CRAZYMILL™ by Mikron Tool Cool

CrazyMill Cool Ball - Type B - Semi-finishing

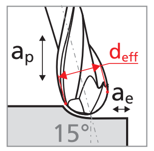
v_c [m/min] | **[SFM]**
f_z [mm] | **[IPT]**
d_{eff} [mm] | **[inch]**

RECOMMENDATION FOR USE
● Excellent | ◐ Good | ○ Acceptable | ⊠ Not recommended

P ●	N ●	S_3 ●
M ●	S_1 ●	H_1 ●
K ●	S_2 ●	H_2 ⊠

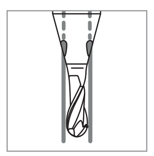
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

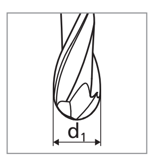
Semi-finishing



- $a_p = 0.25 \times d_1$ ($Ød_1 \leq 0.5$ mm | **.020"**)
- $a_p = 0.5 \times d_1$ ($Ød_1 > 0.5$ mm | **.020"**)
- $a_e = 0.1 \times d_1$

Machining angle = 15°





Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS
P	Unalloyed carbon steel Rm < 800 N/mm²	1.0301	C10	AISI 1010
		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
		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<1200N/mm²	1.2379	X153CrMoV12	AISI D2
		1.2436	X210CrW12	AISI D4/D6
		1.3343	HS6-5-2C	AISI M2
		1.3355	HS18-0-1	AISI T1
M	Stainless steel ferritic	1.4016	X6Cr17	AISI 430
		1.4105	X6CrMoS17	AISI 430F
	Stainless steel martensitic	1.4034	X46Cr13	AISI 420C
		1.4112	X90CrMoV18	AISI 440B
	Stainless steel martensitic – PH	1.4542	X5CrNiCuNb 16-4	AISI 630
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5PH
	Stainless steel austenitic	1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
		1.4441	X2CrNiMo 18-15-3	AISI 316LM
		1.4539	X1NiCrMoCu25-20-5	AISI 904L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM60-40-18
		0.7060	GGG60	ASTM80-60-03
N	Aluminium alloy wrought	3.2315	AlMgSi1	ASTM 6351
		3.4365	AlZnMgCu1.5	ASTM 7075
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380
		3.2381	GD-AlSi10Mg	UNS A03590
	Copper	2.004	Cu-OF / CW008A	UNS C10100
		2.0065	Cu-ETP / CW004A	UNS C11000
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400
		2.036	CuZn40 CW509L	UNS C28000
	Brass, Bronze Rm < 400 N/mm²	2.0401	CuZn39Pb3	UNS C38500
		2.102	CuSn6	UNS C51900
	Bronze Rm < 600 N/mm²	2.0966	CuAl10Ni5Fe4	UNS C63000
		2.096	CuAl9Mn2	UNS C63200
S_1	Super alloys	2.4856		Inconel 625
		2.4668		Inconel 718
		2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
S_2	Titanium pure	3.7035	Gr.2	ASTM B348
		3.7065	Gr.4	ASTM B348
	Titanium alloys	3.7165	TiAl6V4	ASTM B348
		9.9367	TiAl6Nb7	ASTM F1295
S_3	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25
			CrCoMo28	ASTM F1537
H_1	Hardened steel < 55 HRC	1.2510	100MnCrMoW4	AISI O1
H_2	Hardened steel ≥ 55 HRC	1.2379	X153CrMoV12	AISI D2

