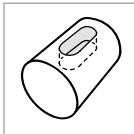
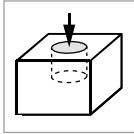
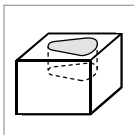

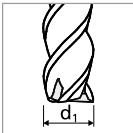
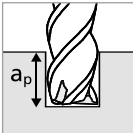
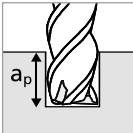
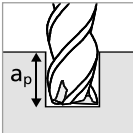
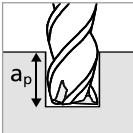


NEW

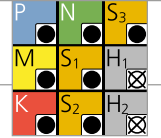
Type A - Keyways - Plunge - Slot milling

MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

	Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	1.0 mm			
						v_c	$f_{z,p}$	$f_{z,s}$	a_p
Keyway slot milling  <ul style="list-style-type: none"> ■ $f_{z,p}$: for plunge milling ■ $f_{z,s}$: for slot milling 	P	Unalloyed carbon steel Rm < 800 N/mm ²	1.0301	C10	AISI 1010	100	0.0013	0.0046	1xd1
			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 ²	1.5752	15NiCr13	ASTM 3415 / AISI 3310	100	0.0014	0.0049	1xd1
			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 ²	1.2379	X153CrMoV12	AISI D2	100	0.0012	0.0042	0.5xd1
			1.2436	X210CrW12	AISI D4/D6				
1.3343	H56-5-2C		AISI M2 / UNS T11302						
1.3355	H518-0-1		AISI T1 / UNS T12001						
Plunge milling  <ul style="list-style-type: none"> ■ $f_{z,p}$: for plunge milling 	M	Stainless steel ferritic	1.4016	X6Cr17	AISI 430 / UNS S43000	100	0.0010	0.0035	1xd1
			1.4105	X6CrMoS17	AISI 430F				
		Stainless steel martensitic	1.4034	X46Cr13	AISI 420C	100	0.0010	0.0035	0.5xd1
			1.4112	X90CrMoV18	AISI 440B				
		Stainless steel martensitic – PH	1.4542	X5CrNiCuNb16-4	AISI 630 / ASTM 17-4 PH	100	0.0010	0.0035	0.5xd1
			1.4545	X5CrNiCuNb15-5	ASTM 15-5 PH				
		Stainless steel austenitic	1.4301	X5CrNi18-10	AISI 304	100	0.0010	0.0035	1xd1
			1.4435	X2CrNiMo18-14-3	AISI 316L				
			1.4441	X2CrNiMo18-15-3	AISI 316LM				
1.4539	X1NiCrMoCu25-20-5	AISI 904L							
Slot milling  <ul style="list-style-type: none"> ■ $f_{z,p}$: for plunge milling ■ $f_{z,s}$: for slot milling 	K	Cast iron	0.6020	GG20	ASTM 30	100	0.0013	0.0042	1xd1
			0.6030	GG30	ASTM 40B				
			0.7040	GGG40	ASTM 60-40-18				
			0.7060	GGG60	ASTM 80-60-03				
 <ul style="list-style-type: none"> ■ $f_{z,p}$: for plunge milling ■ $f_{z,s}$: for slot milling 	N	Aluminium alloy wrought	3.2315	AlMgSi1	ASTM 6351	100	0.0012	0.0100	1xd1
			3.4365	AlZnMgCu1.5	ASTM 7075				
		Aluminium alloy cast	3.2163	GD-ALSi9Cu3	ASTM A380	100	0.0012	0.0100	1xd1
			3.2381	GD-ALSi10Mg	UNS A03590				
		Copper	2.0040	Cu-OF / CW008A	UNS C10100	100	0.0012	0.0100	1xd1
			2.0065	Cu-ETP / CW004A	UNS C11000				
		Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	100	0.0012	0.0100	1xd1
			2.0360	CuZn40 CW509L	UNS C28000				
		Brass, Bronze Rm < 400 N/mm ²	2.0401	CuZn39Pb3 / CW614N	UNS C38500	100	0.0012	0.0100	1xd1
			2.1020	CuSn6	UNS C51900				
		Bronze Rm < 600 N/mm ²	2.0966	CuAl10Ni5Fe4	UNS C63000	100	0.0012	0.0100	1xd1
			2.0960	CuAl9Mn2	UNS C63200				
 d_1	S₁	Super alloys	2.4856		Inconel 625	40	0.0010	0.0035	0.25xd1
			2.4668		Inconel 718				
			2.4617	NiMo28	Hastelloy B-2				
			2.4665	NiCr22Fe18Mo	Hastelloy X				
 d_1	S₂	Titanium pure	3.7035	Gr.2	ASTM B348 / F67	100	0.0010	0.0032	0.25xd1
			3.7065	Gr.4	ASTM B348 / F68				
 d_1	S₃	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	100	0.0010	0.0032	0.25xd1
			9.9367	TiAl6Nb7	ASTM F1295				
 a_p	H₁	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	80	0.0010	0.0035	0.5xd1
				CrCoMo28	ASTM F1537				
 a_p	H₂	Hardened steel < 55 HRC	1.2510	100MnCrMoW4	AISI O1				
			1.2379	X153CrMoV12	AISI D2				

