60 | 159 | | | |
| 34532-11 | 34.5 | 32 | 44 | 71 | 60 | 159 | | | |
| 35032-11 | 35.0 | 32 | 44 | 73 | 60 | 161 | | | |
| 35532-11 | 35.5 | 32 | 44 | 73 | 60 | 161 | | | |
| 36040-13 | 36.0 | 40 | 48 | 76 | 70 | 176 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S |
| 36540-13 | 36.5 | 40 | 48 | 76 | 70 | 176 | | | |
| 37040-13 | 37.0 | 40 | 48 | 78 | 70 | 178 | | | |
| 37540-13 | 37.5 | 40 | 48 | 78 | 70 | 178 | | | |

Applicable inserts G05

KING DRILL-2D *New*

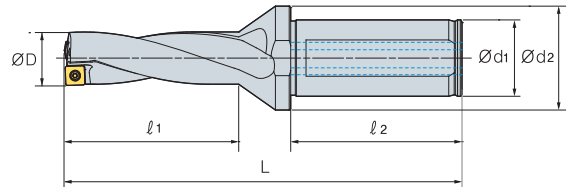
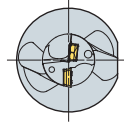


(mm)

| Designation | ØD | Ød ₁ | Ød ₂ | l ₁ | l ₂ | L | Insert | Screw  | Wrench  |
|--------------|------|-----------------|-----------------|----------------|----------------|-----|--------------------------------|---|--|
| K2D 38040-13 | 38.0 | 40 | 48 | 80 | 70 | 181 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S |
| 38540-13 | 38.5 | 40 | 48 | 80 | 70 | 181 | | | |
| 39040-13 | 39.0 | 40 | 48 | 82 | 70 | 183 | | | |
| 39540-13 | 39.5 | 40 | 48 | 82 | 70 | 183 | | | |
| 40040-13 | 40.0 | 40 | 48 | 84 | 70 | 186 | | | |
| 40540-13 | 40.5 | 40 | 48 | 84 | 70 | 186 | | | |
| 41040-13 | 41.0 | 40 | 48 | 86 | 70 | 188 | | | |
| 41540-13 | 41.5 | 40 | 48 | 86 | 70 | 188 | | | |
| 42040-13 | 42.0 | 40 | 48 | 88 | 70 | 191 | | | |
| 42540-13 | 42.5 | 40 | 48 | 88 | 70 | 191 | | | |
| 43040-15 | 43.0 | 40 | 58 | 91 | 70 | 196 | | | |
| 43540-15 | 43.5 | 40 | 58 | 91 | 70 | 196 | | | |
| 44040-15 | 44.0 | 40 | 58 | 93 | 70 | 198 | | | |
| 44540-15 | 44.5 | 40 | 58 | 93 | 70 | 198 | | | |
| 45040-15 | 45.0 | 40 | 58 | 95 | 70 | 201 | | | |
| 45540-15 | 45.5 | 40 | 58 | 95 | 70 | 201 | | | |
| 46040-15 | 46.0 | 40 | 58 | 97 | 70 | 203 | | | |
| 46540-15 | 46.5 | 40 | 58 | 97 | 70 | 203 | | | |
| 47040-15 | 47.0 | 40 | 58 | 99 | 70 | 206 | | | |
| 47540-15 | 47.5 | 40 | 58 | 99 | 70 | 206 | | | |
| 48040-15 | 48.0 | 40 | 58 | 101 | 70 | 208 | | | |
| 48540-15 | 48.5 | 40 | 58 | 101 | 70 | 208 | | | |
| 49040-15 | 49.0 | 40 | 58 | 103 | 70 | 210 | | | |
| 49540-15 | 49.5 | 40 | 58 | 103 | 70 | 210 | | | |
| 50040-15 | 50.0 | 40 | 58 | 105 | 70 | 212 | | | |
| 50540-15 | 50.5 | 40 | 58 | 105 | 70 | 212 | | | |
| 51040-18 | 51.0 | 40 | 68 | 108 | 70 | 218 | | | |
| 51540-18 | 51.5 | 40 | 68 | 108 | 70 | 218 | | | |
| 52040-18 | 52.0 | 40 | 68 | 110 | 70 | 220 | | | |
| 52540-18 | 52.5 | 40 | 68 | 110 | 70 | 220 | | | |
| 53040-18 | 53.0 | 40 | 68 | 112 | 70 | 222 | | | |
| 53540-18 | 53.5 | 40 | 68 | 112 | 70 | 222 | | | |
| 54040-18 | 54.0 | 40 | 68 | 114 | 70 | 224 | | | |
| 54540-18 | 54.5 | 40 | 68 | 114 | 70 | 224 | | | |
| 55040-18 | 55.0 | 40 | 68 | 116 | 70 | 226 | | | |
| 55540-18 | 55.5 | 40 | 68 | 116 | 70 | 226 | | | |
| 56040-18 | 56.0 | 40 | 68 | 118 | 70 | 230 | | | |
| 56540-18 | 56.5 | 40 | 68 | 118 | 70 | 230 | | | |
| 57040-18 | 57.0 | 40 | 68 | 121 | 70 | 233 | | | |
| 57540-18 | 57.5 | 40 | 68 | 121 | 70 | 233 | | | |
| 58040-18 | 58.0 | 40 | 68 | 124 | 70 | 236 | | | |
| 58540-18 | 58.5 | 40 | 68 | 124 | 70 | 236 | | | |
| 59040-18 | 59.0 | 40 | 68 | 127 | 70 | 239 | | | |
| 59540-18 | 59.5 | 40 | 68 | 127 | 70 | 239 | | | |
| 60040-18 | 60.0 | 40 | 68 | 130 | 70 | 242 | | | |
| 60540-18 | 60.5 | 40 | 68 | 130 | 70 | 242 | | | |
| | | | | | | | SPMT15M510-PD XOMT15M508-PD | FTNC04511 | TW20S |
| | | | | | | | SPMT180510-PD XOMT180508-PD | FTNA0511 | TW20-100 |

 Applicable inserts G05

KING DRILL-3D *New*



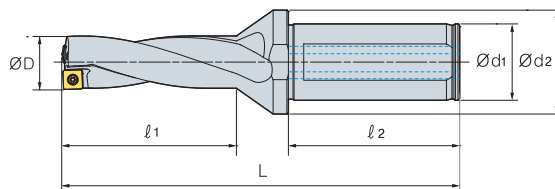
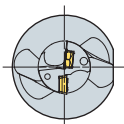
(mm)

| Designation | ØD | Ød1 | Ød2 | l1 | l2 | L | Insert | Screw | Wrench | | |
|-------------|-----------|------|-----|----|----|--------------------------------|--------------------------------|----------|--------|--------------------------------|------------|
| | | | | | | | | | | | |
| K3D | 12020-04* | 12.0 | 20 | 25 | 39 | 50 | SPMT040204-PD XOMT040204-PD | FTNA0204 | TW06P | | |
| | 12220-04 | 12.2 | 20 | 25 | 39 | 50 | | | | | |
| | 12520-04 | 12.5 | 20 | 25 | 39 | 50 | | | | | |
| | 12920-04 | 12.9 | 20 | 25 | 42 | 50 | | | | | |
| | 13020-04 | 13.0 | 20 | 25 | 42 | 50 | | | | | |
| | 13520-04 | 13.5 | 20 | 25 | 42 | 50 | | | | | |
| | 14020-05* | 14.0 | 20 | 25 | 45 | 50 | SPMT050204-PD XOMT050204-PD | FTNA0204 | TW06P | | |
| | 14520-05 | 14.5 | 20 | 25 | 45 | 50 | | | | | |
| | 15020-05 | 15.0 | 20 | 25 | 48 | 50 | | | | | |
| | 15520-05* | 15.5 | 20 | 25 | 48 | 50 | | | | | |
| | 16020-05 | 16.0 | 20 | 25 | 51 | 50 | | | | | |
| | 16525-06 | 16.5 | 25 | 34 | 51 | 56 | | | | SPMT060205-PD XOMT060204-PD | FTKA02206S |
| 17025-06 | 17.0 | 25 | 34 | 54 | 56 | | | | | | |
| 17525-06* | 17.5 | 25 | 34 | 54 | 56 | | | | | | |
| 18025-06 | 18.0 | 25 | 34 | 57 | 56 | | | | | | |
| 18525-06 | 18.5 | 25 | 34 | 57 | 56 | | | | | | |
| 19025-06 | 19.0 | 25 | 34 | 60 | 56 | | | | | | |
| 19525-06* | 19.5 | 25 | 34 | 60 | 56 | | | | | | |
| 20025-07 | 20.0 | 25 | 34 | 63 | 56 | SPMT07T208-PD XOMT07T205-PD | FTKA02565 | TW07S | | | |
| 20525-07 | 20.5 | 25 | 34 | 63 | 56 | | | | | | |
| 21025-07* | 21.0 | 25 | 34 | 66 | 56 | | | | | | |
| 21525-07 | 21.5 | 25 | 34 | 66 | 56 | | | | | | |
| 22025-07 | 22.0 | 25 | 34 | 69 | 56 | | | | | | |
| 22525-07 | 22.5 | 25 | 34 | 69 | 56 | | | | | | |
| 23025-07 | 23 | 25 | 34 | 72 | 56 | | | | | | |
| 23525-07 | 23.5 | 25 | 34 | 72 | 56 | | | | | | |
| 24032-09* | 24.0 | 32 | 44 | 75 | 60 | SPMT090308-PD XOMT090305-PD | FTKA0307 | TW09S | | | |
| 24532-09 | 24.5 | 32 | 44 | 75 | 60 | | | | | | |
| 25032-09 | 25.0 | 32 | 44 | 78 | 60 | | | | | | |
| 25532-09 | 25.5 | 32 | 44 | 78 | 60 | | | | | | |
| 26032-09 | 26.0 | 32 | 44 | 81 | 60 | | | | | | |
| 26532-09* | 26.5 | 32 | 44 | 81 | 60 | | | | | | |
| 27032-09 | 27.0 | 32 | 44 | 84 | 60 | | | | | | |
| 27532-09 | 27.5 | 32 | 44 | 84 | 60 | | | | | | |
| 28032-09 | 28.0 | 32 | 44 | 87 | 60 | | | | | | |
| 28532-09 | 28.5 | 32 | 44 | 87 | 60 | | | | | | |
| 29032-09* | 29.0 | 32 | 44 | 90 | 60 | | | | | | |
| 29532-09 | 29.5 | 32 | 44 | 90 | 60 | | | | | | |

Applicable inserts G05

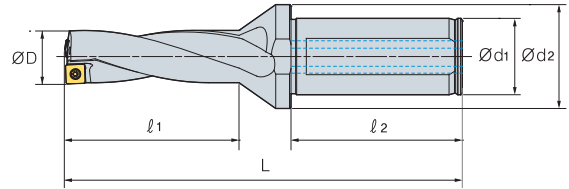
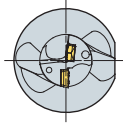
The items marked * can machine a tap foundation hole.

KING DRILL-3D *New*



| Designation | | ØD | Ød1 | Ød2 | l1 | l2 | L | Insert | Screw | Wrench |
|-------------|-----------|------|-----|-----|-----|-----|-----|--------------------------------|-----------|--------|
| K3D | 30032-11* | 30.0 | 32 | 44 | 93 | 60 | 180 | SPMT11T308-PD XOMT11T306-PD | FTKA03508 | TW15S |
| | 30532-11 | 30.5 | 32 | 44 | 93 | 60 | 180 | | | |
| | 31032-11 | 31.0 | 32 | 44 | 96 | 60 | 183 | | | |
| | 31532-11 | 31.5 | 32 | 44 | 96 | 60 | 183 | | | |
| | 32032-11 | 32.0 | 32 | 44 | 99 | 60 | 186 | | | |
| | 32532-11 | 32.5 | 32 | 44 | 99 | 60 | 186 | | | |
| | 33032-11 | 33.0 | 32 | 44 | 102 | 60 | 190 | | | |
| | 33532-11 | 33.5 | 32 | 44 | 102 | 60 | 190 | | | |
| | 34032-11 | 34.0 | 32 | 44 | 105 | 60 | 193 | | | |
| | 34532-11 | 34.5 | 32 | 44 | 105 | 60 | 193 | | | |
| | 35032-11* | 35.0 | 32 | 44 | 108 | 60 | 196 | | | |
| | 35532-11 | 35.5 | 32 | 44 | 108 | 60 | 196 | | | |
| | 36040-13 | 36.0 | 40 | 48 | 112 | 70 | 212 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S |
| | 36540-13 | 36.5 | 40 | 48 | 112 | 70 | 212 | | | |
| | 37040-13 | 37.0 | 40 | 48 | 115 | 70 | 215 | | | |
| | 37540-13 | 37.5 | 40 | 48 | 115 | 70 | 215 | | | |
| | 38040-13 | 38.0 | 40 | 48 | 118 | 70 | 219 | | | |
| | 38540-13 | 38.5 | 40 | 48 | 118 | 70 | 219 | | | |
| | 39040-13 | 39.0 | 40 | 48 | 121 | 70 | 222 | | | |
| | 39540-13 | 39.5 | 40 | 48 | 121 | 70 | 222 | | | |
| | 40040-13 | 40.0 | 40 | 48 | 124 | 70 | 226 | | | |
| | 40540-13 | 40.5 | 40 | 48 | 124 | 70 | 226 | | | |
| | 41040-13 | 41.0 | 40 | 48 | 127 | 70 | 229 | | | |
| | 41540-13 | 41.5 | 40 | 48 | 127 | 70 | 229 | | | |
| | 42040-13 | 42.0 | 40 | 48 | 130 | 70 | 233 | SPMT15M510-PD XOMT15M508-PD | FTNC04511 | TW20S |
| | 42540-13 | 42.5 | 40 | 48 | 130 | 70 | 233 | | | |
| | 43040-15 | 43.0 | 40 | 58 | 134 | 70 | 239 | | | |
| | 43540-15 | 43.5 | 40 | 58 | 134 | 70 | 239 | | | |
| | 44040-15 | 44.0 | 40 | 58 | 137 | 70 | 242 | | | |
| | 44540-15 | 44.5 | 40 | 58 | 137 | 70 | 242 | | | |
| | 45040-15 | 45.0 | 40 | 58 | 140 | 70 | 246 | | | |
| | 45540-15 | 45.5 | 40 | 58 | 140 | 70 | 246 | | | |
| | 46040-15 | 46.0 | 40 | 58 | 143 | 70 | 249 | | | |
| | 46540-15 | 46.5 | 40 | 58 | 143 | 70 | 249 | | | |
| | 47040-15 | 47.0 | 40 | 58 | 146 | 70 | 253 | | | |
| | 47540-15 | 47.5 | 40 | 58 | 146 | 70 | 253 | | | |
| 48040-15 | 48.0 | 40 | 58 | 149 | 70 | 256 | | | | |
| 48540-15 | 48.5 | 40 | 58 | 149 | 70 | 256 | | | | |
| 49040-15 | 49.0 | 40 | 58 | 152 | 70 | 259 | | | | |
| 49540-15 | 49.5 | 40 | 58 | 152 | 70 | 259 | | | | |
| 50040-15 | 50.0 | 40 | 58 | 155 | 70 | 262 | | | | |
| 50540-15 | 50.5 | 40 | 58 | 155 | 70 | 262 | | | | |

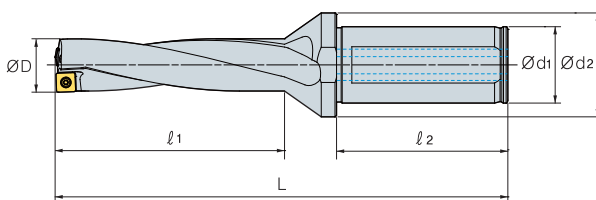
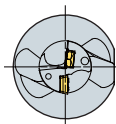
KING DRILL-3D *New*





| Designation | | $\varnothing D$ | $\varnothing d_1$ | $\varnothing d_2$ | l_1 | l_2 | L | Insert | Screw | Wrench |
|-------------|----------|-----------------|-------------------|-------------------|-------|-------|-----|--------------------------------|----------|----------|
| K3D | 51040-18 | 51.0 | 40 | 68 | 159 | 70 | 269 | SPMT180510-PD XOMT180508-PD | FTNA0511 | TW20-100 |
| | 51540-18 | 51.5 | 40 | 68 | 159 | 70 | 269 | | | |
| | 52040-18 | 52.0 | 40 | 68 | 162 | 70 | 272 | | | |
| | 52540-18 | 52.5 | 40 | 68 | 162 | 70 | 272 | | | |
| | 53040-18 | 53.0 | 40 | 68 | 165 | 70 | 275 | | | |
| | 53540-18 | 53.5 | 40 | 68 | 165 | 70 | 275 | | | |
| | 54040-18 | 54.0 | 40 | 68 | 168 | 70 | 278 | | | |
| | 54540-18 | 54.5 | 40 | 68 | 168 | 70 | 278 | | | |
| | 55040-18 | 55.0 | 40 | 68 | 171 | 70 | 281 | | | |
| | 55540-18 | 55.5 | 40 | 68 | 171 | 70 | 281 | | | |
| | 56040-18 | 56.0 | 40 | 68 | 174 | 70 | 286 | | | |
| | 56540-18 | 56.5 | 40 | 68 | 174 | 70 | 286 | | | |
| | 57040-18 | 57.0 | 40 | 68 | 178 | 70 | 290 | | | |
| | 57540-18 | 57.5 | 40 | 68 | 178 | 70 | 290 | | | |
| | 58040-18 | 58.0 | 40 | 68 | 182 | 70 | 294 | | | |
| | 58540-18 | 58.5 | 40 | 68 | 182 | 70 | 294 | | | |
| | 59040-18 | 59.0 | 40 | 68 | 186 | 70 | 298 | | | |
| | 59540-18 | 59.5 | 40 | 68 | 186 | 70 | 298 | | | |
| 60040-18 | 60.0 | 40 | 68 | 190 | 70 | 302 | | | | |
| 60540-18 | 60.5 | 40 | 68 | 190 | 70 | 302 | | | | |

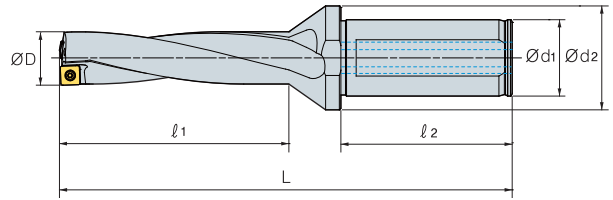
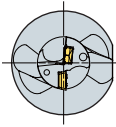
Applicable inserts G05

KING DRILL-4D *New*



| | | | | | | | | (mm) | | |
|-------------|----------|------|-----|-----|-----|-----|--------------------------------|---|--|-------|
| Designation | ØD | Ød1 | Ød2 | l1 | l2 | L | Insert | Screw  | Wrench  | |
| K4D | 12020-04 | 12.0 | 20 | 25 | 51 | 50 | 115 | SPMT040204-PD XOMT040204-PD | FTNA0204 | TW06P |
| | 12520-04 | 12.5 | 20 | 25 | 51 | 50 | 115 | | | |
| | 13020-04 | 13.0 | 20 | 25 | 55 | 50 | 119 | | | |
| | 13520-04 | 13.5 | 20 | 25 | 55 | 50 | 119 | | | |
| | 14020-05 | 14.0 | 20 | 25 | 59 | 50 | 124 | SPMT050204-PD XOMT050204-PD | FTNA0204 | TW06P |
| | 14520-05 | 14.5 | 20 | 25 | 59 | 50 | 124 | | | |
| | 15020-05 | 15.0 | 20 | 25 | 63 | 50 | 129 | | | |
| | 15520-05 | 15.5 | 20 | 25 | 63 | 50 | 129 | | | |
| | 16020-05 | 16.0 | 20 | 25 | 67 | 50 | 133 | | | |
| | 16525-06 | 16.5 | 25 | 34 | 67 | 56 | 139 | | | |
| | 17025-06 | 17.0 | 25 | 34 | 71 | 56 | 143 | | | |
| | 17525-06 | 17.5 | 25 | 34 | 71 | 56 | 143 | | | |
| | 18025-06 | 18.0 | 25 | 34 | 75 | 56 | 148 | | | |
| | 18525-06 | 18.5 | 25 | 34 | 75 | 56 | 148 | | | |
| | 19025-06 | 19.0 | 25 | 34 | 79 | 56 | 152 | | | |
| | 19525-06 | 19.5 | 25 | 34 | 79 | 56 | 152 | SPMT07T208-PD XOMT07T205-PD | FTKA02565 | TW07S |
| | 20025-07 | 20.0 | 25 | 34 | 83 | 56 | 158 | | | |
| | 20525-07 | 20.5 | 25 | 34 | 83 | 56 | 158 | | | |
| | 21025-07 | 21.0 | 25 | 34 | 87 | 56 | 162 | | | |
| | 21525-07 | 21.5 | 25 | 34 | 87 | 56 | 162 | | | |
| | 22025-07 | 22.0 | 25 | 34 | 91 | 56 | 166 | | | |
| | 22525-07 | 22.5 | 25 | 34 | 91 | 56 | 166 | | | |
| | 23025-07 | 23.0 | 25 | 34 | 95 | 56 | 172 | | | |
| | 23525-07 | 23.5 | 25 | 34 | 95 | 56 | 172 | | | |
| | 24032-09 | 24.0 | 32 | 44 | 99 | 60 | 181 | | | |
| | 24532-09 | 24.5 | 32 | 44 | 99 | 60 | 181 | | | |
| | 25032-09 | 25.0 | 32 | 44 | 103 | 60 | 185 | | | |
| | 25532-09 | 25.5 | 32 | 44 | 103 | 60 | 185 | | | |
| | 26032-09 | 26.0 | 32 | 44 | 107 | 60 | 189 | | | |
| | 26532-09 | 26.5 | 32 | 44 | 107 | 60 | 189 | | | |
| | 27032-09 | 27.0 | 32 | 44 | 111 | 60 | 194 | | | |
| | 27532-09 | 27.5 | 32 | 44 | 111 | 60 | 194 | | | |
| | 28032-09 | 28.0 | 32 | 44 | 115 | 60 | 199 | | | |
| | 28532-09 | 28.5 | 32 | 44 | 115 | 60 | 199 | | | |
| | 29032-09 | 29.0 | 32 | 44 | 119 | 60 | 203 | | | |
| | 29532-09 | 29.5 | 32 | 44 | 119 | 60 | 203 | SPMT11T308-PD XOMT11T306-PD | FTKA03508 | TW15S |
| | 30032-11 | 30.0 | 32 | 44 | 123 | 60 | 210 | | | |
| | 30532-11 | 30.5 | 32 | 44 | 123 | 60 | 210 | | | |
| | 31032-11 | 31.0 | 32 | 44 | 127 | 60 | 214 | | | |
| | 31532-11 | 31.5 | 32 | 44 | 127 | 60 | 214 | | | |
| 32032-11 | 32.0 | 32 | 44 | 131 | 60 | 218 | | | | |
| 32532-11 | 32.5 | 32 | 44 | 131 | 60 | 218 | | | | |
| 33032-11 | 33.0 | 32 | 44 | 135 | 60 | 223 | | | | |
| 33532-11 | 33.5 | 32 | 44 | 135 | 60 | 223 | | | | |
| 34032-11 | 34.0 | 32 | 44 | 139 | 60 | 227 | | | | |
| 34532-11 | 34.5 | 32 | 44 | 139 | 60 | 227 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S | |
| 35032-11 | 35.0 | 32 | 44 | 143 | 60 | 231 | | | | |
| 35532-11 | 35.5 | 32 | 44 | 143 | 60 | 231 | | | | |
| 36040-13 | 36.0 | 40 | 48 | 148 | 70 | 248 | | | | |
| 36540-13 | 36.5 | 40 | 48 | 148 | 70 | 248 | | | | |
| 37040-13 | 37.0 | 40 | 48 | 152 | 70 | 252 | | | | |
| 37540-13 | 37.5 | 40 | 48 | 152 | 70 | 252 | | | | |

KING DRILL-4D *New*

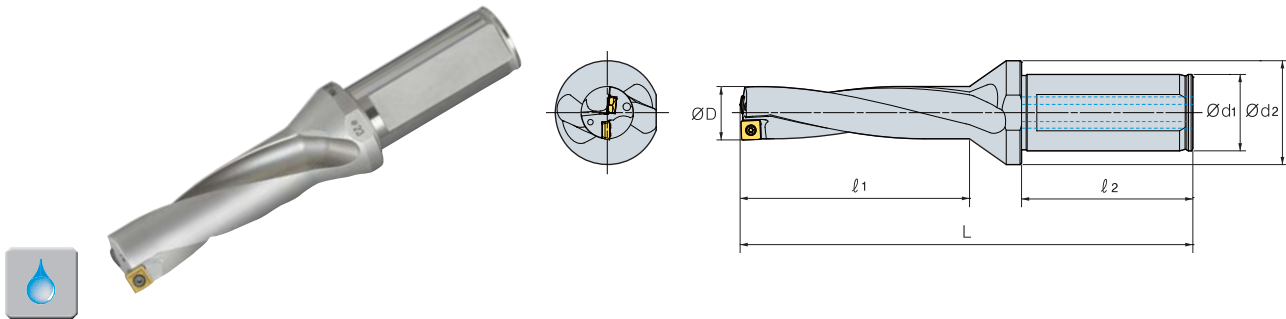


(mm)

| Designation | ØD | Ød1 | Ød2 | l1 | l2 | L | Insert | Screw | Wrench | |
|-------------|----------|------|-----|-----|-----|--------------------------------|--------------------------------|----------|--------|-----|
| | | | | | | | | | | |
| K4D | 38040-13 | 38.0 | 40 | 48 | 156 | 70 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S | |
| | 38540-13 | 38.5 | 40 | 48 | 156 | 70 | | | | 257 |
| | 39040-13 | 39.0 | 40 | 48 | 160 | 70 | | | | 261 |
| | 39540-13 | 39.5 | 40 | 48 | 160 | 70 | | | | 261 |
| | 40040-13 | 40.0 | 40 | 48 | 164 | 70 | | | | 266 |
| | 40540-13 | 40.5 | 40 | 48 | 164 | 70 | | | | 266 |
| | 41040-13 | 41.0 | 40 | 48 | 168 | 70 | | | | 270 |
| | 41540-13 | 41.5 | 40 | 48 | 168 | 70 | | | | 270 |
| | 42040-13 | 42.0 | 40 | 48 | 172 | 70 | | | | 275 |
| | 42540-13 | 42.5 | 40 | 48 | 172 | 70 | | | | 275 |
| 43040-15 | 43.0 | 40 | 58 | 177 | 70 | SPMT15M510-PD XOMT15M508-PD | FTNC04511 | TW20S | | |
| 43540-15 | 43.5 | 40 | 58 | 177 | 70 | | | | 282 | |
| 44040-15 | 44.0 | 40 | 58 | 181 | 70 | | | | 286 | |
| 44540-15 | 44.5 | 40 | 58 | 181 | 70 | | | | 286 | |
| 45040-15 | 45.0 | 40 | 58 | 185 | 70 | | | | 291 | |
| 45540-15 | 45.5 | 40 | 58 | 185 | 70 | | | | 291 | |
| 46040-15 | 46.0 | 40 | 58 | 189 | 70 | | | | 295 | |
| 46540-15 | 46.5 | 40 | 58 | 189 | 70 | | | | 295 | |
| 47040-15 | 47.0 | 40 | 58 | 193 | 70 | | | | 300 | |
| 47540-15 | 47.5 | 40 | 58 | 193 | 70 | | | | 300 | |
| 48040-15 | 48.0 | 40 | 58 | 197 | 70 | SPMT180510-PD XOMT180508-PD | FTNA0511 | TW20-100 | | |
| 48540-15 | 48.5 | 40 | 58 | 197 | 70 | | | | 304 | |
| 49040-15 | 49.0 | 40 | 58 | 201 | 70 | | | | 308 | |
| 49540-15 | 49.5 | 40 | 58 | 201 | 70 | | | | 308 | |
| 50040-15 | 50.0 | 40 | 58 | 205 | 70 | | | | 312 | |
| 50540-15 | 50.5 | 40 | 58 | 205 | 70 | | | | 312 | |
| 51040-18 | 51.0 | 40 | 68 | 210 | 70 | | | | 320 | |
| 51540-18 | 51.5 | 40 | 68 | 210 | 70 | | | | 320 | |
| 52040-18 | 52.0 | 40 | 68 | 214 | 70 | | | | 324 | |
| 52540-18 | 52.5 | 40 | 68 | 214 | 70 | | | | 324 | |
| 53040-18 | 53.0 | 40 | 68 | 218 | 70 | SPMT180510-PD XOMT180508-PD | FTNA0511 | TW20-100 | | |
| 53540-18 | 53.5 | 40 | 68 | 218 | 70 | | | | 328 | |
| 54040-18 | 54.0 | 40 | 68 | 222 | 70 | | | | 332 | |
| 54540-18 | 54.5 | 40 | 68 | 222 | 70 | | | | 332 | |
| 55040-18 | 55.0 | 40 | 68 | 226 | 70 | | | | 336 | |
| 55540-18 | 55.5 | 40 | 68 | 226 | 70 | | | | 336 | |
| 56040-18 | 56.0 | 40 | 68 | 230 | 70 | | | | 342 | |
| 56540-18 | 56.5 | 40 | 68 | 230 | 70 | | | | 342 | |
| 57040-18 | 57.0 | 40 | 68 | 235 | 70 | | | | 347 | |
| 57540-18 | 57.5 | 40 | 68 | 235 | 70 | | | | 347 | |
| 58040-18 | 58.0 | 40 | 68 | 240 | 70 | SPMT180510-PD XOMT180508-PD | FTNA0511 | TW20-100 | | |
| 58540-18 | 58.5 | 40 | 68 | 240 | 70 | | | | 352 | |
| 59040-18 | 59.0 | 40 | 68 | 245 | 70 | | | | 357 | |
| 59540-18 | 59.5 | 40 | 68 | 245 | 70 | | | | 357 | |
| 60040-18 | 60.0 | 40 | 68 | 250 | 70 | | | | 362 | |
| 60540-18 | 60.5 | 40 | 68 | 250 | 70 | | | | 362 | |

Applicable inserts G05

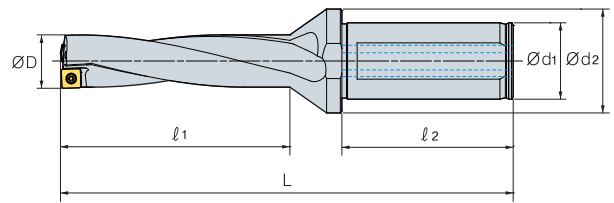
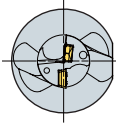
KING DRILL-5D *New*



(mm)

| Designation | | ØD | Ød ₁ | Ød ₂ | l ₁ | l ₂ | L | Insert | Screw | Wrench |
|-------------|----------|------|-----------------|-----------------|----------------|----------------|--------------------------------|--------------------------------|------------|--------|
| K5D | 12020-04 | 12.0 | 20 | 25 | 63 | 50 | 127 | SPMT040204-PD XOMT040204-PD | FTNA0204 | TW06P |
| | 12520-04 | 12.5 | 20 | 25 | 63 | 50 | 127 | | | |
| | 13020-04 | 13.0 | 20 | 25 | 68 | 50 | 132 | | | |
| | 13520-04 | 13.5 | 20 | 25 | 68 | 50 | 132 | | | |
| | 14020-05 | 14.0 | 20 | 25 | 73 | 50 | 138 | SPMT050204-PD XOMT050204-PD | FTNA0204 | TW06P |
| | 14520-05 | 14.5 | 20 | 25 | 73 | 50 | 138 | | | |
| | 15020-05 | 15.0 | 20 | 25 | 78 | 50 | 144 | | | |
| | 15520-05 | 15.5 | 20 | 25 | 78 | 50 | 144 | | | |
| | 16020-05 | 16.0 | 20 | 25 | 83 | 50 | 149 | SPMT060205-PD XOMT060204-PD | FTKA02206S | TW07P |
| | 16525-06 | 16.5 | 25 | 34 | 83 | 56 | 155 | | | |
| | 17025-06 | 17.0 | 25 | 34 | 88 | 56 | 160 | | | |
| | 17525-06 | 17.5 | 25 | 34 | 88 | 56 | 160 | | | |
| | 18025-06 | 18.0 | 25 | 34 | 93 | 56 | 166 | SPMT07T208-PD XOMT07T205-PD | FTKA02565 | TW07S |
| | 18525-06 | 18.5 | 25 | 34 | 93 | 56 | 166 | | | |
| | 19025-06 | 19.0 | 25 | 34 | 98 | 56 | 171 | | | |
| | 19525-06 | 19.5 | 25 | 34 | 98 | 56 | 171 | | | |
| | 20025-07 | 20.0 | 25 | 34 | 103 | 56 | 178 | SPMT090308-PD XOMT090305-PD | FTKA0307 | TW09S |
| | 20525-07 | 20.5 | 25 | 34 | 103 | 56 | 178 | | | |
| | 21025-07 | 21.0 | 25 | 34 | 108 | 56 | 183 | | | |
| | 21525-07 | 21.5 | 25 | 34 | 108 | 56 | 183 | | | |
| | 22025-07 | 22.0 | 25 | 34 | 113 | 56 | 188 | SPMT11T308-PD XOMT11T306-PD | FTKA03508 | TW15S |
| | 22525-07 | 22.5 | 25 | 34 | 113 | 56 | 188 | | | |
| | 23025-07 | 23.0 | 25 | 34 | 118 | 56 | 195 | | | |
| | 23525-07 | 23.5 | 25 | 34 | 118 | 56 | 195 | | | |
| | 24032-09 | 24.0 | 32 | 44 | 123 | 60 | 205 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S |
| | 24532-09 | 24.5 | 32 | 44 | 123 | 60 | 205 | | | |
| | 25032-09 | 25.0 | 32 | 44 | 128 | 60 | 210 | | | |
| | 25532-09 | 25.5 | 32 | 44 | 128 | 60 | 210 | | | |
| | 26032-09 | 26.0 | 32 | 44 | 133 | 60 | 215 | SPMT11T308-PD XOMT11T306-PD | FTKA03508 | TW15S |
| | 26532-09 | 26.5 | 32 | 44 | 133 | 60 | 215 | | | |
| | 27032-09 | 27.0 | 32 | 44 | 138 | 60 | 221 | | | |
| | 27532-09 | 27.5 | 32 | 44 | 138 | 60 | 221 | | | |
| | 28032-09 | 28.0 | 32 | 44 | 143 | 60 | 227 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S |
| | 28532-09 | 28.5 | 32 | 44 | 143 | 60 | 227 | | | |
| | 29032-09 | 29.0 | 32 | 44 | 148 | 60 | 232 | | | |
| | 29532-09 | 29.5 | 32 | 44 | 148 | 60 | 232 | | | |
| | 30032-11 | 30.0 | 32 | 44 | 153 | 60 | 240 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S |
| | 30532-11 | 30.5 | 32 | 44 | 153 | 60 | 240 | | | |
| | 31032-11 | 31.0 | 32 | 44 | 158 | 60 | 245 | | | |
| | 31532-11 | 31.5 | 32 | 44 | 158 | 60 | 245 | | | |
| 32032-11 | 32.0 | 32 | 44 | 163 | 60 | 250 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S | |
| 32532-11 | 32.5 | 32 | 44 | 163 | 60 | 250 | | | | |
| 33032-11 | 33.0 | 32 | 44 | 168 | 60 | 256 | | | | |
| 33532-11 | 33.5 | 32 | 44 | 168 | 60 | 256 | | | | |
| 34032-11 | 34.0 | 32 | 44 | 173 | 60 | 261 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S | |
| 34532-11 | 34.5 | 32 | 44 | 173 | 60 | 261 | | | | |
| 35032-11 | 35.0 | 32 | 44 | 178 | 60 | 266 | | | | |
| 35532-11 | 35.5 | 32 | 44 | 178 | 60 | 266 | | | | |
| 36040-13 | 36.0 | 40 | 48 | 184 | 70 | 284 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S | |
| 36540-13 | 36.5 | 40 | 48 | 184 | 70 | 284 | | | | |
| 37040-13 | 37.0 | 40 | 48 | 189 | 70 | 289 | | | | |
| 37540-13 | 37.5 | 40 | 48 | 189 | 70 | 289 | | | | |

KING DRILL-5D *New*



(mm)

| Designation | ØD | Ød1 | Ød2 | l1 | l2 | L | Insert | Screw | Wrench | |
|-------------|----------|------|-----|-----|-----|-----|--------------------------------|-----------|----------|-----|
| | | | | | | | | | | |
| K5D | 38040-13 | 38.0 | 40 | 48 | 194 | 70 | SPMT130410-PD XOMT130406-PD | FTKA0410 | TW15S | |
| | 38540-13 | 38.5 | 40 | 48 | 194 | 70 | | | | 295 |
| | 39040-13 | 39.0 | 40 | 48 | 199 | 70 | | | | 300 |
| | 39540-13 | 39.5 | 40 | 48 | 199 | 70 | | | | 300 |
| | 40040-13 | 40.0 | 40 | 48 | 204 | 70 | | | | 306 |
| | 40540-13 | 40.5 | 40 | 48 | 204 | 70 | | | | 306 |
| | 41040-13 | 41.0 | 40 | 48 | 209 | 70 | | | | 311 |
| | 41540-13 | 41.5 | 40 | 48 | 209 | 70 | | | | 311 |
| | 42040-13 | 42.0 | 40 | 48 | 214 | 70 | | | | 317 |
| | 42540-13 | 42.5 | 40 | 48 | 214 | 70 | | | | 317 |
| 43040-15 | 43.0 | 40 | 58 | 220 | 70 | 325 | SPMT15M510-PD XOMT15M508-PD | FTNC04511 | TW20S | |
| 43540-15 | 43.5 | 40 | 58 | 221 | 70 | 326 | | | | |
| 44040-15 | 44.0 | 40 | 58 | 225 | 70 | 330 | | | | |
| 44540-15 | 44.5 | 40 | 58 | 225 | 70 | 330 | | | | |
| 45040-15 | 45.0 | 40 | 58 | 230 | 70 | 336 | | | | |
| 45540-15 | 45.5 | 40 | 58 | 230 | 70 | 336 | | | | |
| 46040-15 | 46.0 | 40 | 58 | 235 | 70 | 341 | | | | |
| 46540-15 | 46.5 | 40 | 58 | 235 | 70 | 341 | | | | |
| 47040-15 | 47.0 | 40 | 58 | 240 | 70 | 347 | | | | |
| 47540-15 | 47.5 | 40 | 58 | 240 | 70 | 347 | | | | |
| 48040-15 | 48.0 | 40 | 58 | 245 | 70 | 352 | SPMT180510-PD XOMT180508-PD | FTNA0511 | TW20-100 | |
| 48540-15 | 48.5 | 40 | 58 | 245 | 70 | 352 | | | | |
| 49040-15 | 49.0 | 40 | 58 | 250 | 70 | 357 | | | | |
| 49540-15 | 49.5 | 40 | 58 | 250 | 70 | 357 | | | | |
| 50040-15 | 50.0 | 40 | 58 | 255 | 70 | 362 | | | | |
| 50540-15 | 50.5 | 40 | 58 | 255 | 70 | 362 | | | | |
| 51040-18 | 51.0 | 40 | 68 | 261 | 70 | 371 | | | | |
| 51540-18 | 51.5 | 40 | 68 | 261 | 70 | 371 | | | | |
| 52040-18 | 52.0 | 40 | 68 | 266 | 70 | 376 | | | | |
| 52540-18 | 52.5 | 40 | 68 | 266 | 70 | 376 | | | | |
| 53040-18 | 53.0 | 40 | 68 | 271 | 70 | 381 | | | | |
| 53540-18 | 53.5 | 40 | 68 | 271 | 70 | 381 | | | | |
| 54040-18 | 54.0 | 40 | 68 | 276 | 70 | 386 | | | | |
| 54540-18 | 54.5 | 40 | 68 | 276 | 70 | 386 | | | | |
| 55040-18 | 55.0 | 40 | 68 | 281 | 70 | 391 | | | | |
| 55540-18 | 55.5 | 40 | 68 | 281 | 70 | 391 | | | | |
| 56040-18 | 56.0 | 40 | 68 | 286 | 70 | 398 | | | | |
| 56540-18 | 56.5 | 40 | 68 | 286 | 70 | 398 | | | | |
| 57040-18 | 57.0 | 40 | 68 | 292 | 70 | 404 | | | | |
| 57540-18 | 57.5 | 40 | 68 | 292 | 70 | 404 | | | | |
| 58040-18 | 58.0 | 40 | 68 | 298 | 70 | 410 | | | | |
| 58540-18 | 58.5 | 40 | 68 | 298 | 70 | 410 | | | | |
| 59040-18 | 59.0 | 40 | 68 | 304 | 70 | 416 | | | | |
| 59540-18 | 59.5 | 40 | 68 | 304 | 70 | 416 | | | | |
| 60040-18 | 60.0 | 40 | 68 | 310 | 70 | 422 | | | | |
| 60540-18 | 60.5 | 40 | 68 | 310 | 70 | 422 | | | | |

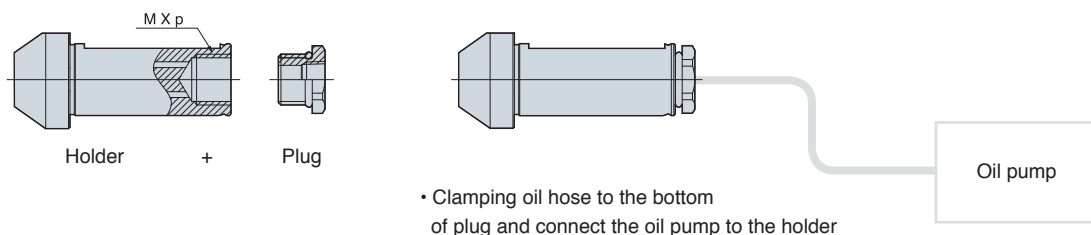
Applicable inserts G05

Drill with through coolant system for general lathe and CNC lathe without through coolant system

New

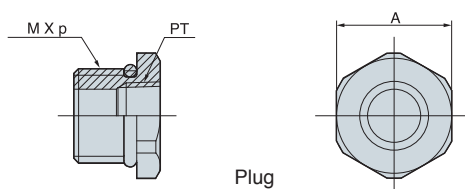
KING DRILL (for through coolant system with a lathe)

- Through coolant system with drill holder, plug, oil-hole hose and oil-hole pump
- NPT TAP in the plug is combined to NPT TAP connected to oil hose.
- Available to use the drill without a plug in milling machine



(mm)

| Designation | Diameter | Shank Dia. | M x p | Plug |
|-------------------|---------------|------------|-----------|-----------|
| K□D120~16020HP-□□ | Ø12.0 ~ Ø16.0 | Ø20 | M12 x 1.5 | PLG12PT18 |
| K□D161~23525HP-□□ | Ø16.1 ~ Ø23.5 | Ø25 | M16 x 1.5 | PLG16PT18 |
| K□D236~35532HP-□□ | Ø23.6 ~ Ø35.5 | Ø32 | M20 x 2.0 | PLG20PT14 |
| K□D356~60940HP-□□ | Ø35.6 ~ Ø60.5 | Ø40 | M27 x 2.0 | PLG27PT38 |

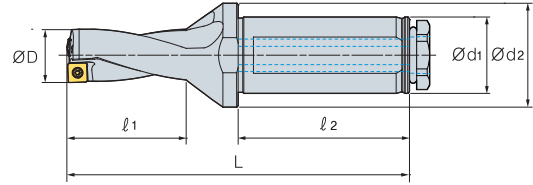
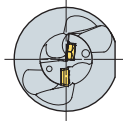


• Plug is assembled.

| Plug Type | M x p | NPT Tap | A |
|-----------|-----------|---------|----|
| PLG12PT18 | M14 x 1.5 | 1/8 | 17 |
| PLG16PT18 | M18 x 2.0 | 1/8 | 22 |
| PLG20PT14 | M22 x 2.0 | 1/4 | 27 |
| PLG27PT38 | M33 x 3.0 | 3/8 | 36 |

KING DRILL (for through coolant system with a lathe)-2D

New

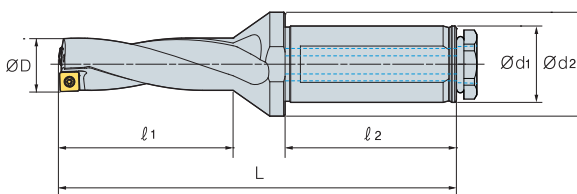
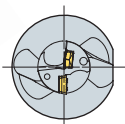


| Designation | | $\varnothing D$ | $\varnothing d_1$ | $\varnothing d_2$ | l_1 | l_2 | L | Insert | Screw | Wrench | | | |
|-------------|------------|-----------------|-------------------|-------------------|-------|-------|-----|--------------------------------|------------|--------|--------------------------------|----------|-------|
| K2D | 13020HP-04 | 13.0 | 20 | 25 | 29 | 50 | 93 | SPMT040204-PD XOMT040204-PD | FTNA0204 | TW06P | | | |
| | 14020HP-05 | 14.0 | 20 | 25 | 31 | 50 | 96 | SPMT050204-PD XOMT050204-PD | FTNA0204 | TW06P | | | |
| | 15020HP-05 | 15.0 | 20 | 25 | 33 | 50 | 99 | | | | | | |
| | 16020HP-05 | 16.0 | 20 | 25 | 35 | 50 | 101 | | | | | | |
| | 17025HP-06 | 17.0 | 25 | 34 | 37 | 56 | 109 | SPMT060205-PD XOMT060204-PD | FTKA02206S | TW07P | | | |
| | 18025HP-06 | 18.0 | 25 | 34 | 39 | 56 | 112 | | | | | | |
| | 19025HP-06 | 19.0 | 25 | 34 | 41 | 56 | 114 | SPMT07T208-PD XOMT07T205-PD | FTKA02565 | TW07S | | | |
| | 20025HP-07 | 20.0 | 25 | 34 | 43 | 56 | 118 | | | | | | |
| | 21025HP-07 | 21.0 | 25 | 34 | 45 | 56 | 120 | | | | | | |
| | 22025HP-07 | 22.0 | 25 | 34 | 47 | 56 | 122 | | | | | | |
| | 23025HP-07 | 23.0 | 25 | 34 | 49 | 56 | 126 | | | | | | |
| | 24032HP-09 | 24.0 | 32 | 44 | 51 | 60 | 133 | | | | SPMT090308-PD XOMT090305-PD | FTKA0307 | TW09S |
| | 25032HP-09 | 25.0 | 32 | 44 | 53 | 60 | 135 | | | | | | |
| | 26032HP-09 | 26.0 | 32 | 44 | 55 | 60 | 137 | | | | | | |
| | 27032HP-09 | 27.0 | 32 | 44 | 57 | 60 | 140 | | | | | | |
| | 28032HP-09 | 28.0 | 32 | 44 | 59 | 60 | 143 | | | | | | |
| 29032HP-09 | 29.0 | 32 | 44 | 61 | 60 | 145 | | | | | | | |

Applicable inserts G05

KING DRILL(for through coolant system with a lathe)-3D

New

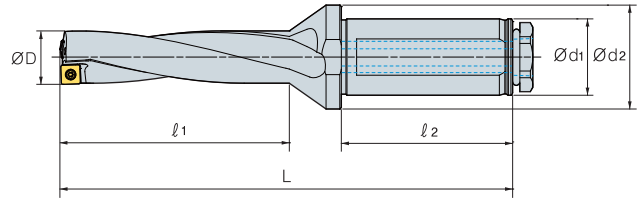
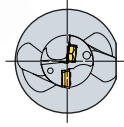


| Designation | | ØD | Ød1 | Ød2 | l1 | l2 | L | Insert | Screw | Wrench |
|-------------|------------|------|-----|-----|----|-----|-----|--------------------------------|------------|--------|
| K3D | 13020HP-04 | 13.0 | 20 | 25 | 42 | 50 | 106 | SPMT040204-PD XOMT040204-PD | FTNA0204 | TW06P |
| | 13520HP-04 | 13.5 | 20 | 25 | 42 | 50 | 106 | | | |
| | 14020HP-05 | 14.0 | 20 | 25 | 45 | 50 | 110 | | | |
| | 14520HP-05 | 14.5 | 20 | 25 | 45 | 50 | 110 | SPMT050204-PD XOMT050204-PD | FTNA0204 | TW06P |
| | 15020HP-05 | 15.0 | 20 | 25 | 48 | 50 | 114 | | | |
| | 15520HP-05 | 15.5 | 20 | 25 | 48 | 50 | 114 | | | |
| | 16020HP-05 | 16.0 | 20 | 25 | 51 | 50 | 117 | | | |
| | 16525HP-06 | 16.5 | 25 | 34 | 51 | 56 | 123 | | | |
| | 17025HP-06 | 17.0 | 25 | 34 | 54 | 56 | 126 | | | |
| | 17525HP-06 | 17.5 | 25 | 34 | 54 | 56 | 126 | SPMT060205-PD XOMT060204-PD | FTKA02206S | TW07P |
| | 18025HP-06 | 18.0 | 25 | 34 | 57 | 56 | 130 | | | |
| | 18525HP-06 | 18.5 | 25 | 34 | 57 | 56 | 130 | | | |
| | 19025HP-06 | 19.0 | 25 | 34 | 60 | 56 | 133 | | | |
| | 19525HP-06 | 19.5 | 25 | 34 | 60 | 56 | 133 | | | |
| | 20025HP-07 | 20.0 | 25 | 34 | 63 | 56 | 138 | | | |
| | 20525HP-07 | 20.5 | 25 | 34 | 63 | 56 | 138 | SPMT07T208-PD XOMT07T205-PD | FTKA02565 | TW07S |
| | 21025HP-07 | 21.0 | 25 | 34 | 66 | 56 | 141 | | | |
| | 21525HP-07 | 21.5 | 25 | 34 | 66 | 56 | 141 | | | |
| | 22025HP-07 | 22.0 | 25 | 34 | 69 | 56 | 144 | | | |
| | 22525HP-07 | 22.5 | 25 | 34 | 69 | 56 | 144 | | | |
| | 23025HP-07 | 23 | 25 | 34 | 72 | 56 | 149 | | | |
| | 23525HP-07 | 23.5 | 25 | 34 | 72 | 56 | 149 | SPMT090308-PD XOMT090305-PD | FTKA0307 | TW09S |
| | 24032HP-09 | 24.0 | 32 | 44 | 75 | 60 | 157 | | | |
| | 24532HP-09 | 24.5 | 32 | 44 | 75 | 60 | 157 | | | |
| | 25032HP-09 | 25.0 | 32 | 44 | 78 | 60 | 160 | | | |
| | 25532HP-09 | 25.5 | 32 | 44 | 78 | 60 | 160 | | | |
| | 26032HP-09 | 26.0 | 32 | 44 | 81 | 60 | 163 | | | |
| | 26532HP-09 | 26.5 | 32 | 44 | 81 | 60 | 163 | | | |
| | 27032HP-09 | 27.0 | 32 | 44 | 84 | 60 | 167 | | | |
| | 27532HP-09 | 27.5 | 32 | 44 | 84 | 60 | 167 | | | |
| 28032HP-09 | 28.0 | 32 | 44 | 87 | 60 | 171 | | | | |
| 28532HP-09 | 28.5 | 32 | 44 | 87 | 60 | 171 | | | | |
| 29032HP-09 | 29.0 | 32 | 44 | 90 | 60 | 174 | | | | |
| 29532HP-09 | 29.5 | 32 | 44 | 90 | 60 | 174 | | | | |

Applicable inserts G05

KING DRILL(for through coolant system with a lathe)-4 D

New



(mm)

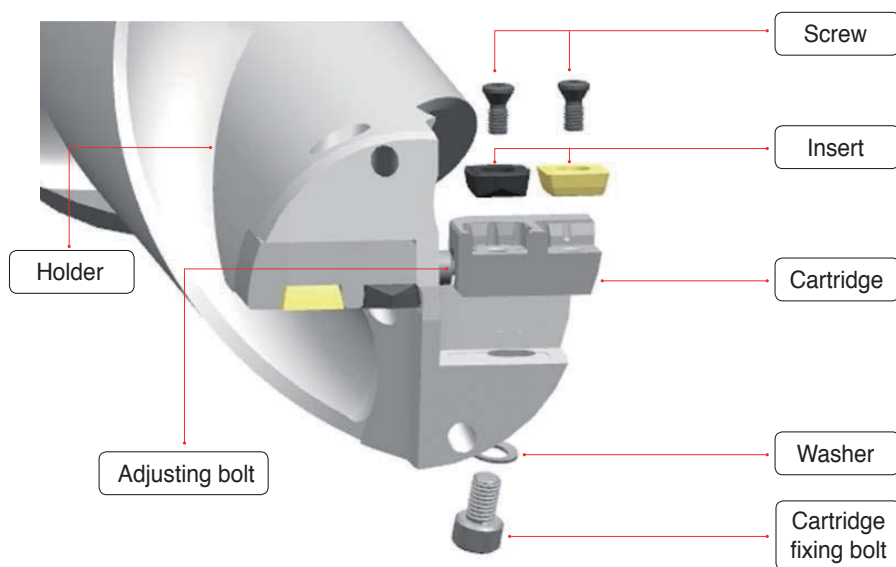
| Designation | $\varnothing D$ | $\varnothing d_1$ | $\varnothing d_2$ | l_1 | l_2 | L | Insert | Screw | Wrench |
|----------------|-----------------|-------------------|-------------------|-------|-------|-----|--------------------------------|--------------------------------|----------|
| K4D 13020HP-04 | 13.0 | 20 | 25 | 55 | 50 | 119 | SPMT040204-PD XOMT040204-PD | FTNA0204 | TW06P |
| | 14.0 | 20 | 25 | 59 | 50 | 124 | SPMT050204-PD XOMT050204-PD | | |
| 15020HP-05 | 15.0 | 20 | 25 | 63 | 50 | 129 | | SPMT060205-PD XOMT060204-PD | FTNA0204 |
| 16020HP-05 | 16.0 | 20 | 25 | 67 | 50 | 133 | | | |
| 17025HP-06 | 17.0 | 25 | 34 | 71 | 56 | 143 | SPMT07T208-PD XOMT07T205-PD | FTKA02206S | TW07P |
| 18025HP-06 | 18.0 | 25 | 34 | 75 | 56 | 148 | | | |
| 19025HP-06 | 19.0 | 25 | 34 | 79 | 56 | 152 | SPMT090308-PD XOMT090305-PD | FTKA02565 | TW07S |
| 20025HP-07 | 20.0 | 25 | 34 | 83 | 56 | 158 | | | |
| 21025HP-07 | 21.0 | 25 | 34 | 87 | 56 | 162 | FTKA0307 | TW09S | |
| 22025HP-07 | 22.0 | 25 | 34 | 91 | 56 | 166 | | | |
| 23025HP-07 | 23.0 | 25 | 34 | 95 | 56 | 172 | FTKA0307 | TW09S | |
| 24032HP-09 | 24.0 | 32 | 44 | 99 | 60 | 181 | | | |
| 25032HP-09 | 25.0 | 32 | 44 | 103 | 60 | 185 | FTKA0307 | TW09S | |
| 26032HP-09 | 26.0 | 32 | 44 | 107 | 60 | 189 | | | |
| 27032HP-09 | 27.0 | 32 | 44 | 111 | 60 | 194 | FTKA0307 | TW09S | |
| 28032HP-09 | 28.0 | 32 | 44 | 115 | 60 | 199 | | | |
| 29032HP-09 | 29.0 | 32 | 44 | 119 | 60 | 203 | FTKA0307 | TW09S | |

Applicable inserts G05

High rigidity drill produces cost efficiency due to cartridge replacement.

KING DRILL (for large diameter drilling) *New*

- Cartridge type for $\varnothing 61\sim\varnothing 100$ drilling.
- Peripheral cartridge can adjust the drilling diameter within 5mm.
- Easy to adjust drilling diameter with adjusting bolt.



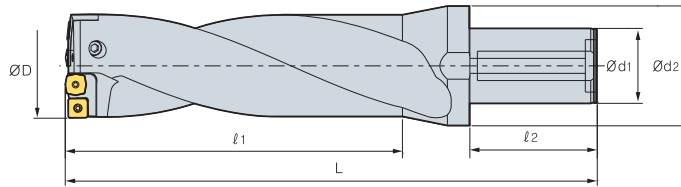
Adjustment of drill diameter

| Adjustment(mm) \varnothing (mm) | Adjusting Washer | |
|--------------------------------------|---------------------|-----------|
| | Designation | Width(mm) |
| 1 | WA0305 | 0.5 |
| 2 | WA0310 | 1.0 |
| 3 | WA0305 + WA0310 | 1.5 |
| 4 | WA0310 x 2 | 2.0 |
| 5 | WA0305 + WA0310 x 2 | 2.5 |

* Adjusting washer adjusts the drilling diameter within 5mm.



KING DRILL(for large diameter drilling) *New*



(mm)

| Designation | øD | ød1 | ød2 | ℓ1 | ℓ2 | L | Cartridge | | Screw | Wrench | |
|-------------|------------|--------|-----|----|-----|----|-----------|-----------|-----------|-----------|----------|
| | | | | | | | Internal | External | | | |
| K2D | 616550-11 | 61~65 | 50 | 80 | 130 | 85 | 260 | KDC6165C | KDC6165P | FTKA03508 | TW15S |
| | 657050-13 | 65~70 | 50 | 88 | 140 | 85 | 270 | KDC6570C | KDC6570P | FTKA0410 | TW15S |
| | 707550-13 | 70~75 | 50 | 88 | 150 | 85 | 280 | KDC7075C | KDC7075P | FTKA0410 | TW15S |
| | 758050-13 | 75~80 | 50 | 88 | 160 | 85 | 290 | KDC7580C | KDC7580P | FTKA0410 | TW15S |
| | 808550-15 | 80~85 | 50 | 88 | 170 | 85 | 300 | KDC8085C | KDC8085P | FTNC04511 | TW20S |
| | 859050-15 | 85~90 | 50 | 95 | 180 | 85 | 310 | KDC8590C | KDC8590P | FTNC04511 | TW20S |
| | 909550-15 | 90~95 | 50 | 95 | 190 | 85 | 320 | KDC9095C | KDC9095P | FTNC04511 | TW20S |
| | 9510050-18 | 95~100 | 50 | 95 | 200 | 85 | 330 | KDC95100C | KDC95100P | FTNA0511 | TW20-100 |
| K3D | 616550-11 | 61~65 | 50 | 80 | 195 | 85 | 325 | KDC6165C | KDC6165P | FTKA03508 | TW15S |
| | 657050-13 | 65~70 | 50 | 88 | 210 | 85 | 340 | KDC6570C | KDC6570P | FTKA0410 | TW15S |
| | 707550-13 | 70~75 | 50 | 88 | 225 | 85 | 355 | KDC7075C | KDC7075P | FTKA0410 | TW15S |
| | 758050-13 | 75~80 | 50 | 88 | 240 | 85 | 370 | KDC7580C | KDC7580P | FTKA0410 | TW15S |
| | 808550-15 | 80~85 | 50 | 88 | 255 | 85 | 385 | KDC8085C | KDC8085P | FTNC04511 | TW20S |
| | 859050-15 | 85~90 | 50 | 95 | 270 | 85 | 400 | KDC8590C | KDC8590P | FTNC04511 | TW20S |
| | 909550-15 | 90~95 | 50 | 95 | 285 | 85 | 415 | KDC9095C | KDC9095P | FTNC04511 | TW20S |
| | 9510050-18 | 95~100 | 50 | 95 | 300 | 85 | 430 | KDC95100C | KDC95100P | FTNA0511 | TW20-100 |
| K4D | 616550-11 | 61~65 | 50 | 80 | 260 | 85 | 390 | KDC6165C | KDC6165P | FTKA03508 | TW15S |
| | 657050-13 | 65~70 | 50 | 88 | 280 | 85 | 410 | KDC6570C | KDC6570P | FTKA0410 | TW15S |
| | 707550-13 | 70~75 | 50 | 88 | 300 | 85 | 430 | KDC7075C | KDC7075P | FTKA0410 | TW15S |
| | 758050-13 | 75~80 | 50 | 88 | 320 | 85 | 450 | KDC7580C | KDC7580P | FTKA0410 | TW15S |
| | 808550-15 | 80~85 | 50 | 88 | 340 | 85 | 470 | KDC8085C | KDC8085P | FTNC04511 | TW20S |
| | 859050-15 | 85~90 | 50 | 95 | 360 | 85 | 490 | KDC8590C | KDC8590P | FTNC04511 | TW20S |
| | 909550-15 | 90~95 | 50 | 95 | 380 | 85 | 510 | KDC9095C | KDC9095P | FTNC04511 | TW20S |
| | 9510050-18 | 95~100 | 50 | 95 | 400 | 85 | 530 | KDC95100C | KDC95100P | FTNA0511 | TW20-100 |

Applicable inserts G05

Parts

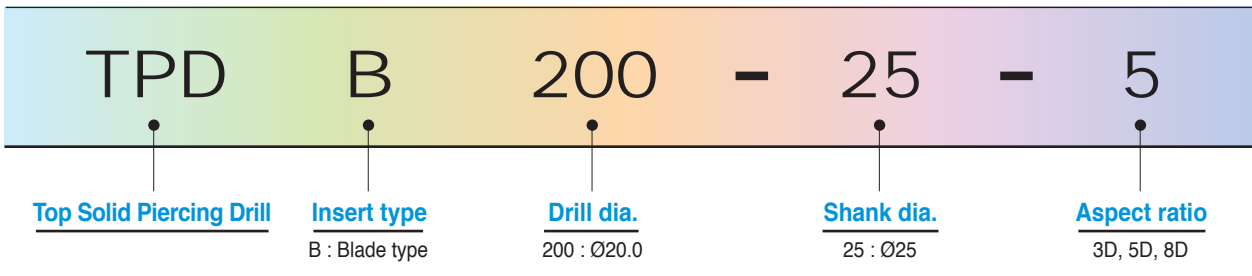
| Cartridge | | Range (Ø) | Insert | | | | Screw | Wrench |
|-----------|-----------|-----------|------------------|----------|------------------|----------|-----------|----------|
| Internal | External | | Designation | Quantity | Designation | Quantity | | |
| KDC6165C | KDC6165P | 61 ~ 65 | XOM(E)T11T306-□□ | 2 | SPM(E)T11T308-□□ | 2 | FTKA03508 | TW15S |
| KDC6570C | KDC6570P | 65 ~ 70 | XOM(E)T130406-□□ | 2 | SPM(E)T130410-□□ | 2 | FTKA0410 | TW15S |
| KDC7075C | KDC7075P | 70 ~ 75 | XOM(E)T130406-□□ | 2 | SPM(E)T130410-□□ | 2 | FTKA0410 | TW15S |
| KDC7580C | KDC7580P | 75 ~ 80 | XOM(E)T130406-□□ | 2 | SPM(E)T130410-□□ | 2 | FTKA0410 | TW15S |
| KDC8085C | KDC8085P | 80 ~ 85 | XOM(E)T15M508-□□ | 2 | SPM(E)T15M510-□□ | 2 | FTNC04511 | TW20S |
| KDC8590C | KDC8590P | 85 ~ 90 | XOM(E)T15M508-□□ | 2 | SPM(E)T15M510-□□ | 2 | FTNC04511 | TW20S |
| KDC9095C | KDC9095P | 90 ~ 95 | XOM(E)T15M508-□□ | 2 | SPM(E)T15M510-□□ | 2 | FTNC04511 | TW20S |
| KDC95100C | KDC95100P | 95 ~ 100 | XOM(E)T180508-□□ | 2 | SPM(E)T180510-□□ | 2 | FTNA0511 | TW20-100 |

High precision grinding and superior clamping precision with auto-centering system

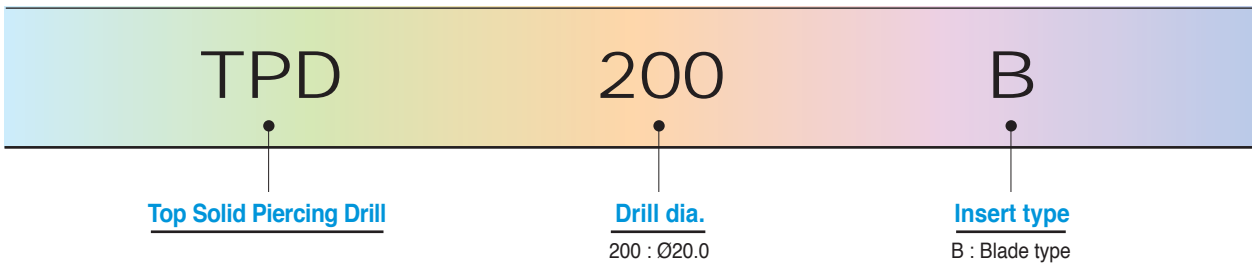
TPDB *New*

- High precision clamping system - High precision grinding and superior clamping precision with auto-centering system.
- Screw on clamping system - Easy clamping system of TPDB insert.
- Sharp cutting edge - Improved chip evacuation, low cutting load, longer tool life with ultra-fine substrate and exclusive coating layer.
- Holder with excellent durability - Holder with high rigidity and superb wear resistance due to special surface treatment.

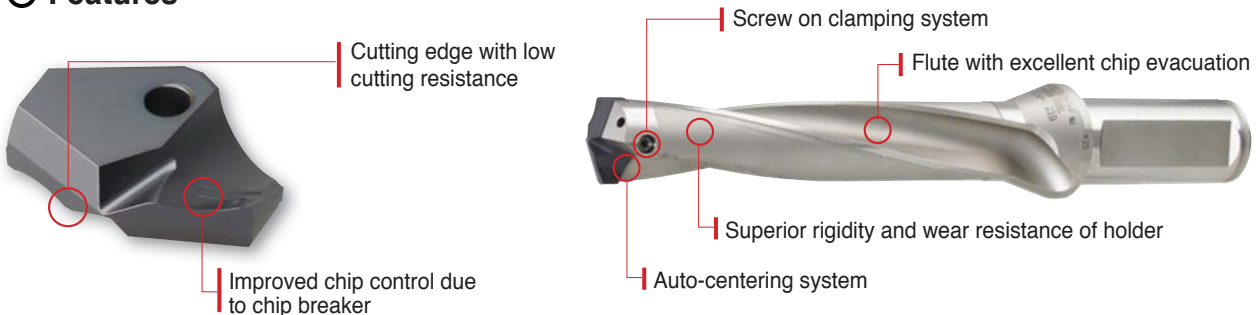
Code system of holder



Code system of Insert

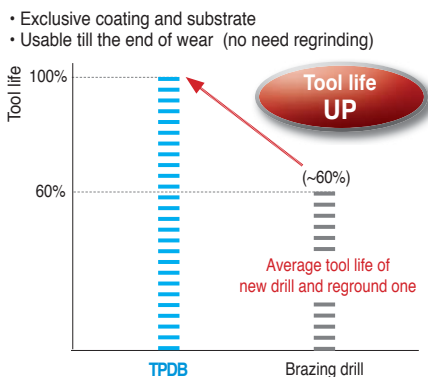


Features

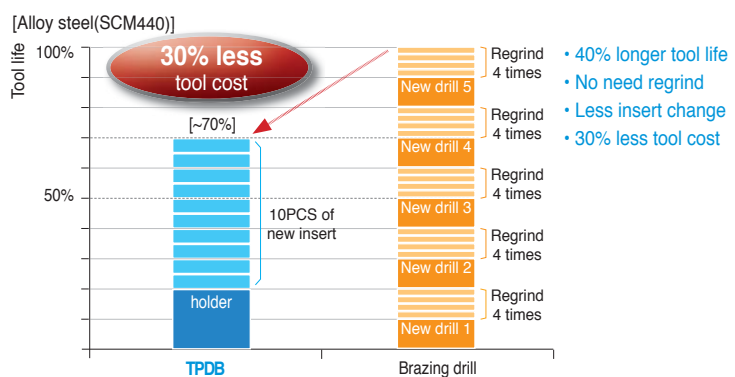


Tool Cost

Comparison of 1 insert tool life



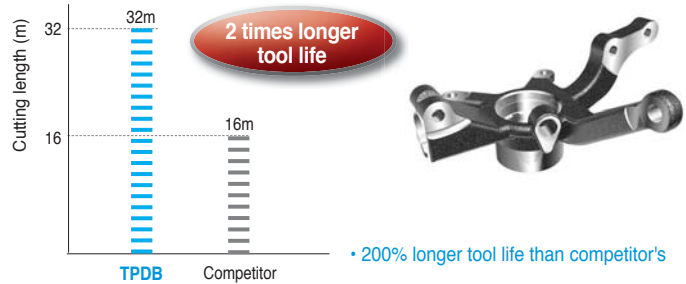
Comparison of tool cost when machining 1000PCS of workpiece



Application example

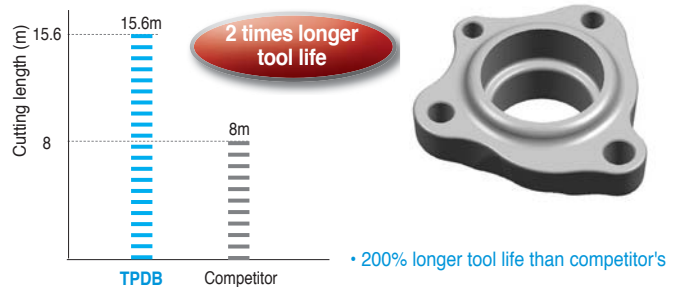
Part of automobile

- **Workpiece** : GCD 500
- **Cutting condition** : $vc(m/min)=98$ $fn(mm/rev)=0.31$,
 $ap(mm)=40$ Inner coolant system
- **Tools** : Insert TPDB195B(PC5300)
Holder TPDB195-25-3
- **Machine** : MCT (vertical)



Part of heavy equipment

- **Workpiece** : Hot Forged Steel
- **Cutting condition** : $vc(m/min)=85$ $fn(mm/rev)=0.2$,
 $ap(mm)=20$ Inner coolant system
- **Tools** : Insert TPDB210B(PC5300)
Holder TPDB210-25-3
- **Machine** : MCT (vertical)



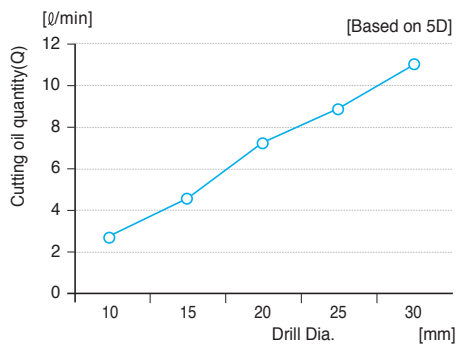
Recommended Cutting Condition

| Workpiece | | | Grade | vc | fn(aspect ratio=3D~5D) | | | |
|-----------|----------------------|-------------------------------------|---------------|---------|---------------------------------|-----------|-----------|-----------|
| ISO | Workpiece | HB | | | Feed(mm/rev) per drill Dia.(mm) | | | |
| | | | | m/min | 10~15.9 | 16~24.9 | 25~29.9 | |
| P | Carbon steel | Low carbon steel | 80-120 | PC5300 | 110(80~140) | 0.15~0.30 | 0.20~0.35 | 0.25~0.40 |
| | | High carbon steel | 180~280 | PC5300 | 100(70~130) | 0.15~0.30 | 0.20~0.35 | 0.25~0.40 |
| | Alloy steel | Low alloy steel | 140~260 | PC5300 | 110(80~140) | 0.18~0.35 | 0.23~0.38 | 0.28~0.43 |
| | | Low pre-hardened steel | 200~400 | PC5300 | 75(50~100) | 0.18~0.35 | 0.23~0.38 | 0.28~0.43 |
| | | High alloy steel | 50-260 | PC5300 | 70(50~90) | 0.18~0.30 | 0.20~0.35 | 0.25~0.40 |
| | | High pre-hardened steel | 220~450 | PC5300 | 60(40~80) | 0.18~0.30 | 0.20~0.35 | 0.25~0.40 |
| M | Stainless Steel | Austenite series | 135-275 Ni>8% | PC5300 | 50(30~70) | 0.13~0.25 | 0.15~0.30 | 0.17~0.33 |
| | | Ferrite series Martensite series | 135-275 | PC5300 | 55(40~70) | 0.13~0.25 | 0.15~0.30 | 0.17~0.33 |
| K | Cast Iron | Gray cast iron | 150-230 | PC 5300 | 110(80~140) | 0.18~0.35 | 0.20~0.40 | 0.25~0.45 |
| | | Ductile cast iron | 160~260 | PC 5300 | 100(70~130) | 0.18~0.35 | 0.20~0.40 | 0.25~0.45 |
| S | Heat Resisting Steel | Ni pre-hardened steel | 130-400 | PC5300 | 40(20~60) | 0.10~0.20 | 0.12~0.22 | 0.13~0.25 |
| | | Ti pre-hardened steel | 130-400 | PC5300 | 40(20~60) | 0.10~0.20 | 0.12~0.22 | 0.13~0.25 |
| | | High hardened steel | 400~ | PC5300 | 35(20~50) | 0.10~0.20 | 0.12~0.22 | 0.13~0.25 |

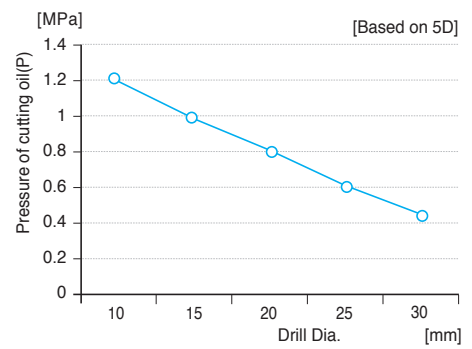
- In case of 8D, reduce the cutting conditions to 40~50% or machine the beginning of hole first.(1.5D)
- In case of interrupted machining, reduce the feed to 30~50% machining around the interrupted part.

Technical information

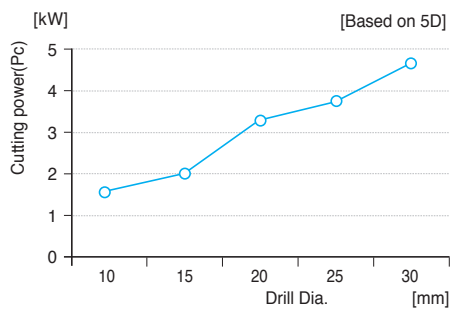
Cutting oil quantity



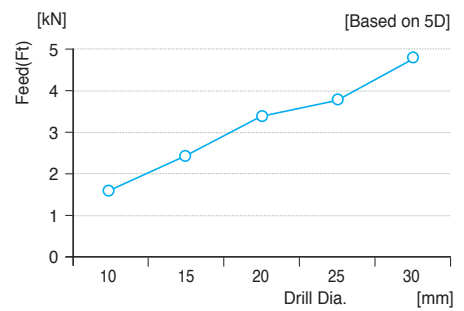
Pressure of cutting oil



Cutting power



Feed



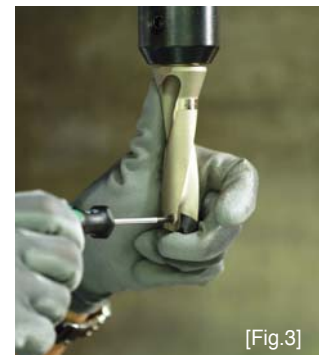
How to clamp a TPDB insert

Clamping an insert on a holder



- Put an insert in the holder.
- As the Fig.1, clamp the insert while pushing it to the V shaped groove of the holder.
- Screw the insert.

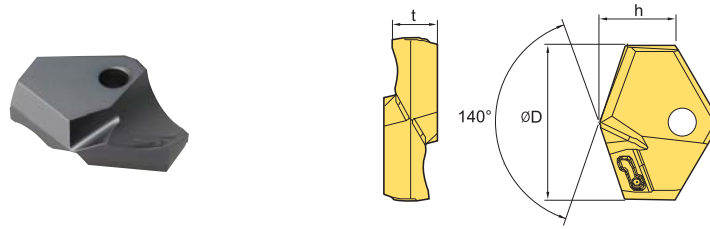
Changing an insert on the machine



- Separate the insert from the holder.
- As the Fig.2, clean the insert seat
- Place the insert to the mounting seat.
- As the Fig.3, clamp the insert while pushing it to the V shaped groove of the holder.



TPDB Insert *New*



| Designation | | Grade | øD | h | t |
|-------------|-----------|-------------|-------------|------|-----|
| TPD | 100B~109B | PC5300 | 10.0 ~ 10.9 | 5.5 | 3.5 |
| | 110B~119B | PC5300 | 11.0 ~ 11.9 | 5.8 | 3.5 |
| | 120B~129B | PC5300 | 12.0 ~ 12.9 | 6.3 | 3.5 |
| | 130B~139B | PC5300 | 13.0 ~ 13.9 | 6.5 | 4.0 |
| | 140B~149B | PC5300 | 14.0 ~ 14.9 | 6.8 | 4.0 |
| | 150B~159B | PC5300 | 15.0 ~ 15.9 | 7.0 | 4.0 |
| | 160B~169B | PC5300 | 16.0 ~ 16.9 | 7.7 | 5.5 |
| | 170B~179B | PC5300 | 17.0 ~ 17.9 | 7.9 | 5.5 |
| | 180B~189B | PC5300 | 18.0 ~ 18.9 | 8.1 | 6.0 |
| | 190B~199B | PC5300 | 19.0 ~ 19.9 | 8.3 | 6.0 |
| | 200B~209B | PC5300 | 20.0 ~ 20.9 | 9.7 | 6.5 |
| | 210B~219B | PC5300 | 21.0 ~ 21.9 | 9.4 | 6.5 |
| | 220B~229B | PC5300 | 22.0 ~ 22.9 | 9.6 | 7.0 |
| | 230B~239B | PC5300 | 23.0 ~ 23.9 | 9.8 | 7.0 |
| | 240B~249B | PC5300 | 24.0 ~ 24.9 | 10.7 | 7.5 |
| | 250B~259B | PC5300 | 25.0 ~ 25.9 | 10.9 | 7.5 |
| | 260B~269B | PC5300 | 26.0 ~ 26.9 | 11.0 | 8.5 |
| | 270B~279B | PC5300 | 27.0 ~ 27.9 | 11.8 | 8.5 |
| | 280B~289B | PC5300 | 28.0 ~ 28.9 | 12.6 | 9.5 |
| | 290B~299B | PC5300 | 29.0 ~ 29.9 | 12.9 | 9.5 |
| 300B~309B | PC5300 | 30.0 ~ 30.9 | 13 | 10 | |
| 310B~319B | PC5300 | 31.0 ~ 31.9 | 13.3 | 10 | |
| 320B~329B | PC5300 | 32.0 ~ 32.9 | 13.5 | 10 | |

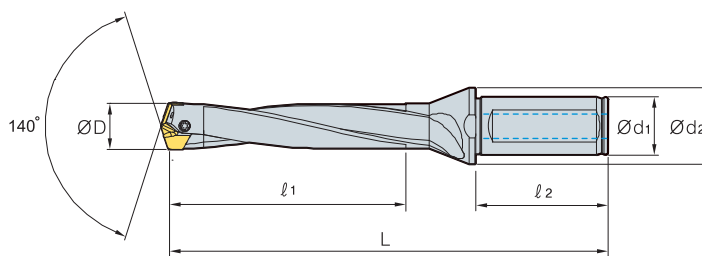
(mm)

Parts

| Designation | | Drill Dia. | Screw | Wrench | Torque (NM) |
|-------------|-----------|-------------|-----------|--------|-------------|
| TPD | 100B~129B | 10.0 ~ 12.9 | FTNB0209 | TW06P | 0.4 |
| | 130B~149B | 13.0 ~ 14.9 | FTNB02512 | TW07S | 0.8 |
| | 150B~179B | 15.0 ~ 17.9 | FTNB02514 | TW07S | 0.8 |
| | 180B~199B | 18.0 ~ 19.9 | FTNB0316 | TW09S | 1.2 |
| | 200B~239B | 20.0 ~ 23.9 | FTNB0319 | TW09S | 1.2 |
| | 240B~259B | 24.0 ~ 25.9 | FTNB03522 | TW15S | 3 |
| | 260B~279B | 26.0 ~ 27.9 | FTNB03524 | TW15S | 3 |
| | 280B~299B | 28.0 ~ 29.9 | FTNB0426 | TW15S | 3 |
| | 300B~329B | 30.0 ~ 32.9 | FTNB0528 | TW20S | 4 |

(mm)

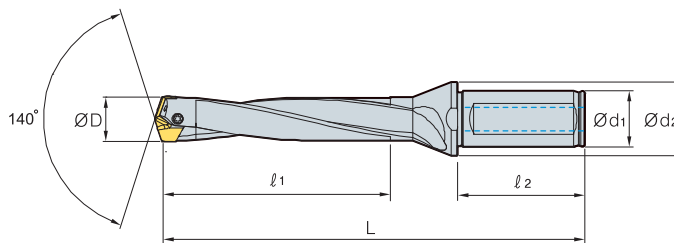
TPDB-3D *New*



(mm)

| Designation | ØD | Ød ₁ | Ød ₂ | ℓ ₁ | ℓ ₂ | L | Insert |
|---------------|-------------|-----------------|-----------------|----------------|----------------|-----|----------------|
| TPDB 100-16-3 | 10.0 ~ 10.4 | 16 | 20 | 30.0 | 48 | 95 | TPD100B ~ 104B |
| 105-16-3 | 10.5 ~ 10.9 | 16 | 20 | 31.5 | 48 | 96 | TPD105B ~ 109B |
| 110-16-3 | 11.0 ~ 11.4 | 16 | 20 | 33.0 | 48 | 98 | TPD110B ~ 114B |
| 115-16-3 | 11.5 ~ 11.9 | 16 | 20 | 34.5 | 48 | 99 | TPD115B ~ 119B |
| 120-16-3 | 12.0 ~ 12.4 | 16 | 20 | 36.0 | 48 | 102 | TPD120B ~ 124B |
| 125-16-3 | 12.5 ~ 12.9 | 16 | 20 | 37.5 | 48 | 104 | TPD125B ~ 129B |
| 130-16-3 | 13.0 ~ 13.4 | 16 | 20 | 39.0 | 48 | 107 | TPD130B ~ 134B |
| 135-16-3 | 13.5 ~ 13.9 | 16 | 20 | 40.5 | 48 | 109 | TPD135B ~ 139B |
| 140-16-3 | 14.0 ~ 14.4 | 16 | 20 | 42.0 | 48 | 111 | TPD140B ~ 144B |
| 145-16-3 | 14.5 ~ 14.9 | 16 | 20 | 43.5 | 48 | 114 | TPD145B ~ 149B |
| 150-20-3 | 15.0 ~ 15.4 | 20 | 25 | 45.0 | 50 | 118 | TPD150B ~ 154B |
| 155-20-3 | 15.5 ~ 15.9 | 20 | 25 | 46.5 | 50 | 120 | TPD155B ~ 159B |
| 160-20-3 | 16.0 ~ 16.4 | 20 | 25 | 48.0 | 50 | 122 | TPD160B ~ 164B |
| 165-20-3 | 16.5 ~ 16.9 | 20 | 25 | 49.5 | 50 | 124 | TPD165B ~ 169B |
| 170-20-3 | 17.0 ~ 17.4 | 20 | 25 | 51.0 | 50 | 127 | TPD170B ~ 174B |
| 175-20-3 | 17.5 ~ 17.9 | 20 | 25 | 52.5 | 50 | 129 | TPD175B ~ 179B |
| 180-25-3 | 18.0 ~ 18.4 | 25 | 33 | 54.0 | 56 | 137 | TPD180B ~ 184B |
| 185-25-3 | 18.5 ~ 18.9 | 25 | 33 | 55.5 | 56 | 139 | TPD185B ~ 189B |
| 190-25-3 | 19.0 ~ 19.4 | 25 | 33 | 57.0 | 56 | 142 | TPD190B ~ 194B |
| 195-25-3 | 19.5 ~ 19.9 | 25 | 33 | 58.5 | 56 | 144 | TPD195B ~ 199B |
| 200-25-3 | 20.0 ~ 20.4 | 25 | 33 | 60.0 | 56 | 146 | TPD200B ~ 204B |
| 205-25-3 | 20.5 ~ 20.9 | 25 | 33 | 61.5 | 56 | 148 | TPD205B ~ 209B |
| 210-25-3 | 21.0 ~ 21.4 | 25 | 33 | 63.0 | 60 | 151 | TPD210B ~ 214B |
| 215-25-3 | 21.5 ~ 21.9 | 25 | 33 | 64.5 | 60 | 153 | TPD215B ~ 219B |
| 220-25-3 | 22.0 ~ 22.4 | 25 | 33 | 66.0 | 60 | 155 | TPD220B ~ 224B |
| 225-25-3 | 22.5 ~ 22.9 | 25 | 33 | 67.5 | 60 | 157 | TPD225B ~ 229B |
| 230-25-3 | 23.0 ~ 23.4 | 25 | 33 | 69.0 | 60 | 160 | TPD230B ~ 234B |
| 235-25-3 | 23.5 ~ 23.9 | 25 | 33 | 70.5 | 60 | 162 | TPD235B ~ 239B |
| 240-32-3 | 24.0 ~ 24.4 | 32 | 43 | 72.0 | 60 | 168 | TPD240B ~ 244B |
| 245-32-3 | 24.5 ~ 24.9 | 32 | 43 | 73.5 | 60 | 170 | TPD245B ~ 249B |
| 250-32-3 | 25.0 ~ 25.4 | 32 | 43 | 75.0 | 60 | 173 | TPD250B ~ 254B |
| 255-32-3 | 25.5 ~ 25.9 | 32 | 43 | 76.5 | 60 | 175 | TPD255B ~ 259B |
| 260-32-3 | 26.0 ~ 26.9 | 32 | 43 | 78.0 | 60 | 177 | TPD260B ~ 269B |
| 270-32-3 | 27.0 ~ 27.9 | 32 | 43 | 81.0 | 60 | 182 | TPD270B ~ 279B |
| 280-32-3 | 28.0 ~ 28.9 | 32 | 43 | 84.0 | 60 | 186 | TPD280B ~ 289B |
| 290-32-3 | 29.0 ~ 29.9 | 32 | 43 | 87.0 | 60 | 191 | TPD290B ~ 299B |
| 300-32-3 | 30.0 ~ 30.9 | 32 | 43 | 90.0 | 60 | 194 | TPD300B ~ 309B |
| 310-32-3 | 31.0 ~ 31.9 | 32 | 43 | 93.0 | 60 | 199 | TPD310B ~ 319B |
| 320-32-3 | 32.0 ~ 32.9 | 32 | 43 | 96.0 | 60 | 201 | TPD320B ~ 329B |

TPDB-5D *New*

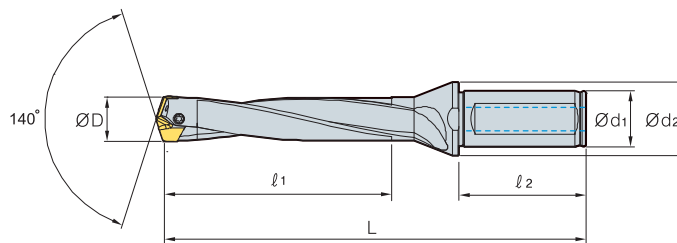


(mm)

| Designation | ØD | Ød ₁ | Ød ₂ | ℓ ₁ | ℓ ₂ | L | Insert |
|---------------|-------------|-----------------|-----------------|----------------|----------------|-----|----------------|
| TPDB 100-16-5 | 10.0 ~ 10.4 | 16 | 20 | 50.0 | 48 | 115 | TPD100B ~ 104B |
| 105-16-5 | 10.5 ~ 10.9 | 16 | 20 | 52.5 | 48 | 117 | TPD105B ~ 109B |
| 110-16-5 | 11.0 ~ 11.4 | 16 | 20 | 55.0 | 48 | 120 | TPD110B ~ 114B |
| 115-16-5 | 11.5 ~ 11.9 | 16 | 20 | 57.5 | 48 | 123 | TPD115B ~ 119B |
| 120-16-5 | 12.0 ~ 12.4 | 16 | 20 | 60.0 | 48 | 126 | TPD120B ~ 124B |
| 125-16-5 | 12.5 ~ 12.9 | 16 | 20 | 62.5 | 48 | 129 | TPD125B ~ 129B |
| 130-16-5 | 13.0 ~ 13.4 | 16 | 20 | 65.0 | 48 | 133 | TPD130B ~ 134B |
| 135-16-5 | 13.5 ~ 13.9 | 16 | 20 | 67.5 | 48 | 136 | TPD135B ~ 139B |
| 140-16-5 | 14.0 ~ 14.4 | 16 | 20 | 70.0 | 48 | 139 | TPD140B ~ 144B |
| 145-16-5 | 14.5 ~ 14.9 | 16 | 20 | 72.5 | 48 | 143 | TPD145B ~ 149B |
| 150-20-5 | 15.0 ~ 15.4 | 20 | 25 | 75.0 | 50 | 148 | TPD150B ~ 154B |
| 155-20-5 | 15.5 ~ 15.9 | 20 | 25 | 77.5 | 50 | 151 | TPD155B ~ 159B |
| 160-20-5 | 16.0 ~ 16.4 | 20 | 25 | 80.0 | 50 | 154 | TPD160B ~ 164B |
| 165-20-5 | 16.5 ~ 16.9 | 20 | 25 | 82.5 | 50 | 157 | TPD165B ~ 169B |
| 170-20-5 | 17.0 ~ 17.4 | 20 | 25 | 85.0 | 50 | 161 | TPD170B ~ 174B |
| 175-20-5 | 17.5 ~ 17.9 | 20 | 25 | 87.5 | 50 | 164 | TPD175B ~ 179B |
| 180-25-5 | 18.0 ~ 18.4 | 25 | 33 | 90.0 | 56 | 173 | TPD180B ~ 184B |
| 185-25-5 | 18.5 ~ 18.9 | 25 | 33 | 92.5 | 56 | 176 | TPD185B ~ 189B |
| 190-25-5 | 19.0 ~ 19.4 | 25 | 33 | 95.0 | 56 | 180 | TPD190B ~ 194B |
| 195-25-5 | 19.5 ~ 19.9 | 25 | 33 | 97.5 | 56 | 183 | TPD195B ~ 199B |
| 200-25-5 | 20.0 ~ 20.4 | 25 | 33 | 100.0 | 56 | 186 | TPD200B ~ 204B |
| 205-25-5 | 20.5 ~ 20.9 | 25 | 33 | 102.5 | 56 | 189 | TPD205B ~ 209B |
| 210-25-5 | 21.0 ~ 21.4 | 25 | 33 | 105.0 | 60 | 193 | TPD210B ~ 214B |
| 215-25-5 | 21.5 ~ 21.9 | 25 | 33 | 107.5 | 60 | 196 | TPD215B ~ 219B |
| 220-25-5 | 22.0 ~ 22.4 | 25 | 33 | 110.0 | 60 | 199 | TPD220B ~ 224B |
| 225-25-5 | 22.5 ~ 22.9 | 25 | 33 | 112.5 | 60 | 202 | TPD225B ~ 229B |
| 230-25-5 | 23.0 ~ 23.4 | 25 | 33 | 115.0 | 60 | 206 | TPD230B ~ 234B |
| 235-25-5 | 23.5 ~ 23.9 | 25 | 33 | 117.5 | 60 | 209 | TPD235B ~ 239B |
| 240-32-5 | 24.0 ~ 24.4 | 32 | 43 | 120.0 | 60 | 216 | TPD240B ~ 244B |
| 245-32-5 | 24.5 ~ 24.9 | 32 | 43 | 122.5 | 60 | 219 | TPD245B ~ 249B |
| 250-32-5 | 25.0 ~ 25.4 | 32 | 43 | 125.0 | 60 | 223 | TPD250B ~ 254B |
| 255-32-5 | 25.5 ~ 25.9 | 32 | 43 | 127.5 | 60 | 226 | TPD255B ~ 259B |
| 260-32-5 | 26.0 ~ 26.9 | 32 | 43 | 130.0 | 60 | 229 | TPD260B ~ 269B |
| 270-32-5 | 27.0 ~ 27.9 | 32 | 43 | 135.0 | 60 | 236 | TPD270B ~ 279B |
| 280-32-5 | 28.0 ~ 28.9 | 32 | 43 | 140.0 | 60 | 242 | TPD280B ~ 289B |
| 290-32-5 | 29.0 ~ 29.9 | 32 | 43 | 145.0 | 60 | 249 | TPD290B ~ 299B |
| 300-32-5 | 30.0 ~ 30.9 | 32 | 43 | 150.0 | 60 | 254 | TPD300B ~ 309B |
| 310-32-5 | 31.0 ~ 31.9 | 32 | 43 | 155.0 | 60 | 261 | TPD310B ~ 319B |
| 320-32-5 | 32.0 ~ 32.9 | 32 | 43 | 160.0 | 60 | 265 | TPD320B ~ 329B |

Applicable inserts G30

TPDB-8D *New*



(mm)

| Designation | ØD | Ød1 | Ød2 | ℓ1 | ℓ2 | L | Insert |
|---------------|-------------|-----|-----|-----|----|-------|----------------|
| TPDB 100-16-8 | 10.0 ~ 10.4 | 16 | 20 | 80 | 48 | 145.0 | TPD100B ~ 104B |
| 105-16-8 | 10.5 ~ 10.9 | 16 | 20 | 84 | 48 | 149.0 | TPD105B ~ 109B |
| 110-16-8 | 11.0 ~ 11.4 | 16 | 20 | 88 | 48 | 153.0 | TPD110B ~ 114B |
| 115-16-8 | 11.5 ~ 11.9 | 16 | 20 | 92 | 48 | 157.0 | TPD115B ~ 119B |
| 120-16-8 | 12.0 ~ 12.4 | 16 | 20 | 96 | 48 | 162.0 | TPD120B ~ 124B |
| 125-16-8 | 12.5 ~ 12.9 | 16 | 20 | 100 | 48 | 166.5 | TPD125B ~ 129B |
| 130-16-8 | 13.0 ~ 13.4 | 16 | 20 | 104 | 48 | 172.0 | TPD130B ~ 134B |
| 135-16-8 | 13.5 ~ 13.9 | 16 | 20 | 108 | 48 | 176.5 | TPD135B ~ 139B |
| 140-16-8 | 14.0 ~ 14.4 | 16 | 20 | 112 | 48 | 181.0 | TPD140B ~ 144B |
| 145-16-8 | 14.5 ~ 14.9 | 16 | 20 | 116 | 48 | 186.5 | TPD145B ~ 149B |
| 150-20-8 | 15.0 ~ 15.4 | 20 | 25 | 120 | 50 | 193.0 | TPD150B ~ 154B |
| 155-20-8 | 15.5 ~ 15.9 | 20 | 25 | 124 | 50 | 197.5 | TPD155B ~ 159B |
| 160-20-8 | 16.0 ~ 16.4 | 20 | 25 | 128 | 50 | 202.0 | TPD160B ~ 164B |
| 165-20-8 | 16.5 ~ 16.9 | 20 | 25 | 132 | 50 | 206.5 | TPD165B ~ 169B |
| 170-20-8 | 17.0 ~ 17.4 | 20 | 25 | 136 | 50 | 212.0 | TPD170B ~ 174B |
| 175-20-8 | 17.5 ~ 17.9 | 20 | 25 | 140 | 50 | 216.5 | TPD175B ~ 179B |
| 180-25-8 | 18.0 ~ 18.4 | 25 | 33 | 144 | 56 | 227.0 | TPD180B ~ 184B |
| 185-25-8 | 18.5 ~ 18.9 | 25 | 33 | 148 | 56 | 231.5 | TPD185B ~ 189B |
| 190-25-8 | 19.0 ~ 19.4 | 25 | 33 | 152 | 56 | 237.0 | TPD190B ~ 194B |
| 195-25-8 | 19.5 ~ 19.9 | 25 | 33 | 156 | 56 | 241.5 | TPD195B ~ 199B |
| 200-25-8 | 20.0 ~ 20.4 | 25 | 33 | 160 | 56 | 246.0 | TPD200B ~ 204B |
| 205-25-8 | 20.5 ~ 20.9 | 25 | 33 | 164 | 56 | 250.5 | TPD205B ~ 209B |
| 210-25-8 | 21.0 ~ 21.4 | 25 | 33 | 168 | 60 | 256.0 | TPD210B ~ 214B |
| 215-25-8 | 21.5 ~ 21.9 | 25 | 33 | 172 | 60 | 260.5 | TPD215B ~ 219B |
| 220-25-8 | 22.0 ~ 22.4 | 25 | 33 | 176 | 60 | 265.0 | TPD220B ~ 224B |
| 225-25-8 | 22.5 ~ 22.9 | 25 | 33 | 180 | 60 | 269.5 | TPD225B ~ 229B |
| 230-25-8 | 23.0 ~ 23.4 | 25 | 33 | 184 | 60 | 275.0 | TPD230B ~ 234B |
| 235-25-8 | 23.5 ~ 23.9 | 25 | 33 | 188 | 60 | 279.5 | TPD235B ~ 239B |
| 240-32-8 | 24.0 ~ 24.4 | 32 | 43 | 192 | 60 | 288.0 | TPD240B ~ 244B |
| 245-32-8 | 24.5 ~ 24.9 | 32 | 43 | 196 | 60 | 292.5 | TPD245B ~ 249B |
| 250-32-8 | 25.0 ~ 25.4 | 32 | 43 | 200 | 60 | 298.0 | TPD250B ~ 254B |
| 255-32-8 | 25.5 ~ 25.9 | 32 | 43 | 204 | 60 | 302.5 | TPD255B ~ 259B |
| 260-32-8 | 26.0 ~ 26.9 | 32 | 43 | 208 | 60 | 307.0 | TPD260B ~ 269B |
| 270-32-8 | 27.0 ~ 27.9 | 32 | 43 | 216 | 60 | 317.0 | TPD270B ~ 279B |
| 280-32-8 | 28.0 ~ 28.9 | 32 | 43 | 224 | 60 | 326.0 | TPD280B ~ 289B |
| 290-32-8 | 29.0 ~ 29.9 | 32 | 43 | 232 | 60 | 336.0 | TPD290B ~ 299B |
| 300-32-8 | 30.0 ~ 30.9 | 32 | 43 | 240 | 60 | 344.0 | TPD300B ~ 309B |
| 310-32-8 | 31.0 ~ 31.9 | 32 | 43 | 248 | 60 | 354.0 | TPD310B ~ 319B |
| 320-32-8 | 32.0 ~ 32.9 | 32 | 43 | 256 | 60 | 361.0 | TPD320B ~ 329B |

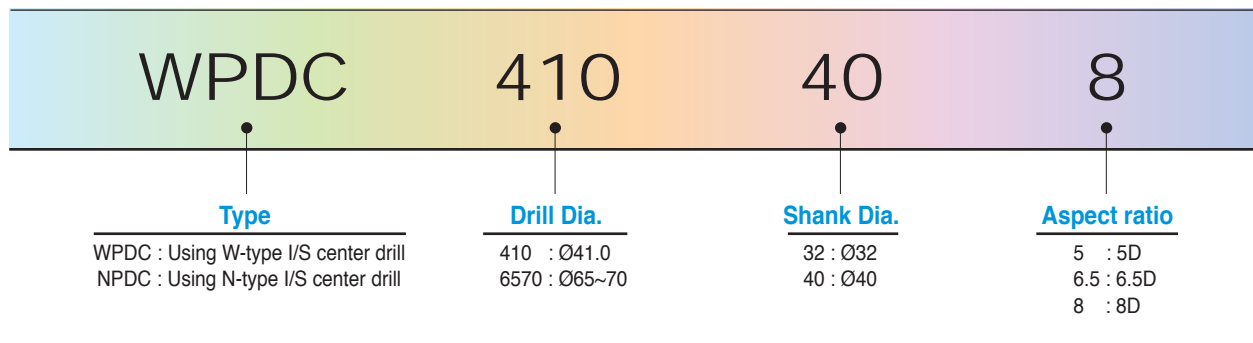
Applicable inserts G30

Convenient and quickly adjustable drill height

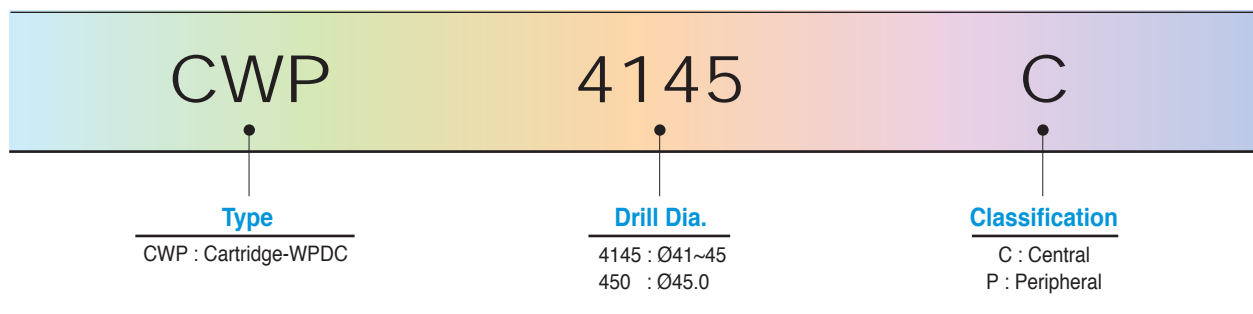
WPDC

Indexable drill clamped with center drill

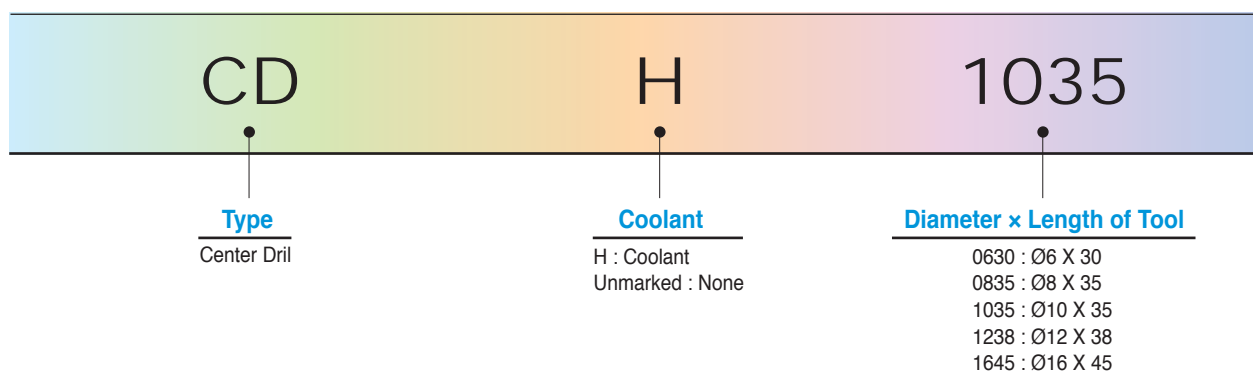
Code System for Drill



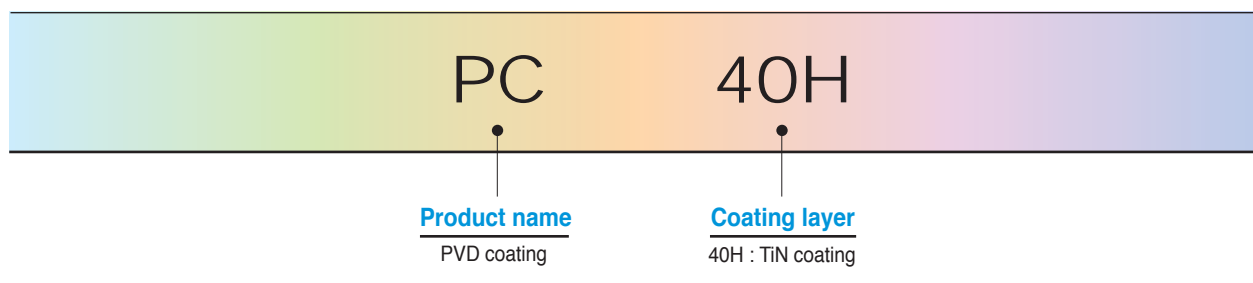
Code System for Cartridge



Code System for Center Drill

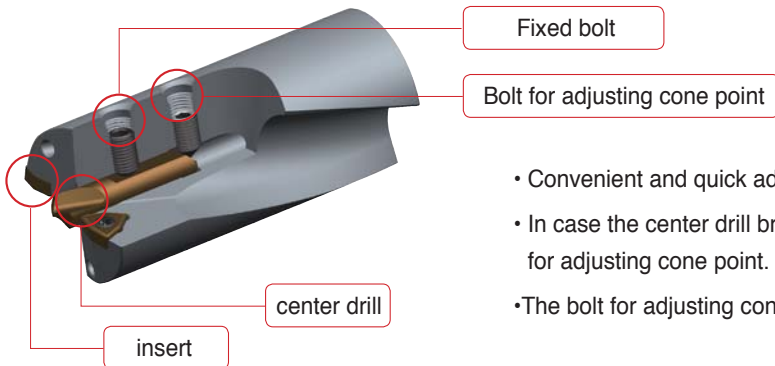


Grade of Center Drill



How to clamp the drills

Feature of corn-point system



- Convenient and quick adjustable heights when inserting the center drill
- In case the center drill brakes while in usage, it can be replaced with the bolt for adjusting cone point.
- The bolt for adjusting cone point prevents chattering on the center drill.

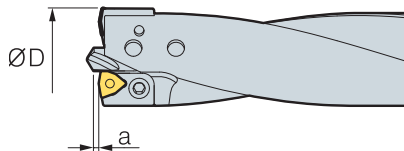
Clamping

- Place a center drill.
- Clamp insert and cartridge.
- Adjust the center drill with the bolt for adjusting cone point.
- Clamp the center drill firmly with fixing bolt.
- Reassure the clamp with bolt for adjusting cone point.

Caution (1) Use safety covers for your safety when clamping the center drill and insert.
 (2) When machining, be careful of the drill disk.

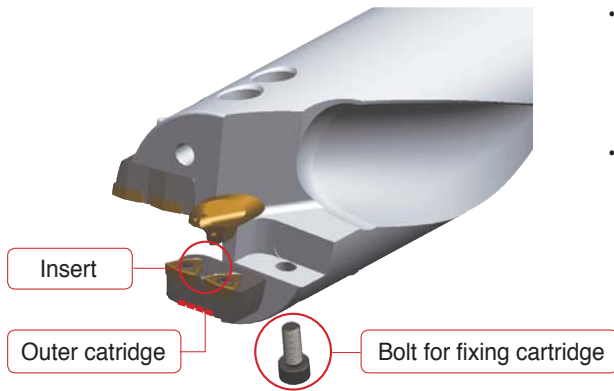
Length of the 'a' part of center drill

The length of 'a' being too short can cause bad surface finish or high cutting load.
 On the other hand, the length of 'a' being too long can make tool failure and chattering while drilling.



| Diameter (ØD) | Length of the 'a' part of center drill | | |
|---------------|--|-------------|-------------------|
| | Steel | Alloy steel | Non-ferrous metal |
| 25~30 | 1.2 | 1.0 | 1.5 |
| 31~40 | 1.5 | 1.3 | 1.8 |
| 41~50 | 1.8 | 1.5 | 2.2 |
| 51~59 | 2.2 | 1.8 | 2.5 |
| 60~75 | 2.5 | 2.0 | 2.8 |
| 76~80 | 3.0 | 2.5 | 3.5 |

Adjusting diameter of cartridge type drill



Range of adjustable drill diameter

1. Single cartridge type(Drill diameter $\varnothing 41\sim\varnothing 59$) \rightsquigarrow -1.0mm
2. Dual cartridge type(Drill diameter $\varnothing 60\sim\varnothing 80$) \rightsquigarrow -5.0mm

Diameter of the standard drills is provided with maximum size of standards.

Ex) WPDC6570-40-6.5 \rightsquigarrow Drill diameter 70.0mm

- Disassemble a cartridge from the holder by loosening the bolt fixed for outer cartridge.
- Machine after calculating the hole size on the side of the outer cartridge.
- Trim the sharp part after machining.
- Clamp the bolt for fixing cartridge without any gap in between the holder and the machined outer cartridge.

Ex) How to adjust drill diameter to $\varnothing 66.0$ machining with WPDC6570-40-8

\rightsquigarrow To make the drill diameter of outer cartridge to $\varnothing 66.0$, machine 2.0mm. ($\varnothing 70.0 - \varnothing 66.0 = 4 \rightsquigarrow 4 \div 2 = 2(\text{radius})$)

Recommended Cutting Condition

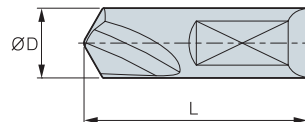
| Workpiece | | | Chip Breaker | Grade | vc | Feed(aspect ratio= 5D, 6.5D, 8D) | | | | | | |
|-----------|----------------------|------------------------------------|--------------|-------|--------|---|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------|
| ISO | Workpiece | HB | | | | Feed (mm/rev) depending on drill Dia.(mm) | | | | | | |
| | | | | | m/min | $\sim\varnothing 30$ | $\varnothing 31\sim\varnothing 40$ | $\varnothing 41\sim\varnothing 50$ | $\varnothing 51\sim\varnothing 59$ | $\varnothing 60\sim\varnothing 75$ | $\varnothing 76\sim\varnothing 80$ | |
| P | Carbon steel | Low carbon steel ($\sim 0.25\%$) | 80~180 | C21 | PC3500 | 190 (160~220) | 0.07~0.11 | 0.08~0.12 | 0.10~0.14 | 0.12~0.16 | 0.12~0.16 | 0.12~0.16 |
| | | High carbon (0.25%~) | 180~280 | C21 | PC3500 | 140 (110~170) | 0.07~0.11 | 0.08~0.12 | 0.10~0.14 | 0.12~0.16 | 0.12~0.16 | 0.12~0.16 |
| | Alloy steel | Low alloy steel | 140~260 | C21 | PC3500 | 130 (100~160) | 0.08~0.12 | 0.08~0.12 | 0.10~0.14 | 0.12~0.18 | 0.12~0.18 | 0.12~0.18 |
| | | Low pre-hardened | 50~260 | C21 | PC3500 | 100 (70~130) | 0.06~0.10 | 0.08~0.12 | 0.08~0.12 | 0.10~0.16 | 0.10~0.16 | 0.10~0.16 |
| M | Stainless steel | Stainless steel | 135~275 | C21 | PC3500 | 100 (70~130) | 0.06~0.10 | 0.08~0.12 | 0.10~0.12 | 0.12~0.14 | 0.12~0.14 | 0.12~0.14 |
| K | Cast iron | Gray cast iron | 150~220 | C21 | PC3500 | 160 (130~190) | 0.09~0.15 | 0.10~0.16 | 0.12~0.2 | 0.14~0.22 | 0.14~0.22 | 0.14~0.22 |
| | | Ductile cast iron | 200~300 | C21 | PC3500 | 140 (170~110) | 0.09~0.15 | 0.10~0.16 | 0.12~0.2 | 0.14~0.22 | 0.14~0.22 | 0.14~0.22 |
| | | Malleable cast iron | 130~230 | C21 | PC3500 | 150 (180~120) | 0.09~0.15 | 0.10~0.16 | 0.12~0.2 | 0.14~0.22 | 0.14~0.22 | 0.14~0.22 |
| N | Alloyed aluminum | Alloyed aluminum | 30~150 | C21 | PC3500 | 300 (250~350) | 0.08~0.12 | 0.10~0.14 | 0.12~0.16 | 0.14~0.18 | 0.14~0.18 | 0.14~0.18 |
| | Alloyed copper | Alloyed copper | 150~160 | C21 | PC3500 | 250 (200~300) | 0.08~0.12 | 0.10~0.14 | 0.12~0.16 | 0.14~0.18 | 0.14~0.18 | 0.14~0.18 |
| S | Heat resisting alloy | Heat resisting alloy | 130~400 | C21 | PC3500 | 50 (70~30) | 0.05~0.08 | 0.05~0.08 | 0.06~0.10 | 0.06~0.10 | 0.06~0.10 | 0.06~0.10 |

Parts of WPDC type indexable drills

| Designation | ØD | Insert | | | Center drill | | | Cartridge | | | | | | | | | |
|------------------|-------|----------------|-----------|--------|--------------|------------|-----------------|-----------|----------|----------------|----------|---------|---------|----------|----------|---------|---------|
| | | Insert | Screw | Wrench | Center drill | fixed bolt | cone point bolt | Inner | Outer | Fixed bolt | | | | | | | |
| WPDC250-32-□ | 25 | WC□T030204-C21 | FTKA02206 | TW06S | CD0630 | KHA0508 | KHC0510 | | | | | | | | | | |
| WPDC260~280-32-□ | 26~28 | WC□T040204-C21 | FTKA02565 | TW07S | | KHA0510 | | | | | | | | | | | |
| WPDC290~300-32-□ | 29~30 | | | | | KHA0610 | | | | | | | | | | | |
| WPDC310~350-32-□ | 31~35 | WC□T050308-C21 | FTKA0307 | TW09S | CD0835 | KHA0612 | KHC0610 | | | | | | | | | | |
| WPDC360~400-32-□ | 36~40 | | | | KHA0812 | CWP4145C | CWP430P | | | | BHA0510 | | | | | | |
| WPDC410-40-□ | 41 | WC□T06T308-C21 | FTKA03508 | TW15S | CDH1035 | | | | | | | KHC0812 | CWP440P | | | | |
| WPDC420-40-□ | 42 | | | | | | | CWP450P | | | | | | | | | |
| WPDC430-40-□ | 43 | | | | | CWP460P | CWP470P | BHA0512 | | | | | | | | | |
| WPDC440-40-□ | 44 | | | | | | | | CWP480P | CWP490P | | | | | | | |
| WPDC450-40-□ | 45 | | | | | | | | | | CWP500P | | | | | | |
| WPDC460-40-□ | 46 | WC□T080408-C21 | FTKA0411K | TW15S | CDH1238 | KHA1015 | KHC1016 | CWP510P | | | | | | | | | |
| WPDC470-40-□ | 47 | | | | | | | CWP5155C | CWP530P | BHA0612 | | | | | | | |
| WPDC480-40-□ | 48 | | | | | | | | | | CWP540P | CWP550P | | | | | |
| WPDC490-40-□ | 49 | | | | | | | | | | | | CWP560P | CWP570P | BHA0614 | | |
| WPDC500-40-□ | 50 | | | | | | | CWP580P | CWP590P | | | | | | | | |
| WPDC510-40-□ | 51 | | | | | | | | | WC□T050308-C21 | FTKA0307 | TW09S | | | | KHA1020 | KHC1020 |
| WPDC520-40-□ | 52 | | | | | | | CWP6570C | CWP6570P | | | | BHA0510 | | | | |
| WPDC530-40-□ | 53 | | | | | | | | | | | | | CWP7075C | CWP7075P | | |
| WPDC540-40-□ | 54 | | | | | | | | | | | | | | | | |
| WPDC550-40-□ | 55 | CDH1645 | | | | | | | | | | | | | | | |
| WPDC560-40-□ | 56 | | | | | | | | | | | | | | | | |
| WPDC570-40-□ | 57 | | | | | | | | | | | | | | | | |
| WPDC580-40-□ | 58 | | | | | | | | | | | | | | | | |
| WPDC590-40-□ | 59 | | | | | | | | | | | | | | | | |
| WPDC6065-40-□ | 60~65 | | | | | | | | | | | | | | | | |
| WPDC6570-40-□ | 65~70 | | | | | | | | | | | | | | | | |
| WPDC7075-40-□ | 70~75 | | | | | | | | | | | | | | | | |
| WPDC7580-40-□ | 75~80 | | | | | | | | | | | | | | | | |

Applicable inserts G05

Center drill



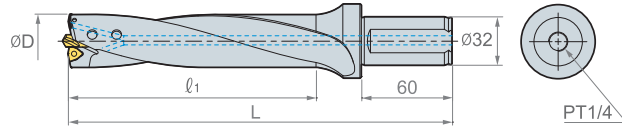
(mm)

| Designation | Grade | ØD | L | Oil-hole |
|-------------|-------|----|----|----------|
| CD 0630 | PC40H | 6 | 30 | × |
| CD 0835 | PC40H | 8 | 35 | × |
| CDH 1035 | PC40H | 10 | 35 | ○ |
| CDH 1238 | PC40H | 12 | 38 | ○ |
| CDH 1645 | PC40H | 16 | 45 | ○ |

• This is HSS with Tin coating

WPDC-5D/6.5D/8D

Standard type



(mm)

| Designation | ØD | 5D | | 6.5D | | 8D | | Insert | Center drill |
|---------------|----|----------------|-----|----------------|-----|----------------|-----|----------------|--------------|
| | | l ₁ | L | l ₁ | L | l ₁ | L | | |
| WPDC 250-32-□ | 25 | 150 | 240 | 185 | 275 | 220 | 310 | WC□T030204-C21 | CD0630 |
| 260-32-□ | 26 | 150 | 240 | 185 | 275 | 220 | 310 | WC□T040204-C21 | |
| 270-32-□ | 27 | 150 | 240 | 185 | 275 | 220 | 310 | | |
| 280-32-□ | 28 | 150 | 240 | 185 | 275 | 220 | 310 | | |
| 290-32-□ | 29 | 150 | 240 | 185 | 275 | 220 | 310 | | |
| 300-32-□ | 30 | 150 | 240 | 185 | 275 | 220 | 310 | | |
| 310-32-□ | 31 | 175 | 265 | 218 | 308 | 260 | 350 | WC□T050308-C21 | CD0835 |
| 320-32-□ | 32 | 175 | 265 | 218 | 308 | 260 | 350 | | |
| 330-32-□ | 33 | 175 | 265 | 218 | 308 | 260 | 350 | | |
| 340-32-□ | 34 | 175 | 265 | 218 | 308 | 260 | 350 | | |
| 350-32-□ | 35 | 175 | 265 | 218 | 308 | 260 | 350 | | |
| 360-32-□ | 36 | 200 | 290 | 250 | 340 | 300 | 390 | | |
| 370-32-□ | 37 | 200 | 290 | 250 | 340 | 300 | 390 | | |
| 380-32-□ | 38 | 200 | 290 | 250 | 340 | 300 | 390 | | |
| 390-32-□ | 39 | 200 | 290 | 250 | 340 | 300 | 390 | | |
| 400-32-□ | 40 | 200 | 290 | 250 | 340 | 300 | 390 | | |

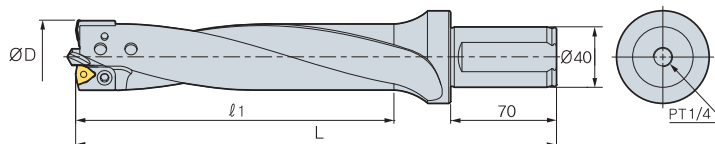
Applicable inserts G05

* We can provide if you order exact diameter
Ex) machining hole 32.5mm * 6.5D → WPDC325-32-6.5



WPDC-5D/6.5D/8D

Single insert cartridge type



(mm)

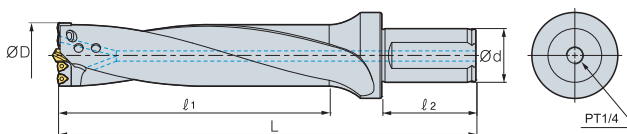
| Designation | ØD | 5D | | 6.5D | | 8D | | Insert | Center drill | Cartridge | | |
|-------------|----------|----|-----|------|-----|-----|-----|--------|----------------|-----------|----------|---------|
| | | ℓ1 | L | ℓ1 | L | ℓ1 | L | | | Inner | Outer | |
| WPDC | 410-40-□ | 41 | 225 | 330 | 283 | 388 | 340 | 445 | WC□T06T308-C21 | CDH1035 | CWP4145C | CWP410P |
| | 420-40-□ | 42 | 225 | 330 | 283 | 388 | 340 | 445 | | | | CWP420P |
| | 430-40-□ | 43 | 225 | 330 | 283 | 388 | 340 | 445 | | | | CWP430P |
| | 440-40-□ | 44 | 225 | 330 | 283 | 388 | 340 | 445 | | | | CWP440P |
| | 450-40-□ | 45 | 225 | 330 | 283 | 388 | 340 | 445 | | | | CWP450P |
| | 460-40-□ | 46 | 250 | 355 | 315 | 420 | 380 | 485 | | | | CWP460P |
| | 470-40-□ | 47 | 250 | 355 | 315 | 420 | 380 | 485 | | | | CWP470P |
| | 480-40-□ | 48 | 250 | 355 | 315 | 420 | 380 | 485 | | | | CWP480P |
| | 490-40-□ | 49 | 250 | 355 | 315 | 420 | 380 | 485 | | | | CWP490P |
| | 500-40-□ | 50 | 250 | 355 | 315 | 420 | 380 | 485 | | | CWP500P | |
| | 510-40-□ | 51 | 275 | 380 | 348 | 453 | 420 | 525 | | | CWP5155C | CWP510P |
| | 520-40-□ | 52 | 275 | 380 | 348 | 453 | 420 | 525 | | | | CWP520P |
| | 530-40-□ | 53 | 275 | 380 | 348 | 453 | 420 | 525 | | | | CWP530P |
| | 540-40-□ | 54 | 275 | 380 | 348 | 453 | 420 | 525 | | | | CWP540P |
| | 550-40-□ | 55 | 275 | 380 | 348 | 453 | 420 | 525 | | | | CWP550P |
| | 560-40-□ | 56 | 300 | 405 | 380 | 485 | 460 | 565 | | | | CWP560P |
| | 570-40-□ | 57 | 300 | 405 | 380 | 485 | 460 | 565 | | | | CWP570P |
| | 580-40-□ | 58 | 300 | 405 | 380 | 485 | 460 | 565 | | | | CWP580P |
| | 590-40-□ | 59 | 300 | 405 | 380 | 485 | 460 | 565 | | | | CWP590P |

Applicable inserts G05

* We can provide if you order exact diameter
Ex) machining hole 47.5mm * 5D -> WPDC475-40-5

WPDC-5D/6.5D/8D

Dual insert cartridge type



(mm)

| Designation | ØD | 5D | | 6.5D | | 8D | | Insert | Center drill | Cartridge | | |
|-------------|-----------|-------|-----|------|-----|-----|-----|--------|----------------|-----------|----------|----------|
| | | ℓ1 | L | ℓ1 | L | ℓ1 | L | | | Inner | Outer | |
| WPDC | 6065-40-□ | 60~65 | 325 | 430 | 423 | 528 | 520 | 625 | WC□T050308-C21 | CDH1238 | CWP6065C | CWP6065P |
| | 6570-40-□ | 65~70 | 350 | 455 | 455 | 560 | 560 | 665 | | | CWP6570C | CWP6570P |
| | 7075-40-□ | 70~75 | 375 | 480 | 488 | 593 | 600 | 705 | | | CWP7075C | CWP7075P |
| | 7580-40-□ | 75~80 | 400 | 505 | 520 | 625 | 640 | 745 | WC□T06T308-C21 | CDH1645 | CWP7580C | CWP7580P |

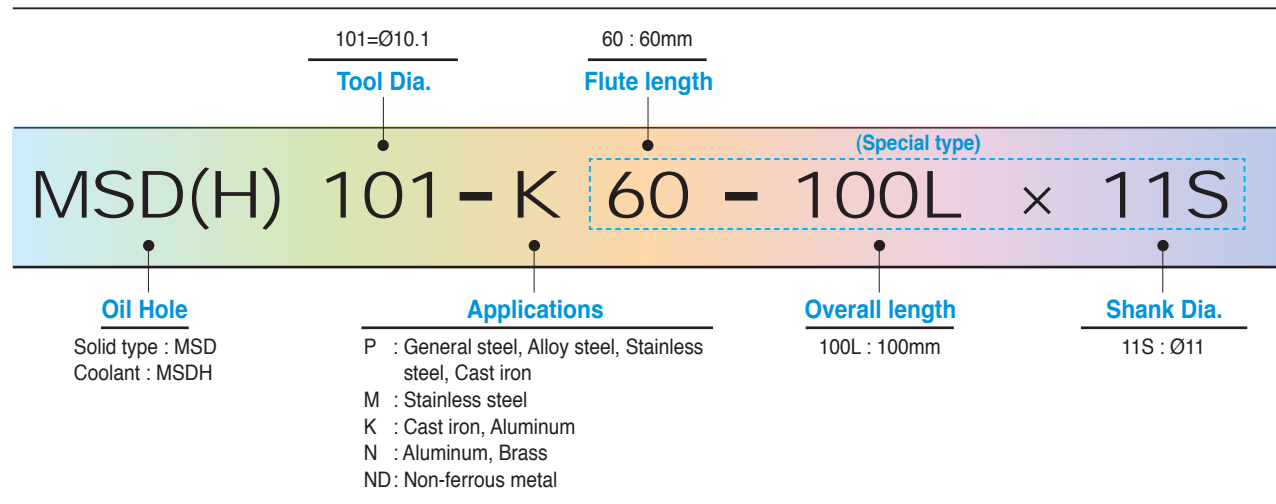
Applicable inserts G05

* We can provide if you order exact diameter
Ex) machining hole 70.5mm * 6.5D -> WPDC705-40-6.5

Various designations of MSD & MSDH enable to do any drilling

Mach solid drill

Code system



Features

▶ Optimally designed chip pocket

- Wide and deep chip pocket improve chip control to minimizing friction during an operation

▶ A curvilinear edge

- A curvilinear edge offers excellent wear resistance and shock resistance by dispersing the cutting load

▶ 3D, 5D, 7D Standardization

- For example) diameter Ø10mm and depth 30mm and outer coolant system, Take MSD100-3P!

▶ MSD : Solid Type & MSDH : Through oil-hole type

- Various designations of MSD & MSDH enable to do any drilling

▶ Low cutting resistance edge

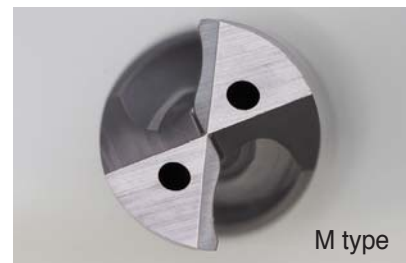
- The MSD & MSDH low cutting resistance edge guarantees a better surface roughness and chip control while allowing the drill to center itself

▶ Rigid neck of drill

- The new design of this drill has an increased rigidity at neck.
This prevents breakage of neck on the drill

▶ Line-up as per workpiece

- P : Steel (Carbon steel, Alloy steel)
General - Carbon steel, Alloy steel, Stainless steel, Cast iron Low cutting resistance edge, Ultra micro grain substrate, K-Black coating
- K : Cast iron, Die casting, Ductile cast iron
Coolant system : Through / Outer(MQL)
- M : Stainless steel, Reduced built-up edge and cutting resistance
Coolant system : Through / Outer(MQL)
- N : Aluminum(Carbide drills), Medium & Low speed cutting performance
Coolant system : Through / Outer(MQL)
- ND : Non-ferrous metal, High speed, High efficiency performance
Improved welding resistance due to applied DLC coating
Coolant system : Through / Outer(MQL)



Features

Low cutting resistance edge

- Uniformity in cutting edge treatment : Reinforces equalized quality in every machined part
- Protecting workpiece : Low cutting resistance edge operates well in medium to finishing machining, workpiece protection and good surface roughness
- Better chip breaking : Based on our cutting processes studies, our drills assure better chip breaking in high or low speeds

Features of TiAlN Coating

- Decreasing of micro particle → Chipping free from macro particle
- Better hardness and toughness → Covering wide cutting speed and feed rate range
- Special coating layer at most-outer edge → Special TiAlN with better lubrication guarantees welding resistance
- Pre-treatment before coating process → Higher adhesion by pre-treatment



Specification line-up

Line-up as per aspect ratio (L:Overall length, D:Tool Dia.)



MSD□□□-7P



MSD□□□-5P



MSD□□□-3P

Line-up as per aspect ratio (Mach Drills : Ø2.5mm~Ø20mm)
Various choices as per aspect ratio (3D,5D,7D)

• For example) Solid, Ø10.2mm, 50mm

Piercing = $50 \div 10.2 \approx 5 \rightarrow$ MSD102-5P

Line-up as per coolant type



MSD Type



MSDH Type

Wide choices for coolant type

- For example) Solid type : MSD,
Through coolant type : MSDH

Line-up as per workpiece

| | |
|-----------|--|
| P | General steel, Alloy steel, Stainless steel, Cast iron |
| M | Stainless steel |
| K | Cast iron, Aluminum |
| N | Aluminum, Brass |
| ND | Non-ferrous metal |

Cutting condition formula

$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}, \quad fn = \frac{vf}{n} \text{ (mm/rev)} \left[n = \frac{vc \times 1000}{\pi \times D} \text{ (min}^{-1}\text{)}, \quad vf = fn \times n \text{ (mm/min)} \right]$$

n : Revolution per minute(min⁻¹)

vf : Feed per minute(mm/min)

D : Drill Dia.(mm)

vc : Cutting speed(m/min)

fn : Feed per revolution(mm/rev)

π : 3.1416

Recommended cutting condition

Mach Drill : Solid Type [MSD ○○○-□ P,M,K]

| Tool Dia. | | Ø2.5 ~ Ø5.0 | | Ø5.1 ~ Ø8.0 | | Ø8.1 ~ Ø10.0 | | Ø10.1 ~ Ø12.0 | | Ø12.1 ~ Ø14.0 | | Ø14.1 ~ Ø20.0 | |
|---|--------|---------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|
| | | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) |
| Mild steel, Alloy steel, General steel (Under H _R C25) | SCM440 | 40~70 (55) | 0.15 ~0.25 | 50~110 (65) | 0.20 ~0.35 | 50~110 (70) | 0.20 ~0.35 | 50~120 (75) | 0.25 ~0.35 | 50~120 (75) | 0.25 ~0.35 | 60~120 (80) | 0.25 ~0.40 |
| | SM45C | 40~80 (60) | 0.15 ~0.25 | 50~120 (70) | 0.20 ~0.30 | 50~120 (75) | 0.20 ~0.30 | 60~120 (80) | 0.20 ~0.30 | 60~120 (80) | 0.25 ~0.35 | 70~120 (90) | 0.30 ~0.40 |
| High alloy steel, High carbon steel (Over H _R C25) | STD11 | 15~35 (30) | 0.08 ~0.15 | 20~40 (30) | 0.10 ~0.20 | 20~50 (35) | 0.10 ~0.20 | 20~60 (35) | 0.15 ~0.25 | 20~60 (40) | 0.15 ~0.25 | 30~65 (40) | 0.15 ~0.25 |
| Stainless steel | STS | 15~30 (25) | 0.05 ~0.10 | 15~45 (25) | 0.10 ~0.20 | 15~50 (30) | 0.10 ~0.20 | 20~60 (35) | 0.10 ~0.20 | 20~65 (35) | 0.10 ~0.20 | 20~70 (40) | 0.10 ~0.20 |
| Cast iron | GC | 40~90 (70) | 0.15 ~0.30 | 50~120 (80) | 0.20 ~0.35 | 50~120 (80) | 0.20 ~0.35 | 60~130 (90) | 0.25 ~0.35 | 60~130 (95) | 0.25 ~0.40 | 60~140 (95) | 0.25 ~0.40 |
| | GCD | 40~80 (60) | 0.10 ~0.25 | 50~110 (75) | 0.20 ~0.35 | 50~110 (80) | 0.20 ~0.35 | 50~130 (80) | 0.25 ~0.35 | 50~130 (85) | 0.25 ~0.35 | 60~130 (90) | 0.25 ~0.40 |

Mach Drill : Through oil-hole Type [MSDH ○○○-□ P,M,K]

| Tool Dia. | | vc(m/min) | Ø2.5 ~ Ø4.0 | | Ø4.1 ~ Ø8.0 | | Ø8.1 ~ Ø12.0 | | Ø12.1 ~ Ø16.0 | | Ø16.1 ~ Ø20.0 | |
|---|--------|-----------|-------------|------------|-------------|------------|--------------|------------|---------------|--|---------------|--|
| | | | fn(mm/rev) | fn(mm/rev) | fn(mm/rev) | fn(mm/rev) | fn(mm/rev) | fn(mm/rev) | | | | |
| Mild steel, Alloy steel, General steel (Under H _R C25) | SCM440 | 60~140 | 0.15~0.35 | 0.15~0.35 | 0.20~0.35 | 0.25~0.40 | 0.30~0.40 | | | | | |
| | SM45C | 60~140 | 0.15~0.30 | 0.15~0.30 | 0.20~0.30 | 0.25~0.35 | 0.30~0.40 | | | | | |
| High alloy steel, High carbon steel (Over H _R C25) | STD11 | 40~80 | 0.08~0.20 | 0.08~0.20 | 0.10~0.25 | 0.15~0.25 | 0.15~0.30 | | | | | |
| Stainless steel | STS | 25~80 | 0.05~0.20 | 0.05~0.20 | 0.10~0.25 | 0.10~0.25 | 0.15~0.30 | | | | | |
| Cast iron | GC | 55~155 | 0.15~0.35 | 0.15~0.35 | 0.20~0.35 | 0.25~0.40 | 0.25~0.40 | | | | | |
| | GCD | 55~145 | 0.10~0.35 | 0.10~0.35 | 0.20~0.35 | 0.25~0.35 | 0.25~0.40 | | | | | |

- Note) 1. Decrease cutting speed 30%~40% contrast with recommended condition when machining forged steel
 2. Decrease cutting condition considering the overhang of drill, machined rigidity, precision of spindle, clamping and surface of workpiece, etc.
 3. For longer tool life, Please apply to step feed at every 1.5D
 4. Put the drill clamping between edge groove and shank boundary part in order to be located in the suitable position
 5. Coolant pressure for through hole type = 3~5kg/cm², volume = 2~5l/min
 6. Cutting formula :

Mach Drills : Through coolant type [MSD(H) ○○○-□ N] cemented carbide

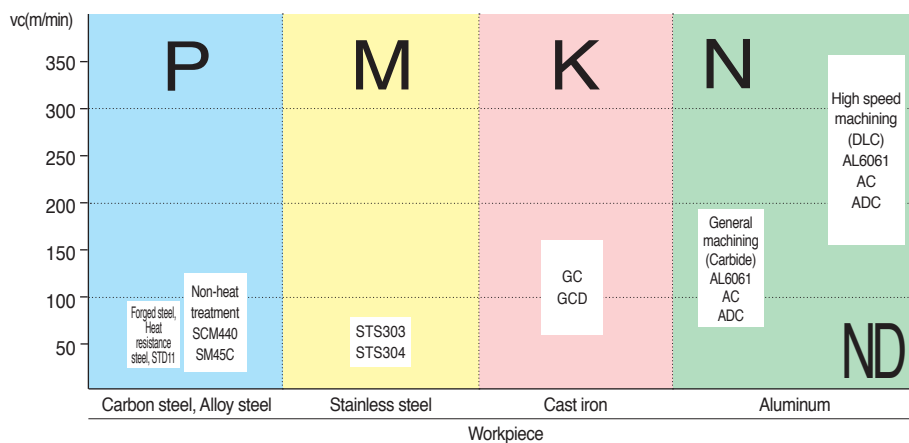
| Tool Dia. | | Ø2.5 ~ Ø4.0 | | Ø5.1 ~ Ø10.0 | | Ø10.1 ~ Ø16.0 | | Ø16.1 ~ Ø20.0 | |
|---------------------|----------------------|-------------|------------|--------------|------------|---------------|------------|---------------|------------|
| | | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) |
| Aluminum | Alloy steel (Al6061) | 60~100 | 0.20~0.35 | 90~100 | 0.30~0.40 | 100~120 | 0.30~0.40 | 100~120 | 0.30~0.45 |
| | Die-casting (AC,ADC) | 60~100 | 0.20~0.35 | 90~100 | 0.30~0.40 | 100~120 | 0.30~0.40 | 100~120 | 0.30~0.45 |
| Copper alloy(CI100) | | 60~80 | 0.08~0.15 | 60~100 | 0.10~0.20 | 80~100 | 0.10~0.25 | 80~100 | 0.10~0.25 |

Mach Drills : Through coolant type [MSDH ○○○-□ ND] DLC coated

| Tool Dia. | | Ø2.5 ~ Ø4.0 | | Ø5.1 ~ Ø10.0 | | Ø10.1 ~ Ø16.0 | | Ø16.1 ~ Ø20.0 | |
|---------------------|----------------------|-------------|------------|--------------|------------|---------------|------------|---------------|------------|
| | | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) |
| Aluminum | Alloy steel (Al6061) | 80~160 | 0.08~0.30 | 80~180 | 0.12~0.35 | 80~180 | 0.15~0.40 | 80~200 | 0.15~0.45 |
| | Die-casting (AC,ADC) | 80~180 | 0.08~0.30 | 80~200 | 0.12~0.35 | 80~200 | 0.15~0.40 | 80~200 | 0.15~0.45 |
| Copper alloy(CI100) | | 80~160 | 0.08~0.15 | 80~180 | 0.10~0.20 | 80~180 | 0.10~0.25 | 80~200 | 0.10~0.25 |

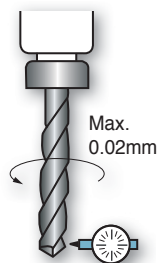
- Note) Recommended cutting speed is one of the important factors for the drill performance. In case of using further cutting speed or feed rate than recommended conditions to improve the productivity, please apply it after enough tests because it could be occurred some problems like early wear, built-up edge, chipping, fracture, etc.

