

MC77-19

Microcut

Sharp Ideas for Carbide Cutting Tools

Special Application Carbide Micro Cutting Tools



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A&M
INDUSTRIAL
PRODUCTS • SERVICES • SOLUTIONS

Microcut

Microcut offers small, miniature, and micro-sized carbide cutting tools along with the latest High Performance carbide end mills and form cutters. Special application and custom designed rotary cutting tools can be quoted upon request.

Operating from modern facilities in Plymouth, Massachusetts, Microcut specializes in CNC manufactured cutting tools and worldwide distribution of miniature and small cutting tools for use by mold builders and production machining facilities.

Microcut's large inventory warehouse assures *Same Day Shipment* of all stocked items, while many special products or modified standards are available with short lead times.

All products are available through selected U.S. Industrial Distributors or direct from the factory in certain geographical areas and countries.

We appreciate your business and look forward to serving you with all your cutting tool requirements.

Our Thanks,

The Microcut Staff

Microcut Corporate Offices Plymouth, MA



Please note: pricing listed in this catalog is subject to change. Please contact A&M Industrial for current pricing and availability.

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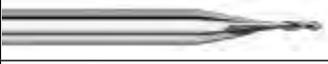
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CARBIDE MICRO END MILLS - Uncoated & Altin Coated

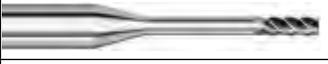
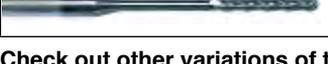
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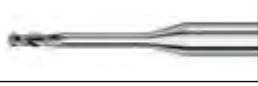
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NEW TOOLS AND SIZES

Microcut expanded its lines of miniature end mills, drills, and specialty cutting tools.

Microcut introduces new 2-flute corner radius and long reach corner radius end mills. Microcut has expanded its 3-flute end mills with many extended reach lengths for deep pocket milling. New 4-flute corner radius micros are added to help reduce tip breakage when milling hardened materials. Other new products include single and double end stub flute end mills, 300-degree spherical ball end mills, 3- and 5-flute chamfer cutters, wood router bits, and many additional end mill sizes.

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3-Flute & 5-Flute Spiral Flute Chamfer Cutters NEW PRODUCT	Pages 174-175	
Wood Router Bits - Downcut - Upcut - Compression NEW PROUDUCT	Pages 180-181	

Hundreds of New Reach Lengths



Hundreds of new reach lengths have been added to our In Stock inventory for same day shipment. If you cannot find the reach length that best suits your tooling requirement, Microcut can grind and ship it to you in 24-48 hours. (Minimum of three tools per size.)

Online Stock Check www.MicrocutUSA.com

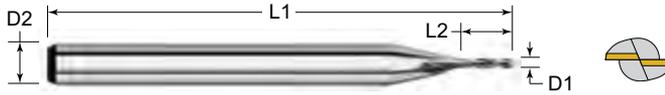
Use our Online Stock Check for up to 10 Tools or click the online Stock Check next to the item on the web page.

Tool #	Description	Price	Available
82015	.015" 2 FL EM	\$19.00	76
84020	.020" 4 FL EM	\$18.75	39
74062	.062" LG RCH	\$27.00	31
28025	1/8" KEYSEAT	\$36.95	11
48203	#3 Thread Mill	\$85.45	7
LF1162	.062" Lg Shk EM	\$30.90	87
ACH1250	1/8" Ext Holder	\$209.50	27
10077	#77 Micro Drill	\$16.50	38
77250	1/4" CVD EM	\$84.75	19



2-FLUTE - DECIMAL

Square & Ball End - UNCOATED - .002" to .024"



Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.002"	.006"	1/8"	1-1/2"	82002	\$39.50	-	-
.003"	.009"	1/8"	1-1/2"	82003	\$34.25	-	-
.004"	.012"	1/8"	1-1/2"	82004	\$29.00	-	-
.005"	.015"	1/8"	1-1/2"	82005	\$27.00	82005B	\$39.50
.006"	.018"	1/8"	1-1/2"	82006	\$27.00	82006B	\$39.50
.007"	.021"	1/8"	1-1/2"	82007	\$27.00	82007B	\$39.50
.008"	.024"	1/8"	1-1/2"	82008	\$27.00	82008B	\$39.50
.009"	.027"	1/8"	1-1/2"	82009	\$27.00	82009B	\$39.50
.010"	.030"	1/8"	1-1/2"	82010	\$24.00	82010B	\$33.75
.011"	.033"	1/8"	1-1/2"	82011	\$24.00	82011B	\$33.75
.012"	.036"	1/8"	1-1/2"	82012	\$24.00	82012B	\$33.75
.013"	.039"	1/8"	1-1/2"	82013	\$22.00	82013B	\$31.50
.014"	.042"	1/8"	1-1/2"	82014	\$22.00	82014B	\$31.50
.015"	.045"	1/8"	1-1/2"	82015	\$19.00	82015B	\$25.75
.016"	.048"	1/8"	1-1/2"	82016	\$19.75	82016B	\$26.00
.017"	.051"	1/8"	1-1/2"	82017	\$19.75	82017B	\$26.00
.018"	.054"	1/8"	1-1/2"	82018	\$19.75	82018B	\$26.00
.019"	.057"	1/8"	1-1/2"	82019	\$19.75	82019B	\$26.00
.020"	.060"	1/8"	1-1/2"	82020	\$18.25	82020B	\$24.75
.021"	.063"	1/8"	1-1/2"	82021	\$19.00	82021B	\$25.25
.022"	.066"	1/8"	1-1/2"	82022	\$19.00	82022B	\$25.25
.023"	.069"	1/8"	1-1/2"	82023	\$19.00	82023B	\$25.25
.024"	.072"	1/8"	1-1/2"	82024	\$19.00	82024B	\$25.25

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2-FLUTE – DECIMAL



Continued from previous page:

Square & Ball End - Uncoated Size Range: .025" to .046"



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.025"	.075"	1/8"	1-1/2"	82025	\$16.75	82025B	\$22.50
.026"	.078"	1/8"	1-1/2"	82026	\$17.50	82026B	\$23.00
.027"	.081"	1/8"	1-1/2"	82027	\$17.50	82027B	\$23.00
.028"	.084"	1/8"	1-1/2"	82028	\$17.50	82028B	\$23.00
.029"	.087"	1/8"	1-1/2"	82029	\$17.50	82029B	\$23.00
.030"	.090"	1/8"	1-1/2"	82030	\$16.75	82030B	\$20.25
.031"	.093"	1/8"	1-1/2"	82031	\$16.75	82031B	\$20.25
.031"	.125"	1/8"	1-1/2"	82031L	\$16.75	82031LB	\$20.25
.032"	.096"	1/8"	1-1/2"	82032	\$17.50	82032B	\$21.00
.033"	.099"	1/8"	1-1/2"	82033	\$17.50	82033B	\$21.00
.034"	.102"	1/8"	1-1/2"	82034	\$17.50	82034B	\$21.00
.035"	.105"	1/8"	1-1/2"	82035	\$14.25	82035B	\$18.50
.036"	.108"	1/8"	1-1/2"	82036	\$14.75	82036B	\$19.25
.037"	.111"	1/8"	1-1/2"	82037	\$14.75	82037B	\$19.25
.038"	.114"	1/8"	1-1/2"	82038	\$14.75	82038B	\$19.25
.039"	.117"	1/8"	1-1/2"	82039	\$14.75	82039B	\$19.25
.040"	.120"	1/8"	1-1/2"	82040	\$14.25	82040B	\$18.50
.041"	.123"	1/8"	1-1/2"	82041	\$14.75	82041B	\$19.25
.042"	.126"	1/8"	1-1/2"	82042	\$14.75	82042B	\$19.25
.043"	.129"	1/8"	1-1/2"	82043	\$14.75	82043B	\$19.25
.044"	.132"	1/8"	1-1/2"	82044	\$14.75	82044B	\$19.25
.045"	.135"	1/8"	1-1/2"	82045	\$14.25	82045B	\$18.50
.046"	.138"	1/8"	1-1/2"	82046	\$14.75	82046B	\$19.25

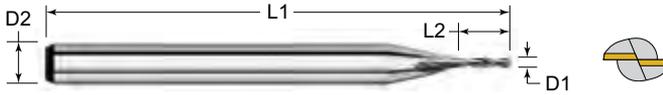
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2-FLUTE - DECIMAL

Square & Ball End - UNCOATED - .047" to .068"

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Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.047"	.141"	1/8"	1-1/2"	82047	\$14.25	82047B	\$18.50
.048"	.144"	1/8"	1-1/2"	82048	\$14.75	82048B	\$19.25
.049"	.147"	1/8"	1-1/2"	82049	\$14.75	82049B	\$19.25
.050"	.150"	1/8"	1-1/2"	82050	\$14.25	82050B	\$18.50
.051"	.153"	1/8"	1-1/2"	82051	\$14.75	82051B	\$19.25
.052"	.156"	1/8"	1-1/2"	82052	\$14.75	82052B	\$19.25
.053"	.159"	1/8"	1-1/2"	82053	\$14.75	82053B	\$19.25
.054"	.162"	1/8"	1-1/2"	82054	\$14.75	82054B	\$19.25
.055"	.165"	1/8"	1-1/2"	82055	\$14.25	82055B	\$18.50
.056"	.168"	1/8"	1-1/2"	82056	\$14.75	82056B	\$19.25
.057"	.171"	1/8"	1-1/2"	82057	\$14.75	82057B	\$19.25
.058"	.174"	1/8"	1-1/2"	82058	\$14.75	82058B	\$19.25
.059"	.177"	1/8"	1-1/2"	82059	\$14.75	82059B	\$19.25
.060"	.180"	1/8"	1-1/2"	82060	\$14.25	82060B	\$18.50
.061"	.183"	1/8"	1-1/2"	82061	\$14.75	82061B	\$19.25
.062"	.186"	1/8"	1-1/2"	82062	\$14.25	82062B	\$18.50
.062"	.250"	1/8"	1-1/2"	82062L	\$14.25	82062LB	\$18.50
.063"	.189"	1/8"	1-1/2"	82063	\$14.25	82063B	\$19.50
.064"	.192"	1/8"	1-1/2"	82064	\$14.25	82064B	\$19.50
.065"	.195"	1/8"	1-1/2"	82065	\$14.25	82065B	\$18.50
.066"	.198"	1/8"	1-1/2"	82066	\$14.25	82066B	\$19.50
.067"	.201"	1/8"	1-1/2"	82067	\$14.25	82067B	\$19.50
.068"	.204"	1/8"	1-1/2"	82068	\$14.25	82068B	\$19.50

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2-FLUTE - DECIMAL



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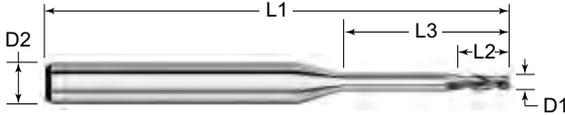
Square & Ball End - Uncoated Size Range: .069" to .125"



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.069"	.207"	1/8"	1-1/2"	82069	\$14.25	82069B	\$19.50
.070"	.210"	1/8"	1-1/2"	82070	\$14.25	82070B	\$18.50
.071"	.213"	1/8"	1-1/2"	82071	\$14.25	82071B	\$19.50
.072"	.216"	1/8"	1-1/2"	82072	\$14.25	82072B	\$19.50
.073"	.219"	1/8"	1-1/2"	82073	\$14.25	82073B	\$19.50
.074"	.222"	1/8"	1-1/2"	82074	\$14.25	82074B	\$19.50
.075"	.225"	1/8"	1-1/2"	82075	\$14.25	82075B	\$18.50
.078"	.234"	1/8"	1-1/2"	82078	\$14.25	82078B	\$18.50
.080"	.240"	1/8"	1-1/2"	82080	\$14.25	82080B	\$18.50
.082"	.246"	1/8"	1-1/2"	82082	\$14.25	82082B	\$19.50
.085"	.255"	1/8"	1-1/2"	82085	\$14.25	82085B	\$18.50
.090"	.270"	1/8"	1-1/2"	82090	\$14.25	82090B	\$18.50
.093"	.279"	1/8"	1-1/2"	82093	\$14.25	82093B	\$18.50
.093"	.375"	1/8"	1-1/2"	82093L	\$14.25	82093LB	\$18.50
.095"	.285"	1/8"	1-1/2"	82095	\$14.25	82095B	\$18.50
.098"	.294"	1/8"	1-1/2"	82098	\$14.25	82098B	\$19.50
.100"	.300"	1/8"	1-1/2"	82100	\$14.25	82100B	\$18.50
.105"	.315"	1/8"	1-1/2"	82105	\$14.25	82105B	\$18.50
.110"	.330"	1/8"	1-1/2"	82110	\$14.25	82110B	\$18.50
.115"	.345"	1/8"	1-1/2"	82115	\$14.25	82115B	\$18.50
.118"	.354"	1/8"	1-1/2"	82118	\$14.25	82118B	\$19.50
.120"	.360"	1/8"	1-1/2"	82120	\$14.25	82120B	\$18.50
.125"	.500"	1/8"	1-1/2"	82125	\$12.50	82125B	\$16.75

2-FLUTE - LONG REACH

Square & Ball End - UNCOATED - .010" to .042"



Neck is reduced for clearance.

Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	.075"	1/8"	1-1/2"	72010	\$39.50	72010B	\$51.50
.010"	.030"	100"	1/8"	1-1/2"	72010-1	\$41.50	72010B-1	\$53.50
.012"	.036"	.075"	1/8"	1-1/2"	72012	\$37.00	72012B	\$48.00
.015"	.045"	.125"	1/8"	1-1/2"	72015	\$31.50	72015B	\$38.50
.015"	.045"	.186"	1/8"	1-1/2"	72015-1	\$33.75	72015B-1	\$40.50
.018"	.054"	.125"	1/8"	1-1/2"	72018	\$31.50	72018B	\$38.50
.020"	.060"	.165"	1/8"	1-1/2"	72020	\$30.75	72020B	\$37.50
.020"	.060"	.250"	1/8"	1-1/2"	72020-1	\$33.00	72020B-1	\$39.50
.022"	.066"	.165"	1/8"	1-1/2"	72022	\$31.50	72022B	\$37.75
.025"	.075"	.205"	1/8"	1-1/2"	72025	\$29.25	72025B	\$35.00
.025"	.075"	.310"	1/8"	1-1/2"	72025-1	\$31.25	72025B-1	\$37.25
.028"	.084"	.205"	1/8"	1-1/2"	72028	\$30.00	72028B	\$35.50
.030"	.090"	.250"	1/8"	1-1/2"	72030	\$29.25	72030B	\$34.00
.030"	.090"	.375"	1/8"	1-1/2"	72030-1	\$31.25	72030B-1	\$36.00
.031"	.093"	.250"	1/8"	1-1/2"	72031	\$29.25	72031B	\$34.00
.031"	.093"	.310"	1/8"	1-1/2"	72031-1	\$29.25	72031B-1	\$34.00
.031"	.093"	.375"	1/8"	1-1/2"	72031-2	\$31.25	72031B-2	\$36.00
.031"	.125"	.250"	1/8"	1-1/2"	72031-3	\$29.25	72031B-3	\$34.00
.031"	.125"	.325"	1/8"	1-1/2"	72031-4	\$29.25	72031B-4	\$34.00
.031"	.125"	.400"	1/8"	1-1/2"	72031-5	\$31.25	72031B-5	\$36.00
.033"	.099"	.250"	1/8"	1-1/2"	72033	\$29.25	72033B	\$34.00
.035"	.105"	.285"	1/8"	1-1/2"	72035	\$29.25	72035B	\$34.00
.040"	.120"	.350"	1/8"	1-1/2"	72040	\$27.00	72040B	\$32.25
.040"	.120"	.480"	1/8"	1-1/2"	72040-1	\$29.00	72040B-1	\$34.25
.042"	.126"	.350"	1/8"	1-1/2"	72042	\$27.25	72042B	\$33.00

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2-FLUTE - LONG REACH



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Square & Ball End - Uncoated Size Range: .045" to .125"

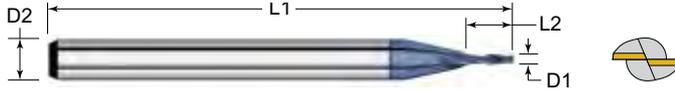


D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.045"	.135"	.300"	1/8"	1-1/2"	72045-1	\$27.00	72045B-1	\$32.25
.045"	.135"	.400"	1/8"	1-1/2"	72045	\$29.00	72045B	\$34.25
.047"	.141"	.300"	1/8"	1-1/2"	72047-1	\$27.00	72047B-1	\$32.25
.047"	.141"	.400"	1/8"	1-1/2"	72047	\$29.00	72047B	\$34.25
.047"	.141"	.500"	1/8"	1-1/2"	72047-2	\$31.00	72047B-2	\$36.25
.050"	.150"	.350"	1/8"	1-1/2"	72050-1	\$27.00	72050B-1	\$32.25
.050"	.150"	.450"	1/8"	1-1/2"	72050	\$27.00	72050B	\$32.25
.052"	.156"	.450"	1/8"	1-1/2"	72052	\$27.25	72052B	\$33.00
.055"	.165"	.500"	1/8"	1-1/2"	72055	\$27.00	72055B	\$32.25
.060"	.180"	.500"	1/8"	1-1/2"	72060	\$27.00	72060B	\$32.25
.060"	.180"	.600"	1/8"	1-1/2"	72060-1	\$30.00	72060B-1	\$35.25
.062"	.186"	.500"	1/8"	1-1/2"	72062	\$27.00	72062B	\$32.25
.062"	.186"	.600"	1/8"	1-1/2"	72062-1	\$30.00	72062B-1	\$35.25
.062"	.250"	.500"	1/8"	1-1/2"	72062-2	\$27.00	72062B-2	\$32.25
.062"	.250"	.625"	1/8"	1-1/2"	72062-3	\$31.00	72062B-3	\$36.25
.065"	.195"	.500"	1/8"	1-1/2"	72065	\$27.00	72065B	\$32.25
.070"	.210"	.550"	1/8"	1-1/2"	72070	\$28.00	72070B	\$33.25
.072"	.216"	.550"	1/8"	1-1/2"	72072	\$28.00	72072B	\$33.25
.075"	.225"	.550"	1/8"	1-1/2"	72075	\$28.00	72075B	\$33.25
.078"	.234"	.550"	1/8"	1-1/2"	72078	\$28.00	72078B	\$33.25
.080"	.240"	.550"	1/8"	1-1/2"	72080	\$28.00	72080B	\$33.25
.090"	.270"	.600"	1/8"	1-1/2"	72090	\$28.00	72090B	\$33.25
.093"	.279"	.600"	1/8"	1-1/2"	72093	\$28.00	72093B	\$33.25
.093"	.375"	.600"	1/8"	1-1/2"	72093-1	\$28.00	72093B-1	\$33.25
.100"	.300"	.600"	1/8"	1-1/2"	72100	\$28.00	72100B	\$33.25
.125"	.500"	.650"	1/8"	1-1/2"	72125	\$28.00	72125B	\$33.25



2-FLUTE - DECIMAL

Square & Ball End - AITiN COATED - .010" to .037"



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	1/8"	1-1/2"	82010TL	\$28.25	82010BTL	\$37.75
.011"	.033"	1/8"	1-1/2"	82011TL	\$28.25	82011BTL	\$37.75
.012"	.036"	1/8"	1-1/2"	82012TL	\$28.25	82012BTL	\$37.75
.013"	.039"	1/8"	1-1/2"	82013TL	\$26.00	82013BTL	\$35.75
.014"	.042"	1/8"	1-1/2"	82014TL	\$26.00	82014BTL	\$35.75
.015"	.045"	1/8"	1-1/2"	82015TL	\$23.25	82015BTL	\$30.00
.016"	.048"	1/8"	1-1/2"	82016TL	\$24.00	82016BTL	\$30.25
.017"	.051"	1/8"	1-1/2"	82017TL	\$24.00	82017BTL	\$30.25
.018"	.054"	1/8"	1-1/2"	82018TL	\$24.00	82018BTL	\$30.25
.019"	.057"	1/8"	1-1/2"	82019TL	\$24.00	82019BTL	\$30.25
.020"	.060"	1/8"	1-1/2"	82020TL	\$22.50	82020BTL	\$29.00
.021"	.063"	1/8"	1-1/2"	82021TL	\$23.00	82021BTL	\$29.50
.022"	.066"	1/8"	1-1/2"	82022TL	\$23.00	82022BTL	\$29.50
.023"	.069"	1/8"	1-1/2"	82023TL	\$23.00	82023BTL	\$29.50
.024"	.072"	1/8"	1-1/2"	82024TL	\$23.00	82024BTL	\$29.50
.025"	.075"	1/8"	1-1/2"	82025TL	\$20.75	82025BTL	\$26.75
.026"	.078"	1/8"	1-1/2"	82026TL	\$21.75	82026BTL	\$27.25
.027"	.081"	1/8"	1-1/2"	82027TL	\$21.75	82027BTL	\$27.25
.028"	.084"	1/8"	1-1/2"	82028TL	\$21.75	82028BTL	\$27.25
.029"	.087"	1/8"	1-1/2"	82029TL	\$21.75	82029BTL	\$27.25
.030"	.090"	1/8"	1-1/2"	82030TL	\$20.75	82030BTL	\$24.50
.031"	.093"	1/8"	1-1/2"	82031TL	\$20.75	82031BTL	\$24.50
.032"	.096"	1/8"	1-1/2"	82032TL	\$21.75	82032BTL	\$25.25
.033"	.099"	1/8"	1-1/2"	82033TL	\$21.75	82033BTL	\$25.25
.034"	.102"	1/8"	1-1/2"	82034TL	\$21.75	82034BTL	\$25.25
.035"	.105"	1/8"	1-1/2"	82035TL	\$18.50	82035BTL	\$22.75
.036"	.108"	1/8"	1-1/2"	82036TL	\$19.00	82036BTL	\$23.75
.037"	.111"	1/8"	1-1/2"	82037TL	\$19.00	82037BTL	\$23.75

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2-FLUTE - DECIMAL



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Square & Ball End - AITiN COATED Size Range: .038" to .125"

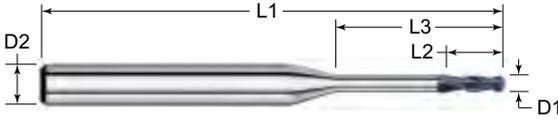


D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.038"	.114"	1/8"	1-1/2"	82038TL	\$19.00	82038BTL	\$23.75
.039"	.117"	1/8"	1-1/2"	82039TL	\$19.00	82039BTL	\$23.75
.040"	.120"	1/8"	1-1/2"	82040TL	\$18.50	82040BTL	\$22.75
.041"	.123"	1/8"	1-1/2"	82041TL	\$19.00	82041BTL	\$23.75
.042"	.126"	1/8"	1-1/2"	82042TL	\$19.00	82042BTL	\$23.75
.043"	.129"	1/8"	1-1/2"	82043TL	\$19.00	82043BTL	\$23.75
.044"	.132"	1/8"	1-1/2"	82044TL	\$19.00	82044BTL	\$23.75
.045"	.135"	1/8"	1-1/2"	82045TL	\$18.50	82045BTL	\$22.75
.046"	.138"	1/8"	1-1/2"	82046TL	\$19.00	82046BTL	\$23.75
.047"	.141"	1/8"	1-1/2"	82047TL	\$18.50	82047BTL	\$22.75
.050"	.150"	1/8"	1-1/2"	82050TL	\$18.50	82050BTL	\$22.75
.052"	.156"	1/8"	1-1/2"	82052TL	\$19.00	82052BTL	\$23.75
.055"	.165"	1/8"	1-1/2"	82055TL	\$18.50	82055BTL	\$22.75
.059"	.177"	1/8"	1-1/2"	82059TL	\$19.00	82059BTL	\$23.75
.060"	.180"	1/8"	1-1/2"	82060TL	\$18.50	82060BTL	\$23.00
.062"	.186"	1/8"	1-1/2"	82062TL	\$18.50	82062BTL	\$22.75
.065"	.195"	1/8"	1-1/2"	82065TL	\$18.50	82065BTL	\$22.75
.067"	.201"	1/8"	1-1/2"	82067TL	\$18.50	82067BTL	\$23.75
.070"	.210"	1/8"	1-1/2"	82070TL	\$18.50	82070BTL	\$22.75
.072"	.216"	1/8"	1-1/2"	82072TL	\$18.50	82072BTL	\$23.75
.075"	.225"	1/8"	1-1/2"	82075TL	\$18.50	82075BTL	\$22.75
.078"	.234"	1/8"	1-1/2"	82078TL	\$18.50	82078BTL	\$22.75
.080"	.240"	1/8"	1-1/2"	82080TL	\$18.50	82080BTL	\$22.75
.085"	.255"	1/8"	1-1/2"	82085TL	\$18.50	82085BTL	\$22.75
.090"	.270"	1/8"	1-1/2"	82090TL	\$18.50	82090BTL	\$22.75
.093"	.279"	1/8"	1-1/2"	82093TL	\$18.50	82093BTL	\$22.75
.098"	.294"	1/8"	1-1/2"	82098TL	\$18.50	82098BTL	\$23.75
.100"	.300"	1/8"	1-1/2"	82100TL	\$18.50	82100BTL	\$22.75
.125"	.500"	1/8"	1-1/2"	82125TL	\$16.75	82125BTL	\$20.75

2-FLUTE - LONG REACH



Square & Ball End - AITIN COATED - .010" to .042"



Neck is reduced for clearance.

Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	.075"	1/8"	1-1/2"	72010TL	\$43.75	72010BTL	\$55.75
.010"	.030"	.100"	1/8"	1-1/2"	72010TL-1	\$45.75	72010BTL-1	\$57.75
.012"	.036"	.075"	1/8"	1-1/2"	72012TL	\$41.25	72012BTL	\$52.25
.015"	.045"	.125"	1/8"	1-1/2"	72015TL	\$36.50	72015BTL	\$45.50
.015"	.045"	.186"	1/8"	1-1/2"	72015TL-1	\$38.50	72015BTL-1	\$47.75
.018"	.054"	.125"	1/8"	1-1/2"	72018TL	\$40.75	72018BTL	\$49.75
.020"	.060"	.165"	1/8"	1-1/2"	72020TL	\$35.25	72020BTL	\$43.25
.020"	.060"	.250"	1/8"	1-1/2"	72020TL-1	\$37.50	72020BTL-1	\$45.50
.022"	.066"	.165"	1/8"	1-1/2"	72022TL	\$35.25	72022BTL	\$43.25
.025"	.075"	.205"	1/8"	1-1/2"	72025TL	\$33.50	72025BTL	\$41.00
.025"	.075"	.310"	1/8"	1-1/2"	72025TL-1	\$35.75	72025BTL-1	\$43.00
.028"	.084"	.205"	1/8"	1-1/2"	72028TL	\$33.50	72028BTL	\$41.00
.030"	.090"	.250"	1/8"	1-1/2"	72030TL	\$33.50	72030BTL	\$43.00
.030"	.090"	.375"	1/8"	1-1/2"	72030TL-1	\$35.75	72030BTL-1	\$46.25
.031"	.093"	.250"	1/8"	1-1/2"	72031TL	\$33.50	72031BTL	\$41.00
.031"	.093"	.310"	1/8"	1-1/2"	72031TL-1	\$33.50	72031BTL-1	\$41.00
.031"	.093"	.375"	1/8"	1-1/2"	72031TL-2	\$35.75	72031BTL-2	\$43.00
.031"	.125"	.250"	1/8"	1-1/2"	72031TL-3	\$33.50	72031BTL-3	\$41.00
.031"	.125"	.325"	1/8"	1-1/2"	72031TL-4	\$33.50	72031BTL-4	\$41.00
.031"	.125"	.400"	1/8"	1-1/2"	72031TL-5	\$35.75	72031BTL-5	\$43.00
.033"	.099"	.250"	1/8"	1-1/2"	72033TL	\$33.50	72033BTL	\$41.00
.035"	.105"	.285"	1/8"	1-1/2"	72035TL	\$33.50	72035BTL	\$41.00
.038"	.114"	.285"	1/8"	1-1/2"	72038TL	\$33.50	72038BTL	\$41.00
.040"	.120"	.350"	1/8"	1-1/2"	72040TL	\$33.50	72040BTL	\$41.00
.040"	.120"	.480"	1/8"	1-1/2"	72040TL-1	\$35.75	72040BTL-1	\$43.00
.042"	.126"	.350"	1/8"	1-1/2"	72042TL	\$33.50	72042BTL	\$41.00

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2-FLUTE - LONG REACH



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Square & Ball End - AITiN COATED Size Range: .045" to .125"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.045"	.135"	.300"	1/8"	1-1/2"	72045TL-1	\$32.50	72045BTL-1	\$39.25
.045"	.135"	.400"	1/8"	1-1/2"	72045TL	\$32.50	72045BTL	\$39.25
.047"	.141"	.300"	1/8"	1-1/2"	72047TL-1	\$32.50	72047BTL-1	\$39.25
.047"	.141"	.400"	1/8"	1-1/2"	72047TL	\$32.50	72047BTL	\$39.25
.047"	.141"	.500"	1/8"	1-1/2"	72047TL-2	\$35.25	72047BTL-2	\$42.00
.050"	.150"	.350"	1/8"	1-1/2"	72050TL-1	\$32.50	72050BTL-1	\$39.25
.050"	.150"	.450"	1/8"	1-1/2"	72050TL	\$32.50	72050BTL	\$39.25
.052"	.156"	.450"	1/8"	1-1/2"	72052TL	\$32.50	72052BTL	\$39.25
.055"	.165"	.500"	1/8"	1-1/2"	72055TL	\$32.50	72055BTL	\$39.25
.060"	.180"	.500"	1/8"	1-1/2"	72060TL	\$32.50	72060BTL	\$39.25
.060"	.180"	.600"	1/8"	1-1/2"	72060TL-1	\$34.25	72060BTL-1	\$41.50
.062"	.186"	.500"	1/8"	1-1/2"	72062TL	\$32.50	72062BTL	\$39.25
.062"	.186"	.600"	1/8"	1-1/2"	72062TL-1	\$34.25	72062BTL-1	\$41.50
.062"	.250"	.500"	1/8"	1-1/2"	72062TL-2	\$32.50	72062BTL-2	\$39.25
.062"	.250"	.625"	1/8"	1-1/2"	72062TL-3	\$34.25	72062BTL-3	\$41.50
.065"	.195"	.500"	1/8"	1-1/2"	72065TL	\$32.50	72065BTL	\$39.25
.070"	.210"	.550"	1/8"	1-1/2"	72070TL	\$32.50	72070BTL	\$39.25
.072"	.216"	.550"	1/8"	1-1/2"	72072TL	\$32.50	72072BTL	\$39.25
.075"	.225"	.550"	1/8"	1-1/2"	72075TL	\$32.50	72075BTL	\$39.25
.078"	.234"	.550"	1/8"	1-1/2"	72078TL	\$32.50	72078BTL	\$39.25
.080"	.240"	.550"	1/8"	1-1/2"	72080TL	\$32.50	72080BTL	\$39.25
.090"	.270"	.600"	1/8"	1-1/2"	72090TL	\$32.50	72090BTL	\$39.25
.093"	.279"	.600"	1/8"	1-1/2"	72093TL	\$32.50	72093BTL	\$39.25
.093"	.375"	.600"	1/8"	1-1/2"	72093TL-1	\$32.50	72093BTL-1	\$39.25
.100"	.300"	.600"	1/8"	1-1/2"	72100TL	\$32.50	72100BTL	\$39.25
.125"	.500"	.650"	1/8"	1-1/2"	72125TL	\$32.50	72125BTL	\$39.25

2-FLUTE - STUB LENGTH

Square & Ball End - UNCOATED - .005" to .032"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Total Number	Price Each
.005"	.007"	1/8"	1-1/2"	81005	\$27.00	81005B	\$39.50
.006"	.009"	1/8"	1-1/2"	81006	\$27.00	81006B	\$39.50
.007"	.010"	1/8"	1-1/2"	81007	\$27.00	81007B	\$39.50
.008"	.012"	1/8"	1-1/2"	81008	\$27.00	81008B	\$39.50
.009"	.013"	1/8"	1-1/2"	81009	\$27.00	81009B	\$39.50
.010"	.015"	1/8"	1-1/2"	81010	\$24.00	81010B	\$33.75
.011"	.017"	1/8"	1-1/2"	81011	\$24.00	81011B	\$33.75
.012"	.018"	1/8"	1-1/2"	81012	\$24.00	81012B	\$33.75
.013"	.019	1/8"	1-1/2"	81013	\$22.00	-	-
.014"	.021"	1/8"	1-1/2"	81014	\$22.00	-	-
.015"	.022"	1/8"	1-1/2"	81015	\$19.00	81015B	\$25.75
.016"	.024"	1/8"	1-1/2"	81016	\$19.75	-	-
.017"	.026"	1/8"	1-1/2"	81017	\$19.75	-	-
.018"	.027"	1/8"	1-1/2"	81018	\$19.75	81018B	\$26.00
.019"	.029"	1/8"	1-1/2"	81019	\$19.75	-	-
.020"	.030"	1/8"	1-1/2"	81020	\$18.25	81020B	\$24.75
.021"	.031"	1/8"	1-1/2"	81021	\$19.00	-	-
.022"	.033"	1/8"	1-1/2"	81022	\$19.00	81022B	\$25.25
.023"	.035"	1/8"	1-1/2"	81023	\$19.00	-	-
.024"	.036"	1/8"	1-1/2"	81024	\$19.00	-	-
.025"	.037"	1/8"	1-1/2"	81025	\$16.75	81025B	\$22.50
.026"	.039"	1/8"	1-1/2"	81026	\$17.50	-	-
.027"	.041"	1/8"	1-1/2"	81027	\$17.50	81027B	\$23.00
.028"	.042"	1/8"	1-1/2"	81028	\$17.50	-	-
.029"	.043"	1/8"	1-1/2"	81029	\$17.50	-	-
.030"	.045"	1/8"	1-1/2"	81030	\$16.75	81030B	\$20.25
.031"	.046"	1/8"	1-1/2"	81031	\$16.75	81031B	\$20.25
.032"	.048"	1/8"	1-1/2"	81032	\$17.50	-	-

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2-FLUTE - STUB LENGTH



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Square & Ball End - UNCOATED Size Range: .033" to .125"

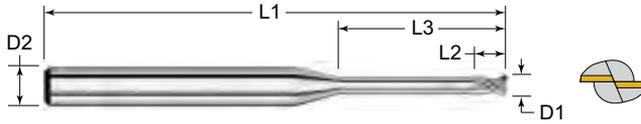


D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Total Number	Price Each
.033"	.049"	1/8"	1-1/2"	81033	\$17.50	-	-
.034"	.051"	1/8"	1-1/2"	81034	\$17.50	-	-
.035"	.052"	1/8"	1-1/2"	81035	\$14.25	81035B	\$18.50
.036"	.054"	1/8"	1-1/2"	81036	\$14.75	-	-
.037"	.055"	1/8"	1-1/2"	81037	\$14.75	-	-
.038"	.057"	1/8"	1-1/2"	81038	\$14.75	-	-
.039"	.058"	1/8"	1-1/2"	81039	\$14.75	-	-
.040"	.060"	1/8"	1-1/2"	81040	\$14.25	81040B	\$18.50
.041"	.061"	1/8"	1-1/2"	81041	\$14.75	-	-
.042"	.063"	1/8"	1-1/2"	81042	\$14.75	-	-
.043"	.065"	1/8"	1-1/2"	81043	\$14.75	-	-
.044"	.066"	1/8"	1-1/2"	81044	\$14.75	-	-
.045"	.067"	1/8"	1-1/2"	81045	\$14.25	81045B	\$18.25
.046"	.069"	1/8"	1-1/2"	81046	\$14.75	-	-
.047"	.070"	1/8"	1-1/2"	81047	\$14.25	81047B	\$18.50
.050"	.075"	1/8"	1-1/2"	81050	\$14.25	81050B	\$18.50
.055"	.082"	1/8"	1-1/2"	81055	\$14.25	81055B	\$19.25
.060"	.090"	1/8"	1-1/2"	81060	\$14.25	81060B	\$19.25
.062"	.093"	1/8"	1-1/2"	81062	\$14.25	81062B	\$18.50
.065"	.098"	1/8"	1-1/2"	81065	\$14.25	81065B	\$18.50
.070"	.105"	1/8"	1-1/2"	81070	\$14.25	81070B	\$18.50
.075"	.113"	1/8"	1-1/2"	81075	\$14.25	81075B	\$18.50
.078"	.117"	1/8"	1-1/2"	81078	\$14.25	81078B	\$18.50
.080"	.120"	1/8"	1-1/2"	81080	\$14.25	81080B	\$18.50
.085"	.127"	1/8"	1-1/2"	81085	\$14.25	81085B	\$18.50
.090"	.135"	1/8"	1-1/2"	81090	\$14.25	81090B	\$18.50
.093"	.140"	1/8"	1-1/2"	81093	\$14.25	81093B	\$18.50
.100"	.150"	1/8"	1-1/2"	81100	\$14.25	81100B	\$18.50
.125"	.250"	1/8"	1-1/2"	81125	\$12.50	81125B	\$16.75



2-FLUTE - STUB LENGTH - LONG RCH

Square & Ball End - UNCOATED - .010" to .047"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	.075"	1/8"	1-1/2"	76210	\$39.50	76210B	\$51.50
.010"	.015"	.100"	1/8"	1-1/2"	76210-1	\$41.50	76210B-1	\$53.50
.012"	.018"	.075"	1/8"	1-1/2"	76202	\$37.00	76202B	\$48.00
.015"	.022"	.100"	1/8"	1-1/2"	76215	\$32.25	76215B	\$41.25
.015"	.022"	.145"	1/8"	1-1/2"	76215-1	\$32.25	76215B-1	\$41.25
.015"	.022"	.190"	1/8"	1-1/2"	76215-2	\$34.50	76215B-2	\$43.50
.018"	.027"	.125"	1/8"	1-1/2"	76218	\$32.25	76218B	\$41.25
.020"	.030"	.120"	1/8"	1-1/2"	76220	\$31.25	76220B	\$38.00
.020"	.030"	.165"	1/8"	1-1/2"	76220-1	\$31.25	76220B-1	\$38.00
.020"	.030"	.200"	1/8"	1-1/2"	76220-2	\$33.25	76220B-2	\$41.25
.020"	.030"	.250"	1/8"	1-1/2"	76220-3	\$33.25	76220B-3	\$41.25
.025"	.037"	.150"	1/8"	1-1/2"	76225	\$29.25	76225B	\$36.75
.025"	.037"	.205"	1/8"	1-1/2"	76225-1	\$29.25	76225B-1	\$36.75
.025"	.037"	.310"	1/8"	1-1/2"	76225-2	\$31.50	76225B-2	\$39.00
.030"	.045"	.180"	1/8"	1-1/2"	76230	\$29.25	76230B	\$36.25
.030"	.045"	.275"	1/8"	1-1/2"	76230-1	\$31.50	76230B-1	\$38.50
.031"	.046"	.187"	1/8"	1-1/2"	76231	\$29.25	76231B	\$36.25
.031"	.046"	.250"	1/8"	1-1/2"	76231-1	\$29.25	76231B-1	\$36.25
.031"	.046"	.312"	1/8"	1-1/2"	76231-2	\$31.50	76231B-2	\$38.25
.031"	.046"	.375"	1/8"	1-1/2"	76231-3	\$31.50	76231B-3	\$38.25
.035"	.052"	.210"	1/8"	1-1/2"	76235	\$29.25	76235B	\$36.25
.035"	.052"	.320"	1/8"	1-1/2"	76235-1	\$31.50	76235B-1	\$38.25
.040"	.060"	.220"	1/8"	1-1/2"	76240	\$29.25	76240B	\$36.25
.040"	.060"	.350"	1/8"	1-1/2"	76240-1	\$31.50	76240B-1	\$38.25
.045"	.067"	.270"	1/8"	1-1/2"	76245	\$28.25	76245B	\$34.00
.045"	.067"	.350"	1/8"	1-1/2"	76245-1	\$28.25	76245B-1	\$34.00
.045"	.067"	.405"	1/8"	1-1/2"	76245-2	\$30.25	76245B-2	\$36.00
.047"	.070"	.280"	1/8"	1-1/2"	76247	\$28.25	76247B	\$34.00
.047"	.070"	.350"	1/8"	1-1/2"	76247-1	\$28.25	76247B-1	\$34.00
.047"	.070"	.450"	1/8"	1-1/2"	76247-2	\$30.25	76247B-2	\$36.00

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2-FLUTE – STUB LENGTH – LONG RCH



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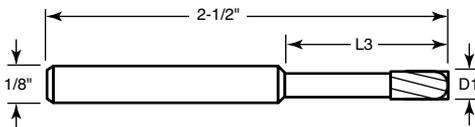
Square & Ball End - UNCOATED Size Range: .050" to .125"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.050"	.075"	.300"	1/8"	1-1/2"	76250	\$28.25	76250B	\$34.00
.050"	.075"	.400"	1/8"	1-1/2"	76250-1	\$28.25	76250B-1	\$34.00
.050"	.075"	.500"	1/8"	1-1/2"	76250-2	\$31.00	76250B-2	\$37.00
.055"	.082"	.330"	1/8"	1-1/2"	76255	\$28.25	76255B	\$34.00
.055"	.082"	.500"	1/8"	1-1/2"	76255-1	\$31.00	76255B-1	\$37.00
.060"	.090"	.360"	1/8"	1-1/2"	76260	\$28.25	76260B	\$34.00
.060"	.090"	.500"	1/8"	1-1/2"	76260-1	\$31.00	76260B-1	\$37.00
.062"	.093"	.375"	1/8"	1-1/2"	76262	\$28.25	76262B	\$34.00
.062"	.093"	.500"	1/8"	1-1/2"	76262-1	\$28.25	76262B-1	\$34.00
.062"	.093"	.600"	1/8"	1-1/2"	76262-2	\$31.00	76262B-2	\$37.00
.065"	.098"	.390"	1/8"	1-1/2"	76265	\$28.25	76265B	\$34.00
.065"	.098"	.500"	1/8"	1-1/2"	76265-1	\$28.25	76265B-1	\$34.00
.070"	.105"	.420"	1/8"	1-1/2"	76270	\$28.25	76270B	\$34.00
.075"	.113"	.450"	1/8"	1-1/2"	76275	\$28.25	76275B	\$34.00
.078"	.117"	.470"	1/8"	1-1/2"	76278	\$28.25	76278B	\$34.00
.080"	.120"	.480"	1/8"	1-1/2"	76280	\$28.25	76280B	\$34.00
.085"	.127"	.510"	1/8"	1-1/2"	76285	\$28.25	76285B	\$34.00
.090"	.135"	.540"	1/8"	1-1/2"	76290	\$28.25	76290B	\$34.00
.093"	.140"	.560"	1/8"	1-1/2"	76293	\$28.25	76293B	\$34.00
.100"	.150"	.600"	1/8"	1-1/2"	76200	\$28.25	76200B	\$34.00
.125"	.250"	.600"	1/8"	1-1/2"	76212	\$28.25	76212B	\$34.00

ORDER SPECIAL Square & Ball LONG REACH MICRO ENDMILLS

To order special long reach micro endmills please specify:



1. Specify: Square End or Ball End.
2. Diameter (D1): _____
3. Flute Length (L2): _____
4. Overall Reach (L3): _____
5. Quantity (Minimum 6): _____
6. Specify: 2-Flute or 4-Flute.

Special Reaches Shipped within 24-48 Hours!

Tools are custom manufactured to order and are nonreturnable.

2-FLUTE - STUB LENGTH



Square & Ball End - AITiN COATED - .005" to .030"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.005"	.007"	1/8"	1-1/2"	81005TL	\$35.25	81005BTL	\$48.00
.006"	.009"	1/8"	1-1/2"	81006TL	\$35.25	81006BTL	\$48.00
.007"	.010"	1/8"	1-1/2"	81007TL	\$35.25	81007BTL	\$48.00
.008"	.012"	1/8"	1-1/2"	81008TL	\$35.25	81008BTL	\$48.00
.009"	.013"	1/8"	1-1/2"	81009TL	\$35.25	81009BTL	\$48.00
.010"	.015"	1/8"	1-1/2"	81010TL	\$28.25	81010BTL	\$37.75
.011"	.017"	1/8"	1-1/2"	81011TL	\$28.25	-	-
.012"	.018"	1/8"	1-1/2"	81012TL	\$28.25	81012BTL	\$37.75
.013"	.019"	1/8"	1-1/2"	81013TL	\$28.25	-	-
.014"	.021"	1/8"	1-1/2"	81014TL	\$28.25	-	-
.015"	.022"	1/8"	1-1/2"	81015TL	\$23.25	81015BTL	\$30.00
.016"	.024"	1/8"	1-1/2"	81016TL	\$24.00	-	-
.017"	.026"	1/8"	1-1/2"	81017TL	\$24.00	-	-
.018"	.027"	1/8"	1-1/2"	81018TL	\$24.00	81018BTL	\$30.25
.019"	.029"	1/8"	1-1/2"	81019TL	\$24.00	-	-
.020"	.030"	1/8"	1-1/2"	81020TL	\$22.50	81020BTL	\$29.00
.021"	.031"	1/8"	1-1/2"	81021TL	\$23.00	-	-
.022"	.033"	1/8"	1-1/2"	81022TL	\$23.00	81022BTL	\$29.50
.023"	.035"	1/8"	1-1/2"	81023TL	\$23.00	-	-
.024"	.036"	1/8"	1-1/2"	81024TL	\$23.00	-	-
.025"	.037"	1/8"	1-1/2"	81025TL	\$20.75	81025BTL	\$26.75
.026"	.039"	1/8"	1-1/2"	81026TL	\$21.75	-	-
.027"	.041"	1/8"	1-1/2"	81027TL	\$21.75	81027BTL	\$27.25
.028"	.042"	1/8"	1-1/2"	81028TL	\$21.75	-	-
.029"	.043"	1/8"	1-1/2"	81029TL	\$21.75	-	-
.030"	.045"	1/8"	1-1/2"	81030TL	\$20.75	81030BTL	\$24.50

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2-FLUTE - STUB LENGTH



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Square & Ball End - AITiN COATED Size Range: .031" to .125"

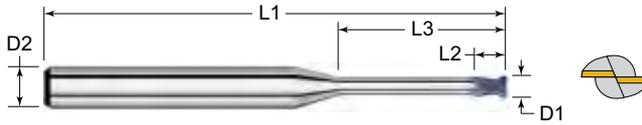


D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.031"	.046"	1/8"	1-1/2"	81031TL	\$20.75	81031BTL	\$24.50
.032"	.048"	1/8"	1-1/2"	81032TL	\$21.75	-	-
.033"	.049"	1/8"	1-1/2"	81033TL	\$21.75	-	-
.034"	.051"	1/8"	1-1/2"	81034TL	\$21.75	-	-
.035"	.052"	1/8"	1-1/2"	81035TL	\$18.50	81035BTL	\$22.75
.036"	.054"	1/8"	1-1/2"	81036TL	\$19.00	-	-
.037"	.055"	1/8"	1-1/2"	81037TL	\$19.00	-	-
.038"	.057"	1/8"	1-1/2"	81038TL	\$19.00	-	-
.039"	.058"	1/8"	1-1/2"	81039TL	\$19.00	-	-
.040"	.060"	1/8"	1-1/2"	81040TL	\$18.50	81040BTL	\$22.75
.041"	.061"	1/8"	1-1/2"	81041TL	\$19.00	-	-
.042"	.063"	1/8"	1-1/2"	81042TL	\$19.00	-	-
.043"	.065"	1/8"	1-1/2"	81043TL	\$19.00	-	-
.044"	.066"	1/8"	1-1/2"	81044TL	\$19.00	-	-
.045"	.067"	1/8"	1-1/2"	81045TL	\$18.50	81045BTL	\$22.75
.046"	.069"	1/8"	1-1/2"	81046TL	\$19.00	-	-
.047"	.070"	1/8"	1-1/2"	81047TL	\$18.50	81047BTL	\$22.75
.050"	.075"	1/8"	1-1/2"	81050TL	\$18.50	81050BTL	\$22.75
.055"	.082"	1/8"	1-1/2"	81055TL	\$18.50	81055BTL	\$22.75
.060"	.090"	1/8"	1-1/2"	81060TL	\$18.50	81060BTL	\$22.75
.062"	.093"	1/8"	1-1/2"	81062TL	\$18.50	81062BTL	\$22.75
.065"	.098"	1/8"	1-1/2"	81065TL	\$18.50	81065BTL	\$22.75
.070"	.105"	1/8"	1-1/2"	81070TL	\$18.50	81070BTL	\$22.75
.075"	.113"	1/8"	1-1/2"	81075TL	\$18.50	81075BTL	\$22.75
.078"	.117"	1/8"	1-1/2"	81078TL	\$18.50	81078BTL	\$22.75
.080"	.120"	1/8"	1-1/2"	81080TL	\$18.50	81080BTL	\$22.75
.085"	.127"	1/8"	1-1/2"	81085TL	\$18.50	81085BTL	\$22.75
.090"	.135"	1/8"	1-1/2"	81090TL	\$18.50	81090BTL	\$22.75
.093"	.140"	1/8"	1-1/2"	81093TL	\$18.50	81093BTL	\$22.75
.100"	.150"	1/8"	1-1/2"	81100TL	\$18.50	81100BTL	\$22.75
.125"	.250"	1/8"	1-1/2"	81125TL	\$16.75	81125BTL	\$20.75



2-FLUTE - STUB LENGTH - LONG RCH

Square & Ball End - AITiN COATED - .010" to .040"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	.075"	1/8"	1-1/2"	76310	\$43.75	76310B	\$55.75
.010"	.015"	.100"	1/8"	1-1/2"	76310-1	\$45.75	76310B-1	\$57.75
.012"	.018"	.075"	1/8"	1-1/2"	76302	\$41.25	76302B	\$52.25
.015"	.022"	.100"	1/8"	1-1/2"	76315	\$36.50	76315B	\$45.50
.015"	.022"	.145"	1/8"	1-1/2"	76315-1	\$36.50	76315B-1	\$45.50
.015"	.022"	.190"	1/8"	1-1/2"	76315-2	\$38.50	76315B-2	\$47.75
.018"	.027"	.125"	1/8"	1-1/2"	76318	\$36.50	76318B	\$45.50
.020"	.030"	.120"	1/8"	1-1/2"	76320	\$35.25	76320B	\$42.00
.020"	.030"	.165"	1/8"	1-1/2"	76320-1	\$35.25	76320B-1	\$42.00
.020"	.030"	.200"	1/8"	1-1/2"	76320-2	\$37.50	76320B-2	\$45.50
.020"	.030"	.250"	1/8"	1-1/2"	76320-3	\$37.50	76320B-3	\$45.50
.025"	.037"	.150"	1/8"	1-1/2"	76325	\$33.50	76325B	\$41.00
.025"	.037"	.205"	1/8"	1-1/2"	76325-1	\$33.50	76325B-1	\$41.00
.025"	.037"	.310"	1/8"	1-1/2"	76325-2	\$36.75	76325B-2	\$43.00
.030"	.045"	.180"	1/8"	1-1/2"	76330	\$33.50	76330B	\$40.25
.030"	.045"	.275"	1/8"	1-1/2"	76330-1	\$35.75	76330B-1	\$42.75
.031"	.046"	.187"	1/8"	1-1/2"	76331	\$33.50	76331B	\$40.25
.031"	.046"	.250"	1/8"	1-1/2"	76331-1	\$33.50	76331B-1	\$40.25
.031"	.046"	.312"	1/8"	1-1/2"	76331-2	\$35.75	76331B-2	\$41.50
.031"	.046"	.375"	1/8"	1-1/2"	76331-3	\$35.75	76331B-3	\$42.50
.035"	.052"	.210"	1/8"	1-1/2"	76335	\$33.50	76335B	\$40.25
.035"	.052"	.320"	1/8"	1-1/2"	76335-1	\$35.75	76335B-1	\$42.50
.040"	.060"	.220"	1/8"	1-1/2"	76340	\$33.50	76340B	\$40.25
.040"	.060"	.350"	1/8"	1-1/2"	76340-1	\$35.75	76340B-1	\$42.50

Continued Next Page

Special long reach end mills quoted on request. Minimum 6 pieces per size.

