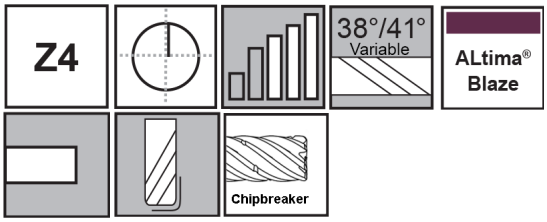
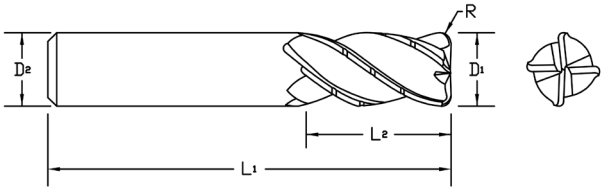
TuffCut® XT Series 277CB



NEW PRODUCT



- Staggered chipbreaker technology.
- Enhanced corner protection.
- Variable helix.

ALtima® Blaze		Diameter D1		Shank D2 (h6)	OAL L1	Flute Length L2	Corner Radius R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
277LCB1250B	27953	1/8	.1250	1/8	1-1/2	1/2	
277LCB1252B	27954	1/8	.1250	1/8	1-1/2	1/2	.015
277LCB1870B	27955	3/16	.1875	3/16	2-1/2	3/4	
277LCB1872B	27956	3/16	.1875	3/16	2-1/2	3/4	.015
277LCB1874B	27957	3/16	.1875	3/16	2-1/2	3/4	.030
277LCB2500B	27958	1/4	.2500	1/4	3	1-1/4	
277LCB2502B	27959	1/4	.2500	1/4	3	1-1/4	.015
277LCB2504B	27960	1/4	.2500	1/4	3	1-1/4	.030
277XCB2500B	27961	1/4	.2500	1/4	4	1-3/4	
277XCB2502B	27962	1/4	.2500	1/4	4	1-3/4	.015
277XCB2504B	27963	1/4	.2500	1/4	4	1-3/4	.030
277LCB3120B	27964	5/16	.3125	5/16	3	1-1/4	
277LCB3122B	27965	5/16	.3125	5/16	3	1-1/4	.015
277LCB3124B	27966	5/16	.3125	5/16	3	1-1/4	.030
277LCB3126B	27967	5/16	.3125	5/16	3	1-1/4	.060
277XCB3120B	27968	5/16	.3125	5/16	4	1-3/4	
277XCB3122B	27969	5/16	.3125	5/16	4	1-3/4	.015
277XCB3124B	27970	5/16	.3125	5/16	4	1-3/4	.030
277XCB3126B	27971	5/16	.3125	5/16	4	1-3/4	.060
277CB37510B	27972	3/8	.3750	3/8	2-1/2	7/8	
277CB37511B	27973	3/8	.3750	3/8	2-1/2	7/8	.010
277CB37512B	27974	3/8	.3750	3/8	2-1/2	7/8	.015
277CB37513B	27975	3/8	.3750	3/8	2-1/2	7/8	.020
277CB37514B	27976	3/8	.3750	3/8	2-1/2	7/8	.030
277CB37516B	27988	3/8	.3750	3/8	2-1/2	7/8	.060
277LCB3750B	27977	3/8	.3750	3/8	4	1-1/2	
277LCB3752B	27978	3/8	.3750	3/8	4	1-1/2	.015
277LCB3754B	27979	3/8	.3750	3/8	4	1-1/2	.030
277LCB3756B	27980	3/8	.3750	3/8	4	1-1/2	.060
277XCB3750B	27981	3/8	.3750	3/8	4	2-1/2	
277XCB3752B	27982	3/8	.3750	3/8	4	2-1/2	.015
277XCB3754B	27983	3/8	.3750	3/8	4	2-1/2	.030
277XCB3756B	27984	3/8	.3750	3/8	4	2-1/2	.060
277LCB4370B	27985	7/16	.4375	7/16	4	2	
277LCB4372B	27986	7/16	.4375	7/16	4	2	.015
277LCB4374B	27987	7/16	.4375	7/16	4	2	.030
277CB50020B	27993	1/2	.5000	1/2	3	1-1/4	
277CB50021B	27994	1/2	.5000	1/2	3	1-1/4	.010
277CB50022B	27995	1/2	.5000	1/2	3	1-1/4	.015
277CB50023B	27996	1/2	.5000	1/2	3	1-1/4	.020

For quick delivery on non-stocked sizes, request Rapid Turn Around and your tools will ship within 5 business days.

