



**YG**  
**V7 Plus**

**HIGH PERFORMANCE  
SOLID CARBIDE END MILLS**

For Steels, Cast Iron and Stainless Steels

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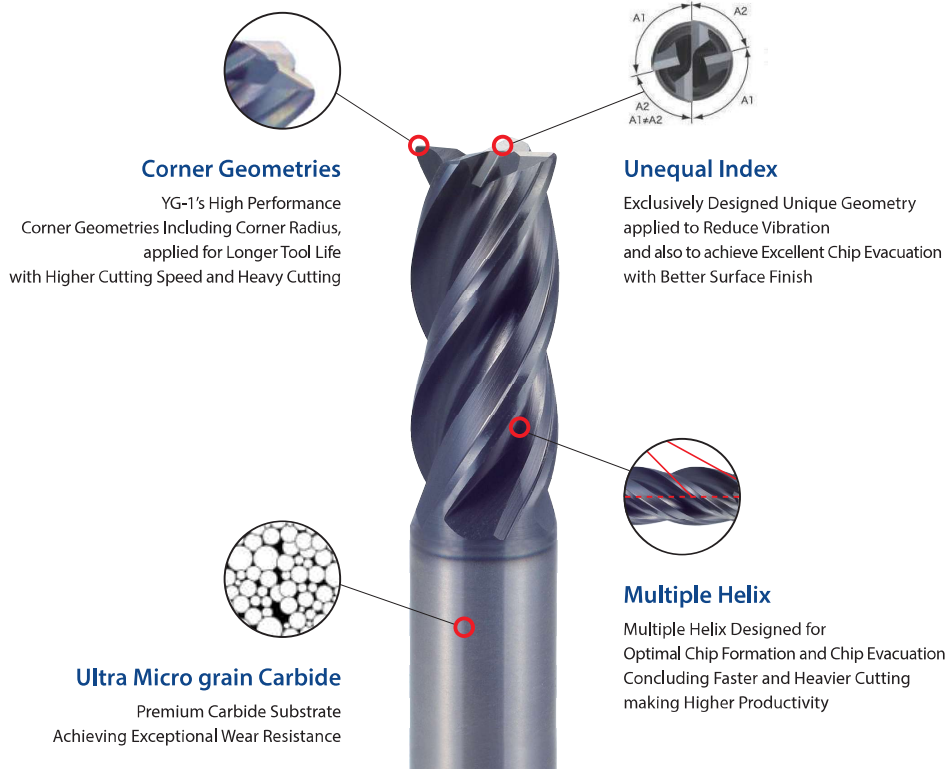
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## PRODUCT FEATURES



- Chatter and Harmonics Reduced for **Improved Stability and Better Finishing**
- Special Design of Flute Geometry for **Optimal Chip Formation and Chip Evacuation**
- Engineered Coating Technology to **Reduced Wear and Increase Heat Resistance**
- Enhanced Corner Geometry for **Longer Tool Life**

## PRODUCT GEOMETRY



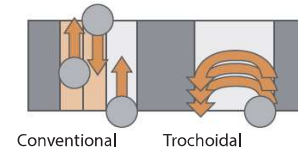
## V7 PLUS 6 FLUTE END MILLS



### THE BEST CHATTER FREE TOOL FOR HIGH SPEED

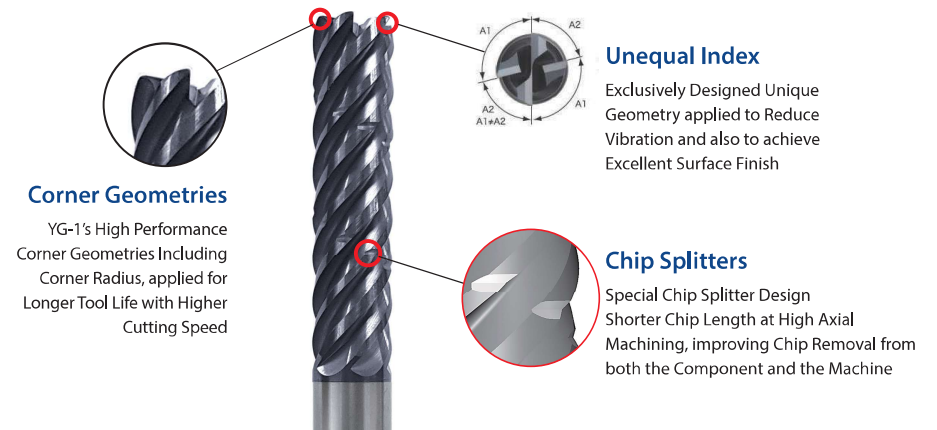
- Unique geometry of the variable pitch provides the best chatter free tool for high speed and also trochoidal milling
- Several slot widths can be used with the same tool diameter in an efficient way
- Provides longer tool life and higher productivity on most materials
- Trochoidal milling is a programming technique applying a small radial width of cut with also higher cutting speed and feed per tooth

Trochoidal Milling performs better than conventional ways because it has..



- Lower Cutting Force from smaller arc engagement
- Longer Tool Life from more flutes, and deeper cutting depth
- Higher Stability, Lower Vibration and Excellent Chip Evacuation

## V7 PLUS 6 FLUTE CHIP SPLITTER NEW



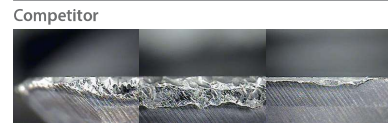
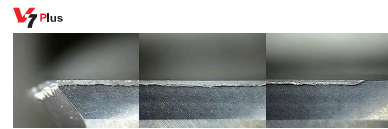
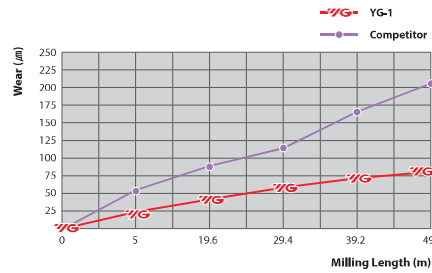
### GUIDE LINE TO ICONS

|  |   |                                 |
|--|---|---------------------------------|
| <b>Tool Raw Material</b><br>CARBIDE        | <b>Helix Angle</b><br>35°/37° 35°/37° 41°~45° 45° | <b>No. of Flutes</b><br>4 5 6   |
| <b>Tolerance of Ball Radius</b><br>R ±0.02 | <b>Type of Shank</b><br>PLAIN FLAT                | <b>Chamfer Angle</b><br>C x 45° |
|  |   | <b>Cutting Condition Pages</b>  |

## CASE STUDY

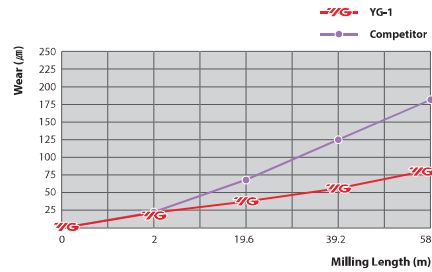
### ▶ V7 Plus 4 Flute vs Competitor

|                   | V7 Plus   | Competitor     |
|-------------------|---|----------------|
| Wear(μm)          | <b>83.518</b>   | <b>203.381</b> |
| Milling Length(m) | 49  | 49             |
| Size(mm)          | Ø10 x Ø10 x 22 x 72   |                |
| Work Material     | -DIN: C45<br>-WR: 1.0503<br>-JIS: S45C<br>(HRC 30 / HB 286) |                |
| Cutting Speed     | 230.09 m/min.   |                |
| RPM               | 7,324 rev./min.   |                |
| Feed              | 1,464 mm/min.   |                |
| Feed per tooth    | 0.05 mm/tooth   |                |
| Milling Method    | Down & Side Cutting   |                |
| Milling Depth     | Axial: 10 mm, Radial: 3 mm                                  |                |
| Coolant           | Wet Cut   |                |
| Overhang          | 34 mm   |                |
| Machine           | Machining Center  |                |



### ▶ V7 Plus 4 Flute vs Competitor

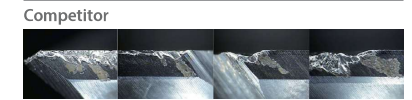
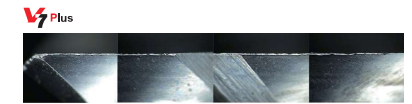
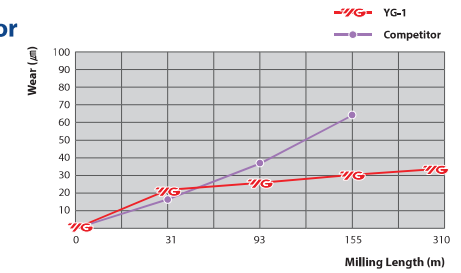
|                   | V7 Plus   | Competitor     |
|-------------------|---|----------------|
| Wear(μm)          | <b>81.485</b>   | <b>183.296</b> |
| Milling Length(m) | 58.8  | 58.8           |
| Size(mm)          | Ø16 x Ø16 x 32 x 92   |                |
| Work Material     | -DIN: C45<br>-WR: 1.0503<br>-JIS: S45C<br>(HRC 30 / HB 286) |                |
| Cutting Speed     | 160.00 m/min.   |                |
| RPM               | 3,183 rev./min.   |                |
| Feed              | 573 mm/min.   |                |
| Feed per tooth    | 0.05 mm/tooth   |                |
| Milling Method    | Down & Side Cutting   |                |
| Milling Depth     | Axial: 14 mm, Radial: 3 mm                                  |                |
| Coolant           | Wet Cut   |                |
| Overhang          | 45 mm   |                |
| Machine           | Machining Center  |                |



## CASE STUDY

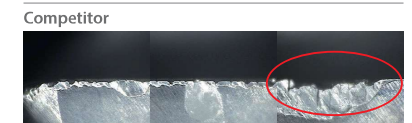
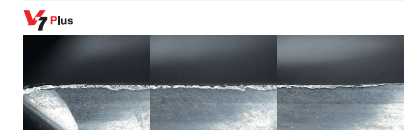
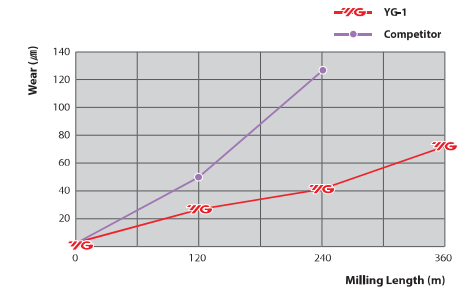
### ▶ V7 Plus 6 Flute Chip Splitter vs Competitor

|                   | V7 Plus   | Competitor   |
|-------------------|---|--------------|
| Wear(μm)          | <b>32.49</b>  | <b>88.26</b> |
| Milling Length(m) | 310   | 155          |
| Size(mm)          | Ø12 x Ø12 x 48 x 120<br>with chip Splitter                  |              |
| Work Material     | -DIN: C45<br>-WR: 1.0503<br>-JIS: S45C<br>(HRC 30 / HB 286) |              |
| Cutting Speed     | 220.01 m/min.   |              |
| RPM               | 5,836 rev./min.   |              |
| Feed              | 3,151 mm/min.   |              |
| Milling Method    | Trochoidal Cutting  |              |
| Milling Depth     | Axial: 36mm, Radial: 0.6 mm                                 |              |
| Coolant           | Wet Cut   |              |
| Overhang          | 56 mm   |              |
| Machine           | Machining Center  |              |



### ▶ V7 Plus 6 Flute vs Competitor

|                   | V7 Plus   | Competitor |
|-------------------|---|------------|
| Milling Length(m) | <b>360</b>  | <b>300</b> |
| Size(mm)          | Ø12(R1) x Ø12 x 26 x 83                                     |            |
| Work Material     | -DIN: C45<br>-WR: 1.0503<br>-JIS: S45C<br>(HRC 30 / HB 286) |            |
| Cutting Speed     | 278.67 m/min.   |            |
| RPM               | 7,392 rev./min.   |            |
| Feed              | 7,495 mm/min.   |            |
| Feed per tooth    | 0.17 mm/tooth   |            |
| Milling Method    | Trochoidal Cutting  |            |
| Milling Depth     | Axial: 24 mm(2D), Radial: 0.6 mm(0.05D)                     |            |
| Coolant           | Wet Cut   |            |
| Overhang          | 36 mm   |            |
| Machine           | Machining Center  |            |



# SELECTION GUIDE



HIGH PERFORMANCE  
SOLID CARBIDE END MILLS  
For Steels, Cast Iron and Stainless Steels

⊙ : Excellent ○ : Good

| ISO      | VDI 3323  | Material Description        | Composition / Structure / Heat Treatment       | HB                    | HRc | GMG55<br>GMG56 | GMF54<br>GMF55 | GMF58<br>GMF59 | GMF62<br>GMF63 |   |
|----------|-----------|-----------------------------|--|-----------------------|-----|----------------|----------------|----------------|----------------|---|
| <b>P</b> | 1         | Non-alloy steel             | About 0.15% C Annealed                         | 125                   |     | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 2         |                             | About 0.45% C Annealed                         | 190                   | 13  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 3         |                             | About 0.45% C Quenched & tempered              | 250                   | 25  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 4         |                             | About 0.75% C Annealed                         | 270                   | 28  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 5         |                             | About 0.75% C Quenched & tempered              | 300                   | 32  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 6         | Low alloy steel             | Annealed                                       | 180                   | 10  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 7         |                             | Quenched & tempered                            | 275                   | 29  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 8         |                             | Quenched & tempered                            | 300                   | 32  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 9         |                             | Quenched & tempered                            | 350                   | 38  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 10        |                             | High alloyed steel, and tool steel             | Annealed              | 200 | 15             | ⊙              | ⊙              | ⊙              | ⊙ |
|          | 11        | Quenched & Tempered         |  | 325                   | 35  | ⊙              | ⊙              | ⊙              | ⊙              |   |
| <b>M</b> | 12        | Stainless steel             | Ferritic / Martensitic Annealed                | 200                   | 15  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 13        |                             | Martensitic Quenched & Tempered                | 240                   | 23  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 14        |                             | Austenitic                                     | 180                   | 10  | ⊙              | ⊙              | ⊙              | ⊙              |   |
| <b>K</b> | 15        | Grey cast iron              | Pearlitic / ferritic                           | 180                   | 10  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 16        |                             | Pearlitic (Martensitic)                        | 260                   | 26  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 17        | Nodular cast iron           | Ferritic                                       | 160                   | 3   | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 18        |                             | Pearlitic                                      | 250                   | 25  | ⊙              | ⊙              | ⊙              | ⊙              |   |
|          | 19        | Malleable cast iron         | Ferritic                                       | 130                   |     | ⊙              | ⊙              | ⊙              | ⊙              |   |
| 20       | Pearlitic |                             | 230  | 21                    | ⊙   | ⊙              | ⊙              | ⊙              |                |   |
| <b>N</b> | 21        | Aluminum-wrought alloy      | Not Curable                                    | 60                    |     |                |                |                |                |   |
|          | 22        |                             | Curable Hardened                               | 100                   |     |                |                |                |                |   |
|          | 23        | Aluminum-cast, alloyed      | ≤ 12% Si, Not Curable                          | 75                    |     |                |                |                |                |   |
|          | 24        |                             | ≤ 12% Si, Curable Hardened                     | 90                    |     |                |                |                |                |   |
|          | 25        |                             | > 12% Si, Not Curable                          | 130                   |     |                |                |                |                |   |
|          | 26        |                             | Copper and Copper Alloys (Bronze / Brass)      | Cutting Alloys, PB>1% | 110 |                |                |                |                |   |
|          | 27        |                             |  | CuZn, CuSnZn (Brass)  | 90  |                |                |                |                |   |
|          | 28        | Non Metallic Materials      | CuSn, lead-free copper and electrolytic copper | 100                   |     |                |                |                |                |   |
|          | 29        |                             | Duroplastic, Fiber Reinforced Plastic          |                       |     |                |                |                |                |   |
|          | 30        |                             | Rubber, Wood, etc.                             |                       |     |                |                |                |                |   |
| <b>S</b> | 31        | Heat Resistant Super Alloys | Fe Based Annealed                              | 200                   | 15  | ○              | ○              | ○              | ○              |   |
|          | 32        |                             | Fe Based Cured                                 | 280                   | 30  | ○              | ○              | ○              | ○              |   |
|          | 33        |                             | Fe Based Annealed                              | 250                   | 25  | ○              | ○              | ○              | ○              |   |
|          | 34        |                             | Ni or Co Based Cured                           | 350                   | 38  | ○              | ○              | ○              | ○              |   |
|          | 35        | Titanium Alloys             | Cast   | 320                   | 34  | ○              | ○              | ○              | ○              |   |
|          | 36        | Titanium Alloys             | Pure Titanium                                  | 400 Rm                |     | ○              | ○              | ○              | ○              |   |
|          | 37        |                             | Alpha + Beta Alloys Hardened                   | 1050 Rm               |     | ○              | ○              | ○              | ○              |   |
| <b>H</b> | 38        | Hardened steel              | Hardened                                       | 550                   | 55  |                |                |                |                |   |
|          | 39        |                             | Hardened                                       | 630                   | 60  |                |                |                |                |   |
|          | 40        | Chilled Cast Iron           | Cast   | 400                   | 42  |                |                |                |                |   |
|          | 41        | Hardened Cast Iron          | Hardened                                       | 550                   | 55  |                |                |                |                |   |

| SERIES             | GMG55<br>GMG56 | GMF54<br>GMF55 | GMF58<br>GMF59 | GMF62<br>GMF63        |
|--------------------|----------------|----------------|----------------|-----------------------|
| FLUTE              | 4              | 4              | 4              | 4                     |
| HELIX ANGLE        | 35°/37°        | 35°/37°        | 35°/37°        | 35°/37°               |
| CUTTING EDGE SHAPE | BALL NOSE      | CORNER RADIUS  | CORNER RADIUS  | CORNER RADIUS         |
| SIZE MIN           | R1.5           | D3.0           | D3.0           | D3.0                  |
| SIZE MAX           | R12.5          | D20.0          | D25.0          | D20.0                 |
| PAGE               | 8              | 9              | 10             | 11                    |
| LONG LENGTH        | Y-Coating      | Y-Coating      | Y-Coating      | LONG LENGTH with NECK |
| SHORT LENGTH       | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating             |



