



| Application  | $v_c$ factor | $f_z$ factor             | Feed width (ae)   | Feed depth (ap) |
|--------------|--------------|--------------------------|-------------------|-----------------|
| Slotting     | 1            | 1 (0.7 for $a_p = 2xd$ ) | 1xd               | 0.5 up to 1xd   |
| Roughing     | 1            | 1 (0.7 for $a_p = 2xd$ ) | 0.4 up to 0.9xd   | 0.5 up to 1xd   |
| Finishing    | 1            | 1                        | 0.01 up to 0.1xd  | 1 up to 2xd     |
| HPC-roughing | 1.3          | 1.5                      | 0.15 up to 0.4xd  | 1 up to 2xd     |
| HSC-roughing | 1.5          | 2                        | 0.05 up to 0.15xd | 1 up to 2xd     |

| Material                                                                                                                                                                                                                                                                                                                                        | Hardness                            | Recom-<br>mended<br>GH 100 type | Type of<br>applica-<br>tion | cut<br>Vc | fz (mm/z) with nom. Ø |       |       |       |       |       |       |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------|-----------------------------|-----------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|                                                                                                                                                                                                                                                                                                                                                 |                                     |                                 |                             |           | 3                     | 6     | 8     | 10    | 12    | 16    | 20    | 25    |
| <b>Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels</b><br>1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937<br>1.0718 11SMnPb30, 1.0736 11SMn37<br>1.0402 C22, 1.1178 C30E<br>1.0503 C45, 1.1191 C30E<br>1.0301 C10, 1.1121 C10E<br>1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9                | up to<br>850<br>N/mm <sup>2</sup>   | U (3-Flt.)                      | Slotting                    | 120       | 0.012                 | 0.024 | 0.041 | 0.045 | 0.054 | 0.070 | 0.090 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 140       | 0.014                 | 0.028 | 0.037 | 0.052 | 0.062 | 0.080 | 0.100 | 0.130 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 240       | 0.013                 | 0.026 | 0.035 | 0.050 | 0.059 | 0.080 | 0.100 | 0.120 |
| <b>Free-cutting steels, unalloyed case hardened steels, nitriding steels</b><br>1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20<br>1.0601 C60, 1.1221 C60E<br>1.7043 38Cr4<br>1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5<br>1.8504 34CrAl6<br>1.8519 31CrMoV9, 1.8550 34CrAlNi7                                                               | 850-<br>1,200<br>N/mm <sup>2</sup>  | U (3-Flt.)                      | Slotting                    | 105       | 0.012                 | 0.024 | 0.041 | 0.045 | 0.054 | 0.070 | 0.090 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 130       | 0.014                 | 0.028 | 0.037 | 0.052 | 0.062 | 0.080 | 0.100 | 0.130 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 210       | 0.013                 | 0.026 | 0.035 | 0.050 | 0.059 | 0.080 | 0.100 | 0.120 |
| <b>Alloyed heat-treatable, tool and high speed steels</b><br>1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4<br>1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4<br>1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrMo12-1<br>1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3<br>Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 | 850-<br>1,400<br>N/mm <sup>2</sup>  | U (3-Flt.)                      | Slotting                    | 90        | 0.011                 | 0.023 | 0.030 | 0.042 | 0.050 | 0.070 | 0.080 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 110       | 0.013                 | 0.026 | 0.035 | 0.048 | 0.058 | 0.080 | 0.100 | 0.120 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 180       | 0.013                 | 0.025 | 0.033 | 0.046 | 0.055 | 0.070 | 0.090 | 0.120 |
| <b>Hardened steel</b><br>Tool steel, heat-treatable steel, spring steel,<br>high-speed steel, case hardened steel, etc.<br>Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4;<br>1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2                                                                                                                 | up to<br>54 HRC<br><br>54-60 HRC    | U (3-Flt.)                      | Slotting                    | 50        | 0.010                 | 0.019 | 0.026 | 0.035 | 0.042 | 0.060 | 0.070 | 0.090 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | H (6-/8-Flt.)*                  | Roughing                    | 100       | 0.024                 | 0.048 | 0.064 | 0.088 | 0.105 | 0.140 | 0.180 | 0.220 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | H (6-/8-Flt.)                   | Finishing                   | 110       | 0.010                 | 0.019 | 0.026 | 0.035 | 0.042 | 0.060 | 0.070 | 0.090 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     |                                 | Finishing                   | 70        | 0.019                 | 0.038 | 0.050 | 0.070 | 0.084 | 0.110 | 0.140 | 0.180 |
| <b>Stainless steel</b><br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9<br>USA = 303, 410, 420F, 430, 430F                                                                                                                                                                                                                           | up to<br>750<br>N/mm <sup>2</sup>   | U (3-Flt.)                      | Slotting                    | 80        | 0.011                 | 0.023 | 0.030 | 0.042 | 0.050 | 0.070 | 0.080 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 100       | 0.013                 | 0.026 | 0.035 | 0.048 | 0.058 | 0.080 | 0.100 | 0.120 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 160       | 0.013                 | 0.025 | 0.033 | 0.046 | 0.055 | 0.070 | 0.090 | 0.120 |
| <b>Stainless steel</b><br>1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8<br>USA = 304, 304L, 420                                                                                                                                                                                                                                        | 750-850<br>N/mm <sup>2</sup>        | U (3-Flt.)                      | Slotting                    | 55        | 0.011                 | 0.021 | 0.028 | 0.038 | 0.046 | 0.060 | 0.080 | 0.100 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 70        | 0.012                 | 0.024 | 0.032 | 0.044 | 0.052 | 0.070 | 0.090 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 110       | 0.012                 | 0.023 | 0.031 | 0.042 | 0.050 | 0.070 | 0.080 | 0.100 |
| <b>Stainless steel</b><br>1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10<br>USA = 310, 316, 316B, 316L, 317                                                                                                                                                                                                               | above<br>850<br>N/mm <sup>2</sup>   | U (3-Flt.)                      | Slotting                    | 40        | 0.010                 | 0.020 | 0.026 | 0.035 | 0.042 | 0.050 | 0.070 | 0.090 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 50        | 0.012                 | 0.024 | 0.032 | 0.042 | 0.050 | 0.070 | 0.080 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 80        | 0.010                 | 0.020 | 0.026 | 0.035 | 0.042 | 0.060 | 0.070 | 0.090 |
