

**NEW** Type A - Pre-machining

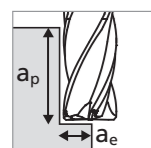
$v_c$  [m/min]  
 $f_z$  [mm]

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



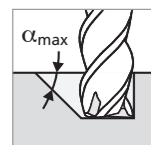
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

Pre-machining

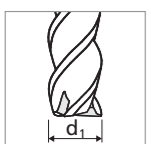


- ①  
■  $a_p = 1.5 \times d_1$   
■  $a_e = 0.3 \times d_1$

- ②  
■  $a_p = 2 \times d_1$   
■  $a_e = 0.2 \times d_1$



**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"			4.0 mm 5/32"			5.0 mm 3/16" - 7/32"			6.0 mm 1/4"			8.0 mm		
					$v_c$	① $f_z$	② $f_z$	$v_c$	① $f_z$	② $f_z$	$v_c$	① $f_z$	② $f_z$	$v_c$	① $f_z$	② $f_z$	$v_c$	① $f_z$	② $f_z$	$v_c$	① $f_z$	② $f_z$	$v_c$	① $f_z$	② $f_z$	$v_c$	① $f_z$	② $f_z$
P	Unalloyed carbon steel Rm < 800 N/mm <sup>2</sup>	1.0301	C10	AISI 1010	140	0.011	0.013	200	0.015	0.017	220	0.024	0.027	240	0.033	0.038	260	0.035	0.040	260	0.035	0.040	260	0.046	0.052	260	0.054	0.064
		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	140	0.010	0.012	200	0.013	0.015	220	0.022	0.025	240	0.031	0.035	260	0.033	0.038	260	0.033	0.038	260	0.044	0.050	260	0.052	0.060
		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	140	0.008	0.009	200	0.011	0.013	220	0.019	0.022	240	0.028	0.032	260	0.030	0.034	260	0.030	0.034	260	0.042	0.048	260	0.050	0.057	
	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	AISI 430 / UNS S43000	140	0.012	0.014	180	0.014	0.016	180	0.021	0.024	200	0.030	0.034	220	0.033	0.038	220	0.033	0.038	220	0.040	0.045	260	0.048	0.055
		1.4105	X6CrMoS17	AISI 430F																								
	Stainless steel martensitic	1.4034	X46Cr13	AISI 420C	140	0.011	0.013	180	0.014	0.016	180	0.021	0.024	200	0.030	0.034	220	0.032	0.037	220	0.032	0.037	220	0.037	0.043	260	0.045	0.052
		1.4112	X90CrMoV18	AISI 440B																								
	Stainless steel martensitic – PH	1.4542	X5CrNiCuNb16-4	AISI 630 / ASTM 17-4 PH	140	0.011	0.013	180	0.014	0.016	180	0.021	0.024	200	0.030	0.034	220	0.032	0.037	220	0.032	0.037	220	0.037	0.043	260	0.045	0.052
		1.4545	X5CrNiCuNb15-5	ASTM 15-5 PH																								
	Stainless steel austenitic	1.4301	X5CrNi18-10	AISI 304	140	0.009	0.011	180	0.012	0.014	180	0.018	0.020	200	0.026	0.030	220	0.031	0.035	220	0.031	0.035	220	0.035	0.040	260	0.042	0.048
1.4435		X2CrNiMo18-14-3	AISI 316L																									
1.4441		X2CrNiMo18-15-3	AISI 316LM																									
K	Cast iron	0.6020	GG20	ASTM 30	120	0.008	0.010	160	0.014	0.016	200	0.019	0.022	220	0.030	0.034	240	0.042	0.048	240	0.042	0.048	240	0.044	0.050	240	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 alloy wrought	3.2315	AlMgSi1	ASTM 6351	160	0.013	0.015	200	0.016	0.018	240	0.026	0.030	260	0.040	0.046	300	0.051	0.058	300	0.051	0.058	320	0.052	0.060	350	0.060	0.069
		3.4365	AlZnMgCu1.5	ASTM 7075																								
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380	160	0.013	0.015	220	0.016	0.018	240	0.026	0.030	260	0.040	0.046	300	0.051	0.058	300	0.051	0.058	320	0.052	0.060	350	0.060	0.069
		3.2381	GD-AlSi10Mg	UNS A03590																								
	Copper	2.0040	Cu-OF / CW008A	UNS C10100	160	0.013	0.015	220	0.016	0.018	240	0.026	0.030	260	0.040	0.046	300	0.051	0.058	300	0.051	0.058	320	0.052	0.060	350	0.060	0.069
		2.0065	Cu-ETP / CW004A	UNS C11000																								
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	160	0.013	0.015	220	0.016	0.018	240	0.026	0.030	260	0.040	0.046	300	0.051	0.058	300	0.051	0.058	320	0.052	0.060	350	0.060	0.069
		2.0360	CuZn40 CW509L	UNS C28000																								
Brass, Bronze Rm < 400 N/mm <sup>2</sup>	2.0401	CuZn39Pb3 / CW614N	UNS C38500	160	0.013	0.015	220	0.016	0.018	240	0.026	0.030	260	0.040	0.046	300	0.051	0.058	300	0.051	0.058	320	0.052	0.060	350	0.060	0.069	
	2.1020	CuSn6	UNS C51900																									
Bronze Rm < 600 N/mm <sup>2</sup>	2.0966	CuAl10Ni5Fe4	UNS C63000	160	0.013	0.015	220	0.016	0.018	240	0.026	0.030	260	0.040	0.046	300	0.051	0.058	300	0.051	0.058	320	0.052	0.060	350	0.060	0.069	
	2.0960	CuAl9Mn2	UNS C63200																									
S <sub>1</sub>	Super alloys	2.4856		Inconel 625	80	-	0.006	100	-	0.008	100	-	0.010	100	-	0.014	120	-	0.016	120	-	0.018	120	-	0.020	120	-	0.025
		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	0.01	0.012	100	0.012	0.014	110	0.017	0.020	110	0.028	0.032	130	0.031	0.035	130	0.031	0.035	130	0.032	0.037	140	0.035	0.040
		3.7065	Gr.4	ASTM B348 / F68																								
S <sub>2</sub>	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	100	0.01	0.012	100	0.012	0.014	110	0.017	0.020	110	0.028	0.032	130	0.031	0.035	130	0.031	0.035	130	0.032	0.037	140	0.035	0.040
		9.9367	TiAl6Nb7	ASTM F1295																								
S <sub>3</sub>	CrCo alloys	2.4964	CoCr20W15Ni CrCoMo28	Haynes 25 ASTM F1537	80	-	0.006	100	-	0.008	100	-	0.010	100	-	0.014	120	-	0.016	120	-	0.018	120	-	0.020	120	-	0.025
H <sub>1</sub> H <sub>2</sub>	Hardened steel ≥ 55 HRC	1.2510	100MnCrMoW4	AISI O1																								
		1.2379	X153CrMoV12	AISI D2																								