

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

2019-1



ADVANCED TOOLING, INC.
TOOL & CUTTER DESIGN & MANUFACTURING

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CUTTING -EDGE TECHNOLOGY

Advanced Tooling, Inc. is committed to stay on the “Cutting Edge” of technology. We have over 40 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 21 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 4 linear ANCA grinders, 2 linear WALTER grinders, and have just installed our first linear ROLLOMATIC.

ATI has 3 off-line wheel dressers to maintain the diamond wheels used in the grinding process. We’ve recently added our second 21 vessel TRANSOR filtration system 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 dressings are offered for added value and longevity.

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

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ATI also stocks the following lines of tools:

- drill mills • chamfer mills • corner rounding end mills • engraving mills • extended reach tapered shank
- ball and bull nose mills • spot drills • milling tools for exotic materials • standard 2 and 4 flute endmills
- extra length 2 and 4 flute endmills

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



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 Ave
Waukesha, WI 53186
414.800.4049
- Go to the website: www.advancedtoolinginc.net for special tooling /RFQ forms.

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, 2%/10 days
- Accounts not paid within the terms are subject to a 2% monthly finance charge.
- Visa / Mastercard accepted.



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 on the same state-of-the-art grinders that the tooling was originally made on. 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" over all length and has 1.00" 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.



SW SERIES

STANDARD & CLEARANCE SHANK
H6 TOL. SHANK



SIDE WALLS
* UP TO 60 HRC



TRUE STRAIGHT WALL GEOMETRY - FLAT BOTTOM

- RIGID FLUTE HEAVY CORE - HIGH HELIX & VARIABLE FLUTE FOR STRAIGHT WALLS WITH EXCELLENT FINISH
- SMOOTH CUTTING EDGES AND FLUTES - CHIPS FLOW FROM CRITICAL CUTTING ZONES INCREASING TOOL LIFE AND FINISH
- NANO COATING TECHNOLOGY - EXTREME HEAT AND WEAR RESISTANCE

DIAMETER	OAL	LOC / EFFEC.	SHANK	FLUTES	PART #	PRICE
.005	2	.025	.125	2	SW0052-20C03	\$54.81
.010	2	.045	.125	2	SW0102-20C03	\$44.51
1/64"	2	.050	.125	4	SW0154-20C03	\$34.20
	2	.030 / .250	.125	4	SWC0154-21C03	\$44.51
.020	2	.075	.125	4	SW0204-20C03	\$28.02
1/32"	2	.100	.125	4	SW0314-20C03	\$16.57
	2	.100 / .500	.125	4	SWC0314-20C03	\$23.90
3/64"	2	.150	.125	4	SW0464-20C03	\$16.57
	2	.200 / .400	.125	4	SWC0464-20C03	\$23.90
1/16"	2	.250	.125	4	SW0624-20C03	\$16.57
	2	.200 / .400	.125	4	SWC0624-20C03	\$23.90
	3	.200 / .600	.125	4	SWC0624-30C03	\$26.11
5/64"	2	.250	.125	4	SW0784-20C03	\$16.57
	2	.450	.125	4	SW0784-21C03	\$16.57
3/32"	2	.375	.125	4	SW0934-20C03	\$18.46
	3	1.00	.125	4	SW0934-30C03	\$19.64
1/8"	2	.500	.125	5	SW1255-20C03	\$18.46
	3	.500	.125	5	SW1255-30C03	\$19.64
	4	.750	.125	4	SW1254-40C03	\$24.60
	6	1.00	.125	4	SW1254-60C03	\$41.70
5/32"	2	.625	.187	5	SW1565-20C03	\$17.29
	2	.625 / .875	.187	5	SWC1565-21C03	\$24.46
3/16"	2	.625	.187	5	SW1875-20C03	\$20.13
	3	.750	.187	5	SW1875-30C03	\$22.69
	4	1.00	.187	5	SW1875-40C03	\$26.58
	6	1.25	.187	5	SW1875-60C03	\$33.59
13/64"	3	1.00	.250	5	SW2035-30C03	\$31.46
7/32"	3	.800	.250	5	SW2185-30C03	\$31.46
1/4"	2.5	.800	.250	5	SW2505-25C03	\$27.42
	3	.800	.250	5	SW2505-30C03	\$27.42
	4	1.00	.250	5	SW2505-40C03	\$30.04
	4	1.5	.250	5	SW2505-41C03	\$33.83
	6	1.5	.250	5	SW2505-60C03	\$39.68

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SW SERIES (continued)



DIAMETER	OAL	LOC / EFFEC.	SHANK	FLUTES	PART #	PRICE
5/16"	3	.900	.312	5	SW3125-30C03	\$39.97
	4	1.5	.312	5	SW3125-40C03	\$48.38
	4	1.125	.312	5	SW3125-41C03	\$48.38
	6	1.5	.312	5	SW3125-60C03	\$57.01
3/8"	3	1.00	.375	5	SW3755-30C03	\$43.33
	4	1.5	.375	5	SW3755-40C03	\$53.72
	6	2.0	.375	5	SW3755-60C03	\$63.42
7/16"	3	1.25	.437	5	SW4375-30C03	\$49.18
	4	2.0	.437	5	SW4375-40C03	\$60.16
	6	1.5	.437	5	SW4375-60C03	\$73.41
1/2"	3	1.25	.500	5	SW5005-30C03	\$63.32
	4	2.0	.500	5	SW5005-40C03	\$76.73
	6	2.0	.500	5	SW5005-60C03	\$93.34
	6	3.250	.500	5	SWS5005-61C03	\$124.14
	6	4.0	.500	5	SWS5005-62C03	\$143.20
	8	5.5	.500	5	SWS5005-80C03	\$184.72
5/8"	4	2.125	.625	5	SW6255-40C03	\$92.18
	6	2.125	.625	5	SW6255-60C03	\$132.16
	6	3.125	.625	5	SWS6255-61C03	\$139.27
	8	2.125	.625	5	SW6255-80C03	\$163.82
	8	5.125	.625	5	SWS6255-81C03	\$225.02
3/4"	4	2.125	.750	5	SW7505-40C03	\$129.56
	6	2.125	.750	5	SW7505-61C03	\$162.38
	6	3.25	.750	5	SW7505-60C03	\$178.97
	7	4.25	.750	5	SWS7505-70C03	\$225.45
	8	5.5	.750	5	SWS7505-80C03	\$298.33
1"	4	2.125	1.00	5	SW1005-40C03	\$189.04
	5	2.5	1.00	5	SW1005-50C03	\$219.45
	6	3.25	1.00	5	SW1005-60C03	\$267.48
	7	4.25	1.00	5	SWS1005-70C03	\$357.77
	8	5.5	1.00	5	SWS1005-80C03	\$421.52
	9	6.5	1.00	5	SWS1005-91C03	\$485.21
1-1/4"	6	3.25	1.25	5	SW12505-60C03	\$468.72
	9	6.5	1.25	5	SWS12505-90C03	\$755.57

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



HR4 & HRC4 SERIES

STANDARD & CLEARANCE SHANK
H6 TOL. SHANK



PROFILE MILLING
* UP TO 60 HRC



AGGRESSIVE MILLING GEOMETRY - 4 FLUTE - BULL NOSE - VARIABLE

- RIGID FLUTE HEAVY CORE GEOMETRY DESIGNED FOR AGGRESSIVE PROFILE MILLING IN STEEL AND IRON
- SMOOTH CUTTING EDGES AND FLUTES - IMPROVES CHIP EVACUATION - IMPROVES TOOL LIFE & FINISH
- VARIABLE FLUTE - QUIET AND CHATTER FREE- INCREASES METAL REMOVAL RATES AND IMPROVES FINISH
- NANO COATING TECHNOLOGY - EXTREME HEAT AND WEAR RESISTANCE

DIAMETER	OAL	RADIUS	LOC / REACH	SHANK	FLUTE #	ATI PART#	PRICE
1/32"	2	.005	.050	.125	4	HR0314-20R005C03	\$16.57
	2	.010	.050	.125	4	HR0314-20R010C03	\$16.57
	3	.005	.050	.125	4	HR0314-30R005C03	\$17.74
	3	.005	.050 / .125	.125	4	HRC0314-30R005C03	\$21.86
	3	.005	.050 / .250	.125	4	HRC0314-31R005C03	\$21.86
	3	.010	.050	.125	4	HR0314-30R010C03	\$17.74
	3	.010	.050 / .125	.125	4	HRC0314-30R010C03	\$21.86
	3	.010	.050 / .250	.125	4	HRC0314-31R010C03	\$21.86
1/16"	2	.005	.125	.125	4	HR0624-20R005C03	\$16.57
	2	.010	.125	.125	4	HR0624-20R010C03	\$16.57
	2	.015	.125	.125	4	HR0624-20R015C03	\$16.57
	3	.005	.125	.125	4	HR0624-30R005C03	\$17.74
	3	.005	.125 / .375	.125	4	HRC0624-30R005C03	\$23.92
	3	.005	.125 / .500	.125	4	HRC0624-31R005C03	\$25.98
	3	.005	.125 / 1.00	.125	4	HRC0624-32R005C03	\$30.10
	3	.010	.125	.125	4	HR0624-30R010C03	\$17.74
	3	.010	.125 / .375	.125	4	HRC0624-30R010C03	\$23.92
	3	.010	.125 / .500	.125	4	HRC0624-31R010C03	\$25.98
	3	.010	.125 / 1.00	.125	4	HRC0624-32R010C03	\$30.10
	3	.015	.125	.125	4	HR0624-30R015C03	\$17.74
	3	.015	.125 / .375	.125	4	HRC0624-30R015C03	\$23.92
	3	.015	.125 / .500	.125	4	HRC0624-31R015C03	\$25.98
	3	.015	.125 / 1.00	.125	4	HRC0624-32R015C03	\$30.10
5/64"	2	.010	.312	.125	4	HR0784-20R010C03	\$16.57
	2	.020	.156 / .600	.125	4	HRC0784-20R020C03	\$18.96
3/32"	2	.015	.187	.125	4	HR0934-20R015C03	\$12.77
	2	.020	.187	.125	4	HR0934-20R020C03	\$12.77
	2	.031	.187	.125	4	HR0934-20R031C03	\$12.77
	3	.010	.187	.125	4	HR0934-30R010C03	\$13.95
	3	.010	.187 / .500	.125	4	HRC0934-30R010C03	\$20.13
	3	.010	.187 / .750	.125	4	HRC0934-31R010C03	\$22.19
	3	.010	.187 / 1.125	.125	4	HRC0934-32R010C03	\$24.25
	3	.015	.187 / .500	.125	4	HRC0934-30R015C03	\$20.13
	3	.015	.187 / .750	.125	4	HRC0934-31R015C03	\$22.19
	3	.015	.187 / 1.125	.125	4	HRC0934-32R015C03	\$24.25
	3	.015	.187	.125	4	HR0934-30R015C03	\$13.95
	3	.020	.187	.125	4	HR0934-30R020C03	\$13.95
	3	.031	.187	.125	4	HR0934-30R031C03	\$13.95
	3	.031	.187 / .500	.125	4	HRC0934-30R031C03	\$20.13
	3	.031	.187 / .750	.125	4	HRC0934-31R031C03	\$22.19
	3	.031	.187 / 1.125	.125	4	HRC0934-32R031C03	\$24.25

