



ATI

2026

ADVANCED
STATE-OF-THE-ART
CUTTING TOOL
MANUFACTURING
IN THE HEART OF
THE MIDWEST

ADVANCED TOOLING, INC.

TOOL & CUTTER DESIGN & MANUFACTURING



Tools IN STOCK at our
Waukesha Wisconsin facility.



CUTTING-EDGE TECHNOLOGY

Advanced Tooling, Inc. is committed to staying on the “Cutting Edge” of technology. We have over 48 state-of-the-art CNC cutter grinders, allowing Advanced Tooling, Inc. to produce high performance tooling that is second-to-none in quality and consistency. By utilizing the best and newest machines from WALTER, ANCA, ROLLOMATIC, UNISON and TRUTECH, we offer unmatched manufacturing versatility in the trade. We are able to manufacture any geometry required to maximize today’s high performance machine tools. To keep up with production and meet industry demands, we have incorporated 31 robots.

We’ve been adding some of the latest technologies to cutter grinding to our floor - linear motion machines. Linear machines produce a superior surface finish. To date, we have 15 linear ANCA grinders, 4 linear WALTER grinders, and 3 linear ROLLOMATIC grinders.

ATI has 3 off-line wheel dressers to maintain the diamond wheels used in the grinding process. We’ve incorporated (2) 21 vessel TRANSOR filtration systems to deliver clean, chilled oil to the grinding machines (filters down to 1 micron). The clean, chilled oil creates a cleaner and cooler grind - creating a better cutting edge on the tool. We use HELICHECKs and a variety of other inspection machines to provide a non-contact measurement to maintain repeatability and edges throughout the manufacturing process. Additionally, a variety of coatings and edge-preps are offered for added performance and tool life.

We are very proud of our facilities and welcome visits at any time.

Our investment in technology is your gain. We'd like to hear about your individual applications. With our years of experience - we understand your needs and can both design and apply our tooling in a way that increases your output and production.

-Tom Pankratz, Owner

SERIES	APPLICATION	MILL TYPE	FLUTE/DEGREE	PAGE
	How to Order, Terms			iii
	Recondition / Remanufacture			iv
SW	Sidewall Milling	Flat	2,4,5	1-3
SWR	Sidewall Milling	Radius	4,5	4-5
HSW	Sidewall Milling Hard Materials	Flat	6,7	6
HSWR	Sidewall Milling Hard Materials	Radius	6,7	7
HF4	Sidewall Milling Aggressive	Flat	4	8
HFXC4	Sidewall Milling Aggressive	Flat	4	9
HRX4	Profile Milling Aggressive	Radius	4	10
HR4	Profile Milling Aggressive	Radius	4	11-14
HRC4	Profile Milling Aggressive	Radius	4	15-16
HB2	Profile Milling Aggressive	Ball	2	17
HBC2	Profile Milling Aggressive	Ball	2	18
HBX2	Profile Milling Aggressive	Ball	2	19-20
HB4	Profile Milling Aggressive	Ball	4	21
T3HB2	Profile Milling Tapered Shank	Ball	2	22
MHBX2	Profile Milling Metric	Ball	2	23
FMC2	Feed Mill	High Speed	2	24
TF4	Heavy Side Milling & Slotting	Flat	4	25-26
TR4	Heavy Side Milling & Slotting	Radius	4	27-29
TR4CB	Heavy Side Milling & Slotting	Radius w/ Chip Breakers	4	30
TB4	Heavy Side Milling & Slotting	Ball	4	31
TSF4	Stainless Aggressive Peripheral Milling	Flat	4	32
TSR4	Stainless Aggressive Peripheral Milling	Radius	4	33-34
TSR4CB	Stainless Aggressive Peripheral Milling	Radius w/ Chip Breakers	4	35
TSB4	Stainless Aggressive Peripheral Milling	Ball	4	36
TSF5	Stainless Aggressive Peripheral Milling	Flat	5	37
TSR5	Stainless Aggressive Peripheral Milling	Radius	5	38
RTAR3	Non Ferrous Heavy Roughing	Radius	3	39
TA3	Non Ferrous Milling	Flat	3	40
TA3CB	Non Ferrous Milling	Flat w/ Chip Breakers	3	41
TAR3	Non Ferrous Milling	Radius	3	42-43
TAR3CB	Non Ferrous Milling	Radius w/Chip Breakers	3	44
TAB3	Non Ferrous Milling	Ball	3	45
SAF6	High Temp Alloy Milling	Flat	6	46
SAR6	High Temp Alloy Milling	Radius	6	47
SAB6	High Temp Alloy Milling	Ball	6	48
RT5	Peripheral Milling	Flat, Radius	5	49
RE MCP4	Roughing	Rougher Carbide	4	50
SE4	General Purpose	Flat	4	51
EL4	General Purpose	Flat Extra Length	4	52
BEM4	General Purpose	Ball	4	53
BEL4	General Purpose	Ball Extra Length	4	54
SE2	General Purpose	Flat	2	55
EL2	General Purpose	Flat Extra Length	2	56
BEM2	General Purpose	Ball	2	57
BEL2	General Purpose	Ball Extra Length	2	58
TM	Threadmill	Threadmill	5	59
CM	Chamfering, Countersink	Chamfer Mill	3,4,5	60
CR4	Corner Round	Corner Round	4	61
DM	Drill, Mill, Chamfer, Spot	Drill Mill	2,4	62
SD	Spot Drilling	Spot Drill	90°, 120°, 142°	63
ET	Engraving	Engraving Mill	2	64
DF	Graphite Milling	CVD Diamond Flat	2,4	65
DR	Graphite Milling	CVD Diamond Radius	4	66
DB	Graphite Milling	CVD Diamond Ball	2,4	67
DP	Graphite Roughing	CVD Diamond Rougher		68
	Burrs	Burr		70-74
	Variable End Mill Speed & Feed Chart			75-76
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	Troubleshooting, Milling Strategies & Conversions			85

HOW TO ORDER

Phone | Fax | Email

- ATI North:
210 Kommers Street | PO Box 218
Mt. Calvary, WI 53057
Call: 920-753-2420
Fax: 920-753-2811
Email: sales@advancedtoolinginc.net
- ATI South:
833 W College Avenue
Waukesha, WI 53186
Call: 262-896-0883
Fax: 262-896-0879
- Go to our website for special tooling /RFQ forms:
advancedtoolinginc.net/quotes.html

PAYMENT / ACCOUNT TERMS

- ALL NEW ACCOUNTS are due upon receipt unless other payment terms are arranged.
- NEW accounts are subject to office approval.
- Established / Approved accounts are NET 30.
- Accounts not paid within the terms are subject to a 2% monthly finance charge.
- Visa, Mastercard, and AmericanExpress accepted.
- ACH payments accepted.

All current stock and price updates will be
published on our website:
advancedtoolinginc.net/resources.html



All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

Advanced Tooling, Inc. | 920-753-2420 | advancedtoolinginc.net



RECONDITIONING SERVICE

Reconditioning removes less of the diameter than re-grinding.

- Don't turn your expensive, high performance cutting tools into cheap re-grinds!
- Simply re-grinding the O.D. of tooling will make a tool sharp again however, with each re-grind, you lose a portion of its original geometry and performance.
- Loss of original design geometry leads to lost tool life and requires machining parameters to be slowed down to match the diminishing performance of re-ground cutting tools.
- High performance tooling has become very sophisticated and expensive.
Time lost on your machine is very expensive.

FOR A FRACTION OF THE COST OF NEW.

ATI will **RECONDITION** your tooling using the same state-of-the-art grinders on which the tooling was originally made. Geometry will be brought back to *original* design specs.

- Reconditioning in 2-3 weeks
- Special containers supplied for safe handling of high dollar tooling
- Pickup and delivery

REMANUFACTURING SERVICE

Remanufacturing maximizes the service life of your tooling.

Your tooling can go through the process of reconditioning several times before it needs to be cut-off and **REMANUFACTURED**.

Cut lengths specifically designated to allow for flute cutoff.

8" OAL tooling to 6" OAL

6" OAL tooling to 4" OAL

4" OAL tooling to 3" OAL

EXAMPLE

HB2 series - part# HB5002-80C03

- 1/2" diameter x 8" overall length and has 1" length of cut.
- When it can no longer be reconditioned, it's sent through **REMANUFACTURING**
- It's 1" LOC is cutoff and regenerated as a 1/2 x 6" OAL with 1" LOC.
- It can go through reconditioning until it is again **REMANUFACTURED**
as a 4" OAL tool with 1" LOC.

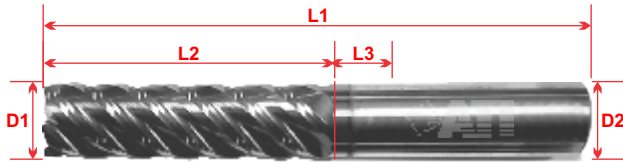
We would like to customize your tooling needs - ask for an IN-SHOP ASSESSMENT and one of our experienced sales and tooling experts will come to your production facility.

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SW SERIES

4 & 5 FLUTE FLAT BOTTOM - TRUE STRAIGHT WALL GEOMETRY



- EXTRA LONG OAL & FLUTE LENGTHS IN STOCK
- CENTER CUTTING

- HIGH PERFORMANCE PROFILE / SIDEWALL MILLING ON APPLICATIONS WITH LIGHT STEP OVER
 - 45 DEGREE HIGH HELIX AND VARIABLE FLUTE = EXCELLENT SURFACE FINISH
 - THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
 - RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR MINIMAL DEFLECTION = STRAIGHT SIDE WALLS
 - SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES
- = INCREASED TOOL LIFE AND IMPROVED FINISH

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
.005	2	.025	/	.125	2	SW0052-20C03	\$61.72
.010	2	.045	/	.125	2	SW0102-20C03	\$50.21
1/64"	2	.050	/	.125	4	SW0154-20C03	\$38.71
	2	.030	.250	.125	4	SWC0154-21C03	\$50.21
.020	2	.075	/	.125	4	SW0204-20C03	\$31.80
1/32"	2	.063	/	.125	4	SW0314-21C03	\$18.00
	2	.100	/	.125	4	SW0314-20C03	\$19.01
	2	.100	.250	.125	4	SWC0314-21C03	\$23.61
	2	.100	.500	.125	4	SWC0314-20C03	\$27.20
3/64"	2	.150	/	.125	4	SW0464-20C03	\$19.01
	2	.200	.400	.125	4	SWC0464-20C03	\$27.20
1/16"	2	.125	/	.125	4	SW0624-21C03	\$18.00
	2	.250	/	.125	4	SW0624-20C03	\$19.01
	2	.200	.400	.125	4	SWC0624-20C03	\$27.20
	2	.375	/	.125	4	SW0624-22C03	\$19.01
	2	.500	/	.125	4	SW0624-23C03	\$19.01
	3	.800	/	.125	4	SW0624-30C03	\$29.84
	3	.200	.600	.125	4	SWC0624-30C03	\$30.99
5/64"	2	.250	/	.125	4	SW0784-20C03	\$19.01
	2	.450	/	.125	4	SW0784-21C03	\$21.13
3/32"	2	.375	/	.125	4	SW0934-20C03	\$21.13
	3	1.00	/	.125	4	SW0934-30C03	\$22.62
1/8"	2	.250	/	.125	5	SW1255-21C03	\$20.30
	2	.500	/	.125	5	SW1255-20C03	\$21.13
	3	.500	/	.125	5	SW1255-30C03	\$22.62
	3	.750	/	.125	5	SW1255-31C03	\$24.67
	4	.750	/	.125	4	SW1254-40C03	\$28.33
	6	1.00	/	.125	4	SW1254-60C03	\$40.85

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

SW SERIES (continued)

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
5/32"	2	.625	/	.187	5	SW1565-20C03	\$19.87
	2	.625	.875	.187	5	SWC1565-21C03	\$27.22
3/16"	2	.375	/	.187	5	SW1875-21C03	\$22.22
	2	.625	/	.187	5	SW1875-20C03	\$23.05
	3	.750	/	.187	5	SW1875-30C03	\$26.51
	4	1.00	/	.187	5	SW1875-40C03	\$31.06
	6	1.25	/	.187	5	SW1875-60C03	\$39.04
13/64"	3	1.00	/	.250	5	SW2035-30C03	\$34.02
7/32"	3	.800	/	.250	5	SW2185-30C03	\$35.08
1/4"	2	.500	/	.250	5	SW2505-20C03	\$29.47
	3	.500	/	.250	5	SW2505-32C03	\$31.98
	3	.800	/	.250	5	SW2505-30C03	\$31.98
	3	1.125	/	.250	5	SW2505-31C03	\$31.98
	4	1.00	/	.250	5	SW2505-40C03	\$35.31
	4	1.50	/	.250	5	SW2505-41C03	\$39.54
	6	1.50	/	.250	5	SW2505-60C03	\$47.22
5/16"	3	.900	/	.312	5	SW3125-30C03	\$47.01
	4	1.125	/	.312	5	SW3125-41C03	\$57.14
	4	1.50	/	.312	5	SW3125-40C03	\$57.14
	6	1.50	/	.312	5	SW3125-60C03	\$68.06
3/8"	3	.625	/	.375	5	SW3755-31C03	\$49.63
	3	1.00	/	.375	5	SW3755-30C03	\$50.69
	4	1.50	/	.375	5	SW3755-40C03	\$63.35
	6	2.00	/	.375	5	SW3755-60C03	\$76.20
	6	3.00	/	.375	5	SW3755-61C03	\$88.17
7/16"	3	1.25	/	.437	5	SW4375-30C03	\$60.62
	4	2.00	/	.437	5	SW4375-40C03	\$74.91
	6	1.50	/	.437	5	SW4375-60C03	\$93.31
1/2"	3	.750	/	.500	5	SW5005-31C03	\$70.73
	3	1.25	/	.500	5	SW5005-30C03	\$71.57
	4	2.00	/	.500	5	SW5005-40C03	\$87.56
	6	2.00	/	.500	5	SW5005-60C03	\$105.68
	6	3.25	/	.500	5	SWS5005-61C03	\$141.51
	6	4.00	/	.500	5	SWS5005-62C03	\$162.10
	8	5.50	/	.500	5	SWS5005-80C03	\$211.10

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

SW SERIES (continued)

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
5/8"	4	1.25	/	.625	5	SW6255-41C03	\$103.72
	4	2.125	/	.625	5	SW6255-40C03	\$105.50
	6	2.125	/	.625	5	SW6255-60C03	\$152.40
	6	3.125	/	.625	5	SWS6255-61C03	\$160.08
	8	2.125	/	.625	5	SW6255-80C03	\$190.80
	8	5.125	/	.625	5	SWS6255-81C03	\$215.08
3/4"	4	1.50	/	.750	5	SW7505-41C03	\$143.64
	4	2.125	/	.750	5	SW7505-40C03	\$146.42
	5	2.750	/	.750	5	SW7505-50C03	\$175.27
	6	2.125	/	.750	5	SW7505-61C03	\$186.43
	6	3.25	/	.750	5	SW7505-60C03	\$204.34
	7	4.25	/	.750	5	SWS7505-70C03	\$258.57
	8	5.50	/	.750	5	SWS7505-80C03	\$342.00
	8	5.50	/	.750	5	SWS7505-80C03	\$342.00
1"	4	2.125	/	1.00	5	SW1005-40C03	\$216.15
	5	2.50	/	1.00	5	SW1005-50C03	\$253.75
	6	3.25	/	1.00	5	SW1005-60C03	\$308.56
	7	4.25	/	1.00	5	SWS1005-70C03	\$411.63
	8	5.50	/	1.00	5	SWS1005-80C03	\$486.01
	9	6.50	/	1.00	5	SWS1005-91C03	\$560.37
1-1/4"	6	3.25	/	1.25	5	SW12505-60C03	\$541.23
	9	6.50	/	1.25	5	SWS12505-90C03	\$872.17

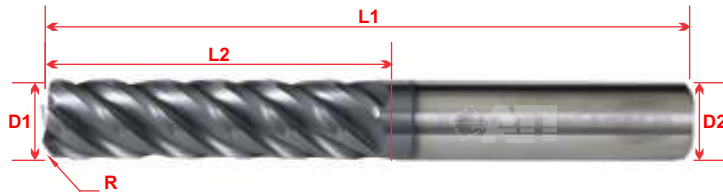


SW SERIES offers an extensive range of sizes from .005" diameter to 1.25" diameter.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

SWR SERIES

4 & 5 FLUTE CORNER RADIUS



- EXTRA LONG OAL's & FLUTE LENGTHS IN STOCK
- CENTER CUTTING

- HIGH PERFORMANCE MILLING ON APPLICATIONS WITH LIGHT STEP OVER
 - 45 DEGREE HIGH HELIX AND VARIABLE FLUTE = EXCELLENT SURFACE FINISH
 - THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
 - RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR MINIMAL DEFLECTION = STRAIGHT SIDE WALLS
 - SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES
- = INCREASED TOOL LIFE AND IMPROVED FINISH

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/32"	2	.005	.063	.125	4	SWR0314-20R005C03	\$20.03
	2	.005	.125	.125	4	SWR0314-21R005C03	\$21.14
1/16"	2	.010	.125	.125	4	SWR0624-20R010C03	\$20.03
	2	.010	.250	.125	4	SWR0624-21R010C03	\$21.14
3/32"	2	.015	.187	.125	4	SWR0934-20R015C03	\$23.47
	3	.015	.375	.125	4	SWR0934-30R015C03	\$25.22
1/8"	2	.015	.250	.125	5	SWR1255-21R015C03	\$22.56
	2	.015	.500	.125	5	SWR1255-20R015C03	\$23.47
	3	.015	.500	.125	5	SWR1255-30R015C03	\$25.22
3/16"	2	.015	.375	.187	5	SWR1875-20R015C03	\$24.64
	2.5	.015	.750	.187	5	SWR1875-25R015C03	\$25.55
1/4"	3	.015	.375	.250	5	SWR2505-30R015C03	\$35.79
	3	.015	.750	.250	5	SWR2505-31R015C03	\$35.79
	3	.031	.375	.250	5	SWR2505-30R031C03	\$35.79
	3	.031	.750	.250	5	SWR2505-31R031C03	\$35.79
	4	.015	1.25	.250	5	SWR2505-40R015C03	\$43.30
	4	.031	1.25	.250	5	SWR2505-40R031C03	\$43.30
	4	.062	1.25	.250	5	SWR2505-40R062C03	\$43.30
	4	.125	.750	.375	5	SWR3755-40R125C03	\$67.12
5/16"	3	.031	.900	.312	5	SWR3125-30R031C03	\$53.06
3/8"	3	.015	.625	.375	5	SWR3755-30R015C03	\$57.03
	3	.031	.625	.375	5	SWR3755-30R031C03	\$57.03
	3	.031	1.00	.375	5	SWR3755-31R031C03	\$57.03
	3	.062	.750	.375	5	SWR3755-30R062C03	\$57.03
	4	.015	.750	.375	5	SWR3755-40R015C03	\$67.12
	4	.031	.750	.375	5	SWR3755-40R031C03	\$67.12
	4	.062	.750	.375	5	SWR3755-40R062C03	\$67.12
	4	.125	.750	.375	5	SWR3755-40R125C03	\$67.12
1/2"	3	.015	.750	.500	5	SWR5005-30R015C03	\$78.86
	3	.031	.750	.500	5	SWR5005-30R031C03	\$78.86
	3	.031	1.25	.500	5	SWR5005-31R031C03	\$79.78
	3	.062	.750	.500	5	SWR5005-30R062C03	\$78.86
	3	.062	1.25	.500	5	SWR5005-31R062C03	\$79.78
	3	.125	1.00	.500	5	SWR5005-30R125C03	\$79.17

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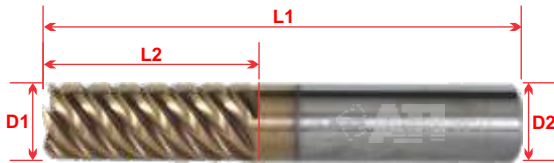
SWR SERIES (continued)

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/2"	4	.015	1.00	.500	5	SWR5005-41R015C03	\$92.12
	4	.031	1.00	.500	5	SWR5005-41R031C03	\$92.12
	4	.031	2.00	.500	5	SWR5005-40R031C03	\$92.12
	4	.047	1.00	.500	5	SWR5005-41R047C03	\$92.12
	4	.047	2.00	.500	5	SWR5005-40R047C03	\$92.12
	4	.062	1.00	.500	5	SWR5005-41R062C03	\$92.12
	4	.062	2.00	.500	5	SWR5005-40R062C03	\$92.12
5/8"	4	.015	1.25	.625	5	SWR6255-40R015C03	\$140.69
	4	.031	1.25	.625	5	SWR6255-40R031C03	\$140.69
	4	.062	1.25	.625	5	SWR6255-40R062C03	\$140.69
	6	.015	2.00	.625	5	SWR6255-60R015C03	\$190.19
	6	.031	2.00	.625	5	SWR6255-60R031C03	\$190.19
	6	.062	2.00	.625	5	SWR6255-60R062C03	\$190.19
	6	.125	2.00	.625	5	SWR6255-60R125C03	\$190.19
3/4"	4	.015	1.625	.750	5	SWR7505-40R015C03	\$180.62
	4	.031	1.625	.750	5	SWR7505-40R031C03	\$180.62
	4	.047	1.625	.750	5	SWR7505-40R047C03	\$180.62
	4	.062	1.625	.750	5	SWR7505-40R062C03	\$180.62
	4	.125	1.625	.750	5	SWR7505-40R125C03	\$180.62
	5	.031	2.75	.750	5	SWR7505-50R031C03	\$193.33
	5	.047	2.75	.750	5	SWR7505-50R047C03	\$193.33
	5	.062	2.75	.750	5	SWR7505-50R062C03	\$193.33
	6	.031	2.00	.750	5	SWR7505-60R031C03	\$214.70
	6	.062	2.00	.750	5	SWR7505-60R062C03	\$214.70
	6	.125	2.00	.750	5	SWR7505-60R125C03	\$214.70
	6	.125	3.25	.750	5	SWR7505-61R125C03	\$233.66
1"	4	.015	1.625	1.00	5	SWR1005-40R015C03	\$220.75
	4	.031	1.625	1.00	5	SWR1005-40R031C03	\$220.75
	4	.062	1.625	1.00	5	SWR1005-40R062C03	\$220.75
	4	.125	1.50	1.00	5	SWR1005-40R125C03	\$220.75
	5	.031	2.75	1.00	5	SWR1005-50R031C03	\$261.93
	5	.062	2.75	1.00	5	SWR1005-50R062C03	\$261.93
	6	.031	1.50	1.00	5	SWR1005-60R031C03	\$302.94
	6	.031	3.25	1.00	5	SWR1005-61R031C03	\$332.10
	6	.062	1.50	1.00	5	SWR1005-60R062C03	\$302.94
	6	.062	3.25	1.00	5	SWR1005-61R062C03	\$332.09
	6	.125	1.50	1.00	5	SWR1005-60R125C03	\$302.94
	6	.125	3.25	1.00	5	SWR1005-61R125C03	\$332.10
	8	.031	2.00	1.00	5	SWR1005-80R031C03	\$426.88
	8	.062	2.00	1.00	5	SWR1005-80R062C03	\$426.88
	8	.125	2.00	1.00	5	SWR1005-80R125C03	\$426.88

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HSW SERIES

HARD SIDEWALL - 6 AND 7 FLUTE FLAT



- CENTER CUTTING
- UP TO 70 HRC

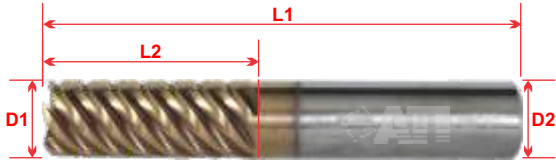
- RADIAL MILLING OF HARDENED MATERIALS
- 55 DEGREE HELIX AND HEAVY CORE MINIMIZE DEFLECTION
- SPECIAL EDGE PREP = IMPROVES CUTTING EDGE STRENGTH
- C15 COATING EXCELS IN MATERIALS ABOVE 70 HRC
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR MINIMAL DEFLECTION = STRAIGHT SIDE WALLS ON HARDENED MATERIALS
- VARIABLE FLUTE FOR STABLE MILLING = INCREASED TOOL LIFE AND METAL REMOVAL RATES WITH IMPROVED SURFACE FINISH

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/8"	2	.250	.125	6	HSW1256 -20C15	\$26.23
	2	.375	.125	6	HSW1256 -21C15	\$28.85
3/16"	2	.312	.187	6	HSW1876 -20C15	\$28.78
	2	.570	.187	6	HSW1876 -21C15	\$31.40
1/4"	3	.500	.250	6	HSW2506-32C15	\$34.86
	3	.800	.250	6	HSW2506-30C15	\$40.05
	3	1.25	.250	6	HSW2506-31C15	\$46.72
3/8"	3	.800	.375	6	HSW3756-30C15	\$63.54
	3	1.25	.375	6	HSW3756-31C15	\$65.08
	4	1.625	.375	6	HSW3756-40C15	\$79.32
1/2"	3	.800	.500	6	HSW5006-31C15	\$80.20
	3	1.30	.500	6	HSW5006-30C15	\$80.20
	4	1.75	.500	6	HSW5006-40C15	\$98.33
	5	2.125	.500	6	HSW5006-50C15	\$129.11
5/8"	4	1.30	.625	6	HSW6256-40C15	\$119.47
	4	1.75	.625	6	HSW6256-41C15	\$121.25
3/4"	4	1.25	.750	7	HSW7507-41C15	\$156.56
	4	1.75	.750	7	HSW7507-40C15	\$164.81
	5	2.125	.750	7	HSW7507-50C15	\$174.38

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HSWR SERIES

HARD SIDEWALL - 6 AND 7 FLUTE CORNER RADIUS



- CENTER CUTTING
- UP TO 70 HRC

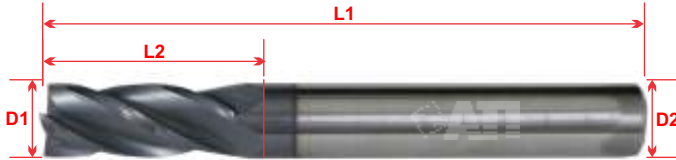
- RADIAL MILLING OF HARDENED MATERIALS
- 55 DEGREE HELIX AND HEAVY CORE MINIMIZE DEFLECTION
- SPECIAL EDGE PREP = IMPROVES CUTTING EDGE STRENGTH
- C15 COATING EXCELS IN MATERIALS ABOVE 70 HRC
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR MINIMAL DEFLECTION = STRAIGHT SIDE WALLS ON HARDENED MATERIALS
- VARIABLE FLUTE FOR STABLE MILLING = INCREASED TOOL LIFE AND METAL REMOVAL RATES WITH IMPROVED SURFACE FINISH

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.031	.800	.250	6	HSWR2506-30R031C15	\$46.89
3/8"	3	.031	1.25	.375	6	HSWR3756-31R031C15	\$76.03
1/2"	3	.031	1.30	.500	6	HSWR5006-30R031C15	\$93.56
	4	.031	1.75	.500	6	HSWR5006-40R031C15	\$113.96
5/8"	4	.031	1.75	.625	6	HSWR6256-41R031C15	\$140.76
3/4"	4	.031	1.75	.750	7	HSWR7507-40R031C15	\$189.38
	5	.031	2.125	.750	7	HSWR7507-50R031C15	\$200.35

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HF4 SERIES

4 FLUTE - FLAT AGGRESSIVE MILLING GEOMETRY



• CENTER CUTTING

- VARIABLE FLUTE FOR STABLE CHATTER FREE MILLING = INCREASED TOOL LIFE AND SURFACE FINISH
- RIGID FLUTE / HEAVY CORE GEOMETRY
- MILLING IN MILD TO ALLOY STEEL AND IRON
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES
- **C03 COATING - THE LATEST IN NANO COATING TECHNOLOGY WITH EXTREME HEAT AND WEAR RESISTANCE**

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/16"	2	.125	.125	4	HF0624-20C03	\$15.71
3/32"	2	.187	.125	4	HF0934-20C03	\$15.71
1/8"	2	.250	.125	4	HF1254-20C03	\$12.30
3/16"	2	.312	.187	4	HF1874-20C03	\$17.09
1/4"	3	.500	.250	4	HF2504-30C03	\$23.58
5/16"	3	.625	.312	4	HF3124-30C03	\$31.54
3/8"	3	.750	.375	4	HF3754-30C03	\$36.48
	4	1.00	.375	4	HF3754-40C03	\$44.51
1/2"	3	1.00	.500	4	HF5004-30C03	\$55.51
	4	1.25	.500	4	HF5004-40C03	\$66.42
5/8"	4	1.25	.625	4	HF6254-40C03	\$112.86
3/4"	4	1.5	.750	4	HF7504-40C03	\$134.11
1"	5	1.5	1.00	4	HF1004-50C03	\$213.29



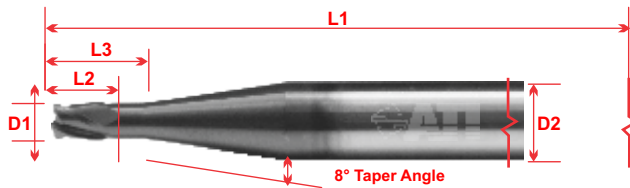
TSUNAMI stainless is unbeatable. See pages 32-38

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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HFXC4 SERIES

4 FLUTE - FLAT AGGRESSIVE MILLING GEOMETRY WITH LARGE DIAMETER SHANK



• CENTER CUTTING

- MILLING IN MILD TO ALLOY STEEL AND IRON
- RIGID FLUTE / HEAVY CORE GEOMETRY
- VARIABLE FLUTE FOR STABLE CHATTER FREE MILLING = INCREASED TOOL LIFE AND SURFACE FINISH
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES
- **C03 COATED - THE LATEST IN NANO COATING TECHNOLOGY WITH EXTREME HEAT AND WEAR RESISTANCE**

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
1/16"	3	.125	.250	.250	4	HFXC0624-30C03	\$34.86
3/32"	3	.187	.500	.250	4	HFXC0934-30C03	\$34.86
1/8"	3	.250	.375	.250	4	HFXC1254-31C03	\$34.86
	3	.250	.625	.250	4	HFXC1254-30C03	\$34.86
3/16"	3	.312	.900	.250	4	HFXC1874-30C03	\$34.86



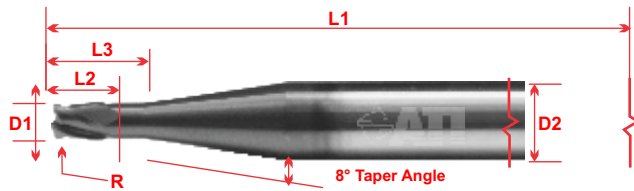
ANCA CPX LINEAR has hydrostatic ways for mirror finishes on flutes and cutting edges.
ANCA's versatility is ideal for quick turn-around specials.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HRX4 SERIES

NEW SIZES

4 FLUTE CORNER RADIUS WITH EXTRA HEAVY CORE AGGRESSIVE MILLING GEOMETRY



• CENTER CUTTING

- VARIABLE FLUTE FOR STABLE CHATTER FREE MILLING = INCREASED TOOL LIFE AND SURFACE FINISH
- EXTRA RIGID - LARGE SHANK TO CUT DIAMETER
- RIGID FLUTE / HEAVY CORE GEOMETRY
- **C03 COATED - THE LATEST IN NANO COATING TECHNOLOGY WITH EXTREME HEAT AND WEAR RESISTANCE**

D1	L1	RADIUS	L2	L3	D2	FLUTES	ATI PART#	PRICE
1/32"	3	.005	.062	.093	.250	4	HRX0314-30R005C03	\$34.73
	3	.010	.062	.093	.250	4	HRX0314-30R010C03	\$34.73
3/64"	3	.010	.093	.141	.250	4	HRX0474-30R010C03	\$34.73
1/16"	3	.005	.125	.187	.250	4	HRX0624-30R005C03	\$34.73
	3	.010	.125	.187	.250	4	HRX0624-30R010C03	\$34.73
	3	.015	.125	.187	.250	4	HRX0624-30R015C03	\$34.73
3/32	3	.005	.187	.280	.250	4	HRX0934-30R005C03	\$34.73
	3	.010	.187	.280	.250	4	HRX0934-30R010C03	\$34.73
	3	.015	.187	.280	.250	4	HRX0934-30R015C03	\$34.73
	3	.031	.187	.280	.250	4	HRX0934-30R031C03	\$34.73
1/8"	3	.015	.250	.375	.250	4	HRX1254-31R015C03	\$34.73
	3	.031	.250	.375	.250	4	HRX1254-31R031C03	\$34.73
3/16"	3	.015	.375	.561	.250	4	HRX1874-30R015C03	\$34.73
	3	.031	.375	.561	.250	4	HRX1874-30R031C03	\$34.73



Cutting oil filtration is extremely important for precision tolerances and high-quality finishes. Our Transor Filtration System filters cutting oils down to 1 micron.

