THE NEW VALUE FRONTIER

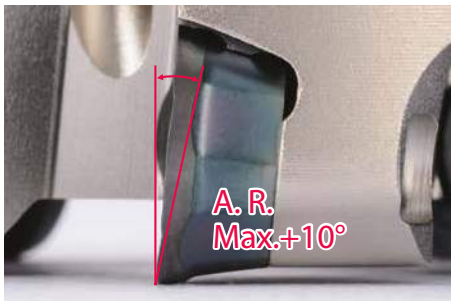
KYOCERA

# MRX Face Mill

## Cutter with positive type round insert

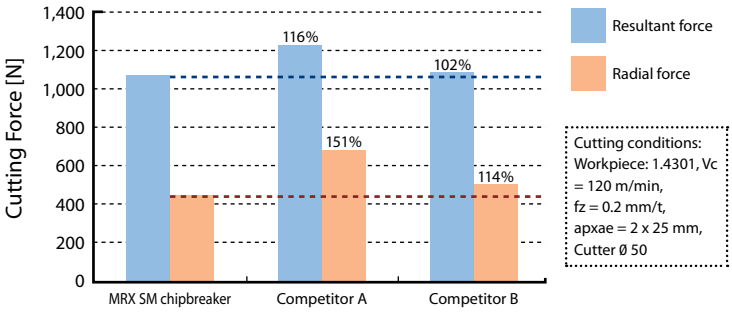
# High efficient cutter

Excellent cutting performance due to low cutting force.




# Waved cutting edge

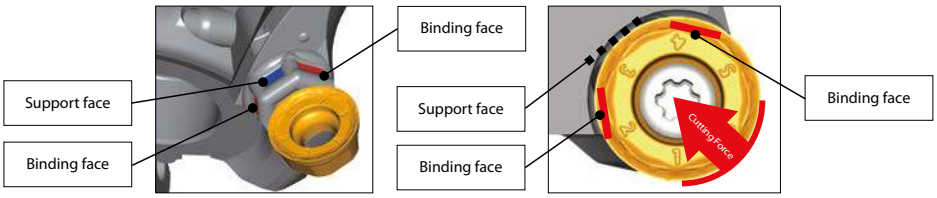
Maximum axial rake of 10° is generated through waved cutting edge design.



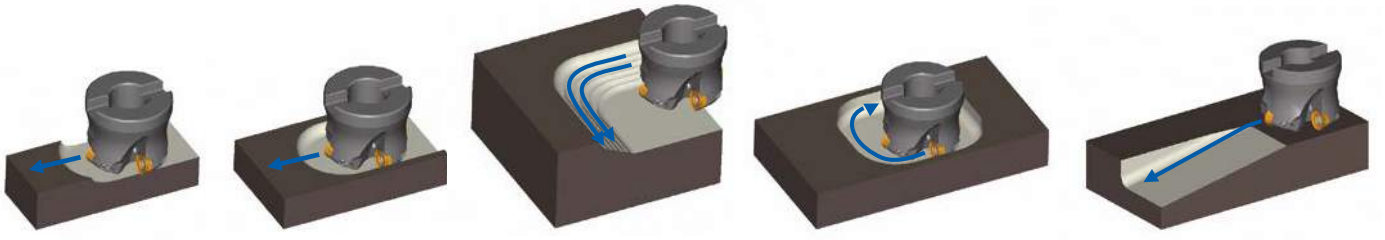

# Flat lock structure

Holds the insert firmly and prevents rotation of the insert during machining and provides stable machining.

Wide flat binding face
- Receives cutting forces evenly
- Prevents insert rotation




# Wide application range



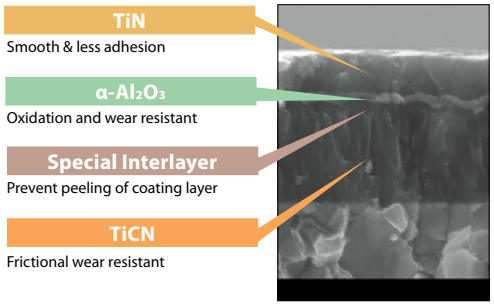
Facing | Slotting | Shouldering | Pocketing | Ramping / Profiling

# Long tool life

Lineup of 4 grades and 3 chipbreakers. Available for steel, stainless steel, and heat resistant alloys.

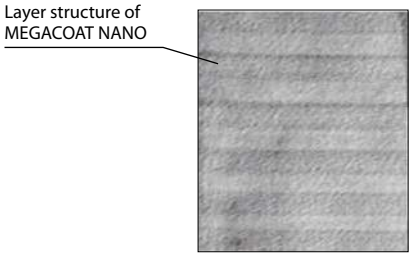
| Workpiece | | Insert Grade | Applicable Chipbreaker |
|---|---|---|---|
| P Carbon Steel / Alloy Steel / Die Steel | | PR1525 | GM/SM/GH Chipbreaker |
| K Gray Cast Iron / Nodular Cast Iron | | PR1510 | GH/GM Chipbreaker |
| S Ni-base Heat Resistant Alloy | M Martensitic Stainless Steel | CA6535 | SM/GM Chipbreaker |
| S Titanium Alloy | M Austenitic Stainless Steel<br>M Precipitation Hardened Stainless Steel | PR1535 | SM/GM Chipbreaker |

For chipbreaker selection and recommended cutting conditions ➡ P11




High efficient machining of Ni-base heat resistant alloy and martensitic stainless steel. The CVD coating offers high heat resistance and wear resistance with improved stability due to the thin film coating technology.

CA6535

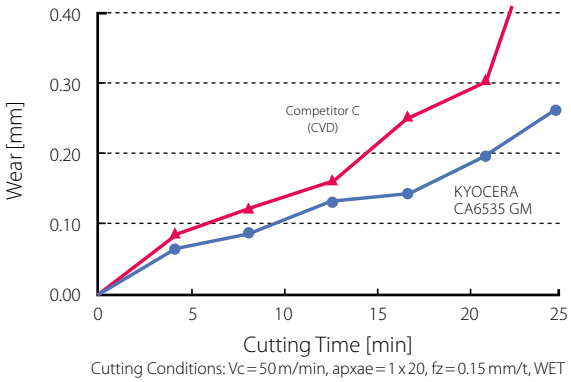



For titanium alloy and precipitation hardened stainless steel. Stabilized milling operation and long tool life with MEGACOAT NANO coating technology.