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HR4 & HRC4 SERIES (continued)



DIAMETER	OAL	RADIUS	LOC / REACH	SHANK	FLUTE #	ATI PART#	PRICE
1/8"	2	.015	.250	.125	4	HR1254-20R015C03	\$12.77
	2	.031	.250	.125	4	HR1254-20R031C03	\$12.77
	3	.015	.250	.125	4	HR1254-30R015C03	\$13.95
	3	.031	.250	.125	4	HR1254-30R031C03	\$13.95
	4	.015	.250	.125	4	HR1254-40R015C03	\$15.12
	4	.031	.250	.125	4	HR1254-40R031C03	\$15.12
	6	.015	.250	.125	4	HR1254-60R015C03	\$32.37
	6	.031	.250	.125	4	HR1254-60R031C03	\$32.37
5/32"	2	.031	.625	.187	4	HR1564-20R031C03	\$16.34
3/16"	2	.015	.375	.187	4	HR1874-20R015C03	\$16.34
	2	.031	.375	.187	4	HR1874-20R031C03	\$16.34
	3	.015	.375	.187	4	HR1874-30R015C03	\$18.89
	3	.015	.375 / 1.25	.187	4	HRC1874-30R015C03	\$25.78
	3	.031	.375	.187	4	HR1874-30R031C03	\$18.89
	3	.031	.375 / 1.25	.187	4	HRC1874-30R031C03	\$25.79
	4	.015	.375	.187	4	HR1874-40R015C03	\$20.73
	4	.015	.375 / 1.25	.187	4	HRC1874-40R015C03	\$27.61
	4	.031	.375	.187	4	HR1874-40R031C03	\$20.73
	4	.031	.375 / 1.25	.187	4	HRC1874-40R031C03	\$27.61
	4	.062	.375	.187	4	HR1874-40R062C03	\$20.73
	4	.062	.375 / 1.25	.187	4	HRC1874-41R062C03	\$25.03
	4	.062	1.00	.187	4	HR1874-41R062C03	\$22.83
	6	.015	.375	.187	4	HR1874-60R015C03	\$24.99
	6	.031	.375	.187	4	HR1874-60R031C03	\$24.99
1/4"	3	.015	.500	.250	4	HR2504-30R015C03	\$23.63
	3	.031	.500	.250	4	HR2504-30R031C03	\$23.63
	3	.062	.500	.250	4	HR2504-30R062C03	\$23.63
	4	.015	.500	.250	4	HR2504-40R015C03	\$26.25
	4	.015	.500 / 2.00"	.250	4	HRC2504-40R015C03	\$33.58
	4	.031	.500	.250	4	HR2504-40R031C03	\$26.25
	4	.031	.500 / 2.00"	.250	4	HRC2504-40R031C03	\$33.58
	4	.062	.500	.250	4	HR2504-40R062C03	\$26.25
	4	.062	.500 / 2.00"	.250	4	HRC2504-40R062C03	\$33.58
	6	.015	.500	.250	4	HR2504-60R015C03	\$32.10
	6	.015	1.50	.250	4	HR2504-61R015C03	\$38.28
	6	.031	.500	.250	4	HR2504-60R031C03	\$32.10
	6	.031	1.50	.250	4	HR2504-61R031C03	\$38.28
	6	.062	.500	.250	4	HR2504-60R062C03	\$32.10
	6	.062	1.50	.250	4	HR2504-61R062C03	\$38.28
5/16"	3	.015	.625	.3125	4	HR3124-30R015C03	\$30.49
	3	.031	.625	.3125	4	HR3124-30R031C03	\$30.49
	3	.062	.625	.3125	4	HR3124-30R062C03	\$30.49
	4	.015	.625	.3125	4	HR3124-40R015C03	\$35.11
	4	.015	.625	.3125	4	HRC3124-40R015C03	\$41.29
	4	.031	.625	.3125	4	HR3124-40R031C03	\$35.11
	4	.031	.625	.3125	4	HRC3124-40R031C03	\$41.29
	4	.062	.625	.3125	4	HR3124-40R062C03	\$35.11
	4	.062	.625	.3125	4	HRC3124-40R062C03	\$41.29
	6	.015	.625	.3125	4	HR3124-60R015C03	\$43.74
	6	.015	1.25	.3125	4	HR3124-61R015C03	\$49.92
	6	.031	.625	.3125	4	HR3124-60R031C03	\$43.74
	6	.031	1.25	.3125	4	HR3124-61R031C03	\$49.92
	6	.062	.625	.3125	4	HR3124-60R062C03	\$49.92
	6	.062	1.25	.3125	4	HR3124-61R062C03	\$49.92

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HR4 & HRC4 SERIES (continued)

DIAMETER	OAL	RADIUS	LOC / REACH	SHANK	FLUTE #	ATI PART#	PRICE
3/8"	3	.015	.750	.375	4	HR3754-30R015C03	\$35.75
	3	.020	.750	.375	4	HR3754-30R020C03	\$35.75
	3	.031	.750	.375	4	HR3754-30R031C03	\$35.75
	3	.062	.750	.375	4	HR3754-30R062C03	\$35.75
	4	.015	.750	.375	4	HR3754-40R015C03	\$42.34
	4	.015	.750 / 1.50	.375	4	HRC3754-40R015C03	\$48.53
	4	.031	.750	.375	4	HR3754-40R031C03	\$42.34
	4	.031	.750 / 1.50	.375	4	HRC3754-40R031C03	\$48.52
	4	.062	.750	.375	4	HR3754-40R062C03	\$42.34
	4	.062	.750 / 1.50	.375	4	HRC3754-40R062C03	\$48.52
	4	.125	.750	.375	4	HR3754-40R125C03	\$42.34
	4	.125	.750 / 1.50	.375	4	HRC3754-40R125C03	\$48.52
	6	.015	.750	.375	4	HR3754-60R015C03	\$52.05
	6	.015	2.00	.375	4	HR3754-61R015C03	\$60.29
	6	.031	.750	.375	4	HR3754-60R031C03	\$52.05
	6	.031	2.00	.375	4	HR3754-61R031C03	\$60.29
	6	.062	.750	.375	4	HR3754-60R062C03	\$52.05
	6	.062	2.00	.375	4	HR3754-61R062C03	\$60.29
	6	.125	.750	.375	4	HR3754-60R125C03	\$52.05
	6	.125	2.00	.375	4	HR3754-61R125C03	\$60.29
1/2"	3	.015	1.00	.500	4	HR5004-30R015C03	\$54.31
	3	.031	1.00	.500	4	HR5004-30R031C03	\$54.31
	3	.062	1.00	.500	4	HR5004-30R062C03	\$54.31
	3	.125	1.00	.500	4	HR5004-30R125C03	\$54.31
	4	.015	1.00	.500	4	HR5004-40R015C03	\$62.99
	4	.015	1.00 / 2.30	.500	4	HRC5004-40R015C03	\$69.17
	4	.031	1.00	.500	4	HR5004-40R031C03	\$62.99
	4	.031	1.00 / 2.30	.500	4	HRC5004-40R031C03	\$69.17
	4	.062	1.00	.500	4	HR5004-40R062C03	\$62.99
	4	.062	1.00 / 2.30	.500	4	HRC5004-40R062C03	\$69.17
	4	.125	1.00	.500	4	HR5004-40R125C03	\$69.17
	4	.125	1.00 / 2.30	.500	4	HRC5004-40R125C03	\$69.17
	6	.015	1.00	.500	4	HR5004-60R015C03	\$79.59
	6	.015	2.00	.500	4	HR5004-61R015C03	\$87.84
	6	.031	1.00	.500	4	HR5004-60R031C03	\$79.59
	6	.031	2.00	.500	4	HR5004-61R031C03	\$87.84
	6	.062	1.00	.500	4	HR5004-60R062C03	\$79.59
	6	.062	2.00	.500	4	HR5004-61R062C03	\$87.84
	6	.125	1.00	.500	4	HR5004-60R125C03	\$79.59
	6	.125	2.00	.500	4	HR5004-61R125C03	\$87.84
	8	.015	1.00	.500	4	HR5004-80R015C03	\$104.63
	8	.031	1.00	.500	4	HR5004-80R031C03	\$104.63
	8	.062	1.00	.500	4	HR5004-80R062C03	\$104.63
	8	.125	1.00	.500	4	HR5004-80R125C03	\$104.63
5/8"	4	.031	1.25	.625	4	HR6254-40R031C03	\$107.87
	4	.062	1.25	.625	4	HR6254-40R062C03	\$107.87
	4	.125	1.25	.625	4	HR6254-40R125C03	\$107.87
	6	.031	1.25	.625	4	HR6254-60R031C03	\$132.84
	6	.062	1.25	.625	4	HR6254-60R062C03	\$132.84
	6	.125	1.25	.625	4	HR6254-60R125C03	\$132.84