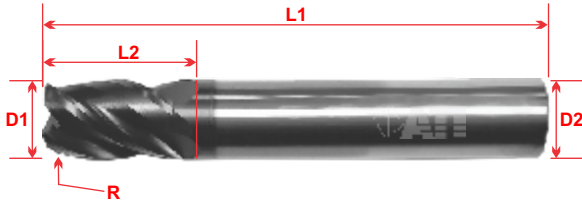
All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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NEW SIZES

HR4 SERIES

4 FLUTE CORNER RADIUS - AGGRESSIVE MILLING GEOMETRY



- EXTRA LONG SIZES IN STOCK
- CENTER CUTTING

- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR AGGRESSIVE PROFILE MILLING IN MILD TO ALLOY STEEL AND IRON
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES = INCREASED TOOL LIFE AND IMPROVED FINISH
- VARIABLE FLUTE FOR STABLE CHATTER FREE MILLING = INCREASED TOOL LIFE, METAL REMOVAL RATES AND IMPROVED FINISH

D1	L1	RADIUS	L2	D2	FLUTES	ATI PART#	PRICE
1/32"	2	.005	.050	.125	4	HR0314-20R005C03	\$18.81
	2	.010	.050	.125	4	HR0314-20R010C03	\$18.81
	3	.005	.050	.125	4	HR0314-30R005C03	\$20.26
	3	.010	.050	.125	4	HR0314-30R010C03	\$20.26
1/16"	2	.005	.125	.125	4	HR0624-20R005C03	\$18.81
	2	.010	.125	.125	4	HR0624-20R010C03	\$18.81
	2	.015	.125	.125	4	HR0624-20R015C03	\$18.81
	3	.005	.125	.125	4	HR0624-30R005C03	\$20.26
	3	.010	.125	.125	4	HR0624-30R010C03	\$20.26
	3	.015	.125	.125	4	HR0624-30R015C03	\$20.26
5/64"	2	.010	.312	.125	4	HR0784-20R010C03	\$18.81
3/32"	2	.015	.187	.125	4	HR0934-20R015C03	\$18.81
	2	.020	.187	.125	4	HR0934-20R020C03	\$18.81
	2	.031	.187	.125	4	HR0934-20R031C03	\$18.81
	3	.010	.187	.125	4	HR0934-30R010C03	\$18.81
	3	.015	.187	.125	4	HR0934-30R015C03	\$20.26
	3	.020	.187	.125	4	HR0934-30R020C03	\$20.26
	3	.031	.187	.125	4	HR0934-30R031C03	\$20.26
	3	.031	.187	.125	4	HR0934-30R031C03	\$20.26
1/8"	2	.015	.250	.125	4	HR1254-20R015C03	\$14.58
	2	.031	.250	.125	4	HR1254-20R031C03	\$14.58
	3	.015	.250	.125	4	HR1254-30R015C03	\$16.02
	3	.031	.250	.125	4	HR1254-30R031C03	\$16.02
	4	.015	.250	.125	4	HR1254-40R015C03	\$17.46
	4	.031	.250	.125	4	HR1254-40R031C03	\$17.46
	6	.015	.250	.125	4	HR1254-60R015C03	\$36.75
	6	.031	.250	.125	4	HR1254-60R031C03	\$36.75
5/32"	2	.031	.625	.187	4	HR1564-20R031C03	\$18.57

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HR4 SERIES (continued)

NEW SIZES

D1	L1	RADIUS	L2	D2	FLUTES	ATI PART#	PRICE
3/16"	2	.015	.375	.187	4	HR1874-20R015C03	\$18.57
	2	.031	.375	.187	4	HR1874-20R031C03	\$18.57
	3	.015	.375	.187	4	HR1874-30R015C03	\$21.88
	3	.031	.375	.187	4	HR1874-30R031C03	\$21.88
	3	.062	.375	.187	4	HR1874-30R062C03	\$21.88
	4	.015	.375	.187	4	HR1874-40R015C03	\$24.09
	4	.031	.375	.187	4	HR1874-40R031C03	\$24.09
	4	.062	.375	.187	4	HR1874-40R062C03	\$24.09
	4	.062	1.00	.187	4	HR1874-41R062C03	\$26.44
	6	.015	.375	.187	4	HR1874-60R015C03	\$29.31
	6	.031	.375	.187	4	HR1874-60R031C03	\$29.31
	6	.062	.375	.187	4	HR1874-60R062C03	\$29.31
1/4"	3	.010	.500	.250	4	HR2504-30R010C03	\$27.24
	3	.015	.500	.250	4	HR2504-30R015C03	\$27.24
	3	.031	.500	.250	4	HR2504-30R031C03	\$27.24
	3	.062	.500	.250	4	HR2504-30R062C03	\$27.24
	4	.010	.500	.250	4	HR2504-40R010C03	\$29.27
	4	.015	.500	.250	4	HR2504-40R015C03	\$30.49
	4	.031	.500	.250	4	HR2504-40R031C03	\$30.49
	4	.062	.500	.250	4	HR2504-40R062C03	\$30.49
	6	.015	.500	.250	4	HR2504-60R015C03	\$37.93
	6	.015	1.50	.250	4	HR2504-61R015C03	\$44.83
	6	.031	.500	.250	4	HR2504-60R031C03	\$37.93
	6	.031	1.50	.250	4	HR2504-61R031C03	\$44.83
	6	.062	.500	.250	4	HR2504-60R062C03	\$37.93
	6	.062	1.50	.250	4	HR2504-61R062C03	\$44.83
5/16"	3	.015	.625	.3125	4	HR3124-30R015C03	\$35.67
	3	.031	.625	.3125	4	HR3124-30R031C03	\$35.67
	3	.062	.625	.3125	4	HR3124-30R062C03	\$35.67
	4	.015	.625	.3125	4	HR3124-40R015C03	\$41.35
	4	.031	.625	.3125	4	HR3124-40R031C03	\$41.35
	4	.062	.625	.3125	4	HR3124-40R062C03	\$41.35
	6	.015	.625	.3125	4	HR3124-60R015C03	\$51.96
	6	.015	1.25	.3125	4	HR3124-61R015C03	\$58.86
	6	.031	.625	.3125	4	HR3124-60R031C03	\$51.96
	6	.031	1.25	.3125	4	HR3124-61R031C03	\$58.86
	6	.062	.625	.3125	4	HR3124-60R062C03	\$51.96
	6	.062	1.25	.3125	4	HR3124-61R062C03	\$58.86

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HR4 SERIES (continued)

D1	L1	RADIUS	L2	D2	FLUTES	ATI PART#	PRICE
3/8"	3	.015	.750	.375	4	HR3754-30R015C03	\$41.47
	3	.020	.750	.375	4	HR3754-30R020C03	\$41.47
	3	.031	.750	.375	4	HR3754-30R031C03	\$41.47
	3	.062	.750	.375	4	HR3754-30R062C03	\$41.47
	4	.015	.750	.375	4	HR3754-40R015C03	\$49.68
	4	.031	.750	.375	4	HR3754-40R031C03	\$49.68
	4	.062	.750	.375	4	HR3754-40R062C03	\$49.68
	4	.125	.750	.375	4	HR3754-40R125C03	\$49.68
	6	.015	.750	.375	4	HR3754-60R015C03	\$62.22
	6	.015	2.00	.375	4	HR3754-61R015C03	\$71.42
	6	.031	.750	.375	4	HR3754-60R031C03	\$62.22
	6	.031	2.00	.375	4	HR3754-61R031C03	\$71.42
	6	.062	.750	.375	4	HR3754-60R062C03	\$62.22
	6	.062	2.00	.375	4	HR3754-61R062C03	\$71.42
	6	.125	.750	.375	4	HR3754-60R125C03	\$62.22
	6	.125	2.00	.375	4	HR3754-61R125C03	\$71.42
	8	.015	2.00	.375	4	HR3754-81R015C03	\$90.41
	8	.031	2.00	.375	4	HR3754-81R031C03	\$90.41
1/2"	3	.010	1.00	.500	4	HR5004-30R010C03	\$60.95
	3	.015	1.00	.500	4	HR5004-30R015C03	\$65.26
	3	.020	1.00	.500	4	HR5004-30R020C03	\$60.95
	3	.031	1.00	.500	4	HR5004-30R031C03	\$60.95
	3	.062	1.00	.500	4	HR5004-30R062C03	\$60.95
	3	.125	1.00	.500	4	HR5004-30R125C03	\$60.95
	4	.010	1.00	.500	4	HR5004-40R010C03	\$71.57
	4	.015	1.00	.500	4	HR5004-40R015C03	\$71.57
	4	.031	1.00	.500	4	HR5004-40R031C03	\$71.57
	4	.062	1.00	.500	4	HR5004-40R062C03	\$71.57
	4	.125	1.00	.500	4	HR5004-40R125C03	\$71.57
	6	.015	1.00	.500	4	HR5004-60R015C03	\$91.78
	6	.015	2.00	.500	4	HR5004-61R015C03	\$99.97
	6	.031	1.00	.500	4	HR5004-60R031C03	\$91.78
	6	.031	2.00	.500	4	HR5004-61R031C03	\$99.97
	6	.062	1.00	.500	4	HR5004-60R062C03	\$91.78
	6	.062	2.00	.500	4	HR5004-61R062C03	\$99.97
	6	.125	1.00	.500	4	HR5004-60R125C03	\$91.78
	6	.125	2.00	.500	4	HR5004-61R125C03	\$99.97
	8	.015	1.00	.500	4	HR5004-80R015C03	\$128.40
	8	.031	1.00	.500	4	HR5004-80R031C03	\$128.40
	8	.062	1.00	.500	4	HR5004-80R062C03	\$128.40
	8	.125	1.00	.500	4	HR5004-80R125C03	\$128.40

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HR4 SERIES (continued)

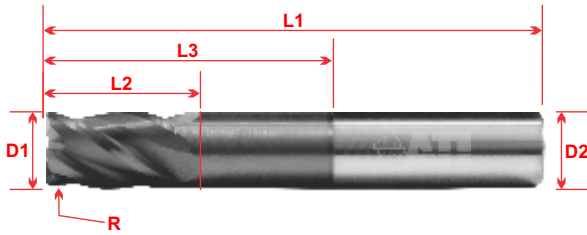
NEW SIZES

D1	L1	RADIUS	L2	D2	FLUTES	ATI PART#	PRICE
5/8"	4	.031	1.25	.625	4	HR6254-40R031C03	\$122.44
	4	.062	1.25	.625	4	HR6254-40R062C03	\$122.44
	4	.125	1.25	.625	4	HR6254-40R125C03	\$122.44
	6	.031	1.25	.625	4	HR6254-60R031C03	\$152.96
	6	.062	1.25	.625	4	HR6254-60R062C03	\$152.96
	6	.125	1.25	.625	4	HR6254-60R125C03	\$152.96
3/4"	4	.015	1.50	.750	4	HR7504-40R015C03	\$145.31
	4	.031	1.50	.750	4	HR7504-40R031C03	\$145.31
	4	.062	1.50	.750	4	HR7504-40R062C03	\$145.31
	4	.125	1.50	.750	4	HR7504-40R125C03	\$145.31
	6	.031	1.50	.750	4	HR7504-60R031C03	\$185.32
	6	.062	1.50	.750	4	HR7504-60R062C03	\$185.32
	6	.125	1.50	.750	4	HR7504-60R125C03	\$185.32
	8	.031	1.50	.750	4	HR7504-80R031C03	\$250.20
	8	.062	1.50	.750	4	HR7504-80R062C03	\$250.20
	8	.125	1.50	.750	4	HR7504-80R125C03	\$250.20
1"	4	.031	1.50	1.00	4	HR1004-40R031C03	\$199.96
	4	.062	1.50	1.00	4	HR1004-40R062C03	\$199.96
	4	.125	1.50	1.00	4	HR1004-40R125C03	\$210.59
	6	.031	1.50	1.00	4	HR1004-60R031C03	\$271.29
	6	.062	1.50	1.00	4	HR1004-60R062C03	\$271.29
	6	.125	1.50	1.00	4	HR1004-60R125C03	\$271.29
	8	.031	1.50	1.00	4	HR1004-80R031C03	\$359.16
	8	.062	1.50	1.00	4	HR1004-80R062C03	\$359.16
	8	.125	1.50	1.00	4	HR1004-80R125C03	\$359.16

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HRC4 SERIES

4 FLUTE CORNER RADIUS WITH CLEARANCE SHANK - AGGRESSIVE MILLING GEOMETRY FOR LONGER REACH APPLICATIONS



• CENTER CUTTING

- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR AGGRESSIVE PROFILE
MILLING IN MILD TO ALLOY STEEL AND IRON
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES
= INCREASED TOOL LIFE AND IMPROVED FINISH
- VARIABLE FLUTE FOR STABLE CHATTER FREE MILLING = INCREASED TOOL LIFE, METAL REMOVAL RATES AND IMPROVED FINISH

D1	L1	RADIUS	L2	L3	D2	FLUTES	ATI PART#	PRICE
1/32"	3	.005	.050	.125	.125	4	HRC0314-30R005C03	\$24.86
	3	.010	.050	.125	.125	4	HRC0314-30R010C03	\$24.86
	3	.005	.050	.250	.125	4	HRC0314-31R005C03	\$24.86
	3	.010	.050	.250	.125	4	HRC0314-31R010C03	\$24.86
1/16"	3	.005	.125	.375	.125	4	HRC0624-30R005C03	\$27.16
	3	.005	.125	.500	.125	4	HRC0624-31R005C03	\$29.46
	3	.005	.125	1.00	.125	4	HRC0624-32R005C03	\$32.92
	3	.010	.125	.375	.125	4	HRC0624-30R010C03	\$27.16
	3	.010	.125	.500	.125	4	HRC0624-31R010C03	\$28.31
	3	.010	.125	1.00	.125	4	HRC0624-32R010C03	\$34.06
	3	.015	.125	.375	.125	4	HRC0624-30R015C03	\$27.16
	3	.015	.125	.500	.125	4	HRC0624-31R015C03	\$29.46
	3	.015	.125	1.00	.125	4	HRC0624-32R015C03	\$34.06
5/64"	2	.020	.156	.600	.125	4	HRC0784-20R020C03	\$21.48
3/32"	3	.010	.187	.500	.125	4	HRC0934-30R010C03	\$22.93
	3	.010	.187	.750	.125	4	HRC0934-31R010C03	\$25.23
	3	.010	.187	1.125	.125	4	HRC0934-32R010C03	\$27.53
	3	.015	.187	.500	.125	4	HRC0934-30R015C03	\$22.93
	3	.015	.187	.750	.125	4	HRC0934-31R015C03	\$25.23
	3	.015	.187	1.125	.125	4	HRC0934-32R015C03	\$27.53
	3	.031	.187	.500	.125	4	HRC0934-30R031C03	\$22.93
	3	.031	.187	.750	.125	4	HRC0934-31R031C03	\$25.23
	3	.031	.187	1.125	.125	4	HRC0934-32R031C03	\$27.53
1/8"	2	.015	.250	1.00	.125	4	HRC1254-20R015C03	\$23.42
	2	.031	.250	1.00	.125	4	HRC1254-20R031C03	\$23.42
	3	.015	.250	1.00	.125	4	HRC1254-30R015C03	\$24.86
	3	.031	.250	1.00	.125	4	HRC1254-30R031C03	\$24.86
	3	.015	.250	1.50	.125	4	HRC1254-31R015C03	\$29.46
	3	.031	.250	1.50	.125	4	HRC1254-31R031C03	\$29.46

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HRC4 SERIES (continued)

D1	L1	RADIUS	L2	L3	D2	FLUTES	ATI PART#	PRICE
3/16"	3	.015	.375	1.25	.187	4	HRC1874-30R015C03	\$29.57
	3	.031	.375	1.25	.187	4	HRC1874-30R031C03	\$29.57
	4	.015	.375	1.80	.187	4	HRC1874-40R015C03	\$31.78
	4	.031	.375	1.80	.187	4	HRC1874-40R031C03	\$31.78
	4	.062	.375	1.80	.187	4	HRC1874-41R062C03	\$31.78
1/4"	3	.015	.500	1.60	.250	4	HRC2504-30R015C03	\$34.14
	3	.031	.500	1.60	.250	4	HRC2504-30R031C03	\$34.14
	3	.062	.500	1.60	.250	4	HRC2504-30R062C03	\$34.14
	4	.015	.500	2.10	.250	4	HRC2504-40R015C03	\$38.68
	4	.031	.500	2.10	.250	4	HRC2504-40R031C03	\$38.68
	4	.062	.500	2.10	.250	4	HRC2504-40R062C03	\$38.68
5/16"	4	.015	1.00	2.30	.3125	4	HRC3124-41R015C03	\$48.26
	4	.031	1.00	2.30	.3125	4	HRC3124-41R031C03	\$48.26
	4	.062	1.00	2.30	.3125	4	HRC3124-41R062C03	\$48.26
3/8"	4	.015	1.00	2.30	.375	4	HRC3754-41R015C03	\$56.58
	4	.031	1.00	2.30	.375	4	HRC3754-41R031C03	\$56.58
	4	.062	1.00	2.30	.375	4	HRC3754-41R062C03	\$56.58
	4	.125	1.00	2.30	.375	4	HRC3754-41R125C03	\$56.58
1/2"	4	.015	1.00	2.30	.500	4	HRC5004-40R015C03	\$78.25
	4	.031	1.00	2.30	.500	4	HRC5004-40R031C03	\$78.25
	4	.062	1.00	2.30	.500	4	HRC5004-40R062C03	\$78.25
	4	.125	1.00	2.30	.500	4	HRC5004-40R125C03	\$78.25



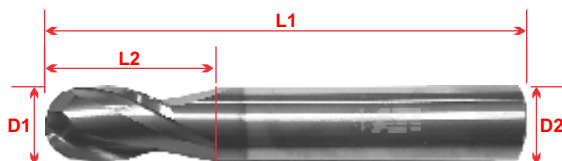
Walter Helitronic Vision with hydrostatic ways produces finishes on cutting edges and flutes that are second to none.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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HB2 SERIES

2 FLUTE BALL NOSE - AGGRESSIVE MILLING GEOMETRY



- EXTRA LONG SIZES IN STOCK
- PROFILE MILLING

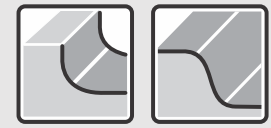
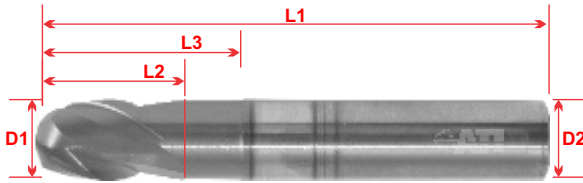
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR AGGRESSIVE PROFILE MILLING IN MILD TO ALLOY STEEL AND IRON
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES = INCREASED TOOL LIFE AND IMPROVED FINISH

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/64"	2	.031	.125	2	HB0152-20C03	\$30.32
1/32"	2	.0625	.125	2	HB0312-20C03	\$18.81
.040	2	.080	.125	2	HB0402-20C03	\$18.81
3/64"	2	.093	.125	2	HB0462-20C03	\$18.81
1/16"	2	.125	.125	2	HB0622-20C03	\$18.81
5/64"	2	.156	.125	2	HB0782-20C03	\$18.81
3/32"	2	.187	.125	2	HB0932-20C03	\$18.81
1/8"	2	.250	.125	2	HB1252-20C03	\$14.58
	3	.250	.125	2	HB1252-30C03	\$16.02
	4	.250	.125	2	HB1252-40C03	\$17.46
	6	.250	.125	2	HB1252-60C03	\$35.71
5/32"	2	.375	.187	2	HB1562-20C03	\$18.57
3/16"	2	.375	.187	2	HB1872-20C03	\$18.57
	3	.375	.187	2	HB1872-30C03	\$22.65
	4	.375	.187	2	HB1872-40C03	\$24.09
	6	.375	.187	2	HB1872-60C03	\$29.31
13/64	3	.400	.250	2	HB2032-30C03	\$29.86
7/32	3	.436	.250	2	HB2182-30C03	\$29.86
9/32	3	.562	.250	2	HB2812-30C03	\$29.86
1/4"	3	.500	.250	2	HB2502-30C03	\$27.24
	4	.500	.250	2	HB2502-40C03	\$30.49
	6	.500	.250	2	HB2502-60C03	\$37.93
5/16"	3	.625	.312	2	HB3122-30C03	\$35.67
	4	.625	.312	2	HB3122-40C03	\$41.35
	6	.625	.312	2	HB3122-60C03	\$51.96
3/8"	3	.750	.375	2	HB3752-30C03	\$41.47
	4	.750	.375	2	HB3752-40C03	\$49.68
	6	.750	.375	2	HB3752-60C03	\$62.22
1/2"	3	1.00	.500	2	HB5002-30C03	\$68.12
	4	1.00	.500	2	HB5002-40C03	\$78.74
	6	1.00	.500	2	HB5002-60C03	\$98.95
	8	1.00	.500	2	HB5002-80C03	\$137.11
3/4"	4	1.50	.750	2	HB7502-40C03	\$178.69
	6	1.50	.750	2	HB7502-60C03	\$205.74

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HBC2 SERIES

2 FLUTE BALL NOSE WITH CLEARANCE SHANK - AGGRESSIVE MILLING GEOMETRY FOR LONGER REACH APPLICATIONS



• PROFILE MILLING

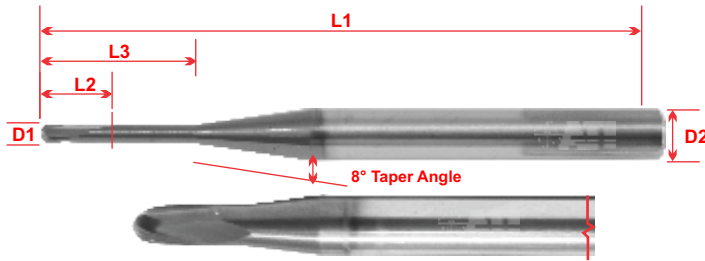
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR AGGRESSIVE PROFILE MILLING IN MILD TO ALLOY STEEL AND IRON
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES
= INCREASED TOOL LIFE AND IMPROVED FINISH

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
1/32"	3	.050	.125	.125	2	HBC0312-30C03	\$24.86
	3	.050	.250	.125	2	HBC0312-31C03	\$24.86
	3	.050	.375	.125	2	HBC0312-32C03	\$24.86
.040	2	.080	.200	.125	2	HBC0402-20C03	\$23.42
3/64"	2	.075	.125	.125	2	HBC0462-20C03	\$23.42
	2	.075	.250	.125	2	HBC0462-21C03	\$23.42
	3	.075	.350	.125	2	HBC0462-30C03	\$24.86
1/16"	3	.125	.250	.125	2	HBC0622-30C03	\$24.86
	3	.125	.375	.125	2	HBC0622-31C03	\$24.86
	3	.125	.500	.125	2	HBC0622-32C03	\$24.86
	3	.125	.750	.125	2	HBC0622-34C03	\$29.46
	3	.125	1.00	.125	2	HBC0622-33C03	\$31.76
5/64"	2	.156	.250	.125	2	HBC0782-20C03	\$23.42
	3	.156	.500	.125	2	HBC0782-30C03	\$24.86
3/32"	3	.187	.312	.125	2	HBC0932-31C03	\$24.86
	3	.187	.500	.125	2	HBC0932-32C03	\$24.86
	3	.187	.750	.125	2	HBC0932-33C03	\$29.46
	3	.187	1.00	.125	2	HBC0932-34C03	\$29.46
1/8"	2	.250	1.00	.125	2	HBC1252-20C03	\$23.42
	3	.250	1.00	.125	2	HBC1252-30C03	\$24.86
	3	.250	1.60	.125	2	HBC1252-31C03	\$30.45
3/16"	3	.375	1.00	.187	2	HBC1872-30C03	\$30.90
	3	.375	1.60	.187	2	HBC1872-31C03	\$33.20
	4	.375	2.30	.187	2	HBC1872-40C03	\$40.02
1/4"	3	.500	1.60	.250	2	HBC2502-30C03	\$34.14
	4	.500	1.60	.250	2	HBC2502-40C03	\$37.39
	4	.500	2.10	.250	2	HBC2502-41C03	\$37.39
5/16"	3	.625	1.60	.312	2	HBC3122-30C03	\$42.57
	4	.625	1.60	.312	2	HBC3122-40C03	\$48.26
	4	.625	2.10	.312	2	HBC3122-41C03	\$48.26
3/8"	3	.750	1.30	.375	2	HBC3752-30C03	\$48.38
	4	.750	1.60	.375	2	HBC3752-40C03	\$56.58
	4	.750	2.30	.375	2	HBC3752-41C03	\$56.58
1/2"	4	1.00	2.30	.500	2	HBC5002-40C03	\$82.96

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HBX2 SERIES

2 FLUTE BALL NOSE WITH EXTRA HEAVY CORE - AGGRESSIVE MILLING GEOMETRY



- EXTRA LONG SIZES IN STOCK
- PROFILE MILLING

- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
- SMALL DIAMETERS ARE ON 1/4" SHANKS FOR ADDED RIGIDITY
- SHORT LOC WITH EXTRA HEAVY CORE GEOMETRY EXCELS ON APPLICATIONS WITH POOR SETUP AND MACHINE RIGIDITY
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES
= INCREASED TOOL LIFE AND IMPROVED FINISH

