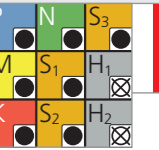


NEW

Type C - Z3 - Side milling - Roughing

v_c [m/min]
 f_z [mm]

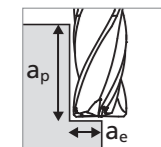
RECOMMENDATION FOR USE
● Excellent | ● Good | ○ Acceptable | ☒ Not recommended



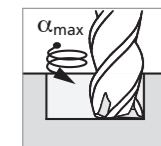
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

Side milling

Roughing

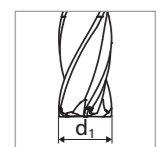
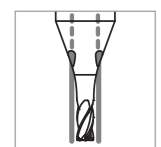


■ $a_p = 1 \times d_1$
■ $a_e = 0.1 \times d_1$



Note:

In case of helical interpolation milling see α_{max} on page 35



| Materials group | Material | Mat. no. | DIN | AISI/ASTM/UNS | Cutting edge geometry | ϕd_1 | | | | | | | | | | | | | | | | |
|--|--|--------------------------|-------------------------|-------------------------|-----------------------|------------|---------|---------|---------|-----------------|---------|---------|---------|---------|---------|---------|---------|-----------------|----------|--------------|----------|-------|
| | | | | | | 0.2 mm | | 0.3 mm | | 0.4 mm 1/64" | | 0.5 mm | | 0.6 mm | | 0.7 mm | | 0.8 mm 1/32" | | 0.9 - 1.0 mm | | |
| | | | | | | v_c | f_z | v_c | f_z | v_c | f_z | v_c | f_z | v_c | f_z | v_c | f_z | v_c | f_z | v_c | f_z | |
| P | Unalloyed carbon steel $R_m < 800 \text{ N/mm}^2$ | 1.0301 | C10 | AISI 1010 | GEOMETRY S | 15 - 25 | 0.004 | 20 - 40 | 0.006 | 25 - 50 | 0.010 | 30 - 65 | 0.012 | 40 - 75 | 0.014 | 45 - 90 | 0.017 | 50 - 100 | 0.019 | 55 - 115 | 0.021 | |
| | | 1.0401 | C15 | AISI 1015 | | | | | | | | | | | | | | | | | | |
| | | 1.1191 | C45E/CK45 | AISI 1045 | | | | | | | | | | | | | | | | | | |
| | | 1.0044 | S275JR | AISI 1020 | | | | | | | | | | | | | | | | | | |
| | | 1.0715 | 11SMn30 | AISI 1215 | | | | | | | | | | | | | | | | | | |
| | | 1.5752 | 15NiCr13 | ASTM 3415 / AISI 3310 | | | | | | | | | | | | | | | | | | |
| | Low alloyed steel $R_m > 900 \text{ N/mm}^2$ | 1.7131 | 16MnCr5 | AISI 5115 | | | | | | | | | | | | | | | | | | |
| | | 1.3505 | 100Cr6 | AISI 52100 | | | | | | | | | | | | | | | | | | |
| | | 1.7225 | 42CrMo4 | AISI 4140 | | | | | | | | | | | | | | | | | | |
| | | 1.2842 | 90MnCrV8 | AISI O2 | | | | | | | | | | | | | | | | | | |
| | | 1.2379 | X153CrMoV12 | AISI D2 | | | | | | | | | | | | | | | | | | |
| | | 1.2436 | X210CrW12 | AISI D4/D6 | | | | | | | | | | | | | | | | | | |
| High alloyed tool steel $R_m < 1200 \text{ N/mm}^2$ | 1.3343 | HS6-5-2C | AISI M2 / UNS T11302 | | | | | | | | | | | | | | | | | | | |
| | 1.3355 | HS18-0-1 | AISI T1 / UNS T12001 | | | | | | | | | | | | | | | | | | | |
| | M | Stainless steel ferritic | 1.4016 | X6Cr17 | AISI 430 / UNS S43000 | GEOMETRY S | 15 - 25 | 0.004 | 20 - 40 | 0.006 | 25 - 50 | 0.010 | 30 - 65 | 0.012 | 40 - 75 | 0.014 | 45 - 90 | 0.017 | 50 - 100 | 0.019 | 55 - 115 | 0.021 |
| | | | 1.4105 | X6CrMoS17 | AISI 430F | | | | | | | | | | | | | | | | | |
| | | | 1.4034 | X46Cr13 | AISI 420C | | | | | | | | | | | | | | | | | |
| | | | 1.4112 | X90CrMoV18 | AISI 440B | | | | | | | | | | | | | | | | | |
| 1.4542 | | | X5CrNiCuNb16-4 | AISI 630 / ASTM 17-4 PH | | | | | | | | | | | | | | | | | | |
| 1.4545 | | | X5CrNiCuNb15-5 | ASTM 15-5 PH | | | | | | | | | | | | | | | | | | |
| Stainless steel martensitic | 1.4301 | X5CrNi18-10 | AISI 304 | | | | | | | | | | | | | | | | | | | |
