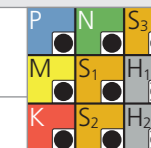


**NEW**

# Type C - Pre-machining

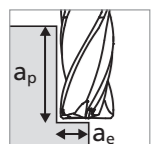
$v_c$  [m/min]  
 $f_z$  [mm]

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

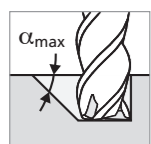


## MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

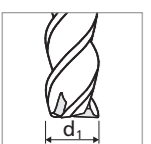
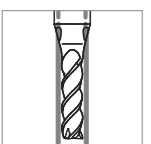
**Pre-machining**



- $a_p = 2 \times d_1$
- $a_e = 0.1 \times d_1$



**Note:**  
In case of linear ramp or helical interpolation milling reduce  $f_z$  by 35%



Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	1.0 mm		1.5 mm 1/16"		2.0 mm 3/32"		3.0 mm 1/8"		Ød. 4.0 mm 5/32"		5.0 mm 3/16" - 7/32"		6.0 mm 1/4"		8.0 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 Rm < 800 N/mm <sup>2</sup>	1.0301	C10	AISI 1010	120	0.017	140	0.026	160	0.038	180	0.048	200	0.050	200	0.052	220	0.056	220	0.068
		1.0401	C15	AISI 1015																
		1.1191	C45E/CK45	AISI 1045																
		1.0044	S275JR	AISI 1020																
		1.0715	11SMn30	AISI 1215																
	Low alloyed steel Rm > 900 N/mm <sup>2</sup>	1.5752	15NiCr13	ASTM 3415 / AISI 3310	120	0.016	140	0.025	160	0.036	180	0.044	200	0.048	200	0.050	220	0.054	220	0.066
		1.7131	16MnCr5	AISI 5115																
		1.3505	100Cr6	AISI 52100																
		1.7225	42CrMo4	AISI 4140																
		1.2842	90MnCrV8	AISI O2																
High alloyed tool steel Rm < 1200 N/mm <sup>2</sup>	1.2379	X153CrMoV12	AISI D2	120	0.012	140	0.022	160	0.035	180	0.042	200	0.043	200	0.045	220	0.048	220	0.058	
	1.2436	X210CrW12	AISI D4/D6																	
	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
1.4105			X6CrMoS17	AISI 430F																
Stainless steel martensitic		1.4034	X46Cr13	AISI 420C	120	0.017	140	0.025	160	0.036	180	0.044	200	0.046	200	0.048	220	0.052	260	0.060
		1.4112	X90CrMoV18	AISI 440B																
Stainless steel martensitic - PH		1.4542	X5CrNiCuNb16-4	AISI 630 / ASTM 17-4 PH	120	0.017	140	0.025	160	0.036	180	0.044	200	0.046	200	0.048	220	0.052	260	0.060
		1.4545	X5CrNiCuNb15-5	ASTM 15-5 PH																
Stainless steel austenitic		1.4301	X5CrNi18-10	AISI 304	120	0.013	140	0.016	160	0.034	180	0.042	200	0.044	200	0.046	220	0.049	260	0.058
	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	100	0.012	120	0.026	140	0.032	160	0.043	180	0.054	180	0.056	200	0.058	200	0.070
		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	170	0.020	190	0.029	210	0.040	230	0.060	250	0.062	250	0.064	270	0.068	270	0.084
		3.4365	AlZnMgCu1.5	ASTM 7075																
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380	170	0.020	190	0.029	210	0.040	230	0.060	250	0.062	250	0.064	270	0.068	270	0.084
		3.2381	GD-AlSi10Mg	UNS A03590																
	Copper	2.0040	Cu-OF / CW008A	UNS C10100	170	0.022	190	0.029	210	0.040	230	0.060	250	0.062	250	0.064	270	0.068	270	0.084
		2.0065	Cu-ETP / CW004A	UNS C11000																
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	170	0.022	190	0.029	210	0.040	230	0.060	250	0.062	250	0.064	270	0.068	270	0.084
		2.0360	CuZn40 CW509L	UNS C28000																
	Brass, Bronze Rm < 400 N/mm <sup>2</sup>	2.0401	CuZn39Pb3 / CW614N	UNS C38500	170	0.022	190	0.029	210	0.040	230	0.060	250	0.062	250	0.064	270	0.068	270	0.084
		2.1020	CuSn6	UNS C51900																
Bronze Rm < 600 N/mm <sup>2</sup>	2.0966	CuAl10Ni5Fe4	UNS C63000	170	0.020	190	0.029	210	0.040	230	0.060	250	0.062	250	0.064	270	0.068	270	0.084	
	2.0960	CuAl9Mn2	UNS C63200																	
S <sub>1</sub>	Super alloys	2.4856		Inconel 625	100	0.008	100	0.010	120	0.012	120	0.016	140	0.018	140	0.020	160	0.022	160	0.024
		2.4668		Inconel 718																
		2.4617	NiMo28	Hastelloy B-2																
		2.4665	NiCr22Fe18Mo	Hastelloy X																
S <sub>2</sub>	Titanium pure	3.7035	Gr.2	ASTM B348 / F67	100	0.018	100	0.022	120	0.032	120	0.042	140	0.044	140	0.046	160	0.048	160	0.054
		3.7065	Gr.4	ASTM B348 / F68																
S <sub>3</sub>	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	100	0.018	100	0.022	120	0.032	120	0.042	140	0.044	140	0.046	160	0.048	160	0.054
		9.9367	TiAl6Nb7	ASTM F1295																
H <sub>1</sub>	Hardened steel < 55 HRC	2.4964	CoCr20W15Ni	Haynes 25	100	0.008	100	0.010	120	0.012	120	0.016	140	0.018	140	0.020	160	0.022	160	0.024
			CrCoMo28	ASTM F1537																
H <sub>2</sub>	Hardened steel ≥ 55 HRC	1.2510	100MnCrMoW4	AISI O1																
		1.2379	X153CrMoV12	AISI D2																