Inch	
D1	Tolerance
1/8 - 1/4	+.000/-.002
>1/4 - 1	+.000/-.003

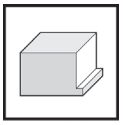
Inch	
D2	Tolerance (h6)
.1182 - .2362	+0/-.00031
.2363 - .3937	+0/-.00035
.3938 - .7087	+0/-.00043
.7088 - 1.000	+0/-.00051

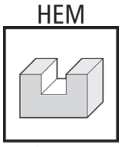
Inch	
R	Tolerance
1/8 - 1	+.0000/-.0016

Materials

- P — Steels
- M — Stainless Steels
- K — Cast Iron
- S — Special Alloys

Applications


HEM


Slotting


Traditional Roughing

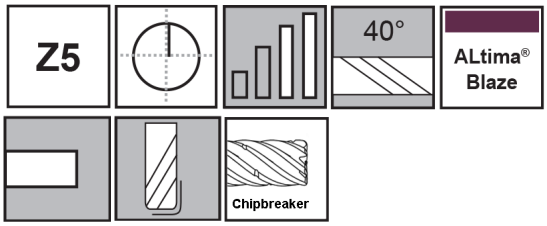
Series 277CB Continued

ALtima® Blaze		Diameter D1		Shank D2 (h6)	OAL L1	Flute Length L2	Corner Radius R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
277CB50024B	27997	1/2	.5000	1/2	3	1-1/4	.030
277CB50026B	27989	1/2	.5000	1/2	3	1-1/4	.060
277LCB5000B	27998	1/2	.5000	1/2	4	2	
277LCB5002B	27999	1/2	.5000	1/2	4	2	.015
277LCB5004B	28000	1/2	.5000	1/2	4	2	.030
277LCB5006B	28002	1/2	.5000	1/2	4	2	.060
277XCB5000B	28003	1/2	.5000	1/2	5	3	
277XCB5002B	28004	1/2	.5000	1/2	5	3	.015
277XCB5004B	28005	1/2	.5000	1/2	5	3	.030
277XCB5006B	28007	1/2	.5000	1/2	5	3	.060
277CB62510B	28008	5/8	.6250	5/8	3-1/2	1-1/4	
277CB62512B	28009	5/8	.6250	5/8	3-1/2	1-1/4	.015
277CB62514B	28010	5/8	.6250	5/8	3-1/2	1-1/4	.030
277CB62516B	27990	5/8	.6250	5/8	3-1/2	1-1/4	.060
277LCB6250B	28012	5/8	.6250	5/8	5	2-1/4	
277LCB6252B	28013	5/8	.6250	5/8	5	2-1/4	.015
277LCB6254B	28014	5/8	.6250	5/8	5	2-1/4	.030
277LCB6256B	28015	5/8	.6250	5/8	5	2-1/4	.060
277XCB6250B	28017	5/8	.6250	5/8	6	3	
277XCB6252B	28018	5/8	.6250	5/8	6	3	.015
277XCB6254B	28019	5/8	.6250	5/8	6	3	.030
277XCB6256B	28020	5/8	.6250	5/8	6	3	.060
277CB75010B	28022	3/4	.7500	3/4	4	1-5/8	
277CB75012B	28023	3/4	.7500	3/4	4	1-5/8	.015
277CB75014B	28024	3/4	.7500	3/4	4	1-5/8	.030
277CB75016B	27991	3/4	.7500	3/4	4	1-5/8	.060
277LCB7500B	28025	3/4	.7500	3/4	5	2-1/4	
277LCB7502B	28027	3/4	.7500	3/4	5	2-1/4	.015
277LCB7504B	28028	3/4	.7500	3/4	5	2-1/4	.030
277LCB7506B	28029	3/4	.7500	3/4	5	2-1/4	.060
277XCB7500B	28030	3/4	.7500	3/4	6	3	
277XCB7502B	28032	3/4	.7500	3/4	6	3	.015
277XCB7504B	28033	3/4	.7500	3/4	6	3	.030
277XCB7506B	28034	3/4	.7500	3/4	6	3	.060
277XXCB750B	28035	3/4	.7500	3/4	7	4-1/8	
277XXCB754B	28037	3/4	.7500	3/4	7	4-1/8	.030
277XXCB756B	28038	3/4	.7500	3/4	7	4-1/8	.060
277CB10010B	28039	1	1.0000	1	4	1-1/2	
277CB10012B	28040	1	1.0000	1	4	1-1/2	.015
277CB10014B	28042	1	1.0000	1	4	1-1/2	.030
277CB10016B	27992	1	1.0000	1	4	1-1/2	.060
277LCB1000B	28043	1	1.0000	1	5	2-1/4	
277LCB1002B	28044	1	1.0000	1	5	2-1/4	.015
277LCB1004B	28045	1	1.0000	1	5	2-1/4	.030
277LCB1006B	28047	1	1.0000	1	5	2-1/4	.060
277XCB1000B	28048	1	1.0000	1	6	3	
277XCB1002B	28049	1	1.0000	1	6	3	.015
277XCB1004B	28050	1	1.0000	1	6	3	.030
277XCB1006B	28052	1	1.0000	1	6	3	.060
277XXCB100B	28053	1	1.0000	1	7	4-1/8	
277XXCB104B	28054	1	1.0000	1	7	4-1/8	.030
277XXCB106B	28055	1	1.0000	1	7	4-1/8	.060

