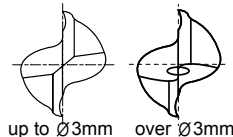


HSS-PM, 2 FLUTE LONG LENGTH

- HSS-PM, 2 SCHNEIDEN LANG
- FRAISES HSS-PM, 2 DENTS, SÉRIE LONGUE
- 2 TAGLIENTI, SERIE LUNGA, HSS-PM

- ▶ Designed to machine carbon steels, alloyed steels, stainless steels.
- ▶ 2 Flute design for slotting.
- ▶ Suitable for high speed cutting of difficult-to-cut materials.
- ▶ YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- ▶ Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- ▶ 2 Schneiden, Geeignet für Nutenfräsen.
- ▶ Geeignet für Hochgeschwindigkeitsfräsen von schwer zu zerspanenden Materialien.
- ▶ Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



HSS PM
DIN 844
2
30°
DIN 1835B
P.656~657

Unit : mm

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|----------|-------------|---------------|----------------|---------------|----------------|
| UNCOATED | TiAlN based | e8 | h6 | | |
| E9A29010 | GAA29010 | 1.0 | 6 | 3 | 47 |
| E9A29020 | GAA29020 | 2.0 | 6 | 7 | 51 |
| E9A29030 | GAA29030 | 3.0 | 6 | 8 | 52 |
| E9A29040 | GAA29040 | 4.0 | 6 | 11 | 55 |
| E9A29050 | GAA29050 | 5.0 | 6 | 13 | 57 |
| E9A29060 | GAA29060 | 6.0 | 6 | 13 | 57 |
| E9A29070 | GAA29070 | 7.0 | 10 | 16 | 66 |
| E9A29080 | GAA29080 | 8.0 | 10 | 19 | 69 |
| E9A29090 | GAA29090 | 9.0 | 10 | 19 | 69 |
| E9A29100 | GAA29100 | 10.0 | 10 | 22 | 72 |
| E9A29120 | GAA29120 | 12.0 | 12 | 26 | 83 |
| E9A29140 | GAA29140 | 14.0 | 12 | 26 | 83 |
| E9A29160 | GAA29160 | 16.0 | 16 | 32 | 92 |
| E9A29180 | GAA29180 | 18.0 | 16 | 32 | 92 |
| E9A29200 | GAA29200 | 20.0 | 20 | 38 | 104 |
| E9A29220 | GAA29220 | 22.0 | 20 | 38 | 104 |
| E9A29250 | GAA29250 | 25.0 | 25 | 45 | 121 |

Tolerances according to DIN 7160 & 7161

| Tolerance range in μm | | | | | |
|----------------------------------|--------------|--------------|--------------|---------------|---------------|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| e8 | - 14 - 28 | - 20 - 38 | - 25 - 47 | - 32 - 59 | - 40 - 73 |
| h6 | 0 - 6 | 0 - 8 | 0 - 9 | 0 - 11 | 0 - 13 |

◎ : Excellent ○ : Good

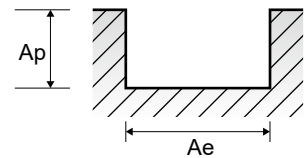
| ISO Material Description | P | | | | | | | | | | M | | | | K | | | | | | |
|--------------------------------|------------------------|-----|------------------------|-----|-----|---|-----|-----|------------------------|-----|------------------------------------|-----|-----|-----|-----------------|-----------------|----------------|----------------|-------------------|--------------------|---------------------|
| | Non-alloy steel | | | | | Low alloy steel | | | | | High alloyed steel, and tool steel | | | | Stainless steel | | Grey cast iron | | Nodular cast iron | | Malleable cast iron |
| 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 | 3 | 21 | |
| HB | 125 | 190 | 250 | 270 | 300 | 180 | 275 | 300 | 350 | 200 | 325 | 200 | 240 | 180 | 180 | 260 | 160 | 250 | 130 | 230 | |
| Recommend | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | |
| 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 | | | 200 | 280 | 250 | 350 | 320 | 400Rm | 1050Rm | 550 | 630 | 400 | 550 |
| HB | | | | | | | | | | | 15 | 30 | 25 | 38 | 34 | | | 55 | 60 | 42 | 55 |
| Recommend | | | | | | ○ | ○ | ○ | | | | | | | | | | | | | |

