



Application	v <sub>c</sub> factor	f <sub>c</sub> factor	Feed width (ae)	Feed depth (ap)
Slotting	1	1 (0.7 for a <sub>p</sub> = 2xd)	1xd	0.5 up to 1xd
Roughing	1	1 (0.7 for a <sub>p</sub> = 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	Recommended type	Type of application	cut 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> 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	up to 850 N/mm <sup>2</sup>	2/3 Flute	Slotting	120	0.012	0.024	0.032	0.042	0.050	0.070	0.080	0.110
		3/4 Flute	Roughing	140	0.014	0.028	0.037	0.048	0.058	0.080	0.100	0.120
		4 Flute	Finishing	240	0.013	0.026	0.035	0.046	0.055	0.070	0.090	0.120
<b>Free-cutting steels, unalloyed case hardened steels, nitriding steels</b> 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1.200 N/mm <sup>2</sup>	2/3 Flute	Slotting	110	0.012	0.024	0.032	0.042	0.050	0.070	0.080	0.110
		3/4 Flute	Roughing	130	0.014	0.028	0.037	0.048	0.058	0.080	0.100	0.120
		4 Flute	Finishing	220	0.013	0.026	0.035	0.046	0.055	0.070	0.090	0.120
<b>Alloyed heat-treatable, tool and high speed steels</b> 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1.400 N/mm <sup>2</sup>	2/3 Flute	Slotting	90	0.011	0.021	0.028	0.039	0.047	0.060	0.080	0.100
		3/4 Flute	Roughing	110	0.012	0.024	0.032	0.045	0.054	0.070	0.090	0.110
		4 Flute	Finishing	180	0.012	0.023	0.031	0.043	0.051	0.070	0.090	0.110
<b>Hardened steel</b> Tool steel, heat-treatable steel, spring steel, high-speed steel, case hardened steel, etc. Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2	up to 54 HRC	2/3 Flute	Slotting	35	0.007	0.013	0.018	0.024	0.029	0.040	0.050	0.060
		3/4 Flute	Roughing	50	0.009	0.017	0.023	0.031	0.037	0.050	0.060	0.080
		4 Flute	Finishing	70	0.007	0.013	0.018	0.024	0.029	0.040	0.050	0.060
<b>Stainless steel</b> 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	up to 750 N/mm <sup>2</sup>	2/3 Flute	Slotting	80	0.008	0.017	0.022	0.030	0.036	0.050	0.060	0.080
		3/4 Flute	Roughing	100	0.009	0.019	0.026	0.035	0.041	0.060	0.070	0.090
		4 Flute	Finishing	160	0.009	0.018	0.025	0.033	0.040	0.050	0.070	0.080
<b>Stainless steel</b> 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm <sup>2</sup>	2/3 Flute	Slotting	55	0.007	0.014	0.019	0.027	0.032	0.040	0.050	0.070
		3/4 Flute	Roughing	70	0.008	0.017	0.022	0.031	0.037	0.050	0.060	0.080
		4 Flute	Finishing	110	0.008	0.016	0.021	0.030	0.036	0.050	0.060	0.070
<b>Stainless steel</b> 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	above 850 N/mm <sup>2</sup>	2/3 Flute	Slotting	50	0.006	0.013	0.017	0.024	0.029	0.040	0.050	0.060
		3/4 Flute	Roughing	70	0.008	0.015	0.020	0.029	0.035	0.050	0.060	0.070
		4 Flute	Finishing	100	0.006	0.013	0.017	0.024	0.029	0.040	0.050	0.060
<b>Special alloys (nickel based "Ni")</b> Nimonic, Inconel, Monel, Hastelloy	up to 1.300 N/mm <sup>2</sup>	2/3 Flute	Slotting	25	0.005	0.009	0.012	0.018	0.022	0.030	0.040	0.050
		3/4 Flute	Roughing	40	0.005	0.011	0.014	0.022	0.026	0.030	0.040	0.050
		4 Flute	Finishing	50	0.005	0.009	0.012	0.018	0.022	0.030	0.040	0.050
<b>Titanium alloys ("Ti")</b> 3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2.5	up to 1.300 N/mm <sup>2</sup>	2/3 Flute	Slotting	40	0.008	0.017	0.022	0.030	0.036	0.050	0.060	0.080
		3/4 Flute	Roughing	50	0.010	0.020	0.027	0.036	0.043	0.060	0.070	0.090
		4 Flute	Finishing	80	0.009	0.018	0.025	0.033	0.040	0.050	0.070	0.080
<b>Cast iron, grey cast iron, spheroidal graphite and malleable cast iron</b> 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	2/3 Flute	Slotting	110	0.011	0.022	0.030	0.039	0.047	0.060	0.080	0.100
		3/4 Flute	Roughing	130	0.013	0.026	0.034	0.045	0.054	0.070	0.090	0.110
		4 Flute	Finishing	220	0.012	0.024	0.033	0.043	0.051	0.070	0.090	0.110
<b>Cast iron, grey cast iron, spheroidal graphite and malleable cast iron</b> 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	above 240 HB 30	2/3 Flute	Slotting	95	0.009	0.019	0.025	0.033	0.040	0.050	0.070	0.080
		3/4 Flute	Roughing	110	0.011	0.021	0.029	0.038	0.046	0.060	0.080	0.090
		4 Flute	Finishing	190	0.010	0.020	0.027	0.036	0.044	0.060	0.070	0.090
<b>Aluminum, Al-wrought alloys, Al-alloys</b> 3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1.5	up to 3% Si	2/3 Flute	Slotting	300	0.019	0.037	0.050	0.065	0.078	0.100	0.130	0.160
		2/3 Flute	Roughing	350	0.021	0.043	0.057	0.075	0.090	0.120	0.150	0.190
		3/4 Flute	Finishing	600	0.020	0.041	0.055	0.072	0.086	0.110	0.140	0.180
<b>Aluminum-cast alloys</b> 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	above 3% Si	2/3 Flute	Slotting	160	0.016	0.031	0.042	0.056	0.067	0.090	0.110	0.140
		2/3 Flute	Roughing	190	0.018	0.036	0.048	0.064	0.077	0.100	0.130	0.160
		3/4 Flute	Finishing	320	0.017	0.034	0.046	0.062	0.074	0.100	0.120	0.150
<b>Magnesium-alloys</b> MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	2/3 Flute	Slotting	125	0.016	0.031	0.042	0.056	0.067	0.090	0.110	0.140
		2/3 Flute	Roughing	210	0.018	0.036	0.048	0.064	0.077	0.100	0.130	0.160
		3/4 Flute	Finishing	360	0.017	0.034	0.046	0.062	0.074	0.100	0.120	0.150
<b>Non-ferrous metals (copper, short- or long-chipping brass or bronze)</b> 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	up to 850 N/mm <sup>2</sup>	2/3 Flute	Slotting	175	0.013	0.025	0.034	0.046	0.055	0.070	0.090	0.120
		2/3 Flute	Roughing	290	0.014	0.029	0.039	0.053	0.063	0.080	0.110	0.130
		3/4 Flute	Finishing	500	0.014	0.028	0.037	0.051	0.061	0.080	0.100	0.130

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