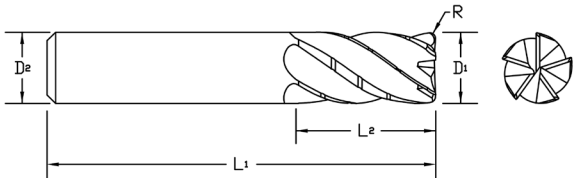
M.A. FORD
High Performance Cutting Tools

For quick delivery on non-stocked sizes, request Rapid Turn Around and your tools will ship within 5 business days.

TuffCut® XT Series 278CB



NEW PRODUCT



- Staggered Chipbreaker technology.
- Improved geometries.
- Enhanced corner protection.

For quick delivery on non-stocked sizes, request Rapid Turn Around and your tools will ship within 5 business days.

ALtima® Blaze		Diameter D1		Shank D2 (h6)	OAL L1	Flute Length L2	Corner Radius R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
278LCB25000B	03900	1/4	.2500	1/4	3	1-1/4	
278LCB25002B	03901	1/4	.2500	1/4	3	1-1/4	.015
278LCB25004B	03902	1/4	.2500	1/4	3	1-1/4	.030
278LCB25006B	03903	1/4	.2500	1/4	3	1-1/4	.060
278LCB25007B	03904	1/4	.2500	1/4	3	1-1/4	.090
278XCB25000B	03905	1/4	.2500	1/4	4	1-3/4	
278XCB25002B	03906	1/4	.2500	1/4	4	1-3/4	.015
278XCB25004B	03907	1/4	.2500	1/4	4	1-3/4	.030
278CB37510B	03942	3/8	.3750	3/8	2-1/2	1	
278CB37511B	03943	3/8	.3750	3/8	2-1/2	1	.010
278CB37512B	03944	3/8	.3750	3/8	2-1/2	1	.015
278CB37513B	03945	3/8	.3750	3/8	2-1/2	1	.020
278CB37514B	03946	3/8	.3750	3/8	2-1/2	1	.030
278CB37516B	03947	3/8	.3750	3/8	2-1/2	1	.060
278LCB37500B	03908	3/8	.3750	3/8	4	1-5/8	
278LCB37502B	03909	3/8	.3750	3/8	4	1-5/8	.015
278LCB37504B	03910	3/8	.3750	3/8	4	1-5/8	.030
278LCB37506B	03911	3/8	.3750	3/8	4	1-5/8	.060
278LCB37507B	03912	3/8	.3750	3/8	4	1-5/8	.090
278LCB37508B	03913	3/8	.3750	3/8	4	1-5/8	.120
278LCB375011B	03914	3/8	.3750	3/8	4	1-5/8	.156
278XCB37500B	03915	3/8	.3750	3/8	4	2-1/2	
278XCB37502B	03916	3/8	.3750	3/8	4	2-1/2	.015
278XCB37504B	03917	3/8	.3750	3/8	4	2-1/2	.030
278CB50020B	03948	1/2	.5000	1/2	3	1-1/4	
278CB50021B	03949	1/2	.5000	1/2	3	1-1/4	.010
278CB50022B	03950	1/2	.5000	1/2	3	1-1/4	.015
278CB50023B	03951	1/2	.5000	1/2	3	1-1/4	.020
278CB50024B	03952	1/2	.5000	1/2	3	1-1/4	.030
278CB50026B	03953	1/2	.5000	1/2	3	1-1/4	.060
278CB50030B	19401	1/2	.5000	1/2	4	1-5/8	
278CB50032B	19432	1/2	.5000	1/2	4	1-5/8	.015
278CB50034B	03956	1/2	.5000	1/2	4	1-5/8	.030