E9936 , E9A29 SERIES 2 FLUTE - SLOTTING

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

| ISO | VDI 3323 | Material Description | Ae | Ap | Parameter | Diameter (Ø) | | | | | | | | | | | | | | | |
|------|----------|--|------|-------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|
| | | | | | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 25.0 | | |
| P | 1 | Non-alloy steel | 1.0D | 0.5D | Vc | 30 | 30 | 35 | 40 | 45 | 45 | 45 | 45 | 50 | 45 | 45 | 40 | 40 | 40 | | |
| | | | | | fz | 0.007 | 0.015 | 0.024 | 0.031 | 0.035 | 0.047 | 0.064 | 0.071 | 0.073 | 0.089 | 0.094 | 0.102 | 0.096 | 0.093 | | |
| | | | | | RPM | 4775 | 3183 | 2785 | 2546 | 2387 | 1790 | 1432 | 1194 | 1137 | 895 | 796 | 637 | 579 | 509 | | |
| | FEED | | 67 | 95 | 134 | 158 | 167 | 168 | 183 | 170 | 166 | 159 | 150 | 130 | 111 | 95 | | | | | |
| | 2 | | 1.0D | 0.5D | Vc | 25 | 25 | 30 | 35 | 40 | 40 | 40 | 40 | 35 | 40 | 35 | 35 | 35 | 35 | | |
| | | | | | fz | 0.007 | 0.015 | 0.023 | 0.028 | 0.034 | 0.05 | 0.069 | 0.075 | 0.082 | 0.09 | 0.094 | 0.093 | 0.094 | 0.099 | | |
| | | | | | RPM | 3979 | 2653 | 2387 | 2228 | 2122 | 1592 | 1273 | 1061 | 796 | 796 | 619 | 557 | 506 | 446 | | |
| | FEED | | 56 | 80 | 110 | 125 | 144 | 159 | 176 | 159 | 131 | 143 | 116 | 104 | 95 | 88 | | | | | |
| | 3-4 | | 1.0D | 0.5D | Vc | 20 | 20 | 25 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 25 | | |
| | | | | | fz | 0.008 | 0.017 | 0.024 | 0.032 | 0.038 | 0.052 | 0.07 | 0.081 | 0.088 | 0.092 | 0.094 | 0.099 | 0.094 | 0.103 | | |
| | | | | | RPM | 3183 | 2122 | 1989 | 1910 | 1592 | 1194 | 955 | 796 | 682 | 597 | 531 | 477 | 434 | 318 | | |
| FEED | 51 | 72 | 95 | 122 | 121 | 124 | 134 | 129 | 110 | 110 | 100 | 95 | 82 | 66 | | | | | | | |
| 5 | 1.0D | 0.5D | Vc | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | | | | |
| | | | fz | 0.01 | 0.016 | 0.023 | 0.03 | 0.033 | 0.047 | 0.067 | 0.07 | 0.076 | 0.086 | 0.081 | 0.092 | 0.093 | 0.094 | | | | |
| | | | RPM | 2387 | 1592 | 1194 | 955 | 1061 | 796 | 637 | 531 | 455 | 398 | 354 | 318 | 289 | 255 | | | | |
| FEED | 48 | 51 | 55 | 57 | 70 | 75 | 85 | 74 | 69 | 68 | 57 | 59 | 54 | 48 | | | | | | | |
| 6 | 1.0D | 0.5D | Vc | 25 | 25 | 30 | 35 | 40 | 40 | 40 | 40 | 35 | 40 | 35 | 35 | 35 | 35 | | | | |
| | | | fz | 0.007 | 0.015 | 0.023 | 0.028 | 0.034 | 0.05 | 0.069 | 0.075 | 0.082 | 0.09 | 0.094 | 0.093 | 0.094 | 0.099 | | | | |
| | | | RPM | 3979 | 2653 | 2387 | 2228 | 2122 | 1592 | 1273 | 1061 | 796 | 796 | 619 | 557 | 506 | 446 | | | | |
| FEED | 56 | 80 | 110 | 125 | 144 | 159 | 176 | 159 | 131 | 143 | 116 | 104 | 95 | 88 | | | | | | | |
