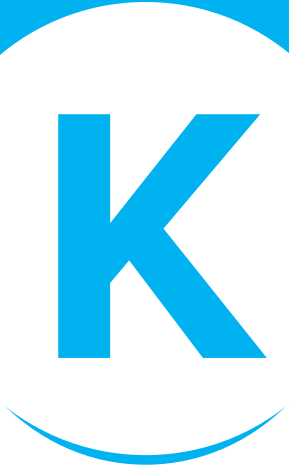


OTHER APPLICATIONS



K

K1 - K14

| OTHER APPLICATIONS | | K2 - K14 |
|--------------------|--------------------------------|----------|
| API | RING GROOVING FOR M/C | K2 |
| CM / CM-AL | CHAMFERING END MILL | K5 |
| MCSE | CHAMFERING END MILL | K6 |
| MEF | BOLT COUNTERSINK END MILL | K8 |
| METS | T-SLOT MILL | K10 |
| MGI | GROOVING END MILL FOR M/C | K12 |
| MVG | RING GROOVING END MILL FOR M/C | K14 |



API Ring Groover

Kyocera is the only choice for economical ring groovers. Featuring an integral shank for maximum rigidity, Kyocera's API Ring Groovers are the most versatile ring grooving tools on the market.

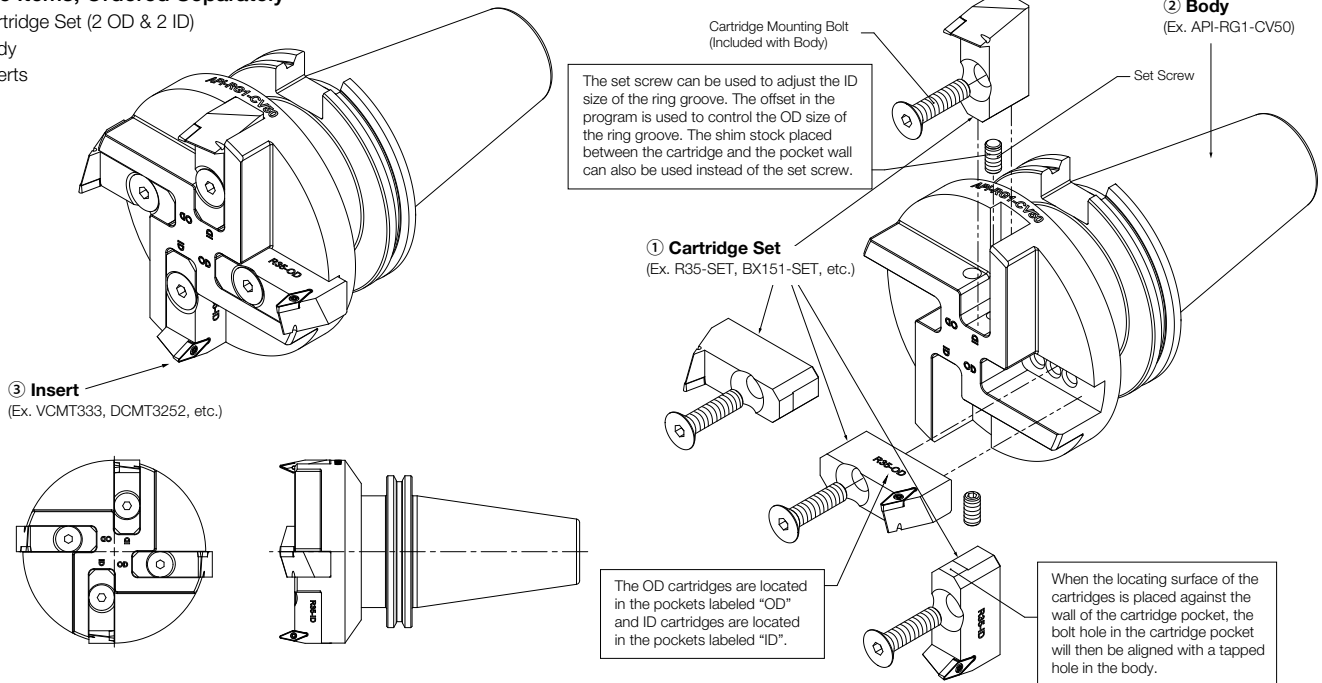


ADVANTAGES

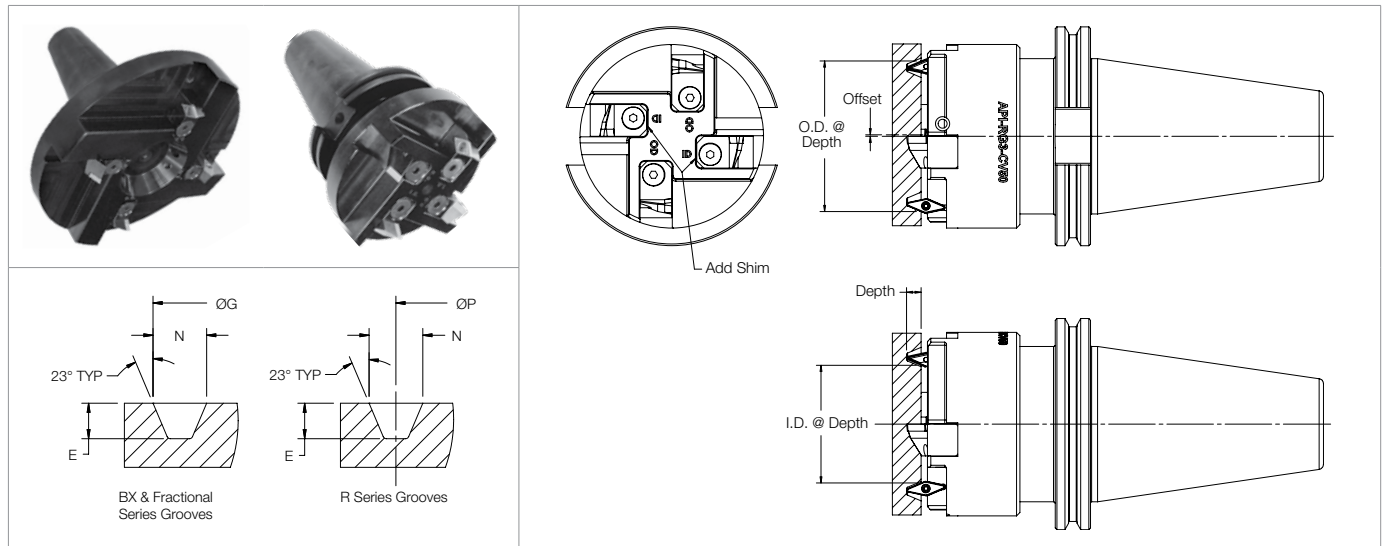
- Create ring grooves per API Spec 6A for BX, R, and RX style grooves
- Roughout and finish of inlay of API Ring Grooves
- Replaceable cartridges allow a single cutter body to produce multiple size API grooves
- Integral shank, multiple sizes and styles available

3 Line Items, Ordered Separately

- ① Cartridge Set (2 OD & 2 ID)
- ② Body
- ③ Inserts



API Ring Groover Dimensions



See Dimension Table [K3](#)