PR1535

## Comparison of tool life

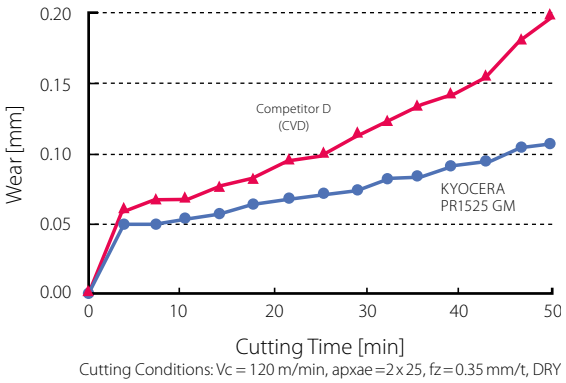
### Ni-base Heat Resistant Alloy




Cutting Conditions: Vc = 50 m/min, apxae = 1 x 20, fz = 0.15 mm/t, WET

1st recommendation
GM chipbreaker

### Tool Steel (38 - 42 HRC)

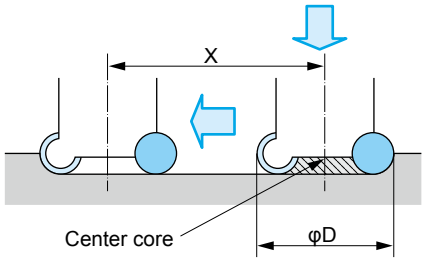



Cutting Conditions: Vc = 120 m/min, apxae = 2 x 25, fz = 0.35 mm/t, DRY

1st recommendation
GM chipbreaker

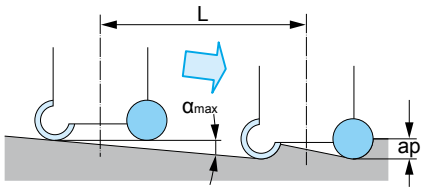
## Tips for peck milling

① Reduce the table feed by 50 % of the recommended conditions until the center core part is completely cut off. The internal cutting edge's radial rake angle is large in the negative direction.
② Min. cutting length for flat bottom face is as the list on page 11.




## Tips for ramping

- Ramping angle should be under αmax (refer to table on page 11).
- Feed rate should be under 70 % of the cutting conditions.



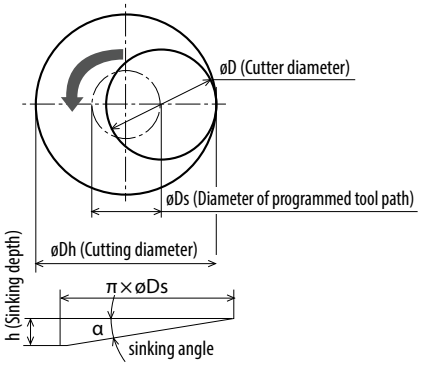

Formula for max. cutting length (L) at max. ramping angle

$$L = \frac{ap}{\tan \alpha_{max}}$$

## Tips for helical milling

- Sinking depth (h) at helical milling should be under max. ap. Sinking angle α (with programmed tool path) should be under αmax (Maximum ramping angle).
- Feed rate should be under 70 % of the cutting conditions.
- Climb milling is recommended.

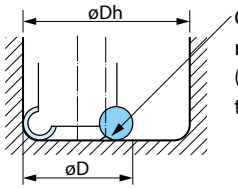
**Helical milling factors**




ØDs (Diameter of programmed tool path) | ØDs = ØDh-ØD

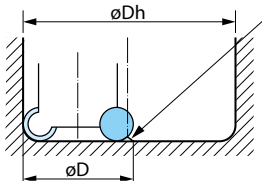
Formula for sinking depth (h)
$h = \pi \times ØDs \times \tan\alpha$
(h should be under ap)
(α should be under $\alpha_{max}$)

When cutting dia. ØDh1 ≤ ØDh < ØDh2




Center core part remains after machining. (Not removable with the same cutter)

When cutting dia. ØDh2 ≤ ØDh ≤ ØDh3

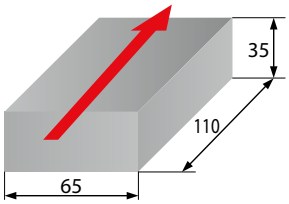



Center core part remains after machining. (Removable by traversing with the same cutter)

*Please refer to P11 the list below for ØDh1 ~ Dh3.

## Case studies

### X5CrNi18-10 (austenitic stainless steel)



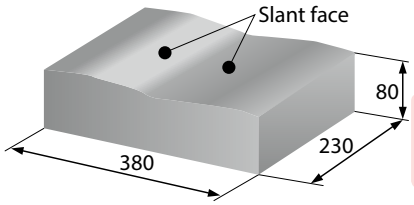

**4.5 times longer tool life**

Nozzle parts
Vc = 113 m/min, fz = 0.14 mm/t, ap × ae = 1.0 × 65 mm, Dry
MRX100R-12-9T-M, RPGT1204M0ER-SM (PR1535)

| | |
|---|---|
| PR1535 | 450 pcs/edge |
| Conventional | 100 pcs/edge |

- Cost savings due to 4.5 times longer tool life and 1.5 times more insert edges.
- MRX prevented burr formation and improved surface finish.

### Tool Steel (47-49HRC)



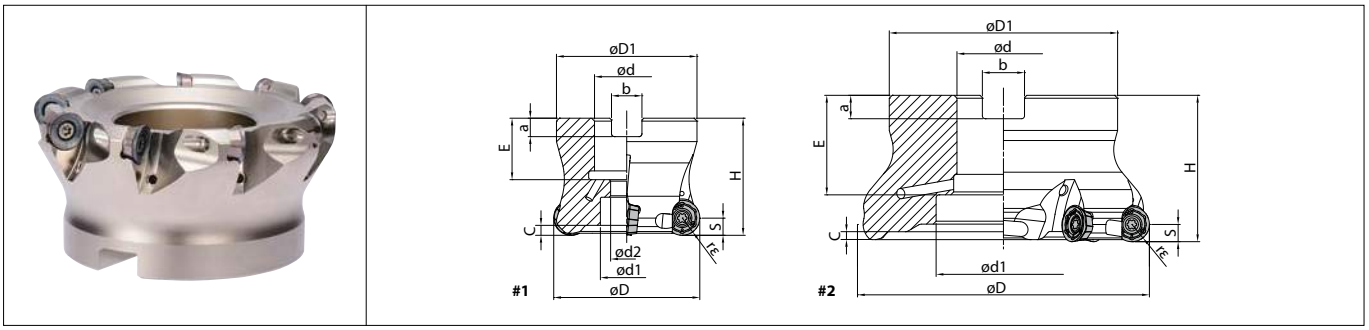

**More than double tool life**

Mold parts
Vc = 125 m/min, fz = 0.25 mm/t, ap × ae = 1.0 ~ 2.0 × 10 mm, Dry
MRX20-S20-08-2T, RDGT0803M0ER-GM (PR1525)

| | |
|---|---|
| PR1525 | 2 pcs and more |
| Conventional | 1 pc (unstable tool life) |

- Conventional tool machined only 1 pc of workpiece due to unstable tool life, but MRX doubled the tool life with stable machining.