| | 1.4435 | X2CrNiMo18-14-3 | AISI 316L | | | | | | | | | | | | | | | | | | | |
| | 1.4441 | X2CrNiMo18-15-3 | AISI 316LM | | | | | | | | | | | | | | | | | | | |
| | 1.4539 | X1NiCrMoCu25-20-5 | AISI 904L | | | | | | | | | | | | | | | | | | | |
| | K | Cast iron | 0.6020 | GG20 | ASTM 30 | GEOMETRY S | 15 - 25 | 0.003 | 20 - 40 | 0.005 | 25 - 50 | 0.007 | 30 - 65 | 0.009 | 40 - 75 | 0.011 | 45 - 90 | 0.013 | 50 - 100 | 0.015 | 55 - 115 | 0.017 |
| | | | 0.6030 | GG30 | ASTM 40B | | | | | | | | | | | | | | | | | |
| 0.7040 | | | GGG40 | ASTM 60-40-18 | | | | | | | | | | | | | | | | | | |
| 0.7060 | | | GGG60 | ASTM 80-60-03 | | | | | | | | | | | | | | | | | | |
| N | Aluminium alloy wrought | 3.2315 | AlMgSi1 | ASTM 6351 | GEOMETRY S | 15 - 25 | 0.006 | 20 - 40 | 0.008 | 25 - 50 | 0.011 | 30 - 65 | 0.016 | 40 - 75 | 0.018 | 45 - 90 | 0.019 | 50 - 100 | 0.021 | 55 - 115 | 0.022 | |
| | | 3.4365 | AlZnMgCu1.5 | ASTM 7075 | | | | | | | | | | | | | | | | | | |
| | Aluminium alloy cast | 3.2163 | GD-AlSi9Cu3 | ASTM A380 | | | | | | | | | | | | | | | | | | |
| | | 3.2381 | GD-AlSi10Mg | UNS A03590 | | | | | | | | | | | | | | | | | | |
| | Copper | 2.0040 | Cu-OF / CW008A | UNS C10100 | | | | | | | | | | | | | | | | | | |
| | | 2.0065 | Cu-ETP / CW004A | UNS C11000 | | | | | | | | | | | | | | | | | | |
| | Brass lead free | 2.0321 | CuZn37 CW508L | UNS C27400 | | | | | | | | | | | | | | | | | | |
| | | 2.0360 | CuZn40 CW509L | UNS C28000 | | | | | | | | | | | | | | | | | | |
| | Brass, Bronze $R_m < 400 \text{ N/mm}^2$ | 2.0401 | CuZn39Pb3 / CW614N | UNS C38500 | | | | | | | | | | | | | | | | | | |
| | | 2.1020 | CuSn6 | UNS C51900 | | | | | | | | | | | | | | | | | | |
| | Bronze $R_m < 600 \text{ N/mm}^2$ | 2.0966 | CuAl10Ni5Fe4 | UNS C63000 | | | | | | | | | | | | | | | | | | |
| | | 2.0960 | CuAl9Mn2 | UNS C63200 | | | | | | | | | | | | | | | | | | |
| S1 | Super alloys | 2.4856 | | Inconel 625 | GEOMETRY SX | 15 - 25 | 0.002 | 20 - 40 | 0.004 | 25 - 50 | 0.006 | 30 - 65 | 0.008 | 40 - 75 | 0.009 | 45 - 90 | 0.010 | 50 - 100 | 0.012 | 55 - 115 | 0.014 | |
| | | 2.4668 | | Inconel 718 | | | | | | | | | | | | | | | | | | |
| | | 2.4617 | NiMo28 | Hastelloy B-2 | | | | | | | | | | | | | | | | | | |
| | | 2.4665 | NiCr22Fe18Mo | Hastelloy X | | | | | | | | | | | | | | | | | | |
| S2 | Titanium pure | 3.7035 | Gr.2 | ASTM B348 / F67 | GEOMETRY S | 15 - 25 | 0.004 | 20 - 40 | 0.006 | 25 - 50 | 0.008 | 30 - 65 | 0.012 | 40 - 75 | 0.013 | 45 - 90 | 0.014 | 50 - 100 | 0.015 | 55 - 115 | 0.017 | |
| | | 3.7065 | Gr.4 | ASTM B348 / F68 | | | | | | | | | | | | | | | | | | |
| | Titanium alloys | 3.7165 | TiAl6V4 | ASTM B348 / F136 | | | | | | | | | | | | | | | | | | |
| S3 | CoCr alloys | 9.9367 | TiAl6Nb7 | ASTM F1295 | GEOMETRY S | 15 - 25 | 0.003 | 20 - 40 | 0.005 | 25 - 50 | 0.007 | 30 - 65 | 0.009 | 40 - 75 | 0.011 | 45 - 90 | 0.013 | 50 - 100 | 0.015 | 55 - 115 | 0.017 | |
| | | 2.4964 | CoCr20W15Ni CrCoMo28 | Haynes 25 ASTM F1537 | | | | | | | | | | | | | | | | | | |
| H1 H2 | Hardened steel $\geq 55 \text{ HRC}$ | 1.2510 | 100MnCrMoW4 | AISI O1 | GEOMETRY SX | 15 - 25 | 0.002 | 20 - 40 | 0.004 | 25 - 50 | 0.006 | 30 - 65 | 0.008 | 40 - 75 | 0.009 | 45 - 90 | 0.010 | 50 - 100 | 0.012 | 55 - 115 | 0.014 | |
| | | 1.2379 | X153CrMoV12 | AISI D2 | | | | | | | | | | | | | | | | | | |