Material	Ød1 0.3 mm | .012"			Ød1 0.4 mm | .016"			Ød1 0.5 mm | .020"			Ød1 0.6 mm | .024"			Ød1 0.8 mm | .032"			Ød1 1.0 mm | .039"			Ød1 1.2 mm | .047"			Ød1 1.5 | .059"		
	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z
Unalloyed carbon steel	55	0.29	0.005	73	0.39	0.007	92	0.48	0.010	100	0.60	0.012	100	0.80	0.014	140	1.00	0.015	140	1.20	0.017	200	1.50	0.024
	180	.011	.00020	240	.015	.00028	302	.019	.00039	328	.024	.00047	328	.032	.00055	459	.039	.00059	459	.047	.00067	656	.059	.00094
Low alloyed steel	55	0.29	0.004	73	0.39	0.006	92	0.48	0.009	100	0.60	0.011	100	0.80	0.012	140	1.00	0.014	140	1.20	0.016	200	1.50	0.022
	180	.011	.00016	240	.015	.00024	302	.019	.00035	328	.024	.00043	328	.032	.00047	459	.039	.00055	459	.047	.00063	656	.059	.00087
High alloyed tool steel	55	0.29	0.004	73	0.39	0.006	92	0.48	0.008	100	0.60	0.009	100	0.80	0.011	140	1.00	0.011	140	1.20	0.013	200	1.50	0.020
	180	.011	.00016	240	.015	.00024	302	.019	.00031	328	.024	.00035	328	.032	.00043	459	.039	.00043	459	.047	.00051	656	.059	.00079
Stainless steel ferritic	55	0.29	0.005	73	0.39	0.007	92	0.48	0.010	100	0.60	0.012	100	0.80	0.014	140	1.00	0.016	140	1.20	0.018	200	1.50	0.024
	180	.011	.00020	240	.015	.00028	302	.019	.00039	328	.024	.00047	328	.032	.00055	459	.039	.00063	459	.047	.00071	656	.059	.00094
Stainless steel martensitic	55	0.29	0.004	73	0.39	0.006	92	0.48	0.009	100	0.60	0.010	100	0.80	0.012	140	1.00	0.015	140	1.20	0.017	200	1.50	0.022
	180	.011	.00016	240	.015	.00024	302	.019	.00035	328	.024	.00039	328	.032	.00047	459	.039	.00059	459	.047	.00067	656	.059	.00087
Stainless steel martensitic – PH	55	0.29	0.004	73	0.39	0.006	92	0.48	0.009	100	0.60	0.010	100	0.80	0.012	140	1.00	0.015	140	1.20	0.017	200	1.50	0.022
	180	.011	.00016	240	.015	.00024	302	.019	.00035	328	.024	.00039	328	.032	.00047	459	.039	.00059	459	.047	.00067	656	.059	.00087
Stainless steel austenitic	55	0.29	0.004	73	0.39	0.006	92	0.48	0.008	100	0.60	0.010	100	0.80	0.011	140	1.00	0.012	140	1.20	0.014	200	1.50	0.016
	180	.011	.00016	240	.015	.00024	302	.019	.00031	328	.024	.00039	328	.032	.00043	459	.039	.00047	459	.047	.00055	656	.059	.00063
Cast iron	55	0.29	0.003	73	0.39	0.005	92	0.48	0.006	100	0.60	0.008	100	0.80	0.009	120	1.00	0.011	120	1.20	0.022	140	1.50	0.024
	180	.011	.00012	240	.015	.00020	302	.019	.00024	328	.024	.00030	328	.032	.00035	394	.039	.00043	394	.047	.00087	459	.059	.00094
Aluminium alloy wrought	55	0.29	0.006	73	0.39	0.008	92	0.48	0.012	100	0.60	0.014	100	0.80	0.016	140	1.00	0.018	140	1.20	0.020	200	1.50	0.026
	180	.011	.00024	240	.015	.00031	302	.019	.00047	328	.024	.00055	328	.032	.00063	459	.039	.00071	459	.047	.00079	656	.059	.00102