v_c [m/min] a_p [mm]
 $f_{z,p}$ [mm] $f_{z,s}$ [mm]

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

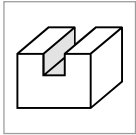

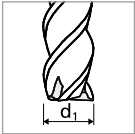
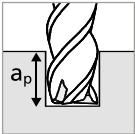


1.5 mm 1/16"				2.0 mm 3/32"				3.0 mm 1/8"				$\varnothing d_1$				4.0 mm 5/32"				5.0 mm 3/16" - 7/32"				6.0 mm - 8.0 mm 1/4"			
v_c	$f_{z,p}$	$f_{z,s}$	a_p	v_c	$f_{z,p}$	$f_{z,s}$	a_p	v_c	$f_{z,p}$	$f_{z,s}$	a_p	v_c	$f_{z,p}$	$f_{z,s}$	a_p	v_c	$f_{z,p}$	$f_{z,s}$	a_p	v_c	$f_{z,p}$	$f_{z,s}$	a_p	v_c	$f_{z,p}$	$f_{z,s}$	a_p
120	0.0020	0.0065	1xd1	120	0.0026	0.0091	1xd1	140	0.004	0.013	1xd1	140	0.005	0.020	1xd1	150	0.005	0.026	1xd1	160	0.006	0.033	1xd1				
120	0.0021	0.0070	1xd1	120	0.0028	0.0098	1xd1	140	0.004	0.014	1xd1	140	0.005	0.021	1xd1	150	0.006	0.027	1xd1	160	0.006	0.034	1xd1				
120	0.0018	0.0060	0.5xd1	120	0.0024	0.0084	0.5xd1	140	0.003	0.012	0.5xd1	140	0.004	0.017	0.5xd1	150	0.004	0.022	0.5xd1	160	0.005	0.028	0.5xd1				
120	0.0015	0.0050	1xd1	120	0.0020	0.0070	1xd1	140	0.003	0.010	1xd1	140	0.004	0.015	1xd1	150	0.004	0.020	1xd1	160	0.005	0.025	1xd1				
120	0.0015	0.0050	0.5xd1	120	0.0020	0.0070	0.5xd1	140	0.003	0.010	0.5xd1	140	0.004	0.015	0.5xd1	150	0.004	0.020	0.5xd1	160	0.005	0.025	0.5xd1				
120	0.0015	0.0050	0.5xd1	120	0.0020	0.0070	0.5xd1	140	0.003	0.010	0.5xd1	140	0.004	0.015	0.5xd1	150	0.004	0.020	0.5xd1	160	0.005	0.025	0.5xd1				
120	0.0015	0.0050	1xd1	120	0.0020	0.0070	1xd1	140	0.003	0.010	1xd1	140	0.004	0.015	1xd1	150	0.004	0.020	1xd1	160	0.005	0.025	1xd1				
120	0.0019	0.0060	1xd1	120	0.0024	0.0084	1xd1	140	0.004	0.012	1xd1	140	0.004	0.017	1xd1	150	0.005	0.022	1xd1	160	0.005	0.028	1xd1				
120	0.0018	0.0160	1xd1	120	0.0024	0.0210	1xd1	150	0.004	0.034	1xd1	160	0.004	0.035	1xd1	170	0.005	0.036	1xd1	180	0.005	0.037	1xd1				
120	0.0018	0.0160	1xd1	120	0.0024	0.0210	1xd1	150	0.004	0.034	1xd1	160	0.004	0.035	1xd1	170	0.005	0.036	1xd1	180	0.005	0.037	1xd1				
120	0.0018	0.0160	1xd1	120	0.0024	0.0210	1xd1	150	0.004	0.034	1xd1	160	0.004	0.035	1xd1	170	0.005	0.036	1xd1	180	0.005	0.037	1xd1				
120	0.0018	0.0160	1xd1	120	0.0024	0.0210	1xd1	150	0.004	0.034	1xd1	160	0.004	0.035	1xd1	170	0.005	0.036	1xd1	180	0.005	0.037	1xd1				
120	0.0018	0.0160	1xd1	120	0.0024	0.0210	1xd1	150	0.004	0.034	1xd1	160	0.004	0.035	1xd1	170	0.005	0.036	1xd1	180	0.005	0.037	1xd1				
120	0.0018	0.0160	1xd1	120	0.0024	0.0210	1xd1	150	0.004	0.034	1xd1	160	0.004	0.035	1xd1	170	0.005	0.036	1xd1	180	0.005	0.037	1xd1				
40	0.0015	0.0050	0.25xd1	50	0.0020	0.0070	0.25xd1	50	0.003	0.010	0.25xd1	60	0.004	0.014	0.25xd1	80	0.004	0.018	0.25xd1	80	0.005	0.021	0.25xd1				
110	0.0014	0.0045	0.25xd1	120	0.0018	0.0063	0.25xd1	130	0.003	0.010	0.25xd1	140	0.004	0.013	0.25xd1	140	0.004	0.016	0.25xd1	140	0.005	0.019	0.25xd1				
110	0.0014	0.0045	0.25xd1	120	0.0018	0.0063	0.25xd1	130	0.003	0.010	0.25xd1	140	0.004	0.013	0.25xd1	140	0.004	0.016	0.25xd1	140	0.005	0.019	0.25xd1				
80	0.0015	0.0050	0.5xd1	100	0.0020	0.0070	0.5xd1	100	0.003	0.010	0.5xd1	120	0.004	0.014	0.5xd1	120	0.004	0.018	0.5xd1	140	0.005	0.021	0.5xd1				

