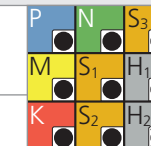


Type C - Roughing

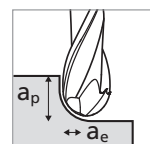
V_c [m/min] | [SFM]
f_z [mm] | [IPT]

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



MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

Roughing

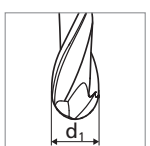
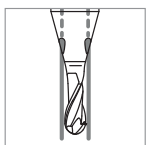


■ a_p = 0.5 x d_i
(Ød_i ≤ 0.5 mm | .020")

■ a_p = 1 x d_i
(Ød_i > 0.5 mm | .020")

■ a_p = 0.3 x d_i

Machining angle = 0°



Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	1/64" 0.3-0.4 mm .012"- .016"		1/32" 0.5-0.8 mm .020"- .032"		1.0-1.2 mm .039"- .047"		Ød1 1/16" 1.5-1.8 mm .059"- .071"		3/32" 2.0-2.5 mm .079"- .098"		1/8" 3.0 mm .118"		5/32-3/16-7/32-1/4" 4.0-6 mm .158"- .236"		8.0 mm .315"																																		
					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 Rm < 800 N/mm²	1.0301	C10	AISI 1010	60 197	0.005-0.007 .00020-.00028	100 328	0.010-0.014 .00039-.00055	140 459	0.015-0.017 .00059-.00067	200 656	0.024-0.026 .00094-.00102	220 722	0.034-0.036 .00134-.00142	240 787	0.040 .00157	280 919	0.050 .00197	280 919	0.050 .00197																																	
		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 Rm > 900 N/mm²	1.7131	16MnCr5	AISI 5115	60 197	0.004-0.006 .00016-.00024	100 328	0.009-0.012 .00035-.00047	140 459	0.014-0.016 .00055-.00063	200 656	0.022-0.024 .00087-.00094	220 722	0.032-0.034 .00126-.00134	240 787	0.038 .00150	280 919	0.048 .00189	280 919	0.048 .00189																																	
		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 Rm < 1200 N/mm²	1.3343	HS6-5-2C	AISI M2 / UNS T11302	60 197	0.004-0.006 .00016-.00024	100 328	0.008-0.011 .00031-.00043	140 459	0.011-0.013 .00043-.00051	200 656	0.020-0.022 .00079-.00087	220 722	0.030-0.032 .00118-.00126	240 787	0.035 .00138	280 919	0.044 .00173	280 919	0.044 .00173																																		
	1.3355	HS18-0-1	AISI T1 / UNS T12001																																																		
	M	Stainless steel ferritic	1.4016																	X6Cr17	AISI 430 / UNS S43000	60 197	0.005-0.007 .00020-.00028	100 328	0.010-0.014 .00039-.00055	140 459	0.016-0.018 .00063-.00071	200 656	0.024-0.026 .00094-.00102	220 722	0.034-0.036 .00134-.00142	240 787	0.040 .00157	280 919	0.048 .00189	280 919	0.048 .00189																
			1.4105																	X6CrMoS17	AISI 430F																																
		Stainless steel martensitic	1.4034																	X46Cr13	AISI 420C																	60 197	0.004-0.006 .00016-.00024	100 328	0.009-0.012 .00035-.00047	140 459	0.015-0.017 .00059-.00067	200 656	0.022-0.024 .00087-.00094	220 722	0.032-0.034 .00126-.00134	240 787	0.036 .00142	280 919	0.046 .00181	280 919	0.046 .00181
			1.4112																	X90CrMoV18	AISI 440B																																
Stainless steel martensitic - PH	1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH	60 197	0.004-0.006 .00016-.00024	100 328	0.009-0.012 .00035-.00047	140 459	0.015-0.017 .00059-.00067	200 656	0.022-0.024 .00087-.00094	220 722	0.032-0.034 .00126-.00134	240 787	0.046 .00142	280 919	0.046 .00181	280 919	0.046 .00181																																		
	1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH																																																		
Stainless steel austenitic	1.4301	X5CrNi 18-10	AISI 304	60 197	0.004-0.006 .00016-.00024	100 328	0.008-0.011 .00031-.00043	140 459	0.012-0.014 .00047-.00055	200 656	0.016-0.018 .00063-.00071	220 722	0.030-0.032 .00118-.00126	240 787	0.034 .00134	280 919	0.044 .00173	280 919	0.044 .00173																																		
	1.4435	X2CrNiMo 18-14-3	AISI 316L																																																		
	1.4441	X2CrNiMo 18-15-3	AISI 316LM																																																		
K	Cast iron	0.6020	GG20	ASTM 30	60 197	0.003-0.005 .00012-.00020	100 328	0.006-0.009 .00024-.00035	120 394	0.011-0.022 .00043-.00087	140 459	0.024-0.026 .00094-.00102	160 525	0.028-0.036 .00110-.00142	180 591	0.042 .00165	200 656	0.052 .00205	200 656	0.052 .00205																																	
		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	60 197	0.006-0.008 .00024-.00031	100 328	0.012-0.016 .00047-.00063	140 459	0.018-0.020 .00071-.00079	200 656	0.026-0.028 .00102-.00110	220 722	0.036-0.040 .00142-.00157	240 787	0.058 .00228	280 919	0.055 .00217	280 919	0.055 .00217																																	