## MRX Face Mill (with coolant hole)




## Toolholder Dimension

| | Description | | Standard | No. of inserts | Dimension (mm) | | | | | | | | | | | | Rake Angle(°) | | Coolant Hole | Drawing | Weight(kg) | Max. Revolution (min$^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | rε | øD | øD1 | ød | ød1 | ød2 | H | E | a | b | C | S | A.R. | R.R. | | | | |
| Metric | MRX | 040R-10-5T-M | ● | 5 | 5 | 40 | 38 | 16 | 15 | 9 | 40 | 19 | 5.6 | 8.4 | 2.9 | 5 | +10° | -5.5° | Yes | #1 | 0.2 | 20,000 |
| | | 050R-10-6T-M | ● | 6 | | 50 | 48 | 22 | 18 | 11 | | 21 | 6.3 | 10.4 | | | | | | | 0.3 | 17,500 |
| | | 063R-10-7T-M | ● | 7 | | 63 | 60 | | | | | | | | | | | | | | 0.6 | 15,000 |
| | MRX | 040R-12-4T-M | ● | 4 | 6 | 40 | 38 | 16 | 13.5 | 9 | 40 | 19 | 5.6 | 8.4 | 3.4 | 6 | +10° | -5.5° | | #1 | 0.2 | 21,000 |
| | | 050R-12-4T-M | ● | 4 | | 50 | 48 | 22 | 18 | 11 | | 21 | 6.3 | 10.4 | | | | | | | 0.3 | 18,000 |
| | | 050R-12-5T-M | ● | 5 | | | | | | | | | | | | | | | | | 0.3 | 18,000 |
| | | 063R-12-5T-M | ● | 5 | | 63 | 60 | | | | | | | | | | | | | | 0.6 | 15,500 |
| | | 063R-12-6T-M | ● | 6 | | | | | | | | | | | | | | | | | 0.6 | 15,500 |
| | | 080R-12-6T-M | ● | 6 | | 80 | 70 | 27 | 20 | 13 | 50 | 24 | 7 | 12.4 | | | | | | | 1.2 | 13,500 |
| | | 080R-12-8T-M | ● | 8 | | | | | | | | | | | | | | | | | 1.1 | 13,500 |
| | | 100R-12-7T-M | ● | 7 | | 100 | 78 | 32 | 46 | - | | 30 | 8 | 14.4 | | | | | | #2 | 1.4 | 12,000 |
| | | 100R-12-9T-M | ● | 9 | | | | | | | | | | | | | | | | | 1.4 | 12,000 |
| | MRX | 063R-16-4T-M | ● | 4 | 8 | 63 | 60 | 22 | 18 | 11 | 40 | 21 | 6.3 | 10.4 | 4.4 | 8 | +10° | -5.5° | | #1 | 0.5 | 13,500 |
| | | 063R-16-5T-M | ● | 5 | | | | | | | | | | | | | | | | | 0.5 | 13,500 |
| | | 080R-16-5T-M | ● | 5 | | 80 | 70 | 27 | 20 | 13 | 50 | 24 | 7 | 12.4 | | | | | | | 1.1 | 11,500 |
| | | 080R-16-6T-M | ● | 6 | | | | | | | | | | | | | | | | | 1.1 | 11,500 |
| | | 100R-16-6T-M | ● | 6 | | 100 | 78 | 32 | 46 | - | | 30 | 8 | 14.4 | | | | | | #2 | 1.4 | 10,000 |
| | | 100R-16-7T-M | ● | 7 | | | | | | | | | | | | | | | | | 1.4 | 10,000 |
| | | 125R-16-6T-M | ● | 6 | | 125 | 89 | 40 | 55 | | 63 | 33 | 9 | 16.4 | | | | | | | 2.6 | 9,000 |
| | | 125R-16-8T-M | ● | 8 | | | | | | | | | | | | | | | | | 2.6 | 9,000 |
| Inch | MRX | 080R-12-6T | □ | 6 | 6 | 80 | 70 | 25.4 | 20 | 13 | 50 | 27 | 6 | 9.5 | 3.4 | 6 | +10° | -5.5° | | #1 | 1.2 | 13,500 |
| | | 080R-12-8T | □ | 8 | | | | | | | | | | | | | | | | | 1.1 | 13,500 |
| | | 100R-12-7T | □ | 7 | | 100 | 78 | 31.75 | 46 | - | | 34 | 8 | 12.7 | | | | | | #2 | 1.5 | 12,000 |
| | | 100R-12-9T | □ | 9 | | | | | | | | | | | | | | | | | 1.5 | 12,000 |
| | MRX | 080R-16-5T | □ | 5 | 8 | 80 | 70 | 25.4 | 20 | 13 | 50 | 27 | 6 | 9.5 | 4.4 | 8 | +10° | -5.5° | | #1 | 1.1 | 11,500 |
| | | 080R-16-6T | □ | 6 | | | | | | | | | | | | | | | | | 1.1 | 11,500 |
| | | 100R-16-6T | □ | 6 | | 100 | 78 | 31.75 | 46 | - | | 34 | 8 | 12.7 | | | | | | #2 | 1.4 | 10,000 |
| | | 100R-16-7T | □ | 7 | | | | | | | | | | | | | | | | | 1.4 | 10,000 |
| | | 125R-16-6T | □ | 6 | | 125 | 89 | 38.1 | 55 | | 63 | 38 | 10 | 15.9 | | | | | | | 2.7 | 9,000 |
| | | 125R-16-8T | □ | 8 | | | | | | | | | | | | | | | | | 2.7 | 9,000 |

●: Standard Item □: Check Availability

## Spare Parts and Applicable Inserts

| Description | | Clamp Screw | Wrench | | Anti-seize Compound | Mounting Bolt | Applicable Inserts |
|---|---|---|---|---|---|---|---|
| | | | DTPM | TTP | | | |
| MRX | 040R-10... | SB-3070TRP | DTPM-10 | | MP-1 | HH8X25 | RPMT10T3M0ER-GM<br>RPGT10T3M0ER-GM<br>RPGT10T3M0ER-SM<br>RPMT10T3M0EN-GH *1 |
| | 050R-10... | Recommended Torque for Insert Clamp 2.0 Nm | | | | HH10X30 | |
| | 063R-10... | | | | | HH10X30 | |
| MRX | 040R-12... | SB-4090TRPN | DTPM-15 | | MP-1 | HH8X25 | RPMT1204M0ER-GM<br>RPGT1204M0ER-GM<br>RPGT1204M0ER-SM<br>RPMT1204M0EN-GH *2 |
| | 050R-12... | Recommended Torque for Insert Clamp 3.5 Nm | | | | HH10X30 | |
| | 063R-12... | | | | | HH10X30 | |
| | 080R-12... | | | | | HH12X35 | |
| | 100R-12... | | | | | - | |
| MRX | 063R-16... | SB-50120TRP | TTP-20 | | MP-1 | HH10X30 | RPMT1605M0ER-GM<br>RPGT1605M0ER-GM<br>RPGT1605M0ER-SM<br>RPMT1605M0EN-GH *3 |
| | 080R-16... | Recommended Torque for Insert Clamp 4.5 Nm | | | | HH12X35 | |
| | 100R-16... | | | | | - | |
| | 125R-16... | | | | | | |

**Caution with Max. Revolution**

- When running an endmill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.
- Coat Anti-seize Compound (MP-1) thinly on portion of taper and thread when insert is fixed.