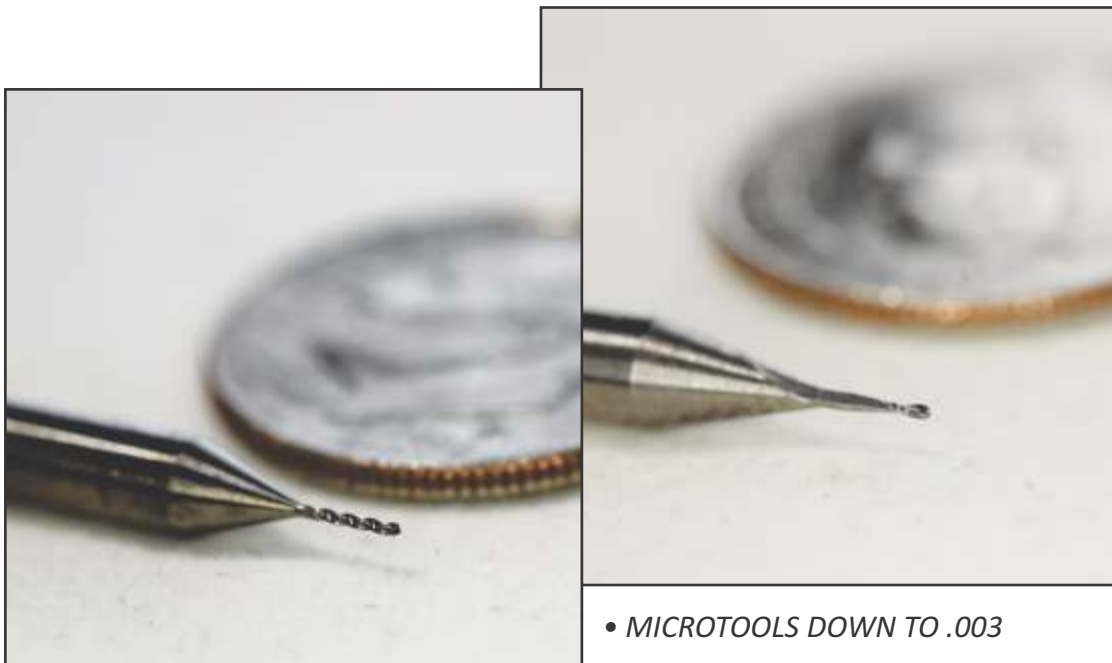
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HR4 & HRC4 SERIES (continued)



DIAMETER	OAL	RADIUS	LOC / REACH	SHANK	FLUTE #	ATI PART#	PRICE
3/4"	4	.015	1.50	.750	4	HR7504-40R015C03	\$128.53
	4	.031	1.50	.750	4	HR7504-40R031C03	\$128.53
	4	.062	1.50	.750	4	HR7504-40R062C03	\$128.53
	4	.125	1.50	.750	4	HR7504-40R125C03	\$128.53
	6	.031	1.50	.750	4	HR7504-60R031C03	\$161.35
	6	.062	1.50	.750	4	HR7504-60R062C03	\$161.35
	6	.125	1.50	.750	4	HR7504-60R125C03	\$161.35
	8	.031	1.50	.750	4	HR7504-80R031C03	\$213.34
	8	.062	1.50	.750	4	HR7504-80R062C03	\$213.34
	8	.125	1.50	.750	4	HR7504-80R125C03	\$213.34
1"	4	.031	1.50	1.00	4	HR1004-40R031C03	\$183.89
	4	.062	1.50	1.00	4	HR1004-40R062C03	\$183.89
	4	.125	1.50	1.00	4	HR1004-40R125C03	\$183.89
	6	.031	1.50	1.00	4	HR1004-60R031C03	\$232.97
	6	.062	1.50	1.00	4	HR1004-60R062C03	\$232.97
	6	.125	1.50	1.00	4	HR1004-60R125C03	\$232.97
	8	.031	1.50	1.00	4	HR1004-80R031C03	\$304.08
	8	.062	1.50	1.00	4	HR1004-80R062C03	\$304.08
	8	.125	1.50	1.00	4	HR1004-80R125C03	\$304.08

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



- MICROTOOLS DOWN TO .003



HR5 SERIES

H6 TOL. SHANK



PROFILE MILLING
* UP TO 60 HRC



AGGRESSIVE MILLING GEOMETRY - 5 FLUTE - BULL NOSE - VARIABLE

- RIGID FLUTE - HEAVY CORE GEOMETRY DESIGNED FOR AGGRESSIVE PROFILE MILLING IN STEEL AND IRON
- SMOOTH CUTTING EDGES AND FLUTES - IMPROVES CHIP EVACUATION - IMPROVES TOOL LIFE & FINISH
- VARIABLE FLUTE - QUIET AND CHATTER FREE- INCREASES METAL REMOVAL RATES AND IMPROVES FINISH
- NANO COATING TECHNOLOGY - EXTREME HEAT AND WEAR RESISTANCE

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE #	PART#	PRICE
3/8"	3	.015	.750	.375	5	HR3755-30R015C03	\$39.32
	3	.031	.750	.375	5	HR3755-30R031C03	\$39.32
	3	.062	.750	.375	5	HR3755-30R062C03	\$39.32
	4	.015	.750	.375	5	HR3755-40R015C03	\$46.58
	4	.031	.750	.375	5	HR3755-40R031C03	\$46.58
	4	.062	.750	.375	5	HR3755-40R062C03	\$46.58
	4	.125	.750	.375	5	HR3755-40R125C03	\$46.58
	6	.015	.750	.375	5	HR3755-60R015C03	\$57.25
	6	.031	.750	.375	5	HR3755-60R031C03	\$57.25
	6	.062	.750	.375	5	HR3755-60R062C03	\$57.25
	6	.125	.750	.375	5	HR3755-60R125C03	\$57.25
1/2"	3	.015	1.00	.500	5	HR5005-30R015C03	\$59.74
	3	.031	1.00	.500	5	HR5005-30R031C03	\$59.74
	3	.062	1.00	.500	5	HR5005-30R062C03	\$59.74
	3	.125	1.00	.500	5	HR5005-30R125C03	\$59.74
	4	.015	1.00	.500	5	HR5005-40R015C03	\$69.29
	4	.031	1.00	.500	5	HR5005-40R031C03	\$69.29
	4	.062	1.00	.500	5	HR5005-40R062C03	\$69.29
	4	.125	1.00	.500	5	HR5005-40R125C03	\$69.29
	6	.015	1.00	.500	5	HR5005-60R015C03	\$87.55
	6	.031	1.00	.500	5	HR5005-60R031C03	\$87.55
	6	.062	1.00	.500	5	HR5005-60R062C03	\$87.55
	6	.125	1.00	.500	5	HR5005-60R125C03	\$87.55
	8	.015	1.00	.500	5	HR5005-80R015C03	\$115.09
	8	.031	1.00	.500	5	HR5005-80R031C03	\$115.09
	8	.062	1.00	.500	5	HR5005-80R062C03	\$115.09
	8	.125	1.00	.500	5	HR5005-80R125C03	\$115.09
5/8"	4	.015	1.25	.625	5	HR6255-40R015C03	\$118.65
	4	.031	1.25	.625	5	HR6255-40R031C03	\$118.65
	4	.062	1.25	.625	5	HR6255-40R062C03	\$118.65
	4	.125	1.25	.625	5	HR6255-40R125C03	\$118.65
	6	.015	2.00	.625	5	HR6255-60R015C03	\$157.46
	6	.031	2.00	.625	5	HR6255-61R031C03	\$157.46
	6	.062	2.00	.625	5	HR6255-60R062C03	\$157.46
	6	.125	2.00	.625	5	HR6255-60R125C03	\$157.46

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HR5 SERIES (continued)



DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE #	PART#	PRICE
3/4"	4	.015	1.50	.750	5	HR7505-40R015C03	\$141.38
	4	.031	1.50	.750	5	HR7505-40R031C03	\$141.38
	4	.062	1.50	.750	5	HR7505-40R062C03	\$141.38
	4	.125	1.50	.750	5	HR7505-40R125C03	\$141.38
	6	.031	2.00	.750	5	HR7505-60R031C03	\$177.49
	6	.062	2.00	.750	5	HR7505-60R062C03	\$177.49
	6	.125	2.00	.750	5	HR7505-60R125C03	\$177.49
	6	.125	3.00	.750	5	HR7505-61R125C03	\$205.82
	8	.031	1.50	.750	5	HR7505-80R031C03	\$234.67
	8	.062	1.50	.750	5	HR7505-80R062C03	\$234.67
	8	.125	1.50	.750	5	HR7505-80R125C03	\$234.67
1"	4	.015	1.50	1.00	5	HR1005-40R015C03	\$202.28
	4	.031	1.50	1.00	5	HR1005-40R031C03	\$202.28
	4	.062	1.50	1.00	5	HR1005-40R062C03	\$202.28
	4	.125	1.50	1.00	5	HR1005-40R125C03	\$202.28
	6	.031	1.50	1.00	5	HR1005-60R031C03	\$256.27
	6	.031	3.25	1.00	5	HR1005-61R031C03	\$312.93
	6	.062	1.50	1.00	5	HR1005-60R062C03	\$256.27
	6	.062	3.25	1.00	5	HR1005-61R062C03	\$312.93
	6	.125	1.50	1.00	5	HR1005-60R125C03	\$256.27
	6	.125	3.25	1.00	5	HR1005-61R125C03	\$312.93
	8	.031	2.00	1.00	5	HR1005-80R031C03	\$368.48
	8	.062	2.00	1.00	5	HR1005-80R062C03	\$368.48
	8	.125	2.00	1.00	5	HR1005-80R125C03	\$368.48

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



• Rollomatic Row



HB2 &HBC2 SERIES

H6 TOL. SHANK



PROFILE MILLING
* UP TO 60 HRC



AGGRESSIVE MILLING GEOMETRY - 2 FLUTE - BALL NOSE

- RIGID FLUTE GEOMETRY AND HEAVY CORE DESIGNED FOR AGGRESSIVE PROFILE MILLING IN STEEL AND IRON
- SMOOTH CUTTING EDGES AND FLUTES - IMPROVES CHIP EVACUATION - IMPROVES TOOL LIFE AND FINISH
- NANO COATING TECHNOLOGY - EXTREME HEAT AND WEAR RESISTANCE