Recommended cutting condition by series

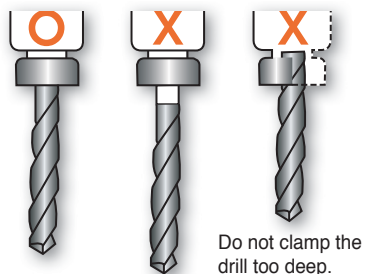


Setting of drills

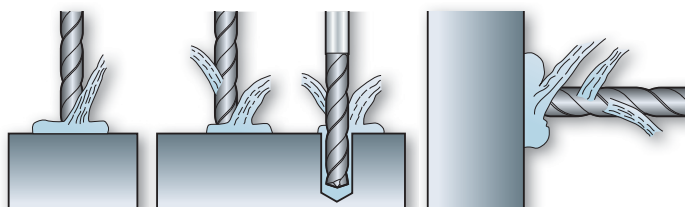
Outer tolerance



Setting condition

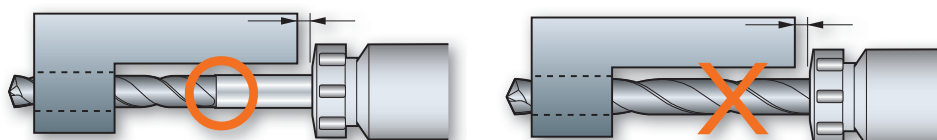


Coolant (External system)



To improve machining method

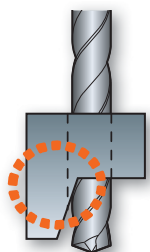
Machining for strength of wheel



Using short flute length

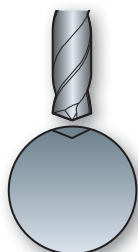
Improvement of drilling

Piercing stage



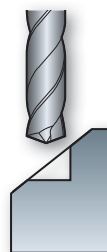
Decrease feed 1/2

Circular surface



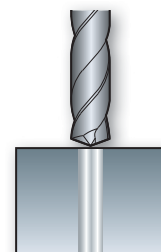
First, center drilling with large point angle

Inclined surface



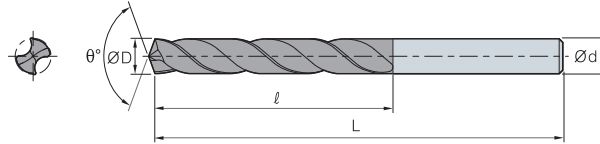
First, facing with endmills

Boring



No recommendation

MSD-□(P/M/K/N)



| Terminology | P | M | K | N |
|------------------------|-----------------|---|------------------|---|
| Coating | TiAlN | | Cemented carbide | |
| Tolerance (drill Dia.) | h7 | | | |
| Tolerance (shank Dia.) | h6 | | | |
| Point angle | 140° | | 135° | |
| Twist angle | 30° | | | |
| Thinning | X type | | | |
| Coolant | External system | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

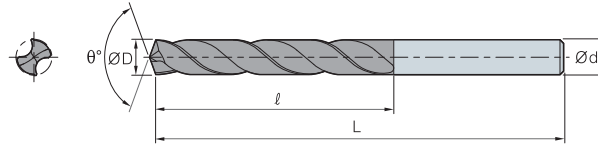
| Designation | øD | ød | 3P,M,K,N | | 5P,M,K,N | | 7P,M,K,N | |
|------------------|-----|-----|----------|----|----------|-----|----------|-----|
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSD 025-□P,M,K,N | 2.5 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 026-□P,M,K,N | 2.6 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 027-□P,M,K,N | 2.7 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 028-□P,M,K,N | 2.8 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 029-□P,M,K,N | 2.9 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 030-□P,M,K,N | 3.0 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 031-□P,M,K,N | 3.1 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 032-□P,M,K,N | 3.2 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 033-□P,M,K,N | 3.3 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 034-□P,M,K,N | 3.4 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 035-□P,M,K,N | 3.5 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 036-□P,M,K,N | 3.6 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 037-□P,M,K,N | 3.7 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 038-□P,M,K,N | 3.8 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 039-□P,M,K,N | 3.9 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 040-□P,M,K,N | 4.0 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 041-□P,M,K,N | 4.1 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 042-□P,M,K,N | 4.2 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 043-□P,M,K,N | 4.3 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 044-□P,M,K,N | 4.4 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 045-□P,M,K,N | 4.5 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 046-□P,M,K,N | 4.6 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 047-□P,M,K,N | 4.7 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 048-□P,M,K,N | 4.8 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 049-□P,M,K,N | 4.9 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 050-□P,M,K,N | 5.0 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 051-□P,M,K,N | 5.1 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 052-□P,M,K,N | 5.2 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 053-□P,M,K,N | 5.3 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 054-□P,M,K,N | 5.4 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 055-□P,M,K,N | 5.5 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 056-□P,M,K,N | 5.6 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 057-□P,M,K,N | 5.7 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 058-□P,M,K,N | 5.8 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 059-□P,M,K,N | 5.9 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 060-□P,M,K,N | 6.0 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 061-□P,M,K,N | 6.1 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 062-□P,M,K,N | 6.2 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 063-□P,M,K,N | 6.3 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 064-□P,M,K,N | 6.4 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 065-□P,M,K,N | 6.5 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 066-□P,M,K,N | 6.6 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 067-□P,M,K,N | 6.7 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 068-□P,M,K,N | 6.8 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |

* Order made items : MSD □ □ □ -Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex. 1) Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex. 2) Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S

MSD-□(P/M/K/N)



| Terminology | P | M | K | N |
|------------------------|-----------------|---|------|------------------|
| Coating | TiAlN | | | Cemented carbide |
| Tolerance (drill Dia.) | h7 | | | |
| Tolerance (shank Dia.) | h6 | | | |
| Point angle | 140° | | 135° | |
| Twist angle | 30° | | | |
| Thinning | X type | | | |
| Coolant | External system | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal

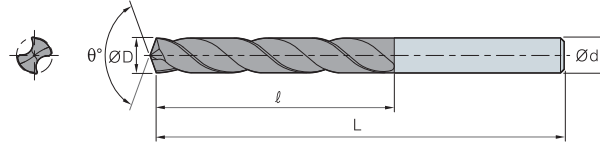
| Designation | øD | ød | (mm) | | | | | |
|------------------|------|------|----------|-----|----------|-----|----------|-----|
| | | | 3P,M,K,N | | 5P,M,K,N | | 7P,M,K,N | |
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSD 069-□P,M,K,N | 6.9 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 070-□P,M,K,N | 7.0 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 071-□P,M,K,N | 7.1 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 072-□P,M,K,N | 7.2 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 073-□P,M,K,N | 7.3 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 074-□P,M,K,N | 7.4 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 075-□P,M,K,N | 7.5 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 076-□P,M,K,N | 7.6 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 077-□P,M,K,N | 7.7 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 078-□P,M,K,N | 7.8 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 079-□P,M,K,N | 7.9 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 080-□P,M,K,N | 8.0 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 081-□P,M,K,N | 8.1 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 082-□P,M,K,N | 8.2 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 083-□P,M,K,N | 8.3 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 084-□P,M,K,N | 8.4 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 085-□P,M,K,N | 8.5 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 086-□P,M,K,N | 8.6 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 087-□P,M,K,N | 8.7 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 088-□P,M,K,N | 8.8 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 089-□P,M,K,N | 8.9 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 090-□P,M,K,N | 9.0 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 091-□P,M,K,N | 9.1 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 092-□P,M,K,N | 9.2 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 093-□P,M,K,N | 9.3 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 094-□P,M,K,N | 9.4 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 095-□P,M,K,N | 9.5 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 096-□P,M,K,N | 9.6 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 097-□P,M,K,N | 9.7 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 098-□P,M,K,N | 9.8 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 099-□P,M,K,N | 9.9 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 100-□P,M,K,N | 10.0 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 101-□P,M,K,N | 10.1 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 102-□P,M,K,N | 10.2 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 103-□P,M,K,N | 10.3 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 104-□P,M,K,N | 10.4 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 105-□P,M,K,N | 10.5 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 106-□P,M,K,N | 10.6 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 107-□P,M,K,N | 10.7 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 108-□P,M,K,N | 10.8 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 109-□P,M,K,N | 10.9 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 110-□P,M,K,N | 11.0 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 111-□P,M,K,N | 11.1 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 112-□P,M,K,N | 11.2 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |

* Order made items : MSD □ □ □ -Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex. 1) Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex. 2) Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S

MSD-□(P/M/K/N)



| Terminology | P | M | K | N |
|------------------------|-----------------|---|------|------------------|
| Coating | TiAlN | | | Cemented carbide |
| Tolerance (drill Dia.) | h7 | | | |
| Tolerance (shank Dia.) | h6 | | | |
| Point angle | 140° | | 135° | |
| Twist angle | 30° | | | |
| Thinning | X type | | | |
| Coolant | External system | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

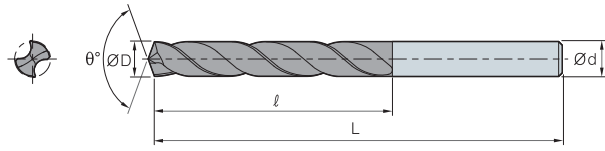
| Designation | ØD | Ød | 3P,M,K,N | | 5P,M,K,N | | 7P,M,K,N | |
|------------------|------|------|----------|-----|----------|-----|----------|-----|
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSD 113-□P,M,K,N | 11.3 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 114-□P,M,K,N | 11.4 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 115-□P,M,K,N | 11.5 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 116-□P,M,K,N | 11.6 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 117-□P,M,K,N | 11.7 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 118-□P,M,K,N | 11.8 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 119-□P,M,K,N | 11.9 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 120-□P,M,K,N | 12.0 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 121-□P,M,K,N | 12.1 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 122-□P,M,K,N | 12.2 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 123-□P,M,K,N | 12.3 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 124-□P,M,K,N | 12.4 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 125-□P,M,K,N | 12.5 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 126-□P,M,K,N | 12.6 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 127-□P,M,K,N | 12.7 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 128-□P,M,K,N | 12.8 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 129-□P,M,K,N | 12.9 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 130-□P,M,K,N | 13.0 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 131-□P,M,K,N | 13.1 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 132-□P,M,K,N | 13.2 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 133-□P,M,K,N | 13.3 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 134-□P,M,K,N | 13.4 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 135-□P,M,K,N | 13.5 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 136-□P,M,K,N | 13.6 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 137-□P,M,K,N | 13.7 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 138-□P,M,K,N | 13.8 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 139-□P,M,K,N | 13.9 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 140-□P,M,K,N | 14.0 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 141-□P,M,K,N | 14.1 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 142-□P,M,K,N | 14.2 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 143-□P,M,K,N | 14.3 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 144-□P,M,K,N | 14.4 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 145-□P,M,K,N | 14.5 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 146-□P,M,K,N | 14.6 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 147-□P,M,K,N | 14.7 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 148-□P,M,K,N | 14.8 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 149-□P,M,K,N | 14.9 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 150-□P,M,K,N | 15.0 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 151-□P,M,K,N | 15.1 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 152-□P,M,K,N | 15.2 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 153-□P,M,K,N | 15.3 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 154-□P,M,K,N | 15.4 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 155-□P,M,K,N | 15.5 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 156-□P,M,K,N | 15.6 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |

* Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S

MSD-□(P/M/K/N)



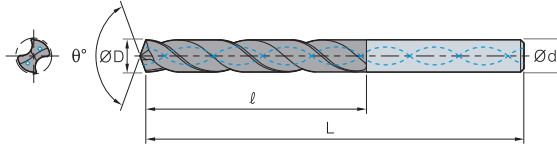
| | | | | |
|------------------------|-----------------|----------|----------|------------------|
| Terminology | P | M | K | N |
| Coating | TiAlN | | | Cemented carbide |
| Tolerance (drill Dia.) | h7 | | | |
| Tolerance (shank Dia.) | h6 | | | |
| Point angle | 140° | 135° | | |
| Twist angle | 30° | | | |
| Thinning | X type | | | |
| Coolant | External system | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal

| Designation | øD | ød | (mm) | | | | | |
|------------------|------|------|----------|-----|----------|-----|----------|-----|
| | | | 3P,M,K,N | | 5P,M,K,N | | 7P,M,K,N | |
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSD 157-□P,M,K,N | 15.7 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 158-□P,M,K,N | 15.8 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 159-□P,M,K,N | 15.9 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 160-□P,M,K,N | 16.0 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 161-□P,M,K,N | 16.1 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 162-□P,M,K,N | 16.2 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 163-□P,M,K,N | 16.3 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 164-□P,M,K,N | 16.4 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 165-□P,M,K,N | 16.5 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 166-□P,M,K,N | 16.6 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 167-□P,M,K,N | 16.7 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 168-□P,M,K,N | 16.8 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 169-□P,M,K,N | 16.9 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 170-□P,M,K,N | 17.0 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 171-□P,M,K,N | 17.1 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 172-□P,M,K,N | 17.2 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 173-□P,M,K,N | 17.3 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 174-□P,M,K,N | 17.4 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 175-□P,M,K,N | 17.5 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 176-□P,M,K,N | 17.6 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 177-□P,M,K,N | 17.7 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 178-□P,M,K,N | 17.8 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 179-□P,M,K,N | 17.9 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 180-□P,M,K,N | 18.0 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 181-□P,M,K,N | 18.1 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 182-□P,M,K,N | 18.2 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 183-□P,M,K,N | 18.3 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 184-□P,M,K,N | 18.4 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 185-□P,M,K,N | 18.5 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 186-□P,M,K,N | 18.6 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 187-□P,M,K,N | 18.7 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 188-□P,M,K,N | 18.8 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 189-□P,M,K,N | 18.9 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 190-□P,M,K,N | 19.0 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 191-□P,M,K,N | 19.1 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 192-□P,M,K,N | 19.2 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 193-□P,M,K,N | 19.3 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 194-□P,M,K,N | 19.4 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 195-□P,M,K,N | 19.5 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 196-□P,M,K,N | 19.6 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 197-□P,M,K,N | 19.7 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 198-□P,M,K,N | 19.8 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 199-□P,M,K,N | 19.9 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 200-□P,M,K,N | 20.0 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |

* Order made items : MSD □ □ □ -Material (P,M,K,N) × Flute length - Total length L × Shank diameter S
 Ex.1) Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S
 Ex.2) Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)



| Terminology | P | M | K | N | ND |
|------------------------|----------------|------|------|------------------|-----|
| Coating | TiAlN | | | Cemented carbide | DLC |
| Tolerance (drill Dia.) | h7 | | | | |
| Tolerance (shank Dia.) | h6 | | | | |
| Point angle | 140° | 135° | 140° | | |
| Twist angle | 30° | | | | |
| Thinning | X type | | | N type | |
| Coolant | Through system | | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



(mm)

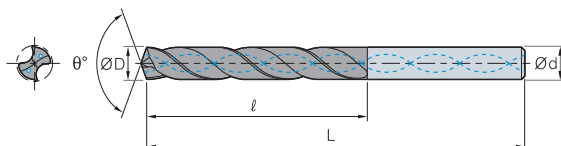
| Designation | øD | ød | 3P,M,K,N,ND | | 5P,M,K,N,ND | | 7P,M,K,N,ND | |
|-------------------|-----|-----|-------------|----|-------------|-----|-------------|-----|
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSDH 025-□P,M,K,N | 2.5 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 026-□P,M,K,N | 2.6 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 027-□P,M,K,N | 2.7 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 028-□P,M,K,N | 2.8 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 029-□P,M,K,N | 2.9 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 030-□P,M,K,N | 3.0 | 3.0 | 20 | 65 | 25 | 70 | 30 | 75 |
| 031-□P,M,K,N | 3.1 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 032-□P,M,K,N | 3.2 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 033-□P,M,K,N | 3.3 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 034-□P,M,K,N | 3.4 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 035-□P,M,K,N | 3.5 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 036-□P,M,K,N | 3.6 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 037-□P,M,K,N | 3.7 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 038-□P,M,K,N | 3.8 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 039-□P,M,K,N | 3.9 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 040-□P,M,K,N | 4.0 | 4.0 | 25 | 71 | 34 | 80 | 40 | 86 |
| 041-□P,M,K,N | 4.1 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 042-□P,M,K,N | 4.2 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 043-□P,M,K,N | 4.3 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 044-□P,M,K,N | 4.4 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 045-□P,M,K,N | 4.5 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 046-□P,M,K,N | 4.6 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 047-□P,M,K,N | 4.7 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 048-□P,M,K,N | 4.8 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 049-□P,M,K,N | 4.9 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 050-□P,M,K,N | 5.0 | 5.0 | 30 | 77 | 43 | 90 | 50 | 97 |
| 051-□P,M,K,N | 5.1 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 052-□P,M,K,N | 5.2 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 053-□P,M,K,N | 5.3 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 054-□P,M,K,N | 5.4 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 055-□P,M,K,N | 5.5 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 056-□P,M,K,N | 5.6 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 057-□P,M,K,N | 5.7 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 058-□P,M,K,N | 5.8 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 059-□P,M,K,N | 5.9 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 060-□P,M,K,N | 6.0 | 6.0 | 35 | 81 | 48 | 96 | 60 | 108 |
| 061-□P,M,K,N | 6.1 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 062-□P,M,K,N | 6.2 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 063-□P,M,K,N | 6.3 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 064-□P,M,K,N | 6.4 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 065-□P,M,K,N | 6.5 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 066-□P,M,K,N | 6.6 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 067-□P,M,K,N | 6.7 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 068-□P,M,K,N | 6.8 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |

* Order made items : MSDH □ □ □ -Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1) Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH101-P × 60 - 80L × 11S

Ex.2) Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)



| Terminology | P | M | K | N | ND |
|------------------------|----------------|------|------|------------------|--------|
| Coating | TiAlN | | | Cemented carbide | DLC |
| Tolerance (drill Dia.) | h7 | | | | |
| Tolerance (shank Dia.) | h6 | | | | |
| Point angle | 140° | 135° | 140° | | |
| Twist angle | 30° | | | | |
| Thinning | X type | | | | N type |
| Coolant | Through system | | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



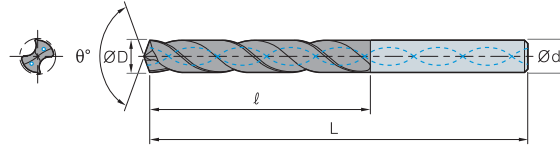
| Designation | ØD | Ød | 3P,M,K,N,ND | | 5P,M,K,N,ND | | 7P,M,K,N,ND | |
|-------------------|------|------|-------------|-----|-------------|-----|-------------|-----|
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSDH 069-□P,M,K,N | 6.9 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 070-□P,M,K,N | 7.0 | 7.0 | 40 | 84 | 56 | 105 | 70 | 120 |
| 071-□P,M,K,N | 7.1 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 072-□P,M,K,N | 7.2 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 073-□P,M,K,N | 7.3 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 074-□P,M,K,N | 7.4 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 075-□P,M,K,N | 7.5 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 076-□P,M,K,N | 7.6 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 077-□P,M,K,N | 7.7 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 078-□P,M,K,N | 7.8 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 079-□P,M,K,N | 7.9 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 080-□P,M,K,N | 8.0 | 8.0 | 45 | 90 | 60 | 110 | 80 | 130 |
| 081-□P,M,K,N | 8.1 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 082-□P,M,K,N | 8.2 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 083-□P,M,K,N | 8.3 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 084-□P,M,K,N | 8.4 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 085-□P,M,K,N | 8.5 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 086-□P,M,K,N | 8.6 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 087-□P,M,K,N | 8.7 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 088-□P,M,K,N | 8.8 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 089-□P,M,K,N | 8.9 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 090-□P,M,K,N | 9.0 | 9.0 | 48 | 97 | 72 | 125 | 90 | 143 |
| 091-□P,M,K,N | 9.1 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 092-□P,M,K,N | 9.2 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 093-□P,M,K,N | 9.3 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 094-□P,M,K,N | 9.4 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 095-□P,M,K,N | 9.5 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 096-□P,M,K,N | 9.6 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 097-□P,M,K,N | 9.7 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 098-□P,M,K,N | 9.8 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 099-□P,M,K,N | 9.9 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 100-□P,M,K,N | 10.0 | 10.0 | 52 | 106 | 75 | 129 | 95 | 150 |
| 101-□P,M,K,N | 10.1 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 102-□P,M,K,N | 10.2 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 103-□P,M,K,N | 10.3 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 104-□P,M,K,N | 10.4 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 105-□P,M,K,N | 10.5 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 106-□P,M,K,N | 10.6 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 107-□P,M,K,N | 10.7 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 108-□P,M,K,N | 10.8 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 109-□P,M,K,N | 10.9 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 110-□P,M,K,N | 11.0 | 11.0 | 56 | 111 | 83 | 140 | 105 | 160 |
| 111-□P,M,K,N | 11.1 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 112-□P,M,K,N | 11.2 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |

* Order made items : MSDH □ □ □ -Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1) Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH101-P × 60 - 80L × 11S

Ex.2) Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)



| Terminology | P | M | K | N | ND |
|------------------------|----------------|------|------|------------------|-----|
| Coating | TiAlN | | | Cemented carbide | DLC |
| Tolerance (drill Dia.) | h7 | | | | |
| Tolerance (shank Dia.) | h6 | | | | |
| Point angle | 140° | 135° | 140° | | |
| Twist angle | 30° | | | | |
| Thinning | X type | | | N type | |
| Coolant | Through system | | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



(mm)

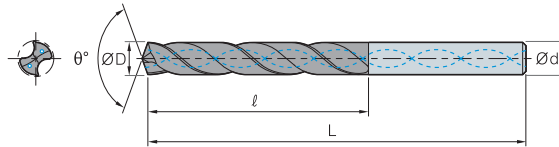
| Designation | øD | ød | 3P,M,K,N,ND | | 5P,M,K,N,ND | | 7P,M,K,N,ND | |
|-------------------|------|------|-------------|-----|-------------|-----|-------------|-----|
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSDH 113-□P,M,K,N | 11.3 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 114-□P,M,K,N | 11.4 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 115-□P,M,K,N | 11.5 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 116-□P,M,K,N | 11.6 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 117-□P,M,K,N | 11.7 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 118-□P,M,K,N | 11.8 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 119-□P,M,K,N | 11.9 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 120-□P,M,K,N | 12.0 | 12.0 | 60 | 118 | 90 | 148 | 114 | 172 |
| 121-□P,M,K,N | 12.1 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 122-□P,M,K,N | 12.2 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 123-□P,M,K,N | 12.3 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 124-□P,M,K,N | 12.4 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 125-□P,M,K,N | 12.5 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 126-□P,M,K,N | 12.6 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 127-□P,M,K,N | 12.7 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 128-□P,M,K,N | 12.8 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 129-□P,M,K,N | 12.9 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 130-□P,M,K,N | 13.0 | 13.0 | 65 | 125 | 98 | 158 | 124 | 184 |
| 131-□P,M,K,N | 13.1 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 132-□P,M,K,N | 13.2 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 133-□P,M,K,N | 13.3 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 134-□P,M,K,N | 13.4 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 135-□P,M,K,N | 13.5 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 136-□P,M,K,N | 13.6 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 137-□P,M,K,N | 13.7 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 138-□P,M,K,N | 13.8 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 139-□P,M,K,N | 13.9 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 140-□P,M,K,N | 14.0 | 14.0 | 70 | 132 | 105 | 167 | 133 | 195 |
| 141-□P,M,K,N | 14.1 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 142-□P,M,K,N | 14.2 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 143-□P,M,K,N | 14.3 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 144-□P,M,K,N | 14.4 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 145-□P,M,K,N | 14.5 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 146-□P,M,K,N | 14.6 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 147-□P,M,K,N | 14.7 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 148-□P,M,K,N | 14.8 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 149-□P,M,K,N | 14.9 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 150-□P,M,K,N | 15.0 | 15.0 | 75 | 139 | 108 | 172 | 138 | 202 |
| 151-□P,M,K,N | 15.1 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 152-□P,M,K,N | 15.2 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 153-□P,M,K,N | 15.3 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 154-□P,M,K,N | 15.4 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 155-□P,M,K,N | 15.5 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 156-□P,M,K,N | 15.6 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |

* Order made items : MSDH□□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)



| Terminology | P | M | K | N | ND |
|------------------------|----------------|---|------|------------------|--------|
| Coating | TiAlN | | | Cemented carbide | DLC |
| Tolerance (drill Dia.) | h7 | | | | |
| Tolerance (shank Dia.) | h6 | | | | |
| Point angle | 140° | | 135° | | 140° |
| Twist angle | 30° | | | | |
| Thinning | X type | | | | N type |
| Coolant | Through system | | | | |

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



| Designation | øD | ød | (mm) | | | | | |
|-------------------|------|------|-------------|-----|-------------|-----|-------------|-----|
| | | | 3P,M,K,N,ND | | 5P,M,K,N,ND | | 7P,M,K,N,ND | |
| | | | ℓ | L | ℓ | L | ℓ | L |
| MSDH 157-□P,M,K,N | 15.7 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 158-□P,M,K,N | 15.8 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 159-□P,M,K,N | 15.9 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 160-□P,M,K,N | 16.0 | 16.0 | 80 | 146 | 112 | 178 | 144 | 210 |
| 161-□P,M,K,N | 16.1 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 162-□P,M,K,N | 16.2 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 163-□P,M,K,N | 16.3 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 164-□P,M,K,N | 16.4 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 165-□P,M,K,N | 16.5 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 166-□P,M,K,N | 16.6 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 167-□P,M,K,N | 16.7 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 168-□P,M,K,N | 16.8 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 169-□P,M,K,N | 16.9 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 170-□P,M,K,N | 17.0 | 17.0 | 85 | 151 | 120 | 186 | 153 | 220 |
| 171-□P,M,K,N | 17.1 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 172-□P,M,K,N | 17.2 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 173-□P,M,K,N | 17.3 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 174-□P,M,K,N | 17.4 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 175-□P,M,K,N | 17.5 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 176-□P,M,K,N | 17.6 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 177-□P,M,K,N | 17.7 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 178-□P,M,K,N | 17.8 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 179-□P,M,K,N | 17.9 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 180-□P,M,K,N | 18.0 | 18.0 | 85 | 153 | 120 | 188 | 162 | 230 |
| 181-□P,M,K,N | 18.1 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 182-□P,M,K,N | 18.2 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 183-□P,M,K,N | 18.3 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 184-□P,M,K,N | 18.4 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 185-□P,M,K,N | 18.5 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 186-□P,M,K,N | 18.6 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 187-□P,M,K,N | 18.7 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 188-□P,M,K,N | 18.8 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 189-□P,M,K,N | 18.9 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 190-□P,M,K,N | 19.0 | 19.0 | 88 | 157 | 124 | 193 | 171 | 240 |
| 191-□P,M,K,N | 19.1 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 192-□P,M,K,N | 19.2 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 193-□P,M,K,N | 19.3 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 194-□P,M,K,N | 19.4 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 195-□P,M,K,N | 19.5 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 196-□P,M,K,N | 19.6 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 197-□P,M,K,N | 19.7 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 198-□P,M,K,N | 19.8 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 199-□P,M,K,N | 19.9 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |
| 200-□P,M,K,N | 20.0 | 20.0 | 90 | 160 | 130 | 200 | 180 | 250 |

* Order made items : MSDH□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1) Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH101-P × 60 - 80L × 11S

Ex.2) Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH1012 - M × 60 - 80L × 11S



Stable deep hole drilling with specially designed low cutting resistance

Mach Long Solid drill

- Over 20D deep hole drilling is possible without step drilling
- The stable hole drilling due to specially designed low cutting resistance
- Special chip pocket has designed for effective chip evacuation
- Optimized design for drill rigidity to prevent the bending of the drill when entering operation
- The lubrication & thermal resistance of coating has been increased by adapting new TiAlN



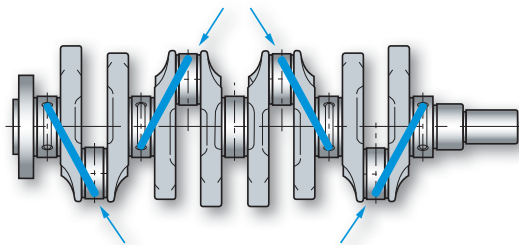
Code system

(Special type)

MLD(P) 1000 - 10 - 100L × 11S

| Type | Tool Dia. | MLDP | Overall length | Shank Dia. |
|--|-------------|--|----------------|------------|
| Mach Long Drill : MLD Pilot Drills For MLD : MLDP | 1000=Ø10.00 | FLUTE length 10 = 10mm MLD Depth of drilling 10 = D X 10 | 100L : 100mm | 11S : Ø11 |

Mach Long Drills - Deep hole drilling



Application example (Oil hole for crank shaft, 20D)

Mach Long Drills are ideal for....

- Deep and inclined hole drilling of crank shaft
- Deep hole drilling of cam shaft
- Deep hole drilling of mold and machinery
→ Deep hole drilling aspect ratio over 15D

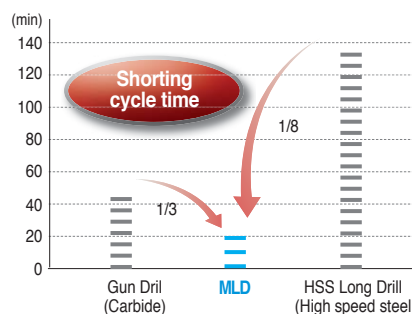
Advantages of MLD

- Shorting cycle time for better productivity
- Tool guide bush is not required
- Reduce idle time by prolonged tool life
- Green coolant solutions(MQL) to protect environment

MLD productivity : MLD0680-20 (Ø6.8mm x 140 x 170L x 7S)

| Tool | vc(m/min) | fn(mm/rev) | n(min ⁻¹) | vf(mm/min) | Coolant | Step operation |
|------------------------------|-----------|------------|-----------------------|------------|-----------------------------|----------------|
| Gun Drills (Carbide) | 100 | 0.04 | 4,683 | 187 | Through coolant oil | No required |
| High Speed Steel Long Drills | 15 | 0.10 | 703 | 70 | Outer coolant oil | 15mm / 9times |
| Mach Long Drills | 80 | 0.14 | 3,747 | 525 | MQL- Air 0.5MPa, Oil 20cc/h | No required |

Cycle time

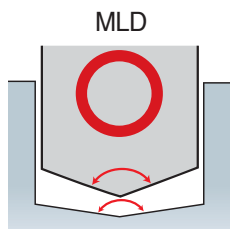


Advantages of MLD against conventional drills

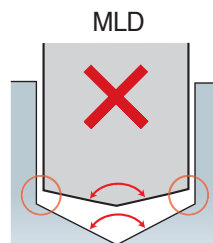
- Decreasing cycle time up to 1/3 ~ 1/8 times
- Increasing productivity by process reduction
- It is easy to reduce running cost
- Improving of effective working condition
- Drill guide bush is not required

Function of MLD & MLDP

Relationship of point angle between MLD & MLDP



Point angle of MLD < Point angle of foundation hole
→ Stable machining



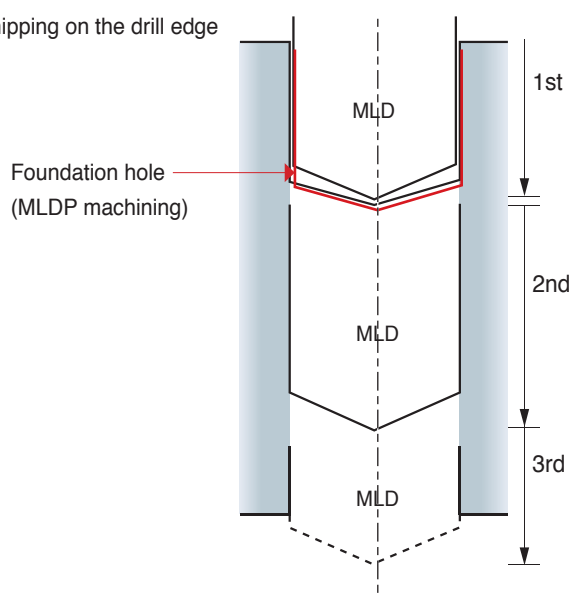
Point angle of MLD > Point angle of foundation hole
→ Chipping on the drill edge

Large point angle of Pilot Drill : **Stable condition**

Small point angle of Pilot Drill : **Unstable condition**

To make the optimal of MLD

Chipping on the drill edge



1st. Pilot drilling

• vc(m/min) = Normal • fn(mm/rev) = Normal

2nd. Deep drilling by MLD

Approach the drill 1mm less than the depth of MLDP drilling.

• vc(m/min) = 15

• fn(mm/rev) = 0.5

2nd MLD drilling (Machining stage)

• vc(m/min) = Normal

• fn(mm/rev) = Normal

3rd MLD drilling (Piercing stage)

• vc(m/min) = Normal

• fn(mm/rev) = Normal feed / 2

Application example

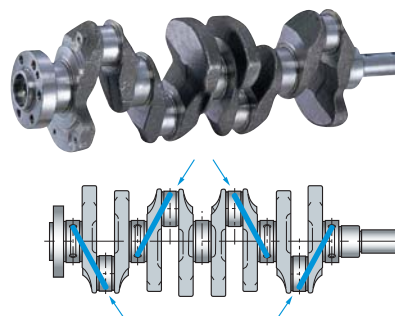
Workpiece Part of automobile (SCM440, HB255~330)

Cutting condition vc(m/min) = 70
fn(mm/rev) = 0.18
MQL(30cc/hour)
Air(MPa) = 0.7

Designation MLD0600-22A (Ø6mm, Aspect ratio 18D)

Machine Horizontal milling machine

Tool life 1000 holes



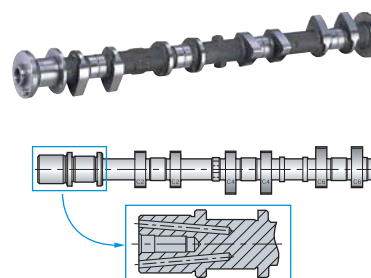
Workpiece Part of automobile (GC250)

Cutting condition vc(m/min) = 63
fn(mm/rev) = 0.1

Designation MLD0400-25A (Ø4mm, Aspect ratio 16D)

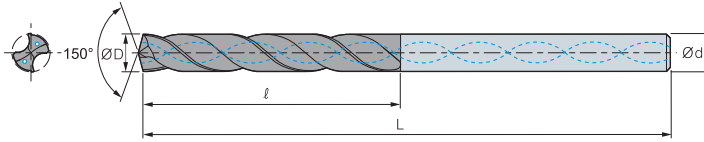
Machine Rotary milling machine

Tool life 440 holes



MLDP(Mach long Drills)

Pilot Drills with oil hole for MLD



| | |
|-----------------------|----------------|
| Coating | TiAlN |
| Tolerance(drill Dia.) | x6 |
| Twist angle | 30° |
| Tolerance | h6 |
| Point angle | 150° |
| Thinning | X type |
| Coolant | Through system |

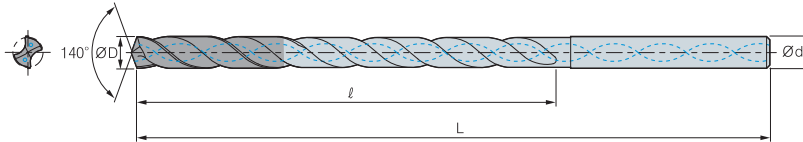


| Designation | ØD | Ød | (mm) | | | |
|-------------|------|------|----------------|-----|----------------|-----|
| | | | 5 (ℓ / ØD = 5) | | 7 (ℓ / ØD = 7) | |
| | | | ℓ | L | ℓ | L |
| MLDP 0300-□ | 3.0 | 3.0 | 25 | 70 | 30 | 75 |
| 0400-□ | 4.0 | 4.0 | 34 | 80 | 40 | 86 |
| 0500-□ | 5.0 | 5.0 | 43 | 90 | 50 | 97 |
| 0600-□ | 6.0 | 6.0 | 48 | 96 | 60 | 108 |
| 0700-□ | 7.0 | 7.0 | 56 | 105 | 70 | 120 |
| 0800-□ | 8.0 | 8.0 | 60 | 110 | 80 | 130 |
| 0900-□ | 9.0 | 9.0 | 72 | 125 | 90 | 143 |
| 1000-□ | 10.0 | 10.0 | 75 | 129 | 95 | 150 |

Order made items : MLDP□□□□ x Flute length - Total length L x Shank diameter S
 Ex.1) Machined diameter : Ø5.8mm, Flute length : 50mm, Total length : 100mm,
 MLDP0580 x 50-100L x 6S

MLD(Mach long Drills)

Mach long drills with oil hole for deep hole machining



| | |
|-----------------------|----------------|
| Coating | TiAlN |
| Tolerance(drill Dia.) | h7 |
| Twist angle | 30° |
| Tolerance | h6 |
| Point angle | 140° |
| Thinning | X type |
| Coolant | Through system |



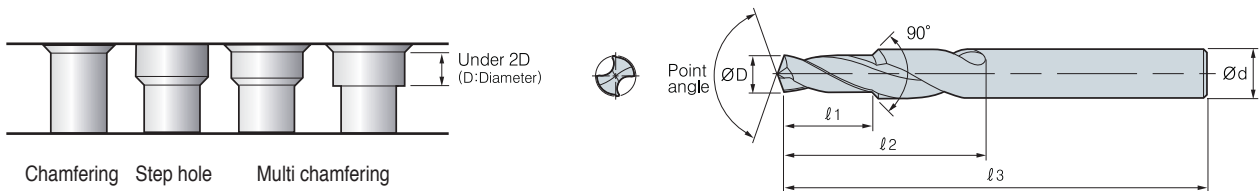
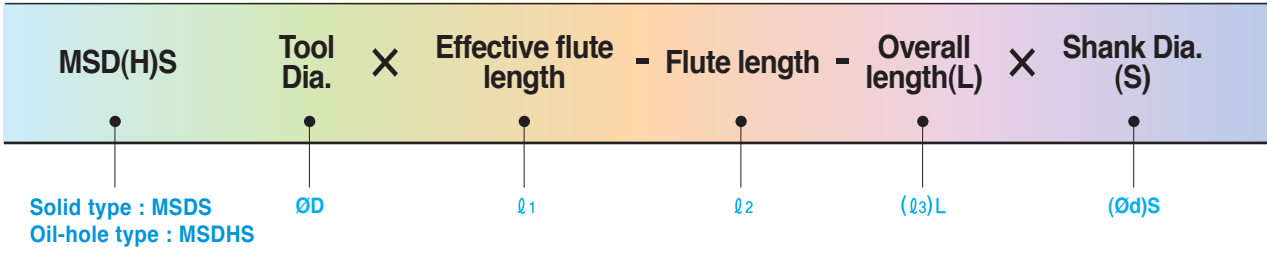
| Designation | ØD | Ød | (mm) | | | |
|-------------|------|------|------------------|-----|------------------|-----|
| | | | 20 (ℓ / ØD = 20) | | 25 (ℓ / ØD = 25) | |
| | | | ℓ | L | ℓ | L |
| MLD 0300-□ | 3.0 | 3.0 | 60 | 110 | 75 | 120 |
| 0400-□ | 4.0 | 4.0 | 80 | 130 | 100 | 150 |
| 0500-□ | 5.0 | 5.0 | 100 | 150 | 125 | 175 |
| 0600-□ | 6.0 | 6.0 | 120 | 170 | 150 | 200 |
| 0700-□ | 7.0 | 7.0 | 140 | 190 | 175 | 225 |
| 0800-□ | 8.0 | 8.0 | 160 | 210 | 200 | 250 |
| 0900-□ | 9.0 | 9.0 | 180 | 230 | - | - |
| 1000-□ | 10.0 | 10.0 | 200 | 250 | - | - |

Order made items : MLD□□□□ -Aspect ratio
 Ex.1) Machined diameter : Ø5.3mm, Flute length : 120mm, Total length : 180mm
 MLD0530-22(Aspect ratio)

Tolerance code

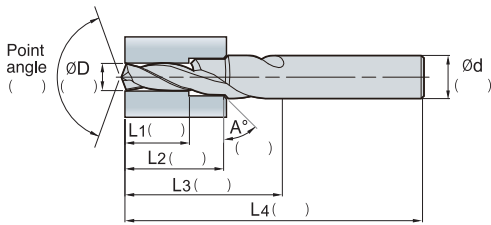
| Drill Dia. (ØD) | | h6 | h7 | x6 |
|-----------------|-------|------------|------------|-------------------|
| Over | Under | | | |
| - | 3 | 0 ~ -0.006 | 0 ~ -0.010 | + 0.020 ~ + 0.026 |
| 3 | 6 | 0 ~ -0.008 | 0 ~ -0.012 | + 0.028 ~ + 0.036 |
| 6 | 10 | 0 ~ -0.009 | 0 ~ -0.015 | + 0.034 ~ + 0.043 |
| 10 | 14 | 0 ~ -0.011 | 0 ~ -0.018 | + 0.040 ~ + 0.051 |
| 14 | 18 | 0 ~ -0.011 | 0 ~ -0.018 | + 0.045 ~ + 0.056 |
| 18 | 24 | 0 ~ -0.013 | 0 ~ -0.021 | + 0.054 ~ + 0.067 |

Code system for mach step drill



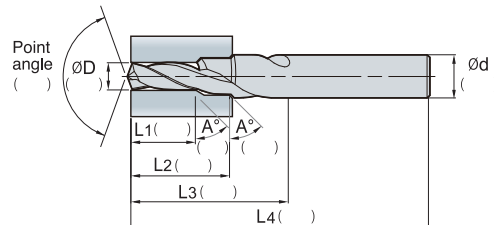
Multi chamfering

(Coolant : Through system External system)



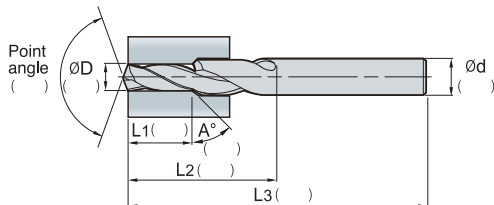
Multi chamfering

(Coolant : Through system External system)



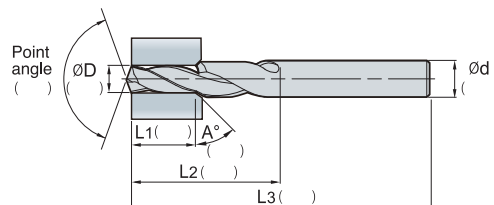
Step hole

(Coolant : Through system External system)



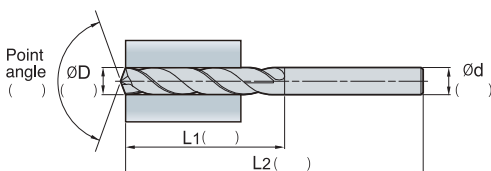
Chamfering

(Coolant : Through system External system)



Drilling

(Coolant : Through system External system)



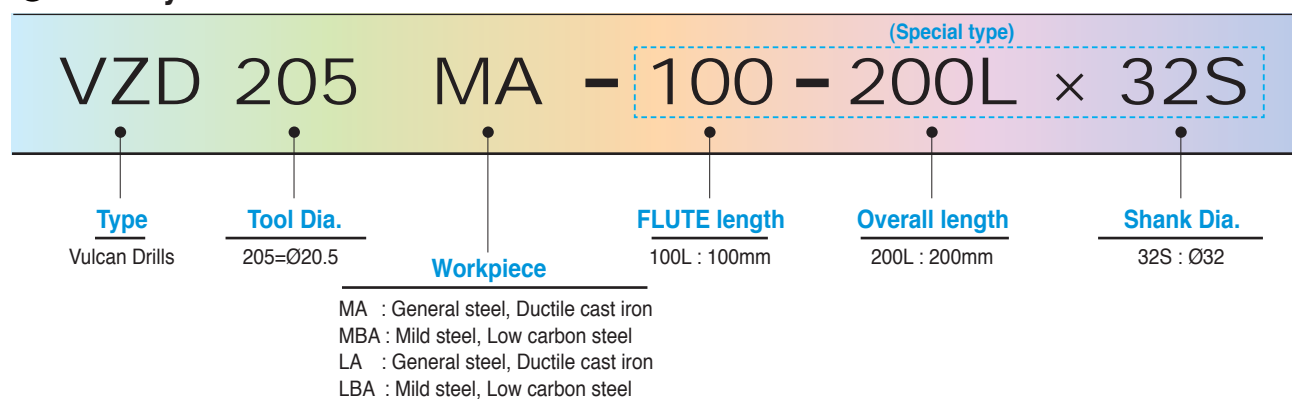
High feed and precision machining with our specially designed point edge

Vulcan Drill

- High feed and precision machining due to specially designed point edge
- Vulcan drills ensure longer tool life under high speed condition because of increased thermal & wear resistance. It also uses a PVD coating with an exclusive substrate to help maintain reduced frictional resistance
- Low cutting resistance by the best design of clearance angle is possible to increase feed
- Smoother chip control due to improved chip breakage
- Rmax: 6~25s, Hole tolerance: IT8 ~ 10
- Strong shock resistance ensures long tool life under the heavy interrupted machining



Code system



Application for Vulcan Drill

Workpiece - General steel, Alloy steel, Mild steel, Dice steel, Stainless steel, Cast iron, Ductile cast iron, Non-ferrous metal, etc



Unsuitable drilling

- Avoid the inclination or unevenness of entering and piercing section of hole as possible
- Reduce the feed 0.1 ~ 0.15mm/rev when drilling at inclined and unevenness

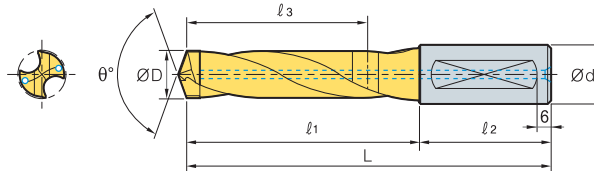
Clamping of workpiece

- In case of wide flat panel or rotation by horizontal component, please clamp to be prevented bending of central part of workpiece for high efficiency

Recommended cutting condition

| Form | Workpiece | Hardness | ~Ø15 | | ~Ø20 | | ~Ø40 | |
|------------|--|-------------|-------------|------------------|-------------|------------------|-------------|------------------|
| | | | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) | vc(m/min) | fn(mm/rev) |
| MA LA | Mild steel, General steel, Alloy steel | Under HB250 | 40~90 (65) | 0.15~0.30 (0.20) | 40~90 (65) | 0.20~0.40 (0.30) | 40~90 (70) | 0.20~0.45 (0.35) |
| | General steel, Alloy steel | Under HB320 | 40~90 (60) | 0.10~0.25 (0.20) | 40~90 (60) | 0.15~0.35 (0.25) | 40~90 (65) | 0.20~0.40 (0.30) |
| | Mild steel | HB250 | 40~70 (50) | 0.10~0.25 (0.20) | 40~70 (50) | 0.15~0.30 (0.25) | 40~70 (50) | 0.20~0.35 (0.30) |
| | Stainless steel | HB250 | 30~50 (45) | 0.10~0.20 (0.15) | 30~50 (45) | 0.15~0.25 (0.20) | 30~50 (45) | 0.20~0.30 (0.25) |
| | Ductile cast iron | - | 50~100 (70) | 0.20~0.35 (0.30) | 50~100 (70) | 0.20~0.40 (0.35) | 50~100 (70) | 0.25~0.50 (0.40) |
| MBA LBA | Mild steel, General steel, Alloy steel | Under HB250 | 40~90 (75) | 0.20~0.40 (0.30) | 40~90 (75) | 0.20~0.40 (0.30) | 40~90 (80) | 0.20~0.45 (0.35) |
| | General steel, Alloy steel | Under HB320 | 35~80 (55) | 0.15~0.30 (0.25) | 35~80 (55) | 0.15~0.30 (0.25) | 40~80 (60) | 0.15~0.40 (0.30) |

Vulcan Drill(VZD)-MA, MBA



| | | |
|-----------------------|----------------|------|
| Type | MA | MBA |
| Coating | TiN | |
| Tolerance(drill Dia.) | h7 | |
| Tolerance(shank Dia.) | h7 | |
| Point angle | 140° | 150° |
| Twist angle | 25° | 20° |
| Thinning | X type | |
| Coolant | Through system | |



(mm)

| Designation | ØD | Ød | L | l ₁ | l ₂ | l ₃ |
|--------------------|-----------|----|-----|----------------|----------------|----------------|
| VZD 126~135MA, MBA | 12.6~13.5 | 16 | 110 | 62 | 48 | 44 |
| 136~145MA, MBA | 13.6~14.5 | 16 | 115 | 67 | 48 | 48 |
| 146~155MA, MBA | 14.6~15.5 | 20 | 125 | 75 | 50 | 55 |
| 156~165MA, MBA | 15.6~16.5 | 20 | 130 | 80 | 50 | 59 |
| 166~175MA, MBA | 16.6~17.5 | 20 | 135 | 85 | 50 | 63 |
| 176~185MA, MBA | 17.6~18.5 | 20 | 140 | 90 | 50 | 66 |
| 186~195MA, MBA | 18.6~19.5 | 25 | 155 | 99 | 56 | 74 |
| 196~205MA, MBA | 19.6~20.5 | 25 | 155 | 99 | 56 | 73 |
| 206~215MA, MBA | 20.6~21.5 | 25 | 155 | 99 | 56 | 72 |
| 216~225MA, MBA | 21.6~22.5 | 25 | 160 | 104 | 56 | 76 |
| 226~235MA, MBA | 22.6~23.5 | 25 | 160 | 104 | 56 | 74 |
| 236~245MA, MBA | 23.6~24.5 | 32 | 170 | 110 | 60 | 79 |
| 246~255MA, MBA | 24.6~25.5 | 32 | 170 | 110 | 60 | 78 |
| 256~265MA, MBA | 25.6~26.5 | 32 | 175 | 115 | 60 | 82 |
| 266~275MA, MBA | 26.6~27.5 | 32 | 175 | 115 | 60 | 80 |
| 276~285MA, MBA | 27.6~28.5 | 32 | 180 | 120 | 60 | 84 |
| 286~295MA, MBA | 28.6~29.5 | 32 | 185 | 125 | 60 | 88 |
| 296~305MA, MBA | 29.6~30.5 | 32 | 185 | 125 | 60 | 87 |
| 306~315MA, MBA | 30.6~31.5 | 40 | 205 | 135 | 70 | 95 |
| 316~325MA, MBA | 31.6~32.5 | 40 | 210 | 140 | 70 | 98 |
| 326~335MA, MBA | 32.6~33.5 | 40 | 215 | 145 | 70 | 101 |
| 336~345MA, MBA | 33.6~34.5 | 40 | 220 | 150 | 70 | 104 |
| 346~355MA, MBA | 34.6~35.5 | 40 | 225 | 155 | 70 | 107 |
| 356~365MA, MBA | 35.6~36.5 | 40 | 225 | 155 | 70 | 110 |
| 366~375MA, MBA | 36.6~37.5 | 40 | 230 | 160 | 70 | 113 |
| 376~385MA, MBA | 37.6~38.5 | 40 | 235 | 165 | 70 | 116 |
| 386~395MA, MBA | 38.6~39.5 | 40 | 240 | 170 | 70 | 119 |
| 396~405MA, MBA | 39.6~40.5 | 40 | 245 | 175 | 70 | 122 |

VZD□□□MA : For General steel, Ductile cast iron
 MBA : For Mild steel, Low carbon steel

Order made items : VZD□□□M□ × Flute length - Total length L

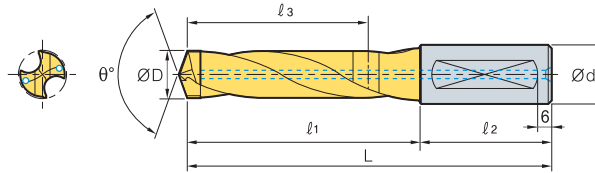
Ex.1) MA Type, Machined diameter : Ø18.6mm, Flute length : 110mm, Total length : 200mm
 --- VZD186MA × 110-200L

Ex.2) MA Type, Machined diameter : Ø18.63, Flute length : 110mm, Total length : 200mm
 --- VZD1863MA × 110-200L

Ex.3) MA Type, Machined diameter : Ø18.6, Standard
 --- VZD186MA



Vulcan Drill(VZD) - LA, LBA



| | | |
|-----------------------|----------------|------|
| Type | LA | LBA |
| Coating | TiN | |
| Tolerance(drill Dia.) | h7 | |
| Tolerance(shank Dia.) | h7 | |
| Point angle | 140° | 150° |
| Twist angle | 25° | 20° |
| Thinning | X type | |
| Coolant | Through system | |



(mm)

| Designation | ØD | Ød | L | l ₁ | l ₂ | l ₃ |
|--------------------|-----------|----|-----|----------------|----------------|----------------|
| VZD 126~135LA, LBA | 12.6~13.5 | 16 | 140 | 92 | 48 | 74 |
| 136~145LA, LBA | 13.6~14.5 | 16 | 145 | 97 | 48 | 78 |
| 146~155LA, LBA | 14.6~15.5 | 20 | 155 | 105 | 50 | 85 |
| 156~165LA, LBA | 15.6~16.5 | 20 | 165 | 115 | 50 | 94 |
| 166~175LA, LBA | 16.6~17.5 | 20 | 170 | 120 | 50 | 98 |
| 176~185LA, LBA | 17.6~18.5 | 20 | 175 | 125 | 50 | 101 |
| 186~195LA, LBA | 18.6~19.5 | 25 | 190 | 134 | 56 | 109 |
| 196~205LA, LBA | 19.6~20.5 | 25 | 195 | 139 | 56 | 113 |
| 206~215LA, LBA | 20.6~21.5 | 25 | 195 | 139 | 56 | 112 |
| 216~225LA, LBA | 21.6~22.5 | 25 | 200 | 144 | 56 | 116 |
| 226~235LA, LBA | 22.6~23.5 | 25 | 210 | 154 | 56 | 124 |
| 236~245LA, LBA | 23.6~24.5 | 32 | 220 | 160 | 60 | 129 |
| 246~255LA, LBA | 24.6~25.5 | 32 | 225 | 165 | 60 | 133 |
| 256~265LA, LBA | 25.6~26.5 | 32 | 230 | 170 | 60 | 137 |
| 266~275LA, LBA | 26.6~27.5 | 32 | 235 | 175 | 60 | 141 |
| 276~285LA, LBA | 27.6~28.5 | 32 | 240 | 180 | 60 | 144 |
| 286~295LA, LBA | 28.6~29.5 | 32 | 245 | 185 | 60 | 148 |
| 296~305LA, LBA | 29.6~30.5 | 32 | 255 | 195 | 60 | 157 |
| 306~315LA, LBA | 30.6~31.5 | 40 | 275 | 205 | 70 | 166 |
| 316~325LA, LBA | 31.6~32.5 | 40 | 280 | 210 | 70 | 172 |
| 326~335LA, LBA | 32.6~33.5 | 40 | 280 | 215 | 70 | 173 |
| 336~345LA, LBA | 33.6~34.5 | 40 | 290 | 220 | 70 | 177 |
| 346~355LA, LBA | 34.6~35.5 | 40 | 295 | 225 | 70 | 181 |
| 356~365LA, LBA | 35.6~36.5 | 40 | 300 | 230 | 70 | 183 |
| 366~375LA, LBA | 36.6~37.5 | 40 | 305 | 235 | 70 | 188 |
| 376~385LA, LBA | 37.6~38.5 | 40 | 315 | 245 | 70 | 193 |
| 386~395LA, LBA | 38.6~39.5 | 40 | 320 | 250 | 70 | 198 |
| 396~405LA, LBA | 39.6~40.5 | 40 | 325 | 255 | 70 | 203 |

VZD□□□LA : For General steel, Ductile cast iron
 LBA : For Mild steel, Low carbon steel

Order made items : VZD□□□□□ × Flute length - Total length L

Ex.1) LA Type, Machined diameter : Ø18.6mm, Flute length : 110mm, Total length : 200mm
 --- VZD186LA × 110-200L

Ex.2) LA Type, Machined diameter : Ø18.63, Flute length : 110mm, Total length : 200mm
 --- VZD1863LA × 110-200L

Ex.3) LA Type, Machined diameter : Ø18.6, Standard
 --- VZD186LA

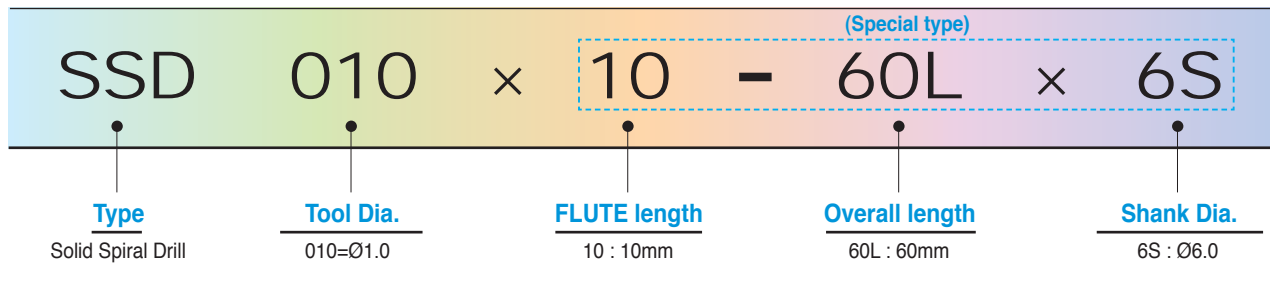
Guarantees excellent chip evacuation and surface roughness by specially designed flute and high rigidity of drill

Carbide Drill

One of the most important aspects of hole-drilling is hole precision and the tool life of the drill. These carbide drills are produced with a super fine exclusive substrate from Korloy designed to meet stress, hardness, and resistance to plastic deformation requirements of today's machining

- Long tool life by improving wear resistance and toughness for small hole drilling(Ø1mm~ Ø4mm)
- Increment of productivity by come true high feed because of specially designed cutting edge to low cutting resistance.(Ø4~ Ø15)
- Available to various workpiece as cast iron, non-ferrous metal, etc.
- Guarantees excellent chip evacuation and surface roughness by specially designed flute and high rigidity of drill

Code system

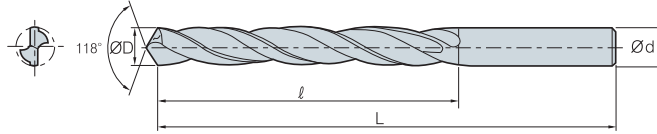


Recommended cutting condition

| Workpiece | Strength | Revolution as per drill Dia.(min ⁻¹) | | | | | | | Feed as per drill Dia.(mm/rev) | | Coolant |
|--------------------------|----------|--|------|------|------|------|------|------|--------------------------------|-----------|-------------|
| | | Ø5 | Ø10 | Ø15 | Ø20 | Ø25 | Ø30 | Ø40 | Ø5~Ø12 | Ø15~Ø40 | |
| SM10C~SM45C | 50 | 2900 | 1600 | 1100 | 1000 | 800 | 700 | 600 | 0.03~0.06 | 0.03~0.06 | Cutting oil |
| SM55C | 70 | 2300 | 1530 | 1050 | 920 | 765 | 640 | 560 | 0.03~0.06 | 0.06~0.12 | Cutting oil |
| SM55C-Pre-hardened steel | 100 | 2200 | 1500 | 1000 | 900 | 750 | 650 | 550 | 0.03 | 0.06 | Cutting oil |
| Pre-hardened steel | 150~180 | 700 | 340 | 250 | 190 | 160 | 140 | 120 | 0.02 | 0.04 | Cutting oil |
| Cr-Ni steel | 100 | 2200 | 1200 | 800 | 652 | 550 | 460 | 380 | 0.03 | 0.06 | Cutting oil |
| Mn-steel | 40~110 | 700 | 340 | 260 | 190 | 170 | 150 | 120 | 0.04 | 0.08 | Dry |
| Casting | 200~300 | 2000 | 1500 | 800 | 600 | 450 | 400 | 350 | 0.03 | 0.06 | Dry |
| Malleable iron | 200 | 2400 | 1500 | 900 | 650 | 500 | 420 | 380 | 0.03 | 0.06 | Dry |
| Chilled casting | 65Hs | 350 | 200 | 150 | 100 | 80 | 70 | 55 | 0.01 | 0.02 | Dry |
| Copper | 60~80 | 6000 | 4000 | 2500 | 2000 | 1400 | 1000 | 800 | 0.06 | 0.12 | Dry |
| Brass | 80~120 | 5000 | 3500 | 2000 | 1500 | 1400 | 1200 | 1000 | 0.05 | 0.10 | Dry |
| Bronze casting | 60~120 | 3500 | 2500 | 1800 | 1500 | 1200 | 1000 | 900 | 0.04 | 0.08 | Dry |
| Aluminum | 60~120 | 16000 | 8500 | 5700 | 4500 | 3700 | 3100 | 2800 | 0.1 | 0.2 | Dry |
| Al alloy (Si13%) | 40 | 8000 | 4500 | 2800 | 2100 | 1750 | 1050 | 700 | 0.05 | 0.15 | Dry |
| Synthetic resin | 90~120 | 8000 | 5400 | 2800 | 2100 | 1750 | 1050 | 200 | 0.05 | 0.15 | Dry |



Carbide Drill-SSD



| | |
|-----------------------|-----------------|
| Coating | × |
| Tolerance(drill Dia.) | h8 |
| Tolerance(shank Dia.) | h7 |
| Point angle | 118° |
| Twist angle | 30° |
| Thinning | S type |
| Coolant | External system |

| (mm) | | | | | | | |
|-------------|---------|----|----|-------------|---------|----|----|
| Designation | ØD = ød | ℓ | L | Designation | ØD = ød | ℓ | L |
| SSD 010 | 1.0 | 10 | 32 | SSD 048 | 4.8 | 38 | 65 |
| 011 | 1.1 | 10 | 32 | 049 | 4.9 | 38 | 65 |
| 012 | 1.2 | 10 | 32 | 050 | 5.0 | 38 | 65 |
| 013 | 1.3 | 10 | 32 | 051 | 5.1 | 38 | 65 |
| 014 | 1.4 | 10 | 32 | 052 | 5.2 | 38 | 65 |
| 015 | 1.5 | 13 | 35 | 053 | 5.3 | 38 | 65 |
| 016 | 1.6 | 13 | 35 | 054 | 5.4 | 38 | 65 |
| 017 | 1.7 | 13 | 35 | 055 | 5.5 | 38 | 65 |
| 018 | 1.8 | 13 | 35 | 056 | 5.6 | 40 | 75 |
| 019 | 1.9 | 13 | 35 | 057 | 5.7 | 40 | 75 |
| 020 | 2.0 | 18 | 40 | 058 | 5.8 | 40 | 75 |
| 021 | 2.1 | 18 | 40 | 059 | 5.9 | 40 | 75 |
| 022 | 2.2 | 18 | 40 | 060 | 6.0 | 40 | 75 |
| 023 | 2.3 | 18 | 40 | 061 | 6.1 | 40 | 75 |
| 024 | 2.4 | 18 | 40 | 062 | 6.2 | 40 | 75 |
| 025 | 2.5 | 22 | 45 | 063 | 6.3 | 40 | 75 |
| 026 | 2.6 | 22 | 45 | 064 | 6.4 | 40 | 75 |
| 027 | 2.7 | 22 | 45 | 065 | 6.5 | 40 | 75 |
| 028 | 2.8 | 22 | 45 | 066 | 6.6 | 46 | 80 |
| 029 | 2.9 | 22 | 45 | 067 | 6.7 | 46 | 80 |
| 030 | 3.0 | 25 | 50 | 068 | 6.8 | 46 | 80 |
| 031 | 3.1 | 25 | 50 | 069 | 6.9 | 46 | 80 |
| 032 | 3.2 | 25 | 50 | 070 | 7.0 | 46 | 80 |
| 033 | 3.3 | 25 | 50 | 071 | 7.1 | 46 | 80 |
| 034 | 3.4 | 25 | 50 | 072 | 7.2 | 46 | 80 |
| 035 | 3.5 | 25 | 50 | 073 | 7.3 | 46 | 80 |
| 036 | 3.6 | 30 | 55 | 074 | 7.4 | 46 | 80 |
| 037 | 3.7 | 30 | 55 | 075 | 7.5 | 46 | 80 |
| 038 | 3.8 | 30 | 55 | 076 | 7.6 | 46 | 80 |
| 039 | 3.9 | 30 | 55 | 077 | 7.7 | 46 | 80 |
| 040 | 4.0 | 30 | 55 | 078 | 7.8 | 46 | 80 |
| 041 | 4.1 | 34 | 60 | 079 | 7.9 | 46 | 80 |
| 042 | 4.2 | 34 | 60 | 080 | 8.0 | 50 | 85 |
| 043 | 4.3 | 34 | 60 | 081 | 8.1 | 50 | 85 |
| 044 | 4.4 | 34 | 60 | 082 | 8.2 | 50 | 85 |
| 045 | 4.5 | 34 | 60 | 083 | 8.3 | 50 | 85 |
| 046 | 4.6 | 38 | 65 | 084 | 8.4 | 50 | 85 |
| 047 | 4.7 | 38 | 65 | 085 | 8.5 | 50 | 85 |

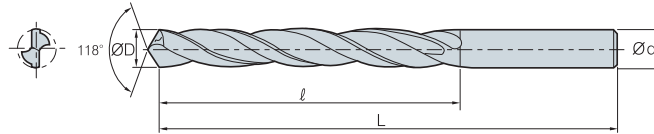
Drill diameter : Available from Ø0.6

Order made items : SSD□□□ × Flute length - Total length L

Ex.1) Genetal type, Machined diameter : Ø8.2mm, Flute length : 60mm, Total length : 90mm --- SSD082 × 60 - 90L

Ex.2) Genetal type, Machined diameter : Ø8.2mm --- SSD082

Carbide Drill-SSD



| | |
|-----------------------|-----------------|
| Coating | X |
| Tolerance(drill Dia.) | h8 |
| Tolerance(shank Dia.) | h7 |
| Point angle | 118° |
| Twist angle | 30° |
| Thinning | S type |
| Coolant | External system |

(mm)

| Designation | ØD = ød | ℓ | L | Designation | ØD = ød | ℓ | L |
|-------------|---------|----|-----|-------------|---------|----|-----|
| SSD 086 | 8.6 | 50 | 95 | SSD 097 | 9.7 | 50 | 100 |
| 087 | 8.7 | 50 | 95 | 098 | 9.8 | 50 | 100 |
| 088 | 8.8 | 50 | 95 | 099 | 9.9 | 50 | 100 |
| 089 | 8.9 | 50 | 95 | 100 | 10.0 | 50 | 100 |
| 090 | 9.0 | 50 | 95 | 105 | 10.5 | 60 | 120 |
| 091 | 9.1 | 50 | 95 | 110 | 11.0 | 60 | 120 |
| 092 | 9.2 | 50 | 95 | 115 | 11.5 | 65 | 125 |
| 093 | 9.3 | 50 | 95 | 120 | 12.0 | 65 | 125 |
| 094 | 9.4 | 50 | 95 | 125 | 12.5 | 65 | 125 |
| 095 | 9.5 | 50 | 95 | 130 | 13.0 | 65 | 125 |
| 096 | 9.6 | 50 | 100 | 150 | 15.0 | 70 | 130 |

Drill diameter : Available from Ø0.6

Order made items : SSD□□□ × Flute length - Total length L

Ex.1) Genetal type, Machined diameter : Ø8.2mm, Flute length : 60mm, Total length : 90mm --- SSD082 × 60 - 90L

Ex.2) Genetal type, Machined diameter : Ø8.2mm --- SSD082

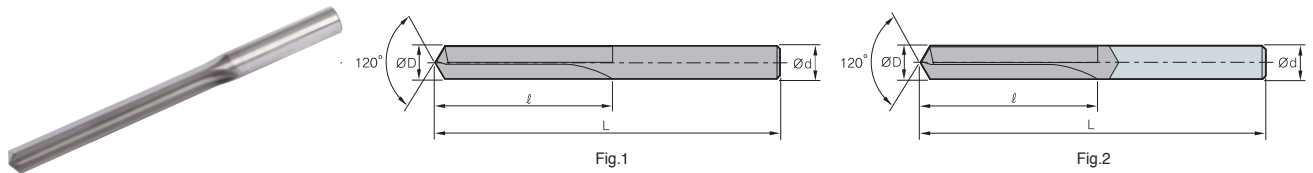


Burnishing Drill

Recommended cutting condition

| Workpiece | Cutting speed vc(m/min) | Feed rate, fn(mm/rev) | | | | |
|---------------------------------|----------------------------|-----------------------|-----------|-----------|-----------|-----------|
| | | Ø2.0~ 3.0 | Ø3.5~ 5.0 | Ø5.5~ 8.0 | Ø8.5~ 12 | Ø12.5~ 18 |
| Aluminum alloy, Copper alloy | 30~60 | 0.02~0.05 | 0.03~0.10 | 0.04~0.15 | 0.05~0.20 | 0.05~0.30 |
| Aluminum alloy for die castings | 50~80 | 0.02~0.05 | 0.03~0.10 | 0.04~0.15 | 0.05~0.20 | 0.05~0.30 |
| Cast iron(GC) Ductile cast | 25~60 | 0.01~0.04 | 0.02~0.08 | 0.05~0.12 | 0.05~0.20 | 0.05~0.30 |
| iron(GCD) | 20~50 | 0.01~0.03 | 0.02~0.05 | 0.03~0.08 | 0.04~0.12 | 0.05~0.15 |

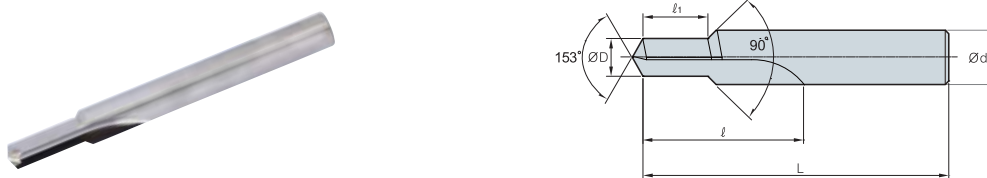
Burnishing Drill - BDS



(mm)

| Designation | ØD | Ød | ℓ | L | Fig. |
|-------------|------|------|-----|-----|------|
| BDS 040S | 4.0 | 4.0 | 35 | 80 | 1 |
| 050S | 5.0 | 5.0 | 40 | 85 | 1 |
| 060S | 6.0 | 6.0 | 50 | 95 | 1 |
| 070S | 7.0 | 7.0 | 55 | 100 | 1 |
| 080S | 8.0 | 8.0 | 65 | 110 | 1 |
| 090S | 9.0 | 9.0 | 70 | 120 | 1 |
| 100S | 10.0 | 10.0 | 80 | 130 | 1 |
| 110S | 11.0 | 11.0 | 90 | 140 | 1 |
| 120B | 12.0 | 12.0 | 95 | 150 | 2 |
| 130B | 13.0 | 16.0 | 105 | 160 | 2 |
| 140B | 14.0 | 16.0 | 110 | 170 | 2 |
| 150B | 15.0 | 16.0 | 120 | 185 | 2 |
| 160B | 16.0 | 16.0 | 125 | 190 | 2 |

Step Burnishing Drill - BDT For tapping a foundation hole



(mm)

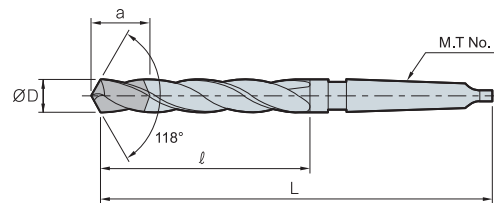
| Designation | ØD | Ød | ℓ | ℓ1 | L | Tap |
|---------------|------|------|----|-------|-----|-----------|
| BDT M05080-Ø1 | 4.2 | 6.0 | 35 | 9~15 | 90 | M5XP0.8 |
| M06100-Ø1 | 5.0 | 7.0 | 40 | 11~18 | 95 | M6XP1.0 |
| M08125-Ø1 | 6.8 | 10.0 | 50 | 15~24 | 105 | M8XP1.25 |
| M10125-Ø1 | 8.8 | 12.0 | 55 | 17~30 | 110 | M10XP1.25 |
| M10150-Ø1 | 8.5 | 12.0 | 55 | 17~30 | 110 | M10XP1.5 |
| M12125-Ø1 | 10.8 | 14.0 | 60 | 19~36 | 120 | M12XP1.25 |
| M12150-Ø1 | 10.5 | 14.0 | 60 | 19~36 | 120 | M12XP1.5 |
| M12175-Ø1 | 10.3 | 14.0 | 60 | 19~36 | 120 | M12XP1.75 |

Top Solid Drill

Recommended cutting condition

| Diameter | Cutting condition | Ductile cast iron | Gray cast iron | Soft steel |
|-----------|-------------------|-------------------|-----------------|-----------------|
| Ø8~Ø10 | vc(m/min) | 30(20~35) | 40(20~60) | 100(50~150) |
| | fn(mm/rev) | 0.30(0.20~0.40) | 0.30(0.20~0.40) | 0.15(0.10~0.20) |
| Ø10.1~Ø15 | vc(m/min) | 50(30~70) | 60(30~80) | 130(70~200) |
| | fn(mm/rev) | 0.35(0.30~0.40) | 0.35(0.30~0.40) | 0.15(0.10~0.20) |
| Ø15.1~Ø25 | vc(m/min) | 60(50~60) | 75(50~100) | 150(100~250) |
| | fn(mm/rev) | 0.35(0.30~0.45) | 0.40(0.30~0.50) | 0.15(0.10~0.20) |

Top Solid Drill - TSDM



(mm)

| Designation | ØD | L | l | a | M.T No |
|--------------|-----------|-----|-----|----|--------|
| TSDM 080-085 | 8.0~8.5 | 168 | 85 | 25 | 1 |
| 086-090 | 8.6~9.0 | 172 | 88 | 25 | 1 |
| 091-095 | 9.1~9.5 | 175 | 92 | 26 | 1 |
| 096-100 | 9.6~10.0 | 178 | 95 | 26 | 1 |
| 101-105 | 10.1~10.5 | 182 | 98 | 26 | 1 |
| 106-110 | 10.6~11.0 | 185 | 102 | 26 | 1 |
| 111-115 | 11.1~11.5 | 188 | 105 | 26 | 1 |
| 116-120 | 11.6~12.0 | 192 | 108 | 26 | 1 |
| 121-125 | 12.1~12.5 | 195 | 112 | 26 | 1 |
| 126-130 | 12.6~13.0 | 198 | 115 | 26 | 2 |
| 131-135 | 13.1~13.5 | 202 | 118 | 27 | 2 |
| 136-140 | 13.6~14.0 | 205 | 122 | 27 | 2 |
| 141-145 | 14.1~14.5 | 222 | 122 | 27 | 2 |
| 146-150 | 14.6~15.0 | 225 | 125 | 27 | 2 |
| 151-155 | 15.1~15.5 | 228 | 125 | 27 | 2 |
| 156-160 | 15.6~16.0 | 230 | 130 | 27 | 2 |
| 161-165 | 16.1~16.5 | 232 | 132 | 27 | 2 |
| 166-170 | 16.6~17.0 | 234 | 135 | 27 | 2 |
| 171-180 | 17.1~18.0 | 240 | 140 | 27 | 2 |
| 181-190 | 18.1~19.0 | 245 | 145 | 27 | 2 |
| 191-200 | 19.1~20.0 | 250 | 150 | 30 | 2 |
| 201-210 | 20.1~21.0 | 255 | 155 | 30 | 2 |
| 211-220 | 21.1~22.0 | 260 | 160 | 30 | 2 |
| 221-230 | 22.1~23.0 | 265 | 165 | 30 | 2 |
| 231-250 | 23.1~25.0 | 285 | 165 | 34 | 3 |

* Order form : TSDM125

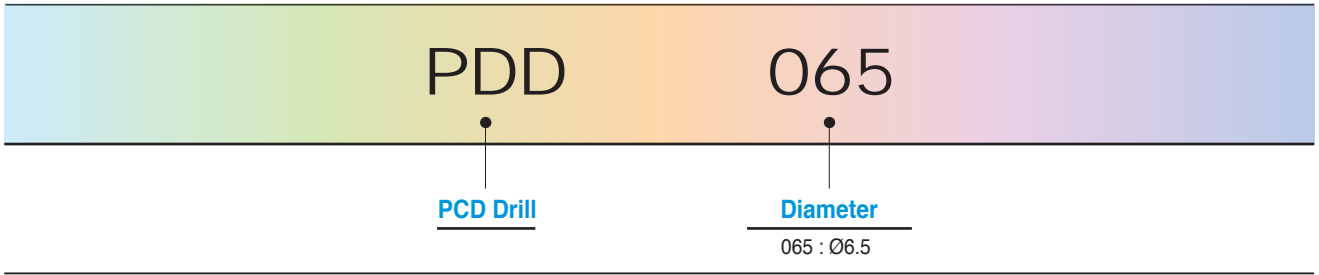


High accuracy hole machining for aluminum alloy

PCD Drill

- High accuracy hole machining for aluminum alloy
- Drilling tolerance : IT7~8class
- Recommendation with high accuracy and high spindle machine

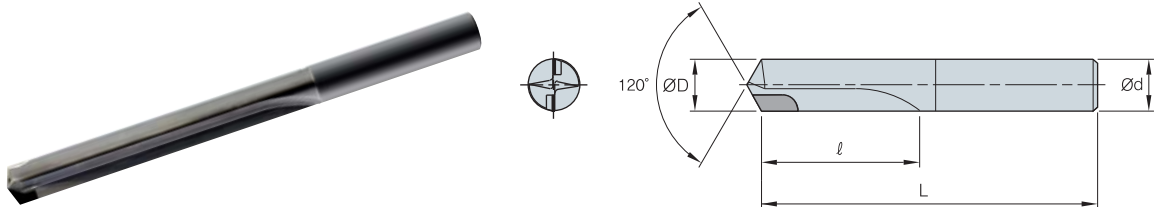
Code system



Recommended cutting condition

| Workpiece | vc(m/min) | fn(mm/rev) |
|----------------|-----------|----------------------------|
| Aluminum alloy | 50 ~ 250 | 0.05 ~ 0.20 0.10 ~ 0.40 |

PDD



| Designation | $\varnothing D$ | $\varnothing d$ | ℓ | L |
|-------------|-----------------|-----------------|--------|-----|
| PDD 0500 | 5.0 | 5.0 | 30 | 80 |
| 0550 | 5.5 | 5.5 | 30 | 80 |
| 0600 | 6.0 | 6.0 | 30 | 80 |
| 0650 | 6.5 | 6.5 | 40 | 95 |
| 0700 | 7.0 | 7.0 | 40 | 95 |
| 0750 | 7.5 | 7.5 | 45 | 100 |
| 0800 | 8.0 | 8.0 | 45 | 100 |
| 0850 | 8.5 | 8.5 | 50 | 110 |
| 0900 | 9.0 | 9.0 | 50 | 110 |
| 0950 | 9.5 | 9.5 | 55 | 115 |
| 1000 | 10.0 | 10.0 | 55 | 115 |
| 1050 | 10.5 | 10.5 | 60 | 120 |
| 1100 | 11.0 | 11.0 | 60 | 120 |
| 1150 | 11.5 | 11.5 | 65 | 125 |
| 1200 | 12.0 | 12.0 | 65 | 125 |

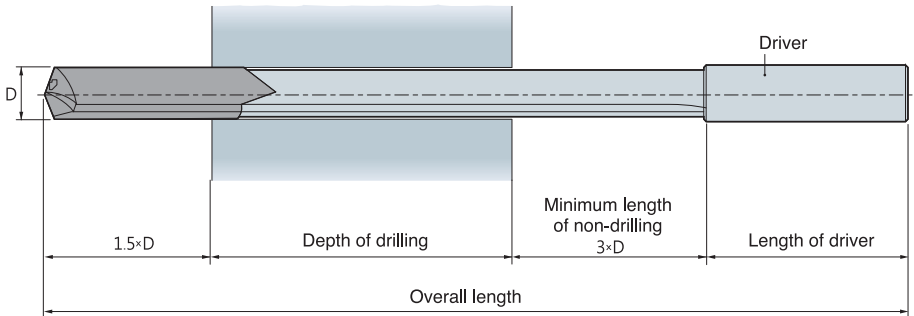
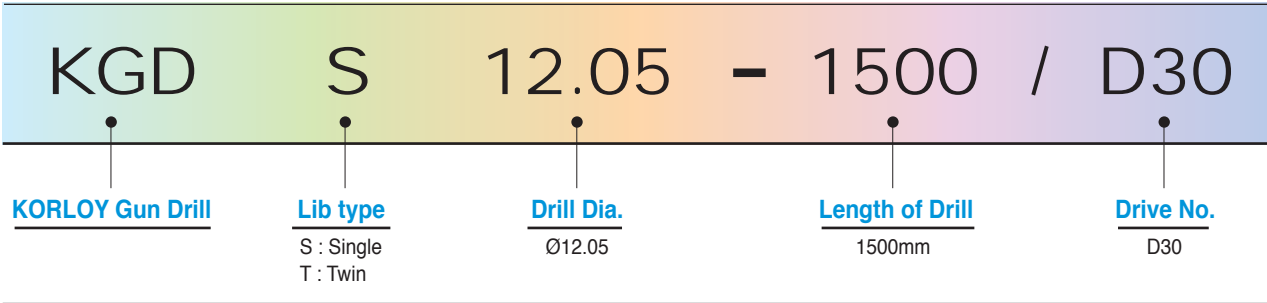
(mm)

Stable performance and hole quality with our unique cutting edge and guide pad
Available regrinding

Gun Drill

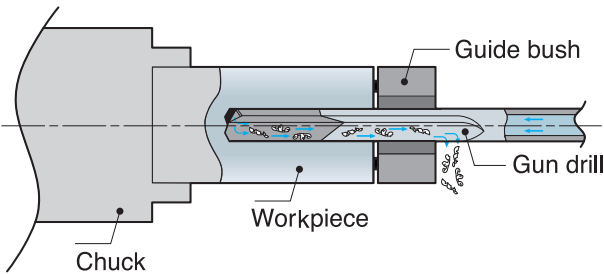
- High efficiency in deep hole machining
- High accuracy (Hole tolerance : IT9, surface finish : Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can recycle as change part of carbide
- Depending on request, The drills can change geometry of cutting edge and drive specification
- For ordering, please check length of drill

Code system



- Refer to the code system and the above drawing when ordering.
- Refer to the page 90 for the size of a driver.

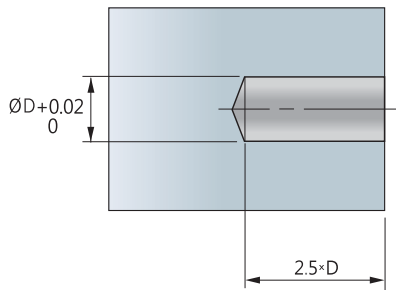
Application of Gun Drill on exclusive machine



- The guide bush is necessary for centering before gun-drilling.

Application of Gun Drill on machining center

1 Machining of a pilot hole

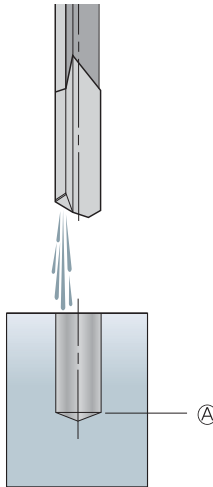


1. A pilot hole is necessary in machining on a machining center instead of a guide bush.
2. The diameter of the pilot hole should be 0.01~0.02(H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 2.5×D.
3. Use Mach Drill(MSD) for machining of a pilot hole.



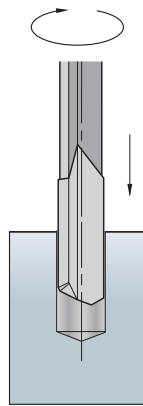
MSD

2 Moving the Gun Drill to the pilot hole



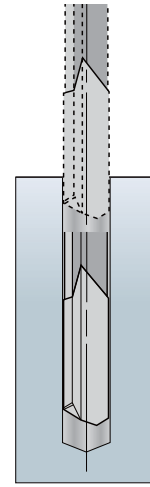
1. The Gun Drill should not drill before entering into the pilot hole.
2. Coolant is necessary for gun drilling.

3 Start Gun Drilling.



1. Rotate the spindle.
2. Machine with drilling to vertical axis.

4 After gun drilling



1. Return the drill.
2. Stop drilling and supplying coolant.
3. Remove the Gun Drill.

Features

| | Single Lip type | Twin Lip type |
|-------------------|--|--|
| Shape | | |
| Drill Dia. | Ø2.0 ~ Ø33.0 | Ø6.0 ~ Ø26.5 |
| Depth of drilling | ≥ 2,000mm | ≥ 1,000mm |
| Tolerance | IT9 | IT10 |
| Surface finish | Ra 0.1 ~ 3.0µm | Ra 1.0 ~ 4.0µm |
| Application | • For all kinds of workpiece machining | • Workpieces with good chip evacuation • Machining of at higher feed than single lip type's |

Recommended cutting condition

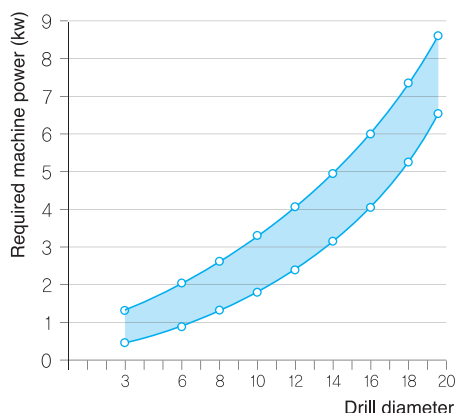
| Workpiece | Hardness (HB) | Cutting speed vc(m/min) | Feed rate, fn(mm/rev) | | | | | |
|-----------------------------|---------------|-------------------------|-----------------------|-------------|-------------|-------------|-------------|-------------|
| | | | ~Ø4 | ~Ø6 | ~Ø10 | ~Ø14 | ~Ø24 | Ø25~ |
| Carbon steel Alloy steel | ~150 | 100~150 | 0.005~0.015 | 0.010~0.025 | 0.015~0.035 | 0.020~0.050 | 0.030~0.070 | 0.040~0.080 |
| | 150~250 | 80~120 | 0.005~0.010 | 0.010~0.020 | 0.015~0.030 | 0.020~0.040 | 0.030~0.060 | 0.030~0.060 |
| | 250~350 | 50~100 | 0.005~0.010 | 0.005~0.010 | 0.010~0.020 | 0.015~0.030 | 0.020~0.040 | 0.020~0.040 |
| | 350~ | ~30 | - | 0.005~0.010 | 0.005~0.010 | 0.010~0.020 | 0.020~0.035 | 0.020~0.035 |
| Stainless steel | ~250 | 50~80 | 0.005~0.015 | 0.010~0.020 | 0.010~0.020 | 0.010~0.030 | 0.020~0.035 | 0.020~0.040 |
| | 250~350 | 40~50 | - | 0.005~0.015 | 0.010~0.015 | 0.010~0.020 | 0.010~0.020 | 0.010~0.020 |
| Cast iron | ~220 | 80~100 | 0.010~0.0120 | 0.020~0.040 | 0.030~0.050 | 0.040~0.080 | 0.080~0.120 | 0.100~0.150 |
| | 220~ | 40~80 | 0.005~0.010 | 0.005~0.015 | 0.010~0.020 | 0.015~0.030 | 0.020~0.050 | 0.025~0.070 |
| Aluminum alloy | - | 180~250 | 0.010~0.020 | 0.020~0.040 | 0.030~0.060 | 0.040~0.080 | 0.100~0.180 | 0.150~0.200 |
| Light alloy | - | 120~200 | 0.005~0.010 | 0.010~0.020 | 0.020~0.025 | 0.020~0.030 | 0.030~0.040 | 0.040~0.060 |

Technical information

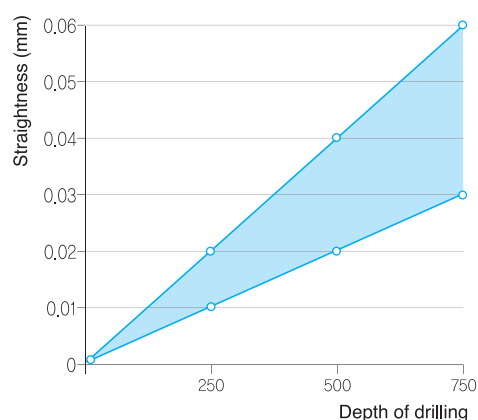
The factors below determines the straightness of hole.

- Drill diameter and depth of drilling
- Cutting condition and kind of application
- Kind of workpiece and machine
- Drill bush

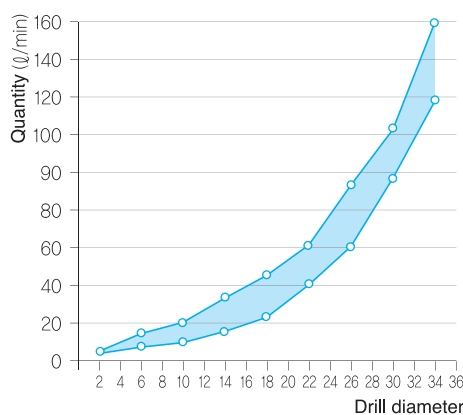
Required machine power



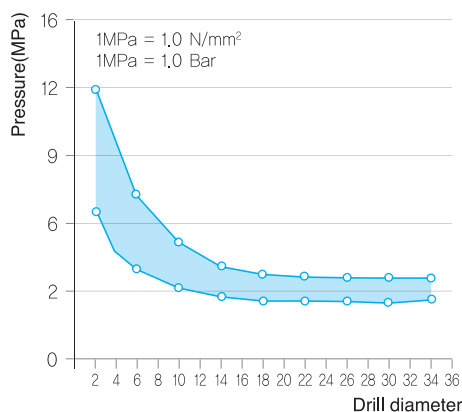
Straightness



Quantity of coolant



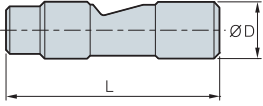
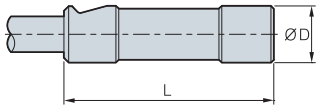
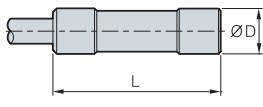
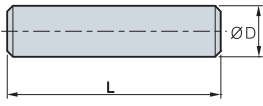
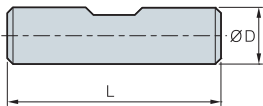
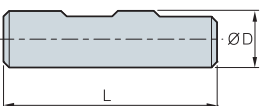
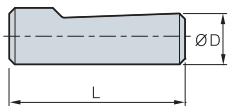
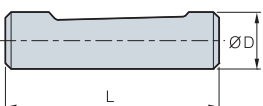
Pressure of coolant



The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc.

- **Pressure and quantity of coolant** - High pressure of coolant ensures excellent chip evacuation and cooling the cutting edge.
- **Use a filter for removing impurities** - The diameter of a filter should be less than 20 μ m. Impurities could make bad flow of coolant, wear on a tool, and high load on the cooling pump.
- **Temperature of coolant** - Proper temperature of coolant : 20°C~ 22°C / Do not use coolant at 50°C above

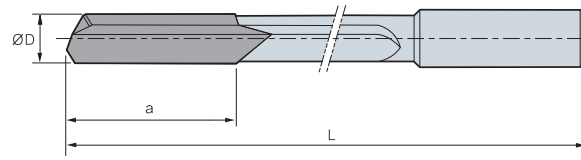
driver standard

| Type | Shape | No. | ØD×L | | Carbide Type | |
|--------------------------------|---|-----|--------------|--------|--------------|-------|
| | | | ØD×L | Thread | Tipped | Solid |
| Central Clamping Surface 15° |  | D01 | 10 × 40 | | ● | ● |
| | | D02 | 16 × 45 | | ● | |
| | | D03 | 19.05 × 69.8 | | ● | |
| | | D04 | 25 × 70 | | ● | |
| | | D05 | 25.4 × 69.8 | | ● | |
| Frontal Clamping Surface 15° |  | D06 | 16 × 50 | | ● | |
| Central Clamping Tapered |  | D07 | 12.7 × 38.1 | | ● | ● |
| | | D08 | 16 × 70 | | | |
| | | D09 | 19.05 × 69.8 | | ● | |
| | | D10 | 20 × 70 | | | |
| Cylindrical DIN1835A DIN6535HA |  | D11 | 4 × 28 | | ● | ● |
| | | D12 | 6 × 36 | | ● | ● |
| | | D13 | 10 × 40 | | ● | ● |
| | | D14 | 16 × 48 | | ● | ● |
| | | D15 | 20 × 50 | | ● | |
| | | D16 | 25 × 56 | | ● | |
| Weldon DIN1835B |  | D17 | 10 × 40 | | ● | ● |
| | | D18 | 12 × 45 | | ● | ● |
| | | D19 | 16 × 48 | | ● | ● |
| | | D20 | 20 × 50 | | ● | ● |
| Weldon DIN6535HB |  | D21 | 25 × 56 | | ● | |
| | | D22 | 32 × 60 | | ● | |
| | | D23 | 40 × 70 | | | |
| Whistle Notch DIN1835E |  | D24 | 10 × 40 | | ● | ● |
| | | D25 | 12 × 45 | | ● | ● |
| | | D26 | 16 × 48 | | ● | ● |
| | | D27 | 20 × 50 | | ● | ● |
| | | D28 | 25 × 56 | | ● | |
| | | D29 | 32 × 60 | | ● | |
| Whistle Notch DIN6535HE |  | D30 | 10 × 40 | | ● | ● |
| | | D31 | 12 × 45 | | ● | ● |
| | | D32 | 16 × 48 | | ● | ● |
| | | D33 | 20 × 50 | | ● | ● |

* Special types are available for quotation with shape and size information.

Gun Drill-KGDS

Single Lip type



| Designation discription | |
|-------------------------|-----------------|
| ○.○○ | Diameter |
| □□□□ | Length |
| △△△ | Driver code no. |



(mm)

| Designation | øD | a |
|----------------------|-------------|----|
| KGDS ○.○○-□□□□ / D△△ | 2.00~2.49 | 18 |
| ○.○○-□□□□ / D△△ | 2.50~2.99 | 18 |
| ○.○○-□□□□ / D△△ | 3.00~3.49 | 19 |
| ○.○○-□□□□ / D△△ | 3.50~3.99 | 19 |
| ○.○○-□□□□ / D△△ | 4.00~4.49 | 23 |
| ○.○○-□□□□ / D△△ | 4.50~4.99 | 23 |
| ○.○○-□□□□ / D△△ | 5.00~5.49 | 24 |
| ○.○○-□□□□ / D△△ | 5.50~5.99 | 26 |
| ○.○○-□□□□ / D△△ | 6.00~6.49 | 27 |
| ○.○○-□□□□ / D△△ | 6.50~6.99 | 28 |
| ○.○○-□□□□ / D△△ | 7.00~7.49 | 29 |
| ○.○○-□□□□ / D△△ | 7.50~7.99 | 30 |
| ○.○○-□□□□ / D△△ | 8.00~8.49 | 31 |
| ○.○○-□□□□ / D△△ | 8.50~8.99 | 31 |
| ○.○○-□□□□ / D△△ | 9.00~8.49 | 31 |
| ○.○○-□□□□ / D△△ | 9.50~9.99 | 31 |
| ○.○○-□□□□ / D△△ | 10.00~10.49 | 31 |
| ○.○○-□□□□ / D△△ | 10.50~10.99 | 32 |
| ○.○○-□□□□ / D△△ | 11.00~11.49 | 35 |
| ○.○○-□□□□ / D△△ | 11.50~11.99 | 35 |
| ○.○○-□□□□ / D△△ | 12.00~12.49 | 38 |
| ○.○○-□□□□ / D△△ | 12.50~12.99 | 38 |
| ○.○○-□□□□ / D△△ | 13.00~13.99 | 38 |
| ○.○○-□□□□ / D△△ | 14.00~14.99 | 38 |
| ○.○○-□□□□ / D△△ | 15.00~15.99 | 39 |
| ○.○○-□□□□ / D△△ | 16.00~16.99 | 39 |
| ○.○○-□□□□ / D△△ | 17.00~17.99 | 40 |
| ○.○○-□□□□ / D△△ | 18.00~18.99 | 41 |
| ○.○○-□□□□ / D△△ | 19.00~19.99 | 41 |
| ○.○○-□□□□ / D△△ | 20.00~20.99 | 44 |
| ○.○○-□□□□ / D△△ | 21.00~21.99 | 46 |
| ○.○○-□□□□ / D△△ | 22.00~22.99 | 49 |
| ○.○○-□□□□ / D△△ | 23.00~23.99 | 51 |
| ○.○○-□□□□ / D△△ | 24.00~24.99 | 52 |
| ○.○○-□□□□ / D△△ | 25.00~25.99 | 54 |
| ○.○○-□□□□ / D△△ | 26.00~26.99 | 54 |
| ○.○○-□□□□ / D△△ | 27.00~27.99 | 54 |
| ○.○○-□□□□ / D△△ | 28.00~28.99 | 54 |
| ○.○○-□□□□ / D△△ | 29.00~29.99 | 56 |
| ○.○○-□□□□ / D△△ | 30.00~30.99 | 59 |
| ○.○○-□□□□ / D△△ | 31.00~31.99 | 61 |
| ○.○○-□□□□ / D△△ | 32.00~32.99 | 61 |

※ When ordering, please mark the overall length and driver number (or drawing).

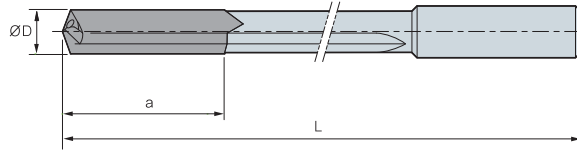
Available overall length

| Designation | Drill Dia. | Overall length | | | | |
|-------------|--------------|----------------|-------|--------|--------|--------|
| | | 250mm | 500mm | 1000mm | 1500mm | 2000mm |
| KGDS | 2.00 ~ 2.99 | ○ | ○ | | | |
| | 3.00 ~ 3.49 | ○ | ○ | ○ | | |
| | 3.50 ~ 32.99 | ○ | ○ | ○ | ○ | ○ |



Gun Drill-KGDT

Twin Lip type



| Designation discription | |
|-------------------------|-----------------|
| ○.○○ | Diameter |
| □□□□ | Length |
| D△△ | Driver code no. |



(mm)

| Designation | øD | a |
|----------------------|-------------|----|
| KGDT ○.○○-□□□□ / D△△ | 6.00~6.49 | 35 |
| ○.○○-□□□□ / D△△ | 6.50~6.99 | 35 |
| ○.○○-□□□□ / D△△ | 7.00~7.49 | 38 |
| ○.○○-□□□□ / D△△ | 7.50~7.99 | 38 |
| ○.○○-□□□□ / D△△ | 8.00~8.49 | 38 |
| ○.○○-□□□□ / D△△ | 8.50~8.99 | 38 |
| ○.○○-□□□□ / D△△ | 9.00~8.49 | 40 |
| ○.○○-□□□□ / D△△ | 9.50~9.99 | 40 |
| ○.○○-□□□□ / D△△ | 10.00~10.49 | 40 |
| ○.○○-□□□□ / D△△ | 10.50~10.99 | 40 |
| ○.○○-□□□□ / D△△ | 11.00~11.49 | 45 |
| ○.○○-□□□□ / D△△ | 11.50~11.99 | 45 |
| ○.○○-□□□□ / D△△ | 12.00~12.49 | 45 |
| ○.○○-□□□□ / D△△ | 12.50~12.99 | 48 |
| ○.○○-□□□□ / D△△ | 13.00~13.99 | 48 |
| ○.○○-□□□□ / D△△ | 14.00~14.99 | 48 |
| ○.○○-□□□□ / D△△ | 15.00~15.99 | 48 |
| ○.○○-□□□□ / D△△ | 16.00~16.99 | 50 |
| ○.○○-□□□□ / D△△ | 17.00~17.99 | 50 |
| ○.○○-□□□□ / D△△ | 18.00~18.99 | 50 |
| ○.○○-□□□□ / D△△ | 19.00~19.99 | 50 |
| ○.○○-□□□□ / D△△ | 20.00~20.99 | 55 |
| ○.○○-□□□□ / D△△ | 21.00~21.99 | 55 |
| ○.○○-□□□□ / D△△ | 22.00~22.99 | 55 |
| ○.○○-□□□□ / D△△ | 23.00~23.99 | 60 |
| ○.○○-□□□□ / D△△ | 24.00~24.99 | 60 |
| ○.○○-□□□□ / D△△ | 25.00~25.99 | 65 |
| ○.○○-□□□□ / D△△ | 26.00~26.50 | 65 |

* When ordering, please mark the overall length and driver number (or drawing).

Available overall length

| Designation | Drill Dia. | Overall length | | | | |
|-------------|--------------|----------------|-------|--------|--------|--------|
| | | 250mm | 500mm | 1000mm | 1500mm | 2000mm |
| KGDT | 6.00 ~ 26.50 | ○ | ○ | ○ | | |

Mass production and High performance

Indexable Reamer

- Suitable for mass production and High performance
- Using PCD or coated insert for high speed machining
- Excellent high accuracy and adjustable machining hole
- Using accuracy chucking system(Hydraulic, rotating type arbor)
- Using inner coolant type machine to evacuate chips
- Using suitable holder and insert
- As insert setting , using setting fixture (KIRSD-210)

Code system

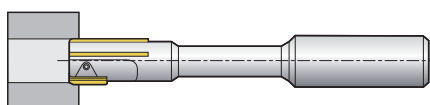
| | | | | | | | |
|------------------|---|--------------------|---|-------------------|---------------|---|--|
| IR | T | 12.000 | - | 16 | 135 | - | 16 |
| Type | Application | Reamer Dia. | | Shank Dia. | length | | Insert size |
| Indexable Reamer | T : Throughout hole machining B : Blind hole machining | 12.000 : Ø12.0 | | 16 : Ø16 | 135 : 135 | | 15 : 15.0×3.0 16 : 16.0×3.5 17 : 17.0×4.5 22 : 22.0×6.5 |

Insert code system

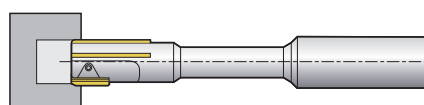
| | | | | |
|---------------|--|---|--|---|
| RI | 16 | - | B | 06 |
| Type | Insert size | | Insert reed type | Angle of C/B |
| Reamer Insert | 15 : 15.0×3.0 16 : 16.0×3.5 17 : 17.0×4.5 22 : 22.0×6.5 | | A : Excellent surface finish, low cutting condition B : General surface finish, high cutting condition C : Aluminum and copper alloy D : Blind hole, low feed | 00 : 0°, Cast iron 06 : 6°, General steel 12 : 12°, Stainless, Al |

Application

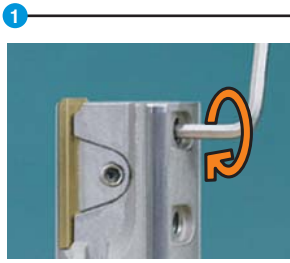
Throughout hole machining(IRT type)



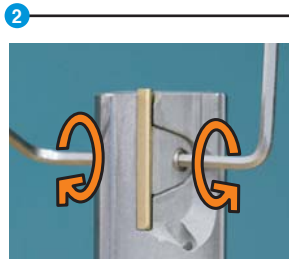
Stuffed hole machining (IRB type)



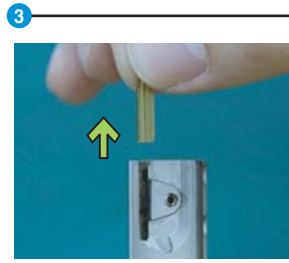
How to set an insert



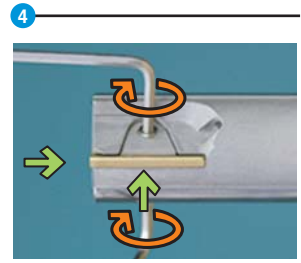
1. Screw the wedge screw counter clockwise with the exclusive wrench.



2. Screw the clamp screw.
 ① Top side : counter clockwise
 ② Lower side : clockwise



3. Remove the insert and clean the pocket.



4. Put the insert up to the edge stopper and clamp the insert.
 ① Top side : clockwise
 ② Lower side : counterclockwise

Exclusive fixture



- Designation: KIRSD-210
- Maximum diameter of reamer: $\text{Ø}60 \times 210\text{mm}$
- The fixture is also available for setting special reamer and mono tool.
- Special reamers (out of maximum setting range) are available quotation.

How to set an insert with fixture



• Adjust the gauge to '0'.



• Rotate the reamer for the insert to touch the gauge.

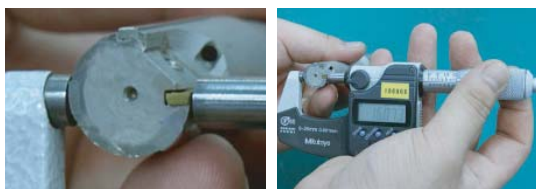


• Set the back taper and adjust the insert height with screw the wedge screw.
 ① Top side of insert : $+0.015 \sim +0.020\text{mm}$
 ② Bottom side of insert : $+0.005 \sim +0.010\text{mm}$
 ③ Back taper : $0.010 \sim 0.015\text{mm}$

Back taper

- Ensures low cutting load and excellent surface finish with good chip evacuation.
- Inaccurate back taper could cause unstable machining with wear of insert.
- The size of back taper of insert down side should be less than $0.010 \sim 0.015\text{mm}$ than one of insert upper side.

Insert setting with a micrometer



• Lathe with both centers or Bench center are also available.

Notice : The setting with a micrometer is not recommended due to chipping on the cutting edge.

Recommended cutting condition

| Workpiece | Insert Type | | Feed rate, f_n (mm/rev) | Cutting speed v_c (m/min) | | |
|--------------------------------|-------------|-----------|---------------------------|-----------------------------|----------|---------|
| | Rake angle | Leed type | | Coated | Uncoated | Cermet |
| Carbon steel General steel | 6 | A | 0.1~0.4 | 60~80 | 40~60 | 110~160 |
| | | B | 0.1~0.3 | 80~120 | 60~80 | |
| | | D | 0.05~0.2 | | | |
| Mild steel Alloy steel | 6 | A | 0.1~0.4 | 40~60 | 20~40 | 110~160 |
| | | B | 0.1~0.3 | 80~120 | 60~80 | |
| | | D | 0.05~0.2 | | | |
| High alloy steel Tool steel | 6 | A | 0.1~0.4 | 20~60 | 20~40 | 20~60 |
| | | B | 0.1~0.3 | 40~80 | 40~60 | 40~80 |
| | | D | 0.05~0.2 | | | |
| Stainless steel | 12 | A | 0.1~0.3 | 40~60 | 20~40 | 40~60 |
| | | B | 0.1~0.2 | 60~80 | 40~60 | 60~80 |
| | | D | 0.05~0.2 | | | |
| Cast iron | 0.6 | A | 0.1~0.3 | 60~100 | 40~60 | |
| | | B | 0.1~0.25 | 80~120 | 60~80 | |
| | | D | 0.05~0.2 | | | |
| Alloyed aluminum | 12 | B | 0.1~0.3 | | 160~200 | |
| | | C | 0.15~0.3 | | 150~250 | |
| | | D | 0.05~0.2 | | 110~200 | |
| Alloyed copper | 0 | B | 0.1~0.2 | | 80~100 | |
| | | D | 0.05~0.2 | | | |
| Non-ferrous alloy | 0 | B | 0.1~0.3 | | 10~70 | |

Parts

| Reamer Size | Clamp | Wedge | Clamp Screw | Wedge Screw (NYLOK) | Clamp Wrench | Wedge Wrench |
|-------------|-------|--------|-------------|------------------------|--------------|--------------|
| 10.0~11.9 | CV 15 | AW2430 | DHA0308 | HSO306 | HW15L | HW15L |
| 12.0~17.9 | CV 16 | AW2435 | | | | |
| 18.0~27.9 | CV 17 | AW3240 | DHA0409 | HS0406 | HW20L | HW20L |
| 28.0~31.9 | CV 22 | AW3260 | | | | |



Indexable Reamer Insert



| Designation | Grade | | | Dimensions | | | Reed type | Rake angle (α°) |
|-------------|---------------|---------------|-------------|------------|-----|-----|-----------|-----------------|
| | K10(Uncoated) | BPK110(TiAlN) | BPK210(TiN) | L | W | S | | |
| RI 15-A06 | | | ○ | 15 | 3.0 | 1.5 | A | 6° |
| | ○ | | | 15 | 3.0 | 1.5 | A | 12° |
| | | ○ | ○ | 15 | 3.0 | 1.5 | B | 6° |
| | | ○ | | 15 | 3.0 | 1.5 | B | 12° |
| 16-A06 | | | ○ | 16 | 3.5 | 1.5 | A | 6° |
| | ○ | | | 16 | 3.5 | 1.5 | A | 12° |
| | | ○ | ○ | 16 | 3.5 | 1.5 | B | 6° |
| | | ○ | | 16 | 3.5 | 1.5 | B | 12° |
| 17-A06 | | | ○ | 17 | 4.5 | 2.0 | A | 6° |
| | ○ | | | 17 | 4.5 | 2.0 | A | 12° |
| | | ○ | ○ | 17 | 4.5 | 2.0 | B | 6° |
| | | ○ | | 17 | 4.5 | 2.0 | B | 12° |
| 22-A06 | | | ○ | 22 | 6.5 | 3.0 | A | 6° |
| | ○ | | | 22 | 6.5 | 3.0 | A | 12° |
| | | ○ | ○ | 22 | 6.5 | 3.0 | B | 6° |
| | | ○ | | 22 | 6.5 | 3.0 | B | 12° |

* ○ This is recommended grade as for insert type

Angle of chip breaker

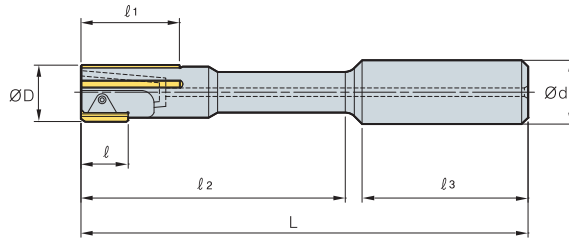
| Shape | 00 | 06 | 12 |
|-------------|-------------------------|-----------------------|--------------------------------------|
| | | | |
| Application | For cast iron machining | For general machining | For stainless and aluminum machining |

Insert lead type

| Type | Shape | Working condition | Type | Shape | Working condition |
|------|-------|---|------|-------|---|
| A | | For excellent surface, low cutting condition | C | | For aluminum and copper alloy machining |
| B | | For general application, high cutting condition | D | | For blind hole machining, low feed |

Indexable Reamer - IRT

Throughout hole



(mm)

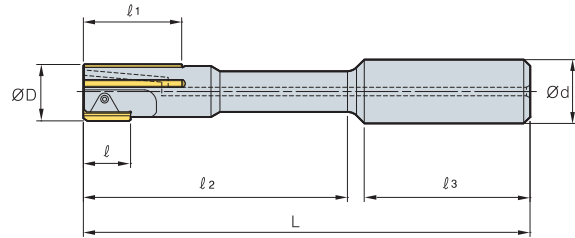
| Designation | $\varnothing D$ | ℓ | ℓ_1 | ℓ_2 | ℓ_3 | L | $\varnothing d$ | Insert |
|---------------------|-----------------|--------|----------|----------|----------|-----|-----------------|--------|
| IRT 10.000-16125-15 | 10 | 15 | 30 | 75 | 45 | 125 | 16 | RI 15 |
| 11.000-16125-15 | 11 | 15 | 30 | 75 | 45 | 125 | 16 | RI 15 |
| 12.000-16135-16 | 12 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 13.000-16135-16 | 13 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 14.000-16135-16 | 14 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 15.000-16135-16 | 15 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 16.000-20155-16 | 16 | 16 | 30 | 100 | 50 | 155 | 20 | RI 16 |
| 17.000-20155-16 | 17 | 16 | 30 | 100 | 50 | 155 | 20 | RI 16 |
| 18.000-20155-17 | 18 | 17 | 30 | 100 | 50 | 155 | 20 | RI 17 |
| 19.000-20155-17 | 19 | 17 | 30 | 100 | 50 | 155 | 20 | RI 17 |
| 20.000-25165-17 | 20 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 21.000-25165-17 | 21 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 22.000-25165-17 | 22 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 23.000-25165-17 | 23 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 24.000-25165-17 | 24 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 25.000-25165-17 | 25 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 26.000-25165-17 | 26 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 27.000-25165-17 | 27 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 28.000-32165-22 | 28 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |
| 29.000-32165-22 | 29 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |
| 30.000-32165-22 | 30 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |
| 31.000-32165-22 | 31 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |

Applicable inserts G65



Indexable Reamer - IRB

Stuffed hole



(mm)

| Designation | $\varnothing D$ | ℓ | ℓ_1 | ℓ_2 | ℓ_3 | L | $\varnothing d$ | Insert |
|---------------------|-----------------|--------|----------|----------|----------|-----|-----------------|--------|
| IRB 10.000-16125-15 | 10 | 15 | 30 | 75 | 45 | 125 | 16 | RI 15 |
| 11.000-16125-15 | 11 | 15 | 30 | 75 | 45 | 125 | 16 | RI 15 |
| 12.000-16135-16 | 12 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 13.000-16135-16 | 13 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 14.000-16135-16 | 14 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 15.000-16135-16 | 15 | 16 | 30 | 85 | 45 | 135 | 16 | RI 16 |
| 16.000-20155-16 | 16 | 16 | 30 | 100 | 50 | 155 | 20 | RI 16 |
| 17.000-20155-16 | 17 | 16 | 30 | 100 | 50 | 155 | 20 | RI 16 |
| 18.000-20155-17 | 18 | 17 | 30 | 100 | 50 | 155 | 20 | RI 17 |
| 19.000-20155-17 | 19 | 17 | 30 | 100 | 50 | 155 | 20 | RI 17 |
| 20.000-25165-17 | 20 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 21.000-25165-17 | 21 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 22.000-25165-17 | 22 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 23.000-25165-17 | 23 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 24.000-25165-17 | 24 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 25.000-25165-17 | 25 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 26.000-25165-17 | 26 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 27.000-25165-17 | 27 | 17 | 30 | 110 | 56 | 165 | 25 | RI 17 |
| 28.000-32165-22 | 28 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |
| 29.000-32165-22 | 29 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |
| 30.000-32165-22 | 30 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |
| 31.000-32165-22 | 31 | 22 | 30 | 110 | 56 | 165 | 32 | RI 22 |

Applicable inserts G65



Chucking / Machine Reamer

Recommended cutting condition

| Workpiece | Hardness (HB) | Cutting condition | Diameter | | |
|------------------|---------------------------|-------------------|-----------|-----------|-----------|
| | | | ~Ø9 | Ø10~25 | Ø26~60 |
| Steel | ~100kg/mm ² | vc(m/min) | 8~12 | 8~12 | 8~12 |
| | | fn(mm/rev) | 0.15~0.25 | 0.20~0.40 | 0.30~0.50 |
| | 100~140kg/mm ² | vc(m/min) | 5~10 | 5~10 | 5~10 |
| | | fn(mm/rev) | 0.10~0.20 | 0.15~0.25 | 0.20~0.40 |
| Cast iron | HB ~220 | vc(m/min) | 6~12 | 6~12 | 8~15 |
| | | fn(mm/rev) | 0.15~0.30 | 0.30~0.50 | 0.40~0.80 |
| | HB 220~ | vc(m/min) | 5~10 | 5~10 | 8~12 |
| | | fn(mm/rev) | 0.10~0.20 | 0.20~0.35 | 0.30~0.50 |
| Brass | HB 50~120 | vc(m/min) | 8~12 | 10~15 | 10~15 |
| | | fn(mm/rev) | 0.10~0.15 | 0.15~0.25 | 0.25~0.40 |
| Bronze | HB 60~100 | vc(m/min) | 8~12 | 10~15 | 10~15 |
| | | fn(mm/rev) | 0.10~0.15 | 0.15~0.25 | 0.25~0.40 |
| Alloyed aluminum | HB 90~120 | vc(m/min) | 15~25 | 15~25 | 20~30 |
| | | fn(mm/rev) | 0.15~0.25 | 0.25~0.40 | 0.40~0.70 |
| Synthetic resins | - | vc(m/min) | 15~30 | 20~35 | 30~40 |
| | | fn(mm/rev) | 0.15~0.25 | 0.25~0.40 | 0.40~0.50 |



Chucking Reamer - SCRS

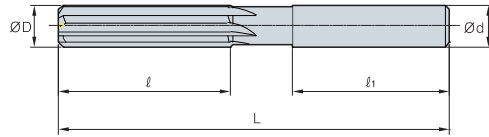


Fig.1

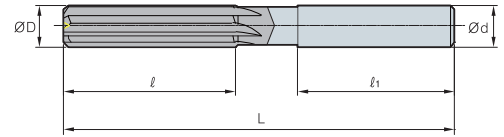


Fig.2

(mm)

| Designation | No. of flute | $\varnothing D$ | $\varnothing d$ | ℓ | ℓ_1 | L | Fig. |
|-------------|--------------|-----------------|-----------------|--------|----------|-----|------|
| SCRS 050S | 4 | 5.0 | 6.0 | 20 | 40 | 100 | 1 |
| 060S | 4 | 6.0 | 6.0 | 20 | 40 | 115 | 1 |
| 070S | 4 | 7.0 | 8.0 | 20 | 40 | 125 | 1 |
| 080S | 4 | 8.0 | 8.0 | 20 | 40 | 135 | 1 |
| 090S | 4 | 9.0 | 10.0 | 20 | 45 | 140 | 1 |
| 100B | 4 | 10.0 | 10.0 | 25 | 50 | 145 | 2 |
| 110B | 4 | 11.0 | 12.0 | 25 | 50 | 150 | 2 |
| 120B | 4 | 12.0 | 12.0 | 25 | 50 | 160 | 2 |
| 130B | 4 | 13.0 | 16.0 | 25 | 50 | 165 | 2 |
| 140B | 6 | 14.0 | 16.0 | 25 | 50 | 170 | 2 |
| 150B | 6 | 15.0 | 16.0 | 30 | 50 | 180 | 2 |
| 160B | 6 | 16.0 | 16.0 | 30 | 50 | 190 | 2 |
| 180B | 6 | 18.0 | 20.0 | 30 | 55 | 210 | 2 |
| 200B | 6 | 20.0 | 20.0 | 40 | 60 | 230 | 2 |

Chucking Reamer - SCRH

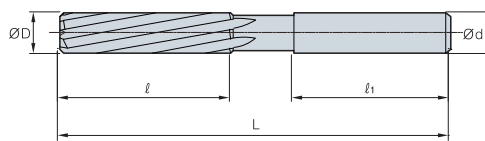


Fig. 1

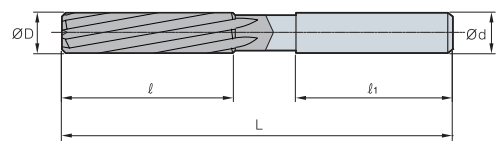
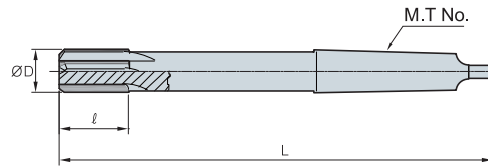


Fig. 2

(mm)

| Designation | No. of flute | $\varnothing D$ | $\varnothing d$ | ℓ | ℓ_1 | L | Fig. |
|-------------|--------------|-----------------|-----------------|--------|----------|-----|------|
| SCRH 050S | 4 | 5.0 | 6.0 | 20 | 40 | 100 | 1 |
| 060S | 4 | 6.0 | 6.0 | 20 | 40 | 115 | 1 |
| 070S | 4 | 7.0 | 8.0 | 20 | 40 | 125 | 1 |
| 080S | 4 | 8.0 | 8.0 | 20 | 40 | 135 | 1 |
| 090S | 4 | 9.0 | 10.0 | 20 | 45 | 140 | 1 |
| 100B | 4 | 10.0 | 10.0 | 25 | 50 | 145 | 2 |
| 110B | 4 | 11.0 | 12.0 | 25 | 50 | 150 | 2 |
| 120B | 4 | 12.0 | 12.0 | 25 | 50 | 160 | 2 |
| 130B | 4 | 13.0 | 16.0 | 25 | 50 | 165 | 2 |
| 140B | 6 | 14.0 | 16.0 | 25 | 50 | 170 | 2 |
| 150B | 6 | 15.0 | 16.0 | 30 | 50 | 180 | 2 |
| 160B | 6 | 16.0 | 16.0 | 30 | 50 | 190 | 2 |
| 180B | 6 | 18.0 | 20.0 | 30 | 55 | 210 | 2 |
| 200B | 6 | 20.0 | 20.0 | 40 | 60 | 230 | 2 |

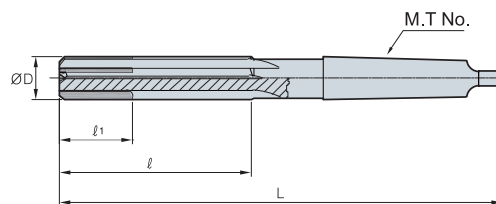
Chucking Reamer - TCRS



(mm)

| Designation | No. of flute | øD | l | L | M.T No. |
|-------------|--------------|------|----|-----|---------|
| TCRS 070 | 4 | 7.0 | 20 | 150 | 1 |
| 080 | 4 | 8.0 | 20 | 150 | 1 |
| 090 | 4 | 9.0 | 20 | 160 | 1 |
| 100 | 4 | 10.0 | 25 | 160 | 1 |
| 110 | 4 | 11.0 | 25 | 170 | 1 |
| 120 | 4 | 12.0 | 25 | 170 | 1 |
| 130 | 4 | 13.0 | 25 | 180 | 1 |
| 140 | 6 | 14.0 | 25 | 190 | 1 |
| 150 | 6 | 15.0 | 30 | 200 | 2 |
| 160 | 6 | 16.0 | 30 | 200 | 2 |
| 180 | 6 | 18.0 | 30 | 220 | 2 |
| 200 | 6 | 20.0 | 40 | 230 | 2 |
| 250 | 6 | 25.0 | 40 | 260 | 3 |
| 280 | 8 | 28.0 | 40 | 270 | 3 |
| 300 | 8 | 30.0 | 50 | 290 | 3 |

Machine Reamer - TMRS



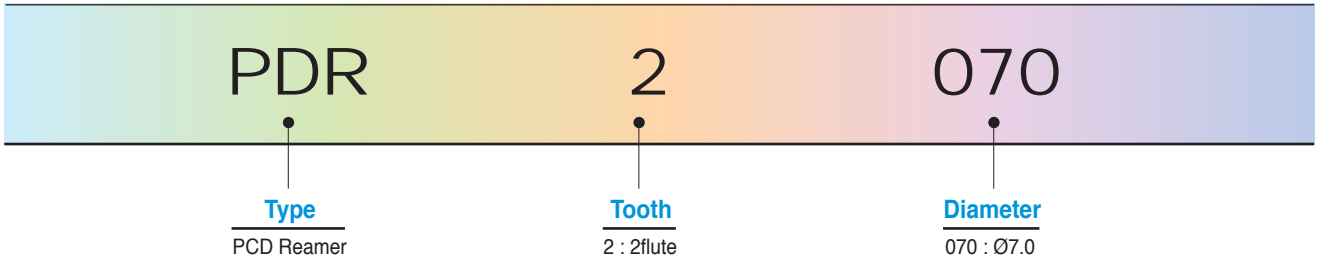
(mm)

| Designation | No. of flute | øD | l | l1 | L | M.T No. |
|-------------|--------------|------|-----|----|-----|---------|
| TMRS 070 | 4 | 7.0 | 60 | 60 | 150 | 1 |
| 080 | 4 | 8.0 | 70 | 70 | 150 | 1 |
| 090 | 4 | 9.0 | 70 | 70 | 160 | 1 |
| 100 | 4 | 10.0 | 75 | 75 | 170 | 1 |
| 110 | 4 | 11.0 | 75 | 75 | 170 | 1 |
| 120 | 4 | 12.0 | 80 | 40 | 180 | 1 |
| 130 | 4 | 13.0 | 85 | 40 | 190 | 1 |
| 140 | 6 | 14.0 | 90 | 45 | 210 | 1 |
| 150 | 6 | 15.0 | 90 | 45 | 215 | 2 |
| 160 | 6 | 16.0 | 100 | 50 | 220 | 2 |
| 180 | 6 | 18.0 | 105 | 50 | 225 | 2 |
| 200 | 6 | 20.0 | 120 | 50 | 240 | 2 |
| 250 | 6 | 25.0 | 130 | 50 | 270 | 3 |
| 280 | 8 | 28.0 | 140 | 50 | 280 | 3 |
| 300 | 8 | 30.0 | 150 | 50 | 290 | 3 |



PCD Reamer

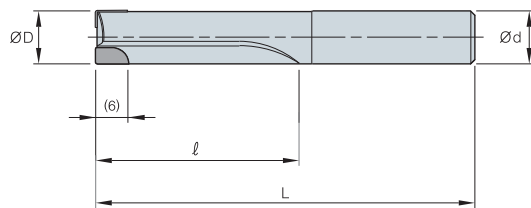
Code system



Recommended cutting condition

| Workpiece | vc(m/min) | fn(mm/rev) |
|----------------|-----------|------------|
| Aluminum alloy | 50~250 | 0.05~0.20 |

PCD Reamer - PDR



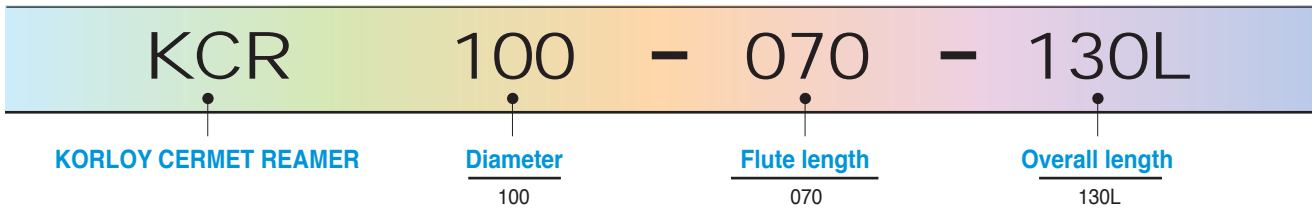
| Designation | | No. of flute | $\varnothing D$ | $\varnothing d$ | ℓ | L |
|-------------|------|--------------|-----------------|-----------------|--------|-----|
| PDR | 2050 | 2 | 5.0 | 6.0 | 30 | 65 |
| | 2060 | 2 | 6.0 | 6.0 | 40 | 75 |
| | 2070 | 2 | 7.0 | 8.0 | 40 | 75 |
| | 2080 | 2 | 8.0 | 8.0 | 40 | 75 |
| | 2090 | 2 | 9.0 | 10.0 | 40 | 85 |
| | 2100 | 2 | 10.0 | 10.0 | 40 | 85 |
| | 2120 | 2 | 12.0 | 12.0 | 50 | 95 |
| | 2140 | 2 | 14.0 | 16.0 | 50 | 95 |
| | 2150 | 2 | 15.0 | 16.0 | 50 | 100 |
| | 4160 | 4 | 16.0 | 16.0 | 50 | 100 |
| | 4180 | 4 | 18.0 | 20.0 | 60 | 110 |
| | 4200 | 4 | 20.0 | 20.0 | 60 | 110 |

(mm)

Cermet Reamer *New*

- Cermet reamer realizes high performance in high hardness steel machining.
(lower performance in casting machining)
- High machinability and wear resistance extend the tool life.
- Over 30% higher productivity, surface roughness, tool life than carbide reamer

Code system



Recommended cutting condition

| Workpiece | Hardness | fz(mm/t) | vc(m/min) |
|--------------------|-----------------|----------|-----------|
| Carbon steel | Under 30HRC | 0.1~0.4 | 50~80 |
| High carbon steel, | 30~40HRC | 0.1~0.4 | 80~120 |
| Alloy steel | 40~50HRC | 0.1~0.4 | 50~80 |
| Alloy steel | More than 50HRC | 0.05~0.2 | 30~60 |

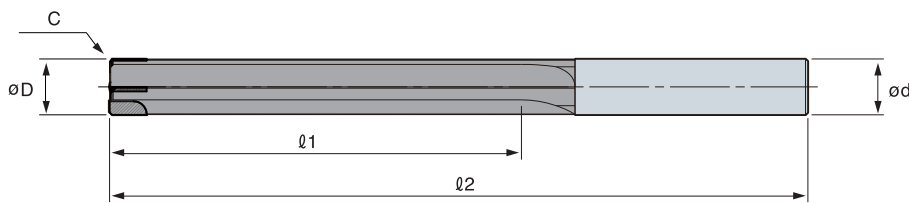
Application example



- **Cutting condition**
- Workpiece : S55CR
 - Hardness : 23~30HRC
 - fn(mm/rev) : 0.4
 - vc(m/min) : 20

Cermet Reamer - KCR

Standard type

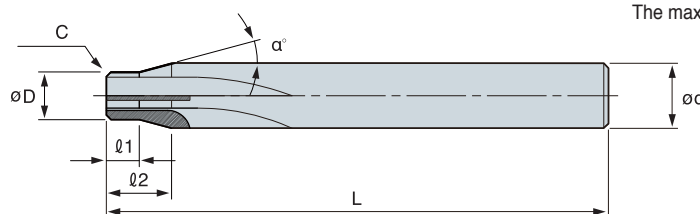


(mm)

| Designation | Flute | øD | ød | l ₁ | L |
|--------------------|-------|-----------|----|----------------|-----|
| KCR 060-079-25-70L | 2 | 6.0~7.9 | 8 | 25 | 70 |
| 080-099-035-90L | 2 | 8.0~9.9 | 10 | 35 | 90 |
| 100-119-050-100L | 4 | 10.0~11.9 | 12 | 50 | 100 |
| 120-159-060-110L | 4 | 12.0~15.9 | 12 | 60 | 110 |
| 160-199-060-110L | 4 | 16.0~19.9 | 16 | 60 | 110 |
| 200-259-060-110L | 4 | 20.0~25.9 | 20 | 60 | 110 |
| 260-300-070-130L | 4 | 26.0~30 | 25 | 70 | 130 |

• The length of flute and overhang length of reamer are available for quotation.
The maximum overhang length is 150mm.

Special type



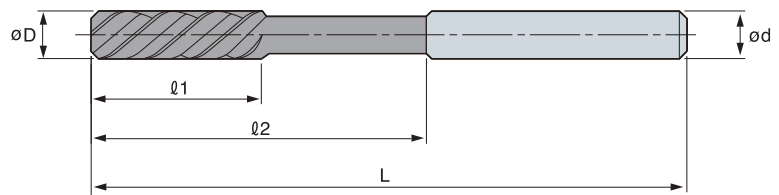
(mm)

| Designation | Flute | øD | ød | l ₁ | l ₂ | L | α° |
|------------------|-------|----------|-------|----------------|----------------|----|---------|
| KCR □□□~□□□-□□□L | 2~4 | 8.0~25.9 | 12~30 | 7~18 | 2~15 | 70 | 10°~60° |

Broach Reamer *New*

- Optimal for thru hole machining with high precision with long tool life
- High helix angle (45 degree) improves machinability.
- Superior surface roughness and high precision
- Strong cutting edge and excellent chip evacuation
- Dia. Ø3.0~ Ø25.0

Broach Reamer - HBRE



| | | | | | | | | (mm) |
|-------------|-------|----|------|----------------|----------------|-----|-----------|------|
| Designation | Flute | øD | ød | l ₁ | l ₂ | L | Type | |
| HBRE | 030 | 3 | 3.0 | 20 | 40 | 70 | Solid | |
| | 040 | 3 | 4.0 | 25 | 40 | 70 | Solid | |
| | 060 | 4 | 6.0 | 30 | 50 | 80 | Solid | |
| | 080 | 4 | 8.0 | 30 | 60 | 100 | Solid | |
| | 100 | 4 | 10.0 | 30 | 60 | 100 | Solid | |
| | 120 | 4 | 12.0 | 40 | 70 | 120 | Top Solid | |
| | 160 | 6 | 16.0 | 40 | 80 | 130 | Top Solid | |
| | 200 | 6 | 20.0 | 50 | 90 | 150 | Top Solid | |
| | 250 | 6 | 25.0 | 50 | 90 | 150 | Top Solid | |

H

BRAZED TOOLS



BRAZED TOOLS

C O N T E N T S

Technical Information for Brazed Tools

- H02** KORLOY Ultra-Fine Grades : F-Series
- H02** Corrosion & Magnetism Proof Grade : IN-Series

General Cutting Tools

- H03** Cemented Carbide, Cermet Blank
- H04** Square Blank
- H06** Round bar Blank
- H06** Ring Blank
- H07** Spiral Blank
- H08** Square Bite
- H09** Auto Tool Bite
- H10** Chuck Jaws

Mining & Construction Tools

- H12** Cemented Carbide Blank for Bit
- H12** Taper Bit
- H12** Boring Crown Blank
- H12** Bit for Construction

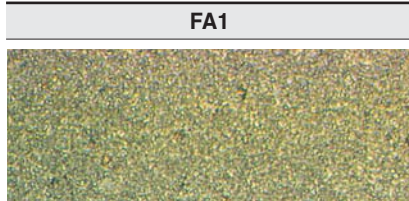
Rotating Brazing Tools

- H13** Rotating Brazing Tool
- H14** Special Rotating Brazing Tool Order Form

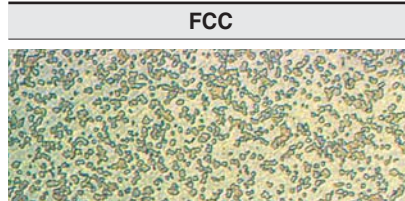
KORLOY Ultra-Fine Grades "F-Series"

Features In general, when we compare cemented carbide to high speed steel, cemented carbide has higher hardness but is more brittle than high speed steel. To neutralize the difference, KORLOY has developed an ultra fine cemented carbide grade "F-Series" (WC size under 0.5 μ m). It provides improved toughness and plastic deformation resistance against cemented carbide having coarse grain sizes. The main coverage for ultra fine cemented carbide is endmilling of difficult-to-cut materials like high temp alloys.

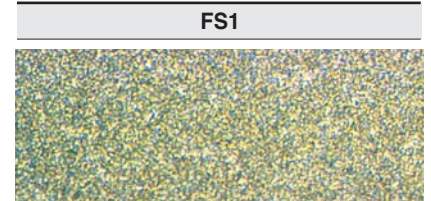
Micro Structure of "F-Series"



Since it is a grade focused on toughness, it is possible to make endmill, side cutter, gun drill, reamer etc. It has superior quality on toughness and anti built-up edge properties.



It has been modified from FA1 to increase thermal shock resistance, thus FCC has proper properties to machine stainless steel and hard to machine materials at medium to high speed milling.



As an ultra fine grade having high hardness and superior toughness at the same time, it is the 1st recommended grade of KORLOY to make sharp cutting edge to cut difficult-to-cut material.

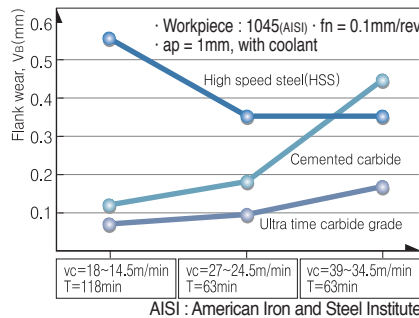
Cutting Performance

Chipping Resistance

| Grade | Chipping length (mm) | Chipping times (min) |
|------------------|-------------------------|----------------------|
| Ultra fine grade | 24.5m (65.5 grooves) | |
| Carbide | G10 (0.96m, 2.5grooves) | chipping |
| | H01 (1.54m, 4grooves) | chipping |
| High speed steel | 2.55m (6.7grooves) | chipping |
| Cutting length | 0, 5, 10, 15, 20, 25 | |
| Cutting times | 0, 20, 40, 60 | |

Workpiece : 4140(AISI) · Tool : Solid carbide endmill (Ø8mm, 2Flutes)
vc = 26.5m/min, fz = 0.0285mm/t, vf = 60mm/min, with coolant

Wear resistance



Special Features

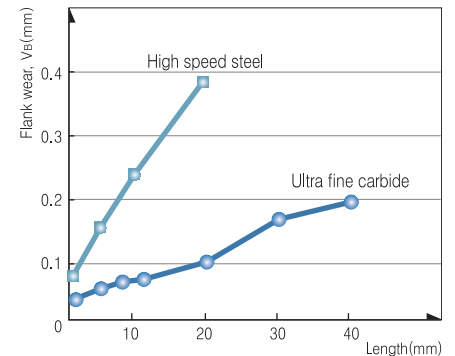
| Grade | Characteristics | | | ISO classification | Wear resistance | Toughness |
|-------|------------------|----------------|----------------------------|--------------------|-----------------|-----------|
| | Specific Gravity | Hardness (HRA) | TRS (kgf/mm ²) | | | |
| FS1 | 14.4 | 92.4 | 250 | Z10 | ⊙ | ○ |
| FCC | 12.6 | 91.5 | 250 | Z10 | ⊙ | ○ |
| FA1 | 14.1 | 91.2 | 300 | Z20 | ○ | ⊙ |
| FG2 | 14.3 | 92.7 | 350 | Z10 | ⊙ | ○ |

Guide of Grade Selection

| | |
|-----------------------------------|---------------------------------------|
| Workpiece | Non-ferrous metal Steel, Cast iron |
| 1 st Recommended Grade | FS1, FG2, FCC, FA1 |
| Application tool | Drill, Endmill |

Cutting condition

- Workpiece : SM55C(HrC20)
- Helix angle : 30°
- Tool : Ø10mm, 2 Flutes(SSE2100)
- RPM = 1,100min⁻¹
- Cutting speed = 35m/min
- Axial depth = 12mm
- Feed = 0.1mm/t
- Radial depth = 1mm
- Downward cutting, Without coolant



KORLOY Corrosion & Magnetism Proof Grades, "IN-Series"

- Features**
- Outstanding corrosion resistance : several hundred times better performance than general carbide grade. (Test have been performed at 30% NHO₃, comparing KORLOY G5 and IN-Series)
 - Excellent hardness & toughness : Over (HRA) 85 hardness, Over (TRS) 200 toughness.
 - Several grades : 3 different kind of grades for specific application, respectively.

| Grade | Specific gravity (g/cm ³) | Hardness (HrA) | TRS (kgf/mm ²) | Magnetic saturation (Gauss·cm ³ /g) | Use |
|-------|---------------------------------------|----------------|----------------------------|--|--|
| IN10 | 14.4 | 91.5 | 230 | 0 | Mechanical Seal, Sliter Knife Anti-corrosive alloy, Magnetism proof alloy. |
| IN20 | 14.5 | 91.0 | 250 | 90 | Mechanical Seal, Sliter Knife Anti-corrosive alloy. |
| IN40 | 13.5 | 85.5 | 280 | 0 | Mold for magnetic powder. Anticorrosive-Magnetism proof alloy. |

Use

| For Anti-corrosive | For Magnetism proof |
|---|--|
| <ul style="list-style-type: none"> Parts for plant of corrosion-high pressure. Die / punch in high temperature. | <ul style="list-style-type: none"> Parts for sea water pump. Mechanical seal. Tape sliter. Mold for magnetic powder. Parts for VTR. |



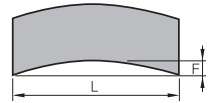
| Inserts | Designation | A | B | C | R | Uncoated | | | | | | | Cermet | | Available blank | |
|---------|-------------|----|----|---|-----|----------|------|-----|------|-----|-----|-----|--------|------|--|------|
| | | | | | | ST10 | ST20 | U40 | GR35 | U20 | H02 | H01 | G10 | CT10 | | CN20 |
| | 01 - 0 | 10 | 6 | 3 | 4 | | | | | | | | | | 31 Type 32 Type 45 Type 46 Type | |
| | 1 | 13 | 9 | 3 | 5 | | | | | | | | | | | |
| | 2 | 16 | 11 | 4 | 5 | • | | | | | | | | | | |
| | 3 | 19 | 13 | 5 | 5 | • | | | | | | | | | | |
| | 4 | 22 | 15 | 6 | 8 | | | | | | | | | | | |
| | 5 | 25 | 17 | 7 | 8 | | | | | | | | | | | |
| | 6 | 30 | 20 | 8 | 8 | | | | | | | | | | | |
| | 02 - 0 | 10 | 6 | 3 | - | • | • | | | • | | • | • | | 41 Type 42 Type | |
| | 1 | 13 | 9 | 3 | - | | • | | | • | | • | • | | | |
| | 2 | 16 | 11 | 4 | - | | • | | | • | | • | • | | | |
| | 3 | 19 | 13 | 5 | - | • | • | | | • | | • | • | | | |
| | 4 | 22 | 15 | 6 | - | | • | | | • | | • | • | | | |
| | 5 | 25 | 17 | 7 | - | | • | | | • | | • | • | | | |
| | 6 | 30 | 20 | 8 | - | | • | | | • | | • | • | | | |
| | 03 - 0 | 10 | - | 3 | - | | | | | | | | | | 37 Type 38 Type 47 Type 48 Type | |
| | 1 | 12 | - | 3 | - | | | | | | | | | | | |
| | 2 | 15 | - | 4 | - | | | | | | | | | | | |
| | 3 | 18 | - | 5 | - | | | | | | | | | | | |
| | 4 | 24 | - | 6 | - | | | | | | | | | | | |
| | 5 | 24 | - | 7 | - | | | | | | | | | | | |
| | 6 | 28 | - | 8 | - | | | | | | | | | | | |
| | 04 - 0 | 10 | 6 | 3 | 4 | | | | | | | | | | 33 Type 34 Type | |
| | 1 | 13 | 9 | 3 | 5 | | • | | | | | | | | | |
| | 2 | 16 | 11 | 4 | 5 | | | | | | | | | | | |
| | 3 | 19 | 13 | 5 | 5 | | • | | | | | | | | | |
| | 4 | 22 | 15 | 6 | 8 | | | | | | | | | | | |
| | 5 | 25 | 17 | 7 | 8 | | | | | | | | | | | |
| | 6 | 30 | 20 | 8 | 8 | | | | | | | | | | | |
| | 05 - 1 | 5 | 8 | 3 | - | | • | | | • | | | | | 49 Type 50 Type 51 Type 52 Type | |
| | 2 | 6 | 10 | 4 | - | | • | | | • | | | | | | |
| | 3 | 7 | 12 | 5 | - | | • | | | • | | | | | | |
| | 4 | 9 | 16 | 6 | - | | • | | | | | | | | | |
| | 5 | 10 | 18 | 7 | - | | | | | | | | | | | |
| | 6 | 11 | 20 | 8 | - | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | 06 - 0 | 10 | 10 | 3 | 2 | | • | | | • | | • | • | | 36 Type 39 Type 40 Type | |
| | 1 | 13 | 13 | 3 | 2.5 | | • | | | • | | • | • | | | |
| | 2 | 16 | 16 | 4 | 3 | • | • | | | • | • | • | • | | | |
| | 3 | 19 | 19 | 5 | 4 | | • | • | | • | • | • | • | | | |
| | 4 | 22 | 22 | 6 | 4 | • | • | | | • | • | • | • | | | |
| | 5 | 25 | 25 | 7 | 5 | | • | | | • | • | • | • | | | |
| | 6 | 30 | 30 | 8 | 6 | | | | | • | • | • | • | | | |
| | 07 - 0 | 10 | 10 | 3 | - | | | | | | | | | | 35 Type | |
| | 1 | 13 | 13 | 3 | - | | | | | | | | | | | |
| | 2 | 16 | 16 | 4 | - | | | | | | | | | | | |
| | 3 | 19 | 19 | 5 | - | | | | | | | | | | | |
| | 4 | 25 | 20 | 6 | - | | | | | | | | | | | |
| | 5 | 25 | 22 | 7 | - | | | | | | | | | | | |
| | 6 | 30 | 25 | 8 | - | | | | | | | | | | | |
| | 08 - 1 | 3 | 8 | 3 | - | | • | | | • | | | | | 43 Type | |
| | 3 | 4 | 13 | 4 | - | • | • | | | • | | • | • | | | |
| | 4 | 5 | 15 | 5 | - | • | • | | | • | | • | • | | | |
| | 5 | 6 | 17 | 6 | - | • | • | | | • | | • | • | | | |
| | 6 | 8 | 20 | 8 | - | | • | | | • | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |



RB



■ Bending Tolerance



| L | | F-max |
|----------|-----------|-------|
| Standard | Tolerance | |
| ~30 | +1.0 - 0 | 0.15 |
| 31~50 | +1.5 - 0 | 0.25 |
| 51~100 | +3.0 - 0 | 0.30 |

※ Code System **RB** **15** **04** □
 Length Width Thickness

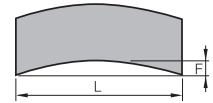
| Designation | L | W | T = □ | | | | | | | Grades G10 |
|-------------|---|----|-------|---|---|---|---|---|---|---------------|
| | | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| RB 303□ | 3 | 3 | | | | | | | | |
| 304□ | 3 | 4 | | | | | | | | |
| 305□ | 3 | 5 | | | | | | | | |
| 306□ | 3 | 6 | | | | | | | | |
| 307□ | 3 | 7 | | | | | | | | |
| 308□ | 3 | 8 | | | | | | | | |
| 309□ | 3 | 9 | | | | | | | | |
| 310□ | 3 | 10 | | | | | | | | |
| RB 403□ | 4 | 3 | | | | | | | | |
| 404□ | 4 | 4 | | | | | | | | |
| 405□ | 4 | 5 | | | | | | | | |
| 406□ | 4 | 6 | | | | | | | | |
| 407□ | 4 | 7 | | | | | | | | |
| 408□ | 4 | 8 | | | | | | | | |
| 409□ | 4 | 9 | | | | | | | | |
| 410□ | 4 | 10 | | | | | | | | |
| RB 503□ | 5 | 3 | | | | | | | | |
| 504□ | 5 | 4 | | | | | | | | |
| 505□ | 5 | 5 | | | | | | | | |
| 506□ | 5 | 6 | | | | | | | | |
| 507□ | 5 | 7 | | | | | | | | |
| 508□ | 5 | 8 | | | | | | | | |
| 509□ | 5 | 9 | | | | | | | | |
| 510□ | 5 | 10 | | | | | | | | |
| RB 603□ | 6 | 3 | | | | | | | | |
| 604□ | 6 | 4 | | | | | | | | |
| 605□ | 6 | 5 | | | | | | | | |
| 606□ | 6 | 6 | | | | | | | | |
| 607□ | 6 | 7 | | | | | | | | |
| 608□ | 6 | 8 | | | | | | | | |
| 609□ | 6 | 9 | | | | | | | | |
| 610□ | 6 | 10 | | | | | | | | |
| RB 703□ | 7 | 3 | | | | | | | | |
| 704□ | 7 | 4 | | | | | | | | |
| 705□ | 7 | 5 | | | | | | | | |

| Designation | L | W | T = □ | | | | | | | Grades G10 |
|-------------|----|----|-------|---|---|---|---|---|---|---------------|
| | | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| RB 706□ | 7 | 6 | | | | | | | | |
| 707□ | 7 | 7 | | | | | | | | |
| 708□ | 7 | 8 | | | | | | | | |
| 709□ | 7 | 9 | | | | | | | | |
| 710□ | 7 | 10 | | | | | | | | |
| RB 803□ | 8 | 3 | | | | | | | | |
| 804□ | 8 | 4 | | | | | | | | |
| 805□ | 8 | 5 | | | | | | | | |
| 806□ | 8 | 6 | | | | | | | | |
| 807□ | 8 | 7 | | | | | | | | |
| 808□ | 8 | 8 | | | | | | | | |
| 809□ | 8 | 9 | | | | | | | | |
| 810□ | 8 | 10 | | | | | | | | |
| RB 903□ | 9 | 3 | | | | | | | | |
| 904□ | 9 | 4 | | | | | | | | |
| 905□ | 9 | 5 | | | | | | | | |
| 906□ | 9 | 6 | | | | | | | | |
| 907□ | 9 | 7 | | | | | | | | |
| 908□ | 9 | 8 | | | | | | | | |
| 909□ | 9 | 9 | | | | | | | | |
| 910□ | 9 | 10 | | | | | | | | |
| RB 1003□ | 10 | 3 | | | | | | | | |
| 1004□ | 10 | 4 | | | | | | | | |
| 1005□ | 10 | 5 | | | | | | | | |
| 1006□ | 10 | 6 | | | | | | | | |
| 1007□ | 10 | 7 | | | | | | | | |
| 1008□ | 10 | 8 | | | | | | | | |
| 1009□ | 10 | 9 | | | | | | | | |
| 1010□ | 10 | 10 | | | | | | | | |
| RB 1504□ | 15 | 4 | | | | | | | | |
| 1505□ | 15 | 5 | | | | | | | | |
| RB 2003□ | 20 | 3 | | | | | | | | |
| 2004□ | 20 | 4 | | | | | | | | |
| 2005□ | 20 | 5 | | | | | | | | |
| 2006□ | 20 | 6 | | | | | | | | |

RB



■ Bending Tolerance



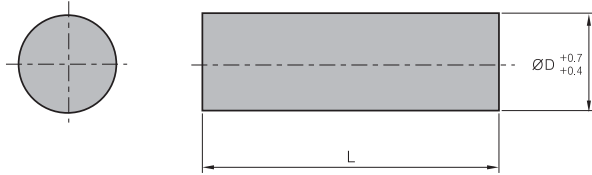
| Standard | L | | F-max |
|----------|-----------|--|-------|
| | Tolerance | | |
| ~30 | +1.0 - 0 | | 0.15 |
| 31~50 | +1.5 - 0 | | 0.25 |
| 51~100 | +3.0 - 0 | | 0.30 |

※ Code System **RB** **15** **04** □
 Length Width Thickness

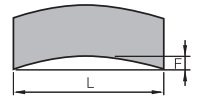
| Designation | L | W | T = □ | | | | | | | | | | Grades G10 |
|-------------|-----|----|-------|---|---|---|---|---|---|----|--|--|---------------|
| | | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | |
| RB 2007□ | 20 | 7 | | | | | | | | | | | |
| 2008□ | 20 | 8 | | | | | | | | | | | |
| 2009□ | 20 | 9 | | | | | | | | | | | |
| 2010□ | 20 | 10 | | | | | | | | | | | |
| RB 3003□ | 30 | 3 | | | | | | | | | | | |
| 3004□ | 30 | 4 | | | | | | | | | | | |
| 3005□ | 30 | 5 | | | | | | | | | | | |
| 3006□ | 30 | 6 | | | | | | | | | | | |
| 3007□ | 30 | 7 | | | | | | | | | | | |
| 3008□ | 30 | 8 | | | | | | | | | | | |
| 3009□ | 30 | 9 | | | | | | | | | | | |
| 3010□ | 30 | 10 | | | | | | | | | | | |
| RB 4003□ | 40 | 3 | | | | | | | | | | | |
| 4004□ | 40 | 4 | | | | | | | | | | | |
| 4005□ | 40 | 5 | | | | | | | | | | | |
| 4006□ | 40 | 6 | | | | | | | | | | | |
| 4007□ | 40 | 7 | | | | | | | | | | | |
| 4008□ | 40 | 8 | | | | | | | | | | | |
| 4009□ | 40 | 9 | | | | | | | | | | | |
| 4010□ | 40 | 10 | | | | | | | | | | | |
| RB 5003□ | 50 | 3 | | | | | | | | | | | |
| 5004□ | 50 | 4 | | | | | | | | | | | |
| 5005□ | 50 | 5 | | | | | | | | | | | |
| 5006□ | 50 | 6 | | | | | | | | | | | |
| 5007□ | 50 | 7 | | | | | | | | | | | |
| 5008□ | 50 | 8 | | | | | | | | | | | |
| 5009□ | 50 | 9 | | | | | | | | | | | |
| 5010□ | 50 | 10 | | | | | | | | | | | |
| RB 6003□ | 60 | 3 | | | | | | | | | | | |
| 6004□ | 60 | 4 | | | | | | | | | | | |
| 6005□ | 60 | 5 | | | | | | | | | | | |
| 6006□ | 60 | 6 | | | | | | | | | | | |
| 6007□ | 60 | 7 | | | | | | | | | | | |
| 6008□ | 60 | 8 | | | | | | | | | | | |
| 6009□ | 60 | 9 | | | | | | | | | | | |
| RB 6010□ | 60 | 10 | | | | | | | | | | | |
| RB 7003□ | 70 | 3 | | | | | | | | | | | |
| 7004□ | 70 | 4 | | | | | | | | | | | |
| 7005□ | 70 | 5 | | | | | | | | | | | |
| 7006□ | 70 | 6 | | | | | | | | | | | |
| 7007□ | 70 | 7 | | | | | | | | | | | |
| 7008□ | 70 | 8 | | | | | | | | | | | |
| 7009□ | 70 | 9 | | | | | | | | | | | |
| 7010□ | 70 | 10 | | | | | | | | | | | |
| RB 8003□ | 80 | 3 | | | | | | | | | | | |
| 8004□ | 80 | 4 | | | | | | | | | | | |
| 8005□ | 80 | 5 | | | | | | | | | | | |
| 8006□ | 80 | 6 | | | | | | | | | | | |
| 8007□ | 80 | 7 | | | | | | | | | | | |
| 8008□ | 80 | 8 | | | | | | | | | | | |
| 8009□ | 80 | 9 | | | | | | | | | | | |
| 8010□ | 80 | 10 | | | | | | | | | | | |
| RB 9003□ | 90 | 3 | | | | | | | | | | | |
| 9004□ | 90 | 4 | | | | | | | | | | | |
| 9005□ | 90 | 5 | | | | | | | | | | | |
| 9006□ | 90 | 6 | | | | | | | | | | | |
| 9007□ | 90 | 7 | | | | | | | | | | | |
| 9008□ | 90 | 8 | | | | | | | | | | | |
| 9009□ | 90 | 9 | | | | | | | | | | | |
| 9010□ | 90 | 10 | | | | | | | | | | | |
| RB 10003□ | 100 | 3 | | | | | | | | | | | |
| 10004□ | 100 | 4 | | | | | | | | | | | |
| 10005□ | 100 | 5 | | | | | | | | | | | |
| 10006□ | 100 | 6 | | | | | | | | | | | |
| 10007□ | 100 | 7 | | | | | | | | | | | |
| 10008□ | 100 | 8 | | | | | | | | | | | |
| 10009□ | 100 | 9 | | | | | | | | | | | |
| 10010□ | 100 | 10 | | | | | | | | | | | |



SR Round bars blank



■ Bending Tolerance

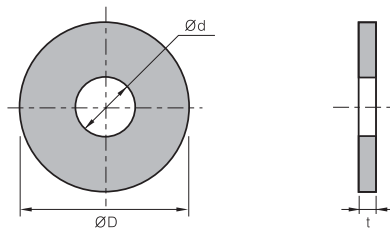


| L | | F-max |
|----------|-----------|-------|
| Standard | Tolerance | |
| ~30 | +1.5 - 0 | 0.10 |
| 31~40 | +1.5 - 0 | 0.15 |
| 41~50 | +1.5 - 0 | 0.20 |
| 51~100 | +2.5 - 0 | 0.25 |

※ Code System **SR** **03** □
 Diameter Length

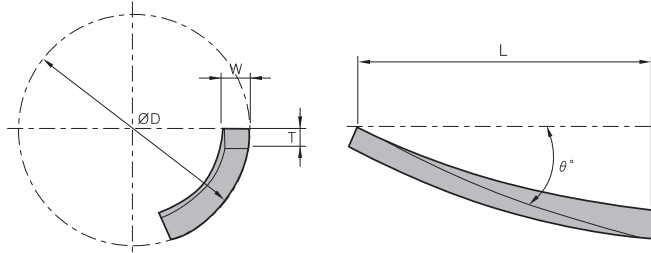
| Designation | ØD | T = □ | | | | | | | | | | Fig | |
|-------------|-----|-------|----|----|----|----|----|----|-----|------|-----|-----|--|
| | | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | ST20 | G10 | | |
| SR | 03□ | 3 | | | | | | | | | | | |
| | 04□ | 4 | | | | | | | | | | | |
| | 05□ | 5 | | | | | | | | | | | |
| | 06□ | 6 | | | | | | | | | | | |
| | 07□ | 7 | | | | | | | | | | | |
| | 08□ | 8 | | | | | | | | | | | |
| | 09□ | 9 | | | | | | | | | | | |
| | 10□ | 10 | | | | | | | | | | | |
| | 11□ | 11 | | | | | | | | | | | |
| | 12□ | 12 | | | | | | | | | | | |

RT Ring blank



| Designation | ØD | Ød | t |
|-------------|-----------|-----------|--------|
| ØD×Ød×t | Ø7.2~Ø200 | Ø2.7~Ø150 | 0.8~10 |

ST Helix blank



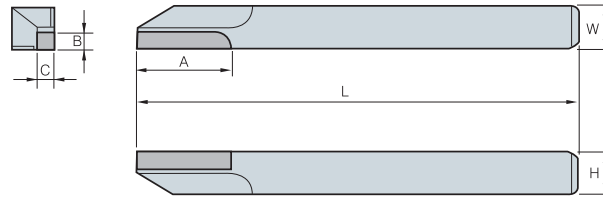
(mm)

| Designation | | Available Endmill (ØD) | L | T | W | θ° |
|-------------|----|------------------------|----|-----|-----|---------|
| ST | 14 | Ø13, 14 | 30 | 2.3 | 4.0 | 23° 44' |
| | 15 | Ø15 | 30 | 2.3 | 4.0 | 25° 13' |
| | 18 | Ø18 | 32 | 2.3 | 4.5 | 25° 13' |
| | 20 | Ø20 | 32 | 2.8 | 5.5 | 24° 09' |
| | 24 | Ø23, 24 | 37 | 2.8 | 5.5 | 25° 13' |
| | 26 | Ø26, 27 | 37 | 3.3 | 6.5 | 24° 24' |
| | 30 | Ø29, 30, 31 | 42 | 3.8 | 7.0 | 25° 13' |
| | 32 | Ø32, 33 | 47 | 3.8 | 7.0 | 26° 41' |
| | 35 | Ø34, 35, 36 | 52 | 3.8 | 7.0 | 24° 36' |
| | 38 | Ø37, 38 | 57 | 3.8 | 7.0 | 23° 51' |
| | 40 | Ø39, 40, 41, 42 | 62 | 4.3 | 7.5 | 24° 57' |
| | 45 | Ø43, 44, 45, 46, 47 | 67 | 4.3 | 7.5 | 25° 13' |
| | 50 | Ø48, 49, 50 | 67 | 4.3 | 7.5 | 24° 09' |



| Feed direction | Figure | Designation | A | B | C | (R) | W | H | L | E | F | Available blank | |
|----------------|--------|-------------|----|------------|---|-----|----|----|-----|----|-----|-----------------|------|
| | | 33, 34 - 0 | 10 | 6 | 3 | 0.3 | 10 | 10 | 80 | 0 | | 04-0 | |
| | | 1 | 13 | 9 | 3 | 0.5 | 13 | 13 | 100 | 4 | | | 04-1 |
| | | 2 | 16 | 11 | 4 | 0.5 | 16 | 16 | 120 | 4 | | | 04-2 |
| | | 3 | 19 | 13 | 5 | 0.5 | 19 | 19 | 140 | 5 | | | 04-3 |
| | | 4 | 22 | 15 | 6 | 1 | 25 | 25 | 160 | 5 | | | 04-4 |
| | | 5 | 25 | 17 | 7 | 1 | 25 | 30 | 180 | 5 | | | 04-5 |
| | | 6 | 30 | 20 | 8 | 1 | 35 | 35 | 200 | 6 | | | 04-6 |
| | | 35 - 0 | 10 | 10 | 3 | 0.3 | 10 | 10 | 80 | | | 07-0 | |
| | | 1 | 13 | 13 | 3 | 0.5 | 13 | 13 | 100 | | | | 07-1 |
| | | 2 | 16 | 16 | 4 | 0.5 | 16 | 16 | 120 | | | | 07-2 |
| | | 3 | 18 | 19 | 5 | 0.5 | 19 | 19 | 140 | | | | 07-3 |
| | | 4 | 25 | 20 | 6 | 1 | 25 | 25 | 160 | | | | 07-4 |
| | | 5 | 25 | 22 | 7 | 1 | 25 | 30 | 180 | | | | 07-5 |
| | | 6 | 30 | 25 | 8 | 1 | 30 | 35 | 200 | | | | 07-6 |
| | | 36 - 0 | 10 | 10 | 3 | 2 | 10 | 10 | 80 | | | 06-0 | |
| | | 1 | 13 | 13 | 3 | 2.5 | 13 | 13 | 100 | | | | 06-1 |
| | | 2 | 16 | 16 | 4 | 3 | 16 | 16 | 120 | | | | 06-2 |
| | | 3 | 18 | 18 | 5 | 4 | 19 | 19 | 140 | | | | 06-3 |
| | | 4 | 22 | 22 | 6 | 4 | 25 | 25 | 160 | | | | 06-4 |
| | | 5 | 25 | 25 | 7 | 5 | 25 | 30 | 180 | | | | 06-5 |
| | | 6 | 30 | 30 | 8 | 6 | 30 | 35 | 200 | | | | 06-6 |
| | | 39, 40 - 0 | 10 | 10 | 3 | 2 | 10 | 10 | 80 | 5 | | 06-0 | |
| | | 1 | 13 | 13 | 3 | 2.5 | 13 | 13 | 100 | 7 | | | 06-1 |
| | | 2 | 16 | 16 | 4 | 3 | 16 | 16 | 120 | 10 | | | 06-2 |
| | | 3 | 19 | 19 | 5 | 4 | 19 | 19 | 140 | 12 | | | 06-3 |
| | | 4 | 22 | 22 | 6 | 4 | 25 | 25 | 160 | 13 | | | 06-4 |
| | | 5 | 25 | 25 | 7 | 5 | 25 | 30 | 180 | 15 | | | 06-5 |
| | | 6 | 30 | 30 | 8 | 6 | 30 | 35 | 200 | 16 | | | 06-6 |
| | | 43 - 1 | 3 | 8 | 3 | | 10 | 16 | 100 | | 13 | 08-1 | |
| | | 2 | 3 | 8 | 3 | | 13 | 19 | 120 | | 16 | | 08-1 |
| | | 3 | 4 | 13 | 4 | | 16 | 22 | 140 | | 20 | | 08-3 |
| | | 4 | 5 | 15 | 5 | | 18 | 25 | 160 | | 25 | | 08-4 |
| | | 5 | 6 | 17 | 6 | | 22 | 32 | 180 | | 30 | | 08-5 |
| | | 6 | 8 | 20 | 8 | | 25 | 38 | 200 | | 40 | | 08-6 |
| | | | | 49, 50 - 1 | 5 | 8 | 3 | | 13 | 13 | 100 | | |
| 2 | 6 | | | 10 | 4 | | 16 | 16 | 120 | | | | 05-2 |
| 3 | 7 | | | 12 | 5 | | 19 | 19 | 140 | | | | 05-3 |
| 4 | 9 | | | 16 | 6 | | 25 | 25 | 160 | | | | 05-4 |

PBX100



| Designation | | A | B | C | W | H | L |
|-------------|-----|----|-----|-----|----|----|-----|
| PBX - | 105 | 20 | 2.0 | 2.0 | 5 | 5 | 125 |
| | 106 | 20 | 2.5 | 2.5 | 6 | 6 | 140 |
| | 107 | 20 | 3.0 | 3.0 | 7 | 7 | 150 |
| | 108 | 20 | 3.0 | 3.0 | 8 | 8 | 150 |
| | 109 | 20 | 3.5 | 3.5 | 9 | 9 | 150 |
| | 110 | 20 | 4.0 | 4.0 | 10 | 10 | 150 |
| | 112 | 20 | 4.0 | 4.0 | 12 | 12 | 150 |
| | 116 | 20 | 4.0 | 4.0 | 16 | 16 | 150 |


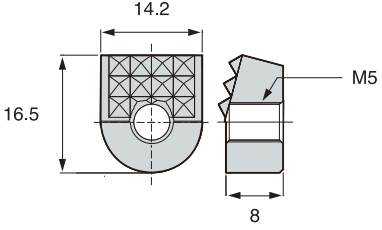





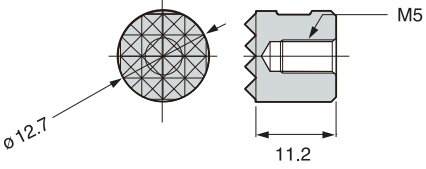


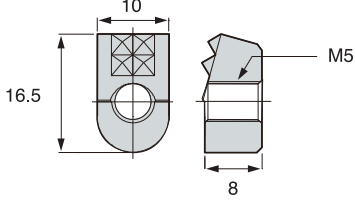

(mm)



Chuck Jaw *New*

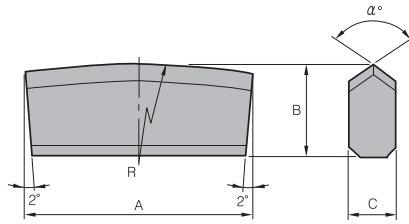
- **Features**
 - ▶ Chuck Jaw strongly clamps rough workpiece in turning and milling (including MCT)
 - ▶ Can chuck any types of workpiece

● **Stock information**

| Designation | Geometry | Dimension |
|-------------|---|---|
| CJ 04 |  |  |
| CJ 12 |  | |
| CJ 21 |  | |
| CJ 22 |  | |
| CJ 23 |  | |
| CJ 31 |  |  |
| CJ 32 |  | |
| CJ 41 |  |  |
| CJ 42 |  | |



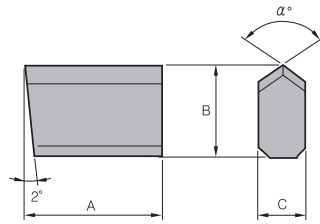
For taper bits (1000Type)



| (mm) | | | | | |
|-------------|----|----|----|----------------|-----|
| Designation | A | B | C | α° | R |
| 1000 - 124 | 24 | 10 | 6 | 100 | 80 |
| 126 | 26 | 10 | 6 | 100 | 80 |
| 128 | 28 | 10 | 6 | 100 | 80 |
| 130 | 30 | 10 | 6 | 100 | 80 |
| 132 | 32 | 10 | 6 | 100 | 80 |
| 232 | 32 | 10 | 6 | 100 | 80 |
| 234 | 34 | 12 | 8 | 110 | 120 |
| 236 | 36 | 12 | 8 | 110 | 120 |
| 238 | 38 | 12 | 8 | 110 | 120 |
| 240 | 40 | 12 | 8 | 110 | 120 |
| 242 | 42 | 12 | 8 | 110 | 120 |
| 332 | 32 | 14 | 8 | 110 | 120 |
| 334 | 34 | 14 | 8 | 110 | 120 |
| 336 | 36 | 14 | 8 | 110 | 120 |
| 338 | 38 | 14 | 8 | 110 | 120 |
| 340 | 40 | 14 | 8 | 110 | 120 |
| 342 | 42 | 14 | 8 | 110 | 120 |
| 434 | 34 | 15 | 10 | 110 | 120 |
| 436 | 36 | 15 | 10 | 110 | 120 |
| 438 | 38 | 15 | 10 | 110 | 120 |
| 440 | 40 | 15 | 10 | 110 | 120 |
| 442 | 42 | 15 | 10 | 110 | 120 |
| 444 | 44 | 15 | 10 | 110 | 120 |
| 446 | 46 | 15 | 10 | 110 | 120 |
| 534 | 34 | 18 | 10 | 110 | 120 |
| 536 | 36 | 18 | 10 | 110 | 120 |
| 538 | 38 | 18 | 10 | 110 | 120 |
| 540 | 40 | 18 | 10 | 110 | 120 |
| 542 | 42 | 18 | 10 | 110 | 120 |
| 544 | 44 | 18 | 10 | 110 | 120 |
| 546 | 46 | 18 | 10 | 110 | 120 |



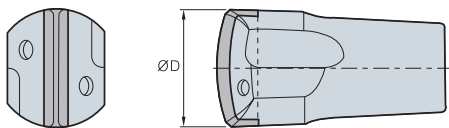
For cross bits (2000Type)



| Designation | A | B | C | α° | R |
|-------------|----|----|---|----------------|---|
| 2000 - 110 | 10 | 10 | 6 | 100 | |
| 111 | 11 | 10 | 6 | 100 | |
| 112 | 12 | 10 | 6 | 100 | |
| 113 | 13 | 10 | 6 | 100 | |
| 114 | 14 | 10 | 6 | 100 | |
| 115 | 15 | 12 | 6 | 100 | |
| 210 | 10 | 12 | 6 | 100 | |
| 211 | 11 | 12 | 6 | 100 | |
| 212 | 12 | 12 | 6 | 100 | |
| 213 | 13 | 12 | 6 | 100 | |
| 214 | 14 | 12 | 6 | 100 | |
| 215 | 15 | 14 | 8 | 100 | |
| 312 | 12 | 14 | 8 | 100 | |
| 313 | 13 | 14 | 8 | 100 | |
| 314 | 14 | 14 | 8 | 100 | |
| 315 | 15 | 14 | 8 | 100 | |
| 316 | 16 | 14 | 8 | 100 | |
| 317 | 17 | 14 | 8 | 100 | |
| 318 | 18 | 14 | 8 | 100 | |

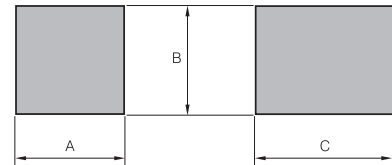
When ordering special items, Please point out the designation, grades, quantity. Available for tailor made.