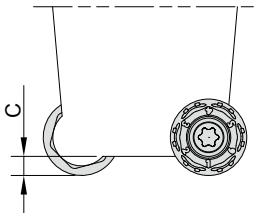
*1 Not compatible with conventional PRMT10T3M0.

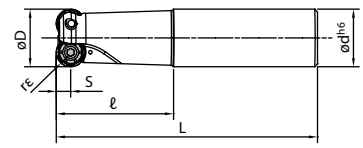
*2 Not compatible with conventional PRMT1204M0 and PRMT1204M0-H.

*3 Not compatible with conventional PRMT1606M0-H.

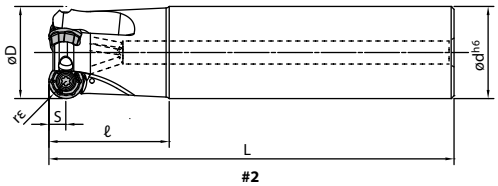
Recommended Cutting Conditions ➡ P11

## MRX End Mill

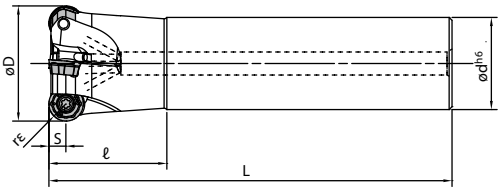


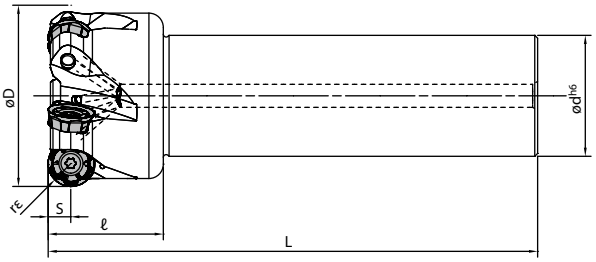
#1



#2

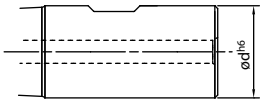


#3

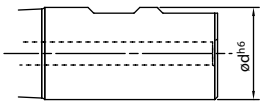


#4

#5

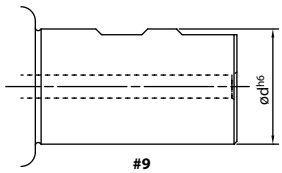


#6



#7

#8



#9

## Toolholder Dimension

| | Description | | Standard | No. of inserts | Dimension (mm) | | | | | | | Rake Angle (°) | | Coolant Hole | Drawing | Max. Revolution (min$^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | rε | øD | ød | L | ℓ | C | S | A.R.(MAX) | R.R. | | | |
| Cylindrical | MRX | 16-S16-08-2T | ● | 2 | 4 | 16 | 16 | 110 | 40 | 2.4 | 4.0 | +3° | -5.5° | No | #1 | 38,000 |
| | | 20-S20-08-2T | ● | 2 | | 20 | 20 | 120 | | | | +10° | | Yes | #2 | 32,000 |
| | | 25-S25-08-4T | ● | 4 | | 25 | 25 | | | | | | | | | 28,000 |
| | MRX | 20-S20-10-2T | ● | 2 | 5 | 20 | 20 | 120 | 40 | 2.9 | 5.0 | +5° | -8° | No | #1 | 30,000 |
| | | 25-S25-10-3T | ● | 3 | | 25 | 25 | | | | | +10° | -5.5° | Yes | #2 | 28,000 |
| | | 32-S32-10-4T | ● | 4 | | 32 | 32 | 140 | | | | | | | | 22,500 |
| | MRX | 32-S32-12-3T | ● | 3 | 6 | 32 | 32 | 140 | 40 | 3.4 | 6.0 | +10° | -5.5° | Yes | #2 | 24,500 |
| | | 40-S32-12-4T | ● | 4 | | 40 | | | | | | | | | #3 | 21,000 |
| | | 50-S42-12-5T | ● | 5 | | 50 | 42 | 170 | | | | | | | | 18,000 |
| | MRX | 40-S32-16-2T | ● | 2 | 8 | 40 | 32 | 140 | 40 | 4.4 | 8.0 | +10° | -5.5° | Yes | #3 | 18,000 |
| | | 50-S42-16-4T | ● | 4 | | 50 | 42 | 170 | | | | | | | | 15,500 |
| | | 63-S42-16-5T | ● | 5 | | 63 | | | | | | | | | #4 | 13,500 |
| Weldon | MRX | 16-W16-08-2T | ● | 2 | 4 | 16 | 16 | 89 | 40 | 2.4 | 4.0 | +3° | -5.5° | No | #5 | 38,000 |
| | | 20-W20-08-2T | ● | 2 | | 20 | 20 | 91 | | | | +10° | | Yes | #6 | 32,000 |
| | | 25-W25-08-4T | ● | 4 | | 25 | 25 | 97 | | | | | | | #7 | 28,000 |
| | MRX | 20-W20-10-2T | ● | 2 | 5 | 20 | 20 | 91 | 40 | 2.9 | 5.0 | +5° | -8° | No | #5 | 30,000 |
| | | 25-W25-10-3T | ● | 3 | | 25 | 25 | 97 | | | | +10° | -5.5° | Yes | #7 | 28,000 |
| | | 32-W32-10-4T | ● | 4 | | 32 | 32 | 101 | | | | | | | #7 | 22,500 |
| | MRX | 32-W32-12-3T | ● | 3 | 6 | 32 | 32 | 101 | 40 | 3.4 | 6.0 | +10° | -5.5° | Yes | #7 | 24,500 |
| | | 40-W32-12-4T | ● | 4 | | 40 | | | | | | | | | #8 | 21,000 |
| | | 50-W40-12-5T | ● | 5 | | 50 | 40 | 111 | | | | | | | | 18,000 |
| | MRX | 40-W32-16-2T | ● | 2 | 8 | 40 | 32 | 101 | 40 | 4.4 | 8.0 | +10° | -5.5° | Yes | #8 | 18,000 |
| | | 50-W40-16-4T | ● | 4 | | 50 | 40 | 111 | | | | | | | | 15,500 |
| | | 63-W40-16-5T | ● | 5 | | 63 | | 112 | | | | | | | #9 | 13,500 |
| Cylindrical (Long) | MRX | 16-S16-08-2T-160 | ● | 2 | 4 | 16 | 16 | 160 | 70 | 2.4 | 4.0 | +3° | -5.5° | No | #1 | 38,000 |
| | | 20-S20-08-2T-180 | ● | 2 | | 20 | 20 | 180 | 80 | | | +10° | | Yes | #2 | 32,000 |
| | | 25-S25-08-4T-180 | ● | 4 | | 25 | 25 | 180 | | | | | | | | 28,000 |
| | MRX | 20-S20-10-2T-180 | ● | 2 | 5 | 20 | 20 | 180 | 80 | 2.9 | 5.0 | +5° | -8° | No | #1 | 30,000 |
| | | 25-S25-10-2T-180 | ● | 2 | | 25 | 25 | 180 | | | | +10° | -5.5° | Yes | #2 | 28,000 |
| | | 32-S32-10-4T-200 | ● | 4 | | 32 | 32 | 200 | | | | | | | | 22,500 |
| | MRX | 32-S32-12-2T-200 | ● | 2 | 6 | 32 | 32 | 200 | 80 | 3.4 | 6.0 | +10° | -5.5° | Yes | #2 | 24,500 |
| | | 40-S32-12-4T-200 | ● | 4 | | 40 | | 200 | 40 | | | | | | #3 | 21,000 |
| | | 50-S42-12-4T-300 | ● | 4 | | 50 | 42 | 300 | | | | | | | | 18,000 |
| | MRX | 40-S32-16-2T-200 | ● | 2 | 8 | 40 | 32 | 200 | 40 | 4.4 | 8.0 | +10° | -5.5° | Yes | #3 | 18,000 |
| | | 50-S42-16-4T-300 | ● | 4 | | 50 | 42 | 300 | | | | | | | | 15,500 |
| | | 63-S42-16-4T-300 | ● | 4 | | 63 | | 300 | | | | | | | #4 | 13,500 |