Aluminium alloy cast	55	0.29	0.006	73	0.39	0.008	92	0.48	0.012	100	0.60	0.014	100	0.80	0.016	140	1.00	0.018	140	1.20	0.020	200	1.50	0.026
	180	.011	.00024	240	.015	.00031	302	.019	.00047	328	.024	.00055	328	.032	.00063	459	.039	.00071	459	.047	.00079	656	.059	.00102
Copper	55	0.29	0.006	73	0.39	0.008	92	0.48	0.014	100	0.60	0.016	100	0.80	0.018	140	1.00	0.020	140	1.20	0.022	200	1.50	0.026
	180	.011	.00024	240	.015	.00031	302	.019	.00055	328	.024	.00063	328	.032	.00071	459	.039	.00079	459	.047	.00087	656	.059	.00102
Brass lead free	55	0.29	0.006	73	0.39	0.008	92	0.48	0.014	100	0.60	0.016	100	0.80	0.018	140	1.00	0.020	140	1.20	0.022	200	1.50	0.026
	180	.011	.00024	240	.015	.00031	302	.019	.00055	328	.024	.00063	328	.032	.00071	459	.039	.00079	459	.047	.00087	656	.059	.00102
Brass, Bronze	55	0.29	0.006	73	0.39	0.008	92	0.48	0.014	100	0.60	0.016	100	0.80	0.018	140	1.00	0.020	140	1.20	0.022	200	1.50	0.026
	180	.011	.00024	240	.015	.00031	302	.019	.00055	328	.024	.00063	328	.032	.00071	459	.039	.00079	459	.047	.00087	656	.059	.00102
Bronze	55	0.29	0.006	73	0.39	0.008	92	0.48	0.012	100	0.60	0.014	100	0.80	0.016	140	1.00	0.018	140	1.20	0.020	200	1.50	0.026
	180	.011	.00024	240	.015	.00031	302	.019	.00047	328	.024	.00055	328	.032	.00063	459	.039	.00071	459	.047	.00079	656	.059	.00102
Super alloys	55	0.29	0.003	73	0.39	0.004	92	0.48	0.004	100	0.60	0.005	100	0.80	0.006	120	1.00	0.007	120	1.20	0.008	130	1.50	0.009
	180	.011	.00012	240	.015	.00016	302	.019	.00016	328	.024	.00020	328	.032	.00024	394	.039	.00028	394	.047	.00031	427	.059	.00035
Titanium pure	55	0.29	0.004	73	0.39	0.004	92	0.48	0.008	100	0.60	0.009	100	0.80	0.011	120	1.00	0.016	120	1.20	0.018	130	1.50	0.020
	180	.011	.00016	240	.015	.00016	302	.019	.00031	328	.024	.00035	328	.032	.00043	394	.039	.00063	394	.047	.00071	427	.059	.00079
Titanium alloys	55	0.29	0.004	73	0.39	0.004	92	0.48	0.008	100	0.60	0.009	100	0.80	0.011	120	1.00	0.016	120	1.20	0.018	130	1.50	0.020
	180	.011	.00016	240	.015	.00016	302	.019	.00031	328	.024	.00035	328	.032	.00043	394	.039	.00063	394	.047	.00071	427	.059	.00079
CrCo alloys	55	0.29	0.003	73	0.39	0.003	92	0.48	0.005	100	0.60	0.005	100	0.80	0.006	140	1.00	0.007	140	1.20	0.008	180	1.50	0.009
	180	.011	.00012	240	.015	.00012	302	.019	.00020	328	.024	.00020	328	.032	.00024	459	.039	.00028	459	.047	.00031	591	.059	.00035
Hardened steel < 55 HRC	55	0.29	0.004	73	0.39	0.006	92	0.48	0.007	80	0.60	0.008	80	0.80	0.009	100	1.00	0.010	100	1.20	0.012	140	1.50	0.014
	180	.011	.00016	240	.015	.00024	302	.019	.00028	262	.024	.00031	262	.032	.00035	328	.039	.00039	328	.047	.00047	459	.059	.00055
Hardened steel ≥ 55 HRC																								