NEW

Type A - Milling of through slots

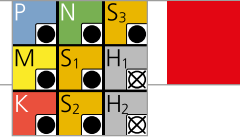
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

	Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	1.0 mm			
						v_c	f_z	a_p	
<p>Through slot milling</p>    	P	Unalloyed carbon steel Rm < 800 N/mm²	1.0301	C10	AISI 1010	140	0.009	1xd1	
			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/mm²	1.5752	15NiCr13	ASTM 3415 / AISI 3310		140	0.008	1xd1
			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/mm²	1.2379	X153CrMoV12	AISI D2	140	0.006	0.5xd1	
			1.2436	X210CrW12	AISI D4/D6				
			1.3343	H56-5-2C	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	0.009	1xd1
1.4105	X6CrMoS17			AISI 430F					
Stainless steel martensitic	1.4034		X46Cr13	AISI 420C	140	0.009	1xd1		
	1.4112		X90CrMoV18	AISI 440B					
Stainless steel martensitic – PH	1.4542		X5CrNiCuNb16-4	AISI 630 / ASTM 17-4 PH	140	0.009	1xd1		
	1.4545		X5CrNiCuNb15-5	ASTM 15-5 PH					
Stainless steel austenitic	1.4301		X5CrNi18-10	AISI 304	140	0.007	1xd1		
	1.4435		X2CrNiMo18-14-3	AISI 316L					
	1.4441	X2CrNiMo18-15-3	AISI 316LM						
K	Cast iron	0.6020	GG20	ASTM 30	120	0.007	1xd1		
		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	140	0.010	1xd1		
		3.4365	AlZnMgCu1.5	ASTM 7075					
	Aluminium alloy cast	3.2163	GD-ALSi9Cu3	ASTM A380	140	0.010	1xd1		
		3.2381	GD-ALSi10Mg	UNS A03590					
	Copper	2.0040	Cu-OF / CW008A	UNS C10100	140	0.012	1xd1		
		2.0065	Cu-ETP / CW004A	UNS C11000					
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	140	0.012	1xd1		
		2.0360	CuZn40 CW509L	UNS C28000					
	Brass, Bronze Rm < 400 N/mm²	2.0401	CuZn39Pb3 / CW614N	UNS C38500	140	0.012	1xd1		
		2.1020	CuSn6	UNS C51900					
Bronze Rm < 600 N/mm²	2.0966	CuAl10Ni5Fe4	UNS C63000	140	0.011	1xd1			
	2.0960	CuAl9Mn2	UNS C63200						
S₁	Super alloys	2.4856		Inconel 625	100	0.005	0.5xd1		
		2.4668		Inconel 718					
		2.4617	NiMo28	Hastelloy B-2					
		2.4665	NiCr22Fe18Mo	Hastelloy X					
S₂	Titanium pure	3.7035	Gr.2	ASTM B348 / F67	100	0.009	0.5xd1		
		3.7065	Gr.4	ASTM B348 / F68					
S₂	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	100	0.009	0.5xd1		
		9.9367	TiAl6Nb7	ASTM F1295					
S₃	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	100	0.005	0.5xd1		