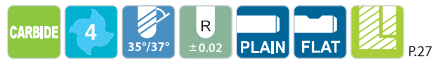
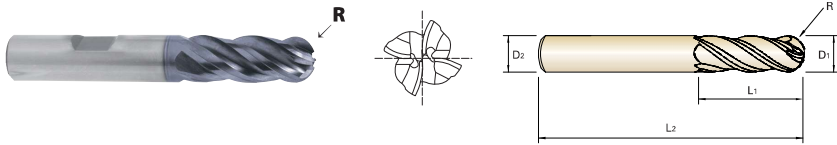
| SERIES             | GMF52<br>GMF53 | GMF56<br>GMF57 | GMF60<br>GMF61 | GMG16<br>GMG17 | GMG18<br>GMG19 | GMH58<br>GMH59 | GMG12<br>GMG13 | GMG14<br>GMG15 | GMH56<br>GMH57 | EMB72<br>EMB73 |
|--------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| FLUTE              | 4              | 4              | 4              | 6              | 6              | 6              | 6              | 6              | 6              | 5              |
| HELIX ANGLE        | 35°/37°        | 35°/37°        | 35°/37°        | 45°            | 45°            | 45°            | 45°            | 45°            | 45°            | 41°~45°        |
| CUTTING EDGE SHAPE | SQUARE         | SQUARE         | SQUARE         | CORNER RADIUS  | CORNER RADIUS  | CORNER RADIUS  | SQUARE         | SQUARE         | SQUARE         | SQUARE         |
| SIZE MIN           | D3.0           | D3.0           | D3.0           | D6.0           | D6.0           | D6.0           | D6.0           | D6.0           | D6.0           | D6.0           |
| SIZE MAX           | D20.0          | D25.0          | D20.0          | D25.0          | D25.0          | D25.0          | D25.0          | D25.0          | D25.0          | D25.0          |
| PAGE               | 14             | 15             | 16             | 18             | 19             | 21             | 23             | 24             | 25             | 26             |
| LONG LENGTH        | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | AITIN          |
| SHORT LENGTH       | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | Y-Coating      | AITIN          |



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE BALL NOSE

**GMG55 PLAIN SHANK**  
**GMG56 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|----------|----------|---------------------|---------------|----------------|---------------|----------------|
| PLAIN    | FLAT     | R (±0.02)           | D1            | D2             | L1            | L2             |
| GMG55030 | GMG56030 | R1.5                | 3.0           | 6              | 8             | 57             |
| GMG55040 | GMG56040 | R2.0                | 4.0           | 6              | 11            | 57             |
| GMG55050 | GMG56050 | R2.5                | 5.0           | 6              | 13            | 57             |
| GMG55060 | GMG56060 | R3.0                | 6.0           | 6              | 13            | 57             |
| GMG55080 | GMG56080 | R4.0                | 8.0           | 8              | 19            | 63             |
| GMG55100 | GMG56100 | R5.0                | 10.0          | 10             | 22            | 72             |
| GMG55120 | GMG56120 | R6.0                | 12.0          | 12             | 26            | 83             |
| GMG55160 | GMG56160 | R8.0                | 16.0          | 16             | 32            | 92             |
| GMG55200 | GMG56200 | R10.0               | 20.0          | 20             | 38            | 104            |
| GMG55250 | GMG56250 | R12.5               | 25.0          | 25             | 38            | 104            |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance                |
|--------------------------|-------------------------------------|
| Up to Ø12                | 0 ~ -0.02<br>h5                     |
| Over Ø12                 | 0 ~ -0.03<br>* Shank Dia. ≥ Ø12: h6 |

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |                | K                 |                     |     |     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |
| VDI3323                     | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13             | 14                | 15                  | 16  | 17  | 18  | 19  | 20  |
| HRc                         | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240            | 180               | 180                 | 260 | 160 | 250 | 130 | 230 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   |

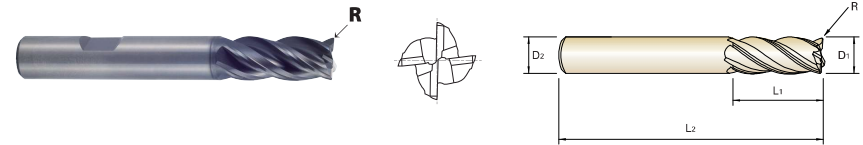
  

| ISO<br>Material Description | N                      |                        |   |    | S                      |     |                             |     |    |    | H               |                |                   |                    |    |    |    |    |    |    |    |
|-----------------------------|------------------------|------------------------|---|----|------------------------|-----|-----------------------------|-----|----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|----|
|                             | Aluminum-wrought alloy | Aluminum-cast, alloyed | Copper and Copper Alloys (Bronze / Brass) |    | Non Metallic Materials |     | Heat Resistant Super Alloys |     |    |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |    |
| VDI3323                     | 21                     | 22                     | 23  | 24 | 25                     | 26  | 27                          | 28  | 29 | 30 | 31              | 32             | 33                | 34                 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc                         | 60                     | 100                    | 75  | 90 | 130                    | 110 | 90                          | 100 |    |    | 15              | 30             | 25                | 38                 | 34 | 36 | 37 | 55 | 60 | 42 | 55 |
| Recommended                 | ◎                      | ◎                      | ◎   | ◎  | ◎                      | ◎   | ◎                           | ◎   | ◎  | ◎  | ◎               | ◎              | ◎                 | ◎                  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS SHORT LENGTH

**GMF54 PLAIN SHANK**  
**GMF55 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|----------|----------|---------------|---------------|----------------|---------------|----------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L2             |
| GMF54030 | GMF55030 | R0.3          | 3.0           | 6              | 7             | 54             |
| GMF54901 | GMF55901 | R0.5          | 3.0           | 6              | 7             | 54             |
| GMF54040 | GMF55040 | R0.3          | 4.0           | 6              | 8             | 54             |
| GMF54902 | GMF55902 | R0.5          | 4.0           | 6              | 8             | 54             |
| GMF54050 | GMF55050 | R0.3          | 5.0           | 6              | 10            | 54             |
| GMF54903 | GMF55903 | R0.5          | 5.0           | 6              | 10            | 54             |
| GMF54060 | GMF55060 | R0.3          | 6.0           | 6              | 10            | 54             |
| GMF54904 | GMF55904 | R0.5          | 6.0           | 6              | 10            | 54             |
| GMF54905 | GMF55905 | R1.0          | 6.0           | 6              | 10            | 54             |
| GMF54080 | GMF55080 | R0.5          | 8.0           | 8              | 12            | 58             |
| GMF54906 | GMF55906 | R1.0          | 8.0           | 8              | 12            | 58             |
| GMF54100 | GMF55100 | R0.5          | 10.0          | 10             | 14            | 66             |
| GMF54907 | GMF55907 | R1.0          | 10.0          | 10             | 14            | 66             |
| GMF54120 | GMF55120 | R0.5          | 12.0          | 12             | 16            | 73             |
| GMF54908 | GMF55908 | R1.0          | 12.0          | 12             | 16            | 73             |
| GMF54909 | GMF55909 | R2.0          | 12.0          | 12             | 16            | 73             |
| GMF54140 | GMF55140 | R0.5          | 14.0          | 14             | 18            | 75             |
| GMF54160 | GMF55160 | R1.0          | 16.0          | 16             | 22            | 82             |
| GMF54912 | GMF55912 | R2.0          | 16.0          | 16             | 22            | 82             |
| GMF54913 | GMF55913 | R3.0          | 16.0          | 16             | 22            | 82             |
| GMF54180 | GMF55180 | R1.0          | 18.0          | 18             | 24            | 84             |
| GMF54200 | GMF55200 | R1.0          | 20.0          | 20             | 26            | 92             |
| GMF54916 | GMF55916 | R2.0          | 20.0          | 20             | 26            | 92             |
| GMF54917 | GMF55917 | R3.0          | 20.0          | 20             | 26            | 92             |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance                |
|--------------------------|-------------------------------------|
| Up to Ø12                | 0 ~ -0.02<br>h5                     |
| Over Ø12                 | 0 ~ -0.03<br>* Shank Dia. ≥ Ø12: h6 |

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |                | K                 |                     |     |     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |
| VDI3323                     | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13             | 14                | 15                  | 16  | 17  | 18  | 19  | 20  |
| HRc                         | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240            | 180               | 180                 | 260 | 160 | 250 | 130 | 230 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   |

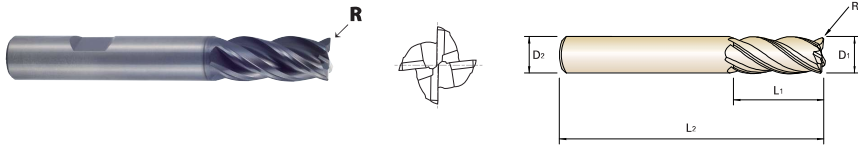
  

| ISO<br>Material Description | N                      |                        |   |    | S                      |     |                             |     |    |    | H               |                |                   |                    |    |    |    |    |    |    |    |
|-----------------------------|------------------------|------------------------|---|----|------------------------|-----|-----------------------------|-----|----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|----|
|                             | Aluminum-wrought alloy | Aluminum-cast, alloyed | Copper and Copper Alloys (Bronze / Brass) |    | Non Metallic Materials |     | Heat Resistant Super Alloys |     |    |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |    |
| VDI3323                     | 21                     | 22                     | 23  | 24 | 25                     | 26  | 27                          | 28  | 29 | 30 | 31              | 32             | 33                | 34                 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc                         | 60                     | 100                    | 75  | 90 | 130                    | 110 | 90                          | 100 |    |    | 15              | 30             | 25                | 38                 | 34 | 36 | 37 | 55 | 60 | 42 | 55 |
| Recommended                 | ◎                      | ◎                      | ◎   | ◎  | ◎                      | ◎   | ◎                           | ◎   | ◎  | ◎  | ◎               | ◎              | ◎                 | ◎                  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS LONG LENGTH

**GMF58 PLAIN SHANK**  
**GMF59 FLAT SHANK**

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|----------|----------|---------------|---------------|----------------|---------------|----------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L2             |
| GMF58030 | GMF59030 | R0.3          | 3.0           | 6              | 8             | 57             |
| GMF58901 | GMF59901 | R0.5          | 3.0           | 6              | 8             | 57             |
| GMF58040 | GMF59040 | R0.3          | 4.0           | 6              | 11            | 57             |
| GMF58902 | GMF59902 | R0.5          | 4.0           | 6              | 11            | 57             |
| GMF58050 | GMF59050 | R0.3          | 5.0           | 6              | 13            | 57             |
| GMF58903 | GMF59903 | R0.5          | 5.0           | 6              | 13            | 57             |
| GMF58060 | GMF59060 | R0.3          | 6.0           | 6              | 13            | 57             |
| GMF58904 | GMF59904 | R0.5          | 6.0           | 6              | 13            | 57             |
| GMF58905 | GMF59905 | R1.0          | 6.0           | 6              | 13            | 57             |
| GMF58080 | GMF59080 | R0.5          | 8.0           | 8              | 19            | 63             |
| GMF58906 | GMF59906 | R1.0          | 8.0           | 8              | 19            | 63             |
| GMF58100 | GMF59100 | R0.5          | 10.0          | 10             | 22            | 72             |
| GMF58907 | GMF59907 | R1.0          | 10.0          | 10             | 22            | 72             |
| GMF58120 | GMF59120 | R0.5          | 12.0          | 12             | 26            | 83             |
| GMF58908 | GMF59908 | R1.0          | 12.0          | 12             | 26            | 83             |
| GMF58909 | GMF59909 | R2.0          | 12.0          | 12             | 26            | 83             |
| GMF58140 | GMF59140 | R0.5          | 14.0          | 14             | 26            | 83             |
| GMF58160 | GMF59160 | R1.0          | 16.0          | 16             | 32            | 92             |
| GMF58912 | GMF59912 | R2.0          | 16.0          | 16             | 32            | 92             |
| GMF58913 | GMF59913 | R3.0          | 16.0          | 16             | 32            | 92             |
| GMF58180 | GMF59180 | R1.0          | 18.0          | 18             | 32            | 92             |
| GMF58200 | GMF59200 | R1.0          | 20.0          | 20             | 38            | 104            |
| GMF58916 | GMF59916 | R2.0          | 20.0          | 20             | 38            | 104            |
| GMF58917 | GMF59917 | R3.0          | 20.0          | 20             | 38            | 104            |
| GMF58250 | GMF59250 | R1.0          | 25.0          | 25             | 38            | 104            |

| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |
|--------------------------|-----------|------------------------|
| Up to Ø12                | 0 ~ -0.02 | h5                     |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |

◎ : Excellent ○ : Good

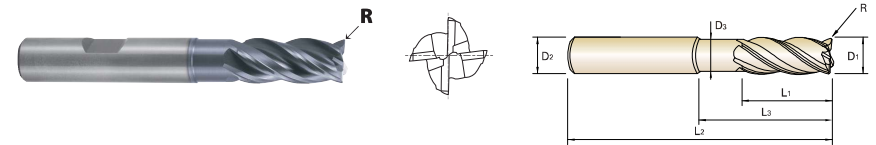
| ISO Material Description | P               |     |     |     |     |                 |     |     |     |     | M                                 |                 | K              |                   |                     |     |     |     |     |     |
|--------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|-----------------------------------|-----------------|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|
|                          | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloyed steel and tool steel | Stainless steel | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |
| VDI3323                  | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                                | 12              | 13             | 14                | 15                  | 16  | 17  | 18  | 19  | 20  |
| HRc                      | 13              | 25  | 28  | 32  | 38  | 42              | 48  | 52  | 58  | 62  | 68                                | 72              | 78             | 82                | 88                  | 92  | 98  | 102 | 108 | 112 |
| HB                       | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                               | 200             | 240            | 180               | 180                 | 260 | 160 | 250 | 130 | 230 |
| Recommended              | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                                 | ◎               | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   |

| ISO Material Description | N                      |     |                        |    | S   |     |                        |     |                             |     | H   |                 |     |              |                   |                  |     |     |     |     |     |
|--------------------------|------------------------|-----|------------------------|----|---|-----|------------------------|-----|-----------------------------|-----|-----|-----------------|-----|--------------|-------------------|------------------|-----|-----|-----|-----|-----|
|                          | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze / Brass) |     | Non Metallic Materials |     | Heat Resistant Super Alloys |     |     | Titanium Alloys |     | Harden steel | Chilled Cast Iron | Harden Cast Iron |     |     |     |     |     |
| VDI3323                  | 21                     | 22  | 23                     | 24 | 25  | 26  | 27                     | 28  | 29                          | 30  | 31  | 32              | 33  | 34           | 35                | 36               | 37  | 38  | 39  | 40  | 41  |
| HRc                      | 15                     | 30  | 25                     | 38 | 34  | 36  | 37                     | 38  | 39                          | 40  | 41  | 42              | 43  | 44           | 45                | 46               | 47  | 48  | 49  | 50  | 51  |
| HB                       | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 | 200                         | 280 | 250 | 350             | 320 | 400 Rm       | 1050 Rm           | 550              | 630 | 400 | 400 | 550 | 550 |
| Recommended              | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎                      | ◎   | ◎                           | ◎   | ◎   | ◎               | ◎   | ◎            | ◎                 | ◎                | ◎   | ◎   | ◎   | ◎   | ◎   |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS WITH NECK