API RING GROOVER

● Ring / Cartridge Set Dimensions

| Ring Specification | ① Cartridge Set Part Number Choose Set | Stock | No. of Inserts | No. of Flutes | Dimensions (in) | | | | | | | Roughout Cartridges | Applicable Body Part Number |
|--------------------|--|-------|----------------|---------------|-----------------|-------|-------|-------|-------|----------|----------|---------------------|--|
| | | | | | Offset | Pitch | OD | Width | Depth | OD Depth | ID Depth | | |
| | | | | | | P | G | N | E | | | | |
| BX-150 | BX150-SET | ● | 4 | 2 | 0.061 | - | 2.893 | 0.450 | 0.220 | 2.771 | 2.115 | - | API-RG-3-CV40 API-RG-3-CV50 API-RG-3-BT50 API-RG-3-DIN-69871 |
| BX-150-R | BX150-R-SET | ● | | 1 | 0.097 | - | 3.341 | 0.841 | 0.485 | 3.147 | 1.853 | Yes | |
| BX-151 | BX151-SET | ● | 4 | 2 | 0.065 | - | 3.062 | 0.466 | 0.220 | 2.932 | 2.260 | - | API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871 |
| BX-151-R | BX151-R-SET | ● | 4 | 1 | 0.097 | - | 3.496 | 0.846 | 0.485 | 3.302 | 1.998 | Yes | API-RG-3-CV40 API-RG-3-CV50 API-RG-3-BT50 API-RG-3-DIN-69871 |
| BX-152 | BX152-SET | ● | 4 | 2 | 0.069 | - | 3.395 | 0.498 | 0.230 | 3.257 | 2.537 | - | API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871 |
| BX-152-R | BX152-R-SET | ● | | 1 | 0.091 | | 3.826 | 0.876 | 0.505 | 3.644 | 2.256 | Yes | |
| BX-153 | BX153-SET | ● | 4 | 2 | 0.077 | - | 4.046 | 0.554 | 0.270 | 3.892 | 3.092 | - | API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871 |
| BX-153-R | BX153-R-SET | ● | | 1 | 0.110 | | 4.486 | 0.936 | 0.535 | 4.266 | 2.834 | Yes | |
| BX-154 | BX154-SET | ● | 4 | 2 | 0.083 | - | 4.685 | 0.606 | 0.300 | 4.519 | 3.369 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| BX-154-R | BX154-R-SET | ● | | 1 | 0.112 | | 5.116 | 0.971 | 0.570 | 4.892 | 3.398 | Yes | |
| BX-155 | BX155-SET | ● | 4 | 2 | 0.100 | - | 5.930 | 0.698 | 0.330 | 5.730 | 4.734 | - | API-RG-4-CV50 API-RG-4-BT50 API-RG-4-DIN-69871 |
| BX-155-R | BX155-R-SET | ● | | 1 | 0.223 | | 6.366 | 1.076 | 0.595 | 5.920 | 4.660 | Yes | |
| BX-156 | BX156-SET | ● | 4 | 2 | 0.132 | - | 9.521 | 0.921 | 0.440 | 9.257 | 7.943 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| BX-156-R | BX156-R-SET | ● | | 1 | 0.166 | | 9.956 | 1.306 | 0.710 | 9.624 | 7.676 | Yes | |
| BX-169 | BX169-SET | ● | 4 | 2 | 0.081 | - | 6.955 | 0.666 | 0.380 | 6.793 | 5.785 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-16 | R16-SET | ● | 4 | 2 | 0.026 | - | 2.000 | 0.344 | 0.250 | 2.292 | 1.708 | - | API-RG-3-CV40 API-RG-3-CV50 API-RG-3-BT50 API-RG-3-DIN-69871 |
| R-18 | R18-SET | ● | | | | | 2.375 | | | 2.667 | 2.083 | - | |
| R-20 | R20-SET | ● | 4 | 2 | 0.046 | - | 2.688 | 0.469 | 0.310 | 2.980 | 2.396 | - | API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871 |
| R-23 | R23-SET | ● | | | | | 3.250 | | | 0.856 | 3.994 | 2.606 | |
| R-23-R | R23-R-SET | ● | 4 | 1 | 0.081 | - | 3.300 | 0.469 | 0.310 | 4.127 | 3.373 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-24 | R24-SET | ● | | | | | 2 | | | 0.046 | 3.750 | 0.871 | |
| R-24-R | R24-R-SET | ● | 4 | 1 | 0.077 | - | 3.800 | 0.469 | 0.310 | 4.377 | 3.623 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-26 | R26-SET | ● | | | | | 2 | | | 0.046 | 4.000 | 4.627 | |
| R-27 | R27-SET | ● | 4 | 2 | 0.044 | - | 4.250 | 0.856 | 0.575 | 4.627 | 3.873 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-31 | R31-SET | ● | | | | | 2 | | | 0.044 | 4.875 | 0.469 | |
| R-31-R | R31-R-SET | ● | 4 | 1 | 0.072 | - | 4.920 | 0.469 | 0.310 | 5.632 | 4.208 | Yes | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-35 | R35-SET | ● | | | | | 2 | | | 0.046 | 5.375 | 0.469 | |
| R-35-R | R35-R-SET | ● | 4 | 1 | 0.081 | - | 5.420 | 0.856 | 0.575 | 6.114 | 4.726 | Yes | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-37 | R37-SET | ● | | | | | 2 | | | 0.046 | 5.875 | 0.469 | |
| R-39 | R39-SET | ● | 4 | 1 | 0.081 | - | 6.375 | 0.856 | 0.575 | 6.752 | 5.998 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-39-R | R39-R-SET | ● | | | | | 1 | | | 0.081 | 6.420 | 0.856 | |
| R-41 | R41-SET | ● | 4 | 2 | 0.046 | - | 7.125 | 0.469 | 0.310 | 7.502 | 6.748 | - | API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871 |
| R-44 | R44-SET | ● | | | | | 2 | | | 0.046 | 7.625 | 0.469 | |
| R-44-R | R44-R-SET | ● | 4 | 1 | 0.071 | - | 7.670 | 0.856 | 0.575 | 8.384 | 6.956 | Yes | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-45 | R45-SET | ● | | | | | 2 | | | 0.046 | 8.313 | 0.469 | |
| R-46 | R46-SET | ● | 4 | 1 | 0.082 | - | 8.360 | 0.531 | 0.380 | 8.748 | 7.878 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| R-46-R | R46-R-SET | ● | | | | | 1 | | | 0.082 | 8.360 | 0.916 | |
| 1-13/16 | 1-13/16-SET | ● | 4 | 2 | 0.034 | - | 4.373 | 0.377 | 0.258 | 4.305 | 3.687 | - | API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871 |
| 2-1/16-10K | 2-1/16-10K-SET | ● | | | | | 4.623 | | | 4.555 | 3.937 | - | |
| 2-9/16-15K | 2-9/16-15K-SET | □ | 4 | 2 | 0.034 | - | 5.873 | 0.377 | 0.258 | 5.805 | 5.187 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| 3-1/16-10K | 3-1/16-10K-SET | ● | | | | | 5.748 | | | 5.680 | 5.062 | - | |
| 4-1/16-10K | 4-1/16-10K-SET | ● | 4 | 1 | 0.034 | - | 7.123 | 0.377 | 0.258 | 7.055 | 6.437 | - | API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871 |
| 5-1/8-10K | 5-1/8-10K-SET | ● | | | | | 8.748 | | | 8.680 | 8.062 | - | |

● Applicable Body Stock

| ② Body Part Number Choose Body | Stock | Shank | Body Spare Parts | |
|--------------------------------------|-------|----------|------------------|-----------|
| | | | Mounting Bolt | Set Screw |
| | | | API-RG-1-CV40 | ● |
| API-RG-1-CV50 | ● | CAT50 | | |
| API-RG-1-BT50 | ● | BT50 | 01-05 | 01-08 |
| API-RG-1-BT40 | □ | BT40 | | |
| API-RG-1-DIN-69871 | □ | DIN69871 | | |
| API-RG-2-CV50 | ● | CAT50 | | |
| API-RG-2-BT50 | ● | BT50 | 01-05 | 01-08 |
| API-RG-2-DIN-69871 | □ | DIN69871 | | |
| API-RG-3-CV40 | ● | CAT40 | | |
| API-RG-3-CV50 | ● | CAT50 | | |
| API-RG-3-BT50 | □ | BT50 | 01-06 | 01-09 |
| API-RG-3-DIN-69871 | □ | DIN69871 | | |
| API-RG-4-CV50 | ● | CAT50 | | |
| API-RG-4-BT50 | □ | BT50 | 01-07 | 01-10 |
| API-RG-4-DIN-69871 | □ | DIN69871 | | |

● Note

The OD and ID dimensions are to set the cut diameter of a given cartridge set using a presetter. The dimensions are the cut diameter of the tool at the depth of the ring groove. By setting zero at the nose radius then moving the presetter to the depth of the API groove the OD and ID can be preset to the dimensions shown.

See illustration on page [K2](#)



● : U.S. Stock Standard
 □ : Made to Order / Quoted Item
 ○ : World Express (Shipping: 7-10 Business Days)



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| | |
|--------------------|---|
| GRADES | A |
| LINEUP / INSERTS | B |
| 45° / 70° LEAD | C |
| 75° LEAD | D |
| 90° LEAD | E |
| HIGH FEED | F |
| MULTI-FUNCTION | G |
| SLOT MILLS | H |
| RADIUS / BALL-NOSE | J |
| OTHER APPLICATIONS | K |
| TOOL HOLDING | O |
| SPARE PARTS | P |
| TECHNICAL | R |
| INDEX | T |

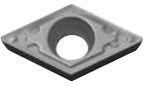
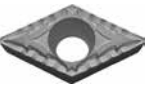


API RING GROOVER

● Cartridge Set Spare Parts & Applicable Inserts

| Ring Specification | Cartridge Set Part Number | Spare Parts | | ③ Applicable Inserts Choose Inserts | | |
|--------------------|---------------------------|--|---|---|----|---------|
| | | Clamp Screw  | Wrench  | | | |
| BX-150 | BX150-SET | SCR-02 | T15 | DCMT3252 | | |
| BX-150-R | BX150-R-SET | | | DCMT3253 | | |
| BX-151 | BX151-SET | | | DCMT3252 | | |
| BX-151-R | BX151-R-SET | | | DCMT3253 | | |
| BX-152 | BX152-SET | | | DCMT3252 | | |
| BX-152-R | BX152-R-SET | | | DCMT3253 | | |
| BX-153 | BX153-SET | | | DCMT3252 | | |
| BX-153-R | BX153-R-SET | | | DCMT3253 | | |
| BX-154 | BX154-SET | | | DCMT3252 | | |
| BX-154-R | BX154-R-SET | | | DCMT3253 | | |
| BX-155 | BX155-SET | | | DCMT3252 | | |
| BX-155-R | BX155-R-SET | | | VCMT333 | | |
| BX-156 | BX156-SET | | | VCMT332 | | |
| BX-156-R | BX156-R-SET | | | VCMT333 | | |
| BX-169 | BX169-SET | | | VCMT332 | | |
| R-16 | R16-SET | | | SCR-01 | T7 | VCMT222 |
| R-18 | R18-SET | | | | | VCMT222 |
| R-20 | R20-SET | | | | | VCMT222 |
| R-23 | R23-SET | SCR-02 | T15 | DCMT3252 | | |
| R-23-R | R23-R-SET | | | VCMT333 | | |
| R-24 | R24-SET | | | DCMT3252 | | |
| R-24-R | R24-R-SET | | | VCMT333 | | |
| | | | | | | VCMT333 |