DIAMETER	OAL	LOC / REACH	SHANK	FLUTE #	PART#	PRICE
1/32"	2	.0625	.125	2	HB0312-20C03	\$16.57
	3	.050 / .125	.125	2	HBC0312-30C03	\$21.86
	3	.050 / .250	.125	2	HBC0312-31C03	\$21.86
	3	.050 / .375	.125	2	HBC0312-32C03	\$21.86
3/64"	2	.075 / .125	.125	2	HBC0462-20C03	\$20.69
	2	.075 / .250	.125	2	HBC0462-21C03	\$21.86
	3	.075 / .350	.125	2	HBC0462-30C03	\$21.86
1/16"	2	.125	.125	2	HB0622-20C03	\$16.57
	3	.125 / .250	.125	2	HBC0622-30C03	\$23.92
	3	.125 / .375	.125	2	HBC0622-31C03	\$23.92
	3	.125 / .500	.125	2	HBC0622-32C03	\$25.98
	3	.125 / .750	.125	2	HBC0622-34C03	\$28.04
	3	.125 / 1.00	.125	2	HBC0622-33C03	\$30.10
5/64"	2	.156	.125	2	HB0782-20C03	\$16.57
	2	.156 / .250	.125	2	HBC0782-20C03	\$20.69
	3	.156 / .500	.125	2	HBC0784-30C03	\$21.86
3/32"	2	.187	.125	2	HB0932-20C03	\$16.57
	3	.187 / .312	.125	2	HBC0932-31C03	\$21.86
	3	.187 / .500	.125	2	HBC0932-32C03	\$21.86
	3	.187 / .750	.125	2	HBC0932-33C03	\$25.98
	3	.187 / 1.00	.125	2	HBC0932-34C03	\$25.98
1/8"	2	.250	.125	2	HB1252-20C03	\$12.77
	3	.250	.125	2	HB1252-30C03	\$13.95
	4	.250	.125	2	HB1252-40C03	\$15.12
	6	.250	.125	2	HB1252-60C03	\$30.57
5/32"	2	.375	.187	2	HB1562-20C03	\$16.34
3/16"	2	.375	.187	2	HB1872-20C03	\$16.34
	3	.375	.187	2	HB1872-30C03	\$18.89
	4	.375	.187	2	HB1872-40C03	\$20.73
	6	.375	.187	2	HB1872-60C03	\$24.99
13/64	3	.400	.250	2	HB2032-30C03	\$25.96
7/32	3	.436	.250	2	HB2182-30C03	\$25.96
9/32	3	.562	.250	2	HB2812-30C03	\$25.96

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HB2 &HBC2 SERIES (continued)



DIAMETER	OAL	LOC / REACH	SHANK	FLUTE #	PART#	PRICE
1/4"	3	.500	.250	2	HB2502-30C03	\$23.63
	4	.500	.250	2	HB2502-40C03	\$26.25
	6	.500	.250	2	HB2502-60C03	\$32.10
5/16"	3	.625	.312	2	HB3122-30C03	\$30.49
	4	.625	.312	2	HB3122-40C03	\$35.11
	6	.625	.312	2	HB3122-60C03	\$43.74
3/8"	3	.750	.375	2	HB3752-30C03	\$35.75
	4	.750	.375	2	HB3752-40C03	\$42.34
	6	.750	.375	2	HB3752-60C03	\$52.05
1/2"	3	1.00	.500	2	HB5002-30C03	\$60.95
	4	1.00	.500	2	HB5002-40C03	\$69.62
	6	1.00	.500	2	HB5002-60C03	\$86.23
	8	1.00	.500	2	HB5002-80C03	\$118.37
3/4"	4	1.50	.750	2	HB7502-40C03	\$159.44
	6	1.50	.750	2	HB7502-60C03	\$192.26

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



Three wheel dressing stations maintain the geometry of our grinding wheels which is very critical in maintaining consistent cutting tool geometry.

State-of-the-art tool inspection allows ATI to ensure proper tool geometry and consistently produce high performance tooling. ATI achieves these high standards with three Helicheck precision measuring machines and multiple in-process inspection stations.





HBX2 SERIES

H6 TOL. SHANK



PROFILE MILLING
* UP TO 60 HRC



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

- EXCELS ON APPLICATIONS WITH POOR SETUP AND MACHINE RIGIDITY
- SMOOTH CUTTING EDGES AND FLUTES - IMPROVES CHIP EVACUATION - IMPROVES TOOL LIFE AND FINISH
- NANO COATING TECHNOLOGY - EXTREME HEAT AND WEAR RESISTANCE

DIAMETER	OAL	LOC / REACH	SHANK	FLUTE	ATI PART #	PRICE
1/32"	3	.031 / .062	.187	2	HBX0312-31C03	\$24.91
	3	.031 / .062	.250	2	HBX0312-30C03	\$27.75
	3	.031 / .187	.250	2	HBX0312-32C03	\$33.48
	3	.031 / .312	.250	2	HBX0312-33C03	\$33.48
	3	.031 / .500	.250	2	HBX0312-34C03	\$35.71
.040	3	.040 / .320	.250	2	HBX0402-32C03	\$33.48
3/64	3	.046 / .093	.250	2	HBX0462-30C03	\$27.75
1/16	3	.062 / .125	.187	2	HBX0622-31C03	\$24.91
	3	.062 / .125	.250	2	HBX0622-30C03	\$27.75
	3	.062 / .312	.250	2	HBX0622-32C03	\$33.48
	3	.062 / .500	.250	2	HBX0622-33C03	\$33.48
	3	.062 / .625	.250	2	HBX0622-34C03	\$35.72
	3	.062 / .750	.250	2	HBX0622-35C03	\$35.72
	3	.062 / 1.00	.250	2	HBX0622-36C03	\$35.72
5/64"	3	.078 / .156	.250	2	HBX0782-30C03	\$27.75
3/32"	3	.093 / .187	.187	2	HBX0932-31C03	\$24.91
	3	.093 / .187	.250	2	HBX0932-30C03	\$27.75
	3	.093 / .312	.250	2	HBX0932-32C03	\$33.48
	3	.093 / .500	.250	2	HBX0932-33C03	\$33.94
	3	.093 / .750	.250	2	HBX0932-34C03	\$35.72
	3	.093 / 1.00	.250	2	HBX0932-35C03	\$35.72
1/8"	3	.125 / .250	.187	2	HBX1252-31C03	\$24.91
	3	.125 / .250	.250	2	HBX1252-30C03	\$27.75
	3	.125 / .500	.250	2	HBX1252-32C03	\$33.94
	3	.125 / .625	.250	2	HBX1252-33C03	\$33.94
	3	.125 / .750	.250	2	HBX1252-34C03	\$36.00
	3	.125 / 1.00	.250	2	HBX1252-35C03	\$36.00
	3	.125 / 1.25	.250	2	HBX1252-36C03	\$36.00
5/32"	3	.156 / .312	.250	2	HBX1562-30C03	\$26.52
	3	.156 / .875	.250	2	HBX1562-32C03	\$32.70

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HBX2 SERIES (continued)



DIAMETER	OAL	LOC / REACH	SHANK	FLUTE	ATI PART #	PRICE
3/16"	2	.187	.187	2	HBX1872-20C03	\$18.89
	3	.187 / .375	.250	2	HBX1872-30C03	\$24.75
	3	.187 / .500	.250	2	HBX1872-31C03	\$33.77
	3	.187 / .750	.250	2	HBX1872-32C03	\$35.72
	3	.187 / 1.00	.250	2	HBX1872-35C03	\$35.72
	4	.187	.187	2	HBX1872-40C03	\$20.73
	6	.187	.187	2	HBX1872-60C03	\$24.99
1/4"	3	.250	.250	2	HBX2502-30C03	\$23.63
	4	.250	.250	2	HBX2502-40C03	\$26.25
	6	.250	.250	2	HBX2502-60C03	\$32.10
5/16"	3	.312	.312	2	HBX3122-30C03	\$30.49
	4	.312	.312	2	HBX3122-40C03	\$35.11
	6	.312	.312	2	HBX3122-60C03	\$43.74
3/8"	4	.375	.375	2	HBX3752-40C03	\$42.34
	6	.375	.375	2	HBX3752-60C03	\$52.05
1/2"	4	.500	.500	2	HBX5002-40C03	\$69.62
	6	.500	.500	2	HBX5002-60C03	\$86.23
	8	.500	.500	2	HBX5002-80C03	\$118.37

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



Our centerless grinding cells allow us to add relief and reach to tools with perfect concentricity. We can also add relief / reach to existing tools.

Our Micro tool division is maintained with 12 Rollomatic CNC grinders.

From high volume robot fed, to small batch specials, Rollomatics will run tooling down to .003 diameter.





HB4 SERIES

H6 TOL. SHANK



PROFILE MILLING
* UP TO 60 HRC



AGGRESSIVE MILLING GEOMETRY - 4 FLUTE HELICAL BALL NOSE

- RIGID HEAVY CORE GEOMETRY FOR AGGRESSIVE PROFILE MILLING IN STEEL AND IRON
- VARIABLE FLUTE - QUIET AND CHATTER FREE INCREASES METAL REMOVAL RATES AND IMPROVES FINISH
- NANO COATING TECHNOLOGY - EXTREME HEAT AND WEAR RESISTANCE

DIAMETER	OAL	LOC	SHANK	FLUTE #	ATI PART #	PRICE
1/32"	2	.062	.125	4	HB0314-20C03	\$16.57
3/64"	2	.093	.125	4	HB0464-20C03	\$16.57
1/16"	2	.250	.125	4	HB0624-20C03	\$16.57
5/64"	2	.312	.125	4	HB0784-20C03	\$16.57
3/32"	2	.375	.125	4	HB0934-20C03	\$12.77
1/8"	2	.250	.125	4	HB1254-20C03	\$12.77
	3	.250	.125	4	HB1254-30C03	\$13.95
	4	.250	.125	4	HB1254-40C03	\$15.12
5/32	2	.625	.187	4	HB1564-20C03	\$17.20
3/16"	2	.375	.187	4	HB1874-20C03	\$16.34
	3	.375	.187	4	HB1874-30C03	\$18.89
	4	.375	.187	4	HB1874-40C03	\$20.73
1/4"	3	.500	.250	4	HB2504-30C03	\$23.63
	4	.500	.250	4	HB2504-40C03	\$26.25
	6	.500	.250	4	HB2504-60C03	\$32.10
5/16"	3	.625	.312	4	HB3124-30C03	\$30.49
	4	.625	.312	4	HB3124-40C03	\$35.11
	6	.625	.312	4	HB3124-60C03	\$43.74
3/8"	3	.750	.375	4	HB3754-30C03	\$35.75
	4	.750	.375	4	HB3754-40C03	\$42.34
	6	.750	.375	4	HB3754-60C03	\$52.05
1/2"	3	1.00	.500	4	HB5004-30C03	\$60.95
	4	1.00	.500	4	HB5004-40C03	\$69.62
	6	1.00	.500	4	HB5004-60C03	\$86.23
	8	1.00	.500	4	HB5004-80C03	\$118.37
5/8"	4	1.25	.625	4	HB6254-40C03	\$107.87
	6	1.25	.625	4	HB6254-60C03	\$132.84
	8	1.25	.625	4	HB6254-80C03	\$167.66
3/4"	4	1.50	.750	4	HB7504-40C03	\$141.41
	6	1.50	.750	4	HB7504-60C03	\$174.23
	8	1.50	.750	4	HB7504-80C03	\$226.21
1"	4	1.50	1.00	4	HB1004-40C03	\$202.28
	6	1.50	1.00	4	HB1004-60C03	\$256.27
	8	1.50	1.00	4	HB1004-80C03	\$368.48

• WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS

• CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



SLOTTING

SIDE
MILLHELI
INT.