●: Standard Item

## Spare Parts and Applicable Inserts

| Description | | Clamp Screw | Wrench | | Anti-seize Compound | Applicable Inserts |
|---|---|---|---|---|---|---|
| | |  | DTPM  | TTP  |   | |
| MRX | •••-08... | SB-2555TRP | DTPM-8 | | MP-1 | RDMT0803M0ER-GM<br>RDGT0803M0ER-GM<br>RDGT0803M0ER-SM<br>RDMT0803M0EN-GH<br>*1 |
| | | Recommended Torque for Insert Clamp 1.2 Nm | | | | |
| MRX | •••-10... | SB-3070TRP | DTPM-10 | | MP-1 | RPMT10T3M0ER-GM<br>RPGT10T3M0ER-GM<br>RPGT10T3M0ER-SM<br>RPMT10T3M0EN-GH<br>*2 |
| | | Recommended Torque for Insert Clamp 2.0 Nm | | | | |
| MRX | •••-12... | SB-4090TRPN | DTPM-15 | | MP-1 | RPMT1204M0ER-GM<br>RPGT1204M0ER-GM<br>RPGT1204M0ER-SM<br>RPMT1204M0EN-GH<br>*3 |
| | | Recommended Torque for Insert Clamp 3.5 Nm | | | | |
| MRX | •••-16... | SB-50120TRP | TTP-20 | | MP-1 | RPMT1605M0ER-GM<br>RPGT1605M0ER-GM<br>RPGT1605M0ER-SM<br>RPMT1605M0EN-GH<br>*4 |
| | | Recommended Torque for Insert Clamp 4.5 Nm | | | | |

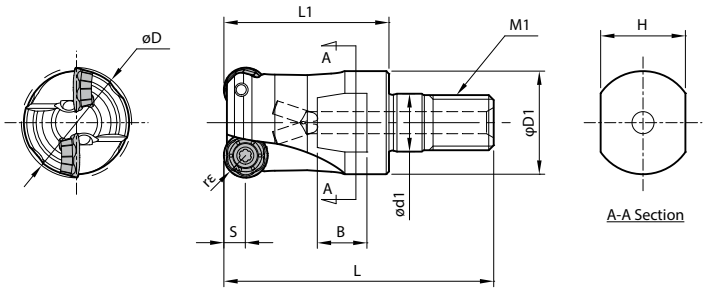
Recommended Cutting Conditions ➡ P11

**Caution with Max. Revolution**

- When running an endmill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.
- Coat Anti-seize Compound (MP-1)  thinly on portion of taper and thread when insert is fixed.

*1 Not compatible with conventional RDMT08T2M0-H.
*2 Not compatible with conventional RPMT10T3M0.
*3 Not compatible with conventional RPMT1204M0 and RPMT1204M0-H.
*4 Not compatible with conventional RPMT1606M0-H.

## MRX Screw on type




## Toolholder Dimension

| Description | | Standard | No. of inserts | Dimension (mm) | | | | | | | | | | Rake Angle (°) | | Coolant Hole | Applicable Inserts | Max. spindle revolution (min$^{-1}$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | rε | ØD | ØD1 | Ød1 | L | L1 | M1 | H | B | S | A.R. (MAX) | R.R. | | | |
| MRX | 16-M08-08-2T | ● | 2 | 4 | 16 | 14.7 | 8.5 | 43 | 25 | M8 | 12 | 8 | 4 | +3° | -5.5° | No | RDMT08 RDGT08 | 38,000 |
| | 20-M10-08-2T | ● | 2 | | 20 | 18.7 | 10.5 | 49 | 30 | M10 | 15 | 9 | | +10° | | Yes | | 32,000 |
| | 25-M12-08-4T | ● | 4 | | 25 | 23 | 12.5 | 57 | 35 | M12 | 19 | 10 | | | | | | 28,000 |
| MRX | 20-M10-10-2T | ● | 2 | 5 | 20 | 18.7 | 10.5 | 49 | 30 | M10 | 15 | 9 | 5 | +5° | -8° | No | RPMT10 RPGT10 | 30,000 |
| | 25-M12-10-3T | ● | 3 | | 25 | 23 | 12.5 | 57 | 35 | M12 | 19 | 10 | | +10° | -5.5° | Yes | | 28,000 |
| | 32-M16-10-4T | ● | 4 | | 32 | 30 | 17 | 63 | 40 | M16 | 24 | 12 | | | | | | 22,500 |
| MRX | 32-M16-12-3T | ● | 3 | 6 | 32 | 30 | 17 | 63 | 40 | M16 | 24 | 12 | 6 | +10° | -5.5° | Yes | RPMT12 RPGT12 | 24,500 |
| | 40-M16-12-4T | ● | 4 | | 40 | 30 | 17 | 63 | 40 | M16 | 24 | 12 | | | | | | 21,000 |
| MRX | 40-M16-16-2T | ● | 2 | 8 | 40 | 30 | 17 | 63 | 40 | M16 | 24 | 12 | 8 | +10° | -5.5° | Yes | RPMT16 RPGT16 | 18,000 |

