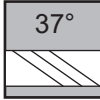
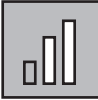


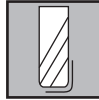
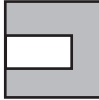
NEW

TuffCut® XT9 Series 380

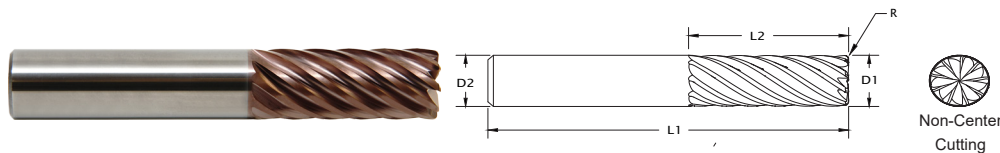
Z9



ALtima® Xtreme



- Designed For High Speed Machining Of Titanium, Inconel, And Similar Materials.
- New ALtima® Xtreme (AX) Coating Designed For High Speed Machining And Dry Machining.
- Uneven Number Of Flutes Reduces Harmonics To Provide Stable Machining Zones.



ALtima® Xtreme Coating Properties	
Microhardness (HV)	3800
Max. Service Temp.	1100° C / 2012° F
Friction Coefficient	0.3 - 0.5
Designation	AX
Color	Copper

Tool Number	EDP	Diameter			Shank		OAL		Flute Length		Corner Radius	
		D1			D2 (h6)		L1		L2		R	
		Inch	mm	Decimal	Inch	mm	Inch	mm	Inch	mm	Inch	mm
380M0800-0.5RAX	38042		8	.3150		8.0		63		22		0.50
380M0800-1.0RAX	38044		8	.3150		8.0		63		22		1.00
38037512AX	38038	3/8		.3750	3/8		2-1/2		1		.015	
38037514AX	38040	3/8		.3750	3/8		2-1/2		1		.030	
380M1000-0.5RAX	38046		10	.3937		10.0		72		27		0.50
380M1000-1.0RAX	38048		10	.3937		10.0		72		27		1.00
380M1200-0.5RAX	38026		12	.4724		12.0		84		32		0.50
380M1200-1.0RAX	38028		12	.4724		12.0		84		32		1.00
38050012AX	38000	1/2		.5000	1/2		3		1-1/4		.015	
38050014AX	38002	1/2		.5000	1/2		3		1-1/4		.030	
38050016AX	38004	1/2		.5000	1/2		3		1-1/4		.060	
380L5004AX	38006	1/2		.5000	1/2		3-1/2		1-3/4		.030	
38062512AX	38008	5/8		.6250	5/8		3-1/2		1-1/4		.015	
38062514AX	38010	5/8		.6250	5/8		3-1/2		1-1/4		.030	
38062516AX	38012	5/8		.6250	5/8		3-1/2		1-1/4		.060	
380L6254AX	38014	5/8		.6250	5/8		4		1-7/8		.030	
380M1600-0.5RAX	38030		16	.6299		16.0		92		42		0.50
380M1600-1.0RAX	38032		16	.6299		16.0		92		42		1.00
38075012AX	38016	3/4		.7500	3/4		4		1-1/2		.015	
38075014AX	38018	3/4		.7500	3/4		4		1-1/2		.030	
38075016AX	38020	3/4		.7500	3/4		4		1-1/2		.060	
38075018AX	38022	3/4		.7500	3/4		4		1-1/2		.120	
380L7504AX	38024	3/4		.7500	3/4		5		2-1/4		.030	
380M2000-0.5RAX	38034		20	.7874		20.0		104		52		0.50
380M2000-1.0RAX	38036		20	.7874		20.0		104		52		1.00

Inch	
D1	Tolerance
.3750 - .3937	+0/- .0020
>.3937 - .7874	+0/- .0025

Inch	
D2	Tolerance (h6)
.3750 - .3937	+0/- .00035
.3938 - .7087	+0/- .00043
.7088 - .7874	+0/- .00051

mm	
D2	Tolerance (h6)
8.0 - 10.0	+0/- .009
>10.0 - 18.0	+0/- .011
>18.0 - 20.0	+0/- .013

mm	
D1	Tolerance
8.0 - 10.0	+0/- .050
>10.0 - 20.0	+0/- .064



Workpiece Material Group	I S O	Hardness	Coolant			Profiling (ae)		End Mill Diameter (inch)			
			• Preferred ○ Possible x Not Possible					3/8	1/2	5/8	3/4
						5%	10%	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	.0039	.0047	.0060	.0078
Medium Carbon Steels 1140, 1145	P	28 to 38 Rc	•	•	•	1130	900	.0039	.0047	.0060	.0078
Alloy Steels 4140, 4145	P	28 to 44 Rc	•	•	•	1035	840	.0039	.0047	.0060	.0078
Die / Tool Steels A2, D2, H13, P20	P	28 to 44 Rc	•	•	•	900	725	.0039	.0047	.0060	.0078
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	•	x	○	675	545	.0015-.0020	.0020-.0031	.0020-.0033	.0022-.0035
Stainless Steel - Austenitic 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	•	x	○	525	430	.0015-.0020	.0020-.0031	.0020-.0033	.0022-.0035
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321	M	up to 28 Rc	•	x	○	410	330	.0015-.0020	.0020-.0031	.0020-.0033	.0022-.0035
Stainless Steel - Difficult to Machine 17-4 PH, PH13-8Mo, Nitronics	M		•	x	○	525	430	.0015-.0020	.0020-.0031	.0020-.0033	.0022-.0035
Cobalt Chrome Alloys	M	over 28 Rc	•	x	○	410	325	.0020	.0031	.0033	.0035
Duplex (22%)	M		•	x	○	245	195	.0020	.0031	.0033	.0035
Super Duplex (25%)	M		•	x	○	245	195	.0020	.0031	.0033	.0035
High Temp Alloys	S	up to 42 Rc	•	x	x	180	150	.0015-.0020	.0020-.0031	.0020-.0033	.0022-.0035
Inconel	S		•	x	x	180	150	.0010-.0016	.0010-.0016	.0010-.0017	.0011-.0018
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	.0010-.0016	.0010-.0016	.0010-.0017	.0011-.0018
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	•	○	○	1625	1295	.0039	.0047	.0060	.0078
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	•	○	○	675	540	.0031	.0039	.0047	.0078
Hardened Steels		40-50 Rc	•	○	○	610	495	.0024	.0030	.0040	.0048
Hardened Steels	H	50-55 Rc	•	○	○	510	410	.0016	.0018	.0024	.0028
Hardened Steels		>55 Rc	•	○	○	330	310	.0010	.0015	.0018	.0021