TR4 & TF4 SERIES



H6 TOL. SHANK

TSUNAMI HIGH VOLUME METAL REMOVAL - 4 FLUTE FLAT & BULL NOSE

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

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE	WELDON FLAT	PART#	PRICE
1/8"	2	FLAT	.250	.125	4	REQUEST	TF1254-20C14	\$13.04
	2	FLAT	.500	.125	4	REQUEST	TF1254-21C14	\$13.68
	2	.010	.250	.125	4	REQUEST	TR1254-20R010C14	\$14.15
	2	.015	.250	.125	4	REQUEST	TR1254-20R015C14	\$14.15
	2	.031	.250	.125	4	REQUEST	TR1254-20R031C14	\$14.15
	3	FLAT	.375	.125	4	REQUEST	TF1254-30C14	\$15.16
	3	.015	.375	.125	4	REQUEST	TR1254-30R015C14	\$15.91
	3	.031	.375	.125	4	REQUEST	TR1254-30R031C14	\$15.91
5/32"	2	FLAT	.450	.187	4	REQUEST	TF1564-20C14	\$17.37
	2	.015	.450	.187	4	REQUEST	TR1564-20R015C14	\$21.44
	3	.015	.450	.187	4	REQUEST	TR1564-30R015C14	\$22.29
	3	.031	.450	.187	4	REQUEST	TR1564-30R031C14	\$22.29
3/16"	2	FLAT	.375	.187	4	REQUEST	TF1874-20C14	\$16.34
	2	.010	.375	.187	4	REQUEST	TR1874-20R010C14	\$18.14
	2	.015	.375	.187	4	REQUEST	TR1874-20R015C14	\$18.14
	2	.015	.750	.187	4	REQUEST	TR1874-21R015C14	\$20.30
	2	.031	.375	.187	4	REQUEST	TR1874-20R031C14	\$18.14
	3	FLAT	.625	.187	4	REQUEST	TF1874-30C14	\$19.29
	3	.015	.625	.187	4	REQUEST	TR1874-30R015C14	\$21.43
	3	.031	.625	.187	4	REQUEST	TR1874-30R031C14	\$21.43
1/4"	3	FLAT	.500	.250	4	REQUEST	TF2504-30C14	\$25.59
	3	FLAT	.875	.250	4	REQUEST	TF2504-31C14	\$25.59
	3	FLAT	1.25	.250	4	REQUEST	TF2504-32C14	\$27.74
	3	.015	.500	.250	4	REQUEST	TR2504-30R015C14	\$27.74
	3	.031	.500	.250	4	REQUEST	TR2504-30R031C14	\$27.74
	3	.062	.500	.250	4	REQUEST	TR2504-30R062C14	\$27.74
	3	.015	.875	.250	4	REQUEST	TR2504-31R015C14	\$27.74
	3	.031	.875	.250	4	REQUEST	TR2504-31R031C14	\$27.74
	3	.062	.875	.250	4	REQUEST	TR2504-31R062C14	\$27.74
5/16"	3	FLAT	.500	.312	4	REQUEST	TF3124-30C14	\$33.13
	3	FLAT	.875	.312	4	REQUEST	TF3124-31C14	\$34.51
	3	.031	.500	.312	4	REQUEST	TR3124-30R031C14	\$35.27
	3	.031	.875	.312	4	REQUEST	TR3124-31R031C14	\$36.65
3/8"	3	FLAT	.875	.375	4	REQUEST	TF3754-31C14	\$41.13
	3	.015	.875	.375	4	REQUEST	TR3754-30R015C14	\$43.27
	3	.031	.875	.375	4	REQUEST	TR3754-30R031C14	\$43.27
	3	.062	.875	.375	4	REQUEST	TR3754-30R062C14	\$43.27
	3	FLAT	1.25	.375	4	REQUEST	TF3754-30C14	\$42.68
	3	.015	1.25	.375	4	REQUEST	TR3754-31R015C14	\$44.82
	3	.031	1.25	.375	4	REQUEST	TR3754-31R031C14	\$44.82
	3	.062	1.25	.375	4	REQUEST	TR3754-31R062C14	\$44.82

(CONTINUED NEXT PAGE)



TR4 & TF4 SERIES (continued)

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE	WELDON FLAT	PART#	PRICE
1/2"	3	FLAT	1.25	.500	4	REQUEST	TF5004-30C14	\$61.83
	3	.015	1.25	.500	4	REQUEST	TR5004-30R015C14	\$64.16
	3	.031	1.25	.500	4	REQUEST	TR5004-30R031C14	\$64.16
	3	.062	1.25	.500	4	REQUEST	TR5004-30R062C14	\$64.16
	3	.125	1.25	.500	4	REQUEST	TR5004-30R125C14	\$64.16
	4	FLAT	1.75	.500	4	REQUEST	TF5004-40C14	\$72.15
	4	.015	1.625	.500	4	REQUEST	TR5004-40R015C14	\$74.16
	4	.031	1.625	.500	4	REQUEST	TR5004-40R031C14	\$74.16
	4	.062	1.625	.500	4	REQUEST	TR5004-40R062C14	\$74.16
	4	.125	1.625	.500	4	REQUEST	TR5004-40R125C14	\$74.16
	5	FLAT	2.25	.500	4	REQUEST	TF5004-50C14	\$85.36
	5	.015	2.25	.500	4	REQUEST	TR5004-50R015C14	\$100.38
	5	.031	2.25	.500	4	REQUEST	TR5004-50R031C14	\$100.38
	6	FLAT	3.25	.500	4	REQUEST	TF5004-60C14	\$103.55
	6	.031	3.25	.500	4	REQUEST	TR5004-60R031C14	\$105.08
5/8"	4	FLAT	1.625	.625	4	REQUEST	TF6254-40C14	\$118.96
	4	.015	1.625	.625	4	REQUEST	TR6254-40R015C14	\$121.28
	4	.031	1.625	.625	4	REQUEST	TR6254-40R031C14	\$121.28
	5	FLAT	2.25	.625	4	REQUEST	TF6254-50C14	\$133.45
	6	FLAT	3.25	.625	4	REQUEST	TF6254-61C14	\$149.04
	6	.031	2.25	.625	4	REQUEST	TR6254-60R031C14	\$151.54
3/4"	4	FLAT	1.75	.750	4	REQUEST	TF7504-40C14	\$135.03
	4	.015	1.625	.750	4	REQUEST	TR7504-40R015C14	\$142.55
	4	.031	1.625	.750	4	REQUEST	TR7504-40R031C14	\$142.55
	4	.062	1.625	.750	4	REQUEST	TR7504-40R062C14	\$142.55
	4	.125	1.625	.750	4	REQUEST	TR7504-40R125C14	\$142.55
	5	FLAT	2.25	.750	4	REQUEST	TF7504-50C14	\$168.95
	5	.031	2.25	.750	4	REQUEST	TR7504-50R031C14	\$178.19
	6	FLAT	3.25	.750	4	REQUEST	TF7504-61C14	\$208.29
	6	.031	2.25	.750	4	REQUEST	TR7504-60R031C14	\$198.62
	6	.031	3.25	.750	4	REQUEST	TR7504-61R031C14	\$210.44
7/8"	4	.031	1.625	.875	4	REQUEST	TR8754-40R031C14	\$194.30
	6	.031	3.25	.875	4	REQUEST	TR8754-60R031C14	\$245.40
1"	4	FLAT	1.75	1.00	4	REQUEST	TF1004-40C14	\$228.74
	4	.031	1.625	1.00	4	REQUEST	TR1004-40R031C14	\$239.51
	5	FLAT	2.625	1.00	4	REQUEST	TF1004-50C14	\$279.31
	5	.031	2.625	1.00	4	REQUEST	TR1004-50R031C14	\$286.70
	5	.062	2.625	1.00	4	REQUEST	TR1004-50R062C14	\$286.70
	5	.250	2.625	1.00	4	REQUEST	TR1004-50R250C14	\$286.70
	6	FLAT	3.25	1.00	4	REQUEST	TF1004-60C14	\$322.63
	6	.031	3.25	1.00	4	REQUEST	TR1004-60R031C14	\$333.38
	7	.031	2.25	1.00	4	REQUEST	TR1004-70R031C14	\$371.67

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



SLOTTING



SIDE
MILL



PROFILE
MILL

TB4 SERIES



TSUNAMI 4 FLUTE BALL

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

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE	WELDON FLAT	ATI PART#	PRICE
1/8"	2	BALL	.375	.125	4	REQUEST	TB1254-20C14	\$15.63
1/4"	3	BALL	.500	.250	4	REQUEST	TB2504-30C14	\$27.74
	3	BALL	.750	.250	4	REQUEST	TB2504-31C14	\$28.95
3/8"	3	BALL	.500	.375	4	REQUEST	TB3754-30C14	\$41.12
1/2"	3	BALL	1.250	.500	4	REQUEST	TB5004-30C14	\$64.17
	4	BALL	1.625	.500	4	REQUEST	TB5004-40C14	\$74.16
5/8"	4	BALL	1.625	.625	4	REQUEST	TB6254-40C14	\$121.28
3/4"	4	BALL	1.625	.750	4	REQUEST	TB7504-40C14	\$141.82
1"	4	BALL	1.625	1.00	4	REQUEST	TB1004-40C14	\$238.20
	5	BALL	2.625	1.00	4	REQUEST	TB1004-50C14	\$271.35

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



- WE SPECIALIZE IN CUSTOMS
- Send us a print/sketch or have one of our experts design one for you!