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
.020	3	.020	.040	.250	2	HBX0202-30C03	\$41.11
1/32"	3	.031	.062	.187	2	HBX0312-31C03	\$28.60
	3	.031	.062	.250	2	HBX0312-30C03	\$31.84
	3	.031	.125	.250	2	HBX0312-35C03	\$38.24
	3	.031	.187	.250	2	HBX0312-32C03	\$38.24
	3	.031	.312	.250	2	HBX0312-33C03	\$38.24
	3	.031	.500	.250	2	HBX0312-34C03	\$40.72
	3	.031	.500	.250	2	HBX0312-34C03	\$40.72
.040	3	.040	.320	.250	2	HBX0402-32C03	\$38.24
3/64	3	.046	.093	.250	2	HBX0462-30C03	\$31.84
	3	.046	.187	.250	2	HBX0462-31C03	\$38.74
1/16	3	.062	.125	.187	2	HBX0622-31C03	\$28.60
	3	.062	.125	.250	2	HBX0622-30C03	\$31.84
	3	.062	.250	.250	2	HBX0622-37C03	\$38.24
	3	.062	.312	.250	2	HBX0622-32C03	\$38.24
	3	.062	.500	.250	2	HBX0622-33C03	\$38.24
	3	.062	.625	.250	2	HBX0622-34C03	\$40.72
	3	.062	.750	.250	2	HBX0622-35C03	\$40.72
	3	.062	1.00	.250	2	HBX0622-36C03	\$40.72
	3	.062	1.00	.250	2	HBX0622-36C03	\$40.72
5/64"	3	.078	.156	.250	2	HBX0782-30C03	\$31.84
3/32"	3	.093	.187	.187	2	HBX0932-31C03	\$28.60
	3	.093	.187	.250	2	HBX0932-30C03	\$31.84
	3	.093	.312	.250	2	HBX0932-32C03	\$38.24
	3	.093	.500	.250	2	HBX0932-33C03	\$38.74
	3	.093	.750	.250	2	HBX0932-34C03	\$40.72
	3	.093	1.00	.250	2	HBX0932-35C03	\$40.72
	3	.093	1.00	.250	2	HBX0932-35C03	\$40.72
1/8"	3	.125	.250	.187	2	HBX1252-31C03	\$28.60
	3	.125	.250	.250	2	HBX1252-30C03	\$31.84
	3	.125	.500	.250	2	HBX1252-32C03	\$38.74
	3	.125	.625	.250	2	HBX1252-33C03	\$38.74
	3	.125	.750	.250	2	HBX1252-34C03	\$41.04
	3	.125	1.00	.250	2	HBX1252-35C03	\$41.04
	3	.125	1.25	.250	2	HBX1252-36C03	\$41.04

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

HBX2 SERIES (continued)

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
5/32"	3	.156	.312	.250	2	HBX1562-30C03	\$30.39
	3	.156	.875	.250	2	HBX1562-32C03	\$37.29
3/16"	2	.187	/	.187	2	HBX1872-20C03	\$20.86
	3	.187	.375	.250	2	HBX1872-30C03	\$30.80
	3	.187	.500	.250	2	HBX1872-31C03	\$38.56
	3	.187	.750	.250	2	HBX1872-32C03	\$40.72
	3	.187	1.00	.250	2	HBX1872-35C03	\$40.72
	4	.187	/	.187	2	HBX1872-40C03	\$24.09
	6	.187	/	.187	2	HBX1872-60C03	\$29.31
13/64"	3	.203	.406	.250	2	HBX2032-30C03	\$31.66
7/32"	3	.218	.436	.250	2	HBX2182-30C03	\$31.66
1/4"	3	.250	/	.250	2	HBX2502-30C03	\$27.24
	4	.250	/	.250	2	HBX2502-40C03	\$30.49
	6	.250	/	.250	2	HBX2502-60C03	\$37.93
9/32"	3	.281	.562	.312	2	HBX2812-30C03	\$38.29
5/16"	3	.312	/	.312	2	HBX3122-30C03	\$35.67
	4	.312	/	.312	2	HBX3122-40C03	\$41.35
	6	.312	/	.312	2	HBX3122-60C03	\$51.96
3/8"	4	.375	/	.375	2	HBX3752-40C03	\$49.68
	6	.375	/	.375	2	HBX3752-60C03	\$62.22
	8	.375	/	.375	2	HBX3752-80C03	\$90.41
1/2"	4	.500	/	.500	2	HBX5002-40C03	\$78.74
	6	.500	/	.500	2	HBX5002-60C03	\$98.95
	8	.500	/	.500	2	HBX5002-80C03	\$137.11



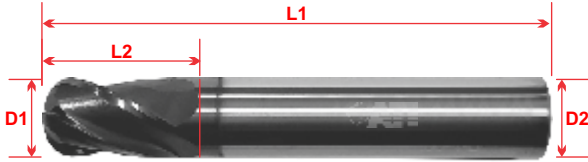
Quantities from high production robotic 24-7 lots to small run specials.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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HB4 SERIES

4 FLUTE HELICAL BALL NOSE - AGGRESSIVE MILLING GEOMETRY



- EXTRA LONG SIZES IN STOCK
- PROFILE MILLING

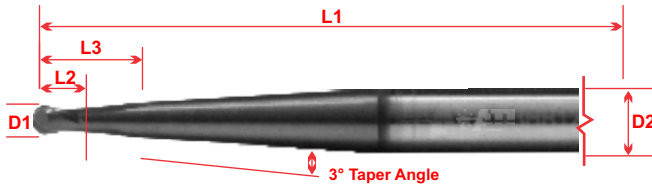
- 4 FLUTE AGGRESSIVE MILLING DESIGN FOR INCREASED FEEDS VS. 2 FLUTE
- VARIABLE FLUTE FOR STABLE CHATTER FREE MILLING = INCREASED TOOL LIFE, METAL REMOVAL RATES AND SURFACE FINISH
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/32"	2	.062	.125	4	HB0314-20C03	\$18.81
3/64"	2	.093	.125	4	HB0464-20C03	\$18.81
1/16"	2	.250	.125	4	HB0624-20C03	\$18.81
5/64"	2	.156	.125	4	HB0784-20C03	\$18.81
3/32"	2	.187	.125	4	HB0934-20C03	\$18.81
1/8"	2	.250	.125	4	HB1254-20C03	\$14.58
	3	.250	.125	4	HB1254-30C03	\$16.02
	4	.250	.125	4	HB1254-40C03	\$17.46
5/32	2	.625	.187	4	HB1564-20C03	\$19.54
3/16"	2	.375	.187	4	HB1874-20C03	\$18.57
	3	.375	.187	4	HB1874-30C03	\$21.88
	4	.375	.187	4	HB1874-40C03	\$24.09
1/4"	3	.500	.250	4	HB2504-30C03	\$27.24
	4	.500	.250	4	HB2504-40C03	\$30.49
	6	.500	.250	4	HB2504-60C03	\$37.93
5/16"	3	.625	.312	4	HB3124-30C03	\$35.67
	4	.625	.312	4	HB3124-40C03	\$41.35
	6	.625	.312	4	HB3124-60C03	\$51.96
3/8"	3	.750	.375	4	HB3754-30C03	\$41.47
	4	.750	.375	4	HB3754-40C03	\$49.68
	6	.750	.375	4	HB3754-60C03	\$62.22
1/2"	3	1.00	.500	4	HB5004-30C03	\$68.12
	4	1.00	.500	4	HB5004-40C03	\$78.74
	6	1.00	.500	4	HB5004-60C03	\$98.95
	8	1.00	.500	4	HB5004-80C03	\$137.11
5/8"	4	1.25	.625	4	HB6254-40C03	\$122.44
	6	1.25	.625	4	HB6254-60C03	\$152.96
	8	1.25	.625	4	HB6254-80C03	\$194.95
3/4"	4	1.50	.750	4	HB7504-40C03	\$159.22
	6	1.50	.750	4	HB7504-60C03	\$199.23
	8	1.50	.750	4	HB7504-80C03	\$264.11
1"	4	1.50	1.00	4	HB1004-40C03	\$230.46
	6	1.50	1.00	4	HB1004-60C03	\$296.46
	8	1.50	1.00	4	HB1004-80C03	\$428.73

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

T3HB2 SERIES

2 FLUTE BALL NOSE WITH 3 DEGREE TAPERED SHANK AGGRESSIVE MILLING GEOMETRY



• PROFILE MILLING

- 3 DEGREE TAPERED SHANK PROVIDES EXTRA RIGIDITY ON APPLICATIONS WHERE LONG REACH IS REQUIRED
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR PROFILE MILLING IN MILD TO ALLOY STEEL AND IRON
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE

D1	L1	L2	L3	D2	FLUTES	ATI PART#	PRICE
1/64"	3	.031	1.50	.250	2	T3HB0152-30C03	\$54.85
1/32"	3	.062	1.50	.250	2	T3HB0312-30C03	\$43.34
3/64"	3	.093	1.50	.250	2	T3HB0462-30C03	\$43.34
1/16"	3	.125	1.50	.250	2	T3HB0622-30C03	\$43.34
5/64	3	.156	1.50	.250	2	T3HB0782-30C03	\$43.34
3/32"	3	.200	1.50	.250	2	T3HB0932-30C03	\$43.34
1/8"	3	.200	1.50	.250	2	T3HB1252-30C03	\$43.34
5/32	3	.300	1.50	.250	2	T3HB1562-30C03	\$43.34
3/16	3	.300	1.00	.250	2	T3HB1872-30C03	\$43.34



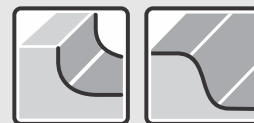
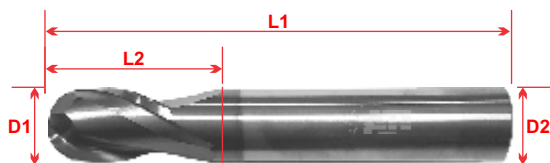
For long reach applications, tapered shanks add significant rigidity over straight shank tooling.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

Advanced Tooling, Inc. | 920-753-2420 | advancedtoolinginc.net

MHBX2 SERIES

METRIC 2 FLUTE BALL NOSE - AGGRESSIVE MILLING GEOMETRY



- EXTRA LONG SIZES IN STOCK
- PROFILE MILLING

- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE
- RIGID FLUTE / HEAVY CORE GEOMETRY DESIGNED FOR AGGRESSIVE PROFILE MILLING IN MILD TO ALLOY STEEL AND IRON
- SPECIAL SMOOTH CUTTING EDGES AND FLUTES DESIGNED FOR CHIP FLOW FROM CRITICAL CUTTING ZONES = INCREASED TOOL LIFE AND IMPROVED FINISH

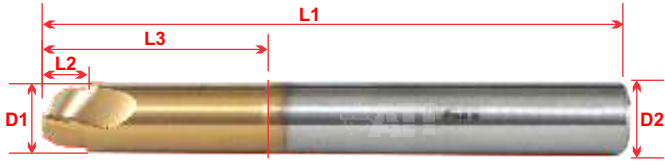
D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
0.4 MM	50 MM	.4 MM	.8 MM	4 MM	2	MHBX0042-50C15	\$33.12
	75 MM	.4 MM	.8 MM	6 MM	2	MHBX0042-75C15	\$46.68
0.8 MM	50 MM	.8 MM	1.6 MM	4 MM	2	MHBX0082-50C15	\$26.21
	75 MM	.8 MM	1.6 MM	6 MM	2	MHBX0082-75C15	\$35.04
1 MM	50 MM	1 MM	2 MM	4 MM	2	MHBX012-50C15	\$26.21
	75 MM	1 MM	2 MM	6 MM	2	MHBX012-75C15	\$35.04
1.5 MM	50 MM	1.5 MM	3 MM	4 MM	2	MHBX0152-50C15	\$26.21
	75 MM	1.5 MM	3 MM	6 MM	2	MHBX0152-75C15	\$35.04
2MM	50 MM	2 MM	4 MM	4 MM	2	MHBX022-50C15	\$26.21
	75 MM	2 MM	4 MM	6 MM	2	MHBX022-75C15	\$32.37
2.5 MM	50 MM	2.5 MM	5 MM	4 MM	2	MHBX0252-50C15	\$26.21
	75 MM	2.5 MM	5 MM	6 MM	2	MHBX0252-75C15	\$35.04
3MM	50 MM	3 MM	6 MM	4 MM	2	MHBX032-50C15	\$26.21
	75 MM	3 MM	6 MM	6 MM	2	MHBX032-75C15	\$35.04
4 MM	50 MM	4 MM	/	4 MM	2	MHBX042-50C15	\$26.21
	75 MM	4 MM	/	6 MM	2	MHBX042-75C15	\$35.04
6MM	63 MM	6 MM	/	6 MM	2	MHBX062-63C15	\$33.84
	75 MM	6 MM	/	6 MM	2	MHBX062-75C15	\$35.04
8 MM	75 MM	8 MM	/	8 MM	2	MHBX082-75C15	\$45.47
	100 MM	8 MM	/	8 MM	2	MHBX082-100C15	\$48.89
10 MM	75 MM	10 MM	/	10 MM	2	MHBX102-75C15	\$55.73
	100 MM	10 MM	/	10 MM	2	MHBX102-100C15	\$60.00
12 MM	75 MM	12 MM	/	12 MM	2	MHBX122-75C15	\$65.78
	100 MM	12 MM	/	12 MM	2	MHBX122-100C15	\$78.88
16 MM	100 MM	16 MM	/	16 MM	2	MHBX162-100C15	\$134.72
20 MM	100 MM	20 MM	/	20 MM	2	MHBX202-100C15	\$196.21

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

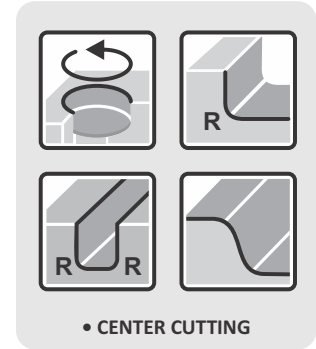
FMC2 SERIES

FEED MILL - 2 FLUTE

NEW SERIES



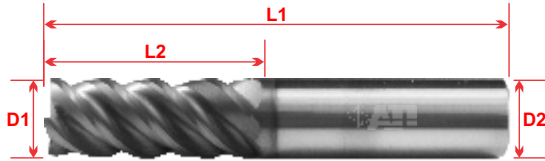
- HIGH FEED LARGE RADIUS END PROFILE = INCREASED CHIP THINNING = HIGHER FEED RATES
= REDUCED MACHINE TIME
- SHALLOW DEPTH OF CUT = REDUCED VIBRATION = STABLE MACHINING = INCREASED TOOL LIFE
- NEW HIGH-PERFORMANCE COATING AND CARBIDE GRADE
= UNBEATABLE PERFORMANCE IN DIE STEELS



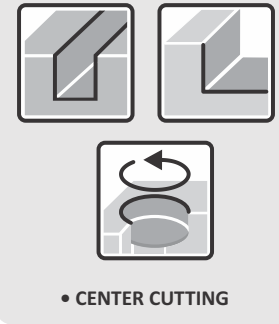
D1	L1	RADIUS	L2	L3	D2	FLUTES	MAX DOC	ATI PART#	PRICE
3/16"	2	.020	.100	.500	.250	2	.010	FMC1872-20C15	\$37.64
	3	.020	.100	1.50	.250	2	.010	FMC1872-30C15	\$39.30
1/4"	3	.025	.125	.800	.250	2	.013	FMC2502-30C15	\$44.04
	3	.025	.125	1.50	.250	2	.013	FMC2502-31C15	\$50.40
3/8"	3	.035	.187	1.25	.375	2	.020	FMC3752-30C15	\$61.33
	4	.035	.187	2.30	.375	2	.020	FMC3752-40C15	\$73.36
1/2"	4	.050	.250	1.50	.500	2	.025	FMC5002-40C15	\$109.21
	4	.050	.250	2.30	.500	2	.025	FMC5002-41C15	\$109.21



TSUNAMI 4 FLUTE FLAT – HIGH VOLUME METAL REMOVAL



- SPECIALLY DESIGNED FOR HIGH VOLUME METAL REMOVAL
- FULL SLOTTING AT 1XD DOC
- HEAVY ENGAGEMENT PROFILE CUTS AT 1.5XD DOC
- EXCELLENT SURFACE FINISH
- DURABLE HEAT AND WEAR RESISTANT COATING SUITED FOR HEAVY ROUGHING APPLICATIONS
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT

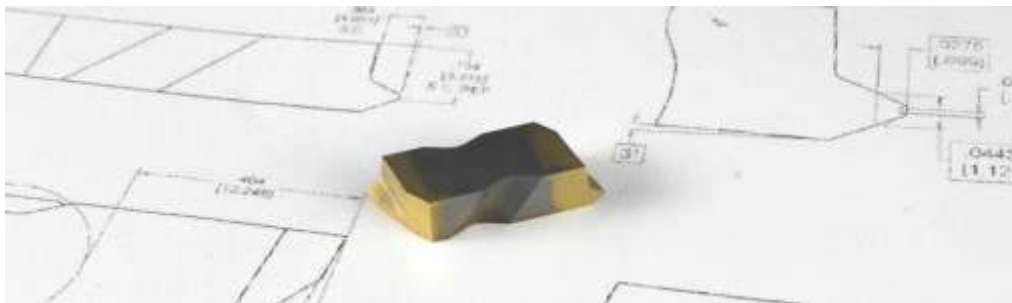


D1	L1	L2	D2	FLUTES	PART #	PRICE
1/16"	2	.125	.125	4	TF0624-20C14	\$14.85
	2	.187	.125	4	TF0624-21C14	\$14.85
3/32"	2	.187	.125	4	TF0934-20C14	\$14.85
	2	.280	.125	4	TF0934-21C14	\$14.85
1/8"	2	.156	.125	4	TF1254-22C14	\$14.85
	2	.250	.125	4	TF1254-20C14	\$14.85
	2	.500	.125	4	TF1254-21C14	\$15.57
	3	.375	.125	4	TF1254-30C14	\$17.31
5/32"	2	.200	.187	4	TF1564-22C14	\$19.84
	2	.450	.187	4	TF1564-20C14	\$19.84
	2	.750	.187	4	TF1564-21C14	\$22.24
3/16"	2	.235	.187	4	TF1874-22C14	\$18.68
	2	.375	.187	4	TF1874-20C14	\$18.68
	2	.625	.187	4	TF1874-21C14	\$19.84
	3	.625	.187	4	TF1874-30C14	\$22.21
1/4"	2	.312	.250	4	TF2504-20C14	\$25.21
	3	.312	.250	4	TF2504-34C14	\$29.49
	3	.500	.250	4	TF2504-30C14	\$29.49
	3	.875	.250	4	TF2504-31C14	\$29.49
	3	1.00	.250	4	TF2504-33C14	\$31.89
	3	1.25	.250	4	TF2504-32C14	\$31.89
5/16"	3	.375	.312	4	TF3124-32C14	\$38.92
	3	.500	.312	4	TF3124-30C14	\$38.92
	3	.875	.312	4	TF3124-31C14	\$40.46
3/8"	3	.450	.375	4	TF3754-33C14	\$48.41
	3	.625	.375	4	TF3754-32C14	\$48.41
	3	.875	.375	4	TF3754-31C14	\$48.41
	3	1.25	.375	4	TF3754-30C14	\$50.14
	4	2.00	.375	4	TF3754-40C14	\$63.65

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

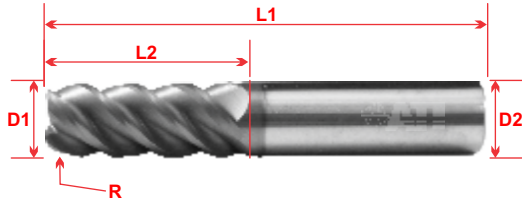
D1	L1	L2	D2	FLUTES	PART #	PRICE
1/2"	3	.600	.500	4	TF5004-32C14	\$70.57
	3	.750	.500	4	TF5004-31C14	\$70.57
	3	1.00	.500	4	TF5004-33C14	\$70.57
	3	1.25	.500	4	TF5004-30C14	\$70.57
	4	.600	.500	4	TF5004-41C14	\$81.11
	4	1.75	.500	4	TF5004-40C14	\$82.85
	5	2.25	.500	4	TF5004-50C14	\$102.04
	6	3.25	.500	4	TF5004-60C14	\$116.42
5/8"	4	.750	.625	4	TF6254-41C14	\$130.58
	4	1.625	.625	4	TF6254-40C14	\$133.01
	5	2.25	.625	4	TF6254-50C14	\$152.64
	6	3.25	.625	4	TF6254-61C14	\$171.75
3/4"	4	1.00	.750	4	TF7504-41C14	\$153.41
	4	1.75	.750	4	TF7504-40C14	\$155.74
	5	2.25	.750	4	TF7504-50C14	\$190.03
	6	3.25	.750	4	TF7504-60C14	\$233.93
1"	4	1.25	1.00	4	TF1004-41C14	\$254.58
	4	1.75	1.00	4	TF1004-40C14	\$256.91
	5	2.625	1.00	4	TF1004-50C14	\$315.83
	6	3.25	1.00	4	TF1004-60C14	\$374.85



ATI CUSTOM insert modifications.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TSUNAMI 4 FLUTE CORNER RADIUS – HIGH VOLUME METAL REMOVAL



- SPECIALLY DESIGNED FOR HIGH VOLUME METAL REMOVAL
- FULL SLOTTING AT 1XD DOC
- HEAVY ENGAGEMENT PROFILE CUTS AT 1.5XD DOC
- EXCELLENT SURFACE FINISH
- DURABLE HEAT AND WEAR RESISTANT COATING SUITED FOR HEAVY ROUGHING APPLICATIONS
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT



- CENTER CUTTING

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/16"	2	.010	.125	.125	4	TR0624-20R010C14	\$16.19
	2	.010	.187	.125	4	TR0624-21R010C14	\$16.19
3/32"	2	.010	.157	.125	4	TR0934-20R010C14	\$16.19
	2	.010	.280	.125	4	TR0934-21R010C14	\$16.19
1/8"	2	.010	.156	.125	4	TR1254-23R010C14	\$16.19
	2	.010	.250	.125	4	TR1254-20R010C14	\$16.19
	2	.015	.156	.125	4	TR1254-21R015C14	\$16.19
	2	.015	.250	.125	4	TR1254-20R015C14	\$16.19
	2	.031	.156	.125	4	TR1254-21R031C14	\$16.18
	2	.031	.250	.125	4	TR1254-20R031C14	\$16.18
	3	.015	.375	.125	4	TR1254-30R015C14	\$17.90
	3	.031	.375	.125	4	TR1254-30R031C14	\$17.90
5/32"	2	.015	.200	.187	4	TR1564-21R015C14	\$23.94
	2	.015	.450	.187	4	TR1564-20R015C14	\$23.94
	3	.015	.450	.187	4	TR1564-30R015C14	\$24.44
	3	.031	.450	.187	4	TR1564-30R031C14	\$24.44
3/16"	2	.010	.235	.187	4	TR1874-21R010C14	\$20.88
	2	.010	.375	.187	4	TR1874-20R010C14	\$20.88
	2	.015	.235	.187	4	TR1874-22R015C14	\$20.88
	2	.015	.375	.187	4	TR1874-20R015C14	\$20.88
	2	.015	.750	.187	4	TR1874-21R015C14	\$23.28
	2	.031	.235	.187	4	TR1874-21R031C14	\$20.88
	2	.031	.375	.187	4	TR1874-20R031C14	\$20.88
	3	.015	.625	.187	4	TR1874-30R015C14	\$24.86
	3	.031	.625	.187	4	TR1874-30R031C14	\$24.86
1/4"	3	.015	.312	.250	4	TR2504-32R015C14	\$31.90
	3	.015	.500	.250	4	TR2504-30R015C14	\$31.90
	3	.015	.875	.250	4	TR2504-31R015C14	\$31.90
	3	.031	.312	.250	4	TR2504-33R031C14	\$31.90

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TR4 SERIES (CONTINUED)

NEW SIZES

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.031	.500	.250	4	TR2504-30R031C14	\$31.90
	3	.031	.875	.250	4	TR2504-31R031C14	\$31.90
	3	.031	1.25	.250	4	TR2504-32R031C14	\$33.24
	3	.062	.312	.250	4	TR2504-32R062C14	\$31.90
	3	.062	.500	.250	4	TR2504-30R062C14	\$31.90
	3	.062	.875	.250	4	TR2504-31R062C14	\$31.90
5/16"	3	.031	.375	.312	4	TR3124-32R031C14	\$41.32
	3	.031	.500	.312	4	TR3124-30R031C14	\$41.32
	3	.031	.875	.312	4	TR3124-31R031C14	\$42.85
3/8"	3	.015	.450	.375	4	TR3754-32R015C14	\$50.81
	3	.015	.875	.375	4	TR3754-30R015C14	\$50.81
	3	.015	1.25	.375	4	TR3754-31R015C14	\$52.53
	3	.031	.450	.375	4	TR3754-32R031C14	\$50.81
	3	.031	.875	.375	4	TR3754-30R031C14	\$50.81
	3	.031	1.25	.375	4	TR3754-31R031C14	\$52.53
	3	.062	.450	.375	4	TR3754-32R062C14	\$50.81
	3	.062	.875	.375	4	TR3754-30R062C14	\$50.81
	3	.062	1.25	.375	4	TR3754-31R062C14	\$52.53
1/2"	3	.015	.600	.500	4	TR5004-31R015C14	\$73.11
	3	.015	1.00	.500	4	TR5004-32R015C14	\$73.11
	3	.015	1.25	.500	4	TR5004-30R015C14	\$73.11
	3	.031	.600	.500	4	TR5004-31R031C14	\$73.11
	3	.031	1.00	.500	4	TR5004-32R031C14	\$73.11
	3	.031	1.25	.500	4	TR5004-30R031C14	\$73.11
	3	.062	.600	.500	4	TR5004-31R062C14	\$73.11
	3	.062	1.00	.500	4	TR5004-32R062C14	\$73.11
	3	.062	1.25	.500	4	TR5004-30R062C14	\$73.11
	3	.125	.600	.500	4	TR5004-31R125C14	\$73.11
	3	.125	1.00	.500	4	TR5004-32R125C14	\$73.11
	3	.125	1.25	.500	4	TR5004-30R125C14	\$73.11
	4	.015	.600	.500	4	TR5004-41R015C14	\$82.71
	4	.015	1.625	.500	4	TR5004-40R015C14	\$85.02
	4	.031	.600	.500	4	TR5004-42R031C14	\$82.71
	4	.031	1.625	.500	4	TR5004-40R031C14	\$85.02
	4	.062	.600	.500	4	TR5004-41R062C14	\$82.71
	4	.062	1.625	.500	4	TR5004-40R062C14	\$85.02
	4	.125	.600	.500	4	TR5004-41R125C14	\$82.71
	4	.125	1.625	.500	4	TR5004-40R125C14	\$85.02
	5	.015	2.25	.500	4	TR5004-50R015C14	\$106.67
	5	.031	2.25	.500	4	TR5004-50R031C14	\$106.67
	6	.031	3.25	.500	4	TR5004-60R031C14	\$118.08

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
5/8"	4	.015	.750	.625	4	TR6254-41R015C14	\$135.93
	4	.015	1.625	.625	4	TR6254-40R015C14	\$138.25
	4	.031	.750	.625	4	TR6254-41R031C14	\$135.93
	4	.031	1.625	.625	4	TR6254-40R031C14	\$138.25
	6	.031	2.25	.625	4	TR6254-60R031C14	\$174.45
3/4"	4	.015	1.00	.750	4	TR7504-41R015C14	\$163.86
	4	.015	1.625	.750	4	TR7504-40R015C14	\$163.86
	4	.031	1.00	.750	4	TR7504-41R031C14	\$163.86
	4	.031	1.625	.750	4	TR7504-40R031C14	\$163.86
	4	.062	1.00	.750	4	TR7504-41R062C14	\$163.86
	4	.062	1.625	.750	4	TR7504-40R062C14	\$163.86
	4	.125	1.00	.750	4	TR7504-41R125C14	\$163.86
	4	.125	1.625	.750	4	TR7504-40R125C14	\$163.86
	5	.031	2.25	.750	4	TR7504-50R031C14	\$200.05
	5	.062	2.25	.750	4	TR7504-50R062C14	\$200.05
	5	.125	2.25	.750	4	TR7504-50R125C14	\$200.05
	6	.031	2.25	.750	4	TR7504-60R031C14	\$223.48
	6	.031	3.25	.750	4	TR7504-61R031C14	\$236.26
	6	.062	3.25	.750	4	TR7504-61R062C14	\$236.26
	6	.125	2.50	.750	4	TR7504-60R125C14	\$236.26
	7	.031	4.25	.750	4	TR7504-72R031C14	\$280.86
7/8"	4	.031	1.625	.875	4	TR8754-40R031C14	\$217.74
	6	.031	3.25	.875	4	TR8754-60R031C14	\$327.50
1"	4	.031	1.625	1.00	4	TR1004-40R031C14	\$268.54
	4	.062	1.625	1.00	4	TR1004-40R062C14	\$268.54
	4	.125	1.625	1.00	4	TR1004-40R125C14	\$268.54
	5	.031	2.625	1.00	4	TR1004-50R031C14	\$323.75
	5	.062	2.625	1.00	4	TR1004-50R062C14	\$323.75
	5	.125	2.625	1.00	4	TR1004-50R125C14	\$323.75
	5	.250	2.625	1.00	4	TR1004-50R250C14	\$323.75
	6	.031	3.25	1.00	4	TR1004-60R031C14	\$386.46
	7	.031	2.25	1.00	4	TR1004-70R031C14	\$417.07
	7	.031	4.25	1.00	4	TR1004-71R031C14	\$440.87

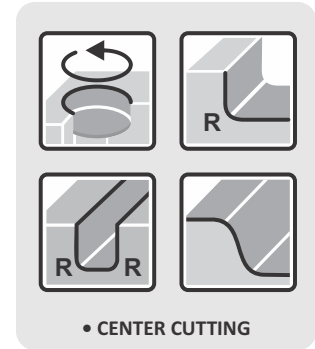
All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TR4CB SERIES

