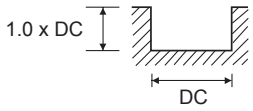
## CUTTING DATA

304303, 304323, 305303, 305323 (3 Flute)

| VDI MATERIAL GROUP | | | HRc | SLOTTING | Size (mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **2.0** | **3.0** | **4.0** | **5.0** | **6.0** | **8.0** | **10.0** | **12.0** | **14.0** | **16.0** | **20.0** |
| **P** | 1-5 | Non-alloy Steel | **<25** | $v_c$ (m/min) | 50 | 55 | 65 | 70 | 70 | 70 | 70 | 70 | 75 | 75 | 70 |
| | | | | n | 7960 | 5835 | 5170 | 4455 | 3715 | 2785 | 2230 | 1855 | 1705 | 1490 | 1115 |
| | | | | $f_z$ | 0.005 | 0.007 | 0.012 | 0.015 | 0.018 | 0.027 | 0.03 | 0.031 | 0.029 | 0.029 | 0.029 |
| | | | | f (mm/min) | 120 | 120 | 185 | 200 | 200 | 225 | 200 | 170 | 150 | 130 | 95 |
| | 6-9 | Low alloy Steel | **25-35** | $v_c$ (m/min) | 50 | 55 | 65 | 70 | 70 | 70 | 70 | 70 | 75 | 75 | 70 |
| | | | | n | 7960 | 5835 | 5170 | 4455 | 3715 | 2785 | 2230 | 1855 | 1705 | 1490 | 1115 |
| | | | | $f_z$ | 0.005 | 0.007 | 0.012 | 0.015 | 0.018 | 0.027 | 0.03 | 0.031 | 0.029 | 0.029 | 0.029 |
| | | | | f (mm/min) | 120 | 120 | 185 | 200 | 200 | 225 | 200 | 170 | 150 | 130 | 95 |
| **M** | 12-13 | Ferritic/ Martensitic Stainless Steel | | $v_c$ (m/min) | 25 | 30 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| | | | | n | 3980 | 3180 | 2785 | 2230 | 1855 | 1390 | 1115 | 930 | 795 | 695 | 555 |
| | | | | $f_z$ | 0.004 | 0.007 | 0.011 | 0.015 | 0.019 | 0.025 | 0.028 | 0.026 | 0.027 | 0.031 | 0.03 |
| | | | | f (mm/min) | 45 | 65 | 90 | 100 | 105 | 105 | 95 | 70 | 65 | 65 | 50 |
| **K** | 15-20 | Cast Iron | | $v_c$ (m/min) | 60 | 55 | 60 | 55 | 55 | 55 | 60 | 55 | 55 | 55 | 55 |
| | | | | n | 9550 | 5835 | 4775 | 3500 | 2920 | 2190 | 1910 | 1460 | 1250 | 1095 | 875 |
| | | | | $f_z$ | 0.007 | 0.011 | 0.013 | 0.018 | 0.026 | 0.036 | 0.046 | 0.063 | 0.073 | 0.086 | 0.115 |
| | | | | f (mm/min) | 200 | 190 | 185 | 190 | 230 | 235 | 265 | 275 | 275 | 280 | 300 |
| **N** | 21-24 | Aluminium/ Aluminium Alloys | | $v_c$ (m/min) | 140 | 145 | 140 | 145 | 145 | 145 | 145 | 140 | 145 | 145 | 140 |
| | | | | n | 22280 | 15385 | 11140 | 9230 | 7690 | 5770 | 4615 | 3715 | 3300 | 2885 | 2230 |
| | | | | $f_z$ | 0.006 | 0.009 | 0.013 | 0.015 | 0.019 | 0.026 | 0.032 | 0.038 | 0.043 | 0.05 | 0.065 |
| | | | | f (mm/min) | 400 | 415 | 435 | 415 | 435 | 450 | 440 | 420 | 425 | 430 | 435 |
| | 26-27 | Copper/ Copper Alloys | | $v_c$ (m/min) | 105 | 105 | 110 | 105 | 105 | 110 | 105 | 105 | 105 | 110 | 105 |
| | | | | n | 16710 | 11140 | 8755 | 6685 | 5570 | 4375 | 3340 | 2785 | 2385 | 2190 | 1670 |
| | | | | $f_z$ | 0.006 | 0.009 | 0.012 | 0.015 | 0.005 | 0.025 | 0.032 | 0.039 | 0.046 | 0.05 | 0.065 |
| | | | | f (mm/min) | 300 | 300 | 315 | 300 | 335 | 330 | 320 | 325 | 330 | 325 | 325 |




▸ The feed rate for long, long reach and uncoated tools should be reduced by up to 50%

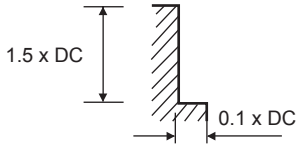
Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.
All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.
**For long series and long necked tools** it may be necessary to reduce feed rate by up to 50%.