| Ring Specification | Cartridge Set Part Number | Spare Parts | | ③ Applicable Inserts Choose Inserts | | |
|--------------------|---------------------------|--|---|---|----|---------|
| | | Clamp Screw  | Wrench  | | | |
| R-26 | R26-SET | SCR-02 | T15 | | | |
| R-27 | R27-SET | | | DCMT3252 | | |
| R-31 | R31-SET | | | VCMT333 | | |
| R-31-R | R31-R-SET | | | DCMT3252 | | |
| R-35 | R35-SET | | | VCMT333 | | |
| R-35-R | R35-R-SET | | | DCMT3252 | | |
| R-37 | R37-SET | | | DCMT3252 | | |
| R-39 | R39-SET | | | VCMT333 | | |
| R-39-R | R39-R-SET | | | VCMT333 | | |
| R-41 | R41-SET | | | DCMT3252 | | |
| R-44 | R44-SET | | | VCMT333 | | |
| R-44-R | R44-R-SET | | | DCMT3252 | | |
| R-45 | R45-SET | | | VCMT333 | | |
| R-46 | R46-SET | | | DCMT3252 | | |
| R-46-R | R46-R-SET | | | VCMT333 | | |
| 1-13/16 | 1-13/16-SET | | | SCR-01 | T7 | VCMT222 |
| 2-1/16-10K | 2-1/16-10K-SET | | | | | VCMT222 |
| 2-9/16-15K | 2-9/16-15K-SET | | | | | VCMT222 |
| 3-1/16-10K | 3-1/16-10K-SET | VCMT222 | | | | |
| 4-1/16-10K | 4-1/16-10K-SET | VCMT222 | | | | |
| 5-1/8-10K | 5-1/8-10K-SET | VCMT222 | | | | |
| | | VCMT222 | | | | |

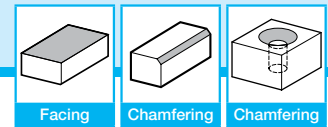
● Applicable Inserts (Inch Size)

| Insert | ANSI Part Number | ISO Part Number | Dimensions (in) | | Angle (°) | Insert Grades | | | | | | | |
|---|------------------|-----------------|-----------------|--------|-----------|---------------|--------|-------|--------------------|---|---|-------------------------|---|
| | | | I.C. (A) | T | | Ød | rε | α | CVD Coated Carbide | | | MEGACOAT Coated Carbide | |
| | | | CA525 | CA5525 | CA6525 | PR1225 | PR1425 | PR660 | | | | | |
|  | DCMT 3252HQ | DCMT 11T308HQ | 3/8 | 5/32 | 0.173 | 1/32 | 7° | ● | ● | ● | | ● | ● |
|  | DCMT 3253CQ | DCMT 11T312CQ | 3/8 | 5/32 | 0.173 | 3/64 | 7° | | ● | ● | | | ● |
|  | VCMT 222HQ | VCMT 110308HQ | 1/4 | 1/8 | 0.110 | 1/32 | 7° | | | | ● | | |
|  | VCMT 332HQ | VCMT 160408HQ | 3/8 | 3/16 | 0.173 | 1/32 | 7° | ● | ● | ● | | | ● |
| | 333HQ | 160412HQ | 3/8 | 3/16 | 0.173 | 3/64 | 7° | | | | ● | | |

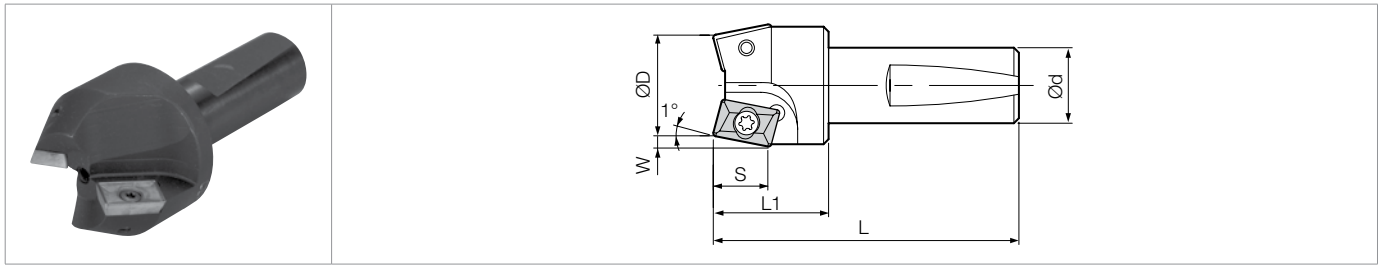
● Sample CNC Program for the API Ring Groover

| | |
|---|--|
| <p>Sample is shown without cutter comp.</p> <p>N10 (Incremental Program)</p> <p>N20 G00 X (As required) Y (As required) Z.100 M03 S (As required)</p> <p>N30 G01 Z0.0 F100</p> <p>N40 G91 Y (Offset) Z-.100 F (As required)</p> <p>N50 G03 J (Offset) Z-.100 F (As required)</p> <p>N60 G03 J (Offset) Z-.100</p> <p>Continue to Depth</p> <p>Last Pass</p> <p>N90 G03 J (Offset) Z0.00</p> | <p>Use 0.03 Depth in Z for Inconel and 0.04 Depth in Z for Steel</p> |
|---|--|

CM / CM-AL CHAMFERING END MILL



CM / CM-AL (For Aluminum Cutting)



Toolholder Dimensions

| Part Number | Stock | No. of Inserts | Dimensions (in) | | | | | | Spare Parts | | Applicable Inserts ● B25 | |
|---------------|-------|----------------|-----------------|-------|-------|-------|-------|-------|-------------|-------------|-----------------------------|-------------|
| | | | ØD | Ød | L | L1 | S | W | α | Clamp Screw | | Wrench |
| CM 0563-15-09 | ● | 2 | 0.563 | 0.500 | 2.780 | 1.000 | 0.340 | 0.089 | 15.0° | SCR-04 | T7 | XPMT090208 |
| 0563-20-09 | ● | | | | | | 0.330 | 0.116 | 20.0° | | | |
| 0563-25-09 | ● | | | | | | 0.310 | 0.143 | 25.0° | | | |
| 0563-30-09 | ● | | 0.563 | 0.625 | 2.910 | 1.000 | 0.300 | 0.169 | 30.0° | SCR-04 | T7 | |
| 0563-35-09 | ● | | | | | | 0.280 | 0.194 | 35.0° | | | |
| 0563-45-09 | ● | | 0.563 | 0.625 | 2.910 | 1.000 | 0.240 | 0.239 | 45.0° | SCR-01 | T7 | |
| 0563-60-09 | ● | | | | | | 0.160 | 0.301 | 60.0° | | | |
| 0563-75-09 | ● | | | | | | 0.080 | 0.327 | 75.0° | | | |
| CM 1000-03 | ● | 2 | 1.000 | 0.750 | 3.150 | 1.250 | 0.589 | 0.031 | 3.0° | SCR-16 | T10 | XPMT15T3... |
| 1000-05 | ● | | | | | | 0.586 | 0.052 | 5.0° | | | |
| 1000-10 | ● | | | | | | 0.577 | 0.103 | 10.0° | | | |
| 1000-15 | ● | | | | | | 0.564 | 0.154 | 15.0° | | | |
| 1000-20 | ● | | 1.000 | 0.750 | 3.150 | 1.250 | 0.547 | 0.204 | 20.0° | SCR-30 | T10 | |
| 1000-25 | ● | | | | | | 0.526 | 0.252 | 25.0° | | | |
| 1000-30 | ● | | | | | | 0.501 | 0.298 | 30.0° | | | |
| 1000-35 | ● | | 1.000 | 0.750 | 3.150 | 1.250 | 0.472 | 0.343 | 35.0° | SCR-30 | T10 | |
| 1000-37.5 | ● | | | | | | 0.456 | 0.372 | 37.5° | | | |
| 1000-41 | ● | | | | | | 0.433 | 0.393 | 41.0° | | | |
| 1000-45 | ● | | | | | | 0.400 | 0.400 | 45.0° | | | |
| 1000-50 | ● | | | | | | 0.376 | 0.454 | 50.0° | | | |
| 1000-55 | ● | | | | | | 0.327 | 0.507 | 55.0° | | | |
| 1000-60 | ● | | | | | | 0.284 | 0.521 | 60.0° | | | |
| 1000-70 | ● | | | | | | 0.193 | 0.547 | 70.0° | | | |
| 1000-75 | ● | | 0.146 | 0.584 | 75.0° | | | | | | | |
| CM 1000-15-AL | ● | 2 | 1.000 | 0.750 | 3.250 | 1.350 | 0.613 | 0.158 | 15.0° | SCR-02 | T15 | APET1604... |
| 1000-20-AL | ● | | | | | | 0.595 | 0.208 | 20.0° | | | |
| 1000-30-AL | ● | | | | | | 0.544 | 0.304 | 30.0° | | | |
| 0800-45-AL | ● | | 0.800 | 0.750 | 3.250 | 1.350 | 0.440 | 0.430 | 45.0° | SCR-02 | T15 | |
| 0800-60-AL | ● | | | | | | 0.308 | 0.528 | 60.0° | | | |
| 0690-75-AL | ● | | | | | | 0.158 | 0.591 | 75.0° | | | |