TSUNAMI 4 FLUTE CORNER RADIUS with CHIP BREAKERS HIGH VOLUME METAL REMOVAL



- CHIP BREAKERS FOR EFFICIENT CHIP MANAGEMENT
- CHIP BREAKERS DECREASE TOOL PRESSURE AND DEFLECTION
- CHIP BREAKERS ARE STAGGERED SO THE FOLLOWING FLUTE CLEANS UP WITNESS LINES
- SPECIALLY DESIGNED FOR HIGH VOLUME METAL REMOVAL
- FULL SLOTTING AT 1XD DOC
- HEAVY ENGAGEMENT PROFILE CUTS AT 1.5XD DOC
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT
- DURABLE HEAT AND WEAR RESISTANT COATING SUITED FOR HEAVY ROUGHING APPLICATIONS



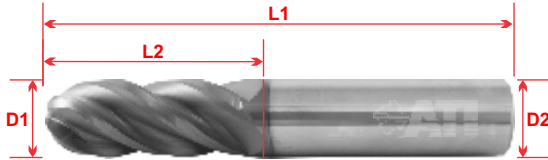
D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.015	.800	.250	4	TR2504-30R015C14CB	\$41.50
	3	.015	1.25	.250	4	TR2504-31R015C14CB	\$43.44
5/16"	3	.015	.875	.3125	4	TR3124-30R015C14CB	\$50.92
	3	.015	1.25	.3125	4	TR3124-31R015C14CB	\$52.46
3/8"	3	.015	1.00	.375	4	TR3754-30R015C14CB	\$59.06
	3	.015	1.25	.375	4	TR3754-31R015C14CB	\$60.79
	4	.015	1.50	.375	4	TR3754-40R015C14CB	\$64.84
1/2"	3	.031	1.25	.500	4	TR5004-30R031C14CB	\$84.72
	4	.031	1.625	.500	4	TR5004-40R031C14CB	\$97.79
	5	.031	2.50	.500	4	TR5004-50R031C14CB	\$126.82
	6	.031	3.25	.500	4	TR5004-60R031C14CB	\$133.17
5/8"	4	.031	1.625	.625	4	TR6254-40R031C14CB	\$151.03
	5	.031	2.50	.625	4	TR6254-50R031C14CB	\$174.44
	6	.031	3.25	.625	4	TR6254-60R031C14CB	\$201.95
3/4"	4	.031	1.625	.750	4	TR7504-40R031C14CB	\$178.96
	5	.031	2.50	.750	4	TR7504-50R031C14CB	\$217.47
	6	.031	3.25	.750	4	TR7504-61R031C14CB	\$258.31
	6	.062	2.25	.750	4	TR7504-60R062C14CB	\$240.90
	7	.031	4.25	.750	4	TR7504-70R031C14CB	\$299.84
1"	4	.031	1.625	1.00	4	TR1004-40R031C14CB	\$285.96
	5	.031	2.625	1.00	4	TR1004-50R031C14CB	\$344.65
	6	.031	3.25	1.00	4	TR1004-60R031C14CB	\$410.84
	7	.031	4.25	1.00	4	TR1004-70R031C14CB	\$440.21

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

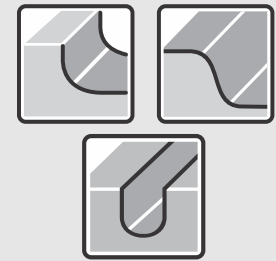
NEW SIZES

TB4 SERIES

TSUNAMI 4 FLUTE BALL NOSE – HIGH VOLUME METAL REMOVAL

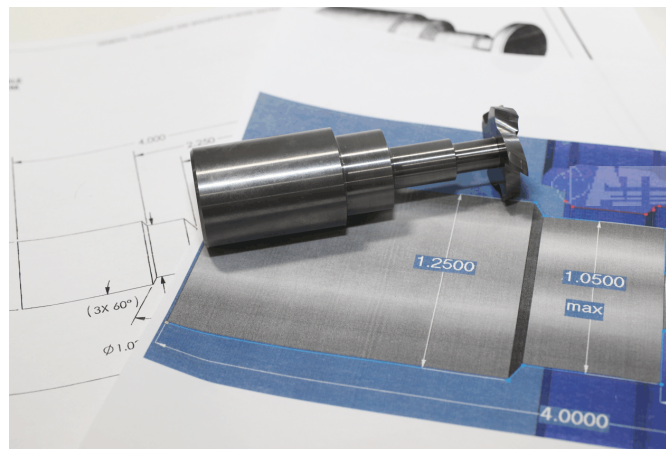


- SPECIALLY DESIGNED FOR HIGH VOLUME METAL REMOVAL
- FULL SLOTTING AT 1XD DOC
- HEAVY ENGAGEMENT PROFILE CUTS AT 1.5XD DOC
- DURABLE HEAT AND WEAR RESISTANT COATING SUITED FOR HEAVY ROUGHING APPLICATIONS
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT



- CENTER CUTTING

DIAMETER	OAL	LOC	SHANK	FLUTES	PART #	PRICE
1/16"	2	.125	.125	4	TB0624-20C14	\$17.50
3/32"	2	.187	.125	4	TB0934-20C14	\$16.20
1/8"	2	.375	.125	4	TB1254-20C14	\$16.20
3/16"	2	.400	.187	4	TB1874-20C14	\$20.29
1/4"	2	.500	.250	4	TB2504-20C14	\$27.15
	3	.500	.250	4	TB2504-30C14	\$29.53
	3	.750	.250	4	TB2504-31C14	\$30.78
5/16"	2.50	.625	.312	4	TB3124-25C14	\$37.13
3/8"	3	.500	.375	4	TB3754-30C14	\$44.82
1/2"	3	1.250	.500	4	TB5004-30C14	\$67.70
	4	1.625	.500	4	TB5004-40C14	\$78.72
5/8"	4	1.625	.625	4	TB6254-40C14	\$128.01
3/4"	4	1.625	.750	4	TB7504-40C14	\$150.99
1"	4	1.625	1.00	4	TB1004-40C14	\$247.94
	5	2.625	1.00	4	TB1004-50C14	\$291.55



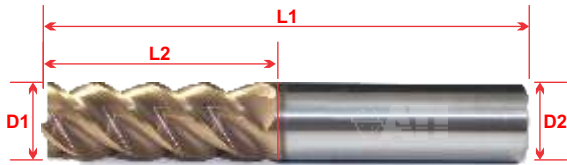
SPECIAL T-SLOT TOOLS custom designed by ATI for maximum rigidity.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

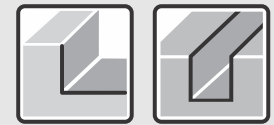
TSF4 SERIES

NEW SIZES

TSUNAMI SS 4 FLUTE FLAT BOTTOM – HIGH VOLUME STAINLESS STEEL MILLING



- DESIGNED FOR SLOTTING AND AGGRESSIVE PERIPHERAL MILLING IN STAINLESS STEEL
- EXCEPTIONAL RESULTS IN NITRONIC STAINLESS APPLICATIONS
- EXOTIC MATERIALS
- SPECIAL SURFACE TREATMENT = SMOOTH CHIP EVACUATION
- NEW, HIGH HARD, WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- EXCELLENT SURFACE FINISH
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT



• CENTER CUTTING

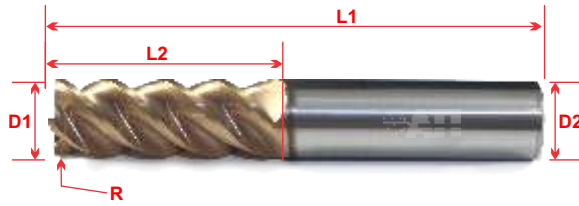
D1	L1	L2	D2	FLUTES	PART #	PRICE
1/32"	2	.062	.125	4	TSF0314-20C15	\$20.53
	2	.093	.125	4	TSF0314-21C15	\$20.53
1/16"	2	.125	.125	4	TSF0624-20C15	\$20.53
	2	.187	.125	4	TSF0624-21C15	\$20.53
3/32"	2	.187	.125	4	TSF0934-20C15	\$20.53
	2	.280	.125	4	TSF0934-21C15	\$20.53
1/8"	2	.250	.125	4	TSF1254-20C15	\$18.55
	2	.375	.125	4	TSF1254-21C15	\$18.55
3/16"	2	.375	.187	4	TSF1874-20C15	\$20.71
	2	.560	.187	4	TSF1874-21C15	\$20.71
1/4"	3	.312	.250	4	TSF2504-32C15	\$33.81
	3	.500	.250	4	TSF2504-30C15	\$33.81
	3	1.00	.250	4	TSF2504-31C15	\$35.13
	3	1.25	.250	4	TSF2504-33C15	\$35.13
5/16"	2.5	.500	.312	4	TSF3124-25C15	\$44.12
	2.5	1.00	.312	4	TSF3124-26C15	\$44.12
3/8"	3	.500	.375	4	TSF3754-32C15	\$52.90
	3	.750	.375	4	TSF3754-30C15	\$52.90
	3	1.25	.375	4	TSF3754-31C15	\$54.80
1/2"	3	.625	.500	4	TSF5004-31C15	\$75.29
	3	1.25	.500	4	TSF5004-30C15	\$76.57
	4	1.75	.500	4	TSF5004-40C15	\$90.93
5/8"	4	.800	.625	4	TSF6254-41C15	\$131.99
	4	1.50	.625	4	TSF6254-40C15	\$134.54
	5	2.25	.625	4	TSF6254-50C15	\$157.29
3/4"	4	1.00	.750	4	TSF7504-41C15	\$163.37
	4	1.75	.750	4	TSF7504-40C15	\$165.80
	5	2.50	.750	4	TSF7504-50C15	\$203.72
1"	4	1.25	1.00	4	TSF1004-40C15	\$312.59
	5	2.00	1.00	4	TSF1004-50C15	\$344.84
	6	2.75	1.00	4	TSF1004-60C15	\$377.14

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

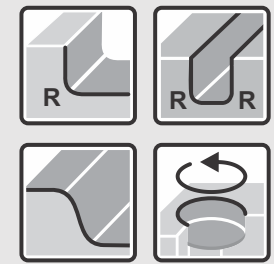
NEW SIZES

TSR4 SERIES

TSUNAMI SS 4 FLUTE CORNER RADIUS – HIGH VOLUME STAINLESS STEEL MILLING



- DESIGNED FOR SLOTTING AND AGGRESSIVE PERIPHERAL MILLING IN STAINLESS STEEL
- EXCEPTIONAL RESULTS IN NITRONIC STAINLESS APPLICATIONS
- EXOTIC MATERIALS
- SPECIAL SURFACE TREATMENT = SMOOTH CHIP EVACUATION
- NEW, HIGH HARD, WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- EXCELLENT SURFACE FINISH
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT



• CENTER CUTTING

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/32"	2	.005	.062	.125	4	TSR0314-20R005C15	\$22.77
	2	.005	.093	.125	4	TSR0314-21R005C15	\$22.77
1/16"	2	.005	.125	.125	4	TSR0624-20R005C15	\$21.32
	2	.005	.187	.125	4	TSR0624-21R005C15	\$21.32
	2	.010	.125	.125	4	TSR0624-20R010C15	\$21.32
	2	.010	.187	.125	4	TSR0624-21R010C15	\$21.32
3/32"	2	.010	.250	.125	4	TSR0934-20R010C15	\$20.92
	2	.010	.375	.125	4	TSR0934-21R010C15	\$20.92
	2	.015	.250	.125	4	TSR0934-20R015C15	\$20.92
	2	.015	.375	.125	4	TSR0934-21R015C15	\$20.92
1/8"	2	.010	.250	.125	4	TSR1254-20R010C15	\$20.13
	2	.010	.375	.125	4	TSR1254-21R010C15	\$20.13
	2	.015	.250	.125	4	TSR1254-20R015C15	\$20.13
	2	.015	.375	.125	4	TSR1254-21R015C15	\$20.13
3/16"	2	.010	.375	.187	4	TSR1874-20R010C15	\$23.35
	2	.010	.562	.187	4	TSR1874-21R010C15	\$23.35
	2	.015	.375	.187	4	TSR1874-20R015C15	\$23.35
	2	.015	.562	.187	4	TSR1874-21R015C15	\$23.35
	2	.031	.375	.187	4	TSR1874-20R031C15	\$23.35
	2	.031	.562	.187	4	TSR1874-21R031C15	\$23.35
1/4"	3	.031	.300	.250	4	TSR2504-32R031C15	\$36.45
	3	.031	.500	.250	4	TSR2504-30R031C15	\$36.45
	3	.031	1.00	.250	4	TSR2504-31R031C15	\$37.61
	3	.062	.300	.250	4	TSR2504-32R062C15	\$36.45
	3	.062	.500	.250	4	TSR2504-30R062C15	\$36.45
	3	.062	1.00	.250	4	TSR2504-31R062C15	\$37.61
5/16"	2.5	.015	.500	.312	4	TSR3124-25R015C15	\$47.50
	2.5	.015	1.00	.312	4	TSR3124-26R015C15	\$48.55
	2.5	.031	.500	.312	4	TSR3124-25R031C15	\$47.50
	2.5	.031	1.00	.312	4	TSR3124-26R031C15	\$48.55

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TSR4 SERIES (CONTINUED)

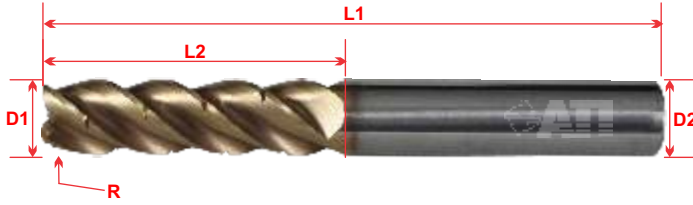
NEW SIZES

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
3/8"	3	.031	.500	.375	4	TSR3754-32R031C15	\$56.28
	3	.031	.750	.375	4	TSR3754-30R031C15	\$56.28
	3	.031	1.25	.375	4	TSR3754-31R031C15	\$58.18
	3	.062	.500	.375	4	TSR3754-32R062C15	\$56.28
	3	.062	.750	.375	4	TSR3754-30R062C15	\$56.28
	3	.062	1.25	.375	4	TSR3754-31R062C15	\$58.18
1/2"	3	.031	.625	.500	4	TSR5004-31R031C15	\$79.85
	3	.031	1.25	.500	4	TSR5004-30R031C15	\$79.85
	3	.062	.625	.500	4	TSR5004-31R062C15	\$79.85
	3	.062	1.25	.500	4	TSR5004-30R062C15	\$79.85
	3	.125	.625	.500	4	TSR5004-31R125C15	\$79.85
	3	.125	1.25	.500	4	TSR5004-30R125C15	\$79.85
	4	.031	1.125	.500	4	TSR5004-41R031C15	\$93.84
	4	.031	1.75	.500	4	TSR5004-40R031C15	\$93.84
	4	.062	1.125	.500	4	TSR5004-41R062C15	\$93.84
	4	.062	1.75	.500	4	TSR5004-40R062C15	\$93.84
	4	.125	1.125	.500	4	TSR5004-41R125C15	\$93.84
	4	.125	1.75	.500	4	TSR5004-40R125C15	\$93.84
5/8"	4	.031	.800	.625	4	TSR6254-41R031C15	\$144.53
	4	.031	1.50	.625	4	TSR6254-40R031C15	\$144.53
	4	.062	.800	.625	4	TSR6254-41R062C15	\$144.53
	4	.062	1.50	.625	4	TSR6254-40R062C15	\$144.53
	5	.031	2.25	.625	4	TSR6254-50R031C15	\$164.05
	5	.062	2.25	.625	4	TSR6254-50R062C15	\$164.05
3/4"	4	.031	1.00	.750	4	TSR7504-41R031C15	\$170.88
	4	.031	1.75	.750	4	TSR7504-40R031C15	\$170.88
	4	.062	1.00	.750	4	TSR7504-41R062C15	\$170.88
	4	.062	1.75	.750	4	TSR7504-40R062C15	\$170.88
	4	.125	1.75	.750	4	TSR7504-40R062C15	\$170.88
	5	.031	2.50	.750	4	TSR7504-50R031C15	\$205.48
	5	.062	2.50	.750	4	TSR7504-50R062C15	\$205.48
	5	.125	2.50	.750	4	TSR7504-50R125C15	\$205.48
1"	4	.031	1.25	1.00	4	TSR1004-40R031C15	\$285.25
	4	.062	1.25	1.00	4	TSR1004-40R062C15	\$285.25
	4	.125	1.50	1.00	4	TSR1004-40R125C15	\$285.25
	5	.031	2.00	1.00	4	TSR1004-50R031C15	\$359.15
	5	.062	2.00	1.00	4	TSR1004-50R062C15	\$359.15
	5	.125	2.00	1.00	4	TSR1004-50R125C15	\$359.15
	6	.031	2.75	1.00	4	TSR1004-60R031C15	\$398.69
	6	.062	2.75	1.00	4	TSR1004-60R062C15	\$398.69

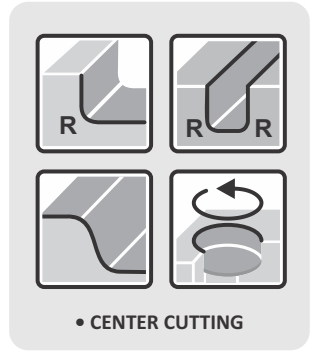
All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TSR4CB SERIES

TSUNAMI STAINLESS STEEL - 4 FLUTE CORNER RADIUS WITH CHIP BREAKER



- DESIGNED FOR SLOTTING AND AGGRESSIVE PERIPHERAL MILLING IN STAINLESS STEEL
- EXCEPTIONAL RESULTS IN NITRONIC STAINLESS APPLICATIONS
- EXOTIC MATERIALS
- SPECIAL SURFACE TREATMENT = SMOOTH CHIP EVACUATION
- NEW, HIGH HARD, WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- EXCELLENT SURFACE FINISH
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT

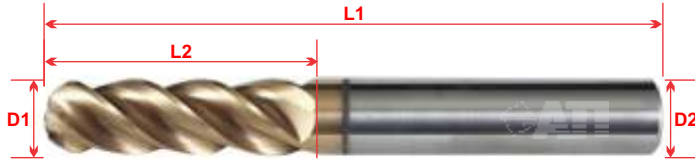


D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.015	.800	.250	4	TSR2504-30R015C15CB	\$40.92
	3	.015	1.25	.250	4	TSR2504-31R015C15CB	\$42.80
5/16"	2.5	.015	.875	.3125	4	TSR3124-25R015C15CB	\$49.30
	3.5	.015	1.25	.3125	4	TSR3124-35R015C15CB	\$50.79
3/8"	3	.015	.750	.375	4	TSR3754-30R015C15CB	\$60.68
	3	.015	1.25	.375	4	TSR3754-31R015C15CB	\$62.35
	4	.015	1.50	.375	4	TSR3754-40R015C15CB	\$72.79
1/2"	3	.031	1.25	.500	4	TSR5004-30R031C15CB	\$87.36
	4	.031	1.750	.500	4	TSR5004-40R031C15CB	\$93.89
	5	.031	2.50	.500	4	TSR5004-50R031C15CB	\$130.55
	6	.031	3.25	.500	4	TSR5004-60R031C15CB	\$139.15
5/8"	4	.031	1.750	.625	4	TSR6254-40R031C15CB	\$157.21
	5	.031	2.50	.625	4	TSR6254-50R031C15CB	\$196.21
	6	.031	3.25	.625	4	TSR6254-60R031C15CB	\$215.17
3/4"	4	.031	1.750	.750	4	TSR7504-40R031C15CB	\$187.15
	5	.031	2.50	.750	4	TSR7504-50R031C15CB	\$225.11
	6	.031	3.25	.750	4	TSR7504-61R031C15CB	\$269.57
1"	4	.031	1.750	1.00	4	TSR1004-40R031C15CB	\$292.86
	5	.031	2.625	1.00	4	TSR1004-50R031C15CB	\$361.98
	6	.031	3.25	1.00	4	TSR1004-60R031C15CB	\$426.87

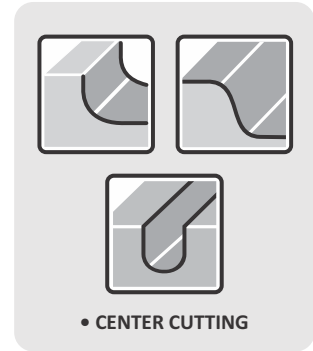
All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TSB4 SERIES

TSUNAMI SS 4 FLUTE BALL NOSE – HIGH VOLUME METAL REMOVAL



- DESIGNED FOR SLOTTING AND AGGRESSIVE PERIPHERAL MILLING IN STAINLESS STEEL
- EXCEPTIONAL RESULTS IN NITRONIC STAINLESS APPLICATIONS
- EXOTIC MATERIALS
- SPECIAL SURFACE TREATMENT = SMOOTH CHIP EVACUATION
- NEW, HIGH HARD, WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- EXCELLENT SURFACE FINISH
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT



D1	L1	L2	SHANK	FLUTES	PART #	PRICE
1/8"	2	.375	.125	4	TSB1254-20C15	\$19.05
3/16"	2	.562	.187	4	TSB1874-20C15	\$22.58
1/4"	3	.500	.250	4	TSB2504-30C15	\$34.97
	3	.875	.250	4	TSB2504-31C15	\$36.45
5/16"	2.5	.500	.312	4	TSB3124-25C15	\$45.65
	2.5	.875	.312	4	TSB3124-26C15	\$45.65
3/8"	3	.500	.375	4	TSB3754-30C15	\$53.64
	3	.875	.375	4	TSB3754-31C15	\$53.64
1/2"	3	1.00	.500	4	TSB5004-30C15	\$79.84
	4	1.625	.500	4	TSB5004-40C15	\$93.80
5/8"	4	1.25	.625	4	TSB6254-40C15	\$138.34
3/4"	4	1.625	.750	4	TSB7504-40C15	\$162.85
1"	4	1.625	1.00	4	TSB1004-40C15	\$261.30



Rollomatic: Lollipop tools down to .030 diameter,
Spade drill down to .030 diameter.

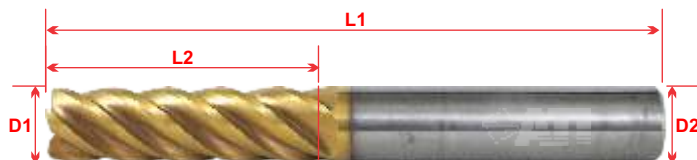
All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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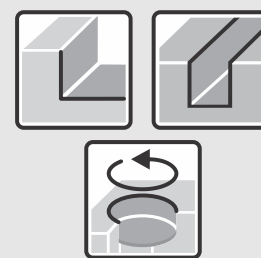
NEW SERIES

TSF5 SERIES

TSUNAMI STAINLESS 5 FLUTE FLAT – HIGH VOLUME METAL REMOVAL



- DESIGNED FOR SLOTTING AND AGGRESSIVE PERIPHERAL MILLING IN STAINLESS STEEL
- EXCEPTIONAL RESULTS IN NITRONIC STAINLESS APPLICATIONS
- EXOTIC MATERIALS
- SPECIAL SURFACE TREATMENT = SMOOTH CHIP EVACUATION
- NEW, HIGH HARD, WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- EXCELLENT SURFACE FINISH
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT



- CENTER CUTTING

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.500	.250	5	TSF2505-30C15	\$37.56
	3	1.00	.250	5	TSF2505-31C15	\$39.03
	3	1.25	.250	5	TSF2505-33C15	\$39.03
5/16"	3	.500	.312	5	TSF3125-30C15	\$51.39
	3	1.00	.312	5	TSF3125-31C15	\$51.39
3/8"	3	.500	.375	5	TSF3755-32C15	\$58.78
	3	.750	.375	5	TSF3755-30C15	\$58.78
	3	1.25	.375	5	TSF3755-31C15	\$60.89
1/2"	3	.625	.500	5	TSF5005-31C15	\$83.66
	3	1.25	.500	5	TSF5005-30C15	\$85.08
	4	1.75	.500	5	TSF5005-40C15	\$101.04
5/8"	4	1.50	.625	5	TSF6255-40C15	\$149.49
3/4"	4	1.75	.750	5	TSF7505-40C15	\$184.23
	5	2.50	.750	5	TSF7505-50C15	\$226.36

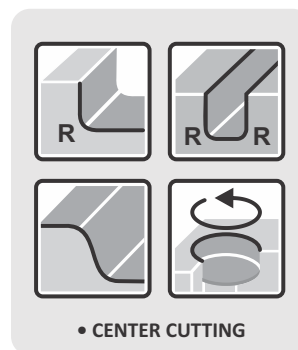
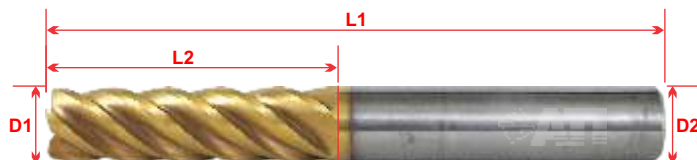
All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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TSR5 SERIES

NEW SERIES

TSUNAMI STAINLESS 5 FLUTE CORNER RADIUS – HIGH VOLUME METAL REMOVAL



- DESIGNED FOR SLOTTING AND AGGRESSIVE PERIPHERAL MILLING IN STAINLESS STEEL
- EXCEPTIONAL RESULTS IN NITRONIC STAINLESS APPLICATIONS
- EXOTIC MATERIALS
- WORKS EXCELLENT IN STEEL - DIE STEEL
- SPECIAL SURFACE TREATMENT = SMOOTH CHIP EVACUATION
- NEW, HIGH HARD, WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- EXCELLENT SURFACE FINISH
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT

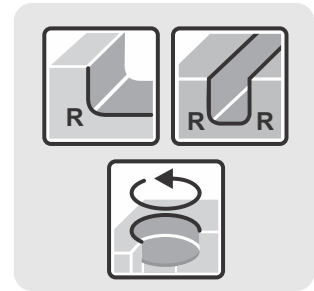
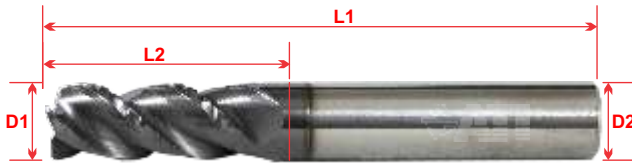
D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.015	.500	.250	5	TSR2505-30R015C15	\$40.50
	3	.015	1.00	.250	5	TSR2505-31R015C15	\$41.79
	3	.031	.500	.250	5	TSR2505-30R031C15	\$40.50
	3	.031	1.00	.250	5	TSR2505-31R031C15	\$41.79
	3	.062	.500	.250	5	TSR2505-30R062C15	\$40.50
	3	.062	1.00	.250	5	TSR2505-31R062C15	\$41.79
5/16"	3	.015	1.00	.312	5	TSR3125-30R015C15	\$56.32
	3	.031	1.00	.312	5	TSR3125-30R031C15	\$56.32
3/8"	3	.015	.750	.375	5	TSR3755-30R015C15	\$62.53
	3	.015	1.25	.375	5	TSR3755-31R015C15	\$64.65
	3	.031	.750	.375	5	TSR3755-30R031C15	\$62.53
	3	.031	1.25	.375	5	TSR3755-31R031C15	\$64.65
	3	.062	.750	.375	5	TSR3755-30R062C15	\$62.53
	3	.062	1.25	.375	5	TSR3755-31R062C15	\$64.65
1/2"	3	.015	1.25	.500	5	TSR5005-30R015C15	\$88.72
	3	.031	1.25	.500	5	TSR5005-30R031C15	\$88.72
	3	.062	1.25	.500	5	TSR5005-30R062C15	\$88.72
	3	.125	1.25	.500	5	TSR5005-30R125C15	\$88.72
	4	.015	1.125	.500	5	TSR5005-41R015C15	\$104.27
	4	.015	1.75	.500	5	TSR5005-40R015C15	\$104.27
	4	.031	1.125	.500	5	TSR5005-41R031C15	\$104.27
	4	.031	1.75	.500	5	TSR5005-40R031C15	\$104.27
	4	.062	1.125	.500	5	TSR5005-41R062C15	\$104.27
	4	.062	1.75	.500	5	TSR5005-40R062C15	\$104.27
	4	.125	1.125	.500	5	TSR5005-41R125C15	\$104.27
	4	.125	1.75	.500	5	TSR5005-40R125C15	\$104.27
5/8"	4	.031	1.50	.625	5	TSR6255-40R031C15	\$160.59
	4	.062	1.50	.625	5	TSR6255-40R062C15	\$160.59
	5	.031	2.25	.625	5	TSR6255-50R031C15	\$182.28
	5	.062	2.25	.625	5	TSR6255-50R062C15	\$182.28
3/4"	4	.031	1.75	.750	5	TSR7505-40R031C15	\$189.87
	4	.062	1.75	.750	5	TSR7505-40R062C15	\$189.87
	4	.125	1.75	.750	5	TSR7505-40R125C15	\$189.87
	5	.031	2.50	.750	5	TSR7505-50R031C15	\$228.31
	5	.062	2.50	.750	5	TSR7505-50R062C15	\$228.31
	5	.125	2.50	.750	5	TSR7505-50R125C15	\$228.31

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

NEW SERIES

RTAR3 SERIES

TSUNAMI 3 FLUTE - NON-FERROUS ROUGHER EXTREME HIGH VOLUME MATERIAL REMOVAL



- NON-FERROUS ROUGHER DESIGN LEADS THE INDUSTRY IN NON-FERROUS MATERIAL REMOVAL RATES AND TOOL LIFE
- EXTREMELY FREE CUTTING = INCREASED FEED RATES
- DIAMOND LIKE COATING = EXTREME WEAR RESISTANCE = ELIMINATES CHIP WELDING
- ROUGHER GEOMETRY = EXCELLENT CHIP MANAGEMENT = LOW TOOL PRESSURE
- EXCELLENT FOR INCREASING MMR ON LOW HORSEPOWER MACHINES