●: Standard Item

**Caution with max. revolution**

When running an endmill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

Screw on type identification system

**MRX 16 - M08 - 08 - 2T**

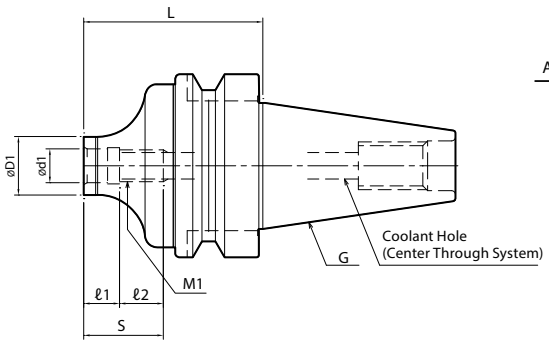
| Series | Cutter Ø | Thread Size | Insert Size | No. of inserts |
|---|---|---|---|---|

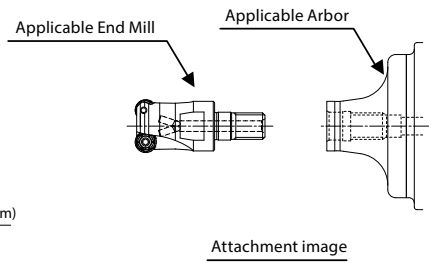
Wrenches and clamp screws are 'Torx Plus'.
1) See Fig. 1 for 'Torx Plus' Wrench. (Blue grip)
2) See Fig. 2 for 'Torx' Wrench. (Black grip)


Fig. 1 'Torx Plus' Wrench (For MRX)


Fig. 2 'Torx' Wrench (Do NOT use it for MRX)

## BT Arbor (for screw on type / two face contact)



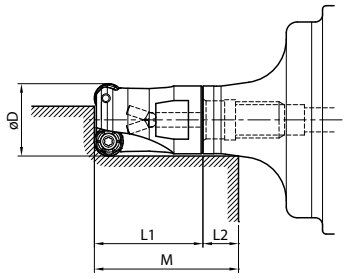




### Arbor Dimension

| Description | | Standard | Dimension (mm) | | | | | | | Coolant hole | Arbor Size | Applicable End Mill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | øD1 | ød1 | S | ℓ1 | ℓ2 | M1 | | | |
| BT30K- | M08-45 | ● | 45 | 14.7 | 8.5 | 20 | 9 | 11 | M8 | Yes | BT30 | MRX16-M08·· |
| | M10-45 | ● | | 18.7 | 10.5 | 21 | | 12 | M10 | | | MRX20-M10·· |
| | M12-45 | ● | | 23 | 12.5 | 24 | | 15 | M12 | | | MRX25-M12·· |
| BT40K- | M08-55 | ● | 55 | 14.7 | 8.5 | 20 | 9 | 11 | M8 | Yes | BT40 | MRX16-M08·· |
| | M10-60 | ● | 60 | 18.7 | 10.5 | 21 | | 12 | M10 | | | MRX20-M10·· |
| | M12-55 | ● | 55 | 23 | 12.5 | 24 | | 15 | M12 | | | MRX25-M12·· |
| | M16-65 | ● | 65 | 30 | 17 | 25 | | 16 | M16 | | | MRX32-M16·· / MRX40-M16·· |

●: Standard Item

### Effective depth of assembled tool




| Arbor Description | | Description | øD | L1 | M | L2 |
|---|---|---|---|---|---|---|
| BT30K- | M08-45 | MRX16-M08·· | 16 | 25 | 31.8 | 6.8 |
| | M10-45 | MRX20-M10·· | 20 | 30 | 36.8 | 6.8 |
| | M12-45 | MRX25-M12·· | 25 | 35 | 42.8 | 7.8 |
| BT40K- | M08-55 | MRX16-M08·· | 16 | 25 | 31.7 | 6.7 |
| | M10-60 | MRX20-M10·· | 20 | 30 | 38.7 | 8.7 |
| | M12-55 | MRX25-M12·· | 25 | 35 | 44.6 | 9.6 |
| | M16-65 | MRX32-M16·· | 32 | 40 | 51.2 | 11.2 |
| | | MRX40-M16·· | 40 | 40 | 64 | 24 |

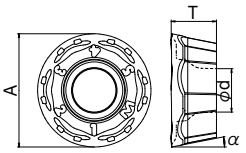
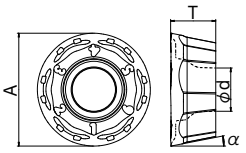
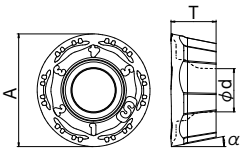
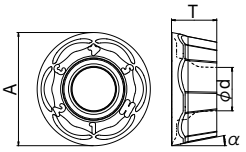
Arbor identification system

**BT30 K - M08 - 45**

| BT30 | K | M08 | 45 |
|---|---|---|---|
| Arbor Size | Two-face Clamping Spindle | Thread Size | Length L |

## Inserts

| Classification of usage | | | | | | |
|---|---|---|---|---|---|---|
| ★ : Roughing / 1st Choice<br>☆ : Roughing / 2nd Choice<br>■ : Finishing / 1st Choice<br>□ : Finishing / 2nd Choice<br>(Hardened material is applicable only under 45HRC) | P | Carbon Steel / Alloy Steel | | ★ | | |
| | | Die Steel | | ★ | | |
| | M | Austenitic Stainless Steel | ★ | ☆ | | |
| | | Martensitic Stainless Steel | ☆ | | | ★ |
| | K | Gray Cast Iron | | | ★ | |
| | | Nodular Cast Iron | | | ★ | |
| | S | Heat-resistant Alloy | ☆ | | | ★ |
| | | Titanium Alloy | ★ | | ☆ | |
| | H | Hardened Material | | □ | | |