**GMF62 PLAIN SHANK**  
**GMF63 FLAT SHANK**

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|----------|----------|---------------|---------------|----------------|---------------|--------------------|----------------|---------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L3                 | L2             | D3            |
| GMF62030 | GMF63030 | R0.3          | 3.0           | 6              | 7             | 12                 | 54             | 2.7           |
| GMF62901 | GMF63901 | R0.5          | 3.0           | 6              | 7             | 12                 | 54             | 2.7           |
| GMF62902 | GMF63902 | R0.3          | 3.0           | 6              | 7             | 17                 | 57             | 2.7           |
| GMF62903 | GMF63903 | R0.5          | 3.0           | 6              | 7             | 17                 | 57             | 2.7           |
| GMF62040 | GMF63040 | R0.3          | 4.0           | 6              | 8             | 15                 | 57             | 3.7           |
| GMF62904 | GMF63904 | R0.5          | 4.0           | 6              | 8             | 15                 | 57             | 3.7           |
| GMF62905 | GMF63905 | R0.3          | 4.0           | 6              | 8             | 22                 | 63             | 3.7           |
| GMF62906 | GMF63906 | R0.5          | 4.0           | 6              | 8             | 22                 | 63             | 3.7           |
| GMF62050 | GMF63050 | R0.3          | 5.0           | 6              | 10            | 17                 | 57             | 4.7           |
| GMF62907 | GMF63907 | R0.5          | 5.0           | 6              | 10            | 17                 | 57             | 4.7           |
| GMF62908 | GMF63908 | R0.3          | 5.0           | 6              | 10            | 27                 | 67             | 4.7           |
| GMF62909 | GMF63909 | R0.5          | 5.0           | 6              | 10            | 27                 | 67             | 4.7           |
| GMF62060 | GMF63060 | R0.3          | 6.0           | 6              | 10            | 15                 | 57             | 5.5           |
| GMF62910 | GMF63910 | R0.5          | 6.0           | 6              | 10            | 15                 | 57             | 5.5           |
| GMF62911 | GMF63911 | R1.0          | 6.0           | 6              | 10            | 15                 | 57             | 5.5           |
| GMF62912 | GMF63912 | R0.3          | 6.0           | 6              | 10            | 20                 | 62             | 5.5           |
| GMF62913 | GMF63913 | R0.5          | 6.0           | 6              | 10            | 20                 | 62             | 5.5           |
| GMF62914 | GMF63914 | R1.0          | 6.0           | 6              | 10            | 20                 | 62             | 5.5           |
| GMF62915 | GMF63915 | R0.3          | 6.0           | 6              | 10            | 32                 | 74             | 5.5           |
| GMF62916 | GMF63916 | R0.5          | 6.0           | 6              | 10            | 32                 | 74             | 5.5           |
| GMF62917 | GMF63917 | R1.0          | 6.0           | 6              | 10            | 32                 | 74             | 5.5           |
| GMF62080 | GMF63080 | R0.5          | 8.0           | 8              | 12            | 20                 | 63             | 7.5           |
| GMF62918 | GMF63918 | R1.0          | 8.0           | 8              | 12            | 20                 | 63             | 7.5           |
| GMF62919 | GMF63919 | R0.5          | 8.0           | 8              | 12            | 30                 | 73             | 7.5           |

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| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |
|--------------------------|-----------|------------------------|
| Up to Ø12                | 0 ~ -0.02 | h5                     |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |

◎ : Excellent ○ : Good

| ISO Material Description | P               |     |     |     |     |                 |     |     |     |     | M                                 |                 | K              |                   |                     |     |     |     |     |     |
|--------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|-----------------------------------|-----------------|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|
|                          | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloyed steel and tool steel | Stainless steel | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |
| VDI3323                  | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                                | 12              | 13             | 14                | 15                  | 16  | 17  | 18  | 19  | 20  |
| HRc                      | 13              | 25  | 28  | 32  | 38  | 42              | 48  | 52  | 58  | 62  | 68                                | 72              | 78             | 82                | 88                  | 92  | 98  | 102 | 108 | 112 |
| HB                       | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                               | 200             | 240            | 180               | 180                 | 260 | 160 | 250 | 130 | 230 |
| Recommended              | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                                 | ◎               | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   |

| ISO Material Description | N                      |     |                        |    | S   |     |                        |     |                             |     | H   |                 |     |              |                   |                  |     |     |     |     |     |
|--------------------------|------------------------|-----|------------------------|----|---|-----|------------------------|-----|-----------------------------|-----|-----|-----------------|-----|--------------|-------------------|------------------|-----|-----|-----|-----|-----|
|                          | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze / Brass) |     | Non Metallic Materials |     | Heat Resistant Super Alloys |     |     | Titanium Alloys |     | Harden steel | Chilled Cast Iron | Harden Cast Iron |     |     |     |     |     |
| VDI3323                  | 21                     | 22  | 23                     | 24 | 25  | 26  | 27                     | 28  | 29                          | 30  | 31  | 32              | 33  | 34           | 35                | 36               | 37  | 38  | 39  | 40  | 41  |
| HRc                      | 15                     | 30  | 25                     | 38 | 34  | 36  | 37                     | 38  | 39                          | 40  | 41  | 42              | 43  | 44           | 45                | 46               | 47  | 48  | 49  | 50  | 51  |
| HB                       | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 | 200                         | 280 | 250 | 350             | 320 | 400 Rm       | 1050 Rm           | 550              | 630 | 400 | 400 | 550 | 550 |
| Recommended              | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎                      | ◎   | ◎                           | ◎   | ◎   | ◎               | ◎   | ◎            | ◎                 | ◎                | ◎   | ◎   | ◎   | ◎   | ◎   |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS WITH NECK

**GMF62 PLAIN SHANK**  
**GMF63 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|----------|----------|---------------|---------------|----------------|---------------|--------------------|----------------|---------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L3                 | L2             | D3            |
| GMF62920 | GMF63920 | R1.0          | 8.0           | 8              | 12            | 30                 | 73             | 7.5           |
| GMF62921 | GMF63921 | R0.5          | 8.0           | 8              | 12            | 46                 | 90             | 7.5           |
| GMF62922 | GMF63922 | R1.0          | 8.0           | 8              | 12            | 46                 | 90             | 7.5           |
| GMF62100 | GMF63100 | R0.5          | 10.0          | 10             | 14            | 25                 | 72             | 9.2           |
| GMF62923 | GMF63923 | R1.0          | 10.0          | 10             | 14            | 25                 | 72             | 9.2           |
| GMF62924 | GMF63924 | R0.5          | 10.0          | 10             | 14            | 35                 | 82             | 9.2           |
| GMF62925 | GMF63925 | R1.0          | 10.0          | 10             | 14            | 35                 | 82             | 9.2           |
| GMF62926 | GMF63926 | R0.5          | 10.0          | 10             | 14            | 55                 | 102            | 9.2           |
| GMF62927 | GMF63927 | R1.0          | 10.0          | 10             | 14            | 55                 | 102            | 9.2           |
| GMF62120 | GMF63120 | R0.5          | 12.0          | 12             | 16            | 30                 | 83             | 11.0          |
| GMF62928 | GMF63928 | R1.0          | 12.0          | 12             | 16            | 30                 | 83             | 11.0          |
| GMF62929 | GMF63929 | R2.0          | 12.0          | 12             | 16            | 30                 | 83             | 11.0          |
| GMF62930 | GMF63930 | R0.5          | 12.0          | 12             | 16            | 40                 | 93             | 11.0          |
| GMF62931 | GMF63931 | R1.0          | 12.0          | 12             | 16            | 40                 | 93             | 11.0          |
| GMF62932 | GMF63932 | R2.0          | 12.0          | 12             | 16            | 40                 | 93             | 11.0          |
| GMF62933 | GMF63933 | R0.5          | 12.0          | 12             | 16            | 64                 | 117            | 11.0          |
| GMF62934 | GMF63934 | R1.0          | 12.0          | 12             | 16            | 64                 | 117            | 11.0          |
| GMF62935 | GMF63935 | R2.0          | 12.0          | 12             | 16            | 64                 | 117            | 11.0          |
| GMF62160 | GMF63160 | R1.0          | 16.0          | 16             | 22            | 38                 | 92             | 15.0          |
| GMF62936 | GMF63936 | R2.0          | 16.0          | 16             | 22            | 38                 | 92             | 15.0          |
| GMF62937 | GMF63937 | R3.0          | 16.0          | 16             | 22            | 38                 | 92             | 15.0          |
| GMF62938 | GMF63938 | R1.0          | 16.0          | 16             | 22            | 55                 | 109            | 15.0          |
| GMF62939 | GMF63939 | R2.0          | 16.0          | 16             | 22            | 55                 | 109            | 15.0          |
| GMF62940 | GMF63940 | R3.0          | 16.0          | 16             | 22            | 55                 | 109            | 15.0          |

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| Mill Dia. Tolerance (mm) |            | Shank Dia. Tolerance   |  |
|--------------------------|------------|------------------------|--|
| Up to Ø12                | 0 ~ - 0.02 | h5                     |  |
| Over Ø12                 | 0 ~ - 0.03 | * Shank Dia. ≥ Ø12: h6 |  |

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |                | K                 |                     |     |     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |
| VDI 3323                    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13             | 14                | 15                  | 16  | 17  | 18  | 19  | 20  |
| HRc                         | 13              | 25  | 28  | 32  | 38  | 42              | 48  | 52  | 58  | 62  | 68                              | 72              | 78             | 82                | 88                  | 92  | 98  | 102 | 108 | 112 |
| HB                          | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240            | 180               | 180                 | 260 | 160 | 250 | 130 | 230 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   |

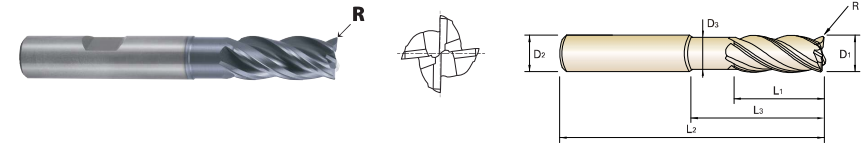
  

| ISO<br>Material Description | N                      |                        |   |                        | S                           |     |    |     |    | H               |                |                   |                    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------|------------------------|---|------------------------|-----------------------------|-----|----|-----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|----|----|
|                             | Aluminum-wrought alloy | Aluminum-cast, alloyed | Copper and Copper Alloys (Bronze / Brass) | Non Metallic Materials | Heat Resistant Super Alloys |     |    |     |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |    |    |
| VDI 3323                    | 21                     | 22                     | 23  | 24                     | 25                          | 26  | 27 | 28  | 29 | 30              | 31             | 32                | 33                 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc                         | 21                     | 22                     | 23  | 24                     | 25                          | 26  | 27 | 28  | 29 | 30              | 31             | 32                | 33                 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HB                          | 60                     | 100                    | 75  | 90                     | 130                         | 110 | 90 | 100 |    |                 | 15             | 30                | 25                 | 38 | 34 | 36 | 55 | 60 | 42 | 55 | 55 |
| Recommended                 | ◎                      | ◎                      | ◎   | ◎                      | ◎                           | ◎   | ◎  | ◎   | ◎  | ◎               | ◎              | ◎                 | ◎                  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS WITH NECK

**GMF62 PLAIN SHANK**  
**GMF63 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|----------|----------|---------------|---------------|----------------|---------------|--------------------|----------------|---------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L3                 | L2             | D3            |
| GMF62941 | GMF63941 | R1.0          | 16.0          | 16             | 22            | 87                 | 141            | 15.0          |
| GMF62942 | GMF63942 | R2.0          | 16.0          | 16             | 22            | 87                 | 141            | 15.0          |
| GMF62943 | GMF63943 | R3.0          | 16.0          | 16             | 22            | 87                 | 141            | 15.0          |
| GMF62200 | GMF63200 | R1.0          | 20.0          | 20             | 26            | 50                 | 104            | 19.0          |
| GMF62944 | GMF63944 | R2.0          | 20.0          | 20             | 26            | 50                 | 104            | 19.0          |
| GMF62945 | GMF63945 | R3.0          | 20.0          | 20             | 26            | 50                 | 104            | 19.0          |
| GMF62946 | GMF63946 | R1.0          | 20.0          | 20             | 26            | 70                 | 124            | 19.0          |
| GMF62947 | GMF63947 | R2.0          | 20.0          | 20             | 26            | 70                 | 124            | 19.0          |
| GMF62948 | GMF63948 | R3.0          | 20.0          | 20             | 26            | 70                 | 124            | 19.0          |
| GMF62949 | GMF63949 | R1.0          | 20.0          | 20             | 26            | 110                | 164            | 19.0          |
| GMF62950 | GMF63950 | R2.0          | 20.0          | 20             | 26            | 110                | 164            | 19.0          |
| GMF62951 | GMF63951 | R3.0          | 20.0          | 20             | 26            | 110                | 164            | 19.0          |

| Mill Dia. Tolerance (mm) |            | Shank Dia. Tolerance   |  |
|--------------------------|------------|------------------------|--|
| Up to Ø12                | 0 ~ - 0.02 | h5                     |  |
| Over Ø12                 | 0 ~ - 0.03 | * Shank Dia. ≥ Ø12: h6 |  |

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |                | K                 |                     |     |     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |
| VDI 3323                    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13             | 14                | 15                  | 16  | 17  | 18  | 19  | 20  |
| HRc                         | 13              | 25  | 28  | 32  | 38  | 42              | 48  | 52  | 58  | 62  | 68                              | 72              | 78             | 82                | 88                  | 92  | 98  | 102 | 108 | 112 |
| HB                          | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240            | 180               | 180                 | 260 | 160 | 250 | 130 | 230 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   |

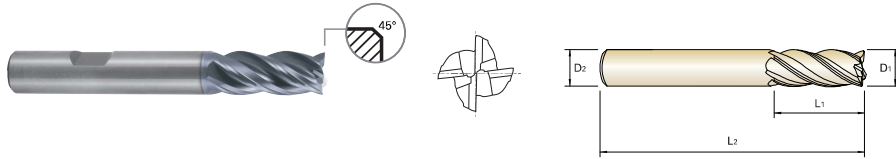
  

| ISO<br>Material Description | N                      |                        |   |                        | S                           |     |    |     |    | H               |                |                   |                    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------|------------------------|---|------------------------|-----------------------------|-----|----|-----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|----|----|
|                             | Aluminum-wrought alloy | Aluminum-cast, alloyed | Copper and Copper Alloys (Bronze / Brass) | Non Metallic Materials | Heat Resistant Super Alloys |     |    |     |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |    |    |
| VDI 3323                    | 21                     | 22                     | 23  | 24                     | 25                          | 26  | 27 | 28  | 29 | 30              | 31             | 32                | 33                 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc                         | 21                     | 22                     | 23  | 24                     | 25                          | 26  | 27 | 28  | 29 | 30              | 31             | 32                | 33                 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HB                          | 60                     | 100                    | 75  | 90                     | 130                         | 110 | 90 | 100 |    |                 | 15             | 30                | 25                 | 38 | 34 | 36 | 55 | 60 | 42 | 55 | 55 |
| Recommended                 | ◎                      | ◎                      | ◎   | ◎                      | ◎                           | ◎   | ◎  | ◎   | ◎  | ◎               | ◎              | ◎                 | ◎                  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE SHORT LENGTH

**GMF52 PLAIN SHANK**  
**GMF53 FLAT SHANK**

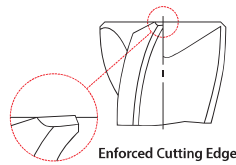
- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

| EDP No.  |          | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | Chamfer |
|----------|----------|---------------|----------------|---------------|----------------|---------|
| PLAIN    | FLAT     | D1            | D2             | L1            | L2             |         |
| GMF52030 | GMF53030 | 3.0           | 6              | 7             | 54             | 0.10    |
| GMF52040 | GMF53040 | 4.0           | 6              | 8             | 54             | 0.15    |
| GMF52050 | GMF53050 | 5.0           | 6              | 10            | 54             | 0.15    |
| GMF52060 | GMF53060 | 6.0           | 6              | 10            | 54             | 0.20    |
| GMF52080 | GMF53080 | 8.0           | 8              | 12            | 58             | 0.20    |
| GMF52100 | GMF53100 | 10.0          | 10             | 14            | 66             | 0.30    |
| GMF52120 | GMF53120 | 12.0          | 12             | 16            | 73             | 0.35    |
| GMF52140 | GMF53140 | 14.0          | 14             | 18            | 75             | 0.40    |
| GMF52160 | GMF53160 | 16.0          | 16             | 22            | 82             | 0.40    |
| GMF52180 | GMF53180 | 18.0          | 18             | 24            | 84             | 0.50    |
| GMF52200 | GMF53200 | 20.0          | 20             | 26            | 92             | 0.50    |

| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |
|--------------------------|-----------|------------------------|
| Up to Ø12                | 0 ~ -0.02 | h5                     |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |



◎ : Excellent ○ : Good

| ISO Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     | K              |                   |                     |     |     |     |     |
|--------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|
|                          | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |
| VDI 3323                 | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16                  | 17  | 18  | 19  | 20  |
| HRC                      |                 | 13  | 25  | 28  | 32  | 10              | 29  | 32  | 38  | 15  | 35                              | 15              | 23  | 10             | 10                | 26                  | 3   | 25  | 130 | 21  |
| HB                       | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260                 | 160 | 250 | 130 | 230 |
| Recommended              | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   |

