

TuffCut® 3D

250 Series Recommended Cutting Data - Inch

Workpiece Material Group	Material Type	Ap			Roughing	Finishing
		Ae			0.5 - 1.0 x D	0.02 - 0.05 x D
		Coolant			0.2 - 0.3 x D	0.02 - 0.05 x D
		Emulsion	Compressed Air	MQL	Vc-SFM	
Steels	P Low Carbon Steels ≤180HB	○	●	●	820	920
	Med Carbon / Alloy Steels 180-350HB	○	●	●	660	720
	Pre-Hardened Steels 35-45HRC	○	●	●	590	660
Stainless Steels	M Free Machining Stainless	●	○	○	520	590
	Austenitic Stainless	●	○	○	430	490
	Difficult Stainless	●	○	○	330	360
Special Alloys	S High Temp Alloys	●	x	x	160	180
	Titanium Alloys	●	x	x	360	390
Cast Irons	K Grey Cast Iron	○	●	x	720	820
	Ductile Cast Iron	○	●	x	590	660
Hardened Steels	H Hardened Steels 45 - 50HRC	○	●	○	520	560
Non-Ferrous	N Aluminum Alloys	●	x	○	980	1640
	Brass / Bronze / Copper	●	x	○	820	1310

● Preferred ○ Possible x Not Possible

Recommended Feed per Tooth by Material Group - Inch

Workpiece Material Group	Material Type	Tool Diameter & Radius (mm)											
		1		1.5		2		3		4		5	
		0.5		0.75		1		1.5		2		2.5	
		Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish
Fz - in/tooth													
Steels	P Low Carbon Steels ≤180HB	.0008	.0006	.0012	.0009	.0016	.0012	.0024	.0018	.0032	.0024	.0040	.0030
	Med Carbon / Alloy Steels 180-350HB	.0008	.0006	.0012	.0009	.0016	.0012	.0024	.0018	.0032	.0024	.0040	.0030
	Pre-Hardened Steels 35-45HRC	.0007	.0006	.0011	.0009	.0014	.0012	.0021	.0018	.0028	.0024	.0035	.0030
Stainless Steels	M Free Machining Stainless	.0007	.0006	.0011	.0009	.0014	.0012	.0021	.0018	.0028	.0024	.0035	.0030
	Austenitic Stainless	.0006	.0006	.0009	.0009	.0012	.0012	.0018	.0018	.0024	.0024	.0030	.0030
	Difficult Stainless	.0006	.0006	.0009	.0009	.0012	.0012	.0018	.0018	.0024	.0024	.0030	.0030
Special Alloys	S High Temp Alloys	.0003	.0004	.0005	.0006	.0006	.0008	.0009	.0012	.0012	.0016	.0015	.0020
	Titanium Alloys	.0005	.0004	.0008	.0006	.0010	.0008	.0015	.0012	.0020	.0016	.0025	.0020
Cast Irons	K Grey Cast Iron	.0008	.0006	.0012	.0009	.0016	.0012	.0024	.0018	.0032	.0024	.0040	.0030
	Ductile Cast Iron	.0007	.0006	.0011	.0009	.0014	.0012	.0021	.0018	.0028	.0024	.0035	.0030
Hardened Steels	H Hardened Steels 45 - 50HRC	.0005	.0005	.0008	.0008	.0010	.0010	.0015	.0015	.0020	.0020	.0025	.0025
Non-Ferrous	N Aluminum Alloys	.0010	.0006	.0015	.0009	.0020	.0012	.0030	.0018	.0040	.0024	.0050	.0030
	Brass / Bronze / Copper	.0008	.0006	.0012	.0009	.0016	.0012	.0024	.0018	.0032	.0024	.0040	.0030

Workpiece Material Group	Material Type	Tool Diameter & Radius (mm)									
		6		8		10		12		16	
		3		4		5		6		8	
		Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish
Fz - in/tooth											
Steels	P Low Carbon Steels ≤180HB	.0048	.0036	.0064	.0048	.0080	.0060	.0096	.0072	.0128	.0096
	Med Carbon / Alloy Steels 180-350HB	.0048	.0036	.0064	.0048	.0080	.0060	.0096	.0072	.0128	.0096
	Pre-Hardened Steels 35-45HRC	.0042	.0036	.0056	.0048	.0070	.0060	.0084	.0072	.0112	.0096
Stainless Steels	M Free Machining Stainless	.0042	.0036	.0056	.0048	.0070	.0060	.0084	.0072	.0112	.0096
	Austenitic Stainless	.0036	.0036	.0048	.0048	.0060	.0060	.0072	.0072	.0096	.0096
	Difficult Stainless	.0036	.0036	.0048	.0048	.0060	.0060	.0072	.0072	.0096	.0096
Special Alloys	S High Temp Alloys	.0018	.0024	.0024	.0032	.0030	.0040	.0036	.0048	.0048	.0064
	Titanium Alloys	.0030	.0024	.0040	.0032	.0050	.0040	.0060	.0048	.0080	.0064
Cast Irons	K Grey Cast Iron	.0048	.0036	.0064	.0048	.0080	.0060	.0096	.0072	.0128	.0096
	Ductile Cast Iron	.0042	.0036	.0056	.0048	.0070	.0060	.0084	.0072	.0112	.0096
Hardened Steels	H Hardened Steels 45 - 50HRC	.0030	.0030	.0040	.0040	.0050	.0050	.0060	.0060	.0080	.0080
Non-Ferrous	N Aluminum Alloys	.0060	.0036	.0080	.0048	.0100	.0060	.0120	.0072	.0160	.0096
	Brass / Bronze / Copper	.0048	.0036	.0064	.0048	.0080	.0060	.0096	.0072	.0128	.0096

