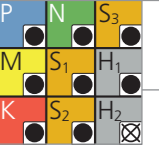


Typ A - Umfang- und trochoidales Nutfräsen

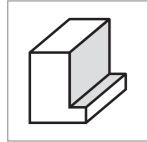
v_c [m/min]
 f_z [mm]

ANWENDUNGSEMPFEHLUNG
● Sehr gut geeignet | ● Gut geeignet | ○ bedingt geeignet | ☒ Nicht empfohlen



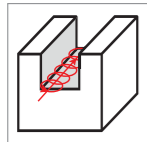
FRÄSEN MIT INTEGRIERTER KÜHLUNG | SCHNITTDATENÜBERSICHT

Umfangfräsen

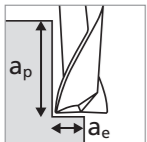
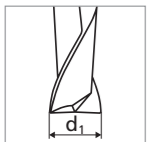
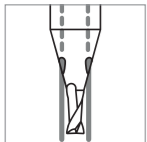


- $a_p = 1 \times d_1$
- $a_e = 0.3 \times d_1$

Trochoidales Nutfräsen



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



| Werkstoffgruppe | Werkstoff | Wr.Nr. | DIN | AISI/ASTM/UNS | 0.3 mm–0.4 mm 1/64" | | 0.5 mm–0.8 mm 1/32" | | 1.0 mm–1.2 mm | | 1.5 mm–1.8 mm 1/16" | | 2.0 mm–2.5 mm 3/32" | | 3.0 mm 1/8" | | 4.0 mm–6.0 mm 5/32–3/16–7/32–1/4" | | | | | | | | | | | | | | | | |
|--|---|------------------------------------|----------------------|-------------------------|------------------------|---------------|------------------------|---------------|---------------|---------------|------------------------|---------------|------------------------|---------------|----------------|---------------|--------------------------------------|---------------|-----------------------|----|---------------|-----|---------------|-----|---------------|-----|---------------|-----|---------------|-----|-------|-----|-------|
| | | | | | 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 | Stähle unlegiert Rm < 800 N/mm ² | 1.0301 | C10 | AISI 1010 | 60 | 0.005 – 0.007 | 100 | 0.010 – 0.014 | 140 | 0.015 – 0.017 | 200 | 0.024 – 0.026 | 220 | 0.034 – 0.036 | 240 | 0.048 | 280 | 0.050 | | | | | | | | | | | | | | | |
| | | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Stähle niedriglegiert Rm > 900 N/mm ² | 1.7131 | 16MnCr5 | AISI 5115 | 60 | 0.004 – 0.006 | 100 | 0.009 – 0.012 | 140 | 0.014 – 0.016 | 200 | 0.022 – 0.024 | 220 | 0.032 – 0.034 | 240 | 0.046 | 280 | 0.048 | | | | | | | | | | | | | | | |
| | | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Werkzeugstähle hochlegiert Rm < 1200 N/mm ² | 1.3343 | HS6-5-2C | AISI M2 / UNS T11302 | 60 | 0.004 – 0.006 | 100 | 0.008 – 0.011 | 140 | 0.011 – 0.013 | 200 | 0.020 – 0.022 | 220 | 0.030 – 0.032 | 240 | 0.042 | 280 | 0.044 | | | | | | | | | | | | | | | | |
| | 1.3355 | HS18-0-1 | AISI T1 / UNS T12001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | M | Rostfreie Stähle- ferritisch | 1.4016 | | | | | | | | | | | | | | | X6Cr17 | AISI 430 / UNS S43000 | 60 | 0.005 – 0.007 | 100 | 0.010 – 0.014 | 140 | 0.016 – 0.018 | 200 | 0.024 – 0.026 | 220 | 0.034 – 0.036 | 240 | 0.046 | 280 | 0.048 |
| | | | 1.4105 | | | | | | | | | | | | | | | X6CrMoS17 | AISI 430F | | | | | | | | | | | | | | |
| | | | 1.4034 | | | | | | | | | | | | | | | X46Cr13 | AISI 420C | | | | | | | | | | | | | | |
| | | Rostfreie Stähle- martensitisch | 1.4112 | | | | | | | | | | | | | | | X90CrMoV18 | AISI 440B | | | | | | | | | | | | | | |
| 1.4542 | | | X5CrNiCuNb 16-4 | AISI 630 / ASTM 17-4 PH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.4545 | | | X5CrNiCuNb 15-5 | ASTM 15-5 PH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rostfreie Stähle- austenitisch – PH | 1.4301 | X5CrNi 18-10 | AISI 304 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1.4435 | X2CrNiMo 18-14-3 | AISI 316L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1.4441 | X2CrNiMo 18-15-3 | AISI 316LM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Gusseisen | 0.6020 | GG20 | ASTM 30 | 60 | 0.003 – 0.005 | 100 | 0.006 – 0.009 | 120 | 0.011 – 0.022 | 140 | 0.024 – 0.026 | 160 | 0.028 – 0.036 | 180 | 0.042 – 0.048 | 200 | 0.052 – 0.057 | | | | | | | | | | | | | | | |