			CrCoMo28	ASTM F1537					
H₁ H₂	Hardened steel < 55 HRC	1.2510	100MnCrMoW4	AISI O1					
		1.2379	X153CrMoV12	AISI D2					

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

RECOMMENDATION FOR USE

● Excellent | ● Good | ○ Acceptable | ⊗ Not recommended

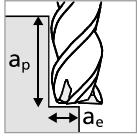

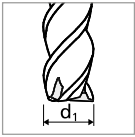


1.5 mm 1/16"			2.0 mm 3/32"			3.0 mm 1/8"			4.0 mm 5/32"			5.0 mm 3/16" - 7/32"			6.0 mm - 8.0 mm 1/4"		
v_c	f_z	a_p	v_c	f_z	a_p	v_c	f_z	a_p	v_c	f_z	a_p	v_c	f_z	a_p	v_c	f_z	a_p
180	0.015	1xd1	200	0.020	1xd1	220	0.029	1xd1	230	0.031	1xd1	240	0.031	1xd1	260	0.032	1xd1
180	0.013	1xd1	200	0.019	1xd1	220	0.028	1xd1	230	0.029	1xd1	240	0.030	1xd1	260	0.031	1xd1
180	0.012	0.5xd1	200	0.017	0.5xd1	220	0.025	0.5xd1	230	0.026	0.5xd1	240	0.026	0.5xd1	260	0.027	0.5xd1
180	0.015	1xd1	200	0.020	1xd1	220	0.028	1xd1	230	0.029	1xd1	240	0.030	1xd1	260	0.031	1xd1
180	0.013	1xd1	200	0.019	1xd1	220	0.027	1xd1	230	0.028	1xd1	240	0.029	1xd1	260	0.029	1xd1
180	0.013	1xd1	200	0.019	1xd1	220	0.027	1xd1	230	0.028	1xd1	240	0.029	1xd1	260	0.029	1xd1
180	0.011	1xd1	200	0.017	1xd1	220	0.025	1xd1	230	0.027	1xd1	240	0.027	1xd1	260	0.028	1xd1
140	0.015	1xd1	160	0.017	1xd1	180	0.025	1xd1	200	0.031	1xd1	200	0.031	1xd1	200	0.032	1xd1
180	0.016	1xd1	200	0.021	1xd1	220	0.034	1xd1	260	0.035	1xd1	300	0.036	1xd1	340	0.037	1xd1
180	0.016	1xd1	200	0.021	1xd1	220	0.032	1xd1	260	0.034	1xd1	300	0.034	1xd1	340	0.036	1xd1
180	0.016	1xd1	200	0.021	1xd1	220	0.034	1xd1	260	0.035	1xd1	300	0.036	1xd1	340	0.037	1xd1
180	0.016	1xd1	200	0.021	1xd1	220	0.034	1xd1	260	0.035	1xd1	300	0.036	1xd1	340	0.037	1xd1
180	0.016	1xd1	200	0.021	1xd1	220	0.034	1xd1	260	0.035	1xd1	300	0.036	1xd1	340	0.037	1xd1
180	0.016	1xd1	200	0.021	1xd1	220	0.034	1xd1	260	0.035	1xd1	300	0.036	1xd1	340	0.037	1xd1
100	0.006	0.5xd1	120	0.007	0.5xd1	120	0.010	0.5xd1	140	0.013	0.5xd1	140	0.013	0.5xd1	140	0.013	0.5xd1
100	0.012	0.5xd1	120	0.017	0.5xd1	120	0.027	0.5xd1	140	0.027	0.5xd1	140	0.027	0.5xd1	140	0.028	0.5xd1
100	0.012	0.5xd1	120	0.017	0.5xd1	120	0.027	0.5xd1	140	0.027	0.5xd1	140	0.027	0.5xd1	140	0.028	0.5xd1
100	0.006	0.5xd1	120	0.007	0.5xd1	120	0.010	0.5xd1	140	0.013	0.5xd1	140	0.013	0.5xd1	140	0.013	0.5xd1