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

TuffCut® 3D

250 Series Recommended Cutting Data - Metric

Workpiece Material Group	Material Type	Ap			Roughing	Finishing	
		Ae			0.5 - 0.10 x D	0.02 - 0.05 x D	
		Coolant			Vc-m/min		
		Emulsion	Compressed Air	MQL			
Steels	P	Low Carbon Steels ≤180HB	○	●	●	250	280
		Med Carbon / Alloy Steels 180-350HB	○	●	●	200	220
		Pre-Hardened Steels 35-45HRC	○	●	●	180	200
Stainless Steels	M	Free Machining Stainless	●	○	○	160	180
		Austenitic Stainless	●	○	○	130	150
		Difficult Stainless	●	○	○	100	110
Special Alloys	S	High Temp Alloys	●	x	x	50	55
		Titanium Alloys	●	x	x	110	120
Cast Irons	K	Grey Cast Iron	○	●	x	220	250
		Ductile Cast Iron	○	●	x	180	200
Hardened Steels	H	Hardened Steels 45 - 50HRC	○	●	○	160	170
Non-Ferrous	N	Aluminum Alloys	●	x	○	300	500
		Brass / Bronze / Copper	●	x	○	250	400

● Preferred ○ Possible x Not Possible

Recommended Feed per Tooth by Material Group - Metric

Workpiece Material Group	Material Type	Tool Diameter & Radius (mm)												
		1		1.5		2		3		4		5		
		0.5		0.75		1		1.5		2		2.5		
		Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	
Fz - mm/tooth														
Steels	P	Low Carbon Steels ≤180HB	0.020	0.015	0.030	0.023	0.040	0.030	0.060	0.045	0.080	0.060	0.100	0.075
		Med Carbon / Alloy Steels 180-350HB	0.020	0.015	0.030	0.023	0.040	0.030	0.060	0.045	0.080	0.060	0.100	0.075
		Pre-Hardened Steels 35-45HRC	0.018	0.015	0.027	0.023	0.036	0.030	0.054	0.045	0.072	0.060	0.090	0.075
Stainless Steels	M	Free Machining Stainless	0.018	0.015	0.027	0.023	0.036	0.030	0.054	0.045	0.072	0.060	0.090	0.075
		Austenitic Stainless	0.015	0.015	0.023	0.023	0.030	0.030	0.045	0.045	0.060	0.060	0.075	0.075
		Difficult Stainless	0.015	0.015	0.023	0.023	0.030	0.030	0.045	0.045	0.060	0.060	0.075	0.075
Special Alloys	S	High Temp Alloys	0.008	0.010	0.012	0.015	0.016	0.020	0.024	0.030	0.032	0.040	0.040	0.050
		Titanium Alloys	0.012	0.010	0.018	0.015	0.024	0.020	0.036	0.030	0.048	0.040	0.060	0.050
Cast Irons	K	Grey Cast Iron	0.020	0.015	0.030	0.023	0.040	0.030	0.060	0.045	0.080	0.060	0.100	0.075
		Ductile Cast Iron	0.018	0.015	0.027	0.023	0.036	0.030	0.054	0.045	0.072	0.060	0.090	0.075
Hardened Steels	H	Hardened Steels 45 - 50HRC	0.013	0.013	0.020	0.019	0.026	0.025	0.039	0.038	0.052	0.050	0.065	0.063
Non-Ferrous	N	Aluminum Alloys	0.025	0.015	0.038	0.023	0.050	0.030	0.075	0.045	0.100	0.060	0.125	0.075
		Brass / Bronze / Copper	0.020	0.015	0.030	0.023	0.040	0.030	0.060	0.045	0.080	0.060	0.100	0.075

Workpiece Material Group	Material Type	Tool Diameter & Radius (mm)										
		6		8		10		12		16		
		3		4		5		6		8		
		Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	Rough	Finish	
Fz - mm/tooth												
Steels	P	Low Carbon Steels ≤180HB	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240
		Med Carbon / Alloy Steels 180-350HB	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240
		Pre-Hardened Steels 35-45HRC	0.108	0.090	0.144	0.120	0.180	0.150	0.216	0.180	0.288	0.240
Stainless Steels	M	Free Machining Stainless	0.108	0.090	0.144	0.120	0.180	0.150	0.216	0.180	0.288	0.240
		Austenitic Stainless	0.090	0.090	0.120	0.120	0.150	0.150	0.180	0.180	0.240	0.240
		Difficult Stainless	0.090	0.090	0.120	0.120	0.150	0.150	0.180	0.180	0.240	0.240
Special Alloys	S	High Temp Alloys	0.048	0.060	0.064	0.080	0.080	0.100	0.096	0.120	0.128	0.160
		Titanium Alloys	0.072	0.060	0.096	0.080	0.120	0.100	0.144	0.120	0.192	0.160
Cast Irons	K	Grey Cast Iron	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240
		Ductile Cast Iron	0.108	0.090	0.144	0.120	0.180	0.150	0.216	0.180	0.288	0.240
Hardened Steels	H	Hardened Steels 45 - 50HRC	0.078	0.075	0.104	0.100	0.130	0.125	0.156	0.150	0.208	0.200
Non-Ferrous	N	Aluminum Alloys	0.150	0.090	0.200	0.120	0.250	0.150	0.300	0.180	0.400	0.240
		Brass / Bronze / Copper	0.120	0.090	0.160	0.120	0.200	0.150	0.240	0.180	0.320	0.240

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