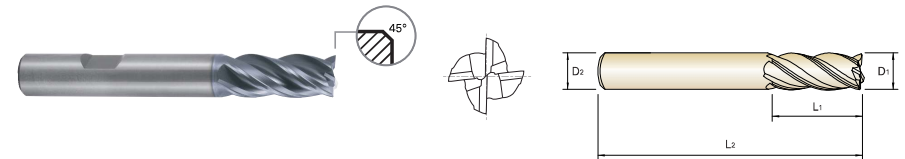
  

| ISO Material Description | N                      |     |                        |    |     | S   |    |     |                        |    | H                           |     |     |                 |                |                   |                    |     |     |     |     |
|--------------------------|------------------------|-----|------------------------|----|-----|---|----|-----|------------------------|----|-----------------------------|-----|-----|-----------------|----------------|-------------------|--------------------|-----|-----|-----|-----|
|                          | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    |     | Copper and Copper Alloys (Bronze / Brass) |    |     | Non Metallic Materials |    | Heat Resistant Super Alloys |     |     | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |     |     |     |     |
| VDI 3323                 | 21                     | 22  | 23                     | 24 | 25  | 26  | 27 | 28  | 29                     | 30 | 31                          | 32  | 33  | 34              | 35             | 36                | 37                 | 38  | 39  | 40  | 41  |
| HRC                      |                        |     |                        |    |     |   |    |     |                        |    | 15                          | 30  | 25  | 38              | 34             | 36                | 37                 | 55  | 60  | 42  | 55  |
| HB                       | 60                     | 100 | 75                     | 90 | 130 | 110                                       | 90 | 100 |                        |    | 200                         | 280 | 250 | 350             | 320            | 400 Rm            | 1050 Rm            | 550 | 630 | 400 | 550 |
| Recommended              | ○                      | ○   | ○                      | ○  | ○   | ○   | ○  | ○   | ○                      | ○  | ○                           | ○   | ○   | ○               | ○              | ○                 | ○                  | ○   | ○   | ○   | ○   |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE LONG LENGTH

**GMF56 PLAIN SHANK**  
**GMF57 FLAT SHANK**

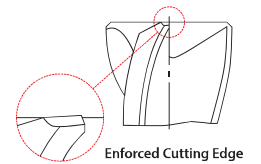
- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

| EDP No.  |          | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | Chamfer |
|----------|----------|---------------|----------------|---------------|----------------|---------|
| PLAIN    | FLAT     | D1            | D2             | L1            | L2             |         |
| GMF56030 | GMF57030 | 3.0           | 6              | 8             | 57             | 0.10    |
| GMF56040 | GMF57040 | 4.0           | 6              | 11            | 57             | 0.15    |
| GMF56050 | GMF57050 | 5.0           | 6              | 13            | 57             | 0.15    |
| GMF56060 | GMF57060 | 6.0           | 6              | 13            | 57             | 0.20    |
| GMF56080 | GMF57080 | 8.0           | 8              | 19            | 63             | 0.20    |
| GMF56100 | GMF57100 | 10.0          | 10             | 22            | 72             | 0.30    |
| GMF56120 | GMF57120 | 12.0          | 12             | 26            | 83             | 0.35    |
| GMF56140 | GMF57140 | 14.0          | 14             | 26            | 83             | 0.40    |
| GMF56160 | GMF57160 | 16.0          | 16             | 32            | 92             | 0.40    |
| GMF56180 | GMF57180 | 18.0          | 18             | 32            | 92             | 0.50    |
| GMF56200 | GMF57200 | 20.0          | 20             | 38            | 104            | 0.50    |
| GMF56250 | GMF57250 | 25.0          | 25             | 38            | 104            | 0.50    |

| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |
|--------------------------|-----------|------------------------|
| Up to Ø12                | 0 ~ -0.02 | h5                     |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |



◎ : Excellent ○ : Good

| ISO Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     | K              |                   |                     |     |     |     |     |
|--------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|
|                          | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |
| VDI 3323                 | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16                  | 17  | 18  | 19  | 20  |
| HRC                      |                 | 13  | 25  | 28  | 32  | 10              | 29  | 32  | 38  | 15  | 35                              | 15              | 23  | 10             | 10                | 26                  | 3   | 25  | 130 | 21  |
| HB                       | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260                 | 160 | 250 | 130 | 230 |
| Recommended              | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   |

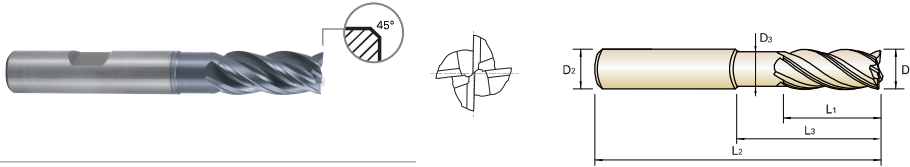
| ISO Material Description | N                      |     |                        |    |     | S   |    |     |                        |    | H                           |     |     |                 |                |                   |                    |     |     |     |     |
|--------------------------|------------------------|-----|------------------------|----|-----|---|----|-----|------------------------|----|-----------------------------|-----|-----|-----------------|----------------|-------------------|--------------------|-----|-----|-----|-----|
|                          | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    |     | Copper and Copper Alloys (Bronze / Brass) |    |     | Non Metallic Materials |    | Heat Resistant Super Alloys |     |     | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |     |     |     |     |
| VDI 3323                 | 21                     | 22  | 23                     | 24 | 25  | 26  | 27 | 28  | 29                     | 30 | 31                          | 32  | 33  | 34              | 35             | 36                | 37                 | 38  | 39  | 40  | 41  |
| HRC                      |                        |     |                        |    |     |   |    |     |                        |    | 15                          | 30  | 25  | 38              | 34             | 36                | 37                 | 55  | 60  | 42  | 55  |
| HB                       | 60                     | 100 | 75                     | 90 | 130 | 110                                       | 90 | 100 |                        |    | 200                         | 280 | 250 | 350             | 320            | 400 Rm            | 1050 Rm            | 550 | 630 | 400 | 550 |
| Recommended              | ○                      | ○   | ○                      | ○  | ○   | ○   | ○  | ○   | ○                      | ○  | ○                           | ○   | ○   | ○               | ○              | ○                 | ○                  | ○   | ○   | ○   | ○   |



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE with EXTENDED NECK

**GMF60 PLAIN SHANK**  
**GMF61 FLAT SHANK**

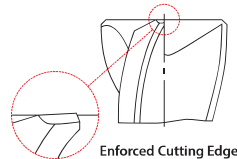
- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

| EDP No.  |          | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | Chamfer |
|----------|----------|---------------|----------------|---------------|--------------------|----------------|---------------|---------|
| PLAIN    | FLAT     | D1            | D2             | L1            | L3                 | L2             | D3            |         |
| GMF60030 | GMF61030 | 3.0           | 6              | 7             | 12                 | 54             | 2.7           | 0.10    |
| GMF60901 | GMF61901 | 3.0           | 6              | 7             | 17                 | 57             | 2.7           | 0.10    |
| GMF60902 | GMF61902 | 3.0           | 6              | 8             | 14                 | 57             | 2.7           | 0.10    |
| GMF60040 | GMF61040 | 4.0           | 6              | 8             | 15                 | 57             | 3.7           | 0.15    |
| GMF60903 | GMF61903 | 4.0           | 6              | 8             | 22                 | 63             | 3.7           | 0.15    |
| GMF60904 | GMF61904 | 4.0           | 6              | 11            | 16                 | 57             | 3.7           | 0.15    |
| GMF60050 | GMF61050 | 5.0           | 6              | 10            | 17                 | 57             | 4.7           | 0.15    |
| GMF60905 | GMF61905 | 5.0           | 6              | 10            | 27                 | 67             | 4.7           | 0.15    |
| GMF60906 | GMF61906 | 5.0           | 6              | 13            | 18                 | 57             | 4.7           | 0.15    |
| GMF60060 | GMF61060 | 6.0           | 6              | 10            | 15                 | 57             | 5.5           | 0.20    |
| GMF60907 | GMF61907 | 6.0           | 6              | 10            | 20                 | 62             | 5.5           | 0.20    |
| GMF60908 | GMF61908 | 6.0           | 6              | 10            | 32                 | 74             | 5.5           | 0.20    |
| GMF60909 | GMF61909 | 6.0           | 6              | 13            | 21                 | 57             | 5.5           | 0.20    |
| GMF60080 | GMF61080 | 8.0           | 8              | 12            | 20                 | 63             | 7.5           | 0.20    |
| GMF60910 | GMF61910 | 8.0           | 8              | 12            | 30                 | 73             | 7.5           | 0.20    |
| GMF60911 | GMF61911 | 8.0           | 8              | 12            | 46                 | 90             | 7.5           | 0.20    |
| GMF60912 | GMF61912 | 8.0           | 8              | 19            | 27                 | 63             | 7.5           | 0.20    |
| GMF60100 | GMF61100 | 10.0          | 10             | 14            | 25                 | 72             | 9.2           | 0.30    |
| GMF60913 | GMF61913 | 10.0          | 10             | 14            | 35                 | 82             | 9.2           | 0.30    |
| GMF60914 | GMF61914 | 10.0          | 10             | 14            | 55                 | 102            | 9.2           | 0.30    |
| GMF60915 | GMF61915 | 10.0          | 10             | 22            | 32                 | 72             | 9.2           | 0.30    |

| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |  |
|--------------------------|-----------|------------------------|--|
| Up to Ø12                | 0 ~ -0.02 | h5                     |  |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |  |



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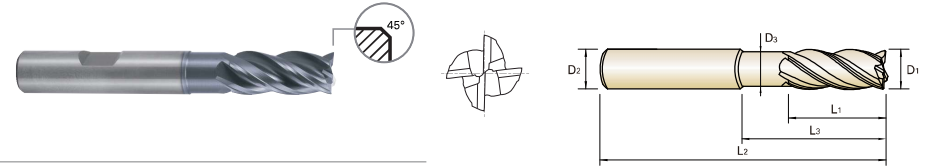
◎ : Excellent ○ : Good

| ISO Material Description | P               |     |     |                 |     |     |                                 |                 |     | M              |                   |                     | K   |     |     |     |     |     |      |      |
|--------------------------|-----------------|-----|-----|-----------------|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|-----|------|------|
|                          | Non-alloy steel |     |     | Low alloy steel |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |     |      |      |
| VDI 3323                 | 1               | 2   | 3   | 4               | 5   | 6   | 7                               | 8               | 9   | 10             | 11                | 12                  | 13  | 14  | 15  | 16  | 17  | 18  | 19   | 20   |
| HRC                      | 13              | 25  | 28  | 32              | 38  | 42  | 48                              | 52              | 58  | 62             | 68                | 72                  | 78  | 82  | 88  | 92  | 98  | 102 | 108  | 112  |
| HB                       | 125             | 190 | 250 | 270             | 300 | 350 | 400                             | 450             | 500 | 550            | 600               | 650                 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 |
| Recommended              | ◎               | ◎   | ◎   | ◎               | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   | ◎   | ◎    | ◎    |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE with EXTENDED NECK

**GMF60 PLAIN SHANK**  
**GMF61 FLAT SHANK**

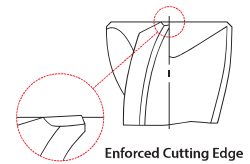
- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

| EDP No.  |          | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | Chamfer |
|----------|----------|---------------|----------------|---------------|--------------------|----------------|---------------|---------|
| PLAIN    | FLAT     | D1            | D2             | L1            | L3                 | L2             | D3            |         |
| GMF60120 | GMF61120 | 12.0          | 12             | 16            | 30                 | 83             | 11.0          | 0.35    |
| GMF60916 | GMF61916 | 12.0          | 12             | 16            | 40                 | 93             | 11.0          | 0.35    |
| GMF60917 | GMF61917 | 12.0          | 12             | 16            | 64                 | 117            | 11.0          | 0.35    |
| GMF60918 | GMF61918 | 12.0          | 12             | 26            | 38                 | 83             | 11.0          | 0.35    |
| GMF60160 | GMF61160 | 16.0          | 16             | 22            | 38                 | 92             | 15.0          | 0.40    |
| GMF60919 | GMF61919 | 16.0          | 16             | 22            | 55                 | 109            | 15.0          | 0.40    |
| GMF60920 | GMF61920 | 16.0          | 16             | 22            | 87                 | 141            | 15.0          | 0.40    |
| GMF60921 | GMF61921 | 16.0          | 16             | 32            | 44                 | 92             | 15.0          | 0.40    |
| GMF60200 | GMF61200 | 20.0          | 20             | 26            | 50                 | 104            | 19.0          | 0.50    |
| GMF60922 | GMF61922 | 20.0          | 20             | 26            | 70                 | 124            | 19.0          | 0.50    |
| GMF60923 | GMF61923 | 20.0          | 20             | 26            | 110                | 164            | 19.0          | 0.50    |
| GMF60924 | GMF61924 | 20.0          | 20             | 38            | 54                 | 104            | 19.0          | 0.50    |

| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |  |
|--------------------------|-----------|------------------------|--|
| Up to Ø12                | 0 ~ -0.02 | h5                     |  |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |  |



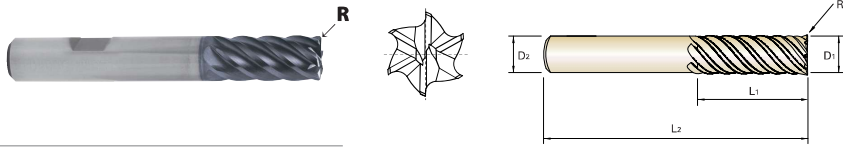
◎ : Excellent ○ : Good

| ISO Material Description | P               |     |     |                 |     |     |                                 |                 |     | M              |                   |                     | K   |     |     |     |     |     |      |      |
|--------------------------|-----------------|-----|-----|-----------------|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|-----|-----|------|------|
|                          | Non-alloy steel |     |     | Low alloy steel |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |     |     |      |      |
| VDI 3323                 | 1               | 2   | 3   | 4               | 5   | 6   | 7                               | 8               | 9   | 10             | 11                | 12                  | 13  | 14  | 15  | 16  | 17  | 18  | 19   | 20   |
| HRC                      | 13              | 25  | 28  | 32              | 38  | 42  | 48                              | 52              | 58  | 62             | 68                | 72                  | 78  | 82  | 88  | 92  | 98  | 102 | 108  | 112  |
| HB                       | 125             | 190 | 250 | 270             | 300 | 350 | 400                             | 450             | 500 | 550            | 600               | 650                 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 |
| Recommended              | ◎               | ◎   | ◎   | ◎               | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   | ◎   | ◎   | ◎    | ◎    |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS LONG LENGTH

**GMG16 PLAIN SHANK**  
**GMG17 FLAT SHANK**

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut |     | Overall Length |
|----------|----------|---------------|---------------|----------------|---------------|-----|----------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L2  |                |
| GMG16060 | GMG17060 | R0.5          | 6.0           | 6              | 13            | 57  |                |
| GMG16901 | GMG17901 | R1.0          | 6.0           | 6              | 13            | 57  |                |
| GMG16080 | GMG17080 | R0.5          | 8.0           | 8              | 19            | 63  |                |
| GMG16902 | GMG17902 | R1.0          | 8.0           | 8              | 19            | 63  |                |
| GMG16100 | GMG17100 | R0.5          | 10.0          | 10             | 22            | 72  |                |
| GMG16903 | GMG17903 | R1.0          | 10.0          | 10             | 22            | 72  |                |
| GMG16904 | GMG17904 | R1.5          | 10.0          | 10             | 22            | 72  |                |
| GMG16905 | GMG17905 | R2.0          | 10.0          | 10             | 22            | 72  |                |
| GMG16120 | GMG17120 | R0.5          | 12.0          | 12             | 26            | 83  |                |
| GMG16906 | GMG17906 | R1.0          | 12.0          | 12             | 26            | 83  |                |
| GMG16907 | GMG17907 | R1.5          | 12.0          | 12             | 26            | 83  |                |
| GMG16908 | GMG17908 | R2.0          | 12.0          | 12             | 26            | 83  |                |
| GMG16909 | GMG17909 | R3.0          | 12.0          | 12             | 26            | 83  |                |
| GMG16160 | GMG17160 | R1.0          | 16.0          | 16             | 32            | 92  |                |
| GMG16910 | GMG17910 | R1.5          | 16.0          | 16             | 32            | 92  |                |
| GMG16911 | GMG17911 | R2.0          | 16.0          | 16             | 32            | 92  |                |
| GMG16912 | GMG17912 | R3.0          | 16.0          | 16             | 32            | 92  |                |
| GMG16200 | GMG17200 | R1.0          | 20.0          | 20             | 38            | 104 |                |
| GMG16913 | GMG17913 | R1.5          | 20.0          | 20             | 38            | 104 |                |
| GMG16914 | GMG17914 | R2.0          | 20.0          | 20             | 38            | 104 |                |
| GMG16915 | GMG17915 | R3.0          | 20.0          | 20             | 38            | 104 |                |
| GMG16250 | GMG17250 | R1.0          | 25.0          | 25             | 44            | 104 |                |
| GMG16916 | GMG17916 | R1.5          | 25.0          | 25             | 44            | 104 |                |
| GMG16917 | GMG17917 | R2.0          | 25.0          | 25             | 44            | 104 |                |
| GMG16918 | GMG17918 | R3.0          | 25.0          | 25             | 44            | 104 |                |

| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |  |
|--------------------------|-----------|------------------------|--|
| Up to Ø12                | 0 ~ -0.02 | h5                     |  |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |  |