Material	Ød1 1.8 mm | .071"			Ød1 2.0 mm | .079"			Ød1 2.5 mm | .098"			Ød1 3.0 mm | .118"			Ød1 4.0 mm | .158"			Ød1 6.0 mm | .236"			Ød1 8.0 mm | .315"		
	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z	v_c	d_{eff}	f_z
Unalloyed carbon steel	200	1.80	0.026	220	2.00	0.034	220	2.50	0.036	240	3.00	0.046	260	4.00	0.050	260	6.00	0.050	260	8.00	0.050
	656	.071	.00102	722	.079	.00134	722	.098	.00142	787	.118	.00181	853	.158	.00197	853	.236	.00197	853	.315	.00197
Low alloyed steel	200	1.80	0.024	220	2.00	0.032	220	2.50	0.034	240	3.00	0.044	260	4.00	0.048	260	6.00	0.048	260	8.00	0.048
	656	.071	.00094	722	.079	.00126	722	.098	.00134	787	.118	.00173	853	.158	.00189	853	.236	.00189	853	.315	.00189
High alloyed tool steel	200	1.80	0.022	220	2.00	0.030	220	2.50	0.032	240	3.00	0.040	260	4.00	0.042	260	6.00	0.042	260	8.00	0.042
	656	.071	.00087	722	.079	.00118	722	.098	.00126	787	.118	.00157	853	.158	.00165	853	.236	.00165	853	.315	.00165
Stainless steel ferritic	200	1.80	0.026	220	2.00	0.034	220	2.50	0.036	240	3.00	0.044	260	4.00	0.048	260	6.00	0.048	260	8.00	0.048
	656	.071	.00102	722	.079	.00134	722	.098	.00142	787	.118	.00173	853	.158	.00189	853	.236	.00189	853	.315	.00189
Stainless steel martensitic	200	1.80	0.024	220	2.00	0.032	220	2.50	0.034	240	3.00	0.044	260	4.00	0.046	260	6.00	0.046	260	8.00	0.046
	656	.071	.00094	722	.079	.00126	722	.098	.00134	787	.118	.00173	853	.158	.00181	853	.236	.00181	853	.315	.00181
Stainless steel martensitic – PH	200	1.80	0.024	220	2.00	0.032	220	2.50	0.034	240	3.00	0.044	260	4.00	0.046	260	6.00	0.046	260	8.00	0.046
	656	.071	.00094	722	.079	.00126	722	.098	.00134	787	.118	.00173	853	.158	.00181	853	.236	.00181	853	.315	.00181
Stainless steel austenitic	200	1.80	0.018	220	2.00	0.030	220	2.50	0.032	240	3.00	0.040	260	4.00	0.044	260	6.00	0.044	260	8.00	0.044
	656	.071	.00071	722	.079	.00118	722	.098	.00126	787	.118	.00157	853	.158	.00173	853	.236	.00173	853	.315	.00173
Cast iron	140	1.80	0.026	160	2.00	0.028	160	2.50	0.036	180	3.00	0.043	200	4.00	0.050	200	6.00	0.052	200	8.00	0.052
	459	.071	.00102	525	.079	.00110	525	.098	.00142	591	.118	.00169	656	.158	.00197	656	.236	.00205	656	.315	.00205
Aluminium alloy wrought	200	1.80	0.028	220	2.00	0.036	220	2.50	0.040	240	3.00	0.058	260	4.00	0.060	260	6.00	0.060	260	8.00	0.060
	656	.071	.00110	722	.079	.00142	722	.098	.00157	787	.118	.00228	853	.158	.00236	853	.236	.00236	853	.315	.00236
Aluminium alloy cast	200	1.80	0.028	220	2.00	0.036	220	2.50	0.040	240	3.00	0.058	260	4.00	0.060	260	6.00	0.060	260	8.00	0.060
	656	.071	.00110	722	.079	.00142	722	.098	.00157	787	.118	.00228	853	.158	.00236	853	.236	.00236	853	.315	.00236
Copper	200	1.80	0.028	220	2.00	0.036	220	2.50	0.040	240	3.00	0.058	260	4.00	0.060	260	6.00	0.060	260	8.00	0.060
	656	.071	.00110	722	.079	.00142	722	.098	.00157	787	.118	.00228	853	.158	.00236	853	.236	.00236	853	.315	.00236
Brass lead free	200	1.80	0.028	220	2.00	0.036	220	2.50	0.040	240	3.00	0.058	260	4.00	0.060	260	6.00	0.060	260	8.00	0.060
	656	.071	.00110	722	.079	.00142	722	.098	.00157	787	.118	.00228	853	.158	.00236	853	.236	.00236	853	.315	.00236
Brass, Bronze	200	1.80	0.028	220	2.00	0.036	220	2.50	0.040	240	3.00	0.058	260	4.00	0.060	260	6.00	0.060	260	8.00	0.060
	656	.071	.00110	722	.079	.00142	722	.098	.00157	787	.118	.00228	853	.158	.00236	853	.236	.00236	853	.315	.00236
Bronze	200	1.80	0.028	220	2.00	0.036	220	2.50	0.040	240	3.00	0.058	260	4.00	0.060	260	6.00	0.060	260	8.00	0.060
	656	.071	.00110	722	.079	.00142	722	.098	.00157	787	.118	.00228	853	.158	.00236	853	.236	.00236	853	.315	.00236
Super alloys	130	1.80	0.010	140	2.00	0.010	140	2.50	0.012	150	3.00	0.015	170	4.00	0.020	170	6.00	0.020	170	8.00	0.020
	427	.071	.00039	459	.079	.00039	459	.098	.00047	492	.118	.00059	558	.158	.00079	558	.236	.00079	558	.315	.00079
Titanium pure	130	1.80	0.022	140	2.00	0.028	140	2.50	0.030	150	3.00	0.040	170	4.00	0.044	170	6.00	0.044	170	8.00	0.044
	427	.071	.00087	459	.079	.00110	459	.098	.00118	492	.118	.00157	558	.158	.00173	558	.236	.00173	558	.315	.00173
Titanium alloys	130	1.80	0.022	140	2.00	0.028	140	2.50	0.030	150	3.00	0.040	170	4.00	0.044	170	6.00	0.044	170	8.00	0.044
	427	.071	.00087	459	.079	.00110	459	.098	.00118	492	.118	.00157	558	.158	.00173	558	.236	.00173	558	.315	.00173
CrCo alloys	180	1.80	0.010	200	2.00	0.010	200	2.50	0.012	220	3.00	0.015	240	4.00	0.020	240	6.00	0.020	240	8.00	0.020
	591	.071	.00039	656	.079	.00039	656	.098	.00047	722	.118	.00059	787	.158	.00079	787	.236	.00079	787	.315	.00079
Hardened steel < 55 HRC	140	1.80	0.018	180	2.00	0.020	180	2.50	0.026	200	3.00	0.033	240	4.00	0.040	240	6.00	0.040	240	8.00	0.040
	459	.071	.00071	591	.079	.00079	591	.098	.00102	656	.118	.00130	787	.158	.00157	787	.236	.00157	787	.315	.00157
Hardened steel ≥ 55 HRC																					

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