Ships within 24-48 hours.

Tools are custom manufactured to order and are nonreturnable.

2-FLUTE - STUB LENGTH - LONG RCH



Continued from previous page:

Square & Ball End - AITiN COATED Size Range: .045" to .125"

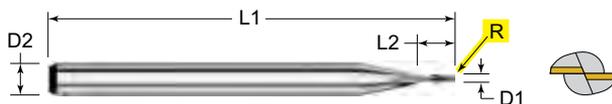


D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.045"	.067"	.270"	1/8"	1-1/2"	76345	\$32.50	76345B	\$38.00
.045"	.067"	.350"	1/8"	1-1/2"	76345-1	\$32.50	76345B-1	\$38.00
.045"	.067"	.405"	1/8"	1-1/2"	76345-2	\$34.50	76345B-2	\$40.25
.047"	.070"	.280"	1/8"	1-1/2"	76347	\$32.50	76347B	\$38.00
.047"	.070"	.350"	1/8"	1-1/2"	76347-1	\$32.50	76347B-1	\$38.00
.047"	.070"	.450"	1/8"	1-1/2"	76347-2	\$34.50	76347B-2	\$40.25
.050"	.075"	.300"	1/8"	1-1/2"	76350	\$32.50	76350B	\$38.00
.050"	.075"	.400"	1/8"	1-1/2"	76350-1	\$32.50	76350B-1	\$38.00
.050"	.075"	.500"	1/8"	1-1/2"	76350-2	\$35.25	76350B-2	\$41.25
.055"	.082"	.330"	1/8"	1-1/2"	76355	\$32.50	76355B	\$41.25
.055"	.082"	.500"	1/8"	1-1/2"	76355-1	\$35.25	76355B-1	\$41.25
.060"	.090"	.360"	1/8"	1-1/2"	76360	\$32.50	76360B	\$38.00
.060"	.090"	.500"	1/8"	1-1/2"	76360-1	\$35.25	76360B-1	\$41.25
.062"	.093"	.375"	1/8"	1-1/2"	76362	\$32.50	76362B	\$38.00
.062"	.093"	.500"	1/8"	1-1/2"	76362-1	\$32.50	76362B-1	\$38.00
.062"	.093"	.600"	1/8"	1-1/2"	76362-2	\$35.25	76362B-2	\$41.25
.065"	.098"	.390"	1/8"	1-1/2"	76365	\$32.50	76365B	\$38.00
.065"	.098"	.500"	1/8"	1-1/2"	76365-1	\$32.50	76365B-1	\$38.00
.070"	.105"	.420"	1/8"	1-1/2"	76370	\$32.50	76370B	\$38.00
.075"	.113"	.450"	1/8"	1-1/2"	76375	\$32.50	76375B	\$38.00
.078"	.117"	.470"	1/8"	1-1/2"	76378	\$32.50	76378B	\$38.00
.080"	.120"	.480"	1/8"	1-1/2"	76380	\$32.50	76380B	\$38.00
.085"	.127"	.510"	1/8"	1-1/2"	76385	\$32.50	76385B	\$38.00
.090"	.135"	.540"	1/8"	1-1/2"	76390	\$32.50	76390B	\$38.00
.093"	.140"	.560"	1/8"	1-1/2"	76393	\$32.50	76393B	\$38.00
.100"	.150"	.600"	1/8"	1-1/2"	76300	\$32.50	76300B	\$38.00
.125"	.250"	.600"	1/8"	1-1/2"	76312	\$32.50	76312B	\$38.00



2-FLUTE - DECIMAL - CORNER RADIUS

Decimal - UNCOATED & **AITiN COATED** .015" to .075" Diameter



Corner radius helps prevent chipping at corners at high feeds and speeds.

Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		ALTiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.003"	.045"	1/8"	1-1/2"	86615-003	\$36.50	86715-003	\$40.50
.020"	.005"	.060"	1/8"	1-1/2"	86620-005	\$32.50	86720-005	\$36.50
.025"	.005"	.075"	1/8"	1-1/2"	86625-005	\$32.50	86725-005	\$36.50
.030"	.005"	.090"	1/8"	1-1/2"	86630-005	\$28.75	86730-005	\$32.75
.030"	.010"	.090"	1/8"	1-1/2"	86630-010	\$28.75	86730-010	\$32.75
.031" (1/32)	.005"	.093"	1/8"	1-1/2"	86631-005	\$28.75	86731-005	\$32.75
.031" (1/32)	.010"	.093"	1/8"	1-1/2"	86631-010	\$28.75	86731-010	\$32.75
.035"	.005"	.105"	1/8"	1-1/2"	86635-005	\$24.75	86735-005	\$28.75
.035"	.010"	.105"	1/8"	1-1/2"	86635-010	\$24.75	86735-010	\$28.75
.040"	.005"	.120"	1/8"	1-1/2"	86640-005	\$21.50	86740-005	\$25.50
.040"	.010"	.120"	1/8"	1-1/2"	86640-010	\$21.50	86740-010	\$25.50
.045"	.005"	.135"	1/8"	1-1/2"	86645-005	\$21.50	86745-005	\$25.50
.045"	.010"	.135"	1/8"	1-1/2"	86645-010	\$21.50	86745-010	\$25.50
.045"	.015"	.135"	1/8"	1-1/2"	86645-015	\$21.50	86745-015	\$25.50
.047" (3/64)	.005"	.141"	1/8"	1-1/2"	86647-005	\$21.50	86747-005	\$25.50
.047" (3/64)	.010"	.141"	1/8"	1-1/2"	86647-010	\$21.50	86747-010	\$25.50
.047" (3/64)	.015"	.141"	1/8"	1-1/2"	86647-015	\$21.50	86747-015	\$25.50
.050"	.005"	.150"	1/8"	1-1/2"	86650-005	\$21.50	86750-005	\$25.50
.050"	.010"	.150"	1/8"	1-1/2"	86650-010	\$21.50	86750-010	\$25.50
.050"	.015"	.150"	1/8"	1-1/2"	86650-015	\$21.50	86750-015	\$25.50
.060"	.005"	.180"	1/8"	1-1/2"	86660-005	\$21.50	86760-005	\$25.50
.060"	.010"	.180"	1/8"	1-1/2"	86660-010	\$21.50	86760-010	\$25.50
.060"	.015"	.180"	1/8"	1-1/2"	86660-015	\$21.50	86760-015	\$25.50
.062" (1/16)	.005"	.186"	1/8"	1-1/2"	86662-005	\$21.50	86762-005	\$25.50
.062" (1/16)	.010"	.186"	1/8"	1-1/2"	86662-010	\$21.50	86762-010	\$25.50
.062" (1/16)	.015"	.186"	1/8"	1-1/2"	86662-015	\$21.50	86762-015	\$25.50
.062" (1/16)	.020"	.186"	1/8"	1-1/2"	86662-020	\$21.50	86762-020	\$25.50
.075"	.005"	.225"	1/8"	1-1/2"	86675-005	\$21.50	86775-005	\$25.50
.075"	.010"	.225"	1/8"	1-1/2"	86675-010	\$21.50	86775-010	\$25.50
.075"	.015"	.225"	1/8"	1-1/2"	86675-015	\$21.50	86775-015	\$25.50

Continued Next Page

2-FLUTE – DECIMAL – CORNER RADIUS



Continued from previous page:

Decimal - UNCOATED & AITiN COATED

Size Range: .078" to .125"



Corner radius helps prevent chipping at corners at high feeds and speeds.

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		ALTiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.078" (5/64)	.005"	.234"	1/8"	1-1/2"	86678-005	\$21.50	86778-005	\$25.50
.078" (5/64)	.010"	.234"	1/8"	1-1/2"	86678-010	\$21.50	86778-010	\$25.50
.078" (5/64)	.015"	.234"	1/8"	1-1/2"	86678-015	\$21.50	86778-015	\$25.50
.078" (5/64)	.020"	.234"	1/8"	1-1/2"	86678-020	\$21.50	86778-020	\$25.50
.090"	.005"	.270"	1/8"	1-1/2"	86690-005	\$21.50	86790-005	\$25.50
.090"	.010"	.270"	1/8"	1-1/2"	86690-010	\$21.50	86790-010	\$25.50
.090"	.015"	.270"	1/8"	1-1/2"	86690-015	\$21.50	86790-015	\$25.50
.093" (3/32)	.005"	.279"	1/8"	1-1/2"	86693-005	\$21.50	86793-005	\$25.50
.093" (3/32)	.010"	.279"	1/8"	1-1/2"	86693-010	\$21.50	86793-010	\$25.50
.093" (3/32)	.015"	.279"	1/8"	1-1/2"	86693-015	\$21.50	86793-015	\$25.50
.093" (3/32)	.020"	.279"	1/8"	1-1/2"	86693-020	\$21.50	86793-020	\$25.50
.125" (1/8)	.005"	.500"	1/8"	1-1/2"	86612-005	\$21.50	86712-005	\$25.50
.125" (1/8)	.010"	.500"	1/8"	1-1/2"	86612-010	\$21.50	86712-010	\$25.50
.125" (1/8)	.015"	.500"	1/8"	1-1/2"	86612-015	\$21.50	86712-015	\$25.50
.125" (1/8)	.020"	.500"	1/8"	1-1/2"	86612-020	\$21.50	86712-020	\$25.50
.125" (1/8)	.030"	.500"	1/8"	1-1/2"	86612-030	\$21.50	86712-030	\$25.50

END MILL EXTENSION HOLDERS

I.D. CONCENTRIC WITHIN .0003"- I.D. HOLE SIZE +.00015/-0

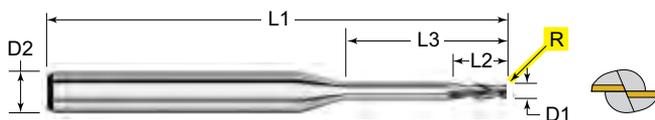


I.D. Hole Size	Shank Diameter	Over All Length	Tool Number	Price Each
.1250"	3/8"	3-1/4"	ACH1250	\$209.50
.1250"	3/8"	6"	ACH1250L	\$285.50
.1875"	1/2"	3-1/2"	ACH1875	\$199.50
.1875"	1/2"	5"	ACH1875L	\$220.50
.2500"	5/8"	4-1/4"	ACH2500	\$199.50
.2500"	5/8"	6"	ACH2500L	\$225.50



2-FLUTE - CORNER RADIUS - LG REACH

Decimal - UNCOATED .031" to .125" Diameter



Corner radius helps prevent chipping at corners at high feeds and speeds.
Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

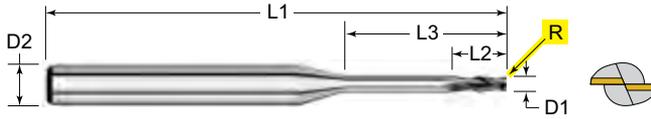
D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach from Tip	D2 Shank Diameter	L1 Over All Length	Tool Number	Price Each
.031" (1/32)	.005"	.093"	.156"	1/8"	1-1/2"	86831-005	\$36.75
.031" (1/32)	.005"	.093"	.250"	1/8"	1-1/2"	86832-005	\$39.75
.031" (1/32)	.010"	.093"	.156"	1/8"	1-1/2"	86833-010	\$36.75
.031" (1/32)	.010"	.093"	.250"	1/8"	1-1/2"	86834-010	\$39.75
.047" (3/64)	.005"	.141"	.250"	1/8"	1-1/2"	86847-005	\$36.75
.047" (3/64)	.005"	.141"	.375"	1/8"	1-1/2"	86848-005	\$39.75
.047" (3/64)	.010"	.141"	.250"	1/8"	1-1/2"	86849-010	\$36.75
.047" (3/64)	.010"	.141"	.375"	1/8"	1-1/2"	86840-010	\$39.75
.062" (1/16)	.005"	.186"	.312"	1/8"	1-1/2"	86862-005	\$36.75
.062" (1/16)	.005"	.186"	.500"	1/8"	1-1/2"	86863-005	\$39.75
.062" (1/16)	.010"	.186"	.312"	1/8"	1-1/2"	86864-010	\$36.75
.062" (1/16)	.010"	.186"	.500"	1/8"	1-1/2"	86865-010	\$39.75
.078" (5/64)	.005"	.234"	.406"	1/8"	1-1/2"	86878-005	\$36.75
.078" (5/64)	.005"	.234"	.500"	1/8"	1-1/2"	86879-005	\$37.50
.078" (5/64)	.005"	.234"	.625"	1/8"	1-1/2"	86870-005	\$39.75
.078" (5/64)	.010"	.234"	.406"	1/8"	1-1/2"	86871-010	\$36.75
.078" (5/64)	.010"	.234"	.500"	1/8"	1-1/2"	86872-010	\$37.50
.078" (5/64)	.010"	.234"	.625"	1/8"	1-1/2"	86873-010	\$39.75
.093" (3/32)	.005"	.279"	.500"	1/8"	1-1/2"	86893-005	\$37.50
.093" (3/32)	.005"	.279"	.625"	1/8"	1-1/2"	86894-005	\$39.75
.093" (3/32)	.010"	.279"	.500"	1/8"	1-1/2"	86895-010	\$37.50
.093" (3/32)	.010"	.279"	.625"	1/8"	1-1/2"	86896-010	\$39.75
.125" (1/8)	.005"	.500"	.625"	1/8"	1-1/2"	86812-005	\$36.75
.125" (1/8)	.010"	.500"	.625"	1/8"	1-1/2"	86812-010	\$36.75
.125" (1/8)	.015"	.500"	.625"	1/8"	1-1/2"	86812-015	\$36.75
.125" (1/8)	.020"	.500"	.625"	1/8"	1-1/2"	86812-020	\$36.75
.125" (1/8)	.030"	.500"	.625"	1/8"	1-1/2"	86812-030	\$36.75
.125" (1/8)	.005"	.500"	.750"	1/8"	1-1/2"	86813-005	\$38.75
.125" (1/8)	.010"	.500"	.750"	1/8"	1-1/2"	86813-010	\$38.75
.125" (1/8)	.015"	.500"	.750"	1/8"	1-1/2"	86813-015	\$38.75
.125" (1/8)	.020"	.500"	.750"	1/8"	1-1/2"	86813-020	\$38.75
.125" (1/8)	.030"	.500"	.750"	1/8"	1-1/2"	86813-030	\$38.75

**Shipped within 24-48 hours. Minimum order 3 tools each size.
Tools are custom manufactured to order and are nonreturnable.**

2-FLUTE - CORNER RADIUS - LG REACH



Decimal - AITiN COATED .031" to .125" Diameter



Corner radius helps prevent chipping at corners at high feeds and speeds.

Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach from Tip	D2 Shank Diameter	L1 Over All Length	Tool Number	Price Each
.031" (1/32)	.005"	.093"	.156"	1/8"	1-1/2"	86931-005	\$40.95
.031" (1/32)	.005"	.093"	.250"	1/8"	1-1/2"	86932-005	\$43.95
.031" (1/32)	.010"	.093"	.156"	1/8"	1-1/2"	86933-010	\$40.95
.031" (1/32)	.010"	.093"	.250"	1/8"	1-1/2"	86934-010	\$43.95
.047" (3/64)	.005"	.141"	.250"	1/8"	1-1/2"	86947-005	\$40.95
.047" (3/64)	.005"	.141"	.375"	1/8"	1-1/2"	86948-005	\$43.95
.047" (3/64)	.010"	.141"	.250"	1/8"	1-1/2"	86949-010	\$40.95
.047" (3/64)	.010"	.141"	.375"	1/8"	1-1/2"	86940-010	\$43.95
.062" (1/16)	.005"	.186"	.312"	1/8"	1-1/2"	86962-005	\$40.95
.062" (1/16)	.005"	.186"	.500"	1/8"	1-1/2"	86963-005	\$43.95
.062" (1/16)	.010"	.186"	.312"	1/8"	1-1/2"	86964-010	\$40.95
.062" (1/16)	.010"	.186"	.500"	1/8"	1-1/2"	86965-010	\$43.95
.078" (5/64)	.005"	.234"	.406"	1/8"	1-1/2"	86978-005	\$40.95
.078" (5/64)	.005"	.234"	.500"	1/8"	1-1/2"	86979-005	\$41.70
.078" (5/64)	.005"	.234"	.625"	1/8"	1-1/2"	86970-005	\$43.95
.078" (5/64)	.010"	.234"	.406"	1/8"	1-1/2"	86971-010	\$40.95
.078" (5/64)	.010"	.234"	.500"	1/8"	1-1/2"	86972-010	\$41.70
.078" (5/64)	.010"	.234"	.625"	1/8"	1-1/2"	86973-010	\$43.95
.093" (3/32)	.005"	.279"	.500"	1/8"	1-1/2"	86993-005	\$41.70
.093" (3/32)	.005"	.279"	.625"	1/8"	1-1/2"	86994-005	\$43.95
.093" (3/32)	.010"	.279"	.500"	1/8"	1-1/2"	86995-010	\$41.70
.093" (3/32)	.010"	.279"	.625"	1/8"	1-1/2"	86996-010	\$43.95
.125" (1/8)	.005"	.500"	.625"	1/8"	1-1/2"	86912-005	\$40.95
.125" (1/8)	.010"	.500"	.625"	1/8"	1-1/2"	86912-010	\$40.95
.125" (1/8)	.015"	.500"	.625"	1/8"	1-1/2"	86912-015	\$40.95
.125" (1/8)	.020"	.500"	.625"	1/8"	1-1/2"	86912-020	\$40.95
.125" (1/8)	.030"	.500"	.625"	1/8"	1-1/2"	86912-030	\$40.95
.125" (1/8)	.005"	.500"	.750"	1/8"	1-1/2"	86913-005	\$42.95
.125" (1/8)	.010"	.500"	.750"	1/8"	1-1/2"	86913-010	\$42.95
.125" (1/8)	.015"	.500"	.750"	1/8"	1-1/2"	86913-015	\$42.95
.125" (1/8)	.020"	.500"	.750"	1/8"	1-1/2"	86913-020	\$42.95
.125" (1/8)	.030"	.500"	.750"	1/8"	1-1/2"	86913-030	\$42.95

**Shipped within 24-48 hours. Minimum order 3 tools each size.
Tools are custom manufactured to order and are nonreturnable.**



3-FLUTE - DECIMAL

Square End - UNCOATED & AITiN COATED - .010" to .125"



Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA 

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		ALTiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	1/8"	1-1/2"	83010	\$25.75	83410	\$31.00
.015"	.045"	1/8"	1-1/2"	83015	\$21.00	83415	\$25.50
.020"	.060"	1/8"	1-1/2"	83020	\$19.75	83420	\$24.50
.025"	.075"	1/8"	1-1/2"	83025	\$18.75	83425	\$23.25
.030"	.090"	1/8"	1-1/2"	83030	\$18.75	83430	\$23.25
.031"	.093"	1/8"	1-1/2"	83031	\$18.75	83431	\$23.25
.035"	.105"	1/8"	1-1/2"	83035	\$16.50	83435	\$21.00
.040"	.120"	1/8"	1-1/2"	83040	\$16.50	83440	\$21.00
.045"	.135"	1/8"	1-1/2"	83045	\$16.50	83445	\$21.00
.047"	.141"	1/8"	1-1/2"	83047	\$16.50	83447	\$21.00
.050"	.150"	1/8"	1-1/2"	83050	\$16.50	83450	\$21.00
.060"	.180"	1/8"	1-1/2"	83060	\$16.50	83460	\$21.00
.062"	.186"	1/8"	1-1/2"	83062	\$15.75	83462	\$20.25
.065"	.195"	1/8"	1-1/2"	83065	\$15.75	83465	\$20.25
.070"	.210"	1/8"	1-1/2"	83070	\$15.75	83470	\$20.25
.075"	.225"	1/8"	1-1/2"	83075	\$15.75	83475	\$20.25
.078"	.234"	1/8"	1-1/2"	83078	\$15.75	83478	\$20.25
.090"	.270"	1/8"	1-1/2"	83090	\$15.75	83490	\$20.25
.093"	.279"	1/8"	1-1/2"	83093	\$15.75	83493	\$20.25
.100"	.300"	1/8"	1-1/2"	83000	\$15.75	83400	\$20.25
.125"	.375"	1/8"	1-1/2"	83012	\$15.75	83412	\$20.25

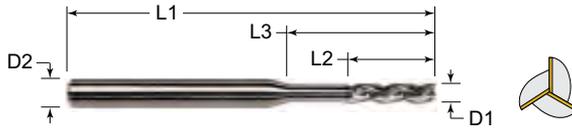
Miniature Keyseat Cutters. See pages 150 and 151.