RT5 SERIES



AGGRESSIVE
SIDE MILLING

H6 TOL. SHANK



RIP TIDE 5 FLUTE SHARP AND BULL NOSE

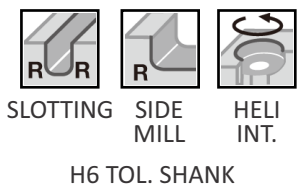
- DESIGNED FOR AGGRESSIVE PERIPHERAL MILLING FOR HIGH VOLUME METAL REMOVAL
- VARIABLE INDEX AND HELIX WITH SPECIAL EDGE PREP = DURABILITY FOR HEAVY TOOL ENGAGEMENT
- EXCELLENT SURFACE FINISH
- RIP TIDE IS WELL SUITED FOR A WIDE VARIETY OF MATERIALS INCLUDING EXOTICS

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE	ATI PART#	PRICE
3/8"	3	SHARP	.875	.375	5	RT3755-30C14	\$41.73
	3	.031	.875	.375	5	RT3755-30R031C14	\$45.65
	3	SHARP	1.125	.375	5	RT3755-31C14	\$45.58
	3	.031	1.125	.375	5	TR3755-31R031C14	\$49.43
1/2"	3	SHARP	1.25	.500	5	RT5005-30C14	\$68.60
	3	.031	1.25	.500	5	RT5005-30R031C14	\$70.65
	4	SHARP	1.625	.500	5	RT5005-40C14	\$81.20
	4	.031	1.625	.500	5	RT5005-40R031C14	\$83.26
5/8"	4	SHARP	1.25	.625	5	RT6255-40C14	\$128.39
	4	.031	1.25	.625	5	RT6255-40R031C14	\$134.99
	4	FLAT	1.625	.625	5	RT6255-41C14	\$128.39
	4	.031	1.625	.625	5	RT6255-41R031C14	\$134.99
3/4"	4	SHARP	1.25	.750	5	RT7505-40C14	\$166.50
	4	.031	1.25	.750	5	RT7505-40R031C14	\$175.30
	4	SHARP	1.625	.750	5	RT7505-41C14	\$169.80
	4	.031	1.625	.750	5	RT7505-41R031C14	\$177.50

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



- ATI SOUTH SPECIALIZES IN BURRS



TA3 & TAR3 SERIES



TSUNAMI NON-FERROUS SHARP AND BULL NOSE

- HIGH VOLUME METAL REMOVAL MILLING GEOMETRY
- VARIABLE PITCH & HELIX, SPECIAL EDGE PREP FOR SMOOTH ENGAGEMENT
- DESIGNED FOR AGGRESSIVE MILLING OF NON-FERROUS MATERIALS
- SPECIAL COATING ELIMINATES NON FERROUS CHIP WELDING

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE	WELDON FLAT	ATI PART#	PRICE
1/8"	2	FLAT	.250	.125	3	REQUEST	TA1253-20C11	\$13.66
	2	FLAT	.525	.125	3	REQUEST	TA1253-21C11	\$12.71
	2	.015	.250	.125	3	REQUEST	TAR1253-20R015C11	\$14.22
	2	.031	.250	.125	3	REQUEST	TAR1253-20R031C11	\$14.22
	3	FLAT	.525	.125	3	REQUEST	TA1253-30C11	\$14.26
	3	FLAT	1.125	.125	3	REQUEST	TA1253-31C11	\$16.18
	3	.015	.500	.125	3	REQUEST	TAR1253-30R015C11	\$15.80
	3	.031	.500	.125	3	REQUEST	TAR1253-30R031C11	\$15.80
5/32"	3	.015	.450	.187	3	REQUEST	TAR1563-30R015C11	\$21.82
3/16"	2	FLAT	.312	.187	3	REQUEST	TA1873-20C11	\$16.50
	2	.015	.312	.187	3	REQUEST	TAR1873-20R015C11	\$18.21
	2	.031	.312	.187	3	REQUEST	TAR1873-20R031C11	\$18.21
	3	FLAT	.750	.187	3	REQUEST	TA1873-30C11	\$20.30
	3	.015	.500	.187	3	REQUEST	TAR1873-30R015C11	\$21.82
	3	.031	.500	.187	3	REQUEST	TAR1873-30R031C11	\$21.82
1/4"	2	FLAT	.550	.250	3	REQUEST	TA2503-20C11	\$25.63
	3	FLAT	.800	.250	3	REQUEST	TA2503-31C11	\$26.93
	3	FLAT	1.125	.250	3	REQUEST	TA2503-30C11	\$28.08
	3	.015	1.125	.250	3	REQUEST	TAR2503-30R015C11	\$28.27
	3	.031	1.125	.250	3	REQUEST	TAR2503-30R031C11	\$28.27
	4	FLAT	1.375	.250	3	REQUEST	TA2503-40C11	\$28.99
	4	.015	1.375	.250	3	REQUEST	TAR2503-40R015C11	\$30.23
	4	.031	1.375	.250	3	REQUEST	TAR2503-40R031C11	\$30.23
5/16"	3	FLAT	1.125	.312	3	REQUEST	TA3123-30C11	\$34.29
	3	.015	1.125	.312	3	REQUEST	TAR3123-30R015C11	\$36.35
	4	.015	1.375	.312	3	REQUEST	TAR3123-40R015C11	\$42.61
3/8"	3	FLAT	.800	.375	3	REQUEST	TA3753-31C11	\$37.83
	3	.015	1.25	.375	3	REQUEST	TAR3753-30R015C11	\$41.95
	3	.031	1.25	.375	3	REQUEST	TAR3753-30R031C11	\$41.95
	4	FLAT	2.125	.375	3	REQUEST	TA3753-40C11	\$41.95
	4	.015	1.625	.375	3	REQUEST	TAR3753-40R015C11	\$52.36
	4	.031	1.625	.375	3	REQUEST	TAR3753-40R031C11	\$52.36
	4	.062	1.625	.375	3	REQUEST	TAR3753-40R062C11	\$52.36

(CONTINUED NEXT PAGE)



TA3 & TAR3 SERIES (continued)

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE	WELDON FLAT	ATI PART#	PRICE
1/2"	3	FLAT	1.25	.500	3	YES	TA5003-30C11	\$62.68
	3	.031	.875	.500	3	YES	TAR5003-31R031C11	\$64.60
	3	.015	1.25	.500	3	REQUEST	TAR5003-30R015C11	\$64.60
	3	.031	1.25	.500	3	REQUEST	TAR5003-30R031C11	\$64.60
	3	.125	1.25	.500	3	REQUEST	TAR5003-30R125C11	\$64.60
	4	FLAT	1.625	.500	3	REQUEST	TA5003-40C11	\$73.21
	4	.015	1.625	.500	3	REQUEST	TAR5003-40R015C11	\$75.13
	4	.031	1.625	.500	3	REQUEST	TAR5003-40R031C11	\$75.13
	4	.062	1.625	.500	3	REQUEST	TAR5003-40R062C11	\$75.13
	5	FLAT	2.25	.500	3	REQUEST	TA5003-50C11	\$80.67
	5	.031	2.25	.500	3	REQUEST	TAR5003-50R031C11	\$88.99
5/8"	4	FLAT	2.125	.625	3	YES	TA6253-40C11	\$110.44
	4	.031	1.625	.625	3	REQUEST	TA6253-40R031C11	\$120.74
	6	FLAT	3.25	.625	3	YES	TA6253-60C11	\$147.46
	6	.031	3.25	.625	3	REQUEST	TAR6253-60R031C11	\$157.77
3/4"	4	FLAT	1.625	.750	3	REQUEST	TA7503-40C11	\$136.81
	4	.015	1.625	.750	3	REQUEST	TAR7503-40R015C11	\$147.11
	4	.031	1.625	.750	3	REQUEST	TAR7503-40R031C11	\$147.11
	4	.125	1.625	.750	3	REQUEST	TAR7503-40R125C11	\$147.11
	5	FLAT	2.25	.750	3	REQUEST	TA7503-50C11	\$154.86
	5	.031	2.25	.750	3	REQUEST	TAR7503-50R031C11	\$165.16
	6	FLAT	3.50	.750	3	REQUEST	TA7503-60C11	\$192.44
	6	.015	2.25	.750	3	REQUEST	TAR7503-60R015C11	\$195.53
	6	.015	3.50	.750	3	REQUEST	TAR7503-61R015C11	\$202.75
	6	.031	3.50	.750	3	REQUEST	TAR7503-60R031C11	\$202.75
	6	.125	3.50	.750	3	REQUEST	TAR7503-60R125C11	\$202.75
	6	.125	3.50	.750	3	REQUEST	TAR7503-60R125C11	\$202.75
1"	4	FLAT	1.625	1.00	3	REQUEST	TA1003-40C11	\$209.34
	4	.015	1.625	1.00	3	REQUEST	TAR1003-40R015C11	\$219.64
	4	.062	1.625	1.00	3	REQUEST	TAR1003-40R062C11	\$219.64
	5	FLAT	2.625	1.00	3	REQUEST	TA1003-50C11	\$233.53
	5	.015	2.625	1.00	3	REQUEST	TAR1003-50R015C11	\$281.43
	6	FLAT	3.50	1.00	3	REQUEST	TA1003-60C11	\$302.14
	6	.015	3.50	1.00	3	REQUEST	TAR1003-60R015C11	\$335.74

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



We use our in-house
Machining Center
to TEST and EVALUATE
the performance of
our tooling.



