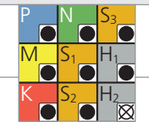
MILLING TOOLS
CRAZYMILL COOL BALL - Z2

Type B - Semi-finishing

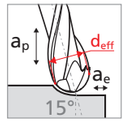
v_c [m/min]
f_z [mm]
d_{eff} [mm]

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



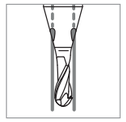
MILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW

Semi-finishing



- $a_p = 0.25 \times d_1$ ($Ød_1 \leq 0.5$ mm)
- $a_p = 0.5 \times d_1$ ($Ød_1 > 0.5$ mm)
- $a_e = 0.1 \times d_1$

Machining angle = 15°



Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	Ød1 0.3 mm	0.4 mm 1/64"	0.5 mm	0.6 mm	0.8 mm 1/32"	1.0 mm	1.2 mm	1.5 mm 1/16"	1.8 mm	2.0 mm	2.5 mm 3/32"	3.0 mm 1/8"	4.0 mm 5/32"	6.0 mm 3/16–7/32–1/4"	8.0 mm
					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	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
P	Unalloyed carbon steel Rm < 800 N/mm²	1.0301	C10	AISI 1010	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	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
		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	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	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
		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	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	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
		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	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	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
		1.4105	X6CrMoS17	AISI 430F															
	Stainless steel martensitic	1.4034	X46Cr13	AISI 420C	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	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
		1.4112	X90CrMoV18	AISI 440B															
	Stainless steel martensitic – PH	1.4542	X5CrNiCuNb 16-4	AISI 630	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	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
		1.4545	X5CrNiCuNb 15-5	ASTM15-5PH															
	Stainless steel austenitic	1.4301	X5CrNi 18-10	AISI 304	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	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
		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	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	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
		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	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	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
		3.4365	AlZnMgCu1.5	ASTM 7075															
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380	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	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
		3.2381	GD-AlSi10Mg	UNS A03590															
	Copper	2.004	Cu-OF / CW008A	UNS C10100	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	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
		2.0065	Cu-ETP / CW004A	UNS C11000															
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	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	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
		2.036	CuZn40 CW509L	UNS C28000															
	Brass, Bronze Rm < 400 N/mm²	2.0401	CuZn39Pb3	UNS C38500	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	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
		2.102	CuSn6	UNS C51900															
	Bronze Rm < 600 N/mm²	2.0966	CuAl10Ni5Fe4	UNS C63000	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	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
		2.096	CuAl9Mn2	UNS C63200															
S_1	Super alloys	2.4856		Inconel 625	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	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
		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	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	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
		3.7065	Gr.4	ASTM B348															
	Titanium alloys	3.7165	TiAl6V4	ASTM B348	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	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
		9.9367	TiAl6Nb7	ASTM F1295															
S_3	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	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 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
			CrCoMo28	ASTM F1537															
H_1	Hardened steel < 55 HRC	1.2510	100MnCrMoW4	AISI O1	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	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
H_2	Hardened steel ≥ 55 HRC	1.2379	X153CrMoV12	AISI D2															