3-FLUTE - DECIMAL - LONG REACH



Square End - UNCOATED & **AlTiN COATED** - .015" to .125"



Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	NOT COATED		AlTiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	.125"	1/8"	1-1/2"	83315	\$32.25	83215	\$36.75
.015"	.045"	.186"	1/8"	1-1/2"	83315-1	\$34.50	83215-1	\$39.00
.020"	.060"	.165"	1/8"	1-1/2"	83320	\$31.25	83220	\$35.75
.020"	.060"	.250"	1/8"	1-1/2"	83320-1	\$33.25	83220-1	\$37.75
.025"	.075"	.205"	1/8"	1-1/2"	83325	\$30.00	83225	\$34.50
.025"	.075"	.310"	1/8"	1-1/2"	83325-1	\$32.25	83225-1	\$36.75
.030"	.090"	.250"	1/8"	1-1/2"	83330	\$30.00	83230	\$34.50
.030"	.090"	.375"	1/8"	1-1/2"	83330-1	\$32.25	83230-1	\$36.75
.031"	.093"	.250"	1/8"	1-1/2"	83331	\$30.00	83231	\$34.50
.031"	.093"	.375"	1/8"	1-1/2"	83331-1	\$32.25	83231-1	\$36.75
.035"	.105"	.285"	1/8"	1-1/2"	83335	\$29.00	83235	\$33.50
.040"	.120"	.350"	1/8"	1-1/2"	83340	\$29.00	83240	\$33.50
.040"	.120"	.480"	1/8"	1-1/2"	83340-1	\$31.00	83240-1	\$35.50
.045"	.135"	.300"	1/8"	1-1/2"	83345-1	\$29.00	83245-1	\$33.50
.045"	.135"	.400"	1/8"	1-1/2"	83345	\$29.00	83245	\$33.50
.045"	.135"	.500"	1/8"	1-1/2"	83345-2	\$31.00	83245-2	\$35.50
.047"	.141"	.400"	1/8"	1-1/2"	83347	\$29.00	83247	\$33.50
.047"	.141"	.500"	1/8"	1-1/2"	83347-1	\$31.00	83247-1	\$35.50
.050"	.150"	.450"	1/8"	1-1/2"	83350	\$29.00	83250	\$33.50
.060"	.180"	.500"	1/8"	1-1/2"	83360	\$29.00	83260	\$33.50
.060"	.180"	.600"	1/8"	1-1/2"	83360-1	\$31.00	83260-1	\$35.50
.062"	.186"	.500"	1/8"	1-1/2"	83362	\$29.00	83262	\$33.50
.062"	.186"	.600"	1/8"	1-1/2"	83362-1	\$31.00	83262-1	\$35.50
.065"	.195"	.500"	1/8"	1-1/2"	83365	\$29.00	83265	\$33.50
.070"	.210"	.500"	1/8"	1-1/2"	83370	\$29.00	83270	\$33.50
.075"	.225"	.550"	1/8"	1-1/2"	83375	\$29.00	83275	\$33.50
.078"	.234"	.550"	1/8"	1-1/2"	83378	\$29.00	83278	\$33.50
.090"	.270"	.600"	1/8"	1-1/2"	83390	\$29.00	83290	\$33.50
.093"	.279"	.600"	1/8"	1-1/2"	83393	\$29.00	83293	\$33.50
.100"	.300"	.600"	1/8"	1-1/2"	83300	\$29.00	83200	\$33.50
.125"	.375"	.600"	1/8"	1-1/2"	83312	\$29.00	83212	\$33.50



3-FLUTE - STUB LENGTH

Square End - UNCOATED & AITiN COATED - .010" to .125"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	1/8"	1-1/2"	83110	\$25.75	83510	\$31.00
.015"	.022"	1/8"	1-1/2"	83115	\$21.00	83515	\$25.50
.020"	.030"	1/8"	1-1/2"	83120	\$19.75	83520	\$24.50
.025"	.037"	1/8"	1-1/2"	83125	\$18.75	83525	\$23.25
.030"	.045"	1/8"	1-1/2"	83130	\$18.75	83530	\$23.25
.031"	.046"	1/8"	1-1/2"	83131	\$18.75	83531	\$23.25
.035"	.052"	1/8"	1-1/2"	83135	\$16.50	83535	\$21.00
.040"	.060"	1/8"	1-1/2"	83140	\$16.50	83540	\$21.00
.045"	.067"	1/8"	1-1/2"	83145	\$16.50	83545	\$21.00
.047"	.070"	1/8"	1-1/2"	83147	\$16.50	83547	\$21.00
.050"	.075"	1/8"	1-1/2"	83150	\$16.50	83550	\$21.00
.060"	.090"	1/8"	1-1/2"	83160	\$16.50	83560	\$21.00
.062"	.093"	1/8"	1-1/2"	83162	\$15.75	83562	\$20.25
.065"	.098"	1/8"	1-1/2"	83165	\$15.75	83565	\$20.25
.070"	.105"	1/8"	1-1/2"	83170	\$15.75	83570	\$20.25
.075"	.113"	1/8"	1-1/2"	83175	\$15.75	83575	\$20.25
.078"	.117"	1/8"	1-1/2"	83178	\$15.75	83578	\$20.25
.090"	.135"	1/8"	1-1/2"	83190	\$15.75	83590	\$20.25
.093"	.187"	1/8"	1-1/2"	83193	\$15.75	83593	\$20.25
.100"	.150"	1/8"	1-1/2"	83100	\$15.75	83500	\$20.25
.125"	.250"	1/8"	1-1/2"	83112	\$15.75	83512	\$20.25

Need corner rounding end mills? See pages 138 to 144.



3-FLUTE - STUB LENGTH - LONG RCH



Square End - UNCOATED & AITiN COATED - .015" to .125"



Length of Cut = 1.5 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.022"	.100"	1/8"	1-1/2"	83615	\$31.00	83715	\$35.75
.015"	.022"	.150"	1/8"	1-1/2"	83615-1	\$33.25	83715-1	\$37.75
.020"	.030"	.120"	1/8"	1-1/2"	83620	\$29.00	83720	\$33.25
.020"	.030"	.180"	1/8"	1-1/2"	83620-1	\$31.00	83720-1	\$35.25
.025"	.037"	.150"	1/8"	1-1/2"	83625	\$29.00	83725	\$33.25
.025"	.037"	.205"	1/8"	1-1/2"	83625-1	\$29.00	83725-1	\$33.25
.030"	.045"	.180"	1/8"	1-1/2"	83630	\$29.00	83730	\$33.25
.030"	.045"	.250"	1/8"	1-1/2"	83630-1	\$29.00	83730-1	\$33.25
.031"	.046"	.187"	1/8"	1-1/2"	83631	\$29.00	83731	\$33.25
.031"	.046"	.250"	1/8"	1-1/2"	83631-1	\$29.00	83731-1	\$33.25
.031"	.046"	.312"	1/8"	1-1/2"	83631-2	\$31.00	83731-2	\$35.25
.035"	.052"	.210"	1/8"	1-1/2"	83635	\$28.00	83735	\$32.25
.035"	.052"	.312"	1/8"	1-1/2"	83635-1	\$30.00	83735-1	\$34.25
.040"	.060"	.220"	1/8"	1-1/2"	83640	\$28.00	83740	\$32.25
.040"	.060"	.320"	1/8"	1-1/2"	83640-1	\$30.00	83740-1	\$34.25
.045"	.067"	.270"	1/8"	1-1/2"	83645	\$28.00	83745	\$32.25
.045"	.067"	.350"	1/8"	1-1/2"	83645-1	\$30.00	83745-1	\$34.25
.047"	.070"	.280"	1/8"	1-1/2"	83647	\$28.00	83747	\$32.25
.047"	.070"	.375"	1/8"	1-1/2"	83647-1	\$30.00	83747-1	\$34.25
.050"	.075"	.300"	1/8"	1-1/2"	83650	\$28.00	83750	\$32.25
.050"	.075"	.400"	1/8"	1-1/2"	83650-1	\$30.00	83750-1	\$34.25
.060"	.090"	.330"	1/8"	1-1/2"	83660	\$27.00	83760	\$31.00
.060"	.090"	.500"	1/8"	1-1/2"	83660-1	\$29.00	83760-1	\$33.25
.062"	.093"	.360"	1/8"	1-1/2"	83662	\$27.00	83762	\$31.00
.062"	.093"	.500"	1/8"	1-1/2"	83662-1	\$29.00	83762-1	\$33.25
.065"	.098"	.375"	1/8"	1-1/2"	83665	\$27.00	83765	\$31.00
.070"	.105"	.390"	1/8"	1-1/2"	83670	\$27.00	83770	\$31.00
.075"	.113"	.420"	1/8"	1-1/2"	83675	\$27.00	83775	\$31.00
.078"	.117"	.450"	1/8"	1-1/2"	83678	\$27.00	83778	\$31.00
.090"	.135"	.540"	1/8"	1-1/2"	83690	\$27.00	83790	\$31.00
.093"	.187"	.560"	1/8"	1-1/2"	83693	\$27.00	83793	\$31.00
.100"	.150"	.600"	1/8"	1-1/2"	83600	\$27.00	83700	\$31.00
.125"	.250"	.600"	1/8"	1-1/2"	83612	\$27.00	83712	\$31.00



3-FLUTE – LONG SHANK – LONG FLUTE

Square & Ball End - UNCOATED - .015" to .047"



Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Dia.	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.078"	1/8"	2-1/2"	LF1015	\$29.90	LF1015B	\$36.90
.015" (1/64)	.125"	1/8"	2-1/2"	LF1015-125	\$52.90	LF1015B-125	\$59.90
.020"	.100"	1/8"	2-1/2"	LF1020	\$25.50	LF1020B	\$31.50
.020"	.125"	1/8"	2-1/2"	LF1020-125	\$30.50	LF1020B-125	\$36.50
.020"	.160"	1/8"	2-1/2"	LF1020-160	\$49.50	LF1020B-160	\$55.50
.025"	.125"	1/8"	2-1/2"	LF1025	\$24.90	LF1025B	\$29.90
.025"	.203"	1/8"	2-1/2"	LF1025-203	\$48.50	LF1025B-203	\$55.90
.025"	.250"	1/8"	2-1/2"	LF1025-250	\$52.50	LF1025B-250	\$59.90
.030"	.150"	1/8"	2-1/2"	LF1030	\$24.50	LF1030B	\$29.50
.030"	.200"	1/8"	2-1/2"	LF1030-200	\$33.50	LF1030B-200	\$39.50
.030"	.250"	1/8"	2-1/2"	LF1030-250	\$45.50	LF1030B-250	\$52.50
.031" (1/32)	.156"	1/8"	2-1/2"	LF1031	\$24.50	LF1031B	\$29.50
.031" (1/32)	.218"	1/8"	2-1/2"	LF1031-218	\$33.50	LF1031B-218	\$39.50
.031" (1/32)	.250"	1/8"	2-1/2"	LF1031-250	\$45.50	LF1031B-250	\$52.50
.031" (1/32)	.312"	1/8"	2-1/2"	LF1031-312	\$50.50	LF1031B-312	\$58.50
.031" (1/32)	.375"	1/8"	2-1/2"	LF1031-375	\$53.50	LF1031B-375	\$61.50
.035"	.175"	1/8"	2-1/2"	LF1035	\$24.50	LF1035B	\$29.50
.035"	.281"	1/8"	2-1/2"	LF1035-281	\$46.50	LF1035B-281	\$54.50
.040"	.200"	1/8"	2-1/2"	LF1040	\$24.50	LF1040B	\$29.25
.040"	.325"	1/8"	2-1/2"	LF1040-325	\$46.50	LF1040B-325	\$54.50
.045"	.225"	1/8"	2-1/2"	LF1045	\$24.50	LF1045B	\$29.25
.045"	.375"	1/8"	2-1/2"	LF1045-375	\$46.50	LF1045B-375	\$54.50
.047" (3/64)	.250"	1/8"	2-1/2"	LF1047	\$24.50	LF1047B	\$29.50
.047" (3/64)	.328"	1/8"	2-1/2"	LF1047-328	\$42.50	LF1047B-328	\$49.50
.047" (3/64)	.375"	1/8"	2-1/2"	LF1047-375	\$45.50	LF1047B-375	\$52.50

Continued Next Page

3-FLUTE – LONG SHANK – LONG FLUTE



Continued from previous page:

Square & Ball End - UNCOATED Size Range: .050" to .125"



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Dia.	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.050"	.250"	1/8"	2-1/2"	LF1050	\$24.50	LF1050B	\$29.50
.050"	.400"	1/8"	2-1/2"	LF1050-400	\$42.50	LF1050B-400	\$49.50
.060"	.312"	1/8"	2-1/2"	LF1060-312	\$22.50	LF1060B-312	\$26.00
.060"	.500"	1/8"	2-1/2"	LF1060	\$25.50	LF1060B	\$29.50
.060"	.720"	1/8"	2-1/2"	LF1060-720	\$52.50	LF1060B-720	\$60.50
.062" (1/16)	.312"	1/8"	2-1/2"	LF1062-312	\$22.50	LF1062B-312	\$26.00
.062" (1/16)	.500"	1/8"	2-1/2"	LF1062	\$25.50	LF1062B	\$29.50
.062" (1/16)	.625"	1/8"	2-1/2"	LF1062-625	\$31.50	LF1062B-625	\$37.50
.062" (1/16)	.750"	1/8"	2-1/2"	LF1062-750	\$43.50	LF1062B-750	\$49.50
.065"	.325"	1/8"	2-1/2"	LF1065-325	\$23.50	LF1065B-325	\$27.50
.065"	.500"	1/8"	2-1/2"	LF1065	\$25.50	LF1065B	\$29.50
.070"	.500"	1/8"	2-1/2"	LF1070	\$25.50	LF1070B	\$29.50
.075"	.500"	1/8"	2-1/2"	LF1075	\$25.50	LF1075B	\$29.50
.078" (5/64)	.500"	1/8"	2-1/2"	LF1078	\$23.50	LF1078B	\$27.50
.078" (5/64)	.625"	1/8"	2-1/2"	LF1078-625	\$25.50	LF1078B-625	\$29.50
.093" (3/32)	.500"	1/8"	2-1/2"	LF1093	\$23.50	LF1093B	\$27.50
.093" (3/32)	.750"	1/8"	2-1/2"	LF1093-750	\$25.50	LF1093B-750	\$29.50
.093" (3/32)	1.125"	1/8"	2-1/2"	LF1093-112	\$43.50	LF1093B-112	\$49.50
.118" (3mm)	.625"	1/8"	2-1/2"	LF1018	\$23.50	LF1018B	\$27.50
.118" (3mm)	.950"	1/8"	2-1/2"	LF1018-950	\$26.50	LF1018B-950	\$30.50
.125" (1/8)	.625"	1/8"	2-1/2"	LF1012-625	\$21.50	LF1012B-625	\$24.50
.125" (1/8)	.750"	1/8"	2-1/2"	LF1012	\$22.50	LF1012B	\$25.50
.125" (1/8)	1.00"	1/8"	2-1/2"	LF1012-100	\$23.50	LF1012B-100	\$26.50



3-FLUTE - LONG SHANK - LONG FLUTE

Square & Ball End - AITiN COATED - .015" to .047"



Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Dia.	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.078"	1/8"	2-1/2"	LF2015	\$34.30	LF2015B	\$41.30
.015" (1/64)	.125"	1/8"	2-1/2"	LF2015-125	\$57.30	LF2015B-125	\$64.30
.020"	.100"	1/8"	2-1/2"	LF2020	\$29.90	LF2020B	\$35.90
.020"	.125"	1/8"	2-1/2"	LF2020-125	\$34.90	LF2020B-125	\$40.90
.020"	.160"	1/8"	2-1/2"	LF2020-160	\$53.90	LF2020B-160	\$59.90
.025"	.125"	1/8"	2-1/2"	LF2025	\$29.30	LF2025B	\$34.30
.025"	.203"	1/8"	2-1/2"	LF2025-203	\$52.90	LF2025B-203	\$60.30
.025"	.250"	1/8"	2-1/2"	LF2025-250	\$56.90	LF2025B-250	\$64.30
.030"	.150"	1/8"	2-1/2"	LF2030	\$28.90	LF2030B	\$33.90
.030"	.200"	1/8"	2-1/2"	LF2030-200	\$37.90	LF2030B-200	\$43.90
.030"	.250"	1/8"	2-1/2"	LF2030-250	\$49.90	LF2030B-250	\$56.90
.031" (1/32)	.156"	1/8"	2-1/2"	LF2031	\$28.90	LF2031B	\$33.90
.031" (1/32)	.218"	1/8"	2-1/2"	LF2031-218	\$37.90	LF2031B-218	\$43.90
.031" (1/32)	.250"	1/8"	2-1/2"	LF2031-250	\$49.90	LF2031B-250	\$56.90
.031" (1/32)	.312"	1/8"	2-1/2"	LF2031-312	\$54.90	LF2031B-312	\$62.90
.031" (1/32)	.375"	1/8"	2-1/2"	LF2031-375	\$57.90	LF2031B-375	\$65.90
.035"	.175"	1/8"	2-1/2"	LF2035	\$28.90	LF2035B	\$33.90
.035"	.281"	1/8"	2-1/2"	LF2035-281	\$50.90	LF2035B-281	\$58.90
.040"	.200"	1/8"	2-1/2"	LF2040	\$28.90	LF2040B	\$33.75
.040"	.325"	1/8"	2-1/2"	LF2040-325	\$50.90	LF2040B-325	\$58.90
.045"	.225"	1/8"	2-1/2"	LF2045	\$28.90	LF2045B	\$33.75
.045"	.375"	1/8"	2-1/2"	LF2045-375	\$50.90	LF2045B-375	\$58.90
.047" (3/64)	.250"	1/8"	2-1/2"	LF2047	\$28.90	LF2047B	\$33.90
.047" (3/64)	.328"	1/8"	2-1/2"	LF2047-328	\$46.90	LF2047B-328	\$53.90
.047" (3/64)	.375"	1/8"	2-1/2"	LF2047-375	\$49.90	LF2047B-375	\$56.90

Continued Next Page

3-FLUTE - LONG SHANK - LONG FLUTE



Continued from previous page:

Square & Ball End - AITiN COATED Size Range: .050" to .125"



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Dia.	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.050"	.250"	1/8"	2-1/2"	LF2050	\$28.90	LF2050B	\$33.90
.050"	.400"	1/8"	2-1/2"	LF2050-400	\$46.90	LF2050B-400	\$53.90
.060"	.312"	1/8"	2-1/2"	LF2060-312	\$26.90	LF2060B-312	\$30.50
.060"	.500"	1/8"	2-1/2"	LF2060	\$29.90	LF2060B	\$33.90
.060"	.720"	1/8"	2-1/2"	LF2060-720	\$56.90	LF2060B-720	\$64.90
.062" (1/16)	.312"	1/8"	2-1/2"	LF2062-312	\$26.90	LF2062B-312	\$30.50
.062" (1/16)	.500"	1/8"	2-1/2"	LF2062	\$29.90	LF2062B	\$33.90
.062" (1/16)	.625"	1/8"	2-1/2"	LF2062-625	\$35.90	LF2062B-625	\$41.90
.062" (1/16)	.750"	1/8"	2-1/2"	LF2062-750	\$47.90	LF2062B-750	\$53.90
.065"	.325"	1/8"	2-1/2"	LF2065-325	\$27.90	LF2065B-325	\$31.90
.065"	.500"	1/8"	2-1/2"	LF2065	\$29.90	LF2065B	\$33.90
.070"	.500"	1/8"	2-1/2"	LF2070	\$29.90	LF2070B	\$33.90
.075"	.500"	1/8"	2-1/2"	LF2075	\$29.90	LF2075B	\$33.90
.078" (5/64)	.500"	1/8"	2-1/2"	LF2078	\$27.90	LF2078B	\$31.90
.078" (5/64)	.625"	1/8"	2-1/2"	LF2078-625	\$29.90	LF2078B-625	\$33.90
.093" (3/32)	.500"	1/8"	2-1/2"	LF2093	\$26.90	LF2093B	\$30.90
.093" (3/32)	.750"	1/8"	2-1/2"	LF2093-750	\$29.90	LF2093B-750	\$33.90
.093" (3/32)	1.125"	1/8"	2-1/2"	LF2093-112	\$47.90	LF2093B-112	\$53.90
.118" (3mm)	.625"	1/8"	2-1/2"	LF2018	\$27.90	LF2018B	\$31.90
.118" (3mm)	.950"	1/8"	2-1/2"	LF2018-950	\$30.90	LF2018B-950	\$34.90
.125" (1/8)	.625"	1/8"	2-1/2"	LF2012-625	\$25.90	LF2012B-625	\$28.90
.125" (1/8)	.750"	1/8"	2-1/2"	LF2012	\$26.90	LF2012B	\$29.90
.125" (1/8)	1.00"	1/8"	2-1/2"	LF2012-100	\$27.90	LF2012B-100	\$30.90



3-FLUTE - LG FLT - LG REACH

Square & Ball End - UNCOATED - 2-1/2" OAL - .015" to .050"



Tools feature an undercut neck for clearance.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.078"	.125"	1/8"	2-1/2"	LF1115S	\$34.90	LF1115BS	\$40.90
.015" (1/64)	.078"	.150"	1/8"	2-1/2"	LF1115	\$34.90	LF1115B	\$40.90
.020"	.100"	.150"	1/8"	2-1/2"	LF1120S	\$30.90	LF1120BS	\$36.90
.020"	.100"	.200"	1/8"	2-1/2"	LF1120	\$32.90	LF1120B	\$38.90
.025"	.125"	.200"	1/8"	2-1/2"	LF1125S	\$29.90	LF1125BS	\$33.90
.025"	.125"	.250"	1/8"	2-1/2"	LF1125	\$30.90	LF1125B	\$34.90
.030"	.150"	.250"	1/8"	2-1/2"	LF1130	\$29.90	LF1130B	\$33.90
.030"	.150"	.300"	1/8"	2-1/2"	LF1130L	\$32.90	LF1130LB	\$36.90
.031" (1/32)	.156"	.250"	1/8"	2-1/2"	LF1131	\$29.90	LF1131B	\$33.90
.031" (1/32)	.156"	.300"	1/8"	2-1/2"	LF1131L	\$32.90	LF1131LB	\$36.90
.031" (1/32)	.156"	.470"	1/8"	2-1/2"	LF1131XL	\$41.90	LF1131XLB	\$47.90
.035"	.175"	.350"	1/8"	2-1/2"	LF1135	\$30.90	LF1135B	\$34.90
.040"	.200"	.350"	1/8"	2-1/2"	LF1140	\$30.90	LF1140B	\$34.90
.040"	.200"	.400"	1/8"	2-1/2"	LF1140L	\$31.90	LF1140LB	\$35.90
.045"	.225"	.350"	1/8"	2-1/2"	LF1145	\$30.90	LF1145B	\$34.90
.045"	.225"	.400"	1/8"	2-1/2"	LF1145L	\$31.90	LF1145LB	\$35.90
.047" (3/64)	.250"	.400"	1/8"	2-1/2"	LF1147	\$30.90	LF1147B	\$34.90
.047" (3/64)	.250"	.500"	1/8"	2-1/2"	LF1147L	\$32.90	LF1147LB	\$36.90
.050"	.250"	.500"	1/8"	2-1/2"	LF1150	\$30.90	LF1150B	\$34.90

Continued Next Page



Don't see the reach you want?? Call customer service.
Shorter reaches available at No Extra Charge and ship in 24-48 Hours.
Longer Reaches need to be quoted by our Sales Department
and ship in 24-48 hours after receipt of order.

3-FLUTE - LG FLT - LG REACH



Continued from previous page:

Square & Ball End - UNCOATED Size Range: .060" to .125" OAL 2-1/2"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.060"	.500"	.650"	1/8"	2-1/2"	LF1160	\$30.90	LF1160B	\$34.90
.060"	.500"	.750"	1/8"	2-1/2"	LF1160L	\$30.90	LF1160LB	\$34.90
.062" (1/16)	.500"	.650"	1/8"	2-1/2"	LF1162S	\$30.90	LF1162BS	\$34.90
.062" (1/16)	.500"	.750"	1/8"	2-1/2"	LF1162	\$30.90	LF1162B	\$34.90
.062" (1/16)	.500"	.850"	1/8"	2-1/2"	LF1162L	\$32.90	LF1162LB	\$36.90
.062" (1/16)	.500"	1.00"	1/8"	2-1/2"	LF1162XL	\$32.90	LF1162XLB	\$36.90
.070"	.500"	.750"	1/8"	2-1/2"	LF1170	\$30.90	LF1170B	\$34.90
.075"	.500"	.750"	1/8"	2-1/2"	LF1175	\$30.90	LF1175B	\$34.90
.075"	.500"	1.00"	1/8"	2-1/2"	LF1175L	\$32.90	LF1175LB	\$36.90
.078" (5/64)	.500"	.750"	1/8"	2-1/2"	LF1178	\$30.90	LF1178B	\$34.90
.078" (5/64)	.500"	.850"	1/8"	2-1/2"	LF1178L	\$31.90	LF1178LB	\$35.90
.078" (5/64)	.500"	1.00"	1/8"	2-1/2"	LF1178XL	\$32.90	LF1178XLB	\$36.90
.093" (3/32)	.500"	.750"	1/8"	2-1/2"	LF1193S	\$30.90	LF1193BS	\$34.90
.093" (3/32)	.500"	.850"	1/8"	2-1/2"	LF1193	\$31.90	LF1193B	\$35.90
.093" (3/32)	.500"	1.00"	1/8"	2-1/2"	LF1193XL	\$32.90	LF1193XLB	\$36.90
.125" (1/8)	.750"	1.25"	1/8"	2-1/2"	LF1112	\$30.90	LF1112B	\$34.90
.125" (1/8)	1.00"	1.50"	1/8"	2-1/2"	LF1112L	\$32.90	LF1112LB	\$36.90

Need Diamond End Mills for machining graphite, aluminum or plastics? See pages 182 to 197.