SLOTTING



SIDE
MILL

H6 TOL. SHANK

TAB SERIES



TSUNAMI NON-FERROUS 3 FLUTE BALL END MILLS

- HIGH VOLUME MATERIAL REMOVAL GEOMETRY
- VARIABLE PITCH & VARIABLE FLUTE, SPECIAL EDGE PREP
- DESIGNED FOR SMOOTH AGGRESSIVE MILLING OF NON-FERROUS MATERIALS
- ADVANCED COATING TECHNOLOGY ELIMINATES NON-FERROUS CHIP WELDING

DIAMETER	OAL	RADIUS	LOC	SHANK	FLUTE	WELDON FLAT	ATI PART#	PRICE
1/8"	2	BALL	.375	.125	3	REQUEST	TAB1253-20C11	\$14.92
1/4"	3	BALL	.500	.250	3	REQUEST	TAB2503-30C11	\$28.27
3/8"	3	BALL	.500	.375	3	REQUEST	TAB3753-30C11	\$41.95
1/2"	3	BALL	1.25	.500	3	REQUEST	TAB5003-30C11	\$64.60
	4	BALL	1.625	.500	3	REQUEST	TAB5003-40C11	\$75.13
	6	BALL	2.25	.500	3	REQUEST	TAB5003-60C11	\$95.54
5/8"	4	BALL	1.625	.625	3	REQUEST	TAB6253-40C11	\$120.74
3/4"	4	BALL	1.625	.750	3	REQUEST	TAB7503-40C11	\$147.11
	6	BALL	3.50	.750	3	REQUEST	TAB7503-60C11	\$190.05
	8	BALL	1.50	.750	3	REQUEST	TAB7503-81C11	\$135.37
1"	4	BALL	1.625	1.00	3	REQUEST	TAB1003-40C11	\$236.12
	6	BALL	3.50	1.00	3	REQUEST	TAB1003-60C11	\$316.48

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



- ANCA LINEAR CNC



D SERIES



H6 TOL. SHANK
CVD DIAMOND



CVD DIAMOND ENDMILLS - FLAT BOTTOM, BALL, AND CORNER RADIUS

• EFF = EFFECTIVE REACH IS LOC PLUS NECKED CLEARANCE EQUALS TOTAL REACH

DIAMETER	OAL	RADIUS	LOC / REACH	SHANK	FLUTE	ATI PART#	PRICE
.010"	2	FLAT	.020 / .050 EFF.	.125	2	DFC0102-20D2	\$71.49
	2	BALL	.020 / .050 EFF.	.125	2	DBC0102-20D2	\$75.07
	3	FLAT	.020 / .050 EFF.	.125	2	DFC0102-30D2	\$71.49
	2	BALL	.020 / .050 EFF.	.125	2	DBC0102-20D2	\$75.07
	3	BALL	.020 / .050 EFF.	.125	2	DBC0102-30D2	\$76.86
.015"	3	FLAT	.030 / .125 EFF.	.125	2	DFC0152-30D2	\$64.32
	3	FLAT	.047 / .312 EFF.	.125	2	DFC0152-31D2	\$69.70
	3	BALL	.030 / .125 EFF.	.125	2	DBC0152-30D2	\$66.11
	3	BALL	.047 / .312 EFF.	.125	2	DBC0152-31D2	\$71.49
.020"	2	FLAT	.050 / .187 EFF.	.125	2	DFC0202-20D2	\$53.57
	2	FLAT	.050 / .300 EFF.	.125	2	DFC0202-21D2	\$62.53
	2	BALL	.050 / .187 EFF.	.125	2	DBC0202-20D2	\$57.15
	2	BALL	.050 / .300 EFF.	.125	2	DBC0202-21D2	\$66.11
1/32"	2	FLAT	.062 / .250 EFF.	.125	4	DFC0314-20D2	\$41.03
	2	FLAT	.062 / .500 EFF.	.125	4	DFC0314-22D2	\$42.82
	2	FLAT	.062 / .625 EFF.	.125	4	DFC0314-21D2	\$42.82
	2	BALL	.062 / .250 EFF.	.125	4	DBC0314-20D2	\$42.82
	2	BALL	.062 / .500 EFF.	.125	4	DBC0314-22D2	\$42.82
	2	BALL	.062 / .625 EFF.	.125	4	DBC0314-23D2	\$42.82
	3	BALL	.250	.125	4	DB0314-32D2	\$39.24
	3	BALL	.062 / .625 EFF.	.125	4	DBC0314-30D2	\$44.61
	3	BALL	.062 / .900 EFF.	.125	4	DBC0314-31D2	\$49.99
3/64"	2	FLAT	.125 / .500 EFF.	.125	4	DFC0464-20D2	\$36.73
	2	FLAT	.125 / .750 EFF.	.125	4	DFC0464-21D2	\$40.31
	2	BALL	.125 / .500 EFF.	.125	4	DBC0464-20D2	\$36.73
	2	BALL	.125 / .750 EFF.	.125	4	DBC0464-21D2	\$40.31
	2	BALL	.125 / 1.00 EFF.	.125	4	DBC0464-22D2	\$43.90
1/16"	2	FLAT	.125 / .500 EFF.	.125	4	DFC0624-20D2	\$36.73
	2	FLAT	.125 / .750 EFF.	.125	4	DFC0624-21D2	\$40.31
	2	FLAT	.125 / 1.00 EFF.	.125	4	DFC0624-22D2	\$42.10
	2	.010	.125 / .500 EFF.	.125	4	DRC0624-20R010D2	\$38.52
	2	BALL	.125 / .500 EFF.	.125	4	DBC0624-20D2	\$38.52
	2	BALL	.125 / .750 EFF.	.125	4	DBC0624-21D2	\$40.31
	2	BALL	.125 / 1.050 EFF.	.125	4	DBC0624-22D2	\$43.90
	3	FLAT	.125 / .500 EFF.	.125	4	DFC0624-30D2	\$37.63
	3	FLAT	.125 / .750 EFF.	.125	4	DFC0624-31D2	\$41.21

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D SERIES (continued)



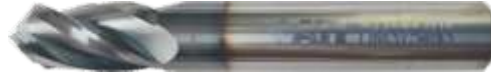
DIAMETER	OAL	RADIUS	LOC / REACH	SHANK	FLUTE	ATI PART#	PRICE
1/16"	3	FLAT	.125 / 1.00 EFF.	.125	4	DFC0624-32D2	\$43.00
	3	BALL	.500	.125	4	DB0624-30D2	\$41.21
	3	BALL	.125 / .750 EFF.	.125	4	DBC0624-32D2	\$46.58
	3	BALL	.125 / 1.050 EFF.	.125	4	DBC0624-33D2	\$46.58
	3	BALL	.125 / 2.050 EFF.	.125	4	DBC0624-34D2	\$52.85
3/32"	2	FLAT	.500	.125	4	DF0934-20D2	\$35.83
	2	FLAT	.250 / .750 EFF.	.125	4	DFC0934-20D2	\$36.73
	2	BALL	.250 / .750 EFF.	.125	4	DBC0934-20D2	\$36.73
	2	BALL	.250 / 1.050 EFF.	.125	4	DBC0934-21D2	\$40.31
	3	FLAT	1.00	.125	4	DF0934-30D2	\$47.48
	3	BALL	.250 / 2.050 EFF.	.125	4	DBC0934-32D2	\$52.85
1/8"	2	BALL	.500	.125	4	DBV1254-20D2	\$39.42
	3	FLAT	.250 / 1.00 EFF.	.125	4	DFVC1254-30D2	\$39.42
	3	.015	.250 / 1.00 EFF.	.125	4	DRV1254-30R015D2	\$41.21
	3	.015	.250 / 1.50 EFF.	.125	4	DRV1254-31R015D2	\$45.69
	3	BALL	1.00	.125	4	DBV1254-30D2	\$42.10
	3	BALL	.250 / 1.00 EFF.	.125	4	DBVC1254-30D2	\$44.79
	4	BALL	.250 / 1.50 EFF.	.125	4	DBVC1254-40D2	\$54.65
3/16"	2	.015	.375	.187	4	DRV1874-20R015D4	\$77.27
	2	BALL	.375	.187	4	DBV1874-20D4	\$77.27
	3	FLAT	.375 / 1.50 EFF.	.187	4	DFVC1874-30D4	\$78.53
	3	.015	.375 / 1.50 EFF.	.187	4	DRV1874-30R015D4	\$82.11
	3	BALL	.375 / 1.50 EFF.	.187	4	DBVC1874-30D4	\$82.11
	4	BALL	.187 / 1.50	.187	4	DBVC1874-40D4	\$89.82
1/4"	3	FLAT	.500 / 1.50 EFF.	.250	4	DFVC2504-30D4	\$100.24
	3	.015	.500 / 1.50 EFF.	.250	4	DRV2504-30R015D4	\$103.83
	3	BALL	.500 / 1.50 EFF.	.250	4	DBVC2504-30D4	\$103.83
	3	.015	.500	.250	4	DRV2504-30R015D4	\$98.45
	4	FLAT	1.50	.250	4	DFV2504-40D4	\$94.87
	4	FLAT	.500 / 1.50 EFF.	.250	4	DFVC2504-40D4	\$107.41
	4	.015	.500 / 1.50 EFF.	.250	4	DRV2504-40R015D4	\$110.99
	4	BALL	.500 / 1.50 EFF.	.250	4	DBVC2504-40D4	\$110.99
	4	BALL	.500 / 2.00 EFF.	.250	4	DBVC2504-41D4	\$112.79
3/8"	6	.020	.500 / 3.00 EFF.	.375	4	DRV3754-61R020D4	\$152.29
1/2"	3	FLAT	1.00	.500	4	DFV5004-30D4	\$168.42
	4	.030	1.50	.500	4	DRV5004-41R030D4	\$179.17
	4	BALL	1.50	.500	4	DBV5004-40D4	\$179.17
	6	.020	.500 / 3.00	.500	4	DRV5004-60R030D4	\$198.88

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



DM

H6 TOL. SHANK



DRILL MILL - 90 DEGREE - 2 & 4 FLUTE

- DRILL, SIDEMILL, CHAMFER, & SLOT WITH ONE TOOL
- VARIABLE INDEX FOR AGGRESSIVE MILLING
- HEAT AND WEAR RESISTANT COATING INCREASING TOOL LIFE

DIAMETER	OAL	LOC	DRILL ANGLE	SHANK	FLUTE	PART #	PRICE
1/8"	2	.500	90	.125	2 FLUTE	DM1252-2-90C03	\$16.92
	2	.500	90	.125	4 FLUTE	DM1254-2-90C03	\$20.45
3/16"	2	.625	90	.187	2 FLUTE	DM1872-2-90C03	\$19.22
	2	.625	90	.187	4 FLUTE	DM1874-2-90C03	\$22.75
1/4"	3	.750	90	.250	2 FLUTE	DM2502-3-90C03	\$28.37
	3	.750	90	.250	4 FLUTE	DM2504-3-90C03	\$31.89
5/16"	3	.812	90	.312	2 FLUTE	DM3122-3-90C03	\$37.03
	3	.812	90	.312	4 FLUTE	DM3124-3-90C03	\$40.56
3/8"	3	1	90	.375	2 FLUTE	DM3752-3-90C03	\$40.90
	3	1	90	.375	4 FLUTE	DM3754-3-90C03	\$44.42
1/2"	4	1.25	90	.500	2 FLUTE	DM5002-4-90C03	\$65.46
	4	1.25	90	.500	4 FLUTE	DM5004-4-90C03	\$70.75
5/8"	4	1.5	90	.625	2 FLUTE	DM6252-4-90C03	\$86.31
	4	1.5	90	.625	4 FLUTE	DM6254-4-90C03	\$91.60
3/4"	4	1.5	90	.750	2 FLUTE	DM7502-4-90C03	\$109.68
	4	1.5	90	.750	4 FLUTE	DM7504-4-90C03	\$118.50

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



- Quantities: 1 to ? Order your truckload of tooling today!