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.031	1.30	.250	3	RTAR2503-30R031C09	\$43.05
3/8"	3	.031	1.30	.375	3	RTAR3753-30R031C09	\$60.72
1/2"	3.5	.031	1.30	.500	3	RTAR5003-35R031C09	\$101.49
	5	.031	2.30	.500	3	RTAR5003-50R031C09	\$120.51
5/8"	4	.031	1.625	.625	3	RTAR6253-40R031C09	\$158.14
	5	.031	2.30	.625	3	RTAR6253-50R031C09	\$182.86
3/4"	4	.031	1.625	.750	3	RTAR7503-40R031C09	\$190.68
	5	.031	2.625	.750	3	RTAR7503-50R031C09	\$221.10
1"	4	.031	1.625	1.00	3	RTAR1003-40R031C09	\$285.01
	5	.031	2.625	1.00	3	RTAR1003-50R031C09	\$346.67



TRU TECH - Automated ultra precision profile grinding up to 3" diameter - sub micron accuracy of $\pm .00005"$

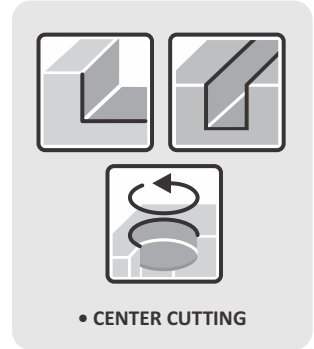
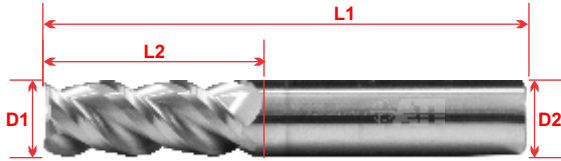
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TA3 SERIES

NEW SIZES

TSUNAMI 3 FLUTE FLAT BOTTOM - NON-FERROUS HIGH VOLUME MATERIAL REMOVAL



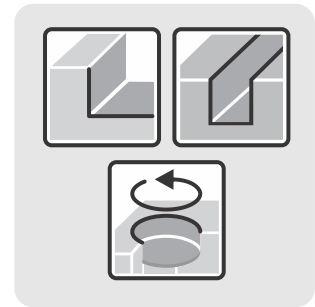
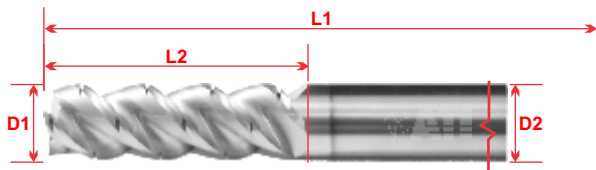
- SPECIFICALLY DESIGNED FOR NON-FERROUS HIGH VOLUME MILLING
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP FOR SMOOTH ENGAGEMENT
- NEW COATING ELIMINATES NON-FERROUS CHIP WELDING
- EXCELLENT SURFACE FINISH

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/16"	2	.125	.125	3	TA0623-20C11	\$15.58
	2	.187	.125	3	TA0623-21C11	\$15.58
3/32"	2	.187	.125	3	TA0933-20C11	\$15.58
	2	.280	.125	3	TA0933-21C11	\$15.58
1/8"	2	.250	.125	3	TA1253-20C11	\$15.58
	2	.525	.125	3	TA1253-21C11	\$15.58
	3	.525	.125	3	TA1253-30C11	\$17.57
	3	1.125	.125	3	TA1253-31C11	\$19.87
3/16"	2	.312	.1875	3	TA1873-20C11	\$18.75
	3	.750	.1875	3	TA1873-30C11	\$23.43
1/4"	2	.550	.250	3	TA2503-20C11	\$28.11
	3	.800	.250	3	TA2503-31C11	\$30.48
	3	1.125	.250	3	TA2503-30C11	\$31.77
	4	1.375	.250	3	TA2503-40C11	\$35.95
5/16"	3	.500	.3125	3	TA3123-31C11	\$40.34
	3	1.125	.3125	3	TA3123-30C11	\$40.34
3/8"	3	.625	.375	3	TA3753-31C11	\$44.85
	3	1.25	.375	3	TA3753-30C11	\$44.85
	4	2.125	.375	3	TA3753-40C11	\$52.16
7/16"	3	.625	.437	3	TA4373-30C11	\$61.60
	3	1.25	.437	3	TA4373-30C11	\$61.60
	4.75	2.25	.437	3	TA4373-47C11	\$85.50
1/2"	3	.750	.500	3	TA5003-31C11	\$69.09
	3	1.25	.500	3	TA5003-30C11	\$69.09
	4	1.625	.500	3	TA5003-40C11	\$81.82
	5	2.25	.500	3	TA5003-50C11	\$92.95
5/8"	4	1.00	.625	3	TA6253-41C11	\$123.73
	4	1.625	.625	3	TA6253-40C11	\$123.73
	6	3.25	.625	3	TA6253-60C11	\$166.54
3/4"	4	1.125	.750	3	TA7503-41C11	\$152.07
	4	1.625	.750	3	TA7503-40C11	\$152.07
	5	2.25	.750	3	TA7503-50C11	\$177.91
	6	3.50	.750	3	TA7503-60C11	\$215.65
1"	4	1.625	1.00	3	TA1003-40C11	\$246.18
	5	2.625	1.00	3	TA1003-50C11	\$291.50
	6	3.50	1.00	3	TA1003-60C11	\$345.82

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TA3CB SERIES

TSUNAMI 3 FLUTE FLAT BOTTOM WITH CHIP BREAKERS NON-FERROUS HIGH VOLUME MATERIAL REMOVAL



- CHIP BREAKERS FOR EFFICIENT CHIP MANAGEMENT
- CHIP BREAKERS DECREASE TOOL PRESSURE AND DEFLECTION
- CHIP BREAKERS ARE STAGGERED SO THE FOLLOWING FLUTE CLEANS UP WITNESS LINES
- SPECIFICALLY DESIGNED FOR NON-FERROUS HIGH VOLUME MILLING
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP FOR SMOOTH ENGAGEMENT
- NEW COATING ELIMINATES NON-FERROUS CHIP WELDING

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/4"	3	1.30	.250	3	TA2503-30C11CB	\$40.97
	4	1.625	.250	3	TA2503-40C11CB	\$47.20
3/8"	3	1.30	.375	3	TA3753-30C11CB	\$54.34
	5	2.25	.375	3	TA3753-50C11CB	\$74.56
1/2"	3	1.30	.500	3	TA5003-30C11CB	\$80.21
	5	2.30	.500	3	TA5003-50C11CB	\$103.57
	6	3.25	.500	3	TA5003-61C11CB	\$124.20
5/8"	4	1.625	.625	3	TA6253-40C11CB	\$141.50
	5	2.30	.625	3	TA6253-50C11CB	\$150.93
	6	3.25	.625	3	TA6253-61C11CB	\$181.00
3/4"	4	1.625	.750	3	TA7503-40C11CB	\$182.20
	5	2.625	.750	3	TA7503-50C11CB	\$194.60
	6	3.50	.750	3	TA7503-61C11CB	\$236.79
1"	4	1.625	1.00	3	TA1003-40C11CB	\$250.33
	5	2.625	1.00	3	TA1003-50C11CB	\$311.53
	6	3.50	1.00	3	TA1003-61C11CB	\$369.19



Issues with chip control and/or tool deflection?
TSUNAMI with chip breakers are an excellent solution.

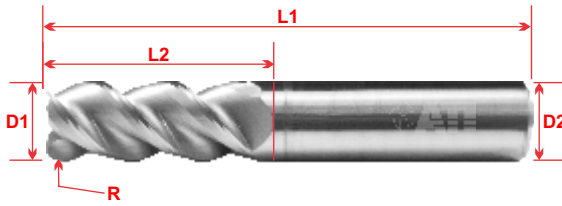
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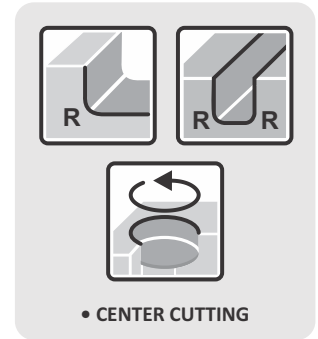
TAR3 SERIES

NEW SIZES

TSUNAMI 3 FLUTE CORNER RADIUS NON-FERROUS HIGH VOLUME MATERIAL REMOVAL



- SPECIFICALLY DESIGNED FOR NON-FERROUS HIGH VOLUME MILLING
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP FOR SMOOTH ENGAGEMENT
- NEW COATING ELIMINATES NON-FERROUS CHIP WELDING
- EXCELLENT SURFACE FINISH



D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/16"	2	.010	.125	.125	3	TAR0623-20R010C11	\$16.19
	2	.010	.187	.125	3	TAR0623-21R010C11	\$18.08
3/32"	2	.015	.187	.125	3	TAR0933-20R015C11	\$16.19
	2	.015	.280	.125	3	TAR0933-21R015C11	\$18.08
1/8"	2	.015	.250	.125	3	TAR1253-20R015C11	\$16.19
	2	.031	.250	.125	3	TAR1253-20R031C11	\$16.19
	3	.015	.500	.125	3	TAR1253-30R015C11	\$18.08
	3	.031	.500	.125	3	TAR1253-30R031C11	\$18.08
5/32"	3	.015	.450	.1875	3	TAR1563-30R015C11	\$25.10
3/16"	2	.015	.312	.1875	3	TAR1873-20R015C11	\$20.64
	2	.031	.312	.1875	3	TAR1873-20R031C11	\$20.64
	3	.015	.500	.1875	3	TAR1873-30R015C11	\$25.10
	3	.031	.500	.1875	3	TAR1873-30R031C11	\$25.10
1/4"	3	.015	.550	.250	3	TAR2503-32R015C11	\$31.93
	3	.015	.875	.250	3	TAR2503-31R015C11	\$31.93
	3	.015	1.125	.250	3	TAR2503-30R015C11	\$31.93
	3	.031	.550	.250	3	TAR2503-32R031C11	\$31.93
	3	.031	.875	.250	3	TAR2503-31R031C11	\$31.93
	3	.031	1.125	.250	3	TAR2503-30R031C11	\$31.93
	3	.062	.550	.250	3	TAR2503-32R062C11	\$31.93
	3	.062	.750	.250	3	TAR2503-31R062C11	\$31.93
	3	.062	1.125	.250	3	TAR2503-30R062C11	\$31.93
	4	.015	.875	.250	3	TAR2503-41R015C11	\$34.34
	4	.015	1.375	.250	3	TAR2503-40R015C11	\$34.34
	4	.031	.875	.250	3	TAR2503-41R031C11	\$34.34
	4	.031	1.375	.250	3	TAR2503-40R031C11	\$34.34
5/16"	3	.015	1.125	.3125	3	TAR3123-30R015C11	\$42.08
	4	.015	1.375	.3125	3	TAR3123-40R015C11	\$49.55

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All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

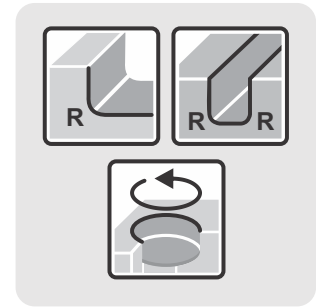
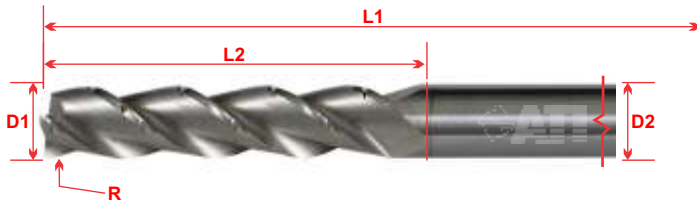
TAR3 SERIES (CONTINUED)

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
3/8"	3	.015	.800	.375	3	TAR3753-31R015C11	\$48.08
	3	.031	.800	.375	3	TAR3753-31R031C11	\$48.08
	3	.015	1.25	.375	3	TAR3753-30R015C11	\$48.08
	3	.031	1.25	.375	3	TAR3753-30R031C11	\$48.08
	4	.015	1.625	.375	3	TAR3753-40R015C11	\$61.24
	4	.031	1.00	.375	3	TAR3753-41R031C11	\$61.24
	4	.031	1.625	.375	3	TAR3753-40R031C11	\$61.24
	4	.062	1.00	.375	3	TAR3753-41R062C11	\$61.24
	4	.062	1.625	.375	3	TAR3753-40R062C11	\$61.24
1/2"	3	.015	.875	.500	3	TAR5003-31R015C11	\$71.17
	3	.015	1.25	.500	3	TAR5003-30R015C11	\$71.17
	3	.031	.875	.500	3	TAR5003-31R031C11	\$71.17
	3	.031	1.25	.500	3	TAR5003-30R031C11	\$71.17
	3	.062	.875	.500	3	TAR5003-31R062C11	\$71.17
	3	.062	1.25	.500	3	TAR5003-30R062C11	\$71.17
	3	.125	.875	.500	3	TAR5003-31R125C11	\$71.17
	3	.125	1.25	.500	3	TAR5003-30R125C11	\$71.17
	4	.015	1.00	.500	3	TAR5003-41R015C11	\$83.90
	4	.015	1.625	.500	3	TAR5003-40R015C11	\$83.90
	4	.031	1.00	.500	3	TAR5003-41R031C11	\$83.90
	4	.031	1.625	.500	3	TAR5003-40R031C11	\$83.90
	4	.062	1.00	.500	3	TAR5003-41R062C11	\$83.90
	4	.062	1.625	.500	3	TAR5003-40R062C11	\$83.90
	4	.125	1.00	.500	3	TAR5003-41R125C11	\$83.90
	5	.031	2.25	.500	3	TAR5003-50R031C11	\$99.96
5/8"	4	.031	1.625	.625	3	TAR6253-40R031C11	\$134.85
	6	.031	3.25	.625	3	TAR6253-60R031C11	\$177.67
3/4"	4	.015	1.625	.750	3	TAR7503-40R015C11	\$163.19
	4	.031	1.625	.750	3	TAR7503-40R031C11	\$163.19
	4	.062	1.625	.750	3	TAR7503-40R062C11	\$163.19
	4	.125	1.625	.750	3	TAR7503-40R125C11	\$163.19
	5	.031	2.25	.750	3	TAR7503-50R031C11	\$189.04
	5	.062	2.25	.750	3	TAR7503-50R062C11	\$189.04
	6	.015	2.25	.750	3	TAR7503-60R015C11	\$218.99
	6	.062	2.25	.750	3	TAR7503-60R062C11	\$218.99
	6	.015	3.50	.750	3	TAR7503-61R015C11	\$226.78
	6	.031	3.50	.750	3	TAR7503-60R031C11	\$226.78
	6	.062	3.50	.750	3	TAR7503-61R062C11	\$226.78
	6	.125	3.50	.750	3	TAR7503-60R125C11	\$226.78
1"	4	.015	1.625	1.00	3	TAR1003-40R015C11	\$257.30
	4	.062	1.625	1.00	3	TAR1003-40R062C11	\$257.30
	5	.015	2.625	1.00	3	TAR1003-50R015C11	\$302.62
	6	.015	3.50	1.00	3	TAR1003-60R015C11	\$369.90

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TAR3CB SERIES

TSUNAMI 3 FLUTE CORNER RADIUS WITH CHIP BREAKERS NON-FERROUS HIGH VOLUME MATERIAL REMOVAL



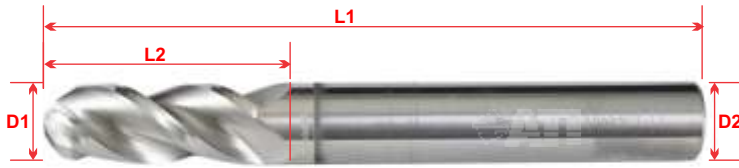
- CHIP BREAKERS FOR EFFICIENT CHIP MANAGEMENT
- CHIP BREAKERS DECREASE TOOL PRESSURE AND DEFLECTION
- CHIP BREAKERS ARE STAGGERED SO THE FOLLOWING FLUTE CLEANS UP WITNESS LINES
- SPECIFICALLY DESIGNED FOR NON-FERROUS HIGH VOLUME MILLING
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP FOR SMOOTH ENGAGEMENT
- NEW COATNG ELIMINATES NON-FERROUS CHIP WELDING

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.015	1.30	.250	3	TAR2503-30R015C11CB	\$41.14
	4	.015	1.625	.250	3	TAR2503-40R015C11CB	\$47.38
3/8"	3	.015	1.30	.375	3	TAR3753-30R015C11CB	\$57.29
	3	.031	1.30	.375	3	TAR3753-30R031C11CB	\$57.29
	4	.015	1.625	.375	3	TAR3753-40R015C11CB	\$71.59
	4	.031	1.625	.375	3	TAR3753-40R031C11CB	\$71.59
	5	.015	2.25	.375	3	TAR3753-50R015C11CB	\$82.04
	5	.031	2.25	.375	3	TAR3753-50R031C11CB	\$82.04
1/2"	3	.031	1.30	.500	3	TAR5003-30R031C11CB	\$87.67
	5	.031	2.30	.500	3	TAR5003-51R031C11CB	\$116.97
	6	.031	3.125	.500	3	TAR5003-61R031C11CB	\$130.87
5/8"	4	.031	1.625	.625	3	TAR6253-40R031C11CB	\$142.06
	5	.031	2.30	.625	3	TAR6253-50R031C11CB	\$150.93
	6	.031	3.25	.625	3	TAR6253-61R031C11CB	\$181.00
3/4"	4	.062	1.625	.750	3	TAR7503-40R062C11CB	\$178.77
	5	.031	2.625	.750	3	TAR7503-50R031C11CB	\$205.73
	5	.062	2.625	.750	3	TAR7503-50R062C11CB	\$205.73
	6	.031	3.25	.750	3	TAR7503-61R031C11CB	\$236.79
	6	.062	1.625	.750	3	TAR7503-60R062C11CB	\$230.12
1"	4	.031	1.625	1.00	3	TAR1003-40R031C11CB	\$261.46
	5	.031	2.625	1.00	3	TAR1003-50R031C11CB	\$322.65
	6	.031	3.50	1.00	3	TAR1003-61R031C11CB	\$380.31

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

TAB3 SERIES

TSUNAMI 3 FLUTE BALL NOSE - NON-FERROUS HIGH VOLUME MATERIAL REMOVAL



- SPECIFICALLY DESIGNED FOR NON-FERROUS HIGH VOLUME MILLING
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP FOR SMOOTH ENGAGEMENT
- NEW COATING ELIMINATES NON-FERROUS CHIP WELDING
- EXCELLENT SURFACE FINISH

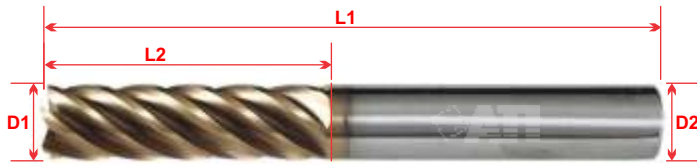
D1	L1	L2	D2	FLUTES	PART #	PRICE
1/16"	2	.125	.125	3	TAB0623-20C11	\$16.59
3/32"	2	.187	.125	3	TAB0933-20C11	\$16.59
1/8"	2	.375	.125	3	TAB1253-20C11	\$16.59
3/16"	2	.400	.187	3	TAB1873-20C11	\$21.05
1/4"	2	.500	.250	3	TAB2503-20C11	\$27.42
	3	.500	.250	3	TAB2503-30C11	\$31.93
	4	.500	.250	3	TAB2503-40C11	\$35.17
5/16"	2.50	.500	.312	3	TAB3123-25C11	\$41.59
3/8"	3	.500	.375	3	TAB3753-30C11	\$48.08
	4	.750	.375	3	TAB3753-40C11	\$54.14
1/2"	3	1.25	.500	3	TAB5003-30C11	\$71.17
	4	1.00	.500	3	TAB5003-41C11	\$83.90
	4	1.25	.500	3	TAB5003-40C11	\$83.90
	4	1.625	.500	3	TAB5003-42C11	\$83.90
	6	2.25	.500	3	TAB5003-60C11	\$109.65
5/8"	4	1.625	.625	3	TAB6253-40C11	\$134.85
3/4"	4	1.625	.750	3	TAB7503-40C11	\$163.19
	6	3.25	.750	3	TAB7503-60C11	\$217.20
	8	1.50	.750	3	TAB7503-81C11	\$292.75
1"	4	1.625	1.00	3	TAB1003-40C11	\$257.30
	6	3.25	1.00	3	TAB1003-60C11	\$362.63

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

SAF6 SERIES

SUPER ALLOY - 6 FLUTE FLAT

NEW SIZES



- DESIGNED FOR MILLING IN TITANIUM AND OTHER HIGH TEMP ALLOYS
- 6 FLUTES FOR HIGH FEED RATES
- NEW HIGH HARD, HEAT AND WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- THE COMBINATION OF COATING, CARBIDE SUBSTRATE AND EDGE GEOMETRY = UNMATCHED TOOL LIFE IN HIGH TEMP ALLOYS

D1	L1	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.312	.250	6	SAF2506-32C15	\$40.85
	3	.500	.250	6	SAF2506-30C15	\$40.85
	3	1.00	.250	6	SAF2506-31C15	\$40.85
	4	1.50	.250	6	SAF2506-40C15	\$48.60
3/8"	3	.500	.375	6	SAF3756-32C15	\$64.31
	3	.750	.375	6	SAF3756-30C15	\$64.31
	3	1.25	.375	6	SAF3756-31C15	\$64.31
1/2"	3	.625	.500	6	SAF5006-31C15	\$91.48
	3	1.25	.500	6	SAF5006-30C15	\$92.42
	4	1.75	.500	6	SAF5006-40C15	\$113.38
5/8"	5	2.50	.625	6	SAF6256-50C15	\$181.95
3/4"	4	1.00	.750	6	SAF7506-41C15	\$186.71
	4	1.75	.750	6	SAF7506-40C15	\$193.74
	5	2.50	.750	6	SAF7506-50C15	\$233.26



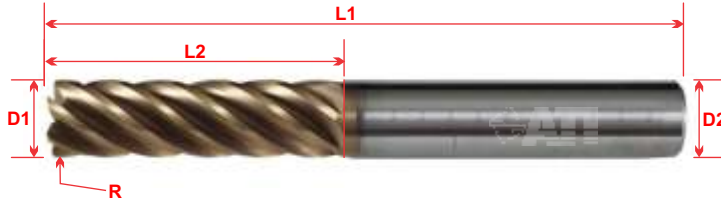
Our ROLLOMATIC MICRO-TOOL DIVISION produces drills down to .004 diameter.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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SAR6 SERIES

SUPER ALLOY - 6 FLUTE - RADIUS



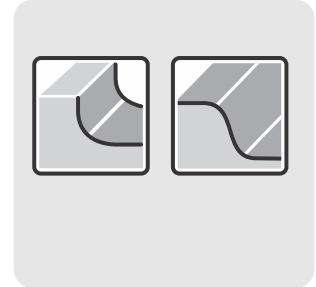
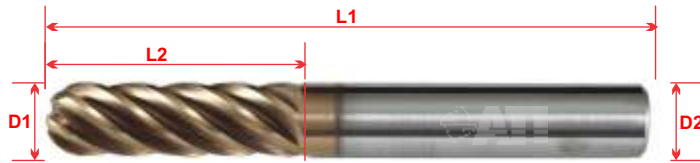
- DESIGNED FOR MILLING IN TITANIUM AND OTHER HIGH TEMP ALLOYS
- 6 FLUTES FOR HIGH FEED RATES
- NEW HIGH HARD, HEAT AND WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- THE COMBINATION OF COATING, CARBIDE SUBSTRATE AND EDGE GEOMETRY = UNMATCHED TOOL LIFE IN HIGH TEMP ALLOYS

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
1/4"	3	.031	.300	.250	6	SAR2506-32R031C15	\$39.35
	3	.031	.500	.250	6	SAR2506-30R031C15	\$39.35
	3	.031	1.00	.250	6	SAR2506-31R031C15	\$39.35
	3	.062	.300	.250	6	SAR2506-32R062C15	\$39.35
	3	.062	.500	.250	6	SAR2506-30R062C15	\$39.35
	3	.062	1.00	.250	6	SAR2506-31R062C15	\$39.35
3/8"	3	.031	.500	.375	6	SAR3756-32R031C15	\$62.76
	3	.031	.750	.375	6	SAR3756-30R031C15	\$62.76
	3	.031	1.25	.375	6	SAR3756-31R031C15	\$62.76
	3	.062	.500	.375	6	SAR3756-32R062C15	\$62.76
	3	.062	.750	.375	6	SAR3756-30R062C15	\$62.76
	3	.062	1.25	.375	6	SAR3756-31R062C15	\$62.76
1/2"	3	.031	.625	.500	6	SAR5006-31R031C15	\$96.25
	3	.031	1.25	.500	6	SAR5006-30R031C15	\$97.32
	3	.062	.625	.500	6	SAR5006-31R062C15	\$96.25
	3	.062	1.25	.500	6	SAR5006-30R062C15	\$97.32
	4	.031	1.125	.500	6	SAR5006-41R031C15	\$112.40
	4	.031	1.75	.500	6	SAR5006-40R031C15	\$115.95
	4	.062	1.125	.500	6	SAR5006-41R062C15	\$112.40
	4	.062	1.75	.500	6	SAR5006-40R062C15	\$115.95
3/4"	4	.031	1.00	.750	6	SAR7506-41R031C15	\$197.07
	4	.031	1.75	.750	6	SAR7506-40R031C15	\$201.33
	4	.062	1.00	.750	6	SAR7506-41R062C15	\$197.07
	4	.062	1.75	.750	6	SAR7506-40R062C15	\$201.33
	5	.031	2.50	.750	6	SAR7506-50R031C15	\$242.31
	5	.062	2.50	.750	6	SAR7506-50R062C15	\$242.31

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

SAB6 SERIES

SUPER ALLOY - 6 FLUTE BALL



- DESIGNED FOR MILLING IN TITANIUM AND OTHER HIGH TEMP ALLOYS
- 6 FLUTES FOR HIGH FEED RATES
- NEW HIGH HARD, HEAT AND WEAR RESISTANT COATING FOR EXCEPTIONAL TOOL LIFE
- THE COMBINATION OF COATING, CARBIDE SUBSTRATE AND EDGE GEOMETRY = UNMATCHED TOOL LIFE IN HIGH TEMP ALLOYS

D1	L1	L2	SHANK	FLUTES	PART #	PRICE
1/4"	3	.875	.250	6	SAB2506-31C15	\$39.35
3/8"	3	.500	.375	6	SAB3756-30C15	\$62.76
	3	.875	.375	6	SAB3756-31C15	\$62.76
1/2"	3	1.00	.500	6	SAB5006-30C15	\$97.32
	4	1.625	.500	6	SAB5006-40C15	\$115.92
5/8"	4	1.625	.625	6	SAB6256-40C15	\$168.68
3/4"	4	1.625	.750	6	SAB7506-40C15	\$201.36

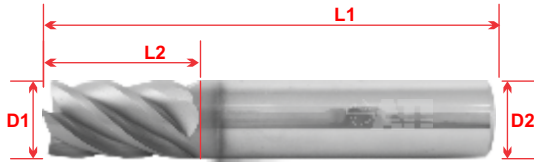


Our *MULTI-FLUTE SUPER ALLOY SERIES* is unbeatable in exotic materials.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.
 Advanced Tooling, Inc. | 920-753-2420 | advancedtoolinginc.net

RT5 SERIES

RIPTIDE 5 FLUTE FLAT BOTTOM – HIGH VOLUME METAL REMOVAL



** DISCONTINUED SERIES
AVAILABLE WHILE SUPPLIES LAST
* REFERENCE TSF5 SERIES FOR
UPGRADED PERFORMANCE*

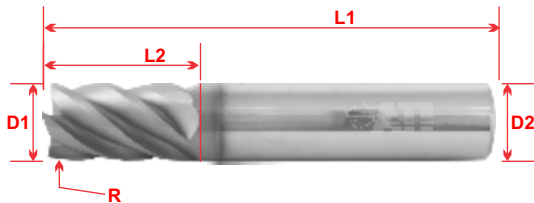


- AGGRESSIVE SIDE MILLING
- CENTER CUTTING

- DURABLE HEAT AND WEAR RESISTANT COATING SUITED FOR HEAVY ROUGHING APPLICATIONS
- EXCELLENT SURFACE FINISH
- DESIGNED FOR AGGRESSIVE PERIPHERAL MILLING IN A WIDE VARIETY OF MATERIAL INCLUDING EXOTICS
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT

D1	L1	L2	D2	FLUTES	PART #	PRICE
3/8"	3	.875	.375	5	RT3755-30C14	\$44.25
	3	1.125	.375	5	RT3755-31C14	\$48.23
1/2"	3	1.25	.500	5	RT5005-30C14	\$70.43
	4	1.625	.500	5	RT5005-40C14	\$83.17
5/8"	4	1.25	.625	5	RT6255-40C14	\$131.01
	4	1.625	.625	5	RT6255-41C14	\$131.01
3/4"	4	1.25	.750	5	RT7505-40C14	\$169.95
	4	1.625	.750	5	RT7505-41C14	\$173.25

RIPTIDE 5 FLUTE CORNER RADIUS – HIGH VOLUME METAL REMOVAL



** DISCONTINUED SERIES
AVAILABLE WHILE SUPPLIES LAST
* REFERENCE TSR5 SERIES FOR
UPGRADED PERFORMANCE*



- AGGRESSIVE SIDE MILLING
- CENTER CUTTING

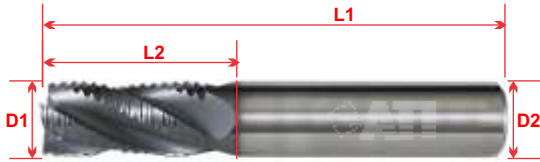
- DURABLE HEAT AND WEAR RESISTANT COATING SUITED FOR HEAVY ROUGHING APPLICATIONS
- EXCELLENT SURFACE FINISH
- DESIGNED FOR AGGRESSIVE PERIPHERAL MILLING IN A WIDE VARIETY OF MATERIAL INCLUDING EXOTICS
- VARIABLE HELIX AND INDEX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT

D1	L1	RADIUS	L2	D2	FLUTES	PART #	PRICE
3/8"	3	.031	.875	.375	5	RT3755-30R031C14	\$48.30
	3	.031	1.125	.375	5	RT3755-31R031C14	\$52.21
1/2"	3	.031	1.25	.500	5	RT5005-30R031C14	\$72.49
	4	.031	1.625	.500	5	RT5005-40R031C14	\$85.23
5/8"	4	.031	1.25	.625	5	RT6255-40R031C14	\$137.61
	4	.031	1.625	.625	5	RT6255-41R031C14	\$137.61
3/4"	4	.031	1.25	.750	5	RT7505-40R031C14	\$178.75
	4	.031	1.625	.750	5	RT7505-41R031C14	\$180.95

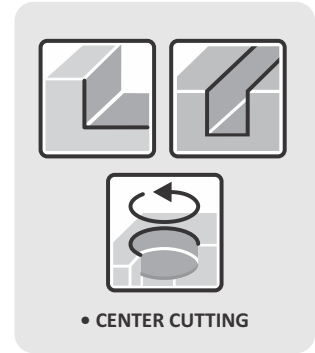
All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

REMCP4 SERIES

4 FLUTE COURSE PITCH ROUGHERS



- REDUCED CUTTING FORCES
- END CUTTING
- PLUNGING CAPABLE
- IMPROVED CHIP REMOVAL
- REDUCED TOOL DEFLECTION
- THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



D1	L1	L2	D2	FLUTES	ATI PART#	PRICE
1/4"	2.50	.750	.250	4	REMCP2504C03	\$23.27
5/16"	2.50	.875	.312	4	REMCP31254C03	\$31.95
3/8"	2.50	.875	.375	4	REMCP3754C03	\$35.16
7/16"	3.00	1.00	.437	4	REMCP43754C03	\$46.36
1/2"	3.00	1.00	.500	4	REMCP5004C03	\$62.25
5/8"	3.00	1.25	.625	4	REMCP6254C03	\$106.51
3/4"	4.00	1.50	.750	4	REMCP7504C03	\$150.06
1"	4.00	1.50	1.00	4	REMCP1004C03	\$225.08



ROUGHERS are an ideal solution for applications where chip management, tool deflection and tool chatter are an issue.