Recommended Cutting Conditions

| Workpiece Material | Feed Rate fz (ipt) | Recommended Insert Grades (Cutting Speed Vc: sfm) | | | | | | |
|--------------------|--------------------|---|----------------|---------------|--------------------|--------------|--------------|----------------|
| | | Cermet | | MEGACOAT NANO | PVD Coated Carbide | | | Carbide |
| | | TN100M | TC60 | PR1525 | PR930 | PR905 | PR830 | KW10 |
| Low Carbon Steel | 0.003-0.006 | ☆ 800-1400 | ★ 800-1400 | ★ 400-800 | ☆ 350-750 | - | - | - |
| Carbon Steel | 0.003-0.006 | ☆ 600-1200 | ★ 600-1200 | ★ 300-700 | ☆ 250-650 | - | - | - |
| Mold Steel | 0.003-0.006 | ☆ 400-700 | ★ 400-700 | ★ 250-600 | ☆ 250-600 | - | - | - |
| Stainless Steel | 0.002-0.006 | ☆ 300-800 | ☆ 300-800 | ★ 300-600 | ☆ 300-500 | - | ☆ 300-800 | - |
| Cast Iron | 0.003-0.008 | ☆ 400-1200 | ★ 400-1200 | - | - | ★ 400-800 | - | ☆ 300-500 |
| Non-ferrous Metals | 0.005-0.007 | ☆ 1500-1800 | ☆ 1500-1800 | - | - | - | - | ★ 2000-4000 |

* Apply sufficient amount of coolant

★: 1st Recommendation ☆: 2nd Recommendation

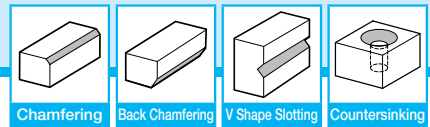
● : U.S. Stock Standard
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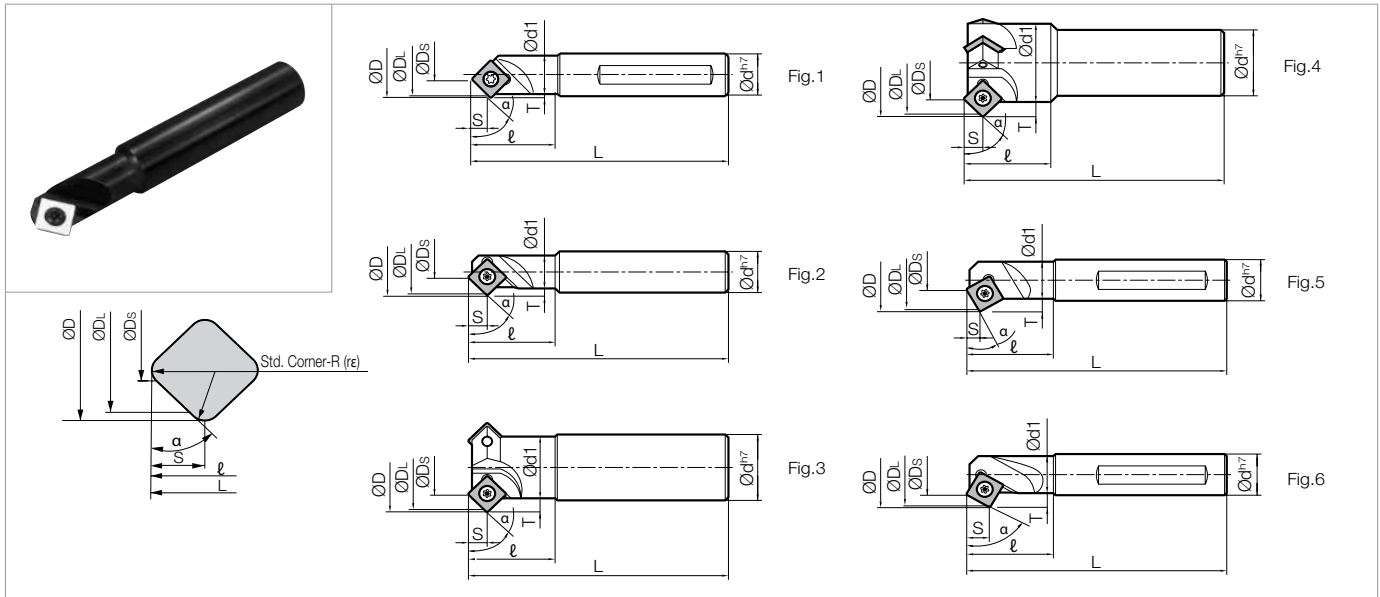


GRADES A
LINEUP / INSERTS B
45° / 70° LEAD C
75° LEAD D
90° LEAD E
HIGH FEED F
MULTI-FUNCTION G
SLOT MILLS H
RADIUS / BALL-NOSE J
OTHER APPLICATIONS K
TOOL HOLDING O
SPARE PARTS P
TECHNICAL R
INDEX T

MCSE CHAMFERING END MILL



MCSE






Toolholder Dimensions

| Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | | | | Std. Corner-R (r) | Angle (°) | Rake Angle (°) | | Drawing | Spare Parts | | | |
|---------------------|-------|----------------|-----------------|-----|-----|----|-----|-----|----|------|-------------------|-----------|----------------|----|---------|-------------|-----------|-------------|--------|
| | | | ØD | ØDL | ØDs | Ød | Ød1 | L | ℓ | S | | | T | α | | A.R. | R.R. | Clamp Screw | Wrench |
| | | | | | | | | | | | | | | | | | | | |
| MCSE 104 | ● | 1 | 16.0 | 15 | 4 | 16 | 15 | 85 | 30 | 6.5 | 0.50 | 0.4 | 45° | 0° | -4.5° | Fig.1 | SB-3060TR | DT-10 | |
| 106 | ● | 1 | 22.0 | 21 | 6 | 20 | 16 | 120 | 40 | 8.6 | 3.00 | 0.8 | 45° | 0° | -1.0° | Fig.2 | SB-5090TR | LTW-20 | |
| 115 | ○ | 1 | 31.0 | 30 | 15 | 20 | 18 | 120 | 40 | 8.6 | 6.50 | | | | +5.0° | | | | |
| 227 | ○ | 2 | 43.0 | 42 | 27 | 32 | 30 | 120 | 40 | 8.6 | 6.50 | 0.8 | 45° | 0° | +8.0° | Fig.3 | SB-5090TR | LTW-20 | |
| 336 | ○ | 3 | 52.0 | 51 | 36 | 32 | 38 | 120 | 40 | 8.6 | 7.00 | 0.8 | 45° | 0° | +10.0° | Fig.4 | SB-5090TR | LTW-20 | |
| MCSE 104-30D | ○ | 1 | 19.0 | 18 | 4 | 16 | 15 | 85 | 30 | 4.7 | 2.00 | 0.4 | 30° | 0° | -4.0° | Fig.5 | SB-3060TR | DT-10 | |
| 108-30D | ○ | 1 | 28.0 | 27 | 8 | 20 | 19 | 110 | 40 | 6.3 | 4.50 | 0.8 | 30° | 0° | -2.5° | Fig.5 | SB-5090TR | LTW-20 | |
| 110-30D | ○ | 1 | 30.0 | 28 | 10 | 20 | 18 | 120 | 40 | 6.3 | 6.00 | | | | 0.0° | | | | |
| MCSE 108-60D | ○ | 1 | 19.5 | 19 | 8 | 20 | 19 | 110 | 40 | 10.0 | 0.25 | 0.8 | 60° | 0° | -3.5° | Fig.6 | SB-5070TR | LTW-20 | |
| 120-60D | ○ | 1 | 31.0 | 30 | 20 | 20 | 18 | 120 | 40 | 10.0 | 6.50 | | | | 0.0° | | | | Fig.6 |

• Dimension T indicates available back chamfering dimension.

Applicable Inserts (Metric Size)

| Part Number | Applicable Inserts B22 | | |
|---------------------|---|---|---|
| |  |  |  |
| MCSE 104 | SDKW 09T204TN | SDKW 09T204FN | SDMT 31.81C |
| 104-30D | | | |
| MCSE 106 | SEKW 421TN | SEKW 421FN | SEMT 421C |
| 115 | | | |
| 227 | | | |
| 336 | | | |
| MCSE 108-30D | SEKW 422TN | SEKW 422FN | SEMT 421C |
| 110-30D | | | |
| MCSE 108-60D | | | |
| 120-60D | | | |

MCSE CHAMFERING END MILL

◆ Recommended Cutting Conditions

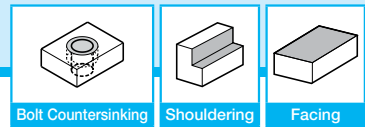
| Workpiece Material | Feed Rate fz (ipt) | | Recommended Insert Grades (Cutting Speed Vc: sfm) | | |
|--------------------|-----------------------|----------------------|---|---------------|--------------|
| | | | Cermet | MEGACOAT | Carbide |
| | ØDs (Ø4mm~Ø20mm) | ØDs (Ø27mm~Ø36mm) | TN100M | PR1225 | KW10 |
| Carbon Steel | 0.002~0.010 | 0.008~0.016 | ★ 330~590 | ★ 390~820 | - |
| Alloy Steel | 0.002~0.010 | 0.008~0.016 | ★ 330~590 | ★ 330~720 | - |
| Mold Steel | 0.002~0.010 | 0.008~0.016 | ★ 330~490 | ★ 260~590 | - |
| Stainless Steel | 0.002~0.008 | 0.004~0.012 | ☆ 330~590 | ★ 390~720 | - |
| Cast Iron | 0.004~0.012 | 0.012~0.020 | - | - | ☆ 260~490 |
| Non-ferrous Metals | 0.004~0.012 | 0.012~0.020 | - | - | ★ 330~980 |

• Use down-cut machining.