NEW

Type A - Side milling - Semi-finishing

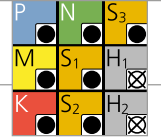
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

	Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	1.0 mm	
						v_c	f_z
<p>Semi-finishing</p>  <p>■ $a_p = 1 \times d_1 - 2 \times d_1$ ■ $a_e = 0.2 \times d_1$</p>  	P	Unalloyed carbon steel Rm < 800 N/mm ²	1.0301	C10	AISI 1010	140	0.013
			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 ²	1.5752	15NiCr13	ASTM 3415 / AISI 3310	140	0.012
			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 ²	1.2379	X153CrMoV12	AISI D2	140	0.009
			1.2436	X210CrW12	AISI D4/D6		
			1.3343	H56-5-2C	AISI M2 / UNS T11302		
			1.3355	H518-0-1	AISI T1 / UNS T12001		
		M	Stainless steel ferritic	1.4016	X6Cr17	AISI 430 / UNS S43000	140
1.4105	X6CrMoS17			AISI 430F			
Stainless steel martensitic	1.4034		X46Cr13	AISI 420C	140	0.013	
	1.4112		X90CrMoV18	AISI 440B			
Stainless steel martensitic – PH	1.4542		X5CrNiCuNb16-4	AISI 630 / ASTM 17-4 PH	140	0.013	
	1.4545		X5CrNiCuNb15-5	ASTM 15-5 PH			
Stainless steel austenitic	1.4301		X5CrNi18-10	AISI 304	140	0.010	
	1.4435		X2CrNiMo18-14-3	AISI 316L			
	1.4441	X2CrNiMo18-15-3	AISI 316LM				
K	Cast iron	0.6020	GG20	ASTM 30	120	0.009	
		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	140	0.015	
		3.4365	AlZnMgCu1.5	ASTM 7075			
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380	140	0.015	
		3.2381	GD-AlSi10Mg	UNS A03590			
	Copper	2.0040	Cu-OF / CW008A	UNS C10100	140	0.017	
		2.0065	Cu-ETP / CW004A	UNS C11000			
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	140	0.017	
		2.0360	CuZn40 CW509L	UNS C28000			
	Brass, Bronze Rm < 400 N/mm ²	2.0401	CuZn39Pb3 / CW614N	UNS C38500	140	0.017	
		2.1020	CuSn6	UNS C51900			
Bronze Rm < 600 N/mm ²	2.0966	CuAl10Ni5Fe4	UNS C63000	140	0.015		
	2.0960	CuAl9Mn2	UNS C63200				
S₁	Super alloys	2.4856		Inconel 625	120	0.006	
		2.4668		Inconel 718			
		2.4617	NiMo28	Hastelloy B-2			
		2.4665	NiCr22Fe18Mo	Hastelloy X			
S₂	Titanium pure	3.7035	Gr.2	ASTM B348 / F67	120	0.014	
		3.7065	Gr.4	ASTM B348 / F68			
S₃	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	120	0.014	
		9.9367	TiAl6Nb7	ASTM F1295			
S₃	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	140	0.006	
			CrCoMo28	ASTM F1537			
H₁	Hardened steel < 55 HRC	1.2510	100MnCrMoW4	AISI O1			
H₂	Hardened steel ≥ 55 HRC	1.2379	X153CrMoV12	AISI D2			

v_c [m/min]
 f_z [mm]