Inch	
D1	Tolerance
1/4	+.000/-.002
>1/4 - 1	+.000/-.003

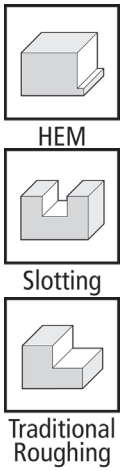
Inch	
D2	Tolerance (h6)
.2500 - .3937	+0/-.00035
.3938 - .7087	+0/-.00043
.7088 - 1.000	+0/-.00051

Inch	
R	Tolerance
1/4 - 1	+.0000/-.0016

Materials

- P — Steels
- M — Stainless Steels
- K — Cast Iron
- S — Special Alloys

Applications



Phone: 800-553-8024 or 563-391-6220 Email: sales@maford.com www.maford.com

Series 278CB Continued

ALtima® Blaze		Diameter D1		Shank D2 (h6)	OAL L1	Flute Length L2	Corner Radius R
Tool No.	EDP	Inch	Decimal	Inch	Inch	Inch	Inch
278CB50036B	03957	1/2	.5000	1/2	4	1-5/8	.060
278LCB50000B	03918	1/2	.5000	1/2	4	2	
278LCB50002B	03919	1/2	.5000	1/2	4	2	.015
278LCB50004B	03920	1/2	.5000	1/2	4	2	.030
278XCB50000B	03921	1/2	.5000	1/2	5	3	
278XCB50002B	03922	1/2	.5000	1/2	5	3	.015
278XCB50004B	03923	1/2	.5000	1/2	5	3	.030
278CB62510B	03958	5/8	.6250	5/8	3-1/2	1-1/4	
278CB62512B	03959	5/8	.6250	5/8	3-1/2	1-1/4	.015
278CB62514B	03960	5/8	.6250	5/8	3-1/2	1-1/4	.030
278CB62516B	03961	5/8	.6250	5/8	3-1/2	1-1/4	.060
278LCB62500B	03924	5/8	.6250	5/8	5	2-1/4	
278LCB62502B	03925	5/8	.6250	5/8	5	2-1/4	.015
278LCB62504B	03926	5/8	.6250	5/8	5	2-1/4	.030
278XCB62500B	03927	5/8	.6250	5/8	6	3	
278XCB62502B	03928	5/8	.6250	5/8	6	3	.015
278XCB62504B	03929	5/8	.6250	5/8	6	3	.030
278CB75010B	03962	3/4	.7500	3/4	4	1-1/2	
278CB75012B	03963	3/4	.7500	3/4	4	1-1/2	.015
278CB75014B	03964	3/4	.7500	3/4	4	1-1/2	.030
278CB75016B	03965	3/4	.7500	3/4	4	1-1/2	.060
278LCB75000B	03930	3/4	.7500	3/4	5	2-1/4	
278LCB75002B	03931	3/4	.7500	3/4	5	2-1/4	.015
278LCB75004B	03932	3/4	.7500	3/4	5	2-1/4	.030
278XCB75000B	03933	3/4	.7500	3/4	6	3	
278XCB75002B	03934	3/4	.7500	3/4	6	3	.015
278XCB75004B	03935	3/4	.7500	3/4	6	3	.030
278CB10010B	03966	1	1.0000	1	4	1-1/2	
278CB10014B	03967	1	1.0000	1	4	1-1/2	.030
278CB10016B	03968	1	1.0000	1	4	1-1/2	.060
278LCB10000B	03936	1	1.0000	1	5	2-1/4	
278LCB10002B	03937	1	1.0000	1	5	2-1/4	.015
278L1CB0004B	03938	1	1.0000	1	5	2-1/4	.030
278XCB10000B	03939	1	1.0000	1	6	3	
278XCB10002B	03940	1	1.0000	1	6	3	.015
278XCB10004B	03941	1	1.0000	1	6	3	.030

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⚠**WARNING:** This product can expose you to chemicals including nickel, cobalt, and lead, which are known to the State of California to cause cancer, and chemicals including lead which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