SE4 SERIES

PREMIUM GENERAL PURPOSE 4 FLUTE FLAT

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



D1	L1	L2	D2	FLUTES	PART #	PRICE
1/32"	1.50	.093	.125	4	SE03134C03	\$10.45
3/64"	1.50	.125	.125	4	SE04694C03	\$10.45
1/16"	1.50	.250	.125	4	SE06254C03	\$9.89
5/64"	1.50	.250	.125	4	SE07814C03	\$9.89
3/32"	1.50	.375	.125	4	SE09384C03	\$9.49
7/64"	1.50	.375	.125	4	SE10944C03	\$9.49
1/8"	1.50	.500	.125	4	SE1254C03	\$8.98
9/64"	2.00	.562	.187	4	SE14064C03	\$13.51
5/32"	2.00	.562	.187	4	SE1564C03	\$13.51
11/64"	2.00	.562	.187	4	SE17194C03	\$13.51
3/16"	2.00	.625	.187	4	SE1874C03	\$13.05
13/64"	2.50	.625	.250	4	SE20314C03	\$19.98
7/32"	2.50	.625	.250	4	SE21884C03	\$19.98
15/64"	2.50	.750	.250	4	SE23444C03	\$19.98
1/4"	2.50	.750	.250	4	SE2504C03	\$18.92
17/64"	2.50	.875	.312	4	SE26564C03	\$31.01
9/32	2.50	.875	.312	4	SE28124C03	\$31.01
19/64"	2.50	.875	.312	4	SE29694C03	\$31.01
5/16"	2.50	.875	.312	4	SE31254C03	\$27.30
21/64"	2.50	.875	.375	4	SE32814C03	\$35.88
11/32"	2.50	.875	.375	4	SE34384C03	\$35.88
23/64"	2.50	.875	.375	4	SE35944C03	\$35.88
3/8"	2.50	.875	.375	4	SE3754C03	\$32.41
25/64"	3.00	.875	.437	4	SE39064C03	\$45.27
13/32"	3.00	.875	.437	4	SE40624C03	\$45.27
27/64"	3.00	.875	.437	4	SE42194C03	\$45.27
7/16"	3.00	1.00	.437	4	SE43754C03	\$41.57
29/64"	3.00	1.00	.500	4	SE45314C03	\$57.20
15/32"	3.00	1.00	.500	4	SE46884C03	\$57.20
31/64"	3.00	1.00	.500	4	SE48444C03	\$57.20
1/2"	3.00	1.00	.500	4	SE5004C03	\$49.77
9/16"	3.50	1.25	.562	4	SE56254C03	\$80.10
5/8"	3.50	1.25	.625	4	SE6254C03	\$89.83
11/16"	4.00	1.50	.750	4	SE68754C03	\$141.23
3/4"	4.00	1.50	.750	4	SE7504C03	\$130.30
7/8"	4.00	1.50	.875	4	SE8754C03	\$192.04
1.00"	4.00	1.50	1.00	4	SE1004C03	\$201.23

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

EL4 SERIES

PREMIUM GENERAL PURPOSE - EXTRA LENGTH 4 FLUTE FLAT

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



D1	L1	L2	D2	FLUTES	ATI PART#	PRICE
1/8"	2.00	.625	.125	4	EL1254-1C03	\$11.88
	3.00	.750	.125	4	EL1254-2C03	\$17.75
	3.00	1.00	.125	4	EL1254-3C03	\$18.15
3/16"	3.00	1.00	.187	4	EL1874-1C03	\$21.46
	3.00	1.125	.187	4	EL1874-2C03	\$21.46
	4.00	1.00	.187	4	EL1874-3C03	\$24.49
1/4"	3.00	1.00	.250	4	EL2504-1C03	\$26.06
	4.00	1.00	.250	4	EL2504-2C03	\$29.21
	4.00	1.50	.250	4	EL2504-3C03	\$29.21
	6.00	1.50	.250	4	EL2504-4C03	\$41.87
5/16"	3.00	1.00	.312	4	EL31254-1C03	\$34.32
	4.00	1.00	.312	4	EL31254-2C03	\$40.66
	4.00	1.625	.312	4	EL31254-3C03	\$40.66
	6.00	1.50	.312	4	EL31254-4C03	\$59.87
3/8"	3.00	1.00	.375	4	EL3754-1C03	\$38.82
	4.00	1.00	.375	4	EL3754-2C03	\$45.84
	4.00	2.00	.375	4	EL3754-3C03	\$45.84
	6.00	1.50	.375	4	EL3754-4C03	\$65.70
	6.00	3.00	.375	4	EL3754-5C03	\$65.70
7/16"	4.00	1.00	.437	4	EL43754-1C03	\$60.34
	4.00	2.00	.437	4	EL43754-2C03	\$60.34
	6.00	1.50	.437	4	EL43754-3C03	\$85.53
	6.00	3.00	.437	4	EL43754-4C03	\$85.53
1/2"	4.00	1.00	.500	4	EL5004-1C03	\$64.45
	4.00	2.00	.500	4	EL5004-2C03	\$64.45
	6.00	1.50	.500	4	EL5004-3C03	\$93.67
	6.00	3.00	.500	4	EL5004-4C03	\$93.67
9/16"	6.00	2.00	.562	4	EL56254-1C03	\$124.44
	6.00	3.00	.562	4	EL56254-2C03	\$124.44
5/8"	6.00	2.00	.625	4	EL6254-1C03	\$132.16
	6.00	3.00	.625	4	EL6254-2C03	\$132.16
3/4"	6.00	2.00	.750	4	EL7504-1C03	\$195.63
	6.00	3.00	.750	4	EL7504-2C03	\$195.63
1.00"	6.00	2.00	1.00	4	EL1004-1C03	\$319.03
	6.00	3.00	1.00	4	EL1004-2C03	\$319.03
	6.00	4.00	1.00	4	EL1004-3C03	\$330.00

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

BEM4 SERIES

PREMIUM GENERAL PURPOSE 4 FLUTE BALL

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



D1	L1	L2	D2	FLUTES	PART #	PRICE
1/64"	1.50	.046	.125	2	BEM01562C03	\$21.18
1/32"	1.50	.093	.125	4	BEM03134C03	\$12.50
3/64"	1.50	.125	.125	4	BEM04694C03	\$12.50
1/16"	1.50	.250	.125	4	BEM06254C03	\$11.96
5/64"	1.50	.250	.125	4	BEM07814C03	\$11.96
3/32"	1.50	.375	.125	4	BEM09384C03	\$11.55
7/64"	1.50	.375	.125	4	BEM10944C03	\$11.55
1/8"	1.50	.500	.125	4	BEM1254C03	\$10.72
9/64"	2.00	.562	.187	4	BEM14064C03	\$16.01
5/32"	2.00	.562	.187	4	BEM1564C03	\$16.01
11/64"	2.00	.562	.187	4	BEM17194C03	\$16.01
3/16"	2.00	.625	.187	4	BEM1874C03	\$14.83
13/64"	2.50	.625	.250	4	BEM20314C03	\$22.01
7/32"	2.50	.625	.250	4	BEM21884C03	\$22.01
15/64"	2.50	.750	.250	4	BEM23444C03	\$22.01
1/4"	2.50	.750	.250	4	BEM2504C03	\$21.46
17/64"	2.50	.875	.312	4	BEM26564C03	\$32.97
9/32"	2.50	.875	.312	4	BEM28124C03	\$32.97
19/64"	2.50	.875	.312	4	BEM29694C03	\$32.97
5/16"	2.50	.875	.312	4	BEM31254C03	\$29.69
21/64"	2.50	.875	.375	4	BEM32814C03	\$38.49
11/32"	2.50	.875	.375	4	BEM34384C03	\$38.49
23/64"	2.50	.875	.375	4	BEM35944C03	\$38.49
3/8"	2.50	.875	.375	4	BEM3754C03	\$35.00
25/64"	3.00	.875	.437	4	BEM39064C03	\$49.22
13/32"	3.00	.875	.437	4	BEM40624C03	\$49.22
27/64"	3.00	.875	.437	4	BEM42194C03	\$49.22
7/16"	3.00	1.00	.437	4	BEM43754C03	\$44.94
29/64"	3.00	1.00	.500	4	BEM45314C03	\$65.12
15/32"	3.00	1.00	.500	4	BEM46884C03	\$65.12
31/64"	3.00	1.00	.500	4	BEM48444C03	\$65.12
1/2"	3.00	1.00	.500	4	BEM5004C03	\$59.02
9/16"	3.50	1.250	.562	4	BEM56254C03	\$86.41
5/8"	3.50	1.250	.625	4	BEM6254C03	\$95.96
11/16"	4.00	1.50	.750	4	BEM68754C03	\$151.37
3/4"	4.00	1.50	.750	4	BEM7504C03	\$136.66
7/8"	4.00	1.50	.875	4	BEM8754C03	\$220.08
1.00"	4.00	1.50	1.00	4	BEM1004C03	\$236.53

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

BEL4 SERIES

PREMIUM GENERAL PURPOSE 4 FLUTE BALL - EXTRA LENGTH

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



D1	L1	L2	D2	FLUTES	ATI PART#	PRICE
1/8"	2	.625	.125	4	BEL1254-1C03	\$12.34
	3	.750	.125	4	BEL1254-2C03	\$18.43
	3	1.00	.125	4	BEL1254-3C03	\$18.85
3/16"	3	1.00	.187	4	BEL1874-1C03	\$22.28
	3	1.125	.187	4	BEL1874-2C03	\$22.28
	4	1.00	.187	4	BEL1874-3C03	\$25.43
1/4"	3	1.00	.250	4	BEL2504-1C03	\$27.06
	4	1.00	.250	4	BEL2504-2C03	\$30.33
	4	1.50	.250	4	BEL2504-3C03	\$30.33
	6	1.50	.250	4	BEL2504-4C03	\$43.48
5/16"	3	1.00	.312	4	BEL31254-1C03	\$35.64
	4	1.00	.312	4	BEL31254-2C03	\$42.23
	4	1.625	.312	4	BEL31254-3C03	\$42.23
	6	1.50	.312	4	BEL31254-4C03	\$62.17
3/8"	3	1.00	.375	4	BEL3754-1C03	\$40.31
	4	1.00	.375	4	BEL3754-2C03	\$47.61
	4	2.00	.375	4	BEL3754-3C03	\$47.61
	6	1.50	.375	4	BEL3754-4C03	\$68.23
	6	3.00	.375	4	BEL3754-5C03	\$68.23
7/16"	4	1.00	.437	4	BEL43754-1C03	\$62.66
	4	2.00	.437	4	BEL43754-2C03	\$62.66
	6	1.50	.437	4	BEL43754-3C03	\$88.82
	6	3.00	.437	4	BEL43754-4C03	\$88.82
1/2"	4	1.00	.500	4	BEL5004-1C03	\$66.93
	4	2.00	.500	4	BEL5004-2C03	\$66.93
	6	1.50	.500	4	BEL5004-3C03	\$97.28
	6	3.00	.500	4	BEL5004-4C03	\$97.28
9/16"	6	2.00	.562	4	BEL56254-1C03	\$129.23
	6	3.00	.562	4	BEL56254-2C03	\$129.23
5/8"	6	2.00	.625	4	BEL6254-1C03	\$137.25
	6	3.00	.625	4	BEL6254-2C03	\$137.25
3/4"	6	2.00	.750	4	BEL7504-1C03	\$203.16
	6	3.00	.750	4	BEL7504-2C03	\$203.16
1.00"	6	2.00	1.00	4	BEL1004-1C03	\$331.30
	6	3.00	1.00	4	BEL1004-2C03	\$331.30
	6	4.00	1.00	4	BEL1004-3C03	\$342.69

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

SE2 SERIES

PREMIUM GENERAL PURPOSE 2 FLUTE FLAT

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



D1	L1	L2	D2	FLUTES	ATI PART#	PRICE
1/64"	1.50	.046	.125	2	SE01562C03	\$18.11
1/32"	1.50	.093	.125	2	SE03132C03	\$10.45
3/64"	1.50	.125	.125	2	SE04692C03	\$10.45
1/16"	1.50	.250	.125	2	SE06252C03	\$9.89
5/64"	1.50	.250	.125	2	SE07812C03	\$9.89
3/32"	1.50	.375	.125	2	SE09382C03	\$9.49
7/64"	1.50	.375	.125	2	SE10942C03	\$9.49
1/8"	1.50	.500	.125	2	SE1252C03	\$8.98
9/64"	2.00	.562	.187	2	SE14062C03	\$13.51
5/32"	2.00	.562	.187	2	SE1562C03	\$13.51
11/64"	2.00	.562	.187	2	SE17192C03	\$13.51
3/16"	2.00	.625	.187	2	SE1872C03	\$13.05
13/64"	2.50	.625	.250	2	SE20312C03	\$19.98
7/32"	2.50	.625	.250	2	SE21882C03	\$19.98
15/64"	2.50	.750	.250	2	SE23442C03	\$19.98
1/4"	2.50	.750	.250	2	SE2502C03	\$18.92
17/64"	2.50	.875	.312	2	SE26562C03	\$31.01
9/32"	2.50	.875	.312	2	SE28122C03	\$31.01
19/64"	2.50	.875	.312	2	SE29692C03	\$31.01
5/16"	2.50	.875	.312	2	SE31252C03	\$27.30
21/64"	2.50	.875	.375	2	SE32812C03	\$35.88
11/32"	2.50	.875	.375	2	SE34382C03	\$35.88
23/64"	2.50	.875	.375	2	SE35942C03	\$35.88
3/8"	2.50	.875	.375	2	SE3752C03	\$32.41
25/64"	3.00	.875	.437	2	SE39062C03	\$45.27
13/32"	3.00	.875	.437	2	SE40622C03	\$45.27
27/64"	3.00	.875	.437	2	SE42192C03	\$45.27
7/16"	3.00	1.00	.437	2	SE43752C03	\$41.57
29/64"	3.00	1.00	.500	2	SE45312C03	\$57.20
15/32"	3.00	1.00	.500	2	SE46882C03	\$57.20
31/64"	3.00	1.00	.500	2	SE48442C03	\$57.20
1/2"	3.00	1.00	.500	2	SE5002C03	\$49.77
9/16"	3.50	1.25	.562	2	SE56252C03	\$80.10
5/8"	3.50	1.25	.625	2	SE6252C03	\$89.83
11/16"	4.00	1.50	.750	2	SE68752C03	\$141.23
3/4"	4.00	1.50	.750	2	SE7502C03	\$130.30
7/8"	4.00	1.50	.875	2	SE8752C03	\$192.04
1.00"	4.00	1.50	1.00	2	SE1002C03	\$201.23

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

EL2 SERIES*

PREMIUM GENERAL PURPOSE - EXTRA LENGTH 2 FLUTE FLAT

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



*NOT COMMON STOCK - CALL FOR STOCK STATUS

D1	L1	L2	D2	FLUTES	ATI PART#	PRICE
1/8"	2	.625	.125	2	EL1252-1C03	\$11.88
	3	.750	.125	2	EL1252-2C03	\$17.75
	3	1.00	.125	2	EL1252-3C03	\$18.15
3/16"	3	1.00	.187	2	EL1872-1C03	\$21.46
	3	1.125	.187	2	EL1872-2C03	\$21.46
	4	1.00	.187	2	EL1872-3C03	\$24.49
1/4"	3	1.00	.250	2	EL2502-1C03	\$26.06
	4	1.00	.250	2	EL2502-2C03	\$29.21
	4	1.50	.250	2	EL2502-3C03	\$29.21
	6	1.50	.250	2	EL2502-4C03	\$41.87
5/16"	3	1.00	.312	2	EL31252-1C03	\$34.32
	4	1.00	.312	2	EL31252-2C03	\$40.66
	4	1.625	.312	2	EL31252-3C03	\$40.66
	6	1.50	.312	2	EL31252-4C03	\$59.87
3/8"	3	1.00	.375	2	EL3752-1C03	\$38.82
	4	1.00	.375	2	EL3752-2C03	\$45.84
	4	2.00	.375	2	EL3752-3C03	\$45.84
	6	1.50	.375	2	EL3752-4C03	\$65.70
	6	3.00	.375	2	EL3752-5C03	\$65.70
7/16"	4	1.00	.437	2	EL43752-1C03	\$60.34
	4	2.00	.437	2	EL43752-2C03	\$60.34
	6	1.50	.437	2	EL43752-3C03	\$85.53
	6	3.00	.437	2	EL43752-4C03	\$85.53
1/2"	4	1.00	.500	2	EL5002-1C03	\$64.45
	4	2.00	.500	2	EL5002-2C03	\$64.45
	6	1.50	.500	2	EL5002-3C03	\$93.67
	6	3.00	.500	2	EL5002-4C03	\$93.67
9/16"	6	2.00	.562	2	EL56252-1C03	\$124.44
	6	3.00	.562	2	EL56252-2C03	\$124.44
5/8"	6	2.00	.625	2	EL6252-1C03	\$132.16
	6	3.00	.625	2	EL6252-2C03	\$132.16
3/4"	6	2.00	.750	2	EL7502-1C03	\$195.63
	6	3.00	.750	2	EL7502-2C03	\$195.63
1.00"	6	2.00	1.00	2	EL1002-1C03	\$319.03
	6	3.00	1.00	2	EL1002-2C03	\$319.03
	6	4.00	1.00	2	EL1002-3C03	\$330.00

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

BEM2 SERIES

PREMIUM GENERAL PURPOSE - 2 FLUTE BALL

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



D1	L1	L2	D2	FLUTES	PART #	PRICE
1/64"	1.50	.046	.125	2	BEM01562C03	\$21.18
1/32"	1.50	.093	.125	2	BEM03132C03	\$12.50
3/64"	1.50	.125	.125	2	BEM04692C03	\$12.50
1/16"	1.50	.250	.125	2	BEM06252C03	\$11.96
5/64"	1.50	.250	.125	2	BEM07812C03	\$11.96
3/32"	1.50	.375	.125	2	BEM09382C03	\$11.55
7/64"	1.50	.375	.125	2	BEM10942C03	\$11.55
1/8"	1.50	.500	.125	2	BEM1252C03	\$10.72
9/64"	2.00	.562	.187	2	BEM14062C03	\$16.01
5/32"	2.00	.562	.187	2	BEM1562C03	\$16.01
11/64"	2.00	.562	.187	2	BEM17192C03	\$16.01
3/16"	2.00	.625	.187	2	BEM1872C03	\$14.83
13/64"	2.50	.625	.250	2	BEM20312C03	\$22.01
7/32"	2.50	.625	.250	2	BEM21882C03	\$22.01
15/64"	2.50	.750	.250	2	BEM23442C03	\$22.01
1/4"	2.50	.750	.250	2	BEM2502C03	\$21.46
17/64"	2.50	.875	.312	2	BEM26562C03	\$32.97
9/32"	2.50	.875	.312	2	BEM28122C03	\$32.97
19/64"	2.50	.875	.312	2	BEM29692C03	\$32.97
5/16"	2.50	.875	.312	2	BEM31252C03	\$29.69
21/64"	2.50	.875	.375	2	BEM32812C03	\$38.49
11/32"	2.50	.875	.375	2	BEM34382C03	\$38.49
23/64"	2.50	.875	.375	2	BEM35942C03	\$38.49
3/8"	2.50	.875	.375	2	BEM3752C03	\$35.00
25/64"	3.00	.875	.437	2	BEM39062C03	\$49.22
13/32"	3.00	.875	.437	2	BEM40622C03	\$49.22
27/64"	3.00	.875	.437	2	BEM42192C03	\$49.22
7/16"	3.00	1.00	.437	2	BEM43752C03	\$44.94
29/64"	3.00	1.00	.500	2	BEM45312C03	\$65.12
15/32"	3.00	1.00	.500	2	BEM46882C03	\$65.12
31/64"	3.00	1.00	.500	2	BEM48442C03	\$65.12
1/2"	3.00	1.00	.500	2	BEM5002C03	\$59.02
9/16"	3.50	1.250	.562	2	BEM56252C03	\$86.41
5/8"	3.50	1.250	.625	2	BEM6252C03	\$95.96
11/16"	4.00	1.50	.750	2	BEM68752C03	\$151.37
3/4"	4.00	1.50	.750	2	BEM7502C03	\$136.66
7/8"	4.00	1.50	.875	2	BEM8752C03	\$220.08
1.00"	4.00	1.50	1.00	2	BEM1002C03	\$236.53

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

BEL2 SERIES*

PREMIUM GENERAL PURPOSE - EXTRA LENGTH 2 FLUTE BALL

• THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE



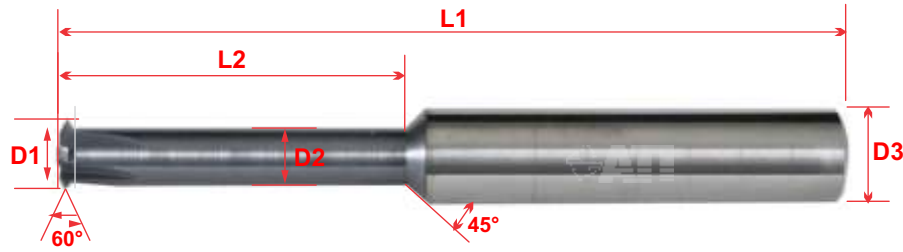
*NOT COMMON STOCK - CALL FOR STOCK STATUS

D1	L1	L2	D2	FLUTES	ATI PART#	PRICE
1/8"	2	.625	.125	2	BEL1252-1C03	\$12.34
	3	.750	.125	2	BEL1252-2C03	\$18.43
	3	1.00	.125	2	BEL1252-3C03	\$18.85
3/16"	3	1.00	.187	2	BEL1872-1C03	\$22.28
	3	1.125	.187	2	BEL1872-2C03	\$22.28
	4	1.00	.187	2	BEL1872-3C03	\$25.43
1/4"	3	1.00	.250	2	BEL2502-1C03	\$27.06
	4	1.00	.250	2	BEL2502-2C03	\$30.33
	4	1.50	.250	2	BEL2502-3C03	\$30.33
	6	1.50	.250	2	BEL2502-4C03	\$43.48
5/16"	3	1.00	.312	2	BEL31252-1C03	\$35.64
	4	1.00	.312	2	BEL31252-2C03	\$42.23
	4	1.625	.312	2	BEL31252-3C03	\$42.23
	6	1.50	.312	2	BEL31252-4C03	\$62.17
3/8"	3	1.00	.375	2	BEL3752-1C03	\$40.31
	4	1.00	.375	2	BEL3752-2C03	\$47.61
	4	2.00	.375	2	BEL3752-3C03	\$47.61
	6	1.50	.375	2	BEL3752-4C03	\$68.23
	6	3.00	.375	2	BEL3752-5C03	\$68.23
7/16"	4	1.00	.437	2	BEL43752-1C03	\$62.66
	4	2.00	.437	2	BEL43752-2C03	\$62.66
	6	1.50	.437	2	BEL43752-3C03	\$88.82
	6	3.00	.437	2	BEL43752-4C03	\$88.82
1/2"	4	1.00	.500	2	BEL5002-1C03	\$66.93
	4	2.00	.500	2	BEL5002-2C03	\$66.93
	6	1.50	.500	2	BEL5002-3C03	\$97.28
	6	3.00	.500	2	BEL5002-4C03	\$97.28
9/16"	6	2.00	.562	2	BEL56252-1C03	\$129.23
	6	3.00	.562	2	BEL56252-2C03	\$129.23
5/8"	6	2.00	.625	2	BEL6252-1C03	\$137.25
	6	3.00	.625	2	BEL6252-2C03	\$137.25
3/4"	6	2.00	.750	2	BEL7502-1C03	\$203.16
	6	3.00	.750	2	BEL7502-2C03	\$203.16
1.00"	6	2.00	1.00	2	BEL1002-1C03	\$331.30
	6	3.00	1.00	2	BEL1002-2C03	\$331.30
	6	4.00	1.00	2	BEL1002-3C03	\$342.69

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

THREADMILL

SINGLE POINT THREAD MILL - 60 DEGREE UN



- THE LATEST IN NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE

THREAD SIZE	PITCH RANGE	D1	D2	L2	D3	L1	FLUTES	PART #	PRICE
10	24-36	.135	.086	.875	.250	2.50	5	TM10-2436C03	\$99.55
.250	20-32	.180	.122	1.00	.250	2.50	5	TM250-2032C03	\$99.55
.312	18-28	.240	.174	1.00	.312	2.50	5	TM312-1828C03	\$99.55
.375	16-28	.300	.227	1.25	.375	2.50	5	TM375-1628C03	\$113.56
.437	14-20	.340	.230	1.50	.500	3.00	5	TM437-1420C03	\$133.54
.500	12-18	.388	.275	1.75	.500	4.00	5	TM500-1218C03	\$134.72
.625	11-18	.450	.300	1.75	.500	4.00	5	TM625-1118C03	\$134.72



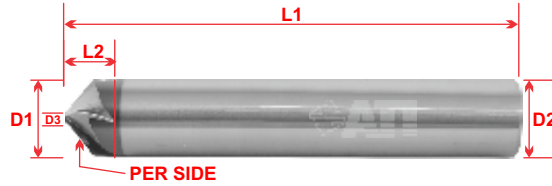
SINGLE POINT THREADMILLS are a very versatile threading option.
Excellent results in hardened steels.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

Advanced Tooling, Inc. | 920-753-2420 | advancedtoolinginc.net

CM SERIES

3 | 4 | 5 FLUTE HELICAL CHAMFER MILL



- HELICAL FLUTES PROVIDE SMOOTH MATERIAL ENGAGEMENT
- BETTER FINISH THAN STRAIGHT FLUTE CHAMFER MILLS
- LONGER TOOL LIFE AND HIGHER FEED RATES THAN STRAIGHT FLUTE TOOLS
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE

D1	ANGLE EPR SIDE	D3	L1	D2	FLUTES	PART #	PRICE
1/4"	22.5	.045	3	.250	3	CM2503-45C03	\$28.09
	22.5	.045	3	.250	4	CM2504-45C03	\$28.09
	30	.045	3	.250	3	CM2503-60C03	\$28.09
	30	.045	3	.250	4	CM2504-60C03	\$28.09
	45	.045	3	.250	3	CM2503-90C03	\$28.09
	45	.045	3	.250	4	CM2504-90C03	\$28.09
3/8"	22.5	.055	3	.375	3	CM3753-45C03	\$43.03
	22.5	.055	3	.375	5	CM3755-45C03	\$43.03
	30	.055	3	.375	3	CM3753-60C03	\$43.03
	30	.055	3	.375	5	CM3755-60C03	\$43.03
	45	.055	3	.375	3	CM3753-90C03	\$43.03
	45	.055	3	.375	5	CM3755-90C03	\$43.03
1/2"	22.5	.070	4	.500	3	CM5003-45C03	\$74.40
	22.5	.070	4	.500	5	CM5005-45C03	\$74.40
	30	.070	4	.500	3	CM5003-60C03	\$74.40
	30	.070	4	.500	5	CM5005-60C03	\$74.40
	45	.070	4	.500	3	CM5003-90C03	\$74.40
	45	.070	4	.500	5	CM5005-90C03	\$74.40
5/8"	22.5	.090	4	.625	5	CM6255-45C03	\$135.03
	30	.090	4	.625	5	CM6255-60C03	\$135.03
	45	.090	4	.625	5	CM6255-90C03	\$135.03
3/4"	22.5	.110	4	.750	5	CM7505-45C03	\$149.85
	45	.110	4	.750	5	CM7505-90C03	\$149.85



Helical cutting geometry leaves a much better finish and overall performance than a straight flute chamfer mill.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

CR4 SERIES

CORNER ROUND - SINGLE END



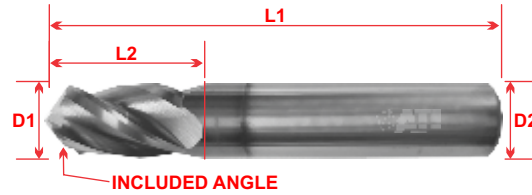
D2	RADIUS	D1	L2	L1	FLUTES	PART #	PRICE
1/4"	.015	.210	.025	3	4	CR2504-30R015C03	28.80
	.030	.180	.040	3	4	CR2504-30R030C03	28.80
3/8"	.030	.305	.040	3	4	CR3754-30R030C03	44.47
	.060	.245	.070	3	4	CR3754-30R060C03	44.47
	.090	.185	.100	3	4	CR3754-30R090C03	44.47
1/2"	.030	.430	.040	4	4	CR5004-40R030C03	66.12
	.060	.370	.070	4	4	CR5004-40R060C03	66.12
	.090	.310	.100	4	4	CR5004-40R090C03	66.12
	.125	.240	.135	4	4	CR5004-40R125C03	66.12
3/4"	.250	.240	.260	4	4	CR7504-40R250C03	152.19
1"	.375	.250	.385	4	4	CR1004-40R375C03	209.38



Walter Helicheck Plus:
Precision inspection
throughout the shop.

