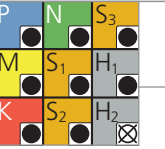


CrazyMill Cool Ball - Type A - Roughing

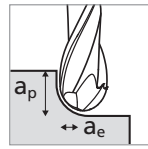
v_c [m/min] | [SFM]
 f_z [mm] | [IPT]

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



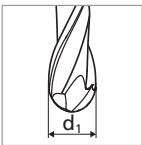
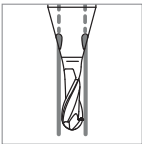
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

Roughing



- $a_p = 0.5 \times d_1$
($d_1 \leq 0.5$ mm | .020")
- $a_e = 1 \times d_1$
($d_1 > 0.5$ mm | .020")
- $a_e = 0.3 \times d_1$

Machining angle = 0°



Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	Ød1 0.3–0.4 mm .012"–.016"		Ød1 0.5–0.8 mm .020"–.031"		Ød1 1.0–1.2 mm .039"–.047"		Ød1 1.5–1.8 mm .059"–.071"		Ød1 2.0–2.5 mm .079"–.098"		Ød1 3.0 mm .118"		Ød1 4.0–6.0 mm .157"–.236"		Ød1 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	v_c	f_z
P	Unalloyed carbon steel Rm < 800 N/mm²	1.0301	C10	AISI 1010																		
		1.0401	C15	AISI 1015																		
		1.1191	C45E/CK45	AISI 1045		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	0.048 .00189	280 919	0.050 .00197	280 919	0.050 .00197	
		1.0044	S275JR	AISI 1020																		
		1.0715	11SMn30	AISI 1215																		
	Low alloyed steel Rm > 900 N/mm²	1.5752	15NiCr13	ASTM 3415 / AISI 3310																		
		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	0.046 .00181	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																		
	High alloyed tool steel Rm < 1200 N/mm²	1.2379	X153CrMoV12	AISI D2		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	0.042 .00165	280 919	0.044 .00173	280 919	0.044 .00173	
		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		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	0.046 .00181	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	0.044 .00173	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	0.044 .00173	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																		
		1.4435	X2CrNiMo 18-14-3	AISI 316L		60 197	0.004–0.006 .00016–.00024	100 328	0.008–0.011 .00031–.00043	140 459	0.012–0.014 .00043–.00051	200 656	0.016–0.018 .00063–.00071	220 722	0.030–0.032 .00118–.00126	240 787	0.042 .00165	280 919	0.044 .00173	280 919	0.044 .00173	
1.4441		X2CrNiMo 18-15-3	AISI 316LM																			
	1.4539	X1NiCrMoCu 25-20-5	AISI 904L																			
K	Cast iron	0.6020	GG20	ASTM 30																		
		0.6030	GG30	ASTM 40B		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	0.042–0.048 .00165–.00189	200 656	0.052–0.057 .00205–.00224	200 656	0.052–0.057 .00205–.00224	
		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	0.060 .00236	280 919	0.060 .00236	
		3.4365	AlZnMgCu1.5	ASTM 7075																		
	Aluminium alloy cast	3.2163	GD-AISi9Cu3	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	0.060 .00236	280 919	0.060 .00236	
		3.2381	GD-AISi10Mg	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	0.060 .00236	280 919	0.060 .00236	
		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	0.060 .00236	280 919	0.060 .00236	
		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	0.060 .00236	280 919	0.060 .00236	
		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	0.060 .00236	280 919	0.060 .00236	
		2.096	CuAl9Mn2	UNS C63200																		
S1	Super alloys	2.4856		Inconel 625																		
		2.4668		Inconel 718		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 .000639–.00047	150 492	0.015 .00059	170 558	0.020 .00079	170 558	0.020 .00079	
		2.4617	NiMo28	Hastelloy B-2																		
		2.4665	NiCr22Fe18Mo	Hastelloy X																		
S2	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	0.042 .00165	170 558	0.044 .00173	170 558	0.044 .00173	
		3.7065	Gr.4	ASTM B348 / F68																		
S2	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						