$v_c$ - cutting speed (m/min)
n - RPM (rev/min)
$f_z$ - feed per tooth (mm)
f - feed rate (mm/min)
$a_p$ - axial depth of cut
$a_e$ - radial depth of cut

## CUTTING DATA

304303, 304323, 305303, 305323 (3 Flute)

| VDI MATERIAL GROUP | | | HRc | SIDE CUTTING | Size (mm) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 20.0 |
| P | 1-5 | Non-alloy Steel | <25 | $v_c$ (m/min) | 60 | 70 | 80 | 85 | 90 | 90 | 85 | 90 | 90 | 95 | 90 |
| | | | | n | 9550 | 7425 | 6365 | 5410 | 4775 | 3580 | 2705 | 2385 | 2045 | 1890 | 1430 |
| | | | | $f_z$ | 0.006 | 0.009 | 0.019 | 0.024 | 0.03 | 0.042 | 0.047 | 0.047 | 0.047 | 0.048 | 0.047 |
| | | | | f (mm/min) | 170 | 200 | 360 | 390 | 430 | 450 | 380 | 335 | 290 | 270 | 200 |
| | 6-9 | Low alloy Steel | 25-35 | $v_c$ (m/min) | 60 | 70 | 80 | 85 | 90 | 90 | 85 | 90 | 90 | 95 | 90 |
| | | | | n | 9550 | 7425 | 6365 | 5410 | 4775 | 3580 | 2705 | 2385 | 2045 | 1890 | 1430 |
| | | | | $f_z$ | 0.006 | 0.009 | 0.019 | 0.024 | 0.03 | 0.042 | 0.047 | 0.047 | 0.047 | 0.048 | 0.047 |
| | | | | f (mm/min) | 170 | 200 | 360 | 390 | 430 | 450 | 380 | 335 | 290 | 270 | 200 |
| M | 12-13 | Ferritic/ Martensitic Stainless Steel | | $v_c$ (m/min) | 35 | 35 | 40 | 40 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| | | | | n | 5570 | 3715 | 3180 | 2545 | 2385 | 1790 | 1430 | 1195 | 1020 | 895 | 715 |
| | | | | $f_z$ | 0.006 | 0.009 | 0.018 | 0.027 | 0.03 | 0.042 | 0.045 | 0.045 | 0.044 | 0.048 | 0.048 |
| | | | | f (mm/min) | 100 | 100 | 170 | 180 | 215 | 225 | 190 | 160 | 135 | 130 | 105 |
| K | 15-20 | Cast Iron | | $v_c$ (m/min) | 60 | 55 | 60 | 55 | 55 | 55 | 60 | 55 | 55 | 55 | 55 |
| | | | | n | 9550 | 5835 | 4775 | 3500 | 2920 | 2190 | 1910 | 1460 | 1250 | 1095 | 875 |
| | | | | $f_z$ | 0.017 | 0.026 | 0.035 | 0.044 | 0.064 | 0.093 | 0.115 | 0.154 | 0.181 | 0.22 | 0.285 |
| | | | | f (mm/min) | 485 | 455 | 500 | 460 | 560 | 610 | 660 | 675 | 680 | 720 | 750 |
| N | 21-24 | Aluminium/ Aluminium Alloys | | $v_c$ (m/min) | 140 | 145 | 140 | 145 | 145 | 145 | 145 | 140 | 145 | 145 | 140 |
| | | | | n | 22280 | 15385 | 11140 | 9230 | 7690 | 5770 | 4615 | 3715 | 3295 | 2885 | 2230 |
| | | | | $f_z$ | 0.016 | 0.021 | 0.031 | 0.037 | 0.048 | 0.064 | 0.08 | 0.098 | 0.444 | 0.129 | 0.167 |
| | | | | f (mm/min) | 1070 | 970 | 1035 | 1025 | 1110 | 1105 | 1105 | 1090 | 1100 | 1115 | 1115 |
| | 26-27 | Copper/ Copper Alloys | | $v_c$ (m/min) | 105 | 105 | 110 | 105 | 105 | 110 | 105 | 105 | 105 | 110 | 105 |
| | | | | n | 16710 | 11140 | 8755 | 6685 | 5570 | 4375 | 3340 | 2785 | 2385 | 2190 | 1670 |
| | | | | $f_z$ | 0.016 | 0.023 | 0.029 | 0.037 | 0.048 | 0.063 | 0.081 | 0.096 | 0.115 | 0.125 | 0.162 |
| | | | | f (mm/min) | 800 | 770 | 760 | 740 | 800 | 825 | 810 | 800 | 825 | 820 | 810 |

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n - RPM (rev/min)
$f_z$ - feed per tooth (mm)
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$a_p$ - axial depth of cut
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