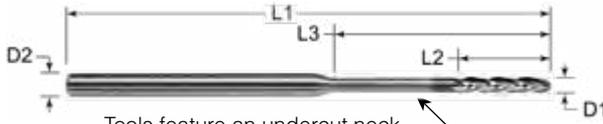
"GRX" series of amorphous diamond coated mills lower tooling costs and improve productivity vs. uncoated carbide.





3-FLUTE - LG FLUTE - LG REACH

Square & Ball End - **AITiN COATED** - 2-1/2" OAL - .015" to .050"



Tools feature an undercut neck for clearance.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.078"	.125"	1/8"	2-1/2"	LF2115S	\$39.30	LF2115BS	\$45.30
.015" (1/64)	.078"	.150"	1/8"	2-1/2"	LF2115	\$39.30	LF2115B	\$45.30
.020"	.100"	.150"	1/8"	2-1/2"	LF2120S	\$35.30	LF2120BS	\$41.30
.020"	.100"	.200"	1/8"	2-1/2"	LF2120	\$37.30	LF2120B	\$43.30
.025"	.125"	.200"	1/8"	2-1/2"	LF2125S	\$34.30	LF2125BS	\$38.30
.025"	.125"	.250"	1/8"	2-1/2"	LF2125	\$35.30	LF2125B	\$39.30
.030"	.150"	.250"	1/8"	2-1/2"	LF2130	\$34.30	LF2130B	\$38.30
.030"	.150"	.300"	1/8"	2-1/2"	LF2130L	\$37.30	LF2130LB	\$41.30
.031" (1/32)	.156"	.250"	1/8"	2-1/2"	LF2131	\$34.30	LF2131B	\$38.30
.031" (1/32)	.156"	.300"	1/8"	2-1/2"	LF2131L	\$37.30	LF2131LB	\$41.30
.031" (1/32)	.156"	.470"	1/8"	2-1/2"	LF2131XL	\$46.30	LF2131XLB	\$50.30
.035"	.175"	.350"	1/8"	2-1/2"	LF2135	\$35.30	LF2135B	\$39.30
.040"	.200"	.350"	1/8"	2-1/2"	LF2140	\$35.30	LF2140B	\$39.30
.040"	.200"	.400"	1/8"	2-1/2"	LF2140L	\$36.30	LF2140LB	\$40.30
.045"	.225"	.350"	1/8"	2-1/2"	LF2145	\$35.30	LF2145B	\$39.30
.045"	.225"	.400"	1/8"	2-1/2"	LF2145L	\$36.30	LF2145LB	\$40.30
.047" (3/64)	.250"	.400"	1/8"	2-1/2"	LF2147	\$35.30	LF2147B	\$39.30
.047" (3/64)	.250"	.500"	1/8"	2-1/2"	LF2147L	\$37.30	LF2147LB	\$41.30
.050"	.250"	.500"	1/8"	2-1/2"	LF2150	\$35.30	LF2150B	\$39.30

Continued Next Page

3-FLUTE - LG FLUTE - LG REACH



Continued from previous page:

Square & Ball End - AITiN COATED Size Range: .060" to .125" OAL 2-1/2"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.060"	.500"	.650"	1/8"	2-1/2"	LF2160	\$35.30	LF2160B	\$39.30
.060"	.500"	.750"	1/8"	2-1/2"	LF2160L	\$35.30	LF2160LB	\$39.30
.062" (1/16)	.500"	.650"	1/8"	2-1/2"	LF2162S	\$35.30	LF2162BS	\$39.30
.062" (1/16)	.500"	.750"	1/8"	2-1/2"	LF2162	\$35.30	LF2162B	\$39.30
.062" (1/16)	.500"	.850"	1/8"	2-1/2"	LF2162L	\$37.30	LF2162LB	\$41.30
.062" (1/16)	.500"	1.00"	1/8"	2-1/2"	LF2162XL	\$37.30	LF2162XLB	\$41.30
.070"	.500"	.750"	1/8"	2-1/2"	LF2170	\$35.30	LF2170B	\$39.30
.075"	.500"	.750"	1/8"	2-1/2"	LF2175	\$35.30	LF2175B	\$39.30
.075"	.500"	1.00"	1/8"	2-1/2"	LF2175L	\$37.30	LF2175LB	\$41.30
.078" (5/64)	.500"	.750"	1/8"	2-1/2"	LF2178	\$35.30	LF2178B	\$39.30
.078" (5/64)	.500"	.850"	1/8"	2-1/2"	LF2178L	\$36.30	LF2178LB	\$40.30
.078" (5/64)	.500"	1.00"	1/8"	2-1/2"	LF2178XL	\$37.30	LF2178XLB	\$41.30
.093" (3/32)	.500"	.750"	1/8"	2-1/2"	LF2193S	\$35.30	LF2193BS	\$39.30
.093" (3/32)	.500"	.850"	1/8"	2-1/2"	LF2193	\$36.30	LF2193B	\$40.30
.093" (3/32)	.500"	1.00"	1/8"	2-1/2"	LF2193XL	\$37.30	LF2193XLB	\$41.30
.125" (1/8)	.750"	1.25"	1/8"	2-1/2"	LF2112	\$35.30	LF2112B	\$39.30
.125" (1/8)	1.00"	1.50"	1/8"	2-1/2"	LF2112L	\$37.30	LF2112LB	\$41.30

Need drill mills?
See pages 146 to 149.



3-FLUTE - STUB FLUTE - LONG SHANK

Square & Ball End - UNCOATED - 2-1/2" OAL Size Range: .010" to .125"

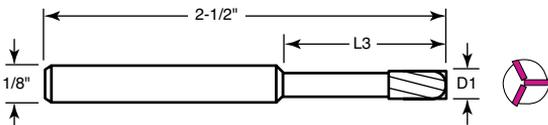


Length of Cut = 1.5 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	1/8"	2-1/2"	SF1010	\$30.00	SF1010B	\$34.25
.015"	.022"	1/8"	2-1/2"	SF1015	\$27.25	SF1015B	\$31.50
.020"	.030"	1/8"	2-1/2"	SF1020	\$25.25	SF1020B	\$29.50
.025"	.037"	1/8"	2-1/2"	SF1025	\$23.00	SF1025B	\$27.25
.030"	.045"	1/8"	2-1/2"	SF1030	\$23.00	SF1030B	\$27.25
.031"	.046"	1/8"	2-1/2"	SF1031	\$23.00	SF1031B	\$27.25
.035"	.052"	1/8"	2-1/2"	SF1035	\$23.00	SF1035B	\$27.25
.040"	.060"	1/8"	2-1/2"	SF1040	\$23.00	SF1040B	\$27.25
.045"	.067"	1/8"	2-1/2"	SF1045	\$23.00	SF1045B	\$27.25
.047"	.070"	1/8"	2-1/2"	SF1047	\$23.00	SF1047B	\$27.25
.050"	.075"	1/8"	2-1/2"	SF1050	\$23.00	SF1050B	\$27.25
.060"	.090"	1/8"	2-1/2"	SF1060	\$23.00	SF1060B	\$27.25
.062"	.094"	1/8"	2-1/2"	SF1062	\$23.00	SF1062B	\$27.25
.065"	.097"	1/8"	2-1/2"	SF1065	\$23.00	SF1065B	\$27.25
.070"	.105"	1/8"	2-1/2"	SF1070	\$23.00	SF1070B	\$27.25
.075"	.112"	1/8"	2-1/2"	SF1075	\$23.00	SF1075B	\$27.25
.078"	.117"	1/8"	2-1/2"	SF1078	\$23.00	SF1078B	\$27.25
.090"	.135"	1/8"	2-1/2"	SF1090	\$23.00	SF1090B	\$27.25
.093"	.139"	1/8"	2-1/2"	SF1093	\$23.00	SF1093B	\$27.25
.125"	.187"	1/8"	2-1/2"	SF1012	\$23.00	SF1012B	\$27.25

ORDER SPECIAL Stub 3-Flute Square & Ball End LONG REACH, LONG SHANK MILLS

To order special long reach end mills please specify:



1. Specify: Square End or Ball End.
2. Diameter (D1): _____ From chart above.
3. Overall Reach (L3): _____
4. Quantity (Minimum 6): _____ 3-Flute

Special Reaches Shipped within 24-48 Hours!

Tools are custom manufactured to order and are nonreturnable.

3-FLUTE - STUB FLUTE - LONG SHANK



Square & Ball End - AITiN COATED - 2-1/2" OAL



Length of Cut = 1.5 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	1/8"	2-1/2"	SF2010	\$36.25	SF2010B	\$40.50
.015"	.022"	1/8"	2-1/2"	SF2015	\$31.50	SF2015B	\$35.75
.020"	.030"	1/8"	2-1/2"	SF2020	\$29.50	SF2020B	\$33.50
.025"	.037"	1/8"	2-1/2"	SF2025	\$27.25	SF2025B	\$31.50
.030"	.045"	1/8"	2-1/2"	SF2030	\$27.25	SF2030B	\$31.50
.031"	.046"	1/8"	2-1/2"	SF2031	\$27.25	SF2031B	\$31.50
.035"	.052"	1/8"	2-1/2"	SF2035	\$27.25	SF2035B	\$31.50
.040"	.060"	1/8"	2-1/2"	SF2040	\$27.25	SF2040B	\$31.50
.045"	.067"	1/8"	2-1/2"	SF2045	\$27.25	SF2045B	\$31.50
.047"	.070"	1/8"	2-1/2"	SF2047	\$27.25	SF2047B	\$31.50
.050"	.075"	1/8"	2-1/2"	SF2050	\$27.25	SF2050B	\$31.50
.060"	.090"	1/8"	2-1/2"	SF2060	\$27.25	SF2060B	\$31.50
.062"	.094"	1/8"	2-1/2"	SF2062	\$27.25	SF2062B	\$31.50
.065"	.097"	1/8"	2-1/2"	SF2065	\$27.25	SF2065B	\$31.50
.070"	.105"	1/8"	2-1/2"	SF2070	\$27.25	SF2070B	\$31.50
.075"	.112"	1/8"	2-1/2"	SF2075	\$27.25	SF2075B	\$31.50
.078"	.117"	1/8"	2-1/2"	SF2078	\$27.25	SF2078B	\$31.50
.090"	.135"	1/8"	2-1/2"	SF2090	\$27.25	SF2090B	\$31.50
.093"	.139"	1/8"	2-1/2"	SF2093	\$27.25	SF2093B	\$31.50
.125"	.187"	1/8"	2-1/2"	SF2012	\$27.25	SF2012B	\$31.50

END MILL EXTENSION HOLDERS I.D. CONCENTRIC WITH .0003" - I.D. HOLE SIZE +.00015/-0



I.D. Hole Size	Shank Diameter	Over All Length	Tool Number	Price Each
.1250"	3/8"	3-1/4"	ACH1250	\$209.50
.1250"	3/8"	6"	ACH1250L	\$285.50
.1875"	1/2"	3-1/2"	ACH1875	\$199.50
.1875"	1/2"	5"	ACH1875L	\$220.50
.2500"	5/8"	4-1/4"	ACH2500	\$199.50
.2500"	5/8"	6"	ACH2500L	\$225.50



3-FLUTE - STUB - LG SHANK - LG REACH

Square & Ball End - UNCOATED - 2-1/2" OAL - .010" to .035"



Length of Cut = 1.5 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	.050"	1/8"	2-1/2"	1110-050	\$38.50	1210-050	\$46.50
.010"	.015"	.080"	1/8"	2-1/2"	1110-080	\$38.50	1210-080	\$46.50
.010"	.015"	.100"	1/8"	2-1/2"	1110-100	\$40.50	1210-100	\$48.50
.010"	.015"	.125"	1/8"	2-1/2"	1110-125	\$40.50	1210-125	\$48.50
.015"	.022"	.078"	1/8"	2-1/2"	1115-078	\$32.50	1215-078	\$40.50
.015"	.022"	.100"	1/8"	2-1/2"	1115-100	\$32.50	1215-100	\$40.50
.015"	.022"	.125"	1/8"	2-1/2"	1115-125	\$32.50	1215-125	\$40.50
.015"	.022"	.156"	1/8"	2-1/2"	1115-156	\$33.50	1215-156	\$42.50
.015"	.022"	.187"	1/8"	2-1/2"	1115-187	\$33.50	1215-187	\$42.50
.015"	.022"	.225"	1/8"	2-1/2"	1115-225	\$37.50	1215-225	\$45.50
.020"	.030"	.100"	1/8"	2-1/2"	1120-100	\$29.90	1220-100	\$37.90
.020"	.030"	.160"	1/8"	2-1/2"	1120-160	\$29.90	1220-160	\$37.90
.020"	.030"	.200"	1/8"	2-1/2"	1120-200	\$31.90	1220-200	\$39.90
.020"	.030"	.250"	1/8"	2-1/2"	1120-250	\$31.90	1220-250	\$39.90
.020"	.030"	.300"	1/8"	2-1/2"	1120-300	\$35.90	1220-300	\$43.90
.025"	.037"	.125"	1/8"	2-1/2"	1125-125	\$29.90	1225-125	\$34.90
.025"	.037"	.203"	1/8"	2-1/2"	1125-203	\$29.90	1225-203	\$34.90
.025"	.037"	.250"	1/8"	2-1/2"	1125-250	\$31.50	1225-250	\$36.50
.025"	.037"	.312"	1/8"	2-1/2"	1125-312	\$31.50	1225-312	\$36.50
.030"	.045"	.156"	1/8"	2-1/2"	1130-156	\$29.90	1230-156	\$34.90
.030"	.045"	.200"	1/8"	2-1/2"	1130-200	\$29.90	1230-200	\$34.90
.030"	.045"	.250"	1/8"	2-1/2"	1130-250	\$29.90	1230-250	\$34.90
.030"	.045"	.312"	1/8"	2-1/2"	1130-312	\$30.50	1230-312	\$35.90
.030"	.045"	.375"	1/8"	2-1/2"	1130-375	\$31.50	1230-375	\$36.90
.031"	.046"	.156"	1/8"	2-1/2"	1131-156	\$29.90	1231-156	\$34.90
.031"	.046"	.187"	1/8"	2-1/2"	1131-187	\$29.90	1231-187	\$34.90
.031"	.046"	.218"	1/8"	2-1/2"	1131-218	\$29.90	1231-218	\$34.90
.031"	.046"	.250"	1/8"	2-1/2"	1131-250	\$29.90	1231-250	\$34.90
.031"	.046"	.312"	1/8"	2-1/2"	1131-312	\$30.50	1231-312	\$35.50
.031"	.046"	.375"	1/8"	2-1/2"	1131-375	\$31.50	1231-375	\$36.50
.035"	.052"	.150"	1/8"	2-1/2"	1135-150	\$29.90	1235-150	\$34.90
.035"	.052"	.187"	1/8"	2-1/2"	1135-187	\$29.90	1235-187	\$34.90
.035"	.052"	.250"	1/8"	2-1/2"	1135-250	\$29.90	1235-250	\$34.90
.035"	.052"	.281"	1/8"	2-1/2"	1135-281	\$30.50	1235-281	\$35.50
.035"	.052"	.350"	1/8"	2-1/2"	1135-350	\$30.50	1235-350	\$35.50
.035"	.052"	.425"	1/8"	2-1/2"	1135-425	\$31.50	1235-425	\$36.50

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3-FLUTE - STUB - LG SHANK - LG REACH



Continued from previous page:

Square & Ball End - UNCOATED Size Range: .040" to .060" OAL 2-1/2"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.040"	.060"	.150"	1/8"	2-1/2"	1140-150	\$29.90	1240-150	\$34.90
.040"	.060"	.203"	1/8"	2-1/2"	1140-203	\$29.90	1240-203	\$34.90
.040"	.060"	.250"	1/8"	2-1/2"	1140-250	\$29.90	1240-250	\$34.90
.040"	.060"	.325"	1/8"	2-1/2"	1140-325	\$30.50	1240-325	\$34.90
.040"	.060"	.400"	1/8"	2-1/2"	1140-400	\$31.50	1240-400	\$35.90
.040"	.060"	.480"	1/8"	2-1/2"	1140-480	\$31.50	1240-480	\$35.90
.045"	.067"	.150"	1/8"	2-1/2"	1145-150	\$29.50	1245-150	\$34.50
.045"	.067"	.225"	1/8"	2-1/2"	1145-225	\$29.50	1245-225	\$34.50
.045"	.067"	.300"	1/8"	2-1/2"	1145-300	\$29.50	1245-300	\$34.50
.045"	.067"	.375"	1/8"	2-1/2"	1145-375	\$29.50	1245-375	\$34.50
.045"	.067"	.450"	1/8"	2-1/2"	1145-450	\$30.50	1245-450	\$35.50
.045"	.067"	.550"	1/8"	2-1/2"	1145-550	\$30.50	1245-550	\$35.50
.047"	.070"	.187"	1/8"	2-1/2"	1147-187	\$29.50	1247-187	\$34.50
.047"	.070"	.250"	1/8"	2-1/2"	1147-250	\$29.50	1247-250	\$34.50
.047"	.070"	.300"	1/8"	2-1/2"	1147-300	\$29.50	1247-300	\$34.50
.047"	.070"	.375"	1/8"	2-1/2"	1147-375	\$29.50	1247-375	\$34.50
.047"	.070"	.480"	1/8"	2-1/2"	1147-480	\$30.50	1247-480	\$35.50
.047"	.070"	.570"	1/8"	2-1/2"	1147-570	\$30.50	1247-570	\$35.50
.047"	.070"	.710"	1/8"	2-1/2"	1147-710	\$34.50	1247-710	\$39.50
.050"	.075"	.250"	1/8"	2-1/2"	1150-250	\$29.50	1250-250	\$34.50
.050"	.075"	.300"	1/8"	2-1/2"	1150-300	\$29.50	1250-300	\$34.50
.050"	.075"	.400"	1/8"	2-1/2"	1150-400	\$29.50	1250-400	\$34.50
.050"	.075"	.500"	1/8"	2-1/2"	1150-500	\$30.50	1250-500	\$35.50
.050"	.075"	.600"	1/8"	2-1/2"	1150-600	\$30.50	1250-600	\$35.50
.060"	.090"	.312"	1/8"	2-1/2"	1160-312	\$29.50	1260-312	\$34.50
.060"	.090"	.400"	1/8"	2-1/2"	1160-400	\$29.50	1260-400	\$34.50
.060"	.090"	.500"	1/8"	2-1/2"	1160-500	\$29.50	1260-500	\$34.50
.060"	.090"	.625"	1/8"	2-1/2"	1160-625	\$30.50	1260-625	\$35.50
.060"	.090"	.720"	1/8"	2-1/2"	1160-720	\$30.50	1260-720	\$35.50
.060"	.090"	.900"	1/8"	2-1/2"	1160-900	\$34.50	1260-900	\$39.50

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3-FLUTE - STUB - LG SHANK - LG REACH

Square & Ball End - UNCOATED - 2-1/2" OAL - .062" to .090"

Continued from previous page:



Length of Cut = 1.5 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.062"	.093"	.312"	1/8"	2-1/2"	1162-312	\$29.50	1262-312	\$34.50
.062"	.093"	.400"	1/8"	2-1/2"	1162-400	\$29.50	1262-400	\$34.50
.062"	.093"	.500"	1/8"	2-1/2"	1162-500	\$29.50	1262-500	\$34.50
.062"	.093"	.625"	1/8"	2-1/2"	1162-625	\$30.50	1262-625	\$35.50
.062"	.093"	.750"	1/8"	2-1/2"	1162-750	\$30.50	1262-750	\$35.50
.062"	.093"	.850"	1/8"	2-1/2"	1162-850	\$32.50	1262-850	\$37.50
.062"	.093"	.950"	1/8"	2-1/2"	1162-950	\$34.50	1262-950	\$39.50
.062"	.093"	1.125"	1/8"	2-1/2"	1162-1125	\$40.50	1262-1125	\$45.50
.062"	.093"	1.250"	1/8"	2-1/2"	1162-1250	\$41.50	1262-1250	\$46.50
.065"	.097"	.325"	1/8"	2-1/2"	1165-325	\$29.50	1265-325	\$34.50
.065"	.097"	.400"	1/8"	2-1/2"	1165-400	\$29.50	1265-400	\$34.50
.065"	.097"	.530"	1/8"	2-1/2"	1165-530	\$29.50	1265-530	\$34.50
.065"	.097"	.650"	1/8"	2-1/2"	1165-650	\$30.50	1265-650	\$35.50
.070"	.105"	.375"	1/8"	2-1/2"	1170-375	\$29.50	1270-375	\$34.50
.070"	.105"	.450"	1/8"	2-1/2"	1170-450	\$29.50	1270-450	\$34.50
.070"	.105"	.570"	1/8"	2-1/2"	1170-570	\$29.50	1270-570	\$34.50
.070"	.105"	.700"	1/8"	2-1/2"	1170-700	\$30.50	1270-700	\$35.50
.070"	.105"	.850"	1/8"	2-1/2"	1170-850	\$30.50	1270-850	\$35.50
.075"	.112"	.375"	1/8"	2-1/2"	1175-375	\$29.50	1275-375	\$34.50
.075"	.112"	.500"	1/8"	2-1/2"	1175-500	\$29.50	1275-500	\$34.50
.075"	.112"	.625"	1/8"	2-1/2"	1175-625	\$29.50	1275-625	\$34.50
.075"	.112"	.750"	1/8"	2-1/2"	1175-750	\$30.50	1275-750	\$35.50
.075"	.112"	.900"	1/8"	2-1/2"	1175-900	\$30.50	1275-900	\$35.50
.078"	.117"	.406"	1/8"	2-1/2"	1178-406	\$29.50	1278-406	\$34.50
.078"	.117"	.550"	1/8"	2-1/2"	1178-550	\$29.50	1278-550	\$34.50
.078"	.117"	.625"	1/8"	2-1/2"	1178-625	\$29.50	1278-625	\$34.50
.078"	.117"	.750"	1/8"	2-1/2"	1178-750	\$30.50	1278-750	\$35.50
.078"	.117"	.940"	1/8"	2-1/2"	1178-940	\$30.50	1278-940	\$35.50
.090"	.135"	.450"	1/8"	2-1/2"	1190-450	\$29.50	1290-450	\$34.50
.090"	.135"	.550"	1/8"	2-1/2"	1190-550	\$29.50	1290-550	\$34.50
.090"	.135"	.650"	1/8"	2-1/2"	1190-650	\$29.50	1290-650	\$34.50
.090"	.135"	.750"	1/8"	2-1/2"	1190-750	\$29.50	1290-750	\$34.50
.090"	.135"	.900"	1/8"	2-1/2"	1190-900	\$30.50	1290-900	\$35.50
.090"	.135"	1.080"	1/8"	2-1/2"	1190-1080	\$30.50	1290-1080	\$35.50

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3-FLUTE - STUB - LG SHANK - LG REACH



Continued from previous page:

Square & Ball End - UNCOATED
Size Range: .093" to .250"
OAL 2-1/2"