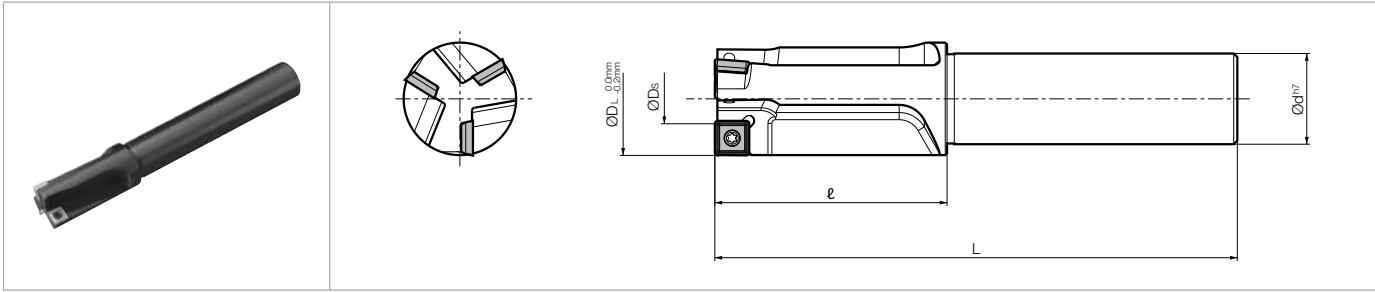
★: 1st Recommendation ☆: 2nd Recommendation

| | |
|--------------------|----------|
| GRADES | A |
| LINEUP / INSERTS | B |
| 45° / 70° LEAD | C |
| 75° LEAD | D |
| 90° LEAD | E |
| HIGH FEED | F |
| MULTI-FUNCTION | G |
| SLOT MILLS | H |
| RADIUS / BALL-NOSE | J |
| OTHER APPLICATIONS | K |
| TOOL HOLDING | O |
| SPARE PARTS | P |
| TECHNICAL | R |
| INDEX | T |



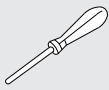
MEF BOLT COUNTERSINKING END MILL



MEF

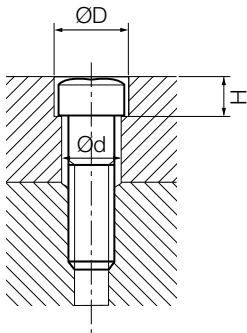


Toolholder Dimensions

| Part Number | Stock | No. of Inserts | Dimensions (mm) | | | | | Std. Corner-R (rε) | Rake Angle (°) | | Objective Bolt Size | Spare Parts | | Applicable Inserts ● B24  | | |
|-------------------|-------|----------------|-----------------|------|----|-----|----|--------------------|----------------|------|---------------------|--|---|--|--------------------------------|-----|
| | | | ØDL | ØDs | Ød | L | ℓ | | A.R. | R.R. | | Clamp Screw  | Wrench  | | | |
| | | | | | | | | | | | | | | | | |
| MEF 11-S10 | ○ | 1 | 11.0 | 3.0 | 10 | 103 | 23 | 0.4 | +5° | -13° | M6 | SB-2250TR | DT-7 | SPMT060204E-Z SPMT060208E-Z | | |
| 14-S12 | ○ | | 14.0 | 4.5 | 12 | 108 | 28 | | | | | M8 | | | SB-2260TR | |
| 17-S16 | ○ | 2 | 17.5 | 7.3 | 16 | 115 | 35 | 0.4 | +5° | -13° | M10 | SB-2260TR | DT-7 | | | |
| 18-S16 | ○ | | 18.0 | 7.7 | 16 | 117 | 38 | | | | | | | | - | |
| 20-S16 | ○ | 3 | 20.0 | 9.5 | 16 | 120 | 40 | 0.4 | +5° | -12° | M12 | SB-2260TR | DT-7 | | | |
| 22-S20 | ○ | | 22.0 | 11.4 | 20 | 124 | 44 | | | | | | | | - | |
| 23-S20 | ○ | | 23.0 | 12.4 | 20 | 126 | 46 | | | | | | | | M14 | |
| 24-S20 | ○ | 3 | 24.0 | 13.4 | 20 | 128 | 48 | 0.8 | +5° | -13° | M18 | SB-3080TR | DT-10 | | SPMT090304E-Z SPMT090308E-Z | |
| 25-S20 | ○ | | 25.0 | 14.4 | 20 | 130 | 50 | | | | | | | | | - |
| 26-S25 | ○ | | 26.0 | 9.8 | 25 | 132 | 52 | | | | | | | | | M16 |
| 27-S25 | ○ | | 27.0 | 10.6 | 25 | 134 | 54 | | | | | | | - | | |
| 28-S25 | ○ | 3 | 28.0 | 11.5 | 25 | 136 | 56 | 0.8 | +5° | -13° | M18 | SB-3080TR | DT-10 | | | |
| 29-S25 | ○ | | 29.0 | 12.6 | 25 | 138 | 58 | | | | | | | - | | |
| 30-S25 | ○ | | 30.0 | 13.5 | 25 | 140 | 60 | | | | | | | M20 | | |
| 32-S25 | ○ | 4 | 32.0 | 15.5 | 25 | 144 | 64 | 0.8 | +5° | -12° | M22 | SB-3080TR | DT-10 | | | |
| 35-S32 | ○ | | 35.0 | 18.4 | 32 | 150 | 70 | | | | | | | M27 | | |
| 39-S32 | ○ | | 39.0 | 22.5 | 32 | 158 | 78 | | | | | | | M30 | | |
| 43-S32 | ○ | 4 | 43.0 | 26.2 | 32 | 166 | 86 | 0.8 | +5° | -12° | M27 | SB-3080TR | DT-10 | | | |
| 48-S32 | ○ | | 48.0 | 31.3 | 32 | 176 | 96 | | | | | | | M30 | | |

● Although Corner-R(rε) pertains to MEF11-S10, ØDS = 3.0mm.

Bolt Counter Sink (Hexagon Socket Head Cap Screw)



| Nominal Screw Size | M6 | M8 | M10 | M12 | M14 | M16 | M18 | M20 | M22 | M24 | M27 | M30 |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ØD (mm) | 11.0 | 14.0 | 17.5 | 20.0 | 23.0 | 26.0 | 29.0 | 32.0 | 35.0 | 39.0 | 43.0 | 48.0 |
| H (mm) | 6.5 | 8.6 | 10.8 | 13.0 | 15.2 | 17.5 | 19.5 | 21.5 | 23.5 | 25.5 | 29.0 | 32.0 |
| Ød (mm) | 6.6 | 9.0 | 11.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 24.0 | 26.0 | 30.0 | 33.0 |
| Applicable End Mill | MEF11 | MEF14 | MEF17 | MEF20 | MEF23 | MEF26 | MEF29 | MEF32 | MEF35 | MEF39 | MEF43 | MEF48 |

OTHER APPLICATIONS

MEF BOLT COUNTERSINKING END MILL

Recommended Cutting Conditions

| Workpiece Material | fz (ipt) | Recommended Insert Grades (Cutting Speed Vc: sfm) | | |
|--------------------|-------------|---|--------------|--------------|
| | | MEGACOAT | | Carbide |
| | | PR1225 | PR1210 | KW10 |
| Carbon Steel | 0.004~0.006 | ★ 390~720 | - | - |
| Alloy Steel | 0.004~0.006 | ★ 390~720 | - | - |
| Mold Steel | 0.002~0.004 | ★ 330~590 | - | - |
| Stainless Steel | 0.002~0.004 | ★ 260~590 | - | - |
| Cast Iron | 0.004~0.008 | - | ★ 330~720 | ☆ 260~390 |
| Non-ferrous Metals | 0.004~0.008 | - | - | ★ 330~980 |

★: 1st Recommendation ☆: 2nd Recommendation

Points at Bolt Counter Sink Milling

① Carbon Steel

Increase the feed rate to fz = 0.004~0.006 ipt for preventing long chips at low feed rates.

Chip control is good when setting Vc = 260 sfm for MEF11~MEF25, and Vc = 390 sfm for MEF26~MEF48.

| Part Number | Cutting Speed Vc (sfm) | fz (ipt) |
|--------------------|------------------------|-------------|
| MEF11~MEF25 | 260 | 0.004~0.006 |
| MEF26~MEF48 | 390 | 0.004~0.006 |

② Sticky Materials

Step feed is recommended for good chip control

Increase the feed rate to fz = 0.004~0.006 ipt for preventing long chips at low feed rate fz = 0.002 ipt.

Use cover to prevent accidents or injury by thick chips at higher feed rates.