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     | K              |                   |                     |     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |
| VDI 3323                    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16                  | 17  | 18  | 19  | 20  |
| HRc                         | 125             | 13  | 25  | 28  | 32  | 10              | 29  | 32  | 38  | 15  | 35                              | 15              | 23  | 10             | 26                | 3                   | 25  | 10  | 21  |     |
| HB                          | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260                 | 160 | 250 | 130 | 230 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   |

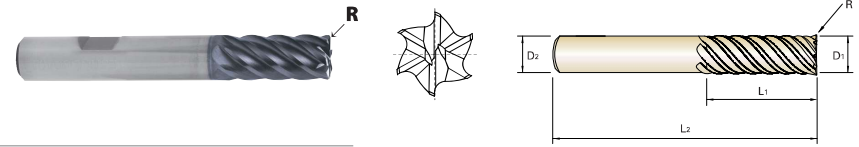
  

| ISO<br>Material Description | N                      |     |                        |    | S   |     |                        |     |                             |    | H   |     |                 |     |              |                   |                  |     |     |     |     |
|-----------------------------|------------------------|-----|------------------------|----|---|-----|------------------------|-----|-----------------------------|----|-----|-----|-----------------|-----|--------------|-------------------|------------------|-----|-----|-----|-----|
|                             | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze / Brass) |     | Non Metallic Materials |     | Heat Resistant Super Alloys |    |     |     | Titanium Alloys |     | Harden steel | Chilled Cast Iron | Harden Cast Iron |     |     |     |     |
| VDI 3323                    | 21                     | 22  | 23                     | 24 | 25  | 26  | 27                     | 28  | 29                          | 30 | 31  | 32  | 33              | 34  | 35           | 36                | 37               | 38  | 39  | 40  | 41  |
| HRc                         | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 |                             |    | 15  | 30  | 25              | 38  | 34           | 36                | 37               | 55  | 60  | 42  | 55  |
| HB                          | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 |                             |    | 200 | 280 | 250             | 350 | 320          | 400 Rm            | 1050 Rm          | 550 | 630 | 400 | 550 |
| Recommended                 | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎                      | ◎   | ◎                           | ◎  | ◎   | ◎   | ◎               | ◎   | ◎            | ◎                 | ◎                | ◎   | ◎   | ◎   | ◎   |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH

**GMG18 PLAIN SHANK**  
**GMG19 FLAT SHANK**

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut |     | Overall Length |
|----------|----------|---------------|---------------|----------------|---------------|-----|----------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L2  |                |
| GMG18060 | GMG19060 | R0.5          | 6.0           | 6              | 24            | 75  |                |
| GMG18901 | GMG19901 | R1.0          | 6.0           | 6              | 24            | 75  |                |
| GMG18080 | GMG19080 | R0.5          | 8.0           | 8              | 32            | 75  |                |
| GMG18902 | GMG19902 | R1.0          | 8.0           | 8              | 32            | 75  |                |
| GMG18903 | GMG19903 | R2.0          | 8.0           | 8              | 32            | 75  |                |
| GMG18100 | GMG19100 | R0.5          | 10.0          | 10             | 40            | 100 |                |
| GMG18904 | GMG19904 | R1.0          | 10.0          | 10             | 40            | 100 |                |
| GMG18905 | GMG19905 | R1.5          | 10.0          | 10             | 40            | 100 |                |
| GMG18906 | GMG19906 | R2.0          | 10.0          | 10             | 40            | 100 |                |
| GMG18120 | GMG19120 | R0.5          | 12.0          | 12             | 48            | 120 |                |
| GMG18907 | GMG19907 | R1.0          | 12.0          | 12             | 48            | 120 |                |
| GMG18908 | GMG19908 | R1.5          | 12.0          | 12             | 48            | 120 |                |
| GMG18909 | GMG19909 | R2.0          | 12.0          | 12             | 48            | 120 |                |
| GMG18910 | GMG19910 | R3.0          | 12.0          | 12             | 48            | 120 |                |
| GMG18160 | GMG19160 | R1.0          | 16.0          | 16             | 64            | 140 |                |
| GMG18911 | GMG19911 | R1.5          | 16.0          | 16             | 64            | 140 |                |
| GMG18912 | GMG19912 | R2.0          | 16.0          | 16             | 64            | 140 |                |
| GMG18913 | GMG19913 | R3.0          | 16.0          | 16             | 64            | 140 |                |
| GMG18200 | GMG19200 | R1.0          | 20.0          | 20             | 80            | 150 |                |
| GMG18914 | GMG19914 | R1.5          | 20.0          | 20             | 80            | 150 |                |
| GMG18915 | GMG19915 | R2.0          | 20.0          | 20             | 80            | 150 |                |
| GMG18916 | GMG19916 | R3.0          | 20.0          | 20             | 80            | 150 |                |
| GMG18917 | GMG19917 | R4.0          | 20.0          | 20             | 80            | 150 |                |

| Mill Dia. Tolerance (mm) |           | Shank Dia. Tolerance   |  |
|--------------------------|-----------|------------------------|--|
| Up to Ø12                | 0 ~ -0.03 | h5                     |  |
| Over Ø12                 | 0 ~ -0.03 | * Shank Dia. ≥ Ø12: h6 |  |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     | K              |                   |                     |     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |
| VDI 3323                    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16                  | 17  | 18  | 19  | 20  |
| HRc                         | 125             | 13  | 25  | 28  | 32  | 10              | 29  | 32  | 38  | 15  | 35                              | 15              | 23  | 10             | 26                | 3                   | 25  | 10  | 21  |     |
| HB                          | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260                 | 160 | 250 | 130 | 230 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   |

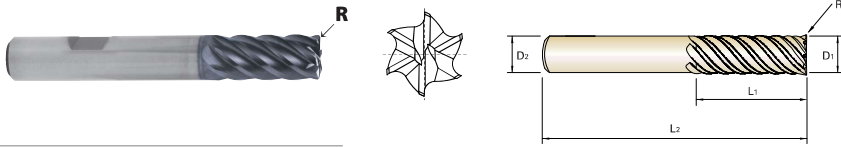
  

| ISO<br>Material Description | N                      |     |                        |    | S   |     |                        |     |                             |    | H   |     |                 |     |              |                   |                  |     |     |     |     |
|-----------------------------|------------------------|-----|------------------------|----|---|-----|------------------------|-----|-----------------------------|----|-----|-----|-----------------|-----|--------------|-------------------|------------------|-----|-----|-----|-----|
|                             | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze / Brass) |     | Non Metallic Materials |     | Heat Resistant Super Alloys |    |     |     | Titanium Alloys |     | Harden steel | Chilled Cast Iron | Harden Cast Iron |     |     |     |     |
| VDI 3323                    | 21                     | 22  | 23                     | 24 | 25  | 26  | 27                     | 28  | 29                          | 30 | 31  | 32  | 33              | 34  | 35           | 36                | 37               | 38  | 39  | 40  | 41  |
| HRc                         | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 |                             |    | 15  | 30  | 25              | 38  | 34           | 36                | 37               | 55  | 60  | 42  | 55  |
| HB                          | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 |                             |    | 200 | 280 | 250             | 350 | 320          | 400 Rm            | 1050 Rm          | 550 | 630 | 400 | 550 |
| Recommended                 | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎                      | ◎   | ◎                           | ◎  | ◎   | ◎   | ◎               | ◎   | ◎            | ◎                 | ◎                | ◎   | ◎   | ◎   | ◎   |

# HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH

**GMG18 PLAIN SHANK**  
**GMG19 FLAT SHANK**

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.         |                 | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut |     | Overall Length |
|-----------------|-----------------|---------------|---------------|----------------|---------------|-----|----------------|
| PLAIN           | FLAT            | R             | D1            | D2             | L1            | L2  |                |
| <b>GMG18918</b> | <b>GMG19918</b> | R5.0          | <b>20.0</b>   | 20             | 80            | 150 |                |
| <b>GMG18250</b> | <b>GMG19250</b> | R1.0          | <b>25.0</b>   | 25             | 100           | 170 |                |
| <b>GMG18919</b> | <b>GMG19919</b> | R1.5          | <b>25.0</b>   | 25             | 100           | 170 |                |
| <b>GMG18920</b> | <b>GMG19920</b> | R2.0          | <b>25.0</b>   | 25             | 100           | 170 |                |
| <b>GMG18921</b> | <b>GMG19921</b> | R3.0          | <b>25.0</b>   | 25             | 100           | 170 |                |
| <b>GMG18922</b> | <b>GMG19922</b> | R4.0          | <b>25.0</b>   | 25             | 100           | 170 |                |
| <b>GMG18923</b> | <b>GMG19923</b> | R5.0          | <b>25.0</b>   | 25             | 100           | 170 |                |

|                          |                              |
|--------------------------|------------------------------|
| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance         |
| 0 ~ - 0.03               | h5<br>* Shank Dia. ≥ Ø12: h6 |

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     |                |                   | K   |                     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|-----|---------------------|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron |     | Malleable cast iron |     |     |     |
| VDI 3323                    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16  | 17                  | 18  | 19  | 20  |
| HRc                         | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260 | 160                 | 250 | 130 | 230 |
| HB                          | 60              | 100 | 130 | 110 | 90  | 100             |     |     |     |     |                                 |                 |     |                |                   |     |                     |     |     |     |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎   | ◎                   | ◎   | ◎   | ◎   |

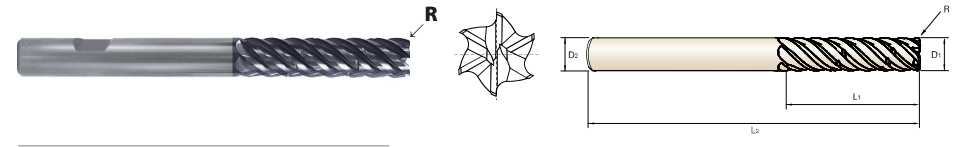
| ISO<br>Material Description | N                      |     |                        |    |     | S   |    |                        |    |    | H                           |     |     |                 |              |                   |                  |     |     |     |     |
|-----------------------------|------------------------|-----|------------------------|----|-----|---|----|------------------------|----|----|-----------------------------|-----|-----|-----------------|--------------|-------------------|------------------|-----|-----|-----|-----|
|                             | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    |     | Copper and Copper Alloys (Bronze / Brass) |    | Non Metallic Materials |    |    | Heat Resistant Super Alloys |     |     | Titanium Alloys | Harden steel | Chilled Cast Iron | Harden Cast Iron |     |     |     |     |
| VDI 3323                    | 21                     | 22  | 23                     | 24 | 25  | 26  | 27 | 28                     | 29 | 30 | 31                          | 32  | 33  | 34              | 35           | 36                | 37               | 38  | 39  | 40  | 41  |
| HRc                         | 21                     | 22  | 23                     | 24 | 25  | 26  | 27 | 28                     | 29 | 30 | 15                          | 30  | 25  | 38              | 34           | 36                | 37               | 55  | 60  | 42  | 55  |
| HB                          | 60                     | 100 | 75                     | 90 | 130 | 110                                       | 90 | 100                    |    |    | 200                         | 280 | 250 | 350             | 320          | 400 Rm            | 1050 Rm          | 550 | 630 | 400 | 550 |
| Recommended                 | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎  | ◎                      | ◎  | ◎  | ◎                           | ◎   | ◎   | ◎               | ◎            | ◎                 | ◎                | ◎   | ◎   | ◎   | ◎   |

# HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH CHIP SPLITTER

**NEW** **GMH58 PLAIN SHANK**  
**GMH59 FLAT SHANK**

Launching Jan of 2020

- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : mm

| EDP No.         |                 | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut |     | Overall Length |
|-----------------|-----------------|---------------|---------------|----------------|---------------|-----|----------------|
| PLAIN           | FLAT            | R             | D1            | D2             | L1            | L2  |                |
| <b>GMH58060</b> | <b>GMH59060</b> | R0.5          | <b>6.0</b>    | 6              | 24            | 75  |                |
| <b>GMH58901</b> | <b>GMH59901</b> | R1.0          | <b>6.0</b>    | 6              | 24            | 75  |                |
| <b>GMH58080</b> | <b>GMH59080</b> | R0.5          | <b>8.0</b>    | 8              | 32            | 75  |                |
| <b>GMH58902</b> | <b>GMH59902</b> | R1.0          | <b>8.0</b>    | 8              | 32            | 75  |                |
| <b>GMH58903</b> | <b>GMH59903</b> | R2.0          | <b>8.0</b>    | 8              | 32            | 75  |                |
| <b>GMH58100</b> | <b>GMH59100</b> | R0.5          | <b>10.0</b>   | 10             | 40            | 100 |                |
| <b>GMH58904</b> | <b>GMH59904</b> | R1.0          | <b>10.0</b>   | 10             | 40            | 100 |                |
| <b>GMH58905</b> | <b>GMH59905</b> | R1.5          | <b>10.0</b>   | 10             | 40            | 100 |                |
| <b>GMH58906</b> | <b>GMH59906</b> | R2.0          | <b>10.0</b>   | 10             | 40            | 100 |                |
| <b>GMH58120</b> | <b>GMH59120</b> | R0.5          | <b>12.0</b>   | 12             | 48            | 120 |                |
| <b>GMH58907</b> | <b>GMH59907</b> | R1.0          | <b>12.0</b>   | 12             | 48            | 120 |                |
| <b>GMH58908</b> | <b>GMH59908</b> | R1.5          | <b>12.0</b>   | 12             | 48            | 120 |                |
| <b>GMH58909</b> | <b>GMH59909</b> | R2.0          | <b>12.0</b>   | 12             | 48            | 120 |                |
| <b>GMH58910</b> | <b>GMH59910</b> | R3.0          | <b>12.0</b>   | 12             | 48            | 120 |                |
| <b>GMH58160</b> | <b>GMH59160</b> | R1.0          | <b>16.0</b>   | 16             | 64            | 140 |                |
| <b>GMH58911</b> | <b>GMH59911</b> | R1.5          | <b>16.0</b>   | 16             | 64            | 140 |                |
| <b>GMH58912</b> | <b>GMH59912</b> | R2.0          | <b>16.0</b>   | 16             | 64            | 140 |                |
| <b>GMH58913</b> | <b>GMH59913</b> | R3.0          | <b>16.0</b>   | 16             | 64            | 140 |                |
| <b>GMH58200</b> | <b>GMH59200</b> | R1.0          | <b>20.0</b>   | 20             | 80            | 150 |                |
| <b>GMH58914</b> | <b>GMH59914</b> | R1.5          | <b>20.0</b>   | 20             | 80            | 150 |                |
| <b>GMH58915</b> | <b>GMH59915</b> | R2.0          | <b>20.0</b>   | 20             | 80            | 150 |                |

|                          |                              |
|--------------------------|------------------------------|
| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance         |
| 0 ~ - 0.03               | h5<br>* Shank Dia. ≥ Ø12: h6 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     |                |                   | K   |                     |     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|-----|---------------------|-----|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron |     | Malleable cast iron |     |     |     |
| VDI 3323                    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16  | 17                  | 18  | 19  | 20  |
| HRc                         | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260 | 160                 | 250 | 130 | 230 |
| HB                          | 60              | 100 | 130 | 110 | 90  | 100             |     |     |     |     |                                 |                 |     |                |                   |     |                     |     |     |     |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎   | ◎                   | ◎   | ◎   | ◎   |

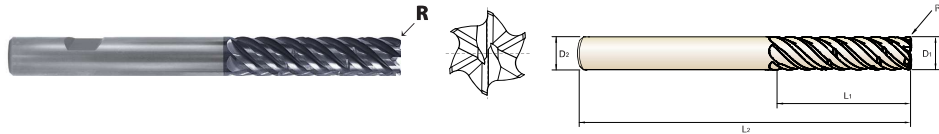
| ISO<br>Material Description | N                      |     |                        |    |     | S   |    |                        |    |    | H                           |     |     |                 |              |                   |                  |     |     |     |     |
|-----------------------------|------------------------|-----|------------------------|----|-----|---|----|------------------------|----|----|-----------------------------|-----|-----|-----------------|--------------|-------------------|------------------|-----|-----|-----|-----|
|                             | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    |     | Copper and Copper Alloys (Bronze / Brass) |    | Non Metallic Materials |    |    | Heat Resistant Super Alloys |     |     | Titanium Alloys | Harden steel | Chilled Cast Iron | Harden Cast Iron |     |     |     |     |
| VDI 3323                    | 21                     | 22  | 23                     | 24 | 25  | 26  | 27 | 28                     | 29 | 30 | 31                          | 32  | 33  | 34              | 35           | 36                | 37               | 38  | 39  | 40  | 41  |
| HRc                         | 21                     | 22  | 23                     | 24 | 25  | 26  | 27 | 28                     | 29 | 30 | 15                          | 30  | 25  | 38              | 34           | 36                | 37               | 55  | 60  | 42  | 55  |
| HB                          | 60                     | 100 | 75                     | 90 | 130 | 110                                       | 90 | 100                    |    |    | 200                         | 280 | 250 | 350             | 320          | 400 Rm            | 1050 Rm          | 550 | 630 | 400 | 550 |
| Recommended                 | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎  | ◎                      | ◎  | ◎  | ◎                           | ◎   | ◎   | ◎               | ◎            | ◎                 | ◎                | ◎   | ◎   | ◎   | ◎   |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH CHIP SPLITTER