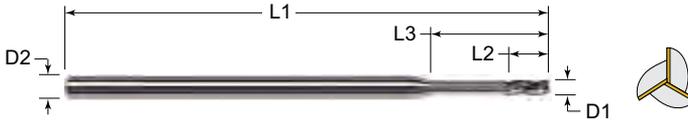


D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.093"	.139"	.400"	1/8"	2-1/2"	1193-400	\$29.50	1293-400	\$34.50
.093"	.139"	.500"	1/8"	2-1/2"	1193-500	\$29.50	1293-500	\$34.50
.093"	.139"	.600"	1/8"	2-1/2"	1193-600	\$29.50	1293-600	\$34.50
.093"	.139"	.750"	1/8"	2-1/2"	1193-750	\$29.50	1293-750	\$34.50
.093"	.139"	.850"	1/8"	2-1/2"	1193-850	\$30.50	1293-850	\$35.50
.093"	.139"	.950"	1/8"	2-1/2"	1193-950	\$30.50	1293-950	\$35.50
.093"	.139"	1.000"	1/8"	2-1/2"	1193-1000	\$30.50	1293-1000	\$35.50
.093"	.139"	1.125"	1/8"	2-1/2"	1193-1125	\$30.50	1293-1125	\$35.50
.100"	.150"	.500"	1/8"	2-1/2"	1100-500	\$29.50	1200-500	\$34.50
.100"	.150"	.650"	1/8"	2-1/2"	1100-650	\$29.50	1200-650	\$34.50
.100"	.150"	.800"	1/8"	2-1/2"	1100-800	\$29.50	1200-800	\$34.50
.100"	.150"	.900"	1/8"	2-1/2"	1100-900	\$30.50	1200-900	\$35.50
.100"	.150"	1.000"	1/8"	2-1/2"	1100-1000	\$30.50	1200-1000	\$35.50
.100"	.150"	1.200"	1/8"	2-1/2"	1100-1200	\$30.50	1200-1200	\$35.50
.125"	.187"	.500"	1/8"	2-1/2"	1125-500	\$29.50	1225-500	\$34.50
.125"	.187"	.625"	1/8"	2-1/2"	1125-625	\$29.50	1225-625	\$34.50
.125"	.187"	.750"	1/8"	2-1/2"	1125-750	\$29.50	1225-750	\$34.50
.125"	.187"	.875"	1/8"	2-1/2"	1125-875	\$29.50	1225-875	\$34.50
.125"	.187"	1.000"	1/8"	2-1/2"	1125-1000	\$29.50	1225-1000	\$34.50
.125"	.187"	1.250"	1/8"	2-1/2"	1125-1250	\$31.50	1225-1250	\$36.50
.125"	.187"	1.500"	1/8"	3"	1125-1500	\$32.50	1225-1500	\$37.50
.125"	.187"	1.750"	1/8"	3"	1125-1750	\$32.50	1225-1750	\$37.50
.125"	.187"	1.875"	1/8"	3-1/2"	1125-1875	\$35.50	1225-1875	\$41.50
.125"	.187"	2.000"	1/8"	4"	1125-2000	\$42.50	1225-2000	\$48.50
.125"	.187"	2.250"	1/8"	4"	1125-2250	\$42.50	1225-2250	\$48.50
.125"	.187"	2.500"	1/8"	4"	1125-2500	\$42.50	1225-2500	\$48.50
.187"	.281"	.750"	3/16"	3"	1187-750	\$34.90	1287-750	\$39.90
.187"	.281"	1.000"	3/16"	3"	1187-1000	\$34.90	1287-1000	\$39.90
.187"	.281"	1.250"	3/16"	3"	1187-1250	\$34.90	1287-1250	\$39.90
.187"	.281"	1.500"	3/16"	3"	1187-1500	\$34.90	1287-1500	\$39.90
.250"	.375"	1.000"	1/4"	4"	1150-1000	\$38.90	1250-1000	\$43.90
.250"	.375"	1.250"	1/4"	4"	1150-1250	\$38.90	1250-1250	\$43.90
.250"	.375"	1.500"	1/4"	4"	1150-1500	\$38.90	1250-1500	\$43.90
.250"	.375"	1.750"	1/4"	4"	1150-1750	\$38.90	1250-1750	\$43.90
.250"	.375"	2.000"	1/4"	4"	1150-2000	\$38.90	1250-2000	\$43.90



3-FLUTE - STUB - LG SHANK - LG REACH

Square & Ball End - AITiN COATED - 2-1/2" OAL - .010" to .035"



Length of Cut = 1.5 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	.050"	1/8"	2-1/2"	2110-050	\$42.90	2210-050	\$50.90
.010"	.015"	.080"	1/8"	2-1/2"	2110-080	\$42.90	2210-080	\$50.90
.010"	.015"	.100"	1/8"	2-1/2"	2110-100	\$44.90	2210-100	\$52.90
.010"	.015"	.125"	1/8"	2-1/2"	2110-125	\$44.90	2210-125	\$52.90
.015"	.022"	.078"	1/8"	2-1/2"	2115-078	\$36.90	2215-078	\$44.90
.015"	.022"	.100"	1/8"	2-1/2"	2115-100	\$36.90	2215-100	\$44.90
.015"	.022"	.125"	1/8"	2-1/2"	2115-125	\$36.90	2215-125	\$44.90
.015"	.022"	.156"	1/8"	2-1/2"	2115-156	\$37.90	2215-156	\$46.90
.015"	.022"	.187"	1/8"	2-1/2"	2115-187	\$37.90	2215-187	\$46.90
.015"	.022"	.225"	1/8"	2-1/2"	2115-225	\$41.90	2215-225	\$49.90
.020"	.030"	.100"	1/8"	2-1/2"	2120-100	\$34.30	2220-100	\$42.30
.020"	.030"	.160"	1/8"	2-1/2"	2120-160	\$34.30	2220-160	\$42.30
.020"	.030"	.200"	1/8"	2-1/2"	2120-200	\$36.30	2220-200	\$44.30
.020"	.030"	.250"	1/8"	2-1/2"	2120-250	\$36.30	2220-250	\$44.30
.020"	.030"	.300"	1/8"	2-1/2"	2120-300	\$40.30	2220-300	\$48.30
.025"	.037"	.125"	1/8"	2-1/2"	2125-125	\$34.30	2225-125	\$39.30
.025"	.037"	.203"	1/8"	2-1/2"	2125-203	\$34.30	2225-203	\$39.30
.025"	.037"	.250"	1/8"	2-1/2"	2125-250	\$35.90	2225-250	\$40.90
.025"	.037"	.312"	1/8"	2-1/2"	2125-312	\$35.90	2225-312	\$40.90
.030"	.045"	.156"	1/8"	2-1/2"	2130-156	\$34.30	2230-156	\$39.30
.030"	.045"	.200"	1/8"	2-1/2"	2130-200	\$34.30	2230-200	\$39.30
.030"	.045"	.250"	1/8"	2-1/2"	2130-250	\$34.30	2230-250	\$39.30
.030"	.045"	.312"	1/8"	2-1/2"	2130-312	\$34.90	2230-312	\$39.90
.030"	.045"	.375"	1/8"	2-1/2"	2130-375	\$35.90	2230-375	\$39.90
.031"	.046"	.156"	1/8"	2-1/2"	2131-156	\$34.30	2231-156	\$39.30
.031"	.046"	.187"	1/8"	2-1/2"	2131-187	\$34.30	2231-187	\$39.30
.031"	.046"	.218"	1/8"	2-1/2"	2131-218	\$34.30	2231-218	\$39.30
.031"	.046"	.250"	1/8"	2-1/2"	2131-250	\$34.30	2231-250	\$39.30
.031"	.046"	.312"	1/8"	2-1/2"	2131-312	\$34.90	2231-312	\$39.90
.031"	.046"	.375"	1/8"	2-1/2"	2131-375	\$35.90	2231-375	\$40.90
.035"	.052"	.150"	1/8"	2-1/2"	2135-150	\$34.30	2235-150	\$39.30
.035"	.052"	.187"	1/8"	2-1/2"	2135-187	\$34.30	2235-187	\$39.30
.035"	.052"	.250"	1/8"	2-1/2"	2135-250	\$34.30	2235-250	\$39.30
.035"	.052"	.281"	1/8"	2-1/2"	2135-281	\$34.90	2235-281	\$39.90
.035"	.052"	.350"	1/8"	2-1/2"	2135-350	\$34.90	2235-350	\$39.90
.035"	.052"	.425"	1/8"	2-1/2"	2135-425	\$35.90	2235-425	\$40.90

Continued Next Page

3-FLUTE - STUB - LG SHANK - LG REACH



Continued from previous page:

Square & Ball End - AITiN COATED

Size Range: .040" to .060"

OAL 2-1/2"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.040"	.060"	.150"	1/8"	2-1/2"	2140-150	\$34.30	2240-150	\$39.30
.040"	.060"	.203"	1/8"	2-1/2"	2140-203	\$34.30	2240-203	\$39.30
.040"	.060"	.250"	1/8"	2-1/2"	2140-250	\$34.30	2240-250	\$39.30
.040"	.060"	.325"	1/8"	2-1/2"	2140-325	\$34.90	2240-325	\$39.30
.040"	.060"	.400"	1/8"	2-1/2"	2140-400	\$35.90	2240-400	\$40.30
.040"	.060"	.480"	1/8"	2-1/2"	2140-480	\$35.90	2240-480	\$40.30
.045"	.067"	.150"	1/8"	2-1/2"	2145-150	\$33.90	2245-150	\$38.90
.045"	.067"	.225"	1/8"	2-1/2"	2145-225	\$33.90	2245-225	\$38.90
.045"	.067"	.300"	1/8"	2-1/2"	2145-300	\$23.90	2245-300	\$38.90
.045"	.067"	.375"	1/8"	2-1/2"	2145-375	\$33.90	2245-375	\$38.90
.045"	.067"	.450"	1/8"	2-1/2"	2145-450	\$34.90	2245-450	\$39.90
.045"	.067"	.550"	1/8"	2-1/2"	2145-550	\$34.90	2245-550	\$39.90
.047"	.070"	.187"	1/8"	2-1/2"	2147-187	\$33.90	2247-187	\$38.90
.047"	.070"	.250"	1/8"	2-1/2"	2147-250	\$33.90	2247-250	\$38.90
.047"	.070"	.300"	1/8"	2-1/2"	2147-300	\$33.90	2247-300	\$38.90
.047"	.070"	.375"	1/8"	2-1/2"	2147-375	\$33.90	2247-375	\$38.90
.047"	.070"	.480"	1/8"	2-1/2"	2147-480	\$34.90	2247-480	\$39.90
.047"	.070"	.570"	1/8"	2-1/2"	2147-570	\$34.90	2247-570	\$39.90
.047"	.070"	.710"	1/8"	2-1/2"	2147-710	\$38.90	2247-710	\$43.90
.050"	.075"	.250"	1/8"	2-1/2"	2150-250	\$33.90	2250-250	\$38.90
.050"	.075"	.300"	1/8"	2-1/2"	2150-300	\$33.90	2250-300	\$38.90
.050"	.075"	.400"	1/8"	2-1/2"	2150-400	\$33.90	2250-400	\$38.90
.050"	.075"	.500"	1/8"	2-1/2"	2150-500	\$34.90	2250-500	\$39.90
.050"	.075"	.600"	1/8"	2-1/2"	2150-600	\$34.90	2250-600	\$39.90
.060"	.090"	.312"	1/8"	2-1/2"	2160-312	\$33.90	2260-312	\$38.90
.060"	.090"	.400"	1/8"	2-1/2"	2160-400	\$33.90	2260-400	\$38.90
.060"	.090"	.500"	1/8"	2-1/2"	2160-500	\$33.90	2260-500	\$38.90
.060"	.090"	.625"	1/8"	2-1/2"	2160-625	\$34.90	2260-625	\$39.90
.060"	.090"	.720"	1/8"	2-1/2"	2160-720	\$34.90	2260-720	\$39.90
.060"	.090"	.900"	1/8"	2-1/2"	2160-900	\$38.90	2260-900	\$43.90

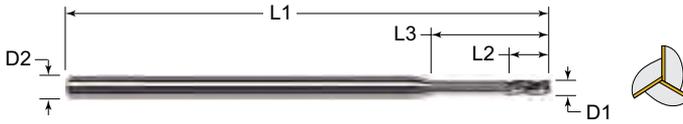
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3-FLUTE - STUB - LG SHANK - LG REACH

Square & Ball End - AITiN COATED - 2-1/2" OAL - .062" to .090"

Continued from previous page:



Length of Cut = 1.5 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.062"	.093"	.312"	1/8"	2-1/2"	2162-312	\$33.90	2262-312	\$38.90
.062"	.093"	.400"	1/8"	2-1/2"	2162-400	\$33.90	2262-400	\$38.90
.062"	.093"	.500"	1/8"	2-1/2"	2162-500	\$33.90	2262-500	\$38.90
.062"	.093"	.625"	1/8"	2-1/2"	2162-625	\$34.90	2262-625	\$39.90
.062"	.093"	.750"	1/8"	2-1/2"	2162-750	\$34.90	2262-750	\$39.90
.062"	.093"	.850"	1/8"	2-1/2"	2162-850	\$36.90	2262-850	\$41.90
.062"	.093"	.950"	1/8"	2-1/2"	2162-950	\$38.90	2262-950	\$43.90
.062"	.093"	1.125"	1/8"	2-1/2"	2162-1125	\$44.90	2262-1125	\$49.90
.062"	.093"	1.250"	1/8"	2-1/2"	2162-1250	\$45.90	2262-1250	\$50.90
.065"	.097"	.325"	1/8"	2-1/2"	2165-325	\$33.90	2265-325	\$38.90
.065"	.097"	.400"	1/8"	2-1/2"	2165-400	\$33.90	2265-400	\$38.90
.065"	.097"	.530"	1/8"	2-1/2"	2165-530	\$33.90	2265-530	\$38.90
.065"	.097"	.650"	1/8"	2-1/2"	2165-650	\$34.90	2265-650	\$39.90
.070"	.105"	.375"	1/8"	2-1/2"	2170-375	\$33.90	2270-375	\$38.90
.070"	.105"	.450"	1/8"	2-1/2"	2170-450	\$33.90	2270-450	\$38.90
.070"	.105"	.570"	1/8"	2-1/2"	2170-570	\$33.90	2270-570	\$38.90
.070"	.105"	.700"	1/8"	2-1/2"	2170-700	\$34.90	2270-700	\$39.90
.070"	.105"	.850"	1/8"	2-1/2"	2170-850	\$34.90	2270-850	\$39.90
.075"	.112"	.375"	1/8"	2-1/2"	2175-375	\$33.90	2275-375	\$38.90
.075"	.112"	.500"	1/8"	2-1/2"	2175-500	\$33.90	2275-500	\$38.90
.075"	.112"	.625"	1/8"	2-1/2"	2175-625	\$33.90	2275-625	\$38.90
.075"	.112"	.750"	1/8"	2-1/2"	2175-750	\$34.90	2275-750	\$39.90
.075"	.112"	.900"	1/8"	2-1/2"	2175-900	\$34.90	2275-900	\$39.90
.078"	.117"	.406"	1/8"	2-1/2"	2178-406	\$33.90	2278-406	\$38.90
.078"	.117"	.550"	1/8"	2-1/2"	2178-550	\$33.90	2278-550	\$38.90
.078"	.117"	.625"	1/8"	2-1/2"	2178-625	\$33.90	2278-625	\$38.90
.078"	.117"	.750"	1/8"	2-1/2"	2178-750	\$34.90	2278-750	\$39.90
.078"	.117"	.940"	1/8"	2-1/2"	2178-940	\$34.90	2278-940	\$39.90
.090"	.135"	.450"	1/8"	2-1/2"	2190-450	\$33.90	2290-450	\$38.90
.090"	.135"	.550"	1/8"	2-1/2"	2190-550	\$33.90	2290-550	\$38.90
.090"	.135"	.650"	1/8"	2-1/2"	2190-650	\$33.90	2290-650	\$38.90
.090"	.135"	.750"	1/8"	2-1/2"	2190-750	\$33.90	2290-750	\$38.90
.090"	.135"	.900"	1/8"	2-1/2"	2190-900	\$34.90	2290-900	\$39.90
.090"	.135"	1.080"	1/8"	2-1/2"	2190-1080	\$34.90	2290-1080	\$39.90

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3-FLUTE - STUB - LG SHANK - LG REACH



Continued from previous page:

Square & Ball End - AITiN COATED

Size Range: .093" to .250"

OAL 2-1/2"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.093"	.139"	.400"	1/8"	2-1/2"	2193-400	\$33.90	2293-400	\$38.90
.093"	.139"	.500"	1/8"	2-1/2"	2193-500	\$33.90	2293-500	\$38.90
.093"	.139"	.600"	1/8"	2-1/2"	2193-600	\$33.90	2293-600	\$38.90
.093"	.139"	.750"	1/8"	2-1/2"	2193-750	\$33.90	2293-750	\$38.90
.093"	.139"	.850"	1/8"	2-1/2"	2193-850	\$34.90	2293-850	\$39.90
.093"	.139"	.950"	1/8"	2-1/2"	2193-950	\$34.90	2293-950	\$39.90
.093"	.139"	1.000"	1/8"	2-1/2"	2193-1000	\$34.90	2293-1000	\$39.90
.093"	.139"	1.125"	1/8"	2-1/2"	2193-1125	\$34.90	2293-1125	\$39.90
.100"	.150"	.500"	1/8"	2-1/2"	2100-500	\$33.90	2200-500	\$38.90
.100"	.150"	.650"	1/8"	2-1/2"	2100-650	\$33.90	2200-650	\$38.90
.100"	.150"	.800"	1/8"	2-1/2"	2100-800	\$33.90	2200-800	\$38.90
.100"	.150"	.900"	1/8"	2-1/2"	2100-900	\$34.90	2200-900	\$39.90
.100"	.150"	1.000"	1/8"	2-1/2"	2100-1000	\$34.90	2200-1000	\$39.90
.100"	.150"	1.200"	1/8"	2-1/2"	2100-1200	\$34.90	2200-1200	\$39.90
.125"	.187"	.500"	1/8"	2-1/2"	2125-500	\$33.90	2225-500	\$38.90
.125"	.187"	.625"	1/8"	2-1/2"	2125-625	\$33.90	2225-625	\$38.90
.125"	.187"	.750"	1/8"	2-1/2"	2125-750	\$33.90	2225-750	\$38.90
.125"	.187"	.875"	1/8"	2-1/2"	2125-875	\$33.90	2225-875	\$38.90
.125"	.187"	1.000"	1/8"	2-1/2"	2125-1000	\$33.90	2225-1000	\$38.90
.125"	.187"	1.250"	1/8"	2-1/2"	2125-1250	\$35.90	2225-1250	\$40.90
.125"	.187"	1.500"	1/8"	3"	2125-1500	\$36.90	2225-1500	\$41.90
.125"	.187"	1.750"	1/8"	3"	2125-1750	\$39.90	2225-1750	\$45.90
.125"	.187"	1.875"	1/8"	3-1/2"	2125-1875	\$39.90	2225-1875	\$45.90
.125"	.187"	2.000"	1/8"	4"	2125-2000	\$47.90	2225-2000	\$53.90
.125"	.187"	2.250"	1/8"	4"	2125-2250	\$47.90	2225-2250	\$53.90
.125"	.187"	2.500"	1/8"	4"	2125-2500	\$47.90	2225-2500	\$53.90
.187"	.281"	.750"	3/16"	3"	2187-750	\$39.90	2287-750	\$44.90
.187"	.281"	1.000"	3/16"	3"	2187-1000	\$39.90	2287-1000	\$44.90
.187"	.281"	1.250"	3/16"	3"	2187-1250	\$39.90	2287-1250	\$44.90
.187"	.281"	1.500"	3/16"	3"	2187-1500	\$39.90	2287-1500	\$44.90
.250"	.375"	1.000"	1/4"	4"	2150-1000	\$44.90	2250-1000	\$49.90
.250"	.375"	1.250"	1/4"	4"	2150-1250	\$44.90	2250-1250	\$49.90
.250"	.375"	1.500"	1/4"	4"	2150-1500	\$44.90	2250-1500	\$49.90
.250"	.375"	1.750"	1/4"	4"	2150-1750	\$44.90	2250-1750	\$49.90
.250"	.375"	2.000"	1/4"	4"	2150-2000	\$44.90	2250-2000	\$49.90



3-FLT - LG SHK - LG REACH - REG FLUTE

Square & Ball End - UNCOATED - 2-1/2" OAL - .015" to .050"



Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	.078"	1/8"	2-1/2"	4115-078	\$32.50	4215-078	\$40.50
.015"	.045"	.128"	1/8"	2-1/2"	4115-128	\$32.50	4215-128	\$40.50
.015"	.045"	.187"	1/8"	2-1/2"	4115-187	\$33.50	4215-187	\$42.50
.020"	.060"	.100"	1/8"	2-1/2"	4120-100	\$29.90	4220-100	\$37.90
.020"	.060"	.170"	1/8"	2-1/2"	4120-170	\$29.90	4220-170	\$37.90
.020"	.060"	.250"	1/8"	2-1/2"	4120-250	\$31.90	4220-250	\$39.90
.025"	.075"	.125"	1/8"	2-1/2"	4125-125	\$29.90	4225-125	\$34.90
.025"	.075"	.210"	1/8"	2-1/2"	4125-210	\$29.90	4225-210	\$34.90
.025"	.075"	.312"	1/8"	2-1/2"	4125-312	\$31.50	4225-312	\$36.50
.030"	.090"	.156"	1/8"	2-1/2"	4130-156	\$29.90	4230-156	\$34.90
.030"	.090"	.270"	1/8"	2-1/2"	4130-270	\$29.90	4230-270	\$34.90
.030"	.090"	.375"	1/8"	2-1/2"	4130-375	\$31.50	4230-375	\$38.90
.031"	.093"	.156"	1/8"	2-1/2"	4131-156	\$29.90	4231-156	\$34.90
.031"	.093"	.279"	1/8"	2-1/2"	4131-279	\$29.90	4231-279	\$34.90
.031"	.093"	.375"	1/8"	2-1/2"	4131-375	\$31.50	4231-375	\$36.50
.035"	.105"	.150"	1/8"	2-1/2"	4135-150	\$29.90	4235-150	\$34.90
.035"	.105"	.315"	1/8"	2-1/2"	4135-315	\$30.50	4235-315	\$35.50
.035"	.105"	.420"	1/8"	2-1/2"	4135-420	\$31.50	4235-420	\$36.50
.040"	.120"	.203"	1/8"	2-1/2"	4140-203	\$29.90	4240-203	\$34.90
.040"	.120"	.360"	1/8"	2-1/2"	4140-360	\$30.50	4240-360	\$35.50
.040"	.120"	.480"	1/8"	2-1/2"	4140-480	\$31.50	4240-480	\$36.50
.045"	.135"	.225"	1/8"	2-1/2"	4145-225	\$29.50	4245-225	\$34.50
.045"	.135"	.405"	1/8"	2-1/2"	4145-405	\$30.50	4245-405	\$35.50
.045"	.135"	.540"	1/8"	2-1/2"	4145-540	\$31.50	4245-540	\$36.50
.047"	.141"	.250"	1/8"	2-1/2"	4147-250	\$29.50	4247-250	\$34.50
.047"	.141"	.425"	1/8"	2-1/2"	4147-425	\$30.50	4247-425	\$35.50
.047"	.141"	.570"	1/8"	2-1/2"	4147-570	\$31.50	4247-570	\$36.50
.050"	.150"	.250"	1/8"	2-1/2"	4150-250	\$29.50	4250-250	\$34.50
.050"	.150"	.400"	1/8"	2-1/2"	4150-400	\$29.50	4250-400	\$34.50
.050"	.150"	.500"	1/8"	2-1/2"	4150-500	\$30.50	4250-500	\$35.50
.050"	.150"	.600"	1/8"	2-1/2"	4150-600	\$31.50	4250-600	\$36.50

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3-FLT - LG SHK - LG REACH - REG FLUTE



Continued from previous page:

Square & Ball End - UNCOATED

Size Range: .060" to .100"

Length of Cut = 3 x Diameter

OAL 2-1/2"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.060"	.180"	.312"	1/8"	2-1/2"	4160-312	\$29.50	4260-312	\$34.50
.060"	.180"	.400"	1/8"	2-1/2"	4160-400	\$29.50	4260-400	\$34.50
.060"	.180"	.500"	1/8"	2-1/2"	4160-500	\$29.50	4260-500	\$34.50
.060"	.180"	.625"	1/8"	2-1/2"	4160-625	\$31.50	4260-625	\$36.50
.060"	.180"	.720"	1/8"	2-1/2"	4160-720	\$31.50	4260-720	\$36.50
.062"	.186"	.312"	1/8"	2-1/2"	4162-312	\$29.50	4262-312	\$34.50
.062"	.186"	.400"	1/8"	2-1/2"	4162-400	\$29.50	4262-400	\$34.50
.062"	.186"	.500"	1/8"	2-1/2"	4162-500	\$29.50	4262-500	\$34.50
.062"	.186"	.625"	1/8"	2-1/2"	4162-625	\$31.50	4262-625	\$36.50
.062"	.186"	.750"	1/8"	2-1/2"	4162-750	\$31.50	4262-750	\$36.50
.070"	.210"	.350"	1/8"	2-1/2"	4170-350	\$29.50	4270-350	\$34.50
.070"	.210"	.450"	1/8"	2-1/2"	4170-450	\$29.50	4270-450	\$34.50
.070"	.210"	.560"	1/8"	2-1/2"	4170-560	\$29.50	4270-560	\$34.50
.070"	.210"	.750"	1/8"	2-1/2"	4170-750	\$31.50	4270-750	\$36.50
.075"	.225"	.375"	1/8"	2-1/2"	4175-375	\$29.50	4275-375	\$34.50
.075"	.225"	.500"	1/8"	2-1/2"	4175-500	\$29.50	4275-500	\$34.50
.075"	.225"	.600"	1/8"	2-1/2"	4175-600	\$29.50	4275-600	\$34.50
.075"	.225"	.750"	1/8"	2-1/2"	4175-750	\$31.50	4275-750	\$36.50
.075"	.225"	.900"	1/8"	2-1/2"	4175-900	\$31.50	4275-900	\$36.50
.078"	.234"	.390"	1/8"	2-1/2"	4178-390	\$29.50	4278-390	\$34.50
.078"	.234"	.550"	1/8"	2-1/2"	4178-550	\$29.50	4278-550	\$34.50
.078"	.234"	.625"	1/8"	2-1/2"	4178-625	\$29.50	4278-625	\$34.50
.078"	.234"	.750"	1/8"	2-1/2"	4178-750	\$31.50	4278-750	\$36.50
.078"	.234"	.940"	1/8"	2-1/2"	4178-940	\$31.50	4278-940	\$36.50
.090"	.270"	.450"	1/8"	2-1/2"	4190-450	\$29.50	4290-450	\$34.50
.090"	.270"	.720"	1/8"	2-1/2"	4190-720	\$29.50	4290-720	\$34.50
.090"	.270"	.900"	1/8"	2-1/2"	4190-900	\$32.50	4290-900	\$37.50
.090"	.270"	1.080"	1/8"	2-1/2"	4190-1080	\$32.50	4290-1080	\$37.50
.093"	.279"	.500"	1/8"	2-1/2"	4193-500	\$29.50	4293-500	\$34.50
.093"	.279"	.600"	1/8"	2-1/2"	4193-600	\$29.50	4293-600	\$34.50
.093"	.279"	.750"	1/8"	2-1/2"	4193-750	\$29.50	4293-750	\$34.50
.093"	.279"	.850"	1/8"	2-1/2"	4193-850	\$32.50	4293-850	\$37.50
.093"	.279"	1.000"	1/8"	2-1/2"	4193-1000	\$32.50	4293-1000	\$37.50
.093"	.279"	1.125"	1/8"	2-1/2"	4193-1125	\$32.50	4293-1125	\$37.50
.100"	.300"	.500"	1/8"	2-1/2"	4100-500	\$29.50	4200-500	\$34.50
.100"	.300"	.800"	1/8"	2-1/2"	4100-800	\$32.50	4200-800	\$37.50
.100"	.300"	1.200"	1/8"	2-1/2"	4100-1200	\$32.50	4200-1200	\$37.50