| 7 | 1.0D | 0.5D | Vc | 20 | 20 | 25 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 25 | | | | |
| | | | fz | 0.008 | 0.017 | 0.024 | 0.032 | 0.038 | 0.052 | 0.07 | 0.081 | 0.088 | 0.092 | 0.094 | 0.099 | 0.094 | 0.103 | | | | |
| | | | RPM | 3183 | 2122 | 1989 | 1910 | 1592 | 1194 | 955 | 796 | 682 | 597 | 531 | 477 | 434 | 318 | | | | |
| FEED | 51 | 72 | 95 | 122 | 121 | 124 | 134 | 129 | 110 | 110 | 100 | 95 | 82 | 66 | | | | | | | |
| 8 | 1.0D | 0.5D | Vc | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | | | | |
| | | | fz | 0.01 | 0.016 | 0.023 | 0.03 | 0.033 | 0.047 | 0.067 | 0.07 | 0.076 | 0.086 | 0.081 | 0.092 | 0.093 | 0.094 | | | | |
| | | | RPM | 2387 | 1592 | 1194 | 955 | 1061 | 796 | 637 | 531 | 455 | 398 | 354 | 318 | 289 | 255 | | | | |
| FEED | 48 | 51 | 55 | 57 | 70 | 75 | 85 | 74 | 69 | 68 | 57 | 59 | 54 | 48 | | | | | | | |
| 9 | 1.0D | 0.5D | Vc | 10 | 10 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | | | | |
| | | | fz | 0.01 | 0.017 | 0.021 | 0.025 | 0.037 | 0.046 | 0.068 | 0.069 | 0.074 | 0.083 | 0.083 | 0.083 | 0.083 | 0.086 | | | | |
| | | | RPM | 1592 | 1061 | 1194 | 955 | 796 | 597 | 477 | 398 | 341 | 298 | 265 | 239 | 217 | 191 | | | | |
| FEED | 32 | 36 | 50 | 48 | 59 | 55 | 65 | 55 | 50 | 50 | 44 | 40 | 36 | 33 | | | | | | | |
| 10 | 1.0D | 0.5D | Vc | 25 | 25 | 30 | 35 | 40 | 40 | 40 | 40 | 35 | 40 | 35 | 35 | 35 | 35 | | | | |
| | | | fz | 0.007 | 0.015 | 0.023 | 0.028 | 0.034 | 0.05 | 0.069 | 0.075 | 0.082 | 0.09 | 0.094 | 0.093 | 0.094 | 0.099 | | | | |
| | | | RPM | 3979 | 2653 | 2387 | 2228 | 2122 | 1592 | 1273 | 1061 | 796 | 796 | 619 | 557 | 506 | 446 | | | | |
| FEED | 56 | 80 | 110 | 125 | 144 | 159 | 176 | 159 | 131 | 143 | 116 | 104 | 95 | 88 | | | | | | | |
| 11.1 | 1.0D | 0.5D | Vc | 15 | 15 | 15 | 15 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | | | | |
| | | | fz | 0.01 | 0.016 | 0.023 | 0.03 | 0.033 | 0.047 | 0.067 | 0.07 | 0.076 | 0.086 | 0.081 | 0.092 | 0.093 | 0.094 | | | | |
| | | | RPM | 2387 | 1592 | 1194 | 955 | 1061 | 796 | 637 | 531 | 455 | 398 | 354 | 318 | 289 | 255 | | | | |
| FEED | 48 | 51 | 55 | 57 | 70 | 75 | 85 | 74 | 69 | 68 | 57 | 59 | 54 | 48 | | | | | | | |
| K | 15-20 | Grey cast iron Nodular cast iron Malleable cast iron | 1.0D | 0.5D | Vc | 25 | 25 | 30 | 35 | 40 | 40 | 40 | 40 | 35 | 40 | 35 | 35 | 35 | 35 | | |
| | | | | | fz | 0.007 | 0.015 | 0.023 | 0.028 | 0.034 | 0.05 | 0.069 | 0.075 | 0.082 | 0.09 | 0.094 | 0.093 | 0.094 | 0.099 | | |
| | | | | | RPM | 3979 | 2653 | 2387 | 2228 | 2122 | 1592 | 1273 | 1061 | 796 | 796 | 619 | 557 | 506 | 446 | | |
| | | | | | FEED | 56 | 80 | 110 | 125 | 144 | 159 | 176 | 159 | 131 | 143 | 116 | 104 | 95 | 88 | | |