**NEW** **GMH58** PLAIN SHANK  
**GMH59** FLAT SHANK

Launching Jan of 2020

- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : mm

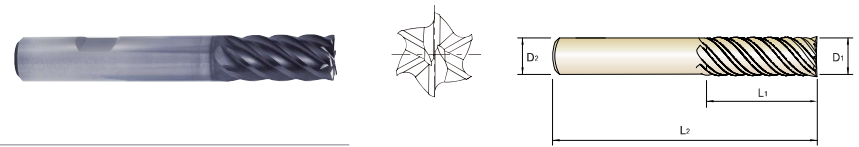
| EDP No.  |          | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|----------|----------|---------------|---------------|----------------|---------------|----------------|
| PLAIN    | FLAT     | R             | D1            | D2             | L1            | L2             |
| GMH58916 | GMH59916 | R3.0          | 20.0          | 20             | 80            | 150            |
| GMH58917 | GMH59917 | R4.0          | 20.0          | 20             | 80            | 150            |
| GMH58918 | GMH59918 | R5.0          | 20.0          | 20             | 80            | 150            |
| GMH58250 | GMH59250 | R1.0          | 25.0          | 25             | 100           | 170            |
| GMH58919 | GMH59919 | R1.5          | 25.0          | 25             | 100           | 170            |
| GMH58920 | GMH59920 | R2.0          | 25.0          | 25             | 100           | 170            |
| GMH58921 | GMH59921 | R3.0          | 25.0          | 25             | 100           | 170            |
| GMH58922 | GMH59922 | R4.0          | 25.0          | 25             | 100           | 170            |
| GMH58923 | GMH59923 | R5.0          | 25.0          | 25             | 100           | 170            |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance         |
|--------------------------|------------------------------|
| 0 ~ - 0.03               | h5<br>* Shank Dia. ≥ Ø12: h6 |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE LONG LENGTH

**GMG12** PLAIN SHANK  
**GMG13** FLAT SHANK

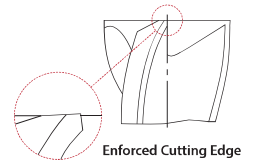
- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

| EDP No.  |          | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|----------|----------|---------------|----------------|---------------|----------------|
| PLAIN    | FLAT     | D1            | D2             | L1            | L2             |
| GMG12060 | GMG13060 | 6.0           | 6              | 13            | 57             |
| GMG12080 | GMG13080 | 8.0           | 8              | 19            | 63             |
| GMG12100 | GMG13100 | 10.0          | 10             | 22            | 72             |
| GMG12120 | GMG13120 | 12.0          | 12             | 26            | 83             |
| GMG12160 | GMG13160 | 16.0          | 16             | 32            | 92             |
| GMG12200 | GMG13200 | 20.0          | 20             | 38            | 104            |
| GMG12250 | GMG13250 | 25.0          | 25             | 44            | 104            |

| Mill Dia. Tolerance (mm) |            | Shank Dia. Tolerance         |
|--------------------------|------------|------------------------------|
| Up to Ø12                | 0 ~ - 0.02 | h5<br>* Shank Dia. ≥ Ø12: h6 |
| Over Ø12                 | 0 ~ - 0.03 |                              |



◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     |                | K   |                   |     |                     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-----|-------------------|-----|---------------------|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron |     | Nodular cast iron |     | Malleable cast iron |     |     |
| VDI3323                     | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15  | 16                | 17  | 18                  | 19  | 20  |
| HRC                         | 125             | 130 | 135 | 140 | 145 | 150             | 155 | 160 | 165 | 170 | 175                             | 180             | 185 | 190            | 195 | 200               | 205 | 210                 | 215 | 220 |
| HB                          | 125             | 130 | 135 | 140 | 145 | 150             | 155 | 160 | 165 | 170 | 175                             | 180             | 185 | 190            | 195 | 200               | 205 | 210                 | 215 | 220 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎   | ◎                 | ◎   | ◎                   | ◎   | ◎   |

| ISO<br>Material Description | N                      |     |                        |    |  | S                      |    |                             |    |    | H               |                |                   |                    |    |    |    |    |    |    |    |
|-----------------------------|------------------------|-----|------------------------|----|--|------------------------|----|-----------------------------|----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|----|
|                             | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze/ Brass) | Non Metallic Materials |    | Heat Resistant Super Alloys |    |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |    |
| VDI3323                     | 21                     | 22  | 23                     | 24 | 25                                       | 26                     | 27 | 28                          | 29 | 30 | 31              | 32             | 33                | 34                 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRC                         | 21                     | 22  | 23                     | 24 | 25                                       | 26                     | 27 | 28                          | 29 | 30 | 31              | 32             | 33                | 34                 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HB                          | 60                     | 100 | 75                     | 90 | 130                                      | 110                    | 90 | 100                         |    |    | 15              | 30             | 25                | 38                 | 34 | 36 | 37 | 55 | 60 | 42 | 55 |
| Recommended                 | ◎                      | ◎   | ◎                      | ◎  | ◎  | ◎                      | ◎  | ◎                           | ◎  | ◎  | ◎               | ◎              | ◎                 | ◎                  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  |

◎ : Excellent ○ : Good

| ISO<br>Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     |                | K   |                   |     |                     |     |     |
|-----------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-----|-------------------|-----|---------------------|-----|-----|
|                             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron |     | Nodular cast iron |     | Malleable cast iron |     |     |
| VDI3323                     | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15  | 16                | 17  | 18                  | 19  | 20  |
| HRC                         | 125             | 130 | 135 | 140 | 145 | 150             | 155 | 160 | 165 | 170 | 175                             | 180             | 185 | 190            | 195 | 200               | 205 | 210                 | 215 | 220 |
| HB                          | 125             | 130 | 135 | 140 | 145 | 150             | 155 | 160 | 165 | 170 | 175                             | 180             | 185 | 190            | 195 | 200               | 205 | 210                 | 215 | 220 |
| Recommended                 | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎   | ◎                 | ◎   | ◎                   | ◎   | ◎   |

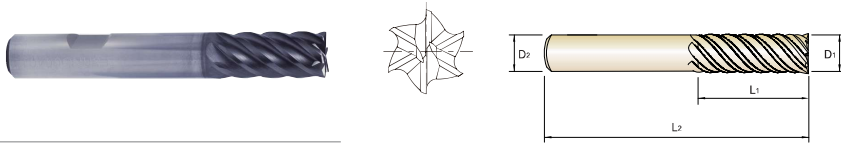
  

| ISO<br>Material Description | N                      |     |                        |    |  | S                      |    |                             |    |    | H               |                |                   |                    |    |    |    |    |    |    |    |
|-----------------------------|------------------------|-----|------------------------|----|--|------------------------|----|-----------------------------|----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|----|
|                             | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze/ Brass) | Non Metallic Materials |    | Heat Resistant Super Alloys |    |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |    |
| VDI3323                     | 21                     | 22  | 23                     | 24 | 25                                       | 26                     | 27 | 28                          | 29 | 30 | 31              | 32             | 33                | 34                 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRC                         | 21                     | 22  | 23                     | 24 | 25                                       | 26                     | 27 | 28                          | 29 | 30 | 31              | 32             | 33                | 34                 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HB                          | 60                     | 100 | 75                     | 90 | 130                                      | 110                    | 90 | 100                         |    |    | 15              | 30             | 25                | 38                 | 34 | 36 | 37 | 55 | 60 | 42 | 55 |
| Recommended                 | ◎                      | ◎   | ◎                      | ◎  | ◎  | ◎                      | ◎  | ◎                           | ◎  | ◎  | ◎               | ◎              | ◎                 | ◎                  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE EXTRA LONG LENGTH

**GMG14 PLAIN SHANK**  
**GMG15 FLAT SHANK**

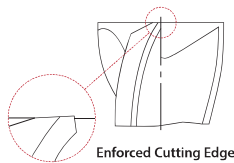
- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



Unit : mm

| EDP No.         |                 | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|-----------------|-----------------|---------------|----------------|---------------|----------------|
| PLAIN           | FLAT            | D1            | D2             | L1            | L2             |
| <b>GMG14060</b> | <b>GMG15060</b> | <b>6.0</b>    | 6              | 24            | 75             |
| <b>GMG14080</b> | <b>GMG15080</b> | <b>8.0</b>    | 8              | 32            | 75             |
| <b>GMG14100</b> | <b>GMG15100</b> | <b>10.0</b>   | 10             | 40            | 100            |
| <b>GMG14120</b> | <b>GMG15120</b> | <b>12.0</b>   | 12             | 48            | 120            |
| <b>GMG14160</b> | <b>GMG15160</b> | <b>16.0</b>   | 16             | 64            | 140            |
| <b>GMG14200</b> | <b>GMG15200</b> | <b>20.0</b>   | 20             | 80            | 150            |
| <b>GMG14250</b> | <b>GMG15250</b> | <b>25.0</b>   | 25             | 100           | 170            |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance         |
|--------------------------|------------------------------|
| 0 ~ -0.03                | h5<br>* Shank Dia. ≥ Ø12: h6 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

| ISO Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     | K              |                   |                     |     |     |     |     |
|--------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|
|                          | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |
| VDI 3323                 | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16                  | 17  | 18  | 19  | 20  |
| HRc                      | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260                 | 160 | 250 | 130 | 230 |
| Recommended              | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   |

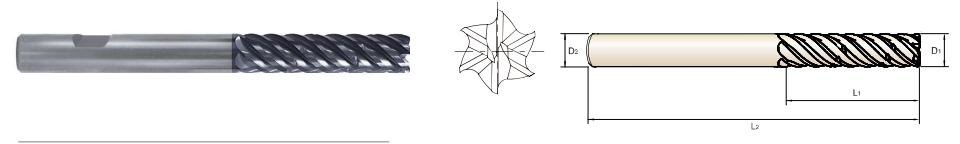
| ISO Material Description | N                      |     |                        |    | S   |     |                        |     |                             |    | H  |                 |                |                   |                    |    |    |    |    |    |    |
|--------------------------|------------------------|-----|------------------------|----|---|-----|------------------------|-----|-----------------------------|----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|
|                          | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze / Brass) |     | Non Metallic Materials |     | Heat Resistant Super Alloys |    |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |
| VDI 3323                 | 21                     | 22  | 23                     | 24 | 25  | 26  | 27                     | 28  | 29                          | 30 | 31 | 32              | 33             | 34                | 35                 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc                      | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 |                             |    | 15 | 30              | 25             | 38                | 34                 | 36 | 37 | 55 | 60 | 42 | 55 |
| Recommended              | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎                      | ◎   | ◎                           | ◎  | ○  | ○               | ○              | ○                 | ○                  | ○  | ○  | ○  | ○  | ○  | ○  |

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE EXTRA LONG LENGTH CHIP SPLITTER

**NEW** **GMH56 PLAIN SHANK**  
**GMH57 FLAT SHANK**

Launching Jan of 2020

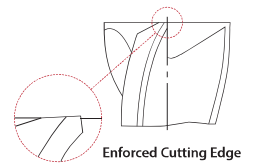
- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : mm

| EDP No.         |                 | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|-----------------|-----------------|---------------|----------------|---------------|----------------|
| PLAIN           | FLAT            | D1            | D2             | L1            | L2             |
| <b>GMH56060</b> | <b>GMH57060</b> | <b>6.0</b>    | 6              | 24            | 75             |
| <b>GMH56080</b> | <b>GMH57080</b> | <b>8.0</b>    | 8              | 32            | 75             |
| <b>GMH56100</b> | <b>GMH57100</b> | <b>10.0</b>   | 10             | 40            | 100            |
| <b>GMH56120</b> | <b>GMH57120</b> | <b>12.0</b>   | 12             | 48            | 120            |
| <b>GMH56160</b> | <b>GMH57160</b> | <b>16.0</b>   | 16             | 64            | 140            |
| <b>GMH56200</b> | <b>GMH57200</b> | <b>20.0</b>   | 20             | 80            | 150            |
| <b>GMH56250</b> | <b>GMH57250</b> | <b>25.0</b>   | 25             | 100           | 170            |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance         |
|--------------------------|------------------------------|
| 0 ~ -0.03                | h5<br>* Shank Dia. ≥ Ø12: h6 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

| ISO Material Description | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     | K              |                   |                     |     |     |     |     |
|--------------------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|----------------|-------------------|---------------------|-----|-----|-----|-----|
|                          | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |     |
| VDI 3323                 | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14             | 15                | 16                  | 17  | 18  | 19  | 20  |
| HRc                      | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180            | 180               | 260                 | 160 | 250 | 130 | 230 |
| Recommended              | ◎               | ◎   | ◎   | ◎   | ◎   | ◎               | ◎   | ◎   | ◎   | ◎   | ◎                               | ◎               | ◎   | ◎              | ◎                 | ◎                   | ◎   | ◎   | ◎   | ◎   |

| ISO Material Description | N                      |     |                        |    | S   |     |                        |     |                             |    | H  |                 |                |                   |                    |    |    |    |    |    |    |
|--------------------------|------------------------|-----|------------------------|----|---|-----|------------------------|-----|-----------------------------|----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|
|                          | Aluminum-wrought alloy |     | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze / Brass) |     | Non Metallic Materials |     | Heat Resistant Super Alloys |    |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |
| VDI 3323                 | 21                     | 22  | 23                     | 24 | 25  | 26  | 27                     | 28  | 29                          | 30 | 31 | 32              | 33             | 34                | 35                 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRc                      | 60                     | 100 | 75                     | 90 | 130                                       | 110 | 90                     | 100 |                             |    | 15 | 30              | 25             | 38                | 34                 | 36 | 37 | 55 | 60 | 42 | 55 |
| Recommended              | ◎                      | ◎   | ◎                      | ◎  | ◎   | ◎   | ◎                      | ◎   | ◎                           | ◎  | ○  | ○               | ○              | ○                 | ○                  | ○  | ○  | ○  | ○  | ○  | ○  |

# HIGH PERFORMANCE SOLID CARBIDE END MILLS 5 FLUTE LONG LENGTH

**EMB72** PLAIN SHANK  
**EMB73** FLAT SHANK

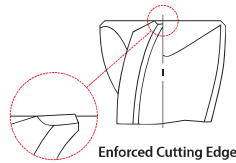
- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steels, cast iron, tool steels, titanium alloys, prehardened steels and low hardness materials under HRC40
- ▶ Excellent finished work piece
- ▶ Higher speeds, deeper cuts and excellent metal removal rates



Unit : mm

| EDP No.  |          | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | Chamfer |
|----------|----------|---------------|----------------|---------------|----------------|---------|
| PLAIN    | FLAT     | D1            | D2             | L1            | L2             |         |
| EMB72060 | EMB73060 | 6.0           | 6              | 13            | 57             | 0.1     |
| EMB72080 | EMB73080 | 8.0           | 8              | 19            | 63             | 0.1     |
| EMB72100 | EMB73100 | 10.0          | 10             | 22            | 72             | 0.1     |
| EMB72120 | EMB73120 | 12.0          | 12             | 26            | 83             | 0.1     |
| EMB72140 | EMB73140 | 14.0          | 14             | 26            | 83             | 0.2     |
| EMB72160 | EMB73160 | 16.0          | 16             | 32            | 92             | 0.2     |
| EMB72180 | EMB73180 | 18.0          | 18             | 32            | 92             | 0.2     |
| EMB72200 | EMB73200 | 20.0          | 20             | 38            | 104            | 0.2     |
| EMB72250 | EMB73250 | 25.0          | 25             | 38            | 104            | 0.2     |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance         |
|--------------------------|------------------------------|
| 0 ~ -0.03                | h5<br>* Shank Dia. ≥ Ø12: h6 |