		3.4365	AlZnMgCu1.5	ASTM 7075																																																	
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380	60 197	0.006-0.008 .00024-.00031	100 328	0.012-0.016 .00047-.00063	140 459	0.018-0.020 .00071-.00079	200 656	0.026-0.028 .00102-.00110	220 722	0.036-0.040 .00142-.00157	240 787	0.058 .00228	280 919	0.055 .00217	280 919	0.055 .00217																																	
		3.2381	GD-AlSi10Mg	UNS A03590																																																	
	Copper	2.004	Cu-OF / CW008A	UNS C10100	60 197	0.006-0.008 .00024-.00031	100 328	0.014-0.018 .00055-.00071	140 459	0.020-0.022 .00079-.00087	200 656	0.026-0.028 .00102-.00110	220 722	0.036-0.040 .00142-.00157	240 787	0.058 .00228	280 919	0.055 .00217	280 919	0.055 .00217																																	
		2.0065	Cu-ETP / CW004A	UNS C11000																																																	
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	60 197	0.006-0.008 .00024-.00031	100 328	0.014-0.018 .00055-.00071	140 459	0.020-0.022 .00079-.00087	200 656	0.026-0.028 .00102-.00110	220 722	0.036-0.040 .00142-.00157	240 787	0.058 .00228	280 919	0.055 .00217	280 919	0.055 .00217																																	
		2.036	CuZn40 CW509L	UNS C28000																																																	
	Brass, Bronze Rm < 400 N/mm²	2.0401	CuZn39Pb3 / CW614N	UNS C38500	60 197	0.006-0.008 .00024-.00031	100 328	0.014-0.018 .00055-.00071	140 459	0.020-0.022 .00079-.00087	200 656	0.026-0.028 .00102-.00110	220 722	0.036-0.040 .00142-.00157	240 787	0.058 .00228	280 919	0.055 .00217	280 919	0.055 .00217																																	
		2.102	CuSn6	UNS C51900																																																	
	Bronze Rm < 600 N/mm²	2.0966	CuAl10Ni5Fe4	UNS C63000	60 197	0.006-0.008 .00024-.00031	100 328	0.012-0.016 .00047-.00063	140 459	0.018-0.020 .00071-.00079	200 656	0.026-0.028 .00102-.00110	220 722	0.036-0.040 .00142-.00157	240 787	0.058 .00228	280 919	0.055 .00217	280 919	0.055 .00217																																	
		2.096	CuAl9Mn2	UNS C63200																																																	
S ₁	Super alloys	2.4856		Inconel 625	60 197	0.003-0.004 .00012-.00016	100 328	0.004-0.006 .00016-.00024	120 394	0.007-0.008 .00028-.00031	130 427	0.009-0.010 .00035-.00039	140 459	0.010-0.012 .00039-.00047	150 492	0.015 .00059	170 558	0.020 .00079	170 558	0.020 .00079																																	
		2.4668		Inconel 718																																																	
		2.4617	NiMo28	Hastelloy B-2																																																	
		2.4665	NiCr22Fe18Mo	Hastelloy X																																																	
S ₂	Titanium pure	3.7035	Gr.2	ASTM B348 / F67	60 197	0.004-0.006 .00016-.00024	100 328	0.008-0.011 .00031-.00043	120 394	0.016-0.018 .00063-.00071	130 427	0.020-0.022 .00079-.00087	140 459	0.028-0.030 .00110-.00118	150 492	0.034 .00134	170 558	0.042 .00165	170 558	0.042 .00165																																	
		3.7065	Gr.4	ASTM B348 / F68																																																	
S ₃	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	60 197	0.004-0.006 .00016-.00024	100 328	0.008-0.011 .00031-.00043	120 394	0.016-0.018 .00063-.00071	130 427	0.020-0.022 .00079-.00087	140 459	0.028-0.030 .00110-.00118	150 492	0.034 .00134	170 558	0.042 .00165	170 558	0.042 .00165																																	
		9.9367	TiAl6Nb7	ASTM F1295																																																	
H ₁	Hardened steel < 55 HRC	2.4964	CoCr20W15Ni	Haynes 25	60 197	0.003-0.004 .00012-.00016	100 328	0.004-0.006 .00016-.00024	140 459	0.007-0.008 .00028-.00031	180 591	0.009-0.010 .00035-.00039	200 656	0.010-0.012 .00039-.00047	220 722	0.015 .00059	240 787	0.020 .00079	240 787	0.020 .00079																																	
			CrCoMo28	ASTM F1537																																																	
H ₂	Hardened steel ≥ 55 HRC	1.2510	100MnCrMoW4	AISI O1	60 197	0.004-0.006 .00016-.00024	80 262	0.007-0.009 .00028-.00035	100 328	0.010-0.012 .00039-.00047	140 459	0.014-0.018 .00055-.00071	180 591	0.020-0.026 .00079-.00102	200 656	0.030 .00118	240 787	0.032 .00126	240 787	0.032 .00126																																	
		1.2379	X153CrMoV12	AISI D2																																																	