Recommended Speeds & Feeds for Tsunami Variable Endmills

Material	Hardness R/C	Starting SFM	Radial WOC up to 10% of dia. — Feed rate, IPT (Inch per Tooth) — Endmill Diameter								Starting SFM	Radial WOC 10%-30% of tool dia. — Feed rate, IPT (Inch per Tooth) — Endmill Diameter							
			1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	1400	.0013	.003	.004	.005	.006	.007	.009	.011	1300-750	.001	.0025	.0032	.004	.0047	.0055	.007	.0085
Medium Carbon and High Carbon, Steels 1030, 1040, 1050, 1060, 1085, 1095, 1541, 1551, 9255, 3135, 3415, 4130, 4140, 4150, 4320, 4520, 5015, 5120, 5140, 8620,	30-40 RC	750	.0013	.003	.004	.005	.006	.007	.009	.011	700-400	.001	.0025	.0032	.004	.0047	.0055	.007	.0085
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	500	.0011	.0027	.0035	.004	.005	.006	.0078	.0087	500-300	.0009	.002	.0028	.0033	.004	.0047	.006	.007
Hardened Steels Hardened Carbon Steels and Tool steels	42-54 RC	350	.0007	.0016	.0023	.0027	.0034	.0046	.0055	.007	350	.0005	.0012	.0018	.002	.0027	.0036	.0043	.0054
	54-62 RC	250	.0005	.0009	.0016	.0025	.0028	.004	.0046	.006	250	.0004	.0007	.0012	.0018	.0022	.003	.0036	.0045
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	750	.0014	.0033	.004	.004	.0047	.007	.0092	.011	750-450	.0011	.0025	.0033	.004	.0047	.055	.007	.0085
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	500	.0011	.0028	.0035	.0043	.005	.006	.007	.085	500-300	.0009	.0022	.0028	.0033	.004	.0047	.0055	.0067
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	450	.011	.0023	.0028	.0037	.0042	.0055	.0065	.0085	450-250	.0009	.0018	.0022	.0029	.0033	.0044	.005	.0067
High Temp alloys Inconel, Monel, Hastelloy	Up to 42 RC	125	.0007	.0016	.0023	.0027	.0035	.0046	.0055	.007	110	.0005	.0012	.0018	.0022	.0027	.0036	.0043	.0055
Titanium	Up to 42 RC	375	.0011	.0028	.0035	.0043	.005	.006	.007	.085	375-275	.0009	.0022	.0028	.0033	.004	.0047	.0055	.0067
Gray Cast iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	———	1200	.0015	.0035	.0042	.0052	.0062	.0072	.0095	.011	1200-800	.0011	.0026	.0035	.0042	.005	.0055	.0075	.0085
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	———	700	.0015	.0035	.0042	.0052	.0062	.0072	.0095	.011	700-450	.0011	.0026	.0035	.0042	.005	.0055	.0075	.0085
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	1500	.0025	.0055	.007	.0085	.011	.014	.016	.022	1500	.002	.0045	.0055	.0065	.0085	.0105	.0125	.0165
Cast Aluminum High Silicon A380, Castings	Over 3% Si	1500	.002	.0045	.0055	.0065	.0085	.011	.0125	.017	1500-1200	.0015	.0035	.0045	.0055	.007	.0085	.010	.013
Magnesium	———	1700	.0015	.0035	.0045	.005	.007	.009	.010	.014	1700-900	.001	.003	.0035	.004	.005	.007	.008	.010
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	1200	.0015	.0025	.003	.004	.005	.0065	.008	.011	1200-650	.001	.002	.003	.004	.005	.006	.007	.009

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Recommended Speeds & Feeds for Tsunami Variable Endmills

			Radial WOC 30%-50% of tool dia.									Slotting							
			Endmill Diameter									*Endmill Diameter*							
Material	Hardness R/C	Starting SFM	Feed rate, IPT *(Inch per Tooth)*								Starting SFM	Feed rate, IPT *(Inch per Tooth)*							
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	750-450	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	450	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0007	.0015	.002	.0025	.003	.0035	.005	.006		.0006	.0015	.0018	.0023	.0026	.003	.004	.005
Medium Carbon and High Carbon, Steels 1030, 1040, 1050, 1060, 1085, 1095, 1541, 1551, 9255, 3135, 3415, 4130, 4140, 4150, 4320, 4520, 5015, 5120, 5140, 8620	30-40 RC	350-275	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	300	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0007	.0015	.002	.0025	.003	.0035	.005	.006		.0006	.0015	.0018	.0023	.0026	.003	.004	.005
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	350-250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0013	.0017	.002	.0025	.003	.004	.005		.005	.0012	.0015	.0018	.0023	.0027	.0035	.004
Hardened Steels Hardened Carbon Steels and Tool steels	42-54 RC	350	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	350	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0004	.0008	.0011	.0014	.0017	.0025	.003	.004		.0003	.0007	.001	.0012	.0015	.002	.0025	.003
	54-62 RC	250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0003	.0005	.0008	.0011	.0015	.002	.0025	.003		.0002	.0004	.0007	.001	.0012	.0017	.002	.0025
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	425-350	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	350	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0007	.0015	.002	.0025	.003	.0035	.005	.006		.0006	.0015	.0018	.0023	.0026	.003	.004	.005
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	200-300	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	225	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0013	.0017	.002	.0025	.003	.004	.005		.005	.0012	.0015	.0018	.0023	.0027	.0035	.004
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	175-275	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0012	.0015	.0018	.002	.0027	.0032	.004		.0005	.001	.0012	.0016	.0018	.0025	.0028	.0038
High Temp alloys Inconel, Monel, Hastelloy	Up to 42 RC	125-100	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	100	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0004	.0008	.0012	.0014	.0017	.0023	.0027	.0033		.0003	.0007	.001	.0012	.0015	.002	.0025	.003
Titanium	Up to 42 RC	375	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	150	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0013	.0017	.002	.0025	.003	.004	.005		.005	.0012	.0015	.0018	.0023	.0027	.0035	.004
Gray Cast iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	———	800-400	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	400	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0007	.0015	.002	.0025	.003	.0035	.005	.006		.0006	.0015	.0018	.0023	.0026	.003	.004	.005
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	———	450-300	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	300	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0007	.0015	.002	.0025	.003	.0035	.005	.006		.0006	.0015	.0018	.0023	.0026	.003	.004	.005
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	1500-1000	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1000	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0012	.0025	.0035	.004	.005	.0065	.0075	.010		.001	.0023	.003	.0035	.0045	.006	.007	.009
Cast Aluminum High Silicon A380, Castings	Over 3% Si	1300-750	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	750	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.001	.002	.0025	.003	.004	.005	.006	.008		.0008	.0018	.0023	.0028	.0036	.0046	.0055	.0075
Magnesium	———	850-650	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	700	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0007	.0017	.002	.0025	.0035	.004	.005	.0065		.0006	.0015	.002	.0023	.003	.004	.0045	.006
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	600-450	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0012	.0016	.002	.0025	.0032	.0038	.005		.0005	.001	.0015	.002	.0025	.003	.0035	.005