TuffCut® XT

277CB Recommended Cutting Data - Profile Milling

Inch

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Profiling (ae)				End Mill Diameter								
						5%	10%	25%	50%	1/8*	3/16*	1/4*	5/16	3/8	1/2	5/8	3/4	1
										*Profile milling at ≥ 50% ap is not recommended for diameters 1/4" and below.								
						2.3	1.8	1.2	1.0	← 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								
Low Carbon Steels 1018, 1020	P	up to 28 Rc	•	•	•	1475	1150	980	500	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Medium Carbon Steels 1140, 1145	P	28 to 38 Rc	•	•	•	1130	900	840	250	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Alloy Steels 4140, 4145	P	28 to 44 Rc	•	•	•	1035	840	755	250	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Die / Tool Steels A2, D2, H13, P20	P	28 to 44 Rc	•	•	•	900	725	615	200	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Hardened Steels A2, D2	H	45 to 50 Rc	•	o	o	610	495	325	250	.0006	0.001	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Hardened Steels A2, D2	H	50 to 55 Rc	•	o	o	510	410	280	200	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	•	x	o	675	545	425	360	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Austenitic 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	•	x	o	525	430	400	210	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321	M	up to 28 Rc	•	x	o	410	330	295	210	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Difficult to Machine 17-4 PH, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	525	430	395	110	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Cobalt Chrome Alloys	M		•	x	o	410	325	295	130	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Duplex (22%)	M		•	x	o	245	195	180	130	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Super Duplex (25%)	M		•	x	o	245	195	180	110	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
High Temp Alloys	S	up to 42 Rc	•	x	x	180	150	130	85	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Inconel	S		•	x	x	180	150	130	85	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.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	375	350	330	175	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Cast-Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	•	o	o	1625	1295	870	350	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	•	o	o	675	540	510	260	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100

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

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

Phone: 800-553-8024 or 563-391-6220 Email: sales@maford.com www.maford.com

TuffCut® XT

277CB Recommended Cutting Data - Slotting
Inch

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Slotting			End Mill Diameter								
						25%	50%	100%	1/8*	3/16*	1/4*	5/16	3/8	1/2	5/8	3/4	1
						*Slotting at > 25% ap is not recommended for diameters 1/4" and below.											
			Max.	Air	MMS	vc - SFM			fz - in/tooth								
Low Carbon Steels 1018, 1020	P	up to 28 Rc	•	•	•	550	500	475	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Medium Carbon Steels 1140, 1145	P	28 to 38 Rc	•	•	•	275	250	225	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Alloy Steels 4140, 4145	P	28 to 44 Rc	•	•	•	275	250	225	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Die / Tool Steels A2, D2, H13, P20	P	28 to 44 Rc	•	•	•	225	200	175	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Hardened Steels A2, D2	H	45 to 50 Rc	•	o	o	275	250	225	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Hardened Steels A2, D2	H	50 to 55 Rc	•	o	o	225	200	175	.0001	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0015
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	•	x	o	385	360	350	.0004	.0010	.0012	.0016	.0020	.0024	.0031	.0040	.0050
Stainless Steel - Austenitic 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	•	x	o	225	210	200	.0004	.0010	.0012	.0016	.0020	.0024	.0031	.0040	.0050
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321	M	up to 28 Rc	•	x	o	225	210	200	.0004	.0010	.0012	.0016	.0020	.0024	.0031	.0040	.0050
Stainless Steel - Difficult to Machine 17-4 PH, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	125	110	100	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Cobalt Chrome Alloys	M		•	x	o	150	130	120	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Duplex (22%)	M		•	x	o	150	130	120	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Super Duplex (25%)	M		•	x	o	120	110	100	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
High Temp Alloys	S	up to 42 Rc	•	x	x	100	85	75	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Inconel	S		•	x	x	95	85	75	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.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	180	175	160	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Cast-Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	•	o	o	375	350	325	.0004	.0010	.0012	.0016	.0020	.0024	.0031	.0040	.0050
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	•	o	o	275	260	250	.0004	.0010	.0012	.0016	.0020	.0024	.0031	.0040	.0050