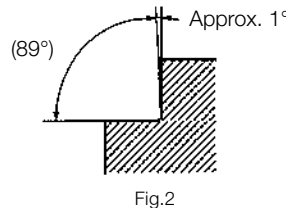
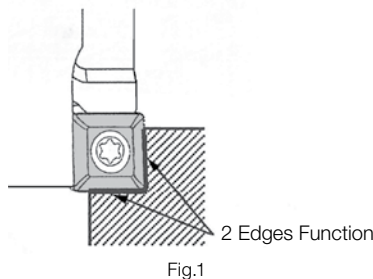
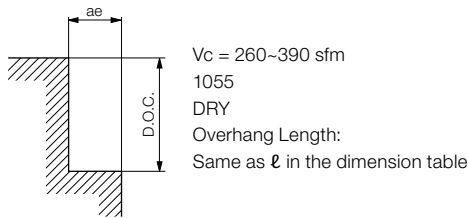
| Part Number | Cutting Speed Vc (sfm) | fz (ipt) | Step Feed (inch) |
|--------------------|------------------------|-------------|------------------|
| MEF11~MEF48 | 260~490 | 0.004~0.006 | 0.020~0.059 |

③ Stainless Steel

Use a lower Cutting Speed. High Cutting Speeds cause chattering.

Cutting Performance when Shouldering

MEF Bolt Countersink End Mill is also recommended for shouldering.

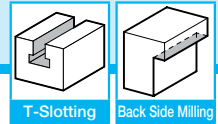


- When shouldering, both side edge and bottom edges function. Both edges wear at the same time depending on D.O.C.. The insert uses 2 edges instead of 4. (Ref. to Fig.1)

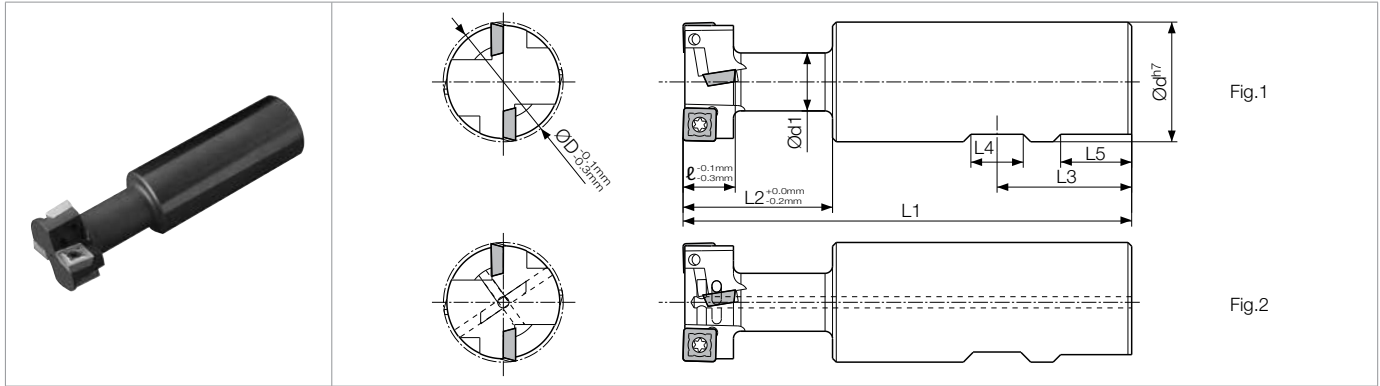
- MEF type's side edge is designed to have a slight clearance for the countersink milling. Therefore, worked side wall is approx. 1° inclined against the vertical face. (Ref. to Fig.2)

| Part Number | Cutting Range |
|--|---------------|
| MEF11-S12 MEF14-S12 MEF17-S16 MEF18-S16 | |
| MEF20-S16 MEF22-S20 ~ MEF25-S20 | |
| MEF26-S25 ~ MEF32-S25 MEF35-S32 | |
| MEF39-S32 MEF43-S32 MEF48-S32 | |

GRADES **A**
LINEUP / INSERTS **B**
45° / 70° LEAD **C**
75° LEAD **D**
90° LEAD **E**
HIGH FEED **F**
MULTI-FUNCTION **G**
SLOT MILLS **H**
RADIUS / BALL-NOSE **J**
OTHER APPLICATIONS **K**
TOOL HOLDING **O**
SPARE PARTS **P**
TECHNICAL **R**
INDEX **T**



METS



Toolholder Dimensions

| Part Number | Stock | No. of Inserts | No. of Flutes | Dimensions (mm) | | | | | | | | | | Rake Angle (°) | | Drawing | Spare Parts | | Applicable Inserts ● B22 |
|----------------------|-------|----------------|---------------|-----------------|----|------|----|-----|----|----|----|----|------|----------------|-------------|-----------|-------------|---------------|-----------------------------|
| | | | | ØD | Ød | Ød1 | ℓ | L1 | L2 | L3 | L4 | L5 | A.R. | R.R. | Clamp Screw | | Wrench | | |
| METS 21-S25 | ○ | 2 | 1 | 21 | 25 | 10.5 | 9 | 109 | 29 | 32 | 12 | 17 | +9° | -10° | Fig.1 | SB-2560TR | DT-8 | SDMT221E-K | |
| 25-S25 | ○ | 4 | 2 | 25 | | 12.5 | 11 | 112 | 32 | | | | | | | | | | |
| 32-S32 | ○ | 4 | 2 | 32 | 32 | 15.5 | 14 | 120 | 38 | 36 | 14 | 19 | +9° | -10° | Fig.1 | SB-3060TR | DT-10 | SDMT080308E-K | |
| 40-S32 | ○ | 4 | 2 | 40 | 32 | 20.5 | 18 | 130 | 50 | 36 | 14 | 19 | +9° | -12° | Fig.1 | SB-4085TR | DT-15 | SDMT432E-K | |
| 50-S32 | ○ | | | 50 | | 26.5 | 22 | 140 | 60 | | | | | | | | | | |
| METS 21-S25-H | ○ | 2 | 1 | 21 | 25 | 10.5 | 9 | 109 | 29 | 32 | 12 | 17 | +9° | -10° | Fig.2 | SB-2560TR | DT-8 | SDMT221E-K | |
| 25-S25-H | ○ | 4 | 2 | 25 | | 12.5 | 11 | 112 | 32 | | | | | | | | | | |
| 32-S32-H | ○ | 4 | 2 | 32 | 32 | 15.5 | 14 | 120 | 38 | 36 | 14 | 19 | +9° | -10° | Fig.2 | SB-3060TR | DT-10 | SDMT080308E-K | |
| 40-S32-H | ○ | 4 | 2 | 40 | 32 | 20.5 | 18 | 130 | 50 | 36 | 14 | 19 | +9° | -12° | Fig.2 | SB-4085TR | DT-15 | SDMT432E-K | |
| 50-S32-H | ○ | | | 50 | | 26.5 | 22 | 140 | 60 | | | | | | | | | | |

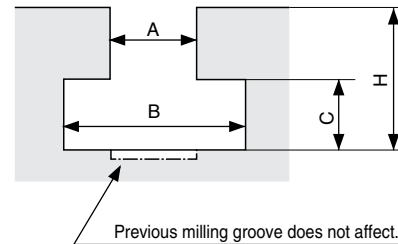
● METS---H type has air holes

Applicable Inserts

| Part Number | Applicable Inserts ● B22 |
|--------------------|--------------------------|
| METS 21-S25 | SDMT 221E-K |
| 21-S25-H | |
| 25-S25 | |
| 25-S25-H | |
| METS 32-S32 | SDMT 080308E-K |
| 32-S32-H | |
| METS 40-S32 | SDMT 432E-K |
| 40-S32-H | |
| 50-S32 | |
| 50-S32-H | |

JIS Standard of T-Slot (Extracted from B0952) (Unit: mm)

| A (Nominal Size) | B | C | H | |
|---------------------|-------------------------------|-------------------------------|------|------|
| | | | Max. | Min. |
| 12 | 19 ⁺² ₀ | 8 ⁺¹ ₀ | 25 | 20 |
| 14 | 23 ⁺² ₀ | 9 ⁺² ₀ | 28 | 23 |
| 18 | 30 ⁺² ₀ | 12 ⁺² ₀ | 36 | 30 |
| 22 | 37 ⁺³ ₀ | 16 ⁺² ₀ | 45 | 38 |
| 28 | 46 ⁺⁴ ₀ | 20 ⁺² ₀ | 56 | 48 |



METS SLOT MILL

Recommended Cutting Conditions

| Workpiece Material | fz (ipt) | Recommended Insert Grades (Cutting Speed Vc: sfm) | | |
|--------------------|-------------|---|--------------|--------------|
| | | MEGACOAT | | Carbide |
| | | PR1230 | PR1210 | KW10 |
| Carbon Steel | 0.004~0.006 | ★ 330~660 | - | - |
| Alloy Steel | 0.003~0.005 | ★ 330~660 | - | - |
| Mold Steel | 0.002~0.004 | ★ 260~490 | - | - |
| Cast Iron | 0.004~0.006 | - | ★ 330~660 | ☆ 260~390 |
| Non-ferrous Metals | 0.004~0.006 | - | - | ★ 330~980 |