| Insert | | Description | | Dimension (mm) | | | | Angle (°) | MEGACOAT NANO carbide | | | CVD carbide |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | T | ød | rε | α | PR1535 | PR1525 | PR1510 | CA6535 |
|  General Purpose (M-class) |  | RDMT | 0803M0ER-GM | 8 | 3.18 | 3.0 | 4 | 15 | ● | ● | ● | ● |
| | | RPMT | 10T3M0ER-GM | 10 | 3.97 | 3.5 | 5 | 11 | ● | ● | ● | ● |
| | | | 1204M0ER-GM | 12 | 4.76 | 4.6 | 6 | | ● | ● | ● | ● |
| | | | 1605M0ER-GM | 16 | 5.56 | 5.8 | 8 | | ● | ● | ● | ● |
|  General Purpose (G-class) |  | RDGT | 0803M0ER-GM | 8 | 3.18 | 3.0 | 4 | 15 | ● | ● | ● | ● |
| | | RPGT | 10T3M0ER-GM | 10 | 3.97 | 3.5 | 5 | 11 | ● | ● | ● | ● |
| | | | 1204M0ER-GM | 12 | 4.76 | 4.6 | 6 | | ● | ● | ● | ● |
| | | | 1605M0ER-GM | 16 | 5.56 | 5.8 | 8 | | ● | ● | ● | ● |
|  For stainless steel (Low cutting force) |  | RDGT | 0803M0ER-SM | 8 | 3.18 | 3.0 | 4 | 15 | ● | ● | | ● |
| | | RPGT | 10T3M0ER-SM | 10 | 3.97 | 3.5 | 5 | 11 | ● | ● | | ● |
| | | | 1204M0ER-SM | 12 | 4.76 | 4.6 | 6 | | ● | ● | | ● |
| | | | 1605M0ER-SM | 16 | 5.56 | 5.8 | 8 | | ● | ● | | ● |
|  Tough Edge (Heavy Milling) |  | RDMT | 0803M0EN-GH | 8 | 3.18 | 3.0 | 4 | 15 | ● | ● | ● | ● |
| | | RPMT | 10T3M0EN-GH | 10 | 3.97 | 3.5 | 5 | 11 | ● | ● | ● | ● |
| | | | 1204M0EN-GH | 12 | 4.76 | 4.6 | 6 | | ● | ● | ● | ● |
| | | | 1605M0EN-GH | 16 | 5.56 | 5.8 | 8 | | ● | ● | ● | ● |

●: Standard Item

## Recommended cutting conditions

| Workpiece Material | Recommended Chipbreaker (fz: mm/t) RD**08 type: ap = 2 mm, RP**10 type: ap = 2.5 mm RP**12 type: ap = 3 mm, RP**16 type: ap = 4 mm | | | | Recommended Insert Grade (Vc: m/min) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | MEGACOAT NANO | | | CVD Coated Carbide |
| | RDMT-GM RPMT-GM | RDGT-GM RPGT-GM | RDGT-SM RPGT-SM | RDMT-GH RPMT-GH | PR1535 | PR1525 | PR1510 | CA6535 |
| Carbon Steel | ★ 0.1 ~ 0.2 ~ 0.3 | ☆ 0.1 ~ 0.2 ~ 0.3 | ☆ 0.06 ~ 0.15 ~ 0.2 | ☆ 0.15 ~ 0.3 ~ 0.35 | - | ★ 120 ~ 180 ~ 250 | - | - |
| Alloy Steel | ★ 0.1 ~ 0.2 ~ 0.3 | ☆ 0.1 ~ 0.2 ~ 0.3 | ☆ 0.06 ~ 0.15 ~ 0.2 | ☆ 0.15 ~ 0.3 ~ 0.35 | - | ★ 100 ~ 160 ~ 220 | - | - |
| Die Steel | ★ 0.1 ~ 0.15 ~ 0.25 | ☆ 0.1 ~ 0.15 ~ 0.25 | ☆ 0.06 ~ 0.12 ~ 0.2 | ☆ 0.15 ~ 0.2 ~ 0.3 | - | ★ 80 ~ 140 ~ 180 | - | - |
| Austenitic Stainless Steel | ☆ 0.1 ~ 0.15 ~ 0.2 | ☆ 0.1 ~ 0.15 ~ 0.2 | ★ 0.06 ~ 0.12 ~ 0.2 | - | ★ 100 ~ 160 ~ 200 | ☆ 100 ~ 160 ~ 200 | - | - |
| Martensitic Stainless Steel | ☆ 0.1 ~ 0.15 ~ 0.2 | ☆ 0.1 ~ 0.15 ~ 0.2 | ★ 0.06 ~ 0.12 ~ 0.2 | - | ☆ 150 ~ 200 ~ 250 | - | - | ★ 180 ~ 240 ~ 300 |
| Precipitation Hardened Stainless Steel | ☆ 0.1 ~ 0.15 ~ 0.2 | ★ 0.1 ~ 0.15 ~ 0.2 | ☆ 0.06 ~ 0.12 ~ 0.2 | - | ★ 90 ~ 120 ~ 150 | - | - | - |
| Gray Cast Iron | ★ 0.1 ~ 0.2 ~ 0.3 | ☆ 0.1 ~ 0.2 ~ 0.3 | - | ☆ 0.15 ~ 0.3 ~ 0.35 | - | - | ★ 120 ~ 180 ~ 250 | - |
| Nodular Cast Iron | ★ 0.1 ~ 0.15 ~ 0.25 | ☆ 0.1 ~ 0.15 ~ 0.25 | - | ☆ 0.15 ~ 0.2 ~ 0.3 | - | - | ★ 100 ~ 150 ~ 200 | - |
| Ni-base Heat Resistant Alloy | ☆ 0.1 ~ 0.12 ~ 0.15 | ★ 0.1 ~ 0.12 ~ 0.15 | ☆ 0.06 ~ 0.1 ~ 0.15 | - | ☆ 20 ~ 30 ~ 50 | - | - | ★ 20 ~ 30 ~ 50 |
| Titanium Alloy | ☆ 0.1 ~ 0.12 ~ 0.15 | ☆ 0.1 ~ 0.12 ~ 0.15 | ★ 0.06 ~ 0.1 ~ 0.15 | - | ★ 40 ~ 60 ~ 80 | - | ☆ 30 ~ 50 ~ 70 | - |

★: 1st recommendation ☆: 2nd recommendation

- Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloy.
- RDGT/RPGT are recommended for stainless steel, Ni-base heat resistant alloy and titanium alloy.
- Recommended feed rate in the table is the reference value when ap is rε/2.
  (2.0 mm for RD**08 / 2.5 mm for RP**10 / 3 mm for RP**12 / 4 mm for RP**16. For other ap, calculate the recommended feed rate based on the conversion factor below.
- For MRX16-S16-08-2T(-160), MRX16-W-08-2T, MRX20-S20-10-2T(-180)and MRX20-W20-10-2T, set the feed rate not higher than 50 % of the recommended cutting conditions.