TB For taper bits



| Designation | $\varnothing D$ |
|-------------|-----------------|
| TB 20 | 20 |
| 32 | 32 |
| 34 | 34 |
| 36 | 36 |
| 38 | 38 |
| 39 | 39 |
| 40 | 40 |

BT Boring Crown Blank



| Designation | A | B | C |
|-------------|---|----|----|
| BT 1 | 5 | 5 | 8 |
| 2 | 6 | 6 | 9 |
| 3 | 8 | 8 | 10 |
| 4 | 7 | 10 | 15 |

Bits for construction

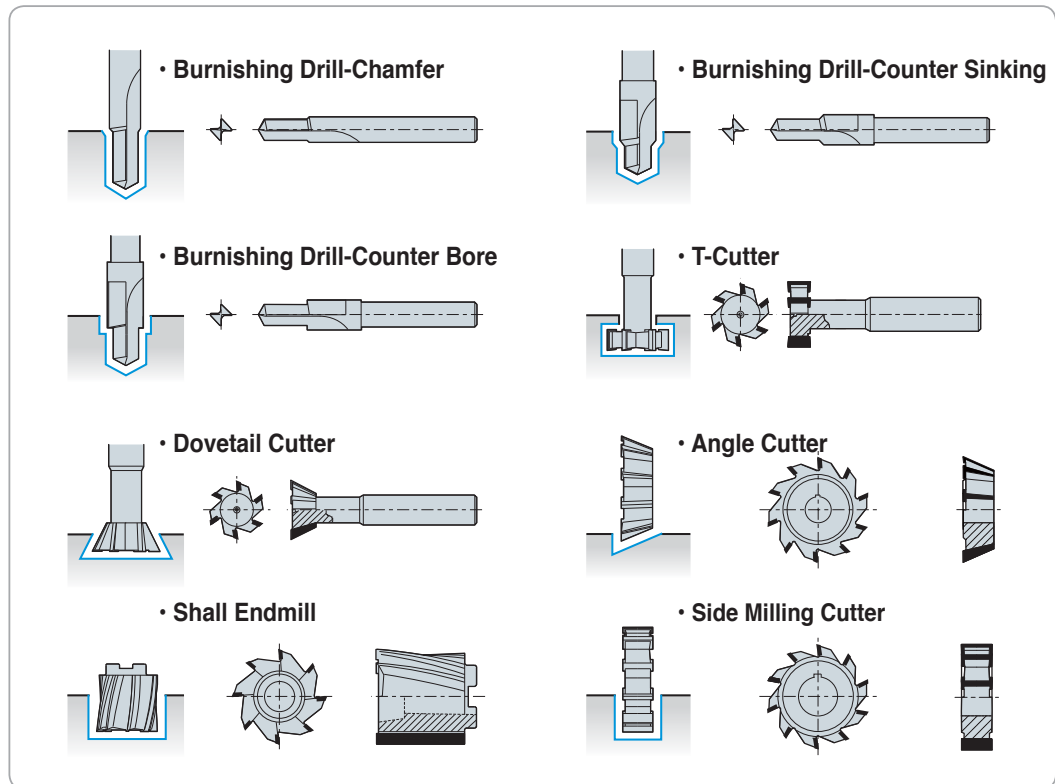
| Configuration | Dimensions | Configuration | Dimensions | Configuration | Dimensions |
|------------------|------------|---------------|------------|---------------|------------|
| Earth Auger Bits | | Casing Bits | | Rod Bits | |

Features

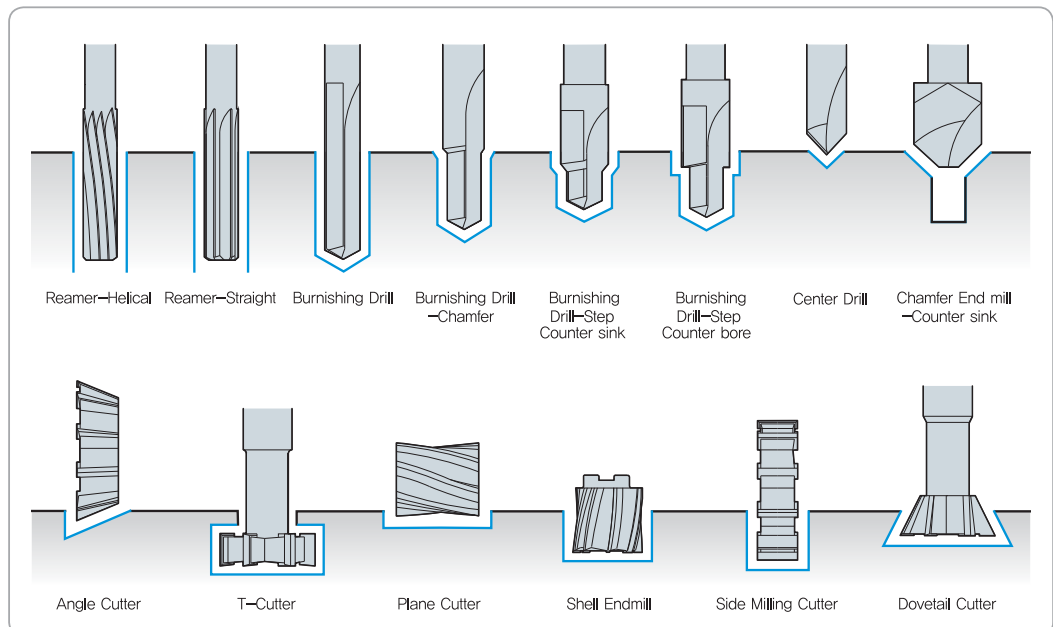
- ▶ For various applications
- ▶ Precise accuracy. Easy to order for special types.
- ▶ Suitable for small tools. Short delivery time.
- ▶ Reasonable tool cost. Reusable after sharpening.



Cutting Process Type

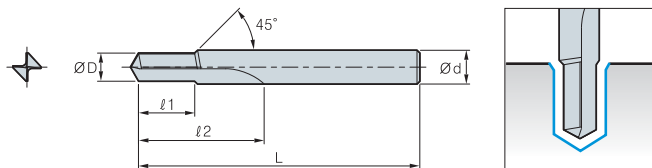


Cutting Processes and Types



H Special Rotating Brazing Tools Order Form

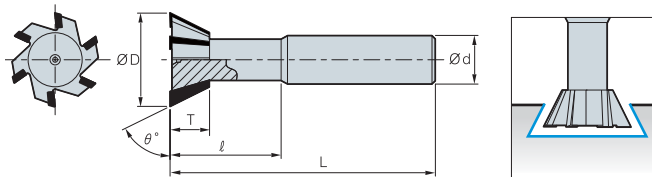
Burnishing Drill-Chamfer



(mm)

| Designation | ØD | l ₁ | l ₂ | L | Ød |
|-------------|----|----------------|----------------|---|----|
| BDC | | | | | |

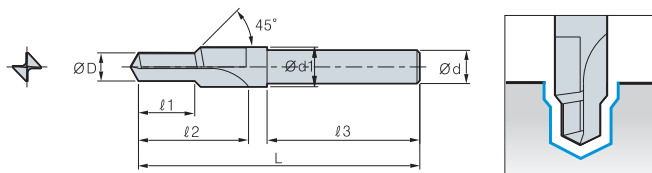
Dovetail Cutter



(mm)

| Designation | ØD | l | θ° | l ₁ | L | Ød | No. of Flute |
|-------------|----|---|----|----------------|---|----|--------------|
| DC | | | | | | | |

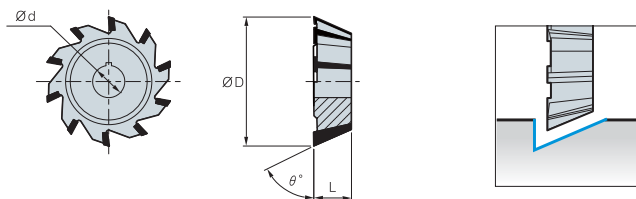
Burnishing Drill-Step



(mm)

| Designation | ØD | Ød1 | l ₁ | l ₂ | l ₃ | L | Ød |
|-------------|----|-----|----------------|----------------|----------------|---|----|
| BDS | | | | | | | |

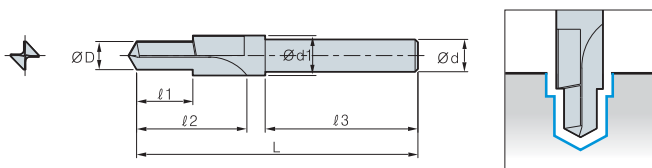
Angle Cutter



(mm)

| Designation | ØD | θ° | Ød | L | No. of Flute |
|-------------|----|----|----|---|--------------|
| AC | | | | | |

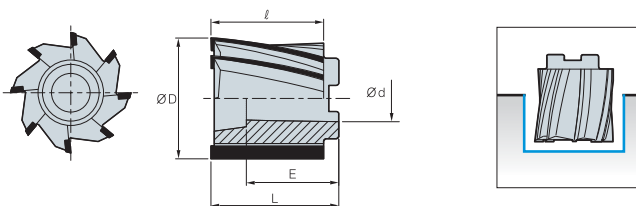
Burnishing Drill-Counter Bore



(mm)

| Designation | ØD | Ød2 | l ₁ | l ₂ | l ₃ | L | Ød |
|-------------|----|-----|----------------|----------------|----------------|---|----|
| BDCB | | | | | | | |

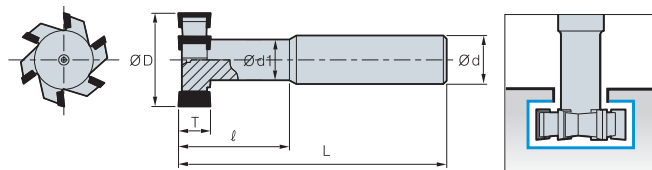
Shall Endmill



(mm)

| Designation | ØD | Ød | l | E | L | No. of Flute |
|-------------|----|----|---|---|---|--------------|
| SEM | | | | | | |

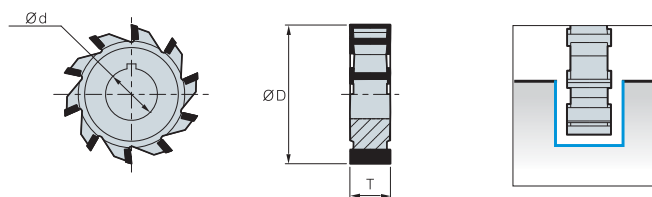
T-Cutter



(mm)

| Designation | ØD | Ød1 | T | l | L | Ød | No. of Flute |
|-------------|----|-----|---|---|---|----|--------------|
| TC | | | | | | | |

Side Milling Cutter



(mm)

| Designation | ØD | Ød | T | No. of Flute |
|-------------|----|----|---|--------------|
| SMC | | | | |



TOOLING SYSTEM



TOOLING SYSTEM

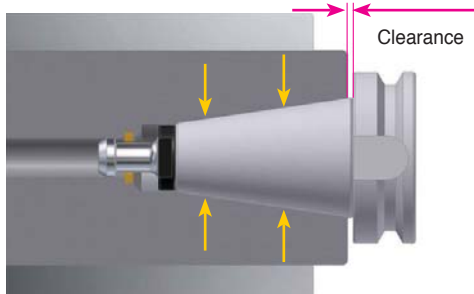
CONTENTS

Tooling System

| | | |
|----------------------------------|--------------------------------------|---|
| I 02 DBT Series | I 48 DTN Series | I 74 Angular Head Series |
| I 03 HSK Tooling System | I 51 TCA Adapter | I 78 FBH Series |
| I 04 Balancing System | I 52 SDT Series | I 83 TBC / FBC Series |
| I 05 Tooling System Index | I 54 KT | I 87 FMD |
| I 06 DHE Series | I 55 TER | I 88 Head Set(Boring Tool) |
| I 11 DSC Series | I 56 Side Lock Arbor Series | I 90 Balance Cut Tool |
| I 16 NPM Series | I 62 Face Mill Arbor Series | I 92 Micro Boring Series |
| I 21 HPM Series | I 68 Morse Taper Arbor Series | I 96 Modular System |
| I 24 Collet | I 70 Side Cutter Arbor Series | I 108 DAMPING PRO |
| I 26 Collet Chuck Series | I 72 Oil Hole Holder | I 115 Others |
| I 46 NPU Series | I 73 Spindle Speeder | I 121 Comparison of Tooling System |

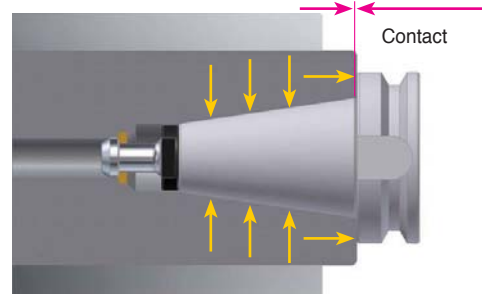
DBT Series

BT type



The clearance between spindle and face of shank

DBT type



Perfect contact of both faces
Better precision / less vibration

Features

- ▶ Stable machining can be possible at high speed
- ▶ Improvement of tool-life for machine spindle and cutting tool
- ▶ Prevention for corrosion of taper portion of both machine spindle and tool holder by heavy duty machining vibration
- ▶ Guarantee for the most suitable machining and high accuracy



Various models

Drilling/Endmilling



DBT-SDC

DBT-HPS

DBT-HDC

Milling



DBT-NPM

DBT-HPM

DBT-DHE

Face Milling



DBT-FMA

Angular Head



DBT-KAG

Test Bar

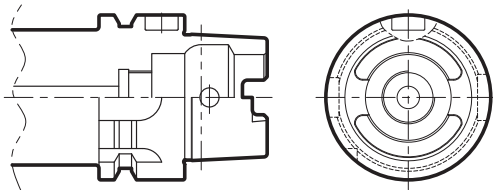


DBT-TB

🎯 Excellent Repeatability-Run out Accuracy

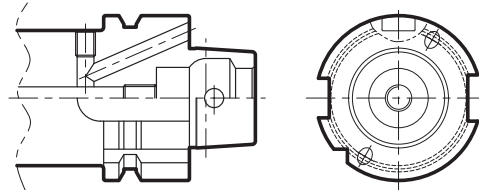
- ▶ As taper of holder will deform elastically following the profile of the spindle shape, there is no eccentricity between the spindle and the other.
- ▶ Also, due to perfect face contact between flange surface of the holder and spindle face, bending strength of the holder is very high, which makes radial and axial and accuracy very high.

HSK Tooling System AType



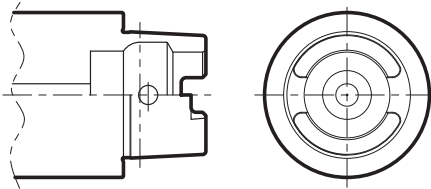
- Application : For Machining centers
- Torque transmission with drive keys on the taper
- 2U-grooves for ATC, Positioning notch

HSK Tooling System BType



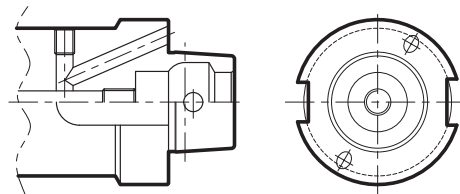
- Application : For Machining centers, milling machines and lathes
- Flange through coolant feed or through coolant feed by coolant tube
- Torque transmission by U-groove on the flange
- Positioning notch

HSK Tooling System CType



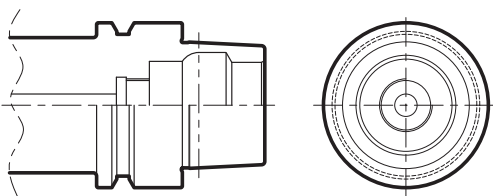
- Application : Transfer lines and special purpose machines without ATC
- Torque transmission with drive keys on the taper

HSK Tooling System DType



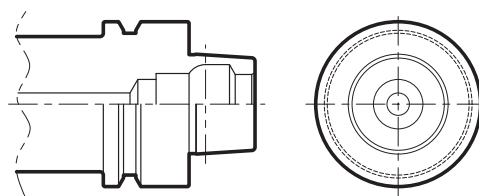
- Application : Transfer lines and special purpose machines without ATC
- Large flange diameter
- Flange through coolant feed
- Torque transmission by U-groove on the flange

HSK Tooling System EType



- Application : High speed machining centers and wood milling machines
- Torque transmission by friction
- Complete symmetrical shape without drive keys

HSK Tooling System FType



- Application : High speed machining centers and wood milling machines
- Large flange diameter



I Balancing System

• The most optimal accuracy at high speed

1. Without bending from rotation of an unbalanced load, High accuracy and rigidity are maintained
2. Excellent Balance ($\leq G1.0$ or $0.5 \text{ g}\cdot\text{mm}/\text{kg}$)
3. Tool life, surface finish, dimension of accuracy and productivity can be realized at high speed
4. Special type can be ordered

BT, SK Shank

Balanced type with hole

All ground balanced type

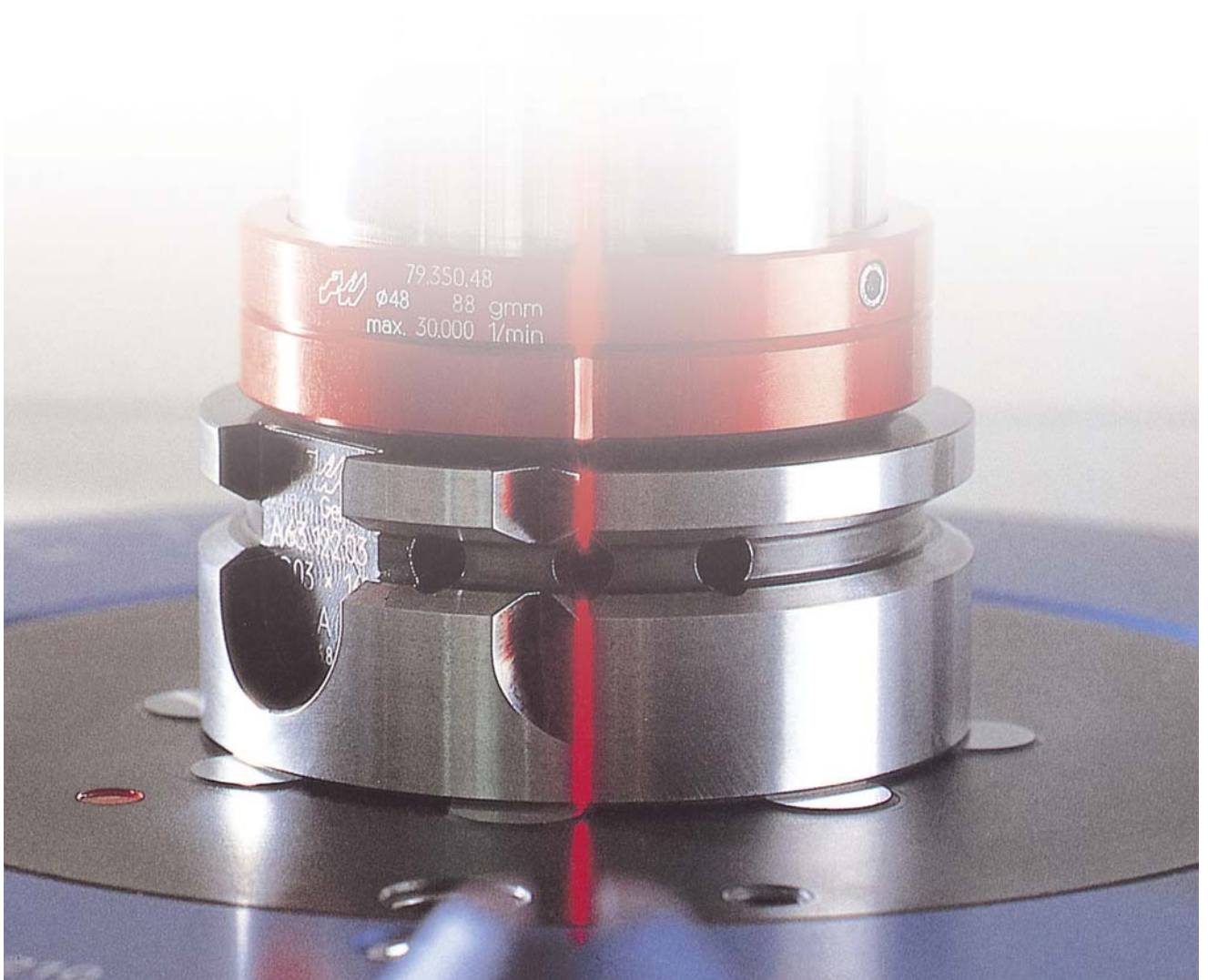
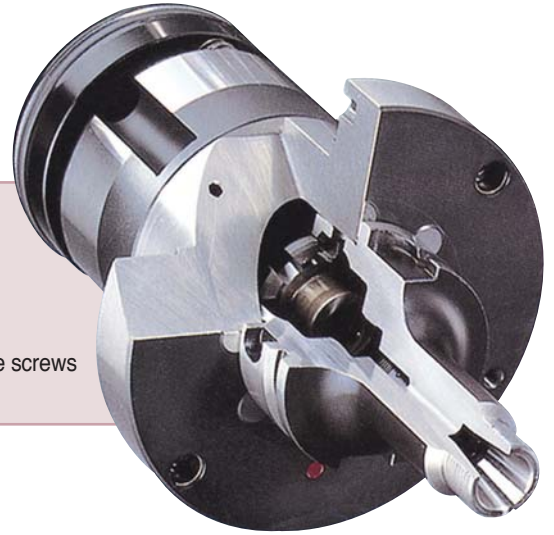
Balanceable type with Adjustable screws

HSK Shank

Balanced type with hole

All ground balanced type

Balanceable type with Adjustable screws



| | | | | |
|--|---|--|--|---|
| Hydraulic Expansion Chuck DHE  I 7 | Shrinking Chuck DSC  I 12 | Milling Chuck NPM  I 18 | High Speed Milling Chuck HPM  I 22 | Collet Chuck SDC  I 27 |
| Collet Chuck SDC/S  I 31 | Collet Chuck DSK  I 34 | Collet Chuck HPS  I 37 | Collet Chuck HDC  I 40 | Drill Chuck NPU  I 46 |
| Tap Chuck DTN  I 49 | Tap Chuck SDT  I 52 | Side Lock Arbor SLA, SLW  I 56 | Face Mill Arbor FMA, FMB, FMC  I 62 | Morse Taper Arbor MTA, MTB  I 68 |
| Side Cutter Arbor SCA  I 70 | Oil Hole Holder OHDC, OHSL  I 72 | Spindle Speeder KSH  I 73 | Angular Head Series KHU, MAH  I 75 | Angular Head Series KAG, HRAG  I 75 |
| Angular Head Series KAH, HAF  I 76 | Angular Head Series KAC  I 77 | Boring Tool FBH  I 79 | Boring Tool TBC  I 85 | Boring Tool FBC  I 86 |
| Boring Tool DBC  I 90 | Boring Tool SMB, SMH  I 92 | Boring Tool KMB  I 94 | Modular System MD  I 97 | Modular System / Extension Bar EXT  I 101 |
| Modular System / Reducer Bar RDC  I 102 | Modular System / Collet Chuck MD-SDC  I 103 | Modular System / Drill Chuck MD-NPU  I 104 | Modular System / Side Lock Head MD-SLA  I 105 | Modular System / Boring Head MD-SMB, SMH  I 106 |
| Modular System / Boring Head MD-KMB  I 107 | DAMPING PRO FMA/FMC  I 110 | | | |



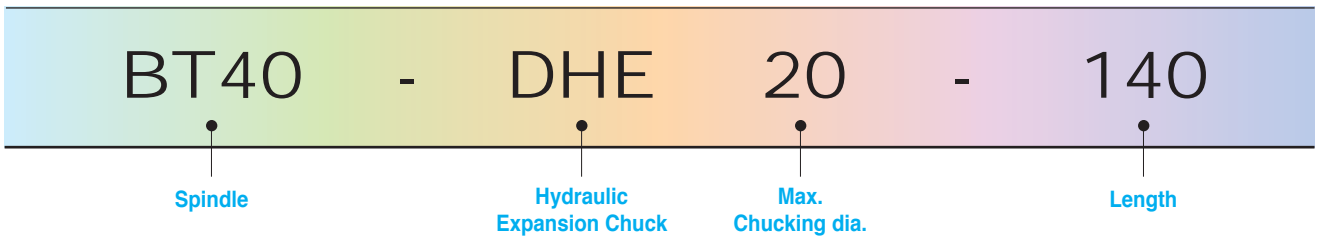
Hydraulic Chuck for high precision machining due to high accuracy and high clamping force

DHE Series

- Application of various uses in machining molds, automobile parts, precision parts, etc.
- With high durability, accuracy and clamping force are maintained
- High clamping force provides stable machining without clamping force fluctuation

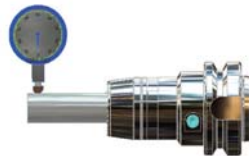


Code System



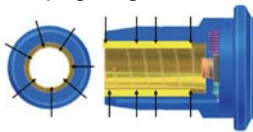
Features

- ▶ High accuracy provides long tool life due to reduced wear and hydraulic room enhances a surface roughness by lessening vibrations.
 - Run out : under 5 μ m
 - L = 3 x \varnothing D
 - Shank : Tolerance of \varnothing D : h6



| Tool Shank | Torque Min (Nm) | Tool Shank Tolerance(h6) |
|------------------|-----------------|--------------------------|
| \varnothing 6 | 14 | 0 ~ -0.008 |
| \varnothing 8 | 22 | 0 ~ -0.009 |
| \varnothing 10 | 42 | 0 ~ -0.011 |
| \varnothing 12 | 83 | 0 ~ -0.011 |
| \varnothing 16 | 176 | 0 ~ -0.011 |
| \varnothing 20 | 308 | 0 ~ -0.013 |
| \varnothing 25 | 495 | 0 ~ -0.013 |
| \varnothing 32 | 715 | 0 ~ -0.016 |

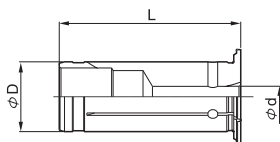
- ▶ Internal sealing structure(Durability)
 - Internal sealing system protects the chuck against dust, cutting oil, lubricant and chips getting into it.
 - Maintaining clamping force and accuracy for a long time



- ▶ Clamping structure for easy operation(Convenience)
 - With simple T-Wrench, very easy to change a tool.
 - : Decrease of worker's fatigue
 - : Improving machine capacity



Collet



| Designation | \varnothing D | \varnothing d | L |
|---------------------|-----------------|-----------------|----|
| DHC20 - 3(P) | 20 | 3 | 52 |
| 4(P) | 20 | 4 | 52 |
| 5(P) | 20 | 5 | 52 |
| 6(P) | 20 | 6 | 52 |
| 8(P) | 20 | 8 | 52 |
| 10(P) | 20 | 10 | 52 |
| 12(P) | 20 | 12 | 52 |
| 16(P) | 20 | 16 | 52 |
| DHC32 - 6(P) | 32 | 6 | 64 |
| 8(P) | 32 | 8 | 64 |
| 10(P) | 32 | 10 | 64 |
| 12(P) | 32 | 12 | 64 |
| 16(P) | 32 | 16 | 64 |
| 20(P) | 32 | 20 | 64 |
| 25(P) | 32 | 25 | 64 |

DBT-DHE



Fig 1

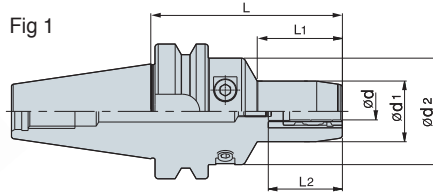


Fig 2

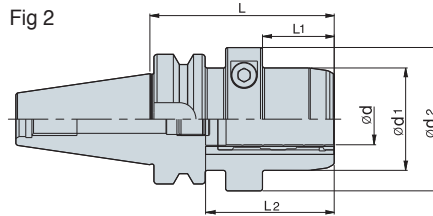
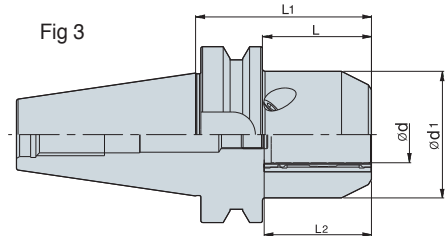


Fig 3



(mm)

| Designation | Ød | L | Ød1 | Ød2 | L1 | L2 | Screw | Fig. | |
|-------------|------------|----|-----|-----|----|-------|-------|------|---|
| DBT30 - | DHE 6 - 65 | 6 | 65 | 29 | 46 | 33 | 30~40 | M5 | 1 |
| | DHE 8 - 65 | 8 | 65 | 31 | 46 | 33 | 30~40 | M5 | 1 |
| | DHE10 - 65 | 10 | 65 | 33 | 46 | 34 | 35~45 | M10 | 1 |
| | DHE12 - 65 | 12 | 65 | 35 | 46 | 34 | 41~51 | M10 | 1 |
| | DHE14 - 90 | 14 | 90 | 38 | 46 | 45 | 43~53 | M10 | 1 |
| | DHE16 - 90 | 16 | 90 | 40 | 46 | 45 | 46~56 | M10 | 1 |
| | DHE18 - 90 | 18 | 90 | 42 | 46 | 45 | 49~59 | M10 | 1 |
| | DHE20 - 90 | 20 | 90 | 44 | 46 | 45 | 49~59 | M10 | 1 |
| DBT40 - | DHE 6 - 90 | 6 | 90 | 29 | 50 | 40 | 30~40 | M5 | 1 |
| | 140 | 6 | 140 | 29 | 50 | 40 | 30~40 | M5 | 1 |
| | DHE 8 - 90 | 8 | 90 | 31 | 50 | 40 | 30~40 | M5 | 1 |
| | 140 | 8 | 140 | 31 | 50 | 40 | 30~40 | M5 | 1 |
| | DHE10 - 90 | 10 | 90 | 33 | 50 | 40 | 35~45 | M5 | 1 |
| | 140 | 10 | 140 | 33 | 50 | 40 | 35~45 | M5 | 1 |
| | DHE12 - 90 | 12 | 90 | 35 | 50 | 40 | 41~51 | M10 | 1 |
| | 140 | 12 | 140 | 35 | 50 | 40 | 41~51 | M10 | 1 |
| | DHE14 - 90 | 14 | 90 | 38 | 50 | 40 | 43~53 | M10 | 1 |
| | 140 | 14 | 140 | 38 | 50 | 40 | 43~53 | M10 | 1 |
| | DHE16 - 90 | 16 | 90 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| | 140 | 16 | 140 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| | DHE18 - 90 | 18 | 90 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| | 140 | 18 | 140 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| | DHE20 - 90 | 20 | 90 | 44 | 50 | 47 | 49~59 | M10 | 1 |
| | 140 | 20 | 140 | 44 | 50 | 47 | 49~59 | M10 | 1 |
| DHE25 - 90 | 25 | 90 | 50 | 70 | 35 | 58~68 | M16 | 2 | |
| DHE32 - 90 | 32 | 90 | 63 | 80 | 35 | 58~68 | M16 | 2 | |
| DBT50 - | DHE 6 - 90 | 6 | 90 | 29 | 50 | 34 | 30~34 | M5 | 1 |
| | 140 | 6 | 140 | 29 | 50 | 34 | 30~34 | M5 | 1 |
| | DHE 8 - 90 | 8 | 90 | 31 | 50 | 34 | 30~34 | M5 | 1 |
| | 140 | 8 | 140 | 31 | 50 | 34 | 30~34 | M5 | 1 |
| | DHE10 - 90 | 10 | 90 | 33 | 50 | 34 | 35~45 | M5 | 1 |
| | 140 | 10 | 140 | 33 | 50 | 34 | 35~45 | M5 | 1 |
| | DHE12 - 90 | 12 | 90 | 35 | 50 | 34 | 41~51 | M10 | 1 |
| | 140 | 12 | 140 | 35 | 50 | 34 | 41~51 | M10 | 1 |
| | DHE14 - 90 | 14 | 90 | 38 | 50 | 34 | 43~53 | M10 | 1 |
| | 140 | 14 | 140 | 38 | 50 | 34 | 43~53 | M10 | 1 |
| | DHE16 - 90 | 16 | 90 | 40 | 50 | 34 | 46~56 | M10 | 1 |
| | 140 | 16 | 140 | 40 | 50 | 34 | 46~56 | M10 | 1 |
| | DHE18 - 90 | 18 | 90 | 42 | 50 | 34 | 49~59 | M10 | 1 |
| | 140 | 18 | 140 | 42 | 50 | 34 | 49~59 | M10 | 1 |
| | DHE20 - 90 | 20 | 90 | 44 | 50 | 34 | 49~59 | M10 | 1 |
| | 140 | 20 | 140 | 44 | 50 | 34 | 49~59 | M10 | 1 |
| DHE25 - 90 | 25 | 90 | 50 | - | 34 | 58~68 | M16 | 3 | |
| DHE32 - 90 | 32 | 90 | 63 | - | 52 | 58~68 | M16 | 3 | |

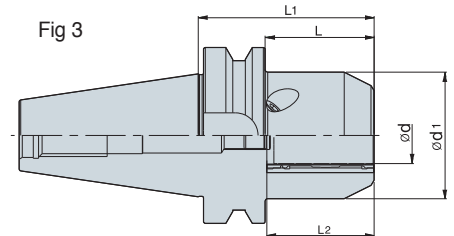
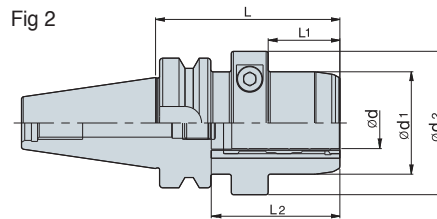
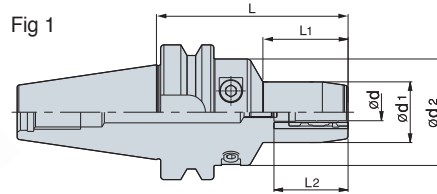
- Application of various uses in machining molds, automobile parts, precision parts, etc.
- With high durability, accuracy and clamping force are maintained
- High clamping force provides stable machining without clamping force fluctuation

- DHE 14 and 18 are order-made items.
- Collet, see pages 6
- Spare Part, see pages 10



BT-DHE

MAS403-BT



(mm)

| Designation | Ød | L | Ød1 | Ød2 | L1 | L2 | Screw | Fig. | |
|-------------|------------|----|-----|-----|----|-------|-------|------|---|
| BT30 - | DHE 6 - 65 | 6 | 65 | 29 | 46 | 33 | 30~40 | M5 | 1 |
| | DHE 8 - 65 | 8 | 65 | 31 | 46 | 33 | 30~40 | M5 | 1 |
| | DHE10 - 65 | 10 | 65 | 33 | 46 | 34 | 35~45 | M10 | 1 |
| | DHE12 - 65 | 12 | 65 | 35 | 46 | 34 | 41~51 | M10 | 1 |
| | DHE14 - 90 | 14 | 90 | 38 | 46 | 45 | 43~53 | M10 | 1 |
| | DHE16 - 90 | 16 | 90 | 40 | 46 | 45 | 46~56 | M10 | 1 |
| | DHE18 - 90 | 18 | 90 | 42 | 46 | 45 | 49~59 | M10 | 1 |
| | DHE20 - 90 | 20 | 90 | 44 | 46 | 45 | 49~59 | M10 | 1 |
| BT40 - | DHE 6 - 90 | 6 | 90 | 29 | 50 | 40 | 30~40 | M5 | 1 |
| | 140 | 6 | 140 | 29 | 50 | 40 | 30~40 | M5 | 1 |
| | DHE 8 - 90 | 8 | 90 | 31 | 50 | 40 | 30~40 | M5 | 1 |
| | 140 | 8 | 140 | 31 | 50 | 40 | 30~40 | M5 | 1 |
| | DHE10 - 90 | 10 | 90 | 33 | 50 | 40 | 35~45 | M5 | 1 |
| | 140 | 10 | 140 | 33 | 50 | 40 | 35~45 | M5 | 1 |
| | DHE12 - 90 | 12 | 90 | 35 | 50 | 40 | 41~51 | M10 | 1 |
| | 140 | 12 | 140 | 35 | 50 | 40 | 41~51 | M10 | 1 |
| | DHE14 - 90 | 14 | 90 | 38 | 50 | 40 | 43~53 | M10 | 1 |
| | 140 | 14 | 140 | 38 | 50 | 40 | 43~53 | M10 | 1 |
| | DHE16 - 90 | 16 | 90 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| | 140 | 16 | 140 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| | DHE18 - 90 | 18 | 90 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| | 140 | 18 | 140 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| | DHE20 - 90 | 20 | 90 | 44 | 50 | 47 | 49~59 | M10 | 1 |
| | 140 | 20 | 140 | 44 | 50 | 47 | 49~59 | M10 | 1 |
| DHE25 - 90 | 25 | 90 | 50 | 70 | 35 | 58~68 | M16 | 2 | |
| DHE32 - 90 | 32 | 90 | 63 | 80 | 35 | 58~68 | M16 | 2 | |
| BT50 - | DHE 6 - 90 | 6 | 90 | 29 | 50 | 34 | 30~34 | M5 | 1 |
| | 140 | 6 | 140 | 29 | 50 | 34 | 30~34 | M5 | 1 |
| | DHE 8 - 90 | 8 | 90 | 31 | 50 | 34 | 30~34 | M5 | 1 |
| | 140 | 8 | 140 | 31 | 50 | 34 | 30~34 | M5 | 1 |
| | DHE10 - 90 | 10 | 90 | 33 | 50 | 34 | 35~45 | M5 | 1 |
| | 140 | 10 | 140 | 33 | 50 | 34 | 35~45 | M5 | 1 |
| | DHE12 - 90 | 12 | 90 | 35 | 50 | 34 | 41~51 | M10 | 1 |
| | 140 | 12 | 140 | 35 | 50 | 34 | 41~51 | M10 | 1 |
| | DHE14 - 90 | 14 | 90 | 38 | 50 | 34 | 43~53 | M10 | 1 |
| | 140 | 14 | 140 | 38 | 50 | 34 | 43~53 | M10 | 1 |
| | DHE16 - 90 | 16 | 90 | 40 | 50 | 34 | 46~56 | M10 | 1 |
| | 140 | 16 | 140 | 40 | 50 | 34 | 46~56 | M10 | 1 |
| | DHE18 - 90 | 18 | 90 | 42 | 50 | 34 | 49~59 | M10 | 1 |
| | 140 | 18 | 140 | 42 | 50 | 34 | 49~59 | M10 | 1 |
| | DHE20 - 90 | 20 | 90 | 44 | 50 | 34 | 49~59 | M10 | 1 |
| | 140 | 20 | 140 | 44 | 50 | 34 | 49~59 | M10 | 1 |
| DHE25 - 90 | 25 | 90 | 50 | - | 34 | 58~68 | M16 | 3 | |
| DHE32 - 90 | 32 | 90 | 63 | - | 52 | 58~68 | M16 | 3 | |

- Application of various uses in machining molds, automobile parts, precision parts, etc.
- With high durability, accuracy and clamping force are maintained
- High clamping force provides stable machining without clamping force fluctuation

- DHE 14 and 18 are order-made items.
- Collet, see pages 6
- Spare Part, see pages 10

HSK-DHE

DIN69893-1, ISO 12164-1:2001

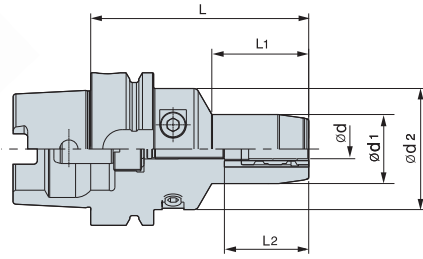


Fig 1

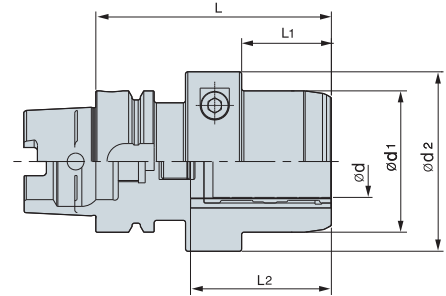


Fig 2

(mm)

| Designation | Ød | L | Ød1 | Ød2 | L1 | L2 | Screw | Fig. | |
|-------------|-------------|-----|-----|-----|----|-------|-------|------|---|
| DBT30 - | DHE 6 - 70 | 6 | 70 | 29 | 40 | 28 | 30~40 | M5 | 1 |
| | DHE 8 - 70 | 8 | 70 | 31 | 40 | 28 | 30~40 | M5 | 1 |
| | DHE10 - 80 | 10 | 80 | 33 | 40 | 35 | 35~45 | M5 | 1 |
| | DHE12 - 90 | 12 | 90 | 35 | 40 | 40 | 41~51 | M10 | 1 |
| | DHE14 - 95 | 14 | 95 | 38 | 53 | 28 | 43~53 | M10 | 2 |
| | DHE16 - 95 | 16 | 95 | 40 | 53 | 28 | 46~56 | M10 | 2 |
| | DHE18 - 100 | 18 | 100 | 42 | 60 | 28 | 49~59 | M10 | 2 |
| | DHE20 - 100 | 20 | 100 | 44 | 60 | 28 | 49~59 | M10 | 2 |
| DBT40 - | DHE 6 - 75 | 6 | 75 | 29 | 50 | 28 | 30~40 | M5 | 1 |
| | - 150 | 6 | 150 | 29 | 50 | 28 | 30~40 | M5 | 1 |
| | DHE 8 - 75 | 8 | 75 | 31 | 50 | 28 | 30~40 | M5 | 1 |
| | - 150 | 8 | 150 | 31 | 50 | 28 | 30~40 | M5 | 1 |
| | DHE10 - 85 | 10 | 85 | 33 | 50 | 28 | 35~45 | M5 | 1 |
| | - 150 | 10 | 150 | 33 | 50 | 28 | 35~45 | M5 | 1 |
| | DHE12 - 90 | 12 | 90 | 35 | 50 | 28 | 41~51 | M10 | 1 |
| | - 150 | 12 | 150 | 35 | 50 | 28 | 41~51 | M10 | 1 |
| | DHE14 - 95 | 14 | 95 | 38 | 50 | 28 | 43~53 | M10 | 1 |
| | - 150 | 14 | 150 | 38 | 50 | 28 | 43~53 | M10 | 1 |
| | DHE16 - 95 | 16 | 95 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| | - 150 | 16 | 150 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| | DHE18 - 100 | 18 | 100 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| | - 150 | 18 | 150 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| | DHE20 - 100 | 20 | 100 | 44 | 50 | 50 | 49~59 | M10 | 1 |
| | - 150 | 20 | 150 | 44 | 50 | 50 | 49~59 | M10 | 1 |
| DHE25 - 110 | 25 | 110 | 50 | 70 | 35 | 58~68 | M16 | 2 | |
| DHE32 - 110 | 32 | 110 | 63 | 80 | 35 | 58~68 | M16 | 2 | |

- Application of various uses in machining molds, automobile parts, precision parts, etc.
- With high durability, accuracy and clamping force are maintained
- High clamping force provides stable machining without clamping force fluctuation

- DHE 14 and 18 are order-made items.
- Collet, see pages 6
- Spare Part, see pages 10



HSK-DHE

DIN69893-1, ISO 12164-1:2001

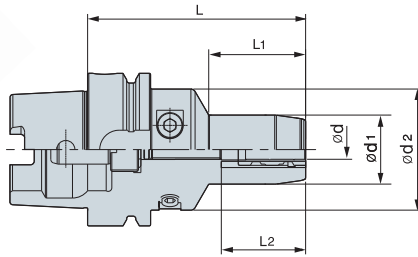


Fig 1

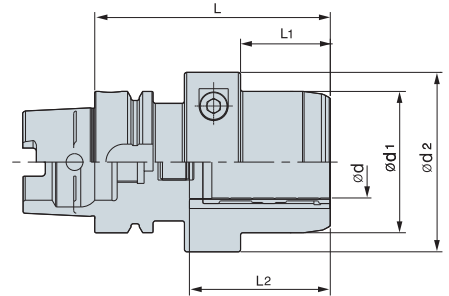


Fig 2

(mm)

| Designation | Ød | L | Ød1 | Ød2 | L1 | L2 | Screw | Fig. |
|---------------------|----|-----|-----|-----|----|-------|-------|------|
| HSK100A- DHE 6 - 80 | 6 | 80 | 29 | 50 | 34 | 30~40 | M5 | 1 |
| | 6 | 150 | 29 | 50 | 34 | 30~40 | M5 | 1 |
| DHE 8 - 80 | 8 | 80 | 31 | 50 | 34 | 30~40 | M5 | 1 |
| | 8 | 150 | 31 | 50 | 34 | 30~40 | M5 | 1 |
| DHE10 - 90 | 10 | 90 | 33 | 50 | 34 | 35~45 | M5 | 1 |
| | 10 | 150 | 33 | 50 | 34 | 35~45 | M5 | 1 |
| DHE12 - 95 | 12 | 95 | 35 | 50 | 34 | 41~51 | M10 | 1 |
| | 12 | 150 | 35 | 50 | 34 | 41~51 | M10 | 1 |
| DHE14 - 100 | 14 | 100 | 38 | 50 | 34 | 43~53 | M10 | 1 |
| | 14 | 150 | 38 | 50 | 34 | 43~53 | M10 | 1 |
| DHE16 - 100 | 16 | 100 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| | 16 | 150 | 40 | 50 | 45 | 46~56 | M10 | 1 |
| DHE18 - 100 | 18 | 100 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| | 18 | 150 | 42 | 50 | 45 | 49~59 | M10 | 1 |
| DHE20 - 105 | 20 | 105 | 44 | 50 | 50 | 49~59 | M10 | 1 |
| | 20 | 150 | 44 | 50 | 50 | 49~59 | M10 | 1 |
| DHE25 - 115 | 25 | 115 | 50 | 70 | 62 | 58~68 | M16 | 2 |
| DHE32 - 115 | 32 | 115 | 63 | 80 | 62 | 58~68 | M16 | 2 |

- Application of various uses in machining molds, automobile parts, precision parts, etc.
- With high durability, accuracy and clamping force are maintained
- High clamping force provides stable machining without clamping force fluctuation

- DHE 14 and 18 are order-made items.
- Collet, see pages 6
- Spare Part, see pages 10

Parts

Spare Parts

| Chuck | | Clamp Screw | | Adjust Screw | |
|--|----------------------------------|-------------|---------|----------------|---------------|
| Type | | | | Type | |
| (D)BT30 / SK30 / HSK50 | DHE 6, 8, 10, 12 | DHE-M8(C) | DHETW-4 | DHE 6, 8, 10 | DHE-M5 (ADJ) |
| (D)BT30 / SK30 / HSK50 | DHE 14, 16, 18, 20 | DHE-M10(C) | DHETW-5 | DHE 12, 16, 20 | DHE-M10 (ADJ) |
| HSK63A / HSK100A / (D)BT40 / (D)BT50 / SK40 / SK50 | DHE 6, 8, 10, 12, 14, 16, 18, 20 | | | DHE 25, 32 | DHE-M16 (ADJ) |
| HSK63A / HSK100A / (D)BT40 / (D)BT50 / SK40 / SK50 | DHE 25, 32 | DHE-M12(C) | DHETW-6 | DHE 25, 32 | DHE-M16 (ADJ) |



Compact Design Shrinking Chuck for Ultra High Speed and high precision

DSC Series

Shrinking Chuck

- High Rigidity
- Compact Design
- Special heat treatment ensures maximum life
- Minium cutting tool overhang
- Various model - HSK type, BT type, SK type
- Chucking dia. : Ø6~Ø32mm

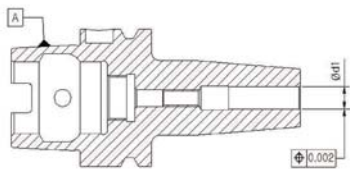


Simple Design

► Symmetric Design

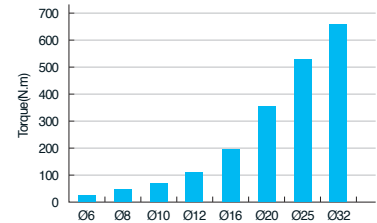


► High run out ($\leq 0.003\text{mm}$)



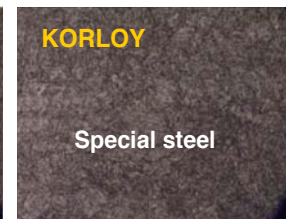
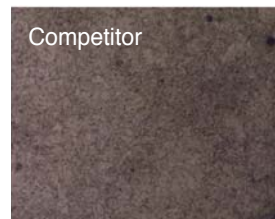
► High Clamping Force

- 30 % stronger Clamping Force
- Higher Power transmission Clamping Force by Inner-Size.



High Durability

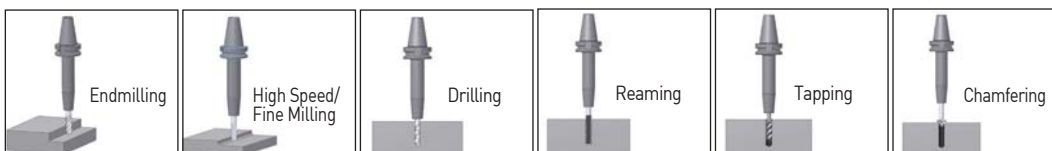
- Verification and heat treatment through analyzation of phase. (more 5,000 times)
- No form, material or character changes even after high frequency heating(Max 450 degree).



Comparison of surfaces after heat treatment (magnified to 1,000 times its actual size)



Application

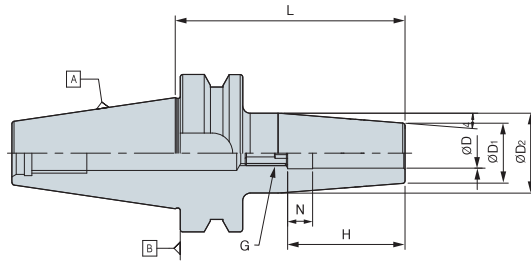


Deep place machining




DBT-DSC

MAS403-BT



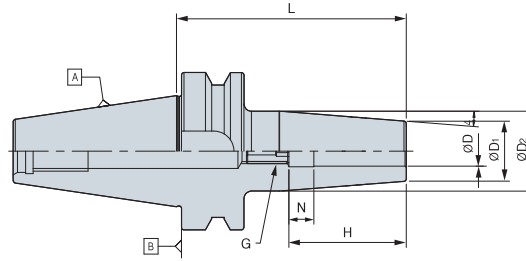
(mm)

| Designation | ØD | L | ØD1 | ØD2 | H | G | N |  | | | |
|--------------|--------------|-------|-------|-----|-----|----|----|---|-----|-----|-----|
| DBT30 - DSC6 | - 80 | 6 | 80 | 21 | 27 | 36 | M5 | 10 | 0.6 | | |
| | - 120 | 6 | 120 | 21 | 27 | 36 | M6 | 10 | 0.6 | | |
| | DSC8 | - 80 | 8 | 80 | 21 | 27 | 36 | M6 | 10 | 0.6 | |
| | | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 1.6 | |
| | DSC10 | - 80 | 10 | 80 | 24 | 32 | 42 | M8 | 10 | 0.7 | |
| | | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 1.7 | |
| | DSC12 | - 80 | 12 | 80 | 24 | 32 | 47 | M10 | 10 | 0.6 | |
| | | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 1.6 | |
| | DSC14 | - 80 | 14 | 80 | 27 | 34 | 47 | M10 | 10 | 0.7 | |
| | | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 1.7 | |
| | DSC16 | - 80 | 16 | 80 | 27 | 34 | 50 | M12 | 10 | 0.7 | |
| | | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 0.7 | |
| DBT40 - DSC6 | - 90 | 6 | 90 | 21 | 27 | 36 | M5 | 10 | 1.2 | | |
| | - 120 | 6 | 120 | 21 | 27 | 36 | M5 | 10 | 1.2 | | |
| | - 160 | 6 | 160 | 21 | 27 | 36 | M5 | 10 | 1.4 | | |
| | DSC8 | - 90 | 8 | 90 | 21 | 27 | 36 | M6 | 10 | 1.2 | |
| | | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 1.2 | |
| | | - 160 | 8 | 160 | 21 | 27 | 36 | M6 | 10 | 1.4 | |
| | DSC10 | - 90 | 10 | 90 | 24 | 32 | 42 | M8 | 10 | 1.2 | |
| | | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 1.2 | |
| | | - 160 | 10 | 160 | 24 | 32 | 42 | M8 | 10 | 1.6 | |
| | DSC12 | - 90 | 12 | 90 | 24 | 32 | 47 | M10 | 10 | 1.2 | |
| | | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 1.2 | |
| | | - 160 | 12 | 160 | 24 | 32 | 47 | M10 | 10 | 1.6 | |
| | DSC14 | - 90 | 14 | 90 | 27 | 34 | 47 | M10 | 10 | 1.2 | |
| | | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 1.2 | |
| | | - 160 | 14 | 160 | 27 | 34 | 47 | M10 | 10 | 1.7 | |
| | DSC16 | - 90 | 16 | 90 | 27 | 34 | 50 | M12 | 10 | 1.2 | |
| | | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 1.3 | |
| | | - 160 | 16 | 160 | 27 | 34 | 50 | M12 | 10 | 1.7 | |
| | DSC18 | - 90 | 18 | 90 | 33 | 42 | 50 | M12 | 10 | 1.3 | |
| | | - 120 | 18 | 120 | 33 | 42 | 50 | M12 | 10 | 1.5 | |
| | | - 160 | 18 | 160 | 33 | 42 | 50 | M12 | 10 | 1.8 | |
| | DSC20 | - 90 | 20 | 90 | 33 | 42 | 52 | M16 | 10 | 1.3 | |
| | | - 120 | 20 | 120 | 33 | 42 | 52 | M16 | 10 | 1.5 | |
| | | - 160 | 20 | 160 | 33 | 42 | 52 | M16 | 10 | 2.1 | |
| | DSC25 | - 100 | 25 | 100 | 44 | 53 | 58 | M16 | 10 | 1.7 | |
| | | - 120 | 25 | 120 | 44 | 53 | 58 | M16 | 10 | 1.8 | |
| | | - 160 | 25 | 160 | 44 | 53 | 58 | M16 | 10 | 2.4 | |
| | DBT50 - DSC6 | - 100 | 6 | 100 | 21 | 27 | 36 | M5 | 10 | 3.7 | |
| | | - 120 | 6 | 120 | 21 | 27 | 36 | M5 | 10 | 3.8 | |
| | | - 160 | 6 | 160 | 21 | 32 | 36 | M5 | 10 | 3.9 | |
| | | DSC8 | - 100 | 8 | 100 | 21 | 27 | 36 | M6 | 10 | 3.7 |
| | | | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 3.8 |
| | | | - 160 | 8 | 160 | 21 | 32 | 36 | M6 | 10 | 3.9 |
| | | DSC10 | - 100 | 10 | 100 | 24 | 32 | 42 | M8 | 10 | 3.8 |
| | | | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 3.9 |
| | | | - 160 | 10 | 160 | 24 | 34 | 42 | M8 | 10 | 4.1 |
| DSC12 | | - 100 | 12 | 100 | 24 | 32 | 47 | M10 | 10 | 3.8 | |
| | | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 3.9 | |
| | | - 160 | 12 | 160 | 24 | 34 | 47 | M10 | 10 | 4.1 | |
| DSC14 | | - 100 | 14 | 100 | 27 | 34 | 47 | M10 | 10 | 3.8 | |
| | | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 3.9 | |
| | | - 160 | 14 | 160 | 27 | 42 | 47 | M10 | 10 | 4.1 | |
| DSC16 | | - 100 | 16 | 100 | 27 | 34 | 50 | M12 | 10 | 3.8 | |
| | | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 3.9 | |
| | | - 160 | 16 | 160 | 27 | 42 | 50 | M12 | 10 | 4.1 | |
| DSC18 | | - 100 | 18 | 100 | 33 | 42 | 50 | M12 | 10 | 4.1 | |
| | | - 120 | 18 | 120 | 33 | 42 | 50 | M12 | 10 | 3.9 | |
| | | - 160 | 18 | 160 | 33 | 51 | 50 | M12 | 10 | 4.5 | |
| DSC20 | | - 100 | 20 | 100 | 33 | 42 | 52 | M16 | 10 | 3.9 | |
| | | - 120 | 20 | 120 | 33 | 42 | 52 | M16 | 10 | 4.2 | |
| | | - 160 | 20 | 160 | 33 | 51 | 52 | M16 | 10 | 4.4 | |
| DSC25 | | - 110 | 25 | 110 | 44 | 53 | 58 | M16 | 10 | 4.4 | |
| | | - 120 | 25 | 120 | 44 | 53 | 58 | M16 | 10 | 4.8 | |
| | | - 160 | 25 | 160 | 44 | 60 | 58 | M16 | 10 | 5.2 | |
| DSC32 | | - 110 | 32 | 110 | 44 | 53 | 62 | M16 | 10 | 4.2 | |
| | | - 120 | 32 | 120 | 44 | 53 | 62 | M16 | 10 | 4.6 | |
| | | - 160 | 32 | 160 | 44 | 60 | 62 | M16 | 10 | 5.1 | |

• Ajust screw see pages 15 • Slim type and 2 piece type can be ordered

BT-DSC

MAS403-BT



(mm)

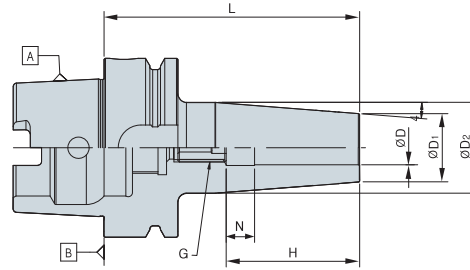
| Designation | ØD | L | ØD1 | ØD2 | H | G | N | kg | | | |
|-------------|-------------|-------|-------|-----|-----|----|----|-----|-----|-----|-----|
| BT30 - DSC6 | - 80 | 6 | 80 | 21 | 27 | 36 | M5 | 10 | 0.6 | | |
| | - 120 | 6 | 120 | 21 | 27 | 36 | M6 | 10 | 0.6 | | |
| | DSC8 | - 80 | 8 | 80 | 21 | 27 | 36 | M6 | 10 | 0.6 | |
| | | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 1.6 | |
| | DSC10 | - 80 | 10 | 80 | 24 | 32 | 42 | M8 | 10 | 0.7 | |
| | | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 1.7 | |
| | DSC12 | - 80 | 12 | 80 | 24 | 32 | 47 | M10 | 10 | 0.6 | |
| | | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 1.6 | |
| | DSC14 | - 80 | 14 | 80 | 27 | 34 | 47 | M10 | 10 | 0.7 | |
| | | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 1.7 | |
| | DSC16 | - 80 | 16 | 80 | 27 | 34 | 50 | M12 | 10 | 0.7 | |
| | | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 0.7 | |
| BT40 - DSC6 | - 90 | 6 | 90 | 21 | 27 | 36 | M5 | 10 | 1.2 | | |
| | - 120 | 6 | 120 | 21 | 27 | 36 | M5 | 10 | 1.2 | | |
| | - 160 | 6 | 160 | 21 | 27 | 36 | M5 | 10 | 1.4 | | |
| | DSC8 | - 90 | 8 | 90 | 21 | 27 | 36 | M6 | 10 | 1.2 | |
| | | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 1.2 | |
| | | - 160 | 8 | 160 | 21 | 27 | 36 | M6 | 10 | 1.4 | |
| | DSC10 | - 90 | 10 | 90 | 24 | 32 | 42 | M8 | 10 | 1.2 | |
| | | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 1.2 | |
| | | - 160 | 10 | 160 | 24 | 32 | 42 | M8 | 10 | 1.6 | |
| | DSC12 | - 90 | 12 | 90 | 24 | 32 | 47 | M10 | 10 | 1.2 | |
| | | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 1.2 | |
| | | - 160 | 12 | 160 | 24 | 32 | 47 | M10 | 10 | 1.6 | |
| | DSC14 | - 90 | 14 | 90 | 27 | 34 | 47 | M10 | 10 | 1.2 | |
| | | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 1.2 | |
| | | - 160 | 14 | 160 | 27 | 34 | 47 | M10 | 10 | 1.7 | |
| | DSC16 | - 90 | 16 | 90 | 27 | 34 | 50 | M12 | 10 | 1.2 | |
| | | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 1.3 | |
| | | - 160 | 16 | 160 | 27 | 34 | 50 | M12 | 10 | 1.7 | |
| | DSC18 | - 90 | 18 | 90 | 33 | 42 | 50 | M12 | 10 | 1.3 | |
| | | - 120 | 18 | 120 | 33 | 42 | 50 | M12 | 10 | 1.5 | |
| | | - 160 | 18 | 160 | 33 | 42 | 50 | M12 | 10 | 1.8 | |
| | DSC20 | - 90 | 20 | 90 | 33 | 42 | 52 | M16 | 10 | 1.3 | |
| | | - 120 | 20 | 120 | 33 | 42 | 52 | M16 | 10 | 1.5 | |
| | | - 160 | 20 | 160 | 33 | 42 | 52 | M16 | 10 | 2.1 | |
| | DSC25 | - 100 | 25 | 100 | 44 | 53 | 58 | M16 | 10 | 1.7 | |
| | | - 120 | 25 | 120 | 44 | 53 | 58 | M16 | 10 | 1.8 | |
| | | - 160 | 25 | 160 | 44 | 53 | 58 | M16 | 10 | 2.4 | |
| | BT50 - DSC6 | - 100 | 6 | 100 | 21 | 27 | 36 | M5 | 10 | 3.7 | |
| | | - 120 | 6 | 120 | 21 | 27 | 36 | M5 | 10 | 3.8 | |
| | | - 160 | 6 | 160 | 21 | 32 | 36 | M5 | 10 | 3.9 | |
| | | DSC8 | - 100 | 8 | 100 | 21 | 27 | 36 | M6 | 10 | 3.7 |
| | | | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 3.8 |
| | | | - 160 | 8 | 160 | 21 | 32 | 36 | M6 | 10 | 3.9 |
| | | DSC10 | - 100 | 10 | 100 | 24 | 32 | 42 | M8 | 10 | 3.8 |
| | | | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 3.9 |
| | | | - 160 | 10 | 160 | 24 | 34 | 42 | M8 | 10 | 4.1 |
| DSC12 | | - 100 | 12 | 100 | 24 | 32 | 47 | M10 | 10 | 3.8 | |
| | | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 3.9 | |
| | | - 160 | 12 | 160 | 24 | 34 | 47 | M10 | 10 | 4.1 | |
| DSC14 | | - 100 | 14 | 100 | 27 | 34 | 47 | M10 | 10 | 3.8 | |
| | | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 3.9 | |
| | | - 160 | 14 | 160 | 27 | 42 | 47 | M10 | 10 | 4.1 | |
| DSC16 | | - 100 | 16 | 100 | 27 | 34 | 50 | M12 | 10 | 3.8 | |
| | | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 3.9 | |
| | | - 160 | 16 | 160 | 27 | 42 | 50 | M12 | 10 | 4.1 | |
| DSC18 | | - 100 | 18 | 100 | 33 | 42 | 50 | M12 | 10 | 4.1 | |
| | | - 120 | 18 | 120 | 33 | 42 | 50 | M12 | 10 | 3.9 | |
| | | - 160 | 18 | 160 | 33 | 51 | 50 | M12 | 10 | 4.5 | |
| DSC20 | | - 100 | 20 | 100 | 33 | 42 | 52 | M16 | 10 | 3.9 | |
| | | - 120 | 20 | 120 | 33 | 42 | 52 | M16 | 10 | 4.2 | |
| | | - 160 | 20 | 160 | 33 | 51 | 52 | M16 | 10 | 4.4 | |
| DSC25 | | - 110 | 25 | 110 | 44 | 53 | 58 | M16 | 10 | 4.4 | |
| | | - 120 | 25 | 120 | 44 | 53 | 58 | M16 | 10 | 4.8 | |
| | | - 160 | 25 | 160 | 44 | 60 | 58 | M16 | 10 | 5.2 | |
| DSC32 | | - 110 | 32 | 110 | 44 | 53 | 62 | M16 | 10 | 4.2 | |
| | | - 120 | 32 | 120 | 44 | 53 | 62 | M16 | 10 | 4.6 | |
| | | - 160 | 32 | 160 | 44 | 60 | 62 | M16 | 10 | 5.1 | |

• Ajust screw see pages 15 • Slim type and 2 piece type can be ordered



HSK-DSC

DIN69893-1, ISO 12164-1 : 2001



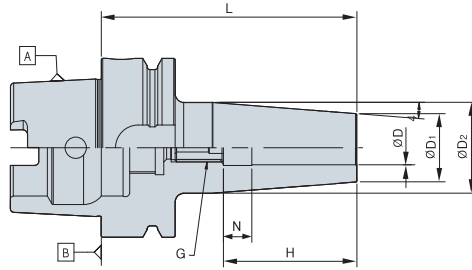
(mm)

| Designation | ØD | L | ØD1 | ØD2 | H | G | N | kg | |
|--------------|-------|-------|-----|-----|------|------|-----|-----|-----|
| HSK50A- DSC6 | - 80 | 6 | 80 | 21 | 27 | 36 | M5 | 10 | 0.6 |
| | - 120 | 6 | 120 | 21 | 27 | 36 | M5 | 10 | 0.7 |
| DSC8 | - 80 | 8 | 80 | 21 | 27 | 36 | M6 | 10 | 0.6 |
| | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 0.7 |
| DSC10 | - 85 | 10 | 85 | 24 | 32 | 42 | M8 | 10 | 0.6 |
| | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 0.7 |
| DSC12 | - 90 | 12 | 90 | 24 | 32 | 47 | M10 | 10 | 0.6 |
| | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 0.7 |
| DSC14 | - 90 | 14 | 90 | 27 | 34 | 47 | M10 | 10 | 0.6 |
| | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 0.8 |
| DSC16 | - 95 | 16 | 95 | 27 | 34 | 50 | M12 | 10 | 0.6 |
| | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 0.8 |
| HSK63A- DSC6 | - 80 | 6 | 80 | 21 | 27 | 36 | M5 | 10 | 0.7 |
| | - 120 | 6 | 120 | 21 | 27 | 36 | M5 | 10 | 1 |
| | - 160 | 6 | 160 | 21 | 32 | 36 | M5 | 10 | 0.9 |
| | DSC8 | - 80 | 8 | 80 | 21 | 27 | 36 | M6 | 10 |
| | - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 0.9 |
| | - 160 | 8 | 160 | 21 | 32 | 36 | M6 | 10 | 0.8 |
| DSC10 | - 85 | 10 | 85 | 24 | 32 | 42 | M8 | 10 | 1.2 |
| | - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 1.1 |
| | - 160 | 10 | 160 | 24 | 34 | 42 | M8 | 10 | 0.8 |
| | DSC12 | - 90 | 12 | 90 | 24 | 32 | 47 | M10 | 10 |
| | - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 1.1 |
| | - 160 | 12 | 160 | 24 | 34 | 47 | M10 | 10 | 0.9 |
| DSC14 | - 90 | 14 | 90 | 27 | 34 | 47 | M10 | 10 | 1.4 |
| | - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 1.2 |
| | - 160 | 14 | 160 | 27 | 42 | 47 | M10 | 10 | 0.9 |
| | DSC16 | - 95 | 16 | 95 | 27 | 34 | 50 | M12 | 10 |
| | - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 1.2 |
| | - 160 | 16 | 160 | 27 | 42 | 50 | M12 | 10 | 1.0 |
| DSC18 | - 95 | 18 | 95 | 33 | 42 | 50 | M12 | 10 | 1.5 |
| | - 120 | 18 | 120 | 33 | 42 | 50 | M12 | 10 | 1.4 |
| | - 160 | 18 | 160 | 33 | 51 | 50 | M12 | 10 | 1.0 |
| | DSC20 | - 100 | 20 | 100 | 33 | 42 | 52 | M16 | 10 |
| | - 120 | 20 | 120 | 33 | 42 | 52 | M16 | 10 | 1.4 |
| | - 160 | 20 | 160 | 33 | 51 | 52 | M16 | 10 | 1.2 |
| DSC25 | - 115 | 25 | 115 | 44 | 52.5 | 58 | M16 | 10 | 1.9 |
| | - 120 | 25 | 120 | 44 | 52.5 | 58 | M16 | 10 | 1.8 |
| | - 160 | 25 | 160 | 44 | 52.5 | 58 | M16 | 10 | 1.2 |
| | DSC32 | - 120 | 32 | 120 | 44 | 52.5 | 62 | M16 | 10 |
| | - 160 | 32 | 160 | 44 | 52.5 | 62 | M16 | 10 | 1.2 |

• Adjust screw see pages 15 • Slim type and 2 piece type can be ordered

HSK-DSC

DIN69893-1, ISO 12164-1 : 2001



(mm)

| Designation | ØD | L | ØD1 | ØD2 | H | G | N | kg |
|--------------------|----|-----|-----|-----|----|-----|----|-----|
| HSK100A- DSC6 - 85 | 6 | 85 | 21 | 27 | 36 | M5 | 10 | 1.9 |
| - 120 | 6 | 120 | 21 | 27 | 36 | M5 | 10 | 2.4 |
| - 160 | 6 | 160 | 21 | 32 | 36 | M5 | 10 | 1.3 |
| DSC8 - 85 | 8 | 85 | 21 | 27 | 36 | M6 | 10 | 2.3 |
| - 120 | 8 | 120 | 21 | 27 | 36 | M6 | 10 | 2.4 |
| - 160 | 8 | 160 | 21 | 32 | 36 | M6 | 10 | 2.2 |
| DSC10 - 90 | 10 | 90 | 24 | 32 | 42 | M8 | 10 | 2.5 |
| - 120 | 10 | 120 | 24 | 32 | 42 | M8 | 10 | 2.5 |
| - 160 | 10 | 160 | 24 | 34 | 42 | M8 | 10 | 2.2 |
| DSC12 - 95 | 12 | 95 | 24 | 32 | 47 | M10 | 10 | 2.5 |
| - 120 | 12 | 120 | 24 | 32 | 47 | M10 | 10 | 2.4 |
| - 160 | 12 | 160 | 24 | 34 | 47 | M10 | 10 | 2.2 |
| DSC14 - 95 | 14 | 95 | 27 | 34 | 47 | M10 | 10 | 2.4 |
| - 120 | 14 | 120 | 27 | 34 | 47 | M10 | 10 | 2.6 |
| - 160 | 14 | 160 | 27 | 42 | 47 | M10 | 10 | 2.8 |
| DSC16 - 100 | 16 | 100 | 27 | 34 | 50 | M12 | 10 | 2.4 |
| - 120 | 16 | 120 | 27 | 34 | 50 | M12 | 10 | 2.6 |
| - 160 | 16 | 160 | 27 | 42 | 50 | M12 | 10 | 2.8 |
| DSC18 - 100 | 18 | 100 | 33 | 42 | 50 | M12 | 10 | 2.5 |
| - 120 | 18 | 120 | 33 | 42 | 50 | M12 | 10 | 2.8 |
| - 160 | 18 | 160 | 33 | 51 | 50 | M12 | 10 | 3.2 |
| DSC20 - 105 | 20 | 105 | 33 | 42 | 52 | M16 | 10 | 2.5 |
| - 120 | 20 | 120 | 33 | 42 | 52 | M16 | 10 | 2.7 |
| - 160 | 20 | 160 | 33 | 51 | 52 | M16 | 10 | 3.1 |
| DSC25 - 115 | 25 | 115 | 44 | 53 | 58 | M16 | 10 | 3.8 |
| - 120 | 25 | 120 | 44 | 53 | 58 | M16 | 10 | 3.1 |
| - 160 | 25 | 160 | 44 | 60 | 58 | M16 | 10 | 3.8 |
| DSC32 - 120 | 32 | 120 | 44 | 53 | 62 | M16 | 10 | 3.1 |
| - 160 | 32 | 160 | 44 | 60 | 62 | M16 | 10 | 3.8 |

• Ajust screw see pages 15 • Slim type and 2 piece type can be ordered

Parts

| | | Spare Parts | | | | | | | | | |
|-------|--|-------------|------|-------|-------|--------|-------|-------|-------|-------|-------|
| Type | | DSC6 | DSC8 | DSC10 | DSC12 | DSC14 | DSC16 | DSC18 | DSC20 | DSC25 | DSC32 |
| Screw | | M520C | | M820C | | M1230C | | | | | |

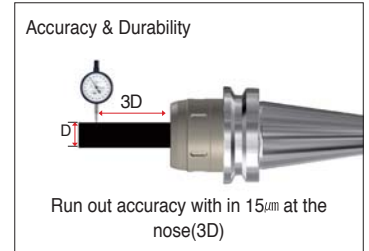


Enhanced Durability Milling Chuck for Medium Cutting by Powerful Clamping and Prevention of Minute dust

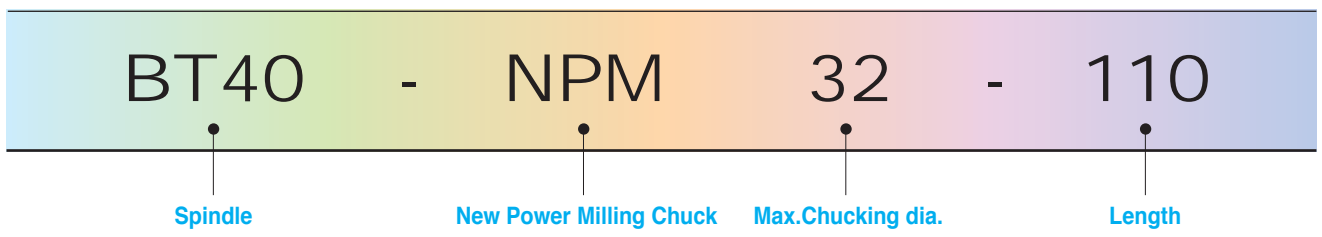
NPM Series

New Power Milling Chuck(Heavy Duty)

- Powerful clamping force - NPM32 : Max. 350kgf·m / NPM42 : Max. 500kgf·m
- Smooth and absolute Clamping/Unclamping
- Powerful clamping force even at 3mm(I.D) from chuck nose.
- High accuracy - L/D=Run out accuracy with in 15 μ m at the nose(3D)
- Clamp I.D accuracy with in 5 μ m
- On the average just 2 revolutions, clamping/unclamping can be possible.



Code System



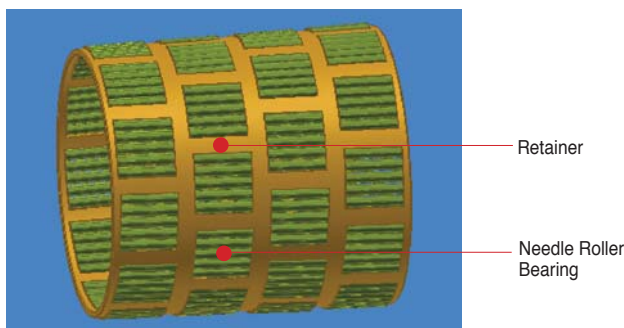
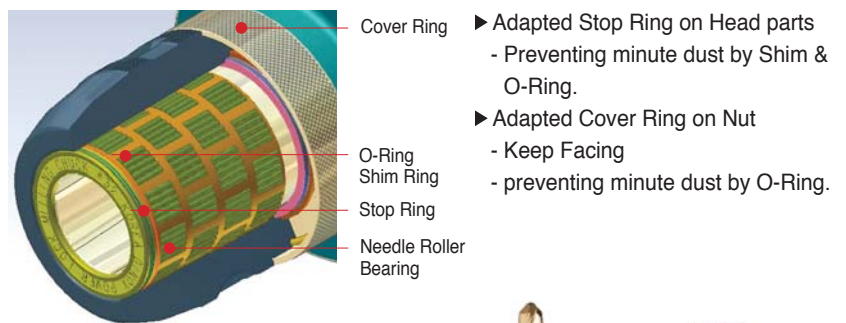
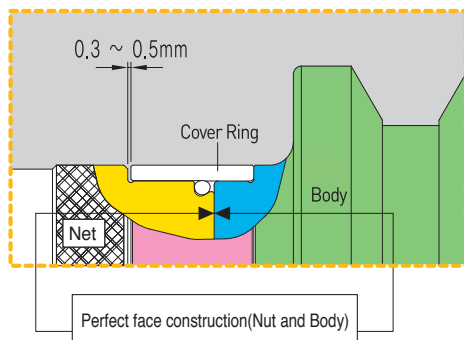
Type

- ▶ DBT Type : DBT30, DBT40, DBT50
- ▶ BT Type : BT30, BT40, BT50
- ▶ HSK Type : HSK50A, HSK63A, HSK100A
- ▶ SK Type : SK40, SK50
- ▶ NT Type : NT40, NT50

Applicable Through Coolant



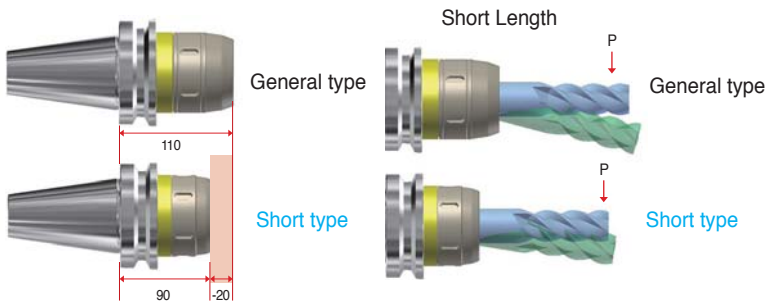
Improvement of Durability by preventing minute dust, chips and coolant



- Specially designed Steel Bearing to prevent the broken.
- Strong Clamping by spreading the force



Short type NPM32 *New*



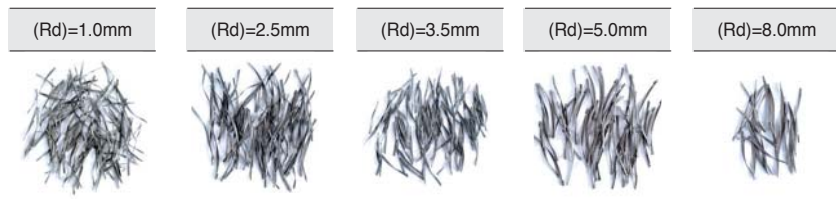
Milling chuck NPM25 *New*



- ▶ Expandable Designation by Short Length.
- ▶ Absolute Face Contact: Powerful Clamping & Preventing Dust and Sludge.
- ▶ Smooth Clamping/Unclamping and high clamping force
- ▶ Less vibration and stable Centrifugal Force under high speed Machining
- ▶ Less vibration and s stable Centrifugal Force under under high speed machining
- ▶ Minimized Tool Bending from Feeding.
- ▶ Minimized Interference to Tool under Vertical machine.

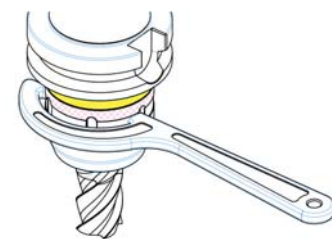
Stable machining from Heavy to Fine

- ▶ Perfect face contact and Powerful clamping force strengthen both Cutting force and Absorbtion of vibration.



* CAUTION

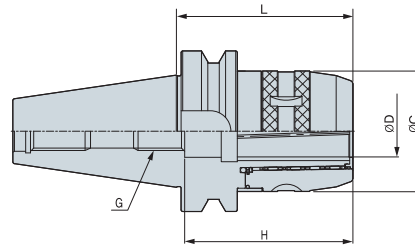
- Do not use a pole for nut clamping.
- Could be damaged in the case of claping with strong force.
- Do not use bare hands for clamping joing
- Please put a collet into the end of chuck inside
- Endmill with improper insertion could be damaged to chuck inside
- Do not disassembly as you please
- The problem caused of disassembly could be never reimbused.




Complete clamping by 2 Revolutions



DBT-NPM



(mm)

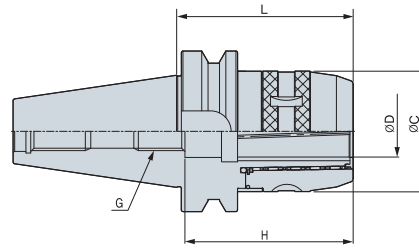
| Designation | ØD | L | ØC | H | G | Collet |  | |
|--------------------|-----|----|-----|------|-----|-----------|---|-----|
| DBT30 - NPM20 - 85 | 20 | 85 | 54 | 85 | M12 | CS20, C20 | 0.8 | |
| DBT40 - NPM20 - | 85 | 20 | 85 | 54 | 85 | M16 | CS20, C20 | 1.5 |
| | 100 | 20 | 100 | 54 | 85 | M16 | CS20, C20 | 1.9 |
| | 135 | 20 | 135 | 54 | 85 | M16 | CS20, C20 | 2.3 |
| NPM25 - 82 | 25 | 82 | 61 | 83.2 | M16 | CS25, C25 | | |
| NPM32 - | 90 | 32 | 90 | 75 | 85 | M16 | CS32, C32 | |
| | 110 | 32 | 110 | 75 | 95 | M16 | CS32, C32 | 2.5 |
| | 120 | 32 | 120 | 75 | 95 | M16 | CS32, C32 | 3.1 |
| | 135 | 32 | 135 | 75 | 95 | M16 | CS32, C32 | 3.3 |
| DBT50 - NPM20 - | 95 | 20 | 95 | 54 | 85 | M16 | CS20, C20 | 1.7 |
| | 125 | 20 | 125 | 54 | 85 | M16 | CS20, C20 | 2.0 |
| | 165 | 20 | 165 | 54 | 85 | M16 | CS20, C20 | 2.4 |
| NPM25 - 93 | 25 | 93 | 61 | 83.2 | M24 | CS25, C25 | | |
| NPM32 - | 90 | 32 | 90 | 75 | 93 | M24 | CS32, C32 | |
| | 110 | 32 | 110 | 75 | 105 | M24 | CS32, C32 | 4.8 |
| | 135 | 32 | 135 | 75 | 105 | M24 | CS32, C32 | 5.3 |
| | 165 | 32 | 165 | 75 | 105 | M24 | CS32, C32 | 6.3 |
| NPM42 - | 110 | 42 | 110 | 90 | 125 | M24 | CS42, C42 | 5.4 |
| | 135 | 42 | 135 | 90 | 125 | M24 | CS42, C42 | 6.0 |
| | 165 | 42 | 165 | 90 | 125 | M24 | CS42, C42 | 7.3 |

• Spare part : see page 20



BT-NPM

MAS403-BT



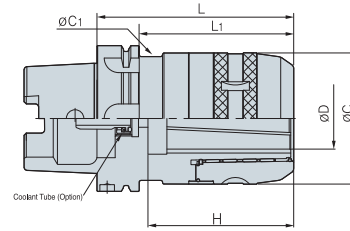
| | | | | | | | (mm) | |
|-------------------|------------|-----|----|------|------|-----------|-----------|--|
| Designation | ØD | L | ØC | H | G | Collet | kg | |
| BT30 - NPM20 - 85 | 20 | 85 | 54 | 85 | M12 | CS20, C20 | 0.8 | |
| BT40 - NPM20 - 85 | 20 | 85 | 54 | 85 | M16 | CS20, C20 | 1.5 | |
| | 100 | 100 | 54 | 85 | M16 | CS20, C20 | 1.9 | |
| | 135 | 135 | 54 | 85 | M16 | CS20, C20 | 2.3 | |
| | NPM25 - 82 | 25 | 82 | 61 | 83.2 | M16 | CS25, C25 | |
| NPM32 - 90 | 32 | 90 | 75 | 85 | M16 | CS32, C32 | | |
| | 110 | 110 | 75 | 95 | M16 | CS32, C32 | 2.5 | |
| | 120 | 120 | 75 | 95 | M16 | CS32, C32 | 3.1 | |
| | 135 | 135 | 75 | 95 | M16 | CS32, C32 | 3.3 | |
| BT50 - NPM20 - 95 | 20 | 95 | 54 | 85 | M16 | CS20, C20 | 1.7 | |
| | 125 | 125 | 54 | 85 | M16 | CS20, C20 | 2.0 | |
| | 165 | 165 | 54 | 85 | M16 | CS20, C20 | 2.4 | |
| NPM25 - 93 | 25 | 93 | 61 | 83.2 | M24 | CS25, C25 | | |
| NPM32 - 90 | 32 | 90 | 75 | 93 | M24 | CS32, C32 | | |
| | 110 | 110 | 75 | 105 | M24 | CS32, C32 | 4.8 | |
| | 135 | 135 | 75 | 105 | M24 | CS32, C32 | 5.3 | |
| | 165 | 165 | 75 | 105 | M24 | CS32, C32 | 6.3 | |
| NPM42 - 110 | 42 | 110 | 90 | 125 | M24 | CS42, C42 | 5.4 | |
| | 135 | 135 | 90 | 125 | M24 | CS42, C42 | 6.0 | |
| | 165 | 165 | 90 | 125 | M24 | CS42, C42 | 7.3 | |

• Spare part : see page 20




HSK-NPM

DIN69893-1, ISO 12164-1 : 2001






(mm)

| Designation | ØD | ØC | ØC1 | L | L1 | H | Collet |  |
|-----------------------|-------------|----|-----|-----|-----|-----|-----------|---|
| HSK 50A - NPM20 - 100 | 20 | 54 | 54 | 100 | 74 | 75 | CS20, C20 | 0.5 |
| HSK 63A - NPM20 - 100 | 20 | 54 | 54 | 100 | 74 | 75 | CS20, C20 | 1.7 |
| | NPM25 - 100 | 25 | 61 | 59 | 100 | 74 | CS25, C25 | |
| | NPM32 - 110 | 32 | 75 | 75 | 110 | 84 | CS32, C32 | |
| | NPM32 - 120 | 32 | 75 | 75 | 120 | 94 | CS32, C32 | 2.5 |
| HSK100A - NPM20 - 110 | 20 | 54 | 54 | 110 | 81 | 75 | CS20, C20 | 1.6 |
| | NPM25 - 110 | 25 | 61 | 59 | 110 | 81 | CS25, C25 | |
| | NPM32 - 115 | 32 | 75 | 75 | 115 | 86 | CS32, C32 | |
| | NPM32 - 130 | 32 | 75 | 75 | 130 | 101 | CS32, C32 | 3.6 |
| | NPM42 - 135 | 42 | 90 | 90 | 135 | 106 | CS42, C42 | 5.0 |

• Spare part : see page 20

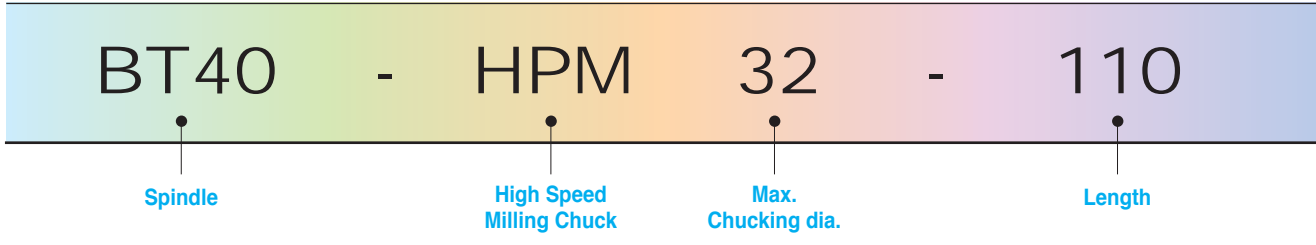
Parts

| Division | Spare Parts | | |
|----------|---|--|---|
| | Collet | Option Spanner | Through Coolant System |
| Type |  |  |  |
| NPM20 | CS20, C20 | 57-60 | CTC20-20 |
| NPM32 | CS32, C32 | 75-79 | CTC32-32 |
| NPM42 | CS42, C42 | 92-96 | CTC42-42 |

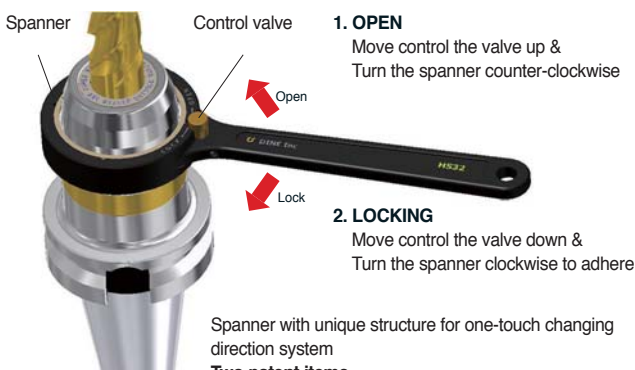
HPM Series

High Speed Milling Chuck

Code System



Spanner's Manual



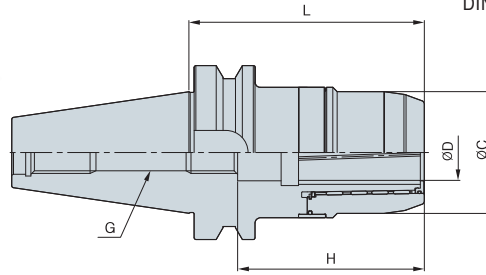
- 1. OPEN**
Move control the valve up & Turn the spanner counter-clockwise
- 2. LOCKING**
Move control the valve down & Turn the spanner clockwise to adhere

| Shank | Grade | Max. Revolution |
|--|-------|-----------------|
| HSK50A - HPM20 HSK63A - HPM20 BT30 - HPM20 | | 25,000rpm |
| HSK63A - HPM32 BT40 - HPM20, 32 | G2.5 | 20,000rpm |
| HSK100A - HPM20, 32, 42 BT50 - HPM20, 32, 42 | | 15,000rpm |



BT-HPM

DIN69893-1, ISO 12164-1 : 2001



(mm)

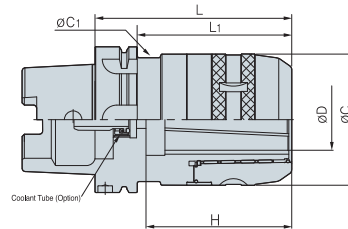
| Designation | ØD | ØC | L | G | H | Collet | kg | Max.rpm | |
|-------------------|-----|----|-----|-----|-----|----------|----------|---------|--------|
| BT30 - HPM20 - 85 | 20 | 54 | 85 | M12 | 85 | CS20,C20 | 0.7 | 25,000 | |
| BT40 - HPM20 - 85 | 20 | 54 | 85 | M12 | 85 | CS20,C20 | 1.3 | 20,000 | |
| | 100 | 20 | 54 | 100 | M12 | 85 | CS20,C20 | 1.6 | 20,000 |
| | 135 | 20 | 54 | 135 | M12 | 85 | CS20,C20 | 2.0 | 20,000 |
| HPM32 - 110 | 32 | 75 | 110 | M16 | 95 | CS32,C32 | 2.3 | 20,000 | |
| | 120 | 32 | 75 | 120 | M16 | 95 | CS32,C32 | 2.8 | 20,000 |
| | 135 | 32 | 75 | 135 | M16 | 95 | CS32,C32 | 3.1 | 20,000 |
| BT50 - HPM20 - 95 | 20 | 54 | 95 | M12 | 85 | CS20,C20 | 1.7 | 15,000 | |
| | 125 | 20 | 54 | 125 | M12 | 85 | CS20,C20 | 2.0 | 15,000 |
| | 165 | 20 | 54 | 165 | M12 | 85 | CS20,C20 | 2.3 | 15,000 |
| HPM32 - 110 | 32 | 75 | 110 | M16 | 105 | CS32,C32 | 4.1 | 15,000 | |
| | 135 | 32 | 75 | 135 | M16 | 105 | CS32,C32 | 5.1 | 15,000 |
| | 165 | 32 | 75 | 165 | M16 | 105 | CS32,C32 | 5.5 | 15,000 |
| HPM42 - 110 | 42 | 90 | 110 | M24 | 125 | CS42,C42 | 5.2 | 15,000 | |
| | 135 | 42 | 90 | 135 | M24 | 125 | CS42,C42 | 5.9 | 15,000 |
| | 165 | 42 | 90 | 165 | M24 | 125 | CS42,C42 | 6.8 | 15,000 |

Parts


| Division | Spare Parts | | |
|----------|------------------------|-----------|---------|
| | Basic | Option | Spanner |
| | Through Coolant System | Collet | |
| Type | | | |
| HPM20 | CTC20-20 | CS20, C20 | HS20 |
| HPM32 | CTC32-32 | CS32, C32 | HS32 |
| HPM42 | CTC42-42 | CS42, C42 | HS42 |

HSK-HPM

DIN69893-1, ISO 12164-1 : 2001






(mm)

| Designation | ØD | ØC | ØC1 | L | L1 | H | Collet |  |
|---------------------|----|----|-----|-----|-----|-----|-----------|---|
| HSK 50A - HPM20-100 | 20 | 54 | 55 | 100 | 74 | 75 | CS20, C20 | 0.5 |
| HSK 63A - HPM20-100 | 20 | 54 | 55 | 100 | 64 | 75 | CS20, C20 | 1.4 |
| HPM32-120 | 32 | 75 | 75 | 120 | 94 | 90 | CS32, C32 | 2.1 |
| HSK100A - HPM20-110 | 20 | 54 | 55 | 110 | 81 | 75 | CS20, C20 | 1.3 |
| HPM32-130 | 32 | 75 | 75 | 130 | 106 | 90 | CS32, C32 | 3.0 |
| HPM42-135 | 42 | 90 | 90 | 135 | 106 | 100 | CS42, C42 | 4.8 |

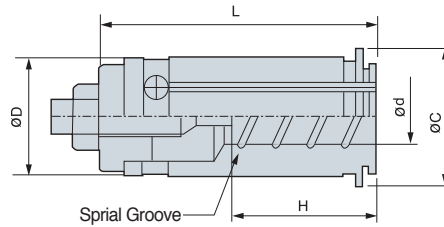
• Optional through coolant system

Parts

| Division | Spare Parts | | | |
|----------|---|--|---|------|
| | Basic | Option | | |
| | Through Coolant System | Collet | Spanner | |
| Type |  |  |  | |
| HPM20 | HSK40 | HSK40-CNS | CS20, C20 | HS20 |
| HPM32 | HSK50 | HSK50-CNS | CS32, C32 | HS32 |
| HPM42 | HSK63 | HSK63-CNS | CS42, C42 | HS42 |
| | HSK100 | HSK100-CNS | | |



CS(Straight Collet)



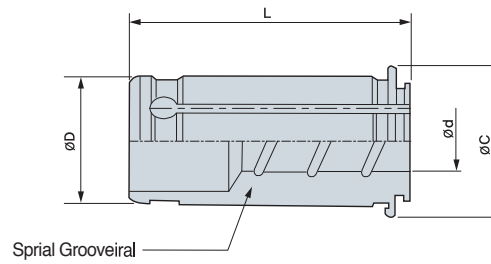
(mm)

| Designation | | ØD | Ød | ØC | L | H | | kg |
|-------------|----|----|----|----|----|-----|-----|-----|
| | | | | | | min | max | |
| CS20 - | 6 | 20 | 6 | 26 | 60 | 26 | 50 | 0.2 |
| | 8 | 20 | 8 | 26 | 60 | 26 | 50 | 0.2 |
| | 10 | 20 | 10 | 26 | 60 | 26 | 50 | 0.2 |
| | 12 | 20 | 12 | 26 | 60 | 26 | 50 | 0.2 |
| | 16 | 20 | 16 | 26 | 60 | 26 | 50 | 0.2 |
| CS32 - | 6 | 32 | 6 | 38 | 77 | 38 | 63 | 0.4 |
| | 8 | 32 | 8 | 38 | 77 | 38 | 63 | 0.4 |
| | 10 | 32 | 10 | 38 | 77 | 38 | 63 | 0.4 |
| | 12 | 32 | 12 | 38 | 77 | 38 | 63 | 0.4 |
| | 14 | 14 | 14 | 38 | 77 | 38 | 63 | 0.4 |
| | 16 | 32 | 16 | 38 | 77 | 38 | 63 | 0.4 |
| | 19 | 32 | 19 | 38 | 77 | 38 | 63 | 0.4 |
| | 20 | 32 | 20 | 38 | 77 | 38 | 63 | 0.4 |
| | 25 | 32 | 25 | 38 | 77 | 38 | 63 | 0.4 |
| CS42 - | 6 | 42 | 6 | 48 | 82 | 48 | 67 | 0.7 |
| | 8 | 42 | 8 | 48 | 82 | 48 | 67 | 0.7 |
| | 10 | 42 | 10 | 48 | 82 | 48 | 67 | 0.7 |
| | 12 | 42 | 12 | 48 | 82 | 48 | 67 | 0.7 |
| | 16 | 42 | 16 | 48 | 82 | 48 | 67 | 0.7 |
| | 20 | 42 | 20 | 48 | 82 | 48 | 67 | 0.7 |
| | 25 | 42 | 25 | 48 | 82 | 48 | 67 | 0.7 |
| | 32 | 42 | 32 | 48 | 82 | 48 | 67 | 0.7 |

• The length is adjustable with an adjustable screw



C(Straight Collet)



| Designation | | ØD | Ød | ØC | L |
|-------------|------|----|----|----|----|
| (mm) | | | | | |
| C20 | - 6 | 20 | 6 | 26 | 55 |
| | - 8 | 20 | 8 | 26 | 55 |
| | - 10 | 20 | 10 | 26 | 55 |
| | - 12 | 20 | 12 | 26 | 55 |
| | - 14 | 20 | 14 | 26 | 55 |
| | - 16 | 20 | 16 | 26 | 55 |
| C 32 | - 6 | 32 | 6 | 38 | 70 |
| | - 8 | 32 | 8 | 38 | 70 |
| | - 10 | 32 | 10 | 38 | 70 |
| | - 12 | 32 | 12 | 38 | 70 |
| | - 14 | 32 | 14 | 38 | 70 |
| | - 16 | 32 | 16 | 38 | 70 |
| | - 19 | 32 | 19 | 38 | 70 |
| | - 20 | 32 | 20 | 38 | 70 |
| | - 25 | 32 | 25 | 38 | 70 |
| C 42 | - 6 | 42 | 6 | 48 | 75 |
| | - 8 | 42 | 8 | 48 | 75 |
| | - 10 | 42 | 10 | 48 | 75 |
| | - 12 | 42 | 12 | 48 | 75 |
| | - 14 | 42 | 14 | 48 | 75 |
| | - 16 | 42 | 16 | 48 | 75 |
| | - 19 | 42 | 19 | 48 | 75 |
| | - 20 | 42 | 20 | 48 | 75 |
| | - 25 | 42 | 25 | 48 | 75 |
| | - 32 | 42 | 32 | 48 | 75 |

• Inch size can be ordered.







Collet Chuck Series

- High Accuracy and Powerful clamping force
- Convenient tool change
- Various models
- Chucking Diameter $\varnothing 0.5 \sim \varnothing 34.0\text{mm}$



Collet Chuck Series

| Collet Chuck | Slim Collet Chuck | High Speed Collet Chuck | Ultra High Speed Collet Chuck |
|--|--|---|---|
|  |  |  |  |
| SDC | SDC/S | HPS | HDC |
| <ul style="list-style-type: none"> - Max. Chucking dia. : $\varnothing 34.0\text{mm}$ - For use of Drilling, Reaming, Endmilling and Tapping etc. | <ul style="list-style-type: none"> - Max. Chucking dia. : $\varnothing 16.0\text{mm}$ - For use of Drilling, Reaming, Endmilling of narrow and deep place | <ul style="list-style-type: none"> - Max. Chucking dia. : $\varnothing 20.0\text{mm}$ - Balanced G6.3 - Max. Revolution : 15,000rpm | <ul style="list-style-type: none"> - Max. Chucking dia. : $\varnothing 13.0\text{mm}$ - Balanced G2.5 - Max. Revolution : 30,000rpm |

High Precision Collet

- Accuracy type : $5\mu\text{m}$ (GER-B)
- High accuracy type : $2\mu\text{m}$ (GER-HP)
- Through Coolant type



- Accuracy type
- High accuracy type

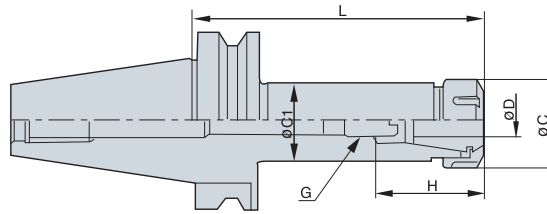


- Through Coolant type




BT-SDC

MAS403-BT



(mm)

| Designation | ØD | ØC | ØC1 | L | H | Collet | Range | G |  kg | |
|-------------------|------------|------------|-----|-----|-----|--------|-------|-----|--|-----|
| BT30 - SDC 7 - 50 | 1.0 ~ 7.0 | 19 | 19 | 50 | 35 | GER11 | 0.5 | M7 | 0.5 | |
| | 75 | 1.0 ~ 7.0 | 19 | 19 | 75 | 35 | GER11 | 0.5 | M7 | 0.5 |
| | 105 | 1.0 ~ 7.0 | 19 | 19 | 105 | 35 | GER11 | 0.5 | M7 | 0.6 |
| SDC10 - 50 | 1.0 ~ 10.0 | 28 | 28 | 50 | 45 | GER16 | 1.0 | M10 | 0.5 | |
| | 75 | 1.0 ~ 10.0 | 28 | 28 | 75 | 45 | GER16 | 1.0 | M10 | 0.5 |
| | 105 | 1.0 ~ 10.0 | 28 | 28 | 105 | 45 | GER16 | 1.0 | M10 | 0.6 |
| SDC13 - 50 | 1.0 ~ 13.0 | 35 | 35 | 50 | 49 | GER20 | 1.0 | M13 | 0.5 | |
| | 75 | 1.0 ~ 13.0 | 35 | 35 | 75 | 49 | GER20 | 1.0 | M13 | 0.6 |
| | 105 | 1.0 ~ 13.0 | 35 | 35 | 105 | 49 | GER20 | 1.0 | M13 | 0.7 |
| SDC16 - 50 | 1.0 ~ 16.0 | 42 | 42 | 50 | 50 | GER25 | 1.0 | M18 | 0.6 | |
| | 75 | 1.0 ~ 16.0 | 42 | 42 | 75 | 50 | GER25 | 1.0 | M18 | 0.7 |
| | 105 | 1.0 ~ 16.0 | 42 | 42 | 105 | 50 | GER25 | 1.0 | M18 | 0.8 |
| SDC20 - 60 | 2.0 ~ 20.0 | 50 | 44 | 60 | 60 | GER32 | 1.0 | M22 | 0.5 | |
| | 90 | 2.0 ~ 20.0 | 50 | 44 | 90 | 60 | GER32 | 1.0 | M22 | 0.8 |
| | 120 | 2.0 ~ 20.0 | 50 | 44 | 120 | 60 | GER32 | 1.0 | M22 | 1.0 |
| BT40 - SDC 7 - 60 | 1.0 ~ 7.0 | 19 | 19 | 60 | 35 | GER11 | 0.5 | M7 | 1.0 | |
| | 90 | 1.0 ~ 7.0 | 19 | 19 | 90 | 35 | GER11 | 0.5 | M7 | 1.1 |
| | 135 | 1.0 ~ 7.0 | 19 | 19 | 135 | 35 | GER11 | 0.5 | M7 | 1.2 |
| SDC10 - 60 | 1.0 ~ 10.0 | 28 | 28 | 60 | 45 | GER16 | 1.0 | M10 | 1.1 | |
| | 90 | 1.0 ~ 10.0 | 28 | 28 | 90 | 45 | GER16 | 1.0 | M10 | 1.2 |
| | 135 | 1.0 ~ 10.0 | 28 | 28 | 135 | 45 | GER16 | 1.0 | M10 | 1.4 |
| SDC13 - 60 | 1.0 ~ 13.0 | 35 | 35 | 60 | 49 | GER20 | 1.0 | M13 | 1.1 | |
| | 90 | 1.0 ~ 13.0 | 35 | 35 | 90 | 49 | GER20 | 1.0 | M13 | 1.3 |
| | 120 | 1.0 ~ 13.0 | 35 | 35 | 120 | 49 | GER20 | 1.0 | M13 | 1.5 |
| | 150 | 1.0 ~ 13.0 | 35 | 35 | 150 | 49 | GER20 | 1.0 | M13 | 1.8 |
| SDC16 - 60 | 1.0 ~ 16.0 | 42 | 42 | 60 | 50 | GER25 | 1.0 | M18 | 1.2 | |
| | 90 | 1.0 ~ 16.0 | 42 | 42 | 90 | 50 | GER25 | 1.0 | M18 | 1.4 |
| | 120 | 1.0 ~ 16.0 | 42 | 42 | 120 | 50 | GER25 | 1.0 | M18 | 1.6 |
| | 150 | 1.0 ~ 16.0 | 42 | 42 | 150 | 50 | GER25 | 1.0 | M18 | 1.8 |
| SDC20 - 60 | 2.0 ~ 20.0 | 50 | 44 | 60 | 60 | GER32 | 1.0 | M22 | 1.1 | |
| | 90 | 2.0 ~ 20.0 | 50 | 44 | 90 | 60 | GER32 | 1.0 | M22 | 1.4 |
| | 120 | 2.0 ~ 20.0 | 50 | 44 | 120 | 60 | GER32 | 1.0 | M22 | 1.7 |
| | 150 | 2.0 ~ 20.0 | 50 | 44 | 150 | 60 | GER32 | 1.0 | M22 | 2.1 |
| | 180 | 2.0 ~ 20.0 | 50 | 44 | 180 | 60 | GER32 | 1.0 | M22 | 2.5 |
| SDC26 - 90 | 3.0 ~ 26.0 | 63 | 54 | 90 | 70 | GER40 | 1.0 | M28 | 2.4 | |
| | 120 | 3.0 ~ 26.0 | 63 | 54 | 120 | 70 | GER40 | 1.0 | M28 | 2.8 |
| SDC34 - 105 | 6.0 ~ 34.0 | 78 | 68 | 105 | 90 | GER50 | 2.0 | M36 | 3.2 | |
| | 135 | 6.0 ~ 34.0 | 78 | 68 | 135 | 90 | GER50 | 2.0 | M36 | 3.7 |

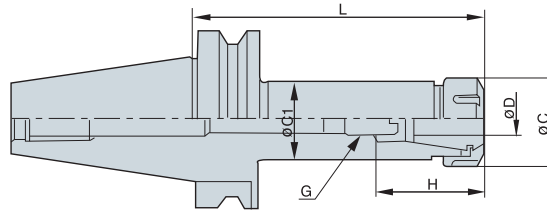
- Pull std bolt & water-proof collet should be adopted for coolant system. (ER □□-ØC)
- Please choose right size in the case of using oilhole type
- Balanced type can be ordered.
- Collet : see page 43~45
- Spanner is option
- Spare Part : see page 29
- Optional through coolant system

- Ordering example)
 - ER20-6C should be adopted in the case of drill 6Ø
 - Standard type : BT40-SDC7-75
 - Balanced type : BT40-SDC7-75B




BT-SDC

MAS403-BT



(mm)

| Designation | ØD | ØC | ØC1 | L | H | Collet | Range | G |  | |
|-------------------|----------|----------|-----|-----|-----|--------|-------|-----|---|-----|
| BT50 - SDC 7 - 90 | 1.0~7.0 | 19 | 19 | 90 | 35 | GER11 | 0.5 | M7 | 3.8 | |
| | 120 | 1.0~7.0 | 19 | 19 | 120 | 35 | GER11 | 0.5 | M7 | 3.9 |
| | 165 | 1.0~7.0 | 19 | 19 | 165 | 35 | GER11 | 0.5 | M7 | 4.0 |
| SDC10 - 90 | 1.0~10.0 | 28 | 28 | 90 | 45 | GER16 | 1.0 | M10 | 3.8 | |
| | 120 | 1.0~10.0 | 28 | 28 | 120 | 45 | GER16 | 1.0 | M10 | 4.0 |
| | 165 | 1.0~10.0 | 28 | 28 | 165 | 45 | GER16 | 1.0 | M10 | 4.2 |
| SDC13 - 75 | 1.0~13.0 | 35 | 35 | 75 | 49 | GER20 | 1.0 | M13 | 3.8 | |
| | 105 | 1.0~13.0 | 35 | 35 | 105 | 49 | GER20 | 1.0 | M13 | 3.9 |
| | 135 | 1.0~13.0 | 35 | 35 | 135 | 49 | GER20 | 1.0 | M13 | 4.1 |
| | 165 | 1.0~13.0 | 35 | 35 | 165 | 49 | GER20 | 1.0 | M13 | 4.5 |
| | 180 | 1.0~13.0 | 35 | 35 | 180 | 49 | GER20 | 1.0 | M13 | 4.6 |
| SDC16 - 75 | 1.0~16.0 | 42 | 42 | 75 | 50 | GER25 | 1.0 | M18 | 3.9 | |
| | 105 | 1.0~16.0 | 42 | 42 | 105 | 50 | GER25 | 1.0 | M18 | 4.1 |
| | 165 | 1.0~16.0 | 42 | 42 | 165 | 50 | GER25 | 1.0 | M18 | 4.4 |
| SDC20 - 75 | 2.0~20.0 | 50 | 44 | 75 | 60 | GER32 | 1.0 | M22 | 4.0 | |
| | 105 | 2.0~20.0 | 50 | 44 | 105 | 60 | GER32 | 1.0 | M22 | 4.3 |
| | 135 | 2.0~20.0 | 50 | 44 | 135 | 60 | GER32 | 1.0 | M22 | 4.9 |
| | 165 | 2.0~20.0 | 50 | 44 | 165 | 60 | GER32 | 1.0 | M22 | 5.0 |
| | 180 | 2.0~20.0 | 50 | 44 | 180 | 60 | GER32 | 1.0 | M22 | 5.0 |
| SDC26 - 75 | 3.0~26.0 | 63 | 54 | 75 | 70 | GER40 | 1.0 | M28 | 3.9 | |
| | 105 | 3.0~26.0 | 63 | 54 | 105 | 70 | GER40 | 1.0 | M28 | 4.6 |
| | 165 | 3.0~26.0 | 63 | 54 | 165 | 70 | GER40 | 1.0 | M28 | 6.0 |
| SDC34 - 105 | 6.0~34.0 | 78 | 66 | 105 | 70 | GER50 | 2.0 | M36 | 5.4 | |
| | 165 | 6.0~34.0 | 78 | 66 | 165 | 70 | GER50 | 2.0 | M36 | 7.2 |

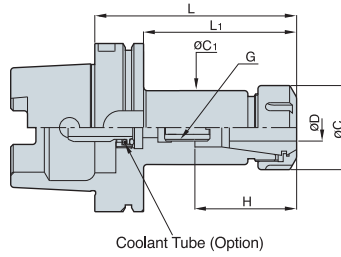
- Pull std bolt & water-proof collet should be adopted for coolant system. (ER □□-ØC)
- Please choose right size in the case of using oilhole type
- Balanced type can be ordered.
- Collet : see page 43~45
- Spanner is option
- Spare Part : see page 29
- Optional through coolant system

- Ordering example)
 - ER20-6C should be adopted in the case of drill 6Ø
 - Standard type : BT40-SDC7-75
 - Balanced type : BT40-SDC7-75B



HSK-SDC

DIN69893-1, ISO 12164-1 : 2001



(mm)

| Designation | ØD | ØC | ØC1 | L | L1 | H | G | Collet | Range | kg | |
|---------------------|-----------|----------|-----|----|-----|-----|----|--------|-------|-----|-----|
| HSK 50A - SDC 7- 75 | 1.0~ 7.0 | 19 | 19 | 75 | 49 | 34 | M7 | GER11 | 0.5 | 0.3 | |
| | SDC10- 90 | 1.0~10.0 | 28 | 28 | 90 | 64 | 45 | M10 | GER16 | 1.0 | 0.4 |
| | SDC13- 95 | 1.0~13.0 | 35 | 35 | 95 | 69 | 49 | M13 | GER20 | 1.0 | 0.8 |
| | SDC16-100 | 1.0~16.0 | 42 | 42 | 100 | 74 | 50 | M18 | GER25 | 1.0 | 0.9 |
| | SDC20-105 | 2.0~20.0 | 50 | 44 | 105 | 79 | 60 | M22 | GER32 | 1.0 | 1.2 |
| HSK 63A - SDC 7- 75 | 1.0~ 7.0 | 19 | 19 | 75 | 49 | 34 | M7 | GER11 | 0.5 | 0.8 | |
| | SDC10- 95 | 1.0~10.0 | 28 | 28 | 95 | 69 | 45 | M10 | GER16 | 1.0 | 1.0 |
| | SDC13- 95 | 1.0~13.0 | 35 | 35 | 95 | 69 | 49 | M13 | GER20 | 1.0 | 1.2 |
| | SDC16-100 | 1.0~16.0 | 42 | 42 | 100 | 74 | 50 | M18 | GER25 | 1.0 | 1.3 |
| | SDC20-110 | 2.0~20.0 | 50 | 44 | 110 | 74 | 60 | M22 | GER32 | 1.0 | 1.4 |
| | SDC26-125 | 3.0~26.0 | 63 | 63 | 125 | 99 | 71 | M28 | GER40 | 1.0 | 1.8 |
| HSK100A - SDC 7- 85 | 1.0~ 7.0 | 19 | 19 | 85 | 56 | 34 | M7 | GER11 | 0.5 | 2.4 | |
| | SDC10- 95 | 1.0~10.0 | 28 | 28 | 95 | 66 | 45 | M10 | GER16 | 1.0 | 2.7 |
| | SDC13-100 | 1.0~13.0 | 35 | 35 | 100 | 71 | 49 | M13 | GER20 | 1.0 | 3.0 |
| | SDC16-110 | 1.0~16.0 | 42 | 42 | 110 | 76 | 50 | M18 | GER25 | 1.0 | 3.2 |
| | SDC20-120 | 2.0~20.0 | 50 | 44 | 120 | 91 | 60 | M22 | GER32 | 1.0 | 3.4 |
| | SDC26-130 | 3.0~26.0 | 63 | 63 | 130 | 101 | 71 | M28 | GER40 | 1.0 | 3.6 |

- Pull std bolt & water-proof collet should be adopted for coolant system. (ER □□-ØC)
- Please choose right size in the case of using oilhole type
- Balanced type can be ordered.
- Collet : see page 43~45
- Spanner is option
- Spare Part : see page 29
- Optional through coolant system

- Ordering example)
 - ER20-6C should be adopted in the case of drill 6Ø
 - Standard type : HSK63A-SDC7-75
 - Balanced type : HSK63A-SDC7-75B
 - Coolant type : HSK63A-SDC7-75C

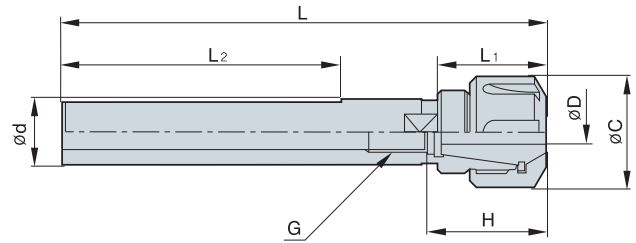
Parts

| Division | Spare Parts | | | |
|----------|-------------|--------------|---------|-------------|
| | Basic | | Option | |
| | Nut | Adjust Screw | Spanner | GER Collet |
| Type | | | | |
| SDC7 | R11 | BN0716F | S-17 | (G)ER 11-ØD |
| SDC10 | R16 | BN1025F | S-25 | (G)ER 16-ØD |
| SDC13 | RU20 | BN1325F | 35-38 | (G)ER 20-ØD |
| SDC16 | RU25 | BN1830F | 42-46 | (G)ER 25-ØD |
| SDC20 | RU32 | BN2230F | 48-52 | (G)ER 32-ØD |
| SDC26 | RU40 | BN2838F | 62-65 | (G)ER 40-ØD |
| SDC34 | RU50 | BN3638F | 75-79 | (G)ER 50-ØD |

- Precaution (spanner)
 - 35-38 spanner : RU20 nut
 - S-30 spanner : R20 nut



S-SDC

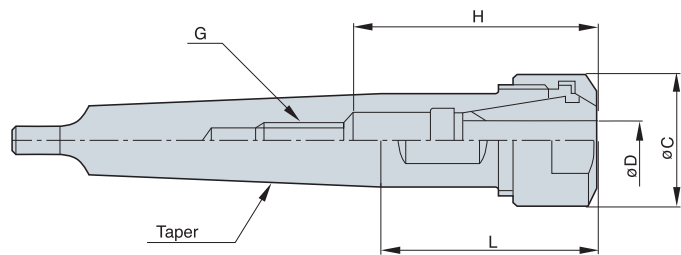


(mm)

| Designation | ØD | Ød | ØC | L | L1 | L2(T) | H | Collet | Range | G | kg |
|-------------|------------|----------|----|-----|------|-------|------|--------|-------|-----|-----|
| S16-SDC | 7-120M(T) | 1.0~7.0 | 16 | 120 | - | 73 | 33 | GER11 | 0.5 | M7 | 0.2 |
| | 10-150M(T) | 1.0~10.0 | 16 | 150 | 46.5 | 83 | 34.5 | GER16 | 1.0 | M10 | 0.2 |
| S20-SDC | 10-150M(T) | 1.0~10.0 | 20 | 150 | 26.5 | 83 | 34.5 | GER16 | 1.0 | M10 | 0.2 |
| | 13-150M(T) | 1.0~13.0 | 20 | 150 | 50 | 83 | 49 | GER20 | 1.0 | M13 | 0.2 |
| S25-SDC | 10-150M(T) | 1.0~10.0 | 25 | 150 | - | 83 | 34.5 | GER16 | 1.0 | M10 | 0.2 |
| | 13-150M(T) | 1.0~13.0 | 25 | 150 | - | 83 | 49 | GER20 | 1.0 | M13 | 0.2 |
| S32-SDC | 13-150M(T) | 1.0~13.0 | 32 | 150 | - | 83 | 49 | GER20 | 1.0 | M13 | 0.2 |
| | 20-165M(T) | 2.0~20.0 | 32 | 165 | - | 83 | 60 | GER32 | 1.0 | M22 | 0.2 |

- Small Chuck is using as a tool holder (drill, endmill, tap, small boring, and reamer) for NC lathe and small CNC lathe.
- When it is used for sleeve of internal boring bar (bite), in particular it is excellent increase the productivity by absorbing cutting vibration.
- Type name with 'M' is used for milling working, therefore, there is no flat section.
- Collet : see page 43~45
- Spanner is option.
- NPM is used as a basic holder.
- Optional through coolant system

MT-SDC



(mm)

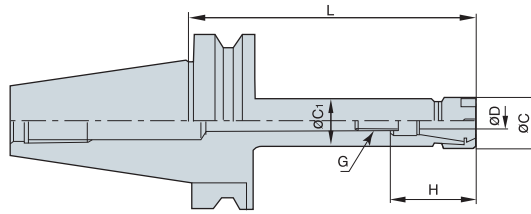
| Designation | ØD | Taper | ØC | L | H | Collet | Range | G |
|--------------|------------|-------|----|----|------|--------|-------|-----|
| MT2-SDC10-45 | 1.0 ~ 10.0 | MT2 | 28 | 45 | 44.5 | GER16 | 1.0 | M10 |
| MT4-SDC13-45 | 1.0 ~ 13.0 | MT4 | 35 | 45 | 49 | GER20 | 1.0 | M13 |
| MT4-SDC20-60 | 2.0 ~ 20.0 | MT4 | 50 | 60 | 67 | GER32 | 1.0 | M22 |
| MT5-SDC20-60 | 2.0 ~ 20.0 | MT5 | 50 | 60 | 60 | GER32 | 1.0 | M22 |
| MT5-SDC26-60 | 3.0 ~ 26.0 | MT5 | 63 | 60 | 71 | GER40 | 1.0 | M22 |
| MT6-SDC20-60 | 2.0 ~ 20.0 | MT6 | 50 | 60 | 60 | GER32 | 1.0 | M22 |
| MT6-SDC26-60 | 3.0 ~ 26.0 | MT6 | 63 | 60 | 71 | GER40 | 1.0 | M28 |

- Collet : see page 43~45
- Spare Part : see page 29



BT-SDC/S

MAS403-BT



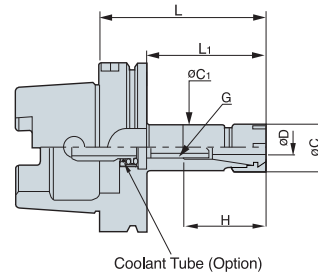
| | | | | | | | | | | (mm) | |
|----------------|----------------|---------|----------|----|-----|--------|-------|-------|-----|------|-----|
| Designation | ØD | ØC | ØC1 | L | H | Collet | Range | G | | | |
| BT30 - SDC7S - | 50 | 1.0~7.0 | 16 | 16 | 50 | 33 | GER11 | 0.5 | M7 | 0.5 | |
| | 75 | 1.0~7.0 | 16 | 16 | 75 | 33 | GER11 | 0.5 | M7 | 0.5 | |
| | 105 | 1.0~7.0 | 16 | 16 | 105 | 33 | GER11 | 0.5 | M7 | 0.6 | |
| | SDC10S - | 50 | 1.0~10.0 | 22 | 22 | 50 | 44.5 | GER16 | 1.0 | M10 | 0.5 |
| | | 75 | 1.0~10.0 | 22 | 22 | 75 | 44.5 | GER16 | 1.0 | M10 | 0.5 |
| | | 105 | 1.0~10.0 | 22 | 22 | 105 | 44.5 | GER16 | 1.0 | M10 | 0.6 |
| | SDC13S - | 50 | 1.0~13.0 | 28 | 28 | 50 | 49 | GER20 | 1.0 | M13 | 0.5 |
| | | 75 | 1.0~13.0 | 28 | 28 | 75 | 49 | GER20 | 1.0 | M13 | 0.6 |
| | | 105 | 1.0~13.0 | 28 | 28 | 105 | 49 | GER20 | 1.0 | M13 | 0.7 |
| | SDC16S - | 50 | 1.0~16.0 | 35 | 35 | 50 | 50 | GER25 | 1.0 | M18 | 0.6 |
| | | 75 | 1.0~16.0 | 35 | 35 | 75 | 50 | GER25 | 1.0 | M18 | 0.7 |
| | | 105 | 1.0~16.0 | 35 | 35 | 105 | 50 | GER25 | 1.0 | M18 | 0.8 |
| | BT40 - SDC7S - | 60 | 1.0~7.0 | 16 | 16 | 60 | 33 | GER11 | 0.5 | M7 | 1.0 |
| | | 90 | 1.0~7.0 | 16 | 16 | 90 | 33 | GER11 | 0.5 | M7 | 1.1 |
| | | 135 | 1.0~7.0 | 16 | 16 | 135 | 33 | GER11 | 0.5 | M7 | 1.2 |
| SDC10S - | | 60 | 1.0~10.0 | 22 | 22 | 60 | 44.5 | GER16 | 1.0 | M10 | 1.1 |
| | | 90 | 1.0~10.0 | 22 | 22 | 90 | 44.5 | GER16 | 1.0 | M10 | 1.2 |
| | | 135 | 1.0~10.0 | 22 | 22 | 135 | 44.5 | GER16 | 1.0 | M10 | 1.4 |
| SDC13S - | | 60 | 1.0~13.0 | 28 | 28 | 60 | 49 | GER20 | 1.0 | M13 | 1.1 |
| | | 90 | 1.0~13.0 | 28 | 28 | 90 | 49 | GER20 | 1.0 | M13 | 1.5 |
| | | 150 | 1.0~13.0 | 28 | 28 | 150 | 49 | GER20 | 1.0 | M13 | 1.8 |
| SDC16S - | | 60 | 1.0~16.0 | 35 | 35 | 60 | 50 | GER25 | 1.0 | M18 | 1.2 |
| | | 90 | 1.0~16.0 | 35 | 35 | 90 | 50 | GER25 | 1.0 | M18 | 1.4 |
| | | 150 | 1.0~16.0 | 35 | 35 | 150 | 50 | GER25 | 1.0 | M18 | 1.8 |
| BT50 - SDC7S - | | 90 | 1.0~7.0 | 16 | 16 | 90 | 33 | GER11 | 0.5 | M7 | 3.8 |
| | | 120 | 1.0~7.0 | 16 | 16 | 120 | 33 | GER11 | 0.5 | M7 | 3.9 |
| | | 165 | 1.0~7.0 | 16 | 16 | 165 | 33 | GER11 | 0.5 | M7 | 4.0 |
| | SDC10S - | 90 | 1.0~10.0 | 22 | 22 | 90 | 44.5 | GER16 | 1.0 | M10 | 3.8 |
| | | 120 | 1.0~10.0 | 22 | 22 | 120 | 44.5 | GER16 | 1.0 | M10 | 4.0 |
| | | 165 | 1.0~10.0 | 22 | 22 | 165 | 44.5 | GER16 | 1.0 | M10 | 4.2 |
| | SDC13S - | 75 | 1.0~13.0 | 28 | 28 | 75 | 49 | GER20 | 1.0 | M13 | 3.8 |
| | | 105 | 1.0~13.0 | 28 | 28 | 105 | 49 | GER20 | 1.0 | M13 | 3.9 |
| | | 165 | 1.0~13.0 | 28 | 28 | 165 | 49 | GER20 | 1.0 | M13 | 4.5 |
| | SDC16S - | 75 | 1.0~16.0 | 35 | 35 | 75 | 50 | GER25 | 1.0 | M18 | 3.9 |
| | | 105 | 1.0~16.0 | 35 | 35 | 105 | 50 | GER25 | 1.0 | M18 | 4.1 |
| | | 165 | 1.0~16.0 | 35 | 35 | 165 | 50 | GER25 | 1.0 | M18 | 4.4 |

• Optional through coolant system




HSK-SDC/S

DIN69893-1, ISO 12164-1 : 2001



(mm)

| Designation | ØD | ØC | ØC1 | L | L1 | H | G | Collet | Range |  | |
|-----------------------|-------------|----------|-----|----|-----|----|----|--------|-------|---|-----|
| HSK 50A - SDC 7S - 75 | 1.0~ 7.0 | 16 | 16 | 75 | 49 | 34 | M7 | GER11 | 0.5 | 0.3 | |
| | SDC10S - 85 | 1.0~10.0 | 22 | 22 | 85 | 59 | 45 | M10 | GER16 | 1.0 | 0.4 |
| | SDC13S - 90 | 1.0~13.0 | 28 | 28 | 90 | 64 | 49 | M13 | GER20 | 1.0 | 0.8 |
| | SDC16S -105 | 1.0~16.0 | 35 | 35 | 105 | 96 | 54 | M18 | GER25 | 1.0 | 1.2 |
| HSK 63A - SDC 7S - 75 | 1.0~ 7.0 | 16 | 16 | 75 | 49 | 34 | M7 | GER11 | 0.5 | 0.8 | |
| | SDC10S - 85 | 1.0~10.0 | 22 | 22 | 85 | 59 | 45 | M10 | GER16 | 1.0 | 1.0 |
| | SDC13S - 95 | 1.0~13.0 | 28 | 28 | 95 | 69 | 49 | M13 | GER20 | 1.0 | 1.2 |
| | SDC16S -105 | 1.0~16.0 | 35 | 35 | 105 | 79 | 54 | M18 | GER25 | 1.0 | 1.4 |
| HSK100A - SDC 7S - 85 | 1.0~ 7.0 | 16 | 16 | 85 | 56 | 34 | M7 | GER11 | 0.5 | 2.4 | |
| | SDC10S - 95 | 1.0~10.0 | 22 | 22 | 95 | 66 | 45 | M10 | GER16 | 1.0 | 2.7 |
| | SDC13S -100 | 1.0~13.0 | 28 | 28 | 100 | 71 | 49 | M13 | GER20 | 1.0 | 3.0 |
| | SDC16S -120 | 1.0~16.0 | 35 | 35 | 120 | 91 | 54 | M18 | GER25 | 1.0 | 3.2 |





Slim collet chuck.

- Drilling or Endmilling of narrow and deep place
- Balanced type can be ordered.
- Collet : see page 43~45
- Spanner is option.
- Spare Part : see page 32
- Optional through coolant system

• Ordering example)

- Standard type : HSK63A-SDC7S-75
- Balanced type : HSK63A-SDC7-75B

Parts

| Division | Spare Parts | | | |
|----------|---|---|---|---|
| | Basic | | Option | |
| | Nut | Adjust Screw | Spanner | GER Collet |
| Type |  |  |  |  |
| SDC7S | R11M | BN0716F | M11M | GER 11-ØD |
| SDC10S | R16M | BN1025F | M16M | GER 16-ØD |
| SDC13S | R20M | BN1325F | M20M | GER 20-ØD |
| SDC16S | R25M | BN1830F | M25M | GER 25-ØD |

S-SDC/S

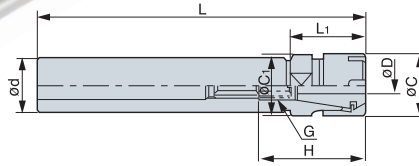


Fig. 1

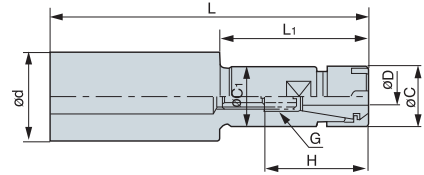


Fig. 2

| | | | | | | | | | | | | | (mm) |
|---------------------|----------|----------|----|-----|-----|-----|------|------|--------|-------|------|-----|------|
| Designation | ØD | Ød | ØC | ØC1 | L | L1 | H | G | Collet | Range | Fig. | kg | |
| S16 - SDC 7S - 100M | 1.0~7.0 | 16 | 16 | - | 100 | - | 33 | M7 | GER11 | 0.5 | 1 | 0.2 | |
| | 150M | 1.0~7.0 | 16 | 16 | - | 150 | - | 33 | M7 | GER11 | 0.5 | 1 | 0.2 |
| SDC10S - 100M | 1.0~10.0 | 16 | 22 | 19 | 100 | 50 | 44.5 | M10 | GER16 | 1.0 | 1 | 0.3 | |
| | 150M | 1.0~10.0 | 16 | 22 | 19 | 150 | 50 | 44.5 | M10 | GER16 | 1.0 | 1 | 0.3 |
| S20 - SDC 7S - 100M | 1.0~7.0 | 20 | 16 | 16 | 100 | 30 | 35 | M7 | GER11 | 0.5 | 2 | 0.3 | |
| | 150M | 1.0~7.0 | 20 | 16 | 16 | 150 | 80 | 35 | M7 | GER11 | 0.5 | 2 | 0.3 |
| SDC 10S - 100M | 1.0~10.0 | 20 | 22 | - | 100 | - | 44.5 | M10 | GER16 | 1.0 | 1 | 0.4 | |
| | 150M | 1.0~10.0 | 20 | 22 | - | 150 | - | 44.5 | M10 | GER16 | 1.0 | 1 | 0.4 |
| SDC 13S - 100M | 1.0~13.0 | 20 | 28 | 24 | 100 | 50 | 49 | M13 | GER20 | 1.0 | 1 | 0.3 | |
| | 150M | 1.0~13.0 | 20 | 28 | 24 | 150 | 50 | 49 | M13 | GER20 | 1.0 | 1 | 0.3 |
| S25 - SDC 7S - 100M | 1.0~7.0 | 25 | 16 | 16 | 100 | 30 | 33 | M7 | GER11 | 0.5 | 2 | 0.4 | |
| | 150M | 1.0~7.0 | 25 | 16 | 16 | 150 | 80 | 33 | M7 | GER11 | 0.5 | 2 | 0.4 |
| SDC 10S - 100M | 1.0~10.0 | 25 | 22 | 22 | 100 | 30 | 44.5 | M10 | GER16 | 1.0 | 2 | 0.4 | |
| | 150M | 1.0~10.0 | 25 | 22 | 22 | 150 | 80 | 44.5 | M10 | GER16 | 1.0 | 2 | 0.4 |
| SDC 13S - 100M | 1.0~13.0 | 25 | 28 | - | 100 | - | 49 | M13 | GER20 | 1.0 | 1 | 0.5 | |
| | 150M | 1.0~13.0 | 25 | 28 | - | 150 | - | 49 | M13 | GER20 | 1.0 | 1 | 0.5 |
| | 200M | 1.0~13.0 | 25 | 28 | - | 200 | - | 49 | M13 | GER20 | 1.0 | 1 | 0.7 |
| SDC 16S - 100M | 1.0~16.0 | 25 | 35 | 35 | 100 | 50 | 50 | M18 | GER25 | 1.0 | 1 | 0.5 | |
| | 150M | 1.0~16.0 | 25 | 35 | 35 | 150 | 50 | 50 | M18 | GER25 | 1.0 | 1 | 0.5 |
| | 200M | 1.0~16.0 | 25 | 35 | 35 | 200 | 50 | 50 | M18 | GER25 | 1.0 | 1 | 0.7 |
| S3 2- SDC 7S - 120M | 1.0~7.0 | 32 | 16 | 16 | 120 | 30 | 33 | M7 | GER11 | 0.5 | 2 | 0.8 | |
| | 150M | 1.0~7.0 | 32 | 16 | 16 | 150 | 60 | 33 | M7 | GER11 | 0.5 | 2 | 0.8 |
| SDC 10S - 120M | 1.0~10.0 | 32 | 22 | 22 | 120 | 50 | 44.5 | M10 | GER16 | 1.0 | 2 | 0.8 | |
| | 150M | 1.0~10.0 | 32 | 22 | 22 | 150 | 60 | 44.5 | M10 | GER16 | 1.0 | 2 | 0.8 |
| | 200M | 1.0~10.0 | 32 | 22 | 22 | 200 | 110 | 44.5 | M10 | GER16 | 1.0 | 2 | 1.0 |
| SDC 13S - 120M | 1.0~13.0 | 32 | 28 | 28 | 120 | 30 | 49 | M13 | GER20 | 1.0 | 2 | 0.8 | |
| | 150M | 1.0~13.0 | 32 | 28 | 28 | 150 | 60 | 49 | M13 | GER20 | 1.0 | 2 | 0.8 |
| | 200M | 1.0~13.0 | 32 | 28 | 28 | 200 | 110 | 49 | M13 | GER20 | 1.0 | 2 | 1.0 |
| SDC 16S - 120M | 1.0~16.0 | 32 | 35 | - | 120 | - | 50 | M18 | GER25 | 1.0 | 1 | 1.0 | |
| | 150M | 1.0~16.0 | 32 | 35 | - | 150 | - | 50 | M18 | GER25 | 1.0 | 1 | 1.0 |
| | 200M | 1.0~16.0 | 32 | 35 | - | 200 | - | 50 | M18 | GER25 | 1.0 | 1 | 1.2 |

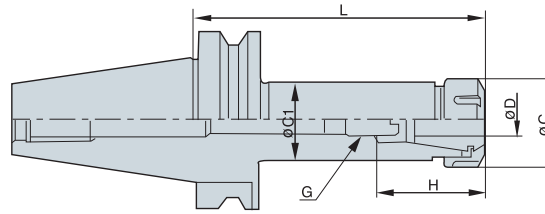
Slim type straight shank collet chuck

• NPM is used as a basic holder. • Collet : see page 43~45 • Spanner is option.




DBT-HPS

Balanced G6.3, Max. 15,000rpm



(mm)

| Designation | ØD | ØC | ØC1 | L | H | Collet | Range | G |  kg | Max.rpm | |
|--------------------|----------|----------|-----|----|------|--------|-------|-----|--|---------|--------|
| DBT30 - HPS 7 - 50 | 1.0~7.0 | 19 | 19 | 50 | 33 | GER11 | 0.5 | M7 | 0.5 | 15,000 | |
| | 75 | 1.0~7.0 | 19 | 19 | 75 | 33 | GER11 | 0.5 | M7 | 0.5 | 15,000 |
| | 105 | 1.0~7.0 | 19 | 19 | 105 | 33 | GER11 | 0.5 | M7 | 0.5 | 15,000 |
| HPS10 - 50 | 1.0~10.0 | 32 | 31 | 50 | 44.5 | GER16 | 1.0 | M10 | 0.5 | 15,000 | |
| | 75 | 1.0~10.0 | 32 | 31 | 75 | 44.5 | GER16 | 1.0 | M10 | 0.5 | 15,000 |
| | 105 | 1.0~10.0 | 32 | 31 | 105 | 44.5 | GER16 | 1.0 | M10 | 0.5 | 15,000 |
| HPS13 - 50 | 1.0~13.0 | 35 | 35 | 50 | 49 | GER20 | 1.0 | M13 | 0.5 | 15,000 | |
| | 75 | 1.0~13.0 | 35 | 35 | 75 | 49 | GER20 | 1.0 | M13 | 0.6 | 15,000 |
| | 105 | 1.0~13.0 | 35 | 35 | 105 | 49 | GER20 | 1.0 | M13 | 0.6 | 15,000 |
| HPS16 - 50 | 1.0~16.0 | 42 | 42 | 50 | 50 | GER25 | 1.0 | M18 | 0.6 | 15,000 | |
| | 75 | 1.0~16.0 | 42 | 42 | 75 | 50 | GER25 | 1.0 | M18 | 0.7 | 15,000 |
| | 105 | 1.0~16.0 | 42 | 42 | 105 | 50 | GER25 | 1.0 | M18 | 0.7 | 15,000 |
| HPS20 - 60 | 2.0~20.0 | 50 | 44 | 60 | 60 | GER32 | 1.0 | M22 | 0.5 | 15,000 | |
| | 90 | 2.0~20.0 | 50 | 44 | 90 | 60 | GER32 | 1.0 | M22 | 0.8 | 15,000 |
| | 120 | 2.0~20.0 | 50 | 44 | 120 | 60 | GER32 | 1.0 | M22 | 0.8 | 15,000 |
| DBT40 - HPS 7 - 60 | 1.0~7.0 | 19 | 19 | 60 | 33 | GER11 | 0.5 | M7 | 1.0 | 10,000 | |
| | 90 | 1.0~7.0 | 19 | 19 | 90 | 33 | GER11 | 0.5 | M7 | 1.1 | 10,000 |
| | 135 | 1.0~7.0 | 19 | 19 | 135 | 33 | GER11 | 0.5 | M7 | 1.2 | 10,000 |
| HPS10 - 60 | 1.0~10.0 | 32 | 31 | 60 | 44.5 | GER16 | 1.0 | M10 | 1.1 | 10,000 | |
| | 90 | 1.0~10.0 | 32 | 31 | 90 | 44.5 | GER16 | 1.0 | M10 | 1.2 | 10,000 |
| | 135 | 1.0~10.0 | 32 | 31 | 135 | 44.5 | GER16 | 1.0 | M10 | 1.3 | 10,000 |
| HPS13 - 60 | 1.0~13.0 | 35 | 35 | 60 | 49 | GER20 | 1.0 | M13 | 1.1 | 10,000 | |
| | 90 | 1.0~13.0 | 35 | 35 | 90 | 49 | GER20 | 1.0 | M13 | 1.5 | 10,000 |
| | 135 | 1.0~13.0 | 35 | 35 | 135 | 49 | GER20 | 1.0 | M13 | 1.6 | 10,000 |
| HPS16 - 60 | 1.0~16.0 | 42 | 42 | 60 | 50 | GER25 | 1.0 | M18 | 1.2 | 10,000 | |
| | 90 | 1.0~16.0 | 42 | 42 | 90 | 50 | GER25 | 1.0 | M18 | 1.4 | 10,000 |
| | 135 | 1.0~16.0 | 42 | 42 | 135 | 50 | GER25 | 1.0 | M18 | 1.6 | 10,000 |
| HPS20 - 60 | 2.0~20.0 | 50 | 44 | 60 | 60 | GER32 | 1.0 | M22 | 1.1 | 10,000 | |
| | 90 | 2.0~20.0 | 50 | 44 | 90 | 60 | GER32 | 1.0 | M22 | 1.4 | 10,000 |
| | 135 | 2.0~20.0 | 50 | 44 | 135 | 60 | GER32 | 1.0 | M22 | 1.4 | 10,000 |
| DBT50 - HPS 7 - 90 | 1.0~7.0 | 19 | 19 | 90 | 33 | GER11 | 0.5 | M7 | 3.8 | 8,000 | |
| | 120 | 1.0~7.0 | 19 | 19 | 120 | 33 | GER11 | 0.5 | M7 | 3.9 | 8,000 |
| | 165 | 1.0~7.0 | 19 | 19 | 165 | 33 | GER11 | 0.5 | M7 | 4.0 | 8,000 |
| HPS10 - 90 | 1.0~10.0 | 32 | 31 | 90 | 44.5 | GER16 | 1.0 | M10 | 3.8 | 8,000 | |
| | 120 | 1.0~10.0 | 32 | 31 | 120 | 44.5 | GER16 | 1.0 | M10 | 4.0 | 8,000 |
| | 165 | 1.0~10.0 | 32 | 31 | 165 | 44.5 | GER16 | 1.0 | M10 | 4.2 | 8,000 |
| HPS13 - 75 | 1.0~13.0 | 35 | 35 | 75 | 49 | GER20 | 1.0 | M13 | 3.8 | 8,000 | |
| | 105 | 1.0~13.0 | 35 | 35 | 105 | 49 | GER20 | 1.0 | M13 | 3.9 | 8,000 |
| | 165 | 1.0~13.0 | 35 | 35 | 165 | 49 | GER20 | 1.0 | M13 | 4.2 | 8,000 |
| HPS16 - 75 | 1.0~16.0 | 42 | 42 | 75 | 50 | GER25 | 1.0 | M18 | 3.9 | 8,000 | |
| | 105 | 1.0~16.0 | 42 | 42 | 105 | 50 | GER25 | 1.0 | M18 | 4.1 | 8,000 |
| | 165 | 1.0~16.0 | 42 | 42 | 165 | 50 | GER25 | 1.0 | M18 | 4.2 | 8,000 |
| DBT50 - HPS20 - 75 | 2.0~20.0 | 50 | 44 | 75 | 60 | GER32 | 1.0 | M22 | 4.0 | 8,000 | |
| | 105 | 2.0~20.0 | 50 | 44 | 105 | 60 | GER32 | 1.0 | M22 | 4.4 | 8,000 |
| | 165 | 2.0~20.0 | 50 | 44 | 165 | 60 | GER32 | 1.0 | M22 | 4.8 | 8,000 |

- Pull std bolt & water-proof collet should be adopted for coolant system. (ER □□-ØC)
- Please choose right size in the case of using oilhole type
- Collet : see page 43~45
- Spanner is option
- Spare Part : see page 35
- Optional through coolant system

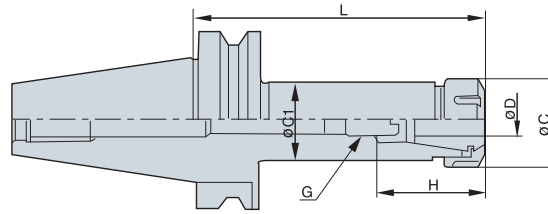
- Ordering example)
- ER20-6C should be adopted in the case of drill 6Ø
- Standard type : DBT30-HPS7-75




BT-HPS



Balanced G6.3, Max. 15,000rpm
MAS403-BT







(mm)

| Designation | ØD | ØC | ØC1 | L | H | Collet | Range | G |  kg | Max.rpm | |
|-------------------|-----|----------|-----|----|-----|--------|-------|-----|--|---------|--------|
| BT30 - HPS 7 - 50 | 75 | 1.0~7.0 | 19 | 19 | 50 | 33 | GER11 | 0.5 | M7 | 0.5 | 15,000 |
| | 75 | 1.0~7.0 | 19 | 19 | 75 | 33 | GER11 | 0.5 | M7 | 0.5 | 15,000 |
| | 105 | 1.0~7.0 | 19 | 19 | 105 | 33 | GER11 | 0.5 | M7 | 0.5 | 15,000 |
| HPS10 - 50 | 75 | 1.0~10.0 | 32 | 31 | 50 | 44.5 | GER16 | 1.0 | M10 | 0.5 | 15,000 |
| | 75 | 1.0~10.0 | 32 | 31 | 75 | 44.5 | GER16 | 1.0 | M10 | 0.5 | 15,000 |
| | 105 | 1.0~10.0 | 32 | 31 | 105 | 44.5 | GER16 | 1.0 | M10 | 0.5 | 15,000 |
| HPS13 - 50 | 75 | 1.0~13.0 | 35 | 35 | 50 | 49 | GER20 | 1.0 | M13 | 0.5 | 15,000 |
| | 75 | 1.0~13.0 | 35 | 35 | 75 | 49 | GER20 | 1.0 | M13 | 0.6 | 15,000 |
| | 105 | 1.0~13.0 | 35 | 35 | 105 | 49 | GER20 | 1.0 | M13 | 0.6 | 15,000 |
| HPS16 - 50 | 75 | 1.0~16.0 | 42 | 42 | 50 | 50 | GER25 | 1.0 | M18 | 0.6 | 15,000 |
| | 75 | 1.0~16.0 | 42 | 42 | 75 | 50 | GER25 | 1.0 | M18 | 0.7 | 15,000 |
| | 105 | 1.0~16.0 | 42 | 42 | 105 | 50 | GER25 | 1.0 | M18 | 0.7 | 15,000 |
| HPS20 - 60 | 90 | 2.0~20.0 | 50 | 44 | 60 | 60 | GER32 | 1.0 | M22 | 0.5 | 15,000 |
| | 90 | 2.0~20.0 | 50 | 44 | 90 | 60 | GER32 | 1.0 | M22 | 0.8 | 15,000 |
| | 120 | 2.0~20.0 | 50 | 44 | 120 | 60 | GER32 | 1.0 | M22 | 0.8 | 15,000 |
| BT40 - HPS 7 - 60 | 90 | 1.0~7.0 | 19 | 19 | 60 | 33 | GER11 | 0.5 | M7 | 1.0 | 10,000 |
| | 90 | 1.0~7.0 | 19 | 19 | 90 | 33 | GER11 | 0.5 | M7 | 1.1 | 10,000 |
| | 135 | 1.0~7.0 | 19 | 19 | 135 | 33 | GER11 | 0.5 | M7 | 1.2 | 10,000 |
| HPS10 - 60 | 90 | 1.0~10.0 | 32 | 31 | 60 | 44.5 | GER16 | 1.0 | M10 | 1.1 | 10,000 |
| | 90 | 1.0~10.0 | 32 | 31 | 90 | 44.5 | GER16 | 1.0 | M10 | 1.2 | 10,000 |
| | 135 | 1.0~10.0 | 32 | 31 | 135 | 44.5 | GER16 | 1.0 | M10 | 1.3 | 10,000 |
| HPS13 - 60 | 90 | 1.0~13.0 | 35 | 35 | 60 | 49 | GER20 | 1.0 | M13 | 1.1 | 10,000 |
| | 90 | 1.0~13.0 | 35 | 35 | 90 | 49 | GER20 | 1.0 | M13 | 1.5 | 10,000 |
| | 135 | 1.0~13.0 | 35 | 35 | 135 | 49 | GER20 | 1.0 | M13 | 1.6 | 10,000 |
| HPS16 - 60 | 90 | 1.0~16.0 | 42 | 42 | 60 | 50 | GER25 | 1.0 | M18 | 1.2 | 10,000 |
| | 90 | 1.0~16.0 | 42 | 42 | 90 | 50 | GER25 | 1.0 | M18 | 1.4 | 10,000 |
| | 135 | 1.0~16.0 | 42 | 42 | 135 | 50 | GER25 | 1.0 | M18 | 1.6 | 10,000 |
| HPS20 - 60 | 90 | 2.0~20.0 | 50 | 44 | 60 | 60 | GER32 | 1.0 | M22 | 1.1 | 10,000 |
| | 90 | 2.0~20.0 | 50 | 44 | 90 | 60 | GER32 | 1.0 | M22 | 1.4 | 10,000 |
| | 135 | 2.0~20.0 | 50 | 44 | 135 | 60 | GER32 | 1.0 | M22 | 1.4 | 10,000 |
| BT50 - HPS 7 - 90 | 120 | 1.0~7.0 | 19 | 19 | 90 | 33 | GER11 | 0.5 | M7 | 3.8 | 8,000 |
| | 120 | 1.0~7.0 | 19 | 19 | 120 | 33 | GER11 | 0.5 | M7 | 3.9 | 8,000 |
| | 165 | 1.0~7.0 | 19 | 19 | 165 | 33 | GER11 | 0.5 | M7 | 4.0 | 8,000 |
| HPS10 - 90 | 120 | 1.0~10.0 | 32 | 31 | 90 | 44.5 | GER16 | 1.0 | M10 | 3.8 | 8,000 |
| | 120 | 1.0~10.0 | 32 | 31 | 120 | 44.5 | GER16 | 1.0 | M10 | 4.0 | 8,000 |
| | 165 | 1.0~10.0 | 32 | 31 | 165 | 44.5 | GER16 | 1.0 | M10 | 4.2 | 8,000 |
| HPS13 - 75 | 105 | 1.0~13.0 | 35 | 35 | 75 | 49 | GER20 | 1.0 | M13 | 3.8 | 8,000 |
| | 105 | 1.0~13.0 | 35 | 35 | 105 | 49 | GER20 | 1.0 | M13 | 3.9 | 8,000 |
| | 165 | 1.0~13.0 | 35 | 35 | 165 | 49 | GER20 | 1.0 | M13 | 4.2 | 8,000 |
| HPS16 - 75 | 105 | 1.0~16.0 | 42 | 42 | 75 | 50 | GER25 | 1.0 | M18 | 3.9 | 8,000 |
| | 105 | 1.0~16.0 | 42 | 42 | 105 | 50 | GER25 | 1.0 | M18 | 4.1 | 8,000 |
| | 165 | 1.0~16.0 | 42 | 42 | 165 | 50 | GER25 | 1.0 | M18 | 4.2 | 8,000 |
| BT50 - HPS20 - 75 | 105 | 2.0~20.0 | 50 | 44 | 75 | 60 | GER32 | 1.0 | M22 | 4.0 | 8,000 |
| | 105 | 2.0~20.0 | 50 | 44 | 105 | 60 | GER32 | 1.0 | M22 | 4.4 | 8,000 |
| | 165 | 2.0~20.0 | 50 | 44 | 165 | 60 | GER32 | 1.0 | M22 | 4.8 | 8,000 |

- Pull std bolt & water-proof collet should be adopted for coolant system. (ER □□-ØC)
- Please choose right size in the case of using oilhole type • Collet : see page 43~45
- Spanner is option • Spare Part : see page 35 • Optional through coolant system

- Ordering example)
- ER20-6C should be adopted in the case of drill 6Ø
- Standard type : BT30-HPS7-75

Parts

| Division | Spare Parts | | | |
|----------|---|---|--|---|
| | Basic | | Option | |
| | Nut | Adjust Screw | Spanner | GER Collet |
| Type |  |  |  |  |
| HPS7 | RN11 | BN0716F | 20-22 | GER 11-ØD |
| HPS10 | RN16 | BN1025F | 32-35 | GER 16-ØD |
| HPS13 | RN20 | BN1325F | 35-38 | GER 20-ØD |
| HPS16 | RN25 | BN1830F | 42-46 | GER 25-ØD |
| HPS20 | RN32 | BN2230F | 48-52 | GER 32-ØD |

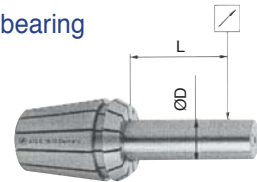


Collet Chuck for Ultra High- Speed & High-Accuracy

HDC Series

Ultra High Speed Collet Chuck

- All grounded chuck and special coated nut increase the clamping force more than 50%, compare to general type collet chuck.
- Guarantee of high accuracy on the high speed revolution due to adaption of sleeve bearing type nut (PRG Type)
- Using collet : High accuracy type (GER-HP : $2\mu\text{m}$)
- Run out accuracy with in $2\mu\text{m}$ at the nose (4D, max. 50mm) from the chuck.