| | | 0.6030 | GG30 | ASTM 40B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0.7040 | GGG40 | ASTM 60-40-18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0.7060 | GGG60 | ASTM 80-60-03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Aluminium Knetlegierungen | 3.2315 | AlMgSi1 | ASTM 6351 | 60 | 0.006 – 0.008 | 100 | 0.012 – 0.016 | 140 | 0.018 – 0.020 | 200 | 0.026 – 0.028 | 220 | 0.036 – 0.040 | 240 | 0.058 | 280 | 0.060 | | | | | | | | | | | | | | | |
| | | 3.4365 | AlZnMgCu1.5 | ASTM 7075 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Aluminium Druckgusslegierungen | 3.2163 | GD-ALSi9Cu3 | ASTM A380 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3.2381 | GD-ALSi10Mg | UNS A03590 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Kupfer | 2.004 | Cu-OF / CW008A | UNS C10100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2.0065 | Cu-ETP / CW004A | UNS C11000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Messing bleifrei | 2.0321 | CuZn37 CW508L | UNS C27400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2.036 | CuZn40 CW509L | UNS C28000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Messing, Bronze Rm < 400 N/mm ² | 2.0401 | CuZn39Pb3 / CW614N | UNS C38500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2.102 | CuSn6 | UNS C51900 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Bronze Rm < 600 N/mm ² | 2.0966 | CuAl10Ni5Fe4 | UNS C63000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2.096 | CuAl9Mn2 | UNS C63200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S ₁ | Hitzebeständige Stähle | 2.4856 | | Inconel 625 | 60 | 0.003 – 0.004 | 100 | 0.004 – 0.006 | 120 | 0.007 – 0.008 | 130 | 0.009 – 0.010 | 140 | 0.010 – 0.012 | 150 | 0.015 | 170 | 0.020 | | | | | | | | | | | | | | | |
| | | 2.4668 | | Inconel 718 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2.4617 | NiMo28 | Hastelloy B-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2.4665 | NiCr22Fe18Mo | Hastelloy X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S ₂ | Titan rein | 3.7035 | Gr.2 | ASTM B348 / F67 | 60 | 0.004 – 0.006 | 100 | 0.008 – 0.011 | 120 | 0.016 – 0.018 | 130 | 0.020 – 0.022 | 140 | 0.028 – 0.030 | 150 | 0.042 | 170 | 0.044 | | | | | | | | | | | | | | | |
| | | 3.7065 | Gr.4 | ASTM B348 / F68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S ₃ | Titan Legierungen | 3.7165 | TiAl6V4 | ASTM B348 / F136 | 60 | 0.004 – 0.006 | 100 | 0.008 – 0.011 | 120 | 0.016 – 0.018 | 130 | 0.020 – 0.022 | 140 | 0.028 – 0.030 | 150 | 0.042 | 170 | 0.044 | | | | | | | | | | | | | | | |
| | | 9.9367 | TiAl6Nb7 | ASTM F1295 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H ₁ | Stähle gehärtet < 55 HRC | 2.4964 | CoCr20W15Ni | Haynes 25 | 60 | 0.003 – 0.004 | 100 | 0.004 – 0.006 | 140 | 0.007 – 0.008 | 180 | 0.009 – 0.010 | 200 | 0.010 – 0.012 | 220 | 0.015 | 240 | 0.020 | | | | | | | | | | | | | | | |
| | | | CrCoMo28 | ASTM F1537 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H ₂ | Stähle gehärtet ≥ 55 HRC | 1.2510 | 100MnCrMoW4 | AISI O1 | 60 | 0.004 – 0.006 | 80 | 0.007 – 0.009 | 100 | 0.010 – 0.012 | 140 | 0.014 – 0.018 | 180 | 0.020 – 0.026 | 200 | 0.035 | 240 | 0.040 | | | | | | | | | | | | | | | |
| | | 1.2379 | X153CrMoV12 | AISI D2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |