TuffCut DM®

157 Recommended Cutting Data - Profile Milling
Inch

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Profile Milling (ae)					End Mill Diameter*				
						5%	10%	20%	30%	50%	1/8	1/4	3/8	1/2	5/8
											*Axial depth during profile milling: OD < 1/4" .25D ap OD > 1/4" 1D ap				
						2.3	1.8	1.2	1.1	1	← Multiply fz by this Factor based on ae. When finishing, use the standard fz per chart below. Only add chip thinning when roughing or semi-finishing.				
			Max.	Air	MMS	vc - SFM					fz - in/tooth				
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	•	•	•	600	550	500	450	400	.0011	.0022	.0035	.0042	.0059
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	•	•	•	600	550	500	450	400	.0011	.0022	.0035	.0042	.0059
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	550	500	450	400	375	.0011	.0020	.0033	.0040	.0055
Hardened Steels	H	40-50 Rc	•	o	o	360	340	300	280	260	.0007	.0014	.0024	.0030	.0040
Hardened Steels	H	50-55 Rc	•	o	o	360	340	300	280	260	.0004	.0008	.0016	.0018	.0024
Hardened Steels	H	>55 Rc	•	o	o	320	300	280	260	240	.0003	.0006	.0010	.0015	.0018
Stainless Steel - Ferritic	M	up to 28 Rc	•	x	o	550	525	500	450	425	.0010	.0020	.0033	.0040	.0055
Stainless Steel - Martensitic	M	up to 28 Rc	•	x	o	550	525	500	450	425	.0010	.0020	.0033	.0040	.0055
Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	550	525	500	450	425	.0010	.0020	.0033	.0040	.0055
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	•	x	x	165	165	130	115	100	.0004	.0008	.0016	.0018	.0024
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 42 Rc	•	x	x	400	375	350	300	250	.0004	.0008	.0016	.0018	.0024

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula: (Calculated Feed x Spindle Maximum)/Calculated Speed

TuffCut DM®

157 Recommended Cutting Data - Profile Milling
Metric

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Profile Milling (ae)					End Mill Diameter (mm)*						
						5%	10%	20%	30%	50%	3	6	8	10	12	16	20
											*Axial depth during profile milling: OD < 6mm .25D ap OD > 6mm 1D ap						
						2.3	1.8	1.2	1.1	1	← Multiply fz by this Factor based on ae. When finishing, use the standard fz per chart below. Only add chip thinning when roughing or semi-finishing.						
			Max.	Air	MMS	vc - m/min					fz - mm/tooth						
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	•	•	•	183	168	152	137	122	.0280	.0559	.0889	.1067	.1498	.1778	.2032
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	•	•	•	183	168	152	137	122	.0280	.0559	.0889	.1067	.1498	.1778	.2032
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	168	152	137	122	114	.0254	.0508	.0838	.1016	.1397	.1702	.1905
Hardened Steels	H	40-50 Rc	•	o	o	110	104	90	85	80	.0178	.0356	.0610	.0762	.1016	.1168	.1524
Hardened Steels		50-55 Rc	•	o	o	110	104	90	85	80	.0102	.0203	.0406	.0457	.0610	.0762	.0889
Hardened Steels		>55 Rc	•	o	o	100	90	85	80	75	.0076	.0152	.0254	.0381	.0457	.0559	.0635
Stainless Steel - Ferritic	M	up to 28 Rc	•	x	o	168	160	152	137	130	.0254	.0508	.0838	.1016	.1397	.1702	.1905
Stainless Steel - Martensitic	M	up to 28 Rc	•	x	o	168	160	152	137	130	.0254	.0508	.0838	.1016	.1397	.1702	.1905
Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	168	160	152	137	130	.0254	.0508	.0838	.1016	.1397	.1702	.1905
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	•	x	x	50	50	40	35	30	.0102	.0203	.0406	.0457	.0610	.0762	.0889
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 42 Rc	•	x	x	122	114	107	90	75	.0102	.0203	.0406	.0457	.0610	.0762	.0889

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula:
(Calculated Feed x Spindle Maximum)/Calculated Speed

TuffCut DM®

157 Recommended Cutting Data - Slotting
Inch

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Slotting			End Mill Diameter				
									1/8	1/4	3/8	1/2	5/8
						25%	50%	100%* *Trochoidal Milling	Axial Depth (ap) during slotting: OD > 1/4" .25D ap				
			Max.	Air	MMS	vc - SFM			fz - in/tooth				
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	•	•	•	480	480	400	.0005	.0011	.0017	.0021	.0029
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	•	•	•	480	480	400	.0005	.0011	.0017	.0020	.0029
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	420	420	380	.0005	.0010	.0016	.0020	.0027
Hardened Steels	H	40-50 Rc	•	o	o	350	350	300	.0003	.0006	.0012	.0015	.0020
Hardened Steels	H	50-55 Rc	•	o	o	180	180	150	.0002	.0004	.0008	.0009	.0012
Hardened Steels	H	>55 Rc	•	o	o	150	150	100	.00015	.0003	.0005	.0007	.0009
Stainless Steel - Ferritic	M	up to 28 Rc	•	x	o	420	420	400	.0005	.0010	.0016	.0020	.0027
Stainless Steel - Martensitic	M	up to 28 Rc	•	x	o	420	420	400	.0005	.0010	.0016	.0020	.0027
Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	400	400	380	.0005	.0010	.0016	.0020	.0027
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	•	x	x	120	120	95	.0002	.0004	.0008	.0009	.0012
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 42 Rc	•	x	x	200	200	175	.0002	.0004	.0008	.0009	.0012

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula: (Calculated Feed x Spindle Maximum)/Calculated Speed

157 Recommended Cutting Data - Slotting
Metric

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Slotting			End Mill Diameter (mm)						
									3	6	8	10	12	16	20
						25%	50%	100%* *Trochoidal Milling	Axial depth (ap) during slotting: OD > 6mm .25D ap						
			Max.	Air	MMS	vc - m/min			fz - mm/tooth						
Free Machining & Low Carbon Steels 1006, 1008, 1015, 1018, 1020, 1022, 1025, 1117, 1140, 1141, 11L08, 11L14, 1213, 12L13, 12L14, 1215, 1330	P	up to 28 Rc	•	•	•	146	146	122	.0122	.0279	.0432	.0533	.0737	.0762	.1016
Medium Carbon & High Carbon Steels, Alloy Steels & Easy to Machine Tool Steels 1030, 1035, 1040, 1045, 1050, 1052, 1055, 1060, 1085, 1095, 1541, 1551, 9255, 2515, 3135, 3415, 4130, 4137, 4140, 4150, 4320, 4340, 4520, 5015, 5115, 5120, 5132, 5140, 5155, 6150, 8620, 9262, 9840, 52100, O1, O2, O6, S2, W1 to W310	P	28 to 38 Rc	•	•	•	146	146	122	.0122	.0279	.0432	.0533	.0737	.0762	.1016
Tool Steels & Die Steels O7, M1, M2, M3, M4, M7, T1, T2, T4, T5, T8, T15, A2, A3, A6, A7, H10, H11, H12, H13, H19, H21, L3, L6, L7, P2, P20, S1, S5, S7, 52100, A128, D2, D3, D4, D5, D7	P	28 to 44 Rc	•	•	•	128	128	115	.0122	.0254	.0406	.0508	.0686	.0839	.0940
Hardened Steels	H	40-50 Rc	•	o	o	106	106	92	.0076	.0152	.0305	.0381	.0508	.0584	.0762
Hardened Steels		50-55 Rc	•	o	o	55	55	45	.0051	.0102	.0203	.0229	.0305	.0381	.0432
Hardened Steels		>55 Rc	•	o	o	45	45	30	.0038	.0076	.0127	.0178	.0229	.0279	.0305
Stainless Steel - Ferritic	M	up to 28 Rc	•	x	o	128	128	122	.0127	.0254	.0406	.0508	.0686	.0838	.0940
Stainless Steel - Martensitic	M	up to 28 Rc	•	x	o	128	128	122	.0127	.0254	.0406	.0508	.0686	.0838	.0940
Stainless Steel - PH 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	122	122	115	.0127	.0254	.0406	.0508	.0686	.0838	.0940
High Temp Alloys Nimonics, Inconel, Monel, Hastelloy	S	up to 42 Rc	•	x	x	36	36	30	.0051	.0102	.0203	.0229	.0305	.0381	.0432
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2 Sn-4Zr-6Mo, 3Al-8V-6Cr4Mo-4Zr, 10V-2Fe-3Al, 13V-11Cr-3Al	S	up to 42 Rc	•	x	x	60	60	55	.0051	.0102	.0203	.0229	.0305	.0381	.0432

Spindle Maximum - Should the calculated spindle speed be more than your actual spindle maximum, use this formula:
(Calculated Feed x Spindle Maximum)/Calculated Speed