◎ : Excellent ○ : Good

| ISO         | P               |     |     |     |     |                 |     |     |     |     | M                               |                 |     |     | K              |                   |                     |     |     |     |
|-------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|---------------------------------|-----------------|-----|-----|----------------|-------------------|---------------------|-----|-----|-----|
|             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloy steel and tool steel | Stainless steel |     |     | Grey cast iron | Nodular cast iron | Malleable cast iron |     |     |     |
| VDI 3323    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                              | 12              | 13  | 14  | 15             | 16                | 17                  | 18  | 19  | 20  |
| HRC         | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                             | 200             | 240 | 180 | 180            | 260               | 160                 | 250 | 130 | 230 |
| Recommended | ◎               | ◎   | ○   | ○   | ○   | ◎               | ○   | ○   | ○   | ◎   | ◎                               | ◎               | ◎   | ○   | ○              | ○                 | ○                   | ○   | ○   | ○   |

| ISO         | N                      |                        |    |   |     | S                      |                             |     |    |                 | H              |                   |                    |    |    |    |    |    |    |    |    |
|-------------|------------------------|------------------------|----|---|-----|------------------------|-----------------------------|-----|----|-----------------|----------------|-------------------|--------------------|----|----|----|----|----|----|----|----|
|             | Aluminum-wrought alloy | Aluminum-cast, alloyed |    | Copper and Copper Alloys (Bronze / Brass) |     | Non Metallic Materials | Heat Resistant Super Alloys |     |    | Titanium Alloys | Hardened steel | Chilled Cast Iron | Hardened Cast Iron |    |    |    |    |    |    |    |    |
| VDI 3323    | 21                     | 22                     | 23 | 24  | 25  | 26                     | 27                          | 28  | 29 | 30              | 31             | 32                | 33                 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| HRC         | 60                     | 100                    | 75 | 90  | 130 | 110                    | 90                          | 100 |    |                 | 15             | 30                | 25                 | 38 | 34 | 36 | 37 | 55 | 60 | 42 | 55 |
| Recommended | ◎                      | ◎                      | ◎  | ◎   | ◎   | ◎                      | ◎                           | ◎   | ◎  | ◎               | ◎              | ◎                 | ◎                  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  | ◎  |

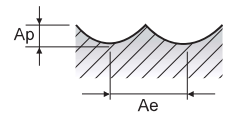
## RECOMMENDED CUTTING CONDITIONS

### GMG55, GMG56 SERIES

#### 4 FLUTE BALL NOSE

Vc = m/min.      fz = mm/tooth  
RPM = rev./min.      FEED = mm/min.

| ISO   | VDI 3323 | Material Description               | Ae              | Ap   | Parameter | Diameter (Ø) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------|----------|------------------------------------|-----------------|------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|       |          |                                    |                 |      |           | 3.0          | 4.0   | 5.0   | 6.0   | 8.0   | 10.0  | 12.0  | 16.0  | 18.0  | 20.0  | 25.0  |       |       |       |       |       |       |       |       |       |       |       |       |       |
| P     | 1~4      | Non-alloy steel                    | 0.5D            | 1.0D | Vc        | 162          | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   | 162   |       |       |       |       |       |       |
|       |          |                                    |                 |      | fz        | 0.025        | 0.027 | 0.03  | 0.04  | 0.06  | 0.065 | 0.07  | 0.075 | 0.08  | 0.09  | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 |       |       |       |       |
|       | 5        | Low alloy steel                    | 0.5D            | 1.0D | Vc        | 1719         | 1289  | 10313 | 8594  | 6446  | 5157  | 4297  | 3223  | 2865  | 2578  | 2063  | 1439  | 1199  | 971   | 863   | 959   | 1079  | 935   | 839   | 665   | 631   | 647   | 570   |       |
|       |          |                                    |                 |      | fz        | 0.025        | 0.027 | 0.03  | 0.04  | 0.06  | 0.065 | 0.07  | 0.075 | 0.08  | 0.09  | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 |
|       | 6-7      | High alloyed steel, and tool steel | 0.5D            | 1.0D | Vc        | 113          | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   | 113   |
|       |          |                                    |                 |      | fz        | 0.025        | 0.027 | 0.03  | 0.04  | 0.06  | 0.065 | 0.07  | 0.075 | 0.08  | 0.09  | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 |
|       | 8-9      | Stainless steel                    | 0.5D            | 1.0D | Vc        | 1719         | 1289  | 10313 | 8594  | 6446  | 5157  | 4297  | 3223  | 2865  | 2578  | 2063  | 1439  | 1199  | 971   | 863   | 959   | 1079  | 935   | 839   | 665   | 631   | 647   | 570   |       |
|       |          |                                    |                 |      | fz        | 0.025        | 0.027 | 0.03  | 0.04  | 0.06  | 0.065 | 0.07  | 0.075 | 0.08  | 0.09  | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 | 0.099 |
|       | 10-11    | Grey cast iron                     | 0.5D            | 1.0D | Vc        | 68           | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    | 68    |
|       |          |                                    |                 |      | fz        | 0.017        | 0.019 | 0.021 | 0.028 | 0.042 | 0.045 | 0.049 | 0.052 | 0.056 | 0.06  | 0.063 | 0.067 | 0.07  | 0.073 | 0.075 | 0.077 | 0.079 | 0.081 | 0.083 | 0.085 | 0.087 | 0.089 | 0.091 | 0.093 |
|       | M        | 12-13                              | Stainless steel | 0.5D | 1.0D      | Vc           | 7215  | 5411  | 4329  | 3608  | 2706  | 2165  | 1804  | 1353  | 1203  | 1082  | 866   | 491   | 411   | 364   | 404   | 455   | 390   | 354   | 281   | 269   | 273   | 242   | 242   |
|       |          |                                    |                 |      |           | fz           | 0.015 | 0.015 | 0.025 | 0.03  | 0.04  | 0.045 | 0.05  | 0.054 | 0.058 | 0.063 | 0.068 | 0.073 | 0.077 | 0.081 | 0.085 | 0.089 | 0.093 | 0.097 | 0.101 | 0.105 | 0.109 | 0.113 | 0.117 |
| 14.1  |          | Titanium Alloys                    | 0.5D            | 1.0D | Vc        | 8170         | 6127  | 4902  | 4085  | 3064  | 2451  | 2042  | 1532  | 1362  | 1225  | 980   | 490   | 368   | 490   | 490   | 490   | 490   | 490   | 441   | 408   | 331   | 321   | 284   | 231   |
|       |          |                                    |                 |      | fz        | 0.02         | 0.02  | 0.025 | 0.041 | 0.045 | 0.05  | 0.055 | 0.06  | 0.064 | 0.068 | 0.073 | 0.077 | 0.081 | 0.085 | 0.089 | 0.093 | 0.097 | 0.101 | 0.105 | 0.109 | 0.113 | 0.117 | 0.121 | 0.125 |
| 14.2  |          | Titanium Alloys                    | 0.5D            | 1.0D | Vc        | 8170         | 6127  | 4902  | 4085  | 3064  | 2451  | 2042  | 1532  | 1362  | 1225  | 980   | 654   | 490   | 490   | 490   | 490   | 490   | 490   | 441   | 408   | 331   | 321   | 284   | 231   |
|       |          |                                    |                 |      | fz        | 0.02         | 0.02  | 0.025 | 0.041 | 0.045 | 0.05  | 0.055 | 0.06  | 0.064 | 0.068 | 0.073 | 0.077 | 0.081 | 0.085 | 0.089 | 0.093 | 0.097 | 0.101 | 0.105 | 0.109 | 0.113 | 0.117 | 0.121 | 0.125 |
| 15-20 |          | Heat Resistant Super Alloys        | 0.5D            | 1.0D | Vc        | 119          | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   | 119   |
|       |          |                                    |                 |      | fz        | 0.031        | 0.033 | 0.037 | 0.05  | 0.074 | 0.081 | 0.087 | 0.093 | 0.099 | 0.105 | 0.111 | 0.117 | 0.123 | 0.129 | 0.135 | 0.141 | 0.147 | 0.153 | 0.159 | 0.165 | 0.171 | 0.177 | 0.183 | 0.189 |
| 31-35 |          | Titanium Alloys                    | 0.5D            | 0.3D | Vc        | 2228         | 1671  | 1337  | 1114  | 836   | 668   | 557   | 418   | 371   | 334   | 267   | 125   | 94    | 91    | 125   | 104   | 94    | 85    | 70    | 67    | 60    | 51    | 51    | 51    |
|       |          |                                    |                 |      | fz        | 0.018        | 0.018 | 0.022 | 0.037 | 0.04  | 0.045 | 0.049 | 0.054 | 0.058 | 0.063 | 0.068 | 0.073 | 0.077 | 0.081 | 0.085 | 0.089 | 0.093 | 0.097 | 0.101 | 0.105 | 0.109 | 0.113 | 0.117 | 0.121 |
| 36-37 |          | Titanium Alloys                    | 0.5D            | 0.3D | Vc        | 4987         | 3740  | 2992  | 2493  | 1870  | 1496  | 1247  | 935   | 831   | 748   | 598   | 359   | 269   | 263   | 369   | 299   | 269   | 244   | 202   | 193   | 174   | 146   | 146   | 146   |
|       |          |                                    |                 |      | fz        | 0.018        | 0.018 | 0.022 | 0.037 | 0.04  | 0.045 | 0.049 | 0.054 | 0.058 | 0.063 | 0.068 | 0.073 | 0.077 | 0.081 | 0.085 | 0.089 | 0.093 | 0.097 | 0.101 | 0.105 | 0.109 | 0.113 | 0.117 | 0.121 |



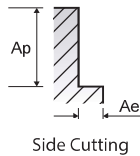
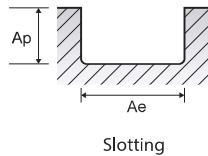
GMF52, GMF54, GMF56, GMF58, GMF60, GMF62,  
GMF53, GMF55, GMF57, GMF59, GMF61, GMF63 SERIES

4 FLUTE - SIDE & SLOTTING

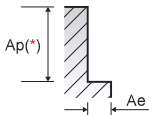
Vc = m/min. fz = mm/tooth  
RPM = rev./min. FEED = mm/min.

| ISO | VDI 3323 | Material Description               | Ae    |          | Ap             |                | Parameter | Diameter (Ø) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----|----------|------------------------------------|-------|----------|----------------|----------------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|     |          |                                    | Side  | Slotting | Side           | Slotting       |           | 3.0          | 4.0   | 5.0   | 6.0   | 8.0   | 10.0  | 12.0  | 14.0  | 16.0  | 18.0  | 20.0  | 25.0  |       |       |       |       |       |       |
| P   | 1-4      | Non-alloy steel                    | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 152          | 152   | 152   | 152   | 152   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   |       |       |
|     |          |                                    |       |          |                |                | fz        | 0.005        | 0.008 | 0.011 | 0.016 | 0.027 | 0.038 | 0.047 | 0.049 | 0.053 | 0.059 | 0.065 | 0.064 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 |
|     |          |                                    | RPM   | 16128    | 12096          | 9677           | 8064      | 6048         | 5348  | 4456  | 3820  | 3342  | 2971  | 2674  | 2139  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  |       |       |
|     |          |                                    | FEED  | 323      | 387            | 426            | 516       | 653          | 813   | 838   | 749   | 709   | 701   | 695   | 548   | 435   | 435   | 435   | 435   | 435   | 435   | 435   | 435   | 435   |       |
|     | 5        | Low alloy steel                    | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 107          | 107   | 107   | 107   | 107   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   |       |
|     |          |                                    |       |          |                |                | fz        | 0.005        | 0.008 | 0.011 | 0.016 | 0.027 | 0.038 | 0.047 | 0.049 | 0.053 | 0.059 | 0.065 | 0.064 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 |
|     |          |                                    | RPM   | 11353    | 8515           | 6812           | 5677      | 4257         | 3724  | 3104  | 2660  | 2328  | 2069  | 1862  | 1490  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  |       |
|     |          |                                    | FEED  | 227      | 272            | 300            | 363       | 460          | 566   | 583   | 521   | 493   | 488   | 484   | 381   | 300   | 300   | 300   | 300   | 300   | 300   | 300   | 300   | 300   | 300   |
|     | 6-7      | Low alloy steel                    | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 152          | 152   | 152   | 152   | 152   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   | 168   |       |
|     |          |                                    |       |          |                |                | fz        | 0.005        | 0.008 | 0.011 | 0.016 | 0.027 | 0.038 | 0.047 | 0.049 | 0.053 | 0.059 | 0.065 | 0.064 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 |
|     |          |                                    | RPM   | 16128    | 12096          | 9677           | 8064      | 6048         | 5348  | 4456  | 3820  | 3342  | 2971  | 2674  | 2139  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  | 1816  |
|     |          |                                    | FEED  | 323      | 387            | 426            | 516       | 653          | 813   | 838   | 749   | 709   | 701   | 695   | 548   | 435   | 435   | 435   | 435   | 435   | 435   | 435   | 435   | 435   | 435   |
|     | 8-9      | Low alloy steel                    | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 107          | 107   | 107   | 107   | 107   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   | 117   |
|     |          |                                    |       |          |                |                | fz        | 0.005        | 0.008 | 0.011 | 0.016 | 0.027 | 0.038 | 0.047 | 0.049 | 0.053 | 0.059 | 0.065 | 0.064 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 | 0.065 |
|     |          |                                    | RPM   | 11353    | 8515           | 6812           | 5677      | 4257         | 3724  | 3104  | 2660  | 2328  | 2069  | 1862  | 1490  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  | 1240  |
|     |          |                                    | FEED  | 227      | 272            | 300            | 363       | 460          | 566   | 583   | 521   | 493   | 488   | 484   | 381   | 300   | 300   | 300   | 300   | 300   | 300   | 300   | 300   | 300   | 300   |
|     | 10-11    | High alloyed steel, and tool steel | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 64           | 64    | 64    | 64    | 64    | 70    | 70    | 70    | 70    | 70    | 70    | 70    | 70    | 70    | 70    | 70    | 70    | 70    |
|     |          |                                    |       |          |                |                | fz        | 0.003        | 0.006 | 0.008 | 0.011 | 0.019 | 0.027 | 0.032 | 0.034 | 0.037 | 0.041 | 0.045 | 0.045 | 0.045 | 0.045 | 0.045 | 0.045 | 0.045 | 0.045 |
|     |          |                                    | RPM   | 6791     | 5093           | 4074           | 3395      | 2546         | 2228  | 1857  | 1592  | 1393  | 1238  | 1114  | 891   | 737   | 737   | 737   | 737   | 737   | 737   | 737   | 737   | 737   | 737   |
|     |          |                                    | FEED  | 81       | 122            | 130            | 149       | 194          | 241   | 238   | 216   | 206   | 203   | 201   | 160   | 129   | 129   | 129   | 129   | 129   | 129   | 129   | 129   | 129   | 129   |
| M   | 12-13    | Stainless steel                    | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 148          | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   | 148   |       |       |
|     |          |                                    |       |          |                |                | fz        | 0.004        | 0.006 | 0.009 | 0.013 | 0.022 | 0.034 | 0.039 | 0.042 | 0.045 | 0.05  | 0.055 | 0.055 | 0.055 | 0.055 | 0.055 | 0.055 | 0.055 | 0.055 |
|     |          |                                    | RPM   | 15703    | 11777          | 9422           | 7852      | 5899         | 4711  | 3926  | 3365  | 2944  | 2617  | 2355  | 1884  | 1570  | 1570  | 1570  | 1570  | 1570  | 1570  | 1570  | 1570  | 1570  | 1570  |
|     |          |                                    | FEED  | 251      | 283            | 339            | 408       | 518          | 641   | 612   | 565   | 530   | 523   | 525   | 416   | 325   | 325   | 325   | 325   | 325   | 325   | 325   | 325   | 325   | 325   |
|     | 14.1     | Stainless steel                    | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 106          | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   | 106   |
|     |          |                                    |       |          |                |                | fz        | 0.005        | 0.008 | 0.013 | 0.018 | 0.028 | 0.048 | 0.055 | 0.059 | 0.062 | 0.07  | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 |
|     |          |                                    | RPM   | 11247    | 8435           | 6748           | 5623      | 4218         | 3374  | 2812  | 2410  | 2109  | 1874  | 1687  | 1350  | 1124  | 1124  | 1124  | 1124  | 1124  | 1124  | 1124  | 1124  | 1124  | 1124  |
|     |          |                                    | FEED  | 225      | 270            | 351            | 405       | 472          | 648   | 619   | 569   | 523   | 525   | 520   | 416   | 325   | 325   | 325   | 325   | 325   | 325   | 325   | 325   | 325   | 325   |
|     | 14.2     | Stainless steel                    | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 95           | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    | 95    |
|     |          |                                    |       |          |                |                | fz        | 0.005        | 0.008 | 0.013 | 0.018 | 0.028 | 0.048 | 0.055 | 0.059 | 0.062 | 0.07  | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 | 0.077 |
|     |          |                                    | RPM   | 10080    | 7560           | 6048           | 5040      | 3780         | 3024  | 2520  | 2160  | 1890  | 1680  | 1512  | 1210  | 1008  | 1008  | 1008  | 1008  | 1008  | 1008  | 1008  | 1008  | 1008  | 1008  |
|     |          |                                    | FEED  | 202      | 242            | 314            | 363       | 423          | 581   | 554   | 510   | 469   | 464   | 460   | 368   | 291   | 291   | 291   | 291   | 291   | 291   | 291   | 291   | 291   | 291   |
| K   | 15-20    | Grey cast iron                     | 0.5D  | 1.0D     | 1.5D<br>(1.2D) | 1.0D<br>(0.8D) | Vc        | 112          | 112   | 112   | 112   | 112   | 123   | 123   | 123   | 123   | 123   | 123   | 123   | 123   | 123   | 123   | 123   | 123   |       |
|     |          |                                    |       |          |                |                | fz        | 0.006        | 0.01  | 0.014 | 0.02  | 0.034 | 0.048 | 0.058 | 0.061 | 0.065 | 0.073 | 0.081 | 0.079 | 0.079 | 0.079 | 0.079 | 0.079 | 0.079 | 0.079 |
|     |          |                                    | RPM   | 11884    | 8913           | 7130           | 5942      | 4456         | 3915  | 3263  | 2797  | 2447  | 2175  | 1958  | 1566  | 1299  | 1299  | 1299  | 1299  | 1299  | 1299  | 1299  | 1299  | 1299  | 1299  |
|     |          |                                    | FEED  | 285      | 357            | 399            | 475       | 606          | 752   | 757   | 682   | 636   | 635   | 634   | 495   | 396   | 396   | 396   | 396   | 396   | 396   | 396   | 396   | 396   | 396   |
| S   | 31-35    | Heat Resistant Super Alloys        | 0.25D | 1.0D     | 1.0D           | 0.5D           | Vc        | 26           | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    | 26    |       |
|     |          |                                    |       |          |                |                | fz        | 0.005        | 0.007 | 0.008 | 0.012 | 0.019 | 0.033 | 0.038 | 0.04  | 0.043 | 0.048 | 0.054 | 0.052 | 0.052 | 0.052 | 0.052 | 0.052 | 0.052 | 0.052 |
|     |          |                                    | RPM   | 2759     | 2069           | 1655           | 1379      | 1035         | 828   | 690   | 591   | 517   | 460   | 414   | 331   | 275   | 275   | 275   | 275   | 275   | 275   | 275   | 275   | 275   | 275   |
|     |          |                                    | FEED  | 55       | 58             | 53             | 66        | 79           | 109   | 105   | 95    | 89    | 88    | 89    | 69    | 53    | 53    | 53    | 53    | 53    | 53    | 53    | 53    | 53    | 53    |
|     | 36-37    | Titanium Alloys                    | 0.4D  | 1.0D     | 1.0D           | 0.5D           | Vc        | 58           | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    | 58    |
|     |          |                                    |       |          |                |                | fz        | 0.004        | 0.007 | 0.011 | 0.016 | 0.025 | 0.042 | 0.05  | 0.053 | 0.055 | 0.062 | 0.068 | 0.069 | 0.069 | 0.069 | 0.069 | 0.069 | 0.069 | 0.069 |
|     |          |                                    | RPM   | 6154     | 4615           | 3692           | 3077      | 2308         | 1846  | 1538  | 1319  | 1154  | 1026  | 923   | 738   | 615   | 615   | 615   | 615   | 615   | 615   | 615   | 615   | 615   | 615   |
|     |          |                                    | FEED  | 98       | 129            | 162            | 197       | 231          | 310   | 308   | 280   | 254   | 254   | 251   | 204   | 155   | 155   | 155   | 155   | 155   | 155   | 155   | 155   | 155   | 155   |