DM SERIES

2 AND 4 FLUTE 90 DEGREE DRILL MILL



- DRILL, MILL, CHAMFER AND SPOT DRILL WITH ONE TOOL
- VARIABLE INDEX FOR SMOOTH TOOL ENGAGEMENT FOR INCREASED TOOL LIFE AND FINISH
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE

D1	L1	L2	INCLUDED ANGLE	D2	FLUTES	ATI PART#	PRICE
1/8"	2	.500	90	.125	2	DM1252-2-90C03	\$20.43
	2	.500	90	.125	4	DM1254-2-90C03	\$24.67
3/16"	2	.625	90	.187	2	DM1872-2-90C03	\$23.11
	2	.625	90	.187	4	DM1874-2-90C03	\$27.35
1/4"	3	.750	90	.250	2	DM2502-3-90C03	\$34.26
	3	.750	90	.250	4	DM2504-3-90C03	\$38.50
5/16"	3	.812	90	.312	2	DM3122-3-90C03	\$45.14
	3	.812	90	.312	4	DM3124-3-90C03	\$49.37
3/8"	3	1	90	.375	2	DM3752-3-90C03	\$49.28
	3	1	90	.375	4	DM3754-3-90C03	\$53.51
1/2"	4	1.25	90	.500	2	DM5002-4-90C03	\$76.67
	4	1.25	90	.500	4	DM5004-4-90C03	\$82.81
5/8"	4	1.5	90	.625	2	DM6252-4-90C03	\$101.63
	4	1.5	90	.625	4	DM6254-4-90C03	\$107.77
3/4"	4	1.5	90	.750	2	DM7502-4-90C03	\$128.23
	4	1.5	90	.750	4	DM7504-4-90C03	\$138.46

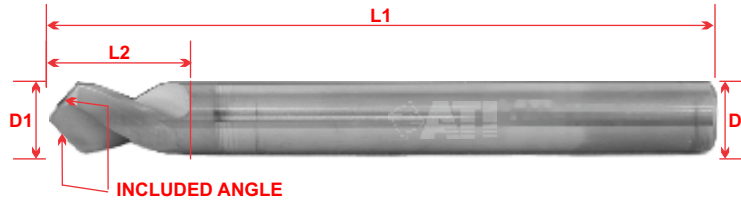


ROLLOMATIC SWISS: Precision down to .003 diameter.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

SD SERIES

NC SPOT DRILL – 90, 120 AND 142 DEGREE POINT



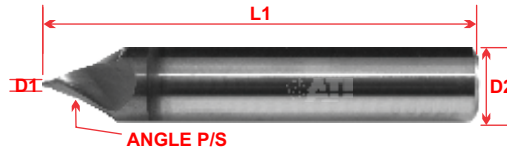
- SPOT ANGLES IN 90, 120 AND 142 DEGREES
- SPOT ANGLE SHOULD BE GREATER THAN THE ANGLE OF THE DRILL POINT
 - AVAILABLE IN 3", 4" AND 6" OAL
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE

D1	INCLUDED ANGLE	L1	D2	L2	PART #	PRICE
1/4"	90	3	.250	.500	SD2502-3-90C02	\$33.99
	90	4	.250	.500	SD2502-4-90C02	\$37.55
	90	6	.250	.500	SD2502-6-90C02	\$52.32
	120	3	.250	.500	SD2502-3-120C02	\$33.99
	120	4	.250	.500	SD2502-4-120C02	\$37.55
	120	6	.250	.500	SD2502-6-120C02	\$52.32
	142	3	.250	.500	SD2502-3-142C02	\$33.99
	142	4	.250	.500	SD2502-4-142C02	\$37.55
	142	6	.250	.500	SD2502-6-142C02	\$52.32
3/8"	90	3	.375	.750	SD3752-3-90C02	\$49.15
	90	4	.375	.750	SD3752-4-90C02	\$58.15
	90	6	.375	.750	SD3752-6-90C02	\$78.45
	120	3	.375	.750	SD3752-3-120C02	\$49.15
	120	4	.375	.750	SD3752-4-120C02	\$58.15
	120	6	.375	.750	SD3752-6-120C02	\$78.45
	142	3	.375	.750	SD3752-3-142C02	\$49.15
	142	4	.375	.750	SD3752-4-142C02	\$58.15
	142	6	.375	.750	SD3752-6-142C02	\$78.45
1/2"	90	3	.500	1	SD5002-3-90C02	\$67.18
	90	4	.500	1	SD5002-4-90C02	\$79.49
	90	6	.500	1	SD5002-6-90C02	\$109.11
	120	3	.500	1	SD5002-3-120C02	\$67.18
	120	4	.500	1	SD5002-4-120C02	\$79.49
	120	6	.500	1	SD5002-6-120C02	\$109.11
	142	3	.500	1	SD5002-3-142C02	\$67.18
	142	4	.500	1	SD5002-4-142C02	\$79.49
	142	6	.500	1	SD5002-6-142C02	\$109.11

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

ET SERIES

HELICAL FLUTE ENGRAVING MILL



- HELICAL FLUTES FOR SUPERIOR PERFORMANCE COMPARED TO STRAIGHT FLUTE ENGRAVING TOOLS
- THE LATEST NANO COATING TECHNOLOGY = EXTREME HEAT AND WEAR RESISTANCE

D1	ANGLE PER SIDE	L1	RADIUS	D2	FLUTES	PART #	PRICE
.015	10	2	.0075	.125	2	ET10152-20C03	\$17.80
	15	2	.0075	.125	2	ET15152-20C03	\$17.80
	20	2	.0075	.125	2	ET20152-20C03	\$17.80
	30	2	.0075	.125	2	ET30152-20C03	\$17.80
	10	2.5	.0075	.250	2	ET10152-25C03	\$29.87
	15	2.5	.0075	.250	2	ET15152-25C03	\$29.87
	20	2.5	.0075	.250	2	ET20152-25C03	\$29.87
	30	2.5	.0075	.250	2	ET30152-25C03	\$29.87
.031	10	2	.015	.125	2	ET10312-20C03	\$17.80
	15	2	.015	.125	2	ET15312-20C03	\$17.80
	20	2	.015	.125	2	ET20312-20C03	\$17.80
	30	2	.015	.125	2	ET30312-20C03	\$17.80
	10	2.5	.015	.250	2	ET10312-25C03	\$29.87
	15	2.5	.015	.250	2	ET15312-25C03	\$29.87
	20	2.5	.015	.250	2	ET20312-25C03	\$29.87
	30	2.5	.015	.250	2	ET30312-25C03	\$29.87



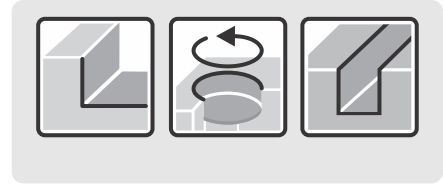
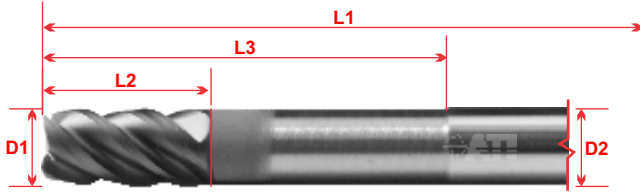
AUTOMATED ultra-precision form grinding. Capable of sub-micron accuracy and incredibly fast production.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

Advanced Tooling, Inc. | 920-753-2420 | advancedtoolinginc.net

DF SERIES

2 AND 4 FLUTE FLAT BOTTOM - CVD DIAMOND COATED END MILL



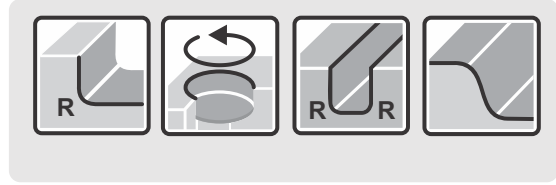
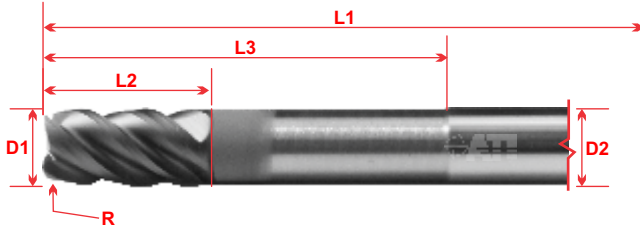
- STANDARD AND EXTENDED REACH with CLEARANCE SHANKS
- VARIABLE FLUTE ALLOWS FOR ACCELERATED FEEDRATES
- H6 TOLERANCE SHANKS

D1	L1	RADIUS	L2	L3	D2	FLUTES	PART #	PRICE
.010"	2	FLAT	.020	.050	.125	2	DFC0102-20D2	\$76.20
	3	FLAT	.020	.050	.125	2	DFC0102-30D2	\$76.20
.015"	3	FLAT	.030	.125	.125	2	DFC0152-30D2	\$68.56
	3	FLAT	.047	.312	.125	2	DFC0152-31D2	\$74.29
.020"	2	FLAT	.050	X	.125	2	DF0202-20D2	\$51.37
	2	FLAT	.050	.187	.125	2	DFC0202-20D2	\$57.10
	2	FLAT	.050	.300	.125	2	DFC0202-21D2	\$66.65
1/32"	2	FLAT	.062	.250	.125	4	DFC0314-20D2	\$43.74
	2	FLAT	.062	.500	.125	4	DFC0314-22D2	\$45.65
	2	FLAT	.062	.625	.125	4	DFC0314-21D2	\$45.65
3/64"	2	FLAT	.125	.500	.125	4	DFC0464-20D2	\$39.15
	2	FLAT	.125	.750	.125	4	DFC0464-21D2	\$42.97
1/16"	2	FLAT	.125	.500	.125	4	DFC0624-20D2	\$39.15
	2	FLAT	.125	.625	.125	4	DFC0624-23D2	\$42.97
	2	FLAT	.125	.750	.125	4	DFC0624-21D2	\$42.97
	2	FLAT	.125	1.00	.125	4	DFC0624-22D2	\$44.88
3/32"	2	FLAT	.250	.750	.125	4	DFC0934-20D2	\$45.84
	3	FLAT	1.00	X	.125	4	DF0934-30D2	\$50.61
1/8"	2	FLAT	.500	X	.125	4	DFV1254-20D2	\$39.15
	2	FLAT	.250	.800	.125	4	DFVC1254-21D2	\$45.84
	3	FLAT	.250	1.00	.125	4	DFVC1254-30D2	\$42.02
3/16"	3	FLAT	.375	1.50	.187	4	DFVC1874-30D4	\$83.71
1/4"	3	FLAT	.500	1.50	.250	4	DFVC2504-30D4	\$106.86
	4	FLAT	1.50	X	.250	4	DFV2504-40D4	\$101.13
	4	FLAT	.500	1.50	.250	4	DFVC2504-40D4	\$114.50
1/2"	3	FLAT	1.00	X	.500	4	DFV5004-30D4	\$181.89

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

DR SERIES

2 AND 4 FLUTE CORNER RADIUS - CVD DIAMOND COATED END MILL



- STANDARD AND EXTENDED REACH with CLEARANCE SHANKS
- VARIABLE FLUTE ALLOWS FOR ACCELERATED FEEDRATES
- H6 TOL. SHANK

D1	L1	RADIUS	L2	L3	D2	FLUTES	PART #	PRICE
1/32"	2	.005	.062	.312	.125	4	DRC0314-20R005D2	\$45.65
1/16"	2	.010	.125	.500	.125	4	DRC0624-20R010D2	\$41.06
	2	.010	.125	.625	.125	4	DRC0624-21R010D2	\$42.97
1/8"	2	.015	.250	.800	.125	4	DRVC1254-21R015D2	\$43.45
	3	.015	.250	1.00	.125	4	DRVC1254-30R015D2	\$43.93
	3	.015	.250	1.50	.125	4	DRVC1254-31R015D2	\$48.70
3/16"	2	.015	.375	X	.187	4	DRV1874-20R015D4	\$82.37
	3	.015	.375	1.50	.187	4	DRVC1874-30R015D4	\$87.53
1/4"	3	.015	.500	1.50	.250	4	DRVC2504-30R015D4	\$110.68
	3	.015	.500	X	.250	4	DRV2504-30R015D4	\$104.95
	4	.015	.500	1.50	.250	4	DRVC2504-40R015D4	\$118.31
3/8"	6	.020	.500	3.00	.375	4	DRVC3754-61R020D4	\$162.34
1/2"	4	.030	1.50	X	.500	4	DRV5004-41R030D4	\$193.50
	6	.020	.500	3.00	.500	4	DRVC5004-60R020D4	\$214.79



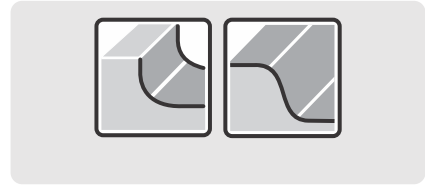
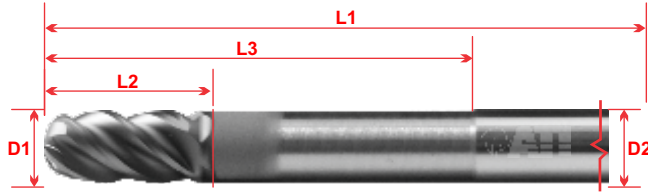
CVD Diamond Coating for extreme wear resistance in non-ferrous metals, carbon/graphite, glass filled plastics and other abrasive materials.

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

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DB SERIES

2 AND 4 FLUTE BALL BOTTOM - CVD DIAMOND COATED END MILL



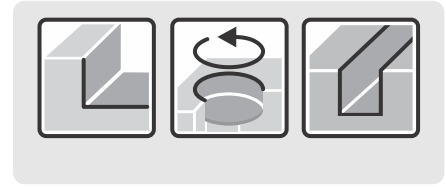
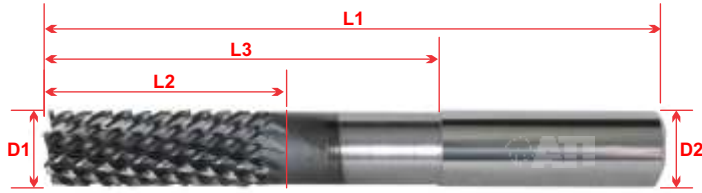
• STANDARD AND EXTENDED REACH with CLEARANCE SHANKS • VARIABLE PITCH ALLOWS FOR ACCELERATED FEED RATES

D1	L1	RADIUS	L2	L3	D2	FLUTES	PART #	PRICE
.010"	2	BALL	.020	.050	.125	2	DBC0102-20D2	\$81.93
	3	BALL	.020	.050	.125	2	DBC0102-30D2	\$81.93
.015"	3	BALL	.030	.125	.125	2	DBC0152-30D2	\$70.47
	3	BALL	.047	.312	.125	2	DBC0152-31D2	\$76.20
.020"	2	BALL	.050	X	.125	2	DB0202-20D2	\$53.28
	2	BALL	.050	.187	.125	2	DBC0202-20D2	\$60.92
	2	BALL	.050	.300	.125	2	DBC0202-21D2	\$70.47
1/32"	2	BALL	.062	.250	.125	4	DBC0314-20D2	\$45.65
	2	BALL	.062	.500	.125	4	DBC0314-22D2	\$45.65
	2	BALL	.062	.625	.125	4	DBC0314-23D2	\$45.65
	3	BALL	.250	X	.125	4	DB0314-32D2	\$41.83
	3	BALL	.062	.625	.125	4	DBC0314-30D2	\$47.56
	3	BALL	.062	.900	.125	4	DBC0314-31D2	\$53.28
3/64"	2	BALL	.125	.500	.125	4	DBC0464-20D2	\$39.15
	2	BALL	.125	.750	.125	4	DBC0464-21D2	\$42.97
	2	BALL	.125	1.00	.125	4	DBC0464-22D2	\$46.79
1/16"	2	BALL	.125	.500	.125	4	DBC0624-20D2	\$41.06
	2	BALL	.125	.625	.125	4	DBC0624-23D2	\$42.97
	2	BALL	.125	.750	.125	4	DBC0624-21D2	\$42.97
	2	BALL	.125	1.00	.125	4	DBC0624-22D2	\$46.79
	3	BALL	.500	X	.125	4	DB0624-30D2	\$43.93
	3	BALL	.125	.750	.125	4	DBC0624-32D2	\$49.66
	3	BALL	.125	1.050	.125	4	DBC0624-33D2	\$49.66
	3	BALL	.125	2.050	.125	4	DBC0624-34D2	\$56.34
	3	BALL	.125	2.050	.125	4	DBC0624-32D2	\$56.34
3/32"	2	BALL	.250	.750	.125	4	DBC0934-20D2	\$46.79
	2	BALL	.250	1.050	.125	4	DBC0934-21D2	\$47.75
	3	BALL	.250	2.050	.125	4	DBC0934-32D2	\$56.34
1/8"	2	BALL	.500	X	.125	4	DBV1254-20D2	\$42.02
	2	BALL	.250	.800	.125	4	DBVC1254-21D2	\$47.75
	3	BALL	1.00	X	.125	4	DBV1254-30D2	\$44.88
	3	BALL	.250	1.00	.125	4	DBVC1254-30D2	\$47.75
	4	BALL	.250	1.50	.125	4	DBVC1254-40D2	\$58.25
	6	BALL	.250	3.125	.125	4	DBVC1254-60D2	\$67.80
3/16"	2	BALL	.375	X	.187	4	DBV1874-20D4	\$82.37
	3	BALL	.375	1.50	.187	4	DBVC1874-30D4	\$87.53
	4	BALL	.187	1.50	.187	4	DBVC1874-40D4	\$95.74
1/4"	3	BALL	.500	1.50	.250	4	DBVC2504-30D4	\$110.68
	4	BALL	.500	1.50	.250	4	DBVC2504-40D4	\$118.31
	4	BALL	.500	2.00	.250	4	DBVC2504-41D4	\$120.22
	6	BALL	.500	3.125	.250	4	DBVC2504-60D4	\$135.50
1/2"	4	BALL	1.50	X	.500	4	DBV5004-40D4	\$193.50
	6	BALL	1.50	3.125	.500	4	DBV5004-60D4	\$214.79

All tools have H6 tolerance shanks unless noted. Weldon flats and / or clearance added upon request.

DP SERIES

CVD DIAMOND COATED ROUGHER



- STANDARD AND EXTENDED REACH with CLEARANCE SHANKS
- VARIABLE PITCH ALLOWS FOR ACCELERATED FEED RATES

D1	L1	L2	L3	D2	FLUTES	PART #	PRICE
3/16"	2.5	.750	/	.187	NA	DP187-30D4	\$84.96
	3	1.00	1.50	.187	NA	DPC187-30D4	\$90.82
1/4"	3	1.25	/	.250	NA	DP250-30D4	\$99.11
	3	.750	1.50	.250	NA	DPC250-30D4	\$103.20
1/2"	4	2.00	/	.500	NA	DP500-40D4	\$255.02
	4	1.25	2.50	.500	NA	DPC500-40D4	\$246.33
	6	.750	4.125	.500	NA	DPC500-60D4	\$286.20



Screw-on Milling Heads ground complete with any cutting geometry.



<< Custom tools for turbine manufacturing



>> Tools for firearms manufacturing



<< Custom step drill - keeping it rigid with stub flutes and straight flute geometry for more aggressive machining and reduced cycle times

ATI BURR DIVISION

Custom burrs to almost any specification.
Almost any shank diameter to head diameter configuration.

- Non-ferrous cut • Standard cut • Aggressive cut
- Extreme aggressive cut • Burned-in sand cut
- Long shank burrs up to 36"
- Flex shank burrs - unlimited length
- Shank diameters: 1/8", 3/16", 1/4", 5/16", 3/8", 1/2"
- Re-conditioning / repairing used and broken burrs



BURR SHAPE REFERENCE



SA		Cylindrical Flat	SH		Flame
SB		Cylindrical Flat with End Cut	SJ		60 Angle
SC		Cylindrical Radius	SK		90 Angle
SD		Spherical	SL		Conical Radius
SE		Elliptical	SM		Conical
SF		Tree Shape Radius	SN		Back Taper
SG		Tree Shape Pointed			

1/4" SHANK BURRS

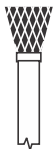
SINGLE & DOUBLE CUT



STYLE	D1	L2	D2	L1	DOUBLE CUT PART #	PRICE
SA-1	.250	.625	.250	2.00	SA-1DC	\$7.04
SA-2	.3125	.750	.250	2.00	SA-2DC	\$10.02
SA-3	.375	.750	.250	2.00	SA-3DC	\$11.01
SA-4	.437	1.00	.250	2.00	SA-4DC	\$14.59
SA-5	.500	1.00	.250	2.00	SA-5DC	\$17.43
SA-6	.625	1.00	.250	2.00	SA-6DC	\$25.05
SA-7	.750	1.00	.250	2.00	SA-7DC	\$32.21
SA-9	1.00	1.00	.250	2.00	SA-9DC	\$51.47
SC-1	.250	.625	.250	2.00	SC-1DC	\$7.62
SC-2	.3125	.750	.250	2.00	SC-2DC	\$10.04
SC-3	.375	.750	.250	2.00	SC-3DC	\$11.76
SC-4	.437	1.00	.250	2.00	SC-4DC	\$15.22
SC-5	.500	1.00	.250	2.00	SC-5DC	\$17.82
SC-6	.625	1.00	.250	2.00	SC-6DC	\$26.62
SC-7	.750	1.00	.250	2.00	SC-7DC	\$33.25
SD-1	.250	.250	.250	2.00	SD-1DC	\$7.76
SD-2	.312	.312	.250	2.00	SD-2DC	\$8.45
SD-3	.375	.375	.250	2.00	SD-3DC	\$9.69
SD-4	.437	.437	.250	2.00	SD-4DC	\$11.41
SD-5	.500	.500	.250	2.00	SD-5DC	\$13.33
SD-6	.625	.625	.250	2.00	SD-6DC	\$19.75
SD-7	.750	.750	.250	2.00	SD-7DC	\$28.22
SD-9	1.00	1.00	.250	2.00	SD-9DC	\$49.02
SE-1	.250	.375	.250	2.00	SE-1DC	\$6.87
SE-3	.375	.625	.250	2.00	SE-3DC	\$10.14
SE-5	.500	.875	.250	2.00	SE-5DC	\$17.47
SE-6	.625	1.00	.250	2.00	SE-6DC	\$26.52
SE-7	.750	1.00	.250	2.00	SE-7DC	\$42.38
SF-1	.250	.625	.250	2.00	SF-1DC	\$7.85
SF-3	.375	.750	.250	2.00	SF-3DC	\$10.95
SF-5	.500	1.00	.250	2.00	SF-5DC	\$13.54
SF-6	.625	1.00	.250	2.00	SF-6DC	\$26.02
SF-7	.750	1.00	.250	2.00	SF-7DC	\$31.63

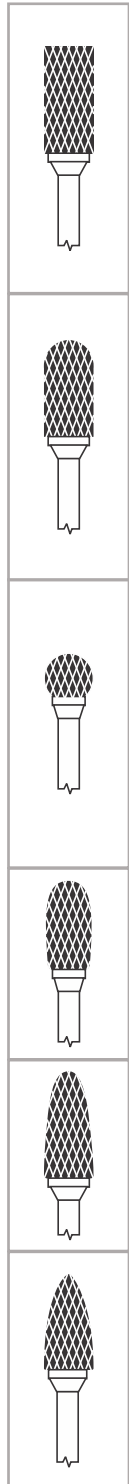
1/4" SHANK BURRS

SINGLE & DOUBLE CUT (CONTINUED)

	STYLE	D1	L2	D2	L1	DOUBLE CUT PART #	PRICE
	SG-1	.250	.625	.250	2.00	SG-1DC	\$7.37
	SG-2	.312	.750	.250	2.00	SG-2DC	\$9.07
	SG-3	.375	.750	.250	2.00	SG-3DC	\$9.83
	SG-5	.500	1.00	.250	2.00	SG-5DC	\$14.47
	SG-6	.625	1.00	.250	2.00	SG-6DC	\$24.59
	SG-7	.750	1.00	.250	2.00	SG-7DC	\$35.46
	SH-2	.312	.750	.250	2.00	SH-2DC	\$10.37
	SH-5	.500	1.25	.250	2.00	SH-5DC	\$19.69
	SH-6	.625	1.437	.250	2.00	SH-6DC	\$32.07
	SH-7	.750	1.625	.250	2.00	SH-7DC	\$43.70
	SJ-2	.312	---	.250	2.00	SJ-2DC	\$7.80
	SJ-3	.375	---	.250	2.00	SJ-3DC	\$8.84
	SJ-5	.500	---	.250	2.00	SJ-5DC	\$11.72
	SJ-6	.625	---	.250	2.00	SJ-6DC	\$19.98
	SJ-7	.750	---	.250	2.00	SJ-7DC	\$28.32
	SJ-9	1.00	---	.250	2.00	SJ-9DC	\$44.01
	SK-3	.375	---	.250	2.00	SK-3DC	\$8.80
	SK-5	.500	---	.250	2.00	SK-5DC	\$11.20
	SK-6	.625	---	.250	2.00	SK-6DC	\$19.27
	SK-7	.750	---	.250	2.00	SK-7DC	\$26.56
	SK-9	1.00	---	.250	2.00	SK-9DC	\$39.89
	SL-1	.250	.625	.250	2.00	SL-1DC	\$9.98
	SL-2	.312	.875	.250	2.00	SL-2DC	\$10.50
	SL-3	.375	1.062	.250	2.00	SL-3DC	\$12.71
	SL-4	.500	1.125	.250	2.00	SL-4DC	\$17.62
	SL-6	.625	1.312	.250	2.00	SL-6DC	\$27.43
	SM-1	.250	.500	.250	2.00	SM-1DC	\$7.54
	SM-4	.375	.625	.250	2.00	SM-4DC	\$9.46
	SM-5	.500	.875	.250	2.00	SM-5DC	\$12.92
	SN-2	.375	.375	.250	2.00	SN-2DC	\$9.03
	SN-3	.500	.500	.250	2.00	SN-3DC	\$12.34
	SN-6	.625	.750	.250	2.00	SN-6DC	\$19.21
	SN-7	.750	.625	.250	2.00	SN-7DC	\$22.63

1/4" X 6" SHANK BURRS

SINGLE & DOUBLE CUT



STYLE	D1	L2	D2	L1	DOUBLE CUT PART #	PRICE
SA-1	.250	.625	.250	6.00	SA-1DC-XL	\$12.11
SA-2	.312	.750	.250	6.00	SA-2DC-XL	\$14.86
SA-3	.375	.750	.250	6.00	SA-3DC-XL	\$15.90
SA-4	.437	1.00	.250	6.00	SA-4DC-XL	\$19.67
SA-5	.500	1.00	.250	6.00	SA-5DC-XL	\$22.32
SA-6	.625	1.00	.250	6.00	SA-6DC-XL	\$24.80
SC-1	.250	.625	.250	6.00	SC-1DC-XL	\$12.69
SC-2	.312	.750	.250	6.00	SC-2DC-XL	\$14.49
SC-3	.375	.750	.250	6.00	SC-3DC-XL	\$16.64
SC-4	.437	1.00	.250	6.00	SC-4DC-XL	\$19.67
SC-5	.500	1.00	.250	6.00	SC-5DC-XL	\$22.71
SC-6	.625	1.00	.250	6.00	SC-6DC-XL	\$25.23
SD-1	.250	.250	.250	6.00	SD-1DC-XL	\$12.63
SD-2	.312	.312	.250	6.00	SD-2DC-XL	\$13.97
SD-3	.375	.375	.250	6.00	SD-3DC-XL	\$15.53
SD-4	.437	.437	.250	6.00	SD-4DC-XL	\$17.20
SD-5	.500	.500	.250	6.00	SD-5DC-XL	\$18.24
SD-6	.625	.625	.250	6.00	SD-6DC-XL	\$24.32
SE-1	.250	.375	.250	6.00	SE-1DC-XL	\$12.26
SE-3	.375	.625	.250	6.00	SE-3DC-XL	\$15.11
SE-5	.500	.875	.250	6.00	SE-5DC-XL	\$23.29
SE-6	.625	1.00	.250	6.00	SE-6DC-XL	\$31.57
SF-1	.250	.625	.250	6.00	SF-1DC-XL	\$12.92
SF-3	.375	.750	.250	6.00	SF-3DC-XL	\$15.84
SF-5	.500	1.00	.250	6.00	SF-5DC-XL	\$21.32
SF-6	.625	1.00	.250	6.00	SF-6DC-XL	\$35.19
SG-1	.250	.625	.250	6.00	SG-1DC-XL	\$12.44
SG-2	.312	.750	.250	6.00	SG-2DC-XL	\$13.87
SG-3	.375	.750	.250	6.00	SG-3DC-XL	\$14.72
SG-5	.500	1.00	.250	6.00	SG-5DC-XL	\$19.36
SG-6	.625	1.00	.250	6.00	SG-6DC-XL	\$30.43

1/4" X 6" SHANK BURRS

SINGLE & DOUBLE CUT (CONTINUED)

	STYLE	D1	L2	D2	L1	DOUBLE CUT PART #	PRICE
	SH-2	.312	.750	.250	6.00	SH-2DC-XL	\$14.88
	SH-5	.500	1.25	.250	6.00	SH-5DC-XL	\$24.57
	SH-6	.625	1.4375	.250	6.00	SH-6DC-XL	\$34.16
	SJ-2	.312	---	.250	6.00	SJ-2DC-XL	\$11.39
	SJ-3	.375	---	.250	6.00	SJ-3DC-XL	\$12.42
	SJ-5	.500	---	.250	6.00	SJ-5DC-XL	\$15.53
	SK-3	.375	---	.250	6.00	SK-3DC-XL	\$11.90
	SK-5	.500	---	.250	6.00	SK-5DC-XL	\$15.01
	SL-1	.250	.625	.250	6.00	SL-1DC-XL	\$13.97
	SL-2	.312	.875	.250	6.00	SL-2DC-XL	\$15.01
	SL-3	.375	1.062	.250	6.00	SL-3DC-XL	\$17.62
	SL-4	.500	1.125	.250	6.00	SL-4DC-XL	\$22.50
	SM-1	.250	.500	.250	6.00	SM-1DC-XL	\$10.45
	SM-4	.375	.625	.250	6.00	SM-4DC-XL	\$13.77
	SM-5	.500	.875	.250	6.00	SM-5DC-XL	\$19.15
	SN-2	.375	.375	.250	6.00	SN-2DC-XL	\$13.04
	SN-3	.500	.500	.250	6.00	SN-3DC-XL	\$16.56



FLEX SHANK BURRS made to most any head configuration and length.