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

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TuffCut® XT

278CB Recommended Cutting Data - Profile Milling

Inch

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Profiling (ae)				End Mill Diameter								
						5%	10%	25%	50%	1/8*	3/16*	1/4*	5/16	3/8	1/2	5/8	3/4	1
						*Profile Milling at ≥ 50% ap is not recommended for diameters 1/4" and below.												
						2.3	1.8	1.2	1.0	← 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								
Low Carbon Steels 1018, 1020	P	up to 28 Rc	•	•	•	1475	1150	980	500	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Medium Carbon Steels 1140, 1145	P	28 to 38 Rc	•	•	•	1130	900	830	250	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Alloy Steels 4140, 4145	P	28 to 44 Rc	•	•	•	1035	840	755	250	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Die / Tool Steels A2, D2, H13, P20	P	28 to 44 Rc	•	•	•	900	725	615	200	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Hardened Steels A2, D2	H	45 to 50 Rc	•	o	o	610	495	325	250	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Hardened Steels A2, D2	H	50 to 55 Rc	•	o	o	510	410	280	200	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	•	x	o	675	545	425	360	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Austenitic 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	•	x	o	525	430	400	210	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321	M	up to 28 Rc	•	x	o	410	330	295	210	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Stainless Steel - Difficult to Machine 17-4 PH, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	525	430	395	110	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Cobalt Chrome Alloys	M		•	x	o	410	325	295	130	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Duplex (22%)	M		•	x	o	245	195	180	130	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
Super Duplex (25%)	M		•	x	o	245	195	180	110	.0006	.0010	.0012	.0016	.0020	.0024	.0030	.0040	.0050
High Temp Alloys	S	up to 42 Rc	•	x	x	180	150	130	85	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Inconel	S		•	x	x	180	150	130	85	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.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	375	350	330	175	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Cast-Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	•	o	o	1625	1295	870	350	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	•	o	o	675	540	510	260	.0012	.0020	.0024	.0031	.0039	.0047	.0060	.0078	.0100

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

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TuffCut® XT

278CB Recommended Cutting Data - Slotting
Inch

Workpiece Material Group	ISO	Hardness	Coolant • Preferred o Possible x Not Possible			Slotting			End Mill Diameter								
									1/8*	3/16*	1/4*	5/16	3/8	1/2	5/8	3/4	1
						25%	50%	100%	*Slotting at > 25% ap is not recommended for diameters 1/4" and below.								
			Max.	Air	MMS	vc - SFM			fz - in/tooth								
Low Carbon Steels 1018, 1020	P	up to 28 Rc	•	•	•	550	500	475	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Medium Carbon Steels 1140, 1145	P	28 to 38 Rc	•	•	•	275	250	225	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Alloy Steels 4140, 4145	P	28 to 44 Rc	•	•	•	275	250	225	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Die / Tool Steels A2, D2, H13, P20	P	28 to 44 Rc	•	•	•	225	200	175	.0004	.0010	.0012	.0016	.0020	.0025	.0031	.0040	.0050
Hardened Steels A2, D2	H	45 to 50 Rc	•	o	o	275	250	225	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Hardened Steels A2, D2	H	50 to 55 Rc	•	o	o	225	200	175	.0001	.0002	.0003	.0004	.0005	.0006	.0008	.0010	.0015
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	•	x	o	385	360	350	.0002	.0004	.0008	.0012	.0014	.0018	.0022	.0026	.0038
Stainless Steel - Austenitic 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	•	x	o	225	210	200	.0002	.0004	.0008	.0012	.0014	.0018	.0022	.0026	.0038
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321	M	up to 28 Rc	•	x	o	225	210	200	.0002	.0004	.0008	.0012	.0014	.0018	.0022	.0026	.0038
Stainless Steel - Difficult to Machine 17-4 PH, PH13-8Mo, Nitronics	M	over 28 Rc	•	x	o	125	110	100	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Cobalt Chrome Alloys	M		•	x	o	150	130	120	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Duplex (22%)	M		•	x	o	150	130	120	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Super Duplex (25%)	M		•	x	o	120	110	100	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
High Temp Alloys	S	up to 42 Rc	•	x	x	100	85	75	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Inconel	S		•	x	x	95	85	75	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.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	180	175	160	.0003	.0005	.0006	.0008	.0010	.0012	.0016	.0020	.0024
Cast-Iron - Gray CG, ASTM A48, CLASS 20, 25, 30, 35, SAE J431C, GRADES G1800, G3000, G3500, GG 10, 15, 20, 25, 30, 35, 40	K	up to 240 HB	•	o	o	375	350	325	.0004	.0010	.0012	.0016	.0020	.0024	.0031	.0040	.0050
Cast Iron - Ductile & Malleable CGI 60-40-18, 65-45-12, D4018, D4512, D5506, 32510, 35108, M3210, M4504, M5503, 250, 300, 350, 400, 450	K	over 240 HB	•	o	o	275	260	250	.0004	.0010	.0012	.0016	.0020	.0024	.0031	.0040	.0050

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

MADE IN USA

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