(\*): Short length & Neck type



(\*): If product's length of Cut (L.O.C) is below 2D, it must be applied L.O.C x 90%



Ap(\*)

Ae

GMG16, GMG18, GMG12, GMG14,  
GMG17, GMG19, GMG13, GMG15 SERIES

6 FLUTE - SIDE CUTTING

Vc = m/min. fz = mm/tooth  
RPM = rev./min. FEED = mm/min.

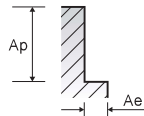
| ISO | VDI 3323        | Material Description | Ae    | Ap    | Parameter | Diameter (Ø) |       |       |       |       |       |       |       |
|-----|-----------------|----------------------|-------|-------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|
|     |                 |                      |       |       |           | 6.0          | 8.0   | 10.0  | 12.0  | 16.0  | 20.0  | 25.0  |       |
| P   | 1-4             | Non-alloy steel      | 0.05D | 2.0D  | Vc        | 300          | 300   | 300   | 300   | 300   | 300   | 300   | 300   |
|     |                 |                      |       |       | fz        | 0.068        | 0.116 | 0.144 | 0.173 | 0.202 | 0.225 | 0.232 | 0.232 |
|     |                 |                      | RPM   | 15915 | 11937     | 9549         | 7958  | 5968  | 4775  | 3820  | 3200  |       |       |
|     |                 |                      | FEED  | 6494  | 8308      | 8251         | 8260  | 7234  | 6446  | 5317  | 4484  |       |       |
|     | 5               | Low alloy steel      | 0.05D | 2.0D  | Vc        | 203          | 203   | 203   | 203   | 203   | 203   | 203   | 203   |
|     |                 |                      |       |       | fz        | 0.05         | 0.085 | 0.106 | 0.128 | 0.149 | 0.167 | 0.174 | 0.174 |
|     |                 |                      | RPM   | 10769 | 8077      | 6462         | 5385  | 4039  | 3231  | 2585  | 2184  |       |       |
|     |                 |                      | FEED  | 4119  | 4119      | 4110         | 4135  | 3610  | 3237  | 2698  | 2240  |       |       |
|     | 6-7             | Low alloy steel      | 0.05D | 2.0D  | Vc        | 300          | 300   | 300   | 300   | 300   | 300   | 300   | 300   |
|     |                 |                      |       |       | fz        | 0.068        | 0.116 | 0.144 | 0.173 | 0.202 | 0.225 | 0.232 | 0.232 |
|     |                 |                      | RPM   | 15915 | 11937     | 9549         | 7958  | 5968  | 4775  | 3820  | 3200  |       |       |
|     |                 |                      | FEED  | 6494  | 8308      | 8251         | 8260  | 7234  | 6446  | 5317  | 4484  |       |       |
| 8-9 | Low alloy steel | 0.05D                | 2.0D  | Vc    | 203       | 203          | 203   | 203   | 203   | 203   | 203   | 203   |       |
|     |                 |                      |       | fz    | 0.05      | 0.085        | 0.106 | 0.128 | 0.149 | 0.167 | 0.174 | 0.174 |       |
|     |                 | RPM                  | 10769 | 8077  | 6462      | 5385         | 4039  | 3231  | 2585  | 2184  |       |       |       |

**GMH58, GMH59,  
GMH56, GMH57** SERIES

**6 FLUTE CHIP SPLITTER - SIDE CUTTING**

Vc = m/min.      fz = mm/tooth  
RPM = rev./min.      FEED = mm/min.

| ISO | VDI 3323 | Material Description | Ae              | Ap              | Parameter       | Diameter (Ø)                       |                 |                             |       |       |       |       |       |       |       |       |       |       |
|-----|----------|----------------------|-----------------|-----------------|-----------------|------------------------------------|-----------------|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|     |          |                      |                 |                 |                 | 6.0                                | 8.0             | 10.0                        | 12.0  | 16.0  | 20.0  | 25.0  |       |       |       |       |       |       |
| P   | 1-4      | Non-alloy steel      | 0.05D           | 3.0D            | Vc              | 270                                | 270             | 270                         | 270   | 270   | 270   | 270   |       |       |       |       |       |       |
|     |          |                      |                 |                 | fz              | 0.034                              | 0.058           | 0.072                       | 0.087 | 0.101 | 0.113 | 0.116 |       |       |       |       |       |       |
|     |          |                      |                 |                 | RPM             | 14324                              | 10743           | 8594                        | 7162  | 5371  | 4297  | 3438  |       |       |       |       |       |       |
|     | P        | 5                    | Low alloy steel | 0.05D           | 3.0D            | Vc                                 | 182.7           | 182.7                       | 182.7 | 182.7 | 182.7 | 182.7 | 182.7 |       |       |       |       |       |
|     |          |                      |                 |                 |                 | fz                                 | 0.025           | 0.043                       | 0.053 | 0.064 | 0.075 | 0.084 | 0.087 |       |       |       |       |       |
|     |          |                      |                 |                 |                 | RPM                                | 9693            | 7269                        | 5816  | 4846  | 3635  | 2908  | 2326  |       |       |       |       |       |
|     |          | P                    | 6-7             | Low alloy steel | 0.05D           | 3.0D                               | Vc              | 270                         | 270   | 270   | 270   | 270   | 270   | 270   |       |       |       |       |
|     |          |                      |                 |                 |                 |                                    | fz              | 0.034                       | 0.058 | 0.072 | 0.087 | 0.101 | 0.113 | 0.116 |       |       |       |       |
|     |          |                      |                 |                 |                 |                                    | RPM             | 14324                       | 10743 | 8594  | 7162  | 5371  | 4297  | 3438  |       |       |       |       |
|     |          |                      | P               | 8-9             | Low alloy steel | 0.05D                              | 3.0D            | Vc                          | 182.7 | 182.7 | 182.7 | 182.7 | 182.7 | 182.7 | 182.7 |       |       |       |
|     |          |                      |                 |                 |                 |                                    |                 | fz                          | 0.025 | 0.043 | 0.053 | 0.064 | 0.075 | 0.084 | 0.087 |       |       |       |
|     |          |                      |                 |                 |                 |                                    |                 | RPM                         | 9693  | 7269  | 5816  | 4846  | 3635  | 2908  | 2326  |       |       |       |
|     |          |                      |                 | P               | 10-11.1         | High alloyed steel, and tool steel | 0.05D           | 3.0D                        | Vc    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |       |       |
|     |          |                      |                 |                 |                 |                                    |                 |                             | fz    | 0.021 | 0.036 | 0.044 | 0.053 | 0.062 | 0.069 | 0.072 |       |       |
|     |          |                      |                 |                 |                 |                                    |                 |                             | RPM   | 4775  | 3581  | 2865  | 2387  | 1790  | 1432  | 1146  |       |       |
|     |          |                      |                 |                 | M               | 12-13                              | Stainless steel | 0.05D                       | 3.0D  | Vc    | 191.7 | 191.7 | 191.7 | 191.7 | 191.7 | 191.7 | 191.7 |       |
|     |          |                      |                 |                 |                 |                                    |                 |                             |       | fz    | 0.025 | 0.042 | 0.052 | 0.063 | 0.073 | 0.081 | 0.084 |       |
|     |          |                      |                 |                 |                 |                                    |                 |                             |       | RPM   | 10170 | 7628  | 6102  | 5085  | 3814  | 3051  | 2441  |       |
|     |          |                      |                 |                 |                 | M                                  | 14.1            | Stainless steel             | 0.05D | 3.0D  | Vc    | 132.3 | 132.3 | 132.3 | 132.3 | 132.3 | 132.3 | 132.3 |
|     |          |                      |                 |                 |                 |                                    |                 |                             |       |       | fz    | 0.021 | 0.036 | 0.044 | 0.053 | 0.062 | 0.069 | 0.072 |
| RPM |          |                      |                 |                 |                 |                                    |                 |                             |       |       | 7019  | 5264  | 4211  | 3509  | 2632  | 2106  | 1684  |       |
| M   |          |                      |                 |                 |                 |                                    | 14.2            | Stainless steel             | 0.05D | 3.0D  | Vc    | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 | 120.6 |
|     |          |                      |                 |                 |                 |                                    |                 |                             |       |       | fz    | 0.021 | 0.036 | 0.044 | 0.053 | 0.062 | 0.069 | 0.071 |
|     | RPM      |                      |                 |                 |                 |                                    |                 |                             |       |       | 6398  | 4799  | 3839  | 3199  | 2399  | 1919  | 1536  |       |
|     | S        |                      |                 |                 |                 |                                    | 31-35           | Heat Resistant Super Alloys | 0.05D | 3.0D  | Vc    | 29.7  | 29.7  | 29.7  | 29.7  | 29.7  | 29.7  | 29.7  |
|     |          |                      |                 |                 |                 |                                    |                 |                             |       |       | fz    | 0.017 | 0.028 | 0.035 | 0.041 | 0.049 | 0.056 | 0.058 |
|     |          | RPM                  |                 |                 |                 |                                    |                 |                             |       |       | 1576  | 1182  | 945   | 788   | 591   | 473   | 378   |       |
|     |          | S                    |                 |                 |                 |                                    | 36-37           | Titanium Alloys             | 0.05D | 3.0D  | Vc    | 104.4 | 104.4 | 104.4 | 104.4 | 104.4 | 104.4 | 104.4 |
|     |          |                      |                 |                 |                 |                                    |                 |                             |       |       | fz    | 0.017 | 0.028 | 0.035 | 0.042 | 0.049 | 0.057 | 0.059 |
|     |          |                      | RPM             |                 |                 |                                    |                 |                             |       |       | 5539  | 4154  | 3323  | 2769  | 2077  | 1662  | 1329  |       |



**EMB72, EMB73** SERIES

**5 FLUTE - SIDE CUTTING**

Vc = m/min.      fz = mm/tooth  
RPM = rev./min.      FEED = mm/min.

| ISO | VDI 3323 | Material Description | Ae              | Ap                                 | Parameter | Diameter (Ø) |       |       |       |       |       |       |       |       |
|-----|----------|----------------------|-----------------|------------------------------------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
|     |          |                      |                 |                                    |           | 6.0          | 8.0   | 10.0  | 12.0  | 14.0  | 16.0  | 20.0  |       |       |
| P   | 1-2      | Non-alloy steel      | 0.25D           | 1.25D                              | Vc        | 135          | 135   | 135   | 135   | 135   | 135   | 135   |       |       |
|     |          |                      |                 |                                    | fz        | 0.034        | 0.038 | 0.050 | 0.063 | 0.069 | 0.076 | 0.089 |       |       |
|     | P        | 6                    | Low alloy steel | 0.25D                              | 1.25D     | Vc           | 1218  | 5371  | 4297  | 3581  | 3069  | 2686  | 2149  |       |
|     |          |                      |                 |                                    |           | fz           | 0.034 | 0.038 | 0.050 | 0.063 | 0.069 | 0.076 | 0.089 |       |
|     |          | P                    | 10              | High alloyed steel, and tool steel | 0.25D     | 1.25D        | Vc    | 1218  | 1021  | 1074  | 1128  | 1059  | 1021  | 956   |
|     |          |                      |                 |                                    |           |              | fz    | 0.034 | 0.038 | 0.050 | 0.063 | 0.069 | 0.076 | 0.089 |
| M   |          |                      | 12-13           | Stainless steel                    | 0.25D     | 1.25D        | Vc    | 105   | 105   | 105   | 145   | 105   | 105   | 105   |
|     |          |                      |                 |                                    |           |              | fz    | 0.030 | 0.032 | 0.038 | 0.043 | 0.064 | 0.068 | 0.076 |
|     | M        |                      | 14.1            | Stainless steel                    | 0.25D     | 1.25D        | Vc    | 5570  | 4178  | 3342  | 3846  | 2387  | 2089  | 1671  |
|     |          |                      |                 |                                    |           |              | fz    | 0.030 | 0.032 | 0.038 | 0.063 | 0.065 | 0.069 | 0.076 |
|     |          | K                    | 15-20           | Grey cast iron                     | 0.25D     | 1.25D        | Vc    | 6101  | 4576  | 3661  | 3050  | 2615  | 2288  | 1830  |
|     |          |                      |                 |                                    |           |              | fz    | 0.030 | 0.032 | 0.038 | 0.063 | 0.065 | 0.069 | 0.076 |
| S   |          |                      | 31-35           | Heat Resistant Super Alloys        | 0.25D     | 1.0D         | Vc    | 915   | 732   | 696   | 961   | 850   | 789   | 696   |
|     |          |                      |                 |                                    |           |              | fz    | 0.017 | 0.020 | 0.025 | 0.036 | 0.045 | 0.048 | 0.060 |
|     | S        |                      | 36-37           | Titanium Alloys                    | 0.25D     | 1.25D        | Vc    | 1326  | 995   | 796   | 663   | 568   | 497   | 398   |
|     |          |                      |                 |                                    |           |              | fz    | 0.017 | 0.020 | 0.025 | 0.036 | 0.045 | 0.048 | 0.060 |
|     |          | S                    | 36-37           | Titanium Alloys                    | 0.25D     | 1.25D        | Vc    | 113   | 99    | 99    | 119   | 128   | 119   | 119   |
|     |          |                      |                 |                                    |           |              | fz    | 0.030 | 0.031 | 0.038 | 0.050 | 0.057 | 0.063 | 0.075 |
| S   |          |                      | 36-37           | Titanium Alloys                    | 0.25D     | 1.25D        | Vc    | 4509  | 3382  | 2706  | 2255  | 1933  | 1691  | 1353  |
|     |          |                      |                 |                                    |           |              | fz    | 0.030 | 0.031 | 0.038 | 0.050 | 0.057 | 0.063 | 0.075 |