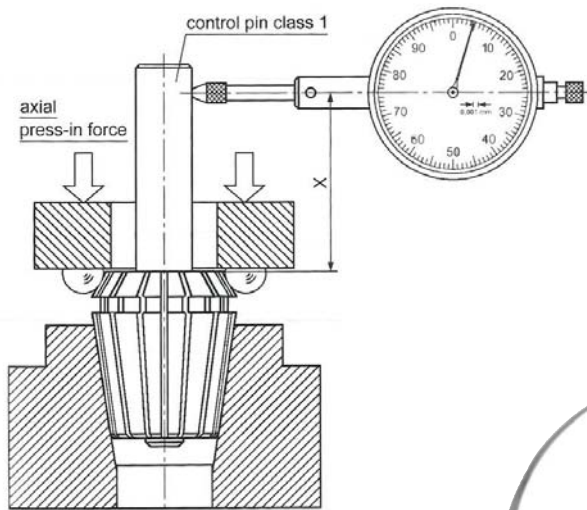
Collet Run-Out

| Clamping Range | L | GER-HP |
|----------------|------|----------------|
| Max.10.0 | 25.0 | $2\mu\text{m}$ |
| Max.13.0 | 40.0 | $2\mu\text{m}$ |

PRG Type Nut

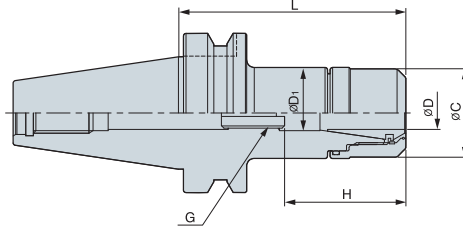


- ▶ The sleeve-bearing clamping nut is used for increased clamping power.
- ▶ The friction occurring when tightening is not transferred to the collet chuck, but rather is received by the sleeve bearing within the clamping nut. For the same torque applied, the Locking torque for clamped tools is raised in comparison with nuts without sleeve bearing.



BT-HDC

Balanced G2.5 Max. 30,000rpm
MAS403-BT



(mm)

| Designation | ØD | ØC | ØC1 | L | H | G | Collet | Max.rpm | kg |
|---------------|----------|----|-----|----|----|-----|---------|---------|-----|
| BT30-HDC10-55 | 1.0~10.0 | 30 | 31 | 55 | 45 | M10 | GER16HP | 30,000 | 0.5 |
| HDC10-75 | 1.0~10.0 | 30 | 31 | 75 | 45 | M10 | GER16HP | 30,000 | 0.5 |
| HDC13-55 | 1.0~13.0 | 35 | 35 | 55 | 49 | M13 | GER20HP | 25,000 | 0.5 |
| HDC13-75 | 1.0~13.0 | 35 | 35 | 75 | 49 | M13 | GER20HP | 25,000 | 0.6 |
| BT40-HDC10-60 | 1.0~10.0 | 30 | 31 | 60 | 45 | M10 | GER16HP | 25,000 | 1.1 |
| HDC10-90 | 1.0~10.0 | 30 | 31 | 90 | 45 | M10 | GER16HP | 25,000 | 1.2 |
| HDC13-60 | 1.0~13.0 | 35 | 35 | 60 | 49 | M13 | GER20HP | 20,000 | 1.1 |
| HDC13-90 | 1.0~13.0 | 35 | 35 | 90 | 49 | M13 | GER20HP | 20,000 | 1.5 |

- Pull std bolt & water-proof collet should be adopted for coolant system. (ER □□-ØC)
- Please choose right size in the case of using oilhole type
- Collet : see page 43~45
- Spanner is option.
- Optional through coolant system

- Ordering example)
 - ER20-6C should be adopted in the case of drill 6Ø
 - Standard type : BT30-HDC10-75

* Please use collet of right size(Nut could be damaged in the case of using bigger dia.)

Ex) 05,50 RD GER20-HP should be adopted for 5.5 Ø tool

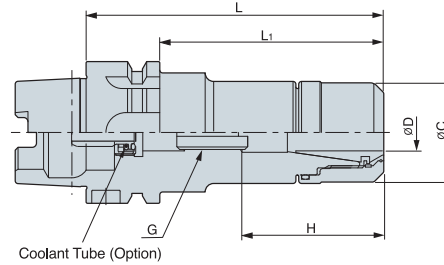
Parts

| Division | Spare Parts | | | |
|----------|-------------|--------------|---------|------------|
| | Basic | Adjust Screw | Spanner | Option |
| Type | Nut | Adjust Screw | Spanner | GER Collet |
| HDC10 | | | | |
| HDC13 | | | | |



HSK-HDC

Balanced G2.5 Max. 30,000rpm Max.



(mm)

| Designation | ØD | ØC | ØC1 | L | L1 | H | G | Collet | Max.rpm | kg |
|--------------------|----------|----|-----|-----|----|----|-----|---------|---------|-----|
| HSK40A-HDC10 - 60 | 1.0~10.0 | 30 | 31 | 60 | 40 | 34 | M10 | GER16HP | 30,000 | 0.2 |
| HDC10 - 90 | 1.0~10.0 | 30 | 31 | 90 | 70 | 45 | M10 | GER16HP | 30,000 | 0.2 |
| HDC13 - 75 | 1.0~13.0 | 35 | 35 | 75 | 55 | 49 | M13 | GER20HP | 30,000 | 0.2 |
| HDC13-105 | 1.0~13.0 | 35 | 35 | 105 | 90 | 54 | M13 | GER20HP | 30,000 | 0.2 |
| HSK50A-HDC10 - 60 | 1.0~10.0 | 30 | 31 | 60 | 34 | 34 | M10 | GER16HP | 30,000 | 0.3 |
| HDC10 - 90 | 1.0~10.0 | 30 | 31 | 90 | 64 | 45 | M10 | GER16HP | 30,000 | 0.4 |
| HDC13 - 75 | 1.0~13.0 | 35 | 35 | 75 | 49 | 49 | M13 | GER20HP | 25,000 | 0.8 |
| HDC13 -105 | 1.0~13.0 | 35 | 35 | 105 | 79 | 54 | M13 | GER20HP | 25,000 | 1.2 |
| HSK63A-HDC10 - 60 | 1.0~10.0 | 30 | 31 | 60 | 34 | 34 | M10 | GER16HP | 25,000 | 0.8 |
| HDC10 - 90 | 1.0~10.0 | 30 | 31 | 90 | 64 | 45 | M10 | GER16HP | 25,000 | 1.0 |
| HDC13 - 75 | 1.0~13.0 | 35 | 35 | 75 | 49 | 49 | M13 | GER20HP | 20,000 | 1.2 |
| HDC13-105 | 1.0~13.0 | 35 | 35 | 105 | 79 | 54 | M13 | GER20HP | 20,000 | 1.4 |
| HSK100A-HDC10 - 90 | 1.0~10.0 | 30 | 31 | 90 | 61 | 34 | M10 | GER16HP | 15,000 | 2.4 |
| HDC10 -120 | 1.0~10.0 | 30 | 31 | 120 | 91 | 45 | M10 | GER16HP | 15,000 | 2.7 |
| HDC13 - 90 | 1.0~13.0 | 35 | 35 | 90 | 61 | 49 | M13 | GER20HP | 15,000 | 3.0 |
| HDC13 -120 | 1.0~13.0 | 35 | 35 | 120 | 91 | 54 | M13 | GER20HP | 15,000 | 3.2 |

- All grounded chuck and special coated nut increase the clamping force more than 50%, compare to general type collet chuck.
- Guarantee of high accuracy on the high speed revolution due to adaption of sleeve bearing type nut (PRG Type)
- Using collet : High accuracy type (GER-HP:2µm) : see page 43~45
- Spanner is option.
- Optional through coolant system

* Please use collet of right size (Nut could be damaged in the case of using bigger dia.)

Ex) 05,50 RD GER20-HP should be adopted for 5.5 Ø tool



Parts

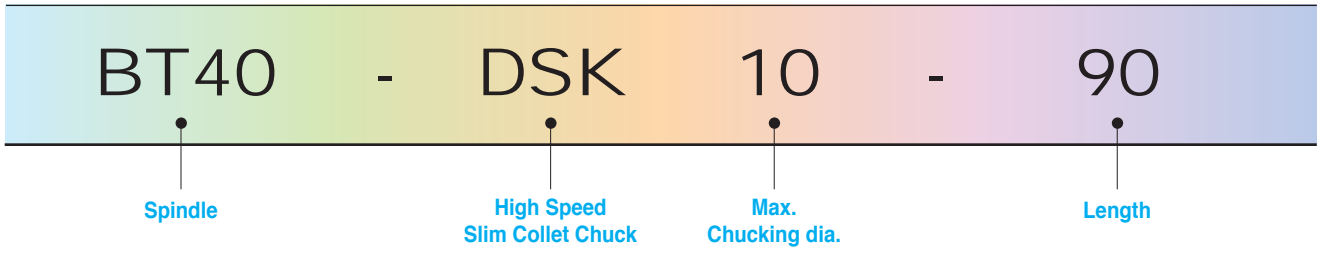
| Division | Spare Parts | | | |
|----------|-------------|--------------|---------|-------------|
| | Basic | | Option | |
| | Nut | Adjust Screw | Spanner | GER Collet |
| Type | | | | |
| HDC10 | PRG16 | BN1025F | NSW30 | GER 16-ØDHP |
| HDC13 | PRG20 | BN1325F | NSW35 | GER 20-ØDHP |

DSK Series

Slim type Collet Chuck

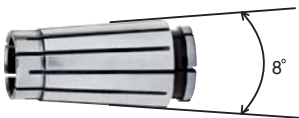
- Multi-purpose application
- Chucking dia. $\varnothing 1.0 \sim \varnothing 25.0\text{mm}$

Code System



Features

- ▶ Chucking dia. $\varnothing 2.75 \sim \varnothing 25\text{mm}$
- ▶ High clamping force type collet
- ▶ Collet accuracy : General type $5\mu\text{m}$
Accuracy type $3\mu\text{m}$
- ▶ High clamping force enables to stable machining without clampinf force fluctuation
- ▶ Multi-purpose application of drilling, endmilling,reaming and tapping etc.
- ▶ Balanced type and Balancable type can be possible



Spanner

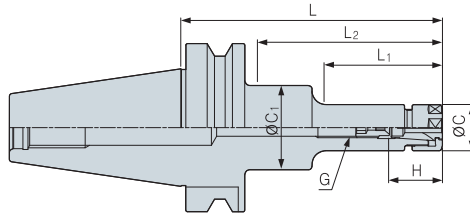


Collet Extractor




BT-DSK

MAS403-BT



(mm)

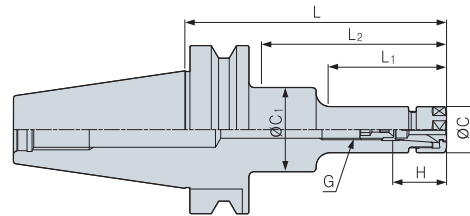
| Designation | ØD | ØC | ØC1 | L | L1 | L2 | H | G | Collet | Range |  | |
|--------------|-------|-----------|------|------|-----|-----|-----|----|--------|-------|---|-----|
| BT30 - DSK 6 | - 60 | 2.75~6.0 | 19.5 | 19.5 | 60 | 33 | 33 | 35 | M8 | HC6 | 0.5 | 0.7 |
| | - 90 | 2.75~6.0 | 19.5 | 32 | 90 | 56 | 65 | 35 | M8 | HC6 | 0.5 | 0.8 |
| | - 120 | 2.75~6.0 | 19.5 | 32 | 120 | 89 | 98 | 35 | M8 | HC6 | 0.5 | 0.9 |
| DSK10 | - 60 | 2.75~10.0 | 27.5 | 27.5 | 60 | 35 | 35 | 50 | M12 | HC10 | 0.5 | 0.9 |
| | - 90 | 2.75~10.0 | 27.5 | 27.5 | 90 | 65 | 65 | 50 | M12 | HC10 | 0.5 | 1.0 |
| | - 120 | 2.75~10.0 | 27.5 | 27.5 | 120 | 95 | 95 | 50 | M12 | HC10 | 0.5 | 1.1 |
| DSK16 | - 60 | 2.75~16.0 | 40 | 40 | 60 | 37 | 37 | 60 | M12 | HC16 | 0.5 | 1.1 |
| | - 90 | 2.75~16.0 | 40 | 40 | 90 | 67 | 67 | 60 | M18 | HC16 | 0.5 | 1.2 |
| | - 120 | 2.75~16.0 | 40 | 40 | 120 | 97 | 97 | 60 | M18 | HC16 | 0.5 | 1.3 |
| DSK20 | - 75 | 3.5~20.0 | 48 | 48 | 75 | 52 | 52 | 70 | M12 | HC20 | 0.5 | 1.1 |
| | - 90 | 3.5~20.0 | 48 | 48 | 90 | 67 | 67 | 70 | M18 | HC20 | 0.5 | 1.2 |
| BT40 - DSK 6 | - 60 | 2.75~6.0 | 19.5 | 19.5 | 60 | 30 | 30 | 35 | M8 | HC6 | 0.5 | 1.0 |
| | - 90 | 2.75~6.0 | 19.5 | 32 | 90 | 51 | 60 | 35 | M8 | HC6 | 0.5 | 1.1 |
| | - 120 | 2.75~6.0 | 19.5 | 32 | 120 | 60 | 90 | 35 | M8 | HC6 | 0.5 | 1.4 |
| | - 150 | 2.75~6.0 | 19.5 | 25 | 150 | 60 | 120 | 35 | M8 | HC6 | 0.5 | 1.5 |
| DSK10 | - 60 | 2.75~10.0 | 27.5 | 27.5 | 60 | 32 | 32 | 50 | M12 | HC10 | 0.5 | 1.1 |
| | - 90 | 2.75~10.0 | 27.5 | 40 | 90 | 48 | 60 | 50 | M12 | HC10 | 0.5 | 1.2 |
| | - 120 | 2.75~10.0 | 27.5 | 40 | 120 | 73 | 90 | 50 | M12 | HC10 | 0.5 | 1.4 |
| | - 150 | 2.75~10.0 | 27.5 | 34.5 | 150 | 73 | 118 | 50 | M12 | HC10 | 0.5 | 1.6 |
| | - 180 | 2.75~10.0 | 27.5 | 39 | 180 | 73 | 148 | 50 | M12 | HC10 | 0.5 | 1.6 |
| DSK16 | - 60 | 2.75~16.0 | 40 | 40 | 60 | 32 | 32 | 60 | M12 | HC16 | 0.5 | 1.3 |
| | - 90 | 2.75~16.0 | 40 | 40 | 90 | 58 | 58 | 60 | M18 | HC16 | 0.5 | 1.5 |
| | - 120 | 2.75~16.0 | 40 | 40 | 120 | 88 | 88 | 60 | M18 | HC16 | 0.5 | 1.7 |
| | - 150 | 2.75~16.0 | 40 | 40 | 150 | 118 | 118 | 60 | M18 | HC16 | 0.5 | 1.9 |
| | - 180 | 2.75~16.0 | 40 | 40 | 180 | 148 | 148 | 60 | M18 | HC16 | 0.5 | 2.0 |
| DSK20 | - 60 | 3.5~20.0 | 48 | 48 | 60 | 32 | 32 | 60 | M12 | HC20 | 0.5 | 1.3 |
| | - 90 | 3.5~20.0 | 48 | 48 | 90 | 60 | 60 | 70 | M22 | HC20 | 0.5 | 1.6 |
| | - 120 | 3.5~20.0 | 48 | 48 | 120 | 90 | 90 | 70 | M22 | HC20 | 0.5 | 2.0 |
| DSK25 | - 90 | 15.5~25.0 | 55 | 55 | 90 | 61 | 61 | 75 | M28 | HC25 | 0.5 | 1.8 |
| | - 120 | 15.5~25.0 | 55 | 55 | 120 | 91 | 91 | 85 | M28 | HC25 | 0.5 | 2.0 |

- Multi-purpose application of drilling, reaming, endmilling and tapping etc.
- Balanced type can be manufactured upon request.
- Spare Part : see page 41
- Optional through coolant system



BT-DSK

MAS403-BT



| | | | | | | | | | | | | (mm) |
|-------------|-------|-----------|------|------|-----|-----|-----|----|-----|--------|-------|------|
| Designation | | ØD | ØC | ØC1 | L | L1 | L2 | H | G | Collet | Range | kg |
| BT50- DSK6 | - 105 | 2.75~6.0 | 19.5 | 32 | 105 | 55 | 64 | 35 | M8 | HC6 | 0.5 | 3.8 |
| | - 135 | 2.75~6.0 | 19.5 | 32 | 135 | 60 | 92 | 35 | M8 | HC6 | 0.5 | 3.9 |
| | - 165 | 2.75~6.0 | 19.5 | 32 | 165 | 60 | 114 | 35 | M8 | HC6 | 0.5 | 4.0 |
| DSK10 | - 105 | 2.75~10.0 | 27.5 | 27.5 | 105 | 57 | 57 | 50 | M12 | HC10 | 0.5 | 4.2 |
| | - 135 | 2.75~10.0 | 27.5 | 32 | 135 | 70 | 92 | 50 | M12 | HC10 | 0.5 | 4.4 |
| | - 165 | 2.75~10.0 | 27.5 | 32 | 165 | 75 | 114 | 50 | M12 | HC10 | 0.5 | 4.6 |
| | - 195 | 2.75~10.0 | 27.5 | 36 | 195 | 75 | 146 | 50 | M12 | HC10 | 0.5 | 4.8 |
| DSK16 | - 105 | 2.75~16.0 | 40 | 40 | 110 | 62 | 62 | 60 | M18 | HC16 | 0.5 | 4.7 |
| | - 135 | 2.75~16.0 | 40 | 40 | 135 | 92 | 92 | 60 | M18 | HC16 | 0.5 | 4.9 |
| | - 165 | 2.75~16.0 | 40 | 50 | 165 | 90 | 122 | 60 | M18 | HC16 | 0.5 | 5.1 |
| | - 195 | 2.75~16.0 | 40 | 52 | 195 | 90 | 152 | 60 | M18 | HC16 | 0.5 | 5.5 |
| DSK20 | - 105 | 3.5~20.0 | 48 | 48 | 105 | 62 | 62 | 70 | M22 | HC20 | 0.5 | 4.3 |
| | - 135 | 3.5~20.0 | 48 | 48 | 135 | 92 | 92 | 70 | M22 | HC20 | 0.5 | 4.6 |
| | - 165 | 3.5~20.0 | 48 | 48 | 165 | 122 | 122 | 70 | M22 | HC20 | 0.5 | 5.0 |
| DSK25 | - 105 | 15.5~25.0 | 55 | 55 | 105 | 62 | 62 | 85 | M28 | HC25 | 0.5 | 5.2 |
| | - 135 | 15.5~25.0 | 55 | 55 | 135 | 92 | 92 | 85 | M28 | HC25 | 0.5 | 5.4 |
| | - 165 | 15.5~25.0 | 55 | 55 | 165 | 122 | 122 | 85 | M28 | HC25 | 0.5 | 5.6 |

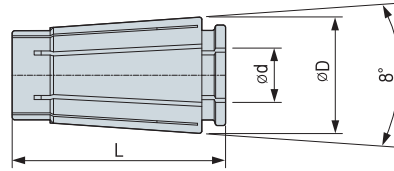
- Multi-purpose application of drilling, reaming, endmilling and tapping etc.
- Balanced type can be manufactured upon request.
- Spare Part : see page 41
- Optional through coolant system

Parts

| Division | Spare Parts | | |
|----------|-------------|--------------|---------|
| | Nut | Adjust Screw | Spanner |
| Type | | | |
| DSK6 | DN6 | BN0825F | DSS-6 |
| DSK10 | DN10 | BN1225F | DSS10 |
| DSK16 | DN16 | BN1830F | DSS16 |
| DSK20 | DN20 | BN2230F | DSS20 |
| DSK25 | DN25 | BN2838F | DSS25 |



HC Slim Collet (General & Accuracy type)

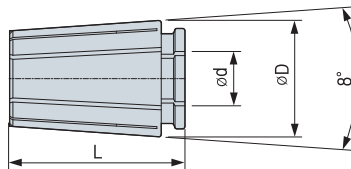


(mm)

| Designation | Clamping Range | ØD | L | Ød (Max.) | Range(mm) | Run-Out |
|-------------|----------------|------|------|-----------|-----------|--|
| HC6 -Ød | 2.75 ~ 6.0 | 10.5 | 25 | 6.0 | 0.5 | General 5 μ m Accuracy type 3 μ m |
| HC10-Ød | 2.75 ~ 10.0 | 15.5 | 30.5 | 10.0 | 0.5 | |
| HC16-Ød | 2.75 ~ 16.0 | 24.6 | 45 | 16.0 | 0.5 | |
| HC20-Ød | 3.5 ~ 20.0 | 29.1 | 54.2 | 20.0 | 0.5 | |
| HC25-Ød | 15.5 ~ 25.0 | 35.6 | 57 | 25.0 | 0.5 | |

- Ordering example
 - General type : HC16-ø8
 - Accuracy type : HC16-ø8P

HC Slim Collet (Through Coolant type)

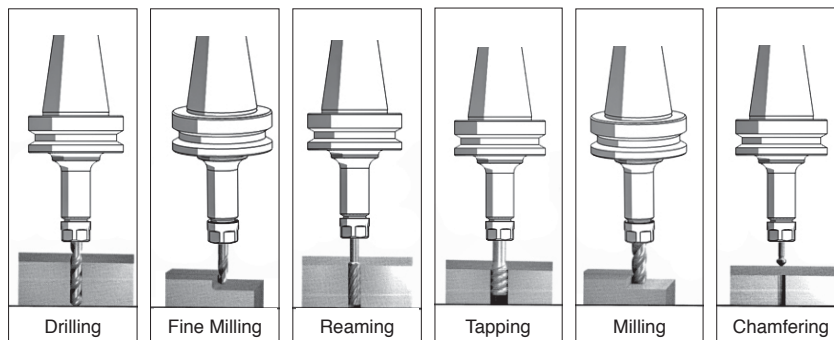


(mm)

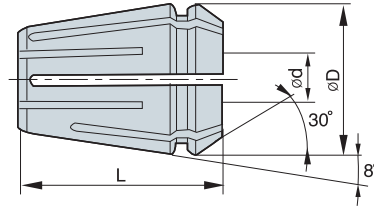
| Designation | Clamping Range | ØD | L | Ød (Max.) | Range(mm) | Run-Out |
|-------------|----------------|------|------|-----------|-----------|----------------------|
| HC10-Ød | 4.0 ~ 10.0 | 15.5 | 24.5 | 10.0 | 1.0 | General 5 μ m |
| HC16-Ød | 10.0 ~ 16.0 | 24.6 | 36 | 16.0 | 1.0 | |
| HC20-Ød | 12.0 ~ 20.0 | 29.1 | 45.2 | 20.0 | 1.0 | |
| HC25-Ød | 16.0 ~ 25.0 | 35.6 | 47.5 | 25.0 | 1.0 | |

- Ordering example
 - Through Coolant type : HC16-ø10C

Application



GER Collet



Dimension

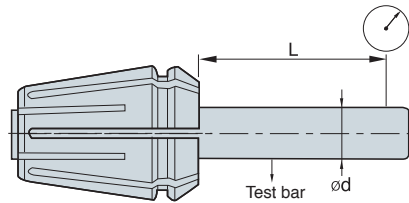
(mm)

| Designation | Collet Size | ØD | L | Ød (Max.) | Range(mm) |
|-------------|-------------|------|------|-----------|-----------|
| GER 11-Ød | 11 | 11.5 | 18.0 | 7.0 | 0.5 |
| 16-Ød | 16 | 17.0 | 27.5 | 10.0 | 0.5 |
| 20-Ød | 20 | 21.0 | 31.5 | 13.0 | 0.5 |
| 25-Ød | 25 | 26.0 | 34.0 | 16.0 | 0.5 |
| 32-Ød | 32 | 33.0 | 40.0 | 20.0 | 0.5 |
| 40-Ød | 40 | 41.0 | 46.0 | 26.0 | 0.5 |
| 50-Ød | 50 | 52.0 | 60.0 | 34.0 | 0.5 |

• Ordering example

- Accuracy type GER20-5.0 : 05,00 RD GER20-B
- High Accuracy type GER16-3.5 : 03,50 RD GER16-HP

Accuracy



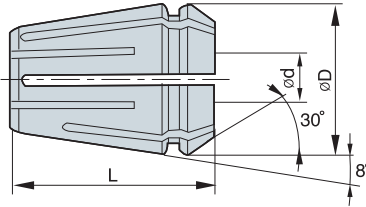
(mm)

| Clamping Range | L | Run-Out | |
|----------------|------|---------------|-----------------------|
| | | General (GER) | Accuracy type(GER-HP) |
| 0.5 ~ 1.6 | 6.0 | 5µm | 2µm |
| 0.6 ~ 3.0 | 10.0 | 5µm | 2µm |
| 0.3 ~ 6.0 | 16.0 | 5µm | 2µm |
| 0.6 ~ 10.0 | 25.0 | 5µm | 2µm |
| 10.0 ~ 18.0 | 40.0 | 5µm | 2µm |
| 18.0 ~ 26.0 | 50.0 | 5µm | 2µm |
| 26.0 ~ 34.0 | 60.0 | 5µm | - |

• High Accuracy and Various Specification



ER/C(Through Coolant Type) Collet



Dimension

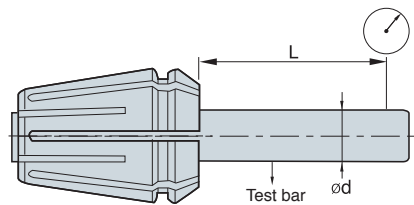
(mm)

| Designation | Collet Size | ØD | L | Ød (Max.) | Ordering(Min.) Ø | Range(mm) |
|-------------|-------------|------|------|-----------|------------------|-----------|
| ER16 - ØdC | 16 | 17.0 | 27.5 | 10.0 | 4.0C | 1.0 |
| ER20 - ØdC | 20 | 21.0 | 31.5 | 13.0 | 6.0C | 1.0 |
| ER25 - ØdC | 25 | 26.0 | 34.0 | 16.0 | 6.0C | 1.0 |
| ER32 - ØdC | 32 | 33.0 | 40.0 | 20.0 | 8.0C | 1.0 |
| ER40 - ØdC | 40 | 41.0 | 46.0 | 26.0 | 10.0C | 1.0 |
| ER50 - ØdC | 50 | 52.0 | 60.0 | 34.0 | 14.0C | 1.0 |

• Ordering example - Collet

- Standard : ER16-4.0C
- High accuracy type : ER16-4.0(A), ER16-4.0(AA)

Accuracy



(mm)

| Clamping Range | L | Run-Out | |
|----------------|------|---------|----------|
| | | General | Accuracy |
| Ø4.0 ~ Ø6.0 | 16.0 | 10µm | 5µm |
| Ø6.0 ~ Ø10.0 | 25.0 | 10µm | 5µm |
| Ø10.0 ~ Ø18.0 | 40.0 | 10µm | 5µm |
| Ø18.0 ~ Ø26.0 | 50.0 | 10µm | 5µm |
| Ø26.0 ~ Ø34.0 | 60.0 | 15µm | 10µm |



Collet Set



Standard

(mm)

| Designation | Range(mm) | Set | | Collet Chuck |
|-------------------------|-----------|-------|-------|--------------|
| | | ER | GER | |
| (G)ER11 - Ø1.0 ~ Ø1.5 | 0.5 | - | 13pcs | SDC7 |
| (G)ER11 - Ø1.5 ~ Ø7.0 | 1.0 | 12pcs | 13pcs | SDC7 |
| (G)ER16 - Ø1.0 ~ Ø10.0 | 1.0 | 10pcs | 10pcs | SDC10 |
| (G)ER20 - Ø2.0 ~ Ø13.0 | 1.0 | 12pcs | 12pcs | SDC13 |
| (G)ER25 - Ø2.0 ~ Ø16.0 | 1.0 | 15pcs | 15pcs | SDC16 |
| (G)ER32 - Ø3.0 ~ Ø20.0 | 1.0 | 18pcs | 18pcs | SDC20 |
| (G)ER40 - Ø4.0 ~ Ø6.0 | 1.0 | - | 23pcs | SDC26 |
| (G)ER40 - Ø6.0 ~ Ø26.0 | 1.0 | 21pcs | 23pcs | SDC26 |
| (G)ER50 - Ø10.0 ~ Ø34.0 | 2.0 | 12pcs | - | SDC34 |

Through Coolant type

(mm)



| Designation | Range(mm) | Set | Collet Chuck |
|--------------------|-----------|-------|--------------|
| ER16 - Ø4C ~ Ø10C | 1.0 | 7pcs | SDC10 |
| ER20 - Ø6C ~ Ø13C | 1.0 | 8pcs | SDC13 |
| ER25 - Ø6C ~ Ø16C | 1.0 | 11pcs | SDC16 |
| ER32 - Ø8C ~ Ø20C | 1.0 | 13pcs | SDC20 |
| ER40 - Ø10C ~ Ø26C | 1.0 | 17pcs | SDC26 |
| ER50 - Ø12C ~ Ø34C | 2.0 | 12pcs | SDC34 |

• ER/C Set : General Class



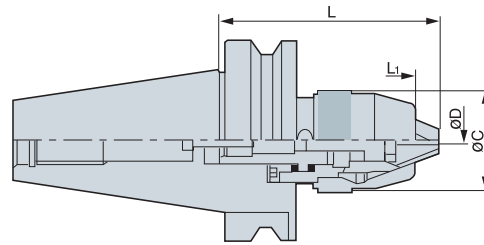
Collet Sets

- Standard : ER32SET
- Accuracy type : GER32-B ø3,0-20,0
- High accuracy type : GER32-HP ø3,0-20,0
- Through Coolant type : ER32 - OC Set



DBT-NPU

MAS403-BT





(mm)

| Designation | Clamping Range ØD | ØC | L | L1 |
|--------------------|----------------------|----|-----|------|
| DBT30 - NPU 8 - 97 | 0 ~ 8 | 38 | 97 | 8.5 |
| NPU13 - 125 | 1 ~ 13 | 50 | 125 | 12.5 |
| DBT40 - NPU 8 - 87 | 0 ~ 8 | 38 | 87 | 8.5 |
| - 120 | 0 ~ 8 | 38 | 120 | 8.5 |
| - 155 | 0 ~ 8 | 38 | 155 | 8.5 |
| NPU13 - 105 | 1 ~ 13 | 50 | 105 | 12.5 |
| - 130 | 1 ~ 13 | 50 | 130 | 12.5 |
| - 175 | 1 ~ 13 | 50 | 175 | 12.5 |
| DBT50 - NPU 8 - 97 | 0 ~ 8 | 38 | 97 | 8.5 |
| - 110 | 0 ~ 8 | 38 | 110 | 8.5 |
| - 170 | 0 ~ 8 | 38 | 170 | 8.5 |
| NPU13 - 115 | 1 ~ 13 | 50 | 115 | 12.5 |
| - 130 | 1 ~ 13 | 50 | 130 | 12.5 |
| - 190 | 1 ~ 13 | 50 | 190 | 12.5 |

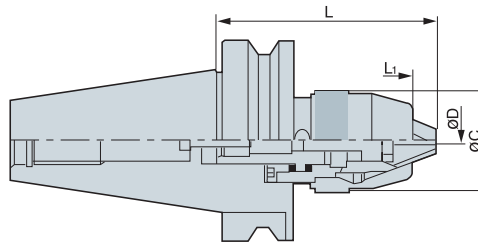
- Unified body of Chuck and Shank reduces the length of tool.
- Improved working accuracy and superior durability
- Relaxation prevention mechanism and automatic incremental tightening feature
- Chuck never detached at the sudden stop of main shaft
- Spanner is Option

Parts

| Division | Spare Parts | |
|----------|---|---|
| | Basic Chuck | Option Spanner |
| Type |  |  |
| NPU08 | NPU08 | NPU0836 |
| NPU13 | NPU13 | NPU1348 |

BT-NPU

MAS403-BT





| Designation | Clamping Range ØD | ØC | L | L1 |
|-------------------|----------------------|----|-----|------|
| BT30 - NPU 8 - 97 | 0 ~ 8 | 38 | 97 | 8.5 |
| NPU13 - 125 | 1 ~ 13 | 50 | 125 | 12.5 |
| BT40 - NPU 8 - 87 | 0 ~ 8 | 38 | 87 | 8.5 |
| - 120 | 0 ~ 8 | 38 | 120 | 8.5 |
| - 155 | 0 ~ 8 | 38 | 155 | 8.5 |
| NPU13 - 105 | 1 ~ 13 | 50 | 105 | 12.5 |
| - 130 | 1 ~ 13 | 50 | 130 | 12.5 |
| - 175 | 1 ~ 13 | 50 | 175 | 12.5 |
| BT50 - NPU 8 - 97 | 0 ~ 8 | 38 | 97 | 8.5 |
| - 110 | 0 ~ 8 | 38 | 110 | 8.5 |
| - 170 | 0 ~ 8 | 38 | 170 | 8.5 |
| NPU13 - 115 | 1 ~ 13 | 50 | 115 | 12.5 |
| - 130 | 1 ~ 13 | 50 | 130 | 12.5 |
| - 190 | 1 ~ 13 | 50 | 190 | 12.5 |

(mm)

- Unified body of Chuck and Shank reduces the length of tool.
- Improved working accuracy and superior durability
- Relaxation prevention mechanism and automatic incremental tightening feature
- Chuck never detached at the sudden stop of main shaft
- Spanner is Option

Parts

| Division | Spare Parts | |
|----------|---|---|
| | Basic Chuck | Option Spanner |
| Type |  |  |
| NPU08 | NPU08 | NPU0836 |
| NPU13 | NPU13 | NPU1348 |



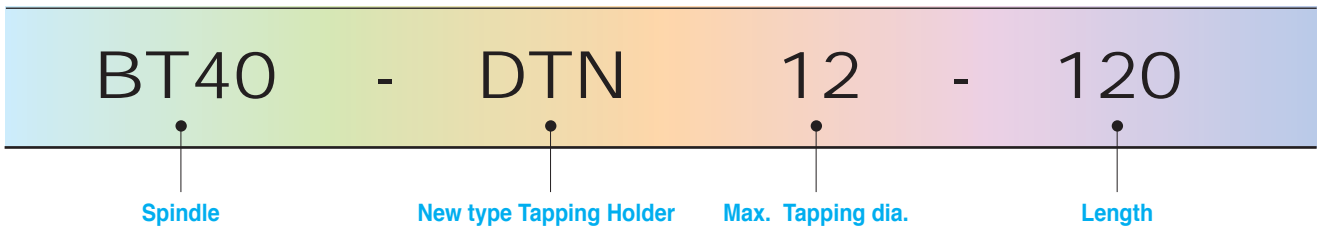
DTN Series

New type Tapping Holder

- Compact design and slim type
- Improvement of tapping force
- Tapping range M3 ~ M38

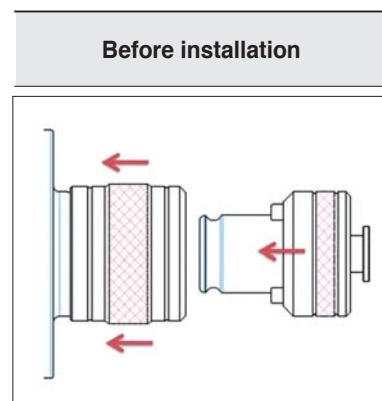


Code System

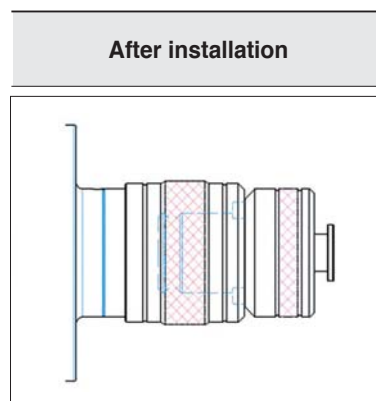


Features

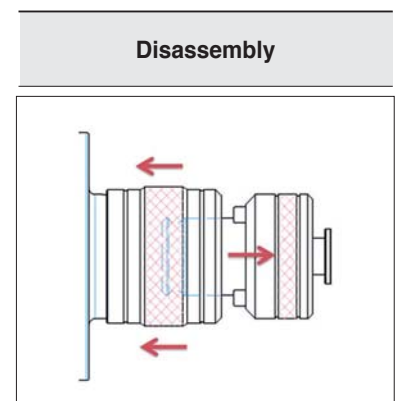
- ▶ Due to adapting of torque safety equipment prevent Tap breakage
- ▶ Easy and quick cutting tool change
- ▶ Changing Tap Adapter by one-touch
- ▶ Tapping Holder provided with tension and compression



1. Insert TCA pushing the cover of tap holder
2. Clamp the TCA in the Key groove and firmly



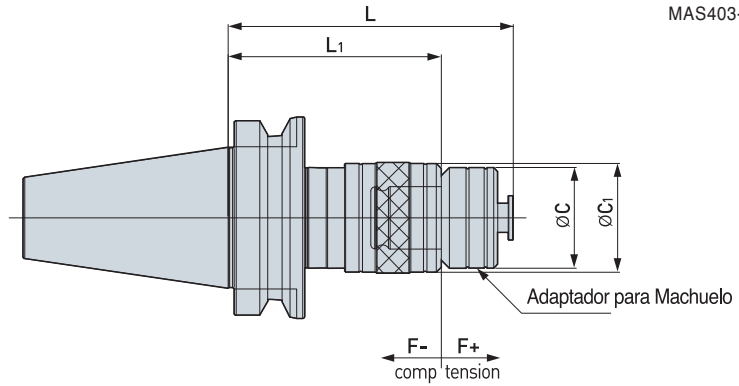
1. The cover of tap holder is placed correctly



1. Separate the TCA pushing the cover of tap holder



DBT-DTN



MAS403-BT

(mm)

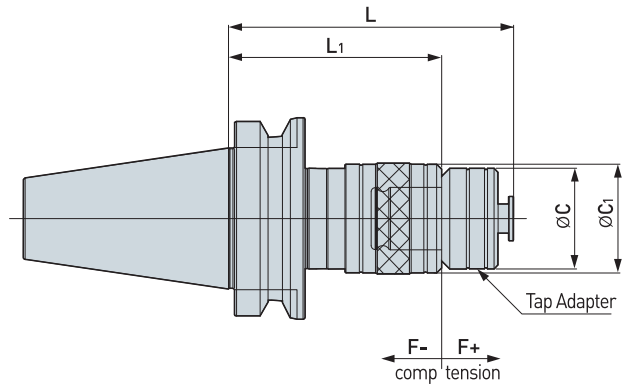
| Designation | Tapping Range | L | L1 | ØC | ØC1 | Float | | Tap Adapter | kg |
|---------------------|---------------|-----|-----|----|-----|-------|------|-------------|-----|
| | | | | | | F- | F+ | | |
| DBT30 - DTN12 - 85 | M3 ~ M12 | 85 | 60 | 32 | 36 | 4 | 10 | TCA1 - M | 0.7 |
| DBT40 - DTN12 - 90 | M3 ~ M12 | 90 | 65 | 32 | 36 | 4 | 10 | TCA1 - M | 1.2 |
| | 120 | 120 | 95 | 32 | 36 | 4 | 10 | TCA1 - M | 1.4 |
| DTN22 - 130 | M8 ~ M22 | 130 | 96 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 1.7 |
| | 160 | 160 | 126 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 2.1 |
| DBT50 - DTN12 - 100 | M3 ~ M12 | 100 | 75 | 32 | 36 | 4 | 10 | TCA1 - M | 3.7 |
| | 130 | 130 | 105 | 32 | 36 | 4 | 10 | TCA1 - M | 3.9 |
| DTN22 - 140 | M8 ~ M22 | 140 | 104 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 4.2 |
| | 170 | 170 | 134 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 4.7 |
| DTN38 - 185 | M16 ~ M38 | 185 | 140 | 72 | 78 | 20 | 20 | TCA3 - M | 5.7 |
| | 215 | 215 | 170 | 72 | 78 | 20 | 20 | TCA3 - M | 6.6 |

- Due to adapting of torque safety equipment prevent Tap breakage
- Tapping Holder provided with a tension and a compression
- Easy and quick cutting tool change
- Changing Tap Adapter by one-touch
- Tap Adapter (TCA Type) : see page 51



BT-DTN

MAS403-BT

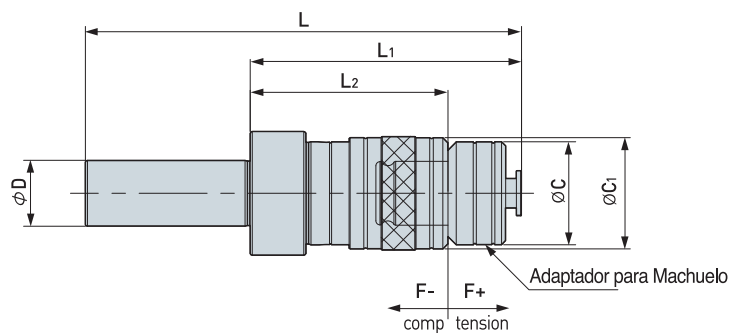


(mm)

| Designation | Tapping Range | L | L1 | ØC | ØC1 | Float | | Tap Adapter | kg |
|-------------------|---------------|-----|-----|----|-----|-------|------|-------------|-----|
| | | | | | | F- | F+ | | |
| BT30 - DTN12 - 85 | M3 ~ M12 | 85 | 60 | 32 | 36 | 4 | 10 | TCA1 - M | 0.7 |
| BT40 - DTN12 - 90 | M3 ~ M12 | 90 | 65 | 32 | 36 | 4 | 10 | TCA1 - M | 1.2 |
| | M3 ~ M12 | 120 | 95 | 32 | 36 | 4 | 10 | TCA1 - M | 1.4 |
| DTN22 -130 | M8 ~ M22 | 130 | 96 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 1.7 |
| | M8 ~ M22 | 160 | 126 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 2.1 |
| BT50 - DTN12 -100 | M3 ~ M12 | 100 | 75 | 32 | 36 | 4 | 10 | TCA1 - M | 3.7 |
| | M3 ~ M12 | 130 | 105 | 32 | 36 | 4 | 10 | TCA1 - M | 3.9 |
| DTN22 -140 | M8 ~ M22 | 140 | 104 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 4.2 |
| | M8 ~ M22 | 170 | 134 | 50 | 53 | 12.5 | 12.5 | TCA2 - M | 4.7 |
| DTN38 -185 | M16 ~ M38 | 185 | 140 | 72 | 78 | 20 | 20 | TCA3 - M | 5.7 |
| | M16 ~ M38 | 215 | 170 | 72 | 78 | 20 | 20 | TCA3 - M | 6.6 |

- Due to adapting of torque safety equipment prevent Tap breakage
- Tapping Holder provided with a tension and a compression
- Easy and quick cutting tool change
- Changing Tap Adapter by one-touch
- Tap Adapter (TCA Type) : see page 51

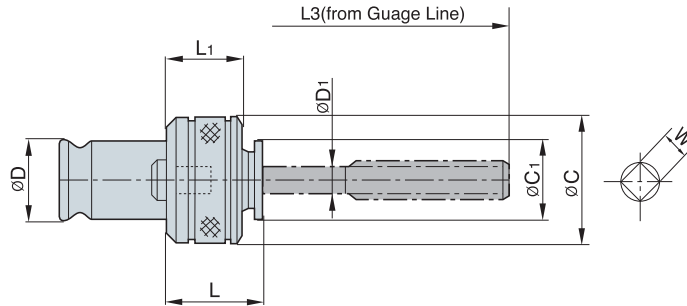
S-DTN



(mm)

| Designation | Tapping Range | ØD | L | L1 | L2 | ØC | ØC1 | Float | | Tap Adapter |
|------------------|---------------|----|-----|-----|-----|----|-----|-------|------|-------------|
| | | | | | | | | F- | F+ | |
| S32 - DTN12 - 90 | M3 ~ M12 | 32 | 170 | 90 | 65 | 32 | 36 | 4 | 10 | TCA1 - M |
| | M8 ~ M22 | 32 | 210 | 130 | 96 | 50 | 53 | 12.5 | 12.5 | TCA2 - M |
| S40 - DTN12 - 90 | M3 ~ M12 | 40 | 170 | 90 | 65 | 32 | 36 | 4 | 10 | TCA1 - M |
| | M8 ~ M22 | 40 | 210 | 130 | 96 | 50 | 53 | 12.5 | 12.5 | TCA2 - M |
| S42 - DTN12 - 90 | M3 ~ M12 | 42 | 170 | 90 | 65 | 32 | 36 | 4 | 10 | TCA1 - M |
| | M8 ~ M22 | 42 | 210 | 130 | 96 | 50 | 53 | 12.5 | 12.5 | TCA2 - M |
| DTN38 - 185 | M16 ~ M38 | 42 | 265 | 185 | 140 | 72 | 78 | 20 | 20 | TCA3 - M |

TCA



(mm)

| Designation | ØD | Tapping Range | | | ØD1 | ØC | ØC1 | L | L1 |
|-------------|----|---------------|----------|---------|---------|----|-----|-------|----|
| | | M | U(W) | P | | | | | |
| TCA 1 - M | 19 | 3 ~ 12 | 1/4~9/16 | 1/8 | 5 ~10.5 | 32 | 19 | 24~28 | 22 |
| 2 - M | 31 | 8 ~ 22 | 3/8~7/8 | 1/8~1/2 | 6.2~17 | 50 | 30 | 38~46 | 28 |
| 3 - M | 48 | 16 ~ 36 | 5/8~1% | 1/4~1% | 12 ~28 | 72 | 47 | 35~68 | 37 |

(JIS STANDARD)

(mm)

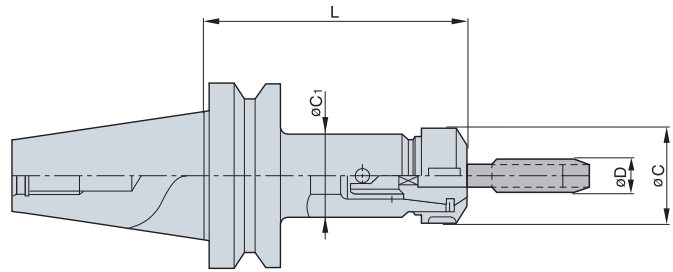
| Type | M(Metric Thread) | | | | | | | | U.W(Unify,Whitworth Thread) | | | | | | PT, PF(Pipe Screw) | | | | | | W | | | | | | |
|-------|------------------|------|------|------|------|------|------|------|-----------------------------|-------|------|------|------|------|--------------------|--------|-------|-------|------|------|----|------|------|------|------|-----|-----|
| | D | ØD1 | L | | | L3 | | | D | ØD1 | L | | | L3 | | | D | ØD1 | L | | | L3 | | | | | |
| | | | TCA1 | TCA2 | TCA3 | TCA1 | TCA2 | TCA3 | | | TCA1 | TCA2 | TCA3 | TCA1 | TCA2 | TCA3 | | | TCA1 | TCA2 | | TCA3 | TCA1 | TCA2 | TCA3 | | |
| TCA 1 | M3 | 4 | 24 | | | | 163 | | | | | | | | | | | | | | | | | | | | 3.2 |
| | M4 | 5 | 24 | | | | 163 | | | - | - | - | - | | | | | | | | | | | | | | 4 |
| | M4.5 | 5 | 24 | | | | 166 | | | - | - | - | - | | | | | | | | | | | | | | 4 |
| | M5 | 5.5 | 24 | | | | 171 | | | - | - | - | - | | | | | | | | | | | | | | 4.5 |
| | M6 | 6 | 24 | | | | 177 | | | 1/4U | 6 | 24 | | 173 | - | | | | | | | | | | | | 4.5 |
| | - | - | - | | | | - | | | 5/16U | 6.1 | | - | 180 | - | | | | | | | | | | | | 5 |
| | M7 | 6.2 | 25 | | | | 175 | 192 | | - | - | 25 | - | - | - | - | | | | | | | | | | | 5 |
| | M8 | 6.2 | 25 | 38 | | | 180 | 197 | | - | - | 25 | 38 | - | - | - | | | | | | | | | | | 5 |
| | M9 | 7 | 25 | 38 | | | 182 | 199 | | 3/8U | 7 | 25 | - | 185 | 202 | - | | | | | | | | | | | 5.5 |
| | M10 | 7 | 25 | 38 | - | - | 185 | 202 | - | - | - | - | 39 | - | - | - | | | | | | | | | | | 5.5 |
| TCA 2 | M11 | 8 | 26 | 39 | | | 189 | 206 | | 7/16U | 8 | 26 | - | 189 | 206 | - | PT1/8 | PF1/8 | 8 | 26 | 28 | | 164 | 192 | | 6 | |
| | M12 | 8.5 | 26 | 39 | | | 191 | 208 | | - | - | - | 40 | | | - | | | | | | | | | | 6.5 | |
| | - | - | - | - | | | - | - | | 1/2U | 9 | 27 | 41 | 193 | 210 | - | - | - | - | - | - | - | - | - | - | - | 7 |
| | M14 | 10.5 | 28 | 41 | | | 195 | 212 | | 9/16U | 10.5 | 28 | - | 197 | 214 | - | | | | | | | | | | | 8 |
| | - | - | - | - | | | - | - | | - | - | - | 42 | | | | PT1/4 | PF1/4 | 11 | 29 | 31 | 34 | 168 | 196 | 238 | | 9 |
| | - | - | - | - | | | - | - | | 5/8U | 12 | | - | 34 | 218 | 271 | - | - | - | - | - | - | - | - | - | - | 9 |
| | M16 | 12.5 | | 43 | 35 | | | 217 | 270 | | - | - | 44 | - | - | - | - | - | - | - | - | - | - | - | - | - | 10 |
| | M18 | 14 | | 44 | 36 | | | 211 | 274 | | 3/4U | 14 | | 36 | 226 | 279 | PT3/8 | PF3/8 | 14 | | 33 | 36 | | | 239 | | 11 |
| | M20 | 15 | | 45 | 37 | | | 225 | 278 | | - | - | 46 | - | - | - | - | - | - | - | - | - | - | | 197 | | 12 |
| | M22 | 17 | | 46 | 38 | | | 234 | 287 | | 7/8U | 17 | | 38 | 234 | 287 | - | - | - | - | - | - | - | - | - | - | 13 |
| TCA 3 | - | - | - | - | | | - | - | | - | - | - | - | - | - | PT1/2 | PF1/2 | 18 | | 36 | 39 | | | 209 | 251 | | 14 |
| | M24 | 19 | | 44 | | | 290 | | | | | | | | | - | - | - | - | - | - | - | - | - | - | 15 | |
| | M27 | 20 | | 62 | 40 | | 278 | 265 | 1U | 20 | | 62 | | 273 | | - | - | - | - | - | - | - | - | - | - | 15 | |
| | - | - | | - | - | | - | - | 11/8U | 22 | | 64 | | 281 | | - | - | - | - | - | - | - | - | - | - | - | 17 |
| | M30 | 23 | | 62 | 42 | | 281 | 303 | - | - | | - | | - | PT3/4 | PF3/4 | P23 | | | | 42 | | | 253 | | 17 | |
| | - | - | | - | - | | - | - | 11/4U | 24 | | 66 | | 289 | | PF7/8 | P24 | | | | | 44 | | | 256 | | 19 |
| | M33 | 25 | | 66 | 44 | | 289 | 311 | - | - | | - | | - | | - | - | - | - | - | - | - | - | - | - | 19 | |
| | - | - | | - | - | | - | - | 13/8U | 26 | | 68 | | 297 | | PT1 | PF1 | P26 | | | | 46 | | | 259 | | 21 |
| | M36 | 28 | | 68 | 46 | | 297 | 319 | | - | | - | | - | | PF11/8 | P28 | | | | | 46 | | | 264 | | 21 |

• Tapping Holder (DTN type), Straight shank




BT-SDT(Synchro Tap Chuck)

MAS403-BT



(mm)

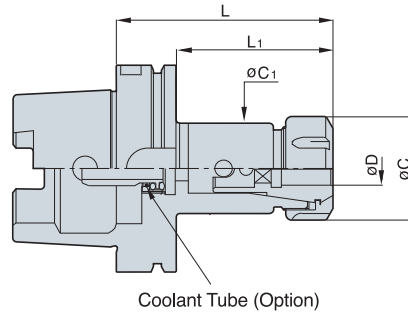
| Designation | Tapping Range ØD | L | ØC | ØC1 | Tap Collet |  kg |
|-------------------|------------------|-----|----|-----|------------|--|
| BT30 - SDT10 - 75 | M2.5 ~ M10 | 75 | 28 | 28 | KT10 | 0.5 |
| SDT13 - 75 | M4 ~ M12 | 75 | 33 | 35 | KT13 | 0.6 |
| SDT20 - 90 | M6 ~ M22 | 90 | 50 | 44 | KT20 | 0.9 |
| BT40 - SDT10 - 75 | M2.5 ~ M10 | 75 | 28 | 28 | KT10 | 1.2 |
| 105 | M2.5 ~ M10 | 105 | 28 | 28 | KT10 | 1.4 |
| 150 | M2.5 ~ M10 | 150 | 28 | 28 | KT10 | 1.4 |
| SDT13 - 75 | M4 ~ M12 | 75 | 35 | 35 | KT13 | 1.2 |
| 105 | M4 ~ M12 | 105 | 35 | 35 | KT13 | 1.4 |
| 150 | M4 ~ M12 | 150 | 35 | 35 | KT13 | 1.4 |
| SDT20 - 90 | M6 ~ M22 | 90 | 50 | 44 | KT20 | 1.4 |
| 120 | M6 ~ M22 | 120 | 50 | 44 | KT20 | 1.8 |
| 180 | M6 ~ M22 | 180 | 50 | 44 | KT20 | 2.0 |
| BT50 - SDT10 - 90 | M2.5 ~ M10 | 90 | 28 | 28 | KT10 | 3.8 |
| 135 | M2.5 ~ M10 | 135 | 28 | 28 | KT10 | 4.0 |
| 165 | M2.5 ~ M10 | 165 | 28 | 28 | KT10 | 4.2 |
| SDT13 - 90 | M4 ~ M12 | 90 | 35 | 35 | KT13 | 3.8 |
| 135 | M4 ~ M12 | 135 | 35 | 35 | KT13 | 4.0 |
| 165 | M4 ~ M12 | 165 | 35 | 35 | KT13 | 4.1 |
| 200 | M4 ~ M12 | 200 | 35 | 35 | KT20 | 4.2 |
| SDT20 -105 | M6 ~ M22 | 105 | 50 | 44 | KT20 | 4.0 |
| 135 | M6 ~ M22 | 135 | 50 | 44 | KT20 | 4.3 |
| 165 | M6 ~ M22 | 165 | 50 | 44 | KT20 | 4.6 |
| 200 | M6 ~ M22 | 200 | 50 | 44 | KT20 | 4.8 |
| SDT26 -105 | M12 ~ M33 | 105 | 63 | 63 | KT26 | 4.4 |
| 165 | M12 ~ M33 | 165 | 63 | 63 | KT26 | 5.7 |


- Synchronous function, i.e., ensure accurate rotation and the feeding of spindle for machining center exclusive basic holder (Rigid tapping, Direct tapping, etc.)
- Using the GER Collet on the SDT Chuck, drilling, reaming and endmilling can be implemented instead of using KT Collet on the SDT Chuck.
- Tap Chuck Collet (KT type) : see page 54
- GER Collet : see page 43
- Spare Part : see page 54



HSK-SDT(Synchro Tap Chuck)

DIN69893-1, ISO 12164-1 : 2001






| Designation | Tapping Range ØD | ØC | ØC1 | L | L1 | Collet |  |
|----------------------|------------------|-----------|-----|----|-----|--------|---|
| HSK 50A - SDT10 - 80 | M2.5-M10 | 28 | 28 | 80 | 54 | KT10 | 0.3 |
| | SDT13 - 85 | M4.0-M12 | 35 | 35 | 85 | KT13 | 0.3 |
| | SDT20 -100 | M6.0-M22 | 50 | 44 | 100 | KT20 | 0.4 |
| HSK 63A - SDT10 - 80 | M2.5-M10 | 28 | 28 | 80 | 54 | KT10 | 0.9 |
| | SDT13 - 85 | M4.0-M12 | 35 | 35 | 85 | KT13 | 0.9 |
| | SDT20 -100 | M6.0-M22 | 50 | 44 | 100 | KT20 | 1.1 |
| | SDT26 -110 | M12.0-M33 | 63 | 63 | 40 | KT26 | 1.3 |
| HSK100A - SDT10 - 85 | M2.5-M10 | 28 | 28 | 85 | 56 | KT10 | 2.7 |
| | SDT13 - 90 | M4.0-M12 | 35 | 35 | 90 | KT13 | 2.7 |
| | SDT20 -105 | M6.0-M22 | 50 | 44 | 105 | KT20 | 3.0 |
| | SDT26 -125 | M12.0-M33 | 63 | 63 | 125 | KT26 | 3.4 |

- Synchronous function, i.e., ensure accurate rotation and the feeding of spindle for machining center exclusive basic holder (Rigid tapping, Direct tapping, etc.)
- Using the GER Collet on the SDT Chuck, drilling, reaming and endmilling can be implemented instead of using KT Collet on the SDT Chuck.
- Tap Chuck Collet (KT type) : see page 54
- GER Collet : see page 43
- Spare Part : see page 54

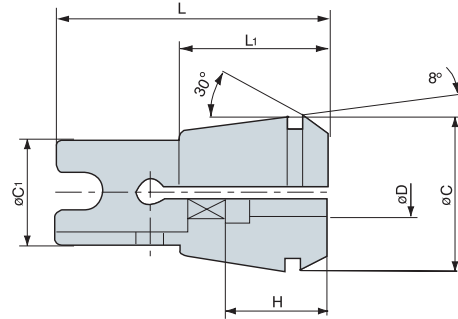
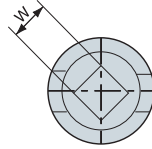
- Ordering example
 - Standard type : HSK63A-SDT13-85
 - Balanced type : HSK63A-SDT13-85B

Parts

| Division | Spare Parts | | |
|----------|---|---|---|
| | Basic Nut | KT-Collet | Option Spanner |
| Type |  |  |  |
| SDT10 | R16 | KT10 | S-25 |
| SDT13 | RU20 | KT13 | 35-38 |
| SDT20 | RU32 | KT20 | 48-52 |
| SDT26 | RU40 | KT26 | 62-65 |



KT (Tap Chuck Collet)



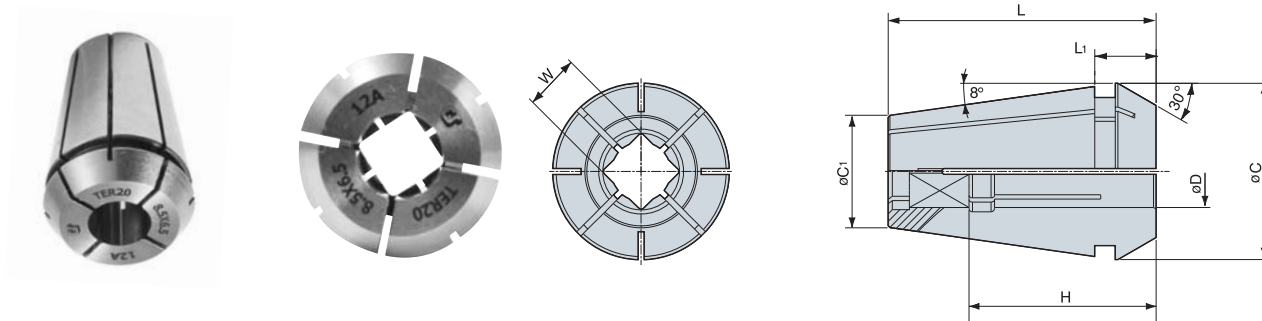
(JIS STANDARD)

(mm)

| Designation | Tap | ØC | ØD | ØC1 | L | L1 | H | W |
|--------------|--------------------|----|------|------|----|----|----|-----|
| KT10 - M 2.5 | ~ M2.5 | 17 | 3.0 | 13 | 36 | 18 | 15 | 2.5 |
| M 3 | M3.0 | 17 | 4.0 | 13 | 36 | 18 | 15 | 3.2 |
| M 4 | M4.0-4.5 | 17 | 5.0 | 13 | 36 | 18 | 15 | 4.0 |
| M 5 | MA5.0 | 17 | 5.5 | 13 | 36 | 18 | 15 | 4.5 |
| M 6 | M6.0, U1/4" | 17 | 6.0 | 13 | 36 | 18 | 15 | 4.5 |
| M 8 | M7.0-8.0 | 17 | 6.2 | 13 | 36 | 18 | 17 | 5.0 |
| M 10 | M9.0-10, U3/8" | 17 | 7.0 | 13 | 36 | 18 | 17 | 5.5 |
| U5/16 | U5/16" | 17 | 6.1 | 13 | 36 | 18 | 17 | 5.0 |
| KT13 - M 4 | M4.0~4.5 | 21 | 5.0 | 15.1 | 42 | 22 | 15 | 4.0 |
| M 5 | M5.0 | 21 | 5.5 | 15.1 | 42 | 22 | 15 | 4.5 |
| M 6 | M6.0, U1/4" | 21 | 6.0 | 15.1 | 42 | 22 | 15 | 4.5 |
| M 8 | M7.0~8.0 | 21 | 6.2 | 15.1 | 42 | 22 | 18 | 5.0 |
| M10 | M9.0~10, U3/8" | 21 | 7.0 | 15.1 | 42 | 22 | 18 | 5.5 |
| M11 | M11, U7/16", P1/8" | 21 | 8.0 | 15.1 | 42 | 22 | 18 | 6.0 |
| M12 | M12 | 21 | 8.5 | 15.1 | 42 | 22 | 20 | 6.5 |
| U5/16 | U5/16" | 21 | 6.1 | 15.1 | 42 | 22 | 18 | 5.0 |
| U 1/2 | U1/2", W1/2" | 21 | 9.0 | 15.1 | 42 | 22 | 20 | 7.0 |
| KT20 - M 6 | M6.0, U1/4" | 33 | 6.0 | 23 | 58 | 32 | 23 | 4.5 |
| M 8 | M7.0-8.0 | 33 | 6.2 | 23 | 58 | 32 | 23 | 5.0 |
| M10 | M9.0-10, U3/8" | 33 | 7.0 | 23 | 58 | 32 | 22 | 5.5 |
| M11 | M11, U7/16", P1/8" | 33 | 8.0 | 23 | 58 | 32 | 22 | 6.0 |
| M12 | M12 | 33 | 8.5 | 23 | 58 | 32 | 22 | 6.5 |
| M14 | M14, U9/16" | 33 | 10.5 | 23 | 58 | 32 | 22 | 8 |
| M16 | M16 | 33 | 12.5 | 23 | 58 | 32 | 22 | 10 |
| M18 | M18, U3/4" | 33 | 14 | 23 | 58 | 32 | 22 | 11 |
| M20 | M20 | 33 | 15 | 23 | 58 | 32 | 22 | 12 |
| M22 | M22, U7/8" | 33 | 17 | 23 | 58 | 32 | 22 | 13 |
| U1/2 | U1/2" | 33 | 9 | 23 | 58 | 32 | 22 | 7 |
| U5/8 | U5/8" | 33 | 12 | 23 | 58 | 32 | 22 | 9 |
| P1/8 | P1/8" | 33 | 8 | 23 | 58 | 32 | 22 | 6 |
| P1/4 | P1/4" | 33 | 11 | 23 | 58 | 32 | 22 | 9 |
| P3/8 | P3/8" | 33 | 14 | 23 | 58 | 32 | 22 | 11 |
| KT26 - M12 | M12 | 41 | 8.5 | 32 | 76 | 38 | 25 | 6.5 |
| M14 | M14, U9/16" | 41 | 10.5 | 32 | 76 | 38 | 25 | 8 |
| M16 | M16 | 41 | 12.5 | 32 | 76 | 38 | 25 | 10 |
| M18 | M18, U3/4" | 41 | 14 | 32 | 76 | 38 | 25 | 11 |
| M20 | M20 | 41 | 15 | 32 | 76 | 38 | 25 | 12 |
| M22 | M22, U7/8" | 41 | 17 | 32 | 76 | 38 | 23 | 13 |
| M24 | M24, P5/8" | 41 | 19 | 32 | 76 | 38 | 23 | 15 |
| M27 | M27, U1" | 41 | 20 | 32 | 76 | 38 | 23 | 15 |
| M30 | M30 | 41 | 23 | 32 | 76 | 38 | 30 | 17 |
| M33 | M33 | 41 | 25 | 32 | 76 | 38 | 30 | 19 |
| U11/8 | U1 1/8" | 41 | 22 | 32 | 76 | 38 | 30 | 17 |
| U11/4 | U1 1/4", P7/8" | 41 | 24 | 32 | 76 | 38 | 23 | 19 |
| P3/8 | P3/8" | 41 | 14 | 32 | 76 | 38 | 15 | 11 |
| P1/2 | P1/2" | 41 | 18 | 32 | 76 | 38 | 18 | 14 |
| P3/4 | P3/4" | 41 | 23 | 32 | 76 | 38 | 23 | 17 |

• Exclusive Collet for SDT

TER(ER Tap Collet)



ER Tap Collets (DIN6499 / ISO15488)

(mm)

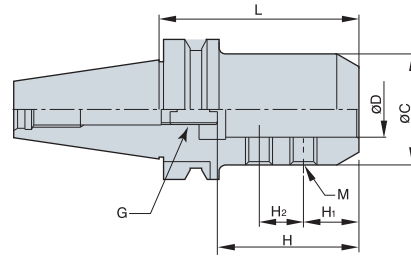
| Designation | Screw standard | ØC | ØD | ØC1 | L | L1 | H | W | |
|---------------|----------------|-------|-------|------|------|------|-----|-----|-----|
| TER16 - 4×3.2 | M3 | 16.74 | 4 | 10.1 | 27.5 | 6.3 | 18 | 3.2 | |
| | M4 | 16.74 | 5 | 10.1 | 27.5 | 6.3 | 18 | 4 | |
| | 5.5×4.5 | M5 | 16.74 | 5.5 | 10.1 | 27.5 | 6.3 | 18 | 4.5 |
| | 6×4.5 | M6 | 16.74 | 6 | 10.1 | 27.5 | 6.3 | 18 | 4.5 |
| | 6.2×5 | M8 | 16.74 | 6.2 | 10.1 | 27.5 | 6.3 | 18 | 5 |
| | 7×5.5 | M10 | 16.74 | 7 | 10.1 | 27.5 | 6.3 | 18 | 5.5 |
| TER20 - 5×4 | M4 | 20.74 | 5 | 13.2 | 31.5 | 7.2 | 18 | 4 | |
| | M5 | 20.74 | 5.5 | 13.2 | 31.5 | 7.2 | 18 | 4.5 | |
| | 6×4.5 | M6 | 20.74 | 6 | 13.2 | 31.5 | 7.2 | 18 | 4.5 |
| | 6.2×5 | M8 | 20.74 | 6.2 | 13.2 | 31.5 | 7.2 | 18 | 5 |
| | 7×5.5 | M10 | 20.74 | 7 | 13.2 | 31.5 | 7.2 | 18 | 5.5 |
| | 8×6 | M11 | 20.74 | 8 | 13.2 | 31.5 | 7.2 | 18 | 6 |
| TER25 - 5×4 | M4 | 25.74 | 5 | 17.6 | 34 | 7.5 | 18 | 4 | |
| | M5 | 25.74 | 5.5 | 17.6 | 34 | 7.5 | 18 | 4.5 | |
| | 6×4.5 | M6 | 25.74 | 6 | 17.6 | 34 | 7.5 | 18 | 4.5 |
| | 6.2×5 | M8 | 25.74 | 6.2 | 17.6 | 34 | 7.5 | 18 | 5 |
| | 7×5.5 | M10 | 25.74 | 7 | 17.6 | 34 | 7.5 | 18 | 5.5 |
| | 8.5×6.5 | M12 | 25.74 | 8.5 | 17.6 | 34 | 7.5 | 22 | 6.5 |
| TER32 - 6×4.5 | M6 | 32.74 | 6 | 23.1 | 40 | 8.2 | 18 | 4.5 | |
| | M8 | 32.74 | 6.2 | 23.1 | 40 | 8.2 | 18 | 5 | |
| | M10 | 32.74 | 7 | 23.1 | 40 | 8.2 | 18 | 5.5 | |
| | M11 | 32.74 | 8 | 23.1 | 40 | 8.2 | 22 | 6 | |
| | M12 | 32.74 | 8.5 | 23.1 | 40 | 8.2 | 22 | 6.5 | |
| | M14 | 32.74 | 10.5 | 23.1 | 40 | 8.2 | 25 | 8 | |
| | M16 | 32.74 | 12.5 | 23.1 | 40 | 8.2 | 25 | 10 | |
| | M18 | 32.74 | 14 | 23.1 | 40 | 8.2 | 25 | 11 | |
| | M20 | 32.74 | 15 | 23.1 | 40 | 8.2 | 25 | 12 | |
| | M22 | 32.74 | 17 | 23.1 | 40 | 8.2 | 25 | 13 | |
| | P1/4 | 32.74 | 11 | 23.1 | 40 | 8.2 | 25 | 9 | |
| | P3/8 | 32.74 | 14 | 23.1 | 40 | 8.2 | 25 | 11 | |
| U5/8 | 32.74 | 12 | 23.1 | 40 | 8.2 | 25 | 9 | | |
| U1/2 | 32.74 | 9 | 23.1 | 40 | 8.2 | 22 | 7 | | |

•Please use after combination with collet chuck (SDC, HPS, HDC)




DBT-SLA (Flat Type)

MAS403-BT



(mm)

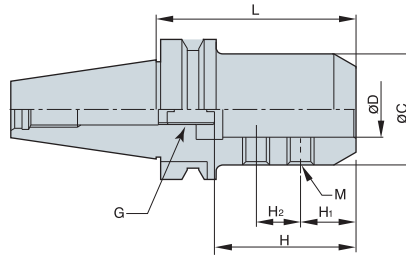
| Designation | ØD | ØC | L | H(max) | H1 | H2 | M | G |  kg |
|--------------------|----|----|-----|--------|----|----|-----|-----|--|
| DBT30 - SLA 6 - 60 | 6 | 25 | 60 | 35 | 18 | - | M5 | M5 | 0.7 |
| SLA 8 - 60 | 8 | 28 | 60 | 35 | 18 | - | M6 | M5 | 0.8 |
| SLA10 - 60 | 10 | 35 | 60 | 50 | 14 | 13 | M8 | M8 | 0.9 |
| SLA12 - 60 | 12 | 40 | 60 | 50 | 14 | 13 | M8 | M8 | 1.1 |
| SLA14 - 60 | 14 | 40 | 60 | 50 | 14 | 13 | M8 | M12 | 1.2 |
| SLA16 - 90 | 16 | 40 | 90 | 70 | 25 | 20 | M10 | M12 | 1.3 |
| SLA19 - 90 | 19 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.4 |
| SLA20 - 90 | 20 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.4 |
| SLA25 - 90 | 25 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.5 |
| DBT40 - SLA 6 - 60 | 6 | 25 | 60 | 35 | 18 | - | M5 | M5 | 1.1 |
| SLA 8 - 60 | 8 | 28 | 60 | 35 | 18 | - | M6 | M5 | 1.1 |
| SLA10 - 60 | 10 | 35 | 60 | 50 | 14 | 13 | M8 | M8 | 1.2 |
| SLA12 - 60 | 12 | 40 | 60 | 50 | 14 | 13 | M8 | M8 | 1.4 |
| SLA14 - 60 | 14 | 40 | 60 | 50 | 14 | 13 | M8 | M12 | 1.4 |
| SLA16 - 90 | 16 | 40 | 90 | 70 | 25 | 20 | M10 | M12 | 1.5 |
| SLA19 - 90 | 19 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.7 |
| SLA20 - 90 | 20 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.8 |
| SLA25 - 90 | 25 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.7 |
| SLA32 - 90 | 32 | 60 | 90 | 80 | 25 | 20 | M14 | M12 | 1.9 |
| SLA32 - 105 | 32 | 60 | 105 | 80 | 25 | 25 | M14 | M12 | 1.9 |
| SLA40 - 105 | 40 | 80 | 105 | 80 | 25 | 25 | M16 | - | 1.8 |
| DBT50 - SLA 6 - 90 | 6 | 25 | 90 | 35 | 18 | - | M5 | M5 | 3.7 |
| SLA 8 - 90 | 8 | 28 | 90 | 35 | 18 | - | M6 | M5 | 3.9 |
| SLA10 - 90 | 10 | 35 | 90 | 50 | 14 | 13 | M8 | M8 | 4.1 |
| SLA12 - 90 | 12 | 40 | 90 | 50 | 14 | 13 | M8 | M8 | 4.3 |
| SLA14 - 90 | 14 | 40 | 90 | 50 | 14 | 13 | M8 | M12 | 4.3 |
| SLA16 - 90 | 16 | 40 | 90 | 70 | 25 | 20 | M10 | M12 | 4.4 |
| SLA19 - 90 | 19 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 4.6 |
| SLA20 - 105 | 20 | 50 | 105 | 70 | 25 | 20 | M12 | M12 | 4.8 |
| SLA25 - 105 | 25 | 50 | 105 | 70 | 25 | 20 | M12 | M12 | 4.9 |
| SLA25 - 135 | 25 | 50 | 135 | 80 | 25 | 25 | M12 | M12 | 5.2 |
| SLA25 - 165 | 25 | 50 | 165 | 80 | 25 | 25 | M12 | M12 | 5.5 |
| SLA32 - 105 | 32 | 60 | 105 | 80 | 25 | 25 | M14 | M12 | 5.1 |
| SLA32 - 135 | 32 | 60 | 135 | 80 | 25 | 25 | M14 | M12 | 5.4 |
| SLA32 - 165 | 32 | 60 | 165 | 80 | 25 | 25 | M14 | M12 | 5.7 |
| SLA40 - 105 | 40 | 90 | 105 | 80 | 25 | 25 | M16 | M12 | 5.3 |
| SLA40 - 150 | 40 | 90 | 150 | 80 | 25 | 25 | M16 | M12 | 5.8 |
| SLA42 - 105 | 42 | 90 | 105 | 80 | 25 | 25 | M16 | M12 | 5.5 |

• Spare Parts : see page 59




BT-SLA (Flat Type)

MAS403-BT



(mm)

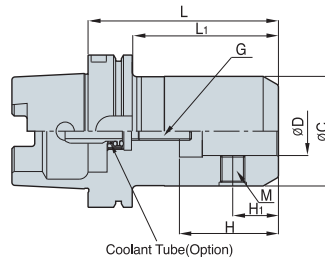
| Designation | ØD | ØC | L | H(max) | H1 | H2 | M | G |  | |
|-------------|------------|----|-----|--------|----|----|-----|-----|---|-----|
| BT30 - | SLA 6 - 60 | 6 | 25 | 60 | 35 | 18 | - | M5 | M5 | 0.7 |
| | SLA 8 - 60 | 8 | 28 | 60 | 35 | 18 | - | M6 | M5 | 0.8 |
| | SLA10 - 60 | 10 | 35 | 60 | 50 | 14 | 13 | M8 | M8 | 0.9 |
| | SLA12 - 60 | 12 | 40 | 60 | 50 | 14 | 13 | M8 | M8 | 1.1 |
| | SLA14 - 60 | 14 | 40 | 60 | 50 | 14 | 13 | M8 | M12 | 1.2 |
| | SLA16 - 90 | 16 | 40 | 90 | 70 | 25 | 20 | M10 | M12 | 1.3 |
| | SLA19 - 90 | 19 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.4 |
| | SLA20 - 90 | 20 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.4 |
| | SLA25 - 90 | 25 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.5 |
| BT40 - | SLA 6 - 60 | 6 | 25 | 60 | 35 | 18 | - | M5 | M5 | 1.1 |
| | SLA 8 - 60 | 8 | 28 | 60 | 35 | 18 | - | M6 | M5 | 1.1 |
| | SLA10 - 60 | 10 | 35 | 60 | 50 | 14 | 13 | M8 | M8 | 1.2 |
| | SLA12 - 60 | 12 | 40 | 60 | 50 | 14 | 13 | M8 | M8 | 1.4 |
| | SLA14 - 60 | 14 | 40 | 60 | 50 | 14 | 13 | M8 | M12 | 1.4 |
| | SLA16 - 90 | 16 | 40 | 90 | 70 | 25 | 20 | M10 | M12 | 1.5 |
| | SLA19 - 90 | 19 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.7 |
| | SLA20 - 90 | 20 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.8 |
| | SLA25 - 90 | 25 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 1.7 |
| | SLA32 - 90 | 32 | 60 | 90 | 80 | 25 | 20 | M14 | M12 | 1.9 |
| SLA32 -105 | 32 | 60 | 105 | 80 | 25 | 25 | M14 | M12 | 1.9 | |
| SLA40 -105 | 40 | 80 | 105 | 80 | 25 | 25 | M16 | - | 1.8 | |
| BT50 - | SLA 6 - 90 | 6 | 25 | 90 | 35 | 18 | - | M5 | M5 | 3.7 |
| | SLA 8 - 90 | 8 | 28 | 90 | 35 | 18 | - | M6 | M5 | 3.9 |
| | SLA10 - 90 | 10 | 35 | 90 | 50 | 14 | 13 | M8 | M8 | 4.1 |
| | SLA12 - 90 | 12 | 40 | 90 | 50 | 14 | 13 | M8 | M8 | 4.3 |
| | SLA14 - 90 | 14 | 40 | 90 | 50 | 14 | 13 | M8 | M12 | 4.3 |
| | SLA16 - 90 | 16 | 40 | 90 | 70 | 25 | 20 | M10 | M12 | 4.4 |
| | SLA19 - 90 | 19 | 50 | 90 | 70 | 25 | 20 | M12 | M12 | 4.6 |
| | SLA20 -105 | 20 | 50 | 105 | 70 | 25 | 20 | M12 | M12 | 4.8 |
| | SLA25 -105 | 25 | 50 | 105 | 70 | 25 | 20 | M12 | M12 | 4.9 |
| | SLA25 -135 | 25 | 50 | 135 | 80 | 25 | 25 | M12 | M12 | 5.2 |
| | SLA25 -165 | 25 | 50 | 165 | 80 | 25 | 25 | M12 | M12 | 5.5 |
| | SLA32 -105 | 32 | 60 | 105 | 80 | 25 | 25 | M14 | M12 | 5.1 |
| | SLA32 -135 | 32 | 60 | 135 | 80 | 25 | 25 | M14 | M12 | 5.4 |
| | SLA32 -165 | 32 | 60 | 165 | 80 | 25 | 25 | M14 | M12 | 5.7 |
| | SLA40 -105 | 40 | 90 | 105 | 80 | 25 | 25 | M16 | M12 | 5.3 |
| SLA40 -150 | 40 | 90 | 150 | 80 | 25 | 25 | M16 | M12 | 5.8 | |
| SLA42 -105 | 42 | 90 | 105 | 80 | 25 | 25 | M16 | M12 | 5.5 | |

• Spare Parts : see page 59




HSK-SLA (Flat Type)

DIN69893-1, ISO 12164-1 : 2001



(mm)

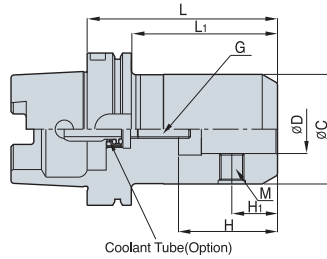
| Designation | ØD | ØC | L | L1 | H | H1 | M | G |  |
|-------------------|----|----|-----|----|----|----|-----|-----|---|
| HSK 40A-SLA 6 -70 | 6 | 25 | 70 | 57 | 37 | 15 | M6 | M5 | 0.3 |
| SLA 8 -70 | 8 | 28 | 70 | 57 | 37 | 15 | M8 | M6 | 0.3 |
| SLA10 -75 | 10 | 35 | 75 | 62 | 43 | 17 | M10 | M8 | 0.3 |
| SLA12 -80 | 12 | 42 | 80 | 67 | 49 | 20 | M12 | M8 | 0.4 |
| SLA14 -85 | 14 | 44 | 85 | 72 | 49 | 20 | M12 | M8 | 0.6 |
| SLA16 -85 | 16 | 48 | 85 | 72 | 55 | 22 | M14 | M8 | 0.6 |
| HSK 50A-SLA 6 -80 | 6 | 25 | 80 | 54 | 37 | 15 | M6 | M5 | 0.8 |
| SLA 8 -80 | 8 | 28 | 80 | 54 | 37 | 15 | M8 | M6 | 0.8 |
| SLA10 -85 | 10 | 35 | 85 | 59 | 43 | 17 | M10 | M8 | 0.9 |
| SLA12 -90 | 12 | 42 | 90 | 64 | 49 | 20 | M12 | M10 | 1.2 |
| SLA14 -90 | 14 | 44 | 90 | 64 | 49 | 20 | M12 | M12 | 1.3 |
| SLA16 -95 | 16 | 48 | 95 | 69 | 55 | 22 | M14 | M12 | 1.4 |
| SLA18 -95 | 18 | 50 | 95 | 69 | 55 | 22 | M14 | M12 | 1.5 |
| SLA20-100 | 20 | 52 | 100 | 74 | 68 | 25 | M16 | M12 | 1.6 |
| HSK 63A-SLA 6 -80 | 6 | 25 | 80 | 54 | 37 | 15 | M6 | M5 | 1.0 |
| SLA 8 -80 | 8 | 28 | 80 | 54 | 37 | 15 | M8 | M6 | 1.1 |
| SLA10 -85 | 10 | 35 | 85 | 59 | 43 | 17 | M10 | M8 | 1.1 |
| SLA12 -90 | 12 | 42 | 90 | 64 | 49 | 20 | M12 | M10 | 1.7 |
| SLA14 -90 | 14 | 44 | 90 | 64 | 49 | 20 | M12 | M12 | 1.7 |
| SLA16 -95 | 16 | 48 | 95 | 69 | 55 | 22 | M14 | M12 | 1.7 |
| SLA18 -95 | 18 | 50 | 95 | 69 | 55 | 22 | M14 | M12 | 1.9 |
| SLA20-100 | 20 | 52 | 100 | 75 | 68 | 25 | M16 | M12 | 2.0 |
| SLA25-105 | 25 | 65 | 105 | 79 | 68 | 25 | M18 | M12 | 2.7 |
| SLA32-105 | 32 | 72 | 105 | 79 | 72 | 30 | M20 | M12 | 2.9 |


- Spare Parts : see page 59
- Optional through coolant system



HSK-SLA (Flat Type)




DIN69893-1, ISO 12164-1 : 2001



| Designation | ØD | ØC | L | L1 | H | H1 | M | G |  |
|-------------------|----|----|-----|-----|----|----|-----|-----|---|
| HSK100A-SLA 6 -90 | 6 | 25 | 90 | 61 | 37 | 15 | M6 | M5 | 3.1 |
| SLA 8 -90 | 8 | 28 | 90 | 61 | 37 | 15 | M8 | M6 | 3.3 |
| SLA10 -90 | 10 | 35 | 90 | 61 | 43 | 17 | M10 | M8 | 3.5 |
| SLA12 -95 | 12 | 42 | 95 | 66 | 49 | 20 | M12 | M10 | 3.5 |
| SLA14 -95 | 14 | 44 | 95 | 66 | 49 | 20 | M12 | M12 | 3.6 |
| SLA16-100 | 16 | 48 | 100 | 71 | 55 | 22 | M14 | M12 | 3.8 |
| SLA18-100 | 18 | 50 | 100 | 71 | 55 | 22 | M14 | M12 | 3.8 |
| SLA20-105 | 20 | 52 | 105 | 76 | 68 | 25 | M16 | M12 | 3.9 |
| SLA25-110 | 25 | 65 | 110 | 81 | 68 | 25 | M18 | M12 | 4.0 |
| SLA32-125 | 32 | 72 | 125 | 96 | 72 | 30 | M20 | M12 | 4.3 |
| SLA40-135 | 40 | 80 | 135 | 106 | 78 | 32 | M20 | M12 | 4.4 |
| SLA42-135 | 42 | 80 | 135 | 106 | 78 | 32 | M20 | M12 | 4.7 |

• Spare Parts : see page 59

Parts

| Division | Spare Parts | | |
|----------|---|---|---|
| | Basic | | Option |
| Type | Set Screw | Adjust Screw | Wrench |
| |  |  |  |
| | DBT / BT type | HSK / SK type | |
| SLA6 | BTF0505 | BTF0606 | M520C |
| SLA8 | BTF0606 | BTF0808 | M520C |
| SLA10 | BTF0808 | BTF1010 | M820C |
| SLA12 | BTF0808 | BTF1212-1.5 | M820C |
| SLA14 | BTF0808 | BTF1212-1.5 | M1230C |
| SLA16 | BTF1010 | BTF1414-1.5 | M1230C |
| SLA19 | BTF1212-1.5 | BTF1616-1.5 | M1230C |
| SLA20 | BTF1212-1.5 | BTF1616-1.5 | M1230C |
| SLA25 | BTF1212-1.5 | BTF1818-1.5 | M1230C |
| SLA32 | BTF1414-1.5 | BTF2020-1.5 | M1230C |
| SLA40 | BTF1624-1.5 | BTF2020-1.5 | M1230C |
| SLA42 | BTF1624-1.5 | BTF2020-1.5 | M1230C |



BT-SLW (Whistle Notch Type)

MAS403-BT

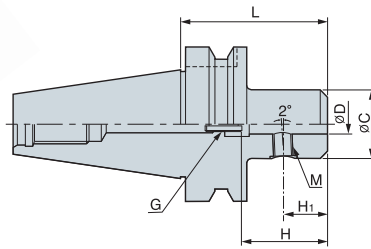


Fig. 1

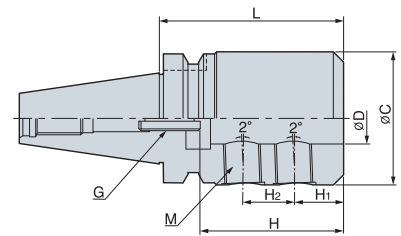


Fig. 2

(mm)

| Designation | ØD | ØC | L | H | H1 | H2 | M | G | $\frac{\sigma}{kg}$ | Fig. |
|----------------|----|----|-----|----|------|----|-----|-----|---------------------|------|
| BT30-SLW 6- 60 | 6 | 25 | 60 | 36 | 18 | - | M6 | M5 | 0.7 | 1 |
| SLW 8- 60 | 8 | 28 | 60 | 36 | 18 | - | M8 | M6 | 0.8 | 1 |
| SLW10- 60 | 10 | 35 | 60 | 40 | 20 | - | M10 | M8 | 0.9 | 1 |
| SLW12- 60 | 12 | 42 | 60 | 45 | 22.5 | - | M12 | M10 | 1.1 | 1 |
| SLW16- 90 | 16 | 48 | 90 | 48 | 24 | - | M14 | M12 | 1.2 | 1 |
| SLW20- 90 | 20 | 52 | 90 | 50 | 25 | - | M16 | M16 | 1.4 | 1 |
| BT40-SLW 6- 60 | 6 | 25 | 60 | 36 | 18 | - | M6 | M5 | 1.1 | 1 |
| SLW 8- 60 | 8 | 28 | 60 | 36 | 18 | - | M8 | M6 | 1.1 | 1 |
| SLW10- 60 | 10 | 35 | 60 | 40 | 20 | - | M10 | M8 | 1.2 | 1 |
| SLW12- 60 | 12 | 42 | 60 | 45 | 22.5 | - | M12 | M10 | 1.4 | 1 |
| SLW16- 90 | 16 | 48 | 90 | 48 | 24 | - | M14 | M12 | 1.6 | 1 |
| SLW20- 90 | 20 | 52 | 90 | 50 | 25 | - | M16 | M16 | 1.8 | 1 |
| SLW25- 90 | 25 | 65 | 90 | 56 | 24 | 22 | M18 | M20 | 2.0 | 2 |
| SLW32-105 | 32 | 72 | 105 | 60 | 24 | 24 | M20 | M20 | 2.2 | 2 |
| BT50-SLW 6- 90 | 6 | 25 | 90 | 36 | 18 | - | M6 | M5 | 3.7 | 1 |
| SLW 8- 90 | 8 | 28 | 90 | 36 | 18 | - | M8 | M6 | 3.9 | 1 |
| SLW10- 90 | 10 | 35 | 90 | 40 | 20 | - | M10 | M8 | 4.0 | 1 |
| SLW12- 90 | 12 | 42 | 90 | 45 | 22.5 | - | M12 | M10 | 4.2 | 1 |
| SLW16- 90 | 16 | 48 | 90 | 48 | 24 | - | M14 | M12 | 4.3 | 1 |
| SLW20-105 | 20 | 52 | 105 | 50 | 25 | - | M16 | M16 | 4.5 | 1 |
| SLW25-105 | 25 | 65 | 105 | 56 | 24 | 22 | M18 | M20 | 4.8 | 2 |
| SLW32-105 | 32 | 72 | 105 | 60 | 24 | 24 | M20 | M20 | 4.9 | 2 |
| SLW40-120 | 40 | 90 | 120 | 73 | 25 | 25 | M20 | M20 | 5.1 | 2 |

• Spare Parts : see page 61



HSK-SLW (Whistle Notch Type)

DIN69893-1, ISO 12164-1 : 2001

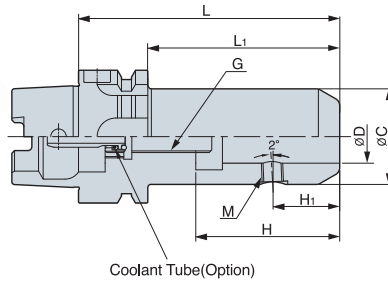


Fig. 1

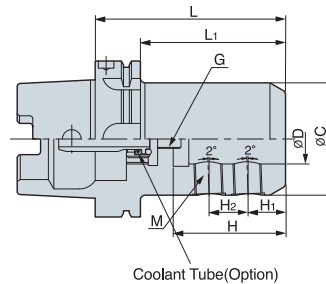





Fig. 2

| Designation | ØD | ØC | L | L1 | H | H1 | H2 | M | G | $\frac{\circ}{kg}$ | Fig. | |
|--------------|-----------|----|-----|-----|----|----|------|-----|-----|--------------------|------|---|
| HSK40A - SLW | 6- 70 | 6 | 25 | 70 | 35 | 36 | 18 | - | M6 | M5 | 0.3 | 1 |
| | 8- 70 | 8 | 28 | 70 | 35 | 36 | 18 | - | M8 | M6 | 0.3 | 1 |
| | SLW10- 75 | 10 | 35 | 75 | 40 | 40 | 20 | - | M10 | M8 | 0.3 | 1 |
| | SLW12- 80 | 12 | 42 | 80 | 45 | 45 | 22.5 | - | M12 | M10 | 0.4 | 1 |
| | SLW16- 85 | 16 | 48 | 85 | 50 | 48 | 24 | - | M14 | M12 | 0.6 | 1 |
| HSK50A - SLW | 6- 80 | 6 | 25 | 80 | 38 | 36 | 18 | - | M6 | M5 | 0.8 | 1 |
| | 8- 80 | 8 | 28 | 80 | 38 | 36 | 18 | - | M8 | M6 | 0.8 | 1 |
| | SLW10- 85 | 10 | 35 | 85 | 43 | 40 | 20 | - | M10 | M8 | 0.9 | 1 |
| | SLW12- 90 | 12 | 42 | 90 | 48 | 45 | 22.5 | - | M12 | M10 | 1.2 | 1 |
| | SLW16- 95 | 16 | 48 | 95 | 53 | 48 | 24 | - | M14 | M12 | 1.3 | 1 |
| SLW20-100 | 20 | 52 | 100 | 58 | 50 | 25 | - | M16 | M16 | 1.4 | 1 | |
| HSK63A - SLW | 6- 80 | 6 | 25 | 80 | 38 | 36 | 18 | - | M6 | M5 | 1.0 | 1 |
| | 8- 80 | 8 | 28 | 80 | 38 | 36 | 18 | - | M8 | M6 | 1.1 | 1 |
| | SLW10- 85 | 10 | 35 | 85 | 43 | 40 | 20 | - | M10 | M8 | 1.1 | 1 |
| | SLW12- 90 | 12 | 42 | 90 | 48 | 45 | 22.5 | - | M12 | M10 | 1.7 | 1 |
| | SLW16- 95 | 16 | 48 | 95 | 53 | 48 | 24 | - | M14 | M12 | 1.7 | 1 |
| SLW20-100 | 20 | 52 | 100 | 63 | 50 | 25 | - | M16 | M16 | 2.0 | 1 | |
| HSK100A- SLW | 6- 90 | 6 | 25 | 90 | 45 | 36 | 18 | - | M6 | M5 | 3.1 | 1 |
| | 8- 90 | 8 | 28 | 90 | 45 | 36 | 18 | - | M8 | M6 | 3.3 | 1 |
| | SLW10- 90 | 10 | 35 | 90 | 45 | 40 | 20 | - | M10 | M8 | 3.5 | 1 |
| | SLW12- 95 | 12 | 42 | 95 | 50 | 45 | 22.5 | - | M12 | M10 | 3.5 | 1 |
| | SLW16-100 | 16 | 48 | 100 | 55 | 48 | 24 | - | M14 | M12 | 3.8 | 1 |
| | SLW20-105 | 20 | 52 | 105 | 60 | 50 | 25 | - | M16 | M16 | 3.9 | 1 |
| | SLW25-110 | 25 | 65 | 110 | 65 | 56 | 24 | 22 | M18 | M20 | 4.0 | 2 |
| SLW32-125 | 32 | 72 | 125 | 80 | 60 | 24 | 24 | M20 | M20 | 4.3 | 2 | |

• Balanced / Balanceable type can be manufactured upon request • Spare Parts : see page 61

Parts

| Division | Spare Parts | | |
|----------|---|---|---|
| | Basic | Option | |
| | Set Screw | Adjust Screw | Wrench |
| Type |  |  |  |
| SLW 6 | BTF0606 | M520C | LW-3 |
| SLW 8 | BTF0808 | M520C | LW-4 |
| SLW10 | BTF1010 | M820C | LW-5 |
| SLW12 | BTF1212-5 | M820C | LW-6 |
| SLW16 | BTF1414-1.5 | M1230C | LW-6 |
| SLW20 | BTF1616-1.5 | M1230C | LW-8 |
| SLW25 | BTF1818-1.5 | M1230C | LW-8 |
| SLW32 | BTF2020-1.5 | M1230C | LW-10 |
| SLW40 | BTF2020-1.5 | M1230C | LW-10 |



DBT-FMA

MAS403-BT

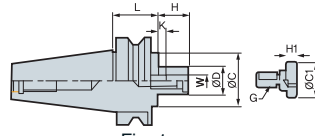


Fig. 1

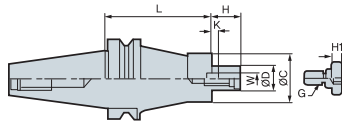


Fig. 2

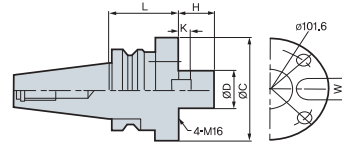


Fig. 3

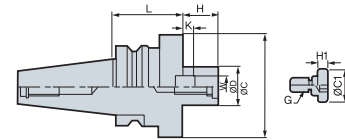


Fig. 4

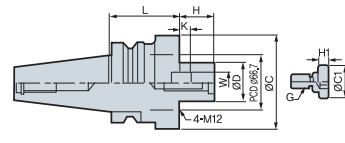



Fig. 5

(mm)

| Designation | Cutter Dia. | ØD | L | ØC | H | W | K | G | ØC1 | H1 |  kg | Fig. |
|----------------------|-------------|--------|-----|-----|----|-------|------|-----|-----|----|--|------|
| DBT30- FMA22.225 -30 | 50 | 22.225 | 30 | 40 | 18 | 8 | 3.5 | M10 | 28 | 9 | 0.6 | 1 |
| FMA25.4 - 45 | 80 | 25.4 | 45 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 0.8 | 4 |
| DBT40- FMA25.4 - 45 | 80 | 25.4 | 45 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 1.4 | 1 |
| | 80 | 25.4 | 90 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 3.1 | 1 |
| FMA31.75 - 45 | 100 | 31.75 | 45 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 1.6 | 1 |
| | 100 | 31.75 | 75 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 3.0 | 1 |
| FMA38.1 - 60 | 125 | 38.1 | 60 | 80 | 34 | 15.9 | 9 | M20 | 50 | 14 | 2.9 | 4 |
| DBT50- FMA25.4 - 45 | 80 | 25.4 | 45 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 3.8 | 1 |
| | 80 | 25.4 | 90 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 4.5 | 1 |
| | 150 | 25.4 | 150 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 5.5 | 2 |
| FMA31.75 - 45 | 100 | 31.75 | 45 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 4.6 | 1 |
| | 100 | 31.75 | 75 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 5.2 | 1 |
| | 105 | 31.75 | 105 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 6.0 | 2 |
| FMA38.1 - 45 | 125 | 38.1 | 45 | 80 | 34 | 15.9 | 9 | M20 | 50 | 14 | 4.3 | 1 |
| | 125 | 38.1 | 75 | 80 | 34 | 15.9 | 9 | M20 | 50 | 14 | 5.5 | 1 |
| FMA50.8 - 45 | 160 | 50.8 | 45 | 100 | 36 | 19.05 | 10 | M24 | 65 | 14 | 4.8 | 1 |
| | 160 | 50.8 | 75 | 100 | 36 | 19.05 | 10 | M24 | 65 | 14 | 6.8 | 1 |
| FMA47.625 -75 | 200 | 47.625 | 75 | 128 | 38 | 25.4 | 12.5 | - | - | - | 7.6 | 3 |

- Type A is for face-milling cutter conforming to JIS B4113.
- Type B and C are arbor for T-MAX face-milling cutter and shoulder Cutter
- Weight, except for cutter body weight.
- Key and screw are attached.
- Wrench is option.
- Spare Part : see page 63



BT-FMA

MAS403-BT

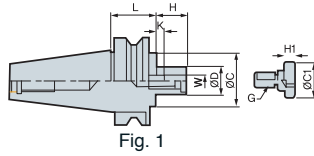


Fig. 1

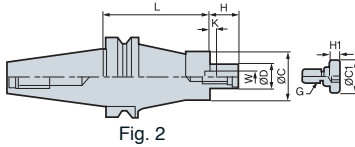


Fig. 2

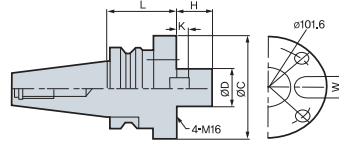


Fig. 3

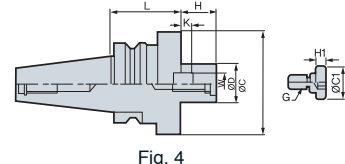


Fig. 4

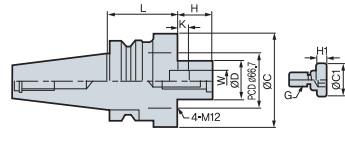


Fig. 5

| Designation | Cutter Dia. | ØD | L | ØC | H | W | K | G | ØC1 | H1 | kg | Fig. |
|---------------------|-------------|--------|-----|-----|----|-------|------|-----|-----|----|-----|------|
| BT30- FMA22.225 -30 | 50 | 22.225 | 30 | 40 | 18 | 8 | 3.5 | M10 | 28 | 9 | 0.6 | 1 |
| FMA25.4 - 45 | 80 | 25.4 | 45 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 0.8 | 4 |
| BT40- FMA25.4 - 45 | 80 | 25.4 | 45 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 1.4 | 1 |
| FMA25.4 - 90 | 80 | 25.4 | 90 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 3.1 | 1 |
| FMA31.75 - 45 | 100 | 31.75 | 45 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 1.6 | 1 |
| FMA31.75 - 75 | 100 | 31.75 | 75 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 3.0 | 1 |
| FMA38.1 - 60 | 125 | 38.1 | 60 | 80 | 34 | 15.9 | 9 | M20 | 50 | 14 | 2.9 | 4 |
| BT50- FMA25.4 - 45 | 80 | 25.4 | 45 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 3.8 | 1 |
| FMA25.4 - 90 | 80 | 25.4 | 90 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 4.5 | 1 |
| FMA25.4 - 150 | 80 | 25.4 | 150 | 50 | 22 | 9.5 | 5 | M12 | 33 | 10 | 5.5 | 2 |
| FMA31.75 - 45 | 100 | 31.75 | 45 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 4.6 | 1 |
| FMA31.75 - 75 | 100 | 31.75 | 75 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 5.2 | 1 |
| FMA31.75 - 105 | 100 | 31.75 | 105 | 60 | 30 | 12.7 | 7 | M16 | 40 | 10 | 6.0 | 2 |
| FMA38.1 - 45 | 125 | 38.1 | 45 | 80 | 34 | 15.9 | 9 | M20 | 50 | 14 | 4.3 | 1 |
| FMA38.1 - 75 | 125 | 38.1 | 75 | 80 | 34 | 15.9 | 9 | M20 | 50 | 14 | 5.5 | 1 |
| FMA50.8 - 45 | 160 | 50.8 | 45 | 100 | 36 | 19.05 | 10 | M24 | 65 | 14 | 4.8 | 1 |
| FMA50.8 - 75 | 160 | 50.8 | 75 | 100 | 36 | 19.05 | 10 | M24 | 65 | 14 | 6.8 | 1 |
| FMA47.625 -75 | 200 | 47.625 | 75 | 128 | 38 | 25.4 | 12.5 | - | - | - | 7.6 | 3 |

- Type A is for face-milling cutter conforming to JIS B4113.
- Type B and C are arbor for T-MAX face-milling cutter and shoulder Cutter
- Weight, except for cutter body weight.
- Key and screw are attached.
- Wrench is option.
- Spare Part : see page 63

Parts

| Division | Spare Parts | | | | |
|------------|-------------|------------|-------------|-------------|--------|
| | Basic | | | | Option |
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Wrench |
| Type | | | | | |
| FMA22 | K8.0 | MBA-M10 | BX0310 | - | LW-8 |
| FMA22.225 | K8.0 | MBA-M10 | BX0310 | - | LW-8 |
| FMA25.4 | K9.5 | MBA-M12 | BX0412 | BX1230 | LW-10 |
| FMA31.75 | K12.7 | MBA-M16 | BX0515 | - | LW-14 |
| FMA38.1 | K15.87 | MBA-M20 | BX0615 | - | LW-17 |
| FMA50.8 | K19.05 | MBA-M24 | BX0820 | - | LW-19 |
| FMA47.625 | K25.4 | - | BX1020 | BX1645 | - |
| S-FMA25.4 | K9.5 | MBA-M12 | BX0412 | BX1230 | LW-10 |
| S-FMA31.75 | K12.7 | MBA-M16 | BX0515 | - | LW-14 |



BT-FMB

MAS403-BT

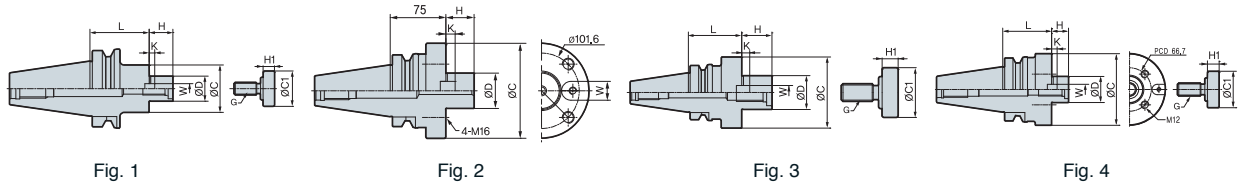



Fig. 1






Fig. 2

Fig. 3

Fig. 4

| | | | | | | | | | | | | (mm) | |
|----------------|-------------|---------|------|-----|-----|----|------|------|-----|----|---|------|---|
| Designation | Cutter Dia. | ØD | L | ØC | H | W | K | G | ØC1 | H1 |  | Fig. | |
| BT40 - FMB25.4 | - 60 | 80 | 25.4 | 60 | 80 | 26 | 9.5 | 5 | M12 | 33 | 10 | 3.6 | 3 |
| | 90 | 80 | 25.4 | 90 | 80 | 26 | 9.5 | 5 | M12 | 33 | 10 | 4.8 | 3 |
| FMB38.1 | - 60 | 100/125 | 38.1 | 60 | 85 | 26 | 15.9 | 9 | M20 | 50 | 14 | 3.5 | 3 |
| FMB27 | - 60 | 80 | 27 | 60 | 80 | 26 | 12 | 6 | M12 | 33 | 10 | 3.6 | 3 |
| | 90 | 80 | 27 | 90 | 80 | 26 | 12 | 6 | M12 | 33 | 10 | 4.8 | 3 |
| FMB40 | - 60 | 100/125 | 40 | 60 | 85 | 26 | 16 | 8.5 | M20 | 50 | 14 | 3.5 | 3 |
| BT50 - FMB25.4 | - 45 | 80 | 25.4 | 45 | 80 | 26 | 9.5 | 5 | M12 | 33 | 10 | 4.0 | 1 |
| | 90 | 80 | 25.4 | 90 | 80 | 26 | 9.5 | 5 | M12 | 33 | 10 | 5.8 | 1 |
| | 150 | 80 | 25.4 | 150 | 80 | 26 | 9.5 | 5 | M12 | 33 | 10 | 8.2 | 1 |
| FMB38.1 | - 45 | 100/125 | 38.1 | 45 | 85 | 26 | 15.9 | 9 | M20 | 50 | 14 | 4.6 | 1 |
| | 75 | 100/125 | 38.1 | 75 | 85 | 26 | 15.9 | 9 | M20 | 50 | 14 | 6.0 | 1 |
| | 105 | 100/125 | 38.1 | 105 | 85 | 26 | 15.9 | 9 | M20 | 50 | 14 | 8.7 | 1 |
| FMB38.1F | - 75 | 160 | 38.1 | 75 | 110 | 26 | 15.9 | 9 | M20 | 50 | 14 | 6.6 | 3 |
| FMB27 | - 45 | 80 | 27 | 45 | 80 | 26 | 12 | 6 | M12 | 33 | 10 | 4.0 | 1 |
| | 90 | 80 | 27 | 90 | 80 | 26 | 12 | 6 | M12 | 33 | 10 | 5.8 | 1 |
| | 150 | 80 | 27 | 150 | 80 | 26 | 12 | 6 | M12 | 33 | 10 | 8.2 | 1 |
| FMB40 | - 45 | 100/125 | 40 | 45 | 85 | 26 | 16 | 8.5 | M20 | 50 | 14 | 4.6 | 1 |
| | 75 | 100/125 | 40 | 75 | 85 | 26 | 16 | 8.5 | M20 | 50 | 14 | 6.0 | 1 |
| | 105 | 100/125 | 40 | 105 | 85 | 26 | 16 | 8.5 | M20 | 50 | 14 | 8.7 | 1 |
| FMB40F | - 75 | 160 | 40 | 75 | 110 | 26 | 16 | 8.5 | M20 | 50 | 14 | 6.6 | 4 |
| FMB60 | - 75 | 200 | 60 | 75 | 140 | 25 | 25.4 | 12.5 | - | - | - | 7.9 | 2 |

Parts

| Division | Spare Parts | | | | |
|-----------|---|---|---|---|---|
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Option Wrench |
| Type |  |  |  |  |  |
| FMB 25.4 | K9.5K | MBA - M12 | BX0412 | BX1230 | LW-10 |
| FMB 38.1 | K15.87(F) | MBA - M20 | BX0616 | - | LW-17 |
| FMB 38.1F | K15.87(F) | MBA - M20 | BX0616 | - | LW-17 |
| FMB 27 | K12.0 | MBA - M16 | BX0516 | - | LW-14 |
| FMB 40 | K15.87(F) | MBA - M20 | BX0616 | - | LW-17 |
| FMB 40F | K15.87(F) | MBA - M20 | BX0616 | - | LW-17 |
| FMB 60 | K25.4(H) | - | BX1020 | BX1645 | - |

DBT-FMC

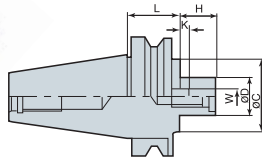


Fig. 1

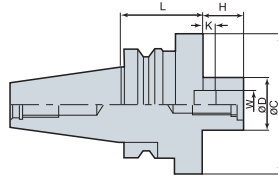


Fig. 2

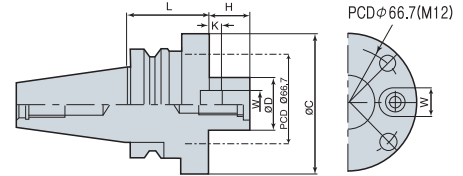


Fig. 3

| (mm) | | | | | | | | | | | |
|-------------|--------------|---------|------|-----|----|------|------|-----|----------------|------|---|
| Designation | Cutter Dia. | ØD | L | ØC | H | W | K | G | $\frac{Q}{kg}$ | Fig. | |
| DBT30 - FMC | 16 - 45 | 40 | 16 | 45 | 38 | 17 | 8.0 | 5.0 | M8 | 1.0 | 1 |
| | FMC 22 - 45 | 50/63 | 22 | 45 | 48 | 19 | 10.0 | 5.6 | M10 | 1.2 | 2 |
| | FMC 27 - 45 | 80 | 27 | 45 | 60 | 21 | 12.0 | 6.3 | M12 | 1.5 | 2 |
| DBT40 - FMC | 16 - 45 | 40 | 16 | 45 | 38 | 17 | 8.0 | 5.0 | M8 | 1.4 | 1 |
| | FMC 22 - 45 | 50/63 | 22 | 45 | 48 | 19 | 10.0 | 5.6 | M10 | 2.0 | 1 |
| | 90 | 50/63 | 22 | 90 | 48 | 19 | 10.0 | 5.6 | M10 | 2.1 | 1 |
| | FMC25.4 - 50 | 80 | 25.4 | 50 | 70 | 20 | 10.0 | 6.0 | M12 | 2.5 | 2 |
| | 90 | 80 | 25.4 | 90 | 70 | 20 | 10.0 | 6.0 | M12 | 2.7 | 2 |
| | FMC 27 - 60 | 80 | 27 | 60 | 60 | 21 | 12.0 | 6.3 | M12 | 2.5 | 2 |
| | 90 | 80 | 27 | 90 | 60 | 21 | 12.0 | 6.3 | M12 | 3.4 | 2 |
| | FMC 32 - 60 | 100 | 32 | 60 | 78 | 24 | 14.0 | 7.0 | M16 | 3.4 | 2 |
| | 90 | 100 | 32 | 90 | 78 | 24 | 14.0 | 7.0 | M16 | 3.4 | 2 |
| | FMC38.1 - 50 | 100 | 38.1 | 50 | 85 | 22 | 15.9 | 7.0 | M16 | 4.7 | 2 |
| 90 | 100 | 38.1 | 90 | 85 | 22 | 15.9 | 7.0 | M16 | 4.8 | 2 | |
| FMC 40 - 50 | 125/160 | 40 | 50 | 89 | 27 | 16.0 | 8.0 | M20 | 5.1 | 3 | |
| DBT50 - FMC | 16 - 60 | 40 | 16 | 60 | 38 | 17 | 8.0 | 5.0 | M8 | 3.5 | 1 |
| | FMC 22 - 60 | 50/63 | 22 | 60 | 48 | 19 | 10.0 | 5.6 | M10 | 3.6 | 1 |
| | FMC25.4 - 40 | 80 | 25.4 | 40 | 70 | 20 | 10.0 | 6.0 | M12 | 4.1 | 1 |
| | 90 | 80 | 25.4 | 90 | 70 | 20 | 10.0 | 6.0 | M12 | 5.5 | 1 |
| | 150 | 80 | 25.4 | 150 | 70 | 20 | 10.0 | 6.0 | M12 | 7.3 | 1 |
| | FMC 27 - 40 | 80 | 27 | 40 | 60 | 21 | 12.0 | 6.3 | M12 | 4.1 | 1 |
| | 90 | 80 | 27 | 90 | 60 | 21 | 12.0 | 6.3 | M12 | 5.5 | 1 |
| | 150 | 80 | 27 | 150 | 60 | 21 | 12.0 | 6.3 | M12 | 7.3 | 1 |
| | FMC 32 - 45 | 100 | 32 | 45 | 78 | 24 | 14.0 | 7.0 | M16 | 4.2 | 1 |
| | 75 | 100 | 32 | 75 | 78 | 24 | 14.0 | 7.0 | M16 | 5.5 | 1 |
| | 105 | 100 | 32 | 105 | 78 | 24 | 14.0 | 7.0 | M16 | 6.8 | 1 |
| | FMC38.1 - 50 | 100 | 38.1 | 50 | 85 | 22 | 15.9 | 7.0 | M16 | 5.8 | 1 |
| | 75 | 100 | 38.1 | 75 | 85 | 22 | 15.9 | 7.0 | M16 | 6.0 | 1 |
| | 105 | 100 | 38.1 | 105 | 85 | 22 | 15.9 | 7.0 | M16 | 6.4 | 1 |
| | FMC 40 - 50 | 125/160 | 40 | 50 | 89 | 27 | 16.0 | 8.0 | M20 | 7.6 | 3 |

Parts

| Division | Spare Parts | | | | |
|----------|-------------|------------|-------------|-------------|--------|
| | Basic | | | | Option |
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Wrench |
| Type | | | | | |
| FMC 16 | K8.0 | - | BX0310 | BX0820 | LW-6 |
| FMC 22 | K10.0 | - | BX0412 | BX1030 | LW-8 |
| FMC 25.4 | K9.5 | - | BX0515 | BX1225 | LW-10 |
| FMC 27 | K12.0 | MBA-M12 | BX0616 | - | LW-10 |
| FMC 32 | K14.0 | MBA-M16 | BX0616 | - | LW-14 |
| FMC38.1 | K15.87 | MBA-M16 | BX0616 | - | LW-14 |
| FMC40 | K15.87 | MBA-M20 | BX0616 | - | LW-17 |



BT-FMC

MAS403-BT

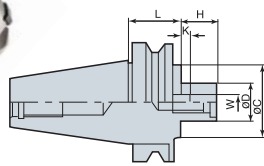


Fig. 1

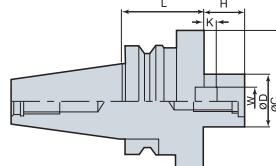


Fig. 2

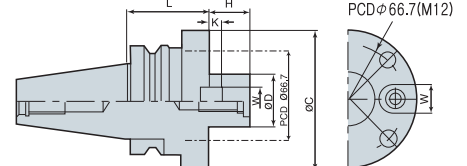








Fig. 3

(mm)

| Designation | Cutter Dia. | ØD | L | ØC | H | W | K | G |  | Fig. | |
|--------------|--------------|-------|------|-----|----|------|------|-----|---|------|---|
| BT30 - FMC | 16 - 45 | 40 | 16 | 45 | 38 | 17 | 8.0 | 5.0 | M8 | 1.0 | 1 |
| | 22 - 45 | 50/63 | 22 | 45 | 48 | 19 | 10.0 | 5.6 | M10 | 1.2 | 2 |
| | 27 - 45 | 80 | 27 | 45 | 60 | 21 | 12.0 | 6.3 | M12 | 1.5 | 2 |
| BT40 - FMC | 16 - 45 | 40 | 16 | 45 | 38 | 17 | 8.0 | 5.0 | M8 | 1.4 | 1 |
| | 22 - 45 | 50/63 | 22 | 45 | 48 | 19 | 10.0 | 5.6 | M10 | 2.0 | 1 |
| | | 50/63 | 22 | 90 | 48 | 19 | 10.0 | 5.6 | M10 | 2.1 | 1 |
| | FMC25.4 - 50 | 80 | 25.4 | 50 | 70 | 20 | 10.0 | 6.0 | M12 | 2.5 | 2 |
| | | 80 | 25.4 | 90 | 70 | 20 | 10.0 | 6.0 | M12 | 2.7 | 2 |
| | FMC 27 - 60 | 80 | 27 | 60 | 60 | 21 | 12.0 | 6.3 | M12 | 2.5 | 2 |
| | | 80 | 27 | 90 | 60 | 21 | 12.0 | 6.3 | M12 | 3.4 | 2 |
| | FMC 32 - 60 | 100 | 32 | 60 | 78 | 24 | 14.0 | 7.0 | M16 | 3.4 | 2 |
| | | 100 | 32 | 90 | 78 | 24 | 14.0 | 7.0 | M16 | 3.4 | 2 |
| FMC38.1 - 50 | 100 | 38.1 | 50 | 85 | 22 | 15.9 | 7.0 | M16 | 4.7 | 2 | |
| | 100 | 38.1 | 90 | 85 | 22 | 15.9 | 7.0 | M16 | 4.8 | 2 | |
| FMC 40 - 50 | 125/160 | 40 | 50 | 89 | 27 | 16.0 | 8.0 | M20 | 5.1 | 3 | |
| BT50 - FMC | 16 - 60 | 40 | 16 | 60 | 38 | 17 | 8.0 | 5.0 | M8 | 3.5 | 1 |
| | 22 - 60 | 50/63 | 22 | 60 | 48 | 19 | 10.0 | 5.6 | M10 | 3.6 | 1 |
| | FMC25.4 - 40 | 80 | 25.4 | 40 | 70 | 20 | 10.0 | 6.0 | M12 | 4.1 | 1 |
| | | 80 | 25.4 | 90 | 70 | 20 | 10.0 | 6.0 | M12 | 5.5 | 1 |
| | | 80 | 25.4 | 150 | 70 | 20 | 10.0 | 6.0 | M12 | 7.3 | 1 |
| | FMC 27 - 40 | 80 | 27 | 40 | 60 | 21 | 12.0 | 6.3 | M12 | 4.1 | 1 |
| | | 80 | 27 | 90 | 60 | 21 | 12.0 | 6.3 | M12 | 5.5 | 1 |
| | | 80 | 27 | 150 | 60 | 21 | 12.0 | 6.3 | M12 | 7.3 | 1 |
| | FMC 32 - 45 | 100 | 32 | 45 | 78 | 24 | 14.0 | 7.0 | M16 | 4.2 | 1 |
| | | 100 | 32 | 75 | 78 | 24 | 14.0 | 7.0 | M16 | 5.5 | 1 |
| | | 100 | 32 | 105 | 78 | 24 | 14.0 | 7.0 | M16 | 6.8 | 1 |
| | FMC38.1 - 50 | 100 | 38.1 | 50 | 85 | 22 | 15.9 | 7.0 | M16 | 5.8 | 1 |
| 100 | | 38.1 | 75 | 85 | 22 | 15.9 | 7.0 | M16 | 6.0 | 1 | |
| 100 | | 38.1 | 105 | 85 | 22 | 15.9 | 7.0 | M16 | 6.4 | 1 | |
| FMC 40 - 50 | 125/160 | 40 | 50 | 89 | 27 | 16.0 | 8.0 | M20 | 7.6 | 3 | |

Parts

| Division | Spare Parts | | | | |
|----------|---|---|---|---|---|
| | Basic | | | | Option |
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Wrench |
| Type |  |  |  |  |  |
| FMC 16 | K8.0 | - | BX0310 | BX0820 | LW-6 |
| FMC 22 | K10.0 | - | BX0412 | BX1030 | LW-8 |
| FMC 25.4 | K9.5 | - | BX0515 | BX1225 | LW-10 |
| FMC 27 | K12.0 | MBA-M12 | BX0616 | - | LW-10 |
| FMC 32 | K14.0 | MBA-M16 | BX0616 | - | LW-14 |
| FMC38.1 | K15.87 | MBA-M16 | BX0616 | - | LW-14 |
| FMC40 | K15.87 | MBA-M20 | BX0616 | - | LW-17 |

HSK-FMC

DIN69893-1, ISO 12164-1 : 2001

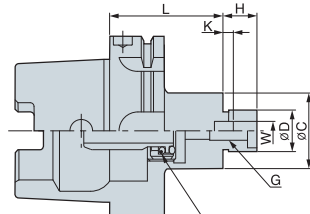


Fig. 1 Coolant Tube (Option)

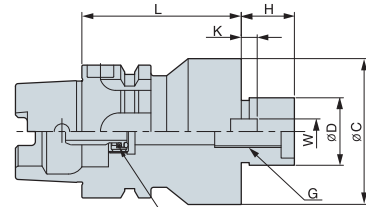


Fig. 2 Coolant Tube (Option)

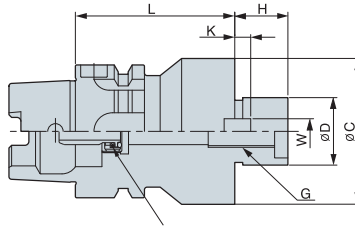
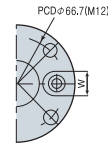


Fig. 3 Coolant Tube (Option)



| Designation | Cutter Dia. | ØD | L | ØC | H | W | K | G | kg | Fig. | |
|-------------------|-------------|---------|------|----|----|----|------|-----|-----|------|---|
| HSK40A -FMC16 -50 | | 40 | 16 | 50 | 38 | 17 | 8.0 | 5.0 | M8 | 0.7 | 1 |
| | FMC22 -45 | 50/63 | 22 | 45 | 48 | 19 | 10.0 | 5.6 | M10 | 0.9 | 2 |
| | FMC25.4-60 | 80 | 25.4 | 60 | 70 | 20 | 9.5 | 6.0 | M12 | 1.0 | 2 |
| HSK50A -FMC16 -40 | | 40 | 16 | 40 | 38 | 17 | 8.0 | 5.0 | M8 | 0.9 | 1 |
| | FMC22 -50 | 50/63 | 22 | 50 | 48 | 19 | 10.0 | 5.6 | M10 | 1.0 | 1 |
| | FMC25.4-60 | 80 | 25.4 | 60 | 70 | 20 | 9.5 | 6.0 | M12 | 1.2 | 1 |
| HSK63A -FMC16 -50 | | 40 | 16 | 50 | 38 | 17 | 8.0 | 5.0 | M8 | 1.1 | 1 |
| | FMC22 -50 | 50/63 | 22 | 50 | 48 | 19 | 10.0 | 5.6 | M10 | 1.2 | 1 |
| | FMC25.4-60 | 80 | 25.4 | 60 | 70 | 20 | 9.5 | 6.0 | M12 | 1.4 | 1 |
| | FMC27 -60 | 80 | 27 | 60 | 60 | 21 | 12.0 | 6.3 | M12 | 1.4 | 1 |
| | FMC32 -60 | 100 | 32 | 60 | 78 | 24 | 14.0 | 7.0 | M16 | 1.8 | 2 |
| | FMC40 -60 | 125/160 | 40 | 60 | 89 | 27 | 16.0 | 8.0 | M20 | 2.0 | 3 |
| HSK100A-FMC16 -60 | | 40 | 16 | 60 | 38 | 17 | 8.0 | 5.0 | M8 | 2.3 | 1 |
| | FMC22 -50 | 50/63 | 22 | 50 | 48 | 19 | 10.0 | 5.6 | M10 | 2.5 | 1 |
| | FMC25.4-60 | 80 | 25.4 | 60 | 70 | 20 | 9.5 | 6.0 | M12 | 2.6 | 1 |
| | FMC27 -50 | 80 | 27 | 50 | 60 | 21 | 12.0 | 6.3 | M12 | 2.6 | 1 |
| | FMC32 -50 | 100 | 32 | 50 | 78 | 24 | 14.0 | 7.0 | M16 | 2.8 | 2 |
| | FMC40 -60 | 125/160 | 40 | 60 | 89 | 27 | 16.0 | 8.0 | M20 | 3.1 | 3 |

- Weight, except for cutter body weight.
- Wrench is option.

- Ordering example
- Standard type : HSK63A-FMC22-50
- Balanced type : HSK63A-FMC22-50B

Parts

| Division | Spare Parts | | | | |
|----------|-------------|------------|-------------|-------------|--------|
| | Basic | | | | Option |
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Wrench |
| Type | | | | | |
| FMC 16 | K8.0 | - | BX0310 | BX0820 | LW-6 |
| FMC 22 | K10.0 | - | BX0412 | BX1030 | LW-8 |
| FMC 25.4 | K9.5 | - | BX0515 | BX1225 | LW-10 |
| FMC 27 | K12.0 | MBA-M12 | BX0616 | - | LW-10 |
| FMC 32 | K14.0 | MBA-M16 | BX0616 | - | LW-14 |
| FMC38.1 | K15.87 | MBA-M16 | BX0616 | - | LW-14 |
| FMC40 | K15.87 | MBA-M20 | BX0616 | - | LW-17 |



BT-MTA

MAS403-BT

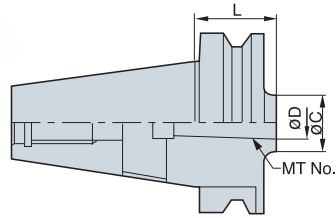


Fig. 1

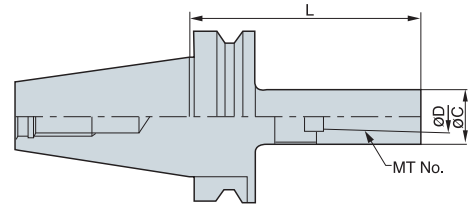



Fig. 2

(mm)

| Designation | MT No. | L | ØD | ØC |  | Fig. | |
|-------------|------------|---|-----|--------|---|------|---|
| BT30 - | MTA1 - 45 | 1 | 45 | 12.065 | 25 | 0.6 | 1 |
| | MTA2 - 60 | 2 | 60 | 17.780 | 32 | 0.6 | 1 |
| | MTA3 - 80 | 3 | 80 | 23.825 | 40 | 0.6 | 1 |
| BT40 - | MTA1 - 45 | 1 | 45 | 12.065 | 25 | 1.1 | 1 |
| | 120 | 1 | 120 | 12.065 | 25 | 1.2 | 2 |
| | MTA2 - 60 | 2 | 60 | 17.780 | 32 | 1.1 | 1 |
| | 120 | 2 | 120 | 17.780 | 32 | 1.6 | 2 |
| | MTA3 - 75 | 3 | 75 | 23.825 | 40 | 1.2 | 1 |
| | 135 | 3 | 135 | 23.825 | 40 | 1.7 | 2 |
| | MTA4 - 95 | 4 | 95 | 31.267 | 50 | 1.3 | 1 |
| | 165 | 4 | 165 | 31.267 | 50 | 3.0 | 2 |
| BT50 - | MTA1 - 45 | 1 | 45 | 12.065 | 25 | 3.9 | 1 |
| | 120 | 1 | 120 | 12.065 | 25 | 4.2 | 2 |
| | 180 | 1 | 180 | 12.065 | 25 | 4.3 | 2 |
| | MTA2 - 45 | 2 | 45 | 17.780 | 32 | 3.9 | 1 |
| | 135 | 2 | 135 | 17.780 | 32 | 4.3 | 2 |
| | 180 | 2 | 180 | 17.780 | 32 | 4.6 | 2 |
| | MTA3 - 45 | 3 | 45 | 23.825 | 40 | 3.8 | 1 |
| | 150 | 3 | 150 | 23.825 | 40 | 4.6 | 2 |
| | 180 | 3 | 180 | 23.825 | 40 | 4.9 | 2 |
| | MTA4 - 75 | 4 | 75 | 31.267 | 50 | 3.9 | 1 |
| | 180 | 4 | 180 | 31.267 | 50 | 5.4 | 2 |
| | MTA5 - 105 | 5 | 105 | 44.399 | 65 | 4.5 | 1 |
| | 210 | 5 | 210 | 44.399 | 65 | 7.2 | 2 |

• Holder for morse taper shank tool (drill, reamer etc)



BT-MTB

MAS403-BT

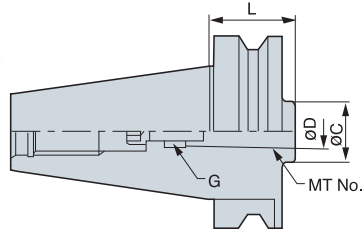


Fig. 1

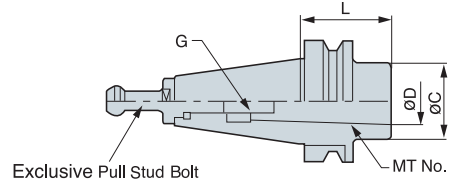



Fig. 2


(mm)

| Designation | MT No. | L | ØD | ØC | G |  | Fig. |
|-----------------|--------|----|--------|----|-----|---|------|
| BT30 - MTB1- 45 | 1 | 45 | 12.065 | 25 | M6 | 0.8 | 1 |
| | 2 | 60 | 17.780 | 32 | M10 | 0.8 | 2 |
| BT40 - MTB1- 45 | 1 | 45 | 12.065 | 25 | M6 | 1.0 | 1 |
| | 2 | 45 | 17.780 | 32 | M10 | 1.0 | 1 |
| | 3 | 45 | 23.825 | 40 | M12 | 1.2 | 2 |
| | 4 | 85 | 31.267 | 50 | M16 | 1.4 | 2 |
| BT50 - MTB1- 45 | 1 | 45 | 12.065 | 25 | M6 | 4.0 | 1 |
| | 2 | 45 | 17.780 | 32 | M10 | 4.0 | 1 |
| | 3 | 60 | 23.825 | 40 | M12 | 4.0 | 1 |
| | 4 | 75 | 31.267 | 50 | M16 | 4.1 | 1 |

- For Fig. 2, it is necessary for Exclusive Pull Stud Bolt as exclusive use.
- Exclusive Pull Stud Bolt is separately sold.



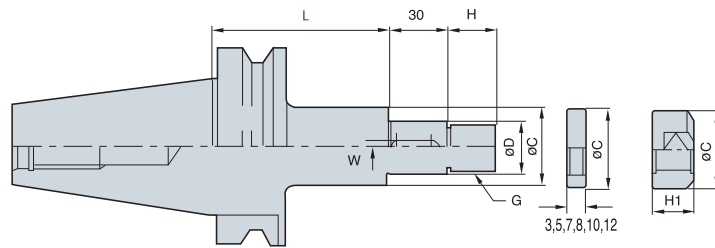
Parts

| Spare Parts | | | |
|-------------|---|----------------|--------|
| Division | Clamp Bolt | | |
| Type |  | | |
| | BT30 | BT30 | BT50 |
| MTB1 | BX0620S | BX0625 | BX0630 |
| MTB2 | Pull Stud Bolt | BX1030 | BX1035 |
| MTB3 | - | Pull Stud Bolt | BX1235 |
| MTB4 | - | Pull Stud Bolt | BX1640 |




BT-SCA

MAS403-BT






(mm)

| Designation | Cutter Dia. | ØD | L | H | W | ØC | H1 | G |  |
|---------------------|-----------------|--------|-----|----|------|----|----|----------|---|
| BT30 - SCA12.7 - 60 | 50 | 12.7 | 60 | 15 | - | 20 | 12 | M12x1.25 | 0.6 |
| SCA15.875 - 60 | 50-60 | 15.875 | 60 | 16 | 3.18 | 26 | 13 | M14x1.5 | 0.7 |
| SCA22.225 - 60 | 60-63-75 | 22.225 | 60 | 21 | 3.18 | 34 | 18 | M20x1.5 | 0.8 |
| SCA25.4 - 60 | 75-80 | 25.4 | 60 | 25 | 6.35 | 40 | 21 | M24x2 | 0.9 |
| BT40 - SCA13 - 75 | 50 | 13 | 75 | 15 | - | 20 | 12 | M12x1.25 | 1.3 |
| 105 | 50 | 13 | 105 | 15 | - | 20 | 12 | M12x1.25 | 1.4 |
| SCA16 - 75 | 50-60 | 16 | 75 | 16 | 4 | 26 | 13 | M14x1.5 | 1.4 |
| 105 | 50-60 | 16 | 105 | 16 | 4 | 26 | 13 | M14x1.5 | 1.5 |
| SCA22 - 75 | 60-63-75 | 22 | 75 | 21 | 6 | 34 | 8 | M20x1.5 | 1.6 |
| 105 | 60-63-75 | 22 | 105 | 21 | 6 | 34 | 8 | M20x1.5 | 1.9 |
| SCA27 - 75 | 75-80-100-125 | 27 | 75 | 25 | 7 | 40 | 21 | M24x2 | 2.1 |
| 120 | 75-80-100-125 | 27 | 120 | 25 | 7 | 40 | 21 | M24x2 | 2.5 |
| SCA32 - 105 | 100-125-150-175 | 32 | 105 | 30 | 8 | 46 | 26 | M30x2 | 2.6 |
| SCA12.7 - 75 | 50 | 12.7 | 75 | 15 | - | 20 | 12 | M12x1.25 | 1.3 |
| 105 | 50 | 12.7 | 105 | 15 | - | 20 | 12 | M12x1.25 | 1.4 |
| SCA15.875 - 75 | 50-60 | 15.875 | 75 | 16 | 3.18 | 26 | 13 | M14x1.5 | 1.4 |
| 105 | 50-60 | 15.875 | 105 | 16 | 3.18 | 26 | 13 | M14x1.5 | 1.5 |
| SCA22.225 - 75 | 60-63-75 | 22.225 | 75 | 21 | 3.18 | 34 | 18 | M20x1.5 | 1.6 |
| 120 | 60-63-75 | 22.225 | 120 | 21 | 3.18 | 34 | 18 | M20x1.5 | 1.9 |
| SCA25.4 - 75 | 75-80-100-125 | 25.4 | 75 | 25 | 6.35 | 40 | 21 | M24x2 | 2.1 |
| 120 | 75-80-100-125 | 25.4 | 120 | 25 | 6.35 | 40 | 21 | M24x2 | 2.5 |
| SCA31.75 - 105 | 100-125-150-175 | 31.75 | 105 | 30 | 7.92 | 46 | 26 | M30x2 | 2.6 |

- Side cutter for JIS B4219, 4109, 4107
- Key and collar enclosed

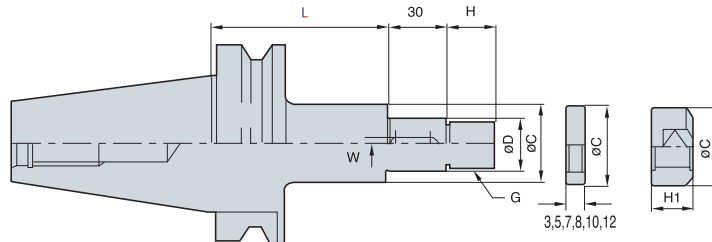
Parts

| Division | Spare Parts | | |
|------------|---|---|---|
| | Parallel Key | Collar | Lock Nut |
| Type |  |  |  |
| SCA 13 | - | SCA13-Set | SCA-M12 |
| SCA 16 | 4x4x25 | SCA16-Set | SCA-M14 |
| SCA 22 | 6x6x25 | SCA22-Set | SCA-M20 |
| SCA 27 | 7x7x25 | SCA27-Set | SCA-M24 |
| SCA 32 | 8x7x25 | SCA32-Set | SCA-M30 |
| SCA 40 | 10x8x25 | SCA40-Set | SCA-M36 |
| SCA 12.7 | - | SCA12.7-Set | SCA-M12 |
| SCA 15.875 | 3.18x3.18x25 | SCA15.875-Set | SCA-M14 |
| SCA 22.225 | 3.18x3.18x25 | SCA22.225-Set | SCA-M20 |
| SCA 25.4 | 6.35x6.35x25 | SCA25.4-Set | SCA-M24 |
| SCA 31.75 | 7.92x7x25 | SCA31.75-Set | SCA-M30 |
| SCA 38.1 | 9.52x8x25 | SCA38.1-Set | SCA-M36 |



BT-SCA

MAS403-BT



| | | | | | | | | | | (mm) |
|----------------|-------------|---------------------|--------|-----|------|------|----|---------|----------|------|
| Designation | Cutter Dia. | ØD | L | H | W | ØC | H1 | G | | |
| BT50 - SCA13 | - 75 | 50 | 13 | 75 | 15 | - | 20 | 12 | M12x1.25 | 3.7 |
| | 105 | 50 | 13 | 105 | 15 | - | 20 | 12 | M12x1.25 | 3.8 |
| SCA16 | - 90 | 50-60 | 16 | 90 | 16 | 4 | 26 | 13 | M14x1.5 | 4.0 |
| | 120 | 50-60 | 16 | 120 | 16 | 4 | 26 | 13 | M14x1.5 | 4.1 |
| SCA22 | - 90 | 60-63-75 | 22 | 90 | 21 | 6 | 34 | 18 | M20x1.5 | 4.3 |
| | 135 | 60-63-75 | 22 | 135 | 21 | 6 | 34 | 18 | M20x1.5 | 4.6 |
| SCA27 | - 90 | 75-80-100-125 | 27 | 90 | 25 | 7 | 40 | 21 | M24x2 | 4.7 |
| | 135 | 75-80-100-125 | 27 | 135 | 25 | 7 | 40 | 21 | M24x2 | 5.1 |
| SCA32 | - 90 | 100-125-175-200 | 32 | 90 | 30 | 8 | 46 | 26 | M30x2 | 5.1 |
| | 135 | 100-125-175-200 | 32 | 135 | 30 | 8 | 46 | 26 | M30x2 | 5.7 |
| SCA40 | - 90 | 150-160-175-200 | 40 | 90 | 36 | 10 | 55 | 31 | M36x2 | 5.8 |
| | 135 | 150-160-175-200 | 40 | 135 | 36 | 10 | 55 | 31 | M36x2 | 6.8 |
| SCA12.7 | - 75 | 50 | 12.7 | 75 | 15 | - | 20 | 12 | M12x1.25 | 3.7 |
| | 105 | 50 | 12.7 | 105 | 15 | - | 20 | 12 | M12x1.25 | 3.8 |
| SCA15.875 | - 90 | 50-60 | 15.875 | 90 | 16 | 3.18 | 26 | 13 | M14x1.5 | 4.0 |
| | 120 | 50-60 | 15.875 | 120 | 16 | 3.18 | 26 | 13 | M14x1.5 | 4.1 |
| SCA22.225 - 90 | 60-63-75 | 22.225 | 90 | 21 | 3.18 | 34 | 18 | M20x1.5 | 4.3 | |
| SCA22.225-135 | 60-63-75 | 22.225 | 135 | 21 | 3.18 | 34 | 18 | M20x1.5 | 4.6 | |
| SCA25.4 | - 90 | 75-80-100-125 | 25.4 | 90 | 25 | 6.35 | 40 | 21 | M24x2 | 4.7 |
| | 135 | 75-80-100-125 | 25.4 | 135 | 25 | 6.35 | 40 | 21 | M24x2 | 5.1 |
| SCA31.75 | - 90 | 100-125-150-175-200 | 31.75 | 90 | 30 | 7.92 | 46 | 26 | M30x2 | 5.1 |
| | 135 | 100-125-150-175-200 | 31.75 | 135 | 30 | 7.92 | 46 | 26 | M30x2 | 5.7 |
| SCA38.1 | - 90 | 150-160-175-200 | 38.1 | 90 | 36 | 9.52 | 55 | 31 | M36x2 | 5.8 |
| | 135 | 150-160-175-200 | 38.1 | 135 | 36 | 9.52 | 55 | 31 | M36x2 | 6.8 |

- Side cutter for JIS B4219, 4109, 4107
- Key and collar enclosed

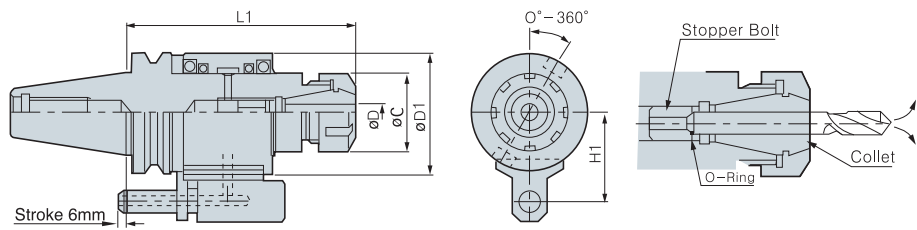
Parts

| Division | Spare Parts | | |
|------------|--------------|---------------|----------|
| | Parallel Key | Collar | Lock Nut |
| Type | | | |
| SCA 13 | - | SCA13-Set | SCA-M12 |
| SCA 16 | 4x4x25 | SCA16-Set | SCA-M14 |
| SCA 22 | 6x6x25 | SCA22-Set | SCA-M20 |
| SCA 27 | 7x7x25 | SCA27-Set | SCA-M24 |
| SCA 32 | 8x7x25 | SCA32-Set | SCA-M30 |
| SCA 40 | 10x8x25 | SCA40-Set | SCA-M36 |
| SCA 12.7 | - | SCA12.7-Set | SCA-M12 |
| SCA 15.875 | 3.18x3.18x25 | SCA15.875-Set | SCA-M14 |
| SCA 22.225 | 3.18x3.18x25 | SCA22.225-Set | SCA-M20 |
| SCA 25.4 | 6.35x6.35x25 | SCA25.4-Set | SCA-M24 |
| SCA 31.75 | 7.92x7x25 | SCA31.75-Set | SCA-M30 |
| SCA 38.1 | 9.52x8x25 | SCA38.1-Set | SCA-M36 |



OHDC

MAS403-BT

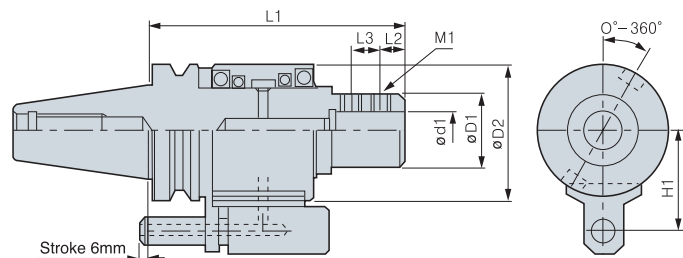


| Designation | ØD | | ØC | D1 | L1 | H1 | Collet | kg |
|-------------------|------|------|----|-----|-----|----|--------|-----|
| | min | max | | | | | | |
| BT40 - OHDC10-165 | 4.0 | 10.0 | 28 | 90 | 165 | 65 | ER16C | 3.6 |
| OHDC20-165 | 8.0 | 20.0 | 50 | 90 | 165 | 65 | ER32C | 3.7 |
| OHDC26-170 | 10.0 | 26.0 | 63 | 90 | 170 | 65 | ER40C | 3.8 |
| BT50 - OHDC10-175 | 4.0 | 10.0 | 28 | 105 | 175 | 80 | ER16C | 7.3 |
| OHDC20-180 | 8.0 | 20.0 | 50 | 105 | 180 | 80 | ER32C | 7.5 |
| OHDC26-175 | 10.0 | 26.0 | 63 | 105 | 175 | 80 | ER40C | 7.7 |

- Collet : see page 43
- Spanner : Option (see page 29)

OHSL

MAS403-BT



| Designation | Ød1 | ØD1 | ØD2 | L1 | H1 | L2 | L3 | M1 | kg |
|-----------------|-----|-----|-----|-----|----|----|----|------------|-----|
| | | | | | | | | | |
| OHSL20-160 | 20 | 48 | 90 | 160 | 65 | - | 25 | M12 x 1.75 | 3.9 |
| OHSL25-175 | 25 | 48 | 90 | 175 | 65 | 15 | 20 | M12 x 1.75 | 4.1 |
| OHSL32-175 | 32 | 50 | 90 | 175 | 65 | 15 | 20 | M10 x 1.5 | 4.7 |
| BT50-OHSL16-170 | 16 | 48 | 105 | 170 | 80 | - | 25 | M12 x 1.75 | 7.6 |
| OHSL20-170 | 20 | 48 | 105 | 170 | 80 | - | 25 | M12 x 1.75 | 7.8 |
| OHSL25-180 | 25 | 55 | 105 | 180 | 80 | 15 | 20 | M12 x 1.75 | 8.0 |
| OHSL32-180 | 32 | 60 | 105 | 180 | 80 | 15 | 20 | M12 x 1.75 | 8.2 |
| OHSL40-180 | 40 | 65 | 105 | 180 | 80 | 15 | 20 | M12 x 1.75 | 8.4 |

- Oil hole holder socket is option

BT-KSH

DIN 69871-1 A/B, ISO 7388-1 : 1983(E)

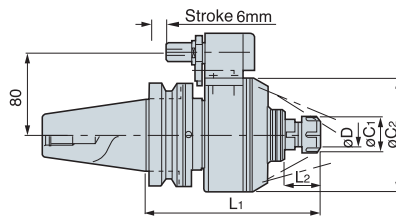


Fig. 1

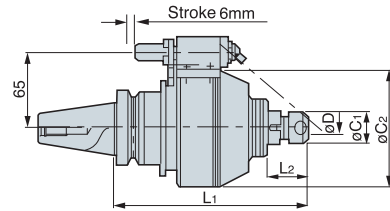


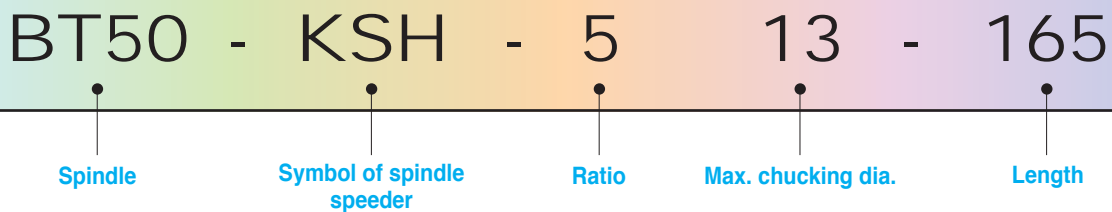
Fig. 2

(mm)

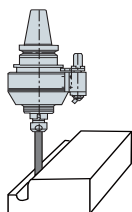
| Designation | ØD1 | L1 | L2 | ØC1 | ØC2 | Ratio | Max.rpm | Collet | kg |
|------------------|----------|-----|----|-----|-----|-------|---------|--------|-----|
| BT40- KSH510-165 | 1.0~10.0 | 165 | 35 | 28 | 100 | 5 | 20,000 | GER16 | 4.6 |
| - KSH513-165 | 1.0~13.0 | 165 | 35 | 35 | 100 | 5 | 20,000 | GER20 | 4.7 |
| BT50- KSH610-170 | 1.0~10.0 | 170 | 35 | 28 | 110 | 6 | 24,000 | GER16 | 8.6 |
| - KSH613-170 | 1.0~13.0 | 170 | 35 | 35 | 110 | 6 | 20,000 | GER20 | 8.7 |
| - KSH416-170 | 2.0~16.0 | 170 | 35 | 42 | 110 | 4 | 12,000 | GER25 | 8.9 |

- Increases the spindle speed by 4,5,6 times.(12,000rpm ~ 24,000rpm)
- High efficiency and rigidity without vibration and noise.
- Collet : Accuracy type, High Accuracy type (see page 43) • Positioning block is manufactured upon request.