3-FLT - LG SHK - LG REACH - REG FLUTE

Square & Ball End - AITiN COATED - 2-1/2" OAL - .015" to .050"



Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	.078"	1/8"	2-1/2"	4315-078	\$37.50	4415-078	\$45.50
.015"	.045"	.128"	1/8"	2-1/2"	4315-128	\$37.50	4415-128	\$45.50
.015"	.045"	.187"	1/8"	2-1/2"	4315-187	\$38.50	4415-187	\$47.50
.020"	.060"	.100"	1/8"	2-1/2"	4320-100	\$34.90	4420-100	\$42.90
.020"	.060"	.170"	1/8"	2-1/2"	4320-170	\$34.90	4420-170	\$42.90
.020"	.060"	.250"	1/8"	2-1/2"	4320-250	\$36.90	4420-250	\$44.90
.025"	.075"	.125"	1/8"	2-1/2"	4325-125	\$34.90	4425-125	\$39.90
.025"	.075"	.210"	1/8"	2-1/2"	4325-210	\$34.90	4425-210	\$39.90
.025"	.075"	.312"	1/8"	2-1/2"	4325-312	\$36.50	4425-312	\$41.50
.030"	.090"	.156"	1/8"	2-1/2"	4330-156	\$34.90	4430-156	\$39.90
.030"	.090"	.270"	1/8"	2-1/2"	4330-270	\$34.90	4430-270	\$39.90
.030"	.090"	.375"	1/8"	2-1/2"	4330-375	\$36.50	4430-375	\$41.50
.031"	.093"	.156"	1/8"	2-1/2"	4331-156	\$34.90	4431-156	\$39.90
.031"	.093"	.279"	1/8"	2-1/2"	4331-279	\$34.90	4431-279	\$39.90
.031"	.093"	.375"	1/8"	2-1/2"	4331-375	\$36.50	4431-375	\$41.50
.035"	.105"	.150"	1/8"	2-1/2"	4335-150	\$34.90	4435-150	\$39.90
.035"	.105"	.315"	1/8"	2-1/2"	4335-315	\$35.50	4435-315	\$40.50
.035"	.105"	.420"	1/8"	2-1/2"	4335-420	\$36.50	4435-420	\$41.50
.040"	.120"	.203"	1/8"	2-1/2"	4340-203	\$34.90	4440-203	\$39.90
.040"	.120"	.360"	1/8"	2-1/2"	4340-360	\$35.50	4440-360	\$40.50
.040"	.120"	.480"	1/8"	2-1/2"	4340-480	\$36.50	4440-480	\$41.50
.045"	.135"	.225"	1/8"	2-1/2"	4345-225	\$34.50	4445-225	\$39.50
.045"	.135"	.405"	1/8"	2-1/2"	4345-405	\$35.50	4445-405	\$40.50
.045"	.135"	.540"	1/8"	2-1/2"	4345-540	\$36.50	4445-540	\$41.50
.047"	.141"	.250"	1/8"	2-1/2"	4347-250	\$34.50	4447-250	\$39.50
.047"	.141"	.425"	1/8"	2-1/2"	4347-425	\$35.50	4447-425	\$40.50
.047"	.141"	.570"	1/8"	2-1/2"	4347-570	\$36.50	4447-570	\$41.50
.050"	.150"	.250"	1/8"	2-1/2"	4350-250	\$34.50	4450-250	\$39.50
.050"	.150"	.400"	1/8"	2-1/2"	4350-400	\$34.50	4450-400	\$39.50
.050"	.150"	.500"	1/8"	2-1/2"	4350-500	\$35.50	4450-500	\$40.50
.050"	.150"	.600"	1/8"	2-1/2"	4350-600	\$36.50	4450-600	\$41.50

Continued Next Page

3-FLT - LG SHK - LG REACH - REG FLUTE



Continued from previous page:

Square & Ball End - AITiN COATED

Size Range: .060" to .100"

Length of Cut = 3 x Diameter

OAL 2-1/2"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.060"	.180"	.312"	1/8"	2-1/2"	4360-312	\$34.50	4460-312	\$39.50
.060"	.180"	.400"	1/8"	2-1/2"	4360-400	\$34.50	4460-400	\$39.50
.060"	.180"	.500"	1/8"	2-1/2"	4360-500	\$34.50	4460-500	\$39.50
.060"	.180"	.625"	1/8"	2-1/2"	4360-625	\$36.50	4460-625	\$41.50
.060"	.180"	.720"	1/8"	2-1/2"	4360-720	\$36.50	4460-720	\$41.50
.062"	.186"	.312"	1/8"	2-1/2"	4362-312	\$34.50	4462-312	\$39.50
.062"	.186"	.400"	1/8"	2-1/2"	4362-400	\$34.50	4462-400	\$39.50
.062"	.186"	.500"	1/8"	2-1/2"	4362-500	\$34.50	4462-500	\$39.50
.062"	.186"	.625"	1/8"	2-1/2"	4362-625	\$36.50	4462-625	\$41.50
.062"	.186"	.750"	1/8"	2-1/2"	4362-750	\$36.50	4462-750	\$41.50
.070"	.210"	.350"	1/8"	2-1/2"	4370-350	\$34.50	4470-350	\$39.50
.070"	.210"	.450"	1/8"	2-1/2"	4370-450	\$34.50	4470-450	\$39.50
.070"	.210"	.560"	1/8"	2-1/2"	4370-560	\$34.50	4470-560	\$39.50
.070"	.210"	.750"	1/8"	2-1/2"	4370-750	\$36.50	4470-750	\$41.50
.075"	.225"	.375"	1/8"	2-1/2"	4375-375	\$34.50	4475-375	\$39.50
.075"	.225"	.500"	1/8"	2-1/2"	4375-500	\$34.50	4475-500	\$39.50
.075"	.225"	.600"	1/8"	2-1/2"	4375-600	\$34.50	4475-600	\$39.50
.075"	.225"	.750"	1/8"	2-1/2"	4375-750	\$36.50	4475-750	\$41.50
.075"	.225"	.900"	1/8"	2-1/2"	4375-900	\$36.50	4475-900	\$41.50
.078"	.234"	.390"	1/8"	2-1/2"	4378-390	\$34.50	4478-390	\$39.50
.078"	.234"	.550"	1/8"	2-1/2"	4378-550	\$34.50	4478-550	\$39.50
.078"	.234"	.625"	1/8"	2-1/2"	4378-625	\$34.50	4478-625	\$39.50
.078"	.234"	.750"	1/8"	2-1/2"	4378-750	\$36.50	4478-750	\$41.50
.078"	.234"	.940"	1/8"	2-1/2"	4378-940	\$36.50	4478-940	\$41.50
.090"	.270"	.450"	1/8"	2-1/2"	4390-450	\$34.50	4490-450	\$39.50
.090"	.270"	.720"	1/8"	2-1/2"	4390-720	\$34.50	4490-720	\$39.50
.090"	.270"	.900"	1/8"	2-1/2"	4390-900	\$37.50	4490-900	\$42.50
.090"	.270"	1.080"	1/8"	2-1/2"	4390-1080	\$37.50	4490-1080	\$42.50
.093"	.279"	.500"	1/8"	2-1/2"	4393-500	\$34.50	4493-500	\$39.50
.093"	.279"	.600"	1/8"	2-1/2"	4393-600	\$34.50	4493-600	\$39.50
.093"	.279"	.750"	1/8"	2-1/2"	4393-750	\$34.50	4493-750	\$39.50
.093"	.279"	.850"	1/8"	2-1/2"	4393-850	\$37.50	4493-850	\$42.50
.093"	.279"	1.000"	1/8"	2-1/2"	4393-1000	\$37.50	4493-1000	\$42.50
.093"	.279"	1.125"	1/8"	2-1/2"	4393-1125	\$37.50	4493-1125	\$42.50
.100"	.300"	.500"	1/8"	2-1/2"	4300-500	\$34.50	4400-500	\$39.50
.100"	.300"	.800"	1/8"	2-1/2"	4300-800	\$37.50	4400-800	\$42.50
.100"	.300"	1.200"	1/8"	2-1/2"	4300-1200	\$37.50	4400-1200	\$42.50



3-FLT - STUB - CORNER RAD - LG SHK

Corner Radius - UNCOATED & AITiN COATED 2-1/2" OAL - LOC = 1.5 x DIA.

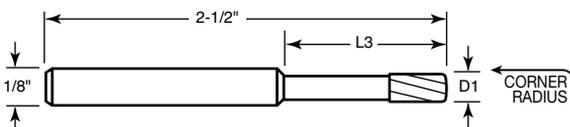


Flute Length = 1.5 x Diameter or as specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Dia. +/- .0005"	R Corner Radius +/- .001"	L2 Length of Cut +.010" -.000"	D2 Shank Dia.	L1 Over All Length	NOT COATED		AITiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.003"	.023"	1/8"	2-1/2"	SR1015-003	\$32.50	SR2015-003	\$36.75
.020"	.005"	.030"	1/8"	2-1/2"	SR1020-005	\$32.50	SR2020-005	\$36.75
.031"	.005"	.046"	1/8"	2-1/2"	SR1031-005	\$27.25	SR2031-005	\$31.50
.040"	.005"	.060"	1/8"	2-1/2"	SR1040-005	\$27.25	SR2040-005	\$31.50
.047"	.005"	.070"	1/8"	2-1/2"	SR1047-005	\$27.25	SR2047-005	\$31.50
.047"	.010"	.070"	1/8"	2-1/2"	SR1047-010	\$27.25	SR2047-010	\$31.50
.062"	.005"	.094"	1/8"	2-1/2"	SR1062-005	\$27.25	SR2062-005	\$31.50
.062"	.010"	.094"	1/8"	2-1/2"	SR1062-010	\$27.25	SR2062-010	\$31.50
.062"	.015"	.094"	1/8"	2-1/2"	SR1062-015	\$27.25	SR2062-015	\$31.50
.070"	.005"	.105"	1/8"	2-1/2"	SR1070-005	\$27.25	SR2070-005	\$31.50
.078"	.005"	.117"	1/8"	2-1/2"	SR1078-005	\$27.25	SR2078-005	\$31.50
.078"	.010"	.117"	1/8"	2-1/2"	SR1078-010	\$27.25	SR2078-010	\$31.50
.078"	.015"	.117"	1/8"	2-1/2"	SR1078-015	\$27.25	SR2078-015	\$31.50
.093"	.005"	.139"	1/8"	2-1/2"	SR1093-005	\$27.25	SR2093-005	\$31.50
.093"	.010"	.139"	1/8"	2-1/2"	SR1093-010	\$27.25	SR2093-010	\$31.50
.093"	.015"	.139"	1/8"	2-1/2"	SR1093-015	\$27.25	SR2093-015	\$31.50
.125"	.005"	.187"	1/8"	2-1/2"	SR1125-005	\$27.25	SR2125-005	\$31.50
.125"	.010"	.187"	1/8"	2-1/2"	SR1125-010	\$27.25	SR2125-010	\$31.50
.125"	.015"	.187"	1/8"	2-1/2"	SR1125-015	\$27.25	SR2125-015	\$31.50
.125"	.020"	.187"	1/8"	2-1/2"	SR1125-020	\$27.25	SR2125-020	\$31.50
.125"	.030"	.187"	1/8"	2-1/2"	SR1125-030	\$27.25	SR2125-030	\$31.50

ORDER SPECIAL 3-Flute Square & Ball End LONG REACH, LONG SHANK MILLS

To order special long reach end mills please specify:



1. Diameter (D1): _____ From chart above.
2. Corner Rad. (R): _____ From chart above.
3. Overall Reach (L3): _____
4. Quantity (Minimum 6): _____

3-Flute

Special Reaches Shipped within 24-48 Hours!

Tools are custom manufactured to order and are nonreturnable.

3-FLT - STUB - CORNER RAD - LG SHK & RCH



Corner Radius - UNCOATED & AITiN COATED - .015" to .047"



Minimum
3 Tools
Each Size

**Shipped
Within 24-48
Hours**

Flute Length = 1.5 x Diameter or as specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter +/- .0005"	R Corner Radius +/- .001"	L2 Length of Cut +.010" -.000"	L3 Reach From Tip	D2 Shank Dia.	L1 Over All Length	NOT COATED		AITiN COATED	
						Tool Number	Price Each	Tool Number	Price Each
.015"	.003"	.023"	.080"	1/8"	2-1/2"	2315-080	\$41.00	2415-080	\$45.25
.015"	.003"	.023"	.125"	1/8"	2-1/2"	2315-125	\$41.00	2415-125	\$45.25
.020"	.005"	.030"	.100"	1/8"	2-1/2"	2320-100	\$41.00	2420-100	\$45.25
.020"	.005"	.030"	.150"	1/8"	2-1/2"	2320-150	\$41.00	2420-150	\$45.25
.031"	.005"	.046"	.150"	1/8"	2-1/2"	2331-150	\$35.75	2431-150	\$40.00
.031"	.005"	.046"	.200"	1/8"	2-1/2"	2331-200	\$35.75	2431-200	\$40.00
.031"	.005"	.046"	.250"	1/8"	2-1/2"	2331-250	\$35.75	2431-250	\$40.00
.040"	.005"	.060"	.150"	1/8"	2-1/2"	2340-150	\$35.75	2440-150	\$40.00
.040"	.005"	.060"	.200"	1/8"	2-1/2"	2340-200	\$35.75	2440-200	\$40.00
.040"	.005"	.060"	.250"	1/8"	2-1/2"	2340-250	\$35.75	2440-250	\$40.00
.040"	.005"	.060"	.300"	1/8"	2-1/2"	2340-300	\$35.75	2440-300	\$40.00
.047"	.005"	.070"	.200"	1/8"	2-1/2"	2347-200	\$34.75	2447-200	\$38.75
.047"	.005"	.070"	.250"	1/8"	2-1/2"	2347-250	\$34.75	2447-250	\$38.75
.047"	.005"	.070"	.300"	1/8"	2-1/2"	2347-300	\$34.75	2447-300	\$38.75
.047"	.005"	.070"	.350"	1/8"	2-1/2"	2347-350	\$34.75	2447-350	\$38.75
.047"	.005"	.070"	.400"	1/8"	2-1/2"	2347-400	\$35.75	2447-400	\$40.00
.047"	.005"	.070"	.450"	1/8"	2-1/2"	2347-450	\$35.75	2447-450	\$40.00
.047"	.010"	.070"	.200"	1/8"	2-1/2"	2547-200	\$34.75	2647-200	\$38.75
.047"	.010"	.070"	.250"	1/8"	2-1/2"	2547-250	\$34.75	2647-250	\$38.75
.047"	.010"	.070"	.300"	1/8"	2-1/2"	2547-300	\$34.75	2647-300	\$38.75
.047"	.010"	.070"	.350"	1/8"	2-1/2"	2547-350	\$34.75	2647-350	\$38.75
.047"	.010"	.070"	.400"	1/8"	2-1/2"	2547-400	\$35.75	2647-400	\$40.00
.047"	.010"	.070"	.450"	1/8"	2-1/2"	2547-450	\$35.75	2647-450	\$40.00

Tools are custom manufactured to order and are nonreturnable.

Continued Next Page



3-FLT - STUB - CORNER RAD - LG SHK & RCH

Corner Radius - UNCOATED & AITiN COATED - .062" to .078"

Continued from previous page:



Minimum 3 Tools Each Size



Flute Length = 1.5 x Diameter or as specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter +/- .0005"	R Corner Radius +/- .001"	L2 Length of Cut +.010" -.000"	L3 Reach From Tip	D2 Shank Dia.	L1 Over All Length	NOT COATED		AITiN COATED	
						Tool Number	Price Each	Tool Number	Price Each
.062"	.005"	.094"	.300"	1/8"	2-1/2"	2362-300	\$34.75	2462-300	\$38.75
.062"	.005"	.094"	.400"	1/8"	2-1/2"	2362-400	\$34.75	2462-400	\$38.75
.062"	.005"	.094"	.500"	1/8"	2-1/2"	2362-500	\$34.75	2462-500	\$38.75
.062"	.005"	.094"	.625"	1/8"	2-1/2"	2362-625	\$35.75	2462-625	\$40.00
.062"	.005"	.094"	.750"	1/8"	2-1/2"	2362-750	\$35.75	2462-750	\$40.00
.062"	.010"	.094"	.300"	1/8"	2-1/2"	2562-300	\$34.75	2662-300	\$38.75
.062"	.010"	.094"	.400"	1/8"	2-1/2"	2562-400	\$34.75	2662-400	\$38.75
.062"	.010"	.094"	.500"	1/8"	2-1/2"	2562-500	\$34.75	2662-500	\$38.75
.062"	.010"	.094"	.625"	1/8"	2-1/2"	2562-625	\$35.75	2662-625	\$40.00
.062"	.010"	.094"	.750"	1/8"	2-1/2"	2562-750	\$35.75	2662-750	\$40.00
.062"	.015"	.094"	.300"	1/8"	2-1/2"	2762-300	\$34.75	2862-300	\$38.75
.062"	.015"	.094"	.400"	1/8"	2-1/2"	2762-400	\$34.75	2862-400	\$38.75
.062"	.015"	.094"	.500"	1/8"	2-1/2"	2762-500	\$34.75	2862-500	\$38.75
.062"	.015"	.094"	.625"	1/8"	2-1/2"	2762-625	\$35.75	2862-625	\$40.00
.062"	.015"	.094"	.750"	1/8"	2-1/2"	2762-750	\$35.75	2862-750	\$40.00
.070"	.005"	.105"	.350"	1/8"	2-1/2"	2370-350	\$35.75	2470-350	\$40.00
.070"	.005"	.105"	.500"	1/8"	2-1/2"	2370-500	\$35.75	2470-500	\$40.00
.078"	.005"	.117"	.300"	1/8"	2-1/2"	2378-300	\$34.75	2478-300	\$38.75
.078"	.005"	.117"	.400"	1/8"	2-1/2"	2378-400	\$34.75	2478-400	\$38.75
.078"	.005"	.117"	.500"	1/8"	2-1/2"	2378-500	\$34.75	2478-500	\$38.75
.078"	.005"	.117"	.625"	1/8"	2-1/2"	2378-625	\$34.75	2478-625	\$38.75
.078"	.005"	.117"	.750"	1/8"	2-1/2"	2378-750	\$35.75	2478-750	\$40.00
.078"	.010"	.117"	.300"	1/8"	2-1/2"	2578-300	\$34.75	2678-300	\$38.75
.078"	.010"	.117"	.400"	1/8"	2-1/2"	2578-400	\$34.75	2678-400	\$38.75
.078"	.010"	.117"	.500"	1/8"	2-1/2"	2578-500	\$34.75	2678-500	\$38.75
.078"	.010"	.117"	.625"	1/8"	2-1/2"	2578-625	\$35.75	2678-625	\$40.00
.078"	.010"	.117"	.750"	1/8"	2-1/2"	2578-750	\$35.75	2678-750	\$40.00

Tools are custom manufactured to order and are nonreturnable.

Continued Next Page

3-FLT - STUB - CORNER RAD - LG SHK & RCH



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Corner Radius - UNCOATED & AITiN COATED - .093" to .125"

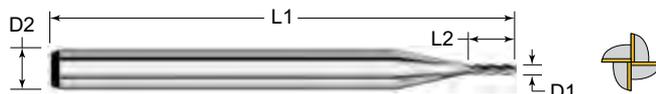


D1 Cutter Diameter +/- .0005"	R Corner Radius +/- .001"	L2 Length of Cut +.010" -.000"	L3 Reach From Tip	D2 Shank Dia.	L1 Over All Length	NOT COATED		AITiN COATED	
						Tool Number	Price Each	Tool Number	Price Each
.093"	.005"	.139"	.500"	1/8"	2-1/2"	2393-500	\$34.75	2493-500	\$38.75
.093"	.005"	.139"	.600"	1/8"	2-1/2"	2393-600	\$34.75	2493-600	\$38.75
.093"	.005"	.139"	.700"	1/8"	2-1/2"	2393-700	\$34.75	2493-700	\$38.75
.093"	.005"	.139"	.800"	1/8"	2-1/2"	2393-800	\$35.75	2493-800	\$40.00
.093"	.005"	.139"	.900"	1/8"	2-1/2"	2393-900	\$35.75	2493-900	\$40.00
.093"	.005"	.139"	1.00"	1/8"	2-1/2"	2393-100	\$36.75	2493-100	\$41.00
.093"	.010"	.139"	.500"	1/8"	2-1/2"	2593-500	\$34.75	2693-500	\$38.75
.093"	.010"	.139"	.600"	1/8"	2-1/2"	2593-600	\$34.75	2693-600	\$38.75
.093"	.010"	.139"	.700"	1/8"	2-1/2"	2593-700	\$34.75	2693-700	\$38.75
.093"	.010"	.139"	.800"	1/8"	2-1/2"	2593-800	\$35.75	2693-800	\$40.00
.093"	.010"	.139"	.900"	1/8"	2-1/2"	2593-900	\$35.75	2693-900	\$40.00
.093"	.010"	.139"	1.00"	1/8"	2-1/2"	2593-100	\$36.75	2693-100	\$41.00
.093"	.015"	.139"	.500"	1/8"	2-1/2"	2793-500	\$34.75	2893-500	\$38.75
.093"	.015"	.139"	.600"	1/8"	2-1/2"	2793-600	\$34.75	2893-600	\$38.75
.093"	.015"	.139"	.700"	1/8"	2-1/2"	2793-700	\$34.75	2893-700	\$38.75
.093"	.015"	.139"	.800"	1/8"	2-1/2"	2793-800	\$35.75	2893-800	\$40.00
.093"	.015"	.139"	.900"	1/8"	2-1/2"	2793-900	\$35.75	2893-900	\$40.00
.093"	.015"	.139"	1.00"	1/8"	2-1/2"	2793-100	\$36.75	2893-100	\$41.00
.125"	.005"	.187"	.650"	1/8"	2-1/2"	2312-650	\$34.75	2412-650	\$38.75
.125"	.005"	.187"	.750"	1/8"	2-1/2"	2312-750	\$34.75	2412-750	\$38.75
.125"	.005"	.187"	.850"	1/8"	2-1/2"	2312-850	\$35.75	2412-850	\$40.00
.125"	.005"	.187"	1.000"	1/8"	2-1/2"	2312-100	\$35.75	2412-100	\$40.00
.125"	.005"	.187"	1.250"	1/8"	2-1/2"	2312-125	\$37.75	2412-125	\$42.00
.125"	.010"	.187"	.650"	1/8"	2-1/2"	2512-650	\$34.75	2612-650	\$38.75
.125"	.010"	.187"	.750"	1/8"	2-1/2"	2512-750	\$34.75	2612-750	\$38.75
.125"	.010"	.187"	.850"	1/8"	2-1/2"	2512-850	\$35.75	2612-850	\$40.00
.125"	.010"	.187"	1.000"	1/8"	2-1/2"	2512-100	\$35.75	2612-100	\$40.00
.125"	.010"	.187"	1.250"	1/8"	2-1/2"	2512-125	\$37.75	2612-125	\$42.00
.125"	.015"	.187"	.650"	1/8"	2-1/2"	2712-650	\$34.75	2812-650	\$38.75
.125"	.015"	.187"	.750"	1/8"	2-1/2"	2712-750	\$34.75	2812-750	\$38.75
.125"	.015"	.187"	.850"	1/8"	2-1/2"	2712-850	\$35.75	2812-850	\$40.00
.125"	.015"	.187"	1.000"	1/8"	2-1/2"	2712-100	\$35.75	2812-100	\$40.00
.125"	.015"	.187"	1.250"	1/8"	2-1/2"	2712-125	\$37.75	2812-125	\$42.00