※ The FEED, in long & extra long types, should be reduced by around 50%



SELECTION GUIDE



| SERIES | E9940 GA940 | E9A32 GAA32 | E9936 GA936 | E9A29 GAA29 |
|--------------------|----------------|----------------|----------------|----------------|
| FLUTE | 2 | 2 | 2 | 2 |
| HELIX ANGLE | 30° | 30° | 30° | 30° |
| CUTTING EDGE SHAPE | BALL NOSE | BALL NOSE | SQUARE | SQUARE |
| SIZE MIN | R0.5 | R1.0 | D1.0 | D1.0 |
| SIZE MAX | R12.5 | R12.5 | D25.0 | D25.0 |
| PAGE | 640 | 641 | 642 | 643 |

HSS-PM
TANK-POWER
END MILLS

High Toughness, for Stainless Steels, Carbon steels, Alloy Steels
For General Application, Rough & Finish

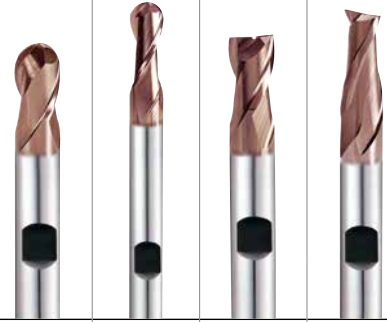


Please visit
globalyg1.com/mat
for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : P 654

| SHORT LENGTH | LONG LENGTH | SHORT LENGTH | LONG LENGTH |
|--------------|-------------|--------------|-------------|
| TiAlN based | TiAlN based | TiAlN based | TiAlN based |



| ISO | VDI 3323 | Material Description | Composition / Structure / Heat Treatment | HB | HRc | | | | | |
|-----|----------|---|--|---------------------|-----|----|---|---|---|---|
| P | 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 | ○ | ○ | ○ | ○ |
| M | 12 | Stainless steel | Ferritic / Martensitic Annealed | 200 | 15 | ◎ | ◎ | ◎ | ◎ | |
| | 13 | | Martensitic Quenched & Tempered | 240 | 23 | ◎ | ◎ | ◎ | ◎ | |
| | 14 | | Austenitic | 180 | 10 | ◎ | ◎ | ◎ | ◎ | |
| K | 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 | ◎ | ◎ | ◎ | ◎ | |
| N | 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 | | Cutting Alloys, PB>1% | 110 | | | ○ | ○ | ○ | ○ |
| | 27 | Copper and Copper Alloys (Bronze / Brass) | CuZn, CuSnZn (Brass) | 90 | | ○ | ○ | ○ | ○ | |
| | 28 | | CuSn, lead-free copper and electrolytic copper | 100 | | ○ | ○ | ○ | ○ | |
| | 29 | Non Metallic Materials | Duroplastic, Fiber Reinforced Plastic | | | | | | | |
| | 30 | | Rubber, Wood, etc. | | | | | | | |
| S | 31 | Heat Resistant Super Alloys | Fe Based Annealed | 200 | 15 | | | | | |
| | 32 | | Cured | 280 | 30 | | | | | |
| | 33 | | Annealed | 250 | 25 | | | | | |
| | 34 | | Ni or Co Based Cured | 350 | 38 | | | | | |
| | 35 | | Cast | 320 | 34 | | | | | |
| | 36 | Titanium Alloys | Pure Titanium | 400 Rm | | | | | | |
| | 37 | | Alpha + Beta Alloys Hardened | 1050 Rm | | | | | | |
| H | 38 | Hardened steel | Hardened | 550 | 55 | | | | | |
| | 39 | | Hardened | 630 | 60 | | | | | |
| | 40 | Chilled Cast Iron | Cast | 400 | 42 | | | | | |
| | 41 | Hardened Cast Iron | Hardened | 550 | 55 | | | | | |