★: 1st Recommendation ☆: 2nd Recommendation

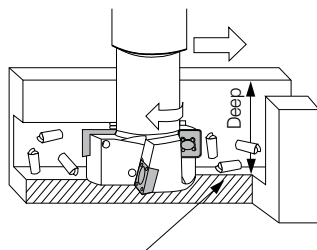
| Part Number (T-Slot Nominal Size) | Steel | | | Cast Iron | | |
|--|---|---|---|--------------------------------|--|--|
| | Groove Shape at Pre-process | T-Slotting Conditions | Conditions to Prevent Chattering | Groove Shape at Pre-process | T-Slotting Conditions | Conditions to Prevent Chattering |
| METS21-S25(-H) (Nominal Size 12) | $C = 0.039 \sim 0.118''$ | Vc = 390 fz = 0.004 (n = 1,820) (Vf = 7.165) | Vc = 200 fz = 0.006 (n = 920) (Vf = 5.394) | $C = \text{Over } 0.039''$ | Vc = 390 fz = 0.005 (n = 1,820) (Vf = 8.583) | Vc = 260 fz = 0.006 (n = 1,210) (Vf = 7.165) |
| METS25-S25(-H) (Nominal Size 14) | $C = 0.039 \sim 0.118''$ | Vc = 390 fz = 0.004 (n = 1,530) (Vf = 12.047) | Vc = 200 fz = 0.006 (n = 760) (Vf = 8.976) | $C = \text{Over } 0.039''$ | Vc = 390 fz = 0.005 (n = 1,530) (Vf = 14.449) | Vc = 260 fz = 0.006 (n = 1,020) (Vf = 12.047) |
| METS32-S32(-H) (Nominal Size 18) | $C = 0.039 \sim 0.118''$ | Vc = 330 fz = 0.004 (n = 1,000) (Vf = 7.874) | Vc = 200 fz = 0.006 (n = 600) (Vf = 7.087) | $C = \text{Over } 0.039''$ | Vc = 390 fz = 0.005 (n = 1,190) (Vf = 11.260) | Vc = 260 fz = 0.006 (n = 800) (Vf = 9.449) |
| METS40-S32(-H) (Nominal Size 22) | $C = 0.354''$ | Vc = 260 fz = 0.006 Chattering is likely when set to shallower than $C = 0.354''$. | Vc = 200 fz = 0.006 (n = 480) (Vf = 5.669) | $C = \text{Over } 0.354''$ | Vc = 390 fz = 0.006 (n = 960) (Vf = 8.976) | Vc = 260 fz = 0.006 (n = 640) (Vf = 7.559) |
| METS50-S32(-H) (Nominal Size 28) | Not recommended for steel because of chattering | | | | Vc = 390 fz = 0.006 (n = 760) (Vf = 8.976) | Vc = 260 fz = 0.006 (n = 510) (Vf = 6.024) |

[Cutting Speed : Vc (sfm), Spindle Revolution : n (min⁻¹), Feed Rate fz (ipt), Table Feed Vf (ipm)]

- Chattering is likely when fz is less than fz = 0.004 ipt. Keep feed rate between fz = 0.004~0.006 ipt. For cast iron machining, the bigger the C-dimension becomes, the less chattering occurs.

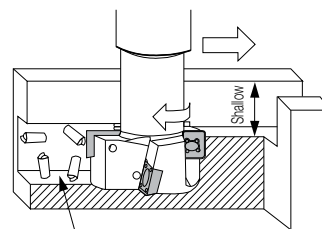
How to Prevent Damaging Chips when Steel Machining

Before Improvement (Deep Groove at Pre-Process)



Chips stay in the pre-process groove.

After Improvement (Shallow Groove at Pre-Process)



Chips are evacuated backward and chances of damaging chips are less.

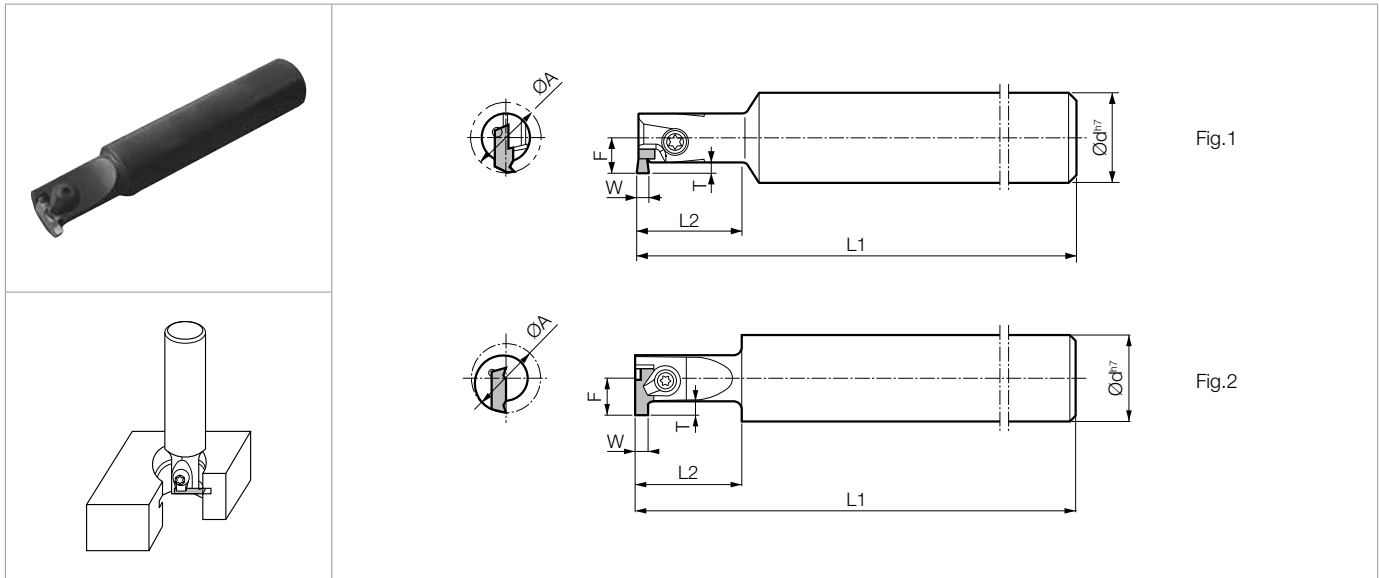
Improvement of chip biting

Make pre-process groove shallower to prevent the tool from becoming damaged from chips. Use compressed air to aid in chip evacuation.

GRADES A
LINEUP / INSERTS B
45° / 70° LEAD C
75° LEAD D
90° LEAD E
HIGH FEED F
MULTI-FUNCTION G
SLOT MILLS H
RADIUS / BALL-NOSE J
OTHER APPLICATIONS K
TOOL HOLDING O
SPARE PARTS P
TECHNICAL R
INDEX T

MGI GROOVING END MILL

MGI



Toolholder Dimensions

| Part Number | Stock | Min. Bore Dia. | Dimensions (mm) | | | | | | Edge Width | Drawing | Spare Parts | | | | Applicable Inserts K13 | |
|---------------------|-------|----------------|-----------------|-----|----|------|--------------|----------|------------|---------|-------------|-----------|-------|-----------------------------|---------------------------|----------|
| | | | ØA | Ød | L1 | L2 | F | T | | | W | Clamp Set | | Clamp Screw | | Wrench |
| | | | | | | | | | | | | 5F | 6F | | | FT LW |
| MGI 1420-1SS | ○ | 14 | 20 | 100 | 20 | 6.8 | 2.2 | 1.0~3.0 | Fig.1 | - | - | SB-4065TR | FT-15 | GVR...-020SS | | |
| 1620-1S | ○ | 16 | 20 | 110 | 25 | 7.8 | 2.2 | 1.0~3.4 | Fig.1 | - | - | SB-4085TR | FT-15 | GVR...-020S | | |
| 2020-1A | ○ | 20 | 20 | 110 | 30 | 9.8 | 2.2 | 1.0~3.4 | Fig.2 | CPS-5F | - | - | FT-15 | GVR...-020A GVR...-...AR | | |
| 2220-1B | ○ | 22 | 20 | 110 | 30 | 11.0 | 2.8 | 1.45~4.0 | Fig.2 | CPS-5F | - | - | FT-15 | GVR...-020B GVR...-...BR | | |
| 3225-1C | ○ | 32 | 25 | 120 | 35 | 16.0 | 5.5 (4.5) | 2.8~4.0 | Fig.2 | - | CPS-6F | - | LW-3 | GVR...-020C | | |
| 4025-1C | ○ | 40 | 25 | 120 | 40 | 20.0 | | | | | | | | | | |

- Dimension T shows available grooving depth.
- **GVR280-020C, GVR300-020C** inserts are available for groove depths up to 4.5mm.
- **GVR430-020C ~ GVR500-020C** inserts can be installed into **MGI3225-1C** and **MGI4025-1C** holders, but are not recommended for steel machining because of toolholder's rigidity.