### Conversion factor for feed per tooth by depth of cut (ap)

| Insert | ap (max) | Conversion factor for feed per tooth | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ap = 0.5 mm | ap = 1 mm | ap = 1.5 mm | ap = 2 mm | ap = 2.5 mm | ap = 3 mm | ap = 4 mm | ap = 5 mm | ap = 6 mm | ap = 8 mm |
| RD**08 type (GM / SM / GH chipbreaker) | 4 mm | 1.7 | 1.3 | 1.1 | 1 (Standard) | 0.9 | 0.8 | 0.8 | – | – | – |
| RP**10 type (GM / SM / GH chipbreaker) | 5 mm | 1.9 | 1.4 | 1.2 | 1 | 1 (Standard) | 0.9 | 0.8 | 0.8 | – | – |
| RP**12 type (GM / SM / GH chipbreaker) | 6 mm | 2.1 | 1.5 | 1.3 | 1.1 | 1 | 1 (Standard) | 0.9 | 0.8 | 0.8 | – |
| RP**16 type (GM / SM / GH chipbreaker) | 8 mm | 2.4 | 1.7 | 1.4 | 1.3 | 1.1 | 1.1 | 1 (Standard) | 0.9 | 0.8 | 0.8 |

**Calculation example for recommended feed rate:**
Workpiece: carbon steel, RPMT12 type, ap = 1 mm,

0.2 mm/t x 1.5 = 0.3 mm/t
(Reference value for carbon steel/GM chipbreaker)
x (Conversion factor for RP**12 type, ap = 1 mm)
= Recommended feed rate

### Peck Milling / Ramping / Helical milling

| Insert | Toolholder Ø | Max. ap | Peck Milling | | Ramping | | | Helical milling | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Max. Cutting Depth | Min. Cutting Length for flat bottom face | Ramping angle $\alpha_{max}$ (°) | tan $\alpha_{max}$ | Max. Cutting Length at Max. Ramping Angle | Min. Cutting Dia Ø Dh1 | Min. Cutting Dia. for flat bottom facing Ø Dh2 | Max. Cutting Dia. ØDh3 |
| RD**08 type | 16 | 4 | 0.7 | 9 | 8 | 0.141 | 28 | 20 | 24 | 30 |
| | 20 | | 1.4 | 13 | 9 | 0.158 | 25 | 26 | 32 | 38 |
| | 25 | | | 18 | 5 | 0.087 | 45 | 36 | 42 | 48 |
| RP**10 type | 20 | 5 | 0.6 | 11 | 5 | 0.087 | 57 | 26 | 30 | 38 |
| | 25 | | 1.9 | 16 | 10 | 0.176 | 28 | 33 | 40 | 48 |
| | 32 | | | 23 | 6 | 0.105 | 47 | 47 | 54 | 62 |
| | 40 | | | 31 | 4 | 0.070 | 71 | 63 | 70 | 78 |
| | 50 | | | 41 | 3 | 0.052 | 95 | 83 | 90 | 98 |
| | 63 | | | 54 | 2 | 0.035 | 143 | 109 | 116 | 124 |
| RP**12 type | 32 | 6 | 2.4 | 21 | 9 | 0.158 | 37 | 43 | 52 | 62 |
| | 40 | | | 29 | 5 | 0.087 | 68 | 59 | 68 | 78 |
| | 50 | | | 39 | 4 | 0.070 | 85 | 79 | 88 | 98 |
| | 63 | | | 52 | 2 | 0.035 | 171 | 105 | 114 | 124 |
| | 80 | | | 69 | | 0.035 | | 139 | 148 | 158 |
| | 100 | | | 89 | 1 | 0.017 | 343 | 179 | 188 | 198 |
| RP**16 type | 40 | 8 | 3.4 | 25 | 11 | 0.194 | 41 | 51 | 64 | 78 |
| | 50 | | | 35 | 7 | 0.123 | 65 | 71 | 84 | 98 |
| | 63 | | | 48 | 4 | 0.070 | 114 | 97 | 110 | 124 |
| | 80 | | | 65 | 3 | 0.052 | 152 | 131 | 144 | 158 |
| | 100 | | | 85 | 2 | 0.035 | 229 | 171 | 184 | 198 |
| | 125 | | | 110 | 1 | 0.017 | 458 | 221 | 234 | 248 |

The above value is based on the clearance of 1 mm between the tool body and the workpiece.

Unit: mm

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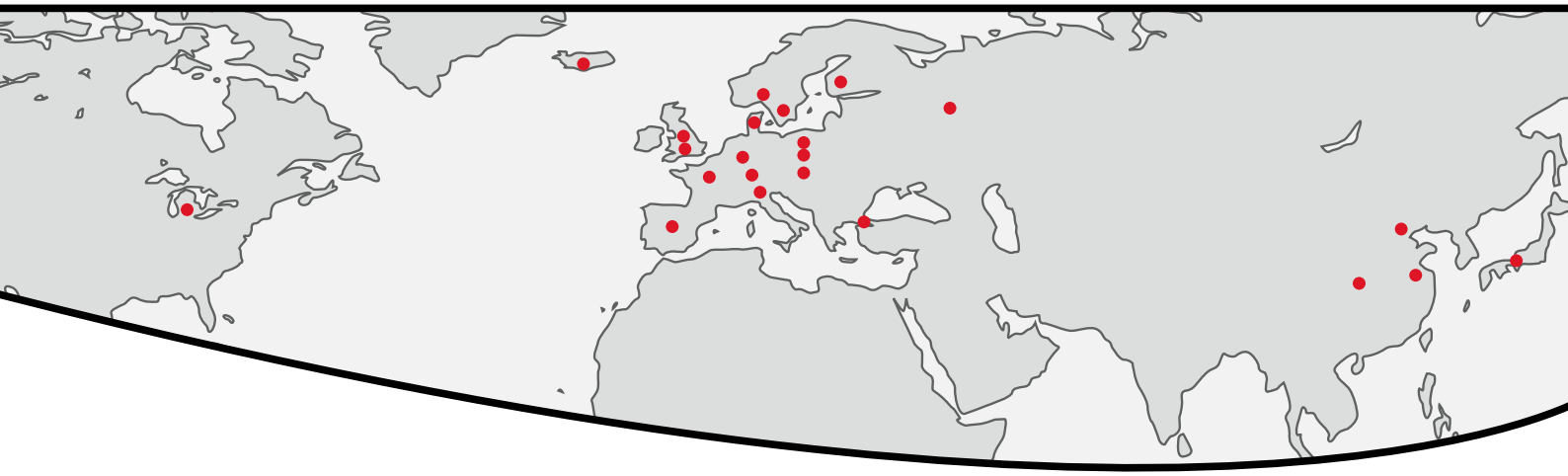


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