Code System

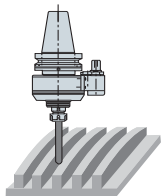


Ordering example



Mold Base

- Workpiece : S55C
- Tool : Ø8Carbide Endmill(4flutes)
- Cutting Condition
vc=250m/min, s=9,950rpm,
fz=0.04mm/tooth
vf=1,592mm/min. ap=2mm



Electronic Part

- Workpiece : Al Alloy
- Tool : R3 Carbide Ball Endmill(2flutes)
- Cutting Condition
vc=377m/min, s=20,010rpm
fz=0.18mm/tooth
vf=7,203mm/min. ap=0.6mm

Parts

Spare Parts

| Division | Spare Parts | | |
|------------|-------------|----------------|----------------------|
| | Basic Nut | Option Spanner | Option GER-HP Collet |
| Type | | | |
| KSH510/610 | RT16 | 32-35 | GER 16-ØDHP |
| KSH513/613 | RT20 | 35-38 | GER 20-ØDHP |
| KSH416 | RT25 | 42-46 | GER 25-ØDHP |



Productivity is increased as high as double.

Angular Head Series

- High rigidity, Steel guide housing
- Special coating prevents rust.
- Useable oil hole type.
- Ensuring power transfer using grinding level gear
- Various head exchangeable



Features

- ▶ Minimize noise level down to 80db using high precision gear.
- ▶ High precision bearing enables highly accurate job done.
 - Vibration of near the collet area within 0.005mm.
- ▶ Head exchange design provides multi-functions.
- ▶ Very economical choice.
- ▶ Sharp outlook.

Application

- ▶ In case of need to several fixing due to simple working process of big work-piece.
- ▶ Precision work, as the one time fixing, need to multi-side processing.
- ▶ Working with slanted material from basis.
- ▶ Working of maintaining a certain angle, copy milling such as ball-endmilling work.



KHU Type



KAG Type



KAH Type



MAH Type

Machine limit weight and interference are necessary to check a prior to make an order.
Special type is also manufactured by customer specification
Check the rotation direction of spindle before ordering

MAH *New*

■ Better performance by improving universal A/H

1. Stability on large mold processing
2. Possible to use Ball endmill of 32mm (D).
3. Enhanced stiffness from KHU type.
4. Advanced Ball end-mill life cycle.



HRAG *New*

■ HRAG : The stiffness of attachable bracket enhanced upto 200%

1. Stability on face milling processing.
2. Improved compatibility with machine even in BT50 type by adapting easy bracket installation.
3. Enhanced stiffness from KAG type.
4. Improved life cycle.
5. Compatibility with other A.H.

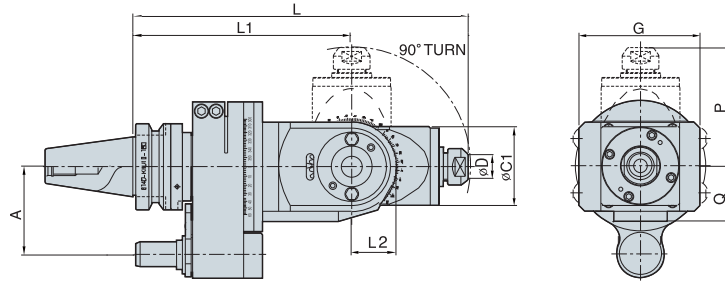


HAF Modular Type *New*

1. Enhanced distortion stiffness
2. Enhanced stiffness against flank load
3. Better compatibility by easy bracket installation



BT-KHU/MAH



MAS403-BT

(mm)

| Designation | L | L1 | L2 | ØD | ØC1 | G | P | Q | A | IN:OUT | Direction of rotation (IN:OUT) | Max. Rotation | Collet | kg |
|----------------|-----|-----|----|----------|-----|-----|-----|----|---------|--------|--------------------------------|---------------|--------|------|
| BT40-KHU10-160 | 247 | 160 | 33 | 1.0~10.0 | 58 | 90 | 87 | 40 | 65 | 1 : 2 | CW : CW | 6,000rpm | GER16 | 6.4 |
| BT50-KHU10-180 | 267 | 180 | 33 | 1.0~10.0 | 58 | 90 | 87 | 40 | 80(110) | 1 : 2 | CW : CW | 6,000rpm | GER16 | 10.5 |
| BT50-KHU20-195 | 315 | 195 | 47 | 2.0~20.0 | 84 | 124 | 120 | 63 | 80(110) | 1 : 1 | CW : CW | 3,000rpm | GER32 | 15.8 |

- Free radius positioning in 360° and axial positioning in 90°
- Tap collet : Detailed discussion is needed.
- HSK type can be manufactured upon request.
- Coolant Type - Order to make

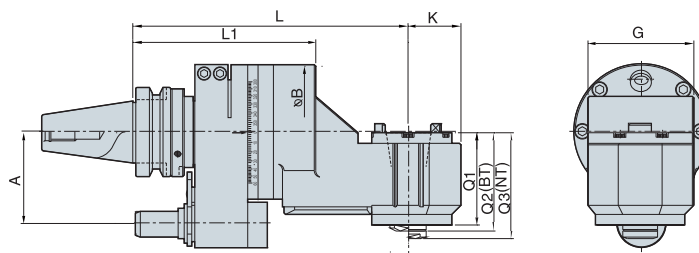
MAH

New

(mm)

| Designation | L | L1 | L2 | ØD | ØC1 | G | P | Q | A | Collet | kg |
|----------------|-----|-----|----|----|-----|-----|-----|----|---------|-----------|----|
| BT50-MAH32-200 | 325 | 200 | 47 | 32 | 95 | 154 | 125 | 63 | 80(110) | SIDE LOCK | 19 |

BT-KAG/HRAG



MAS403-BT

(mm)

| Designation | L | L1 | K | G | Q1 | Q2 | Q3 | A | IN:OUT | Direction of rotation (IN:OUT) | ØB | Max. Rotation | Tool | kg |
|----------------|-----|-----|------|----|----|----|-----|---------|--------|--------------------------------|-----|---------------|-----------|------|
| BT40-KAG30-195 | 195 | 130 | 37.5 | 75 | 66 | 70 | 76 | 65 | 1 : 1 | CW : CW | 96 | 4,000rpm | BT30,NT30 | 7.6 |
| BT50-KAG40-230 | 230 | 145 | 46.5 | 93 | 90 | 95 | 102 | 80(110) | 1 : 1 | CW : CW | 114 | 3,000rpm | BT40,NT40 | 14.8 |

- Free radius positioning in 360°
- Versatile tool can be used (BT40 or BT30 tools)
- Coolant Type - Order to make

HRAG

New

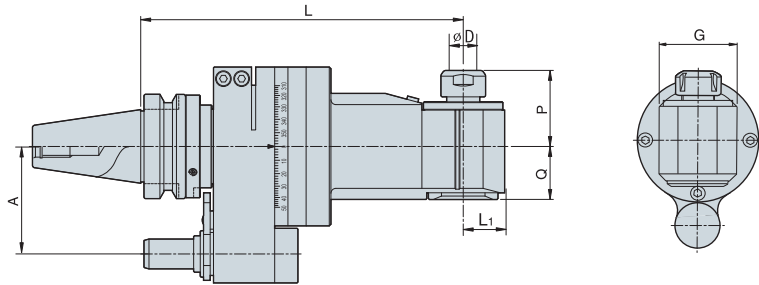
(mm)

| Designation | L | L1 | K | G | Q1 | Q2 | Q3 | ØB | A | Tool | kg |
|----------------|-----|-----|------|----|----|----|-----|-----|---------|-----------|-------|
| BT50-MAH32-200 | 230 | 145 | 46.5 | 93 | 90 | 95 | 102 | 136 | 80(110) | BT40,NT40 | 15.75 |




BT-KAH (90° type)

MAS403-BT



(mm)


| Designation | L | ØD | G | P | Q | A | L1 | IN:OUT | Direction of rotation (IN:OUT) | Max. Rotation | Collet |  | |
|-------------|-----------|------------|------------|----|----|---------|---------|--------|--------------------------------|---------------|----------|---|------|
| BT40- | KAH07-170 | 170 | 10 ~ 7.0 | 40 | 37 | 24.5 | 65 | 20 | 1 : 1 | CW : CW | 5,000rpm | GER11 | 4.6 |
| | KAH07-200 | 200 | 1.0 ~ 7.0 | 40 | 37 | 24.5 | 65 | 20 | 1 : 1 | CW : CW | 5,000rpm | GER11 | 4.9 |
| | KAH10-165 | 165 | 1.0 ~ 10.0 | 58 | 46 | 32 | 65 | 25 | 1 : 1 | CW : CW | 5,000rpm | GER16 | 5.6 |
| | KAH10-195 | 195 | 1.0 ~ 10.0 | 58 | 46 | 32 | 65 | 25 | 1 : 1 | CW : CW | 5,000rpm | GER16 | 5.8 |
| | KAH10-240 | 240 | 1.0 ~ 10.0 | 58 | 46 | 32 | 65 | 25 | 1 : 1 | CW : CW | 5,000rpm | GER16 | 6.1 |
| | KAH13-165 | 165 | 1.0 ~ 13.0 | 60 | 53 | 35 | 65 | 28 | 1 : 1 | CW : CW | 5,000rpm | GER20 | 5.7 |
| | KAH13-195 | 195 | 1.0 ~ 13.0 | 60 | 53 | 35 | 65 | 28 | 1 : 1 | CW : CW | 5,000rpm | GER20 | 5.9 |
| | KAH13-240 | 240 | 1.0 ~ 13.0 | 60 | 53 | 35 | 65 | 28 | 1 : 1 | CW : CW | 5,000rpm | GER20 | 6.3 |
| | KAH20-180 | 180 | 2.0 ~ 20.0 | 76 | 71 | 49 | 65 | 38 | 1 : 1 | CW : CW | 3,500rpm | GER32 | 6.7 |
| KAH20-220 | 220 | 2.0 ~ 20.0 | 76 | 71 | 49 | 65 | 38 | 1 : 1 | CW : CW | 3,500rpm | GER32 | 7.5 | |
| BT50- | KAH07-190 | 190 | 1.0 ~ 7.0 | 40 | 37 | 24.5 | 80(110) | 20 | 1 : 1 | CW : CW | 5,000rpm | GER11 | 9.5 |
| | KAH07-220 | 220 | 1.0 ~ 7.0 | 40 | 37 | 24.5 | 80(110) | 20 | 1 : 1 | CW : CW | 5,000rpm | GER11 | 9.8 |
| | KAH10-185 | 185 | 1.0 ~ 10.0 | 58 | 46 | 32 | 80(110) | 25 | 1 : 1 | CW : CW | 5,000rpm | GER16 | 10.5 |
| | KAH10-215 | 215 | 1.0 ~ 10.0 | 58 | 46 | 32 | 80(110) | 25 | 1 : 1 | CW : CW | 5,000rpm | GER16 | 10.7 |
| | KAH10-260 | 260 | 1.0 ~ 10.0 | 58 | 46 | 32 | 80(110) | 25 | 1 : 1 | CW : CW | 5,000rpm | GER16 | 11.0 |
| | KAH13-185 | 185 | 1.0 ~ 13.0 | 60 | 53 | 35 | 80(110) | 28 | 1 : 1 | CW : CW | 5,000rpm | GER20 | 10.6 |
| | KAH13-215 | 215 | 1.0 ~ 13.0 | 60 | 53 | 35 | 80(110) | 28 | 1 : 1 | CW : CW | 5,000rpm | GER20 | 10.8 |
| | KAH13-260 | 260 | 1.0 ~ 13.0 | 60 | 53 | 35 | 80(110) | 28 | 1 : 1 | CW : CW | 5,000rpm | GER20 | 11.2 |
| | KAH20-200 | 200 | 2.0 ~ 20.0 | 76 | 71 | 49 | 80(110) | 38 | 1 : 1 | CW : CW | 3,500rpm | GER32 | 11.6 |
| KAH20-240 | 240 | 2.0 ~ 20.0 | 76 | 71 | 49 | 80(110) | 38 | 1 : 1 | CW : CW | 3,500rpm | GER32 | 12.4 | |

- Free radius position in 360°
- Collet : see page 43
- Tap collet : Detailed discussion is needed.
- HSK type can be manufactured upon request.
- Coolant Type - Order to make

■ HAF Modular Type

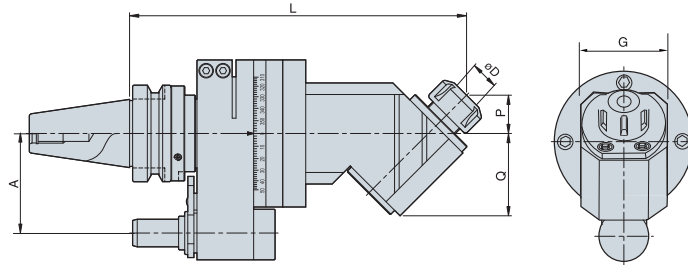
New

(mm)


| Designation | L | ØD | G | P | Q | A | L1 | Collet |  |
|----------------|-----|----------|----|----|----|---------|----|--------|---|
| BT50-HAH20-215 | 215 | 2.0~20.0 | 76 | 71 | 49 | 80(110) | 38 | GER32 | 16.8 |

BT-KAC (45° type)

MAS403-BT






(mm)

| Designation | L | ØD | G | P | Q | A | Max. Rotation | Collet |  |
|----------------|-----|------------|----|----|----|---------|---------------|--------|---|
| BT40-KAC10-220 | 220 | 1.0 ~ 10.0 | 60 | 25 | 54 | 65 | 5,000rpm | GER16 | 5.3 |
| KAC13-220 | 220 | 1.0 ~ 13.0 | 60 | 25 | 54 | 65 | 5,000rpm | GER20 | 5.5 |
| KAC20-230 | 230 | 2.0 ~ 20.0 | 72 | 30 | 60 | 65 | 3,500rpm | GER32 | 6.8 |
| BT50-KAC10-240 | 240 | 1.0 ~ 10.0 | 60 | 25 | 54 | 80(110) | 5,000rpm | GER16 | 10.2 |
| KAC13-240 | 240 | 1.0 ~ 13.0 | 60 | 25 | 54 | 80(110) | 5,000rpm | GER20 | 10.4 |
| KAC20-250 | 250 | 2.0 ~ 20.0 | 72 | 30 | 60 | 80(110) | 3,500rpm | GER32 | 11.7 |

- Free radius position in 360°
- Collet : see page 43
- Spanner : see page 29
- Tap collet : Detailed discussion is needed.
- HSK type can be manufactured upon request.

Parts

| Division | Spare Parts | | |
|--------------|---|--|---|
| | Basic | Option | |
| Type | Nut | Spanner | GER Collet |
| |  |  |  |
| KAH07 | R11 | S-17 | GER 11-ØD |
| KAH10, KAC10 | make inquiries | S-25 | GER 16-ØD |
| KAH13, KAC13 | make inquiries | 35-38 | GER 20-ØD |
| KAH20, KAC20 | RU32 | 48-52 | GER 32-ØD |

- Before NUT is ordered, please inquire about it.



It can be applicable for various kinds of basic holders

Micro Boring Bar FBH Series

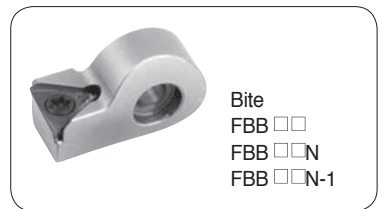
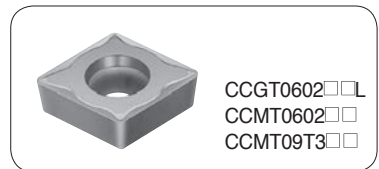
1DIV. = $\varnothing 0.01\text{mm}$

Boring Range : $\varnothing 15.0\text{mm} \sim \varnothing 172.0\text{mm}$

- Fine adjusting available, one graduation on the scale is $\varnothing 0.01\text{mm}$
Compact design and intensive function can meet H6, H7 tolerance.
- Wide Boring range : Min. diameter : 15.0mm Max. diameter : 172.0mm
- It can be applicable for various kinds of basic holders.
- Through coolant type is standard.



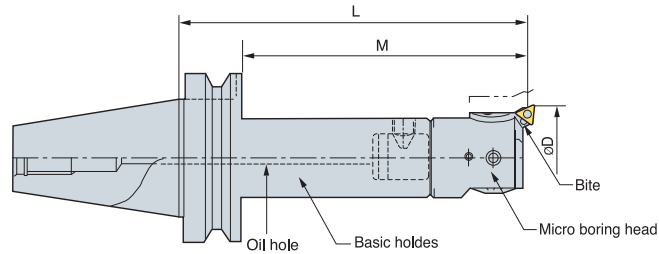
Insert




Micro Boring Head FBH type

BT-FBH Micro Boring Bar(for High precision)

MAS403-BT



(mm)

| Designation | Boring Range ϕD | | L | max.Boring Depth M | Body (Basic Holder) | Micro Boring Head | Bite |  |
|------------------|-----------------------|----------|-----|--------------------|---------------------|-------------------|-----------------------------|---|
| | min | max | | | | | | |
| BT30 -FBH20 -103 | 20 | 26(30) | 103 | 77 | BT30-MD19F- 70 | FBH1920N | FBB20N, FBB20N-C | 0.53 |
| | 26 | 34(40) | 127 | 101 | -MD25F- 90 | FBH2526N | FBB26N, FBB26N-C | 0.7 |
| | 33 | 43(50) | 121 | 95 | -MD32F- 80 | FBH3233N | FBB33N, FBB33N-C | 0.82 |
| | 42 | 54(62) | 127 | 101 | -MD40F- 80 | FBH4042N | FBB42N, FBB42N-C, FBB42N-11 | 1.1 |
| | 53 | 70(82) | 127 | 101 | -MD50F- 70 | FBH5053N | FBB53N, FBB53N-C, FBB53N-11 | 1.7 |
| BT40 -FBH20 -103 | 20 | 26(30) | 103 | 72 | BT40-MD19F- 70 | FBH1920N | FBB20N, FBB20N-C | 1.9 |
| | 26 | 34(40) | 133 | 100 | -MD25F- 95 | FBH2526N | FBB26N, FBB26N-C | 2.0 |
| | 33 | 43(50) | 141 | 110 | -MD32F-100 | FBH3233N | FBB33N, FBB33N-C | 2.5 |
| | 42 | 54(62) | 162 | 130 | -MD40F-115 | FBH4042N | FBB42N, FBB42N-C, FBB42N-11 | 3.1 |
| | 53 | 70(82) | 162 | 130 | -MD50F-105 | FBH5053N | FBB53N, FBB53N-C, FBB53N-11 | 3.5 |
| | 68 | 100(122) | 181 | 150 | -MD63F-110 | FBH6368N | FBB68N, FBB68N-C, FBB68N-11 | 6.3 |
| | 98 | 150(172) | 206 | 173 | -MD63F-135 | FBH6398N | FBB68N, FBB68N-C, FBB68N-11 | 7.1 |
| BT50 -FBH20 -118 | 20 | 26(30) | 118 | 76 | BT50-MD19F- 85 | FBH1920N | FBB20N, FBB20N-C | 5.2 |
| | 26 | 34(40) | 142 | 100 | -MD25F-105 | FBH2526N | FBB26N, FBB26N-C | 5.8 |
| | 33 | 43(50) | 151 | 109 | -MD32F-110 | FBH3233N | FBB33N, FBB33N-C | 6.0 |
| | 42 | 54(62) | 192 | 150 | -MD40F-145 | FBH4042N | FBB42N, FBB42N-C, FBB42N-11 | 6.3 |
| | 42 | 54(62) | 242 | 200 | -MD40F-195 | FBH4042N | FBB42N, FBB42N-C, FBB42N-11 | 6.6 |
| | 53 | 70(82) | 182 | 140 | -MD50F-125 | FBH5053N | FBB53N, FBB53N-C, FBB53N-11 | 6.9 |
| | 53 | 70(82) | 282 | 240 | -MD50F-225 | FBH5053N | FBB53N, FBB53N-C, FBB53N-11 | 7.2 |
| | 68 | 100(122) | 201 | 159 | -MD63F-130 | FBH6368N | FBB68N, FBB68N-C, FBB68N-11 | 8.1 |
| | 68 | 100(122) | 301 | 260 | -MD63F-230 | FBH6368N | FBB68N, FBB68N-C, FBB68N-11 | 8.5 |
| | 98 | 150(172) | 211 | 169 | -MD63F-140 | FBH6398N | FBB68N, FBB68N-C, FBB68N-11 | 8.9 |
| | 98 | 150(172) | 265 | 224 | -MD63F-195 | FBH6398N | FBB68N, FBB68N-C, FBB68N-11 | 9.4 |

Stock item Basic Holder, Head, Bite Separately

() : ExtensionType max.Boring dia

- Fine adjusting available, one graduation on the scale is $\phi 0.01\text{mm}$
- Compact design and intensive function can meet H6, H7 tolerance
- Wide boring range; Min. diameter : $\phi 20.0\text{mm}$ / Max. diameter : $\phi 172.0\text{mm}$
- It can be applicable for various kinds of basic holders
- Oil hole type is standard
- Micro Boring Head : see page 81
- Bite : see page 82
- Insert : see page 81

• Ordering example)

In case of BT30-FBH20-103

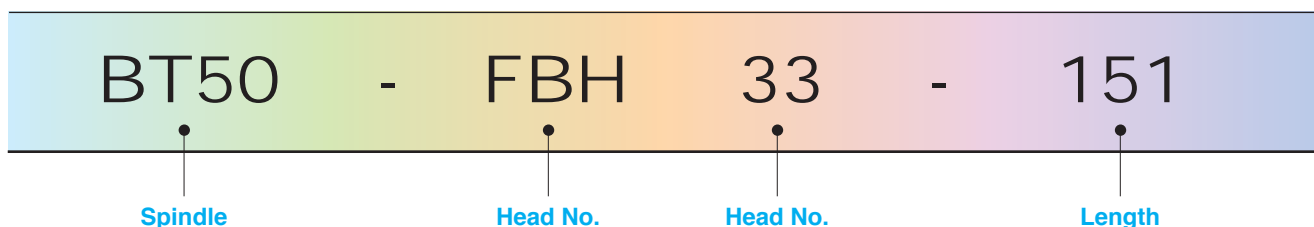
- Basic Holder : BT30-MD19F -70

- Micro boring head : FBH1920N

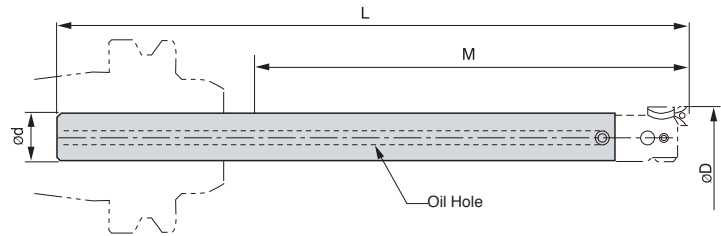
- Bite : FBB20N

* N : New Type

Code System



S-FBH (Modular type Micro Boring Bar with Carbide / Steel Shank)

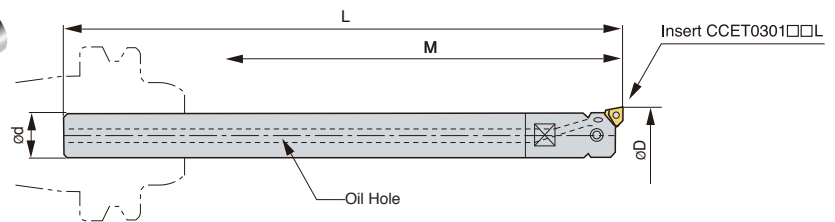


(mm)

| Designation | Shank dia ød | Boring Range øD | | Total length L | Max. Boring Depth M | Basic Shank | Micro Boring Head | Bite | |
|--------------------|-----------------|-----------------|--------|-------------------|------------------------|--------------------|----------------------|----------|--------|
| | | min | max | | | | | | |
| S19W - FBH20 - 120 | 19 | 20 | 26(30) | 190 | 120 | S19W-MD19F - 157 | FBH1920N | FBB20N | |
| | 140 | 19 | 20 | 26(30) | 210 | - 177 | FBH1920N | FBB20N | |
| | 160 | 19 | 20 | 26(30) | 230 | 160 | - 197 | FBH1920N | FBB20N |
| S25W - FBH26 - 150 | 25 | 26 | 34(40) | 235 | 150 | S25W-MD25F - 197.5 | FBH2526N | FBB26N | |
| | 175 | 25 | 26 | 34(40) | 260 | - 222.5 | FBH2526N | FBB26N | |
| | 200 | 25 | 26 | 34(40) | 285 | 200 | - 247.5 | FBH2526N | FBB26N |
| S32W - FBH33 - 180 | 32 | 33 | 43(50) | 280 | 180 | S32W-MD32F - 239 | FBH3233N | FBB33N | |
| | 240 | 32 | 33 | 43(50) | 340 | - 299 | FBH3233N | FBB33N | |
| S19 - FBH20 | -40 | 19 | 20 | 26(30) | 110 | 40 | S19-MD19 F- 77 | FBH1920N | FBB20N |
| | -60 | 19 | 20 | 26(30) | 130 | 60 | - 97 | FBH1920N | FBB20N |
| | -80 | 19 | 20 | 26(30) | 150 | 80 | - 117 | FBH1920N | FBB20N |
| S25 - FBH26 | -50 | 25 | 26 | 34(40) | 135 | 50 | S25-MD25F - 97.5 | FBH2526N | FBB26N |
| | -75 | 25 | 26 | 34(40) | 160 | 75 | - 122.5 | FBH2526N | FBB26N |
| | -100 | 25 | 26 | 34(40) | 185 | 100 | - 147.5 | FBH2526N | FBB26N |
| S32 - FBH33 | -90 | 32 | 33 | 43(50) | 190 | 90 | S32-MD32F - 149 | FBH3233N | FBB33N |
| | -120 | 32 | 33 | 43(50) | 220 | 120 | - 179 | FBH3233N | FBB33N |

- Shank + Head + Bite
- Bite : see page 82)

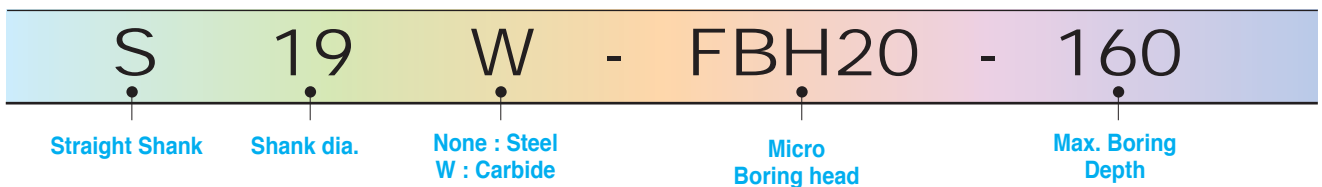
Small Micro Boring Bar with Carbide/Steel Shank



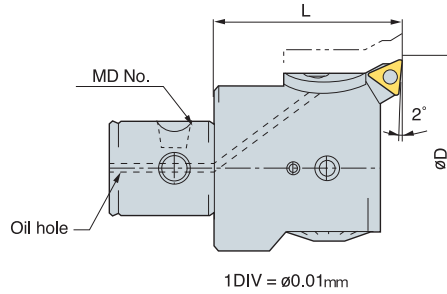
(mm)

| Designation | Shank dia ød | Boring Range øD | | Total length L | Max. Boring Depth M | Basic Shank | Micro Boring Head | Bite |
|-------------------|-----------------|-----------------|-----|-------------------|------------------------|-------------|----------------------|---------|
| | | min | max | | | | | |
| S14W - FBH15 - 85 | 14 | 15 | 18 | 155 | 85 | S14W-M6-123 | FBH15 | FBB15-C |
| | 110 | 14 | 15 | 18 | 180 | -148 | FBH15 | FBB15-C |
| S16W - FBH18 - 95 | 16 | 18 | 22 | 165 | 95 | S16W-M8-128 | FBH18 | FBB15-C |
| | 125 | 16 | 18 | 22 | 195 | -158 | FBH18 | FBB15-C |
| S14 - FBH15 - 40 | 14 | 15 | 18 | 110 | 40 | S14-M6-78 | FBH15 | FBB15-C |
| | 55 | 14 | 15 | 18 | 125 | -93 | FBH15 | FBB15-C |
| S16 - FBH18 - 45 | 16 | 18 | 22 | 115 | 45 | S16-M8-78 | FBH18 | FBB15-C |
| | 60 | 16 | 18 | 22 | 130 | -93 | FBH18 | FBB15-C |

Code System



FBH (Micro Boring Head)



FBH1920N
New Type



| Designation | Boring Range øD | | L | Scale Ring 1Rev. Adjustable range | MD No. | kg |
|-------------|-----------------|----------|----|-----------------------------------|--------|------|
| | min | max | | | | |
| FBH1920N | 20 | 26(30) | 33 | Ø0.4mm | MD1911 | 0.06 |
| FBH2526N | 26 | 34(40) | 37 | Ø0.4mm | MD2514 | 0.12 |
| FBH3233N | 33 | 43(50) | 41 | Ø0.5mm | MD3218 | 0.24 |
| FBH4042N | 42 | 54(62) | 47 | Ø0.5mm | MD4022 | 0.41 |
| FBH5053N | 53 | 70(82) | 57 | Ø0.6mm | MD5028 | 0.8 |
| FBH6368N | 68 | 100(122) | 71 | Ø0.8mm | MD6336 | 1.7 |
| FBH6398N | 98 | 150(172) | 71 | Ø0.8mm | MD6336 | 2.35 |

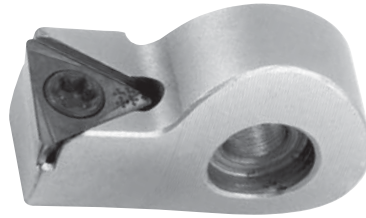
Designation is separately for Basic holder, Head Bite
() : ExtensionType Max.Boring dia.

Insert (for Micro Boring Bar)

| Designation | Grade | Application | Screw | Wrench |
|---------------------------|---|---|------------|--------|
| CCET0401□□L (KORLOY) | PC9030 | Stainless steel | BFTX0204N | TRX06 |
| | CN1000 or CN2000 | Steel | | |
| | H01 | Aluminum, Copper alloy | | |
| TPGT0802□□L TPGW0802□□ | PCD:DA150(DINE) | Aluminium, Copper alloy, Semi-Sintered Carbide, Hard rubber | BFTX0204A | TRX06 |
| | Cermet : T1200A(SEI), T1500A(SEI) | Steel, Cast-iron | | |
| | cBN:DBN250(DINE) | Hardened Steel | | |
| TPGT1103□□L | Cermet : T1200A(SEI), T1500A(SEI) | Steel, Cast-iron | BFTX0307A | TRX10 |
| CCGT0602□□L | Coated : ACK200, AC510V, AC520C | Steel, Cast-iron, Stainless steel, High temperature alloy | BFTX02506N | TRX08 |
| | Cermet : T1200A(SEI), T1500A(SEI) | Steel, Cast-iron | | |
| CCMT0602□□ | Coated : AC820P, AC830P(SEI) | Steel | BFTX0409N | TRX15 |
| | Cermet : T1200A, T1500A, T2000Z, T3000Z(SEI) | Steel, Cast-iron | | |
| CCMT09T3□□ | Coated : AC820P, Cermet : T1200A, T1500A(SEI) | Steel, Cast-iron | BFTX0409N | TRX15 |
| CCET0301□□L (KORLOY) | PC9030 | Stainless steel | FTNA01633 | TRX06 |
| | CN1000 or CN2000 | Steel | | |
| | H01 | Aluminum, Copper alloy | | |



FBB Bite (New Type)

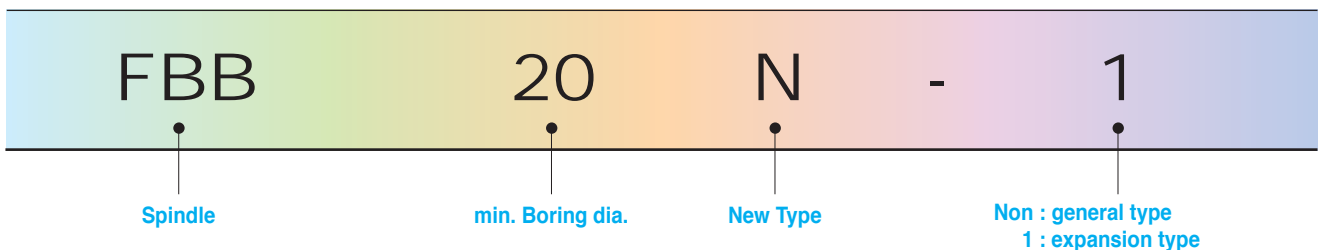


(mm)

| Designation | Insert | Boring Range | Clamp Bolt | Micro Boring Head |
|--------------|------------------------|-----------------------------|------------|-------------------|
| FBB20N | TPGT0802□□L,TPGW0802□□ | Ø20 ~ Ø26mm | BXC0304 | FBH1920N |
| FBB20N-C | CCET0401□□L | Ø20 ~ Ø26mm | BXC0304 | FBH1920N |
| FBB20N-1 | TPGT0802□□L,TPGW0802□□ | Ø24 ~ Ø30mm | BXC0304 | FBH1920N |
| FBB20N-1-C | CCET0401□□L | Ø24 ~ Ø30mm | BXC0304 | FBH1920N |
| FBB26N | TPGT0802□□L,TPGW0802□□ | Ø26 ~ Ø34mm | BXC0405 | FBH2526N |
| FBB26N-C | CCET0401□□L | Ø26 ~ Ø34mm | BXC0405 | FBH2526N |
| FBB26N-1 | TPGT0802□□L,TPGW0802□□ | Ø32 ~ Ø40mm | BXC0405 | FBH2526N |
| FBB26N-1-C | CCET0401□□L | Ø32 ~ Ø40mm | BXC0405 | FBH2526N |
| FBB33N | TPGT0802□□L,TPGW0802□□ | Ø33 ~ Ø43mm | BXC0506 | FBH3233N |
| FBB33N-C | CCMT0602□□,CCGT0602□□L | Ø33 ~ Ø43mm | BXC0506 | FBH3233N |
| FBB33N-1 | TPGT0802□□L,TPGW0802□□ | Ø41 ~ Ø50mm | BXC0506 | FBH3233N |
| FBB33N-1-C | CCMT0602□□,CCGT0602□□L | Ø41 ~ Ø50mm | BXC0506 | FBH3233N |
| FBB42N | TPGT0802□□L,TPGW0802□□ | Ø42 ~ Ø54mm | BXC0610 | FBH4042N |
| FBB42N-C | CCMT0602□□,CCGT0602□□L | Ø42 ~ Ø54mm | BXC0610 | FBH4042N |
| FBB42N-11 | TPGT1103□□L | Ø42 ~ Ø54mm | BXC0610 | FBH4042N |
| FBB42N-1 | TPGT0802□□L,TPGW0802□□ | Ø50 ~ Ø62mm | BXC0610 | FBH4042N |
| FBB42N-1-C | CCMT0602□□,CCGT0602□□L | Ø50 ~ Ø62mm | BXC0610 | FBH4042N |
| FBB42N-1-T11 | TPGT1103□□L | Ø50 ~ Ø62mm | BXC0610 | FBH4042N |
| FBB53N | TPGT0802□□L,TPGW0802□□ | Ø53 ~ Ø70mm | BXC0610 | FBH5053N |
| FBB53N-C | CCMT0602□□,CCGT0602□□L | Ø53 ~ Ø70mm | BXC0610 | FBH5053N |
| FBB53N-C09 | CCMT09T3□□,CCGT09T3□□L | Ø53 ~ Ø70mm | BXC0610 | FBH5053N |
| FBB53N-11 | TPGT1103□□L | Ø53 ~ Ø70mm | BXC0610 | FBH5053N |
| FBB53N-1 | TPGT0802□□L,TPGW0802□□ | Ø65 ~ Ø82mm | BXC0610 | FBH5053N |
| FBB53N-1-C | CCMT0602□□,CCGT0602□□L | Ø65 ~ Ø82mm | BXC0610 | FBH5053N |
| FBB53N-1-C09 | CCMT09T3□□,CCGT09T3□□L | Ø65 ~ Ø82mm | BXC0610 | FBH5053N |
| FBB53N-1-T11 | TPGT1103□□L | Ø65 ~ Ø82mm | BXC0610 | FBH5053N |
| FBB68N | TPGT0802□□L,TPGW0802□□ | Ø68 ~ Ø100mm, Ø98 ~ Ø150mm | BXC0810 | FBH6368N,FBH6398N |
| FBB68N-C | CCMT09T3□□,CCGT09T3□□L | Ø68 ~ Ø100mm, Ø98 ~ Ø150mm | BXC0810 | FBH6368N,FBH6398N |
| FBB68N-11 | TPGT1103□□L | Ø68 ~ Ø100mm, Ø98 ~ Ø150mm | BXC0810 | FBH6368N,FBH6398N |
| FBB68N-1 | TPGT0802□□L,TPGW0802□□ | Ø90 ~ Ø122mm, Ø120 ~ Ø172mm | BXC0810 | FBH6368N,FBH6398N |
| FBB68N-1-C09 | CCMT09T3□□,CCGT09T3□□L | Ø90 ~ Ø122mm, Ø120 ~ Ø172mm | BXC0810 | FBH6368N,FBH6398N |
| FBB68N-1-T11 | TPGT1103□□L | Ø90 ~ Ø122mm, Ø120 ~ Ø172mm | BXC0810 | FBH6368N,FBH6398N |

• Insert : see page 81

Code System

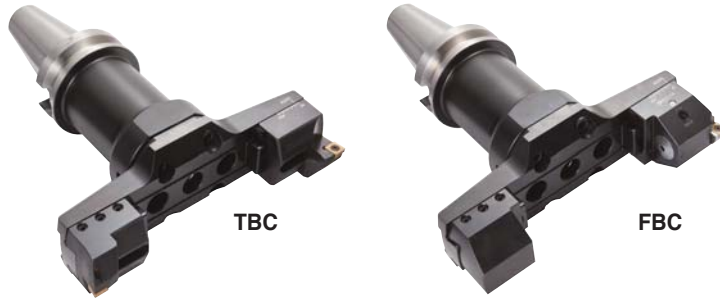


For Rough Boring TBC / For Finish Boring FBC

- Wide boring range : $\phi 130 \sim \phi 540\text{mm}$
- Fully stable structure with the ability to cope with Heavy cutting
- Both rough and finish are available by exchange cartridge sets.

TBC Head Set *New*

FBC Head Set *New*



Insert

- ▶ TBC : CCMT1204□□, CNMG1204□□
- ▶ FBC : CCMT09T3□□, CCGT09T3□□, CCMT1204□□, TPMT1103□□, TPGT1103□□

TBC

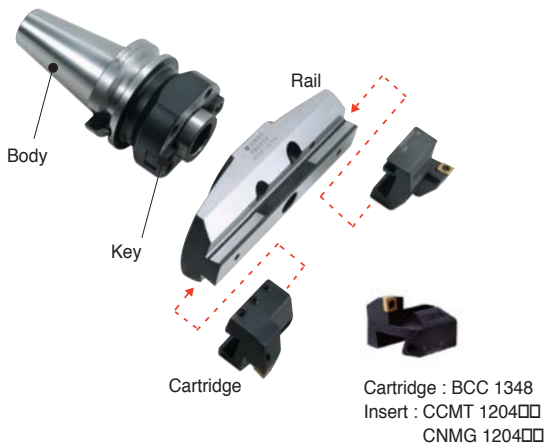
Feature

- ▶ Wide boring range for big diameters - $\phi 130 \sim \phi 540\text{mm}$.
- ▶ Stable structure against for cutting load - Assembly by dove-tail structure
- ▶ Interconvert with FBC - Common boring head and rail adopted, different cartridge
- ▶ Light-weight (5%~20% reduced)
- ▶ Various cartridge approach angle - $15^\circ, 45^\circ$
- ▶ Internal coolant pin - Easy assembly - Spray coolant to 6 directions

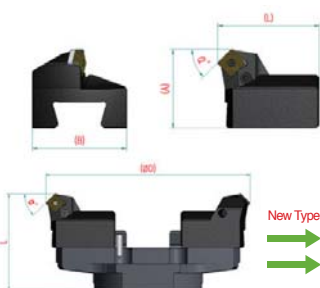
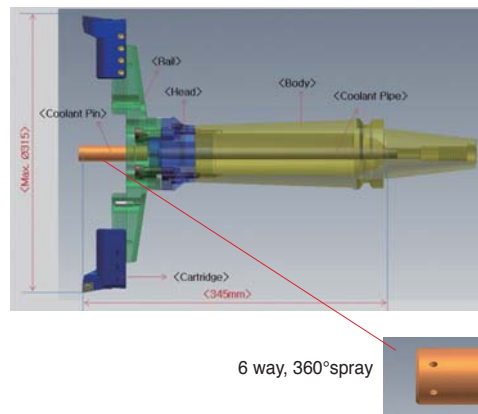


Recommended cutting condition

TBC Compositions

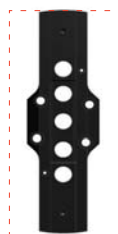


Coolant system detail



| Cartridge | (A) | (B) | (L) | (α°) | Insert |
|--------------|-----|-----|------|--------------------|------------|
| TBC1348 | 50 | 60 | 64.5 | 1° | CCMT060200 |
| TBC1348(15°) | | | | 15° | SNMG120400 |
| TBC1348(45°) | | | | 45° | SNMG120400 |
| TBC1354 | 50 | 60 | 89.5 | 0° | CCMT060200 |
| TBC1354(15°) | | | | 15° | SNMG120400 |
| TBC1354(45°) | | | | 45° | SNMG120400 |

Various cartridge (15°, 45°)



Less Weigh and more margin for Chip evacuation



Enhanced Strength and Weight



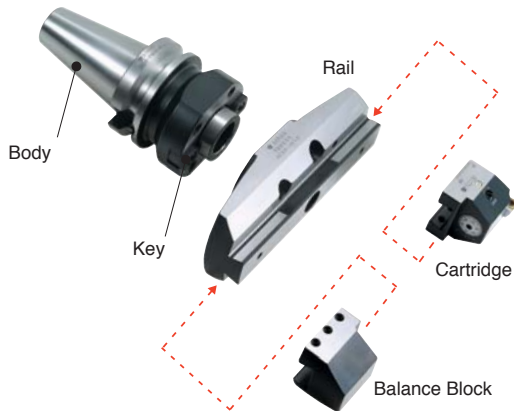
FBC

Feature

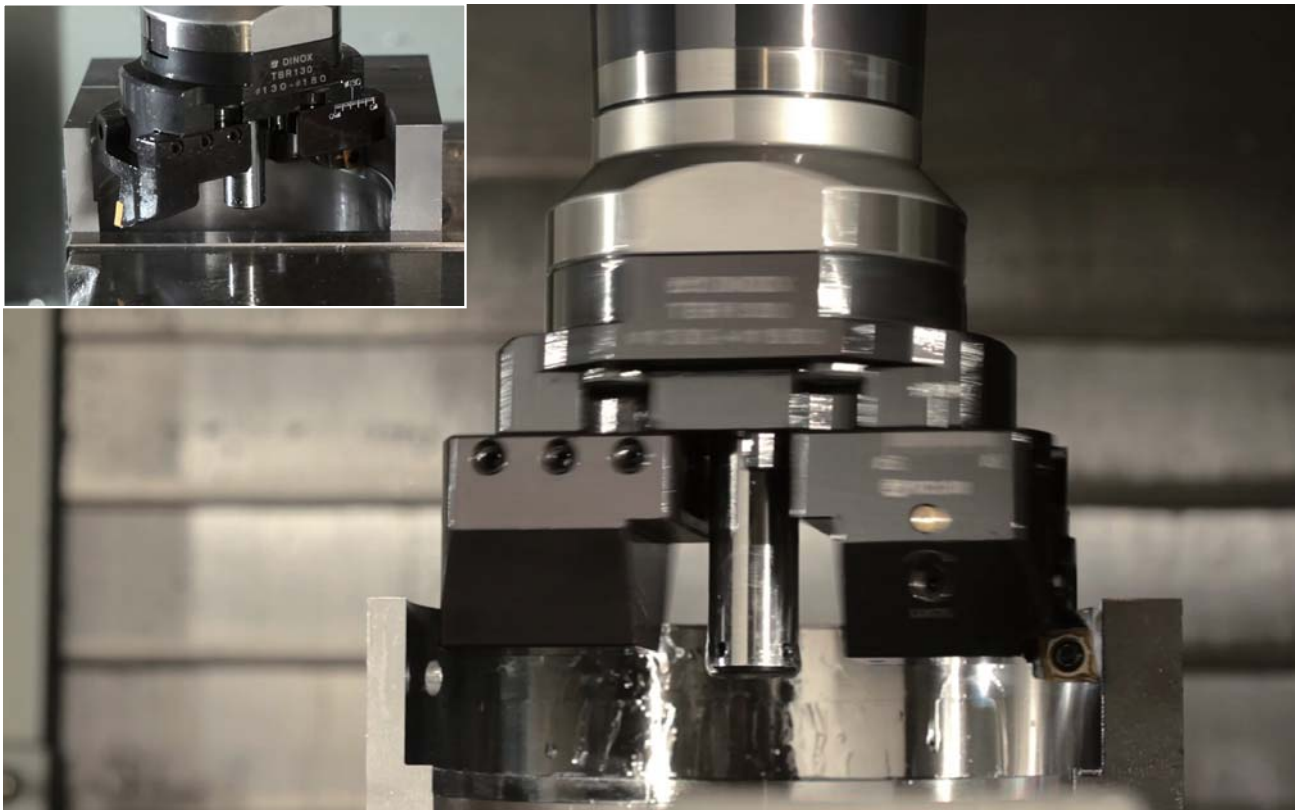
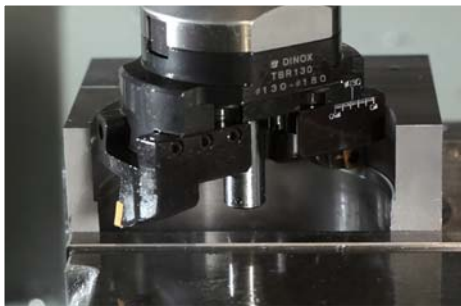
- ▶ Wide boring range for big diameters
 - $\varnothing 130 \sim \varnothing 540\text{mm}$.
- ▶ Interconvert with TBC
 - Common boring head and rail adopted, different cartridge [micro cartridge + balancing block]
- ▶ Various Insert depend on bite
 - Applicable insert : CCMT09T3/1204, TPMT1103 (Cermet, cBN, PCD)



Recommended cutting condition

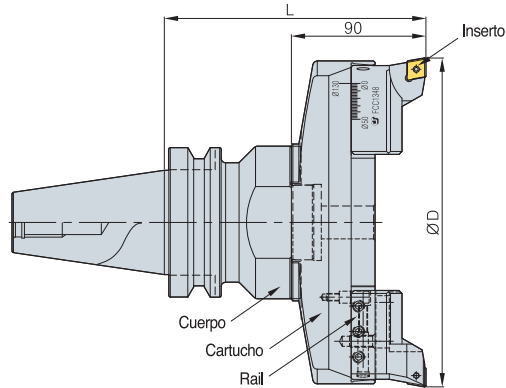


FBC Boring - lightweight



BT-TBC Balance Cut Tool for Rough Boring(Wide Diameter)

MAS403-BT



| Designation | Boring Range ϕD | | | L | Body | Head Set (Head+Cartridge) | Insert | kg |
|---------------|-----------------------|-----|-----|-----|-------------------|----------------------------------|------------|------|
| | min | max | | | | | | |
| BT50 -TBC 130 | -175 | 130 | 180 | 175 | BT50 - FMD50 - 85 | TBC - 130S (TBR130 + BCC1348) | CCMT1204□□ | 9.8 |
| | 245 | 130 | 180 | 245 | 155 | | | 11.8 |
| | 295 | 130 | 180 | 295 | 205 | | | 13.6 |
| | 345 | 130 | 180 | 345 | 255 | | | 14.3 |
| BT50 -TBC 175 | -175 | 175 | 225 | 175 | BT50 - FMD50 - 85 | TBC - 175S (TBR175 + BCC1348) | CCMT1204□□ | 10.8 |
| | 245 | 175 | 225 | 245 | 155 | | | 12.8 |
| | 295 | 175 | 225 | 295 | 205 | | | 14.6 |
| | 345 | 175 | 225 | 345 | 255 | | | 15.3 |
| BT50 -TBC 220 | -175 | 220 | 270 | 175 | BT50 - FMD50 - 85 | TBC - 220S (TBR220 + BCC1348) | CCMT1204□□ | 11.7 |
| | 245 | 220 | 270 | 245 | 155 | | | 13.7 |
| | 295 | 220 | 270 | 295 | 205 | | | 15.5 |
| | 345 | 220 | 270 | 345 | 255 | | | 16.2 |
| BT50 -TBC 265 | -175 | 265 | 315 | 175 | BT50 - FMD50 - 85 | TBC - 265S (TBR265 + BCC1348) | CCMT1204□□ | 13.2 |
| | 245 | 265 | 315 | 245 | 155 | | | 15.2 |
| | 295 | 265 | 315 | 295 | 205 | | | 17.1 |
| | 345 | 265 | 315 | 345 | 255 | | | 17.8 |
| BT50 -TBC 310 | -175 | 310 | 390 | 175 | BT50 - FMD50 - 85 | TBC - 310S (TBR310 + BCC1354) | CCMT1204□□ | 14.5 |
| | 245 | 310 | 390 | 245 | 155 | | | 16.5 |
| | 295 | 310 | 390 | 295 | 205 | | | 18.4 |
| | 345 | 310 | 390 | 345 | 255 | | | 19.1 |
| BT50 -TBC 385 | -175 | 385 | 465 | 175 | BT50 - FMD50 - 85 | TBC - 385S (TBR385 + BCC1354) | CCMT1204□□ | 16.4 |
| | 245 | 385 | 465 | 245 | 155 | | | 18.4 |
| | 295 | 385 | 465 | 295 | 205 | | | 20.3 |
| | 345 | 385 | 465 | 345 | 255 | | | 21.0 |
| BT50 -TBC 460 | -175 | 460 | 540 | 175 | BT50 - FMD50 - 85 | TBC - 460S (TBR460 + BCC1354) | CCMT1204□□ | 18.9 |
| | 245 | 460 | 540 | 245 | 155 | | | 20.9 |
| | 295 | 460 | 540 | 295 | 205 | | | 22.8 |
| | 345 | 460 | 540 | 345 | 255 | | | 23.5 |

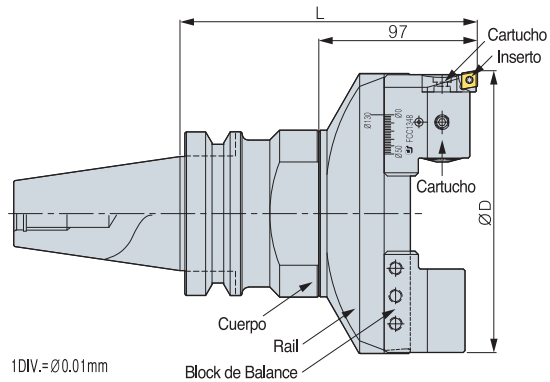
- Cartridge set for CNMG 1204□□ can be manufactured upon request.
- Body : see page 87. Head Set : see page 88. Spare Part : see page 88
- Coolant pin is Option

- Ordering example
 - In case of BT50-TBC130-245
 - Body : BT50-FMD50-155
 - Head Set : TBC-130S



BT-FBC Balance Cut Tool for Finish Boring(Wide Diameter)

MAS403-BT



| Designation | Boring Range ϕD | | L | Body | Micro Boring Head | Bite | $\frac{\text{kg}}{\text{kg}}$ |
|---------------|-----------------------|---------|-----|-------------------|---------------------------------------|--|-------------------------------|
| | min | max | | | | | |
| BT50 -FBC 130 | -182 | 130 180 | 182 | BT50 - FMD50 - 85 | FBC130S (TBR130 + FCC130 + FCB130) | FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCM1204□□) FBB130-T11 (TPMT1103□□, TPGT1103□□L) | 10.4 |
| | 252 | 130 180 | 252 | 155 | | | 12.4 |
| | 302 | 130 180 | 302 | 205 | | | 14.2 |
| | 352 | 130 180 | 352 | 255 | | | 14.9 |
| BT50 -FBC 175 | -182 | 175 225 | 182 | BT50 - FMD50 - 85 | FBC175S (TBR175 + FCC130 + FCB130) | FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCM1204□□) FBB130-T11 (TPMT1103□□, TPGT1103□□L) | 11.4 |
| | 252 | 175 225 | 252 | 155 | | | 13.4 |
| | 302 | 175 225 | 302 | 205 | | | 15.2 |
| | 352 | 175 225 | 352 | 255 | | | 15.9 |
| BT50 -FBC 220 | -182 | 220 270 | 182 | BT50 - FMD50 - 85 | FBC220S (TBR220 + FCC130 + FCB130) | FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCM1204□□) FBB130-T11 (TPMT1103□□, TPGT1103□□L) | 12.3 |
| | 252 | 220 270 | 252 | 155 | | | 14.3 |
| | 302 | 220 270 | 302 | 205 | | | 16.1 |
| | 352 | 220 270 | 352 | 255 | | | 16.8 |
| BT50 -FBC 265 | -182 | 265 315 | 182 | BT50 - FMD50 - 85 | FBC265S (TBR265 + FCC130 + FCB130) | FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCM1204□□) FBB130-T11 (TPMT1103□□, TPGT1103□□L) | 13.8 |
| | 252 | 265 315 | 252 | 155 | | | 15.8 |
| | 302 | 265 315 | 302 | 205 | | | 17.6 |
| | 352 | 265 315 | 352 | 255 | | | 18.3 |
| BT50 -FBC 310 | -182 | 310 390 | 182 | BT50 - FMD50 - 85 | FBC265S (TBR265 + FCC130 + FCB130) | FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCM1204□□) FBB130-T11 (TPMT1103□□, TPGT1103□□L) | 15.0 |
| | 252 | 310 390 | 252 | 155 | | | 17.0 |
| | 302 | 310 390 | 302 | 205 | | | 19.0 |
| | 352 | 310 390 | 352 | 255 | | | 19.7 |
| BT50 -FBC 385 | -182 | 385 465 | 182 | BT50 - FMD50 - 85 | FBC385S (TBR385 + FCC130 + FCB130) | FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCM1204□□) FBB130-T11 (TPMT1103□□, TPGT1103□□L) | 17.0 |
| | 252 | 385 465 | 252 | 155 | | | 19.0 |
| | 302 | 385 465 | 302 | 205 | | | 20.8 |
| | 352 | 385 465 | 352 | 255 | | | 21.5 |
| BT50 -FBC460 | -182 | 460 540 | 182 | BT50 - FMD50 - 85 | FBC385S (TBR385 + FCC130 + FCB130) | FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCM1204□□) FBB130-T11 (TPMT1103□□, TPGT1103□□L) | 19.5 |
| | 252 | 460 540 | 252 | 155 | | | 21.5 |
| | 302 | 460 540 | 302 | 205 | | | 23.3 |
| | 352 | 460 540 | 352 | 255 | | | 24.0 |

- When you use FBB130-C12 Bite, minium boring range enlarged by $\phi 6.7\text{mm}$
- Coolant pin is Option

BT-FMD, SK-FMD Body(Basic Holder)

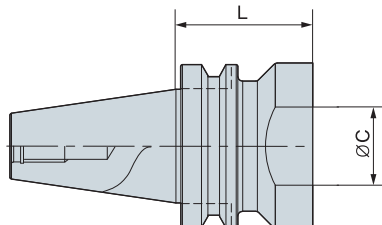


Fig. 1

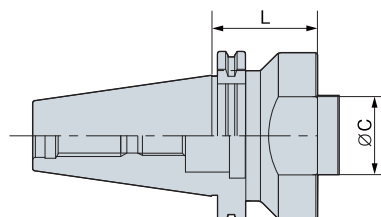
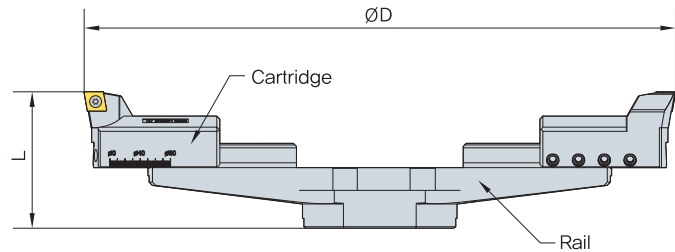


Fig. 2

| | | | | | (mm) |
|------------------|-----|----|------|------|------|
| Designation | L | ØC | kg | Fig. | |
| BT50 - FMD50- 85 | 85 | 50 | 5.9 | 1 | |
| FMD50-155 | 155 | 50 | 7.9 | 1 | |
| FMD50-205 | 205 | 50 | 9.7 | 1 | |
| FMD50-255 | 255 | 50 | 10.4 | 1 | |
| SK50 - FMD50- 85 | 85 | 50 | 5.9 | 2 | |
| FMD50-155 | 155 | 50 | 7.9 | 2 | |
| FMD50-205 | 205 | 50 | 9.7 | 2 | |
| FMD50-255 | 255 | 50 | 10.4 | 2 | |



TBC Head Set



(mm)

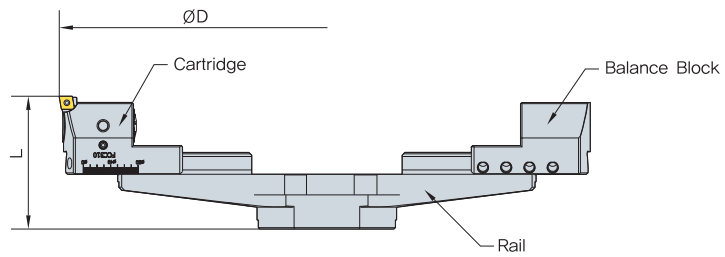
| Designation | Boring Range $\varnothing D$ | | L | kg | Cartridge | Insert |
|-------------|------------------------------|-----|----|-----|-----------|------------|
| | min | max | | | | |
| TBC - 130S | 130 | 180 | 90 | 3.3 | BCC1348 | CCMT1204□□ |
| TBC - 175S | 175 | 225 | 90 | 3.6 | BCC1348 | CCMT1204□□ |
| TBC - 220S | 220 | 270 | 90 | 4.0 | BCC1348 | CCMT1204□□ |
| TBC - 265S | 265 | 315 | 90 | 4.1 | BCC1348 | CCMT1204□□ |
| TBC - 310S | 310 | 390 | 90 | 5.0 | BCC1354 | CCMT1204□□ |
| TBC - 385S | 385 | 465 | 90 | 5.2 | BCC1354 | CCMT1204□□ |
| TBC - 460S | 460 | 540 | 90 | 8.1 | BCC1354 | CCMT1204□□ |

Parts

(mm)

| Division | Spare Parts | | | | | | | | | |
|----------|-------------|-----------|-----------|------------|------------|---------------|--------|-------------|--------|--------------------|
| | Rail | Cartridge | Cartridge | Clamp Bolt | Clamp Bolt | Balance Block | Wrench | Clamp Screw | Wrench | Option Coolant pin |
| Type | | | | | | | | | | |
| TBC-130S | TBR130 | | - | BX0820 | BTF0814 | - | | BFTX0511N | TW20 | Same Coolant pin |
| TBC-175S | TBR175 | BCC1348 | - | BX0820 | BTF0814 | - | | BFTX0511N | TW20 | |
| TBC-220S | TBR220 | (BCN1348) | - | BX0820 | BTF0814 | - | LW-3 | BFTX0511N | TW20 | |
| TBC-265S | TBR265 | | - | BX0820 | BTF0814 | - | LW-4 | BFTX0511N | TW20 | |
| TBC-310S | TBR310 | BCC1354 | - | BX0820 | BTF0814 | - | LW-6 | BFTX0511N | TW20 | |
| TBC-385S | TBR385 | (BCN1354) | - | BX0820 | BTF0814 | - | | BFTX0511N | TW20 | |
| TBC-460S | TBR460 | | - | BX0820 | BTF0814 | - | | BFTX0511N | TW20 | |
| FBC-130S | TBR130 | | FCC130 | BT0645 | BTF0814 | FCB130 | | BT0630 | - | |
| FBC-175S | TBR175 | | FCC130 | BT0645 | BTF0814 | FCB130 | | BT0630 | - | |
| FBC-220S | TBR220 | | FCC130 | BT0645 | BTF0814 | FCB130 | | BT0630 | - | |
| FBC-265S | TBR265 | | FCC130 | BT0645 | BTF0814 | FCB130 | LW-3 | BT0630 | - | |
| FBC-310S | TBR310 | | FCC310 | BT0660 | BTF0814 | FCB310 | LW-4 | BT0630 | - | |
| FBC-385S | TBR385 | | FCC310 | BT0660 | BTF0814 | FCB310 | | BT0630 | - | |
| FBC-460S | TBR460 | | FCC310 | BT0660 | BTF0814 | FCB310 | | BT0630 | - | |

FBC Head Set



| Designation | Boring Range $\varnothing D$ | | L | kg | Bite |
|-------------|------------------------------|-----|----|------|--|
| | min | max | | | |
| FBC-130S | 130 | 180 | 97 | 4.1 | FBB130-C09 FBB130-C12 FBB130-T11 |
| FBC-175S | 175 | 225 | 97 | 5.1 | |
| FBC-220S | 220 | 270 | 97 | 6.0 | |
| FBC-265S | 265 | 315 | 97 | 7.0 | |
| FBC-310S | 310 | 390 | 97 | 8.0 | |
| FBC-385S | 385 | 465 | 97 | 10.1 | |
| FBC-460S | 460 | 540 | 97 | 12.3 | |

FBB FBB Bite

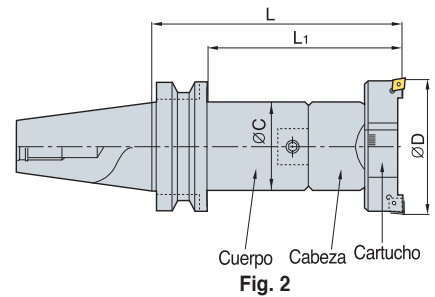
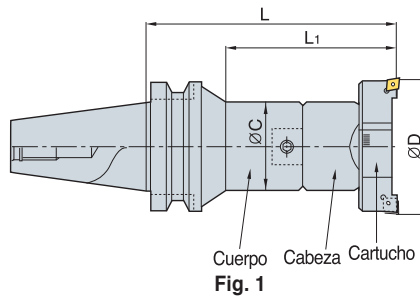


| Designation | Insert |
|-------------|------------------------|
| FBB130-C09 | CCGT09T3□□ |
| FBB130-C12 | CCMT09T3□□, CCMT1204□□ |
| FBB130-T11 | TPGT1103□□, TPMT1103□□ |



BT-DBC (Modular Type)

MAS403-BT



| Designation | Boring Range øD | | L | Boring Depth L1 | ØC | Body (Basic Holder) | Head Set (Head+Cartridge) | Head Set (Head+Cartridge) | kg | Fig. |
|--------------------|-----------------|-----|-----|-----------------|----|---------------------|---------------------------|---------------------------|------|------|
| | min | max | | | | | | | | |
| BT40 - DBC28 - 165 | 28 | 35 | 165 | 100 | 25 | BT40 - MD25F - 105R | DBC-2528S | CCMT0602□□ | 1.7 | 1 |
| 35 - 180 | 35 | 46 | 180 | 110 | 32 | - MD32F - 115R | -3235S | CCMT0602□□ | 1.9 | 1 |
| 46 - 180 | 46 | 58 | 180 | 130 | 40 | - MD40F - 110R | -4046S | CCMT09T3□□ | 2.6 | 1 |
| 58 - 180 | 58 | 74 | 180 | 130 | 50 | - MD50F - 100R | -5058S | CCMT09T3□□ | 3.8 | 1 |
| 74 - 180 | 74 | 94 | 180 | 150 | 63 | - MD63F - 90 | -6374S | CCMT1204□□ | 5.8 | 2 |
| 94 - 200 | 94 | 120 | 200 | 173 | 80 | - MD80F - 100 | -8094S | CCMT1204□□ | 7.5 | 2 |
| BT50 - DBC28 - 180 | 28 | 35 | 180 | 100 | 25 | BT50 - MD25F - 120R | BCH-28SF | CCMT0602□□ | 4.5 | 1 |
| 35 - 180 | 35 | 46 | 180 | 110 | 32 | - MD32F - 115R | -3235S | CCMT0602□□ | 4.8 | 1 |
| - 300 | 35 | 46 | 300 | 180 | 32 | - MD32F - 235R | -3235S | CCMT0602□□ | 5.4 | 1 |
| 46 - 195 | 46 | 58 | 195 | 130 | 40 | - MD40F - 125R | -4046S | CCMT09T3□□ | 5.6 | 1 |
| - 300 | 46 | 58 | 300 | 250 | 40 | MD40F - 230R | -4046S | CCMT09T3□□ | 6.7 | 1 |
| 58 - 240 | 58 | 74 | 240 | 140 | 50 | - MD50F - 160R | -5058S | CCMT09T3□□ | 7.2 | 1 |
| - 330 | 58 | 74 | 330 | 280 | 50 | - MD50F - 250R | -5058S | CCMT09T3□□ | 8.6 | 1 |
| 74 - 230 | 74 | 94 | 230 | 160 | 63 | - MD63F - 140R | -6374S | CCMT1204□□ | 8.8 | 1 |
| - 330 | 74 | 94 | 330 | 280 | 63 | - MD63F - 240R | -6374S | CCMT1204□□ | 11.0 | 1 |
| 94 - 210 | 94 | 120 | 210 | 170 | 80 | - MD80F - 110 | -8094S | CCMT1204□□ | 9.0 | 2 |
| - 275 | 94 | 120 | 275 | 225 | 80 | - MD80F - 175 | -8094S | CCMT1204□□ | 11.8 | 2 |
| 120 - 175 | 120 | 175 | 175 | - | - | - MD80F - 75 | DBC-120N | CCMT1204□□ | 8.2 | |
| - 210 | 120 | 175 | 210 | - | - | - MD80F - 110 | DBC-120N+BCC120 | CCMT1204□□ | 10.3 | |
| - 275 | 120 | 175 | 275 | - | - | - MD80F - 175 | | CCMT1204□□ | 13.0 | |

- Insert : see page 164
- Body(Basic Holder) : see page 192

- Ordering example
- In case of BT50-DBC120-175
- Body : BT50-MD80F-75
- Head Set : BCH-120NS

Parts

| Division | Spare Parts | | | | |
|----------|-------------|-------------|---------|------------|--------|
| | Body | Taper Screw | Head | Cartridge | Wrench |
| Type | | | | | |
| DBC 28 | MD25F | BTT0608F | DBC2528 | BCC28 SET | LW-3 |
| DBC 35 | MD32F | BTT0810F | DBC3235 | BCC35 SET | LW-4 |
| DBC 46 | MD40F | BTT1013F | DBC4046 | BCC46 SET | LW-5 |
| DBC 58 | MD50F | BTT1215F | DBC5058 | BCC58 SET | LW-5 |
| DBC 74 | MD63F | BTT1620F | DBC6374 | BCC74 SET | LW-6 |
| DBC 94 | MD80F | BTT1631F | DBC8094 | BCC94 SET | LW-8 |
| DBC120 | MD80F | BTT1631F | DBC120N | BCC120 SET | LW-8 |



Insert (BT-DBC)

Insert for DBC

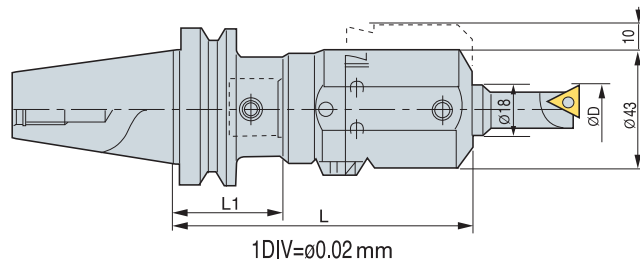
| Insert | Grade | Workpiece | Cutting | Page |
|------------|---------------------------------|-------------------------------|-------------------|----------|
| CCMT0602□□ | Coated : NC3220, NC3120 | Steel, Alloy Steel, Cast iron | general~ | B50 |
| | Coated : NC6110 | Steel, Alloy Steel | general~ | B50 |
| | Coated : PC8110, PC5300, NC9025 | Stainless Steel | general~ | B50 |
| | Cermet : CN1000, CN2000 | Steel, Cast iron | finishing~general | B50 |
| CCGT0602□□ | Coated : NC3020, NC3120 | Steel, Alloy Steel | general~ | B49, B50 |
| | W.C : H01 | Cast iron | finishing~general | B49, B50 |
| | Cermet : CN1000, CN2000 | Stainless Steel | finishing~general | B49, B50 |
| CCMT09T3□□ | Coated : NC3220, NC3120 | Stainless Steel | general~ | B50 |
| | Coated : NC6110 | Steel, Alloy Steel, Cast iron | general~ | B50 |
| | Coated : PC8110, PC5300, NC9025 | Steel, Cast iron | general~ | B50 |
| | Cermet : CN1000, CN2000 | Steel, Alloy Steel | finishing~general | B50 |
| CCGT09T3□□ | Coated : PC8110, PC5300, NC9025 | Aluminum | general~ | B49, B50 |
| | W.C : H01 | Steel, Alloy Steel, Cast iron | finishing~general | B49, B50 |
| | Cermet : CN1000, CN2000 | Steel, Alloy Steel | finishing~general | B49, B50 |
| CCMT1204□□ | Coated : NC3220, NC3120 | Cast iron | general~ | B50 |
| | Coated : NC6110 | Stainless Steel | general~ | B50 |
| | Coated : PC8110, PC5300, NC9025 | Steel, Cast iron | general~ | B50 |
| | Cermet : CN1000, CN2000 | Steel, Alloy Steel | finishing~general | B50 |
| CCGT1204□□ | W.C : H01 | Cast iron | finishing~general | B49 |

- Insert of grade and C/B can be chosen according to various working method
- Please distinguish cartridge from for CNMG1204□□ and for CCMT1204□□



BT-SMB Small Micro Boring Bar

MAS403-BT

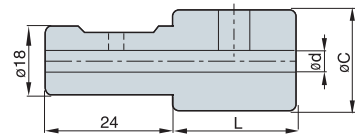
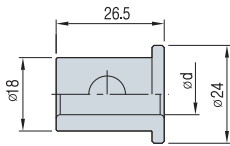


(mm)

| Designation | L | L1 | Body (Basic Holder) | Head | Boring Bite | kg |
|-------------|-------|----|---------------------|---------|-------------|-----|
| BT40-SMB | 122.5 | 60 | BT40-MD40F-60 | SMB4022 | BB18-□S | 2.8 |
| BT50-SMB | 122.5 | 60 | BT50-MD40F-60 | SMB4022 | BB18-□S | 5.4 |

- Finish cutting modular type micro boring bar best suiting small size hole.
- Boring range : (BB18 Boring Bite): $\phi 8.0 \sim \phi 38.0\text{mm}$ • Adjustable length : 10mm
- Basic holders can be chucking : HSK, BT, SK, NT50/40, MT6, Straight Shank
- Head : see page 106 • Body(Basic Holder) : see page 97

Clamping Sleeve



(mm)

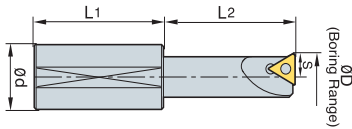
| Designation | ϕd |
|-------------|----------|
| CSL 4 | 4 |
| CSL 5 | 5 |
| CSL 6 | 6 |
| CSL 7 | 7 |
| CSL 8 | 8 |
| CSL 10 | 10 |
| CSL 12 | 12 |

| Designation | ϕd | ϕC | L |
|-------------|----------|----------|----|
| LCSL 5 | 5 | 18 | 18 |
| LCSL 6 | 6 | 18 | 18 |
| LCSL 7 | 7 | 18 | 18 |
| LCSL 8 | 8 | 22 | 22 |
| LCSL 10 | 10 | 25 | 25 |
| LCSL 12 | 12 | 25 | 30 |

* Special size can be ordered

Boring Bite : BBType(for SMB)

(mm)



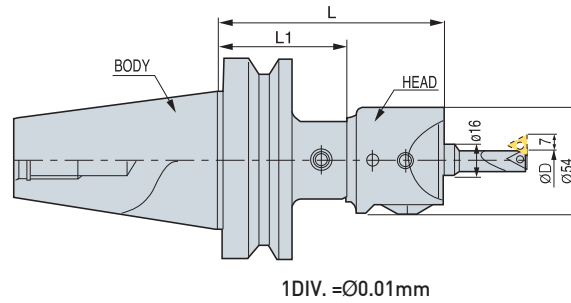
| Designation | Boring Range ϕD | | S | ϕd | L1 | L2 | Insert | Insert Screw |
|-------------|-----------------------|-----|-----|----------|----|----|-------------|--------------|
| | min | max | | | | | | |
| BB 18-7(S) | 8 | 28 | 3.5 | 18 | 30 | 30 | TBGT0601□□L | BFTX0204A |
| 18-9(S) | 10 | 30 | 4.5 | 18 | 30 | 40 | TPGT0802□□L | BFTX0204A |
| 18-11(S) | 12 | 32 | 5.5 | 18 | 30 | 45 | TPGT1103□□L | BFTX0307A |
| 18-13(S) | 14 | 34 | 6.5 | 18 | 40 | 45 | TPGT1103□□L | BFTX0307A |
| 18-15(S) | 16 | 36 | 7.5 | 18 | 40 | 50 | TPGT1103□□L | BFTX0307A |
| 18-17(S) | 18 | 38 | 8.5 | 18 | 40 | 50 | TPGT1103□□L | BFTX0307A |

Parts

| Division | Spare Parts | | | | |
|----------|-------------|-------------|-------------|--------|-------------|
| | Basic | | | | Option |
| | Body | Boring Head | Taper Screw | Wrench | Boring Bite |
| Type | | | | | |
| SMB | MD40F | SMH4022 | BTT1013F | LW-5 | BB18 |

BT-SMH Small Micro Boring Bar(for High Precision)

MAS403-BT

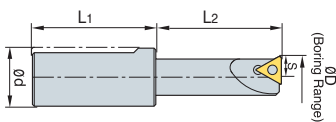


| Designation | L | L1 | Body | Head | Boring Bite | kg |
|-------------|-----|----|---------------|---------|-------------|-----|
| BT40 - SMH | 109 | 60 | BT40-MD40F-60 | SMH4022 | BB16-□S | 3.0 |
| BT50 - SMH | 109 | 60 | BT50-MD40F-60 | SMH4022 | BB16-□S | 6.0 |

- Finish cutting modular type micro boring bar best suiting small size hole
- Boring range : $\phi 6.0 \sim \phi 34.0\text{mm}$
- Adjustable Length : 7mm
- Basic holders can be chucking : HSK, BT, SK, NT50/40, MT6, Straight Shank
- Head : see page 106
- Body(Basic Holder) : see page 97
- Optional through coolant system

Boring Bite : BBType(for SMH)

(mm)



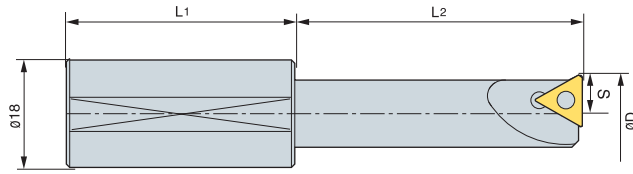
| Designation | Boring Range ϕD | | S | ϕd | L1 | L2 | Insert | Insert Screw | Wrench |
|-------------|-----------------------|-----|------|----------|----|----|--------------|--------------|--------|
| | min | max | | | | | | | |
| BB 16-5(S) | 6 | 20 | 2.75 | 16 | 34 | 20 | WBG0601□□□□ | BFTX0203A | TW06 |
| 16-7(S) | 8 | 22 | 3.5 | 16 | 34 | 30 | TBGT0601□□□□ | BFTX0204A | TW06 |
| 16-9(S) | 10 | 24 | 4.5 | 16 | 34 | 40 | TPGT0802□□□□ | BFTX0204A | TW06 |
| 16-11(S) | 12 | 26 | 5.5 | 16 | 34 | 45 | TPGT1103□□□□ | BFTX0307A | TW10 |
| 16-15(S) | 16 | 30 | 7.5 | 16 | 34 | 50 | TPGT1103□□□□ | BFTX0307A | TW10 |
| 16-19(S) | 20 | 34 | 9.5 | 16 | 34 | 60 | TPGT1604□□□□ | BFTX0410A | TW15 |

Parts

| Division | Spare Parts | | | | |
|----------|-------------|-------------|-------------|--------|-------------|
| | Basic | | | | Option |
| | Body | Boring Head | Taper Screw | Wrench | Boring Bite |
| Type | | | | | |
| SMH | MD40F | SMH4022 | BTT1013F | LW-5 | BB16 |



BB Bite



🎯 Boring Bite : BB type(for SMB, KMB)

(mm)

| Designation | Insert | ØD min. Boring | S | L1 | L2 | Screw | Wrench |
|-------------|-------------|-------------------|-----|----|----|-----------|--------|
| BB18-7(S) | TBGT0601□□L | 8 | 3.5 | 30 | 30 | BFTX0204A | TRX06 |
| BB18-9(S) | TPGT0802□□L | 10 | 4.5 | 30 | 40 | BFTX0204A | TRX06 |
| BB18-11(S) | TPGT1103□□L | 12 | 5.5 | 30 | 45 | BFTX0307A | TRX10 |
| BB18-13(S) | TPGT1103□□L | 14 | 6.5 | 40 | 45 | BFTX0307A | TRX10 |
| BB18-15(S) | TPGT1103□□L | 16 | 7.5 | 40 | 50 | BFTX0307A | TRX10 |
| BB18-17(S) | TPGT1103□□L | 18 | 8.5 | 40 | 50 | BFTX0307A | TRX10 |

🎯 Standard Boring Bite

| Internal Bite Series | Application | Shank Size | Application Insert |
|--|----------------------------------|--------------------------|--|
| BBPT(WBPT: Internal Bite Series) BBPW(WBPW: Internal Bite Series) | For Through hole boring | Ø8,10,12,16 Ø5.5,8,10 | TBGT0601□□L, TPGT0802□□L, TPGT1103□□L WBG0601□□L, WBMT0601□□L, WBG0802□□L |
| S-SCLCR (C-SCLCR: Internal Bite Series) | For Stop and Through hole boring | Ø8,10,12,16 | CCGT0602□□, CCMT0602□□, CCGT09T3□□, CCMT09T3□□ |
| S-SWUBR(E-SWUBR:Internal Bite Series) | For Through hole boring | Ø5.5,8,10 | TPGT1103□□L |
| S-STUPR | | Ø8 | TBGT0601□□L, TPGT0802□□L |
| S-STFPR(C-STFPR:Internal Bite Series) | | Ø12,16 | WBG020102L, WBG0 S3020□□L |
| S-SCLCR(C-SCLCR:Internal Bite Series) S-SCLPR(C-SCLPR:Internal Bite Series) | For Stop and through hole boring | Ø10,12,16 Ø8,10,12,16 | CCMT0602□□,CCGT0602□□,CCMT09T3□□,CCGT09T3□□ CPGT0802□□,CPGT0903□□ |

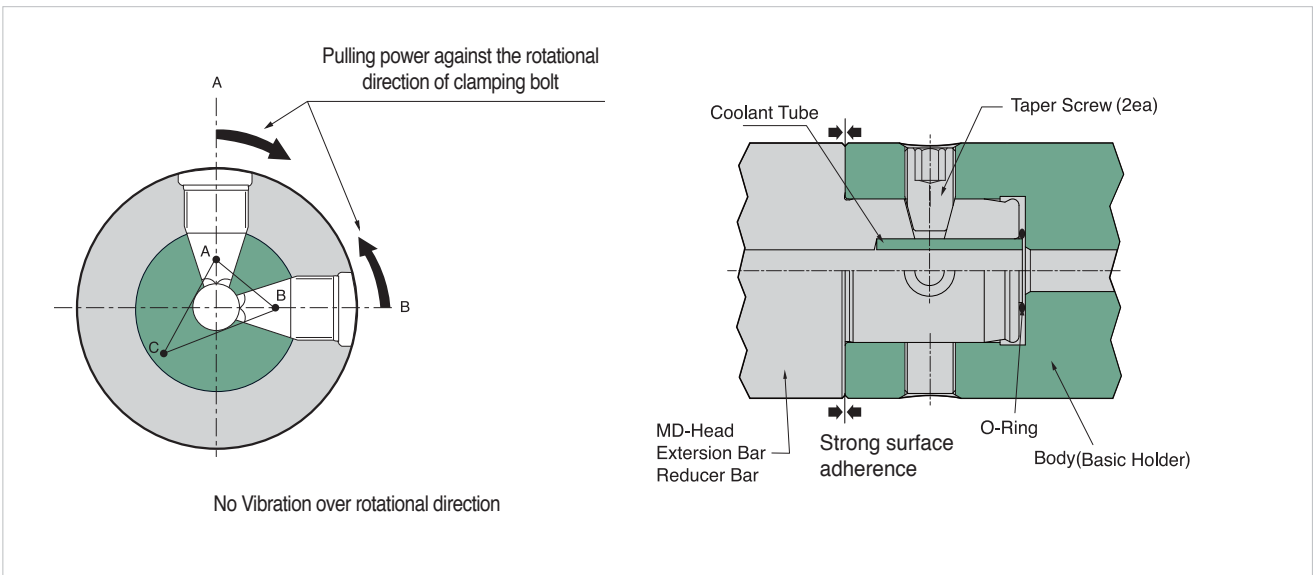
- Carbide bite can be ordered
- If you using clamping sleeve, you can using standard boring bite and insert
- cBN and PCD can be ordered



Versatile tooling system conforming to FMS specification

Modular System

- Flexible combination of tool units according to conditions
- Joining with a specially designed screw provides high accuracy (error less than $5\mu\text{m}$) and ease of detach for one step setting
- Cutting edge of boring system aligned with the groove of drive key
- Likely equal accuracy and stiffness compared to uni-body type



DBT-MD

MAS403-BT

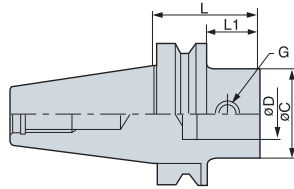


Fig.1

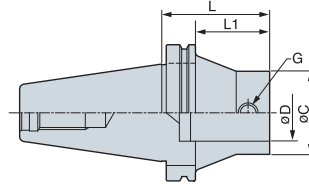


Fig.2

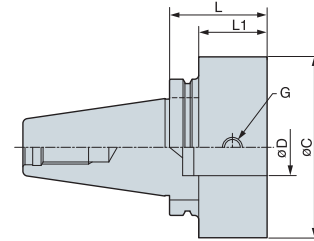



Fig.3

(mm)

| Designation | ØC | ØD | L | L1 | G |  kg | Fig. |
|--------------------|----|----|-----|-----|-----|--|------|
| DBT30 - MD19F - 70 | 19 | 11 | 70 | 48 | M5 | 0.4 | 1 |
| MD25F - 40 | 25 | 14 | 40 | 18 | M6 | 0.3 | 1 |
| 90 | 25 | 14 | 90 | 68 | M6 | 0.4 | 1 |
| MD32F - 40 | 32 | 18 | 40 | 32 | M8 | 0.4 | 1 |
| 80 | 32 | 18 | 80 | 58 | M8 | 0.4 | 1 |
| MD40F - 45 | 40 | 22 | 45 | 23 | M10 | 0.4 | 1 |
| 80 | 40 | 22 | 80 | 58 | M10 | 0.5 | 1 |
| MD50F - 55 | 50 | 28 | 55 | 33 | M12 | 0.7 | 3 |
| 70 | 50 | 28 | 70 | 48 | M12 | 0.8 | 3 |
| DBT40 - MD19F - 70 | 19 | | 70 | 43 | M5 | 1.8 | 1 |
| MD25F - 45 | 25 | 14 | 45 | 18 | M6 | 1.7 | 1 |
| 95 | 25 | 14 | 95 | 68 | M6 | 1.9 | 1 |
| MD32F - 45 | 32 | 18 | 45 | 18 | M8 | 1.7 | 1 |
| 100 | 32 | 18 | 100 | 73 | M8 | 2.3 | 1 |
| MD40F - 50 | 40 | 22 | 50 | 23 | M10 | 2.7 | 1 |
| 115 | 40 | 22 | 115 | 88 | M10 | 2.7 | 1 |
| MD50F - 60 | 50 | 28 | 60 | 33 | M12 | 2.3 | 1 |
| 105 | 50 | 28 | 105 | 78 | M12 | 2.7 | 1 |
| MD63F - 64 | 63 | 36 | 64 | 37 | M16 | 3.3 | 3 |
| 110 | 63 | 36 | 110 | 83 | M16 | 4.6 | 3 |
| MD80F - 70 | 80 | 45 | 70 | 43 | M16 | 4.7 | 3 |
| 100 | 80 | 45 | 100 | 73 | M16 | 4.8 | 3 |
| DBT50 - MD19F - 50 | 19 | 11 | 50 | 12 | M5 | 4.0 | 1 |
| 100 | 19 | 11 | 100 | 62 | M5 | 4.3 | 1 |
| MD25F - 55 | 25 | 14 | 55 | 17 | M6 | 4.3 | 1 |
| 105 | 25 | 14 | 105 | 67 | M6 | 4.5 | 1 |
| MD32F - 60 | 32 | 18 | 60 | 22 | M8 | 4.3 | 1 |
| 110 | 32 | 18 | 110 | 72 | M8 | 5.1 | 1 |
| 235R | 32 | 18 | 235 | 148 | M8 | 5.1 | 2 |
| MD40F - 60 | 40 | 22 | 60 | 22 | M10 | 5.0 | 1 |
| 145 | 40 | 22 | 145 | 107 | M10 | 5.1 | 1 |
| MD40F - 230R | 40 | 22 | 230 | 192 | M10 | 5.6 | 2 |
| MD50F - 70 | 50 | 28 | 70 | 22 | M12 | 5.6 | 1 |
| 125 | 50 | 28 | 125 | 87 | M12 | 6.0 | 1 |
| 160R | 50 | 28 | 160 | 122 | M12 | 6.2 | 2 |
| 250R | 50 | 28 | 250 | 212 | M12 | 6.5 | 2 |
| MD63F - 75 | 63 | 36 | 75 | 37 | M16 | 6.8 | 1 |
| 130 | 63 | 36 | 130 | 92 | M16 | 6.0 | 1 |
| 140R | 63 | 36 | 140 | 102 | M16 | 6.0 | 2 |
| 240R | 63 | 36 | 240 | 202 | M16 | 8.4 | 2 |
| MD80F - 75 | 80 | 45 | 75 | 37 | M16 | 9.1 | 1 |
| 160 | 80 | 45 | 160 | 72 | M16 | 9.4 | 1 |
| 245 | 80 | 45 | 245 | 137 | M16 | 9.5 | 1 |
| MD90F - 75 | 90 | 45 | 75 | 72 | M16 | 9.8 | 1 |
| 160 | 90 | 45 | 160 | 137 | M16 | 10.2 | 1 |
| 245 | 90 | 45 | 245 | 157 | M16 | 10.4 | 1 |

• Beside above mentioned types, Basic Holders are also manufactured by customer's order.
 • Select the type in accordance with the machine spindle taper. • Spare Part : see page 100



BT-MD

MAS403-BT

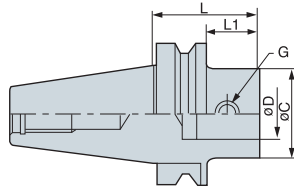


Fig.1

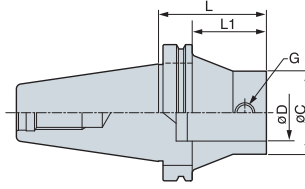


Fig.2

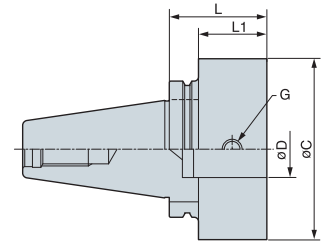


Fig.3

(mm)

| Designation | øC | øD | L | L1 | G | $\frac{m}{kg}$ | Fig. | | |
|-------------|---------|------|----|-----|-----|----------------|------|------|---|
| BT30- | MD19F - | 35 | 19 | 11 | 35 | 13 | M5 | 0.3 | 1 |
| | | 70 | 19 | 11 | 70 | 48 | M5 | 0.4 | 1 |
| | MD25F - | 40 | 25 | 14 | 40 | 18 | M6 | 0.3 | 1 |
| | | 90 | 25 | 14 | 90 | 68 | M6 | 0.4 | 1 |
| | MD32F - | 54 | 32 | 18 | 54 | 32 | M8 | 0.4 | 1 |
| | | 80 | 32 | 18 | 80 | 58 | M8 | 0.4 | 1 |
| | MD40F - | 45 | 40 | 22 | 45 | 23 | M10 | 0.4 | 1 |
| | | 60 | 40 | 22 | 60 | 38 | M10 | 0.45 | 1 |
| | | 80 | 40 | 22 | 80 | 58 | M10 | 0.5 | 1 |
| | | 110 | 40 | 22 | 110 | 88 | M10 | 0.8 | 1 |
| MD50F - | 55 | 50 | 28 | 55 | 33 | M12 | 0.7 | 3 | |
| | 70 | 50 | 28 | 70 | 48 | M12 | 0.8 | 3 | |
| BT40- | MD19F - | 40 | 19 | 11 | 40 | 13 | M5 | 1.6 | 1 |
| | | 70 | 19 | 11 | 70 | 43 | M5 | 1.8 | 1 |
| | MD25F - | 45 | 25 | 14 | 45 | 18 | M6 | 1.7 | 1 |
| | | 95 | 25 | 14 | 95 | 68 | M6 | 1.9 | 1 |
| | | 105R | 25 | 14 | 105 | 78 | M6 | 1.9 | 2 |
| | MD32F - | 45 | 32 | 18 | 45 | 18 | M8 | 1.7 | 1 |
| | | 100 | 32 | 18 | 100 | 73 | M8 | 2.3 | 1 |
| | | 115R | 32 | 18 | 115 | 88 | M8 | 2.4 | 2 |
| | MD40F - | 50 | 40 | 22 | 50 | 23 | M10 | 2.7 | 1 |
| | | 60 | 40 | 22 | 60 | 33 | M10 | 2.7 | 1 |
| | | 110R | 40 | 22 | 110 | 83 | M10 | 2.7 | 2 |
| | | 115 | 40 | 22 | 115 | 88 | M10 | 2.7 | 1 |
| | MD50F - | 60 | 50 | 28 | 60 | 33 | M12 | 2.3 | 1 |
| | | 100R | 50 | 28 | 100 | 73 | M12 | 2.7 | 2 |
| | | 105 | 50 | 28 | 105 | 78 | M12 | 2.7 | 1 |
| | MD63F - | 64 | 63 | 36 | 64 | 37 | M16 | 3.3 | 3 |
| 90 | | 63 | 36 | 90 | 63 | M16 | 3.6 | 3 | |
| 110 | | 63 | 36 | 110 | 83 | M16 | 4.6 | 3 | |
| 135 | | 63 | 36 | 135 | 108 | M16 | 4.7 | 3 | |
| MD80F - | 70 | 80 | 45 | 70 | 43 | M16 | 4.7 | 3 | |
| | 100 | 80 | 45 | 100 | 73 | M16 | 4.8 | 3 | |
| BT50- | MD19F - | 50 | 19 | 11 | 50 | 12 | M5 | 4.0 | 1 |
| | | 85 | 19 | 11 | 85 | 47 | M5 | 4.3 | 1 |
| | | 100 | 19 | 11 | 100 | 62 | M5 | 4.3 | 1 |
| | MD25F - | 55 | 25 | 14 | 55 | 17 | M6 | 4.3 | 1 |
| | | 105 | 25 | 14 | 105 | 67 | M6 | 4.5 | 1 |
| | | 120R | 25 | 14 | 120 | 82 | M6 | 4.7 | 2 |
| | MD32F - | 60 | 32 | 18 | 60 | 22 | M8 | 4.3 | 1 |
| | | 110 | 32 | 18 | 110 | 72 | M8 | 5.1 | 1 |
| | | 115R | 32 | 18 | 115 | 77 | M8 | 5.1 | 2 |
| | | 235R | 32 | 18 | 235 | 148 | M8 | 5.1 | 2 |
| MD40F - | 60 | 40 | 22 | 60 | 22 | M10 | 5.0 | 1 | |
| | 125R | 40 | 22 | 125 | 87 | M10 | 5.1 | 2 | |
| | 145 | 40 | 22 | 145 | 107 | M10 | 5.1 | 1 | |



BT-MD

MAS403-BT

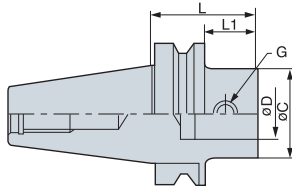


Fig.1

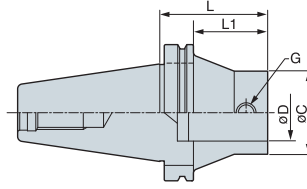


Fig.2

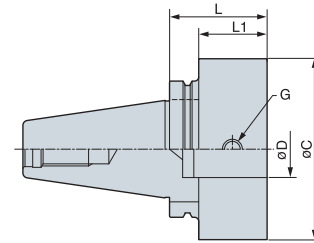



Fig.3

(mm)

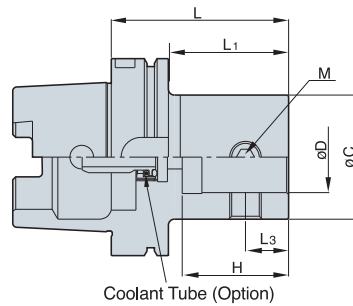
| Designation | ØC | ØD | L | L1 | G |  | Fig. | |
|-------------|-------------|----|----|-----|-----|---|------|-----|
| BT50- | MD40F - 195 | 40 | 22 | 195 | 157 | M10 | 5.4 | 1 |
| | - 230R | 40 | 22 | 230 | 192 | M10 | 5.6 | 2 |
| MD50F - | 70 | 50 | 28 | 70 | 22 | M12 | 5.6 | 1 |
| | - 125 | 50 | 28 | 125 | 87 | M12 | 6.0 | 1 |
| | - 160R | 50 | 28 | 160 | 122 | M12 | 6.2 | 2 |
| | - 225 | 50 | 28 | 225 | 187 | M12 | 8.4 | 1 |
| | - 250R | 50 | 28 | 250 | 212 | M12 | 6.5 | 2 |
| | MD63F - | 75 | 63 | 36 | 75 | 37 | M12 | 6.8 |
| MD63F - | 130 | 63 | 36 | 130 | 92 | M16 | 6.0 | 1 |
| | - 140 | 63 | 36 | 140 | 92 | M16 | 6.0 | 1 |
| | - 140R | 63 | 36 | 140 | 102 | M16 | 6.0 | 2 |
| | - 195 | 63 | 36 | 195 | 157 | M16 | 8.0 | 1 |
| | - 230 | 63 | 36 | 230 | 192 | M16 | 8.4 | 1 |
| | - 240R | 63 | 36 | 240 | 202 | M16 | 8.4 | 2 |
| MD80F - | 75 | 80 | 45 | 75 | 37 | M16 | 9.1 | 1 |
| | - 110 | 80 | 45 | 110 | 72 | M16 | 9.4 | 1 |
| | - 175 | 80 | 45 | 175 | 137 | M16 | 9.5 | 1 |
| MD90F - | 110 | 90 | 45 | 75 | 37 | M16 | 9.8 | 1 |
| | - 175 | 90 | 45 | 175 | 137 | M16 | 10.2 | 1 |
| MT6- | MD19F - 30 | 19 | 11 | 30 | - | M5 | - | - |
| | MD25F - 30 | 25 | 14 | 30 | - | M6 | - | - |
| | MD32F - 35 | 32 | 18 | 35 | - | M8 | - | - |
| | MD40F - 45 | 40 | 22 | 45 | - | M10 | - | - |
| | MD50F - 45 | 50 | 28 | 45 | - | M12 | - | - |
| | MD63F - 45 | 63 | 36 | 45 | - | M16 | - | - |
| | MD80F - 75 | 80 | 45 | 75 | - | M16 | - | - |
| | MD90F - 75 | 90 | 45 | 75 | 22 | M16 | - | - |
| S32- | MD40F - 22 | 40 | 22 | 102 | 60 | M10 | - | - |
| | MD63F - 60 | 63 | 36 | 140 | 22 | M16 | - | - |
| S42- | MD40F - 22 | 40 | 22 | 102 | 60 | M10 | - | - |
| | MD63F - 60 | 63 | 36 | 140 | - | M16 | - | - |

• Spare Part : see page 100



HSK-MD

DIN 69893-1, ISO 12164-1 : 2001





(mm)

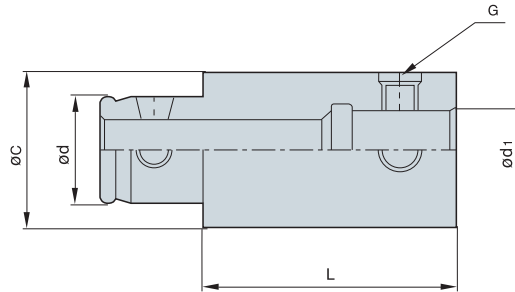
| Designation | ØD | ØC | L | L1 | L3 | H | K | |
|-------------|------------|----|----|-----|----|-----|----|-----|
| HSK 50A- | MD19F- 60 | 11 | 19 | 60 | 36 | 6.5 | 15 | M5 |
| | MD25F- 60 | 14 | 25 | 60 | 34 | 8 | 23 | M6 |
| | MD32F- 70 | 18 | 32 | 70 | 44 | 11 | 28 | M8 |
| | MD40F- 75 | 22 | 40 | 75 | 49 | 13 | 33 | M10 |
| | MD50F- 95 | 28 | 50 | 95 | 69 | 17 | 44 | M12 |
| HSK 63A- | MD19F- 60 | 11 | 19 | 60 | 36 | 6.5 | 15 | M5 |
| | MD25F- 60 | 14 | 25 | 60 | 34 | 8 | 23 | M6 |
| | MD32F- 65 | 18 | 32 | 65 | 39 | 11 | 28 | M8 |
| | MD40F- 70 | 22 | 40 | 70 | 44 | 13 | 33 | M10 |
| | MD50F- 85 | 28 | 50 | 85 | 59 | 17 | 44 | M12 |
| | MD63F- 95 | 36 | 63 | 95 | 69 | 22 | 54 | M16 |
| HSK100A- | MD19F- 60 | 11 | 19 | 60 | 36 | 6.5 | 15 | M5 |
| | MD25F- 60 | 14 | 25 | 60 | 36 | 8 | 23 | M6 |
| | MD32F- 65 | 18 | 32 | 65 | 36 | 11 | 28 | M8 |
| | MD40F- 70 | 22 | 40 | 70 | 41 | 13 | 33 | M10 |
| | MD50F- 80 | 28 | 50 | 80 | 51 | 17 | 44 | M12 |
| | MD63F- 90 | 36 | 63 | 90 | 61 | 22 | 54 | M16 |
| | MD80F- 105 | 45 | 80 | 105 | 76 | 27 | 65 | M16 |
| | MD90F- 105 | 45 | 90 | 105 | 76 | 27 | 65 | M16 |

• Optional through coolant system

Parts

| Division | Spare Parts | |
|----------|---|---|
| | Basic Taper Screw | Option Wrench |
| Type |  |  |
| MD19F | BTT0506F | LW-2.5 |
| MD25F | BTT0608F | LW-3 |
| MD32F | BTT0810F | LW-4 |
| MD40F | BTT1013F | LW-5 |
| MD50F | BTT1215F | LW-6 |
| MD63F | BTT1620F | LW-8 |
| MD80F | BTT1626F | LW-8 |
| MD90F | BTT1631F | LW-8 |

EXT

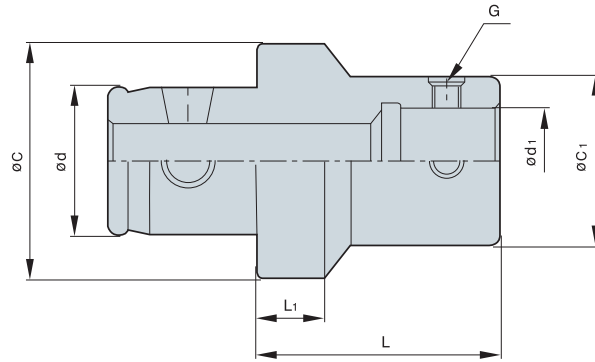


(mm)

| Designation | ØC | Ød | L | Ød1 | G |
|-------------|----|----|-----|-----|-----|
| EXT 1930F | 19 | 11 | 30 | 11 | M5 |
| EXT 1950F | 19 | 11 | 50 | 11 | M5 |
| EXT 2530F | 25 | 14 | 30 | 14 | M6 |
| EXT 2550F | 25 | 14 | 50 | 14 | M6 |
| EXT 3235F | 32 | 18 | 35 | 18 | M8 |
| EXT 3260F | 32 | 18 | 60 | 18 | M8 |
| EXT 4040F | 40 | 22 | 40 | 22 | M10 |
| EXT 4090F | 40 | 22 | 90 | 22 | M12 |
| EXT 5050F | 50 | 28 | 50 | 28 | M12 |
| EXT 50100F | 50 | 28 | 100 | 28 | M12 |
| EXT 6360F | 63 | 36 | 60 | 36 | M16 |
| EXT 63120F | 63 | 36 | 120 | 36 | M16 |
| EXT 8070F | 80 | 45 | 70 | 45 | M16 |
| EXT 80120F | 80 | 45 | 120 | 45 | M16 |
| EXT 9080F | 90 | 45 | 80 | 45 | M16 |
| EXT 90130F | 90 | 45 | 130 | 45 | M16 |






RDC



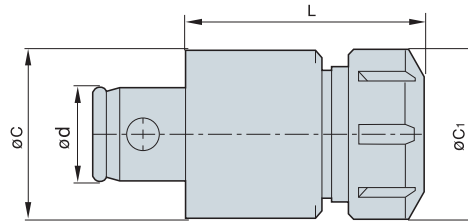
(mm)

| Designation | | Ød | ØC1 | Ød1 | ØC | L | L1 | G |
|-------------|-------|----|-----|-----|----|----|----|-----|
| RDC | 3225F | 18 | 25 | 14 | 32 | 30 | 9 | M6 |
| | 4025F | 22 | 25 | 14 | 40 | 30 | 9 | M6 |
| | 4032F | 22 | 32 | 18 | 40 | 30 | 9 | M8 |
| | 5025F | 28 | 25 | 14 | 50 | 30 | 9 | M6 |
| | 5032F | 28 | 32 | 18 | 50 | 30 | 9 | M8 |
| | 5040F | 28 | 40 | 22 | 50 | 40 | 10 | M10 |
| | 6325F | 36 | 25 | 14 | 63 | 30 | 9 | M6 |
| | 6332F | 36 | 32 | 18 | 63 | 30 | 9 | M8 |
| | 6340F | 36 | 40 | 22 | 63 | 40 | 10 | M10 |
| | 6350F | 36 | 50 | 28 | 63 | 45 | 10 | M12 |
| | 8032F | 45 | 32 | 18 | 80 | 30 | 9 | M6 |
| | 8040F | 45 | 40 | 22 | 80 | 40 | 10 | M10 |
| | 8050F | 45 | 50 | 28 | 80 | 45 | 10 | M12 |
| | 8063F | 45 | 63 | 36 | 80 | 50 | 13 | M16 |

Parts

| Division | Spare Parts | | |
|----------|---|---|---|
| | Basic | | Option |
| | Taper Screw | Spring Pin | Wrench |
| Type |  |  |  |
| MD19F | BTT0506F | - | LW-2.5 |
| MD25F | BTT0608F | SP0308 | LW-3 |
| MD32F | BTT0810F | SP0410 | LW-4 |
| MD40F | BTT1013F | SP0516 | LW-5 |
| MD50F | BTT1215F | SP0616 | LW-6 |
| MD63F | BTT1620F | SP0818 | LW-8 |
| MD80F | BTT1626F | SP1020 | LW-8 |
| MD90F | BTT1631F | SP1020 | LW-8 |

MD-SDC








(mm)

| Designation | | Chucking Range | ØC | Ød | ØC1 | L | Collet | Range |
|-------------|-------|----------------|----|----|-----|----|--------|-------|
| SDC | 2507F | Ø1.0 ~ Ø7.0 | 25 | 14 | 19 | 45 | GER11 | 0.5 |
| | 2510F | Ø1.0 ~ Ø10.0 | 25 | 14 | 28 | 50 | GER16 | 1.0 |
| | 3213 | Ø1.0 ~ Ø13.0 | 32 | 18 | 35 | 60 | GER20 | 1.0 |
| | 4013 | Ø1.0 ~ Ø13.0 | 40 | 22 | 35 | 65 | GER20 | 1.0 |
| | 5020 | Ø2.0 ~ Ø20 | 50 | 28 | 50 | 76 | GER32 | 1.0 |
| | 6326 | Ø3.0 ~ Ø26 | 63 | 36 | 63 | 90 | GER40 | 1.0 |

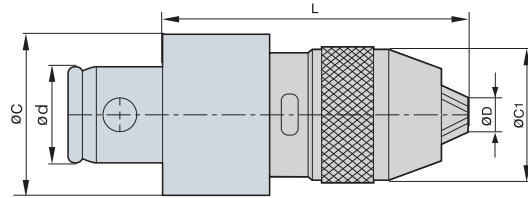
• Collet : see page 43

Parts

| Division | Spare Parts | | | | |
|----------|---|---|---|---|---|
| | Nut | Basic Adjust Screw | Spring Pin | Spanner | Option GER Collet |
| Type |  |  |  |  |  |
| SDC2507F | R11 | BN0716F | SP0308 | S-17 | GER11-ØD |
| SDC2510 | R16 | BN1025F | SP0308 | 32-25 | GER16-ØD |
| SDC3213 | RU20 | BN1325F | SP0410 | 35-38 | GER20-ØD |
| SDC4013 | RU20 | BN1830F | SP0516 | 35-38 | GER20-ØD |
| SDC5020 | RU32 | BN2230F | SP0616 | 48-52 | GER32-ØD |
| SDC6326 | RU40 | BN2838F | SP0818 | 62-65 | GER40-ØD |






MD-NPU



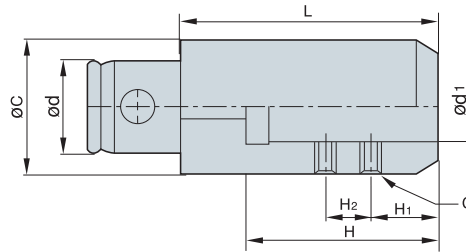
(mm)

| Designation | Chucking Dia. $\varnothing D$ | | $\varnothing C$ | $\varnothing D$ | $\varnothing C1$ | L | |
|-------------|-------------------------------|-----|-----------------|-----------------|------------------|----|-----|
| | min | max | | | | | |
| NPU | 4008 | 0 | 8 | 40 | 22 | 38 | 115 |
| | 5008 | 0 | 8 | 50 | 28 | 38 | 115 |
| | 5013 | 1 | 13 | 50 | 28 | 50 | 145 |
| | 6308 | 0 | 8 | 63 | 36 | 38 | 115 |
| | 6313 | 1 | 13 | 63 | 36 | 50 | 145 |

Parts

| Division | Spare Parts | | |
|----------|---|---|---|
| | Chuck | Basic | Option Spanner |
| Type |  |  |  |
| NPU4008 | NPU08 | SP0516 | NPU0836 |
| NPU5008 | NPU08 | SP0616 | NPU0836 |
| NPU5013 | NPU13 | SP0616 | NPU1348 |
| NPU6308 | NPU08 | SP0818 | NPU0836 |
| NPU6313 | NPU13 | SP0818 | NPU1348 |





MD-SLA



(mm)

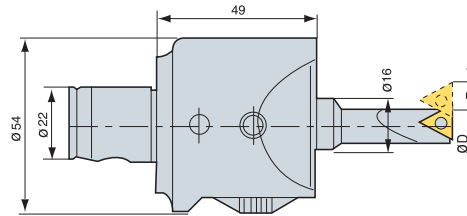
| Designation | | ØC | Ød | Ød1 | L | H | H1 | H2 | G |
|-------------|------|----|----|-----|----|----|----|----|-----|
| SLA | 5012 | 50 | 28 | 12 | 55 | 50 | 14 | 13 | M 8 |
| | 5016 | 50 | 28 | 16 | 55 | 50 | 20 | - | M10 |
| | 5020 | 50 | 28 | 20 | 60 | 50 | 25 | - | M12 |
| | 6312 | 63 | 36 | 12 | 55 | 50 | 14 | 13 | M 8 |
| | 6316 | 63 | 36 | 16 | 55 | 50 | 20 | - | M10 |
| | 6320 | 63 | 36 | 20 | 60 | 50 | 25 | - | M12 |
| | 6325 | 63 | 36 | 25 | 80 | 70 | 24 | 25 | M12 |
| | 6332 | 63 | 36 | 32 | 85 | 80 | 25 | 20 | M14 |
| | 8040 | 80 | 45 | 40 | 85 | 80 | 25 | 25 | M16 |

Parts

| Division | Spare Parts | | | |
|----------|---|---|--|---|
| | Basic | | | Option |
| | Set Screw | Adjust Screw | Spring Pin | Wrench |
| Type |  |  |  |  |
| SLA5012 | BTF0808 | BN1030C | SP0616 | LW-4 |
| SLA5016 | BTF1010 | BN1240C | SP0616 | LW-5 |
| SLA5020 | BTF1212 | BN1240C | SP0616 | LW-6 |
| SLA6312 | BTF0808 | BN1030C | SP0818 | LW-4 |
| SLA6316 | BTF1010 | BN1240C | SP0818 | LW-5 |
| SLA6320 | BTF1212 | BN1240C | SP0818 | LW-6 |
| SLA6325 | BTF1212 | BN1240C | SP0818 | LW-6 |
| SLA6332 | BTF1414 | BN1240C | SP0818 | LW-7 |
| SLA8040 | BTF1616 | BN1240C | SP1020 | LW-8 |




MD-SMH








※ 1DIV=0.01mm

(mm)

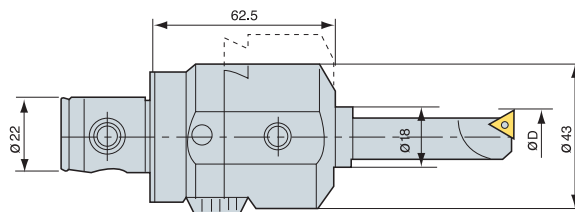
| Designation | MD No. | Boring Range ϕD |  |
|-------------|--------|------------------------------|---|
| SMH4022 | 40 | $\phi 6.0\text{--}\phi 34.0$ | 0.7 |

• Adjustable length : 7mm • Boring bite : see page 93

Parts


| Division | Spare Parts | | | | |
|----------|---|---|---|---|---|
| | Set Screw | Basic Set Screw | Wrench | Boring Bite | Basic Holder |
| Type |  |  |  |  |  |
| SMH | BTF0610 | BTF0608 | LW-3 | BB16 | MD40F |

MD-SMB



※ 1DIV=0.02 mm

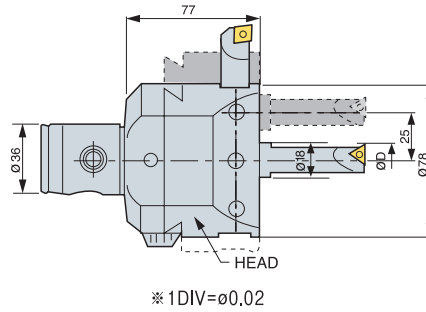
(mm)

| Designation | MD No. | Boring Range ϕD |  |
|-------------|--------|------------------------------|---|
| SMB4022 | 40 | $\phi 8.0\text{--}\phi 38.0$ | 0.65 |


| Designation | Boring Range ϕD | | Insert | Screw |
|-------------|-----------------------|-----|--------------|-----------|
| | min | min | | |
| BB18-7S | 8 | 28 | TBGT0601□□□□ | BFTX0204A |
| BB18-9S | 10 | 30 | TPGT0802□□□□ | BFTX0204A |
| BB18-11S | 12 | 32 | TPGT1103□□□□ | BFTX0307A |
| BB18-13S | 14 | 34 | TPGT1103□□□□ | BFTX0307A |
| BB18-15S | 16 | 36 | TPGT1103□□□□ | BFTX0307A |
| BB18-17S | 18 | 38 | TPGT1103□□□□ | BFTX0307A |

• Adjustable length : 10mm • Clamping Sleeve : see page 94

MD-KMB



(mm)

| Designation | MD No. | Bite Position | Boring Range ϕD |  kg |
|-------------|--------|----------------|-----------------------------|--|
| KMB6336 | 63 | Center Hole | $\phi 8.0 \sim \phi 38.0$ | 2.2 |
| KMB6336 | 63 | Eccentric Hole | $\phi 41.0 \sim \phi 101.0$ | 2.2 |
| KMB6336 | 63 | Side Hole | Max. $\phi 165.0$ | 2.2 |

• Adjustable length : 17mm • Clamping Sleeve : see page 94

BB Bite (KMB)

| Designation | Boring Range ϕD | | | | Insert | Screw |
|-------------|-----------------------|-----|----------------|-----|--------------|-----------|
| | Center Hole | | Eccentric Hole | | | |
| | min | max | min | max | | |
| BB18-7S | 8 | 41 | 43 | 91 | TBGT0601□□L | BFTX0204A |
| BB18-9S | 10 | 43 | 45 | 93 | TPGT08021□□L | BFTX0204A |
| BB18-11S | 12 | 45 | 47 | 95 | TPGT11031□□L | BFTX0307A |
| BB18-13S | 14 | 47 | 49 | 97 | TPGT11031□□L | BFTX0307A |
| BB18-15S | 16 | 49 | 51 | 99 | TPGT11031□□L | BFTX0307A |
| BB18-17S | 18 | 51 | 53 | 101 | TPGT11031□□L | BFTX0307A |



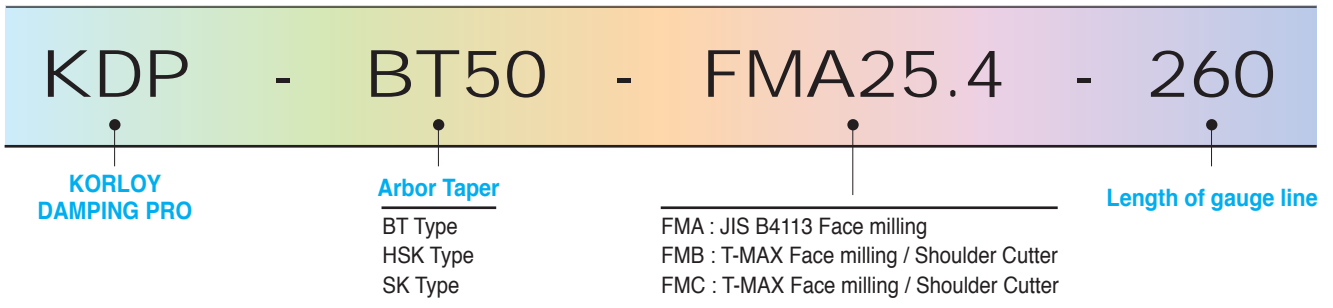


DAMPING PRO

KORLOY Anti-Vibration Tool

- The application of a special design provides an excellent Anti-Vibration effect and is optimized for Overhang work
- Capable to elevate Feed comparing to standard arbor with stable machining
- Longer tool life and noise decrease
- Provides a solution for Mold, Deep Cavity machining, and Heavy-duty work

Code System



Features



- ▶ Anti-Vibration : Exclusively designed Anti-Vibration structure
- ▶ Material : Special alloy steel
- ▶ Anti-Vibration body : Application of High density damper
- ▶ Overhang : Capable for 2D ~ 5D
- ▶ Coolant : Inner coolant is capable

- ▶ Size : Various types and sizes are applicable



BT Type

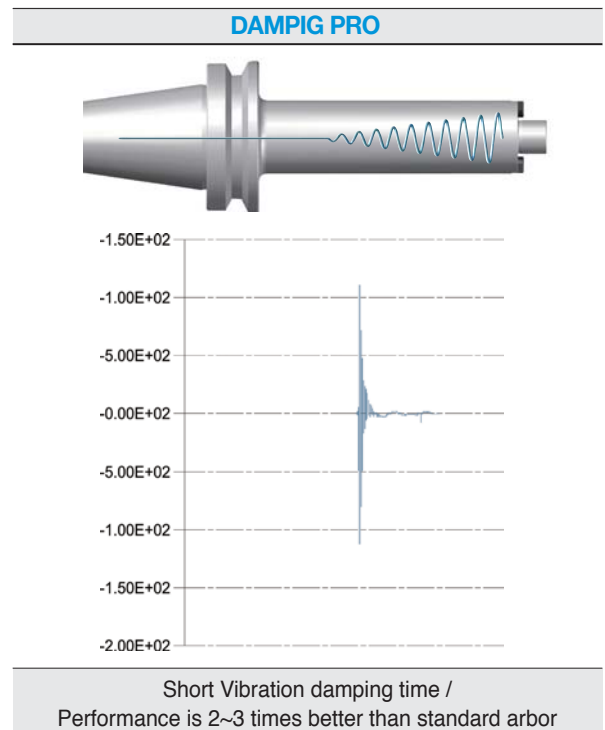
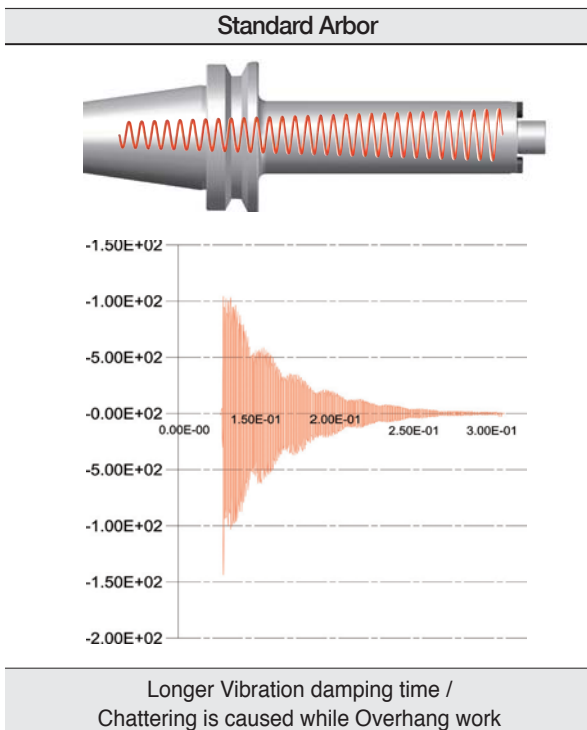


HSK Type

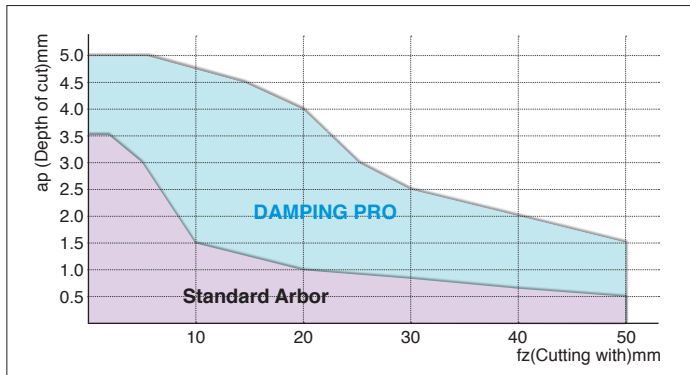


SK Type

Comparison of Vibration damping time



Features



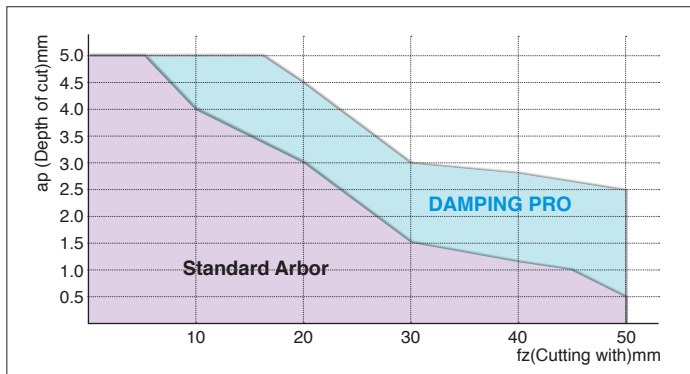
Cutting condition : fz(mm/t) = 0.1

vc(m/min) = 100

CUTTER : AMC4063HS 6flute

Arbor : BT50-FMC22-210 General arbor

KDP-BT50-FMC22-210



Cutting condition : fz(mm/t) = 0.1

vc(m/min) = 100

CUTTER : FMRC3063HRD-H 6flute

Arbor : BT50-FMC22-210 General arbor

KDP-BT50-FMC22-210

Application Example

Mold machining



Better productivity than general arbor

Side milling cutter machining



Excellent performance in the deep grooving

Facing for long depth



Better productivity and surface roughness than General arbor

Deep-hole Boring machining



Better surface roughness and machinability than General arbor

Side milling cutter machining example

- Faulty occurrence on size and surface roughness by the vibration, when use the general arbor
- **Using DAMPING PRO, good size and surface roughness**

Big size Crankshaft machining example

- General arbor : ap=2mm
- KORLOY DAMPING PRO : ap=4mm available
- **2 times better productivity**

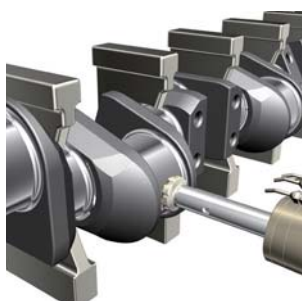


General arbor

Cutting condition :
vc(m/min) = 50
fz(mm/t) = 0.1
ae(mm) = 20

DAMPING PRO

Cutting condition :
vc(m/min) = 100
fz(mm/t) = 0.1
ae(mm) = 20



General arbor

Cutting condition :
vc(m/min) = 100
fz(mm/t) = 0.15
ap(mm) = 2

DAMPING PRO

Cutting condition :
vc(m/min) = 100
fz(mm/t) = 0.15
ap(mm) = 4



BT-FMA

MAS403-BT

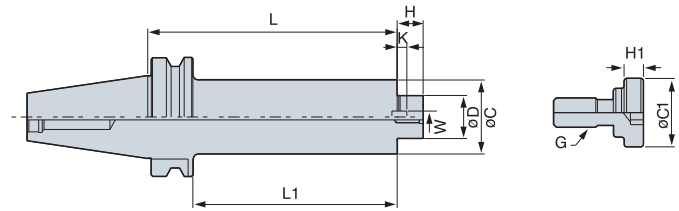


Fig.1

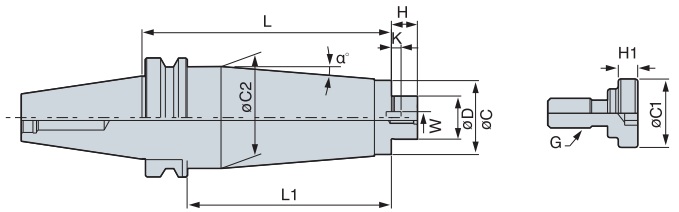








Fig.2

(mm)

| Designation | Cutter Dia. | ØD | L | L1 | ØC | ØC2 | H | W | K | G | ØC1 | H1 |  kg | Fig. | α° |
|----------------------|-------------|-------|-----|-----|----|-----|----|------|---|-----|-----|----|--|------|-----|
| KDP-BT40-FMA25.4-210 | 80 | 25.4 | 210 | 183 | 50 | 60 | 22 | 9.5 | 5 | M12 | 33 | 10 | 5.42 | 2 | 1 |
| FMA25.4-260 | 80 | 25.4 | 260 | 233 | 50 | 60 | 22 | 9.5 | 5 | M12 | 33 | 10 | 6.5 | 2 | 1.1 |
| FMA31.75-210 | 100 | 31.75 | 210 | 183 | 60 | - | 30 | 12.7 | 7 | M16 | 40 | 10 | 5.94 | 1 | - |
| FMA31.75-260 | 100 | 31.75 | 260 | 233 | 60 | - | 30 | 12.7 | 7 | M16 | 40 | 10 | 7.25 | 1 | - |
| KDP-BT50-FMA25.4-210 | 80 | 25.4 | 210 | 172 | 50 | 78 | 22 | 9.5 | 5 | M12 | 33 | 10 | 9.63 | 2 | 4 |
| FMA25.4-260 | 80 | 25.4 | 260 | 222 | 50 | 78 | 22 | 9.5 | 5 | M12 | 33 | 10 | 11.8 | 2 | 3 |
| FMA31.75-210 | 100 | 31.75 | 210 | 172 | 60 | 85 | 30 | 12.7 | 7 | M16 | 40 | 10 | 11.8 | 2 | 3 |
| FMA31.75-260 | 100 | 31.75 | 260 | 222 | 60 | 85 | 30 | 12.7 | 7 | M16 | 40 | 10 | 13.6 | 2 | 2.5 |

- The A type is for JIS B4113 Face milling.
- The B type and C type are arbors for T-MAX Face Milling and shoulder Curren .
- The weight(kg) shown in the chart does not include the weight of face cutter.
- Key and screw are clamped.
- Wrench is separately sold.

Parts

| Division | Spare Parts | | | | |
|----------|---|---|---|---|---|
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Option Wrench |
| Type |  |  |  |  |  |
| FMA25.4 | K9.5(B) | MBA-M12 | BX0412 | BX1225 | LW-10 |
| FMA31.75 | K12.7(D) | MBA-M16 | BX0515 | - | LW-14 |

BT-FMC

MAS403-BT

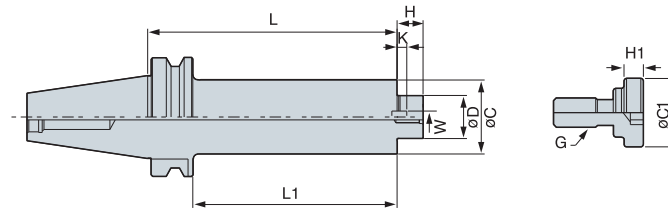


Fig.1

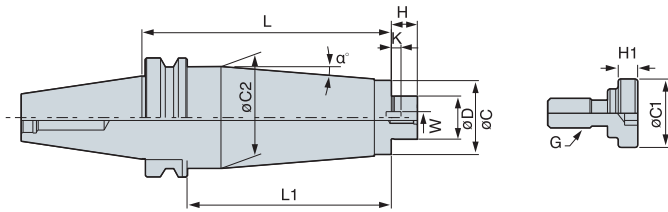








Fig.2

| (mm) | | | | | | | | | | | | | | |
|----------------------|-------------|-------|----|-----|-----|-----|------|----|----|-----|--|------|----|-----|
| Designation | Cutter Dia. | ØD | L | L1 | ØC | ØC2 | H | W | K | G |  kg | Fig. | α° | |
| KDP-BT40 - FMC16-160 | FMC16-160 | 40 | 16 | 160 | 133 | 38 | - | 17 | 8 | 5 | M8 | 2.45 | 1 | - |
| | FMC22-210 | 50/63 | 22 | 210 | 183 | 48 | 4.95 | 19 | 10 | 5.6 | M10 | 4.37 | 2 | 0.1 |
| | FMC22-260 | 50/63 | 22 | 260 | 233 | 48 | 60 | 19 | 10 | 5.6 | M10 | 6.3 | 2 | 1.5 |
| | FMC27-210 | 80 | 27 | 210 | 183 | 60 | - | 21 | 12 | 6.3 | M12 | 6 | 1 | - |
| | FMC27-260 | 80 | 27 | 260 | 233 | 60 | - | 21 | 12 | 6.3 | M12 | 7.25 | 1 | - |
| KDP-BT50 - FMC16-171 | FMC16-171 | 40 | 16 | 171 | 133 | 38 | - | 17 | 8 | 5 | M8 | 5.1 | 1 | - |
| | FMC22-210 | 50/63 | 22 | 210 | 172 | 48 | 49.5 | 19 | 10 | 5.6 | M10 | 7.3 | 2 | 0.1 |
| | FMC22-260 | 50/63 | 22 | 260 | 222 | 48 | 62 | 19 | 10 | 5.6 | M10 | 10 | 2 | 1 |
| | FMC27-210 | 80 | 27 | 210 | 172 | 60 | 78 | 21 | 12 | 6.3 | M12 | 10.6 | 2 | 2.5 |
| | FMC27-260 | 80 | 27 | 260 | 222 | 60 | 78 | 21 | 12 | 6.3 | M12 | 12.6 | 2 | 2 |
| | FMC27-320 | 80 | 27 | 320 | 282 | 60 | 78 | 21 | 12 | 6.3 | M12 | 14.8 | 2 | 1 |
| | FMC32-210 | 100 | 32 | 210 | 172 | 78 | - | 24 | 14 | 7 | M16 | 11.7 | 1 | - |
| | FMC32-260 | 100 | 32 | 260 | 222 | 78 | - | 24 | 14 | 7 | M16 | 14.2 | 1 | - |
| | FMC32-330 | 100 | 32 | 330 | 292 | 78 | - | 24 | 14 | 7 | M16 | 16.6 | 1 | - |

Parts

| Division | Spare Parts | | | | |
|----------|---|---|---|---|---|
| | Basic | | | | Option |
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Wrench |
| Type |  |  |  |  |  |
| FMC16 | K8.0(A) | - | BX0310 | BX0820 | LW-6 |
| FMC22 | K10.0(C) | - | BX0412 | BX1030 | LW-8 |
| FMC27 | K12.0 | MBA-M12 | BX0616 | - | LW-10 |
| FMC32 | K14.0 | MBA-M16 | BX0820 | - | LW-14 |



HSK-FMA

DIN69893-1, ISO 12164-1 : 2001

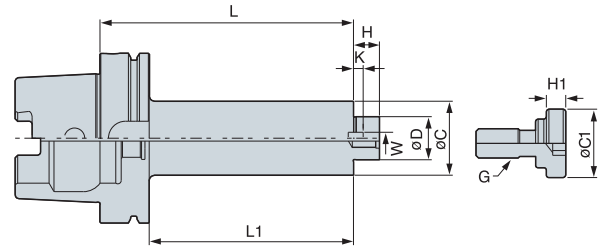


Fig.1

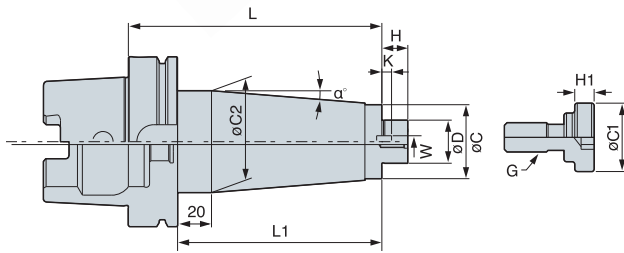


Fig.2

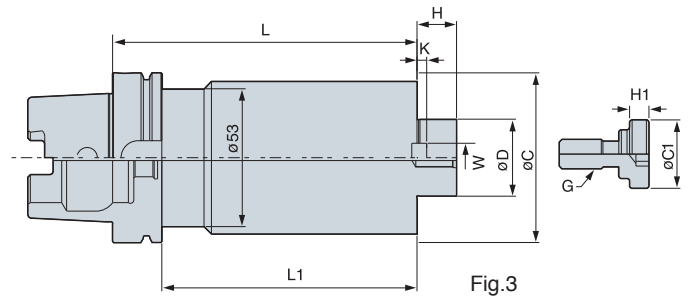


Fig.3

(mm)

| Designation | Cutter Dia. | ØD | L | L1 | ØC | ØC2 | H | W | K | G | ØC1 | H1 | kg | Fig. | α° | |
|-------------|--------------|-----|-------|-----|-----|-----|----|----|------|---|-----|----|----|------|----|-----|
| KDP-HSK63- | FMA25.4-210 | 80 | 25.4 | 210 | 184 | 50 | 53 | 22 | 9.5 | 5 | M12 | 33 | 10 | 4.55 | 3 | 0.1 |
| | FMA25.4-260 | 80 | 25.4 | 260 | 234 | 50 | 53 | 22 | 9.5 | 5 | M12 | 33 | 10 | 5.6 | 3 | 0.1 |
| | FMA31.75-210 | 100 | 31.75 | 210 | 184 | 60 | - | 30 | 12.7 | 7 | M16 | 40 | 10 | 5.52 | 2 | - |
| | FMA31.75-260 | 100 | 31.75 | 260 | 234 | 60 | - | 30 | 12.7 | 7 | M16 | 40 | 10 | 6.9 | 2 | - |
| KDP-HSK100- | FMA25.4-210 | 80 | 25.4 | 210 | 181 | 50 | 78 | 22 | 9.5 | 5 | M12 | 33 | 10 | 8.32 | 3 | 4 |
| | FMA25.4-260 | 80 | 25.4 | 260 | 231 | 50 | 78 | 22 | 9.5 | 5 | M12 | 33 | 10 | 10.5 | 3 | 3 |
| | FMA31.75-210 | 100 | 31.75 | 210 | 181 | 60 | 85 | 30 | 12.7 | 7 | M16 | 40 | 10 | 10.9 | 3 | 3 |
| | FMA31.75-260 | 100 | 31.75 | 260 | 231 | 60 | 85 | 30 | 12.7 | 7 | M16 | 40 | 10 | 12.8 | 3 | 2.5 |

- The A type is for JIS B4113 Face milling.
- The B type and C type are arbors for T-MAX Face Milling and shoulder Curren .
- The weight(kg) shown in the chart does not include the weight of face cutter.
- Key and screw are clamped.
- Wrench is separately sold.

Parts

| Division | Spare Parts | | | | |
|----------|-------------|------------|-------------|-------------|--------|
| | Basic | | | | Option |
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Wrench |
| Type | | | | | |
| FMA25.4 | K9.5(B) | MBA-M12 | BX0412 | BX1230 | LW-10 |
| FMA31.75 | K12.7(D) | MBA-M16 | BX0515 | - | LW-14 |

HSK-FMC

DIN69893-1, ISO 12164-1 : 2001

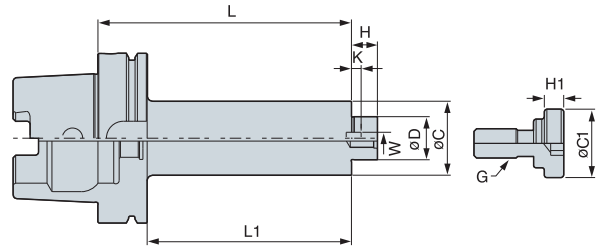


Fig.1

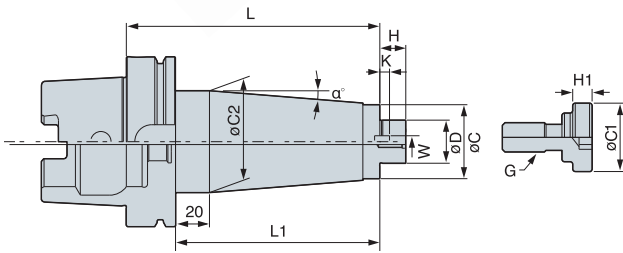


Fig.2

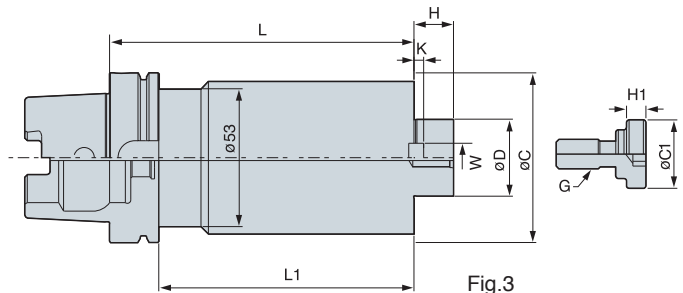


Fig.3

| | | | | | | | | | | | | | | (mm) |
|--------------|-------------|-------|----|-----|-----|-----|------|----|----|-----|-----|-------|----|------|
| Designation | Cutter Dia. | ØD | L | L1 | ØC | ØC2 | H | W | K | G | | Fig. | α° | |
| KDP-HSK63 - | FMC16-160 | 40 | 16 | 160 | 134 | 38 | - | 17 | 8 | 5 | M8 | 2.10 | 1 | - |
| | FMC22-210 | 50/63 | 22 | 210 | 184 | 48 | 4.95 | 19 | 10 | 5.6 | M10 | 3.82 | 1 | 0.1 |
| | FMC22-260 | 50/63 | 22 | 260 | 234 | 48 | 62 | 19 | 10 | 5.6 | M10 | 6.14 | 3 | 1.6 |
| | FMC27-210 | 80 | 27 | 210 | 184 | 60 | - | 21 | 12 | 6.3 | M12 | 5.53 | 2 | - |
| | FMC27-260 | 80 | 27 | 260 | 234 | 60 | - | 21 | 12 | 6.3 | M12 | 6.83 | 2 | - |
| KDP-HSK100 - | FMC16-160 | 40 | 16 | 160 | 131 | 38 | - | 17 | 8 | 5 | M8 | 3.45 | 1 | - |
| | FMC22-210 | 50/63 | 22 | 210 | 181 | 48 | 49.5 | 19 | 10 | 5.6 | M10 | 4.60 | 3 | 0.1 |
| | FMC22-260 | 50/63 | 22 | 260 | 231 | 48 | 62 | 19 | 10 | 5.6 | M10 | 8.10 | 3 | 1 |
| | FMC27-210 | 80 | 27 | 210 | 181 | 60 | 78 | 21 | 12 | 6.3 | M12 | 8.44 | 3 | 2.5 |
| | FMC27-260 | 80 | 27 | 260 | 231 | 60 | 78 | 21 | 12 | 6.3 | M12 | 10.40 | 3 | 2 |
| | FMC27-320 | 80 | 27 | 320 | 291 | 60 | 78 | 21 | 12 | 6.3 | M12 | 13.60 | 3 | 1 |
| | FMC32-210 | 100 | 32 | 210 | 181 | 78 | - | 24 | 14 | 7 | M16 | 10.20 | 1 | - |
| | FMC32-260 | 100 | 32 | 260 | 231 | 78 | - | 24 | 14 | 7 | M16 | 13.00 | 1 | - |
| | FMC32-330 | 100 | 32 | 330 | 301 | 78 | - | 24 | 14 | 7 | M16 | 15.43 | 1 | - |

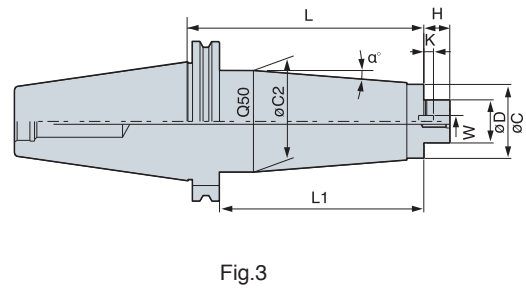
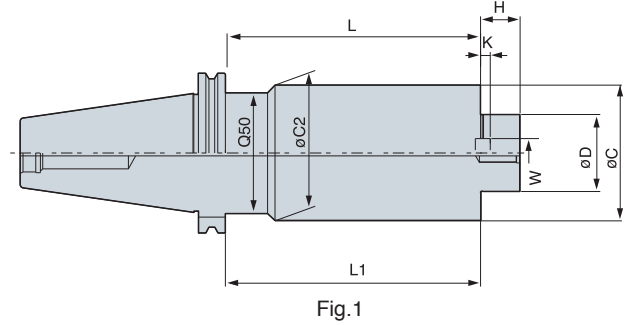
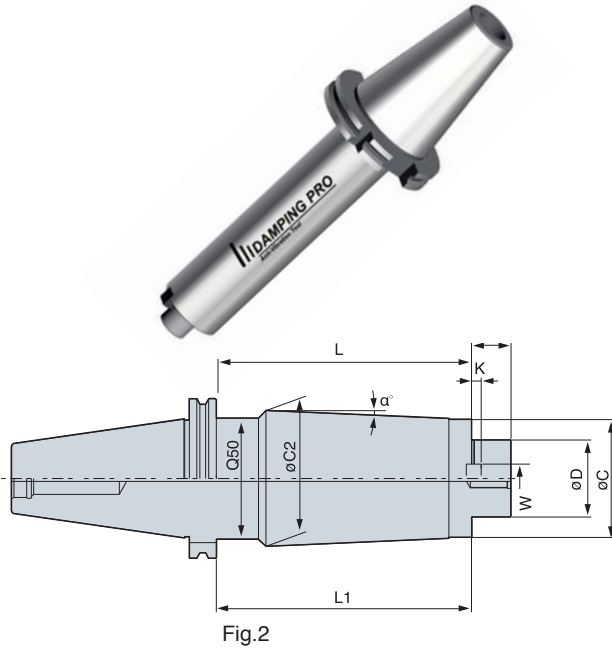
Parts

| Division | Spare Parts | | | | |
|----------|-------------|------------|-------------|-------------|--------|
| | Basic | | | | Option |
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Wrench |
| Type | | | | | |
| FMC16 | K8.0(A) | - | BX0310 | BX0820 | LW-6 |
| FMC22 | K10.0(C) | - | BX0412 | BX1030 | LW-8 |
| FMC27 | K12.0 | MBA-M12 | BX0616 | - | LW-10 |
| FMC32 | K14.0 | MBA-M16 | BX0820 | - | LW-14 |



SK-FMC






MAS403-BT



(mm)

| Designation | Cutter Dia. | ØD | L | L1 | ØC | ØC2 | H | W | K | G | $\frac{G}{kg}$ | Fig. | α° |
|----------------------|-------------|----|-----|-------|----|------|----|----|-----|-----|----------------|------|----------------|
| KDP-SK40 - FMC22-210 | 50/63 | 22 | 210 | 183.0 | 48 | 49.5 | 19 | 10 | 4.4 | M10 | 4.4 | 3 | 0.1 |
| FMC22-260 | 50/63 | 22 | 260 | 233.0 | 48 | 60 | 19 | 10 | 5.6 | M10 | 6.2 | 2 | 1.4 |
| FMC27-210 | 80 | 27 | 210 | 183.0 | 60 | 60 | 21 | 12 | 6.3 | M12 | 5.9 | 1 | - |
| FMC27-260 | 80 | 27 | 260 | 233.0 | 60 | 60 | 21 | 12 | 6.3 | M12 | 7.2 | 1 | - |
| KDP-SK50 - FMC22-210 | 50/63 | 22 | 210 | 190.9 | 48 | 49.5 | 19 | 10 | 5.6 | M10 | 6.4 | 3 | 0.1 |
| FMC22-260 | 50/63 | 22 | 260 | 240.9 | 48 | 62 | 19 | 10 | 5.6 | M10 | 9.1 | 3 | 1 |
| FMC27-210 | 80 | 27 | 210 | 190.9 | 60 | 78 | 21 | 12 | 6.3 | M12 | 9.8 | 3 | 2.5 |
| FMC27-260 | 80 | 27 | 260 | 240.9 | 60 | 78 | 21 | 12 | 6.3 | M12 | 12.4 | 3 | 1.8 |
| FMC27-320 | 80 | 27 | 320 | 300.9 | 60 | 78 | 21 | 12 | 6.3 | M12 | 14.5 | 3 | 1.2 |
| FMC32-210 | 100 | 32 | 210 | 190.9 | 78 | - | 24 | 14 | 7 | M16 | 11.5 | 1 | - |
| FMC32-260 | 100 | 32 | 260 | 240.9 | 78 | - | 24 | 14 | 7 | M16 | 14 | 1 | - |
| FMC32-330 | 100 | 32 | 330 | 310.9 | 78 | - | 24 | 14 | 7 | M16 | 16.4 | 1 | - |

Parts

| Division | Spare Parts | | | | |
|----------|---|---|---|---|---|
| | Key | Clamp Bolt | Wrench Bolt | Wrench Bolt | Option Wrench |
| Type |  |  |  |  |  |
| FMC16 | K8.0(A) | - | BX0310 | BX0820 | LW-6 |
| FMC22 | K10.0(C) | - | BX0412 | BX1030 | LW-8 |
| FMC27 | K12.0 | MBA-M12 | BX0616 | - | LW-10 |
| FMC32 | K14.0 | MBA-M16 | BX0820 | - | LW-14 |

Induction Shrink fit System

- Induction shrinking fit unit : 8kw~10kw
- Clamping range - carbide : $\varnothing 3\sim\varnothing 32\text{mm}$, HSS : $\varnothing 6\sim\varnothing 32\text{mm}$
- Shrinking time : 3~5sec
- Wide range tool length : Max. 450mm
- Convenient for operating Automatic return of the coil to start position after the heating process

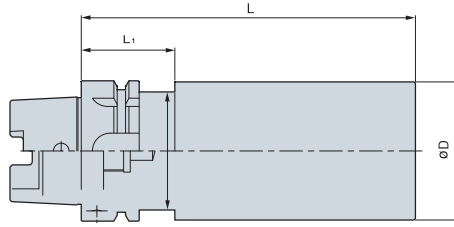
| | ISG2200 | ISG2200WK | ISG3200 | ISG3200WK |
|--|---|---|--|--|
| Body |  |  |  |  |
| Clamping range | $\varnothing 3\text{-}20\text{mm}$ (Carbide) | $\varnothing 3\text{-}20\text{mm}$ (Carbide) | $\varnothing 3\text{-}32\text{mm}$ (Carbide) $\varnothing 6\text{-}32\text{mm}$ (H.S.S) | $\varnothing 3\text{-}32\text{mm}$ (Carbide) $\varnothing 6\text{-}32\text{mm}$ (H.S.S) |
| Max. Tool length | 290mm | 265mm | 470mm | 450mm |
| Max. Shrinking time | within 5s | within 5s | with in 5s | with in 5s |
| Cooling time | within 30s | within 5~10s | within 30s | within 5~10s |
| Cooling method | Air | emulsion | Air | emulsion |
| Power | 8 KW | 8 KW | 10KW | 10KW |
| Air supply | 6bar/90psi | 6bar/90psi | 6bar/90psi | 6bar/90psi |
| Electric supply | 3 * 400v/16A | 3 * 400v/16A | 3 * 400v/16A | 3 * 400v/16A |
| Size | 310(W) x 390(L) x 640(H) | 700(W) x 550(L) x 1540(H) | 592(W) x 584(L) x 1030(H) | 700(W) x 620(L) x 1 700(H) |
| Weight | 25kg | 100kg | 43kg | 120kg |
| Option | | | | |
| Tool holder | BT30/BT40/BT50, SK30/SK40/SK50, CAT30/CAT40/CAT50, HSK32/HSK40/HSK50/HSK63/HSK80/HSK100 | | | |
| Induction coil | - | - | $\varnothing 32\sim 50\text{mm}$ | $\varnothing 32\sim 50\text{mm}$ |
| Cooling adapter (120, 200mm Length) | $\varnothing 3\sim 5.9 / \varnothing 6\sim 9 / \varnothing 9.1\sim 12 / \varnothing 12.1\sim 16 / \varnothing 16.1\sim 22$ | - | $\varnothing 3\sim 5.9 / \varnothing 6\sim 9 / \varnothing 9.1\sim 12 / \varnothing 12.1\sim 16 / \varnothing 16.1\sim 22$ | - |
| Interchangeable discs | $\varnothing 3.0\sim 5.9\text{mm} / \varnothing 6.0\sim 12.0\text{mm} / \varnothing 12.1\sim 22.00\text{mm} / \varnothing 22.1\sim 32.0\text{mm}$ | | | |
| Cooling plate | T3-ZWZ | | | |
| Coolant emulsion | - | Zetasol 120/5 | - | Zetasol 120/5 |
| Protective cover | ISG2200-SH | | ISG3200-SH | |

• Induction Coil $\varnothing 32\sim 50\text{mm}$ Option

• Slim Interchangeable discs one pieces Option



Blank Tool (BLK)

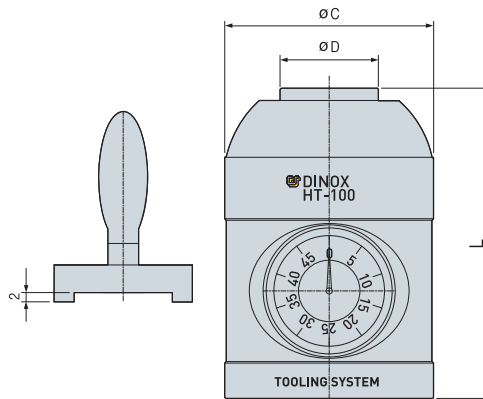


(mm)

| Designation | Ød | ØC | L | L1 |
|--------------------|------------|-----|-----|----|
| HSK40A- BLK42 -180 | 42 | 34 | 180 | 35 |
| HSK50A- BLK52 -200 | 52 | 42 | 200 | 42 |
| HSK63A- | BLK63 -150 | 63 | 150 | 42 |
| | BLK63 -250 | 63 | 250 | 42 |
| | BLK82 -200 | 82 | 200 | 42 |
| HSK100A- | BLK102-150 | 102 | 150 | 45 |
| | BLK102-250 | 102 | 250 | 45 |
| | BLK126-200 | 126 | 200 | 45 |
| BT30- | BLK48 -180 | 48 | 180 | 30 |
| BT40- | BLK63-150 | 63 | 150 | 35 |
| | BLK63-250 | 63 | 250 | 35 |
| | BLK82-200 | 82 | 200 | 35 |
| BT50- | BLK102-150 | 102 | 150 | 48 |
| | BLK102-250 | 102 | 250 | 48 |
| | BLK126-200 | 126 | 200 | 48 |

- Heat treatment Hardness for shank portion(HRC48-52) and Tooling portion(HRC40-43) according to Blank Tool's Figure & Application
- Blank Tool needs for special Tool or short delivery and order made can be produced

HT



(mm)

| Designation | ØD | ØC | L |
|-------------|----|----|-----|
| HT-100 | 32 | 68 | 100 |

- Good for setting the Tool length at CNC machine
- No interference between height Touch setter and Tool makes safe work
- Location Accuracy : ± 0.003mm

SC (Spindle Cleaner)



(mm)

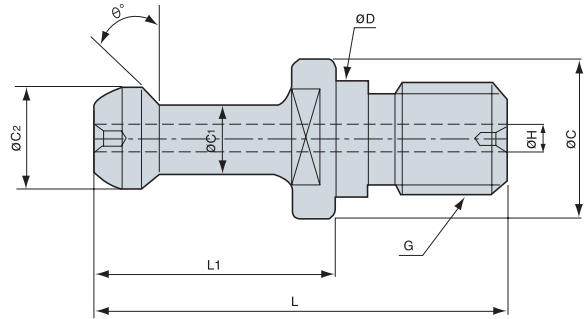
| Designation | Taper | N.W. | G.W. |
|-------------|--------|--------|--------|
| SC - BT30 | BT30 | 0.06kg | 0.08kg |
| SC - BT40 | BT40 | 0.07kg | 0.1kg |
| SC - BT50 | BT50 | 0.16kg | 0.2kg |
| SC - HSK50 | HSK50 | 0.08kg | 0.12kg |
| SC - HSK63 | HSK63 | 0.1kg | 0.13kg |
| SC - HSK100 | HSK100 | 0.5kg | 0.7kg |

Features

- ▶ Cleaning strips of taper wipe is made of lambskin.
It can clean inside slide of spindles to prevention of static electricity and to extend spindles and tapers durable life.