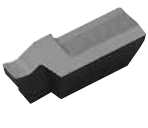
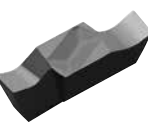
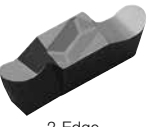
Recommended Cutting Conditions

| Workpiece Material | Feed Rate fz (ipt) | Recommended Insert Grades (Cutting Speed Vc: sfm) | | | | | |
|--------------------|--------------------|---|--------------|--------------|--------------|--------------------|--------------|
| | | Cermet | | | MEGA COAT | PVD Coated Carbide | Carbide |
| | | TN90 | TC40N | TC60 | PR1225 | PR930 | KW10 |
| Carbon Steel | 0.002~0.006 | ★ 390~660 | ☆ 390~660 | ☆ 330~590 | ★ 260~490 | ☆ 260~490 | - |
| Alloy Steel | 0.002~0.006 | ★ 390~660 | ☆ 390~660 | ☆ 330~590 | ★ 260~490 | ☆ 260~490 | - |
| Mold Steel | 0.001~0.005 | ★ 330~590 | ☆ 330~590 | ☆ 260~490 | ★ 200~430 | ☆ 200~430 | - |
| Stainless Steel | 0.001~0.005 | ☆ 330~590 | ☆ 330~590 | ★ 260~490 | ★ 200~430 | ☆ 200~430 | - |
| Cast Iron | 0.002~0.008 | ★ 330~490 | ☆ 330~490 | - | - | - | ★ 260~490 |
| Non-ferrous Metals | 0.002~0.008 | - | - | - | - | - | ★ 330~980 |

- Use down-cut machining.
- ★: 1st Recommendation ☆: 2nd Recommendation

MGI GROOVING END MILL

● Applicable Inserts (Metric Size)

| Insert Right-handed Insert Shown | Part Number | Previous Part Number | Dimensions (mm) | | | | | | Insert Grades | | | | | | | | | |
|---|---|-------------------------|-----------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | | W | B | r _e | A | L | H | Cermet | | | MEGA COAT | PVD | Carbide | | | | |
| | | | | | | | | | TN90 | TC40 | TC60 | | | | | | | |
|  1-Edge | GVR 100-020SS | GVR 100SS | 1.00 | 2.3 | 0.2 | 3.6 | 9 | 3.0 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 125-020SS | 125SS | 1.25 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 145-020SS | 145SS | 1.45 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 200-020SS | 200SS | 2.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 250-020SS | 250SS | 2.50 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 300-020SS | 300SS | 3.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | GVR 100-020S | GVR 100S | 1.00 | 2.3 | 0.2 | 4.0 | 11 | 4.0 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 125-020S | 125S | 1.25 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 145-020S | 145S | 1.45 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 185-020S | 185S | 1.85 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 200-020S | 200S | 2.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 250-020S | 250S | 2.50 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| | 340-020S | 340S | 3.40 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| |  2-Edge | GVR 100-020A | GVR 100A | 1.00 | 2.3 | 0.2 | 4.0 | 12 | 5.0 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| 125-020A | | 125A | 1.25 | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 145-020A | | 145A | 1.45 | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 185-020A | | 185A | 1.85 | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 200-020A | | 200A | 2.00 | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 250-020A | | 250A | 2.50 | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 300-020A | | 300A | 3.00 | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 340-020A | | 340A | 3.40 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | |
| GVR 145-020B | | GVR 145B | 1.45 | 3.2 | 0.2 | 4.5 | 15 | 5.5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| 185-020B | | 185B | 1.85 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 200-020B | | 200B | 2.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 230-020B | | 230B | 2.30 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 250-020B | | 250B | 2.50 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 280-020B | | 280B | 2.80 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 300-020B | | 300B | 3.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 340-020B | | 340B | 3.40 | 4.2 | 0.2 | 4.5 | 15 | 5.5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| 400-020B | | 400B | 4.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| GVR 280-020C | | GVR 280C | 2.80 | | | | | | 5.5 | 0.2 | 5.8 | 21 | 6.5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 300-020C | | 300C | 3.00 | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 340-020C | | 340C | 3.40 | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 400-020C | | 400C | 4.00 | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (430-020C) | | (430C) | 4.30 | | | | | | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (460-020C) | (460C) | 4.60 | 6.3 | 0.2 | 5.8 | 21 | 6.5 | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| (500-020C) | (500C) | 5.00 | | | | | | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
|  2-Edge Full-R | GVR 200-100AR | GVR 100AR | 2.00 | 2.3 | 1.00 | 4.0 | 12 | 5.0 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| | 250-125AR | 125AR | 2.50 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| | 300-150AR | 150AR | 3.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| | GVR 200-100BR | GVR 100BR | 2.00 | 4.2 | 1.00 | 4.5 | 15 | 5.5 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| | 300-150BR | 150BR | 3.00 | | | | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |

- Only Right-hand insert is applicable.
- GVR280-020C, GVR300-020C inserts are available for groove depths up to 4.5mm.
- GVR430-020C ~ GVR500-020C inserts can be installed into MGI3225-1C and MGI4025-1C holders, but are not recommended for steel machining because of toolholder's rigidity.

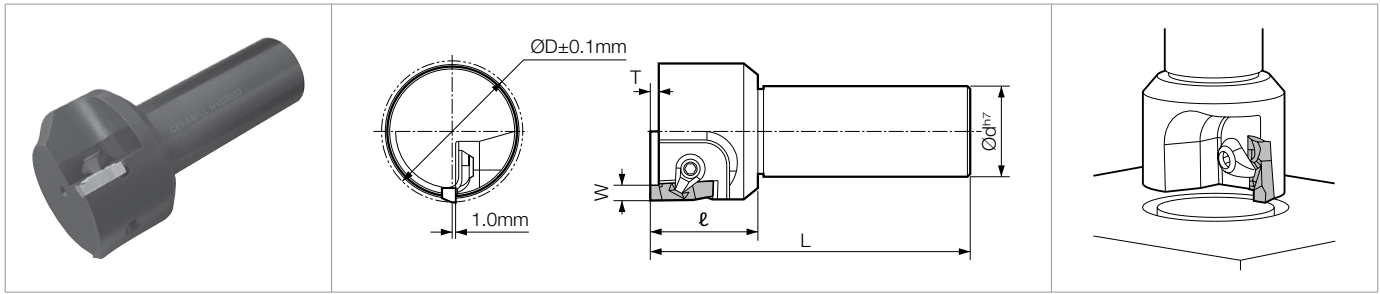
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
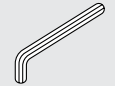
GRADES A
LINEUP / INSERTS B
45° / 70° LEAD C
75° LEAD D
90° LEAD E
HIGH FEED F
MULTI-FUNCTION G
SLOT MILLS H
RADIUS / BALL-NOSE J
OTHER APPLICATIONS K
TOOL HOLDING O
SPARE PARTS P
TECHNICAL R
INDEX T



MVG

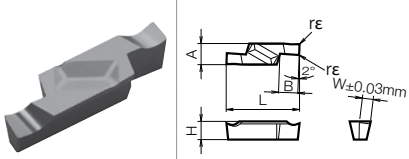


Toolholder Dimensions

| Part Number | Stock | Dimensions (mm) | | | | | Edge Width | Spare Parts | |
|-------------|-------|-----------------|-----------------|-----|--------|-----|-------------------|---|---|
| | | $\varnothing D$ | $\varnothing d$ | L | ℓ | T | | W | Clamp Set |
| MVG 3032 | ○ | 30 | 32 | 120 | 40 | 5.2 | 4.00 ~ 4.90 |  |  |
| 3532 | ○ | 35 | | | | | | | |
| 4032 | ○ | 40 | | | | | | | |
| 4532 | ○ | 45 | | | | | | | |
| 5032 | ○ | 50 | | | | | | | |
| 5532 | ○ | 55 | | | | | | | |
| 6032 | ○ | 60 | | | | | | | |

- Dimension T shows available grooving depth.

Applicable Inserts

| Insert Right-handed Insert Shown | Part Number | Previous Part Number | Dimensions (mm) | | | | | | | Insert Grades | | | | |
|---|---------------|----------------------|-----------------|-----|-------------|-----|----|-----|--------|---------------|-----------|-----|---------|------|
| | | | W | B | $r\epsilon$ | A | L | H | Cermet | | MEGA COAT | PVD | Carbide | |
| | | | | | | | | | TN90 | TC40 | | | | TC60 |
|  | GVFR 400-020B | GVFR 400B | 4.00 | 5.3 | 0.2 | 5.8 | 20 | 5.0 | ○ | ○ | ○ | ○ | ○ | ○ |
| | 430-020B | 430B | 4.30 | | | | | | ○ | ○ | ○ | ○ | ○ | ○ |
| | 460-020B | 460B | 4.60 | | | | | | ○ | ○ | ○ | ○ | ○ | ○ |
| | 490-020B | 490B | 4.90 | | | | | | ○ | ○ | ○ | ○ | ○ | |

- GVFR430B-020B inserts are applicable for sealing groove of G-series
For other ring grooving applications, GVFR400B-020B - GVFR490B-020B are applicable.
- Only Right-hand insert is applicable.

Recommended Cutting Conditions

| Workpiece Material | Feed Rate fz (ipt) | Recommended Insert Grades (Cutting Speed Vc: sfm) | | | | | |
|--------------------|--------------------|---|--------------|--------------|--------------|--------------------|--------------|
| | | Cermet | | | MEGACOAT | PVD Coated Carbide | Carbide |
| | | TN90 | TC40 | TC60 | PR1225 | PR930 | KW10 |
| Carbon Steel | 0.002-0.006 | - | ★ 390-660 | ☆ 330-590 | ★ 260-560 | ☆ 260-490 | - |
| Alloy Steel | 0.002-0.006 | - | ★ 390-660 | ☆ 330-590 | ★ 260-560 | ☆ 260-490 | - |
| Mold Steel | 0.001-0.005 | - | ★ 330-590 | ☆ 260-490 | ★ 200-490 | ☆ 200-430 | - |
| Stainless Steel | 0.001-0.005 | - | ☆ 330-590 | ☆ 260-490 | ★ 200-490 | ☆ 200-430 | - |
| Cast Iron | 0.002-0.008 | - | - | - | - | - | ★ 260-490 |
| Non-ferrous Metals | 0.002-0.008 | - | - | - | - | - | ★ 330-980 |

★: 1st Recommendation ☆: 2nd Recommendation