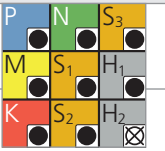


CrazyMill Cool Ball - Type C - Roughing

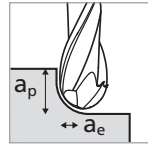
V_c [m/min] | [SFM]
f_z [mm] | [IPT]

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



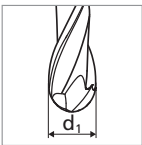
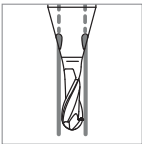
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

Roughing



- ap = 0.5 x d_i
(Ød_i ≤ 0.5 mm | .020")
- ae = 1 x d_i
(Ød_i > 0.5 mm | .020")
- ae = 0.3 x d_i

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/mm ²	1.0301 1.0401 1.1191 1.0044 1.0715	C10 C15 C45E/CK45 S275JR 11SMn30	AISI 1010 AISI 1015 AISI 1045 AISI 1020 AISI 1215	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
	Low alloyed steel Rm > 900 N/mm ²	1.5752 1.7131 1.3505 1.7225 1.2842	15NiCr13 16MnCr5 100Cr6 42CrMo4 90MnCrV8	ASTM 3415 / AISI 3310 AISI 5115 AISI 52100 AISI 4140 AISI O2	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		
	High alloyed tool steel Rm < 1200 N/mm ²	1.2379 1.2436 1.3343 1.3355	X153CrMoV12 X210CrW12 HS6-5-2C HS18-0-1	AISI D2 AISI D4/D6 AISI M2 / UNS T11302 AISI T1 / UNS T12001	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		
M	Stainless steel ferritic	1.4016 1.4105	X6Cr17 X6CrMoS17	AISI 430 / UNS S43000 AISI 430F	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		
	Stainless steel martensitic	1.4034 1.4112	X46Cr13 X90CrMoV18	AISI 420C AISI 440B	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		
	Stainless steel martensitic - PH	1.4542 1.4545	X5CrNiCuNb 16-4 X5CrNiCuNb 15-5	AISI 630 / ASTM 17-4 PH ASTM 15-5 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		
	Stainless steel austenitic	1.4301 1.4435 1.4441 1.4539	X5CrNi 18-10 X2CrNiMo 18-14-3 X2CrNiMo 18-15-3 X1NiCrMoCu 25-20-5	AISI 304 AISI 316L AISI 316LM AISI 904L	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		
K	Cast iron	0.6020 0.6030 0.7040 0.7060	GG20 GG30 GGG40 GGG60	ASTM 30 ASTM 40B ASTM 60-40-18 ASTM 80-60-03	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		
N	Aluminium alloy wrought	3.2315 3.4365	AlMgSi1 AlZnMgCu1.5	ASTM 6351 ASTM 7075	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		
	Aluminium alloy cast	3.2163 3.2381	GD-AISI9Cu3 GD-AISI10Mg	ASTM A380 UNS A03590	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		
	Copper	2.004 2.0065	Cu-OF / CW008A Cu-ETP / CW004A	UNS C10100 UNS C11000	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		
	Brass lead free	2.0321 2.036	CuZn37 CW508L CuZn40 CW509L	UNS C27400 UNS C28000	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		
	Brass, Bronze Rm < 400 N/mm ²	2.0401 2.102	CuZn39Pb3 / CW614N CuSn6	UNS C38500 UNS C51900	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		
	Bronze Rm < 600 N/mm ²	2.0966 2.096	CuAl10Ni5Fe4 CuAl9Mn2	UNS C63000 UNS C63200	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		
S₁	Super alloys	2.4856 2.4668 2.4617 2.4665		Inconel 625 Inconel 718 Hastelloy B-2 Hastelloy X	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		
S₂	Titanium pure	3.7035 3.7065	Gr.2 Gr.4	ASTM B348 / F67 ASTM B348 / F68	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		
	Titanium alloys	3.7165 9.9367	TiAl6V4 TiAl6Nb7	ASTM B348 / F136 ASTM F1295	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		
S₃	CrCo alloys	2.4964	CoCr20W15Ni CrCoMo28	Haynes 25 ASTM F1537	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 .000639-.00047	220 722	0.015 .00059	240 787	0.020 .00079	240 787	0.020 .00079		
H₁	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 .000639-.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		
H₂	Hardened steel ≥ 55 HRC	1.2379	X153CrMoV12	AISI D2																		

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