RECOMMENDATION FOR USE

● Excellent | ● Good | ○ Acceptable | ⊗ Not recommended

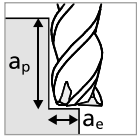

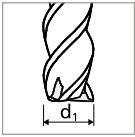


	1.5 mm 1/16"		2.0 mm 3/32"		3.0 mm 1/8"		Ød ₁ 4.0 mm 5/32"		5.0 mm 3/16" - 7/32"		6.0 mm 1/4"		8.0 mm	
	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z
	200	0.020	220	0.029	240	0.037	260	0.040	260	0.040	260	0.043	260	0.051
	200	0.019	220	0.027	240	0.035	260	0.038	260	0.038	260	0.041	260	0.049
	200	0.017	220	0.026	240	0.032	260	0.034	260	0.034	260	0.036	260	0.043
	200	0.020	220	0.029	240	0.035	260	0.038	260	0.038	260	0.041	260	0.046
	200	0.019	220	0.027	240	0.035	260	0.037	260	0.037	260	0.039	260	0.045
	200	0.019	220	0.027	240	0.035	260	0.037	260	0.037	260	0.039	260	0.045
	200	0.014	220	0.026	240	0.032	260	0.035	260	0.035	260	0.037	260	0.043
	140	0.020	160	0.024	180	0.034	200	0.040	200	0.042	200	0.044	200	0.052
	200	0.022	220	0.031	240	0.046	260	0.048	260	0.048	260	0.051	260	0.063
	200	0.022	220	0.031	240	0.046	260	0.048	260	0.048	260	0.051	260	0.063
	200	0.022	220	0.031	240	0.046	260	0.048	260	0.048	260	0.051	260	0.063
	200	0.022	220	0.031	240	0.046	260	0.048	260	0.048	260	0.051	260	0.063
	200	0.022	220	0.031	240	0.046	260	0.048	260	0.048	260	0.051	260	0.063
	200	0.022	220	0.031	240	0.046	260	0.048	260	0.048	260	0.051	260	0.063
	130	0.008	140	0.009	150	0.012	170	0.016	170	0.016	170	0.017	170	0.018
	130	0.017	140	0.024	150	0.032	170	0.035	170	0.035	170	0.037	170	0.040
	130	0.017	140	0.024	150	0.032	170	0.035	170	0.035	170	0.037	170	0.040
	180	0.008	200	0.009	220	0.012	240	0.016	240	0.016	240	0.017	240	0.018

NEW

Type A - Side milling - Finishing

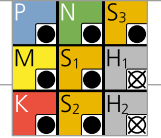
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

	Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	1.0 mm	
						v_c	f_z
<p>Finishing</p>  <p>■ $a_p = 2.5 \times d_1$ ■ $a_e = 0.05 \times d_1$</p>  	P	Unalloyed carbon steel Rm < 800 N/mm ²	1.0301	C10	AISI 1010	130	0.008
			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 ²	1.5752	15NiCr13	ASTM 3415 / AISI 3310	130	0.007
			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 ²	1.2379	X153CrMoV12	AISI D2	130	0.006
			1.2436	X210CrW12	AISI D4/D6		
			1.3343	H56-5-2C	AISI M2 / UNS T11302		
			1.3355	H518-0-1	AISI T1 / UNS T12001		
		M	Stainless steel ferritic	1.4016	X6Cr17	AISI 430 / UNS S43000	130
1.4105	X6CrMoS17			AISI 430F			
Stainless steel martensitic	1.4034		X46Cr13	AISI 420C	130	0.008	
	1.4112		X90CrMoV18	AISI 440B			
Stainless steel martensitic – PH	1.4542		X5CrNiCuNb16-4	AISI 630 / ASTM 17-4 PH	130	0.008	
	1.4545		X5CrNiCuNb15-5	ASTM 15-5 PH			
Stainless steel austenitic	1.4301		X5CrNi18-10	AISI 304	130	0.006	
	1.4435		X2CrNiMo18-14-3	AISI 316L			
	1.4441	X2CrNiMo18-15-3	AISI 316LM				
K	Cast iron	0.6020	GG20	ASTM 30	110	0.006	
		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	130	0.009	
		3.4365	AlZnMgCu1.5	ASTM 7075			
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380	130	0.009	
		3.2381	GD-AlSi10Mg	UNS A03590			
	Copper	2.0040	Cu-OF / CW008A	UNS C10100	130	0.010	
		2.0065	Cu-ETP / CW004A	UNS C11000			
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	130	0.010	
		2.0360	CuZn40 CW509L	UNS C28000			
	Brass, Bronze Rm < 400 N/mm ²	2.0401	CuZn39Pb3 / CW614N	UNS C38500	130	0.010	
		2.1020	CuSn6	UNS C51900			
Bronze Rm < 600 N/mm ²	2.0966	CuAl10Ni5Fe4	UNS C63000	130	0.009		
	2.0960	CuAl9Mn2	UNS C63200				
S₁	Super alloys	2.4856		Inconel 625	110	0.004	
		2.4668		Inconel 718			
		2.4617	NiMo28	Hastelloy B-2			
		2.4665	NiCr22Fe18Mo	Hastelloy X			
S₂	Titanium pure	3.7035	Gr.2	ASTM B348 / F67	110	0.008	
		3.7065	Gr.4	ASTM B348 / F68			
S₃	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	110	0.008	
		9.9367	TiAl6Nb7	ASTM F1295			
S₃	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	130	0.004	
			CrCoMo28	ASTM F1537			
H₁	Hardened steel < 55 HRC	1.2510	100MnCrMoW4	AISI O1			
H₂	Hardened steel ≥ 55 HRC	1.2379	X153CrMoV12	AISI D2			

v_c [m/min]
 f_z [mm]

RECOMMENDATION FOR USE

● Excellent | ● Good | ○ Acceptable | ⊗ Not recommended



	1.5 mm 1/16"		2.0 mm 3/32"		3.0 mm 1/8"		Ød ₁ 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
	180	0.012	200	0.017	210	0.023	220	0.025	220	0.028	220	0.033	220	0.042
	180	0.011	200	0.016	210	0.022	220	0.024	220	0.026	220	0.029	220	0.038
	180	0.010	200	0.015	210	0.020	220	0.021	220	0.023	220	0.025	220	0.034
	180	0.012	200	0.017	210	0.022	220	0.024	220	0.026	220	0.029	220	0.036
	180	0.011	200	0.016	210	0.022	220	0.023	220	0.025	220	0.028	220	0.037
	180	0.011	200	0.016	210	0.022	220	0.023	220	0.025	220	0.028	220	0.037
	180	0.008	200	0.015	210	0.020	220	0.022	220	0.024	220	0.026	220	0.035
	130	0.012	150	0.014	160	0.022	170	0.025	170	0.029	170	0.031	200	0.040
	180	0.013	200	0.018	210	0.029	220	0.030	220	0.033	220	0.036	270	0.045
	180	0.013	200	0.018	210	0.029	220	0.030	220	0.033	220	0.036	270	0.045
	180	0.013	200	0.018	210	0.029	220	0.030	220	0.033	220	0.036	270	0.045
	180	0.013	200	0.018	210	0.029	220	0.030	220	0.033	220	0.036	270	0.045
	180	0.013	200	0.018	210	0.029	220	0.030	220	0.033	220	0.036	270	0.045
	180	0.013	200	0.018	210	0.029	220	0.030	220	0.033	220	0.036	270	0.045
	120	0.005	130	0.005	130	0.008	140	0.010	140	0.011	150	0.012	160	0.021
	120	0.010	130	0.014	130	0.020	140	0.022	140	0.024	150	0.026	160	0.035
	120	0.010	130	0.014	130	0.020	140	0.022	140	0.024	150	0.026	160	0.035
	160	0.005	180	0.005	190	0.008	200	0.010	200	0.011	200	0.012	200	0.021