Pull Stud Bolt



(mm)

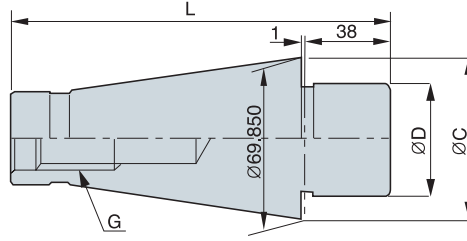
| Designation | ØD | ØC | ØC1 | ØC2 | L1 | L | θ | G | ØH |
|----------------------|------|------|-------|-------|-------|-------|-----|-----|--------|
| P30T-1 | 12.5 | 16.5 | 7 | 11 | 23 | 43 | 45° | M12 | |
| P30T-2 | 12.5 | 16.5 | 7 | 11 | 23 | 43 | 30° | M12 | |
| P40T-1 | 17 | 23 | 10 | 15 | 35 | 60 | 45° | M16 | |
| P40T-1(3) | 17 | 23 | 10 | 15 | 35 | 60 | 45° | M16 | Ø3 |
| P40T-2 | 17 | 23 | 10 | 15 | 35 | 60 | 30° | M16 | |
| P40T-2(3) | 17 | 23 | 10 | 15 | 35 | 60 | 30° | M16 | Ø3 |
| PS40-3F | 17 | 23 | 10 | 15 | 35 | 60 | 0° | M16 | |
| PS40-1F | 17 | 23 | 10 | 15 | 29.6 | 54.6 | 0° | M16 | |
| PS-G51 | 17 | 22 | 12.45 | 18.80 | 19.11 | 44.11 | 45° | M16 | Ø7 |
| MP-40 | 17 | 23 | 10 | 15 | 25 | 50 | 0° | M16 | |
| DIN69872-A40 | 17 | 23 | 14 | 19 | 26 | 54 | 15° | M16 | Ø7 |
| DIN69872-B40 | 17 | 23 | 14 | 19 | 26 | 54 | 15° | M16 | |
| ISO7388/A40 | 17 | 23 | 14 | 19 | 26 | 54 | 15° | M16 | Ø7 |
| ISO7388/B40 | 17 | 22.5 | 12.95 | 18.95 | 16.4 | 44.5 | 45° | M16 | Ø7.35 |
| JISB6339-A40(PS-806) | 17 | 23 | 14 | 19 | 29 | 54 | 15° | M16 | Ø7 |
| JISB6339-B40(PS-805) | 17 | 23 | 14 | 19 | 29 | 54 | 15° | M16 | |
| P50T-1 | 25 | 38 | 17 | 23 | 45 | 85 | 45° | M24 | |
| P50T-1(7) | 25 | 38 | 17 | 23 | 45 | 85 | 45° | M24 | Ø7 |
| P50T-2 | 25 | 38 | 17 | 23 | 45 | 85 | 30° | M24 | |
| P50T-2(7) | 25 | 38 | 17 | 23 | 45 | 85 | 30° | M24 | Ø7 |
| PS50-1F | 25 | 38 | 17 | 23 | 45 | 85 | 0° | M24 | |
| PS50-1FH | 25 | 38 | 17 | 23 | 45 | 85 | 0° | M24 | Ø8 |
| PS50-1L | 25 | 38 | 16 | 22 | 72 | 110 | 30° | M24 | |
| PS50-2L | 25 | 39 | 18 | 25 | 55 | 95 | 30° | M24 | |
| PS50-3L | 25 | 39.3 | 18 | 23 | 64 | 104 | R4 | M24 | |
| PS50-4L | 25 | 39 | 15 | 21 | 63.1 | 105.1 | 45° | M24 | |
| PS-G41 | 25 | 37 | 20.83 | 28.96 | 25.2 | 65.2 | 45° | M24 | Ø10 |
| MP-50 | 25 | 36 | 18 | 24 | 31 | 71 | 0° | M24 | |
| DIN69872-A50 | 25 | 36 | 21 | 28 | 34 | 74 | 15° | M24 | Ø11.5 |
| DIN69872-B50 | 25 | 36 | 21 | 28 | 34 | 74 | 15° | M24 | O-Ring |
| ISO7388/A50 | 25 | 36 | 21 | 28 | 34 | 74 | 15° | M24 | Ø11.5 |
| ISO7388/B50 | 25 | 37 | 19.6 | 29.1 | 25.55 | 65.5 | 45° | M24 | Ø11.5 |
| JISB6339-A50 | 25 | 38 | 21 | 28 | 34 | 74 | 15° | M24 | Ø10 |
| JISB6339-B50 | 25 | 38 | 21 | 28 | 34 | 74 | 15° | M24 | |

Pull stud Bolt in Domestic Market Tool Maker

| MACHINE TOOL MAKER | MODEL | Tool shape | PSB | Oil Hole Type | MACHINE TOOL MAKER | MODEL | Tool shape | PSB | Oil Hole Type | |
|--------------------|-------------------|-------------|--------|---------------|--------------------|-------------------|----------------|---------|---------------|-----------|
| DOOSAN | ACE-TC320D | BT30 | P30T-1 | P40T-1(3) | WIA | VX500/50 | BT50 | P50T-2 | P50T-2(7) | |
| | ACE-TC400 | BT30 | P30T-1 | P40T-1(3) | SMEC | Any Mill LCV30A/B | BT30 | P30T-2 | | |
| | ACE-HC400/500 | BT40 | P40T-1 | P40T-1(3) | | Any Mill LCV55S | BT50 | P50T-2 | P50T-2(7) | |
| | ACE-HP4000/5100 | BT40 | P40T-1 | P40T-1(3) | | Any Mill LCV650S | BT50 | P50T-1 | P50T-1(7) | |
| | ACE-V430 | BT40 | P40T-1 | P40T-1(3) | | Any Mill LCV66 | BT50 | P50T-1 | P50T-1(7) | |
| | ACE-VC500 | BT40 | P40T-1 | P40T-1(3) | | Any Mill LCV80 | BT50 | P50T-1 | P50T-1(7) | |
| | ACE-VM5410/510 | BT40 | P40T-1 | P40T-1(3) | | DMC-3000 | BT50 | P50T-1F | PS50-1FH | |
| | ACE-VM600 | BT40 | P40T-1 | P40T-1(3) | | PCH40 | BT40 | P40T-1 | P40T-1(3) | |
| | ACE-VMD450 | BT40 | P40T-1 | P40T-1(3) | | PCH50 | BT50 | P50T-1 | P50T-1(7) | |
| | Mynx 410 | BT40 | P40T-1 | P40T-1(3) | | HWACHEON | SIRIUS-1 | BT30 | P30T-1 | |
| | Mynx NM410 | BT40 | P40T-1 | P40T-1(3) | SIRIUS-550 | | BT40 | P40T-1 | P40T-1(3) | |
| | ACE-H100 | BT50 | P50T-1 | P50T-1(7) | SIRIUS-UL/ULG | | BT40 | P40T-1 | P40T-1(3) | |
| | ACE-HM500/630/800 | BT50 | P50T-1 | P50T-1(7) | SIRIUS-12580 | | BT50 | PS50-1F | PS50-1FH | |
| | ACE-HP500/630 | BT50 | P50T-1 | P50T-1(7) | SIRIUS-650/650N | | BT50 | PS50-1F | PS50-1FH | |
| | ACE-VM710 | BT50 | P50T-1 | P50T-1(7) | SIRIUS-700 | | BT50 | PS50-1F | PS50-1FH | |
| | ACE-VM900/950 | BT50 | P50T-1 | P50T-1(7) | SIRIUS-7040 | | BT50 | PS50-1F | PS50-1FH | |
| | Mynx 500 | BT50 | P50T-1 | P50T-1(7) | SIRIUS-850/850N | | BT50 | PS50-1F | PS50-1FH | |
| | Mynx 650 | BT50 | P50T-1 | P50T-1(7) | HASS | | TM-1/2 | BT40 | P40T-1 | P40T-1(3) |
| | Mynx 750 | BT50 | P50T-1 | P50T-1(7) | | | VF-4SS/3SS/2SS | BT40 | P40T-1 | P40T-1(3) |
| | NR 510M | BT50 | P50T-1 | P50T-1(7) | | VF-2TR | BT40 | P40T-1 | P40T-1(3) | |
| | NR 700 | BT50 | P50T-1 | P50T-1(7) | | VF-5/50TR | BT50 | P50T-1 | P50T-1(7) | |
| | NX 5000 | BT50 | P50T-1 | P50T-1(7) | | VF-9/50 | BT50 | P50T-1 | P50T-1(7) | |
| | VM 70(H) | BT50 | P50T-1 | P50T-1(7) | | VF-8/50 | BT50 | P50T-1 | P50T-1(7) | |
| | VM 84 | BT50 | P50T-1 | P50T-1(7) | MAZZAK | | BT40 | | PS-G51 | |
| | VM 925L | BT50 | P50T-1 | P50T-1(7) | | | BT50 | | PS-G41 | |
| | VM 560/50 | BT50 | P50T-1 | P50T-1(7) | | | BT40 | PS40-3F | | |
| | WIA | MX380/420 | BT30 | P30T-1 | | MORI SEKI | | BT50 | PS50-1F | PS50-1FH |
| | | VX380T/420T | BT30 | P30T-1 | | S&T | FX-500H | BT40 | P40T-2 | P40T-2(3) |
| | | KV45/45P | BT40 | P40T-1 | P40T-1(3) | | TCH-45 | BT40 | P40T-1 | P40T-1(3) |
| VX400/460 | | BT40 | P40T-1 | P40T-1(3) | TNV-40A | | BT40 | P40T-1 | P40T-1(3) | |
| VX500 | | BT40 | P40T-1 | P40T-1(3) | TNV-80A | | BT40 | P40T-1 | P40T-1(3) | |
| VX510M/660M | | BT40 | P40T-1 | P40T-1(3) | TCH-50 | | BT50 | P50T-2 | P50T-2(7) | |
| VX700/40 | | BT40 | P40T-1 | P40T-1(3) | TCH-80 | | BT50 | P50T-2 | P50T-2(7) | |
| VX700/50 | | BT50 | P50T-1 | P50T-1(7) | TCH-80TS | | BT50 | P50T-2 | P50T-2(7) | |
| KV60N/90 | | BT50 | P50T-1 | P50T-1(7) | TNV-650V | | BT50 | P50T-2 | P50T-2(7) | |
| VX750 | | BT50 | P50T-1 | P50T-1(7) | | | | | | |



KCP



(mm)

| Designation | Taper | Cutter Dia. | ØD | ØC | L | G |
|-------------------|-------|-------------|--------|-------|--------|------------|
| NTN 50- KCP47.625 | NT50 | 200(8"~) | 47.625 | 69.55 | 164.00 | U1"-8(M24) |
| NTN 50- KCP60 | NT50 | 200(8"~) | 60 | 69.55 | 164.00 | M24 |



OVERSEAS

| Tool Name | DINE | JEIL | HERTEL | DSP |
|---|-------------|-------------|-------------|-------------|
| | Designation | Designation | Designation | Designation |
| 2-Face Constrained(BT) | DBT | - | - | - |
| Hydraulic Expansion Chuck | DHE | JHM | HC | - |
| Milling Chckuk | NPM | C | C | C |
| High Speed Milling Chckuk | HPM | - | C-HS | C-P |
| Shrinking Chckuk | DSC | SFC | SFH | |
| ER Collet Chuck | SDC,SDC/S | ER | ER,ER-M | ER, ER-M |
| High Speed Collet Chuck | HPS | - | - | - |
| Ultra High Speed Collet Chuck | HDC | - | - | - |
| Slim Collet Chuck | DSK | JSK | SKA | SX |
| NPU Drill Chuck | NPU | NPU | NPU | NPU |
| Morse Taper Arbor (Tang Type) | MTA | MTA | MTA | MTA |
| Morse Taper Arbor (Draw Bolt Type) | MTB | MTB | MTB | MTB |
| Jacobs Taper Arbor | JTA | JTA | JTA | JTA |
| Side Lock Arbor | SLA, SLW | EMH | SLA,SLB | SLA |
| Tapping Holder | DTN | TC | TC | TCH |
| Synchro Tap Chuck | SDT | - | TER | - |
| Face Mill Arbor | FMA,FMB,FMC | FMA,FMB,FMC | FMA,FMB,FMC | FMA,FMB,FMC |
| Side Cutter Arbor | SCA | SCA | SCA | SCA |
| Square Boring Bar(45°/90° type) | BSA, BSB | BSA,BSB | BSA,BSB | BSA,BSB |
| Balance Cut Tool for Rough Boring | DBC | RBH | TBH | RTC |
| Balance Cut Tool for Rough Boring(Wide Dia.) | TBC | - | TBH | LBH-R |
| FZ Micro Boring Tool 45° type | BKA | - | - | - |
| FZ Micro Boring Bar 90° type | BKB | - | - | - |
| Micro Boring Tool | BCF | - | - | - |
| Small Micro Boring Tool(for High Precision) | SMH | - | - | - |
| Small Micro Boring Tool | SMB | - | - | - |
| MicroBoring Tool | KMB | - | - | - |
| Micro Boring Tool(for High Precision) | FBH | JFBH | - | DFB |
| Balance Cut Tool for Finish Boring(Wide Dia.) | FBC | | - | LBH-F |
| MUP type Micro Boring Tool | MUP | BCA | BCA | BCA |
| Collet Chuck type Oil Hole Holder | OHDC | OHDC | - | |
| Side Lock type Oil Hole Holder | OHSL | OHSL | - | |
| Spindle Speeder | KSH | MV | - | |
| Universal type Angular Head | KHU | - | - | |
| Attachment type Angular Head | KAG | - | - | |
| Angular Head(90° type) | KAH | | - | |
| Angular Head(45° type) | KAC | | - | |



I Comparison of Tooling System

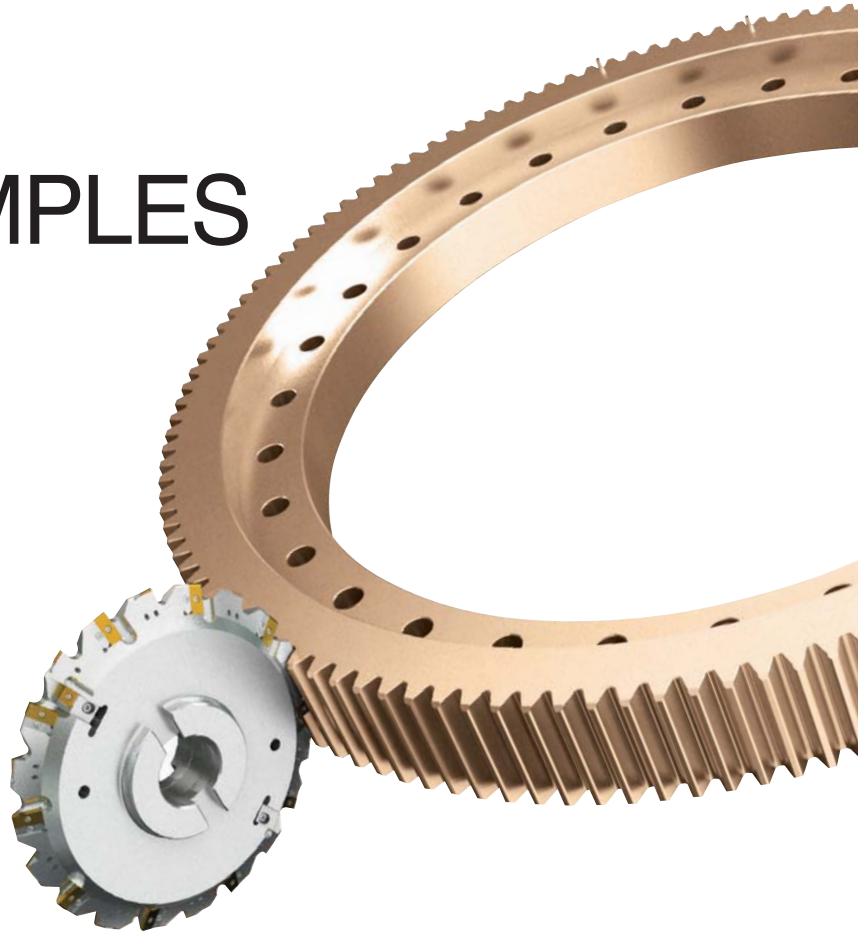
OVERSEAS

| Tool Name | DINE | NIKKEN | BIG |
|---|-------------|-------------|-------------|
| | Designation | Designation | Designation |
| 2-Face Constrained(BT) | | NBT | BBT |
| Hydraulic Expansion Chuck | DHE | - | HDC |
| Milling Chcuk | NPM | C | HMC |
| High Speed Milling Chcuk | HPM | C-G | MEGA-DS |
| Shrinking Chcuk | DSC | - | SRC |
| ER Collet Chuck | SDC,SDC/S | - | NBS |
| High Speed Collet Chuck | HPS | - | - |
| Ultra High Speed Collet Chuck | HDC | - | MEGA-A |
| Slim Collet Chuck | DSK | SK | MEGA-E |
| NPU Drill Chuck | NPU | NPU | - |
| Morse Taper Arbor (Tang Type) | MTA | MTA | MTA |
| Morse Taper Arbor (Draw Bolt Type) | MTB | MTB | - |
| Jacobs Taper Arbor | JTA | JTA | JTA |
| Side Lock Arbor | SLA,SLW | SLA | ISL |
| Tapping Holder | DTN | Z | ATE |
| Synchro Tap Chuck | SDT | - | - |
| Face Mill Arbor | FMA,FMB,FMC | FMA,FMB,FMC | FMA,FMC |
| Side Cutter Arbor | SCA | SCA | - |
| Square Boring Bar(45°/90° type) | BSA,BSB | BSA,BSB | - |
| Balance Cut Tool for Rough Boring | DBC | RAC | TWN |
| Balance Cut Tool for Rough Boring(Wide Dia.) | TBC | RAC | - |
| FZ Micro Boring Tool 45° type | BKA | - | - |
| FZ Micro Boring Bar 90° type | BKB | - | - |
| Micro Boring Tool | BCF | - | - |
| Small Micro Boring Tool(for High Precision) | SMH | DJ | EW |
| Small Micro Boring Tool | SMB | | |
| MicroBoring Tool | KMB | - | - |
| Micro Boring Tool(for High Precision) | FBH | ZMAC | EWN |
| Balance Cut Tool for Finish Boring(Wide Dia.) | FBC | BCB | |
| MUP type Micro Boring Tool | MUP | BCB | - |
| Collet Chuck type Oil Hole Holder | OHDC | MOK | ONBS |
| Side Lock type Oil Hole Holder | OHSL | MOL | OSL |
| Spindle Speeder | KSH | NX,PX | GTR |
| Universal type Angular Head | KHU | - | AGU/NBS |
| Attachment type Angular Head | KAG | AFK | AG90/ |
| Angular Head(90° type) | KAH | AHM | AG90/NBS |
| Angular Head(45° type) | KAC | AHT | AG45/NBS |



J

TOOLING EXAMPLES



TOOLING EXAMPLES

C O N T E N T S

Industrial Tooling Example

- J02** Gear Machining Solution
- J04** Ship Building Industrial Solution
- J07** Role Machining Solution
- J08** Railway Industrial Solution
- J10** Pipe Industrial Solution
- J12** Bearing working Solution
- J13** Development Industrial Solution
- J14** Aviation Industrial Solution
- J18** Slitter Knife

Tooling Example For Auto Industry

- J19** Crankshaft
- J20** Knuckle
- J22** Brake
- J24** Connecting Rod
- J26** Block
- J28** Head

Gear machining (External Gear)

🎯 Cutter For Roughing



- Cutter diameter : Ø300
- The Number of Edges : 60
- Available for High Speed working through onrolled V-Style edges to reduce Cutting Force



🎯 Cutter For Medium



- Cutter diameter : Ø280
- The Number of Edges : 48
- Available for High Efficiency and Long Life and high productivity through Korloy's own insert shape
- Made R part of gear by proper designed 'R'-shape of insert

🎯 Cutter For Finishing: M20

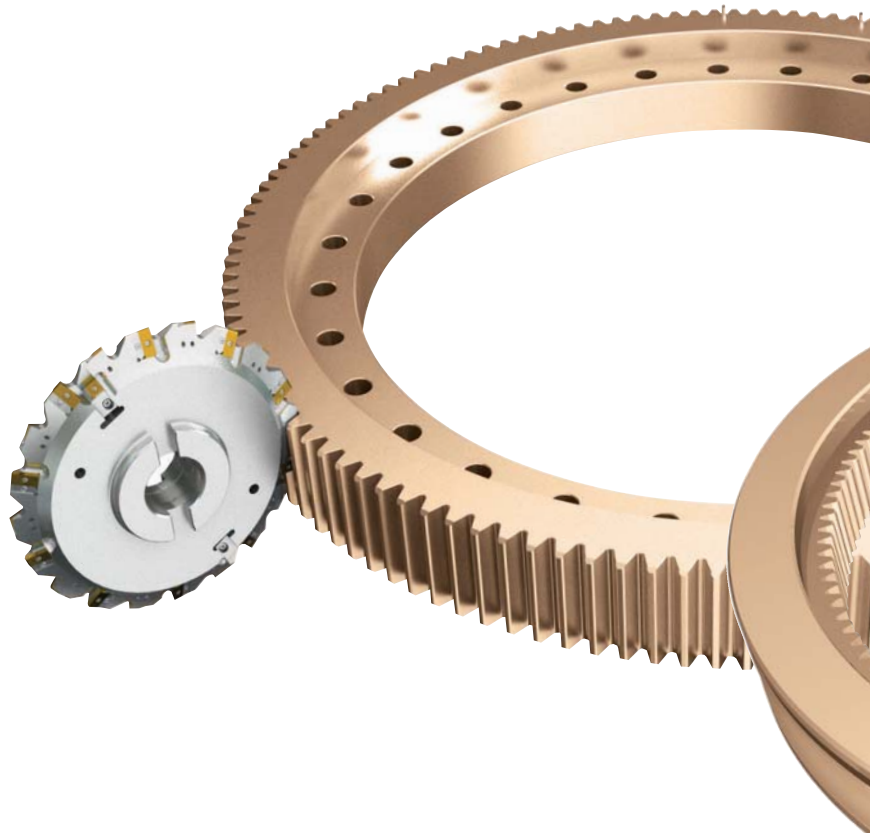


- Cutter diameter : Ø400
- The Number of Edges : 20
- Gear cutter for Medium is realized on the 4 grade of precision. (KS, JS)
- Chamfering system available for machining efficiency

🎯 Hob Cutter



- Cutter diameter : Ø350
- The Number of Edges : 100
- Indexable Hob for roughing worked by generating cutting action
- Available for customized producing by user



🎯 KING DRILL



Optimal indexable drill design

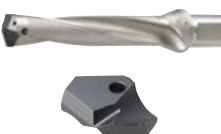
- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300

🎯 VH Chip breaker



- Innovative improved chip breaking on the medium working
- Provided good performance on the flange and continuous working
- Type of SNMM / CNMM

🎯 TPDB



High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

🎯 VT Chip breaker



- Excellent rigidity on the high feed and depth
- Excellent impact resistance and long life based on stable structure and outstanding rigidity
- Type of SNMM / CNMM

Gear machining (Internal Gear)

🎯 Cutter for Roughing



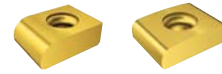
- Cutter diameter : Ø560
- The Number of Edges : 140
- Available for all module gear working is caused by edges designed stair shape



🎯 Cutter for Medium



- Cutter diameter : Ø400
- The Number of Edges : 48
- Available for making involute curve shape of internal gear



🎯 Cutter for Finishing



- Cutter diameter : Ø400
- The Number of Edges : 20
- Cutter for finishing available for 4 grades accuracy of internal gear
- Available for chamfering on the same time and unnessariness of extra working



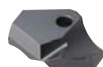
🎯 KING DRILL



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300

🎯 TPDB



High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

Ship building (Engine block)

⊙ Roughing cutter for cylinder block



- Cutter diameter: Ø200
- Applicable insert: SNCF1507ANN-MF
- Economical concepts: 8 edge available insert, high feed available tool
- KORLOY exclusive latch clamping system provides quick change of insert

⊙ TPDB



High precision and high efficiency indexable drill

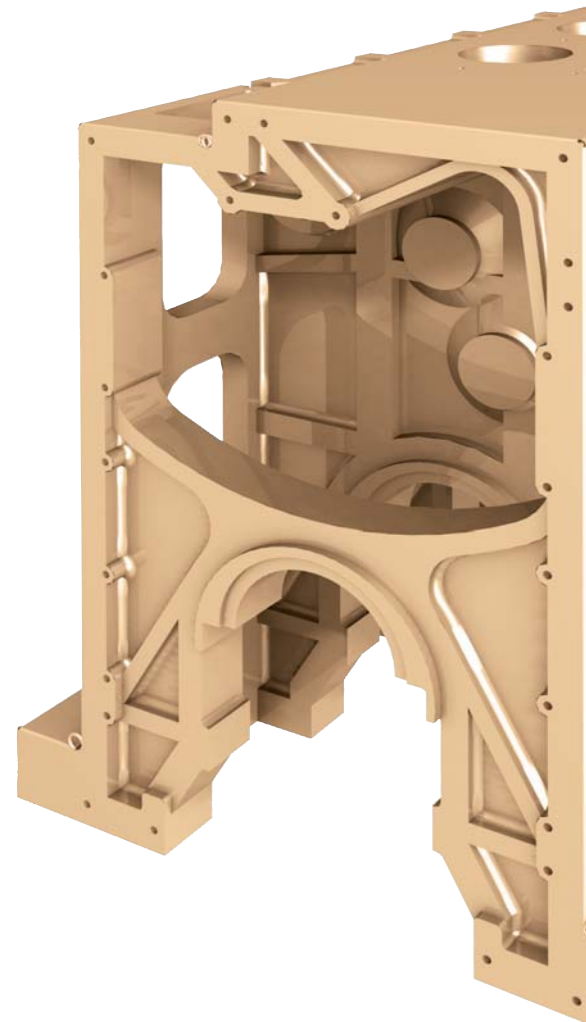
- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

⊙ KING DRILL



Optimal indexable drill design

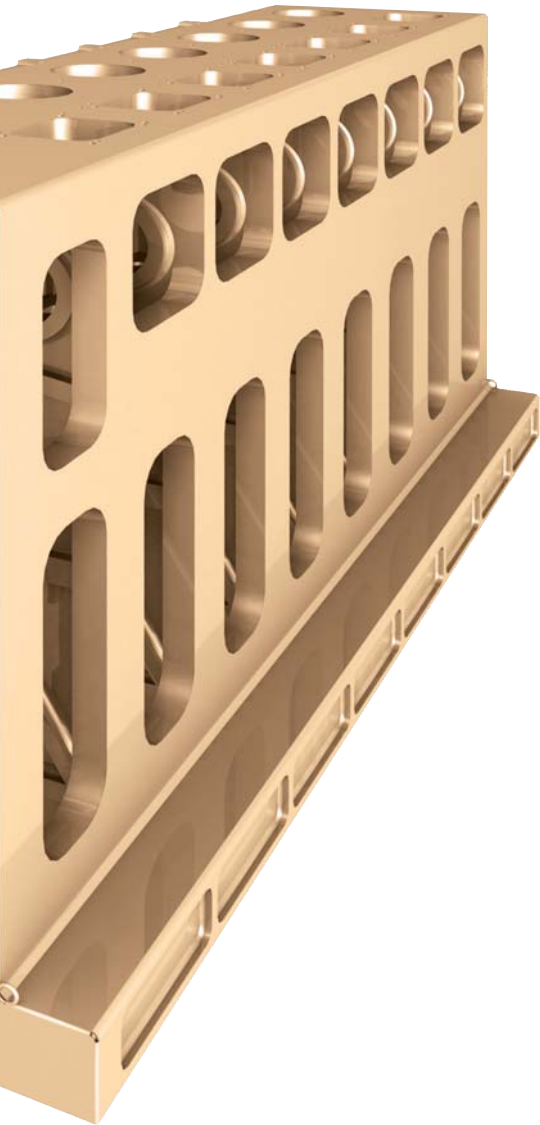
- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300



⊙ Cylinder block cam shaft boring cutter (Aluminum body cutter)



- Cutter diameter : Ø270
- Applicable insert : LNE434 / SDKX1506
- Right-hand rotational aluminum cutter body, easy to handle, makes high precision boring



🎯 Cylinder block roughing and medium (Both)



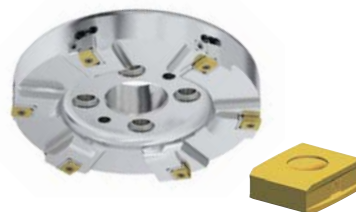
- Cutter diameter: Ø200
- Applicable insert: LNE434 / LNCS1907-R3.0-WC
- Designs available for roughing and medium applications
- Available high efficiency working to chose LNE 434 insert for roughing and high reliability grade
- Good surface working through LNCS1907-R3.0-WC Wiper shape for medium

🎯 High rake-angle applied cylinder block roughing cutter



- Cutter diameter : Ø250
- Applicable insert : SECN2606AFN
- High rake angle cutter suitable for the machining applications that have the tendency to create chatter

🎯 Adjustable medium machining cutter



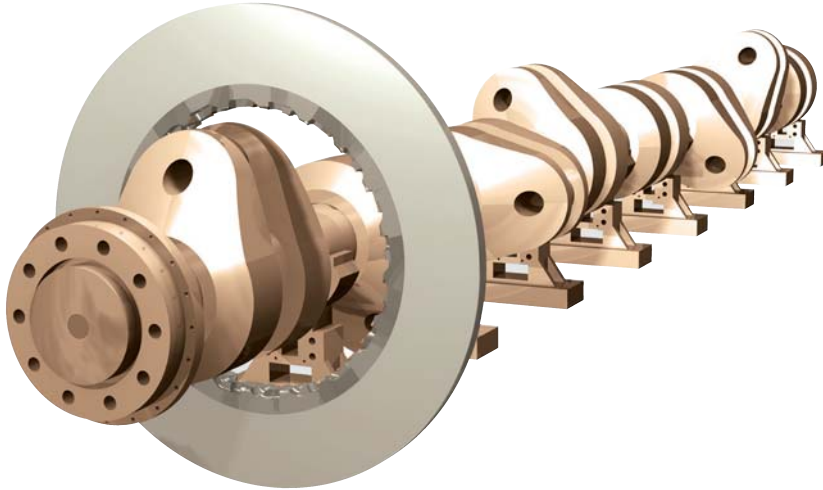
- Cutter diameter : Ø250
- Applicable insert : LNCS1907-C1.5-WC
- Cutting edge height adjustable device provides excellent surface finish

🎯 Cylinder block bearing cap seat machining cutter



- Cutter diameter: Ø250
- Applicable insert: RDKT2006M0
- Several sizes of inserts are prepared to meet the radius requirement of work-piece
- Rigid inserts for high efficiency machining

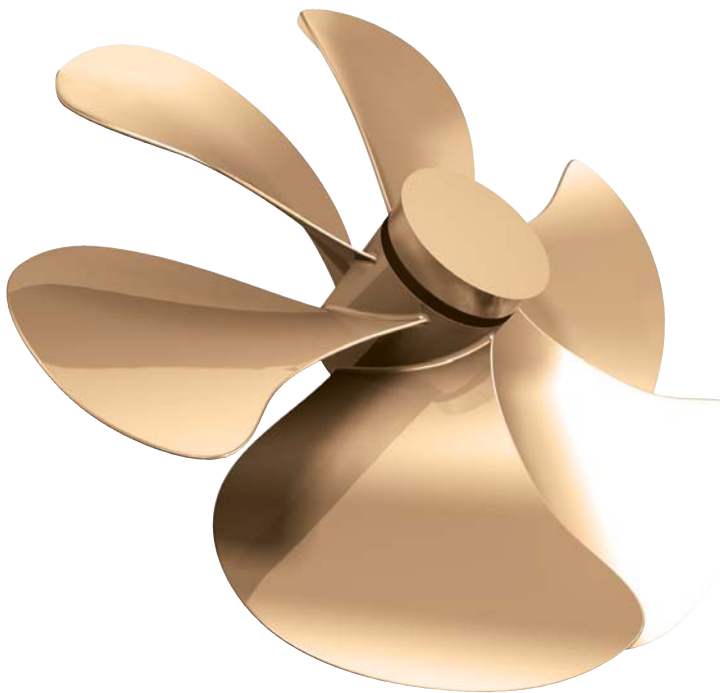
Ship building (Crank shaft / Propeller)



🎯 KORLOY exclusive screw-on type internal pin miller



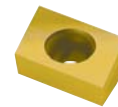
- Cutter diameter : Over $\text{Ø}2000$
- Weight : 1.5 tons
- Pin miller for crank shaft of medium size ship engine
- Special segment assembly system developed by KORLOY makes it easy to handle and provides excellent cutting performance with good chip forming



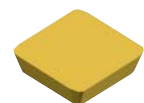
🎯 Periphery side of propeller machining tool



- Cutter diameter : $\text{Ø}150$
- Applicable insert : CDEW170708R
- Positive relief angle applied to get smooth cutting without chatter



🎯 Top face of propeller machining tool



- Cutter diameter : $\text{Ø}250$
- Applicable insert: SECN1904EER
- Double layer insert array provides big depth of cut



Role machining (Body / Shape / Parting-off)

Role machining (Body / Shape / Parting-off)

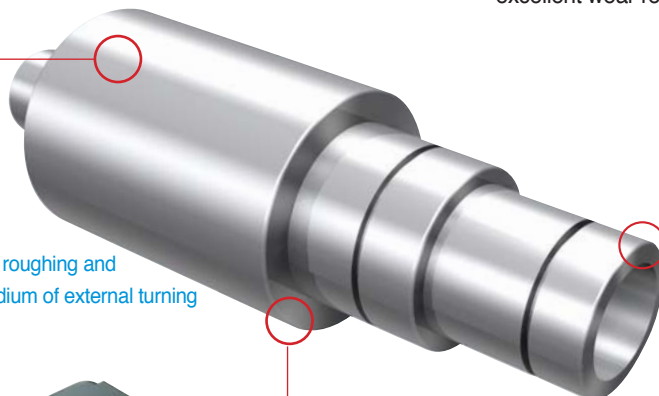
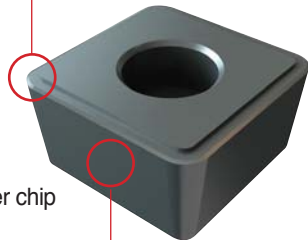


Closer chip breaker to the cutting edge provides better chip control even in deep grooving

- Good chip evacuation even in deep grooving
- High hardness coating grade that has excellent wear resistance prevents damage from cutting load. (Photo shows edge damage after machining same time under same conditions)

Parting-off Roll

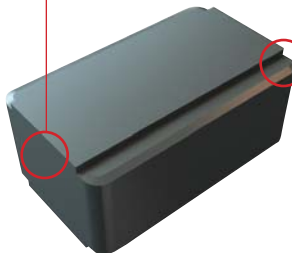
- Unique insert geometry for better chip control even in deep grooving
- High hardness coating grade provides excellent wear resistance



For roughing and medium of external turning

For parting-off

For forming and machining of joint



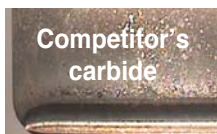
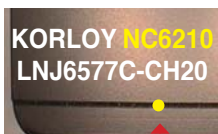
External turning of Roll

- Match of high hardness coating grade (NC6210) with chip breaker provides longer tool life with smooth chip control
- Various cutting edge designs are applicable according to workpiece materials and cutting conditions



Application case

The combination of high hardness coating grade (NC6210) and chip breaker shows better performance



- Equipped with wide chip breaker enough to prevent crater wear
- Better chip control from the beginning of the machining, together with high hardness coating grade provides 3 times longer tool life than conventional tool. (especially at finishing)

Forming and grooving of Roll

- Special chip breaker focus on suitable chip forming (engineered chip breaker width and depth)
- Strong cutting edge treatment prevents un-expected fracture of insert

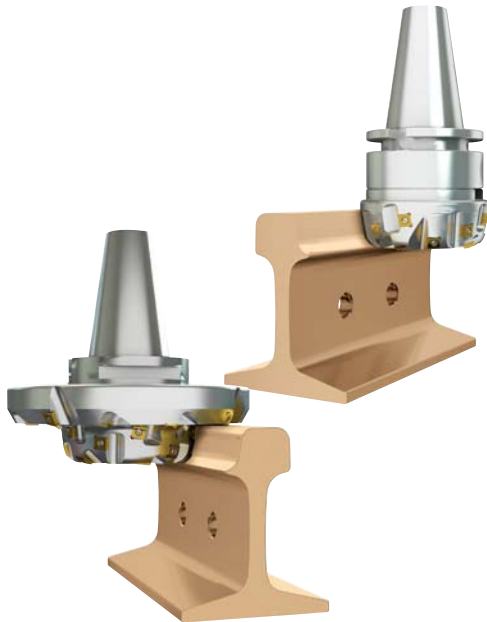
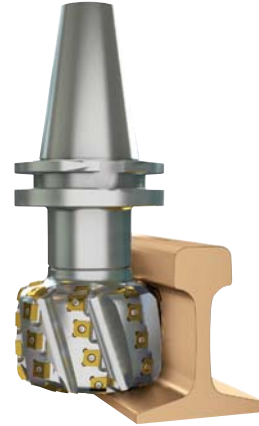


Railway Industry (Separator / Crossing / Rail)

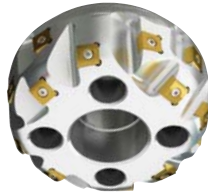
🎯 Rail separator joint face milling cutter



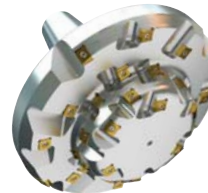
- Cutter diameter : $\varnothing 160$
- The Number of Edges : 54
- Special customizing is available upon customer's requests



🎯 Cutter for top of guard-rail working



- Cutter diameter : $\varnothing 160$
- The Number of Edges : 16
- Precise forming of rail way is possible



- Cutter diameter : $\varnothing 300$
- The Number of Edges : 33
- One body design of cutter and arbor provides high rigidity

🎯 Taper milling for top of guard-rail working



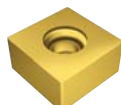
- Cutter diameter : $\varnothing 200$
- The Number of Edges : 24
- Economical 8 edge available insert
- Special customizing is available upon customer's requests



🎯 Periphery face milling for the top side of rail way



- Cutter diameter : $\varnothing 240$
- The Number of Edges : 25



🎯 Cutter for repairing rail

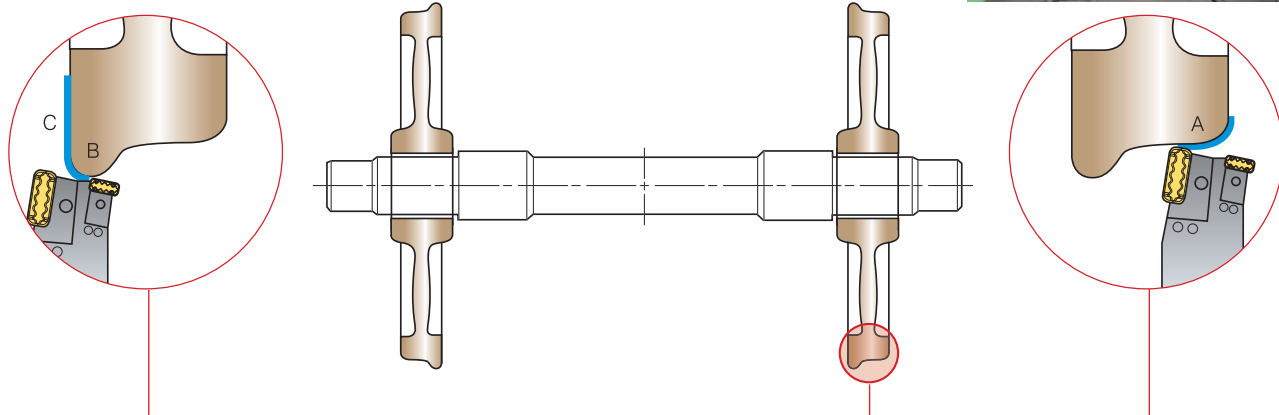
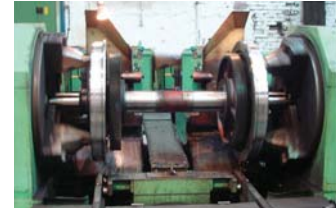




- Cutter diameter : $\varnothing 600$
- The Number of Edges : 198
- Milling applicable on the rail of part requested repairing

Rail Industry (Wheel)

🎯 The type of LNUX for the working of wheel (Repair)

- Material : SSW2. Ø920~1000
- Cutting conditions : $vc=78\text{m/min}$ (13~18min-1) $fn=1.0\text{mm/rev}$ $ap=3\sim 4\text{mm}$
- Insert : LNUX301940-TM Grade : NC3220
- Result : good chip evacuation, stable structure and long life tool life

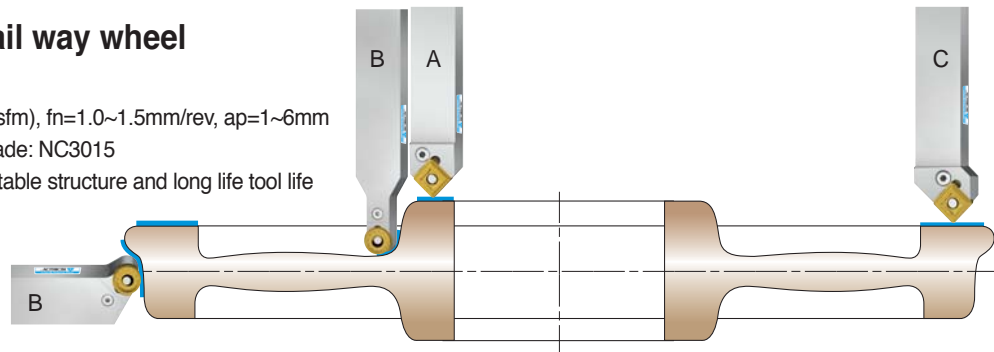


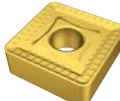




| LNUX301940-TF | LNUX301940-TM |
|--|---|
|  <ul style="list-style-type: none"> • For light cutting, it generates a low load with good chips |  <ul style="list-style-type: none"> • Comprehensive design for general use, strong cutting edge with good chip forming (First recommendation) |







| Working procedure | A | B | C |
|-------------------|--------------------------------------|--|---|
| Insert | LNUX301940-TF/TM | LNUX191940-25/22 | |
| Grade | NC3220 | NC3220 | |
| Cutting condition | Decrease the speed on deep part of A | Increase the speed to get good chip evacuation | |

🎯 RCMX insert for rail way wheel

- Material: SSW2. Ø840
- Cutting conditions: $vc=55\sim 100(\text{sfm})$, $fn=1.0\sim 1.5\text{mm/rev}$, $ap=1\sim 6\text{mm}$
- Insert: RCMX3209M0-SL Grade: NC3015
- Result: good chip evacuation, stable structure and long life tool life



| VT chip breaker | |
|--|--|
|  <ul style="list-style-type: none"> • Strong cutting edge for high feed and deep cutting depth • Tough design of chip breaker provides excellent impact resistance • SNMM type | |
| SL chip breaker | |
|  <ul style="list-style-type: none"> • Comprehensive chip breaker covers wide application range • Proper chip control with long tool life | |
| SB chip breaker | |
|  <ul style="list-style-type: none"> • Better chip control at low depth of cut machining | |
| B chip breaker | |
|  <ul style="list-style-type: none"> • Comprehensive roughing design having strong edge strength with long tool life | |
| TM chip breaker | |
|  <ul style="list-style-type: none"> • Medium-finishing chip breaker, proper surface finish, superior wear resistance | |

| Working procedure | A | B | C |
|-------------------|--|--|--|
| Applicable insert |   |   |   |
| Holder | PSDNN5050-U25 | PRDCN5050-U32 PRGCN5050-U32 | PSSNR5050-S25 |
| Insert | SNMM250724-GH | RCMX3209M0-SL | SNMM250724-VT |
| Grade | NC3220 | NC3220 | NC3220 |

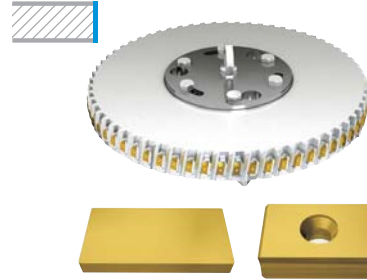
Pipe Industry (Edge milling)

“X” shape machining

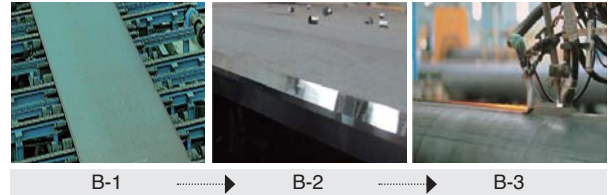
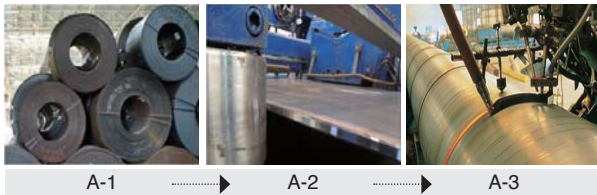
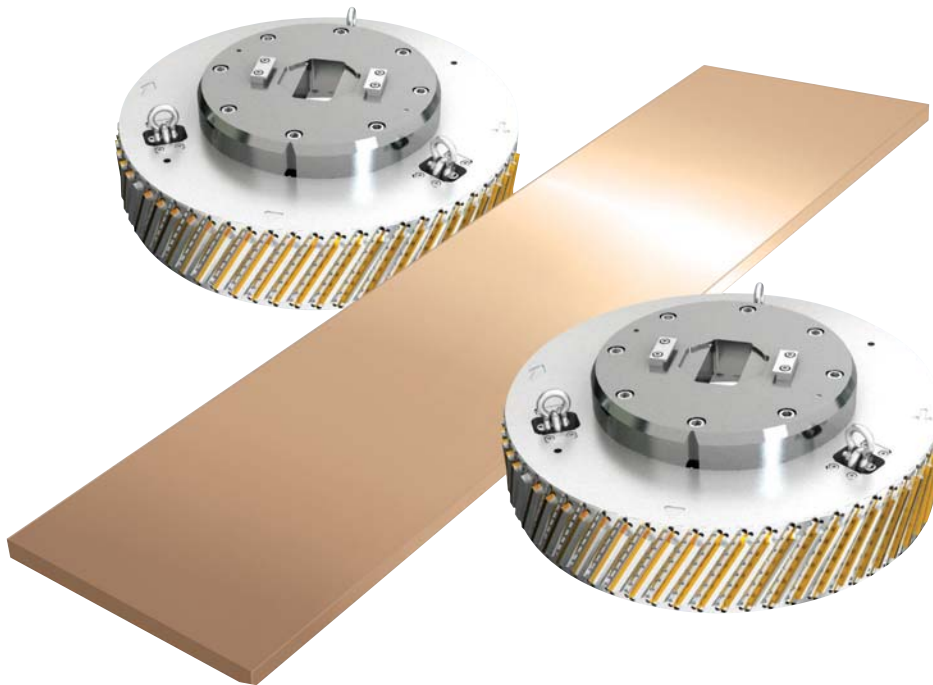


- A cutter to make the “X” shape on the both side-end of steel plate, to do bevel-end welding
- Locator wedge type clamping system applied for the cutter provides long durability of cutter as well as strong clamping power

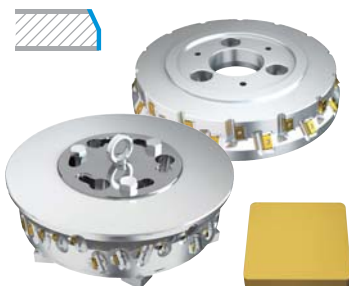
“I” shape machining



- A machining to make “I” shape on the both side-end of steel plate, to do bevel-end or plane-end welding.
- Variety of inserts (with chip breaker or without chip breaker) are available according to your cutting conditions

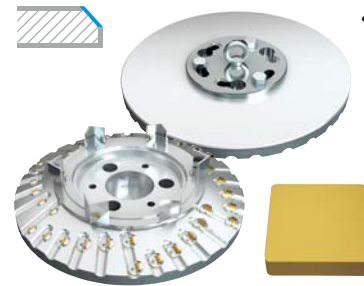


“Y” shape machining



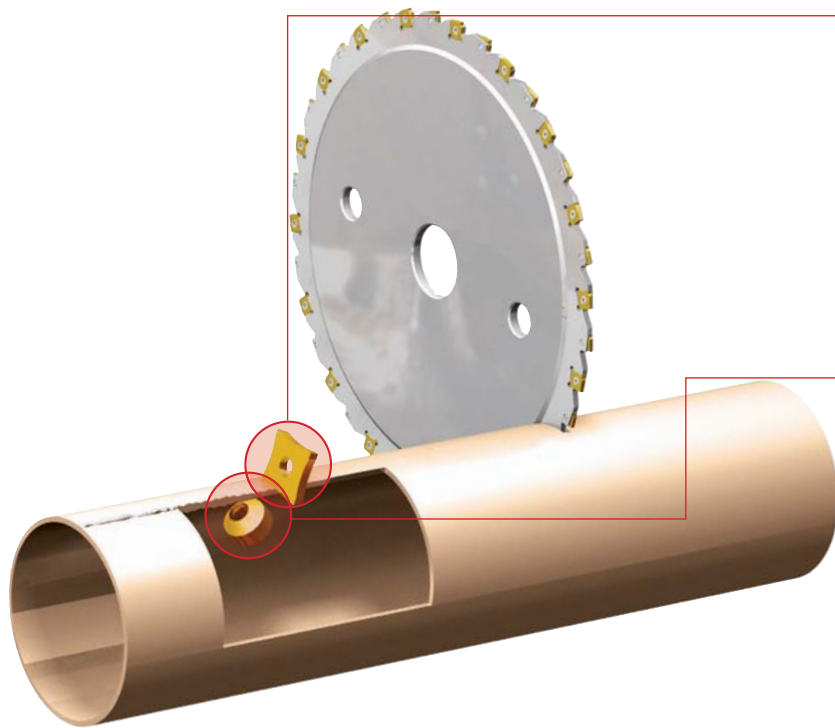
- A machining to make “Y” shape on the both side-end of steel plate, to do bevel-end welding
- Wide chip pocket on cutter provides long durability of it by reducing contact of chip with cutter body

Special machining

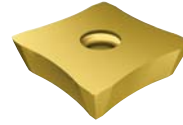


- Special design of cutter as per side-end shape of steel plant upon customer’s request is available

Pipe Industry (Bead removal / Parting-off / Chamfering)



🎯 Bead removal insert : External



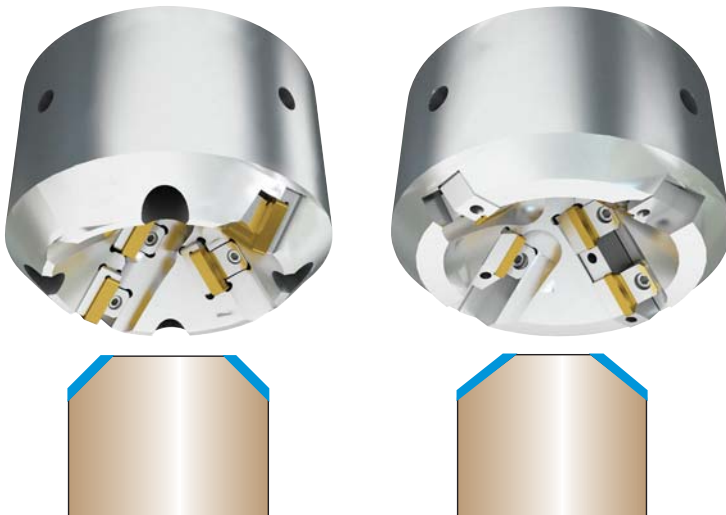
- Tool removing protruded part of melted welding material at outside of pipe
- Economical tool by using square insert, utilizing 4 cutting edges
- Grade: NC3030

🎯 Bead removal insert : Internal

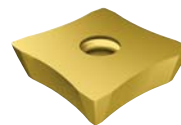


- Tool removing protruded part of melted welding material at inside of pipe
- Grade: CX1222

| Working Method | Application range | Applicable Inserts | Cutter |
|----------------|---------------------------|---|-------------|
| | For external bead removal | SDMX80-R□□ / SEGW54-R□□ SNMG150708-R□□ / SNMN1207(SUN452)-□□R SNMN1507(SNU552)-□□R / SOET1906-254 SEGX2509-R□□ | Customizing |
| | For internal bead removal | AR□□(AC) / SF□□R-□□ | |



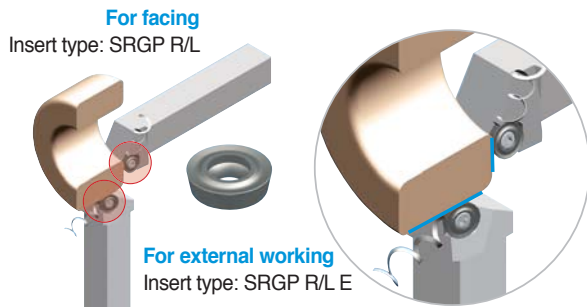
🎯 Chamfer Tool



- Chamfering tool machining cut-off face of pipe
- Special chamfering angle design is possible upon customer's request
- Cost effective concept: Triangle and Square double sided insert provides 6~8 effective cutting edges
- Grade : NCM325, PC3500

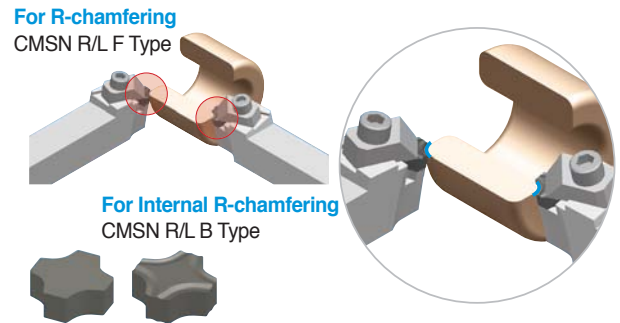
Bearing

For external and facingworking



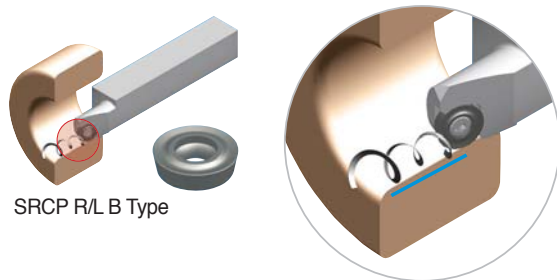
- Applicable on the internal, external and facing working

For Internal and external R-chamfering

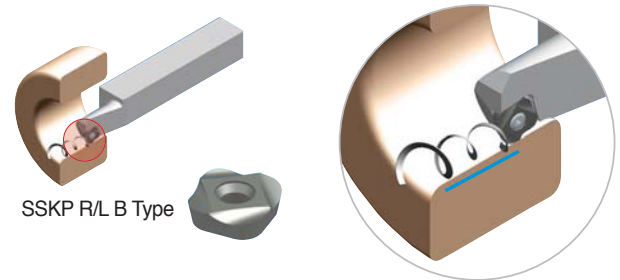


- Applicable 8 corner of insert
- R-shape is realized to internal and external part of corner

For internal working



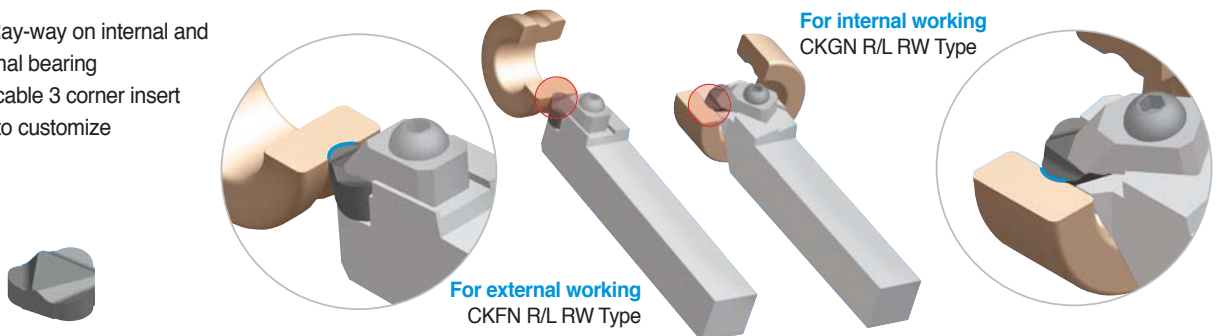
- Applicable over $\varnothing 12$



- Applicable over $\varnothing 11.5$ with 4-corner insert for internal and low working

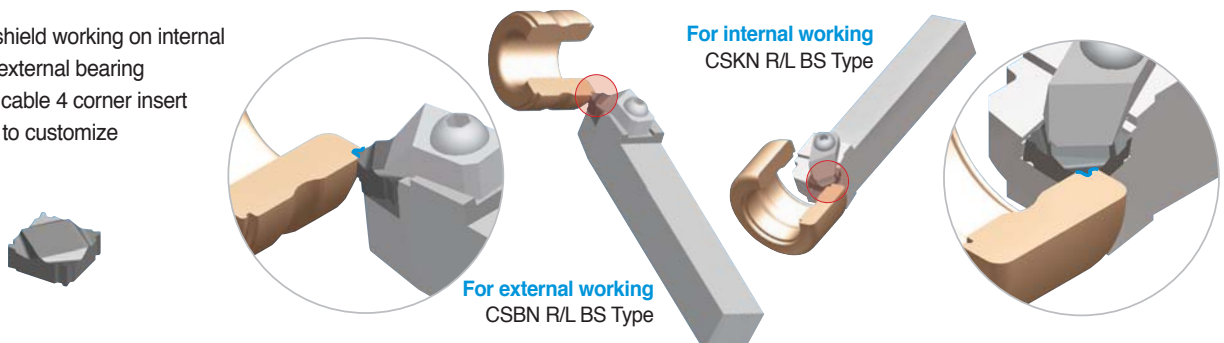
For ray-way

- For Ray-way on internal and external bearing
- Applicable 3 corner insert
- Able to customize



For shield way

- For shield working on internal and external bearing
- Applicable 4 corner insert
- Able to customize



Power Generation (Wind Power Generation Shaft / Tower Flange)

VH Chip breaker



- Good chip control in heavy machining
- Excellent performance for flange machining
- Suitable for continuous cutting conditions
- SNMM / CNMM type

VT Chip breaker



- Strong cutting edge for high feed and deep cutting depth
- Though design of chip breaker provides excellent impact resistance
- SNMM / CNMM type

TM (Thread Milling)



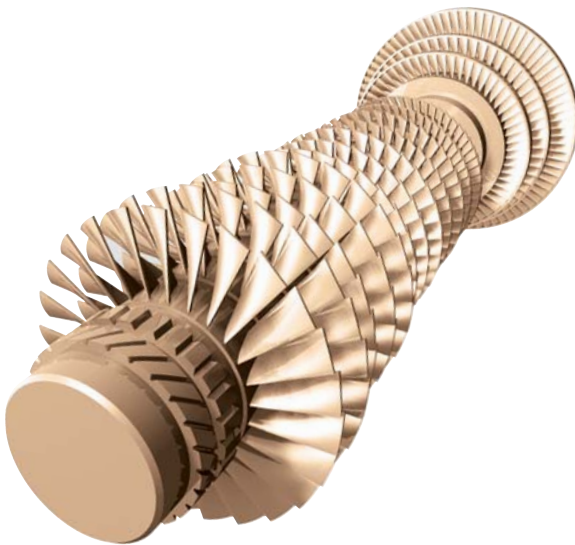
- Thread milling indexable tools
- Various type of holder (standard, long, taper) and inserts
- Screw diameter: $\varnothing 9 \sim \varnothing 46\text{mm}$

H-MAX



Solid end-mill for hardened material

- Sub-micron carbide provides strength on sharp cutting edge preventing small chipping on it
- Advanced PVD coating has high hardness with strong antioxidation property, provides excellent tool life at the machining of hard to cut material having high hardness



RCMX type



- High quality machining
- Rigid insert ensures good surface finish and long tool life
- RCMX type

Vulcan Drills (VZD)



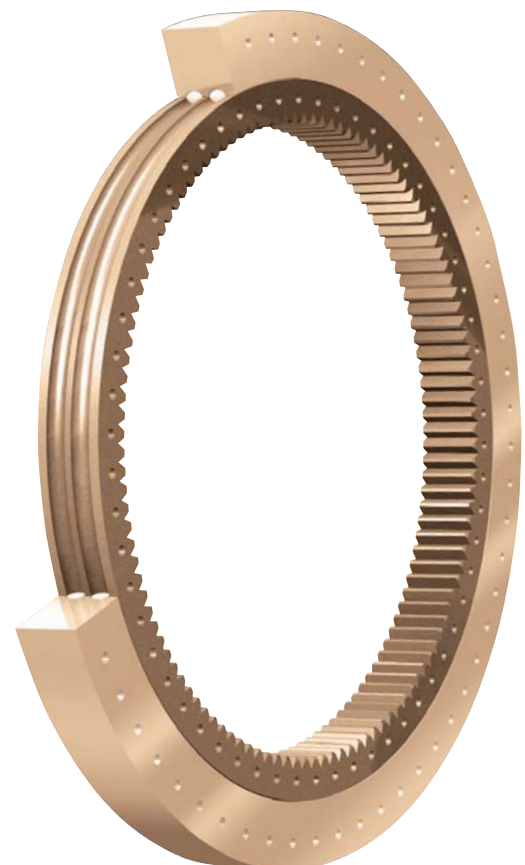
- Rigid body for high feed and precision machining
- Better chip evacuation from improved chip breaker
- Applicable for the drilling under poor cutting conditions

KING DRILL



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300



Aviation Industry (Engine / Turbine)

TPDB



High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

ISO Turning



- Available to customize whole and special items for complicated and various shape

Boring Bar



Internal Turning

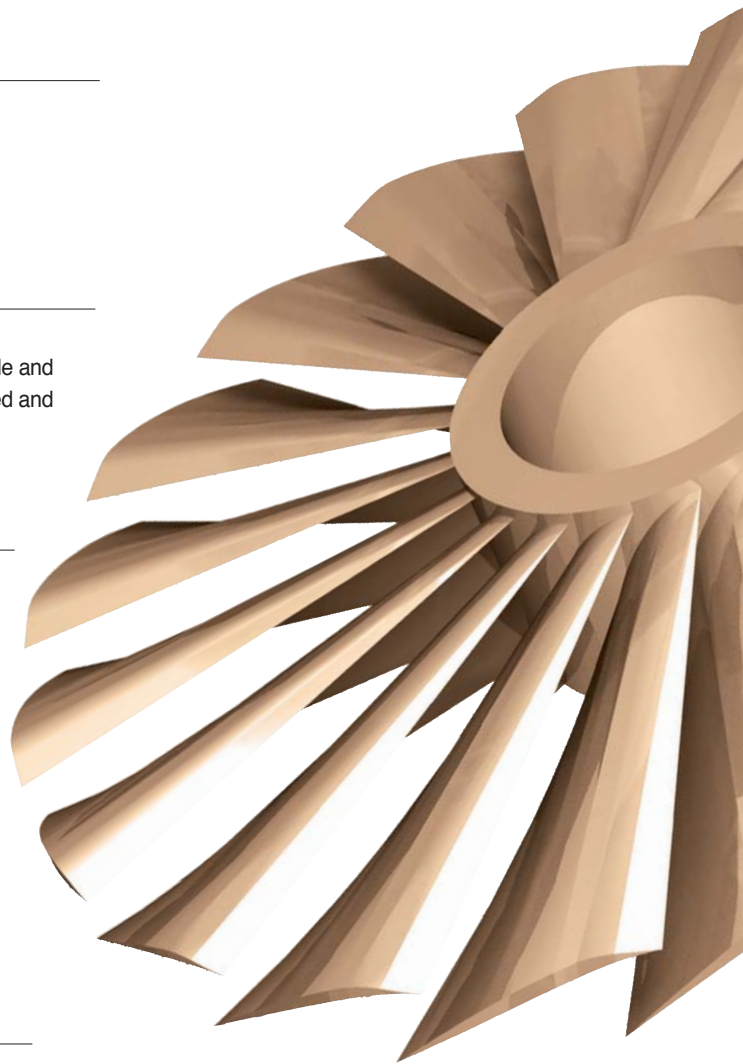
- ISO standard boring bar for internal machining

I-Max



Solid end-mill for hard to cut material(IFSE3000)

- High rake angle with helical flute provides excellent chip control
- Specially designed cutting edge applied to overcome work-hardening
- Best quality at the machining of hard to cut material



Rich Mill



- Increased number of edges and excellent tool life due to 8 corner edges
- Smooth cutting with low cutting load due to the unique geometry & high rake angle of cutting edge, this combination provides excellent tool life

MSD



Long tool life with protecting material

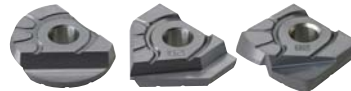
- Good chip control with proper chip-pocket
- Decrease the chipping and increase the cutting ability due to applicable streamlined shape insert
- Increase impact resistance and lubrication due to apply PVD K Black coating on the sub-micron material

Laser Mill



Multi-functional indexable end-mill

- Extremely hard grade provides long tool life
- Easy and simple clamping of insert by using single screw
- Excellent quality for fine finishing due to its precise tolerance



H-Max



Solid end-mill for hard material

- Sub-micron carbide provides strength on sharp cutting edge preventing small chipping on it
- Advanced PVD coating having high hardness with strong anti-oxidation property coated on it provides excellent tool life as the machining of hard to cut material having high hardness

Aviation Industry (Landing Gear / Accessory)

HRMDouble



High efficient and cost effective tool utilizing a double sided insert

- Cost effective tool by using double sided insert with a total of 6 cutting edges
- Smooth cutting utilizing a high rake angle sharp cutting edge insert

MGT



For Grooving, Turning, Profiling, Cut-off

- Multi functional grooving tool can over variety of machining with



Pro-X Mill



High-speed Aluminum Milling tool

- Unique mounting system of insert provides tight clamping of insert
- Mirror surface and high rake angle of insert provides excellent machined surface by reduced cutting load and edge build-up
- Grade: H01

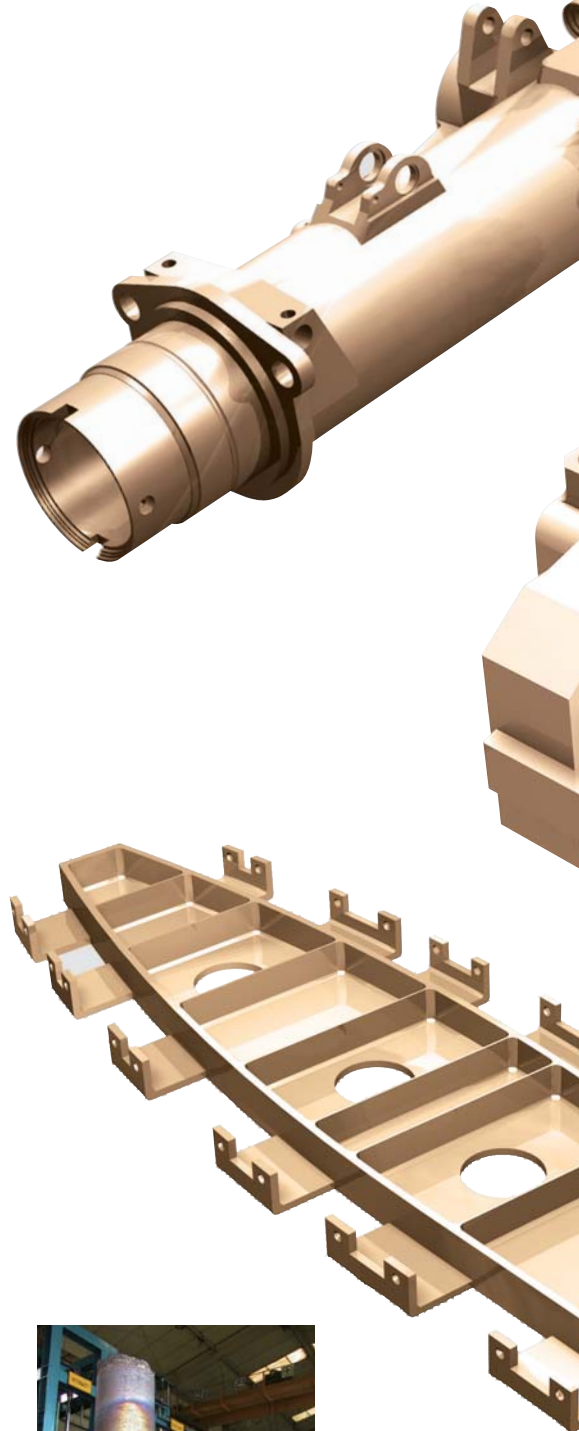


SSEA

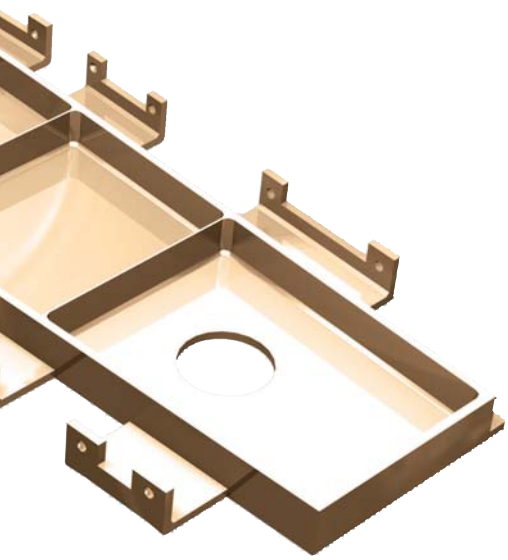
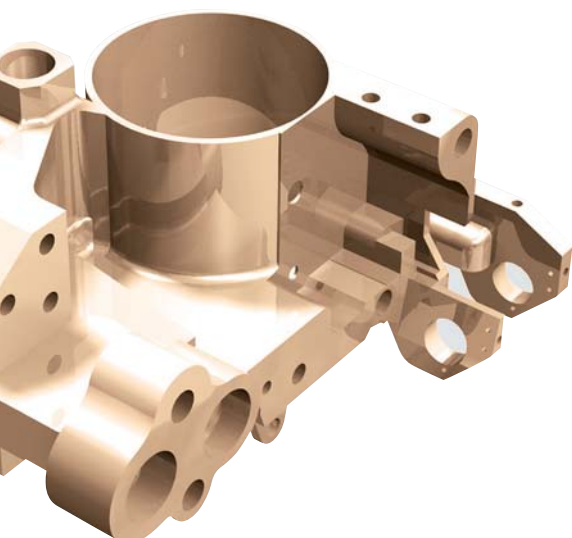


Solid carbide end-mill for Aluminum machining

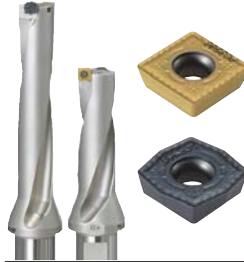
- Advanced geometry of end-mill refrains build-up-edge
- Superior surface machined
- DLC coated end-mills available



Titanium
Picture provided : KPC Inc.



KING DRILL



Optimal indexable drill design

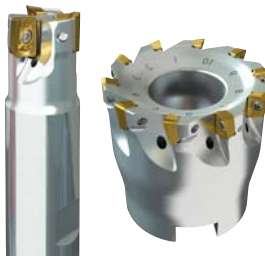
- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade : PC3500, PC5300



MLD (Mach Long Drill)

- Direct drilling without separate operation (step drilling) over 20 x D
- Wider flute space along with drill provides effective chip control
- Special design for rigid body provides smooth drilling without bending of drill

Alpha Mill



Multi functional milling tool

- Vast coverage of milling operation due to its variety of cutters and inserts
- 3 dimensional chip breaker design provides smooth cutting

Brazed End-Mill



- Apply High Spiral Angle (over 40 degrees) able to get good sharpness
- Available high speed milling due to reduce the working temperature
- Expected long tool life by applying hardened carbide material.
- Economical welded tool due to available 2 or 3 times re-grinding

Slitter Knife

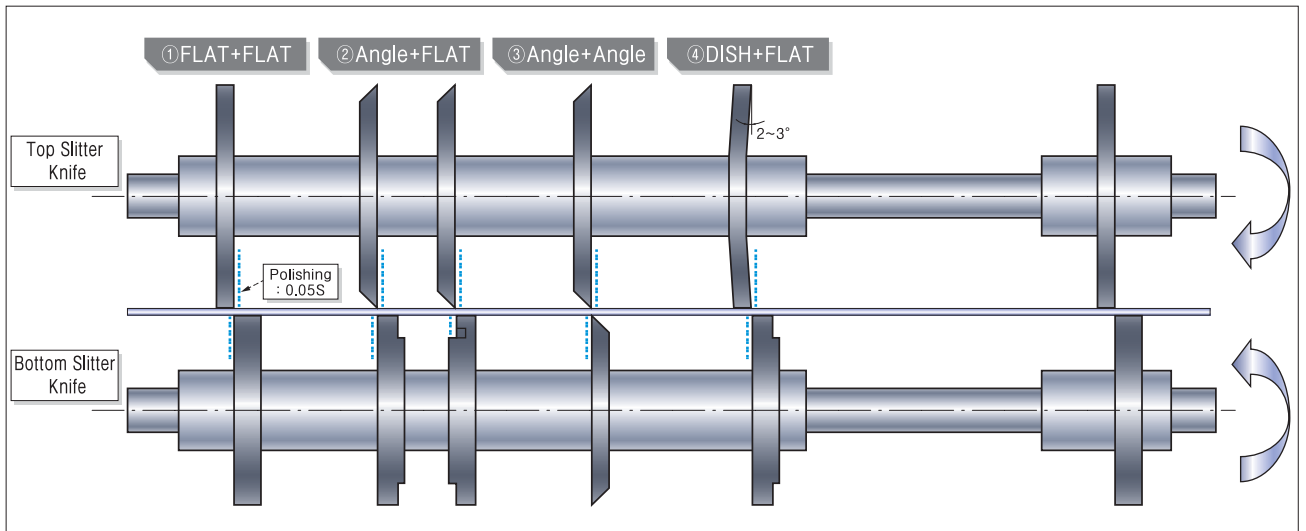
- Application**
- ▶ For video tape
 - ▶ For audio tape
 - ▶ For magnetic tape
 - ▶ For brass plate, mobile battery



Tool selection

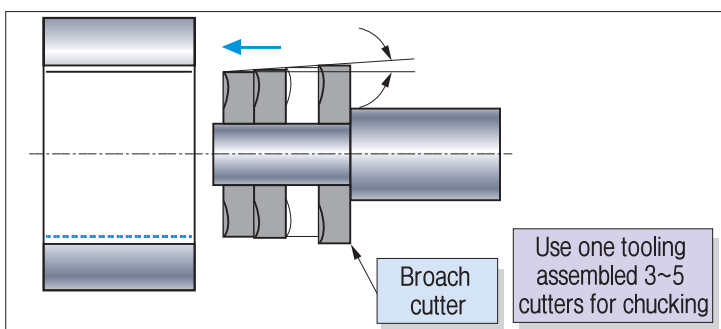
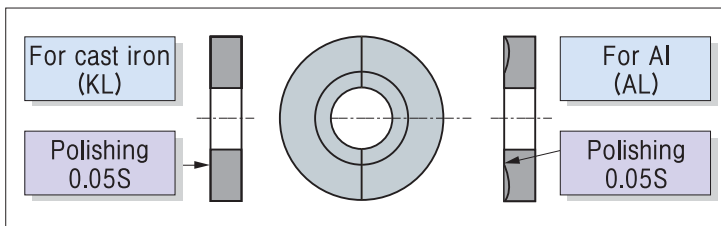
- ▶ Top slitter knife : Thickness : $\pm 0.01 \sim 0.02 \text{mm}$
- ▶ Bottom slitter knife : Thickness : $\pm 0.001 \text{mm}$
Flatness : under 0.0005mm
Polishing surface roughness : under 0.05S

Machining example



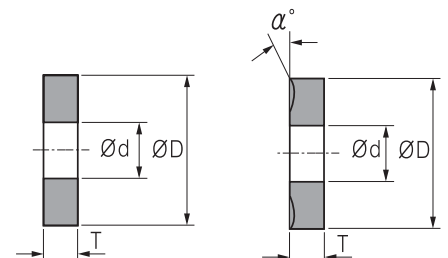
Broach cutter

- Application**
- ▶ Broach cutters apply to inner machining of metal bearing which is used for automobile crank shaft



Order

- Designation for cast iron : $KL \ \varnothing d \times \varnothing D \times T$
 - Designation for AL : $AL \ \varnothing d \times \varnothing D \times T$
: $AL \ \varnothing d \times \varnothing D \times T \times \alpha$
- (If there is no mentioned any angle, $\alpha = 30^\circ$)



Automobile engine tooling example (Crank Shaft)

Oil Bore - Mach Long Drill(MLD)



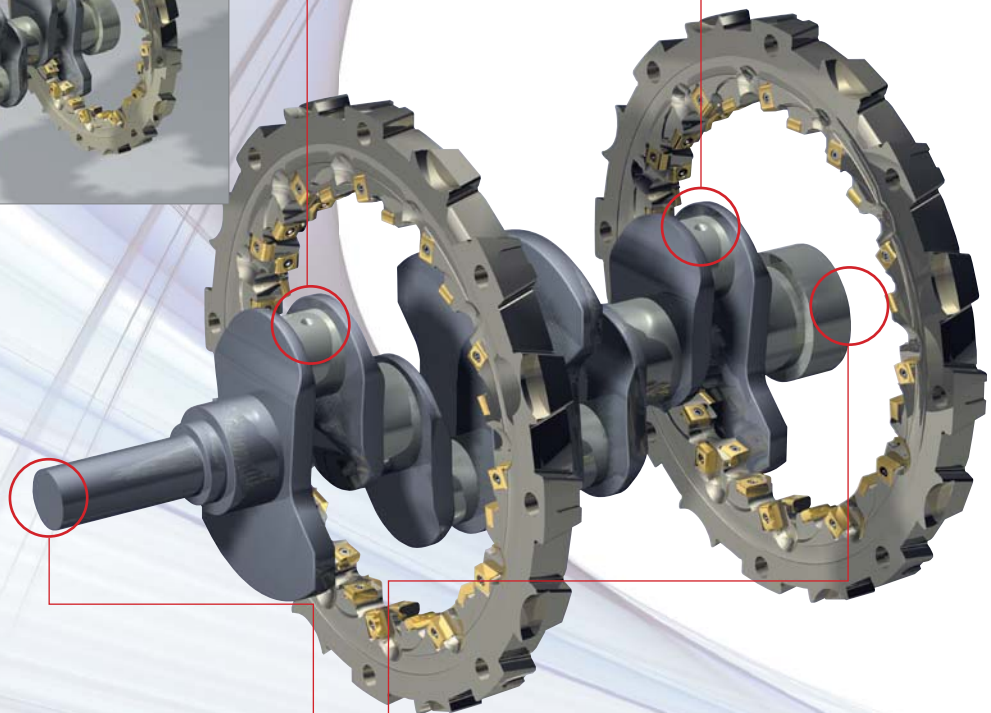
Taper Spline Structure
(Rigidity has been enhanced due to increased contact area)

Oil Bore - Mach Long Drill(MLD)

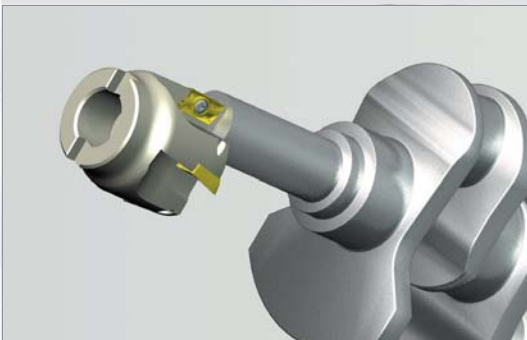


- Machining without step feed operation for deep hole drilling like 20D
- Optimal performance with MQL System

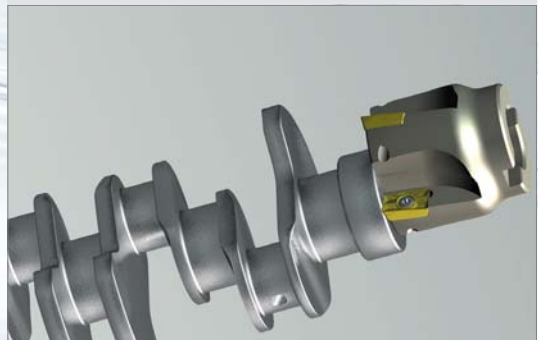
Pin & Journal - Crankshaft Cutter(Internal / External)



Post End - Alpha Mill



Flange End - Alpha Mill



Automobile tooling example (Knuckle)

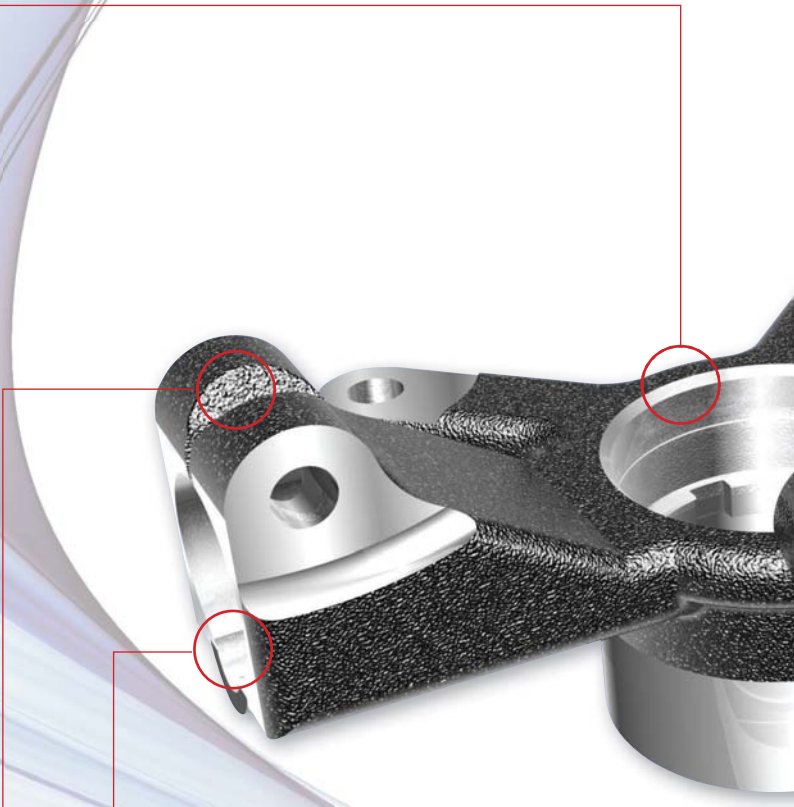
Micro Boring bar



Mach Drill



Micro Boring bar



Indexable Side Cutter (SPB)



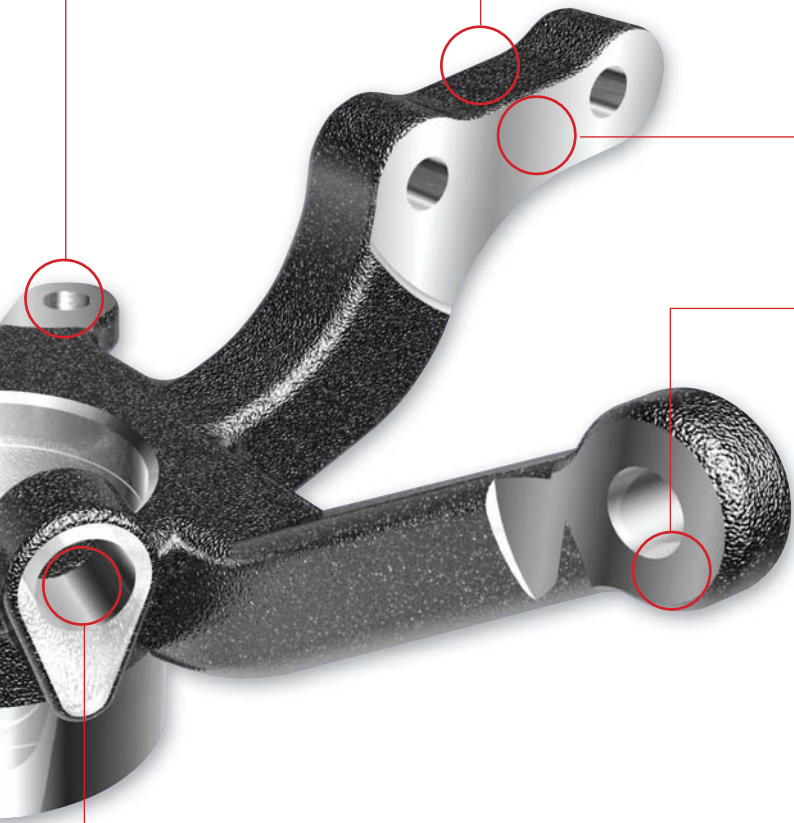
Future Mill (FMP)



Indexable Side Cutter(Tangential type)



Indexable Side Cutter(Radial type)



Future Mill(FMP)



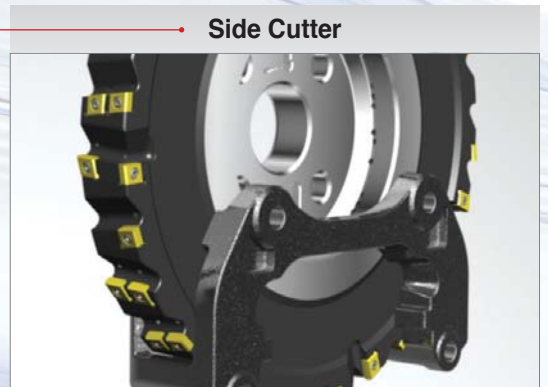
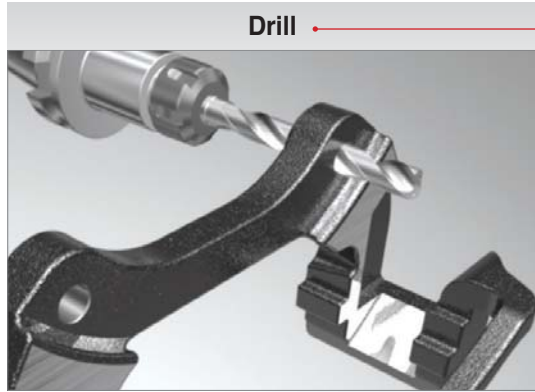
Step Drill



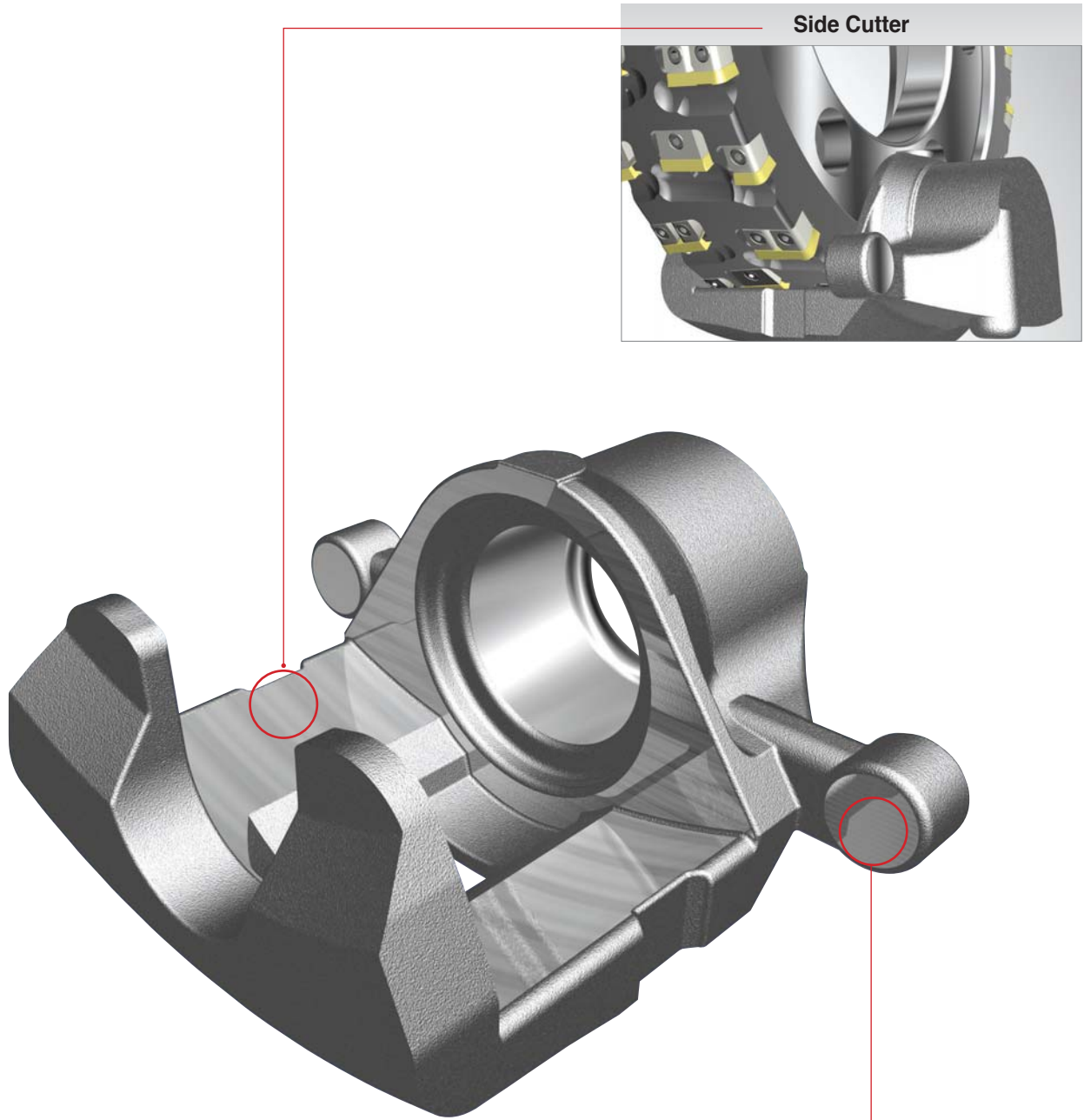
Drill(KING DRILL)



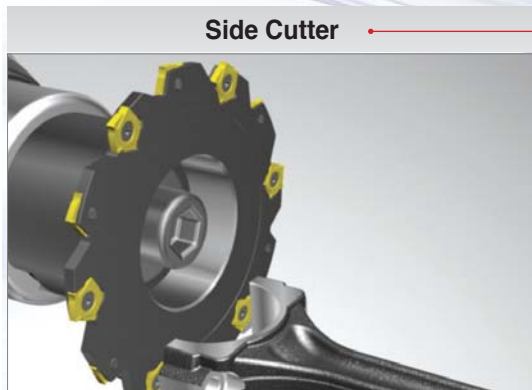
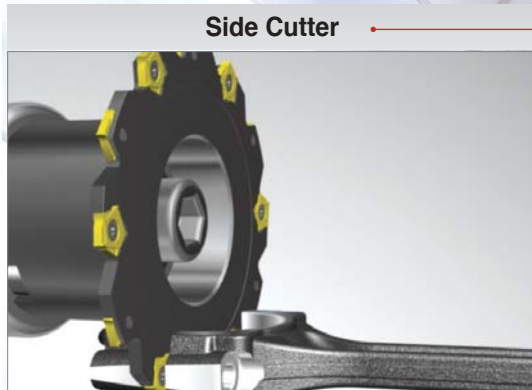
Automobile break tooling example (Carrier)



Automobile break tooling example (Housing)



Automobile tooling example (Connecting Rod)



Rich Mill(RM8)



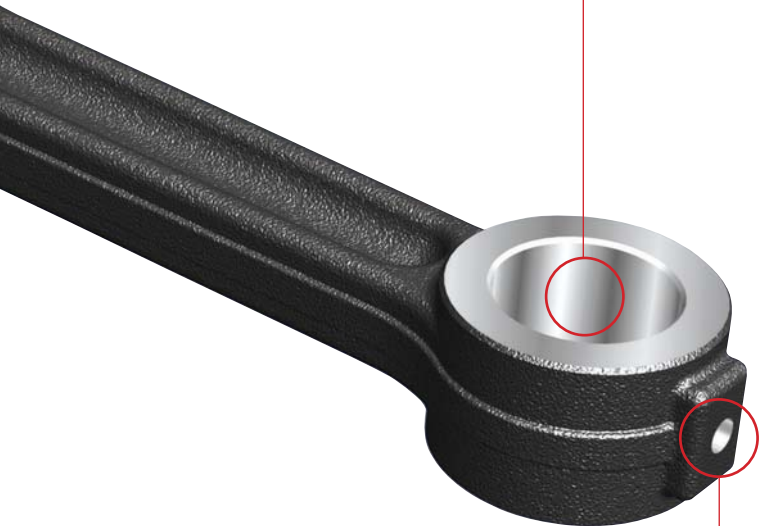
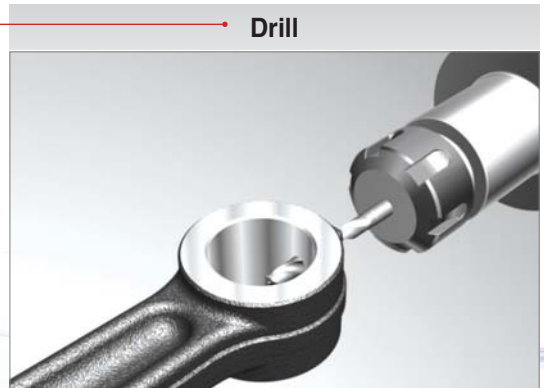
Drill(KING DRILL)



Step Drill

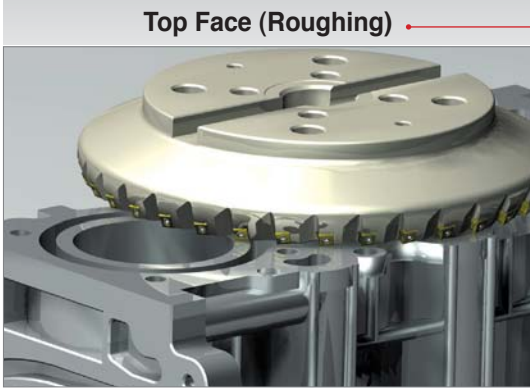


Drill



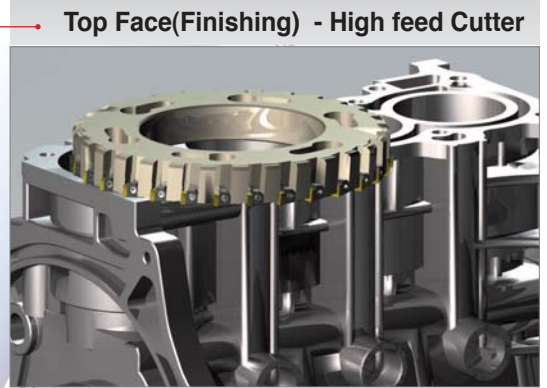
Automobile engine tooling example (Block)

Top Face (Roughing)



• Applied 8 corner edges of insert

Top Face(Finishing) - High feed Cutter



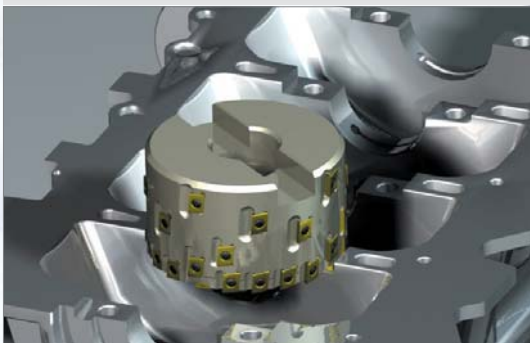
Bosses - Alpha Mill



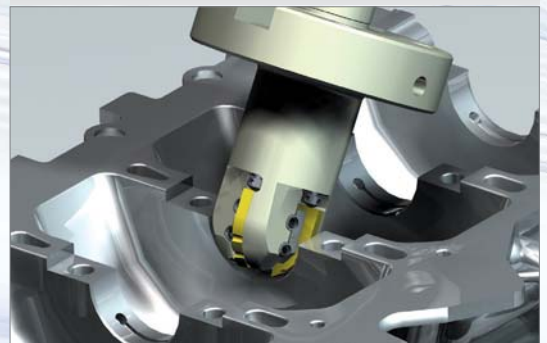
Line Boring Bar Reamer



Bearing Cap Seat - Form Cutter



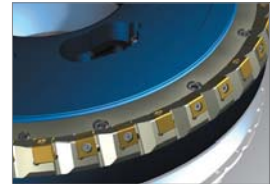
Crank Bore(Crankshaft Bearing Bore) - Form Cutter



Cylinder Bore(Roughing) - Boring Cutter



Front & Rear Face - Cube Couple Mill

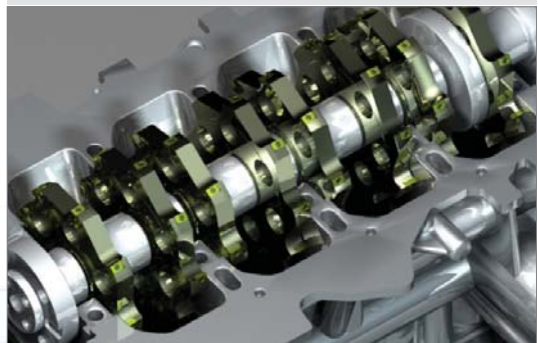


- High feed cutter made of aluminum
- Due to light weight, it's easy to handle & effective to prevent accident

Cheek Faces - Gang Cutter

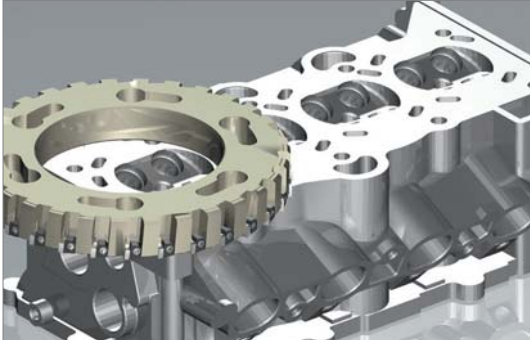


Cheek Faces - Gang Cutter



Automobile engine tooling example (Head)

Top Face(Roughing & Finishing) - High Feed Cutter



• Carbide insert, PCD insert

Top Face(Roughing & Finishing) - Aero Mill



• Due to the light weight of aluminum body that about 50% of steel body, excellent cutting performance with high speed machining can be achieved.

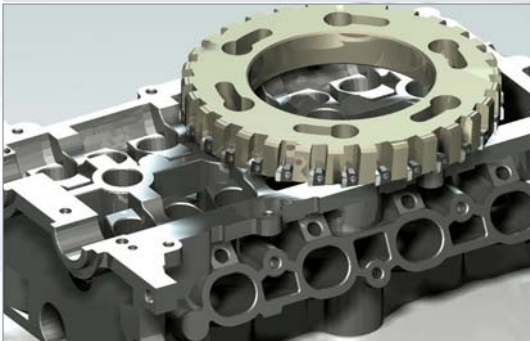
Step Burnishing Reamer



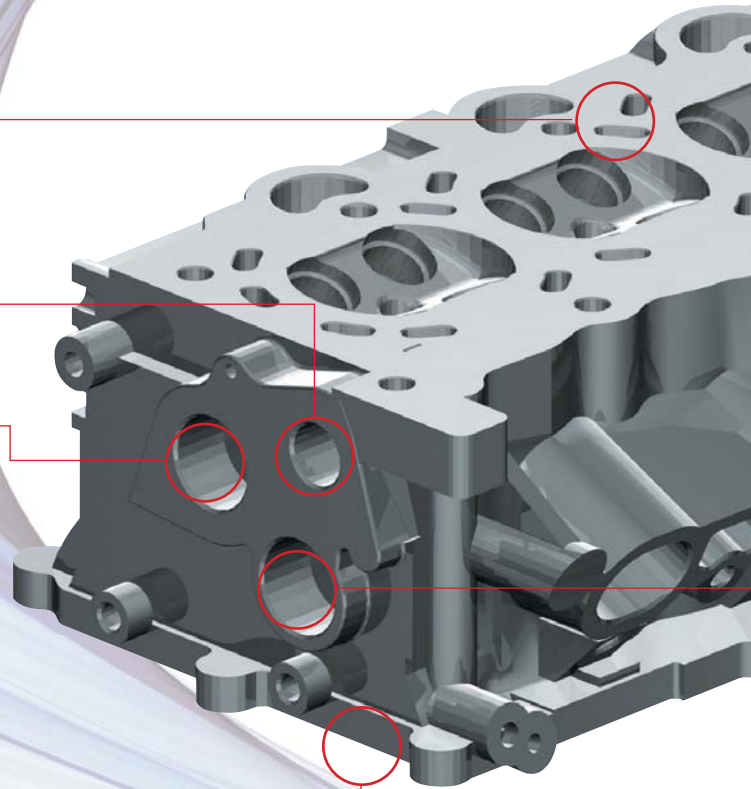
Straight Reamer



Bottom Face(Roughing & Finishing) - High feed Cutter



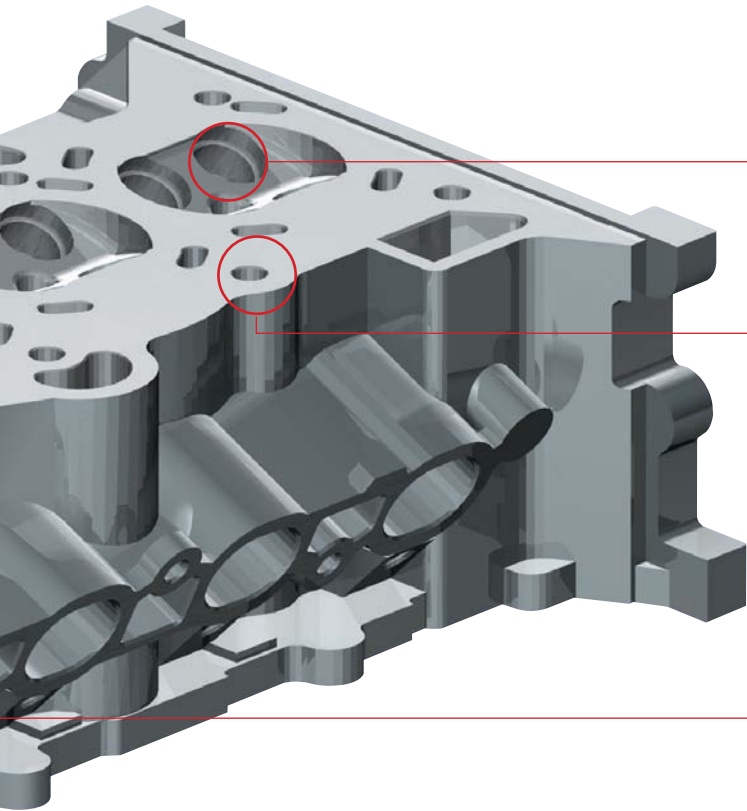
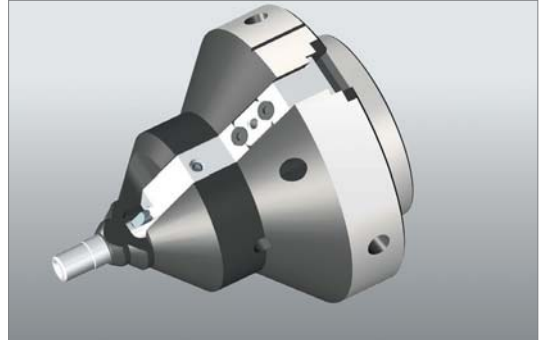
• Carbide insert, PCD insert



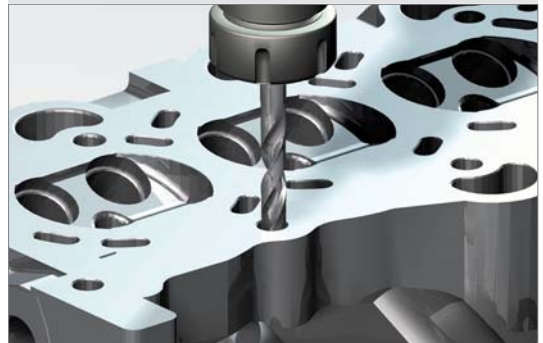
Counter Bore Tool



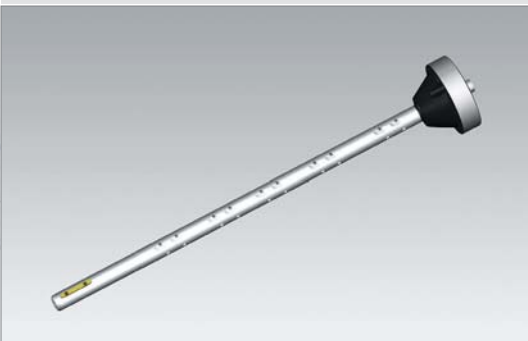
Valve Seat - Apolo Cutter(Special Boring Holder)



Top Face(Drilling) - Mach Drill



Cam Shaft Bearing Seat - Line Boring Bar



Cam Journal Bore - High Speed Reamer



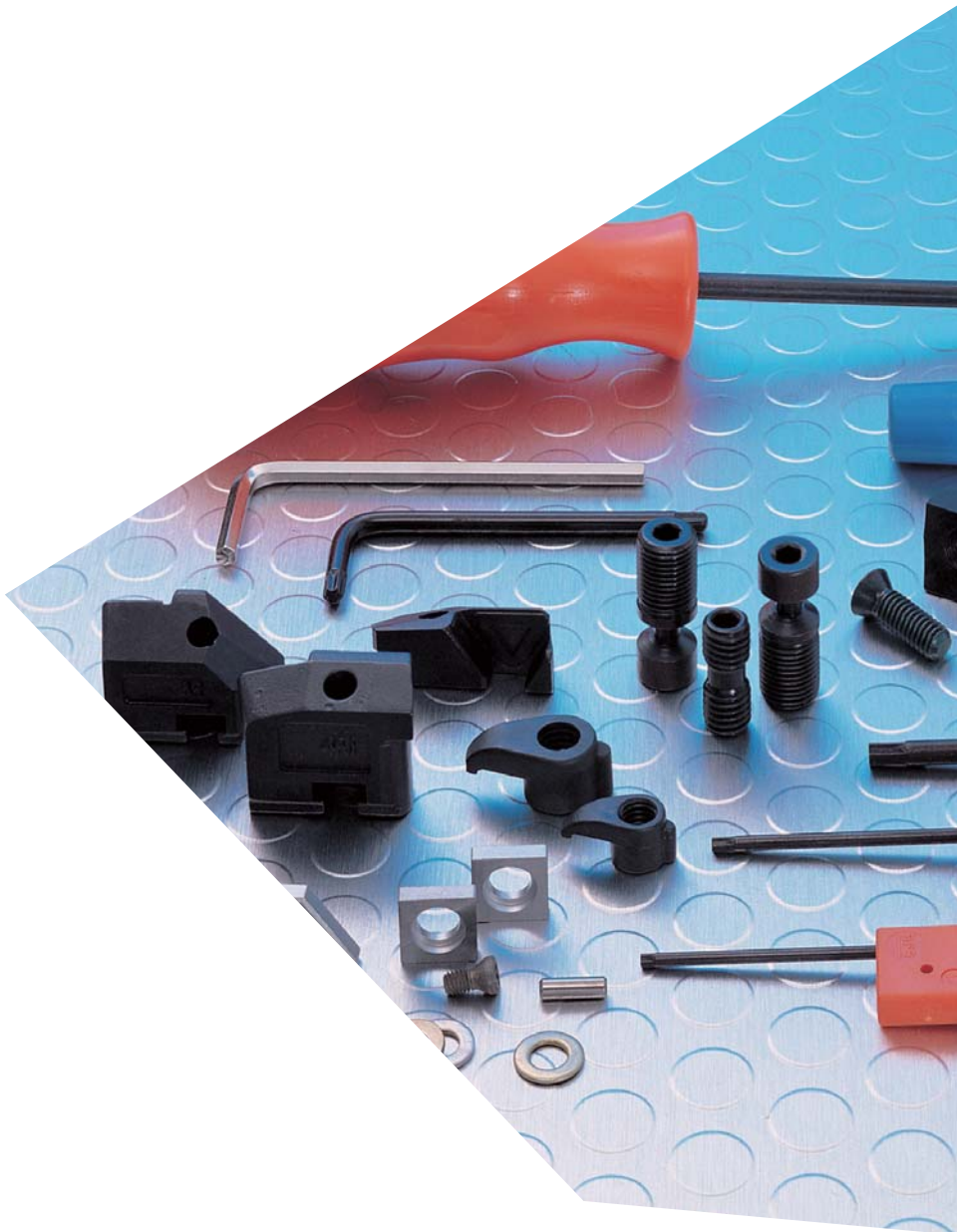
- Stable machining at high speed without chattering

- Available for high speed machining
- Excellent surface finish & roundness



K

PARTS



CONTENTS

PARTS

Parts

| | | |
|-------------------------|---------------------|----------------------|
| K02 Shim | K04 Lever | K07 Spring |
| K03 Cartridge | K05 Locator | K07 Wrench |
| K03 Chip Breaker | K05 Nut | K07 Stop Ring |
| K03 Chip Cover | K05 Pin | K07 Washer |
| K03 Clamp | K05 Screw | K07 Stopper |
| K04 Coolant Bolt | K06 Shim Pin | K07 Nozzle |
| K04 Wrench Bolt | | |

Shim

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|------|------|-------|-------|
| | | a | b | c | d | angle |
| | SC32 | 8.5 | 3.18 | | 4.9 | |
| | SC32N | 8.5 | 3.18 | | 4.88 | |
| | SC42 | 12.5 | 3.18 | | 6.9 | |
| | SC42N | 11.6 | 3.18 | | 6.5 | |
| | SC53 | 15.7 | 4.76 | | 7.9 | |
| | SC53N | 14.6 | 4.76 | | 8.11 | |
| | SC63 | 18.85 | 4.76 | | 10 | |
| | SC63N | 17.8 | 4.76 | | 9.6 | |
| | SC83 | 24.4 | 4.76 | | 12.8 | |
| | SC84N | 24.2 | 6.35 | | 13 | |
| | SC42B | 12.5 | 3.18 | | 6.9 | |
| | SC42CC | 12.5 | 3.18 | | 3.5 | |
| | SC32D | 9.27 | 3.18 | | 6.48 | |
| | SC43D | 12.45 | 4.76 | | 7.34 | |
| | SC53D | 15.62 | 4.76 | | 9.65 | |
| | SC63D | 18.8 | 4.76 | | 11.25 | |
| | SC84D | 25.08 | 6.35 | | 14.85 | |
| | SC42S | 11.5 | 3.18 | | 6.4 | |
| | SC32S | 8.3 | 3.18 | | 5.4 | |
| | SC63V | 18.35 | 4.76 | | 5.5 | |
| | SC83V | 25.3 | 4.76 | | 6.55 | |
| | SC84V | 25.3 | 6.35 | | 6.35 | |
| SC32V | 9.12 | 3.18 | | 3.4 | | |
| SC42V | 12.6 | 3.18 | | 4.5 | | |
| SC44V | 12.6 | 6.35 | | 4.5 | | |
| SC54V | 15.75 | 6.35 | | 5.5 | | |
| | SS32V | 9.12 | 3.18 | | 3.4 | |
| | SS42V | 12.6 | 3.18 | | 4.5 | |
| | SS54V | 15.75 | 6.35 | | 5.5 | |
| | SS64V | 18.9 | 6.35 | | 5.5 | |
| | SD317 | 9.35 | 2.7 | | 5.2 | |
| | SD32N | 8.5 | 3.18 | | 4.88 | |
| | SD42 | 12.5 | 3.18 | | 6.9 | |
| | SD42N | 11.6 | 3.18 | | 6.5 | |
| | SD43N | 11.6 | 4.75 | | 6.5 | |
| | SD32D | 9.2 | 3.18 | | 5.8 | |
| SD43D | 12.45 | 4.76 | | 7.34 | | |
| | SD32S | 8.5 | 3.18 | | 5.4 | |
| | SD42S | 11.5 | 3.18 | | 6.4 | |
| | SD32V | 9.12 | 3.18 | | 3.4 | |
| | SD43V | 12.6 | 4.76 | | 4.5 | |
| | SD44V | 12.6 | 6.35 | | 4.5 | |

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|------|------|-------|-------|
| | | a | b | c | d | angle |
| | SES33C | 9.1 | 12 | 4.76 | 3.5 | |
| | | | | | | |
| | SK33C | 9.33 | 14.7 | 4.8 | 3.5 | |
| | SK33CL | 9.33 | 14.7 | 4.8 | 3.5 | |
| | SR10 | 8.4 | 3.18 | | 4.7 | |
| | SR12 | 10 | 3.18 | | 4.7 | |
| | SR16 | 13.55 | 4.76 | | 6.9 | |
| | SR20 | 17.1 | 4.85 | | 7.9 | |
| | SR25 | 22 | 6.35 | | 9.6 | |
| | SR32 | 27.8 | 6.35 | | 13 | |
| | SR42CC | 12.575 | 3.18 | | 3.5 | |
| | | | | | | |
| | SR10S | 8.8 | 3.18 | | 5.4 | |
| | SR12S | 10.55 | 3.18 | | 5.4 | |
| | SS32 | 8.5 | 3.18 | | 4.9 | |
| | SS32N | 8.5 | 3.18 | | 4.88 | |
| | SS42 | 12.5 | 3.18 | | 6.9 | |
| | SS42B | 12.5 | 3.18 | | 6.9 | |
| | SS42N | 11.6 | 3.18 | | 6.5 | |
| | SS53 | 15.7 | 4.76 | | 7.9 | |
| | SS53N | 14.6 | 4.76 | | 8.11 | |
| | SS63 | 18.85 | 4.76 | | 10 | |
| | SS63N | 17.8 | 4.76 | | 9.6 | |
| | SS84 | 24.4 | 6.35 | | 12.8 | |
| | SS84N | 24.2 | 6.35 | | 13 | |
| | SS42CC | 12.5 | 3.18 | | 3.5 | |
| | SS32CC | 9.3 | 3.18 | | 3.5 | |
| | SS32D | 9.27 | 3.18 | | 5.77 | |
| | SS43D | 12.45 | 4.76 | | 7.34 | |
| | SS53D | 15.62 | 4.76 | | 9.65 | |
| | SS63D | 18.8 | 4.76 | | 11.25 | |
| | SS84D | 25.15 | 6.35 | | 14.43 | |
| | | | | | | |
| | SS32S | 8.3 | 3.18 | | 5.4 | |
| | SS42S | 11.5 | 3.18 | | 6.4 | |
| | SS42SAF | 11.2 | 3 | | 5.5 | |
| | | | | | | |
| | ST317 | 9.35 | 2.7 | | 5 | |
| | ST317B | 9.35 | 2.7 | | 5 | |
| | ST317N | 8.5 | 2.7 | | 4.88 | |
| | ST42 | 12.5 | 3.18 | | 6.9 | |
| | ST42N | 11.6 | 3.18 | | 6.5 | |
| ST53 | 15.7 | 4.76 | | 7.9 | | |



Shim

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|------|---|-------|-------|
| | | a | b | c | d | angle |
| | ST32CC | 9.35 | 3.18 | | 3.5 | |
| | ST32C1 | 9.13 | 3.18 | | 4.95 | |
| | ST42C1 | 12.3 | 3.18 | | 4.95 | |
| | ST32D | 9.35 | 3.18 | | 5.77 | |
| | ST43D | 12.52 | 4.76 | | 7.34 | |
| | ST53D | 15.7 | 4.76 | | 9.65 | |
| | ST63D | 18.87 | 4.76 | | 11.25 | |
| | ST32M | 8.7 | 3.18 | | 4.7 | |
| | ST43M | 12.5 | 4.76 | | 6.3 | |
| | ST32S | 8.5 | 3.18 | | 5.4 | |
| | ST32V | 9.12 | 6.18 | | 3.4 | |
| | ST44V | 12.6 | 6.35 | | 4.5 | |
| | SV32D | 9.2 | 3.18 | | 5.8 | |
| | SV43D | 12.29 | 4.76 | | 7.34 | |
| | SV32D2 | 9.2 | 3.18 | | 5.8 | |
| | SV32S | 8.4 | 3.18 | | 5.4 | |
| | SW317 | 9.35 | 2.7 | | 5 | |
| | SW317N | 8.5 | 2.7 | | 4.88 | |
| | SW42 | 12.5 | 3.18 | | 6.9 | |
| | SW42N | 11.6 | 3.18 | | 6.5 | |
| | SW32D | 9.25 | 3.18 | | 5.8 | |
| | SW43D | 12.45 | 4.76 | | 7.34 | |
| | SW53D | 15.62 | 4.76 | | 9.65 | |
| | SW63D | 18.8 | 4.76 | | 11.25 | |
| | SW84D | 24.89 | 6.35 | | 14.43 | |
| | | | | | | |
| | SW43M | 12.5 | 4.76 | | 6.2 | |
| | SW32M | 8.52 | 3.18 | | 5.2 | |
| | SW32V | 9.12 | 3.18 | | 3.4 | |
| | SW44V | 12.6 | 6.35 | | 4.5 | |
| | SW54V | 15.75 | 4.76 | | 5.5 | |

Cartridge

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|----|----|----|-------|
| | | a | b | c | d | angle |
| | LAPDR-AJ | M4x0.7 | 30 | 15 | 10 | |

Chip Breaker

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|-----|----|---|-------|
| | | a | b | c | d | angle |
| | CB20 | 8.5 | 3.4 | 20 | | |

Chip Cover

| Geometry | Designation | Dimensions | | | | |
|----------|--------------|------------|----|---|--------|-------|
| | | a | b | c | d | angle |
| | CFMP3R14R1-A | 10.5 | 20 | 1 | (Ø4.3) | |
| | CFMP3R-A | 8 | 18 | 1 | (Ø4.3) | |
| | CFMP4R-A | 8 | 22 | 1 | (Ø4.3) | |

Clamp

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|------|-------|------|-------|
| | | a | b | c | d | angle |
| | CA05R | 8.9 | 5.5 | 17.6 | 3.3 | |
| | CA06R | 12 | 7.2 | 20.6 | 5.3 | |
| | CH5R3 | 7.85 | 7.2 | 14.8 | 3.1 | |
| | CH6R4 | 12.02 | 9 | 23.97 | 3.75 | |
| | CBH4.5R1 | 8 | 5.74 | 17.7 | 4 | |
| | CBH4.5R2 | 9.5 | 6.4 | 18 | 4 | |
| | CBH5R1 | 10 | 7.8 | 21.3 | 5 | |
| | CBH6R1 | 12 | 9.3 | 26 | 6 | |
| | CDH6N | 9.5 | 10 | 18.6 | 6.1 | |
| | CDH7N | 7.9 | 11.4 | 14.7 | 4.7 | |
| | CDH8N | 10.9 | 16.9 | 22.4 | 6.1 | |
| | CDH8N1 | 10.9 | 16.9 | 19.1 | 6.1 | |
| | CDH8N2 | 10.9 | 16.9 | 25.4 | 6.1 | |
| | CDH8N3 | 12.5 | 19.8 | 25.4 | 9.2 | |
| | CDS8N | 10.8 | 17 | 22.2 | 5 | |
| | CGH5R1 | 19.5 | 9.5 | 28.8 | 2.5 | |
| | CGH5R2 | 20.5 | 9.5 | 28.8 | 3.5 | |
| | CGH5R3 | 22.5 | 9.5 | 28.8 | 5.5 | |



Clamp

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|------|-------|-------|-------|
| | | a | b | c | d | angle |
| | CGH6R1 | 22.3 | 11.9 | 23.2 | 2.5 | |
| | CGH6R2 | 23.2 | 11.9 | 23.2 | 3.4 | |
| | CGH6R3 | 24.0 | 11.9 | 23.2 | 4.2 | |
| | CHH3.5R1 | 7.5 | 6.7 | 13 | 2.45 | |
| | CHH4.5R1 | 7.9 | 7.85 | 14.1 | 2.54 | |
| | CHH5.5R1 | 9.8 | 10 | 16.4 | 4 | |
| | CH4R1 | 7.4 | 5 | 14.1 | 3.1 | |
| | CH5R1 | 10.0 | 6.6 | 20.2 | 4.5 | |
| | CH5R2 | 6.85 | 7 | 13.8 | 2 | |
| | CH6R2 | 8.85 | 8.7 | 16.5 | 2 | |
| | CH6R3 | 11.8 | 10 | 23 | 4.2 | |
| | CMH5R1 | 18.5 | 7.9 | 16 | 6.26 | |
| | CMH6R2 | 20.0 | 11 | 17.5 | 13.8 | |
| | CMH6R6 | 18.5 | 7.9 | 16 | 6.26 | |
| | CMH6R1 | 24 | 8.5 | 16.5 | 8.28 | |
| | CMH6R3 | 20.0 | 11 | 17.51 | | |
| | CMH6L3 | 20.0 | 11 | 17.51 | | |
| | CS5R1 | 6.8 | 7 | 14.5 | 2 | |
| | CS6R1 | 8.8 | 8.5 | 18.1 | 2.7 | |
| | CS8R1 | 11.8 | 10 | 23 | 4.2 | |
| | CTH6L1 | 23.5 | 12 | 25.4 | 14.35 | |
| | CTH6R1 | 23.5 | 12 | 25.4 | 14.35 | |
| | CTH6R2 | 21.78 | 12.9 | 31.22 | 17.33 | |
| | CVH3 | 21 | 11 | 5.8 | 7.7 | |
| | CVH3V | 29 | 14 | 7 | 8 | |
| | CVH4 | 25.5 | 14.5 | 6 | 7 | |
| | CVH5 | 30 | 17 | 7.5 | 9.5 | |
| | CVH6 | 33.5 | 18.5 | 8 | 10 | |
| | CXH8N | 10.1 | 10.0 | 17.5 | - | |

Coolant Bolt

| Geometry | Designation | Dimensions | | | | | |
|----------|---------------|------------|-----|-----|------|------|------|
| | | a | b | c | d | B(T) | á |
| | CBA063-3IN/MM | M10 | Ø25 | Ø16 | 37 | 8 | (27) |
| | CBA063-4IN/MM | M10 | Ø25 | Ø16 | 42.5 | 8 | (27) |
| | CBA080-IN/MM | M12 | Ø28 | Ø18 | 45.5 | 10 | (32) |
| | CBP063-IN/MM | M10 | Ø22 | Ø16 | 38.6 | 8 | (27) |
| | CBP080-IN/MM | M12 | Ø25 | Ø18 | 48.6 | 10 | (32) |

Coolant Bolt

| Geometry | Designation | Dimensions | | | | | |
|----------|----------------|------------|-----|-----|------|------|------|
| | | a | b | c | d | B(T) | á |
| | CBA100-IN/MM | M16 | Ø54 | Ø43 | 47 | 14 | (32) |
| | CBA100-IN-25.4 | M12 | Ø44 | Ø36 | 41.5 | 10 | (25) |
| | CBA125-IN | M20 | Ø65 | Ø54 | 56 | 17 | (38) |
| | CBA125-IN-25.4 | M12 | Ø44 | Ø36 | 43.5 | 10 | (25) |
| | CBA125-MM | M20 | Ø65 | Ø54 | 57 | 17 | (35) |
| | CBA160-IN | M24 | Ø83 | Ø73 | 56 | 19 | (38) |
| | CBA160-MM | M20 | Ø83 | Ø73 | 53 | 17 | (34) |
| | CBP100-IN | M16 | Ø50 | Ø43 | 48.6 | 14 | (32) |
| | CBP100-IN-25.4 | M12 | Ø44 | Ø36 | 46.5 | 10 | (25) |
| | CBP100-MM-1 | M16 | Ø50 | Ø43 | 48.6 | 14 | (36) |
| | CBP125-IN | M20 | Ø65 | Ø54 | 56 | 17 | (38) |
| | CBP125-IN-25.4 | M12 | Ø44 | Ø36 | 55 | 10 | (25) |
| | CBP125-MM | M20 | Ø65 | Ø54 | 57 | 17 | (35) |
| | CBP125-MM-1 | M20 | Ø61 | Ø54 | 65.6 | 14 | (33) |
| | CBP160-IN | M24 | Ø83 | Ø73 | 56 | 19 | (38) |
| | CBP160-MM | M20 | Ø83 | Ø73 | 53 | 17 | (34) |

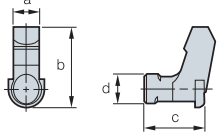
Wrench Bolt

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|----|----|----|------------|
| | | A | C | K | L | M |
| | SB0825 | 13 | 6 | 8 | 25 | M08 x 1.25 |
| | SB1025 | 16 | 8 | 10 | 25 | M10 x 1.50 |
| | SB1035 | 16 | 8 | 10 | 35 | M10 x 1.50 |
| | SB1230 | 18 | 10 | 12 | 30 | M12 x 1.75 |
| | SB1630 | 24 | 14 | 16 | 30 | M16 x 2.0 |
| | SB1645 | 24 | 14 | 16 | 45 | M6 x 2.0 |
| | SB2040 | 30 | 17 | 20 | 40 | M20 x 2.5 |
| | CB1025 | 13 | 6 | 8 | 25 | M08x1.25 |
| | CB1025 | 16 | 8 | 10 | 25 | M10x1.50 |
| | CB1035 | 16 | 8 | 10 | 35 | M10x1.50 |
| | CB1230 | 18 | 10 | 12 | 30 | M12x1.75 |
| | CB1245 | 18 | 10 | 12 | 45 | M12x1.75 |
| | CB1630 | 24 | 14 | 16 | 30 | M16x2.0 |
| | CB1645 | 24 | 14 | 16 | 45 | M16x2.0 |
| | CB2040 | 30 | 17 | 20 | 40 | M20x2.5 |

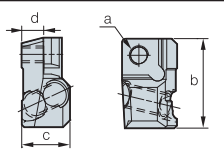
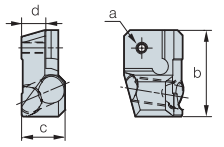
Lever

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|-------|-------|------|-------|
| | | a | b | c | d | angle |
| | LR10 | 3.4 | 10.8 | 11.7 | 3 | |
| | LR12 | 3.7 | 13.5 | 13.4 | 3.5 | |
| | LR16 | 4.75 | 18.7 | 18.3 | 4.3 | |
| | LR20 | 5.9 | 20.5 | 18.7 | 5.55 | |
| | LR25 | 7.35 | 24.25 | 23.7 | 6.2 | |
| | LR32 | 8.45 | 29.7 | 26.95 | 7.9 | |
| | LV2 | 2.6 | 7.75 | 6 | 2.1 | |
| | LV3B | 3.1 | 10 | 9.5 | 3.7 | |
| | LV4B | 4.7 | 14.55 | 15.6 | 4.7 | |
| | LV4BN | 4.7 | 16 | 14.9 | 4.68 | |
| | LV3 | 3.7 | 10 | 12 | 3.6 | |
| | LV3N | 3.75 | 10 | 12 | 3.55 | |
| | LV3AN | 3.75 | 12.1 | 11.4 | 4.64 | |
| | LV3C | 3.1 | 10 | 7.85 | 3.6 | |
| | LV3CN | 3.2 | 10 | 7.8 | 3.6 | |
| | LV3D | 3.1 | 11.7 | 9.5 | 3.6 | |
| | LV3DN | 3.2 | 11.65 | 9.5 | 3.55 | |
| | LV4 | 4.7 | 14.55 | 14 | 4.7 | |
| | LV4N | 4.7 | 13.45 | 13.2 | 4.68 | |
| | LV5 | 6 | 17.1 | 17 | 6 | |
| | LV5N | 6 | 16.4 | 17.08 | 5.95 | |
| | LV5AN | 6 | 18.82 | 17.3 | 5.95 | |
| LV6N | 7.5 | 20.5 | 21 | 7.6 | | |
| LV8N | 8.6 | 25.5 | 25.4 | 8.6 | | |

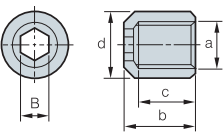
Lever

| Geometry | Designation | Dimensions | | | |
|---|-------------|------------|-------|------|------|
| | | a | b | c | d |
|  | LV4A | 4.6 | 13.24 | 9.95 | 4.7 |
| | LV4AN | 4.7 | 13.3 | 10 | 4.68 |

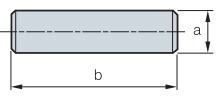
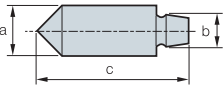
Locator

| Geometry | Designation | Dimensions | | | |
|---|-------------|------------|------|------|-----|
| | | a | b | c | d |
|  | LFMP3R-A | M3.5 | 18.7 | 10.1 | 4.6 |
| | LFMP4R1-A | M4.5 | 24.3 | 13.8 | 6.2 |
| | LFMP4R-A | M4.5 | 26.3 | 13.8 | 6.2 |
|  | LFMA3R-A | M3 | 18.5 | 9.5 | 4.8 |
| | LFMA4R-A | M3.5 | 26 | 13.1 | 7.3 |

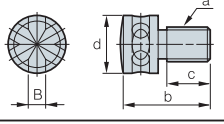
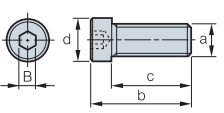
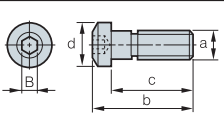
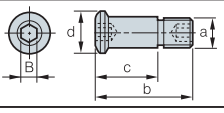
Nut

| Geometry | Designation | Dimensions | | | | | |
|---|-------------|------------|-----|-----|---|------|---|
| | | a | b | c | d | B(T) | á |
|  | N0407 | M4 X 0.7 | 7.5 | 6 | 7 | 3 | 3 |
| | N0508 | M5 X 0.8 | 8.3 | 6.6 | 7 | 3 | 3 |

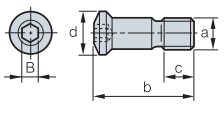
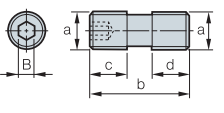
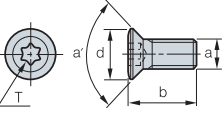
Pin

| Geometry | Designation | Dimensions | | |
|---|-------------|------------|-----|------|
| | | a | b | c |
|  | PN0308 | 3.0 | 8 | |
| | PN0310 | 3.0 | 10 | |
| | PN0312 | 3.0 | 12 | |
| | PN0314 | 3.0 | 14 | |
|  | PN0515 | 4.8 | 3.3 | 14.5 |

Screw

| Geometry | Designation | Dimensions | | | | | |
|---|---------------|------------|------|------|-----|------|---|
| | | a | b | c | d | B(T) | á |
|  | AZ0508F | M5 X 0.5 | 13 | 8 | 9 | Ø2 | |
| | AZ0514 | M5 X 0.8 | 14 | 7 | 9 | Ø2.5 | |
|  | BHA0510 | M5 X 0.8 | 15 | 10 | 8.5 | 4.0 | |
| | BHA0512 | M5 X 0.8 | 17 | 12 | 8.5 | 4.0 | |
| | BHA0612 | M6 X 1.0 | 18 | 12 | 10 | 5.0 | |
| | BHA0614 | M6 X 1.0 | 20 | 14 | 10 | 5.0 | |
| | BHA0616 | M6 X 1.0 | 22 | 16 | 10 | 5 | |
|  | BHA0619-NYLOK | M6 X 1.0 | 25 | 19 | 10 | 5 | |
| | CHX0407 | M4 X 0.7 | 9.5 | 7.36 | 5.7 | 2.5 | |
| | CHX0415 | M4 X 0.7 | 17.5 | 15 | 5.4 | 2.5 | |
| | CHX0510 | M5 X 0.8 | 13.1 | 10.1 | 7.7 | 3 | |
| | CHX0518 | M5 X 0.8 | 21.5 | 18 | 8 | 3 | |
|  | CHX0622 | M6 X 1.0 | 26.5 | 22 | 10 | 4 | |
| | CHX0513 | M5 X 0.8 | 13 | 8 | 6.4 | 2.5 | |
| | CHX0616 | M6 X 1.0 | 16.2 | 10.1 | 8.5 | 3 | |
| | CHX0617L | M6 X 1.0 | 17.2 | 10.1 | 8.5 | 3 | |
| | CHX0621 | M6 X 1.0 | 21 | 10.1 | 8.5 | 3 | |

Screw

| Geometry | Designation | Dimensions | | | | | |
|--|-------------|-------------|------|------|------|------|-----|
| | | a | b | c | d | B(T) | á |
|  | CHX0625 | 1/4-20UNC | 24.8 | 11 | 10 | 4 | |
| | CTX03510 | M3.5 X 0.6 | 10 | 4.7 | 5.3 | 15 | |
| | CTX04513 | M4.5 X 0.75 | 13.1 | 6.9 | 6.8 | 20 | |
| | CTX04513H | M4.5 X 0.75 | 13.1 | 7.2 | 6.8 | 20 | |
| | CTX0515 | M5 X 0.8 | 15 | 8 | 7 | 20 | |
| | CTX0517 | M5 X 0.8 | 17.5 | 10 | 7 | 20 | |
| | CTX0621 | M6 X 1.0 | 21.2 | 12.4 | 9 | 25 | |
| | DHA0514 | M5 X 0.8 | 14.0 | 5.0 | 7.0 | 2.5 | |
| | DHA0617 | M6 X 1.0 | 17.0 | 7.0 | 7.5 | 3.0 | |
| | DHA0620 | M6 X 1.0 | 20.0 | 8.0 | 8.0 | 3.0 | |
|  | DHA0624 | M6 X 1.0 | 24.0 | 12.0 | 8.5 | 3.0 | |
| | DHA0815 | M8 X 1.25 | 15.5 | 6.25 | 6.25 | 4.0 | |
| | DHA0818F | M8 X 1.0 | 18 | 8.5 | 5.5 | 4.0 | |
| | DHA0820 | M8 X 1.25 | 20.0 | 8.0 | 9.0 | 4.0 | |
| | DHA0821F | M8 X 1.0 | 21.0 | 8.5 | 8.5 | 4.0 | |
| | DHA0825 | M8 X 1.25 | 25.0 | 10.0 | 9.0 | 4.0 | |
| | DHA0830 | M8 X 1.25 | 30.0 | 11.5 | 11.5 | 4.0 | |
| | ETGA0520CBM | M5 X 0.8 | 20 | | 6.5 | 20 | 43° |
| | ETGD0825 | M8 X 1.25 | 25.2 | | 11.1 | 40 | 40° |
| | ETKA0523 | M5 X 0.8 | 23 | | 7.6 | 20 | 43° |
|  | ETKA0625 | M6 X 1.0 | 25.5 | | 8.8 | 20 | 43° |
| | ETKD0516 | M5 X 0.8 | 16.4 | | 6.8 | 20 | 40° |
| | ETKD0620 | M6 X 1.0 | 20 | | 8.3 | 30 | 40° |
| | ETNA02506 | M2.5 X 0.45 | 5.7 | | 3.4 | 7 | 43° |
| | ETNA0408 | M4 X 0.7 | 8.0 | | 5.1 | 15 | 43° |
| | ETNA0412 | M4 X 0.7 | 12 | | 5.1 | 15 | 43° |
| | ETNA0511 | M5 X 0.8 | 11.0 | | 6.4 | 20 | 43° |
| | ETND02506F | M2.5 X 0.35 | 6.25 | | 3.1 | 7 | 40° |
| | ETND0307F | M3 X 0.35 | 7.8 | | 3.7 | 8 | 40° |
| | ETND03509 | M3.5 X 0.6 | 9.6 | | 4.7 | 10 | 40° |
| | FTGA03507 | M3.5 X 0.6 | 7.0 | | 5.3 | 15 | 60° |
| | FTGA03508 | M3.5 X 0.6 | 8.0 | | 5.3 | 15 | 60° |
| | FTGA03510 | M3.5 X 0.6 | 10.0 | | 5.3 | 15 | 60° |
| | FTGA03512 | M3.5 X 0.6 | 12.0 | | 5.0 | 15 | 60° |
| | FTGA0411F | M4 X 0.5 | 11.0 | | 7.0 | 15 | 60° |
| | FTGA0417CBM | M4 X 0.7 | 17.0 | | 5.5 | 15 | 62° |
| | FTGA0510-P | M5 X 0.8 | 10.0 | | 7.0 | 20 | 63° |
| | FTGA0512-P | M5 X 0.8 | 12.0 | | 7.0 | 20 | 63° |
| | FTGA0513 | M5 X 0.8 | 13.2 | | 7.0 | 20 | 61° |
| | FTGA0513-P | M5 X 0.8 | 13.0 | | 7.0 | 20 | 63° |
| FTGA0517 | M5 X 0.8 | 17.0 | | 7.5 | 20 | 61° | |
| FTGA0621 | M6 X 1.0 | 21.5 | | 9.0 | 20 | 61° | |
| FTGA0826 | M8 X 1.25 | 26.0 | | 11.6 | 25 | 61° | |
| FTKA02206 | M2.2 X 0.45 | 5.5 | | 3.0 | 6 | 60° | |
| FTKA02206S | M2.2 X 0.45 | 5.6 | | 3.05 | 7 | 60° | |
| FTKA02555 | M2.5 X 0.45 | 5.5 | | 3.5 | 7 | 60° | |
| FTKA02565 | M2.5 X 0.45 | 6.5 | | 3.5 | 7 | 60° | |
| FTKA02565S | M2.5 X 0.45 | 6.5 | | 3.8 | 8 | 60° | |
| FTKA0307 | M3 X 0.5 | 7.2 | | 4.2 | 9 | 60° | |
| FTKA03508 | M3.5 X 0.6 | 8.4 | | 5.5 | 15 | 60° | |
| FTKA03510 | M3.5 X 0.6 | 10.4 | | 5.5 | 15 | 60° | |
| FTKA03511A | M3.5 X 0.6 | 11.0 | | 5.2 | 15 | 60° | |
| FTKA0408 | M4 X 0.7 | 8.4 | | 5.5 | 15 | 60° | |
| FTKA0410 | M4 X 0.7 | 10.0 | | 5.5 | 15 | 60° | |
| FTKA0411K | M4 X 0.7 | 11.0 | | 6.8 | 15 | 60° | |
| FTKA0412B | M4 X 0.7 | 12.5 | | 5.5 | 15 | 60° | |
| FTKA0413 | M4 X 0.7 | 13.0 | | 5.5 | 15 | 60° | |
| FTNA01633 | M1.6 X 0.35 | 3.3 | | 2.6 | 6 | 60° | |
| FTNA0203 | M2 X 0.4 | 3.0 | | 2.7 | 6 | 60° | |
| FTNA02033 | M2 X 0.4 | 3.3 | | 2.7 | 6 | 60° | |
| FTNA0204 | M2 X 0.4 | 4.3 | | 2.7 | 6 | 60° | |
| FTNA02205 | M2.2 X 0.45 | 4.5 | | 3.0 | 6 | 60° | |
| FTNA0238 | M2 X 0.4 | 3.8 | | 3.0 | 6 | 60° | |
| FTNA0305 | M3 X 0.5 | 5.2 | | 4.2 | 9 | 60° | |
| FTNA0306 | M3 X 0.5 | 6.2 | | 4.2 | 9 | 60° | |
| FTNA0307 | M3 X 0.5 | 7.2 | | 4.2 | 9 | 60° | |
| FTNA0408 | M4 X 0.7 | 8.5 | | 5.5 | 15 | 60° | |
| FTNA0411 | M4 X 0.7 | 11.0 | | 5.5 | 15 | 60° | |
| FTNA0511 | M4 X 0.8 | 7 | 11 | 6.7 | 20 | 63° | |
| FTNA0513 | M5 X 0.8 | 13.0 | | 7.0 | 20 | 60° | |
| FTNA0516 | M5 X 0.8 | 16.0 | | 7.0 | 20 | 60° | |



Screw

| Geometry | Designation | Dimensions | | | | | |
|-------------|-------------|-------------|------|------|-----|------|-----|
| | | a | b | c | d | B(T) | á |
| | FTNB0411 | M4 X 0.7 | 10.8 | | 5.7 | 15 | 60° |
| | FTNC04509 | M4.5 X 0.75 | 9.5 | | 6.8 | 20 | 55° |
| | FTNC04511 | M4.5 X 0.75 | 11.5 | | 6.8 | 20 | 55° |
| | KHA0508 | M5 X 0.8 | 8 | | | 2.5 | |
| | KHA0510 | M5 X 0.8 | 10 | | | 2.5 | |
| | KHA0610 | M6 X 1.0 | 10 | | | 3 | |
| | KHA0612 | M6 X 1.0 | 12 | | | 3.0 | |
| | KHA0812 | M8 X 1.25 | 12 | | | 4.0 | |
| | KHA0815 | M8 X 1.25 | 15 | | | 4.0 | |
| | KHA1015 | M10 X 1.5 | 15 | | | 5.0 | |
| | KHA1020 | M10 X 1.5 | 20 | | | 5.0 | |
| | KHB0417 | M4 X 0.7 | 17.2 | 4.5 | 2.5 | 2 | |
| | KHB0406 | M4 X 0.7 | 6 | 4.2 | 3 | 2 | |
| | KHC0510 | M5 X 0.8 | 10 | 8.1 | | 2.5 | 90° |
| | KHC0610 | M6 X 1.0 | 10 | 7.8 | | 3.0 | 90° |
| | KHC0812 | M8 X 1.25 | 12 | 9 | | 4.0 | 90° |
| | KHC1016 | M10 X 1.5 | 16 | 12.3 | | 5.0 | 90° |
| | KHC1020 | M10 X 1.5 | 20 | 16.3 | | 5.0 | 90° |
| | KHD0510 | M5 X 0.8 | 10 | 9 | 3 | 2.5 | |
| | KHD0610 | M6 X 1.0 | 10 | 10 | 4 | 3 | |
| KHD0810 | M8 X 1.25 | 10 | 10 | 7.5 | 4 | | |
| | LTX0512 | M5 X 0.8 | 15.1 | 12 | 7.3 | 20 | |
| | LTX0514 | M5 X 0.8 | 17.1 | 14 | 7.3 | 20 | |
| | MHA0512 | M5 X 0.8 | 17.0 | 10.8 | 8.0 | 4.0 | |
| | MHB0310 | M3 X 0.5 | 13.4 | 8.0 | 5.5 | 2.5 | |
| | MHB0410 | M4 X 0.7 | 14.0 | 8.0 | 7.0 | 3.0 | |
| | MHB1055 | M10 X 1.5 | 65 | 50 | 16 | 8 | |
| | MHB1260 | M12 X 1.75 | 72 | 55 | 18 | 10 | |
| | MHB1680 | M16 X 2.0 | 96 | 75 | 24 | 14 | |
| | MHX0523 | M5 X 0.8 | 23.5 | 9.7 | 10 | 2.5 | |
| | MHX0626 | M6 X 1.0 | 25.8 | 10 | 11 | 3 | |
| MHX0630 | M6 X 1.0 | 30 | 12.5 | 10.5 | 4 | | |
| | PTKA02508 | M2.5 X 0.45 | 8 | 5 | 3.8 | 8 | 92° |
| | PTKA03510 | M3.5 X 0.6 | 10 | 5 | 5 | 15 | 92° |
| | PTKA0407 | M4 X 0.7 | 7 | 4.6 | 5.5 | 15 | 86° |
| | PTKA0407F | M4 X 0.5 | 7.3 | 3.8 | 6.5 | 15 | 91° |
| | PTKA0408 | M4 X 0.7 | 8 | 5.6 | 5.5 | 15 | 86° |
| | PTKA0408F | M4 X 0.5 | 8.3 | 5.7 | 6.5 | 15 | 91° |
| | PTKA0409F | M4 X 0.5 | 9.3 | 6.7 | 6.5 | 15 | 91° |
| | PTKA0410F | M4 X 0.5 | 10.3 | 7.7 | 6.5 | 15 | 91° |
| | PTKA0411F | M4 X 0.5 | 11.3 | 8.7 | 6.5 | 15 | 91° |
| | PTKA0412 | M4 X 0.7 | 12 | 7.5 | 5.9 | 15 | 92° |
| | PTKA0412F | M4 X 0.5 | 12.3 | 9.7 | 6.5 | 15 | 91° |
| | PTKA0413F | M4 X 0.5 | 13.3 | 10.7 | 6.5 | 15 | 91° |
| | PTKA0512 | M5 X 0.8 | 12 | 7 | 6.9 | 20 | 92° |
| | PTMA03508 | M3.5 X 0.6 | 8 | 5.3 | 6 | 9 | 90° |
| | PTMA0403F | M4 X 0.5 | 3.3 | 1.7 | 6.5 | 15 | 91° |
| | PTMA0404F | M4 X 0.5 | 4.3 | 2.7 | 6.5 | 15 | 91° |
| | PTMA0405F | M4 X 0.5 | 5.3 | 3.7 | 6.5 | 15 | 91° |
| PTMA0406F | M4 X 0.5 | 6.3 | 4.7 | 6.5 | 15 | 91° | |
| PTMA0411 | M4 X 0.7 | 11 | 8.5 | 6.6 | 15 | 90° | |
| PTKA0411-R3 | M4 X 0.7 | 11 | 6.9 | 6 | 15 | | |

| Geometry | Designation | Dimensions | | | | | |
|----------|-------------|------------|------------|-------|------|------|-----|
| | | a | b | c | d | B(T) | á |
| | PXMA0306 | M3 X 0.5 | 5.9 | | 5.7 | 2 | 90° |
| | SHX0310 | M3 X 0.5 | 10 | | 5.9 | 2 | 91° |
| | RHA0510 | M5 X 0.8 | | 10 | | 4.0 | |
| | RHA0613 | M6 X 1.0 | 16.3 | 13 | 10.5 | 4.0 | |
| | RHA0620 | M6 X 1.0 | 24 | 20 | 10.5 | 4.0 | |
| | FHG0618 | M6 X 1.0 | 18 | | 8.5 | 4.0 | 61° |
| | VHX0509B | M5 X 0.8 | 9 | 4.15 | 5 | 2 | |
| | VHX0512B | M5 X 0.8 | 12 | 6.5 | 5 | 2 | |
| | VHX0512BN | M5 X 0.8 | 12 | 6.56 | 5 | 2 | |
| | VHX0514 | M5 X 0.8 | 14.5 | 8.25 | 5 | 2 | |
| | VHX0613N | M6 X 1.0 | 13.4 | 7.5 | 5.93 | 2.5 | |
| | VHX0617 | M6 X 1.0 | 17 | 10 | 6 | 2.5 | |
| | VHX0617N | M6 X 1.0 | 16.75 | 8.34 | 5.9 | 2.5 | |
| | VHX0817N | M8 X 1.0 | 17.05 | 7.98 | 7.9 | 3 | |
| | VHX0820N | M8 X 1.0 | 20.7 | 7.98 | 7.9 | 3 | |
| | VHX0820AN | M8 X 1.0 | 20.5 | 10.36 | 7.9 | 3 | |
| | VHX0821 | M8 X 1.0 | 21 | 10 | 8 | 3 | |
| | VHX0821N | M8 X 1.0 | 21.2 | 9.68 | 7.9 | 3 | |
| | VHX0823N | M8 X 1.0 | 23.5 | 10.36 | 7.9 | 3 | |
| | VHX0825 | M8 X 1.0 | 25 | 12 | 8 | 3 | |
| | VHX1027N | M10 X 1.0 | 27.2 | 14.4 | 9.8 | 5 | |
| | VHX1236N | M12 X 1.0 | 36 | 18.3 | 11.8 | 5 | |
| | VHX0613A | M6 X 1.0 | 13.4 | 9.1 | 6.0 | 2.5 | |
| | SHXN0509F | M5 X 0.5 | M3.5 X 0.6 | 8.65 | 6.3 | 3.5 | |
| | SHXN0610F | M6 X 0.75 | M4 X 0.5 | 10 | 7.8 | 4 | |
| | SHXN0712F | M7 X 0.75 | M5 X 0.8 | 12 | 8.5 | 5 | |
| | WTX0813 | M8 X 1.25 | 17.2 | 4.9 | 8.5 | 25 | |
| | WTX0817 | M8 X 1.25 | 22 | 4.9 | 8.5 | 25 | |

Shim Pin

| Geometry | Designation | Dimensions | | | |
|----------|-------------|------------|------|----------|----------|
| | | a | b | c | d |
| | SP3 | 5.5 | 3.5 | 5.9 | |
| | SP3N | 6.85 | 3.3 | 5.55 | |
| | SP3N-1 | 5.3 | 3.3 | 5.55 | |
| | SP4 | 7.0 | 4.0 | 7.6 | |
| | SP4N | 5.8 | 4.35 | 7.4 | |
| | SP5 | 8.5 | 4.5 | 8.8 | |
| | SP5N | 8.5 | 5.68 | 9 | |
| | SP6N | 11.1 | 6.0 | 11.0 | |
| | SP8N | 12.0 | 10.0 | 15.35 | |
| | | SP2M | 5 | 14 | M5 X 0.8 |
| SP3M | | 3.5 | 19.5 | M4 X 0.7 | 4 |
| SP3M-1 | | 3.5 | 16.5 | M4 X 0.7 | 4 |
| SP4M | | 5 | 19 | M5 X 0.8 | 6 |



Shim Pin

| Geometry | Designation | Dimensions | | | |
|----------|-------------|------------|-------|------------|-------|
| | | a | b | c | d |
| | SP3D | 3.7 | 13.1 | UNF10-32 | 5.6 |
| | SP3D2 | 3.6 | 12 | UNF10-32 | 5.5 |
| | SP3DS | 3.7 | 11.54 | UNF10-32 | 5.6 |
| | SP4D | 4.97 | 17.19 | UNF1/4 28 | 7.12 |
| | SP4DL | 5 | 17.1 | UNF1/4 28 | 7 |
| | SP4DS | 4.97 | 13.26 | UNF1/4 28 | |
| | SP5D | 6.21 | 21.9 | UNF5/16-24 | 9.44 |
| | SP6D | 7.75 | 21.9 | UNF3/8-24 | 11.02 |
| | SP8D | 9.02 | 29.63 | UNF7/16-20 | 14.21 |
| | LSPS3 | 60 | 8.2 | 5.55 | |
| | LSPS4 | 65 | 10 | 7 | |
| | LSPS5 | 69 | 11.4 | 8.85 | |
| | LSPS6 | 69 | 13 | 11 | |
| | LSPS8 | 73 | 16.5 | 15.2 | |

Spring

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|------|------|-----|-------|
| | | a | b | c | d | angle |
| | SR2 | 4.0 | 2.8 | 12.6 | 0.4 | |
| | | | | | | |
| | SPR0315 | 3.0 | 15 | | | |
| | SPR0415 | 4.0 | 15 | | | |
| | SR3 | 9.2 | 12.5 | | | |
| | SR4 | 4.0 | 11.0 | | | |
| | SPR0714 | 7 | 14 | | | |
| | SPR0510 | 5 | 10 | | | |
| | SPR0714 | 7 | 14 | | | |
| | SPR0811 | 8 | 11 | | | |

Wrench

| Geometry | Designation | Dimensions | | |
|----------|-------------|------------|------|------|
| | | a | b | B(T) |
| | HW20L | 52 | 18 | 2 |
| | HW25L | 58.5 | 20.5 | 2.5 |
| | HW30L | 66 | 23 | 3 |
| | HW35L | 72 | 25 | 3.5 |
| | HW40L | 74 | 29 | 4 |
| | HW50L | 85 | 33 | 5 |
| | HW40 | 82 | 80 | 4 |
| | HW50 | 96 | 90 | 5 |
| | SW50L | 70 | 27.5 | |
| | | | | |
| | TW06P | 63 | 6 | |
| | TW07P | 63 | 7 | |
| | TW08P | 71 | 8 | |
| | TW09P | 75 | 9 | |
| | TW10P | 78 | 10 | |
| | TW15P | 82 | 15 | |
| | TW20P | 86 | 20 | |
| | TW15L | 60 | 21 | 15 |
| TW20L | 60 | 21 | 20 | |