Recommended Speeds & Feeds for Variable Endmills 1 of 2

			Radial WOC up to 10% of dia.									Radial WOC 10%-30% of tool dia.							
			Feed Rate, IPT (Inch per Tooth)									Feed Rate, IPT (Inch per Tooth)							
Material	Hardness R/C	Starting SFM	Endmill Diameter								Starting SFM	Endmill Diameter							
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	1400	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1300-750	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0013	.003	.004	.005	.006	.007	.009	.011		.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									700-400								
			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
			.0013	.003	.004	.005	.006	.007	.009	.011		.001	.0025	.0032	.004	.0047	.0055	.007	.0085
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	500-300	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0011	.0027	.0035	.004	.005	.006	.0078	.0087		.0009	.002	.0028	.0033	.004	.0047	.006	.007
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
			.0007	.0016	.0023	.0027	.0034	.0046	.0055	.007		.0005	.0012	.0018	.002	.0027	.0036	.0043	.0054
	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
			.0005	.0009	.0016	.0025	.0028	.004	.0046	.006		.0004	.0007	.0012	.0018	.0022	.003	.0036	.0045
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	750	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	750-450	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0014	.0033	.004	.004	.0047	.007	.0092	.011		.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	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	500-300	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0011	.0028	.0035	.0043	.005	.006	.007	.085		.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	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	450-250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.011	.0023	.0028	.0037	.0042	.0055	.0065	.0085		.0009	.0018	.0022	.0029	.0033	.0044	.005	.0067
High Temp Alloys Inconel, Monel, Hastelloy	Up to 42 RC	125	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	110	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0007	.0016	.0023	.0027	.0035	.0046	.0055	.007		.0005	.0012	.0018	.0022	.0027	.0036	.0043	.0055
Titanium	Up to 42 RC	375	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	375-275	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0011	.0028	.0035	.0043	.005	.006	.007	.085		.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	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1200-800	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0015	.0035	.0042	.0052	.0062	.0072	.0095	.011		.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	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	700-450	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0015	.0035	.0042	.0052	.0062	.0072	.0095	.011		.0011	.0026	.0035	.0042	.005	.0055	.0075	.0085
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	1500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0025	.0055	.007	.0085	.011	.014	.016	.022		.002	.0045	.0055	.0065	.0085	.0105	.0125	.0165
Cast Aluminum High Silicon A380, Castings	Over 3% Si	1500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1500-1200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.0045	.0055	.0065	.0085	.011	.0125	.017		.0015	.0035	.0045	.0055	.007	.0085	.010	.013
Magnesium	——	1700	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1700-900	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0015	.0035	.0045	.005	.007	.009	.010	.014		.001	.003	.0035	.004	.005	.007	.008	.010
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	1200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1200-650	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0015	.0025	.003	.004	.005	.0065	.008	.011		.001	.002	.003	.004	.005	.006	.007	.009

Recommended Speeds & Feeds for Variable Endmills 2 of 2

			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		.0005	.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

Recommended Speeds & Feeds for Spot Drills

		Starting SFM	<i>Feed Rate, IPR (Inch per Revolution)</i>							
Material	Hardness R/C	Starting SFM								
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0025	.004	.005	.006	.007	.008	.010	.012
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	200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.003	.004	.005	.006	.007	.009	.011
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	150	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0015	.0025	.003	.004	.0045	.005	.006	.008
Hardened Steels Hardened Carbon Steels and Tool Steels	42-54 RC	75	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.001	.002	.0025	.003	.004	.005	.006	.007
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	125	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0025	.004	.005	.006	.007	.008	.010	.012
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	100	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.003	.004	.005	.006	.007	.009	.010
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	85	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.003	.004	.005	.006	.007	.009	.010
High Temp Alloys Inconel, Monel, Hastelloy	Up to 42 RC	50	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.001	.002	.003	.004	.0045	.005	.0065	.008
Titanium	Up to 42 RC	65	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.003	.0035	.0045	.005	.006	.0075	.009
Gray Cast Iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	———	325	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0025	.004	.005	.0055	.0065	.008	.010	.0125
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	———	250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.0035	.004	.005	.006	.007	.009	.011
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	750	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.005	.008	.009	.011	.012	.016	.020	.025
Cast Aluminum High Silicon A380, Castings	Over 3% Si	500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.004	.006	.008	.010	.011	.013	.016	.020
Magnesium	———	600	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.003	.005	.006	.007	.008	.009	.011	.014
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	450	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.003	.005	.006	.007	.008	.010	.012	.016

Recommended Speeds & Feeds for Drill Mills

		Milling									Chamfering								
		Feed Rate, IPT (Inch per Tooth)									Feed Rate, IPT (Inch per Tooth)								
Material	Hardness R/C	Starting SFM	Drill Mill Diameter								Starting SFM	Drill Mill Diameter							
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	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	.0015	.0018	.0023	.0026	.003	.004	.005		.0006	.0013	.0015	.0018	.0025	.0031	.004	.0052
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	300									350								
			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
			.0006	.0015	.0018	.0023	.0026	.003	.004	.005		.0005	.0011	.0014	.0017	.0023	.0028	.0034	.0045
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 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
			.0005	.0012	.0015	.0018	.0023	.0027	.0035	.004		.0006	.0013	.0015	.002	.0025	.003	.004	.005
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 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
			.0006	.0015	.0018	.0023	.0026	.003	.004	.005		.0006	.0011	.0016	.0021	.0028	.0033	.0041	.0055
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	225	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
			.0005	.0012	.0015	.0018	.0023	.0027	.0035	.004		.0002	.0007	.001	.0012	.0016	.002	.0024	.003
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	200	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
			.0005	.001	.0012	.0016	.0018	.0025	.0028	.0038		.0006	.0012	.0016	.0019	.0025	.003	.0037	.0048
Gray Cast Iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	————	400	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	900	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0015	.0018	.0023	.0026	.003	.004	.005		.0012	.0025	.003	.0035	.005	.006	.007	.009
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	————	300	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	600	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0015	.0018	.0023	.0026	.003	.004	.005		.001	.002	.0025	.003	.004	.005	.0065	.0075
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	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
			.001	.0023	.003	.0035	.0045	.006	.007	.009		.0012	.0025	.003	.0035	.005	.006	.007	.009
Cast Aluminum High Silicon A380, Castings	Over 3% Si	750	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
			.0008	.0018	.0023	.0028	.0036	.0046	.0055	.0075		.0014	.0028	.0035	.0042	.0055	.007	.0085	.011
Magnesium	————	700	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0006	.0015	.002	.0023	.003	.004	.0045	.006		.0012	.0025	.003	.0035	.0045	.006	.007	.0095
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	500	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
			.0005	.001	.0015	.002	.0025	.003	.0035	.005		.001	.002	.0025	.003	.004	.005	.006	.007

** Use OD of tool for all speed and feed calculations.

** If milling axial DOC exceeds .5 x dia, reduce IPT or radial DOC by 50%.

** Drilling - use milling IPT. Please note feed is listed as inches per tooth, not inches per rev.

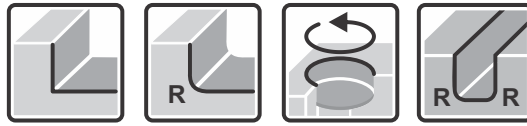
** Calculate all drilling with 2 flutes. Even the 4 flute style since only 2 flutes are effective when drilling.

** Please note speeds and feeds are approximate values and can vary greatly depending on cutting situations.

Recommended Speeds & Feeds for Carbide Chamfer Mills

			Parameters for Edge break up to 20% of tool dia.								Parameters for chamfer larger than 20% of tool dia.								
			Starting SFM	Chamfer Mill Diameter								Starting SFM	Chamfer Mill Diameter						
Material	Hardness R/C	Feed Rate, IPT (Inch per Tooth)								Feed Rate, IPT (Inch per Tooth)									
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	650	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	600-500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.001	.0017	.002	.0025	.0035	.0042	.005	.007		.0006	.0013	.0015	.0018	.0025	.0031	.004	.0052
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	450									400-300								
			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
			.0007	.0015	.0018	.0023	.0031	.0037	.0045	.006		.0005	.0011	.0014	.0017	.0023	.0028	.0034	.0045
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	350	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	300-200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0008	.0015	.002	.0025	.0032	.004	.005	.0065	.0006	.0013	.0015	.002	.0025	.003	.004	.005	
Hardened Steels Hardened Carbon Steels and Tool Steels	42-54 RC	200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	150-100	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0005	.0011	.0016	.0021	.0027	.0034	.0042	.005	.0003	.0008	.0012	.0017	.0022	.003	.0038	.0045	
	54-65 RC	150	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	150-100	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0004	.0008	.0011	.0016	.002	.0025	.003	.0035									
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	450-350	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0008	.0015	.002	.0025	.0032	.004	.005	.0065	.0006	.0011	.0016	.0021	.0028	.0033	.0041	.0055	
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	250	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	200-150	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0005	.001	.0012	.0015	.002	.0025	.003	.0035	.0002	.0007	.001	.0012	.0016	.002	.0024	.003	
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	350	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	300-200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0008	.0015	.002	.0025	.003	.0036	.0043	.006	.0006	.0012	.0016	.0019	.0025	.003	.0037	.0048	
High Temp Alloys Inconel, Monel, Hastelloy	Up to 42 RC	75	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	50	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0004	.0009	.001	.0014	.0018	.0023	.0027	.0036	.0002	.0005	.0007	.0009	.0011	.0014	.0017	.0023	
Titanium	Up to 42 RC	150	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	125-100	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0005	.0009	.0012	.0015	.002	.0025	.003	.0038	.0003	.0006	.0008	.0009	.0012	.0015	.0018	.0025	
Gray Cast Iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	—	1200	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1100-900	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.004	.005	.006	.0075	.0095	.012	.015	.0012	.0025	.003	.0035	.005	.006	.007	.009	
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	—	750	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	700-500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.0015	.0035	.0042	.0052	.0062	.0072	.0095	.011	.001	.002	.0025	.003	.004	.005	.0065	.0075	
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	1100	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
			.002	.004	.005	.006	.0075	.0095	.012	.015	.0012	.0025	.003	.0035	.005	.006	.007	.009	
Cast Aluminum High Silicon A380, Castings	Over 3% Si	750	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
			.0018	.0035	.0043	.0052	.007	.0085	.010	.0135	.0014	.0028	.0035	.0042	.0055	.007	.0085	.011	
Magnesium	—	1500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	1500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1
			.002	.004	.005	.0055	.0075	.0095	.011	.015	.0012	.0025	.003	.0035	.0045	.006	.007	.0095	
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	600	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
			.0015	.003	.004	.0045	.006	.0075	.009	.012	.001	.002	.0025	.003	.004	.005	.006	.007	

Recommended Speeds & Feeds for Roughing Endmills



Material	Hardness R/C	Starting SFM	Feed Rate, IPT (Inch per Tooth)								Starting SFM	Feed Rate, IPT (Inch per Tooth)							
		Radial WOC 30%-50% of tool dia.	Endmill Diameter								Slotting	Endmill Diameter							
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	600-350	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
			.0005	.0013	.0016	.002	.0023	.0027	.0036	.0042		.0005	.0013	.0016	.002	.0023	.0027	.0036	.0042
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	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
			.0005	.0013	.0016	.002	.0023	.0027	.0036	.0042		.0005	.0013	.0016	.002	.0023	.0027	.0036	.0042
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
			.0003	.001	.0012	.0015	.002	.0023	.0028	.0034		.0003	.001	.0012	.0015	.002	.0023	.0028	.0034
Gray Cast Iron ASTM A48, Class 20, 25, 30, 35, SAE J431C, Grades G1800, G3000, G3500, GG10, 15, 20, 25, 30, 35, 40	—	350	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
			.0005	.0013	.0016	.002	.0023	.0027	.0036	.0042		.0005	.0013	.0016	.002	.0023	.0027	.0036	.0042
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	—	250	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
			.0003	.001	.0012	.0015	.002	.0023	.0028	.0034		.0003	.001	.0012	.0015	.002	.0023	.0028	.0034



Screw-on milling heads - manufactured complete with any cutting geometry.

Recommended Speeds & Feeds for Standard Endmills 1 of 2

		Endmill Diameter Feed Rate, IPT (Inch per Tooth)									Endmill Diameter Feed Rate, IPT (Inch per Tooth)										
Material	Hardness R/C	Starting SFM Radial WOC up to 10% of tool dia.									Starting SFM Radial WOC up to 10%-30% of tool dia.										
		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	650	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		
			0.0008	0.0015	0.002	0.0023	0.0033	0.0039	0.0048	0.0063		.0005	.001	.0013	.0015	.0022	.0026	.0032	.0042		
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	550										425									
			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		
			0.0008	0.0015	0.002	0.0023	0.0033	0.0039	0.0048	0.0063	.0005		.001	.0013	.0015	.0022	.0026	.0032	.0042		
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	500	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	359	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			0.0008	0.0015	0.0020	0.0023	0.0033	0.0039	0.0048	0.0063		.0005	.001	.0013	.0015	.0022	.0026	.0032	.0042		
Hardened Steels Hardened Carbon Steels and Tool Steels	42-54 RC	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA			
	54-62 RC	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA			
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 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		
			0.0003	0.0008	0.0011	0.0015	#####	0.0027	0.0032	0.0005		.0002	.0005	.0007	.001	.0014	.0018	.0021	.0003		
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 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		
			0.0002	0.0005	0.0008	0.0012	0.0015	0.0021	0.0027	0.0038		.0001	.0003	.0005	.0008	.001	.0014	.0018	.0025		
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	200	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		
			0.0002	0.0005	0.0008	0.0012	0.0015	0.0021	0.0027	0.0030		.00015	.0003	.0005	.0008	.001	.0014	.0018	.002		
High Temp Alloys Inconel, Monel, Hastelloy	Up to 42 RC	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA			
Titanium	Up to 42 RC	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	NA	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA			
Gray Cast Iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	—	500	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		
			0.0006	0.0011	0.0015	0.0018	0.0027	0.0033	0.0045	0.0054		.0004	.0007	.001	.0012	.0018	.0022	.003	.0036		
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	—	450	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		
			0.0006	0.0009	0.0015	0.0018	0.0023	0.0030	0.0036	0.0045		.0004	.0006	.001	.0012	.0015	.002	.0024	.003		
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	1100	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	900	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			0.0012	0.0020	0.0030	0.0035	0.0045	0.0060	0.0068	0.0090		.0008	.0013	.002	.0023	.003	.004	.0045	.006		
Cast Aluminum High Silicon A380, Castings	Over 3% Si	800	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	650	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			0.0008	0.0017	0.0023	0.0032	0.0039	0.0053	0.0060	0.0075		.0005	.0011	.0015	.0021	.0026	.0035	.004	.005		
Magnesium	—	650	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	650	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			0.0008	0.0017	0.0023	0.0032	0.0039	0.0053	0.0060	0.0075		.0005	.0011	.0015	.0021	.0026	.0035	.004	.005		
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	900	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1	900	1/8	1/4	5/16	3/8	1/2	5/8	3/4	1		
			0.0008	0.0014	0.0017	0.0026	0.0030	0.0038	0.0048	0.0068		.0005	.0009	.0011	.0017	.002	.0025	.0032	.0045		

Recommended Speeds & Feeds for Standard Endmills 2 of 2

		Endmill Diameter Feed Rate, IPT (Inch per Tooth) Starting SFM Radial WOC up to 30%-50% of tool dia.									Endmill Diameter Feed Rate, IPT (Inch per Tooth) Starting SFM Slotting								
Material	Hardness R/C		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	450									NA								
			.0005	.001	.0013	.0015	.0022	.0026	.0032	.0042		NA	NA	NA	NA	NA	NA	NA	NA
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									NA								
			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
			.0005	.001	.0013	.0015	.0022	.0026	.0032	.0042		NA	NA	NA	NA	NA	NA	NA	NA
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	300									NA								
			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
			.0005	.001	.0013	.0015	.0022	.0026	.0032	.0042		NA	NA	NA	NA	NA	NA	NA	NA
Hardened Steels Hardened Carbon Steels and Tool Steels	42-54 RC	NA									NA								
			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
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
	54-62 RC	NA									NA								
			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
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	275									NA								
			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
			.0002	.0005	.0007	.001	.0014	.0018	.0021	.0003		NA	NA	NA	NA	NA	NA	NA	NA
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	200									NA								
			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
			.0001	.0003	.0005	.0008	.001	.0014	.0018	.0025		NA	NA	NA	NA	NA	NA	NA	NA
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	150									NA								
			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
			.00015	.0003	.0005	.0008	.001	.0014	.0018	.002		NA	NA	NA	NA	NA	NA	NA	NA
High Temp Alloys Inconel, Monel, Hastelloy	Up to 42 RC	NA									NA								
			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
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Titanium	Up to 42 RC	NA									NA								
			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
			NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
Gray Cast Iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	——	350									NA								
			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
			.0004	.0007	.001	.0012	.0018	.0022	.003	.0036		NA	NA	NA	NA	NA	NA	NA	NA
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	——	300									NA								
			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
			.0004	.0006	.001	.0012	.0015	.002	.0024	.003		NA	NA	NA	NA	NA	NA	NA	NA
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	850									NA								
			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
			.0008	.0013	.002	.0023	.003	.004	.0045	.006		NA	NA	NA	NA	NA	NA	NA	NA
Cast Aluminum High Silicon A380, Castings	Over 3% Si	500									NA								
			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
			.0005	.0011	.0015	.0021	.0026	.0035	.004	.005		NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	——	350									NA								
			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
			.0005	.0011	.0015	.0021	.0026	.0035	.004	.005		NA	NA	NA	NA	NA	NA	NA	NA
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	600									NA								
			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
			.0005	.0009	.0011	.0017	.002	.0025	.0032	.0045		NA	NA	NA	NA	NA	NA	NA	NA

Recommended Speeds & Feeds for Carbide Corner Rounding Tools

		Starting SFM	Feed Rate, IPR <i>(Inch per Revolution)</i>								
Material	Hardness R/C		Corner Rounder Programmable Dia								
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	500	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.001	.0013	.0015	.0017	.0018	.0019	.0021	.0022	.0024
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	400									
			0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0008	.001	.0012	.0013	.0015	.0016	.0017	.0018	.0021
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	300	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0004	.0005	.0006	.0009	.0011	.0013	.0015	.0016	.0019
Hardened Steels Hardened Carbon Steels and Tool Steels	45-65 RC	100	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0003	.0004	.0005	.0006	.0007	.0008	.0009	.001	.0011
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	300	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.001	.0011	.0012	.0013	.0015	.0016	.0018	.002	.0022
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	250	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0008	.001	.0011	.0012	.0014	.0015	.0017	.0018	.002
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	200	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0005	.0006	.0007	.0008	.0009	.001	.0011	.0013	.0015
High Temp Alloys Inconel, Monel, Hastelloy	Up to 42 RC	75	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.00035	.0004	.00045	.0005	.00055	.0006	.0007	.0009	.001
Titanium	Up to 42 RC	200	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0006	.00065	.0007	.00076	.00085	.0009	.001	.0011	.0012
Gray Cast Iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	————	500	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0012	.0015	.0017	.0019	.0021	.0023	.0026	.0028	.003
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	————	400	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0008	.001	.0012	.0013	.0015	.0016	.0017	.0018	.0021
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	750	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0022	.0025	.0028	.0032	.0036	.0038	.0042	.0045	.005
Cast Aluminum High Silicon A380, Castings	Over 3% Si	600	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0021	.0023	.0026	.0028	.0031	.0034	.0038	.004	.0045
Magnesium	————	1000	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0022	.0025	.0028	.0032	.0036	.0038	.0042	.0045	.005
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	500	0.210	0.225	0.275	0.305	0.335	0.365	0.400	0.430	0.460
			.0018	.002	.0022	.0025	.0027	.003	.0033	.0037	.004

- Programmable diameter is determined by the tools tip diameter added to the tool radius.
- Speeds and Feeds are based on tool at full axial depth and taking 2 radial passes, with first radial pass at 70% and second radial pass at 30%.
 - For rounding both sides of a slot simultaneously, reduce IPT by 60%-70%.
 - Adding more passes will allow for increased feed rates.
 - For better surface finish, increase SFM in 10% increments.

Recommended Speeds & Feeds for High Feed Endmills



Material	Hardness R/C	Starting SFM	Feed Rate, IPT (Inch per Tooth)				Starting SFM	Feed Rate, IPT (Inch per Tooth)			
		Radial WOC up to 60% tool dia.	Endmill Diameter				Slotting	Endmill Diameter			
Low Carbon Steel 1006, 1008, 1018, 1020, 1022, 1025, 1117, 1140, 1215, 1330	Up to 30	750-1000	3/16	1/4	3/8	1/2	750-1000	3/16	1/4	3/8	1/2
			.025	.028	.030	.035		.013	.014	.015	.016
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	700-900	3/16	1/4	3/8	1/2	700-900	3/16	1/4	3/8	1/2
			.020	.022	.026	.030		.010	.011	.013	.015
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	500-750	3/16	1/4	3/8	1/2	500-750	3/16	1/4	3/8	1/2
			.020	.022	.026	.030		.010	.011	.013	.015
Stainless Steels 300 Series	29-40 RC	600-750	3/16	1/4	3/8	1/2	600-750	3/16	1/4	3/8	1/2
			.020	.022	.026	.030		.010	.011	.013	.015
Stainless Steels 400 Series	20-40 RC	600-800	3/16	1/4	3/8	1/2	600-800	3/16	1/4	3/8	1/2
			.025	.028	.030	.035		.013	.014	.015	.016
Gray Cast Iron ASTM A48, Class 20,25,30,35, SAE J431C, Grades G1800,G3000,G3500, GG10,15,20,25,30,35,40	—	700-800	3/16	1/4	3/8	1/2	700-800	3/16	1/4	3/8	1/2
			.040	.042	.044	.046		.020	.021	.022	.023
Ductile Cast Iron 60-40-18, 65-45-12, D40148, D4512, 32510, 35108, M3210, M4504, M5503, 2502, 300, 350, 400, 450	—	450-600	3/16	1/4	3/8	1/2	450-600	3/16	1/4	3/8	1/2
			.020	.022	.026	.030		.010	.011	.013	.015

- Axial depth of cut 2.5% - 5.0% of the tool diameter.
- Programmable radius based on tool diameter. REFER TO CATALOG PAGE **
 - Ramp Angle 1-2 degrees.
- Reduce feed per tooth up to 30% for long version of each tool.

TROUBLESHOOTING AND MILLING STRATEGIES

Surface finish quality

If surface finish quality is sub-par or does not meet specifications

- Review/improve workpiece holding and tool holding
- Reduce feed rate (IPM)
- Increase cutting speed (RPM)
- Review tool selection / switch to tool better suited for finish requirements

Vibration

Excessive tool wear, poor surface finish, loud audible tool noise, and poor dimensional accuracy

- Review/improve workpiece holding and tool holding
- Increase feed rate (IPM)
- Decrease cutting speed (RPM)
- Review milling strategy.
ie: Climb vs conventional milling, or WOC / DOC
- Review tool selection.
ie: Number of teeth, helix angle, etc.

Chip congestion / Tool breakage

Insufficient chip evacuation, chipping on cutting edges, or edge build-up resulting in poor tool life or breakage

- Review delivery method of coolant / air
- Increase / adjust coolant flow
- Reduce feed rate (IPM)
- Review tool selection.
ie: Number of teeth, helix angle, etc.

Feed rate adjustments for extended DOC

When extended DOC is used, adjustment of the feed rate may be necessary to avoid deflection, chatter, and poor surface finish

- if DOC = 1xD, use feed rate per recommended values
- if DOC = 2xD, reduce feed rate 50%
- if DOC = 3xD, reduce feed rate 75%
- Cutting speed (SFM) can remain unchanged up to DOC of 3xD

Feed rate adjustments for Ramping & Plunging

Feed rates should be adjusted for ramping and plunging applications

- On a 90 degree vertical plunge with center cutting endmill reduce feed rate 70%
- Ramping with ramp angles 1-15 degrees, use normal recommended feed rates
- Ramping with angles from 15-30 degrees, reduce feed rate by 30%
- Helical plunging reduce feed rate by 15% with .100-.200 DOC per revolution

Entry in Hard Material

Feed rates should be adjusted into material over 44 RC

- Arcing into the cut is always recommended if possible
- When arc entry is not possible, see recommendation for feed reduction below:
 - When WOC is 1xD, reduce feed 50% until tool is engaged
 - When WOC is .5xD, reduce feed 30% until tool is engaged
 - When WOC is .25xD, reduce feed 20% until tool is engaged

CONVERSIONS

Inch

SFM	Surface Feet per Minute	$SFM = RPM \times D / 3.82$
RPM	Revolutions Per Minute	$RPM = 3.82 \times SFM / DIA$
IPT	Inches Per Tooth	$IPT = IPM / (Z \times RPM)$
IPM	Inches Per Minute	$IPM = IPT \times Z \times RPM$
CIM	Cubic Inches per Minute	$CIM = Feed \times WOC \times DOC$

D = Tool Diameter Z = Number of flutes
WOC = Width Of Cut DOC = Depth Of Cut

Metric

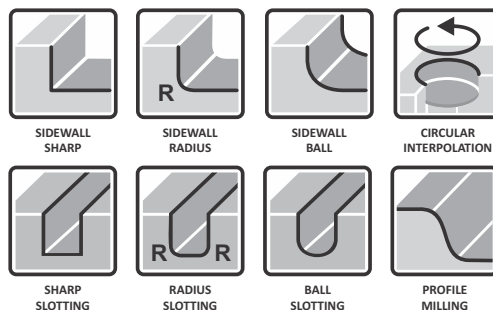
Vc	Surface Meters per minute	$Vc = 3.1416 \times D \times n / 1000$
n	Revolutions per minute	$n = Vc \times 1000 / 3.1416 \times D$
fz	Feed per tooth	$fz = vf / n \times z$
Vf	Millimeters per minute	$vf = (n) \times (z) \times (fz)$

D = Tool Diameter (mm) Z = Number of flutes

Conversion Formulas

Inch to mm	Inch number x 25.4
mm to Inch	mm number x .03937

PROFILE THUMBNAILS:





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