SD SERIES



H6 TOL. SHANK



NC SPOT DRILLS

- SPOT ANGLES IN 90, 120 & 142 DEGREES OAL IN 3", 4" & 6"
- SPOT ANGLE SHOULD BE GREATER THAN THE DRILL POINT ANGLE

SHANK	SPOT ANGLE	OAL	SHANK	LOC	ATI PART#	PRICE
1/4"	90 DEGREE	3	.250	.500	SD2502-3-90C02	\$11.74
	90 DEGREE	4	.250	.500	SD2502-4-90C02	\$14.81
	90 DEGREE	6	.250	.500	SD2502-6-90C02	\$21.56
	120 DEGREE	3	.250	.500	SD2502-3-120C02	\$11.74
	120 DEGREE	4	.250	.500	SD2502-4-120C02	\$14.81
	120 DEGREE	6	.250	.500	SD2502-6-120C02	\$21.56
	142 DEGREE	3	.250	.500	SD2502-3-142C02	\$11.74
	142 DEGREE	4	.250	.500	SD2502-4-142C02	\$14.81
	142 DEGREE	6	.250	.500	SD2502-6-142C02	\$21.56
3/8"	90 DEGREE	3	.375	.750	SD3752-3-90C02	\$21.61
	90 DEGREE	4	.375	.750	SD3752-4-90C02	\$29.35
	90 DEGREE	6	.375	.750	SD3752-6-90C02	\$40.63
	120 DEGREE	3	.375	.750	SD3752-3-120C02	\$21.61
	120 DEGREE	4	.375	.750	SD3752-4-120C02	\$29.35
	120 DEGREE	6	.375	.750	SD3752-6-120C02	\$40.63
	142 DEGREE	3	.375	.750	SD3752-3-142C02	\$21.61
	142 DEGREE	4	.375	.750	SD3752-4-142C02	\$29.35
	142 DEGREE	6	.375	.750	SD3752-6-142C02	\$40.63
1/2"	90 DEGREE	3	.500	1	SD5002-3-90C02	\$32.07
	90 DEGREE	4	.500	1	SD5002-4-90C02	\$42.75
	90 DEGREE	6	.500	1	SD5002-6-90C02	\$62.36
	120 DEGREE	3	.500	1	SD5002-3-120C02	\$32.07
	120 DEGREE	4	.500	1	SD5002-4-120C02	\$42.75
	120 DEGREE	6	.500	1	SD5002-6-120C02	\$62.36
	142 DEGREE	3	.500	1	SD5002-3-142C02	\$32.07
	142 DEGREE	4	.500	1	SD5002-4-142C02	\$42.75
	142 DEGREE	6	.500	1	SD5002-6-142C02	\$62.36

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- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS



CM SERIES

H6 TOL. SHANK



HELICAL FLUTE CHAMFER MILLS

- HELICAL FLUTES = SMOOTH ENGAGEMENT - BETTER FINISH - LONGER TOOL LIFE - HIGHER FEED
- HEAT AND WEAR RESISTANT COATING INCREASES TOOL LIFE

SHANK DIAMETER	CHAMFER ANGLE PER SIDE	TIP DIAMETER	OAL	FLUTE	ATI PART#	PRICE
1/4"	30	.045	3	3	CM2503-30C03	\$25.87
	30	.045	3	4	CM2504-30C03	\$25.87
	45	.045	3	3	CM2503-45C03	\$25.87
	45	.045	3	4	CM2504-45C03	\$25.87
	60	.045	3	3	CM2503-60C03	\$25.87
	60	.045	3	4	CM2504-60C03	\$25.87
	90	.045	3	3	CM2503-90C03	\$25.87
	90	.045	3	4	CM2504-90C03	\$25.87
3/8"	30	.055	3	3	CM3753-30C03	\$37.79
	30	.055	3	5	CM3755-30C03	\$37.79
	45	.055	3	3	CM3753-45C03	\$37.79
	45	.055	3	5	CM3755-45C03	\$37.79
	60	.055	3	3	CM3753-60C03	\$37.79
	60	.055	3	5	CM3755-60C03	\$37.79
	90	.055	3	3	CM3753-90C03	\$37.79
	90	.055	3	5	CM3755-90C03	\$37.79
1/2"	30	.070	4	3	CM5003-30C03	\$67.03
	30	.070	4	5	CM5005-30C03	\$67.03
	45	.070	4	3	CM5003-45C03	\$67.03
	45	.070	4	5	CM5005-45C03	\$67.03
	60	.070	4	5	CM5005-60C03	\$67.03
	90	.070	4	3	CM5003-90C03	\$67.03
	90	.070	4	5	CM5005-90C03	\$67.03
5/8"	30	.090	4	5	CM6256-30C03	\$129.33
	45	.090	4	5	CM6256-45C03	\$129.33
	60	.090	4	5	CM6256-60C03	\$129.33
	90	.090	4	5	CM6256-90C03	\$129.33
3/4"	30	.110	4	5	CM7506-30C03	\$135.29
	45	.110	4	5	CM7506-45C03	\$135.29
	90	.110	4	5	CM7506-90C03	\$135.29

- WELDON FLATS CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS
- CLEARANCE CAN BE ADDED TO ANY TOOL WITHIN 48 HOURS

Recommended Speeds & Feeds for Tsunami Variable Endmills

			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

• TSUNAMI S&F CONTINUES - NEXT PAGE



Recommended Speeds & Feeds for Tsunami Variable Endmills

			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		.005	.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 .0025	1/4 .004	5/16 .005	3/8 .006	1/2 .007	5/8 .008	3/4 .010	1 .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 .002	1/4 .003	5/16 .004	3/8 .005	1/2 .006	5/8 .007	3/4 .009	1 .011
Tool Steels T1, T2, T15, A2, A7, H13, P20, S7, D2	30-44 RC	150	1/8 .0015	1/4 .0025	5/16 .003	3/8 .004	1/2 .0045	5/8 .005	3/4 .006	1 .008
Hardened Steels Hardened Carbon Steels and Tool steels	42-54 RC	75	1/8 .001	1/4 .002	5/16 .0025	3/8 .003	1/2 .004	5/8 .005	3/4 .006	1 .007
Stainless Steel 430F, 301, 303, 410, 416, 420F, 430, 430F	Up to 30 RC	125	1/8 .0025	1/4 .004	5/16 .005	3/8 .006	1/2 .007	5/8 .008	3/4 .010	1 .012
Stainless Steel 301, 302, 303, 304, 305, 420, 15-5PH, 17-4PH, 17-7PH	Up to 30 RC	100	1/8 .002	1/4 .003	5/16 .004	3/8 .005	1/2 .006	5/8 .007	3/4 .009	1 .010
Stainless Steel 302B, 304B, 309, 310, 316, 316B, 316L, 317, 317L, 321, Nitronic	Over 30 RC	85	1/8 .002	1/4 .003	5/16 .004	3/8 .005	1/2 .006	5/8 .007	3/4 .009	1 .010
High Temp alloys Inconel, Monel, Hastelloy	Up to 42 RC	50	1/8 .001	1/4 .002	5/16 .003	3/8 .004	1/2 .0045	5/8 .005	3/4 .0065	1 .008
Titanium	Up to 42 RC	65	1/8 .002	1/4 .003	5/16 .0035	3/8 .0045	1/2 .005	5/8 .006	3/4 .0075	1 .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 .0025	1/4 .004	5/16 .005	3/8 .0055	1/2 .0065	5/8 .008	3/4 .010	1 .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 .002	1/4 .0035	5/16 .004	3/8 .005	1/2 .006	5/8 .007	3/4 .009	1 .011
Aluminum 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	Up to 3% Si	750	1/8 .005	1/4 .008	5/16 .009	3/8 .011	1/2 .012	5/8 .016	3/4 .020	1 .025
Cast Aluminum High Silicon A380, Castings	Over 3% Si	500	1/8 .004	1/4 .006	5/16 .008	3/8 .010	1/2 .011	5/8 .013	3/4 .016	1 .020
Magnesium	———	600	1/8 .003	1/4 .005	5/16 .006	3/8 .007	1/2 .008	5/8 .009	3/4 .011	1 .014
Non Ferrous Copper, Brass, Bronze	Up to 30 RC	450	1/8 .003	1/4 .005	5/16 .006	3/8 .007	1/2 .008	5/8 .010	3/4 .012	1 .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	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		.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
		54-62 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

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:



SIDEWALL
RADIUS



CIRCULAR
INTERPOLATION



SLOTING

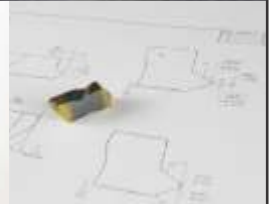
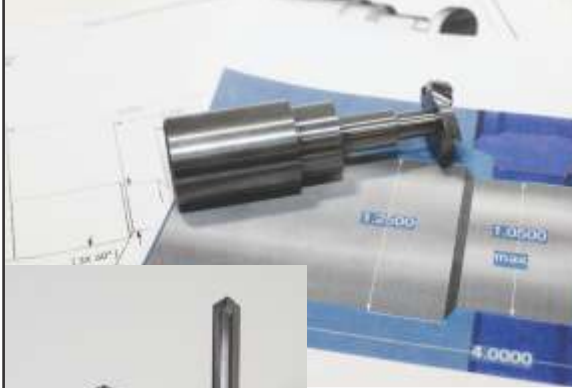


PROFILE
MILLING



SIDEWALL
SHARP

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