Wrench

| Geometry | Designation | Dimensions | | | |
|----------|-------------|------------|----|------|--|
| | | a | b | B(T) | |
| | TW07S | 140 | 60 | 7 | |
| | TW08S | 150 | 76 | 8 | |
| | TW09S | 165 | 70 | 9 | |
| | TW15S | 190 | 90 | 15 | |
| | TW20S | 195 | 91 | 20 | |
| | TW20 | 75 | 80 | 20 | |
| | TW25 | 74 | 80 | 25 | |
| | SW15S | 150 | 13 | | |
| | | | | | |

Stop Ring

| Geometry | Designation | Dimensions | | | | |
|----------|-------------|------------|-----|-----|-----|-------|
| | | a | b | c | d | angle |
| | CR03 | 4.8 | 2.6 | 0.4 | 3.0 | |
| | CR04 | 6.6 | 3.6 | 0.4 | 4.0 | |
| | CR05 | 7.6 | 4.6 | 0.4 | 5.0 | |
| | ER03 | 7.0 | 2.6 | 0.6 | 3.0 | |
| | ER04 | 9.0 | 3.5 | 0.6 | 4.0 | |
| | ER05 | 11 | 4.3 | 0.6 | 5.0 | |

Washer

| Geometry | Designation | Dimensions | | |
|----------|-------------|------------|-----|---------|
| | | a | b | c |
| | WA3 | 11.0 | 6.8 | 0.5~1.0 |
| | WA4 | 10.0 | 5.3 | 0.5~1.0 |

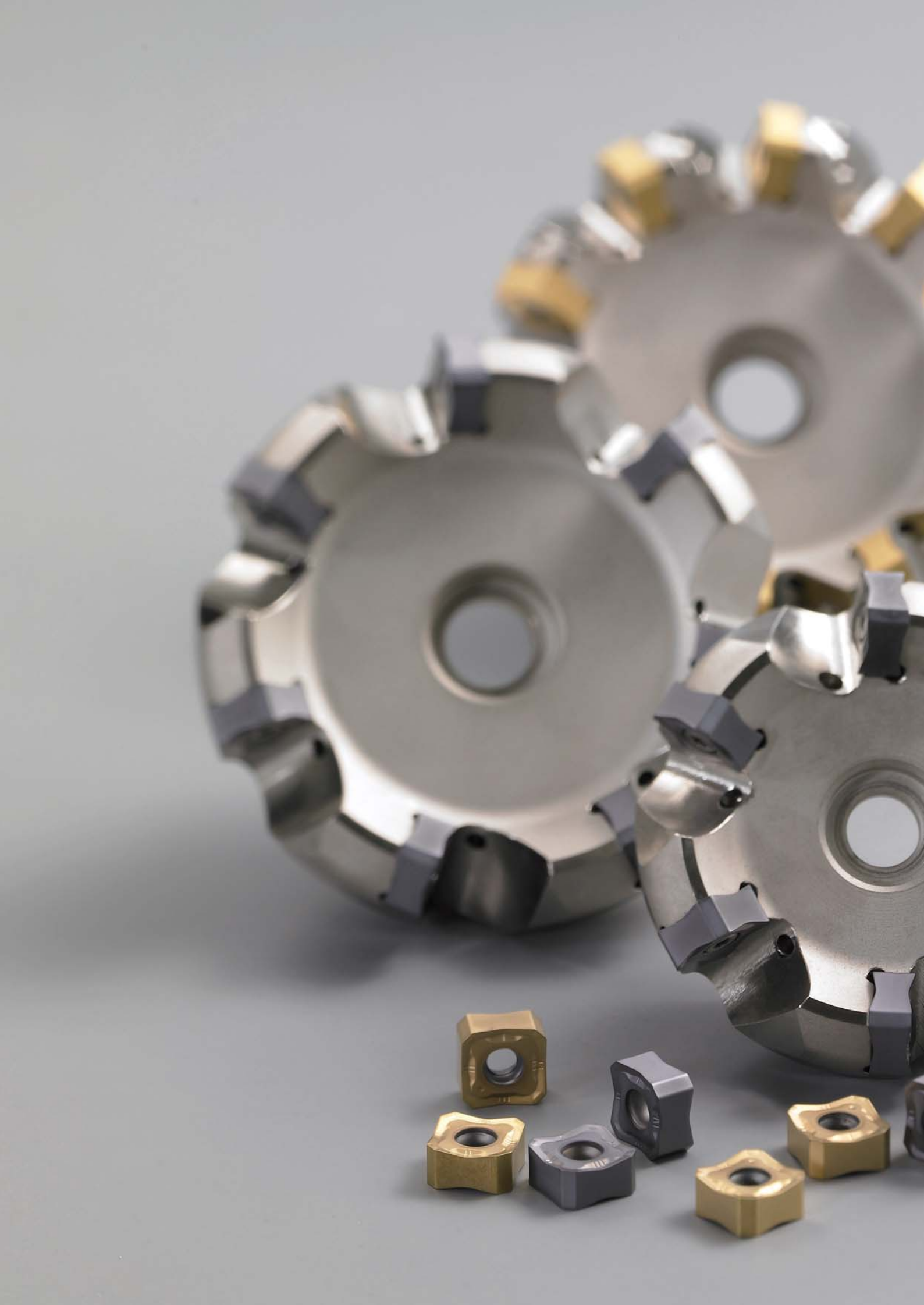
Stopper

| Geometry | Designation | Dimensions | | | |
|----------|-------------|------------|------|----|-----|
| | | a | b | c | d° |
| | STP5 | 11 | 10.2 | 11 | 30° |

Nozzle

| Geometry | Designation | Dimensions | |
|----------|-------------|------------|-----|
| | | a | b |
| | CN0605 | 6 | 4.6 |





L

TECHNICAL INFORMATION



TECHNICAL INFORMATION

C O N T E N T S

General Information I

- L02** Workpiece material grades
- L06** Steel, Non-ferrous metal symbol list
- L07** SI unit conversion table
- L08** Hardness calculating table
- L09** Properties of Korloy grades
- L10** Technical Info. for Stainless steel

Technical Information

- L12** Technical Information for Turning
- L20** Technical Information for Milling
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General Information II

- L36** The comparison of chip breakers
- L37** KORLOY Grade table
- L40** The comparison of grades

Carbon steel and alloy steel for structural use

| Type | Korea | ISO | Japan | U.S.A | | Great Britain | Germany | France | Russia | |
|----------------|----------------------------------|------------------------------------|-------------------------|--------------------|---------------------------------------|--|--------------------------------------|-------------------------|-------------|---------------|
| | KS | ISO | JIS | AISI | SAE | BS | DIN | NF | GOCT | |
| | | | | | | BS/EN | DIN/EN | NF/EN | | |
| Carbon steel | SM10C | C10 | S10C | 1010 | | 040A10 045A10 045M10 | C10E C10R | XC10 | - | |
| | SM15C | C15E4 C15M2 | S15C | 1015 | | 055M15 | C15E C15R | - | - | |
| | SM20C | - | S20C | 1020 | | 070M20 C22, C22E C22R | C22 C22E C22R | C22 C22E C22R | - | |
| | SM25C | C25 C25E4 C25M2 | S25C | 1025 | | C25 C25E C25R | C25 C25E C25R | C25 C25E C25R | - | |
| | SM30C | C30 C30E4 C30M2 | S30C | 1030 | | 080A30 080M30 CC30 C30E C30R | C30 C30E C30R | C30 C30E C30R | 30Г | |
| | SM35C | C35 C35E4 C35M2 | S35C | 1035 | | C35 C35E C35R | C35 C35E C35R | C35 C35E C35R | 35Г | |
| | SM40C | C40 C40E4 C40M2 | S40C | 1039 1040 | | 080M40 C40 C40E C40R | C40 C40E C40R | C40 C40E C40R | 40Г | |
| | SM43C | - | S43C | 1042 1043 | | 080A42 | - | - | 40Г | |
| | SM45C | C45 C45E4 C45M2 | S45C | 1045 1046 | | C45 C45E C45R | C45 C45E C45R | C45 C45E C45R | 45Г | |
| | SM48C | - | S48C | - | | 080A47 | - | - | 45Г | |
| | SM50C | C50 C50E4 C50M2 | S50C | 1049 | | 080M50 C50 C50E C50R | C50 C50E C50R | C50 C50E C50R | 50Г | |
| | SM53C | - | S53C | 1050 1053 | | - | - | - | 50Г | |
| | SM55C | C55 C55E4 C55M2 | S55C | 1055 | | 070M55 C55 C55E C55R | C55 C55E C55R | C55 C55E C55R | - | |
| | SM58C | C60 C60E4 C60M2 | S58C | 1059 1060 | | C60 C60E C60R | C60 C60E C60R | C60 C60E C60R | 60Г | |
| Alloy steel | Nickel chromium steel | SNC236 | - | SNC236 | - | - | - | - | 40XH | |
| | | SNC415(H) | - | SNC415(H) | - | - | - | - | - | |
| | | SNC631(H) | - | SNC631(H) | - | - | - | - | 30XH3A | |
| | | SNC815(H) | 15NiCr13 | SNC815(H) | - | 655M13(655H13) | 15NiCr13 | - | - | |
| | SNC836 | - | SNC836 | - | - | - | - | - | | |
| | Nickel chromium molybdenum steel | SNCM220 | 20NiCrMo2 20NiCrMoS2 | SNCM220 | 8615 8617(H) 8620(H) 8622(H) | | 805A20 805M20 805A22 805M22 | 20NiCrMo2 20NiCrMoS2 | 20NCD2 | - |
| | | SNCM240 | 41CrNiMo2 41CrNiMoS2 | SNCM240 | 8637 8640 | | - | - | - | - |
| | | SNCM415 | - | SNCM415 | - | - | - | - | - | - |
| | | SNCM420(H) | - | SNCM420(H) | 4320(H) | | - | - | - | 20XH2M(20XHM) |
| | | SNCM431 | - | SNCM431 | - | - | - | - | - | - |
| | | SNCM439 | - | SNCM439 | 4340 | | - | - | - | - |
| | | SNCM447 | - | SNCM447 | - | - | - | - | - | - |
| | | SNCM616 | - | SNCM616 | - | - | - | - | - | - |
| | SNCM625 | - | SNCM625 | - | - | - | - | - | - | |
| SNCM630 | - | SNCM630 | - | - | - | - | - | - | | |
| SNCM815 | - | SNCM815 | - | - | - | - | - | - | | |
| Chromium steel | SCr415(H) | - | SCr415(H) | - | | - | 17Cr3 17CrS3 | - | 15X 15XA | |
| | SCr420(H) | 20Cr4(H) 20CrS4 | SCr420(H) | 5120(H) | | - | - | - | 20X | |
| | SCr430(H) | 34Cr4 34CrS4 | SCr430(H) | 5130(H) 5132(H) | | 34Cr4 34CrS4 | 34Cr4 34CrS4 | 34Cr4 34CrS4 | 30X | |
| | SCr435(H) | 34Cr4 34CrS4 37Cr4 37CrS4 | SCr435(H) | 5135(H) | | 37Cr4 37CrS4 | 37Cr4 37CrS4 | 37Cr4 37CrS4 | 35X | |
| | SCr440(H) | 37Cr4 37CrS4 41Cr4 41CrS4 | SCr440(H) | 5140(H) | | 530M40 41Cr4 41CrS4 | 41Cr4 41CrS4 | 41Cr4 41CrS4 | 40X | |
| | SCr445(H) | - | SCr445(H) | - | | - | - | - | 45X | |

• The above Alloy steel can supplied by domestic manufacturing



| Type | Korea | ISO | Japan | U.S.A | Great Britain | Germany | France | Russia | |
|------------------------------------|--|------------------------|--------------------------|------------------------|--------------------|---|---------------------|---------------------|-------------------|
| | KS | ISO | JIS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | GOCT | |
| Alloy steel | Chromium molybdenum steel | SCM415(H) | - | SCM415(H) | - | - | - | - | |
| | | SCM418(H) | 18CrMo4 18CrMoS4 | SCM418(H) | - | - | 18CrMo4 18CrMoS4 | - | 20XM |
| | | SCM420(H) | - | SCM420(H) | - | 708M20(708H20) | - | - | 20XM |
| | | SCM430 | - | SCM430 | 4130 | - | - | - | 30XM 30XMA |
| | | SCM432 | - | SCM432 | - | - | - | - | - |
| | | SCM435(H) | 34CrMo4 34CrMoS4 | SCM435(H) | (4135H) 4137(H) | 34CrMo4 34CrMoS4 | 34CrMo4 34CrMoS4 | 34CrMo4 34CrMoS4 | 35XM |
| | | SCM440(H) | 42CrMo4 42CrMoS4 | SCM440(H) | 4140(H) 4142(H) | 708M70 709M40 42CrMo4 42CrMoS4 | 42CrMo4 42CrMoS4 | 42CrMo4 42CrMoS4 | - |
| | | SCM445(H) | - | SCM445(H) | 4145(H) 4147(H) | - | - | - | - |
| | Manganese steel and Manganese chromium steel | SMn420(H) SMn433(H) | 22Mn6(H) - | SMn420(H) SMn433(H) | 1522(H) 1534 | 150M19 150M36 | - | - | - 30Г2 35Г2 |
| | | SMn438(H) | 36Mn6(H) | SMn438(H) | 1541(H) | 150M36 | - | - | 35Г2 40Г2 |
| SMn443(H) | | 42Mn6(H) | SMn443(H) | 1541(H) | - | - | - | 40Г2 45Г2 | |
| SMnC420(H) SMnC443(H) | | - - | SMnC420(H) SMnC443(H) | - - | - - | - - | - - | - - | |
| SACM645 | | 41CrAlMo74 | SACM645 | - | - | - | - | - | |
| Aluminum chromium molybdenum steel | | | | | | | | | |

• The above Alloy steel can supplied by domestic manufacturing

Tool steel

| Type | Korea | ISO | Japan | U.S.A | Great Britain | Germany | France | Russia | | | | |
|------------------|------------------|--------------|-------|---------------------|---------------|--------------|-----------|--------|--|------------|---------|--|
| | KS | ISO | JIS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | GOCT | | | | |
| High speed steel | SKH2 | HS18-0-1 | SKH2 | T1 | BM 2 | S6/5/2 | Z 85 WDCV | | | | | |
| | SKH3 | - | SKH3 | T4 | | | | | | | | |
| | SKH4 | - | SKH4 | T5 | | | | | | | | |
| | SKH10 | - | SKH10 | T15 | | | | | | | | |
| | SKH51 | HS6-5-2 | SKH51 | M2 | | | | | | | | |
| | SKH52 | HS6-6-2 | SKH52 | M3-1 | BM 35 | S6/5/2/5 | 6-5-2-5 | | | | | |
| | SKH53 | HS6-5-3 | SKH53 | M3-2 | | | | | | | | |
| | SKH54 | HS6-5-4 | SKH54 | M4 | | | | | | | | |
| | SKH55 | HS6-5-2-5 | SKH55 | M 35 | | | | | | | | |
| | SKH56 | - | SKH56 | M36 | | | | | | | | |
| | SKH57 | HS10-4-3-10 | SKH57 | - | | S2/9/2 | | | | | | |
| | SKH58 | HS2-9-2 | SKH58 | M7 | | | | | | | | |
| | SKH59 | HS2-9-1-8 | SKH59 | M42 | | | | | | | | |
| | | | | | | | | | | | | |
| | Alloy tool steel | STS11 | - | SKS11 | F2 | | | | | | | |
| STS2 | | - | SKS2 | - | | | | | | | | |
| STS21 | | - | SKS21 | - | | | | | | | | |
| STS5 | | - | SKS5 | - | | | | | | | | |
| STS51 | | - | SKS51 | L6 | | | | | | | | |
| STS7 | | - | SKS7 | - | | | | | | | | |
| STS8 | | - | SKS8 | - | | | | | | | | |
| STS4 | | - | SKS4 | - | | | | | | | | |
| STS41 | | - | SKS41 | - | | | | | | | | |
| STS43 | | 105V | SKS43 | W2-9 1/ W2-8 1-2 | | | | | | | | |
| STS44 | | - | SKS44 | - | | | | | | | | |
| STS3 | | - | SKS3 | - | 105WCr6 | | | | | 105WC13 | | |
| STS31 | | 105WCr1 | SKS31 | - | | | | | | | | |
| STS93 | | - | SKS93 | - | | | | | | | | |
| STS94 | | - | SKS94 | - | | | | | | | | |
| STS95 | | - | SKS95 | - | | | | | | | | |
| STD1 | | 210Cr12 | SKD1 | D3 | BD3 | X210Cr12 | Z200C12 | | | | | |
| STD11 | | - | SKD11 | D2 | BA2 | X100CrMoV5 1 | Z100CDV5 | | | | | |
| STD12 | | 100CrMoV5 | SKD12 | A2 | BH21 | X30WCrV9 3 | Z30WCV9 | | | | | |
| STD4 | | - | SKD4 | - | | | | | | | | |
| STD5 | | X30WCrV9-3 | SKD5 | H21 | | | | | | | | |
| STD6 | | X37CrMoV5-1 | SKD6 | H11 | | | | | | | | |
| STD61 | | X40CrMoV5-1 | SKD61 | H13 | | | | | | | | |
| STD62 | | X35CrWMoV5 | SKD62 | H12 | BH13 | X40CrMoV5 1 | Z40CDV5 | | | | | |
| STD7 | | 32CrMoV12-28 | SKD7 | H10 | | | | | | | | |
| STD8 | | - | SKD8 | H19 | | | | | | | | |
| STF3 | | - | SKT3 | - | | | | | | | | |
| STF4 | | 55NiCrMoV7 | SKT4 | L6 | | | | | | 55NiCrMoV6 | 55NCDV7 | |

• The above High speed steel can supplied by domestic manufacturing



General Information I

| Type | Korea | ISO | Japan | U.S.A | | Great Britain | Germany | France | Russia |
|---------------------------|--------|-----------|--------|--------------------|----------|---------------|------------|----------|--------|
| | KS | ISO | JIS | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | GOCT |
| Free cutting carbon steel | SUM11 | - | SUM11 | 1110 | | | | | |
| | SUM12 | - | SUM12 | 1109 | | | | | |
| | SUM21 | 9S20 | SUM21 | 1212 | | | | | |
| | SUM22 | 11SMn28 | SUM22 | 1213 | | 230M07 | 9SMn28 | S250 | |
| | SUM22L | 11SMnPb28 | SUM22L | 12L13 | | | 9SMnPb28 | S250Pb | |
| | SUM23 | - | SUM23 | 1215 | | 240M07 | 9SMn36 | S 300 | |
| | SUM23L | - | SUM23L | - | | | | | |
| | SUM24L | 11SMnPb28 | SUM24L | 12L14 | | | 9SMnPb36 | S300Pb | |
| | SUM25 | 12SMn35 | SUM25 | - | | | | | |
| | SUM31 | - | SUM31 | 1117 | | | | | |
| | SUM31L | - | SUM31L | - | | | | | |
| | SUM32 | - | SUM32 | - | | | | | |
| | SUM41 | - | SUM41 | 1137 | | | | | |
| | SUM42 | - | SUM42 | 1141 | | | | | |
| | SUM43 | 44SMn28 | SUM43 | 1144 | | | | | |
| High carbon chromium | STB1 | - | SUJ1 | - | | | | | |
| | STB2 | B1 | SUJ2 | 52100 | | 534A99 | 100Cr6 | 100Cr6 | |
| | STB3 | B2 | SUJ3 | ASTM A 485 Grade 1 | | | | | |
| | STB4 | - | SUJ4 | - | | | | | |
| | STB5 | - | SUJ5 | - | | | | | |

• The above Special speed steel can supplied by domestic manufacturing

Stainless steel

| Type | Korea | ISO | Japan | U.S.A | | Great Britain | Germany | France | Russia |
|-----------------|----------------|---|----------|--------|----------|---------------|------------------------------------|--------------------------------|------------|
| | KS | ISO | JIS | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | GOCT |
| Stainless steel | STS201 | X12CrMnNiN17-7-5 | SUS201 | S20100 | 201 | 284S16 | X12CrNi17-7 | Z12CMN17-07Az | 12X17-9AH4 |
| | STS202 | X12CrMnNiN18-9-5 | SUS202 | S20200 | 202 | 301S21 | X2CrNiN18-7 | | 07X16H6 |
| | STS301 | X10CrNi18-8 | SUS301 | S30100 | 301 | | X12CrNi17-7 | Z11CN17-08 | |
| | STS301L | X2CrNiN18-7 | SUS301L | | | | | | |
| | STS301J1 | | SUS301J1 | | | 302S25 | | | 12X18H9 |
| | STS302 | | SUS302 | S30200 | 302 | | X10CrNiS18-9 | Z12CN18-09 | |
| | STS302B | X12CrNiSi18-9-3 | SUS302B | S30215 | 302B | 303S21 | | | |
| | STS303 | X10CrNiS18-9 | SUS303 | S30300 | 303 | 303S41 | | Z8CNF18-09 | 12X18H10E |
| | STS303Se | | SUS303Se | S30323 | 303Se | | X5CrNi18-10 | | |
| | STS303Cu | | SUS303Cu | | | 304S31 | | | 08X18H10 |
| | STS304 | X5CrNi18-9 X2CrNi18-9 | SUS304 | S30400 | 304 | 304S11 | X2CrNi19-11 | Z7CN18-09 | 03X18H11 |
| | STS304L | X2CrNi19-11 | SUS304L | S30403 | 304L | | X2CrNiN18-10 | Z3CN19-11 | |
| | STS304N1 | X5CrNiN18-8 | SUS304N1 | S30451 | 304N | | | Z6CN19-09Az | |
| | STS304LN | X2CrNiN18-8 | SUS304LN | S30453 | 304LN | | X5CrNi18-12 | Z3CN18-10Az | |
| | STS304J1 | | SUS304J1 | | | 305S19 | | | 06X18H11 |
| | STS305 | X6CrNi18-12 | SUS305 | S30500 | 305 | | | Z8CN18-12 | |
| | STS309S | | SUS309S | S30908 | 309S | 310S31 | X5CrNiMo27-12-2 | Z10CN24-13 | 10X23H18 |
| | STS310S | X6CrNi25-20 | SUS310S | S31008 | 310S | 316S31 | X5CrNiMo27-13-3 | Z8CN25-20 | |
| | STS316 | X5CrNiMo17-12-2 X3CrNiMo17-12-3 | SUS316 | S31600 | 316 | 316S11 | X2CrNiMo17-13-2 X2CrNiMo17-14-3 | Z7CND17-12-02 Z6CND18-12-03 | 03X17H14M3 |
| | STS316L | X2CrNiMo17-12-2 X2CrNiMo17-12-3 X2CrNiMo18-14-3 | SUS316L | S31603 | 316L | | | Z3CND17-12-02 Z3CND17-12-03 | |
| | STS316N | | SUS316N | S31651 | 316N | 317S16 | X6CrNiTi18-10 | | |
| | STS317 | | SUS317 | S31700 | 317 | 321S31 | X6CrNiNb18-10 | | 08X18H10T |
| | STS321 | X6CrNiTi18-10 | SUS321 | S32100 | 321 | 347S31 | | Z6CNT18-10 | 08X18H12 |
| | STS347 | X6CrNiNb18-10 | SUS347 | S34700 | 347 | | X6CrAl13 | Z6CNNb18-10 | |
| | STS384 | X3NiCr18-16 | SUS384 | S38400 | 384 | 405S17 | | Z6CN18-16 | |
| | STS405 | X6CrAl13 | SUS405 | S40500 | 405 | | | Z8CA12 | |
| | STS410L | | SUS410L | | | | X6Cr17 | Z3C14 | |
| STS429 | | SUS429 | S42900 | 429 | 430S17 | X7CrS18 | | 12X17 | |
| STS430 | X6Cr17 | SUS430 | S43000 | 430 | | X6CrMo17-1 | Z8C17 | | |
| STS430F | X7CrS17 | SUS430F | S43020 | 430F | 434S17 | | Z8CF17 | | |
| STS434 | X6CrMo17-1 | SUS434 | S43400 | 434 | | | Z8CD17-01 | | |
| STS444 | X2CrMoTi18-2 | SUS444 | S44400 | 444 | | | Z3CDT18-02 | | |
| STSM27 | | SUSXM27 | S44627 | | | X10Cr13 | Z1CD26-01 | | |
| STS403 | | SUS403 | S40300 | 403 | 410S21 | | | | |
| STS410 | X12Cr13 | SUS410 | S41000 | 410 | 416S21 | X20Cr13 | Z13C13 | | |
| STS416 | X12CrS13 | SUS416 | S41600 | 416 | 420S29 | X20CrNi17-2 | Z11CF13 | 20X13 | |
| STS420J1 | X20Cr13 | SUS420J1 | S42000 | 420 | 431S29 | | Z20C13 | 20X17H2 | |
| STS431 | X19CrNi16-2 | SUS431 | S43100 | 431 | | | Z15CN16-02 | | |
| STS440A | X70CrMo15 | SUS440A | S44002 | 440A | | X7CrNiAl17-7 | Z70C15 | | |
| STS630 | X5CrNiCuNb16-4 | SUS630 | S17400 | S17400 | | | Z6CNU17-04 | 09X17H7IO | |
| STS631 | X7CrNiAl17-7 | SUS631 | S17700 | S17700 | | | Z9CNA17-07 | | |
| STS631J1 | | SUS631J1 | | | | | | | |

• The above Stainless steel can supplied by domestic manufacturing



🎯 Casting or forging steel

| Type | Korea | ISO | Japan | U.S.A | Great Britain | Germany | France | Russia | |
|--|-------------------|---|-----------------------------|--------------------------------------|--------------------------|--|--------------------------|---------|---|
| | KS | ISO | JIS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | GOCT | |
| Casting Iron | Gray iron casting | GC100 | 100,150, 200, 250, 300, 350 | FC100 | No 20 B | Grade 150 Grade 220 Grade 260 Grade 300 Grade 350 Grade 400 | GG 10 | Ft 10 D | - |
| | | GC150 | | FC150 | No 25 B | | GG 15 | Ft 15 D | |
| | | GC200 | | FC200 | No 30 B | | GG 20 | Ft 20 D | |
| | | GC250 | | FC250 | No 35 B | | GG 25 | Ft 25 D | |
| | GC300 | FC300 | No 45 B | GG 30 | Ft 30 D | | | | |
| | GC350 | FC350 | No 50 B | GG 35 | Ft 35 D | | | | |
| | | | No 55 B | GG 40 | Ft 40 D | | | | |
| Spheroidal graphite iron casting | GCD400 | 700-2, 600-3, 500-7, 450-10, 400-15, 400-18, 350-22 | FCD400 | 60-40-18 | SNG 420/12 SNG 370/17 | GGG 40 GGG 40.3 | FCS 400-12 FGS 370-17 | B | |
| | GCD500 | | FCD500 | 80-55-06 | SNG 500/7 | GGG 50 | FGS 500-7 | | |
| | GCD600 | | FCD600 | 100-70-03 | SNG 600/3 | GGG 60 | FGS 600-3 | | |
| | GCD700 | | FCD700 | - | SNG 700/2 | GGG 70 | FGS 700-2 | | |
| Austempered Spheroidal graphite iron casting | FCAD | - | FCAD | - | EN-GJS- | EN-GJS- | EN-GJS- | - | |
| Austenitic iron casting | FCA-FCDA- | L-, S- | FCA-FCDA- | Type 1, 2, Type D-2, D-3A Class 1, 2 | F1, F2, S2W, S5S | GGL-, GGG- | L-, S- | - | |

🎯 Non-ferrous alloy

| Type | Korea | ISO | Japan | U.S.A | Great Britain | Germany | France | Russia | |
|--------------------------------|-----------------------------------|--------------|--------------|----------|---------------|----------------|----------------|----------|--|
| | KS | ISO | JIS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | GOCT | |
| Aluminum alloy | Aluminum alloy ingots for casting | AC1B | Al-Cu4MgTi | AC1B | 204.0 | - | - | A-U5GT | |
| | | AC2A | - | AC2A | - | - | - | - | |
| | | AC2B | - | AC2B | 319.0 | - | - | - | |
| | | AC3A | - | AC3A | - | LM-6 | - | - | |
| | | AC4A | - | AC4A | - | - | G(GK)-AlSi9Cu3 | - | |
| | | AC4B | - | AC4B | - | - | - | - | |
| | | AC4C | Al-Si7Mg(Fe) | AC4C | 356.0 | LM-25 | G(GK)-AlSi7MG | A-S7G | |
| | | AC4CH | Al-Si7Mg | AC4CH | A356.0 | - | - | - | |
| | | AC4D | Al-Si5Cu1Mg | AC4D | 355.0 | LM-16 | - | - | |
| | | AC5A | Al-Cu4Ni2Mg2 | AC5A | 242.0 | - | G(GK)-AlMg5 | A-U4NT | |
| | | AC7A | - | AC7A | 514.0 | LM-5 | - | - | |
| | | AC8A | - | AC8A | - | LM-13 | - | A-S12UNG | |
| | | AC8B | - | AC8B | - | LM-26 | - | A-S10UG | |
| | | AC8C | - | AC8C | - | - | - | A-S10UG | |
| | AC9A | - | AC9A | - | LM-29 | - | - | | |
| | AC9B | - | AC9B | - | - | GD-AlSi12 (Cu) | A-S18UNG | | |
| | Aluminum alloy die casting | ALDC1 | Al-Si12CuFe | ADC1 | A413.0 | LM20 | GD-AlSi10Mg | A-S13 | |
| | | ALDC2 | - | ADC3 | A360.0 | - | GD-AlMg9 | A-S9G | |
| | | ALDC3 | - | ADC5 | 518.0 | - | - | A-G6 | |
| | | ALDC4 | - | ADC6 | - | - | GD-AlSi9Cu3 | A-G3T | |
| | | ALDC7 | Al-Si8Cu3Fe | ADC10 | A380.0 | - | GD-AlSi9Cu3 | - | |
| | | ALDC7Z | Al-Si8Cu3Fe | ADC10Z | A380.0 | LM24 | - | - | |
| | | ALDC8 | - | ADC12 | 383.0 | LM2 | - | - | |
| | | ALDC8Z | - | ADC12Z | 383.0 | LM2 | - | - | |
| ALDC9 | | - | ADC14 | B390.0 | LM30 | EN AW-5052 | - | | |
| Aluminum alloy extruded shapes | A5052S | - | A5052S | 5052 | EN AW-5052 | EN AW-5454 | EN AW-5052 | | |
| | A5454S | - | A5454S | 5454 | EN AW-5454 | EN AW-5083 | EN AW-5454 | | |
| | A5083S | AlMg4.5Mn0.7 | A5083S | 5083 | EN AW-5083 | EN AW-5086 | EN AW-5083 | | |
| | A5086S | - | A5086S | 5086 | EN AW-5086 | EN AW-6061 | EN AW-5086 | | |
| | A6061S | AlMg1SiCu | A6061S | 6061 | EN AW-6061 | EN AW-6063 | EN AW-6061 | | |
| | A6063S | AlMg0.7Si | A6063S | 6063 | EN AW-6063 | EN AW-7003 | EN AW-6063 | | |
| | A7003S | - | A7003S | - | EN AW-7003 | - | EN AW-7003 | | |
| | A7N01S | - | A7N01S | - | - | EN AW-7075 | - | | |
| | A7075S | AlZn5.5MgCu | A7075S | 7075 | EN AW-7075 | - | EN AW-7075 | | |

🎯 Heat resistant steel

| Type | Korea | ISO | Japan | U.S.A | | Great Britain | Germany | France | Russia |
|----------------------|------------|---------|----------|---------|----------|---------------|------------|---------------|----------------|
| | KS | ISO | JIS | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | GOCT |
| Heat resistant steel | Austenitic | STR31 | | SUH31 | | | 331S42 | | Z35CNWS14-14 |
| | | STR35 | | SUH35 | | | 349S52 | X53CrMnNi21-9 | Z52CMN21-09-Az |
| | | STR36 | | SUH36 | | | 349S54 | | Z55CMN21-09-Az |
| | | STR37 | | SUH37 | | S63008 | | | |
| | | STR38 | | SUH38 | | S63017 | | | |
| | | STR309 | | SUH309 | | | 309S24 | CrNi2520 | Z15CN24-13 |
| | | STR310 | | SUH310 | | S30900 | 310S24 | | Z15CN25-20 |
| | | STR330 | | SUH330 | | S31000 | 309 | | Z12NCS35-16 |
| | | STR660 | | SUH660 | | N08330 | 310 | | Z6NCTV25-20 |
| | | STR661 | | SUH661 | | S66286 | N08330 | | |
| | | STR21 | | SUH21 | | R30155 | | CrAl1205 | |
| | | STR409 | X6CrTi12 | SUH409 | | | 409S19 | X6CrTi12 | Z6CT12 |
| | | STR409L | X2CrTi12 | SUH409L | | S40900 | | | Z3CT12 |
| | | STR446 | | SUH446 | | | 409 | X45CrSi9-3 | Z12C25 |
| Martensitic | STR1 | | SUH1 | | S44600 | 401S45 | | Z45CS9 | |
| | STR3 | | SUH3 | | S65007 | 446 | | Z40CSD10 | |
| | STR4 | | SUH4 | | | 443S65 | | Z80CSN20-02 | |
| | STR11 | | SUH11 | | | | | | |
| | STR600 | | SUH600 | | | | | | |
| | STR616 | | SUH616 | | S42200 | | | | |

• The above Heat resistant steel can supplied by domestic manufacturing



Steel, Non-ferrous metal symbol list

Comparison of workpiece material standards

| GROUP | STANDARD TERM | CODE | GROUP | STANDARD TERM | CODE | |
|---|--|---|------------------------------------|--|-----------------------------|------|
| Structural Steel | Rolled Steel for Welded Structure | SWS | Forged steel | Carbon Steel Forging | SF | |
| | Rerolled Steel | SBR | | Chromium Molybdenum Steel Forging | SFCM | |
| | Rolled Steel for General Structure | SB | | Nickel Chromium Molybdenum Steel Forging | SFNCM | |
| | Light Gauge Steel for General Structure | SBC | Cast iron | Gray Cast iron | GC | |
| | Hot-rolled Steel Plate, Sheet/ Strip for Automobile Structural Use | SAPH | | Spheroidal Graphite Cast iron | GCD | |
| Steel Plate | Cold-rolled Steel Sheet/Strip | SBC | | Blackheart Malleable Cast iron | BMC | |
| | Hot-rolled Soft Steel Sheet/Strip | SHP | | Whiteheat Malleable Cast iron | WMC | |
| Steel Pipe | Carbon Steel Pipe for Ordinary Piping | SPP | Pearlitic Malleable Cast iron | PMC | | |
| | Carbon Steel Pipe for Boiler and Heat Exchanger | STH | Cast steel | Carbon Cast Steel | SC | |
| | Seamless Steel Pipe for High Pressure Gas Cylinder | STHG | | High Tensile Strength Carbon Cast Steel&Low Alloy Cast Steel | HSC | |
| | Carbon Steel Pipe for General Structural Use | SPS | | Stainless Cast Steel | SSC | |
| | Carbon Steel Pipe for Machine Structural Use | STST | | Heat Resisting Cast Steel | HRSC | |
| | Alloy Steel Pipe for Structural Use | STA | | High Manganese Cast Steel | HMnSC | |
| | Stainless Steel Pipe for Machine and Structural Use | STS-TK | | Cast Steel for High Temperature and High Pressure Service | SCPH | |
| | Carbon Steel Square Pipe for General Structural Use | SPSR | | Casting | Brass Casting | BsC |
| | Alloy Steel Pipe | SPA | | | High Strength Brass Casting | HBsC |
| | Carbon Steel Pipe for Pressure Service | SPPS | Bronze Casting | | BrC | |
| | Carbon Steel Pipe for High Temperature Service | SPSR | Phosphoric Bronze Casting | | PCB | |
| | Carbon Steel Pipe for High Pressure Service | SPPH | Aluminum Bronze Casting | | AIBC | |
| | Stainless Steel Pipe | STSxT | Aluminum Alloy Casting | | ACxA | |
| | Iron and Steel | Carbon Steel for Machine Structural Use | SMxxC, SMxxCK | | Magnesium Alloy Casting | MgC |
| Aluminum Chromium Molybdenum Steel | | SACM | Zinc Alloy Die Casting | | ZnDC | |
| Chromium Molybdenum Steel | | SCM | Aluminum Alloy Die Casting | | ADC | |
| Chromium Steel | | SCr | Magnesium Alloy Die Casting | | MgDC | |
| Nickel Chromium Steel | | SNC | White Metal | | WM | |
| Nickel Chromium Molybdenum Steel | | SNCM | Aluminum Alloy Casting for Bearing | | AM | |
| Manganese Steel and manganese Chromium Steel for Machine Structural Use | | SMn, SMnC | Brass Alloy Casting for Bearing | KM | | |
| Special steel | | Tool steel | Carbon Tool Steel | STC | | |
| | Hollow Drill Steel | | SKC | | | |
| | Alloy Tool Steel | | STS, STD, STF | | | |
| | High Speed Tool Steel | | SKH | | | |
| | Stainless steel | Stainless Steel Bar | STS | | | |
| | | Heat resisting steel | Heat Resisting Steel | STR | | |
| | | | Heat Resisting Steel Bar | STR | | |
| | Heat Resisting Steel Sheet | | STR | | | |
| | Free cutting carbon steel | SUM | | | | |
| | Special steel | STB | | | | |
| | Spring steel | SPS | | | | |



SI unit conversion table

Major SI unit conversion table

● Force

| N | kgf | dyn |
|--------------------|--------------------------|-----------------------|
| 1 | 1.01972×10^{-1} | 1×10^5 |
| 9.80665 | 1 | 9.80665×10^5 |
| 1×10^{-5} | 1.01972×10^{-6} | 1 |

● Stress

| Pa or N/m ² | MPa or N/mm ² | kgf/mm ² | kgf/cm ² | kgf/m ² |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | 1×10^{-6} | 1.01972×10^{-7} | 1.01972×10^{-5} | 1.01972×10^{-1} |
| 1×10^6 | 1 | 1.01972×10^{-1} | 1.01972×10 | 1.01972×10^5 |
| 9.80665×10^6 | 9.80665 | 1 | 1×10^2 | 1×10^6 |
| 9.80665×10^4 | 9.80665×10^{-2} | 1×10^{-2} | 1 | 1×10^4 |
| 9.80665 | 9.80665×10^{-6} | 1×10^{-6} | 1×10^{-4} | 1 |

● Pressure

| Pa | kPa | MPa | bar | kgf/cm ² |
|-----------------------|---------------------|--------------------------|--------------------------|--------------------------|
| 1 | 1×10^{-3} | 1×10^{-6} | 1×10^{-5} | 1.01972×10^{-5} |
| 1×10^3 | 1 | 1×10^{-3} | 1×10^2 | 1.01972×10^2 |
| 1×10^6 | 1×10^3 | 1 | 1×10 | 1.01972×10 |
| 1×10^5 | 1×10^2 | 1×10^{-1} | 1 | 1.01972 |
| 9.80665×10^4 | 9.80665×10 | 9.80665×10^{-2} | 9.80665×10^{-1} | 1 |

● Work, Energy, Calorie

| J | kW·h | kgf·m | kcal |
|-----------------------|--------------------------|--------------------------|--------------------------|
| 1 | 2.77778×10^{-7} | 1.01972×10^{-1} | 2.38889×10^{-4} |
| 3.60000×10^6 | 1 | 3.67098×10^5 | 8.60000×10^2 |
| 9.80665 | 2.72407×10^{-6} | 1 | 2.34270×10^{-3} |
| 4.18605×10^3 | 1.16279×10^{-3} | 4.26858×10^2 | 1 |

● Power

| W | kW | kgf·m/s | PS | kcal/h |
|---------------------|--------------------------|--------------------------|--------------------------|-----------------------|
| 1 | 1×10^{-3} | 1.01972×10^{-1} | 1.35962×10^{-3} | 0.860 |
| 1×10^3 | 1 | 1.01972×10^2 | 1.359 62 | 8.60000×10^2 |
| 9.81 65 | 9.80665×10^{-3} | 1 | 1.33333×10^{-2} | 8.433 71 |
| 7.355×10^2 | 7.355×10^{-1} | 7.5×10 | 1 | 6.32529×10^2 |
| 1.162 79 | 1.16279×10^{-3} | 1.18572×10^{-1} | 1.58095×10^{-3} | 1 |

● Specific heat

| J/(kgK) | kcal/(kg°C) | cal/(g°C) |
|-----------------------|--------------------------|-----------|
| 1 | 2.38889×10^{-4} | |
| 4.18605×10^3 | 1 | |

● Thermal conductivity

| W/(mK) | kcal/(hm°C) |
|---------|-------------------------|
| 1 | 8.6000×10^{-1} |
| 1.16279 | 1 |

● Revolution per minute

| min ⁻¹ | s ⁻¹ | r.p.m. |
|-------------------|-----------------|--------|
| 1 | 0.0167 | 1 |
| 60 | 1 | 60 |



Hardness calculating table

Work piece hardness calculating table

| Vickers 50kgf Hv | Brinell, 3000kgf HB | | Rockwell | | | | Shore HS | Tensile strength (approximate value) MPa(1) |
|------------------------|--------------------------|-------------------------------------|--|--|---|---|-------------|---|
| | Standard ball 10mm | Cemented carbide ball 10mm | A scale 60kgf Diamond particle HrA | B scale 100kgf 1/16in ball HrB | C scale 150kgf Diamond particle HrC | D scale 100kgf Diamond particle HrD | | |
| 940 | - | - | 85.6 | - | 68.0 | 76.9 | 97 | |
| 920 | - | - | 85.3 | - | 67.5 | 76.5 | 96 | |
| 900 | - | - | 85.0 | - | 67.0 | 76.1 | 95 | |
| 880 | - | (767) | 84.7 | - | 66.4 | 75.7 | 93 | |
| 860 | - | (757) | 84.4 | - | 65.9 | 75.3 | 92 | |
| 840 | - | (745) | 84.1 | - | 65.3 | 74.8 | 91 | |
| 820 | - | (733) | 83.8 | - | 64.7 | 74.3 | 90 | |
| 800 | - | (722) | 83.4 | - | 64.0 | 74.8 | 88 | |
| 780 | - | (710) | 83.0 | - | 63.3 | 73.3 | 87 | |
| 760 | - | (698) | 82.6 | - | 62.5 | 72.6 | 86 | |
| 740 | - | (684) | 82.2 | - | 61.8 | 72.1 | 84 | |
| 720 | - | (670) | 81.8 | - | 61.0 | 71.5 | 83 | |
| 700 | - | (656) | 81.3 | - | 60.1 | 70.8 | 81 | |
| 690 | - | (647) | 81.1 | - | 59.7 | 70.5 | - | |
| 680 | - | (638) | 80.8 | - | 59.2 | 70.1 | 80 | |
| 670 | - | 630 | 80.6 | - | 58.8 | 69.8 | - | |
| 660 | - | 620 | 80.3 | - | 58.3 | 69.4 | 79 | |
| 650 | - | 611 | 80.0 | - | 57.8 | 69.0 | - | |
| 640 | - | 601 | 79.8 | - | 57.3 | 68.7 | 77 | |
| 630 | - | 591 | 79.5 | - | 56.8 | 68.3 | - | |
| 620 | - | 582 | 79.2 | - | 56.3 | 67.9 | 75 | |
| 610 | - | 573 | 78.9 | - | 55.7 | 67.5 | - | |
| 600 | - | 564 | 78.6 | - | 55.2 | 67.0 | 74 | |
| 590 | - | 554 | 78.4 | - | 54.7 | 66.7 | - | 2055 |
| 580 | - | 545 | 78.0 | - | 54.1 | 66.2 | 72 | 2020 |
| 570 | - | 535 | 77.8 | - | 53.6 | 65.8 | - | 1985 |
| 560 | - | 525 | 77.4 | - | 53.0 | 65.4 | 71 | 1950 |
| 550 | (505) | 517 | 77.0 | - | 52.3 | 64.8 | - | 1905 |
| 540 | (496) | 507 | 76.7 | - | 51.7 | 64.4 | 69 | 1860 |
| 530 | (488) | 497 | 76.4 | - | 51.1 | 63.9 | - | 1825 |
| 520 | (480) | 488 | 76.1 | - | 50.5 | 63.5 | 67 | 1795 |
| 510 | (473) | 479 | 75.7 | - | 49.8 | 62.9 | - | 1750 |
| 500 | (465) | 471 | 75.3 | - | 49.1 | 62.2 | 66 | 1705 |
| 490 | (456) | 460 | 74.9 | - | 48.4 | 61.6 | - | 1660 |
| 480 | 488 | 452 | 74.5 | - | 47.7 | 61.3 | 64 | 1620 |
| 470 | 441 | 442 | 74.1 | - | 46.9 | 60.7 | - | 1570 |
| 460 | 433 | 433 | 73.6 | - | 46.1 | 60.1 | 62 | 1530 |
| 450 | 425 | 425 | 73.3 | - | 45.3 | 59.4 | - | 1495 |
| 440 | 415 | 415 | 72.8 | - | 44.5 | 58.8 | 59 | 1460 |
| 430 | 405 | 405 | 72.3 | - | 43.6 | 58.2 | - | 1410 |
| 420 | 397 | 397 | 71.8 | - | 42.7 | 57.5 | 57 | 1370 |
| 410 | 388 | 388 | 71.4 | - | 41.8 | 56.8 | - | 1330 |
| 100 | 379 | 379 | 70.8 | - | 40.8 | 56.0 | 55 | 1290 |
| 390 | 369 | 369 | 70.3 | - | 39.8 | 55.2 | - | 1240 |
| 380 | 360 | 360 | 69.8 | (100.0) | 38.8 | 54.4 | 52 | 1205 |
| 370 | 350 | 350 | 69.2 | - | 39.9 | 53.6 | - | 1170 |
| 360 | 341 | 341 | 68.7 | (109.0) | 36.6 | 52.8 | 50 | 1130 |
| 350 | 331 | 331 | 68.1 | - | 35.5 | 51.9 | - | 1095 |
| 340 | 322 | 322 | 67.6 | (108.0) | 34.4 | 51.1 | 47 | 1070 |
| 330 | 313 | 313 | 67.0 | - | 33.3 | 50.2 | - | 1035 |

| Vickers 50kgf Hv | Brinell, 3000kgf HB | | Rockwell | | | | Shore HS | Tensile strength (approximate value) MPa(1) |
|------------------------|--------------------------|-------------------------------------|--|--|---|---|-------------|---|
| | Standard ball 10mm | Cemented carbide ball 10mm | A scale 60kgf Diamond particle HrA | B scale 100kgf 1/16in ball HrB | C scale 150kgf Diamond particle HrC | D scale 100kgf Diamond particle HrD | | |
| 320 | 303 | 303 | 66.4 | (107.0) | 32.2 | 49.4 | 45 | 1005 |
| 310 | 294 | 294 | 65.8 | - | 31.0 | 48.4 | - | 980 |
| 300 | 284 | 284 | 65.2 | (105.5) | 29.8 | 47.5 | 42 | 950 |
| 295 | 280 | 280 | 64.8 | - | 29.2 | 47.1 | - | 935 |
| 290 | 275 | 275 | 64.5 | (104.5) | 28.5 | 46.5 | 41 | 915 |
| 285 | 270 | 270 | 64.2 | - | 27.8 | 46.0 | - | 905 |
| 280 | 265 | 265 | 63.8 | (103.5) | 27.1 | 45.3 | 40 | 890 |
| 275 | 261 | 261 | 63.5 | - | 26.4 | 44.9 | - | 875 |
| 270 | 256 | 256 | 63.1 | (102.0) | 25.6 | 44.3 | 38 | 855 |
| 265 | 252 | 252 | 62.7 | - | 24.8 | 43.7 | - | 840 |
| 260 | 247 | 247 | 62.4 | (101.0) | 24.0 | 43.1 | 37 | 825 |
| 255 | 243 | 243 | 62.0 | - | 23.1 | 42.2 | - | 805 |
| 250 | 238 | 238 | 61.6 | 99.5 | 22.2 | 41.7 | 36 | 795 |
| 245 | 233 | 233 | 61.2 | - | 21.3 | 41.1 | - | 780 |
| 240 | 228 | 228 | 60.7 | 98.1 | 20.3 | 40.3 | 34 | 765 |
| 230 | 219 | 219 | - | 96.7 | (18.0) | - | 33 | 730 |
| 220 | 209 | 209 | - | 95.0 | (15.7) | - | 32 | 695 |
| 210 | 200 | 200 | - | 93.4 | (13.4) | - | 30 | 670 |
| 200 | 190 | 190 | - | 91.5 | (11.0) | - | 29 | 635 |
| 190 | 181 | 181 | - | 89.5 | (8.5) | - | 28 | 605 |
| 180 | 171 | 171 | - | 87.1 | (6.0) | - | 26 | 580 |
| 170 | 162 | 162 | - | 85.0 | (3.0) | - | 25 | 545 |
| 160 | 152 | 152 | - | 81.7 | (0.0) | - | 24 | 515 |
| 150 | 143 | 143 | - | 78.7 | - | - | 22 | 490 |
| 140 | 133 | 133 | - | 75.0 | - | - | 21 | 455 |
| 130 | 124 | 124 | - | 71.2 | - | - | 20 | 425 |
| 120 | 114 | 114 | - | 66.7 | - | - | - | 390 |
| 110 | 105 | 105 | - | 62.3 | - | - | - | - |
| 100 | 95 | 95 | - | 56.2 | - | - | - | - |
| 95 | 90 | 90 | - | 52.0 | - | - | - | - |
| 90 | 86 | 86 | - | 48.0 | - | - | - | - |
| 85 | 81 | 81 | - | 41.0 | - | - | - | - |

Note1.) Gothic number is ASTM E 1 in the list 140

Note2.) 1. 1MPa=1N/mm²

2. The number in the blank is not generally used ranges.



Properties of Korloy grades

Physical properties of Korloy grades

| Application | ISO Classification symbol | Korloy grades | Specific gravity (g/cm ³) | Hardness (HRA) | TRS (kgf/mm ²) | Compressive strength (kg/mm ²) | Young's modulus (103kgf/mm ²) | Thermal expansion coefficient (10 ⁻⁶ /°C) | Thermal conductivity (cal/cm·sec·°C) |
|--|---------------------------|---------------|---------------------------------------|----------------|----------------------------|--|---|--|--------------------------------------|
| Grades for cutting tools | P | P01 | ST05E | 10.6 | 92.7 | 140 | 440 | - | - |
| | | P10 | ST10P | 10.0 | 92.1 | 175 | 460 | 48 | 6.2 |
| | | P20 | ST20E | 11.8 | 91.9 | 200 | 480 | 56 | 5.2 |
| | | P30 | A30 | 12.2 | 91.3 | 230 | 500 | 53 | 5.2 |
| | M | M10 | U10E | 12.9 | 92.4 | 170 | 500 | 47 | - |
| | | M20 | U2 | 13.1 | 91.1 | 210 | 500 | - | - |
| | | M30 | A30 | 12.2 | 91.3 | 230 | 500 | 53 | 5.2 |
| | | M40 | A40 | 13.3 | 89.2 | 270 | 440 | - | - |
| | K | K01 | H2 | 14.8 | 93.2 | 185 | - | 61 | 4.4 |
| | | K10 | H01 | 13.0 | 92.9 | 210 | 570 | 66 | 4.7 |
| K20 | | G10E | 14.7 | 90.9 | 250 | 500 | 63 | - | |
| Ultra fine grain alloy | Z | Z10 | FA1 | 14.1 | 91.4 | 290 | - | 58 | 5.7 |
| | | Z20 | FCC | 12.5 | 91.3 | 235 | - | - | - |
| Grade for tungsten carbide wear parts | V | V1 | D1 | 15.0 | 92.3 | 205 | 520 | - | - |
| | | V2 | D2 | 14.8 | 90.9 | 250 | 150 | - | - |
| | | V3 | D3 | 14.6 | 89.7 | 310 | 410 | - | - |
| | | V4 | G5 | 14.3 | 89.0 | 320 | 380 | - | - |
| | | V5 | G6 | 14.0 | 87.7 | 350 | 330 | - | - |
| Grade for mining and civil engineering tools | E | E1 | GR10 | 14.8 | 90.9 | 220 | - | - | - |
| | | E2 | GR20 | 14.8 | 90.3 | 240 | - | - | - |
| | | E3 | GR30 | 14.8 | 89.0 | 270 | - | - | - |
| | | E4 | GR35 | 14.8 | 88.2 | 270 | - | - | - |
| | | E5 | GR50 | 14.5 | 87.0 | 300 | - | - | - |

The physical properties of element

| Element | Specific gravity (g/cm ³) | Hardness (Hv) | Young's modulus (×103kgf/mm ²) | Thermal conductivity (cal/cm·sec·°C) | Thermal expansion coefficient (×10 ⁻⁶ /°C) | Melting point (°C) |
|--------------------------------|---------------------------------------|---------------|--|--------------------------------------|---|--------------------|
| WC | 15.6 | 2,150 | 70 | 0.3 | 5.1 | 2,900 |
| TiC | 4.94 | 3,200 | 45 | 0.04 | 7.6 | 3,200 |
| TaC | 14.5 | 1,800 | 29 | 0.05 | 6.6 | 3,800 |
| NbC | 8.2 | 2,050 | 35 | 0.04 | 6.8 | 3,500 |
| TiN | 5.43 | 2,000 | 26 | 0.07 | 9.2 | 2,950 |
| Al ₂ O ₃ | 3.98 | 3,000 | 42 | 0.07 | 8.5 | 2,050 |
| cBN | 3.48 | 4,500 | 71 | 3.1 | 4.7 | - |
| Diamond | 3.52 | 9,000 | 99 | 5.0 | 3.1 | - |
| Co | 8.9 | - | 10~18 | 0.165 | 12.3 | 1,495 |
| Ni | 8.9 | - | 20 | 0.22 | 13.3 | 1,455 |



Technical information for Stainless steel

🎯 Guide of stainless-steel machining

- ▶ Stainless steels are well known for their excellent anti-corrosive property.
- ▶ Excellent anti-corrosive property is due to the Chromium added to these alloys. In general, stainless steels have 4%~10% Chromium content .

● Classifications & Features of Stainless steel.

- 1) Austenite series : One of the most general kinds of stainless steels, it has some of the best corrosion-resistance properties due to a high Cr & Ni content. A high Nickel content also makes machining more difficult. Austenite series stainless steels are usually used for can processing, chemical products and construction purposes. (AISI 303,304,316)
- 2) Ferrite series : It has Chromium content similar to Austenite series, but none of the Ni content which results in freer machining. (AISI 410,430,434)
- 3) Martensite series : The only stainless steel with the ability to be heat treated. It has a high carbon content but poor corrosion resistance, so it is used for parts that need higher hardness. (AISI410, 420,432)
- 4) Precipitate hardened series : A Chromium-Nickel alloy, it has improved hardness through low temperature heat-treatment and has superior corrosion resistance and toughness at the same time. (AISI 17, 15)
- 5) Austenite-Ferrite series : Though it has similar properties with Austenite and Ferrite, it has much more superior heat-resistance (approx. 2 times better). Usually used where thermal-corrosion stability is needed, such as condensers (AISI S2304, 2507).

● Difficult-to-Cut Factors of Stainless steel.

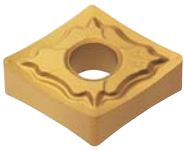

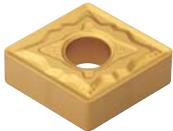

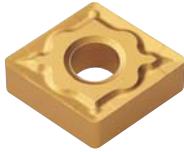



- 1) Work-hardening property - Causes premature wear of tool and poor control chip.
- 2) Low thermal conductivity - Causes plastic deformation of cutting edge and fast wear of tools.
- 3) Built-up-edge - More susceptible to micro-chipping on cutting edges and causes bad surface-finish.
- 4) Chemical affinity between tool and workpiece caused by work-hardening and low thermal-conductivity of workpiece, this might generate abnormal-wear, chipping and/or abnormal fracture.

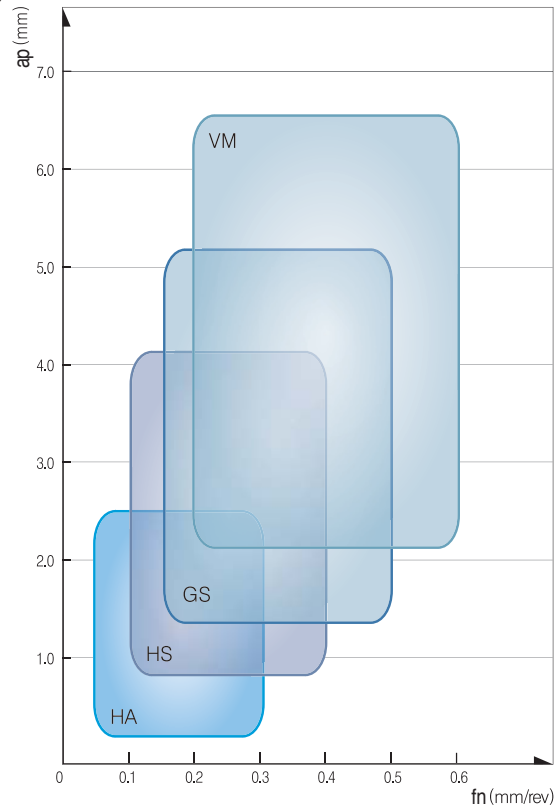
● Tips for Machining of Stainless steel.

- 1) Use a tool that has higher thermal-conductivity
Low thermal-conductivity of stainless steels accelerates tool wear resulting from a decline in hardness of the cutting edge of an insert, this is due to heat piling up. It is better to use a tool that has higher thermal conductivity and with enough coolant.
- 2) Sharper cutting edge-line
It is necessary to utilize larger rake-angles and wider chip-breaker lands to reduce cutting-load pressure and prevent build-up-edge. This will help provide better chip control.
- 3) Optimal cutting condition
Inappropriate machining conditions like extremely low or high-speeds or low feed rates can cause poor tool life due to work-hardening of work piece.
- 4) Choose an appropriate tool
Tools for stainless steels should have good toughness attributes, enough strength on their edge-line (cutting edge) & a higher film adhesion.



Chip Breakers for Stainless steel

| HA / Finishing | | |
|---|---|---|
|  |  | <ul style="list-style-type: none"> • Sharp edge for shallow depth cutting • Increase tool life through reduced chip control friction at high speed cutting • Good surface finish of work piece |
| HS / Medium cutting | | |
|  |  | <ul style="list-style-type: none"> • Enhanced cutting efficiency and increase tool life due to enhanced chip flow. • Reinforced wear resistance through adopting a high land rake angle. • Special land design to prevent notching and enhance toughness |
| GS / Medium to Rough cutting | | |
|  |  | <ul style="list-style-type: none"> • Superior tool life at light intermittent cutting • Better chip flow through wide chip pocket • Prevent build-up-edge by low cutting force design |
| VM / Roughing | | |
|  |  | <ul style="list-style-type: none"> • Chip breaker for intermittent cutting • Unique chip breaker design provide smooth chip control. • Strong edge line permit superior toughness |



Korloy's New Grades for Stainless steel machining.

► KORLOY New Grades for Stainless steel machining

● NC9020, For high speed turning of Stainless steel.

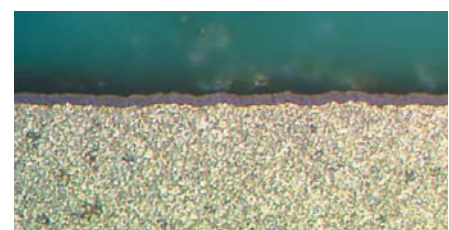
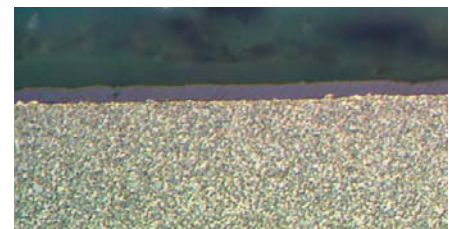
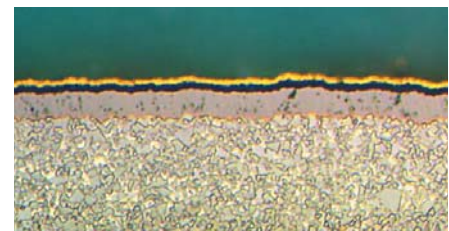
- Specially designed substrate & film suitable for high-speed machining of stainless steels.
- Superior cutting performance under conditions in moderate-speed applications for cutting low-carbon steels and low-carbon alloy steel
- Longer tool-life can be achieved thanks to a superior chipping-resistance design in the grade.
- Obtain better cutting performance. Korloy offers a variety of combinations of chip breakers to machine easily even in deeper depth of cut.

● PC9030, for medium to low speed turning of Stainless steel.

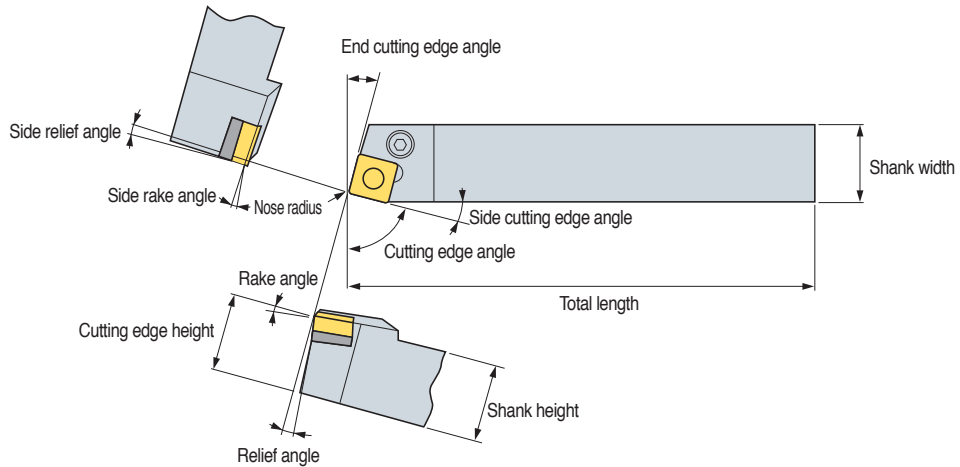
- By using an ultra fine carbide substrate, the PC9030 has a tougher substrate for moderate speed machining and intermittent cutting of Stainless steel
- A PVD coating is applied to this grade to enhance chipping-resistance and adhesion-resistance during machining of difficult-to-cut material
- Exclusive grade for stainless steel, using tougher carbide as a substrate and a PVD coated, this gives the insert superior lubrication properties.
- Enhance your surface finish and reduce burrs by utilizing our chip-breakers, exclusively made for Stainless steels.

● PC9530, for medium to low speed milling of Stainless steel.

- Tough ultra-fine carbide substrate primarily used for roughing and/or intermittent milling applications in stainless steel
- A PVD coating is applied to achieve better tool life in stainless steel and Ni-Cr steel applications.
- To reduce chipping in the cutting edge Korloy uses a tough carbide substrate and PVD coating to help prevent material build up around the cutting edges.



Insert shape and terminology

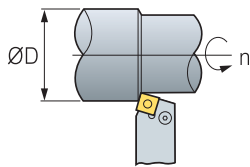


Relating angles between tool and workpiece

| Cutting edge inclination | Terminology | Function | Effect |
|---------------------------|-----------------------------------|---|--|
| Rake angle | Side rake angle Rake angle | • Cutting force, Cutting heat, The effects of chip control on tool life | • (+) : Excellent machine-ability (reducing cutting force, weakening cutting edge strength) • (+) : When machining excellent machine-ability or thin workpiece. • (-) : When strong cutting edge is needed at interrupted condition or mill scale. |
| Relief angle | Relief angle Side relief angle | • Only cutting edge contact with cutting face | • (-) : Cutting edge is strong but has short tool life to make bad influence on flank wear. |
| Cutting edge angle | Cutting edge angle | • Affects chip control and cutting force direction | • (+) : Improved chip control because chip thickness is big. |
| | Side cutting edge angle | • Affects chip control and cutting force direction | • (+) : Strong cutting edge due to distributed cutting force but chip control is bad by thin chip thickness • (-) : Improved chip performance. |
| | End cutting edge angle | • Prevent friction between cutting edge and cutting face | • (-) : Cutting edge is strong but has short tool life to make bad influence on flank wear. |

Calculation formulas for machining

Cutting speed



$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}$$

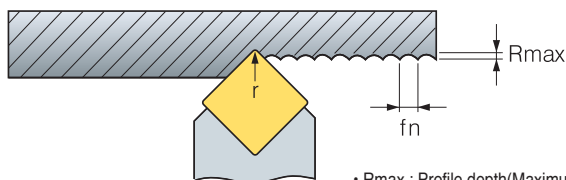
- vc : Cutting speed (m/min)
- n : Revolution per minute (min⁻¹)
- D : Diameter (mm)
- π : Circular constant(3.14)

Feed

$$fn = \frac{vf}{n} \text{ (mm/rev)}$$

- fn : Feed per revolution(mm/rev)
- vf : Table feed (mm/min)
- n : Revolution per minute (min⁻¹)

Surface finish



- Rmax : Profile depth(Maximum height roughness) (μ)
- fn : feed (mm/rev)
- r : nose radius

- Theoretical surface roughness

$$R_{max} = \frac{fn^2}{8r} 1000(\mu\text{m})$$

- Practical surface roughness

Steel : $R_{max} \times (1.5\sim3)$
Cast iron : $R_{max} \times (3\sim5)$

Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \quad P_{hp} = \frac{P_{kw}}{0.75} \quad Q = \frac{vc \times fn \times ap}{1000}$$

- PKW : Power requirement [kW]
- PHP : Power requirement (horse power) [HP]
- vc : Cutting speed [m/min]
- ap : Depth of cut [mm]
- fn : Feed per revolution [mm/rev]
- kc : Specific cutting resistance [kg/mm²]
- η : Machine efficiency rate (0.7~0.8)

Rough Kc

| | |
|---------------------|-----|
| Mild steel | 190 |
| Medium carbon steel | 210 |
| High carbon steel | 240 |
| Low alloy steel | 190 |
| High alloy steel | 245 |
| Cast iron | 93 |
| Malleable cast iron | 120 |
| Bronze, Brass | 70 |

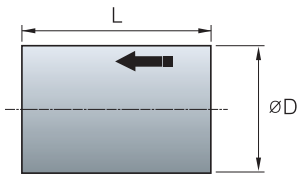
Material removal rate

$$Q = \frac{vc \times fn \times ap}{1000}$$

- Q : Material removal rate [cm³/min]
- ap : Depth of cut [mm]
- vc : Cutting speed [m/min]
- fn : Feed per revolution [mm/rev]

● Machining time

External face machining 1



Constant Revolution per minute

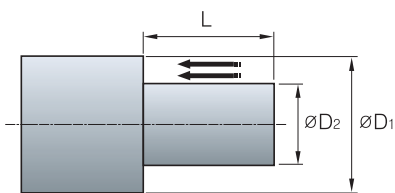
$$T = \frac{60 \times L}{f_n \times n}$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times f_n \times v_c}$$

T : Machining time [sec]
L : Cutting length [mm]
f_n : Feed per revolution [mm/rev]
n : Revolution per minute [min]
D : Diameter of workpiece [mm]
v_c : Cutting speed [m/min]

External face machining 2



Constant Revolution per minute

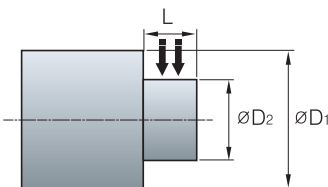
$$T = \frac{60 \times L}{f_n \times n} \times N$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1000 \times f_n \times v_c} \times N$$

T : Machining time [sec]
L : Cutting length [mm]
f_n : Feed per revolution [mm/rev]
n : Revolution per minute [min]
D₁ : Maximum diameter of workpiece [mm]
D₂ : Minimum diameter of workpiece [mm]
v_c : Cutting speed [m/min]
N : The number of pass = (D₁-D₂)/d/2

Facing



Constant Revolution per minute

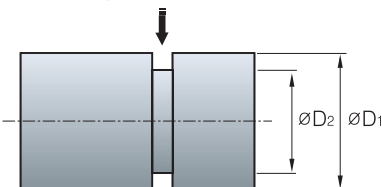
$$T = \frac{60 \times (D_1 - D_2)}{2 \times f_n \times n} \times N$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times f_n \times v_c} \times N$$

T : Machining time [sec]
T₁ : Machining time before the maximum rpm[sec]
L : Width of machining [mm]
f_n : Feed per revolution [mm/rev]
n : Revolution per minute [min-1]
D₁ : Maximum diameter of workpiece [mm]
D₂ : Minimum diameter of workpiece [mm]
v_c : Cutting speed [m/min]
N : The number of pass = (D₁-D₂)/d/2

Grooving



Constant Revolution per minute

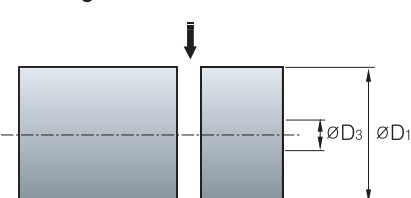
$$T = \frac{60 \times (D_1 - D_2)}{2 \times f_n \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times f_n \times v_c}$$

T : Machining time [sec]
T₁ : Machining time before the maximum rpm[sec]
L : Width of machining [mm]
f_n : Feed per revolution [mm/rev]
n : Revolution per minute [min-1]
D₁ : Maximum diameter of workpiece [mm]
D₂ : Minimum diameter of workpiece [mm]
v_c : Cutting speed [m/min]

Parting



Constant Revolution per minute

$$T = \frac{60 \times D_1}{2 \times f_n \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3) \times (D_1 - D_3)}{4000 \times f_n \times v_c}$$

$$T_3 = T_1 + \frac{60 \times D_3}{2 \times f_n \times n_{max}}$$

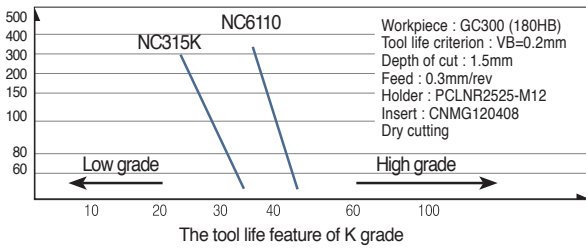
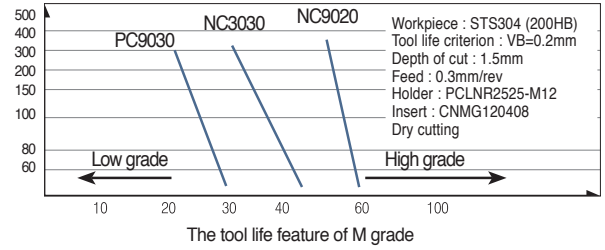
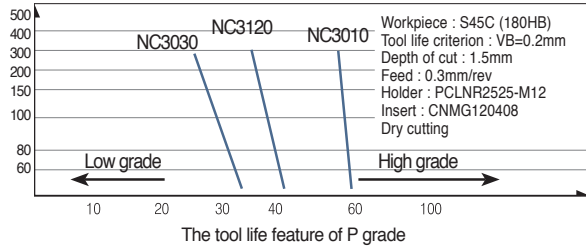
T : Machining time [sec]
T₁ : Machining time before the maximum rpm[sec]
T₃ : Machining time till maximum RPM[sec]
f_n : Feed per revolution [mm/rev]
n : Revolution per minute [min-1]
n_{max} : Maximum revolution per minute [min-1]
D₁ : Maximum diameter of workpiece [mm]
D₃ : Maximum diameter at maximum RPM [mm]
v_c : Cutting speed [m/min]



The affects of cutting condition

- ▶ The most desirable machining means short machining time, long tool life and good precision. This is the reason that proper cutting condition for each tools should be selected according to material's properties, hardness, shapes, the efficiency of machine.

Cutting speed



Cutting Speed's effects

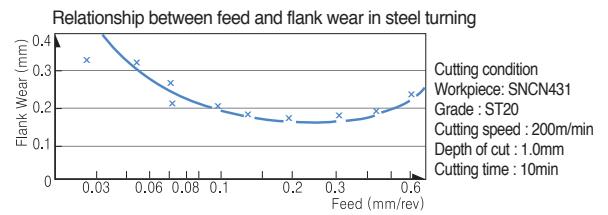
- ▶ When the cutting speed increases up to 20% in an application, the tool life respectively decreases down 50%. Although inversely, if the cutting speed increases up to 50% the tool life decreases 20%. On the other hand if cutting speed is too low (20-40m/min) Tool life shortens due to vibration.

Feed

- ▶ The feed rate in turning means the progressed interval of a distance in a work piece within 1 revolution. The feed rate in a milling application means the table feed divided by number of teeth of cutter (feed rate per tooth).

The effects of feed

- ▶ When the feed rate decreases the flank wear is increased. When the feed rate is too low, the tool life shortens radically.
- ▶ When the feed rate increases, the flank wear increases due to high temperatures, however the feed rates effects tool life less than the cutting speed. And higher feed rates improve machining efficiency.

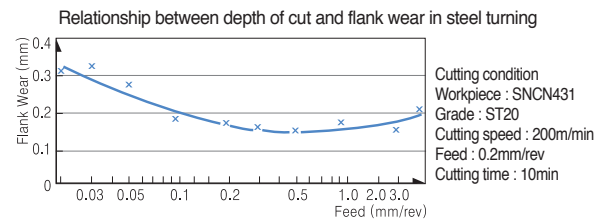


Depth of cut

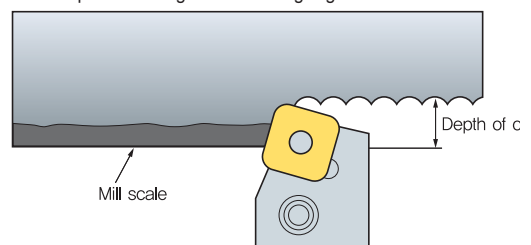
- ▶ Determined by the required allowances in machining a material and the capacity the machine can tolerate. There are cutting limits according to the different shapes and sizes of the insert.

The effect of a depth of cut

- ▶ The depth of cut does not have a big influence on tool life.
- ▶ When the depth of cut is small the work piece is not cut but rather rubbed. In these cases, machine off the work hardened parts that decrease tool life.
- ▶ When machining a cast skin or milling scale smaller depth of cuts usually cause chipping and abnormal wear because of hard impurities in the surface of the work piece.



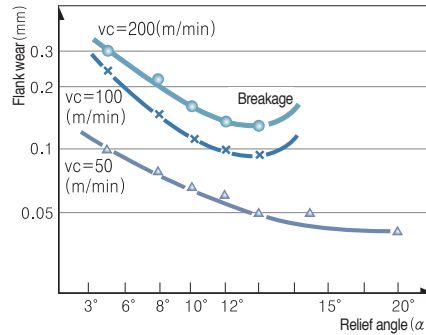
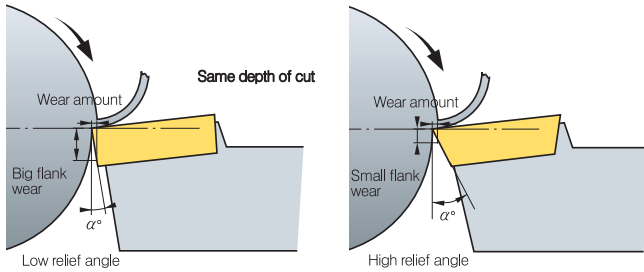
Surface parts including mill scale Roughing



Relief angle

Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily.

Relationship between various relief angle and flank wear



- Workpiece : SNCM431(HB200)
- Grade : P20
- ap : 1mm
- fn : 0.32mm/rev
- T : 20min

Affects

1. If relief angle is big Flank wear decreases.
2. If relief angle is big Cutting edge strength weakens.
3. If relief angle is small Chattering occurs.

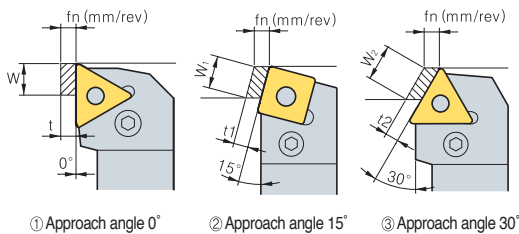
Selection system

1. Hard workpiece / When strong cutting edge is needed - Low relief angle
2. Soft workpiece / Workpiece turning to work hardening easily - High relief angle

Side cutting edge angle

Side cutting edge angle has big influence on chip flow and cutting force therefore proper Side cutting edge angle is very important.

Side cutting edge angle and Chip thickness



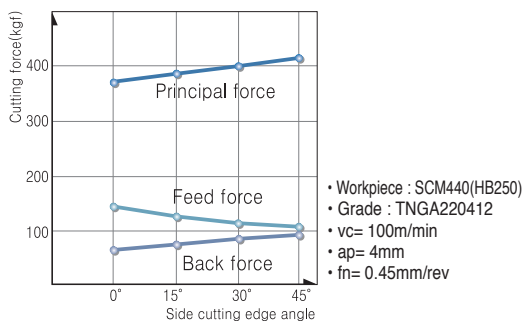
As side cutting edge angle is getting bigger chips are getting thinner and wider(refer to left picture).

At the same feed and depth of cut with approach angle 0°
Chip thickness is the same as feed($t=fn$) and chip width is equal to depth of cut ($W=ap$).

$$t1 = 0.97t, W1 = 1.04W$$

$$t2 = 0.87t, W2 = 1.15W$$

Side cutting edge angle and 3 cutting forces



- Workpiece : SCM440(HB250)
- Grade : TNGA220412
- vc= 100m/min
- ap= 4mm
- fn= 0.45mm/rev

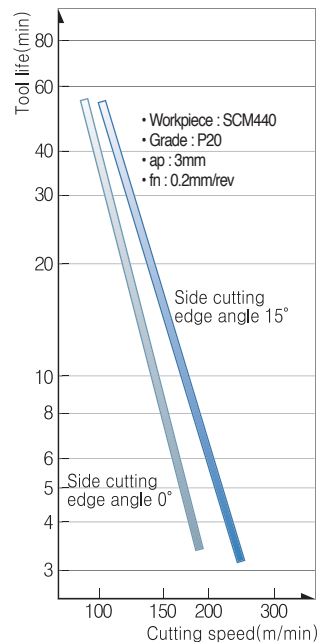
Affects

1. Big side cutting edge angle with the same feed makes chip attaching length longer and chip thickness thinner. So that cutting forces scatter to long cutting edge therefore tool life gets longer.
2. Big side cutting edge angle for machining long bars can cause bending.

Selection system

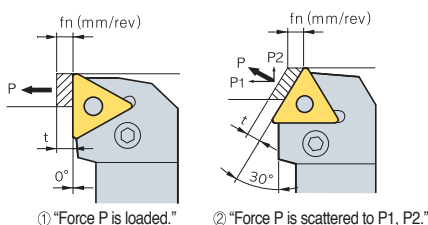
1. Deep depth of cut finishing / Long thin workpiece / Low machine rigidity - Side cutting edge angle
2. Hard and high calorific power workpiece / Roughing big workpiece / High machine rigidity - Side cutting edge angle

Side cutting edge angle and Tool life



- Workpiece : SCM440
- Grade : P20
- ap : 3mm
- fn : 0.2mm/rev

Side cutting edge angle and Cutting load



- ① "Force P is loaded."
- ② "Force P is scattered to P1, P2."

As approach angle gets bigger Back force gets bigger and feed force gets smaller.

Side cutting edge angle and Cutting performance

| Specification | Low | ← Approach angle → | High |
|--------------------|-------------------------|--------------------|---------------------------|
| Wear rate | High | ←.....→ | Low |
| Workpiece | Easy to cut material | ←.....→ | Difficult to cut material |
| Machining power | Small | ←.....→ | Big |
| Chatter | Hard to occur | ←.....→ | Easy to occur |
| How to machine | Finishing | ←.....→ | Roughing |
| Workpiece rigidity | Long thin workpiece | ←.....→ | Thick workpiece |
| Machine rigidity | In case of low rigidity | ←.....→ | In case of high rigidity |



End cutting edge angle

It affects machined surface to prevent interference between surface of workpiece and insert.

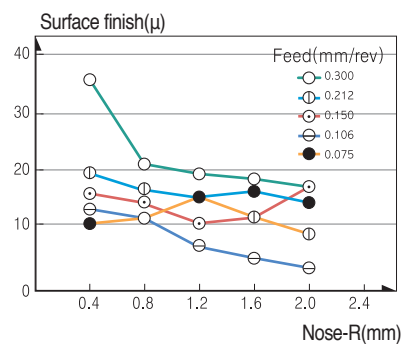
Affects

1. If end cutting edge angle reduces cutting edge get stronger but cutting heat generated by machining increases.
2. Small end cutting edge angle can cause chattering due to the increases cutting force.

Nose-R

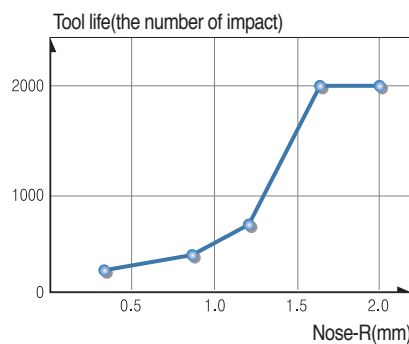
1. Nose-R affects not only surface roughness but strength of cutting edge.
2. In general, It's desirable that Nose-R is 2~3 times bigger than feed.

Nose R and surface finish



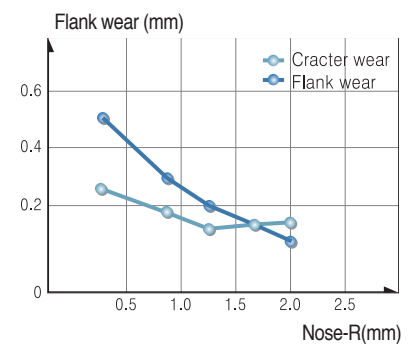
- Workpiece : SNCM439, HB200
- Grade : P20
- vc = 120m/min, ap = 0.5mm

Nose R and tool life



- Workpiece : SCM440, HB280
- Grade : P10
- vc = 100m/min, ap = 0.5mm
- fn = 0.3mm/rev

Nose R and wear of tool



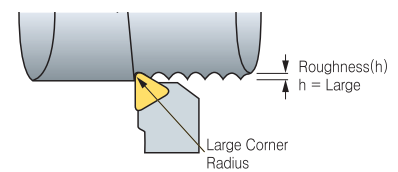
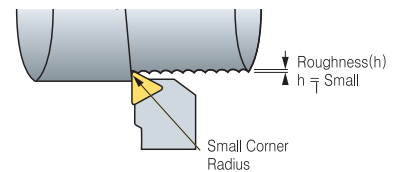
- Workpiece : SNCM439, HB200
- Grade : P10
- vc = 140m/min, ap = 2mm
- fn = 0.2mm/rev, T = 10min

Affects of Nose-R

1. Big Nose-R improves surface finish.
2. Big Nose-R improves cutting edge strength.
3. Big Nose-R reduces flank wear and crater wear.
4. Too big Nose-R causes chattering due to increased cutting force.

Selection system

1. For finishing with small depth of cut / long and thin workpiece / When machine power is low - Small Nose-R
2. For applications that need strong cutting edge such as intermittent and machining mill scale / For roughing of big workpiece / When the machine power is strong enough - Big Nose-R



Relationship between nose radius, feed and various surface roughness.

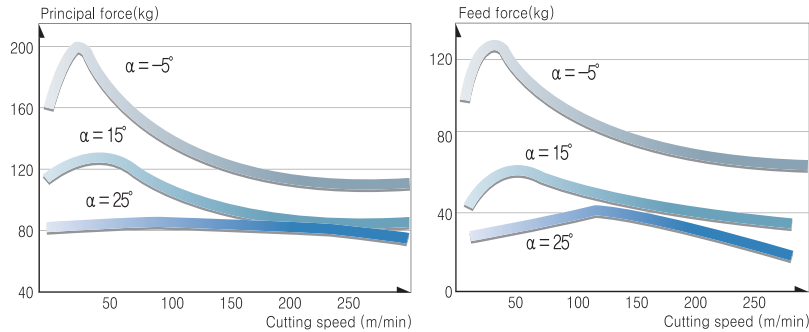
| Nose "R" / Feed(mm/rev) | 0.4 | 0.8 | 1.2 |
|-------------------------|-----|-----|-----|
| 0.15 | | | |
| 0.26 | | | |
| 0.46 | | | |



🎯 Cutting edge shape and the affects

● Rake angle

Rake angle has big influence on cutting force, chip flow and tool life.



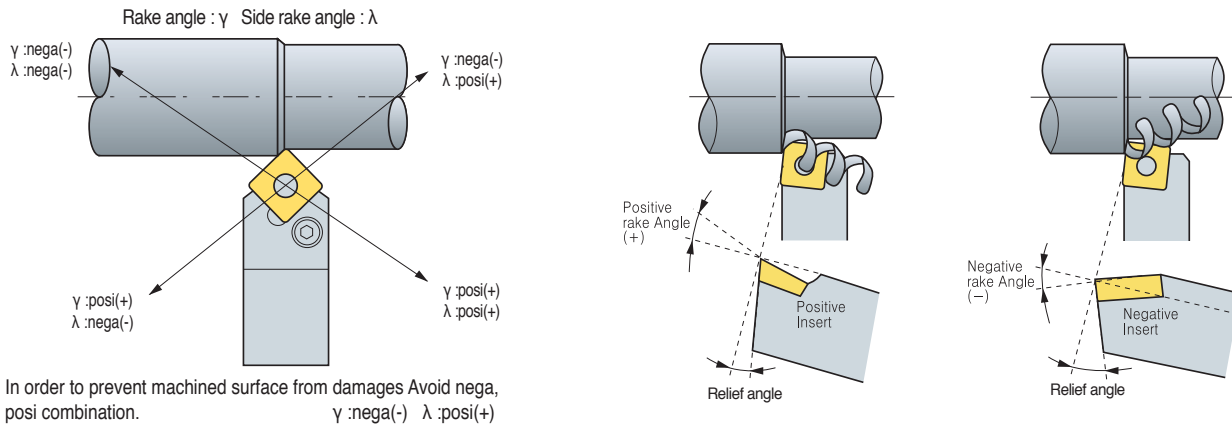
• Affects

1. High rake angle results in good surface finish.
2. As the rake angle increases by 1° Machining power decreases by 1%.
3. High rake angle weakens cutting edge.

• Selection system

1. For hard workpiece / For applications that need strong cutting edge such as interrupted and machining mill scale - Low rake angle
2. For soft workpiece / Easy to cut material / When the rigidity of machine power and workpiece is low - High rake angle

● Rake angle and the direction of chip flow



🎯 Selecting proper tools

Nowadays, It's very difficult to select the best tools in complicating tooling system and various cutting conditions. However, It can be simplified by classifying basic factors below.

● Selection of inserts and tool holder

Listed below is the basic factors and choose B according to A.

A : Basic factors


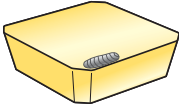


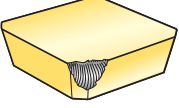
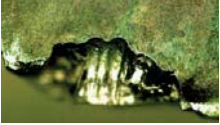

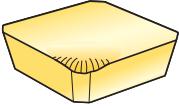
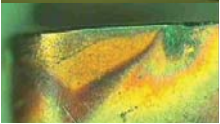
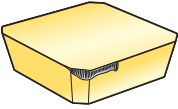
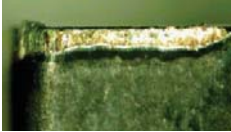
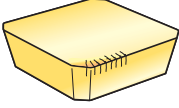

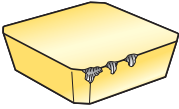

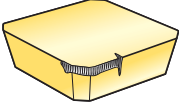


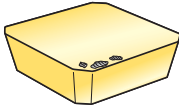

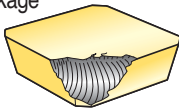


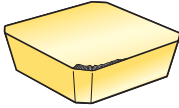

- Workpiece material
- Workpiece shape
- Workpiece size
- Hardness of workpiece
- Surface roughness of workpiece (before machining)
- Surface finish required
- Type of lathe machine
- Condition of lathe machine (rigidity, power etc)
- Horse power of machine
- Clamping method of workpiece

B : Selection system

- ① Select as big approach angle as possible.
- ② Select as big shank as possible.
- ③ Select as strong cutting edge of insert as possible
- ④ Select as big nose radius as possible
- ⑤ In finishing, Select the insert using many corners
- ⑥ Select as small insert as possible
- ⑦ Cutting speed should be determined carefully according to cutting conditions
- ⑧ Select as deep depth of cut as possible
- ⑨ Select as fast feed as possible
- ⑩ Cutting condition should be determined within chip breaker application ranges.



Trouble shooting

| Tool Failure | | | Cause | Solution |
|--|--|--|--|--|
| Crater wear    | | | <ul style="list-style-type: none"> • Improper grade • Excessive cutting condition | <ul style="list-style-type: none"> • Choose harder grade • Decrease cutting condition |
| Fracture    | | | <ul style="list-style-type: none"> • Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder | <ul style="list-style-type: none"> • Choose tougher grade • Decrease feed • Apply to large honed or chamfered edge • Choose bigger size holder |
| Plastic deformation    | | | <ul style="list-style-type: none"> • Improper grade • Excessive cutting condition • High cutting temperature | <ul style="list-style-type: none"> • Choose harder grade • Decrease cutting condition • Choose grade with heat conductivity are big |
| Wear on nose radius (Flank wear)   | | | <ul style="list-style-type: none"> • When the hardness of workpiece is too high compare with tool • When machining surface hardened workpiece • Improper grade • Excessive cutting speed • Too small relief angle • Too low feed | <ul style="list-style-type: none"> • Choose harder grade • Decrease cutting speed • Choose larger relief angle • Increase feed |
| Thermal crack   | | | <ul style="list-style-type: none"> • Expansion and shrinking by cutting temperature • Improper grade (*Specially milling operation) | <ul style="list-style-type: none"> • Apply to dry cutting (In case of wet cutting, use enough coolant) • Choose tougher grade |
| Chipping   | | | <ul style="list-style-type: none"> • Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder | <ul style="list-style-type: none"> • Choose tougher grade • Decrease feed • Apply to large honing or chamfer edge • Choose bigger size holder |
| Notch wear   | | | <ul style="list-style-type: none"> • Surface hardened workpiece • Friction due to bad chip geometry (Generate vibration) | <ul style="list-style-type: none"> • Choose harder grade • Improve chip control from large rake angle |
| Flaking    | | | <ul style="list-style-type: none"> • Deposition on cutting edge • Bad chip control | <ul style="list-style-type: none"> • Improve cutting performance from large rake angle • Apply to chip pocket with big size |
| Complete breakage   | | | <ul style="list-style-type: none"> • Unusable condition due to wear off the most parts of cutting edge by progress of wear | <ul style="list-style-type: none"> • Reduce the feed rate. • Reduce the depth of cut. • Select a tougher grade. • Select a stronger chipbreaker. • Select a thicker insert. |
| Built-up edge    | | | <ul style="list-style-type: none"> • Slow cutting speed • Sticky materials | <ul style="list-style-type: none"> • Increase cutting speed. • Use more positive rake geometry. • Use tougher grade |



Types of tool failure and trouble shooting

| Troubles | Causes | Solution | | | | | | | | | | | | | | | | | |
|--|---|--------------------|------|--------------|-------------|------------------------|----------------------|--|---|------------------------|------------|-------------|-------------------------|------------------------------|--|---------------------------|--------------------|-----------------|-------------------|
| | | Cutting conditions | | | | Selecting insert grade | | | | Tool shape | | | | | | Machine clamping | | | |
| | | Cutting speed | Feed | Depth of cut | Coolant | Select harder grade | Select tougher grade | Select better heat-impact resistance grade | Select better adhesion resistance grade | Chip breaker valuation | Rake angle | Nose radius | Side cutting edge angle | Cutting edge strength Honing | Improving insert precision M class → G class | Improving holder rigidity | Clamping workpiece | Holder overhang | Machine vibration |
| Poor precision Unstable machining size | Insert precision is variable | | | | | | | | | | | | | | ● | | | | |
| | Workpiece, Separation of tool | | | | | | | | ● | ↑ | ↓ | | | | | ● | ● | ● | ● |
| Cutting edge back thrust is big It's necessary to adjust because machining precision changes during operation. | Flank wear increase | | | | | ● | | | | | | ↑ | | | | | | | |
| | Cutting condition is improper | ↓ | ↑ | | | | | | | | | | | | | | | | |
| Poor surface roughness for finishing Criterion of tool life. | Weakened cutting force by increasing wear of tool | ↓ | | | Wet cutting | ● | | ● | ● | ↑ | ↑ | | ↓ | ● | | | | | |
| | Cutting edge chipping | | ↓ | ↓ | | | ● | | ● | | ↑ | | ↑ | | | ● | ● | ● | |
| | Adhesion, built-up edge | ↑ | ↑ | | Wet cutting | | | ● | ● | ↑ | | | ↓ | ● | | | | | |
| | Improper cutting conditions | ↑ | ↓ | ↓ | Wet cutting | | | | | | | | | | | | | | |
| | Improper tool and shape of cutting edge | | | | | | | | ● | | ↑ | | ↓ | ● | | | | | |
| | Vibration, chattering | ↓ | ↓ | ↓ | Wet cutting | ● | | | ● | ↑ | ↓ | | ↓ | | | ● | ● | ● | ● |
| Cutting heat generation Poor machining precision and short tool life by cutting heat | Improper cutting conditions | ↓ | ↓ | ↓ | | | | | | | | | | | | | | | |
| | Improper tool and shape of cutting edge | | | | | ● | | | ● | ↑ | | | ↓ | | | | | | |
| burr, chipping, nap steel, aluminum (burr) | Improper cutting conditions | ↓ | ↑ | | Wet cutting | | | | | | | | | | | | | | |
| | Wear on the tool, improper shape of cutting edge | | | | | ● | | ⊙ | ● | ↑ | ↓ | | ↓ | | | | | | |
| Cast iron (Weak chipping) | Improper cutting conditions | | ↓ | ↓ | | | | | | | | | | | | | | | |
| | Wear on the tool, improper shape of cutting edge | | | | | ● | | | ● | ↑ | ↑ | | ↓ | | ● | ● | ● | ● | |
| Soft steel (nap) | Improper cutting conditions | ↑ | ↑↓ | | Wet cutting | | | | | | | | | | | | | | |
| | Wear on the tool, improper shape of cutting edge | | | | | ● | | ⊙ | ● | ↑ | | | ↓ | | | | | | |

↑ : Increase ↓ : Decrease ● : use ⊙ : Correct use

Tool life criterion

● KS B0813

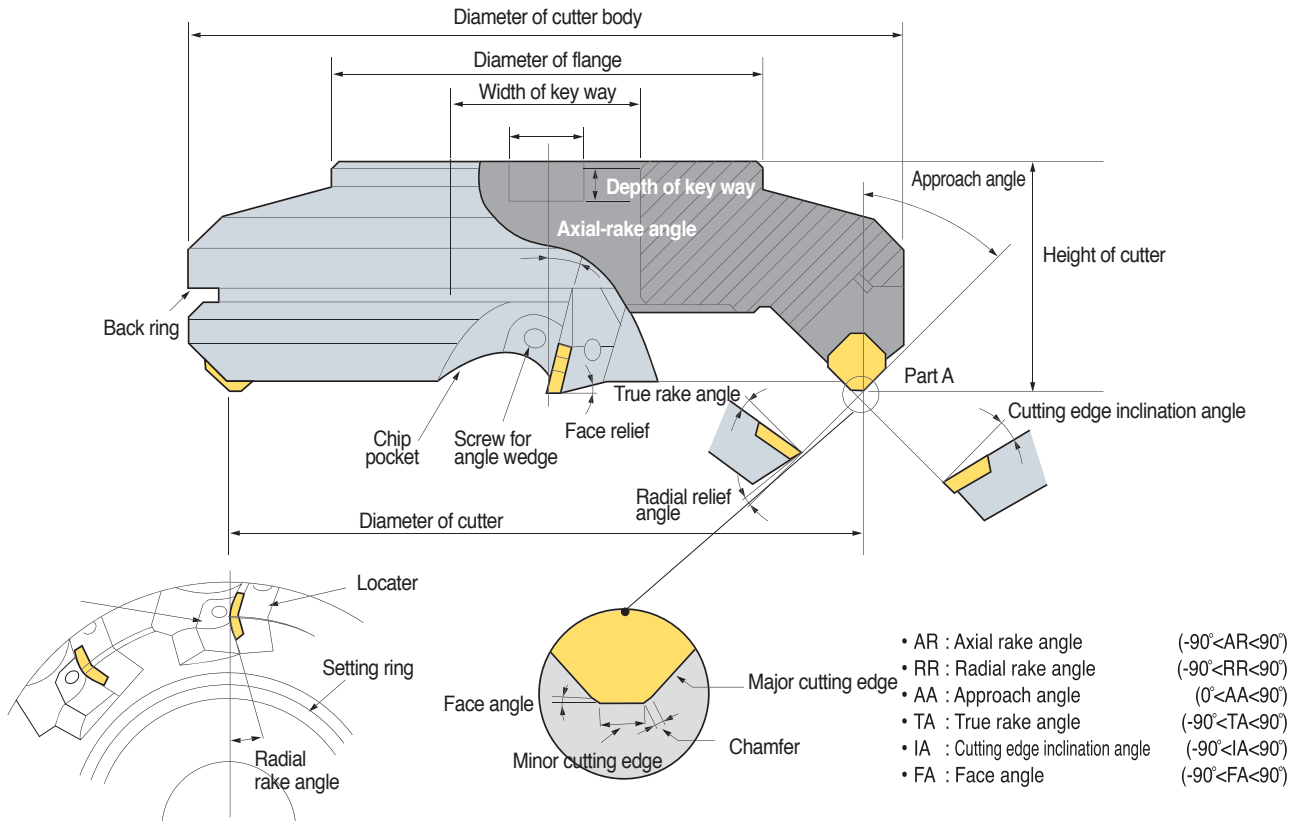
| Flank wear width | 0.2mm | Precision light cutting , Finishing in nonferrous alloy |
|----------------------|------------------------|---|
| | 0.4mm | Machining special steel |
| | 0.7mm | General cutting in cast iron, steel etc |
| | 1~1.25mm | General cutting in cast iron, steel etc |
| Depth of crater wear | In general 0.05~0.1 mm | |

● ISO(B8688)

| Tool life criterion | Application |
|--|--|
| Complete breakage | Machining special steel |
| Flank wear width VB = 0.3mm | Even flank wear of cemented carbides, Ceramic tool |
| VBmax = 0.5mm | Uneven flank wear |
| Crater wear width KT = 0.06+0.3fmm (f:mm/rev) | Cemented carbides tool |
| Criterion by surface roughness 1, 1.6, 2.5, 4, 6.3, 10 _μ Ra | When surface roughness is important |



Milling cutter shape and designation



The terminology and functions of cutting edge angle

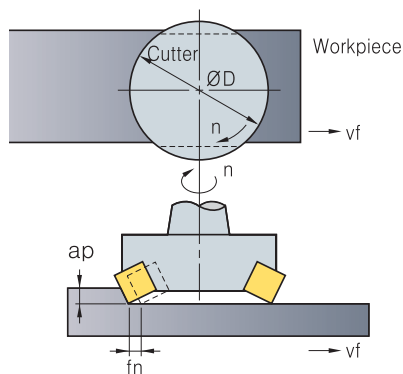
| | Tool failure | Symbol | Function | Effects |
|---|--------------------------------|--------|---|--|
| 1 | Axial rake angle | A.R | Chip flow direction, Adhesion | - |
| 2 | Radial rake angle | R.R | Affecting on thrust | - |
| 3 | Approach angle | A.A | Chip thickness, Determines flow direction | (+) : Chip thickness become thinner, cutting force could be reduced. |
| 4 | True rake angle | T.A | Effective rake angle | (+) : Better cutting. Preventing adhesion, Weakening cutting edge strength. (-) : Cutting edge strength increases, easy to adhere |
| 5 | Cutting edge inclination angle | I.A | Determines chip flow direction | (+) : Good chip flow, cutting force decreases, Corner edge strength weakens |
| 6 | Face angle | F.A | Controlling surface roughness for finishing | (-) : Surface roughness improves |
| 7 | Relief angle | R.A | Controlling cutting edge strength, tool life and chattering | - |



Features by combination of rake angle

| | Double positive angle | Double negative angle | Posi - Negative angle | Nega - Positive angle |
|----------------------|---|--|--|--|
| | | | | |
| Use | <ul style="list-style-type: none"> General machining of steel, cast iron, stainless steel Machining soft steel that brings about built-up edge easily Machining material having tendency to poor surface roughness | <ul style="list-style-type: none"> Under interrupted cutting condition Roughing of cast iron and steel | <ul style="list-style-type: none"> Machining difficult to cut material Roughing with deep depth of cut and wide width of cut in steel and cast iron | <ul style="list-style-type: none"> Chip flows to center of cutter body |
| Advantages | <ul style="list-style-type: none"> As for tough workpiece material It prevents built-up edge to improve surface roughness. Low cutting load and better machinability | <ul style="list-style-type: none"> Strong cutting edge. Roughing of workpiece that has bad surface condition containing sand, mill scale Double sided inserts can be applied(Economical). Good chip control. | <ul style="list-style-type: none"> Good chip flow and machinability. Suitable for machining of difficult-to-cut material Un-even partition clamping prevents chattering | - |
| Disadvantages | <ul style="list-style-type: none"> Weak cutting edge strength. Only single sided inserts are available (No economical). Machine and cutter need enough power and rigidity. | <ul style="list-style-type: none"> Machine and cutter need enough power and rigidity. | <ul style="list-style-type: none"> Only single sided inserts are available (No economical) | <ul style="list-style-type: none"> Since the chips flows toward the center of cutter. Chips scratch on machined surface. Bad chip flow. No economical |

Major cutting formulas



● Cutting speed

$$vc = \frac{\pi \cdot D \cdot n}{1000} \text{ (m/min)}$$

- vc : Cutting speed (m/min)
- D : Diameter of tool (mm)
- n : Revolution per minute (min⁻¹)
- π : Circular constant (3.14)

● Feed

$$fz = \frac{vf}{z \cdot n} \text{ (mm/t)}$$

- fz : Feed per tooth (mm/t)
- vf : Feed per minute (mm/min)
- n : Revolution per minute (min⁻¹)
- z : Number of tooth

● Chip removal amount

$$Q = \frac{L \times vf \times ap}{1000} \text{ (cm}^3\text{/min)}$$

- Q : Chip removal amount (cm³/min)
- L : Width of cut (mm)
- vf : Table feed (mm/min)
- ap : Depth of cut (mm)

● Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \quad P_{hp} = \frac{P_{kw}}{0.75}$$

- Pc : Power requirement (kW)
- H : Horse power requirement (hp)
- Q : Chip removal amount (cm³/min)
- kc : Specific cutting resistance (kgf/mm²)
- η : Machine efficiency rate (0.7-0.8)

● Machining time

$$T = \frac{60 \times Lt}{vf} \text{ (sec)}$$

- T : Machining time (sec)
- Lt : Total length of table feed (mm)=(Lw+D+2R)
- Lw : The length of workpiece (mm)
- D : The diameter of cutter body (mm)
- vf : Table feed (mm/min)
- R : Relief length (mm)

● True rake angle / Cutting edge inclination angle

True rake angle $\tan(T) = \tan(R) \times \cos(AA) + \tan(A) \times \sin(C)$
 Cutting edge inclination angle $\tan(I) = \tan(A) \times \cos(AA) - \tan(R) \times \sin(C)$



Values of specific cutting resistance

| Workpiece | Tensile strength (kg/mm ²) and hardness | Specific cutting resistance according to various feed kc(MPa) | | | | |
|--------------------------------|---|---|------------|------------|------------|------------|
| | | 0.1 (mm/t) | 0.2 (mm/t) | 0.3 (mm/t) | 0.4 (mm/t) | 0.6 (mm/t) |
| Soft steel | 52 | 220 | 195 | 182 | 170 | 158 |
| Medium carbon steel | 62 | 198 | 180 | 173 | 160 | 157 |
| High carbon steel | 72 | 252 | 220 | 204 | 185 | 174 |
| Tool steel | 67 | 198 | 180 | 173 | 170 | 160 |
| Tool steel | 77 | 203 | 180 | 175 | 170 | 158 |
| Chrome manganese steel | 77 | 230 | 200 | 188 | 175 | 166 |
| Chrome manganese steel | 63 | 275 | 230 | 206 | 180 | 178 |
| Chrome molybdenum steel | 73 | 254 | 225 | 214 | 200 | 180 |
| Chrome molybdenum steel | 60 | 218 | 200 | 186 | 180 | 167 |
| Nickel Chrome molybdenum steel | 94 | 200 | 180 | 168 | 160 | 150 |
| Nickel Chrome molybdenum steel | HB352 | 210 | 190 | 176 | 170 | 153 |
| Cast steel | 52 | 280 | 250 | 232 | 220 | 204 |
| Hardened cast iron | HRC46 | 300 | 270 | 250 | 240 | 220 |
| Meehanite cast iron | 36 | 218 | 200 | 175 | 160 | 147 |
| Gray cast iron | HB200 | 175 | 140 | 124 | 105 | 97 |
| Brass | 50 | 115 | 95 | 80 | 70 | 63 |
| Light alloy(Al - Mg) | 16 | 58 | 48 | 40 | 35 | 32 |
| Light alloy(Al - Si) | 20 | 70 | 60 | 52 | 45 | 39 |

Chip removal amount(cm³/min) per rated horse power

| Workpiece | Rated horse power | 5Hp | 10Hp | 20Hp | 30Hp | 40Hp | 50Hp |
|------------------|-------------------|--------------|------|------|------|-------|-------|
| | | Steel | Soft | 32 | 75 | 163 | 295 |
| | Medium | 26 | 55 | 127 | 212 | 310 | 425 |
| | hard | 18 | 41 | 93 | 163 | 228 | 310 |
| Cast iron | Soft | 52 | 116 | 260 | 455 | 670 | 880 |
| | Medium | 32 | 75 | 163 | 295 | 425 | 570 |
| | hard | 26 | 55 | 127 | 212 | 310 | 425 |
| Bronze | Soft | 77 | 163 | 390 | 670 | 980 | 1,280 |
| Brass | Medium | 54 | 118 | 275 | 490 | 700 | 910 |
| | hard | 26 | 55 | 127 | 245 | 325 | 425 |
| Aluminum | | 90 | 195 | 440 | 780 | 1,110 | 1,500 |

Classification of surface roughness

| Type | Symbol | How to calculate | Measured value |
|---------------------------|--------|---|----------------|
| Maximum height | Rmax | <ul style="list-style-type: none"> The distance between the top of profile peak line and the bottom of profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve (Expressed by unit: μ). Exclude extraordinary values(too small or big) that look like grooves or mountains. | |
| +10 point mean roughness | Rz | <ul style="list-style-type: none"> Sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute value of the highest profile peaks and the depths of five deepest profile valleys measured in the vertical magnification is expressed by micro meter(μ). | |
| Arithmetic mean roughness | Ra | <ul style="list-style-type: none"> Sampling only the reference length from the roughness curve in the direction of mean line, taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and is expressed by micro meter(μ). Generally, Read measured value by Ra measurer. | |

| Finish mark | | ▽▽▽▽ | ▽▽▽ | ▽▽ | ▽ | ~ |
|-------------------|------|------|------|------|------|-------------|
| Surface roughness | Rmax | 0.8s | 6.3s | 25s | 100s | Unspecified |
| | Rz | 0.8z | 6.3z | 25z | 100z | |
| | Ra | 0.2a | 1.6a | 6.3a | 25a | |

Selection of MILL-MAX diameter(D)

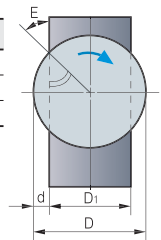
Selection by machine rigidity

| Machine horse power(PS) | 10~15 | 15~20 | Over 20 |
|--------------------------------------|----------|-----------|-----------|
| Proper cutter body specification(mm) | φ80~φ100 | φ125~φ160 | φ160~φ200 |

Selection by machine rigidity

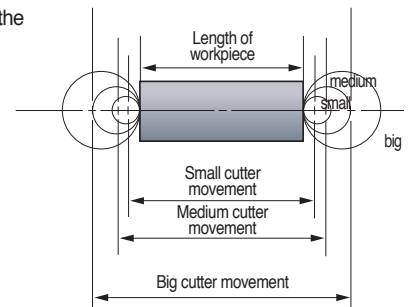
| Workpiece | E | δ |
|-------------|------------|-------|
| Steel | +20°~10° | 3 : 2 |
| Cast iron | Under +50° | 5 : 4 |
| Light alloy | Under +40° | 5 : 3 |

D : External diameter of cutter body
D1 : Width of workpiece
d : Projected part of cutter body
E : Engage angle
δ : Ratio of cutter body and width of workpiece(D:D1)



Selection by machining time

The bigger size cutter the longer machining time.



Selection by number of tooth

| Workpiece | Steel | Cast iron | Light alloy |
|-----------------|-----------|-----------|-------------|
| Number of tooth | Dx(1~1.5) | Dx(1~4) | Dx1+a |

ex) D=φ100 ⇒ 4" x(1~1.5)=4~6

D is the size of cutter body converted into inch size.

🎯 Trouble shooting for milling

| Trouble | Causes | Solutions | | | | | | | | | | |
|---------------------|---|--------------------|--------------|------|---------|------------|--------------|----------------|----------------------------|--------------|-----------|----------|
| | | Cutting conditions | | | | Tool shape | | | | Insert grade | | |
| | | Cutting speed | Depth of cut | Feed | Coolant | Rake angle | Relief angle | Approach angle | Chattering at cutting edge | Nose radius | Toughness | Hardness |
| Flank wear | <ul style="list-style-type: none"> Improper insert grade Improper cutting conditions Chattering | ↓ | | ↑ | | | ↑ | ↓ | | ↑ | | ↑ |
| Crater wear | <ul style="list-style-type: none"> Improper cutting conditions Improper insert grade | ↓ | ↓ | ↓ | ● | ↑ | | | | ↓ | | ↑ |
| Chipping | <ul style="list-style-type: none"> Lack of insert toughness Excessive feed Excessive cutting load | | | ↓ | | ↓ | ↓ | ↓ | | ↑ | ↑ | |
| Built-up edge | <ul style="list-style-type: none"> Improper cutting conditions Improper cutting edge shape Improper insert grade | ↑ | ↓ | ↑ | | ↑ | | | | ↓ | | |
| Chattering | <ul style="list-style-type: none"> Improper cutting conditions Lack of number of cutting teeth Improper cutting edge shape Bad chip flow Unstable workpiece clamping | | ↓ | ↓ | ● | ↑ | | ↑ | ↓ | ↓ | | |
| Poor surface finish | <ul style="list-style-type: none"> Built-up edge Improper cutting conditions Chattering Bad chip flow | ↑ | ↓ | ↓ | ● | ↑ | | | ↓ | ↑ | | |
| Thermal crack | <ul style="list-style-type: none"> Improper cutting conditions Improper insert grade | ↓ | ↓ | ↓ | ⊙ | ↑ | | | | ↑ | ↑ | |
| Fracture | <ul style="list-style-type: none"> Improper insert grade Excessive cutting load Bad chip flow Chattering Excessive overhang | | ↓ | ↓ | ● | | | | | | ↑ | |

↑ : Increase ↓ : Decrease ● : use ⊙ : Correct use

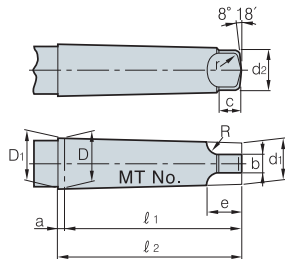
🎯 General formulas for milling

● Machine efficiency rate (η)

| Power transmission mode | Efficiency rate (E) | Reference |
|--|---------------------|---|
| Principal axis direct connection driving | 0.90 | |
| Belt driving | 0.85 | Double connection : $0.85 \times 0.85 \approx 0.70$ |
| Starting driving | 0.75 | |
| Oil pressure driving | 0.60~0.90 | |

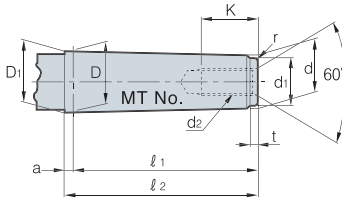


● Morse taper (Tang type)



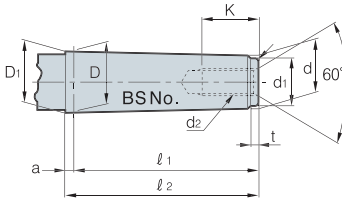
| MT No. | Taper | Taper angle(α) | D | a | D ₁ | d ₁ | l ₁ | l ₂ | d ₂ | b | c | e | R | r |
|--------|--------------------|----------------|--------|-----|----------------|----------------|----------------|----------------|----------------|------|-----|------|----|-----|
| 0 | $\frac{1}{19.212}$ | 1°29'27" | 9.045 | 3 | 9.201 | 6.104 | 56.5 | 59.5 | 6.0 | 3.9 | 6.5 | 10.5 | 4 | 1 |
| 1 | $\frac{1}{20.047}$ | 1°25'43" | 12.065 | 3.5 | 12.240 | 8.972 | 62.0 | 65.5 | 8.7 | 5.2 | 8.5 | 13.5 | 5 | 1.2 |
| 2 | $\frac{1}{20.020}$ | 1°25'50" | 17.780 | 5 | 18.030 | 14.034 | 75.0 | 80.0 | 13.5 | 6.3 | 10 | 16 | 6 | 1.6 |
| 3 | $\frac{1}{19.922}$ | 1°26'16" | 23.825 | 5 | 24.076 | 19.107 | 94.0 | 99.0 | 18.5 | 7.9 | 13 | 20 | 7 | 2 |
| 4 | $\frac{1}{19.254}$ | 1°29'15" | 31.267 | 6.5 | 31.605 | 25.164 | 117.5 | 124.0 | 24.5 | 11.9 | 16 | 24 | 8 | 2.5 |
| 5 | $\frac{1}{19.002}$ | 1°30'26" | 44.399 | 6.5 | 4.741 | 36.531 | 149.5 | 156.0 | 35.7 | 15.9 | 19 | 29 | 10 | 3 |
| 6 | $\frac{1}{19.180}$ | 1°29'36" | 63.348 | 8 | 63.765 | 52.399 | 210.0 | 218.0 | 51.0 | 19.0 | 27 | 40 | 13 | 4 |
| 7 | $\frac{1}{19.231}$ | 1°29'22" | 83.058 | 10 | 83.578 | 68.186 | 286.0 | 296.0 | 66.8 | 28.6 | 35 | 54 | 19 | 5 |

● Morse taper (Screw type)



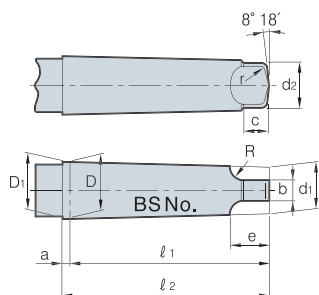
| MT No. | Taper | Taper angle(α) | D | a | D ₁ | d | l ₁ | l ₂ | d ₁ | d ₂ | k | t | r |
|--------|--------------------|----------------|--------|-----|----------------|--------|----------------|----------------|----------------|----------------|----|------|-----|
| 0 | $\frac{1}{19.212}$ | 1°29'27" | 9.045 | 3 | 9.201 | 6.442 | 50 | 53 | 6 | - | | 4 | 0.2 |
| 1 | $\frac{1}{20.047}$ | 1°25'43" | 12.065 | 3.5 | 12.230 | 9.396 | 53.5 | 57 | 9 | M6 | 16 | 5 | 0.2 |
| 2 | $\frac{1}{20.020}$ | 1°25'50" | 17.780 | 5 | 18.030 | 14.583 | 64 | 69 | 14 | M10 | 24 | 5 | 0.2 |
| 3 | $\frac{1}{19.922}$ | 1°26'16" | 23.825 | 5 | 24.076 | 19.759 | 81 | 86 | 19 | M12 | 28 | 7 | 0.6 |
| 4 | $\frac{1}{19.254}$ | 1°29'15" | 31.267 | 6.5 | 31.605 | 25.943 | 102.5 | 109 | 25 | M16 | 32 | 9 | 1 |
| 5 | $\frac{1}{19.002}$ | 1°30'26" | 44.399 | 6.5 | 4.741 | 37.584 | 129.5 | 136 | 35.7 | M20 | 40 | 9 | 2.5 |
| 6 | $\frac{1}{19.180}$ | 1°29'36" | 63.348 | 8 | 63.765 | 53.859 | 182 | 190 | 51 | M24 | 50 | 12 | 4 |
| 7 | $\frac{1}{19.231}$ | 1°29'22" | 83.058 | 10 | 83.578 | 70.058 | 250 | 260 | 65 | M33 | 80 | 18.5 | 5 |

● Brown sharp taper (Screw type)



| B&S No. | D | a | D ₁ | d | d ₁ | l ₁ | l ₂ | t | r | d ₂ | K |
|---------|--------|-----|----------------|--------|----------------|----------------|----------------|---|-----|----------------|----|
| 4 | 10.221 | 2.4 | 10.321 | 8.890 | 8.0 | 31.0 | 34.2 | 2 | 0.2 | - | - |
| 5 | 13.286 | 2.4 | 13.386 | 11.430 | 10.0 | 44.4 | 46.8 | 3 | 0.2 | - | - |
| 6 | 15.229 | 2.4 | 15.330 | 12.700 | 11.0 | 60.0 | 62.7 | 3 | 0.2 | M 8(1/4) | 20 |
| 7 | 18.424 | 2.4 | 18.524 | 15.240 | 14.0 | 76.2 | 78.6 | 4 | 0.2 | M10(3/8) | 24 |
| 8 | 22.828 | 3.2 | 22.962 | 19.090 | 17.0 | 90.5 | 93.7 | 4 | 0.6 | M12(1/2) | 28 |
| 9 | 27.104 | 3.2 | 27.238 | 22.863 | 21.0 | 101.6 | 104.8 | 4 | 0.6 | M12(1/2) | 28 |
| 10 | 32.749 | 3.2 | 32.887 | 26.534 | 24.0 | 144.5 | 147.7 | 5 | 1.0 | M16(5/8) | 32 |
| 11 | 38.905 | 3.2 | 39.039 | 31.749 | 29.0 | 171.4 | 174.6 | 5 | 1.0 | M16(5/8) | 32 |
| 12 | 45.641 | 3.2 | 45.774 | 38.103 | 35.0 | 181.0 | 184.2 | 6 | 2.5 | M20(3/4) | 40 |
| 13 | 52.654 | 3.2 | 52.787 | 44.451 | 41.0 | 196.8 | 200.0 | 6 | 3.0 | M20(3/4) | 40 |
| 14 | 59.533 | 3.2 | 59.666 | 50.800 | 47.0 | 209.6 | 212.8 | 7 | 4.0 | M24(1) | 40 |
| 15 | 66.408 | 3.2 | 66.541 | 57.150 | 53.0 | 222.2 | 225.4 | 7 | 4.0 | M24(1) | 50 |
| 16 | 73.292 | 3.2 | 73.425 | 63.500 | 59.0 | 35.0 | 238.2 | 8 | 5.0 | M30(11/8) | 60 |

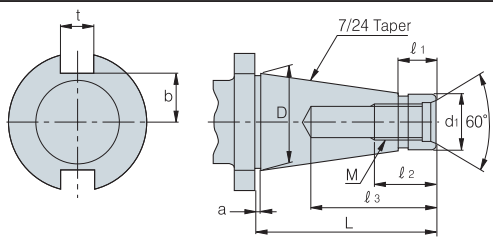
● Brown sharp taper (Tang type)



| B&S No. | D | a | D ₁ | d ₁ | d ₂ | l ₁ | l ₂ | b | c | e | R | r |
|---------|--------|-----|----------------|----------------|----------------|----------------|----------------|------|------|------|------|-----|
| 4 | 10.221 | 2.4 | 10.321 | 8.458 | 8.1 | 42.1 | 44.5 | 5.5 | 8.7 | 14.4 | 7.9 | 1.3 |
| 5 | 13.286 | 2.4 | 13.386 | 10.962 | 10.7 | 55.6 | 58.0 | 6.3 | 9.5 | 16.2 | 7.9 | 1.5 |
| 6 | 15.229 | 2.4 | 15.330 | 12.167 | 11.7 | 73.0 | 75.4 | 7.1 | 11.1 | 18.0 | 7.9 | 1.5 |
| 7 | 18.424 | 2.4 | 18.524 | 14.675 | 14.2 | 89.7 | 92.1 | 7.9 | 11.9 | 20.3 | 9.5 | 1.8 |
| 8 | 22.828 | 3.2 | 22.962 | 18.453 | 18.0 | 104.8 | 108.0 | 8.7 | 12.7 | 22.0 | 9.5 | 2.0 |
| 9 | 28.104 | 3.2 | 27.238 | 22.200 | 21.8 | 117.5 | 120.7 | 9.5 | 14.3 | 25.4 | 11.1 | 2.5 |
| 10 | 32.749 | 3.2 | 32.887 | 25.751 | 25.7 | 162.7 | 165.9 | 11.1 | 16.7 | 28.1 | 11.1 | 2.8 |
| 11 | 38.905 | 3.2 | 39.039 | 30.985 | 30.7 | 189.7 | 192.9 | 11.1 | 16.7 | 30.0 | 12.7 | 3.3 |
| 12 | 45.641 | 3.2 | 45.774 | 37.246 | 37.1 | 201.6 | 204.8 | 12.7 | 19.0 | 32.5 | 12.7 | 3.8 |
| 13 | 52.654 | 3.2 | 52.787 | 43.589 | 43.4 | 217.5 | 220.7 | 12.7 | 19.0 | 35.7 | 15.9 | 4.3 |
| 14 | 59.533 | 3.2 | 59.666 | 49.841 | 49.8 | 232.6 | 235.8 | 14.2 | 21.4 | 41.2 | 19.0 | 4.8 |
| 15 | 66.408 | 3.2 | 66.541 | 56.186 | 56.1 | 245.3 | 248.5 | 14.2 | 21.4 | 44.4 | 22.2 | 5.3 |
| 16 | 73.292 | 3.2 | 73.425 | 62.441 | 62.2 | 260.4 | 263.6 | 15.8 | 23.8 | 50.0 | 25.4 | 5.8 |

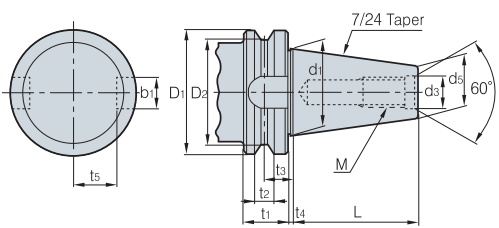


● Standard taper of American milling machine



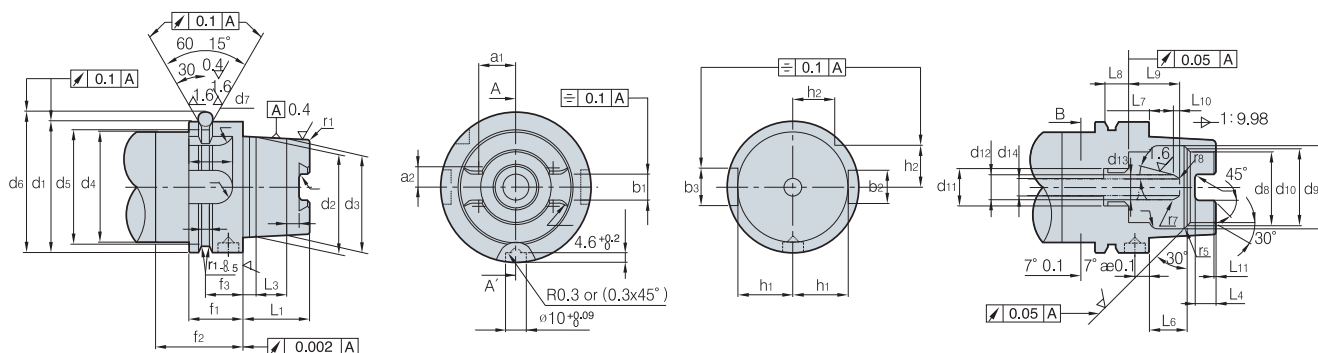
| NT No. | Dimensions | D | D ₁ | L | l ₁ | M | l ₂ | l ₃ | a | t | b |
|--------|-------------------------------|---------|--|-----|----------------|-------------------------------------|----------------|----------------|-----|------|------|
| 30 | 1 ¹ / ₄ | 31.750 | 17.40 ^{-0.29} _{-0.36} | 70 | 20 | UNC 1 ¹ / ₂ " | 24 | 50 | 1.6 | 15.9 | 6 |
| 40 | 1 ³ / ₄ | 44.450 | 25.32 ^{-0.30} _{-0.384} | 95 | 25 | UNC 5 ⁵ / ₈ " | 30 | 60 | 1.6 | 15.9 | 22.5 |
| 50 | 2 ³ / ₄ | 69.850 | 39.60 ^{-0.31} _{-0.41} | 130 | 25 | UNC 1" | 45 | 90 | 3.2 | 25.4 | 35 |
| 60 | 4 ¹ / ₄ | 107.950 | 60.20 ^{-0.34} _{-0.46} | 210 | 45 | UNC 1 ¹ / ₄ " | 56 | 110 | 3.2 | 25.4 | 60 |

● Bottle grip taper



| BT No. | D ₁ | D ₂ | t ₁ | t ₂ | t ₃ | t ₄ | d ₁ | d ₃ | L | M | b ₁ | t ₅ | d ₅ |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|----------|----------------|----------------|----------------|
| 35 | 53 | 43 | 22 | 10 | 14.6 | 2 | 38.1 | 13 | 56.5 | M12x1.75 | 16.1 | 19.6 | 21.62 |
| 40 | 63 | 52 | 25 | 10 | 16.6 | 2 | 44.45 | 17 | 65.4 | M16x2 | 16.1 | 22.6 | 25.3 |
| 45 | 85 | 73 | 30 | 12 | 21.2 | 3 | 57.15 | 21 | 82.8 | M20x2.5 | 19.3 | 29.1 | 33.1 |
| 50 | 100 | 85 | 35 | 15 | 23.2 | 3 | 69.85 | 25 | 101.8 | M24x3 | 25.7 | 35.4 | 40.1 |
| 60 | 155 | 135 | 45 | 20 | 28.2 | 3 | 107.95 | 31 | 161.8 | M30x3.5 | 25.7 | 60.1 | 60.7 |

● HSK shank (DIN 69893)

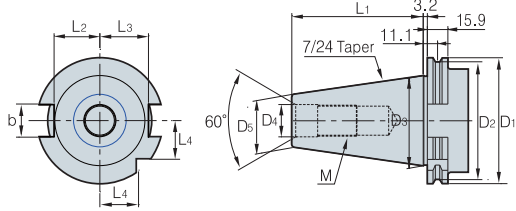


| HSK No. | b ₁ | b ₂ | b ₃ | d ₁ | d ₂ | d ₃ | d ₄ | d ₅ | d ₆ | d ₇ | d ₈ | d ₉ | d ₁₀ | d ₁₁ | d ₁₂ | d ₁₃ | d ₁₄ | a ₁ | a ₂ |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|
| 50 | 10.54 | 12 | 14 | 50 | 38 | 36.90 | 42 | 43 | 59.3 | 7 | 26 | 32 | 29 | M16X1 | 10 | 6.8 | 6.8 | 13.997 | 7.648 |
| 63 | 12.5 | 16 | 14 | 63 | 48 | 46.53 | 53 | 55 | 72.3 | 7 | 34 | 40 | 37 | M18X1 | 12 | 8 | 8.4 | 17.862 | 9.25 |
| 100 | 20 | 20 | 14 | 100 | 75 | 72.80 | 85 | 92 | 109.75 | 7 | 53 | 63 | 58 | M24X1.5 | 16 | 12 | 12 | 27.329 | 15.00 |

| HSK No. | f ₁ | f ₂ | f ₃ | f ₄ | b ₁ | b ₂ | L ₁ | L ₂ | L ₃ | L ₄ | L ₅ | L ₆ | L ₇ | L ₈ | L ₉ | L ₁₀ | L ₁₁ | L ₁₂ | r ₁ | r ₂ | r ₃ | r ₄ | r ₅ | r ₆ | r ₇ | r ₈ |
|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 50 | 26 | 42 | 18 | 3.75 | 2 | 15.5 | 25 | 5 | 11 | 7.5 | 4.5 | 14.13 | 10 | 10 | 23 | 3 | 1 | 19 | 1 | 1.5 | 2.38 | 6 | 0.5 | 1 | 2 | 6 |
| 63 | 26 | 42 | 18 | 3.75 | 28.5 | 20 | 32 | 6.3 | 14.7 | 10 | 6 | 18.13 | 10 | 12 | 24.5 | 3 | 1 | 21 | 1.2 | 1.5 | 3 | 8 | 0.6 | 1.5 | 3 | 8 |
| 100 | 29 | 45 | 20 | 3.75 | 44 | 31.5 | 50 | 10 | 24 | 15 | 10 | 28.56 | 12.5 | 16 | 28 | 3 | 1.5 | 24 | 2 | 2 | 3 | 12 | 1 | 1.5 | 3 | 10 |

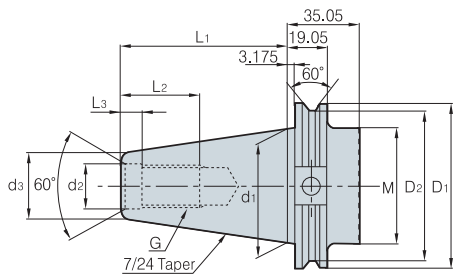


● DIN 69871



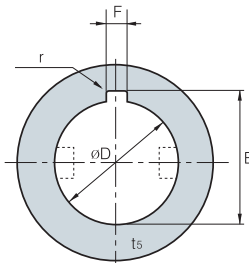
| Shank No | D ₁ | D ₂ | D ₃ | D ₄ | D ₅ | L ₁ | L ₂ | L ₃ | L | b | M |
|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|------|----------|
| 30 | 50.0 | 44.3 | 31.75 | 13 | 17.8 | 47.8 | 16.4 | 19.0 | 33.5 | 16 | M12x1.75 |
| 40 | 63.5 | 56.2 | 44.45 | 17 | 24.5 | 68.4 | 22.8 | 25.0 | 42.5 | 16.1 | M16x2 |
| 45 | 82.5 | 57.2 | 57.15 | 21 | 33.0 | 82.7 | 29.1 | 31.3 | 52.5 | 19.3 | M20x2.5 |
| 50 | 97.5 | 91.2 | 68.85 | 25 | 40.1 | 101.7 | 35.5 | 37.7 | 61.5 | 25.7 | M24x3 |

● CAT shank



| Shank No | D ₁ | D ₂ | M | d ₁ | d ₂ | d ₃ | L ₁ | L ₂ | L ₃ | G |
|----------|----------------|----------------|-------|----------------|----------------|----------------|----------------|----------------|----------------|--------|
| CAT40 | 63.5 | 56.36 | 44.45 | 44.45 | 16.28 | 21.84 | 68.25 | 28.45 | 4.78 | 5/8-11 |
| CAT45 | 82.55 | 75.41 | 57.15 | 57.15 | 19.46 | 27.69 | 82.55 | 38.1 | 4.78 | 3/4-10 |
| CAT50 | 98.43 | 91.29 | 69.85 | 69.85 | 26.19 | 35.05 | 101.6 | 44.45 | 6.35 | 1-8 |

● Standard of milling cutter hole (KSB3203)



● Type A

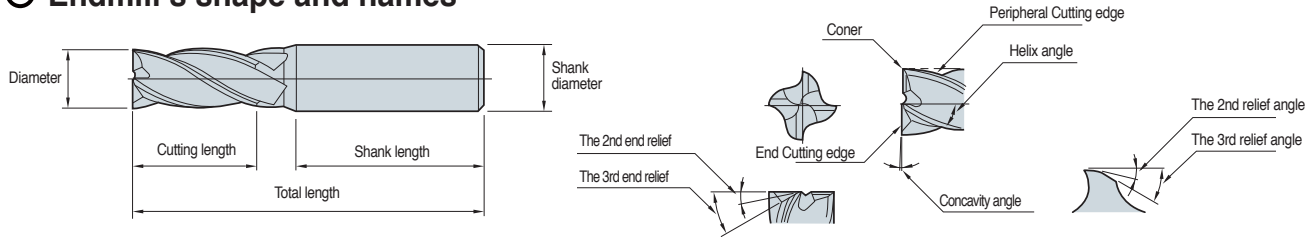
| Diameter | øDH7 | E | F | r |
|----------|------------------------------------|------------------------------------|--|-----|
| 8 | 8 ^{+0.015} ₀ | 8.9 ^{+0.25} ₀ | 2 ^{+0.16} _{+0.06} | 0.4 |
| 10 | 10 ^{+0.015} ₀ | 11.5 ^{+0.25} ₀ | 3 ^{+0.16} _{+0.06} | 0.4 |
| 13 | 13 ^{+0.018} ₀ | 14.6 ^{+0.25} ₀ | 3 ^{+0.16} _{+0.06} | 0.6 |
| 16 | 16 ^{+0.018} ₀ | 17.7 ^{+0.25} ₀ | 4 ^{+0.19} _{+0.07} | 0.6 |
| 19 | 19 ^{+0.021} ₀ | 21.1 ^{+0.25} ₀ | 5 ^{+0.19} _{+0.07} | 1 |
| 22 | 22 ^{+0.021} ₀ | 24.1 ^{+0.25} ₀ | 6 ^{+0.19} _{+0.07} | 1 |
| 27 | 27 ^{+0.021} ₀ | 29.8 ^{+0.25} ₀ | 7 ^{+0.23} _{+0.08} | 1.2 |
| 32 | 32 ^{+0.025} ₀ | 34.8 ^{+0.25} ₀ | 8 ^{+0.23} _{+0.08} | 1.2 |
| 40 | 40 ^{+0.025} ₀ | 43.5 ^{+0.3} ₀ | 10 ^{+0.23} _{+0.08} | 1.2 |
| 50 | 50 ^{+0.025} ₀ | 53.5 ^{+0.3} ₀ | 12 ^{+0.275} _{+0.095} | 1.6 |
| 60 | 60 ^{+0.030} ₀ | 64.2 ^{+0.3} ₀ | 14 ^{+0.275} _{+0.095} | 1.6 |
| 70 | 70 ^{+0.030} ₀ | 75.0 ^{+0.3} ₀ | 16 ^{+0.275} _{+0.095} | 2 |
| 80 | 80 ^{+0.030} ₀ | 85.5 ^{+0.3} ₀ | 18 ^{+0.275} _{+0.095} | 2 |
| 100 | 100 ^{+0.035} ₀ | 107.0 ^{+0.3} ₀ | 24 ^{+0.32} _{+0.11} | 2.5 |

● Type B

| Diameter | øDH7 | E | F | r |
|-----------------|---------------------------------------|--------------------------------------|---|-----|
| $\frac{1}{2}$ | 12.70 ^{+0.018} ₀ | 14.17 ^{+0.25} ₀ | 2.38 ^{+0.31} _{+0.13} | 0.5 |
| $\frac{5}{8}$ | 15.875 ^{+0.018} ₀ | 17.74 ^{+0.25} ₀ | 3.18 ^{+0.31} _{+0.13} | 0.8 |
| $\frac{3}{4}$ | 19.050 ^{+0.021} ₀ | 20.89 ^{+0.25} ₀ | 3.18 ^{+0.31} _{+0.13} | 0.8 |
| $\frac{7}{8}$ | 22.225 ^{+0.021} ₀ | 24.07 ^{+0.25} ₀ | 3.18 ^{+0.31} _{+0.13} | 0.8 |
| 1 | 25.40 ^{+0.021} ₀ | 28.04 ^{+0.25} ₀ | 6.35 ^{+0.31} _{+0.13} | 1.2 |
| 1 $\frac{1}{4}$ | 31.750 ^{+0.025} ₀ | 35.18 ^{+0.25} ₀ | 7.94 ^{+0.32} _{+0.14} | 1.6 |
| 1 $\frac{1}{2}$ | 38.10 ^{+0.025} ₀ | 42.32 ^{+0.25} ₀ | 9.53 ^{+0.89} _{+0.25} | 1.6 |
| 1 $\frac{3}{4}$ | 44.450 ^{+0.025} ₀ | 49.48 ^{+0.25} ₀ | 11.11 ^{+0.89} _{+0.25} | 1.6 |
| 2 | 50.80 ^{+0.03} ₀ | 55.83 ^{+0.25} ₀ | 12.7 ^{+0.89} _{+0.25} | 1.6 |
| 2 $\frac{1}{2}$ | 63.50 ^{+0.03} ₀ | 69.42 ^{+0.25} ₀ | 15.81 ^{+0.89} _{+0.25} | 1.6 |
| 3 | 76.20 ^{+0.03} ₀ | 82.93 ^{+0.25} ₀ | 19.05 ^{+0.89} _{+0.25} | 2.4 |
| 3 $\frac{1}{2}$ | 88.90 ^{+0.035} ₀ | 98.81 ^{+0.25} ₀ | 22.23 ^{+0.89} _{+0.25} | 2.4 |
| 4 | 101.60 ^{+0.035} ₀ | 111.51 ^{+0.25} ₀ | 25.4 ^{+0.89} _{+0.25} | 2.4 |
| 4 $\frac{1}{2}$ | 114.30 ^{+0.035} ₀ | 125.81 ^{+0.25} ₀ | 25.58 ^{+0.89} _{+0.25} | 3.2 |
| 5 | 127.0 ^{+0.04} ₀ | 140.08 ^{+0.25} ₀ | 31.75 ^{+0.89} _{+0.25} | 3.2 |



Endmill's shape and names



The comparison according to number of flute

Features of number of flute

| Ø10mm | 2 flutes (IFE2100) | 3 flutes (IFE3100) | 4 flutes (IFE4100) |
|---------------|-----------------------|--|--------------------|
| Shape | | | |
| Cross section | 44mm ² | 46mm ² | 48mm ² |
| Ratio | 56% | 58% | 61% |
| Advantages | Good chip flow | Good chip flow | High rigidity |
| Disadvantages | Weak rigidity | Difficult to measure external diameter | Bad chip flow |
| Usages | Side facing, Grooving | Side facing, Grooving | Side cutting |
| | Multi-functional | Medium, finishing | Finishing |

Affection of number of flute

| Specification | Major features | 2 flutes | 4 flutes |
|----------------|---------------------|----------|----------|
| Tool rigidity | Torsional rigidity | ○ | ◎ |
| | Bending rigidity | ○ | ◎ |
| Surface finish | Surface roughness | ○ | ◎ |
| | Machining precision | ○ | ◎ |
| Chip control | Chip clogging | ◎ | ○ |
| | Chip evacuation | ◎ | ○ |
| Grooving | Chip evacuation | ◎ | ○ |
| | Grooving | ◎ | ○ |
| Side facing | Surface finish | ○ | ◎ |
| | Vibration | ◎ | ○ |

◎-Excellent ○-Good

The differences between general endmills and high speed endmills

| General endmills | | High speed endmills | |
|---------------------|---|---------------------|--|
| Cross section shape | Features | Cross section shape | Features |
| | <ul style="list-style-type: none"> - Applied for Low speed, High depth of cut, Low feed - Low hardness workpiece (general steel, cast iron) | | <ul style="list-style-type: none"> - Applied for high speed, low depth of cut, high feed - Useful for hardened workpiece such as die steel |

Calculations of cutting condition

Calculations of Cutting speed

$$vc = \frac{\pi \times D \times n}{1000} \quad n = \frac{1000 \times vc}{\pi \times D}$$

Calculations of feed speed

$$vf = n \times fn \quad \text{or} \quad n \times fz \times z$$

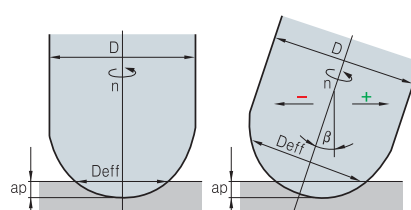
$$fn = \frac{vf}{n} \quad fz = \frac{fn}{z} \quad \text{or} \quad \frac{vf}{n \times z}$$

vc : Cutting speed(m/min) vf : Feed speed(m/min)
 π : Circular constant (3.141592) fn : Feed per revolution(mm/rev)
 D : Endmill diameter(mm) fz : Feed per flute (mm/t)
 n : Revolution per minute(min⁻¹) z : Number of flute

Ball endmills cutting speed calculation formulas

| | |
|-----------------------|---|
| Revolution per minute | $n = \frac{vc \times 1000}{D \times \pi}$ |
| Cutting speed | $vc = \frac{D \times \pi \times n}{1000}$ |
| Feed per tooth | $fz = \frac{vf}{z \times n}$ |
| Feed per revolution | $fn = fz \times z$ |
| Feed speed | $vf = fz \times z \times n$ |
| Chip removal rate | $Q = ae \times ap \times vf$ |

Effective diameter of Ball Endmill



$$D_{eff} = 2 \times \sqrt{D \times ap - ap^2} \quad \text{Calculation Table}$$

$$D_{eff} = D \times \sin \left[\beta \pm \arccos \left(\frac{D - 2ap}{D} \right) \right]$$



The affection of flute length

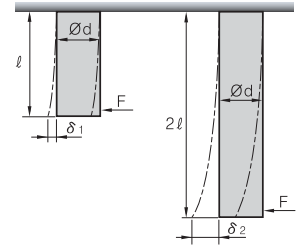
● Expression of aspect ratio

- Aspect ratio
- l/d
- Ex) 3D, 15D, 22D

● Deformation rate according to length

- Deformation rate is reaction force against external force.
- Proportional to the cube of length
- Set flute length and overall length as short as possible
- The more flute the better rigidity
- When flute width rate is narrower drill's rigidity is higher.

$$\delta = \frac{P l^3}{3EI}$$



δ = Deformation volume l = Length of cut

P = Cutting force E = Elasticity coefficient

$$I = \text{Inertia moment} (I = \frac{\pi d^4}{64})$$

• $l \rightarrow 2l$

• $\delta_1 \rightarrow \delta_1 = 8\delta_1 = \delta_2$

Spindle revolution conversion table(RPM) - external diameter

| vc External | Cutting speed (vc, m/min) | | | | | | | | | | | | | | | |
|----------------|---------------------------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 120 | 140 | 150 | 180 | 200 | 250 | 300 |
| 0.2 | 31,831 | 47,746 | 63,662 | 79,577 | 95,493 | 111,408 | 127,324 | 143,239 | 159,155 | 190,986 | 222,817 | 23,872 | 286,479 | 318,310 | 397,887 | 477,465 |
| 0.3 | 21,221 | 31,831 | 42,441 | 53,052 | 63,662 | 74,272 | 84,883 | 95,493 | 106,103 | 127,324 | 148,545 | 159,155 | 190,986 | 212,207 | 265,258 | 318,310 |
| 0.4 | 15,915 | 23,873 | 31,831 | 39,789 | 47,746 | 55,704 | 63,662 | 71,620 | 79,577 | 95,493 | 111,408 | 119,366 | 143,239 | 159,155 | 198,944 | 238,732 |
| 0.5 | 12,732 | 19,099 | 25,465 | 31,831 | 38,197 | 44,563 | 50,930 | 57,296 | 63,662 | 76,394 | 89,127 | 95,493 | 114,592 | 127,324 | 159,155 | 190,986 |
| 0.6 | 10,610 | 15,915 | 21,221 | 26,526 | 31,831 | 37,136 | 42,441 | 47,746 | 53,052 | 63,662 | 74,272 | 79,577 | 95,493 | 106,103 | 132,629 | 159,155 |
| 0.7 | 9,095 | 13,642 | 18,189 | 22,736 | 27,284 | 31,831 | 36,378 | 40,926 | 45,473 | 54,567 | 63,662 | 68,209 | 81,851 | 90,946 | 113,682 | 136,419 |
| 0.8 | 7,958 | 11,937 | 15,915 | 19,894 | 23,873 | 27,852 | 31,831 | 35,810 | 39,789 | 47,746 | 55,704 | 59,683 | 71,620 | 79,577 | 99,472 | 119,366 |
| 0.9 | 7,074 | 10,610 | 14,147 | 17,684 | 21,221 | 24,757 | 28,294 | 31,831 | 35,368 | 42,441 | 49,515 | 53,052 | 63,662 | 70,736 | 88,419 | 106,103 |
| 1 | 6,366 | 9,549 | 12,732 | 15,915 | 19,099 | 22,282 | 25,465 | 28,648 | 31,831 | 38,197 | 44,563 | 47,746 | 57,296 | 63,662 | 79,577 | 95,793 |
| 1.5 | 4,244 | 6,366 | 8,488 | 10,610 | 12,732 | 14,854 | 16,977 | 19,099 | 21,221 | 25,465 | 29,709 | 31,831 | 38,197 | 42,441 | 53,052 | 63,662 |
| 2 | 3,183 | 4,775 | 6,366 | 7,958 | 9,549 | 11,141 | 12,732 | 14,324 | 15,915 | 19,099 | 22,282 | 23,873 | 28,648 | 31,831 | 39,789 | 47,746 |
| 2.5 | 2,546 | 3,820 | 5,093 | 6,366 | 7,639 | 8,913 | 10,186 | 11,459 | 12,732 | 15,279 | 17,825 | 19,099 | 22,918 | 25,465 | 31,831 | 38,197 |
| 3 | 2,122 | 3,183 | 4,244 | 5,305 | 6,366 | 7,427 | 8,488 | 9,549 | 10,610 | 12,732 | 14,854 | 15,915 | 19,099 | 21,221 | 26,526 | 31,831 |
| 3.5 | 1,819 | 2,728 | 3,638 | 4,547 | 5,457 | 6,366 | 7,276 | 8,185 | 9,095 | 10,913 | 12,732 | 13,642 | 16,370 | 18,189 | 22,736 | 27,284 |
| 4 | 1,592 | 2,387 | 3,183 | 3,979 | 4,775 | 5,570 | 6,366 | 7,162 | 7,958 | 9,549 | 11,141 | 11,937 | 14,324 | 15,915 | 19,894 | 23,873 |
| 4.5 | 1,415 | 2,122 | 2,829 | 3,537 | 4,244 | 4,951 | 5,659 | 6,366 | 7,074 | 8,488 | 9,903 | 10,610 | 12,732 | 14,147 | 17,684 | 21,221 |
| 5 | 1,273 | 1,910 | 2,546 | 3,183 | 3,820 | 4,456 | 5,093 | 5,730 | 6,366 | 7,639 | 8,913 | 9,549 | 11,459 | 12,732 | 15,915 | 19,099 |
| 5.5 | 1,157 | 1,736 | 2,315 | 2,894 | 3,472 | 4,051 | 4,630 | 5,209 | 5,787 | 6,945 | 8,102 | 8,681 | 10,417 | 11,575 | 14,469 | 17,362 |
| 6 | 1,061 | 1,592 | 2,122 | 2,653 | 3,183 | 3,714 | 4,244 | 4,775 | 5,305 | 6,366 | 7,427 | 7,958 | 9,549 | 10,610 | 13,263 | 15,915 |
| 6.5 | 979 | 1,469 | 1,959 | 2,449 | 2,938 | 3,428 | 3,918 | 4,407 | 4,897 | 5,876 | 6,856 | 7,346 | 8,815 | 9,794 | 12,243 | 14,691 |
| 7 | 909 | 1,364 | 1,819 | 2,274 | 2,728 | 3,183 | 3,638 | 4,093 | 4,547 | 5,457 | 6,366 | 6,821 | 8,185 | 9,095 | 11,368 | 13,642 |
| 7.5 | 849 | 1,273 | 1,698 | 2,122 | 2,546 | 2,971 | 3,395 | 3,820 | 4,244 | 5,093 | 5,942 | 6,366 | 7,639 | 8,488 | 10,610 | 12,732 |
| 8 | 796 | 1,194 | 1,592 | 1,989 | 2,387 | 2,785 | 3,183 | 3,581 | 3,979 | 4,775 | 5,570 | 5,968 | 7,162 | 7,958 | 9,947 | 11,937 |
| 8.5 | 749 | 1,123 | 1,498 | 1,872 | 2,247 | 2,621 | 2,996 | 3,370 | 3,745 | 4,494 | 5,243 | 5,617 | 6,741 | 7,490 | 9,362 | 11,234 |
| 9 | 707 | 1,061 | 1,415 | 1,768 | 2,122 | 2,476 | 2,829 | 3,183 | 3,537 | 4,244 | 4,951 | 5,305 | 6,366 | 7,074 | 8,842 | 10,610 |
| 9.5 | 670 | 1,005 | 1,340 | 1,675 | 2,010 | 2,345 | 2,681 | 3,016 | 3,351 | 4,021 | 4,691 | 5,026 | 6,031 | 6,701 | 9,377 | 10,052 |
| 10 | 637 | 955 | 1,273 | 1,592 | 1,910 | 2,228 | 2,546 | 2,865 | 3,183 | 3,820 | 4,456 | 4,775 | 5,730 | 6,366 | 7,958 | 9,549 |
| 11 | 579 | 868 | 1,157 | 1,447 | 1,736 | 2,026 | 2,315 | 2,604 | 2,894 | 3,472 | 4,051 | 4,341 | 5,209 | 5,787 | 7,234 | 8,681 |
| 12 | 531 | 796 | 1,061 | 1,326 | 1,592 | 1,857 | 2,122 | 2,387 | 2,653 | 3,183 | 3,714 | 3,979 | 4,775 | 5,305 | 6,631 | 7,958 |
| 13 | 490 | 735 | 979 | 1,224 | 1,469 | 1,714 | 1,959 | 2,204 | 2,449 | 2,938 | 3,428 | 3,673 | 4,407 | 4,897 | 6,121 | 7,346 |
| 14 | 455 | 682 | 909 | 1,137 | 1,364 | 1,592 | 1,819 | 2,046 | 2,274 | 2,728 | 3,183 | 3,410 | 4,093 | 4,547 | 5,684 | 6,821 |
| 15 | 424 | 637 | 849 | 1,061 | 1,273 | 1,485 | 1,698 | 1,910 | 2,122 | 2,546 | 2,971 | 3,183 | 3,820 | 4,244 | 5,305 | 6,366 |
| 16 | 398 | 597 | 796 | 995 | 1,194 | 1,393 | 1,592 | 1,790 | 1,989 | 2,387 | 2,785 | 2,984 | 3,581 | 3,979 | 4,974 | 5,968 |
| 17 | 374 | 562 | 749 | 969 | 1,123 | 1,311 | 1,498 | 1,685 | 1,872 | 2,247 | 2,621 | 2,809 | 3,370 | 3,745 | 4,681 | 5,617 |
| 18 | 354 | 531 | 707 | 884 | 1,061 | 1,238 | 1,415 | 1,592 | 1,768 | 2,122 | 2,476 | 2,653 | 3,183 | 3,537 | 4,421 | 5,305 |
| 19 | 335 | 503 | 670 | 838 | 1,005 | 1,173 | 1,340 | 1,508 | 1,675 | 2,010 | 2,345 | 2,513 | 3,016 | 3,351 | 4,188 | 5,026 |
| 20 | 318 | 477 | 637 | 796 | 955 | 1,114 | 1,273 | 1,432 | 1,592 | 1,910 | 2,228 | 2,387 | 2,865 | 3,183 | 3,979 | 4,775 |
| 21 | 303 | 455 | 606 | 758 | 909 | 1,061 | 1,213 | 1,364 | 1,516 | 1,819 | 2,122 | 2,274 | 2,728 | 3,032 | 3,789 | 4,547 |
| 22 | 289 | 434 | 579 | 723 | 868 | 1,013 | 1,157 | 1,302 | 1,447 | 1,736 | 2,026 | 2,170 | 2,604 | 2,894 | 3,617 | 4,341 |
| 23 | 277 | 415 | 554 | 692 | 830 | 969 | 1,107 | 1,246 | 1,384 | 1,661 | 1,938 | 2,076 | 2,491 | 2,768 | 3,460 | 4,152 |
| 24 | 265 | 398 | 531 | 663 | 796 | 928 | 1,061 | 1,194 | 1,326 | 1,592 | 1,857 | 1,989 | 2,387 | 2,653 | 3,316 | 3,979 |
| 25 | 255 | 382 | 509 | 637 | 764 | 891 | 1,019 | 1,146 | 1,273 | 1,528 | 1,783 | 1,910 | 2,292 | 2,546 | 3,183 | 3,820 |



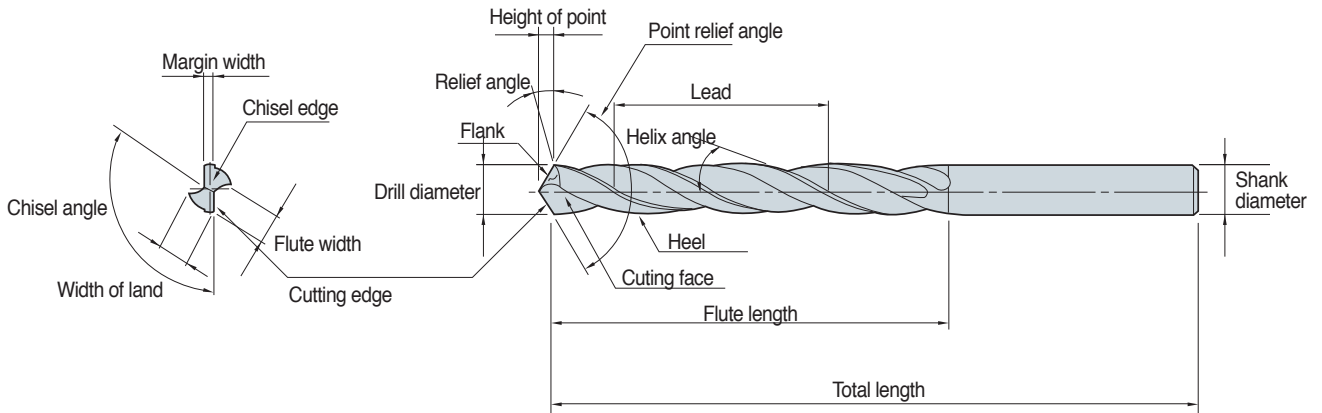
🔍 Tool failure and trouble shooting

| Trouble | Causes | Solutions | | | | | | | | | | | | | | | | |
|--|----------------------------------|-------------------|------|--------------|---------|-----------------|--------------|------------|-----------------|-----------------|--------|-------------|-----------|----------|------------------|-------------------|------------------|----------|
| | | Cutting condition | | | | | Tool shape | | | | | Grade | | etc | | | | |
| | | Cutting speed | Feed | Depth of cut | Coolant | Up cut-down cut | Relief angle | Lead angle | Length of flute | Number of flute | Honing | Chip pocket | Toughness | Hardness | Machine rigidity | Machine vibration | Workpiece fixing | Overhang |
| Damage at cutting edge | Excessive periphery cutting edge | ↓ | ↑ | | ● | | | | | | | | | | | | ↑ | |
| | Chipping | | ↓ | | | ↓ | ↓ | | | ● | | ↑ | | | | ↓ | ↑ | ↓ |
| | Fracture during operation | | ↓ | ↓ | | | | ↓ | | | ↑ | | | ↑ | | ↑ | ↓ | |
| Poor surface finish | Generating built-up edge | ↑ | ↑ | | ● | | | ↑ | | ● | | | | | | | | |
| | Chattering | ↓ | | | | ↓ | | ↓ | | | | | | ↑ | ↓ | ↑ | ↓ | |
| | Poor straightness | | ↓ | ↓ | | ↑ | | ↑ | ↓ | | | | | | | | ↓ | |
| Poor machining precision (Machined size, Perpendicularity) | Improper cutting conditions | ↑ | ↓ | | | | | ↓ | ↑ | | | | | ↑ | ↓ | | ↓ | |
| Bad chip evacuation | Excessive cutting volume | | ↓ | ↓ | | | | | | | | | | | | | | |
| Bad chip evacuation | Improper chip pocket | | | | | | | | ↓ | | ↑ | | | | | | | |
| Bad chip evacuation | Improper cutting conditions | | | | | | | | | | | | | | | | | |

↑ : Increase ↓ : Decrease ● : use ○ : Correct use



The shape of drills and the names

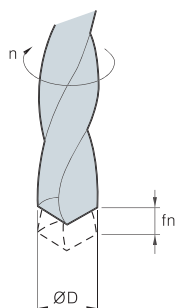


Shape and the feature of cutting

| Helix angle | Plays rake angle of cutting edge's role. If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases. Poor machinability ◀ low - Helix angle - high ▶ Smooth chip evacuation Hard workpiece(hardened steel) ◀ low - Helix angle - high ▶ Soft material(aluminum etc) | | | | | | | | | | | | |
|------------------------|---|---|--------------------------------------|---------|-----------------|---------------|--|---|--------------------------------------|---------------|--|--|------------------|
| Length of flute | The path of both chip evacuation and cooling lubricant. Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage. | | | | | | | | | | | | |
| Point angle | Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118. thrust resistance decrease ◀ low - Point angle - high ▶ thrust resistance increase Torque increase, Burr on exit increase ◀ low - Point angle - high ▶ Torque decrease, Burr on exit decrease Soft material(aluminum etc) ◀ low - Point angle - high ▶ Hard workpiece(hardened steel) | | | | | | | | | | | | |
| Margin | While machining Margin is the part of contact between workpiece and drill's external. It prevents bending and plays guide's role . It depends on drill size. Cutting force decrease ◀ small - Margin - big ▶ Cutting force increase Poor guide ◀ small - Margin - big ▶ Good guide | | | | | | | | | | | | |
| Web thickness | Web is the part of center of drill and drill's rigidity depends on the web. Drill needs cutting edge, chisel edge, at the tip of drill because drill makes a hole at the beginning of drilling . When web thickness is big Thinning is needed to reduce cutting force. Cutting force decrease ◀ small - Web thickness - big ▶ Cutting force increase Rigidity decrease ◀ small - Web thickness - big ▶ Rigidity increase Good chip evacuation ◀ small - Web thickness - big ▶ Bad chip evacuation Soft material(aluminum etc) ◀ small - Web thickness - big ▶ Hard workpiece(hardened steel) | | | | | | | | | | | | |
| Back taper | Drill diameter size is getting smaller from point to shank in order to avoid the friction between drill periphery and workpiece. The decrease of diameter divided by flute length 100mm generally becomes 0.04~0.1mm. As for high performance drills and drills for hole shrinkage workpiece during operation have big back taper. | | | | | | | | | | | | |
| Thinning | In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Types of</th> <th>Edge shape</th> <th>Feature</th> <th>Korloy's drills</th> </tr> </thead> <tbody> <tr> <td>X type</td> <td></td> <td>Good centering High central thickness Crank shaft</td> <td>Mach drill(MSD) Vulcan drill(VZD)</td> </tr> <tr> <td>S type</td> <td></td> <td>For wide use For general Easy regrinding</td> <td>Solid drill(SSD)</td> </tr> </tbody> </table> | Types of | Edge shape | Feature | Korloy's drills | X type | | Good centering High central thickness Crank shaft | Mach drill(MSD) Vulcan drill(VZD) | S type | | For wide use For general Easy regrinding | Solid drill(SSD) |
| Types of | Edge shape | Feature | Korloy's drills | | | | | | | | | | |
| X type | | Good centering High central thickness Crank shaft | Mach drill(MSD) Vulcan drill(VZD) | | | | | | | | | | |
| S type | | For wide use For general Easy regrinding | Solid drill(SSD) | | | | | | | | | | |



Major cutting formulas



| Cutting speed | Feed | Helix angle | Machining time |
|---|--|---|--|
| $vc = \frac{\pi \cdot D \cdot n}{1000}$ (m/min) | $fn = \frac{vf}{n}$ (mm/rev) | $\delta = \tan^{-1} \left(\frac{\pi D}{L} \right)$ | $tc = \frac{ld}{n \cdot fn}$ (min) |
| <ul style="list-style-type: none"> • vc : Cutting speed (m/min) • D : Drill diameter (mm) • n : Revolution per minute (min⁻¹) • π : Circular constant (3.14) | <ul style="list-style-type: none"> • fn : Feed per revolution (mm/rev) • vf : Feed per minute (mm/min) • n : Revolution per minute (min⁻¹) | <ul style="list-style-type: none"> • δ : Helix angle • D : Drill diameter (mm) • L : Lead (mm) • π : Circular constant (3.14) | <ul style="list-style-type: none"> • tc : Machining time (min) • n : Revolution per minute (min⁻¹) • ld : Drilling time (mm) • fn : Feed (mm/rev) |

Cutting torque and thrust (calculation formulas)

$$Md = KD^2 \times (0.0631 + 1.686 \times fn) \text{ (kg}\cdot\text{cm)}$$

$$T = 57.95KDfn^{0.85} \text{ (kg)}$$

• Md : Cutting torque (kg·cm)
 • T : Cutting thrust (kg)
 • D : Drill diameter (mm)
 • fn : Feed per revolution (mm/rev)
 • K : Material coefficient

| Workpiece material (SAE/AISI) | Tensile strength (kgf) | Hardness (HB) | Material coefficient K | |
|-------------------------------|---------------------------------|---------------|------------------------|------|
| Cast iron | Cast iron (Gray) | 21 | 177 | 1.00 |
| | Cast iron | 28 | 198 | 1.39 |
| | Cast iron (Ductile) | 35 | 224 | 1.88 |
| General steel | 1020 (carbon steel C 0.2%) | 55 | 160 | 2.22 |
| | 1112 (C 0.12, S 0.2%) | 62 | 183 | 1.42 |
| | 1335 (Mn 1.75%) | 63 | 197 | 1.45 |
| Nickel Chrome steel | 3115 (Ni 1.25, Cr 0.6, Mn 0.5) | 53 | 163 | 1.56 |
| | 3120 (Ni 1.25, Cr 0.6, Mn 0.7) | 69 | 174 | 2.02 |
| | 3140 | 88 | 241 | 2.32 |
| Chrome molybdenum steel | 4115 (Cr 0.5, Mo 0.11, Mn 0.8) | 63 | 167 | 1.62 |
| | 4130 (Cr 0.95, Mo 0.2, Mn 0.5) | 77 | 229 | 2.10 |
| | 4140 (Cr 0.95, Mo 0.2, Mn 0.85) | 94 | 269 | 2.41 |
| Nickel molybdenum steel | 4615 (Ni 1.8, Mo 0.25, Mn 0.5) | 75 | 212 | 2.12 |
| | 4820 (Ni 3.5, Mo 0.25, Mn 0.6) | 140 | 390 | 3.44 |
| Chrome steel | 5150 (Cr 0.8, Mn 0.8) | 95 | 277 | 2.46 |
| Chrome vanadium steel | 6115 (Cr 0.6, Mn 0.6, V 0.12) | 58 | 174 | 2.08 |
| | 6120 (Cr 0.8, Mn 0.8, V 0.1) | 80 | 255 | 2.22 |

Cutting torque and thrust (empirical formula)

$$Md = K_1 \cdot d^2 \cdot fn^m$$

$$T = K_2 \cdot d \cdot fn^n$$

• Md : Cutting torque (kg·cm)
 • T : Thrust (kg)
 • fn : Feed (mm/rev)
 • d : Drill diameter (mm)
 • K1, K2, m, n : Experimental Data Characteristic value

| Workpiece | K ₁ | m | K ₂ | n |
|-----------------|----------------|------|----------------|------|
| Soft steel | 5.9 | 1.00 | 125.0 | 0.88 |
| Rolled steel | 3.5 | 1.00 | 55.0 | 0.88 |
| 7-3 brass | 2.5 | 0.94 | 44.4 | 0.87 |
| Aluminum | 1.5 | 0.90 | 33.3 | 0.78 |
| Zinc | 1.4 | 0.88 | 27.0 | 0.74 |
| Gun metal | 2.0 | 0.94 | 21.6 | 0.75 |
| Galvanized Iron | 0.3 | 0.57 | 6.4 | 0.55 |



Tool failures and solutions

| Trouble | Causes | Solutions | | | | | | | | | | | | | | | | |
|--|--|---------------------------------|------|-----------|--------------|---------|--------------|-------------|----------------|--------|------------------|----------|-----------|----------|------------------|-------------------|------------|--------------------|
| | | Cutting condition | | | | | Tool shape | | | | | | Grade | | etc | | | |
| | | Cutting speed | Feed | Step feed | Initial feed | Coolant | Relief angle | Point angle | Thinning angle | Honing | Flute width rate | Thinning | Toughness | Hardness | Machine rigidity | Machine vibration | Guide bush | Clamping workpiece |
| Chipping | • Too sharp cutting edge (too big relief angle) (thinning edge is too sharp) | | | | | | ↓ | | ↓ | ↑ | | | ↑ | | | | | |
| | • Excessive cutting speed | ↓ | | | | ● | | | | | | | | | | | | |
| | • Built-up edge | | | | | ● | ↓ | | ↓ | ↑ | | | ↑ | | | | | |
| | • Vibration and chattering | ↓ | | | | | | | | | | | | | ↑ | ↓ | | ● |
| Wear | • Excessive cutting speed (Abnormal wear at margin) | ↓ | | | | ● | | | | | | | | | | | | |
| | • Insufficient cutting speed (Abnormal wear at center) | ↑ | | | | ● | | | | | | | | | | | | |
| Chip | • Long chip | ↑ | ↑ | | | ● | | | | ↓ | | | | | | | | |
| | • Over lap | ↑ | ↑ | | | | | | | | | | | | | | | |
| | • Chip burning | ↑ | | | | ● | | | | | | | | | | | | |
| Hole precision Burr, Poor surface finish | • Tool clamping precision | | | | ↓ | | | ↓ | | ↓ | | | | | ↑ | ↓ | | ● |
| | • Excessive feed, sharp point angle | | ↓ | | | | | ↑ | | ↓ | | | | | | | | |
| | • Excessive cutting speed (Considered tool grade) | ↑ | | | | ● | ↓ | ⊙ | | | | | ↑ | | | | | |
| Fracture | Breakage on contact | • Poor surface finish | | | ● | ↓ | | | | | | | | | | | | ● |
| | | • Insufficient machine rigidity | | | | | | | | | | | | | ↑ | | | ● |
| | | • Improper cutting condition | ↑ | ↓ | | | | | | | | | | | | | | |
| | Breakage at hole bottom | • Crooked hole | ↑ | | | | | | ↑ | | | | ● | | | | ↓ | ● |
| | | • Chip clogging | | ↓ | ● | | | | | | | ↑ | | | | | | |

↑ : Increase ↓ : Decrease ● : use ⊙ : Correct use



 Hole size for threading

● Metric coarse screw threads

| Specification | | | | Hole diameter |
|---------------|---|------|--|---------------|
| M1 | X | 0.25 | | 0.75 |
| M1.1 | X | 0.25 | | 0.85 |
| M1.2 | X | 0.25 | | 0.95 |
| M1.4 | X | 0.3 | | 1.1 |
| M1.6 | X | 0.35 | | 1.25 |
| M1.7 | X | 0.35 | | 1.35 |
| M1.8 | X | 0.35 | | 1.45 |
| M2 | X | 0.4 | | 1.6 |
| M2.2 | X | 0.45 | | 1.75 |
| M2.3 | X | 0.4 | | 1.9 |
| M2.5 | X | 0.45 | | 2.1 |
| M2.6 | X | 0.45 | | 2.2 |
| M3 | X | 0.6 | | 2.4 |
| M3 | X | 0.5 | | 2.5 |
| M3.5 | X | 0.6 | | 2.9 |
| M4 | X | 0.75 | | 3.25 |
| M4 | X | 0.7 | | 3.3 |
| M4.5 | X | 0.75 | | 3.8 |
| M5 | X | 0.9 | | 4.1 |
| M5 | X | 0.8 | | 4.2 |
| M5.5 | X | 0.9 | | 4.6 |
| M6 | X | 1 | | 5 |
| M7 | X | 1 | | 6 |
| M8 | X | 1.25 | | 6.8 |
| M9 | X | 1.25 | | 7.8 |
| M10 | X | 1.5 | | 8.5 |
| M11 | X | 1.5 | | 9.5 |
| M12 | X | 1.75 | | 10.3 |
| M14 | X | 2 | | 12 |
| M16 | X | 2 | | 14 |
| M18 | X | 2.5 | | 15.5 |
| M20 | X | 2.5 | | 17.5 |
| M22 | X | 2.5 | | 19.5 |
| M24 | X | 3 | | 21 |
| M27 | X | 3 | | 24 |
| M30 | X | 3.5 | | 26.5 |
| M33 | X | 3.5 | | 29.5 |
| M36 | X | 4 | | 32 |
| M39 | X | 4 | | 35 |
| M42 | X | 4.5 | | 37.5 |
| M45 | X | 4.5 | | 40.5 |
| M48 | X | 5 | | 43 |

● Metric coarse screw threads

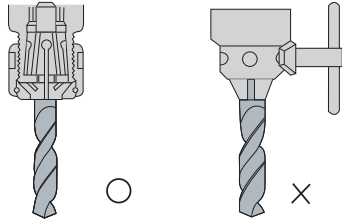
| Specification | | | | Hole diameter |
|---------------|---|------|--|---------------|
| M2.5 | X | 0.35 | | 2.2 |
| M3 | X | 0.35 | | 2.7 |
| M3.5 | X | 0.35 | | 3.2 |
| M4 | X | 0.5 | | 3.5 |
| M4.5 | X | 0.5 | | 4 |
| M5 | X | 0.5 | | 4.5 |
| M5.5 | X | 0.5 | | 5 |
| M6 | X | 0.75 | | 5.3 |
| M7 | X | 0.75 | | 6.3 |
| M8 | X | 1 | | 7 |
| M8 | X | 0.75 | | 7.3 |
| M9 | X | 1 | | 8 |
| M9 | X | 0.75 | | 8.3 |
| M10 | X | 1.25 | | 8.8 |
| M10 | X | 1 | | 9 |
| M10 | X | 0.75 | | 9.3 |
| M11 | X | 1 | | 10 |
| M11 | X | 0.75 | | 10.3 |
| M12 | X | 1.5 | | 10.5 |
| M12 | X | 1.25 | | 10.8 |
| M12 | X | 1 | | 11 |
| M14 | X | 1.5 | | 12.5 |
| M14 | X | 1 | | 13 |
| M15 | X | 1.5 | | 13.5 |
| M15 | X | 1 | | 14 |
| M16 | X | 1.5 | | 14.5 |
| M16 | X | 1 | | 15 |
| M17 | X | 1.5 | | 15.5 |
| M17 | X | 1 | | 16 |
| M18 | X | 2 | | 16 |
| M18 | X | 1.5 | | 16.5 |
| M18 | X | 1 | | 17 |
| M20 | X | 2 | | 18 |
| M20 | X | 1.5 | | 18.5 |
| M20 | X | 1 | | 19 |
| M22 | X | 2 | | 20 |
| M22 | X | 1.5 | | 20.5 |
| M22 | X | 1 | | 21 |
| M24 | X | 2 | | 22 |
| M24 | X | 1.5 | | 22.5 |
| M24 | X | 1 | | 23 |
| M25 | X | 2 | | 23 |
| M25 | X | 1.5 | | 23.5 |
| M25 | X | 1 | | 24 |
| M26 | X | 1.5 | | 24.5 |
| M27 | X | 2 | | 25 |



⊙ Cautions

● Selection of drill chuck

- Collect chuck is favorable Because it has strong grip power (General drill-chuck and Keyless chuck don't have enough grip power.)