| <b>Special alloys (nickel based "Ni")</b><br>Nimonic, Inconel, Monel, Hastelloy                                                                                                                                                                                                                                                                 | up to<br>1,300<br>N/mm <sup>2</sup> | U (3-Flt.)                      | Slotting                    | 40        | 0.010                 | 0.020 | 0.026 | 0.038 | 0.046 | 0.060 | 0.080 | 0.100 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 50        | 0.012                 | 0.024 | 0.032 | 0.046 | 0.055 | 0.070 | 0.090 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 80        | 0.011                 | 0.022 | 0.029 | 0.042 | 0.050 | 0.070 | 0.080 | 0.100 |
| <b>Titanium alloys ("Ti")</b><br>3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2<br>3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2.5                                                                                                                                                                                                        | up to<br>1,300<br>N/mm <sup>2</sup> | U (3-Flt.)                      | Slotting                    | 20        | 0.008                 | 0.015 | 0.020 | 0.030 | 0.036 | 0.050 | 0.060 | 0.080 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 30        | 0.009                 | 0.018 | 0.024 | 0.036 | 0.043 | 0.060 | 0.070 | 0.090 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 40        | 0.008                 | 0.015 | 0.020 | 0.030 | 0.036 | 0.050 | 0.060 | 0.080 |
| <b>Cast iron, grey cast iron, spheroidal graphite and malleable cast iron</b><br>0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20),<br>0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)                                                                                                                                                 | up to<br>240 HB 30                  | U (3-Flt.)                      | Slotting                    | 105       | 0.012                 | 0.024 | 0.032 | 0.045 | 0.054 | 0.070 | 0.090 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 130       | 0.014                 | 0.028 | 0.037 | 0.052 | 0.062 | 0.080 | 0.100 | 0.130 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 210       | 0.013                 | 0.026 | 0.035 | 0.050 | 0.059 | 0.080 | 0.100 | 0.120 |
| <b>Cast iron, grey cast iron, spheroidal graphite and malleable cast iron</b><br>0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35),<br>0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)                                                                                                                                                 | above<br>240 HB 30                  | U (3-Flt.)                      | Slotting                    | 90        | 0.011                 | 0.023 | 0.030 | 0.042 | 0.050 | 0.070 | 0.080 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (3-Flt.)                      | Roughing                    | 110       | 0.013                 | 0.026 | 0.035 | 0.048 | 0.058 | 0.080 | 0.100 | 0.120 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 180       | 0.013                 | 0.025 | 0.033 | 0.046 | 0.055 | 0.070 | 0.090 | 0.120 |
| <b>Aluminum, Al-wrought alloys, Al-alloys</b><br>3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1<br>3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1.5                                                                                                                                                                             | up to<br>3% Si                      | A (3-Flt.)                      | Slotting                    | 300       | 0.015                 | 0.030 | 0.040 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | A (3-Flt.)                      | Roughing                    | 400       | 0.017                 | 0.035 | 0.046 | 0.063 | 0.076 | 0.100 | 0.130 | 0.160 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | A (3-Flt.)                      | Finishing                   | 600       | 0.017                 | 0.033 | 0.044 | 0.061 | 0.073 | 0.100 | 0.120 | 0.150 |
| <b>Aluminum-cast alloys</b><br>3.2131 G-ALSi5Cu1, 3.2153 G-ALSi7Cu3, 3.2573 G-ALSi9<br>3.2581 G-ALSi12, 3.2583 G-ALSi12Cu, - G-ALSi12CuNiMg                                                                                                                                                                                                     | above<br>3% Si                      | A (3-Flt.)                      | Slotting                    | 180       | 0.014                 | 0.027 | 0.036 | 0.050 | 0.060 | 0.080 | 0.100 | 0.130 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | A (3-Flt.)                      | Roughing                    | 300       | 0.016                 | 0.031 | 0.041 | 0.058 | 0.069 | 0.090 | 0.120 | 0.140 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 360       | 0.015                 | 0.030 | 0.040 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |
| <b>Magnesium-alloys</b><br>MgMn2, G-MgAl8Zn1, G-MgAl6Zn3                                                                                                                                                                                                                                                                                        | —                                   | A (3-Flt.)                      | Slotting                    | 150       | 0.013                 | 0.025 | 0.034 | 0.045 | 0.054 | 0.070 | 0.090 | 0.110 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | A (3-Flt.)                      | Roughing                    | 180       | 0.014                 | 0.029 | 0.039 | 0.052 | 0.062 | 0.080 | 0.100 | 0.130 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | A (3-Flt.)                      | Finishing                   | 300       | 0.014                 | 0.028 | 0.037 | 0.050 | 0.059 | 0.080 | 0.100 | 0.120 |
| <b>Non-ferrous metals (copper, short- or long-chipping brass or bronze)</b><br>2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPB<br>2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2<br>2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5<br>2.1090 CuSn7ZnPB, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn<br>2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10  | up to<br>850<br>N/mm <sup>2</sup>   | A (3-Flt.)                      | Slotting                    | 200       | 0.014                 | 0.027 | 0.036 | 0.050 | 0.060 | 0.080 | 0.100 | 0.130 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | A (3-Flt.)                      | Roughing                    | 230       | 0.016                 | 0.031 | 0.041 | 0.058 | 0.069 | 0.090 | 0.120 | 0.140 |
|                                                                                                                                                                                                                                                                                                                                                 |                                     | U (6-/8-Flt.)                   | Finishing                   | 400       | 0.015                 | 0.030 | 0.040 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |

\* trochoid milling strategy

All recommendations are valid for coated tools. For bright milling cutters please vc - 40% and fz -25%

# Alumi-Tech GA200 A (2-flute) - Metric - Standard Length

## center cutting



Standard



No. of Flutes



Helix Angle



Chamfer



Rake Angle



Slotting



Roughing



Ramping



Helix



Plunging



Finishing

Tool material

Surface finish



HA



HB

Solid Carbide

bright

bright

Series

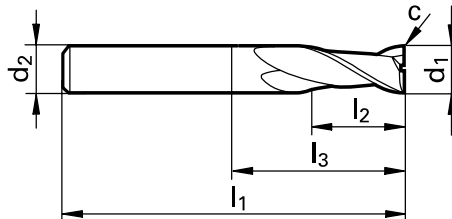
3309

3059

| Application group | Material examples | Ideal for |
|-------------------|-------------------|-----------|
| P                 | Steel             | —         |
| M                 | Stainless steel   | —         |
| K                 | Cast iron         | —         |
| N                 | Aluminum          | ●         |
| S                 | Ni / Ti alloys    | —         |
| H                 | Hardened steel    | —         |

●=Optimal ○=Secondary

Speed and Feed data found on page 297



| d1 e8  | d2 h6  | l1     | l2    | l3    | c        | No. of Flutes | Code no. | EDP Number    |               |
|--------|--------|--------|-------|-------|----------|---------------|----------|---------------|---------------|
| mm     | mm     | mm     | mm    | mm    | mm x 45° |               |          |               |               |
| 3.000  | 6.000  | 57.00  | 7.00  | 10.90 | 0.03     | 2             | 3.000    | 9033090030000 | 9030590030000 |
| 4.000  | 6.000  | 57.00  | 8.00  | 11.90 | 0.03     | 2             | 4.000    | 9033090040000 | 9030590040000 |
| 5.000  | 6.000  | 57.00  | 10.00 | 15.40 | 0.03     | 2             | 5.000    | 9033090050000 | 9030590050000 |
| 6.000  | 6.000  | 57.00  | 10.00 | 21.00 | 0.03     | 2             | 6.000    | 9033090060000 | 9030590060000 |
| 8.000  | 8.000  | 63.00  | 16.00 | 27.00 | 0.05     | 2             | 8.000    | 9033090080000 | 9030590080000 |
| 10.000 | 10.000 | 72.00  | 19.00 | 32.00 | 0.05     | 2             | 10.000   | 9033090100000 | 9030590100000 |
| 12.000 | 12.000 | 83.00  | 22.00 | 38.00 | 0.10     | 2             | 12.000   | 9033090120000 | 9030590120000 |
| 14.000 | 14.000 | 83.00  | 22.00 | 38.00 | 0.10     | 2             | 14.000   | 9033090140000 | 9030590140000 |
| 16.000 | 16.000 | 92.00  | 26.00 | 44.00 | 0.10     | 2             | 16.000   | 9033090160000 | 9030590160000 |
| 18.000 | 18.000 | 92.00  | 26.00 | 44.00 | 0.10     | 2             | 18.000   | 9033090180000 | 9030590180000 |
| 20.000 | 20.000 | 104.00 | 32.00 | 54.00 | 0.10     | 2             | 20.000   | 9033090200000 | 9030590200000 |