Made in USA
ISO 9001:2008 Certified

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.

TuffCut® XT9

380 Series Recommended Cutting Data - Profile Milling Metric



Workpiece Material Group	ISO	Hardness	Coolant			Profiling (ae)		End Mill Diameter (mm)				
			● Preferred ○ Possible x Not Possible					8	10	12	16	20
						2.30	1.67	← 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					
Low Carbon Steels 1018, 1020	P	up to 28 Rc	●	●	●	450	350	.0800	.1000	.1100	.1500	.2540
Medium Carbon Steels 1140, 1145	P	28 to 38 Rc	●	●	●	345	275	.0800	.1000	.1100	.1500	.2540
Alloy Steels 4140, 4145	P	28 to 44 Rc	●	●	●	315	255	.0800	.1000	.1100	.1500	.2540
Die / Tool Steels A2, D2, H13, P20	P	28 to 44 Rc	●	●	●	275	220	.0800	.1000	.1100	.1500	.2540
Stainless Steel - Easy to Machine 430F, 301, 303, 410, 416 Annealed, 420F, 430	M	up to 28 Rc	●	x	○	205	165	.030-.040	.038-.050	.050-.078	.050-.083	.060-.099
Stainless Steel - Austenitic 301, 302, 303 High Tensile, 304, 304L, 305, 420, 15-5PH, 17-4PH, 17-7PH	M	up to 28 Rc	●	x	○	160	130	.030-.040	.038-.050	.050-.078	.050-.083	.060-.099
Stainless Steel - Difficult to Machine 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321	M	up to 28 Rc	●	x	○	125	100	.030-.040	.038-.050	.050-.078	.050-.083	.060-.099
Stainless Steel - Difficult to Machine 17-4 PH, PH13-8Mo, Nitronics	M	over 28 Rc	●	x	○	160	130	.030-.040	.038-.050	.050-.078	.050-.083	.060-.099
Cobalt Chrome Alloys	M		●	x	○	125	100	.0400	.0500	.0780	.0830	.0990
Duplex (22%)	M		●	x	○	75	60	.0400	.0500	.0780	.0830	.0990
Super Duplex (25%)	M		●	x	○	75	60	.0400	.0500	.0780	.0830	.0990
High Temp Alloys	S	up to 42 Rc	●	x	x	55	45	.030-.040	.038-.050	.025-.040	.025-.043	.030-.050
Inconel	S	42 Rc	●	x	x	55	45	.020-.030	.025-.040	.025-.040	.025-.043	.030-.050
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	115	105	.020-.030	.025-.040	.050-.078	.050-.083	.030-.050
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	●	○	○	495	395	.0800	.1000	.1100	.1500	.2540
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	●	○	○	205	165	.0650	.0800	.1100	.1500	.2540
Hardened Steels	H	40-50 Rc	●	○	○	185	150	.0500	.0600	.1016	.1168	.1524
Hardened Steels		50-55 Rc	●	○	○	155	125	.0300	.0400	.0610	.0762	.0889
Hardened Steels		>55 Rc	●	○	○	100	95	.0200	.0250	.0457	.0559	.0635

Safety Note

Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should be fully guarded. Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

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.

New products also available:

TurboCut® OP Series 116

Special Radial Options now available As Standard!

ISO 9001:2008 Certified

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Series 116R

TurboCut® Series 169

Now Reduce Delays when Handling As Standard!

Designed for aggressive cutting. Improved over the best general purpose.

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Series 169R

TurboCut® XR-AL Series 334

NEW

- Eliminated face design for improved chip control and reduced cutting forces
- Characterized sharp geometry and face from a traditional face design and will not chip
- Variable hole strengthens the back corner reducing the chance of a chipped corner
- Manufactured from premium grade cobalt matrix carbide for superior tool life

XR-AL: Strong Bouncing for ALUMINUM

Gains Coating (GPI)

Re-engineered for aluminum and aluminum alloys. Superior finish and chip control. Gains process excels at edge protection and maintains work holding edges.

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Series 334

TurboCut® 187 Series 180CB Chipbreaker

NEW

- Longer tool life using longer one with chipbreaker
- Higher feed rates allowed
- Cutting forces reduced resulting in straighter work for long axial engagement
- Chatter reduced or eliminated

Prevents 90% of all chip breaking resulting in 40% more tool life

Creates sharper chips that can be successfully more used

Corner Radius provides a stronger process for less wear during ramping or braking

Corner of chipbreaker grit

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Series 180CB

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Micro X-D Series MXDCR

NEW

- Designed for high performance drilling in a broad range of materials
- Wide internal flute design to reduce cutting forces during the cutting operation
- Coated design that allows more consistent cutting edges and the great results
- Increases the strength of the cutting edges
- All sizes are now coated with an improved chip breaker
- Coated with AL-5000 Coating

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Series MXDCR

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