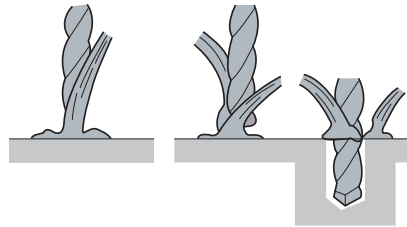


• Collect chuck

• General drill-chuck

● Coolant supply

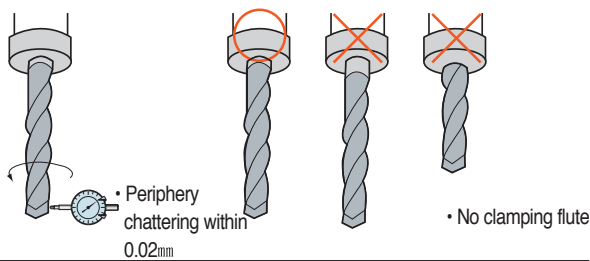
- Supply enough coolant around hole entrance.
- Standard cutting oil pressure : 3~5kg/cm², Flux : 2~5l/min.



• Supply much coolant at hole entrance

● Mounting drill

- When mounting drill Periphery chattering should be within 0.02mm.
- Flute should not be clamped.

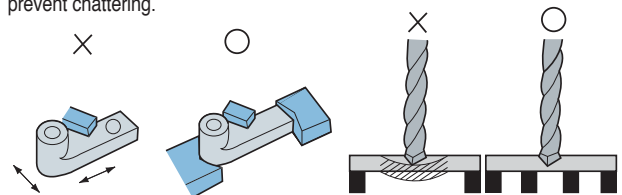


• Periphery chattering within 0.02mm

• No clamping flute

● How to clamp workpiece

- At high performance drilling High thrust, torque and horizontal cutting force work at the same time so that workpiece should be clamped strongly to prevent chattering.



• Uniform and strong clamping is needed (Right and left, up and down)

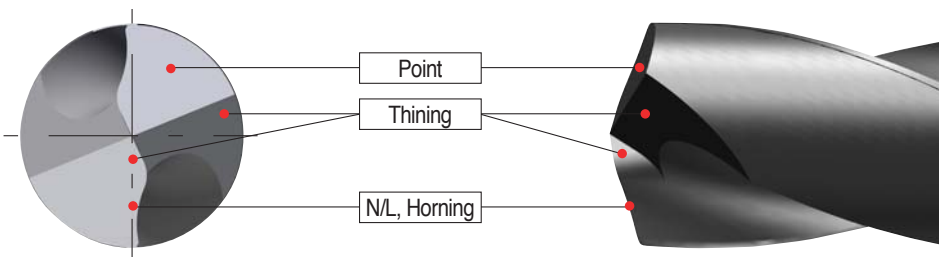
• Strong clamping is needed because bending causes chipping

⊙ Notice

- 1) For better drill's life, small damage and wear are favorable to be regrinding.
- 2) Damage and wear size should be within 1.5mm for regrinding.
- 3) If drill has crack, regrinding is impossible.
- 4) Ordering for regrinding is acceptable or purchase regrinding machine

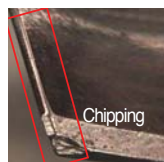
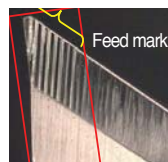
⊙ Regrinding procedures

● Regrinding method (Mach Drill)



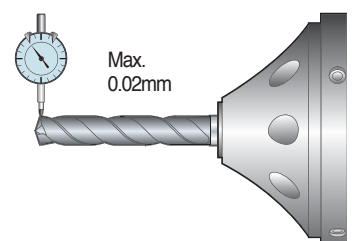
1) Preparation

- Determination of regrinding areas Check the cutting edge for damage and wear If large fracture is found, remove it by rough grinding.



2) Grinding operation

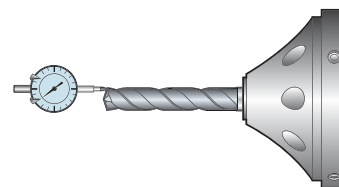
- Drills setting Drill is clamped to collet chuck Chattering is kept within 0.02mm.



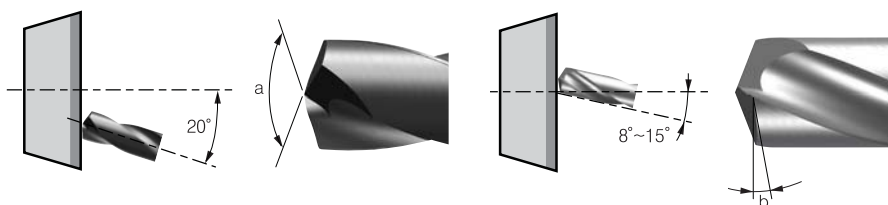
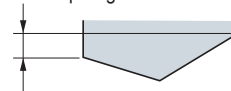
3) Grinding operation-Grinding point

- Check damage and wear at the point and remove it completely.
- The difference of the lip height is kept within 0.02mm.

Point angle(a) : 140°
Point relief angle(b)t : 8°~ 15°



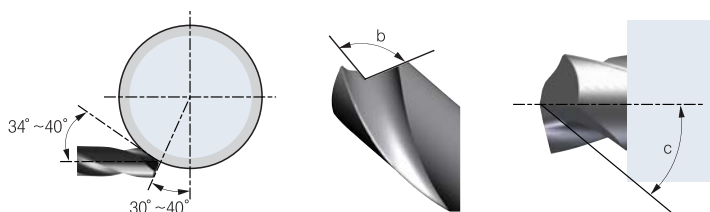
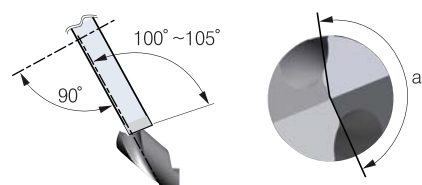
The difference of the lip height Max. 0.02mm



4) Grinding operation-Thinning grinding

- Considering N/L width Cutting edge length from the center of drill axis should be 0.03~0.08mm for balancing.
- Set the wheel to tilt drill axis by 34°~ 40°.

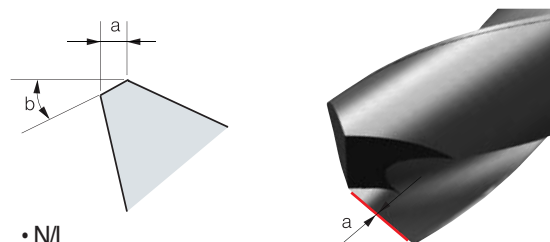
Thinning angle(a)° : 155°~ 160°/ Thining open angle(b) : 100°~ 105°
Thinning relief angle(c) : 34°~ 40°



5) Grinding - N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge.
- After negaland operation Finishes with brush or handstone.

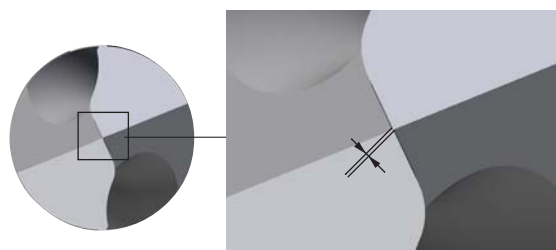
N/L width(a) : 0.05mm~0.16mm / N/L angle(b) : 24°~26°



● TIP

- Making point
 - Without center drill, the point width should be below 0.10mm.

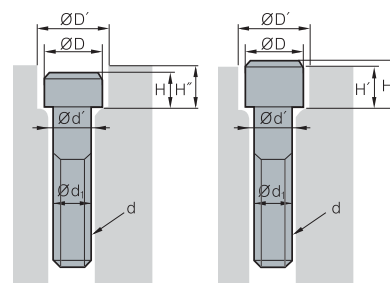
- Recommended grinding condition
 - Diamond wheel : 240~400 mesh
 - Diamond chisel : 400~600 mesh
 - Diamond hand stone : 800~1500 mesh



Hexagonal socket bolt(Clamping screw) size

● Counter boring and size of bolt hole for hexagonal socket bolt

| ISO (d) | M3 | M4 | M5 | M6 | M8 | M10 | M12 | M14 | M16 | M18 | M20 | M22 | M24 | M27 | M30 |
|-----------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|-----|-----|
| Ød _i | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 27 | 30 |
| Ød' | 3.4 | 4.5 | 5.5 | 6.5 | 8.5 | 11 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 30 | 33 |
| ØD | 5.5 | 7 | 8.5 | 10 | 13 | 16 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 40 | 45 |
| ØD' | 5 | 8 | 9.5 | 11 | 14 | 17.5 | 20 | 23 | 26 | 29 | 32 | 35 | 39 | 43 | 48 |
| H | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 27 | 30 |
| H' | 2.7 | 3.6 | 4.6 | 5.5 | 7.4 | 9.2 | 11.0 | 12.8 | 14.5 | 16.5 | 18.5 | 20.5 | 22.5 | 25 | 28 |
| H'' | 3.3 | 4.4 | 5.4 | 6.5 | 8.6 | 10.8 | 13.0 | 15.2 | 17.5 | 19.5 | 21.5 | 23.5 | 25.5 | 29 | 32 |



The comparison of chip breakers

| APPLICATION | | KORLOY | KYOCERA | TAEGUTEC | SUMITOMO | SANDVIK | KENAMETAL | ISCAR | WLATER | MITSUBISHI | SECO | |
|----------------------|--|--------------------------|------------------|------------|-------------|------------|-----------|------------|--------------------|-------------------------|---------------|----------|
| NEGATIVE | P | Ultra-Finishing | - | DP (G) | - | - | - | FF(G) | - | - | PK(G) | - |
| | | | VL | GP, PP | FA | FA, FL | QF | UF | SF | NF3 | FH,FS | FF1 |
| | | Finishing | VF | HQ | FG | LU, SU | PF | FN | NF | NF4 | SH, C | FF2 |
| | | | VB | - | SF | SE | 61 | - | F3M | PF5 | LP | - |
| | | Medium to finishing | VQ, HC | CQ | MC | SX | - | LF, CT | TF | NS6 | SA, C() | MF2, MF3 |
| | | | VC | PQ | FC | - | - | - | - | MP3 | MV | MF5 |
| | Medium machining | GM, HM, VM | HK, CS GS HS, PS | MP, MT | GU, UX | QM, SM | MP, MN | GN | NM4, NP5 | MA, MH | M3, M5 | |
| | | - | - | PC | GE | PM | - | M3M | NM5, NM6 | MP | - | |
| | Roughing | B25 | - | - | - | - | - | - | - | - | M5 | |
| | | HR, GR | PT, GT, HT, PH | RT | MU, ME, MX | PR | RN | NR, R3M | NM9, PP5 | GH, RP | MR5, MR6, MR7 | |
| Heavy duty machining | GH | PX | RH, RX | HG, MP | PR | RH | NM | NR4, NRF | HZ | R4, R5 | | |
| | VH | HX | HZ | HP | QR | RM | HR | NR8 | HV, HX, HAX | R6, R7, R8 | | |
| | | VT | - | HT, HY | HU, HW, HF | HR | MM | - | HBS, HCS, HDS, HXD | RR6, PR9, R56, R57, R68 | | |
| Low carbon steel | Soft steel | VL | XF, XP, XP-T | SF | FL | LC | - | - | - | FY | - | |
| | | - | XQ, XS | - | - | - | - | - | - | SY | - | |
| High feed | High feed cutting | VW | WP | WS | LUW, SEW | WF, WL | FW | WF | NF | SW | FF2, MF2 | |
| | | LW | WQ | WT | GUW | WM, WMX | MW | WG | NM | MW | MF5, M3 | |
| | | - | - | - | - | WR | RW | - | - | - | R4, R7 | |
| Application | Shaft (long bar) | SH | CJ, ST | FS, VF, FX | HM | K | - | - | - | ES | UX | |
| | | KNUX- | KNMX- | KNUX- | - | KNUX-71 | - | - | - | KNMX-19 | - | |
| M | Stainless steel | HA, VP2 | MQ, GU | EA | SU | MF | FP | F3P | NF4 | LM | MF1 | |
| | | GS, HS | HU, TK, MU | MP, EM | EX, GU | MM | MP | M3M | NM4 | MA, GM, MM | MF3 | |
| | | VM | MS | ET | MU, HM | MR | RP | R3M | NR4 | RM | M5 | |
| K | Cast iron | VM | C | MT | UZ | KF | FN | TF | NM, MK5 | LK | M4 | |
| | | GR, VK | ZS | RT KT | UX, GZ | KM | RP | GN | NM5, RK5 | MA, MK | M5 | |
| | | -MA | -MA, GC | -MA | -MA | KR | UN | -MA | -MA, MK5 | GH, -MA, RK | MR7 | |
| S | HRSA | VP1 | MQ | EA | EF | - | FS, LF | PF | NF4 | FJ(G), LS | M1 | |
| | | VP2 | TK | ML | UP, EG | 23.SR | MS | PP | - | MJ | MF1 | |
| | | VP3 | MS, MU | EM | EX | Xcel-SM | MP | VL | NM4 | MS, MS | MF4 | |
| | | VM | - | ET | MU | - | RP | - | NR4 | GJ, RS | MR4 | |
| N | Aluminium | HA | AH | ML | UP (GX), AG | 23 | MS | PP | - | MJ | MF1 | |
| POSITIVE | Application | Finishing | VL | XP | FA | LU | PF | UF | - | PF | FV | FF1 |
| | | | VF | GP | - | FP, FC, SI | UF | - | PF | PF, PF2 | SV | F1 |
| | | Medium machining | - | XQ | FG | - | PM | LF | 14 | - | - | MF2 |
| | | | HMP | HQ, CK | PC | SU, SC | UM | - | SM | PF4, PF5 | MV | F2 |
| | Roughing | C25 | - | MT | MU | PR, UR | MF | - | PM5 | - | M5 | |
| | | | | | | | | | | | | |
| | High feed | | | | LUW | WF | FW | WF | PF | SW | F1 | |
| | | | | | WT | - | WM | MW | - | PM | MW | F2 |
| | M, S | Stainless steel For HRSA | VP1 | CF, GF, GQ | FG | FC | KF | LF | PF | PM | FJ, LM | F1 |
| | | | - | MQ | SA | - | KM | MF | SM | PM5 | AM, MM | MF2 |
| K | Cast iron | HMP | GK | PC | MU | UM | LF | 17 | - | - | M3 | |
| | | C25 | HQ | MT | C/B | KR | MF, UF | 19 | C/B | C/B | M5 | |
| N | Aluminium | AK, AR | AH | FL | AW, AG | AL | HP | AS, AF | PM2 | F | AL | |
| | High precision bar turning (tolerance class G&E) | KF, KM | FSF, USF | GF, FF | FY, FX, FZ | UM | -GH | LF, RF, XL | - | F, SR, SS, SM | UX | |



KORLOY Grades

| Cat. | ISO | Grade | Range | Workpiece Application | Turning | Milling | Facing | Grooving | Threading | Parting | Index Drill | Solid Drill | Endmill | Coating layer | |
|--------|--------|-------------------|---|--|---------|---------|--------|----------|-----------|---------|-------------|-------------|---------|---------------|--|
| CVD | P | NC3010 | P05-P15 | High speed Cutting for Steel | ● | | | ● | | ● | | | | | |
| | | New NC3220 | P15-P25 | Medium for Steel | ● | | | ● | | ● | | | | | |
| | | NC3120 | P15-P25 | Medium for Steel | ● | | ● | ● | | | ● | | | | |
| | | NC3030 | P25-P35 | Roughing & Intermittent Cutting for steel | ● | | | ● | | | ● | | | | |
| | | New NC5330 | P30-P40 | General Cutting for Mild Steel & Forging Steel | ● | ● | ● | ● | | | ● | ● | | | |
| | | NC500H | P25-P35 | Heavy Cutting for Steel | ● | | | | | | ● | | | | |
| | | NCM325 | P20-P30 | High speed milling Cutting for Steel | | ● | | | | ● | | ● | | | |
| | | NCM335 | P30-P40 | Roughing & Intermittent Milling Cutting for steel High speed Cutting for castiron | | ● | | | | | | | | | |
| | K | New NC6205 | K01-K10 | General Cutting for gray castiron & ductile castiron | ● | | | ● | | | | | | | |
| | | New NC6210 | K05-K15 | General Cutting for gray castiron & ductile castiron | ● | | | ● | | | | | | | |
| | | NC315K | K10-K20 | Low speed & intermittent Cutting for castiron | ● | | | ● | | | | | | | |
| | | NC5330 | K20-K30 | General stainless Steel | ● | ● | | ● | | | ● | | | | |
| | M | NC9025 | M25-M35 | Stainless Steel | ● | | | | | | | | | | |
| | | NC5330 | M25-M35 | General Steel(1st Rec.) | | ● | ● | ● | | | ● | ● | | | |
| NCM325 | | M20-M30 | High speed Milling Cutting for stainless Steel | | ● | | | | | ● | ● | | | | |
| NCM335 | | M30-M40 | Roughing & Intermittent Milling Cutting for stainless steel | | ● | | | | | | | | | | |
| S | NC5330 | S20-S30 | Intermittent Cutting for Heat resistance Alloy | ● | | | ● | ● | | ● | ● | | | | |
| PVD | P | PC230 | P15-P30 | Finishing, Medium Cutting for Steel | | ● | | | ● | | ● | | | | |
| | | PC3600 | P25-P35 | Medium, Roughing Milling Cutting (1st Rec.) for Steel | | ● | ● | ● | ● | | ● | | | | |
| | | PC5300 | P30-P40 | Medium, Roughing Milling Cutting for Steel | ● | ● | ● | ● | ● | ● | | | | | |
| | | PC3545 | P35-P45 | Medium, Roughing, Heavy Intermittent Milling Cutting for Steel | | ● | | | | | | | | | |
| | | PC3030T | P20-P30 | Threading Cutting for Steel | | | | | | ● | | | | | |
| | | PC203F | P01-P10 | High speed E/M Cutting for Steel | | | | | | | | | | | |
| | | PC210F | P10-P20 | General & Alloy Steel, High speed Milling Cutting | | | | | | | | | | | |



KORLOY Grades

| Cat. | ISO | Grade | Range | Workpiece Application | Turning | Milling | Facing | Grooving | Threading | Parting | Index Drill | Solid Drill | Endmill | Coating layer | |
|--------|-----|----------------------|---|---|---------|---------|--------|----------|-----------|---------|-------------|-------------|---------|---|---|
| PVD | P | New PC3600 | P15-P35 | General milling for steel | | ● | | | | | | | | ★New TiAlN film (High hardness / Oxidation resistance) | |
| | | PC220 | P15-P35 | General E/M Cutting for Steel | | | | | | | | ● | | ★New TiAlN film (High hardness / Oxidation resistance) | |
| | | PC205F | P15-P30 | Drill Cutting (general)/ under Ø20 for Solid Drill | | | | | | | | | ● | | TiAlN |
| | K | PC8110 | K01-K15 | Milling, Turning Cutting Finishing for cast iron | ● | ● | | ● | | | | | | | ★New TiAlN film (High hardness / Oxidation resistance) |
| | | PC6510 | K01-K15 | High speed Milling Cutting for castiron | | ● | | | | ● | | ● | | | TiN TiAlN |
| | | PC5300 | K15-K25 | Medium & Roughing Turning/Milling Cutting for castiron | ● | ● | ● | ● | ● | ● | ● | ● | | | ★New TiAlN film (High hardness / Oxidation resistance) |
| | | PC203F | K01-K10 | High speed I E/M Cutting for castiron | | | | | | | | | | ● | ★New TiAlN film (High hardness / Oxidation resistance) |
| | | PC220 | K15-K35 | General E/M Cutting for castiron | | | | | | | | | | ● | ★New TiAlN film (High hardness / Oxidation resistance) |
| | | PC205F | K10-K20 | Drill Cutting(General)/ under φ20 for Solid Drill | | | | | | | | | | ● | TiAlN |
| | | PC215K | K15-K30 | Medium & Roughing Milling Cutting for castiron | | ● | ● | ● | ● | | | | | | TiAlN |
| | M | PC8110 | M01-M10 | Finishing to Medium Cutting for stainless Steel | ● | | | ● | | | ● | | | | ★New TiAlN film (High hardness / Oxidation resistance) |
| | | PC5300 | M20-M35 | Medium, Roughing Turning/Milling Cutting for stainless Steel | ● | ● | ● | ● | ● | ● | ● | ● | | | ★New TiAlN film (High hardness / Oxidation resistance) |
| | | PC9030 | M20-M35 | Medium, Roughing & Intermittent Turning Cutting for stainless Steel | ● | | | ● | ● | | ● | | | | TiAlN |
| | | PC9530 | M20-M35 | Medium, Roughing & Intermittent Milling Cutting for stainless Steel | | ● | | | | | | ● | | | TiAlN |
| | | PC3545 | M30-M50 | Roughing/ Heavy Inermittent Milling Cutting stainless Steel | | ● | | | | | | | | | TiN TiAlN |
| | | PC3030T | M20-M30 | Threading Cutting for stainless Steel | | | | | | | ● | | | | TiAlN |
| | | PC210 | M15-M30 | General E/M Cutting for stainless Steel | | | | | | | | | | ● | ★New TiAlN film (High hardness / Oxidation resistance) |
| | S | PC205F | M15-M30 | Drill Cutting(General)/ under φ20 for Solid Drill | | | | | | | | | | ● | TiAlN |
| | | PC8110 | S01-S20 | Medium to Finishing Turning Cutting for Heat resistant Alloy Steel | ● | | | ● | | | ● | | | | ★New TiAlN film (High hardness / Oxidation resistance) |
| | | PC5300 | S15-S25 | Medium to Roughing Turning/Milling Cutting for Heat resistant Alloy Steel | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ★New TiAlN film (High hardness / Oxidation resistance) |
| PC3545 | | S30-S50 | Roughing/ Heavy Intermittent Milling Cutting for Heat resistant Alloy Steel | | ● | | | | | | | | | TiN TiAlN | |
| PC210 | | S15-S30 | General E/M Cutting for Heat resistant Alloy Steel | | | | | | | | | | ● | ★New TiAlN film (High hardness / Oxidation resistance) | |
| PC205F | | S15-S25 | Drill Cutting(General)/ under φ20 for Solid Drill | | | | | | | | | | ● | TiAlN | |



KORLOY Grades

| Cat. | ISO | Grade | Range | Workpiece Application | Turning | Milling | Facing | Grooving | Threading | Parting | Index Drill | Solid Drill | Endmill | Coating layer |
|-----------------|--------|---------|---|---|---------|---------|--------|----------|-----------|---------|-------------|-------------|---------|---------------|
| Uncoated | P | A30 | P25-P35 | General Cutting for Steel | ● | | ● | | ● | ● | | | | |
| | K | H01 | K05-K15 | Finishing Cutting for castiron, Nonferrous Metal(Al. etc) | ● | | | ● | | | | ● | ● | |
| | | H05 | K05-K15 | Finishing for cast iron | ● | ● | | | | | | | | |
| | | G10 | K15-K25 | Medium Cutting for castiron | ● | ● | | ● | | | | | | |
| | N | H01 | N05-K15 | Finishing Cutting for castiron, Nonferrous Metal(Al. etc) | ● | | | ● | | | ● | | ● | |
| Cermet | P | CC105 | P01-P10 | High speed light Cutting for Steel (optimal precise boring) | ● | | | | | | | | | |
| | | CC115 | P10-P20 | Medium, High speed light Cutting for Steel | ● | | | | | | | | | |
| | | CC125 | P15-P25 | Medium, Roughing Milling Cutting for Steel | ● | | | | | | | | | |
| | | CN1000 | P05-P15 | Highspeed Cutting for Steel(Sintered Metal Cutting) | ● | | | | | | | | | |
| | CN20 | P15-P25 | General Turning/Milling Cutting for Steel | ● | ● | | ● | ● | ● | | | | | |
| | CN2000 | P10-P20 | Medium, Roughing Turning/ Milling Cutting for Steel | ● | ● | | ● | | ● | | | | | |
| | CN30 | P20-P30 | Roughing Milling Cutting for Steel | ● | | | | | | | | | | |
| | K | CN1000 | K05-K10 | High speed Cutting for Castiron | ● | | | | | | | | | |
| cBN | H | KB410 | H01-H10 | High speed continuous Cutting for Heat treatment steel | ● | | | | | | | | | |
| | | KB420 | H05-H15 | High Efficiency Cutting for Heat treatment steel | ● | | | | | | | | | |
| | | DBN210 | H10-H20 | High speed continuous/light intermittent Cutting for Heat treatment steel | ● | | | | | | | | | |
| | | KB425 | H15-H25 | High speed intermittent Cutting for Heat treatment steel | ● | | | | | | | | | |
| | | KB320 | H15-H25 | Continuous, intermittent Cutting for Heat treatment steel | ● | | | | | | | | | |
| | | DBN350 | H25-H35 | Intermittent Cutting for Heat treatment steel(Heavy intermittent) | ● | | | | | | | | | |
| | K | KB350 | K01-K10 | High Hardness cutting for castiron | ● | | | | | | | | | |
| | | KB370 | K05-K15 | High speed cutting for castiron | ● | ● | | | | | | | | |
| PCD | N | DP90 | N01-N10 | Cemented carbide, Ceramic roughing, High Si-Al alloy, Rock, Stone | ● | | | | | | | | | |
| | | DP150 | N05-N15 | High Si-Al alloy, copper Alloy, Rubber, Wood, Carbon | ● | | | | | | | | | |
| | | DP200 | N10-N20 | Plastic, Wood, Al precise finishing Cutting | ● | | | | | | | | | |
| DLC | N | PD1000 | N01-N20 | Nonferrous(Al. etc) Turing cutting | ● | | | | | | | | | |
| | | PD2000 | N01-N20 | Nonferrous(Al. etc) Milling cutting | | ● | | | | | | | | |
| | | PD3000 | N01-N20 | Nonferrous(Al. etc) E/M cutting | | | | | | | | ● | | |
| Diamond Coating | N | ND1000 | N01-N20 | Nonferrous(graphite, Al, Bronze) Turning cutting | ● | | | | | | | | | |
| | | ND2000 | N01-N20 | Nonferrous(graphite, Al, Bronze) Milling cutting | | ● | | | | | | | | |
| | | ND3000 | N01-N20 | Nonferrous(graphite, Al, Bronze) E/ M cutting | | | | | | | | ● | | |



The comparison of grade for turning

WC

| ISO | KORLOY | SUMITOMO | KYOCERA | ISCAR | SANDVIK | SECO | KENAMETAL | TOSHIBA | MITSUBISHI | HITACHI | VALENITE | WALTER | TAECUTEC | NTK | DIJET | |
|---------|--------|--|----------------|-------|---------------------|----------------------------------|-------------------|--------------------------|----------------------|-----------------|----------------------|----------------------------------|---------------------------|-----|-------|----------------|
| Turning | P | ST50E ST10 | ST10P ST20E | PW30 | IC50M IC54 | S1P SM30 TTX TTM TTR | K45 KM K420 | TX10S TX20 | ST10T ST120T | SRN5 WS20B | S1F | P10 P20 VC6 VC5 VC56 | P30 P40 | | | |
| | | MA2 ST30 ST30A ST30N ST40E | | | | | | A30 | TX30 | UT120T | EX35 EX40 EX45 | | | | | VC27 VC28 |
| | | U10 U20 | | | | | | U10E U2 A30 A40 | AT10 AT15 TTR | K2885 K2S | TU10 TU20 TU40 | | | | | WAM10B EX35 |
| Turning | K | H02 H01 H05 H10 G10 | H1 | KW10H | IC4 IC20 IC28 | H1P H10F | THM THR | K68 K8735 | TH03 TH10 KS20 | HT10T HT120T | WH05 W10 WH20 | VC3 VC2 VC1 | K10 K20 K20M K30 | | | |

CVD Coated

| ISO | KORLOY | SUMITOMO | KYOCERA | ISCAR | SANDVIK | SECO | KENAMETAL | TOSHIBA | MITSUBISHI | HITACHI | VALENITE | WALTER | TAECUTEC | NTK | DIJET | |
|---------|--------|---|------------------|----------------------------|------------------|----------------------------|----------------------------|-------------------------|-------------------------|----------------------------|------------------|----------------------------|----------------------------------|----------------------------|------------|----------------------------|
| Turning | P | NC3010 NC3220* | AC810P AC820P | CA5505 CA5515 CA5525 | IC8150 IC8250 | GC4205 GC4215 GC4225 | TP0500 TP1500 TP2500 | KCP05 KCP10 KCP25 | T9105 T9115 T9125 | UE6105 UE6110 UE6020 | HG8010 HG8025 | VP5515 VP5525 | WPP01 WPP05 WPP10 WPP20 | TT8115 TT8125 | CP5 | JC110V JC215V |
| | | NC3120 NC3030 NC5330* NC500H | AC830P | CA5535 | IC8350 | GC4235 | TP3500 | KU30 KCP40 | T9135 | UE6035 | GM8035 | VP5535 | WPP30 | TT8135 | | JC325V JC450 |
| | | NC9020 NC9025 | AC610M AC630M | CA6515 CA6525 | IC8250 IC8350 | GC2015 GC2025 | TM2000 TM4000 | KCM15 KCM25 KCM35 | T6020 T6030 | US7020 US735 | GM25 GX30 | VP8515 VP8525 | WAM10 WAM20 | TT9215 TT9225 TT9235 | | TT9215 TT9225 TT9235 |
| Turning | K | NC6205* NC6210* NC315K NC5330* | AC410K AC420K | CA4505 CA4515 CA4120 | IC5005 IC5010 | GC3205 GC3210 GC3215 | TK1001 TK2001 | KCK05 KCK15 KCK20 | T5105 T5115 T5125 | UC5105 UC5115 | HG3505 HG3515 | VP1505 VP1510 VP5515 | WAK10 WAK20 | TT1300 TT7310 | CP2 CP5 | JC105V JC110V JC215V |

PVD Coated

| ISO | KORLOY | SUMITOMO | KYOCERA | ISCAR | SANDVIK | SECO | KENAMETAL | TOSHIBA | MITSUBISHI | HITACHI | VALENITE | WALTER | TAECUTEC | NTK | DIJET |
|---------|--------|------------------------------|--|--|-------------------------|-------------------------|---|-------------------------|----------------------------|---|--|--------------------------|----------|-----|------------------|
| Turning | P | PC230 PC5300* | PR1005 PR915 PR1115 PR930 PR1025 PR630 PR660 | IC507 IC808* | GC1025 | CP200 | KU10T KU25T | AH710 GH730 | VP15TF VP20MF | IP2000 | VC907 VC927 | WTA43 | TT5030 | | JC5003 JC5015 |
| | | PC3545 | | IC830* IC908 IC3028 | | CP250 | AH330 AH740 AH120 GH330 | IP3000 | | VC905 | WTA41 | | | | |
| | | PC8110* PC5300* PC9030 | | IC330* IC808* | | CP200 CP250 CP500 | AH330 GH330 AH120 GH730 AH140 | IP505* IP1005* | | VC929 VC927 VC902 VC901 VC905 | | ZM3 QM3 VM1 TAS | | | |
| Turning | K | PC5300* | EH510Z EH520Z | IC5100* IC810* IC220 IC908 IC228 | CP200 CP250 CP500 | TS2000* TS2500* | K50510 K50525 | AH110 GH110 AH120 | VP05RT VP10RT VP15TF | CY110H | VC929 VC903 VC927 VC902 VC901 VC907 | | TT5030 | | |
| | | PC8110* PC5300* | PR915 PC660 | IC808* | | GC1105 GC1025 | | KC5010 KC5025 | | AH110 AH120 | TT5030 | | | | |
| | | PC5300* | PR915 PC660 | IC808* | | GC1105 GC1025 | | KC5010 KC5025 | | AH110 AH120 | TT5030 | | | | |

CERMET

| ISO | KORLOY | SUMITOMO | KYOCERA | ISCAR | SANDVIK | SECO | KENAMETAL | TUNGALOY | MITSUBISHI | HITACHI | VALENITE | WALTER | TAECUTEC | NTK | DIJET |
|---------|--------|--------------------------|--------------------|---------------------------------|-----------------|------------------|-------------------|------------------------|-------------------------|---------------------------|-------------------------|------------------|-------------------|-------------------|----------------------|
| Turning | P | CN1000 | T110A T2000Z* | PV30* TN30 | IC20N IC520N | CT5015 | CM C15M | HT2 KT125 | NS520 GT530* | NX2525 NX3035 | CH350 CZ25* | WTA43* WTA41* | PV3010* CT3000 | T3N T15 N20 | LN10 CX50 CX75 |
| | | CC115* CN2000 CN20 | T1500A* T3000Z* | PV60* TN60 TN6020 TN90 | IC30N IC530N | CT525 GC1525* | TP1020 TP1030* | HT5 KT175 KT195M | NS530 NS540 NS730 | UP35N* AP25N* NX335 | CH530 CH550 CH570 | | VC83 | C30 N40 | CX90 CX99 |
| | | | T1500A* | | | | | | | | | | | | |
| Turning | K | CN1000 | T110A T1500A* | | | | | | NX2525 | | | | CT3000 | T15 | LN10 CX75 |

★ : PVD Coating cermet ★ : New Grade

The comparison of grade for milling

CVD Coated

| ISO | KORLOY | SUMITOMO | KYOCERA | ISCAR | SANDVIK | SECO | KENAMETAL | TOSHIBA | mitsubishi | HITACHI | VALENITE | WALTER | TAECUTEC | NTK | DIJET |
|---------|--------|----------|---------|-------|---------|--------|------------------|---------|------------|-----------------|----------|----------------|----------|-----|-------|
| Milling | P | NC5330* | ACP100 | | IC5400 | GC4220 | MP1500 | | | | | WQM15 | TT7400 | | |
| | | NCM325 | | | | GC4230 | MP2500 T25M | | | | | WKP25 WQM25 | TT7800 | | |
| | | NCM335 | | | | GC4240 | T350M | | T3130 | FH7020 F7030 | | SM245 | | | |
| Milling | M | NC5330* | | | | | | | | | | | | | |
| | | MCM325 | | | | | MP2500 GC2040 | | T3130 | | | WQM25 WTP35 | | | |
| | | NCM335 | | | | GC2040 | | | | F7030 | | | | | |
| Milling | K | NC5330* | ACK200 | | IC5100 | GC3220 | MK1500 MK3000 | KC992M | | T1115 T1015 | | V01 VN8 | TT6800 | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

PVD Coated

| ISO | KORLOY | SUMITOMO | KYOCERA | ISCAR | SANDVIK | SECO | KENAMETAL | TOSHIBA | mitsubishi | HITACHI | VALENITE | WALTER | TAECUTEC | NTK | DIJET | | |
|---------|---------|------------------|------------------|------------------|--------------------------|-------------------------|--|------------------|--------------------------------------|---|---------------------------|---|----------|----------------------------|------------------|------------------|--------|
| Milling | P | PC210F | | | | | | | | ATH80D PCA08M ACS05E PCA12M PC20M JX1005 TB6005 JX1020 CY9020 | | | | | | | |
| | | PC3600 PC3500 | ACZ310 | PR730 | IC903 IC908 IC950 | GC1010 | MP3000* | KC522M KUC20M | GH330 | AP20M GP20M | | | | | | JC5003 | |
| | | | ACP200 | PR830 PR630 | IC908 | GC1025 GC1030 | F25M F30M | | KC525M KUC30M | AH120 | VP15TF | VC935 | | TT7070 TT7080 TT7030 | | JC5015 | |
| | | PC5300* | ACP300 ACZ350 | PR660 | IC928 | GC1030 | F40M T60M | | KC935M KC7140 KC720 | UP20M | TB6045 CY250 PTH30E | | | | QM3 ZM3 | JC5030 JC5040 | |
| | | | PC3545 | PR660 | IC928 | GC1030 | F40M T60M | | KC935M KC7140 KC720 | VP30RT | PTH40H | | | TT8020 | | | |
| | | | | PR730 | IC903 | | | | KC5510 KC7020 | | | JX1020 CY9020 JX1015 TB6020 CY250 | | | | QM3 ZM3 | JC5003 |
| | Milling | M | PC5300* | ACP200 | PR1025 PR630 PR660 | IC900 IC250 IC928 | GC1125 GC1025 GC2030 GC1030 | F25M | KC522M KC725M KC735M KC7030 | AH120 | | VC928 VC902 VC901 | | TT9030 | | JC5015 | |
| | | | PC9530 | ACP300 ACZ350 | PR660 | IC928 | GC1030 | F30M | KC7030 | AH140 | JX1045 TB6045 | | WQM35 | TT9080 | | JC5030 JC5040 | |
| | | | PC3545 | | | IC328 | | F40M | KC722 | | JX1060 TB6060 | | WSP45 | TT8020 | | | |
| | | Milling | K | PC8110* | | PR510 PR905 | DT7150 IC900 IC910 IC950 IC350 | | | | | VC903 VC928 | | TT6290 | | JC5003 | |
| | | | | PC6510 | | | | | | KC510M KC915M | AH120 | VP10MF VP15TF | | | TT6030 TT6060 | | JC5015 |
| | | | | PC5300* | | | | | | KC520M | | VP20RT | | VC902 VC901 | | | |
| Milling | S | PC5300* | AC520U | PC660 | IC328 | GC1025 | TS2500 | KC510M | | VP15TF | | ACS05E | TT9030 | | | | |

CERMET

| ISO | KORLOY | SUMITOMO | KYOCERA | ISCAR | SANDVIK | SECO | KENAMETAL | TOSHIBA | mitsubishi | HITACHI | VALENITE | WALTER | TAECUTEC | NTK | DIJET |
|---------|--------|------------------------|---------|-----------------|---------|------|-----------|----------------|------------------|----------------|----------|--------|------------------|-----|-------|
| Milling | P | CN2000 CN20 CN30 | T250A | TN100M TC60M | IC30N | | | NS540 NS740 | NX2525 NX4545 | CH550 CH570 | | | CT3000 CT7000 | C50 | |
| | | Milling | M | | | | | | | | | | | | |
| | | | | T250A | | | | CT530 | | | | | | | |
| Milling | K | | | | | | | | NX2525 | | | | | | |

★ : PVD Coating cermet ★ : New Grade





M

OLD-FASHIONED PRODUCT INFORMATION



OLD-FASHIONED PRODUCT INFORMATION

C O N T E N T S

Old-fashioned product information

- M02** Grade
- M02** External Holder
- M03** Fine Tool
- M03** Threading Tool
- M03** Mill Max
- M04** Cen Mill
- M04** Jip Drill
- M04** LPD / SPD / NPD

Grade

| ISO material code | | Old grade | New grade |
|-------------------|------------|--------------------------------|----------------|
| Coating grade | P | NC310 | NC3010 |
| | | NC320, NC3020, NC3120 | NC3220 |
| | | NC330 | NC3030 |
| | M | PC3530, PC3525, PC3535, PC3500 | PC3600 |
| | K | NC305K, NC6105 | NC6205 |
| | S | NC6110 | NC6205, NC6210 |
| | | PC8010 | PC8110 |
| | P, M, K, S | | PC8520, PC215K |
| Cermet | | PC225F | PC205F |
| | | CN100 | CN1000 |
| | | CT10, CN200 | CN2000 |

- Korloy always study and develops cutting-edge technology tools and grades which covers higher speed and feed conditions
- Korloy guarantees better performance and wide stock-management range for the new grade

External holder

| Designation | Insert | Old parts name | | | | | | New holder | Page |
|---------------|----------|----------------|---------|------|----------|--------|-----------------|----------------|------|
| | | Lever | Screw | Shim | Shim pin | Wrench | Shim pin Wrench | | |
| PCBNR□□□□-□19 | CN□□1906 | LV6 | VHX1027 | SC63 | SP6 | HW40L | - | PCBNR□□□□-□19N | B94 |
| PCBNR□□□□-□25 | CN□□2509 | LV8 | VHX1236 | SC83 | SP8 | HW50L | - | PCBNR□□□□-□25N | |
| PCLNR□□□□-□19 | CN□□1906 | LV6 | VHX1027 | SC63 | SP6 | HW40L | - | PCLNR□□□□-□19N | B95 |
| PCLNR□□□□-□25 | CN□□2509 | LV8 | VHX1236 | SC83 | SP8 | HW50L | - | PCLNR□□□□-□25N | |
| PSBNR□□□□-□19 | SN□□1906 | LV6 | VHX1027 | SS63 | SP6 | HW40L | - | PSBNR□□□□-□19N | B98 |
| PSBNR□□□□-□25 | SN□□2507 | LV8 | VHX1236 | SS83 | SP8 | HW50L | - | PSBNR□□□□-□25N | |
| PSDNN□□□□-□19 | SN□□1906 | LV6 | VHX1027 | SS63 | SP6 | HW40L | - | PSDNN□□□□-□19N | B98 |
| PSDNN□□□□-□25 | SN□□2507 | LV8 | VHX1236 | SS83 | SP8 | HW50L | - | PSDNN□□□□-□25N | |
| PSKNR□□□□-□19 | SN□□1906 | LV6 | VHX1027 | SS63 | SP6 | HW40L | - | PSKNR□□□□-□19N | B99 |
| PSKNR□□□□-□25 | SN□□2507 | LV8 | VHX1236 | SS83 | SP8 | HW50L | - | PSKNR□□□□-□25N | |
| PSSNR□□□□-□19 | SN□□1906 | LV6 | VHX1027 | SS63 | SP6 | HW40L | - | PSSNR□□□□-□19N | B99 |
| PSSNR□□□□-□25 | SN□□2507 | LV8 | VHX1236 | SS83 | SP8 | HW50L | - | PSSNR□□□□-□25N | |

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service

| Designation | Insert | Old parts name | | | | New holder | Page |
|-----------------------------------|----------|----------------|---------|--------|----------------|---------------|------|
| | | Wedge clamp | Screw | Washer | Others | | |
| WTENN□□□□-□16 (Old Type:MTEEN) | TN□□1604 | CMH5R1 | MHX0523 | WA4 | Same as before | WTENN□□□□-□16 | B102 |
| WTJNR□□□□-□16 (Old Type:MTJNR) | TN□□1604 | CMH5R1 | MHX0523 | WA4 | Same as before | WTJNR□□□□-□16 | B102 |
| WTXNR□□□□-□16 (Old Type:MTXNR) | TN□□1604 | CMH5R1 | MHX0523 | WA4 | Same as before | WTXNR□□□□-□16 | B102 |

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service



Fine tool

| Designation | Insert | Old parts name | | New holder | Page |
|-------------|------------|---------------------|-----------|------------|--------------|
| | | Screw | Wrench | | |
| FTIH | FTIH08□□□□ | FTG08, FTT08, FTF08 | PTKA02508 | TW08P | NFTIH C42 |
| | FTIH11□□□□ | FTG11, FTT11, FTF11 | PTKA03510 | TW15P | |
| | FTIH14□□□□ | FTG14, FTT14, FTF14 | PTKA0412 | TW15P | |
| | FTIH16□□□□ | FTG16, FTT16, FTF16 | PTKA0512 | TW20P | |

- Old inserts and parts are not interchangeable with new fine tool
- Good performance and convenient use of new fine tool gives customer best quality of service

Threading tool

| Designation | Insert | Old parts name | | | | | | | New holder | Page |
|-------------|---------------------|----------------|-------------|--------|-----------|--------|-------------------|----------|------------|------|
| | | Clamp | Clamp screw | Shim | Screw | C-ring | Wrench | | | |
| ETH | ~ETH3□□R ECTR3□□□ | CH5R3 | CHX0513 | ST32C1 | SHX0310 | CR04 | HW20L,HW25L | ER(L)H-□ | D31 | |
| | ~ETH4□□R ECTR4□□□ | CH6R4 | CHX0621 | ST42C1 | SHX0310 | CR05 | HW20L,HW30L | | | |
| ITH | ~ITH2□□R ICTR2□□□ | CH5R3 | CHX0513 | ST32C1 | FTKA02565 | CR04 | TW07P | IR(L)H-□ | D32 | |
| | ~ITH3□□R ICTR3□□□ | CH5R3 | CHX0513 | ST32C1 | SHX0310 | CR04 | TW15P,HW20L,HW25L | | | |
| | ~ITH4□□R ICTR4□□□ | CH6R4 | CHX0621 | ST42C1 | SHX0310 | CR05 | HW20L,HW30L | | | |

- Old inserts and parts are not interchangeable with threading holders
- Good performance and convenient use of new fine tool gives customer best quality of service

Mill-Max

| Designation | Insert | Old parts name | | | | | New cutter | Page |
|-------------|----------|----------------------------------|--------|---------------------------------|---------------|--------|---------------|------|
| | | Locator | Wedge | Wedge screw | Locator screw | Wrench | | |
| AD(ADM)4000 | SD□□1203 | LAS4R/L | WASR/L | WTX0817 | LTX0512 | TW25 | ADN(ADNM)4000 | E33 |
| AD(ADM)5000 | SD□□1504 | LAS5R/L | WASR/L | WTX0817 | LTX0512 | TW25 | ADN(ADNM)5000 | E34 |
| EP(EPM)4000 | SP□□1203 | LES4R/L LES4R1/L1(Ø80 ~ Ø100) | WESR/L | WTX0817 WTX0813((Ø80 ~ Ø100) | LTX0512 | TW25 | EPN(EPNM)4000 | E39 |
| EP(EPM)5000 | SP□□1504 | LES5R/L LES5R1/L1(Ø80 ~ Ø100) | WESR/L | WTX0817 WTX0813((Ø80 ~ Ø100) | LTX0512 | TW25 | EPN(EPNM)5000 | E40 |
| PP(PPM)4000 | TP□□2204 | LPT4R/L LPT4R1/L1(Ø80 ~ Ø100) | WESR/L | WTX0817 WTX0813((Ø80 ~ Ø100) | LTX0512 | TW25 | PPN(PPNM)4000 | E42 |

- Parts are not interchangeable with new mill-max cutters
- Good performance and convenient use of new mill-max gives customer best quality of service



Cen-Mill

| Designation | Insert | | Old parts name | | New product | Page |
|----------------------|------------------------------|------------------------------|-----------------------------|-----------------------|------------------------------|-----------|
| | | | Screw | Wrench | | |
| HE | Ø25 | MCMT080308EN ZCMT080308ER | FTNA0307 | TW09P | AMS□□□□M | E127~E128 |
| | Ø32, 40, 50 | MCMT09T308EN ZCMT09T308ER | FTNA0408 | TW15P | | |
| LE (LEM) | LOCX1205ZZ | | FTNB0411 | TW15P | AMC□□□□M | E106~E116 |
| SE | Ø25 | MPMT090308 | FTNA0408 | TW15L | AMS□□□□MH | E128 |
| | Ø32, 40 | MPMT120408 | FTNA0513 | TW20L | | |
| TM | MIT100 MET150,200,300,400 | | FTNA0408 FTNA0513(TM950) | TW15L TW20L(TM950) | TMS(I) | D49 |
| PM | EDCW1604ZDF/TR | | FTNA0513 | TW20L | RM4Z | E87~E88 |
| CE (Code changed) | SPG(M)N1203□□ | | | | CE45-□□□□R-S32 (New code) | E230 |

- Old inserts and parts are not interchangeable with new milling product
- New product : Alpha mill which has unique alpha-curve edge guarantees wide range machining and good performance.
- Good performance and convenient use of new milling tool gives customer best quality of service

Jip Drill

| Designation | Insert | | Old parts name | | New indexable drill | Page |
|-------------|---------|----------------|----------------|--------|---------------------|---------|
| | | | Screw | Wrench | | |
| JD | ~ JD200 | WCMT030208-C20 | FTKA02565 | TW07P | K□D (KING-DRILL) | G11~G19 |
| | ~ JD250 | WCMT040208-C20 | | | | |
| | ~ JD300 | WCMT050308-C20 | FTNA0307 | TW09P | | |
| | ~ JD410 | WCMT06T308-C20 | FTGA03508 | | | |
| | ~ JD580 | WCMT080408-C20 | FTNA0408 | TW15P | | |

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service

LPD / SPD / NPD

| Designation | Insert | | Old parts name | | New indexable drill | Page |
|-------------|----------|------------------------------|----------------|--------|---------------------|---------|
| | | | Screw | Wrench | | |
| LPD | ~ LPD135 | LPMT040203-DF | FTNA0204 | TW06P | K□D (KING-DRILL) | G11~G19 |
| SPD | ~ SPD155 | SPM(E)T050203-DM, DF, DS, DA | FTNA0204 | TW06P | | |
| | ~ SPD195 | SPM(E)T060204-DM, DS, DR, DA | FTKA02206S | TW07S | | |
| | ~ SPD225 | SPM(E)T070204-DM, DS, DR, DA | FTKA02565 | TW07S | | |
| NPD | ~ NPD245 | NPM(E)T222408-DM, DS, DR, DA | FTKA02565 | TW07S | | |
| | ~ NPD285 | NPM(E)T252808-DM, DS, DR, DA | FTKA0307 | TW09S | | |
| | ~ NPD325 | NPM(E)T293208-DM, DS, DR, DA | FTKA0307 | TW09S | | |
| | ~ NPD405 | NPM(E)T334008-DM, DS, DR, DA | FTKA03508 | TW15S | | |
| | ~ NPD505 | NPM(E)T415008-DM, DS, DR, DA | FTKA0410 | TW15S | | |
| | ~ NPD605 | NPM(E)T516012-DM, DS, DR, DA | FTNC04511 | TW20S | | |

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service



N

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D

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E

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G

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| GFT | Multi functional tools | C40 |
| GH | Multi functional tools | C41 |
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H

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I

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| IGH | Multi functional tools | C39 |
| I - MAX | Endmill | F20 |
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J

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| Jip Drill | Old-fashioned product information | M04 |
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K

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K

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| KT | Tooling System | I 54 |

L

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| Line Casing (EL) | Threading | D30 |
| Locator | Parts | K05 |
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M

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| MGT | Multi functional tools | C21 |
| MGT Aluminum Wheel Holder | Multi functional tools | C34 |
| MGT Aluminum Wheel Insert | Multi functional tools | C36 |
| MGT Cartridge | Multi functional tools | C20 |
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| O-Ring Cutter | Milling | E223 |
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| PCD face cutter | Milling | E102 |
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| PCD Inserts | Turning | B81 |
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| PH | Multi functional tools | C43 |
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| Technical Information for HSK tooling syste | Turning | B146 |
| Technical Information for HSK tooling system | Milling | E135 |
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| V-Endmill | Endmill | F14 |
| Vertical Type Holder | Threading | D33 |
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W

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| Washer | Parts | K07 |
| Wedge Clamp System (Holder) | Turning | B102 |
| Whit Worth (BSW, BSF, BSP, BSB) | Threading | D18 |
| Wind Mill | Milling | E268 |
| Workpiece material grades | Technical Information | L02 |
| WPDC | Drill | G38 |
| Wrench | Parts | K07 |
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A

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| AD(ADM)5000 | Mill-Max | M03 |
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| ADLT | Milling insert (Tank Mill) | E04 |
| ADN(M)4000 | Mill-Max | E34 |
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| ADS4000 | Turbo Mill | E44 |
| ADS5000 | Turbo Mill | E45 |
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| AMC(M)1500S | Alpha Mill | E109 |
| AMC(M)2000M | Alpha Mill | E116 |
| AMC(M)2000S | Alpha Mill | E110 |
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| AMS1500S | Alpha Mill | E120 |
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| AMS3000S | Alpha Mill | E123 |
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A

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| APKT-MA | Milling insert (Alpha Mill) | E04 |
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| APKT-MA3 | Milling insert (Alpha Mill) | E04 |
| APKT-MF | Milling insert (Alpha Mill) | E04 |
| APKT-MM | Milling insert (Alpha Mill) | E04 |
| APKT-MM1 | Milling insert (Alpha Mill) | E04 |
| APKT-X22 | Milling insert (Alpha Mill) | E04 |
| APKT-X23 | Milling insert (Alpha Mill) | E05 |
| APKT-X24 | Milling insert (Alpha Mill) | E05 |
| APLT | Milling insert (Tank Mill) | E05 |
| APMT-MA | Milling insert (Alpha Mill) | E05 |
| APMT-MF | Milling insert (Alpha Mill) | E05 |
| APMT-ML | Milling insert (Alpha Mill) | E05 |
| APMT-MM | Milling insert (Alpha Mill) | E05 |
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B

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| BAPDR/L-XAF | Milling insert (Aero Mill) | E06 |
| BAPDR/L-XAW | Milling insert (Aero Mill) | E06 |
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| BRE | BRE | E222 |
| BT | Brazed Tools (Boring Crown Blank) | H12 |



B

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| BT40 AM1500 | BT Tooling System (Multi edge) | E142 |
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|-----------------|--|-------------|
| CBE2000 | Endmill (C-Max Ball type) | F66 |
| CBNE2000 | Endmill (C-Max Long Neck Ball type) | F66 |
| CCET | Turning Insert_Positive (Carbide Shank Boring Bar) | B48 |
| CCGT-AK | Aluminum Insert_Positive (Screw on System) | B68 |
| CCGT-AR | Aluminum Insert_Positive (Screw on System) | B68 |
| CCGT-C05 | Turning Insert_Positive (Screw on System) | B49 |
| CCGT-HFP | Turning Insert_Positive (Screw on System) | B49 |
| CCGT-KF | Turning Insert_Positive (Screw on System) | B49 |
| CCGT-KM | Turning Insert_Positive (Screw on System) | B49 |
| CCGT-VP1 | Turning Insert_Positive (Screw on System) | B50 |
| CCLNR/L | Ceramic Holder | B120 |
| CCMT | PCD Insert_Positive | B81 |
| CCMT-C25 | Turning Insert_Positive (Screw on System) | B50 |
| CCMT-HFP | Turning Insert_Positive (Screw on System) | B50 |
| CCMT-HMP | Turning Insert_Positive (Screw on System) | B50 |
| CCMT-VF | Turning Insert_Positive (Screw on System) | B50 |
| CCMT-VL | Turning Insert_Positive (Screw on System) | B50 |
| CCMW | cBN Insert_Positive (Regrinding) | B75 |
| CCT | Solid Chamfer Tool | E232 |
| CD | Drill Insert (Center Drill) | G37 |
| CDEW-NAF | Milling Insert (Aero Mill) | E06 |
| CDEW-NAW | Milling Insert (Aero Mill) | E06 |
| CDEW-XAF | Milling Insert (Aero Mill) | E06 |
| CDEW-XAW | Milling Insert (Aero Mill) | E06 |

C

| | | |
|-------------------------|---|-------------|
| CDEW-XCF | Milling Insert (Aero Mill) | E07 |
| CDH | Drill Insert (Center Drill) | G37 |
| CDH4000 | High feed Cutter | E281 |
| CDH5000 | High feed Cutter | E282 |
| CE | Chamfer Tool (Back & Front Chamfer) | E228 |
| CE | Chamfer Tool (Long Chamfer) | E229 |
| CE | Multi-functional Chamfer Tool | E230 |
| CET | Solid Chamfer Tool | E231 |
| CFE2000 | Endmill (C-Max Flat type) | F65 |
| CFNE2000 | Endmill (C-Max Long Neck Flat type) | F65 |
| CJ | Brazed Tools (Chuck jaws) | H10 |
| CKFNR/L...RW | Bearing Solution | C54 |
| CKGNR...RW | Bearing Solution | C54 |
| CKJNR/L | Holder (Clamp on System) | B104 |
| CKNNR/L | Holder (Clamp on System) | B104 |
| CKUNR/L | Boring Bar (Clamp on System) | B131 |
| CMSNR/L...B | Bearing Solution | C51 |
| CMSNR/L...F | Bearing Solution | C51 |
| CNGG-VP1 | Turning Insert_Negative (Multi Lock / Lever Lock System) | B18 |
| CNGN | cBN Insert_Negative(Regrinding) | B75 |
| CNHQ | Milling Insert (Side milling cutter_Tangential type) | E07 |
| CNMA | Turning Insert_Negative (Multi Lock / Lever Lock System) | B18 |
| CNMA(PCD Insert) | cBN Insert_Negative (Double clamp / Multi Lock/Lever Lock System) | B75 |
| CNMG-B25 | Turning Insert_Negative (Multi Lock / Lever Lock System) | B18 |
| CNMG-GM | Turning Insert_Negative (Multi Lock / Lever Lock System) | B18 |
| CNMG-GR | Turning Insert_Negative (Multi Lock / Lever Lock System) | B19 |
| CNMG-GS | Turning Insert_Negative (Multi Lock / Lever Lock System) | B19 |
| CNMG-HA | Turning Insert_Negative (Multi Lock / Lever Lock System) | B19 |
| CNMG-HC | Turning Insert_Negative (Multi Lock / Lever Lock System) | B19 |
| CNMG-HR | Turning Insert_Negative (Multi Lock / Lever Lock System) | B19 |
| CNMG-HS | Turning Insert_Negative (Multi Lock / Lever Lock System) | B20 |
| CNMG-LW | Turning Insert_Negative (Multi Lock / Lever Lock System) | B20 |
| CNMG-VB | Turning Insert_Negative (Multi Lock / Lever Lock System) | B20 |
| CNMG-VC | Turning Insert_Negative (Multi Lock / Lever Lock System) | B20 |
| CNMG-VF | Turning Insert_Negative (Multi Lock / Lever Lock System) | B20 |
| CNMG-VG | Turning Insert_Negative (Multi Lock / Lever Lock System) | B21 |
| CNMG-VK | Turning Insert_Negative (Multi Lock / Lever Lock System) | B22 |
| CNMG-VL | Turning Insert_Negative (Multi Lock / Lever Lock System) | B20 |
| CNMG-VM | Turning Insert_Negative (Multi Lock / Lever Lock System) | B21 |
| CNMG-VP2 | Turning Insert_Negative (Multi Lock / Lever Lock System) | B21 |
| CNMG-VP3 | Turning Insert_Negative (Multi Lock / Lever Lock System) | B21 |
| CNMG-VQ | Turning Insert_Negative (Multi Lock / Lever Lock System) | B21 |
| CNMG-VW | Turning Insert_Negative (Multi Lock / Lever Lock System) | B21 |

| C | | |
|-------------------------|--|----------------|
| CNMM | PCD Insert_Negative | B81 |
| CNMM-GH | Turning Insert_Negative (Multi Lock / Lever Lock System) | B22 |
| CNMM-GM | Turning Insert_Negative (Lever Lock System) | B22 |
| CNMM-GR | Turning Insert_Negative (Lever Lock System) | B22 |
| CNMM-HA | Turning Insert_Negative (Lever Lock System) | B22 |
| CNMM-VH | Turning Insert_Negative (Lever Lock System) | B22 |
| CNMM-VT | Turning Insert_Negative (Lever Lock System) | B22 |
| CNMX | PCD Insert_Negative | B81 |
| CPGB | cBN Insert_Positive (Regrinding) | B75 |
| CPGT | Turning Insert_Positive (Screw on System) | B51 |
| CPGT-C05 | Turning Insert_Positive (Screw on System) | B51 |
| CPGT-HMP | Turning Insert_Positive (Screw on System) | B51 |
| CPGW | cBN Insert_Positive (Regrinding) | B75 |
| CPMH | Milling Insert (T-Cutter) | E07 |
| CPMT | Milling Insert (T-Cutter) | E07 |
| CPMT(PCD Insert) | PCD Insert_Positive | B81 |
| CPMT-VF | Turning Insert_Positive (Screw on System) | B51 |
| CRDNN | Insert for Ceramic Holder | B120 |
| CRE2000 | Endmill (C-Max Radius type) | F67 |
| CRGNR/L | Insert for Ceramic Holder | B120 |
| CRNE2000 | Endmill (C-Max Long Neck Radius type) | F67 |
| CS | Tooling System (Straight Collet) | I 24~25 |
| CSBNR/L...BS | Bearing Solution | C55 |
| CSDNN | Insert for Ceramic Holder | B120 |
| CSDPN | Holder (Clamp on System) | B104 |
| CSGNR/L...RW | Bearing Solution | C54 |
| CSGNR/L...RW | Bearing Solution | C54 |
| CSKNR/L | Insert for Ceramic Holder | B121 |
| CSKNR/L...BS | Bearing Solution | C55 |
| CSKNR/L...BS | Bearing Solution | C55 |
| CSKPR/L | Holder (Clamp on System) | B105 |
| CSKPR/L | Boring Bar (Clamp on System) | B131 |
| CSKPR/L | Cartridge (Clamp on System) | B161 |
| CSKPR/L...B | Bearing Solution | C52 |
| CTFNR/L | Insert for Ceramic Holder | B121 |
| CTFPR/L | Holder (Clamp on System) | B105 |
| CTFPR/L | Boring Bar (Clamp on System) | B131 |
| CTFPR/L | Cartridge (Clamp on System) | B161 |
| CTGNR/L | Insert for Ceramic Holder | B121 |
| CTGNR/L...BS | Bearing Solution | C55 |
| CTGPR/L | Holder (Clamp on System) | B105 |
| CTSPR/L | Cartridge (Clamp on System) | B161 |
| CTTPR/L | Cartridge (Clamp on System) | B162 |

| C | | |
|----------------------|---|------------------|
| CTWPR/L | Cartridge (Clamp on System) | B162 |
| D | | |
| DB | Multi functional Insert (Grooving Tools) | C39 |
| DBC | Tooling System (DBC) | I 90 |
| DBE2000(Ball) | Endmill (D-Max Ball type) | F70 |
| DBH | Multi functional holder (Grooving Tools) | C39 |
| DC | Multi functional Insert (Grooving Tools) | C39 |
| DCBNR/L | Holder (Double clamp system) | B89 |
| DCGT-AK | Aluminum Insert_Positive (Screw on System) | B69 |
| DCGT-AR | Aluminum Insert_Positive (Screw on System) | B69 |
| DCGT-C05 | Turning Insert_Positive (Screw on System) | B52 |
| DCGT-HFP | Turning Insert_Positive (Screw on System) | B52 |
| DCGT-KF | Turning Insert_Positive (Screw on System) | B52 |
| DCGT-KM | Turning Insert_Positive (Screw on System) | B52 |
| DCGT-VP1 | Turning Insert_Positive (Screw on System) | B52 |
| DCKNR/L | Holder (Double clamp system) | B89 |
| DCLNR/L | Boring Bar (Double clamp system) | B126 |
| DCLNR/L | HSK Tooling System | B149, 153 |
| DCLNR/L | KM Tooling System | B155 |
| DCLNR/L | Holder (Double clamp system) | B89 |
| DCLNR/L | HSK Tooling System | B149, 153 |
| DCMNN | HSK Tooling System | B149 |
| DCMNN | KM Tooling System | B155 |
| DCMT | PCD Insert_Positive | B81 |
| DCMT-C25 | Turning Insert_Positive (Screw on System) | B53 |
| DCMT-HFP | Turning Insert_Positive (Screw on System) | B53 |
| DCMT-HMP | Turning Insert_Positive (Screw on System) | B53 |
| DCMT-VF | Turning Insert_Positive (Screw on System) | B53 |
| DCMT-VL | Turning Insert_Positive (Screw on System) | B53 |
| DCMW | cBN Insert_Positive (Regrinding) | B75 |
| DDJNR/L | HSK Tooling System | B149 |
| DDJNR/L | KM Tooling System | B155 |
| DDJNR/L | Holder (Double clamp system) | B90 |
| DDNNN | HSK Tooling System | B149 |
| DDNNN | KM Tooling System | B156 |
| DDNNN | HSK Tooling System | B149 |
| DDUNR/L | Boring Bar (Double clamp system) | B126 |
| DEH5000 | High feed Cutter | E283 |
| DF | Side Cutter | E265 |
| DFE2000 | Endmill (D-Max Flat type) | F70 |
| DHE | Tooling System (DHE series) | I 07~10 |
| DNGG-VP1 | Turning Insert_Negative (Multi Lock / Lever Lock, HSK Tooling System) | B23 |



D

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|-----------------|--|----------------|
| DNMA | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B23 |
| DNMA | cBN Insert_Negative(Regrinding) | B75 |
| DNMG-B25 | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B23 |
| DNMG-GM | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B23 |
| DNMG-GR | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B23 |
| DNMG-GS | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B24 |
| DNMG-HA | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B24 |
| DNMG-HC | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B24 |
| DNMG-HR | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B24 |
| DNMG-HS | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B24 |
| DNMG-LW | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B24 |
| DNMG-VB | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B25 |
| DNMG-VC | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B25 |
| DNMG-VF | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B25 |
| DNMG-VG | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B25 |
| DNMG-VK | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B26 |
| DNMG-VL | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B25 |
| DNMG-VM | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B25 |
| DNMG-VP2 | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B26 |
| DNMG-VP3 | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B26 |
| DNMG-VQ | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B26 |
| DNMG-VW | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B26 |
| DNMM | PCD Insert_Negative | B81 |
| DNMX | PCD Insert_Negative | B81 |
| DNMX-SH | Turning Insert_Negative (Multi Lock / Lever Lock, HSKTooling System) | B26 |
| DPH5000 | High feed Cutter | E272 |
| DRE2000 | Endmill (D-Max Radius type) | F70 |
| DSBNR/L | Holder (Double clamp system) | B90 |
| DSC | Tooling System (DSC series) | I 12~15 |
| DSDNN | Holder (Double clamp system) | B91 |
| DSK | Tooling System (DSK series) | I 40~41 |
| DSKNR/L | Boring Bar (Double clamp system) | B126 |
| DSKNR/L | Holder (Double clamp system) | B91 |
| DSSNR/L | Holder (Double clamp system) | B91 |
| DTFNR/L | Boring Bar (Double clamp system) | B127 |
| DTFNR/L | Holder (Double clamp system) | B92 |
| DTGNR/L | Holder (Double clamp system) | B92 |
| DTN | Tooling System (DTN series) | I 49~50 |
| DVJNR/L | Holder (Double clamp system) | B92 |
| DVVNN | Holder (Double clamp system) | B93 |
| DWLNRL | Boring Bar (Double clamp system) | B127 |
| DWLNRL | Holder (Double clamp system) | B93 |

E

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|------------------------|---|---------------|
| EF(M)4000 | Mill-max | E38 |
| EH | Parting off Tools | C43 |
| EN(M)4000 | Mill-max | E39 |
| EP(M)4000/5000 | Mill-max | M03 |
| EPN(M)4000 | Mill-max | E40 |
| EPN(M)5000+ | Mill-max Plus | E41 |
| ER(L) | Thread Insert | D10~31 |
| ER(L)H | Thread External Holderr (Screw on System) | D31 |
| ER(L)H-C | Thread External Holderr (Clamp on System) | D31 |
| ER/C | Tooling System (ER / C Collet) | I 44 |
| ERM | Thread Insert | D10~13 |
| ESB | Parting off Tools (Inserts) | C43 |
| ETH | Threading tool | M03 |
| EV2525R/L-105-3 | HSK Tooling System | B154 |
| EV2525R/L-112 | HSK Tooling System | B154 |
| EV2525R/L-115 | HSK Tooling System | B154 |
| EXT | Tooling System (Modular System) | I 101 |

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|--------------------------|------------------------------------|----------------|
| F | | |
| FBB | Tooling System (FBB Bite) | I 89 |
| FBB(N) | Tooling System (FBB New Type Bite) | I 82 |
| FBC | Tooling System (FBC) | I 86 |
| FBC | Tooling System (Head Set) | I 89 |
| FBH | Tooling System (FBH series) | I 79~81 |
| FC | Full Side Cutter | E261 |
| FE2000(Long Flat) | Endmill (I-Max Long Flat type) | F32 |
| FE2000(Flat) | Endmill (I-Max Flat type) | F30 |
| FE2000-T | Endmill (I-Max Taper Flat type) | F33 |
| FE3000(Flat) | Endmill (I-Max Flat type) | F30 |
| FE4000(Long Flat) | Endmill (I-Max Long Flat type) | F32 |
| FE4000(Flat) | Endmill (I-Max Flat type) | F31 |
| FGD | MGT Insert | C29 |
| FGHH | MGT Holder (Face Grooving) | C27 |
| FGM | MGT Insert | C29 |
| FGVH | MGT Holder (Face Grooving) | C28 |
| FMA | Tooling System (FMA series) | I 62~63 |
| FMAC(M)3000 | Future Mill | E162 |
| FMAC(M)3000-A | Future Mill (Aluminum body) | E164 |
| FMAC(M)4000 | Future Mill | E163 |
| FMAC(M)4000-A | Future Mill (Aluminum body) | E165 |
| FMAS3000 | Future Mill | E166 |
| FMAS4000 | Future Mill | E167 |
| FMB | Tooling System (FMB series) | I 64 |



F

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|----------------------|-----------------------------------|----------------|
| FMC | Tooling System (FMC series) | I 65~67 |
| FMD | Tooling System (FMD Basic Holder) | I 87 |
| FME4000 | Endmill (F-Endmill Standar type) | F55 |
| FMLE4000 | Endmill (F-Endmill Long type) | F55 |
| FMM | MGT Insert | C29 |
| FMPC(M)3000 | Future Mill | E168 |
| FMPC(M)3000-A | Future Mill_Aluminum body) | E170 |
| FMPC(M)4000 | Future Mill | E169 |
| FMPC(M)4000-A | Future Mill_Aluminum body) | E171 |
| FMPS3000 | Future Mill | E172 |
| FMPS4000 | Future Mill | E173 |
| FMRC(M)3000 | Future Mill | E174 |
| FMRC(M)4000 | Future Mill | E175 |
| FMRC(M)5000 | Future Mill | E176 |
| FMRC(M)6000 | Future Mill | E177 |
| FMRM1000 | Future Mill | E184 |
| FMRM1500 | Future Mill | E184 |
| FMRM2000 | Future Mill | E184 |
| FMRM2500 | Future Mill | E184 |
| FMRM3000 | Future Mill | E185 |
| FMRM4000 | Future Mill | E185 |
| FMRM5000 | Future Mill | E185 |
| FMRS1000 | Future Mill | E178 |
| FMRS1500 | Future Mill | E178 |
| FMRS2000 | Future Mill | E179 |
| FMRS2500 | Future Mill | E179 |
| FMRS3000 | Future Mill | E180 |
| FMRS4000 | Future Mill | E181 |
| FMRS5000 | Future Mill | E182 |
| FMRS6000 | Future Mill | E183 |
| FTIH | Fine Tool | M03 |

G

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|--------------|--|-------------|
| GBE | GBE (Single edge type) | E220 |
| GBEM | GBE (Modular type) | E221 |
| GBE-M | GBE (Multi edge type) | E220 |
| GER | Tooling System (GER Collet) | I 43 |
| GFIK | Multi functional (Grooving Tools) | C42 |
| GFIP | Multi functional (Grooving Tools) | C40 |
| GFT | Multi functional (Grooving Tools) | C40 |
| GH | Multi functional Insert (Grooving Tools) | C42 |
| GO | Multi functional Insert (Grooving Tools) | C42 |
| GR | Multi functional Insert (Grooving Tools) | C42 |

G

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| GS | Multi functional Insert (Grooving Tools) | C42 |
| GW | Multi functional Insert (Grooving Tools) | C40 |

H

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|------------------------|--------------------------------------|----------------|
| HBRE | Broach Reamer | G82 |
| HC | Tooling System (HC Slim Collet) | I 42 |
| HC | Half Side Cutter | E256 |
| HDC | Tooling System (HDC series) | I 37~38 |
| HE | Cen-Mill | M04 |
| HECN | Milling Insert (High feed Cutter) | E07 |
| HPBE2000 | Endmill (H-Max Ball type) | F10 |
| HPBE2000L | Endmill (H-Max Long ball type) | F10 |
| HPBE2000T | Endmill (H-Max Taper Ball type) | F10 |
| HPEN | Milling Insert (High feed Cutter) | E07 |
| HPEN-WC | Milling Insert (High feed Cutter) | E07 |
| HPM | Tooling System (HPM series) | I 22~23 |
| HPRE2000 | Endmill (H-Max Radius type) | F11 |
| HPRE2000T | Endmill (H-Max Taper Radius type) | F11 |
| HPRE4000 | Endmill (H-Max Radius type) | F11 |
| HPRE4000T | Endmill (H-Max Taper Radius type) | F11 |
| HPS | Tooling System (HPS series) | I 34~35 |
| HRAG | Tooling System (Angular Head Series) | I 75 |
| HRMC(M)13/15 | HRM | E201 |
| HRMDC(M)09 | HRMDouble | E191 |
| HRMDC(M)13 | HRMDouble | E192 |
| HRMDC(M)16 | HRMDouble | E193 |
| HRMDM 06 | HRMDouble | E199 |
| HRMDM 09/13 | HRMDouble | E200 |
| HRMDS06 | HRMDouble | E194 |
| HRMDS09 | HRMDouble | E195 |
| HRMDS13 | HRMDouble | E197 |
| HRMM08/10/13 | HRM | E205 |
| HRMS 08/10 | HRM | E202 |
| HRMS 13 | HRM | E203 |
| HRMS 15 | HRM | E204 |
| HSK100A | HSKTooling System (Modular) | E151 |
| HSK100A AM3000 | HSKTooling System (Multi edge) | E148 |
| HSK100A AM4000 | HSKTooling System (Multi edge) | E149 |
| HSK63A | HSKTooling System (Modular) | E151 |
| HSK63A AM1000 | HSKTooling System (Multi edge) | E146 |
| HSK63A AM1000HS | HSKTooling System (Single edge) | E139 |
| HSK63A AM1500 | HSKTooling System (Multi edge) | E146 |
| HSK63A AM1500HS | HSKTooling System (Single edge) | E139 |



H

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| HSK63A AM2000 | HSKTooling System (Multi edge) | E147 |
| HSK63A AM2000HS | HSKTooling System (Single edge) | E140 |
| HSK63A AM3000HS | HSKTooling System (Single edge) | E141 |
| HSK63A AM4000HS | HSKTooling System (Single edge) | E141 |
| HSK63A/100A PAX5000 | HSKTooling System (Single edge) | E252 |
| HT | Tooling System (Other) | I 116 |

I

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| IBE2000 | Endmill (I-Max Long Ball type) | F26 |
| IBE2000 | Endmill (I-Max Ball type) | F25 |
| IBE2000-T | Endmill (I-Max Taper Ball type) | F26 |
| IBE4000 | Endmill (I-Max Ball type) | F25 |
| IFE2000 | Endmill (I-Max Flat type) | F20 |
| IFE2000 | Endmill (I-Max Long Flat type) | F22 |
| IFE2000-T | Endmill (I-Max Taper Flat type) | F23~24 |
| IFE3000 | Endmill (I-Max Flat type) | F20 |
| IFE4000 | Endmill (I-Max Flat type) | F21 |
| IFE4000 | Endmill (I-Max Long Flat type) | F22 |
| IFSE3000 | Endmill (Hard-to-cut material Flat type) | F60 |
| IG | Multi functional Insert (Grooving Tools) | C39 |
| IGH | Multi functional Insert (Grooving Tools) | C39 |
| IPBE2000 | Endmill (I+ Endmill Ball type) | F45 |
| IPBE4000 | Endmill (I+ Endmill Ball type) | F47 |
| IPFE2000 | Endmill (I+ Endmill Flat type) | F41 |
| IPLBE2000 | Endmill (I+ Endmill Long Ball type) | F46 |
| IPLFE2000 | Endmill (I+ Endmill Long Flat type) | F42 |
| IPLFE4000 | Endmill (I+ Endmill Long Flat type) | F44 |
| IPLRE2000 | Endmill (I+ Endmill Long Radius type) | F50 |
| IPLRE4000 | Endmill (I+ Endmill Long Radius type) | F52 |
| IPPE4000 | Endmill (I+ Endmill Flat type) | F43 |
| IPRE2000 | Endmill (I+ Endmill Radius type) | F48~49 |
| IPRE4000 | Endmill (I+ Endmill Radius type) | F51 |
| IR(L) | Thread Insert | D10~32 |
| IR(L)H | Thread Internal Holder (Screw on System) | D32 |
| IR(L)H-C | Thread Internal Holder (Clamp on System) | D32 |
| IRB | Indexable Reamer (Stuffed hole) | G76 |
| IRE2000 | Endmill (I-Max Radius type) | F28 |
| IRE4000 | Endmill (I-Max Radius type) | F29 |
| IRM | Thread Insert | D10~11 |
| IRT | Indexable Reamer (Throughout hole) | G75 |
| ITH | Threading tool | M03 |

J

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| JD | Jip drill | M04 |
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K

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|--------------------|---|---------------|
| K2D | KING DRILL-2D | G12~13 |
| K2D-HP | KING DRILL(for through coolant system with a lathe)-2D | G22 |
| K2D | KING DRILL(for large diameter drilling)-2D | G26 |
| K3D | KING DRILL-3D | G14~16 |
| K3D-HP | KING DRILL(for through coolant system with a lathe)-3D | G23 |
| K3D | KING DRILL(for large diameter drilling)-3D | G26 |
| K3D* | KING DRILL(for machining a tap foundation hole)-3D | G14~15 |
| K4D | KING DRILL-4D | G17~18 |
| K4D-HP | KING DRILL(for through coolant system with a lathe)-4D | G24 |
| K4D | KING DRILL(for large diameter drilling)-4D | G26 |
| K5D | KING DRILL(for large diameter drilling)-5D | G19~20 |
| KAC | Tooling System (Angular Head Series) | I 77 |
| KAG | Tooling System (Angular Head Series) | I 75 |
| KAH | Tooling System (Angular Head Series) | I 76 |
| KCP | Tooling System (Other) | I 120 |
| KCR | Cermet Reamer | G81 |
| KDP-BT-FMA | Tooling System (DAMPING PRO) | I 110 |
| KDP-BT-FMC | Tooling System (DAMPING PRO) | I 111 |
| KDP-HSK-FMA | Tooling System (DAMPING PRO) | I 112 |
| KDP-HSK-FMC | Tooling System (DAMPING PRO) | I 113 |
| KDP-SK-FMC | Tooling System (DAMPING PRO) | I 114 |
| KGDS | Gun Drill (Single Lip type) | G69 |
| KGDT | Gun Drill (Twin Lip type) | G70 |
| KGEHR/L | Multi functional (KGT Holder) | C08 |
| KGEUR/L | Multi functional (KGT Holder) | C11 |
| KGEVR/L | Multi functional (KGT Holder) | C10 |
| KGFHR/L | Multi functional (KGT Holder) | C11 |
| KGFVR/L | Multi functional (KGT Holder) | C11 |
| KGGN-B | Multi functional Insert (KGT series) | C13 |
| KGIUR/L | Multi functional (KGT Holder) | C11 |
| KGIVR/L | Multi functional (KGT Holder) | C12 |
| KGMI-T | Multi functional Insert (KGT series) | C13 |
| KGMN-L | Multi functional Insert (KGT series) | C13 |
| KGMN-R | Multi functional Insert (KGT series) | C13 |
| KGMN-T | Multi functional Insert (KGT series) | C13 |
| KGMR-LP | Multi functional Insert (KGT series) | C13 |
| KGMR-RP | Multi functional Insert (KGT series) | C13 |
| KHU | Tooling System (Angular Head Series) | I 75 |
| KMB | Tooling System (KMB) | I 94 |
| KM-DCLNR/L | KM Tooling System | B158 |

K

| | | |
|----------------|---|-------------|
| KNUX-11 | Turning Insert_Negative (Clamp on System) | B27 |
| KNUX-12 | Turning Insert_Negative (Clamp on System) | B27 |
| KRMN-C | Multi functional Insert(KGT series) | C13 |
| KSH | Tooling System (Spindle Speeder) | I 73 |
| KT | Tooling System (Tap Chuck Collet) | I 54 |

L

| | | |
|-----------------------------------|--|-------------|
| LBE08/10/12/16/20/25/30/32 | Laser Mill (Carbide Shank-Ball, Corner R type) | E215 |
| LBE08/10/12/16/20/25/30/32 | Laser Mill (Steel Shank-Ball, Corner R type) | E216 |
| LBE12/16/20/25/30/32 | Laser Mill (Steel Shank-Ball, Corner R type) | E216 |
| LBE-MHD | Laser Mill (Modular type) | E218 |
| LBH | Milling Insert (Laser Mill) | E07 |
| LBS | Milling Insert (Laser Mill) | E07 |
| LCF | Milling Insert (Laser Mill) | E08 |
| LE(M) | Cen-Mill | M04 |
| LFH | Milling Insert (Laser Mill) | E08 |
| LNCS | Milling Insert (Laser Mill) | E08 |
| LNE | Milling Insert | E09 |
| LNEX-ANN | Milling Insert | E09 |
| LNEX-MA | Milling Insert (Rich Mill) | E09 |
| LNEX-MF | Milling Insert (Rich Mill) | E09 |
| LNEX-MM | Milling Insert (Rich Mill) | E09 |
| LNEX-QNN | Milling Insert | E09 |
| LNMX-MF | Milling Insert (Rich Mill) | E09 |
| LNMX-MM | Milling Insert (Rich Mill) | E09 |
| LPD | LPD | M04 |
| LPMT-DF | Drill Insert | G04 |
| LR | Milling Insert (Laser Mill) | E08 |
| LRE10/12 | Laser Mill (Steel Shank-Corner R type) | E217 |
| LRE10/12/16/20/25/30/32 | Laser Mill (Carbide Shank-Ball, Corner R type) | E217 |
| LRE12/16/25/30/32 | Laser Mill (Steel Shank, Corner R type) | E218 |
| LRH | Milling Insert (Laser Mill) | E08 |
| LXET-MA | Milling Insert (Pro-L Mill) | E10 |
| LXET-ML | Milling Insert (Pro-L Mill) | E10 |

M

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|------------------------|--------------------------------------|-------------|
| MAH | Tooling System (Angular Head Series) | I 75 |
| MAPD000HR/L-Z0 | Aero Mill-Mini | E101 |
| MAPDS000HR/L-Z0 | Aero Mill-Mini | E101 |
| MAT | Modular Adaptor (Steel Shank) | E253 |
| MAT-C | Modular Adaptor (Carbide Shank) | E254 |
| MBBR | MSB Tools (Back Boring) | B175 |
| MBCR | MSB Tools (Copying) | B174 |

M

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|-------------------|--|-----------------|
| MBFR | MSB Tools (Chamfering) | B175 |
| MBR | MSB Tools (Boring) | B174 |
| MCER/L | HSK Tooling System (Cartridge) | B152 |
| MCER/L | KM Tooling System (Cartridge) | B158 |
| MCER/L | Multi functional (MGT Cartridge) | C20 |
| MCFR/L | HSK Tooling System (Cartridge) | B153 |
| MCFR/L | Multi functional (MGT Cartridge) | C20 |
| MCHR/L | HSK Tooling System | B152 |
| MCHR/L | KM Tooling System | B157 |
| MCHR/L | Multi functional (MGT Holder) | C19 |
| MCKNR/L | Holder (Multi Lock System) | B106 |
| MCLNR/L | Holder (Multi Lock System) | B106 |
| MCLNR/L | Boring Bar (Multi Lock System) | B132 |
| MCMNN | Holder (Multi Lock System) | B106 |
| MCRNR/L | Holder (Multi Lock System) | B107 |
| MCVR/L | Multi functional (MGT Holder) | C19 |
| MD | Tooling System (Modular System) | I 97~100 |
| MDJNR/L | Holder (Multi Lock System) | B107 |
| MD-KMB | Tooling System (Modular System) | I 107 |
| MDNNN | Holder (Multi Lock System) | B107 |
| MD-NPU | Tooling System (Modular System) | I 104 |
| MDQNR/L | Holder (Multi Lock System) | B108 |
| MD-SDC | Tooling System (Modular System) | I 103 |
| MD-SLA | Tooling System (Modular System) | I 105 |
| MD-SMB | Tooling System (Modular System) | I 106 |
| MD-SMH | Tooling System (Modular System) | I 106 |
| MDUNR/L | Boring Bar (Multi Lock System) | B132 |
| MFMN | Multi functional Insert (MGT Cartridge, MGT) | C29 |
| MGEHR/L | Holder (Auto Tools-MGT Type) | B171 |
| MGEHR/L | Multi functional (MGT Holder) | C21 |
| MGEHR/L | Multi functional (MGT Aluminum Wheel Holder) | C34 |
| MGEHR/L-15 | Multi functional MGT Aluminum Wheel Holder) | C34 |
| MGEUR/L | Multi functional (MGT Holder) | C22 |
| MGEVR/L | Multi functional (MGT Holder) | C23 |
| MGEXR/L | Multi functional (MGT Aluminum Wheel Holder) | C35 |
| MGFHR/L | Multi functional (MGT Holder) | C26 |
| MGFR | MSB Tools (Face Grooving) | B177 |
| MGFVR/L | Multi functional (MGT Holder) | C26 |
| MGGN-A | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MGGN-M | Multi functional Insert (MGT Cartridge, MGT) | C29 |
| MGIUR/L | Multi functional (MGT Holder) | C24 |
| MGIUR/L-MR | Multi functional (MGT Aluminum Wheel Holder) | C34 |
| MGIUR/L-MV | Multi functional (MGT Aluminum Wheel Holder) | C35 |



M

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|-------------------|--|---------------|
| MGIVR/L | Multi functional (MGT Holder) | C25 |
| MGIXR/L-MR | Multi functional (MGT Aluminum Wheel Holder) | C35 |
| MGMN | Auto Tools Insert (MGT type) | B171 |
| MGMN-G | Multi functional Insert (MGT Cartridge, MGT) | C29 |
| MGMN-L | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MGMN-M | Multi functional Insert (MGT Cartridge, MGT) | C29 |
| MGMN-R | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MGMN-T | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MGMR/L-PS | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MGMR/L-PT | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MGR | MSB Tools (Square Grooving) | B176 |
| MGRR | MSB Tools (Round Grooving) | B177 |
| MLD | Mach long Drill | G54 |
| MLDP | Mach long Drill(Pilot Drills with oil hole for MLD) | G54 |
| MPMT | Milling Insert | E10 |
| MRGN-A | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MRGN-A | Multi functional (MGT Insert for MGT Aluminum Wheel) | C36 |
| MRMN-M | Multi functional Insert (MGT Cartridge, MGT) | C30 |
| MSBE2000 | Endmill (Micro Endmills Ball type) | F57 |
| MSBNR/L | Holder (Multi Lock System) | B108 |
| MSD | Mach Drill | G44~47 |
| MSDH | Mach Drill (Oil hole type) | G48~51 |
| MSDNN | Holder (Multi Lock System) | B108 |
| MSE2000 | Endmill (Micro Endmills Flat type) | F57 |
| MSKNR/L | Holder (Multi Lock System) | B109 |
| MSKNR/L | Boring Bar (Multi Lock System) | B132 |
| MSRNR/L | Holder (Multi Lock System) | B109 |
| MSSNR/L | Holder (Multi Lock System) | B110 |
| MT | Multi functional (Multi Turn) | C49 |
| MTA | Tooling System (MTA series) | I 68 |
| MTB | Tooling System (MTB series) | I 69 |
| MTENN | Holder (Multi Lock System) | B110 |
| MTFNR/L | Holder (Multi Lock System) | B110 |
| MTFNR/L | Boring Bar (Multi Lock System) | B133 |
| MTGNR/L | Holder (Multi Lock System) | B111 |
| MTJNR/L | Holder (Multi Lock System) | B111 |
| MTR | MSB Tools (Threading) | B178 |
| MVGN | Multi functional (Insert for MGT Aluminum Wheel) | C36 |
| MVJNR/L | Holder (Multi Lock System) | B111 |
| MVQNR/L | Holder (Multi Lock System) | B112 |
| MVUNR/L | Boring Bar (Multi Lock System) | B133 |
| MVVNN | Holder (Multi Lock System) | B112 |
| MWLNR/L | Holder (Multi Lock System) | B112 |

M

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|----------------|--------------------------------|-------------|
| MWLNR/L | Boring Bar (Multi Lock System) | B133 |
|----------------|--------------------------------|-------------|

N

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|----------------|--|----------------|
| NFTFR/L | Multi functional Insert (New Fine Tools) | C45 |
| NFTGR/L | Multi functional Insert (New Fine Tools) | C46 |
| NFTIH | Multi functional (New Fine Tools Holder) | C45 |
| NFTTR/L | Multi functional Insert (New Fine Tools) | C46 |
| NPD | NPD | M04 |
| NPET-DA | Drill Insert | G04 |
| NPET-DR | Drill Insert | G04 |
| NPM | Tooling System (NPM series) | I 18~20 |
| NPMT-DM | Drill Insert | G04 |
| NPMT-DS | Drill Insert | G04 |
| NPU | Tooling System (NPU series) | I 46~47 |
| NU-CCGW | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-CCGW | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-CCMW | cBN Insert_Positive (One-Use Type) | B78 |
| NU-CCMW | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-CNGA | cBN Insert_Negative (Multi-Corner Type) | B79 |
| NU-CNMA | cBN Insert_Negative (One-Use Type) | B78 |
| NU-CPMB | cBN Insert_Positive (One-Use Type) | B78 |
| NU-DCGW | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-DCMW | cBN Insert_Positive (One-Use Type) | B78 |
| NU-DNGA | cBN Insert_Negative (Multi-Corner Type) | B79 |
| NU-DNMA | cBN Insert_Negative (One-Use Type) | B78 |
| NU-SCGW | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-SNGA | cBN Insert_Negative (Multi-Corner Type) | B80 |
| NU-SNMA | cBN Insert_Negative (One-Use Type) | B78 |
| NU-SPGN | cBN Insert_Positive (One-Use Type) | B79 |
| NU-TCGW | cBN Insert_Positive (One-Use Type) | B78 |
| NU-TNGA | cBN Insert_Negative (Multi-Corner Type) | B80 |
| NU-TNMA | cBN Insert_Negative (One-Use Type) | B78 |
| NU-TPGB | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-TPGN | cBN Insert_Positive (One-Use Type) | B79 |
| NU-TPGN | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-TPGW | cBN Insert_Positive (One-Use Type) | B78 |
| NU-TPGW | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-VBGW | cBN Insert_Positive (Multi-Corner Type) | B80 |
| NU-VBMW | cBN Insert_Positive (One-Use Type) | B79 |
| NU-VCMW | cBN Insert_Positive (One-Use Type) | B79 |
| NU-VNGA | cBN Insert_Negative (Multi-Corner Type) | B80 |
| NU-VNMA | cBN Insert_Negative (One-Use Type) | B78 |

O

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|----------------|----------------------------------|-------------|
| OFCN | Milling Insert (Double Mill) | E10 |
| OFCW | Milling Insert (Double Mill) | E10 |
| OFKR-MA | Milling Insert (Double Mill) | E11 |
| OFKR-MF | Milling Insert (Double Mill) | E11 |
| OFKR-MM | Milling Insert (Double Mill) | E11 |
| OFKT-MA | Milling Insert (Double Mill) | E11 |
| OFKT-MF | Milling Insert (Double Mill) | E11 |
| OFKT-MM | Milling Insert (Double Mill) | E11 |
| OHDC | Tooling System (Oil hole Holder) | I 72 |
| OHSL | Tooling System (Oil hole Holder) | I 72 |
| ONHX-MA | Milling Insert (Rich Mill) | E11 |
| ONHX-MF | Milling Insert (Rich Mill) | E11 |
| ONHX-MM | Milling Insert (Rich Mill) | E11 |
| ONHX-W | Milling Insert (Rich Mill) | E11 |
| ONMX-MF | Milling Insert (Rich Mill) | E12 |
| ONMX-MM | Milling Insert (Rich Mill) | E12 |
| ORC | O-Ring Cutter | E224 |
| ORG | Milling Insert (O-Ring Cutter) | E12 |

P

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|--------------------|--------------------------------|-------------|
| PAC(M)4000 | Pro-A Mill | E244 |
| PALC(M) | Pro-L Mill | E237 |
| PALS | Pro-L Mill | E238 |
| PALS | Pro-L Mill | E239 |
| PAM2000 | Pro-A Mill | E246 |
| PAS2000 | Pro-A Mill | E245 |
| PAS4000 | Pro-A Mill | E245 |
| PAXC(M)5000 | Pro-X Mill | E247 |
| PAXC(M)6000 | Pro-X Mill | E248 |
| PAXM5000 | Pro-X Mill | E251 |
| PAXS5000 | Pro-X Mill | E249 |
| PAXS6000 | Pro-X Mill | E250 |
| PBAC(M)5000 | Power Buster | E52 |
| PBX | Brazed Tools (Auto Tool Bits) | H09 |
| PBZC(M)5000 | Power Buster | E53 |
| PCBNR/L | Holder (Lever Lock System) | B94 |
| PCKNR/L | Holder (Lever Lock System) | B94 |
| PCLNR/L | Boring Bar (Lever Lock System) | B128 |
| PCLNR/L | HSK Tooling System | B150 |
| PCLNR/L | KM Tooling System | B156 |
| PCLNR/L | Holder (Lever Lock System) | B95 |
| PCMNN | HSK Tooling System | B150 |
| PCMNN | KM Tooling System | B156 |

P

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|-----------------------|---|--------------|
| PDD | PCD Drill | G64 |
| PDE1000 | Endmill (PCD Endmill Flat type) | F72 |
| PDE2000 | Endmill (PCD Endmill Flat type) | F72 |
| PDF | PCD Face cutter | E102 |
| PDJNR/L | HSK Tooling System | B150 |
| PDJNR/L | KM Tooling System | B157 |
| PDJNR/L | Holder (Lever Lock System) | B95 |
| PDJNR/L | Holder (Lever Lock System) | B96 |
| PDNNN | HSK Tooling System | B150 |
| PDNNN | KM Tooling System | B157 |
| PDNNR/L | Holder (Lever Lock System) | B96 |
| PDR | PCD Reamer | G80 |
| PDSNR/L | Boring Bar (Lever Lock System) | B128 |
| PDUNR/L | Boring Bar (Lever Lock System) | B129 |
| PES2000 | Turbo Mill | E46 |
| PES3000 | Turbo Mill | E46 |
| PES4000 | Turbo Mill | E46 |
| PF(M)4000 | Mill-Max | E42 |
| PH | Multi functional (Parting off Tools) | C43 |
| PM | Cen-Mill | M04 |
| PNEJ | Side Cutter | E12 |
| PNEJ-C | Side Cutter | E12 |
| PNH4000 | High feed Cutter | E285 |
| PNH5000 | High feed Cutter | E285 |
| POB | Multi functional Insert (Parting off Tools) | C43 |
| PP(M)4000 | Mill-Max | M03 |
| PPH4000 | High feed Cutter | E286 |
| PPN(M)4000 | Mill-Max | E43 |
| PRDCN | HSK Tooling System | B151 |
| PRDCN | Holder (Lever Lock System) | B97 |
| PRGCR/L | HSK Tooling System | B151 |
| PRGCR/L | Holder (Lever Lock System) | B97 |
| PSBNR/L | Holder (Lever Lock System) | B98 |
| PSDNN | Holder (Lever Lock System) | B98 |
| PSKNR/L | Boring Bar (Lever Lock System) | B129 |
| PSKNR/L | Holder (Lever Lock System) | B99 |
| PSSNR/L | Holder (Lever Lock System) | B99 |
| PTFNR/L | Holder (Lever Lock System) | B100 |
| PTFNR/L | Boring Bar (Lever Lock System) | B130 |
| PTGNR/L | Holder (Lever Lock System) | B100 |
| PTTNR/L | Holder (Lever Lock System) | B101 |
| Pull Stud Bolt | Tooling System (Pull Stud Bolt) | I 118 |
| PWLNLR/L | Holder (Lever Lock System) | B101 |



P

PWLNR/L Boring Bar (Lever Lock System) **B130**

Q

QCMT Multi functional Insert (Multi Turn) **C49**

R

RAFCB Side Milling Cutter (Radial type-Full side cutter) **E259**

RAFCP Side Milling Cutter (Radial type-Full side cutter) **E259**

RAHCB Side Milling Cutter (Radial type-Half side cutter) **E260**

RAHCP Side Milling Cutter (Radial type-Half side cutter) **E260**

RB Brazed Tools (Square Blank) **H04**

RBG cBN Insert_Positive(Regrinding) **B76**

RC Milling Insert (BFE) **E12**

RCGA cBN Insert_Positive(Regrinding) **B76**

RCGT-AK Aluminum Insert_Positive (Screw on System) **B70**

RCGT-AR Aluminum Insert_Positive (Screw on System) **B70**

RCMX Turning Insert_Positive (Lever Lock System) **B54**

RDC Tooling System (Modular System) **I 102**

RDCT-MA Milling Insert (Future Mill) **E12**

RDHW Milling Insert (Future Mill) **E12**

RDKT-MF Milling Insert (Future Mill) **E13**

RDKT-ML Milling Insert (Future Mill) **E13**

RDKT-MM Milling Insert (Future Mill) **E13**

RDKW Milling Insert (Future Mill) **E13**

REKR-MM Milling Insert (Double Mill) **E13**

RI Drill (Indexable Reamer Insert) **G74**

RM16AC(M)6000 Rich Mill **E90**

RM16AC(M)8000 Rich Mill **E91**

RM4PC(M)3000 Rich Mill **E75**

RM4PC(M)4000 Rich Mill **E76**

RM4PFCB3000 Rich Mill **E76**

RM4PFCB4000 Rich Mill **E78**

RM4PFPC3000 Rich Mill **E81**

RM4PFPC4000 Rich Mill **E82**

RM4PHCB3000 Rich Mill **E79**

RM4PHCB4000 Rich Mill **E80**

RM4PHCP3000 Rich Mill **E83**

RM4PHCP4000 Rich Mill **E84**

RM4PM Rich Mill **E87**

RM4PS3000 Rich Mill **E85**

RM4PS4000 Rich Mill **E86**

RM4ZC(M)3000 Rich Mill **E88**

RM4ZC(M)4000 Rich Mill **E88**

R

RM4ZM3000 Rich Mill **E89**

RM4ZS3000 Rich Mill **E89**

RM8AC(M)4000 Rich Mill **E65**

RM8AC(M)5000 Rich Mill **E67**

RM8EC(M)4000 Rich Mill **E69**

RM8EC(M)5000 Rich Mill **E71**

RM8QC(M)4000 Rich Mill **E73**

RMH8AC(M)4000 Rich Mill **E66**

RMH8AC(M)5000 Rich Mill **E68**

RMH8EC(M)4000 Rich Mill **E70**

RMH8EC(M)5000 Rich Mill **E72**

RMH8QC(M)4000 Rich Mill **E74**

RMT8A(M)4000 Rich Mill **E92**

RMT8A(M)5000 Rich Mill **E93**

RMT8E(M)4000 Rich Mill **E94**

RMT8E(M)5000 Rich Mill **E95**

RMT8Q(M) Rich Mill **E96**

RNGN cBN Insert_Negative(Regrinding) **B76**

RNMG-B25 Turning Insert_Negative **B27**

RT Brazed Tools (Ring blank) **H06**

RTGN cBN Insert_Positive(Regrinding) **B76**

S

SBR/L Auto Tools Insert (Multi functional type) **B169**

SC Tooling System (Spindle Cleaner) **I 117**

SCA Tooling System (SCA series) **I 70~71**

SCACR/L Holder (Screw on System) **B113**

SCACR/L Holder (Auto Tools-ISO Type) **B167**

SCGT-AK Aluminum Insert_Positive (Screw on System) **B71**

SCGT-AR Aluminum Insert_Positive (Screw on System) **B71**

SCGT-C05 Turning Insert_Positive (Screw on System) **B54**

SCGT-HFP Turning Insert_Positive (Screw on System) **B54**

SCLCR/L Holder (Screw on System) **B113**

SCLCR/L Boring Bar (Screw on System) **B134**

SCLCR/L Compact Mini **B140**

SCLCR/L Carbide Shank Boring Bar **B141**

SCLCR/L Holder (Auto Tools-ISO Type) **B167**

SCLPR/L Boring Bar (Screw on System) **B134**

SCLPR/L Carbide Shank Boring Bar **B142**

SCMT PCD Insert_Positive **B81**

SCMT-C25 Turning Insert_Positive (Screw on System) **B55**

SCMT-HFP Turning Insert_Positive (Screw on System) **B55**

SCMT-HMP Turning Insert_Positive (Screw on System) **B55**

| S | | |
|----------------|---|----------------|
| SCMT-VF | Turning Insert_Positive (Screw on System) | B55 |
| SCMT-VL | Turning Insert_Positive (Screw on System) | B55 |
| SCMW | cBN Insert_Positive (Regrinding) | B76 |
| SCR/L | Auto Tools Insert (Multi functional type) | B169 |
| SCRH | Drill (Chucking Reamer) | G78 |
| SCRS | Drill (Chucking Reamer) | G78 |
| SDACR/L | Holder (Screw on System) | B113 |
| SDC | Tooling System (SDC series) | I 27~30 |
| SDC/S | Tooling System (SDC / S series) | I 31~33 |
| SDCN | Milling Insert (Mill-max, High feed Cutter) | E13 |
| SDET-MA | Milling Insert (Future Mill) | E13 |
| SDET-MF | Milling Insert (Future Mill) | E14 |
| SDET-MM | Milling Insert (Future Mill) | E14 |
| SDJCR/L | Holder (Screw on System) | B114 |
| SDJCR/L | Holder (Auto Tools-ISO Type) | B167 |
| SDKN-SM | Milling Insert (Mill-Max, Turbo Mill) | E14 |
| SDKN-SU | Milling Insert (Mill-Max, Turbo Mill) | E14 |
| SDKR-MX | Milling Insert (Mill-Max, Turbo Mill) | E14 |
| SDKR-SM | Milling Insert (Mill-Max, Turbo Mill) | E14 |
| SDMT-MM | Milling Insert (Tank Mill, GBE) | E14 |
| SDNCN | Holder (Screw on System) | B114 |
| SDNCN | Holder (Auto Tools-ISO Type) | B168 |
| SDQCR/L | Boring Bar (Screw on System) | B135 |
| SDQCR/L | Carbide Shank Boring Bar | B142 |
| SDT | Tooling System (SDT series) | I 52~53 |
| SDUCR/L | Boring Bar (Screw on System) | B135 |
| SDUCR/L | Carbide Shank Boring Bar | B143 |
| SDXN-FM | Milling Insert (Mill-Max, Turbo Mill) | E14 |
| SDXR-FM | Milling Insert (Mill-Max, Turbo Mill) | E14 |
| SDXT-MA | Milling Insert (Future Mill) | E14 |
| SDXT-MF | Milling Insert (Future Mill) | E15 |
| SDXT-MM | Milling Insert (Future Mill) | E15 |
| SDZCR/L | Boring Bar (Screw on System) | B136 |
| SE | Cen-Mill | M04 |
| SECA | Milling Insert | E15 |
| SECN | Milling Insert (Mill-Max) | E15 |
| SEET-MA | Milling Insert (Future Mill) | E15 |
| SEET-MF | Milling Insert (Future Mill) | E15 |
| SEET-MM | Milling Insert (Future Mill) | E15 |
| SEEW | Milling Insert (Future Mill) | E15 |
| SEEW-W | Milling Insert (Future Mill) | E15 |
| SEKN-SM | Milling Insert (Mill-Max) | E16 |
| SEKN-SU | Milling Insert (Mill-Max) | E16 |

| S | | |
|--------------------|--|----------------|
| SEKR-MF1 | Milling Insert (Mill-Max) | E16 |
| SEKR-MX | Milling Insert (Mill-Max) | E16 |
| SEKR-SM | Milling Insert (Mill-Max) | E16 |
| SEKR-X35 | Milling Insert (Mill-Max) | E16 |
| SEMNI | Milling Insert (Mill-Max) | E16 |
| SEMN | Milling Insert (Mill-Max) | E16 |
| SEXN-FM | Milling Insert (Mill-Max) | E16 |
| SEXR-FM | Milling Insert (Mill-Max) | E16 |
| SEXT-MF | Milling Insert (Future Mill) | E16 |
| SEXT-MM | Milling Insert (Future Mill) | E16 |
| SEXT-MR | Milling Insert (Future Mill) | E16 |
| SFCN | Milling Insert (Mill-Max) | E17 |
| SGBR/L | Auto Tools Insert (Multi functional type) | B170 |
| SGR/L | Auto Tools Insert (Multi functional type) | B170 |
| SL | Sleeve | B178 |
| SLA | Tooling System (SLA series) | I 56~59 |
| SLW | Tooling System (SLW series) | I 60~61 |
| SMB | Tooling System (SMB) | I 92 |
| SMBB | Multi functional(Saw-man_Block) | C38 |
| SMH | Tooling System (SMH) | I 93 |
| SNCF-MF | Milling Insert (Rich Mill) | E17 |
| SNCF-MM | Milling Insert (Rich Mill) | E17 |
| SNCN | Milling Insert (Mill-max, High feed Cutter) | E17 |
| SNEF | Milling Insert (High feed Cutter) | E17 |
| SNEN | cBN Insert_Milling Insert (Regrinding) | B76 |
| SNEU ANN-MF | Milling Insert (Shave Mill) | E18 |
| SNEU-MF | Milling Insert (Shave Mill) | E18 |
| SNEU-TBW | Milling Insert (Shave Mill) | E18 |
| SNEU-WMF | Milling Insert (Shave Mill) | E18 |
| SNEW | Milling Insert (Aero Mill-Mini) | E18 |
| SNEW-NAF | Milling Insert (Aero Mill-Mini) | E18 |
| SNEX | Milling Insert (Cube Mill) | E18 |
| SNEX-CU1 | Milling Insert (Cube Mill) | E18 |
| SNEX-MA | Milling Insert (Rich Mill) | E18 |
| SNEX-MF | Milling Insert (Rich Mill) | E19 |
| SNEX-MM | Milling Insert (Rich Mill) | E19 |
| SNEX-W | Milling Insert (Rich Mill) | E19 |
| SNGA | Turning Insert_Negative (Multi Lock / Lever Lock System) | B28 |
| SNGG | Turning Insert_Negative (Multi Lock / Lever Lock System) | B28 |
| SNGG-HU | Turning Insert_Negative (Multi Lock / Lever Lock System) | B28 |
| SNGN | Turning Insert_Negative (Ceramic Holder) | B28 |
| SNGN | cBN Insert_Negative(Regrinding) | B75 |
| SNGX | Turning Insert_Negative (Multi Lock / Lever Lock System) | B29 |
| SNHT-WX | Milling Insert (Wind Mill) | E18 |



S

| | | |
|-----------------|--|-------------|
| SNKN | Milling Insert (Mill-max, High feed Cutter) | E19 |
| SNMA | Turning Insert_Negative (Multi Lock / Lever Lock System) | B29 |
| SNMA | cBN Insert_Negative(Regrinding) | B75 |
| SNMF-MF | Milling Insert (Rich Mill) | E17 |
| SNMF-MM | Milling Insert (Rich Mill) | E17 |
| SNMG-B25 | Turning Insert_Negative (Multi Lock / Lever Lock System) | B29 |
| SNMG-GM | Turning Insert_Negative (Multi Lock / Lever Lock System) | B30 |
| SNMG-GR | Turning Insert_Negative (Multi Lock / Lever Lock System) | B30 |
| SNMG-GS | Turning Insert_Negative (Multi Lock / Lever Lock System) | B30 |
| SNMG-HA | Turning Insert_Negative (Multi Lock / Lever Lock System) | B30 |
| SNMG-HC | Turning Insert_Negative (Multi Lock / Lever Lock System) | B30 |
| SNMG-HR | Turning Insert_Negative (Multi Lock / Lever Lock System) | B31 |
| SNMG-HS | Turning Insert_Negative (Multi Lock / Lever Lock System) | B31 |
| SNMG-VC | Turning Insert_Negative (Multi Lock / Lever Lock System) | B31 |
| SNMG-VF | Turning Insert_Negative (Multi Lock / Lever Lock System) | B32 |
| SNMG-VG | Turning Insert_Negative (Multi Lock / Lever Lock System) | B32 |
| SNMG-VK | Turning Insert_Negative (Multi Lock / Lever Lock System) | B33 |
| SNMG-VL | Turning Insert_Negative (Multi Lock / Lever Lock System) | B31 |
| SNMG-VM | Turning Insert_Negative (Multi Lock / Lever Lock System) | B32 |
| SNMG-VP2 | Turning Insert_Negative (Multi Lock / Lever Lock System) | B32 |
| SNMG-VP3 | Turning Insert_Negative (Multi Lock / Lever Lock System) | B32 |
| SNMG-VQ | Turning Insert_Negative (Multi Lock / Lever Lock System) | B32 |
| SNMM-GH | Turning Insert_Negative (Multi Lock / Lever Lock System) | B33 |
| SNMM-GM | Turning Insert_Negative (Multi Lock / Lever Lock System) | B33 |
| SNMM-GR | Turning Insert_Negative (Multi Lock / Lever Lock System) | B34 |
| SNMM-VH | Turning Insert_Negative (Lever Lock System) | B33 |
| SNMM-VT | Turning Insert_Negative (Lever Lock System) | B33 |
| SNMN | Turning Insert_Negative (Ceramic Holde) | B34 |
| SNMX | Turning Insert_Negative (Multi Lock / Lever Lock System) | B34 |
| SNMX-MF | Milling Insert (Rich Mill) | E19 |
| SNMX-MM | Milling Insert (Rich Mill) | E19 |
| SNUN | Turning Insert_Negative (Ceramic Holder) | B34 |
| SP | Multi functional Insert (Saw-man) | C38 |
| SP | Multi functional Insert (Bearing Solution) | C56 |
| SPB | Multi functional (Saw-man_Blades) | C37 |
| SPB(M) | Side cutter | E264 |
| SPB-S | Multi functional (Saw-man_Blades) | C37 |
| SPB-S | Multi functional (Bearing Solution) | C56 |
| SPCN | Milling Insert (Mill-Max) | E20 |
| SPD | SPD | M04 |
| SPEN-WC | Milling Insert (Shave Mill Ultra) | E20 |
| SPET-DA | Drill Insert | G04 |
| SPET-ND | Drill Insert | G04 |

S

| | | |
|--------------------|---|-------------|
| SPEX | Milling Insert | E20 |
| SPFN | Milling Insert | E20 |
| SPGA | Turning Insert_Positive | B56 |
| SPGN | Turning Insert_Positive | B56 |
| SPGN | cBN Insert_Positive(Regrinding) | B76 |
| SPGN | PCD Insert_Positive | B82 |
| SPGR-F | Turning Insert_Positive (Clamp on System) | B56 |
| SPGR-M | Turning Insert_Positive (Clamp on System) | B56 |
| SPGT | Turning Insert_Positive (Screw on System) | B57 |
| SPGT-C05 | Turning Insert_Positive (Screw on System) | B57 |
| SPGW | PCD Insert_Positive | B81 |
| SPH | Multi functional (Saw-man_Holder) | C37 |
| SPH-S | Multi functional (Saw-man_Holder) | C37 |
| SPKN-MU | Milling Insert (Mill-Max) | E20 |
| SPKN-SM | Milling Insert (Mill-Max) | E20 |
| SPKN-SU | Milling Insert (Mill-Max) | E20 |
| SPKR-MX | Milling Insert (Mill-Max) | E20 |
| SPKR-SM | Milling Insert (Mill-Max) | E20 |
| SPMN | Milling Insert (Chamfer tools) | E21 |
| SPMR-F | Turning Insert_Positive (Clamp on System) | B57 |
| SPMR-M | Turning Insert_Positive (Clamp on System) | B57 |
| SPMT | Milling Insert (Tank Mill, GBE, BTTooling System) | E21 |
| SPMT-DF | Drill Insert | G04 |
| SPMT-DM | Drill Insert | G04 |
| SPMT-DS | Drill Insert | G04 |
| SPMT-KC | Milling Insert (Chamfer tools) | E21 |
| SPMT-LD | Drill Insert | G05 |
| SPMT-MM | Milling Insert (Tank Mill, GBE) | E21 |
| SPMT-PD | Drill Insert (KING DRILL) | G05 |
| SPMT-VF | Turning Insert_Positive (Clamp on System) | B57 |
| SPP(M) | Side cutter | E263 |
| SPS | Side cutter | E265 |
| SPUN | Turning Insert_Positive | B57 |
| SPXN-FM | Milling Insert (Mill-Max) | E21 |
| SPXR-FM | Milling Insert (Mill-Max) | E21 |
| SR | Brazed Tools (Round bars blank) | H06 |
| SRCPR/L...B | Bearing Solution | C52 |
| SRDCN | Holder (Screw on System) | B114 |
| SRGCR/L | Holder (Screw on System) | B115 |
| SRGPR/L...E | Bearing Solution | C52 |
| SRGPR/L...F | Bearing Solution | C52 |
| SSBCR/L | Holder (Screw on System) | B115 |
| SSBEA2000 | Endmill (Solid Endmills for Aluminum Ball type) | F63 |

| S | | |
|--------------------|---|---------------|
| SSD | Carbide Drill | G60~61 |
| SSDCN | Holder (Screw on System) | B115 |
| SSEA2000 | Endmill (Solid Endmills for Aluminum Endmill Flat type) | F62 |
| SSEA3000 | Endmill (Solid Endmills for Aluminum Endmill Flat type) | F62 |
| SSKCR/L | Holder (Screw on System) | B116 |
| SSKCR/L | Boring Bar (Screw on System) | B136 |
| SSKCR/L | Cartridge (Screw on System) | B163 |
| SSKPR/L | Boring Bar (Screw on System) | B136 |
| SSKPR/L...B | Bearing Solution | C53 |
| SSSCR/L | Holder (Screw on System) | B116 |
| SSSCR/L | Cartridge (Screw on System) | B163 |
| ST | Tooling System (Helix blank) | H07 |
| STACR/L | Holder (Screw on System) | B116 |
| STACR/L | Holder (Auto Tools-ISO Type) | B168 |
| STFCR/L | Holder (Screw on System) | B116 |
| STFCR/L | Boring Bar (Screw on System) | B137 |
| STFCR/L | Carbide Shank Boring Bar | B143 |
| STFCR/L | Cartridge (Screw on System) | B163 |
| STFPR/L | Boring Bar (Screw on System) | B137 |
| STFPR/L | Carbide Shank Boring Bar | B144 |
| STGCR/L | Holder (Screw on System) | B117 |
| STMD2L | Solid Threading Endmills (ISO Metric / UN) | D59~60 |
| STMD3T | Solid Threading Endmills (ISO Metric / UN) | D57~58 |
| STMHC | Solid Threading Endmills (ISO Metric) | D51~54 |
| STMHCC | Solid Threading Endmills (ISO Metric) | D55 |
| STMHCD | Solid Threading Endmills (ISO Metric) | D56 |
| STMHCR | Solid Threading Endmills (ISO Metric) | D55 |
| STR/L | Auto Tools Insert (FGT type) | B170 |
| STTCR/L | Holder (Screw on System) | B117 |
| STTCR/L | Cartridge (Screw on System) | B164 |
| STUBR/L | Compact Mini | B140 |
| STUBR/L | Carbide Shank Boring Bar | B144 |
| STUPR/L | Compact Mini | B140 |
| STUPR/L | Carbide Shank Boring Bar | B145 |
| STWCR/L | Cartridge (Screw on System) | B164 |
| STWPR/L | Boring Bar (Screw on System) | B137 |
| SVABR/L | Holder (Screw on System) | B117 |
| SVHBR/L | Holder (Screw on System) | B118 |
| SVJBR/L | Holder (Screw on System) | B118 |
| SVJBR/L | Holder (Auto Tools-ISO Type) | B168 |
| SVJCR/L | Holder (Screw on System) | B118 |
| SVJCR/L | Boring Bar (Screw on System) | B138 |
| SVJCR/L | Holder (Auto Tools-ISO Type) | B168 |

| S | | |
|-------------------|------------------------------|-------------|
| SVM4000 | Shave Mill | E287 |
| SVMM4000 | Shave Mill | E287 |
| SVPBR/L | HSK Tooling System | B151 |
| SVQBR/L | Boring Bar (Screw on System) | B138 |
| SVQCR/L | Boring Bar (Screw on System) | B138 |
| SVUBR/L | Boring Bar (Screw on System) | B139 |
| SVUCR/L | Boring Bar (Screw on System) | B139 |
| SVUM6000 | Shave Mill Ultra | E288 |
| SVUM6000-B | Shave Mill Ultra | E289 |
| SVVBN | Holder (Screw on System) | B119 |
| SVVBN | HSK Tooling System | B151 |
| SVVCN | Holder (Screw on System) | B119 |
| SWACR/L | Holder (Screw on System) | B119 |
| SWLCR/L | Boring Bar (Screw on System) | B139 |
| SWUBR/L | Compact Mini | B140 |
| SWUBR/L | Carbide Shank Boring Bar | B145 |
| SXGNR/L | Holder (Auto Tools-FGT Type) | B169 |

| T | | |
|-----------------|--|-------------|
| TAFCB | Side Milling Cutter (Tangential type-Full side cutter) | E257 |
| TAFCP | Side Milling Cutter (Tangential type-Full side cutter) | E257 |
| TAHCB | Side Milling Cutter (Tangential type-Half side cutter) | E258 |
| TAHCP | Side Milling Cutter (Tangential type-Half side cutter) | E258 |
| TB | Multi functional Insert (Grooving Tools) | C41 |
| TB | Brazed Tools (Taper bits) | H12 |
| TBC | Tooling System (TBC) | I 85 |
| TBC | Tooling System (TBC Head Set) | I 88 |
| TBGN | cBN Insert_Positive(Regrinding) | B76 |
| TBGT | Turning Insert_Positive (Compact Mini) | B58 |
| TBGW | PCD Insert_Positive | B82 |
| TBH | Multi functional (Grooving Tools) | C41 |
| TB-M | Multi functional Insert (Grooving Tools) | C41 |
| TCA | Tooling System (TCA Adapter) | I 51 |
| TCGT-AK | Aluminum Insert_Positive (Screw on System) | B72 |
| TCGT-AR | Aluminum Insert_Positive (Screw on System) | B72 |
| TCGT-C25 | Turning Insert_Positive (Screw on System) | B58 |
| TCGT-HFP | Turning Insert_Positive (Screw on System) | B58 |
| TCGT-KF | Turning Insert_Positive (Screw on System) | B59 |
| TCGW | cBN Insert_Positive(Regrinding) | B76 |
| TCMT | PCD Insert_Positive | B82 |
| TCMT-C25 | Turning Insert_Positive (Screw on System) | B59 |
| TCMT-HFP | Turning Insert_Positive (Screw on System) | B59 |
| TCMT-HMP | Turning Insert_Positive (Screw on System) | B59 |



T

| | | |
|-----------------|--|----------------|
| TCMT-VF | Turning Insert_Positive (Screw on System) | B59 |
| TCMT-VL | Turning Insert_Positive (Screw on System) | B59 |
| TCRS | Drill (Chucking Reamer) | G79 |
| TEC(E)N | Milling Insert (Turbo Mill) | E21 |
| TEEN | Milling Insert (Turbo Mill) | E21 |
| TFCN | Milling Insert (Mill-Max) | E21 |
| TFE | T-Cutter | E233 |
| THE | Tank Mill | E206 |
| TM | Thread Milling Inserts (ISO Metric) | D44~49 |
| TMRS | Drill (Machine Reamer) | G79 |
| TNGA | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B35 |
| TNGG | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B35 |
| TNGG-SC | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B35 |
| TNGN | Turning Insert_Negative (Ceramic Holder) | B36 |
| TNGN | cBN Insert_Negative(Regrinding) | B75 |
| TNMA | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B36 |
| TNMA | cBN Insert_Negative(Regrinding) | B75 |
| TNMG-B25 | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B36, 37 |
| TNMG-GM | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B37 |
| TNMG-GR | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B37 |
| TNMG-GS | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B37 |
| TNMG-HA | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B37 |
| TNMG-HC | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B37 |
| TNMG-HR | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B38 |
| TNMG-HS | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B38 |
| TNMG-LW | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B38 |
| TNMG-VB | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B38 |
| TNMG-VC | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B38 |
| TNMG-VF | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B39 |
| TNMG-VG | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B39 |
| TNMG-VK | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B40 |
| TNMG-VL | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B39 |
| TNMG-VM | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B39 |
| TNMG-VP2 | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B39 |
| TNMG-VP3 | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B39 |
| TNMG-VQ | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B40 |
| TNMG-VW | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B40 |
| TNMM-GH | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B40 |
| TNMM-GM | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B41 |
| TNMM-GR | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B41 |
| TNMN | Turning Insert_Negative (Ceramic Holder) | B41 |
| TNMX | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B41 |
| TNMX | PCD Insert_Negative | B81 |

T

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|-----------------|--|----------------|
| TNMX | Milling Insert (Power Buster) | E21 |
| TNMX-SH | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B41 |
| TOEH | Turning Insert_Positive | B60 |
| TPCN | Milling Insert (Mill-max, Side cutter) | E22 |
| TPDB | Drill Insert (TPDB) | G30 |
| TPDB-3D | Drill (TPDB) | G31 |
| TPDB-5D | Drill (TPDB) | G32 |
| TPDB-8D | Drill (TPDB) | G33 |
| TPGB | PCD Insert_Positive | B82 |
| TPGH | Turning Insert_Positive | B60 |
| TPGN | Turning Insert_Positive | B60, 61 |
| TPGN | cBN Insert_Positive(Regrinding) | B76 |
| TPGN | PCD Insert_Positive | B82 |
| TPGR-F | Turning Insert_Positive (Clamp on System) | B61 |
| TPGR-M | Turning Insert_Positive (Clamp on System) | B61 |
| TPGT | Turning Insert_Positive (Screw on System) | B61 |
| TPGT | PCD Insert_Positive | B82 |
| TPGT-C05 | Turning Insert_Positive (Screw on System) | B61 |
| TPGT-HFP | Turning Insert_Positive (Screw on System) | B61 |
| TPGW | PCD Insert_Positive | B82 |
| TPGX | PCD Insert_Positive | B62 |
| TPKN-MU | Milling Insert (Mill-Max) | E22 |
| TPKN-SM | Milling Insert (Mill-Max) | E22 |
| TPKN-SU | Milling Insert (Mill-Max) | E22 |
| TPKR-MX | Milling Insert (Mill-Max) | E22 |
| TPKR-SM | Milling Insert (Mill-Max) | E22 |
| TPMR-F | Turning Insert_Positive (Clamp on System) | B62 |
| TPMR-M | Turning Insert_Positive (Clamp on System) | B62 |
| TPMT-VF | Turning Insert_Positive (Screw on System) | B62 |
| TPUN | Turning Insert_Positive | B62 |
| TPXN-FM | Milling Insert (Mill-Max) | E22 |
| TPXR-FM | Milling Insert (Mill-Max) | E23 |
| TSDM | Top Solid drill | G63 |
| TWX-KC | Milling Insert (Multi functional Chamfer Tool) | E23 |

V

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|-----------------|--|------------|
| VBGT | Turning Insert_Positive (Screw on System) | B63 |
| VBGT-AK | Aluminum Insert_Positive (Screw on System) | B73 |
| VBGT-AR | Aluminum Insert_Positive (Screw on System) | B73 |
| VBGT-HFP | Turning Insert_Positive (Screw on System) | B63 |
| VBGT-KF | Turning Insert_Positive (Screw on System) | B63 |
| VBGT-KM | Turning Insert_Positive (Screw on System) | B63 |
| VBMT | Turning Insert_Positive (Screw on System) | B63 |



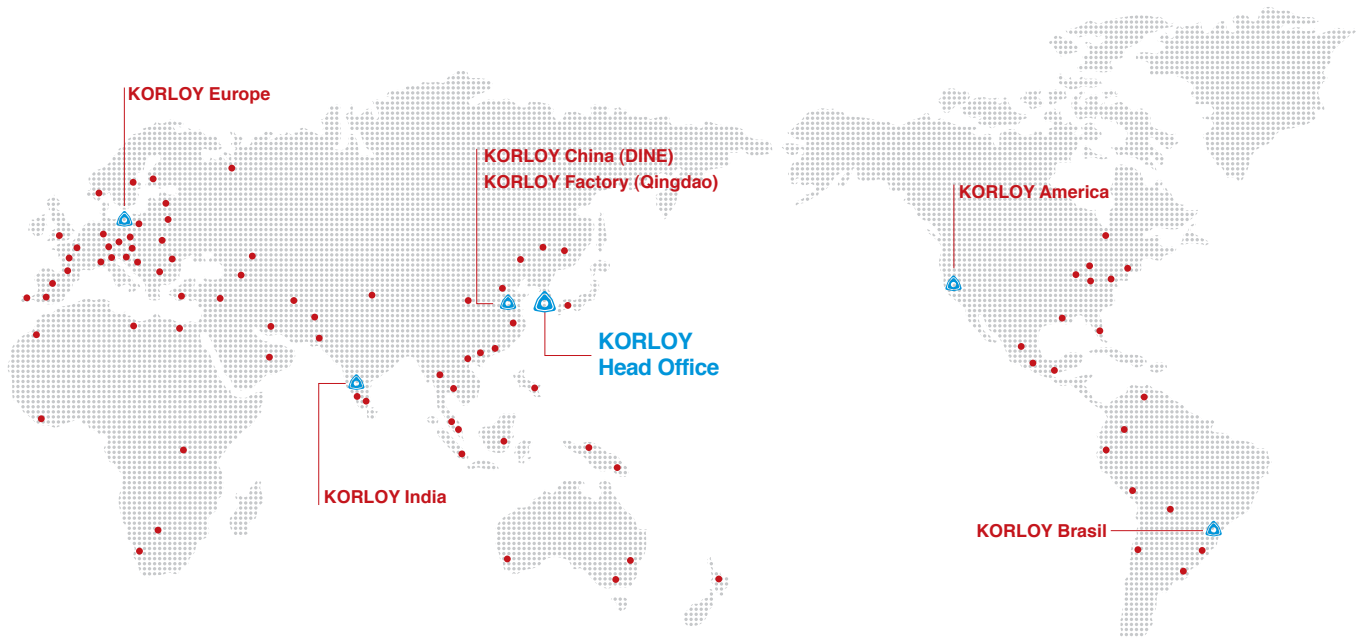
| V | | |
|--------------------|---|------------|
| VBMT | PCD Insert_Positive | B82 |
| VBMT-HMP | Turning Insert_Positive (Screw on System) | B63 |
| VBMT-VF | Turning Insert_Positive (Screw on System) | B63 |
| VBMT-VL | Turning Insert_Positive (Screw on System) | B63 |
| VBMT-VM | Turning Insert_Positive (Screw on System) | B63 |
| VBMW | cBN Insert_Positive (Regrinding) | B76 |
| VCGT-AK | Aluminum Insert_Positive (Screw on System) | B74 |
| VCGT-AR | Aluminum Insert_Positive (Screw on System) | B74 |
| VCGT-HFP | Turning Insert_Positive (Screw on System) | B64 |
| VCGT-KF | Turning Insert_Positive (Screw on System) | B64 |
| VCGT-KM | Turning Insert_Positive (Screw on System) | B64 |
| VCGT-VP1 | Turning Insert_Positive (Screw on System) | B64 |
| VCKT-MA | Milling Insert (Pro-A Mill) | E23 |
| VCMT | PCD Insert_Positive | B82 |
| VCMT-HFP | Turning Insert_Positive (Screw on System) | B64 |
| VCMT-HMP | Turning Insert_Positive (Screw on System) | B64 |
| VCMT-VF | Turning Insert_Positive (Screw on System) | B64 |
| VCMT-VL | Turning Insert_Positive (Screw on System) | B65 |
| VCMT-VM | Turning Insert_Positive (Screw on System) | B65 |
| VCMW | cBN Insert_Positive(Regrinding) | B76 |
| VDKT-MA | Milling Insert (Pro-A Mill) | E23 |
| VETR | Thread Insert (Vertical Type) | D33 |
| VFE4000 | V-Endmill (Flat type) | F14 |
| VNGG-HA | Turning Insert_Negative (Multi Lock System) | B42 |
| VNMA | cBN Insert_Negative (Regrinding) | B75 |
| VNMG-GM | Turning Insert_Negative (Multi Lock System) | B42 |
| VNMG-HA | Turning Insert_Negative (Multi Lock System) | B42 |
| VNMG-HR | Turning Insert_Negative (Multi Lock System) | B42 |
| VNMG-HS | Turning Insert_Negative (Multi Lock System) | B42 |
| VNMG-VB | Turning Insert_Negative (Multi Lock System) | B42 |
| VNMG-VC | Turning Insert_Negative (Multi Lock System) | B43 |
| VNMG-VF | Turning Insert_Negative (Multi Lock System) | B43 |
| VNMG-VG | Turning Insert_Negative (Multi Lock System) | B44 |
| VNMG-VK | Turning Insert_Negative (Multi Lock System) | B44 |
| VNMG-VL | Turning Insert_Negative (Multi Lock System) | B43 |
| VNMG-VM | Turning Insert_Negative (Multi Lock System) | B44 |
| VNMG-VP3 | Turning Insert_Negative (Multi Lock System) | B43 |
| VNMG-VQ | Turning Insert_Negative (Multi Lock System) | B44 |
| VNMX | PCD Insert_Negative | B81 |
| VPGT-VP1 | Turning Insert_Positive (Screw on System) | B65 |
| VTH | Vertical Type Holder | D33 |
| VZD-LA, LBA | Vulcan Drill | G58 |
| VZD-MA, MBA | Vulcan Drill | G57 |

| W | | |
|-------------------|--|-------------|
| WBG | Turning Insert_Positive (Compact Mini) | B66 |
| WCGT-C05 | Turning Insert_Positive (Screw on System) | B66 |
| WCKT-C21 | Drill Insert | G05 |
| WCKT-DA | Drill Insert | G05 |
| WCMT-C20 | Drill Insert | G05 |
| WCMT-C21 | Drill Insert | G05 |
| WCMT-DS(P) | Drill Insert | G05 |
| WDKT-MH | Milling Insert (HRM) | E23 |
| WFSB(M) | Wind Mill_BOSS TYPE | E268 |
| WFSP(M) | Wind Mill_PLANE TYPE | E269 |
| WNMA | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-B25 | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-GM | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-GR | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-GS | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-HA | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-HC | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-HR | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B45 |
| WNMG-HS | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B46 |
| WNMG-LW | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B46 |
| WNMG-VB | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B46 |
| WNMG-VC | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B46 |
| WNMG-VF | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B46 |
| WNMG-VG | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B46 |
| WNMG-VK | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B47 |
| WNMG-VL | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B46 |
| WNMG-VM | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B47 |
| WNMG-VP2 | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B47 |
| WNMG-VP3 | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B47 |
| WNMG-VQ | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B47 |
| WNMG-VW | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B47 |
| WNMM-B25 | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B47 |
| WNMX-MM | Milling Insert (HRMDouble) | E23 |
| WNMX-SH | Turning Insert_Negative (Lever Lock, Wedge Clamp, Multi Lock System) | B48 |
| WPDC-5D | Drill (WPDC Standard type) | G38 |
| WPDC-5D | Drill (WPDC Single insert cartridge / Dual insert cartridge) | G39 |
| WPDC-6.5D | Drill (WPDC Standard type) | G38 |
| WPDC-6.5D | Drill (WPDC Single insert cartridge / Dual insert cartridge) | G39 |
| WPDC-8D | Drill (WPDC Standard type) | G38 |
| WPDC-8D | Drill (WPDC Single insert cartridge / Dual insert cartridge) | G39 |
| WS | Side cutter | E265 |
| WTENN | Holder (Wedge Clamp System) | B102 |
| WTJNR/L | Holder (Wedge Clamp System) | B102 |



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