4-FLUTE - DECIMAL - STD LOC

Square & Ball End - UNCOATED - .010" to .067"



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	1/8"	1-1/2"	84010	\$24.00	84010B	\$33.75
.012"	.036"	1/8"	1-1/2"	84012	\$24.00	84012B	\$33.75
.015"	.045"	1/8"	1-1/2"	84015	\$19.00	84015B	\$25.75
.018"	.054"	1/8"	1-1/2"	84018	\$19.75	84018B	\$26.00
.020"	.060"	1/8"	1-1/2"	84020	\$18.25	84020B	\$24.75
.022"	.066"	1/8"	1-1/2"	84022	\$19.00	84022B	\$25.25
.025"	.075"	1/8"	1-1/2"	84025	\$16.75	84025B	\$22.50
.027"	.081"	1/8"	1-1/2"	84027	\$17.50	84027B	\$23.00
.030"	.090"	1/8"	1-1/2"	84030	\$16.75	84030B	\$20.25
.031"	.093"	1/8"	1-1/2"	84031	\$16.75	84031B	\$20.25
.031"	.125"	1/8"	1-1/2"	84031L	\$16.75	84031LB	\$20.25
.033"	.099"	1/8"	1-1/2"	84033	\$17.50	84033B	\$21.00
.035"	.105"	1/8"	1-1/2"	84035	\$14.25	84035B	\$18.25
.037"	.111"	1/8"	1-1/2"	84037	\$14.75	84037B	\$19.25
.039"	.117"	1/8"	1-1/2"	84039	\$14.75	84039B	\$19.25
.040"	.120"	1/8"	1-1/2"	84040	\$14.25	84040B	\$18.25
.042"	.126"	1/8"	1-1/2"	84042	\$14.75	84042B	\$19.25
.045"	.135"	1/8"	1-1/2"	84045	\$14.25	84045B	\$18.25
.047"	.141"	1/8"	1-1/2"	84047	\$14.25	84047B	\$18.50
.050"	.150"	1/8"	1-1/2"	84050	\$14.25	84050B	\$18.50
.052"	.156"	1/8"	1-1/2"	84052	\$14.75	84052B	\$19.25
.055"	.165"	1/8"	1-1/2"	84055	\$14.25	84055B	\$19.25
.057"	.171"	1/8"	1-1/2"	84057	\$14.75	84057B	\$19.25
.059"	.177"	1/8"	1-1/2"	84059	\$14.75	84059B	\$19.25
.060"	.180"	1/8"	1-1/2"	84060	\$14.25	84060B	\$19.25
.062"	.187"	1/8"	1-1/2"	84062	\$14.25	84062B	\$18.50
.062"	.250"	1/8"	1-1/2"	84062L	\$14.25	84062LB	\$18.50
.065"	.195"	1/8"	1-1/2"	84065	\$14.25	84065B	\$18.50
.067"	.201"	1/8"	1-1/2"	84067	\$14.25	84067B	\$19.50

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4-FLUTE - DECIMAL - STD LOC



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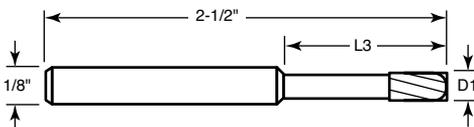
Square & Ball End - UNCOATED Size Range: .070" to .125"



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.070"	.210"	1/8"	1-1/2"	84070	\$14.25	84070B	\$18.50
.072"	.216"	1/8"	1-1/2"	84072	\$14.25	84072B	\$19.50
.075"	.225"	1/8"	1-1/2"	84075	\$14.25	84075B	\$18.50
.078"	.234"	1/8"	1-1/2"	84078	\$14.25	84078B	\$18.50
.080"	.240"	1/8"	1-1/2"	84080	\$14.25	84080B	\$18.50
.085"	.265"	1/8"	1-1/2"	84085	\$14.25	84085B	\$18.50
.090"	.270"	1/8"	1-1/2"	84090	\$14.25	84090B	\$18.50
.093"	.279"	1/8"	1-1/2"	84093	\$14.25	84093B	\$18.50
.093"	.375"	1/8"	1-1/2"	84093L	\$14.25	84093LB	\$18.50
.095"	.285"	1/8"	1-1/2"	84095	\$14.25	84095B	\$18.50
.098"	.294"	1/8"	1-1/2"	84098	\$14.25	84098B	\$19.50
.100"	.300"	1/8"	1-1/2"	84100	\$14.25	84100B	\$18.50
.105"	.315"	1/8"	1-1/2"	84105	\$14.25	84105B	\$18.50
.110"	.330"	1/8"	1-1/2"	84110	\$14.25	84110B	\$18.50
.115"	.345"	1/8"	1-1/2"	84115	\$14.25	84115B	\$18.50
.118"	.354"	1/8"	1-1/2"	84118	\$14.25	84118B	\$19.50
.120"	.360"	1/8"	1-1/2"	84120	\$14.25	84120B	\$18.50
.125"	.500"	1/8"	1-1/2"	84125	\$12.50	84125B	\$16.75

ORDER SPECIAL Square & Ball End LONG REACH MILLS

To order special long reach end mills please specify:



1. Specify: Square End or Ball End.
2. Diameter (D1): _____
3. Overall Reach (L3): _____
4. Quantity (Minimum 6): _____
5. Specify: 2-Flute or 4-Flute.

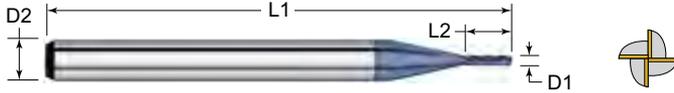
Special Reaches Shipped within 24-48 Hours!

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - DECIMAL - STD LOC

Square & Ball End - AITiN COATED - .010" to .067"



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	1/8"	1-1/2"	88010	\$28.25	88010B	\$37.75
.012"	.036"	1/8"	1-1/2"	88012	\$28.25	88012B	\$37.75
.015"	.045"	1/8"	1-1/2"	88015	\$23.25	88015B	\$30.00
.018"	.054"	1/8"	1-1/2"	88018	\$24.00	88018B	\$30.25
.020"	.060"	1/8"	1-1/2"	88020	\$22.50	88020B	\$29.00
.022"	.066"	1/8"	1-1/2"	88022	\$23.00	88022B	\$29.50
.025"	.075"	1/8"	1-1/2"	88025	\$20.75	88025B	\$26.75
.027"	.081"	1/8"	1-1/2"	88027	\$21.75	88027B	\$27.25
.030"	.090"	1/8"	1-1/2"	88030	\$20.75	88030B	\$24.50
.031"	.093"	1/8"	1-1/2"	88031	\$20.75	88031B	\$24.50
.031"	.125"	1/8"	1-1/2"	88031L	\$20.75	88031LB	\$24.50
.033"	.099"	1/8"	1-1/2"	88033	\$21.75	88033B	\$25.25
.035"	.105"	1/8"	1-1/2"	88035	\$18.50	88035B	\$22.75
.037"	.111"	1/8"	1-1/2"	88037	\$19.00	88037B	\$23.75
.039"	.117"	1/8"	1-1/2"	88039	\$19.00	88039B	\$23.75
.040"	.120"	1/8"	1-1/2"	88040	\$18.50	88040B	\$22.75
.042"	.126"	1/8"	1-1/2"	88042	\$19.00	88042B	\$23.75
.045"	.135"	1/8"	1-1/2"	88045	\$18.50	88045B	\$22.75
.047"	.141"	1/8"	1-1/2"	88047	\$18.50	88047B	\$22.75
.050"	.150"	1/8"	1-1/2"	88050	\$18.50	88050B	\$22.75
.052"	.156"	1/8"	1-1/2"	88052	\$19.00	88052B	\$23.75
.055"	.165"	1/8"	1-1/2"	88055	\$18.50	88055B	\$22.75
.057"	.171"	1/8"	1-1/2"	88057	\$19.00	88057B	\$23.75
.059"	.177"	1/8"	1-1/2"	88059	\$19.00	88059B	\$23.75
.060"	.180"	1/8"	1-1/2"	88060	\$18.50	88060B	\$23.00
.062"	.187"	1/8"	1-1/2"	88062	\$18.50	88062B	\$22.75
.062"	.250"	1/8"	1-1/2"	88062L	\$18.50	88062LB	\$22.75
.065"	.195"	1/8"	1-1/2"	88065	\$18.50	88065B	\$22.75
.067"	.201"	1/8"	1-1/2"	88067	\$18.50	88067B	\$23.75

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4-FLUTE - DECIMAL - STD LOC



Continued from previous page:

Square & Ball End - AITiN COATED Size Range: .070" to .125"



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.070"	.210"	1/8"	1-1/2"	88070	\$18.50	88070B	\$22.75
.072"	.216"	1/8"	1-1/2"	88072	\$18.50	88072B	\$23.75
.075"	.225"	1/8"	1-1/2"	88075	\$18.50	88075B	\$22.75
.078"	.234"	1/8"	1-1/2"	88078	\$18.50	88078B	\$22.75
.080"	.240"	1/8"	1-1/2"	88080	\$18.50	88080B	\$22.75
.085"	.255"	1/8"	1-1/2"	88085	\$18.50	88085B	\$22.75
.090"	.270"	1/8"	1-1/2"	88090	\$18.50	88090B	\$22.75
.093"	.279"	1/8"	1-1/2"	88093	\$18.50	88093B	\$22.75
.093"	.375"	1/8"	1-1/2"	88093L	\$18.50	88093LB	\$22.75
.095"	.285"	1/8"	1-1/2"	88095	\$18.50	88095B	\$22.75
.098"	.294"	1/8"	1-1/2"	88098	\$18.50	88098B	\$23.75
.100"	.300"	1/8"	1-1/2"	88100	\$18.50	88100B	\$22.75
.105"	.315"	1/8"	1-1/2"	88105	\$18.50	88105B	\$22.75
.110"	.330"	1/8"	1-1/2"	88110	\$18.50	88110B	\$22.75
.115"	.345"	1/8"	1-1/2"	88115	\$18.50	88115B	\$22.75
.118"	.354"	1/8"	1-1/2"	88118	\$18.50	88118B	\$23.75
.120"	.360"	1/8"	1-1/2"	88120	\$18.50	88120B	\$22.75
.125"	.500"	1/8"	1-1/2"	88125	\$16.75	88125B	\$20.75

Locate Your Distributor

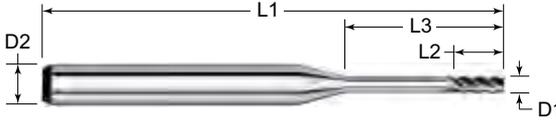


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4-FLUTE - DECIMAL - LONG REACH

Square & Ball End - UNCOATED - .010" to .035"



Neck is reduced for clearance.

Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Dia.	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	.075"	1/8"	1-1/2"	74010	\$39.50	74010B	\$51.50
.010"	.030"	.100"	1/8"	1-1/2"	74010-1	\$41.50	74010B-1	\$53.50
.010"	.030"	.125"	1/8"	1-1/2"	74010-2	\$41.50	74010B-2	\$55.75
.012"	.036"	.075"	1/8"	1-1/2"	74012	\$37.00	74012B	\$48.00
.012"	.036"	.100"	1/8"	1-1/2"	74012-1	\$40.25	74012B-1	\$51.25
.012"	.036"	.125"	1/8"	1-1/2"	74012-2	\$42.50	74012B-2	\$53.50
.015"	.045"	.125"	1/8"	1-1/2"	74015	\$31.50	74015B	\$38.50
.015"	.045"	.186"	1/8"	1-1/2"	74015-1	\$33.75	74015B-1	\$40.50
.018"	.054"	.125"	1/8"	1-1/2"	74018	\$31.50	74018B	\$38.50
.020"	.060"	.165"	1/8"	1-1/2"	74020	\$30.75	74020B	\$37.50
.020"	.060"	.200"	1/8"	1-1/2"	74020-1	\$30.75	74020B-1	\$37.50
.020"	.060"	.250"	1/8"	1-1/2"	74020-2	\$33.00	74020B-2	\$39.50
.022"	.066"	.165"	1/8"	1-1/2"	74022	\$31.50	74022B	\$37.75
.025"	.075"	.205"	1/8"	1-1/2"	74025	\$29.25	74025B	\$35.00
.025"	.075"	.310"	1/8"	1-1/2"	74025-1	\$31.25	74025B-1	\$37.25
.028"	.084"	.205"	1/8"	1-1/2"	74028	\$30.00	74028B	\$35.50
.030"	.090"	.250"	1/8"	1-1/2"	74030	\$29.25	74030B	\$34.00
.030"	.090"	.300"	1/8"	1-1/2"	74030-1	\$31.25	74030B-1	\$36.00
.030"	.090"	.375"	1/8"	1-1/2"	74030-2	\$31.25	74030B-2	\$36.00
.031"	.093"	.250"	1/8"	1-1/2"	74031	\$29.25	74031B	\$34.00
.031"	.093"	.310"	1/8"	1-1/2"	74031-1	\$29.25	74031B-1	\$34.00
.031"	.093"	.375"	1/8"	1-1/2"	74031-2	\$31.25	74031B-2	\$36.00
.031"	.125"	.250"	1/8"	1-1/2"	74031-3	\$29.25	74031B-3	\$34.00
.031"	.125"	.310"	1/8"	1-1/2"	74031-4	\$29.25	74031B-4	\$34.00
.031"	.125"	.375"	1/8"	1-1/2"	74031-5	\$31.25	74031B-5	\$36.00
.033"	.099"	.250"	1/8"	1-1/2"	74033	\$29.25	74033B	\$35.00
.035"	.105"	.285"	1/8"	1-1/2"	74035	\$29.25	74035B	\$34.00
.035"	.105"	.350"	1/8"	1-1/2"	74035-1	\$31.25	74035B-1	\$36.00

Continued Next Page

4-FLUTE - DECIMAL - LONG REACH



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Square & Ball End - UNCOATED Size Range: .040" to .125"

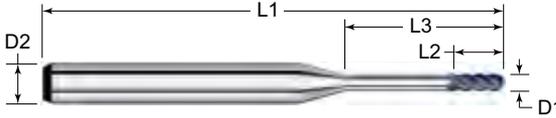


D1 Cutter Dia.	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.040"	.120"	.350"	1/8"	1-1/2"	74040	\$27.00	74040B	\$32.25
.040"	.120"	.480"	1/8"	1-1/2"	74040-1	\$29.00	74040B-1	\$34.25
.042"	.126"	.350"	1/8"	1-1/2"	74042	\$27.25	74042B	\$33.00
.045"	.135"	.400"	1/8"	1-1/2"	74045	\$29.00	74045B	\$34.25
.047"	.141"	.400"	1/8"	1-1/2"	74047	\$29.00	74047B	\$34.25
.047"	.141"	.500"	1/8"	1-1/2"	74047-1	\$31.00	74047B-1	\$36.25
.050"	.150"	.450"	1/8"	1-1/2"	74050	\$27.00	74050B	\$32.25
.052"	.156"	.450"	1/8"	1-1/2"	74052	\$27.25	74052B	\$33.00
.055"	.165"	.500"	1/8"	1-1/2"	74055	\$27.00	74055B	\$32.25
.060"	.180"	.500"	1/8"	1-1/2"	74060	\$27.00	74060B	\$32.25
.060"	.180"	.600"	1/8"	1-1/2"	74060-1	\$30.00	74060B-1	\$35.25
.062"	.187"	.500"	1/8"	1-1/2"	74062	\$27.00	74062B	\$32.25
.062"	.187"	.600"	1/8"	1-1/2"	74062-1	\$30.00	74062B-1	\$35.25
.062"	.250"	.500"	1/8"	1-1/2"	74062-2	\$27.00	74062B-2	\$32.25
.062"	.250"	.625"	1/8"	1-1/2"	74062-3	\$31.00	74062B-3	\$36.25
.065"	.195"	.500"	1/8"	1-1/2"	74065	\$27.00	74065B	\$32.25
.070"	.210"	.550"	1/8"	1-1/2"	74070	\$28.00	74070B	\$33.25
.072"	.216"	.550"	1/8"	1-1/2"	74072	\$28.00	74072B	\$33.25
.075"	.225"	.550"	1/8"	1-1/2"	74075	\$28.00	74075B	\$33.25
.075"	.225"	.650"	1/8"	1-1/2"	74075-1	\$28.00	74075B-1	\$33.25
.078"	.234"	.550"	1/8"	1-1/2"	74078	\$28.00	74078B	\$33.25
.078"	.234"	.650"	1/8"	1-1/2"	74078-1	\$31.00	74078B-1	\$36.25
.080"	.240"	.550"	1/8"	1-1/2"	74080	\$28.00	74080B	\$33.25
.090"	.270"	.600"	1/8"	1-1/2"	74090	\$28.00	74090B	\$33.25
.093"	.279"	.600"	1/8"	1-1/2"	74093	\$28.00	74093B	\$33.25
.093"	.375"	.600"	1/8"	1-1/2"	74093-1	\$28.00	74093B-1	\$33.25
.100"	.300"	.600"	1/8"	1-1/2"	74100	\$28.00	74100B	\$33.25
.125"	.500"	.650"	1/8"	1-1/2"	74125	\$28.00	74125B	\$33.25



4-FLUTE - DECIMAL - LONG REACH

Square & Ball End - AITiN COATED - .010" to .035"



Neck is reduced for clearance.

Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Dia.	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	.075"	1/8"	1-1/2"	74010TL	\$43.75	74010BTL	\$55.75
.010"	.030"	.100"	1/8"	1-1/2"	74010TL-1	\$45.75	74010BTL-1	\$57.75
.010"	.030"	.125"	1/8"	1-1/2"	74010TL-2	\$45.75	74010BTL-2	\$58.75
.012"	.036"	.075"	1/8"	1-1/2"	74012TL	\$42.25	74012BTL	\$53.25
.012"	.036"	.100"	1/8"	1-1/2"	74012TL-1	\$45.50	74012BTL-1	\$56.50
.012"	.036"	.125"	1/8"	1-1/2"	74012TL-2	\$47.75	74012BTL-2	\$58.75
.015"	.045"	.125"	1/8"	1-1/2"	74015TL	\$36.75	74015BTL	\$43.75
.015"	.045"	.186"	1/8"	1-1/2"	74015TL-1	\$39.00	74015BTL-1	\$45.75
.018"	.054"	.125"	1/8"	1-1/2"	74018TL	\$36.75	74018BTL	\$43.75
.020"	.060"	.165"	1/8"	1-1/2"	74020TL	\$35.00	74020BTL	\$41.50
.020"	.060"	.200"	1/8"	1-1/2"	74020TL-1	\$35.00	74020BTL-1	\$41.50
.020"	.060"	.250"	1/8"	1-1/2"	74020TL-2	\$37.25	74020BTL-2	\$43.75
.022"	.066"	.165"	1/8"	1-1/2"	74022TL	\$35.75	74022BTL	\$42.00
.025"	.075"	.205"	1/8"	1-1/2"	74025TL	\$33.50	74025BTL	\$39.25
.025"	.075"	.310"	1/8"	1-1/2"	74025TL-1	\$35.50	74025BTL-1	\$41.25
.028"	.084"	.205"	1/8"	1-1/2"	74028TL	\$34.25	74028BTL	\$39.75
.030"	.090"	.250"	1/8"	1-1/2"	74030TL	\$33.50	74030BTL	\$38.25
.030"	.090"	.300"	1/8"	1-1/2"	74030TL-1	\$35.50	74030BTL-1	\$40.25
.030"	.090"	.375"	1/8"	1-1/2"	74030TL-2	\$35.50	74030BTL-2	\$40.25
.031"	.093"	.250"	1/8"	1-1/2"	74031TL	\$33.50	74031BTL	\$38.25
.031"	.093"	.300"	1/8"	1-1/2"	74031TL-1	\$33.50	74031BTL-1	\$38.25
.031"	.093"	.350"	1/8"	1-1/2"	74031TL-2	\$35.50	74031BTL-2	\$40.25
.031"	.125"	.250"	1/8"	1-1/2"	74031TL-3	\$33.50	74031BTL-3	\$38.25
.031"	.125"	.310"	1/8"	1-1/2"	74031TL-4	\$33.50	74031BTL-4	\$38.25
.031"	.125"	.375"	1/8"	1-1/2"	74031TL-5	\$35.50	74031BTL-5	\$40.25
.033"	.099"	.250"	1/8"	1-1/2"	74033TL	\$33.50	74033BTL	\$38.25
.035"	.105"	.285"	1/8"	1-1/2"	74035TL	\$33.50	74035BTL	\$38.25
.035"	.105"	.350"	1/8"	1-1/2"	74035TL-1	\$35.50	74035BTL-1	\$40.25

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4-FLUTE - DECIMAL - LONG REACH



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Square & Ball End - AITiN COATED
Size Range: .040" to .125"

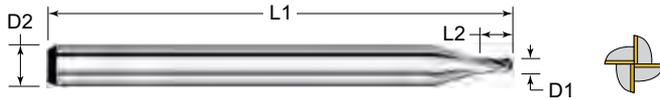


D1 Cutter Dia.	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.040"	.120"	.350"	1/8"	1-1/2"	74040TL	\$31.00	74040BTL	\$36.25
.040"	.120"	.480"	1/8"	1-1/2"	74040TL-1	\$33.25	74040BTL-1	\$38.50
.042"	.126"	.350"	1/8"	1-1/2"	74042TL	\$31.50	74042BTL	\$37.25
.045"	.135"	.400"	1/8"	1-1/2"	74045TL	\$33.25	74045BTL	\$38.50
.047"	.141"	.400"	1/8"	1-1/2"	74047TL	\$33.25	74047BTL	\$38.50
.047"	.141"	.500"	1/8"	1-1/2"	74047TL-1	\$35.25	74047BTL-1	\$40.50
.050"	.150"	.450"	1/8"	1-1/2"	74050TL	\$31.00	74050BTL	\$36.25
.052"	.156"	.450"	1/8"	1-1/2"	74052TL	\$31.50	74052BTL	\$37.25
.055"	.165"	.500"	1/8"	1-1/2"	74055TL	\$31.00	74055BTL	\$36.25
.060"	.180"	.500"	1/8"	1-1/2"	74060TL	\$31.00	74060BTL	\$36.25
.060"	.180"	.600"	1/8"	1-1/2"	74060TL-1	\$34.25	74060BTL-1	\$39.50
.062"	.187"	.500"	1/8"	1-1/2"	74062TL	\$31.00	74062BTL	\$36.25
.062"	.187"	.600"	1/8"	1-1/2"	74062TL-1	\$34.25	74062BTL-1	\$39.50
.062"	.250"	.500"	1/8"	1-1/2"	74062TL-2	\$31.00	74062BTL-2	\$36.25
.062"	.250"	.625"	1/8"	1-1/2"	74062TL-3	\$35.25	74062BTL-3	\$39.50
.065"	.195"	.500"	1/8"	1-1/2"	74065TL	\$31.00	74065BTL	\$36.25
.070"	.210"	.550"	1/8"	1-1/2"	74070TL	\$32.25	74070BTL	\$37.50
.072"	.216"	.550"	1/8"	1-1/2"	74072TL	\$32.25	74072BTL	\$37.50
.075"	.225"	.550"	1/8"	1-1/2"	74075TL	\$32.25	74075BTL	\$37.50
.075"	.225"	.650"	1/8"	1-1/2"	74075TL-1	\$32.25	74075BTL-1	\$37.50
.078"	.234"	.550"	1/8"	1-1/2"	74078TL	\$32.25	74078BTL	\$37.50
.078"	.234"	.650"	1/8"	1-1/2"	74078TL-1	\$32.25	74078BTL-1	\$37.50
.080"	.240"	.550"	1/8"	1-1/2"	74080TL	\$32.25	74080BTL	\$37.50
.090"	.270"	.600"	1/8"	1-1/2"	74090TL	\$32.25	74090BTL	\$37.50
.093"	.279"	.600"	1/8"	1-1/2"	74093TL	\$32.25	74093BTL	\$37.50
.093"	.375"	.600"	1/8"	1-1/2"	74093TL-1	\$32.25	74093BTL-1	\$37.50
.100"	.300"	.600"	1/8"	1-1/2"	74100TL	\$32.25	74100BTL	\$37.50
.125"	.500"	.650"	1/8"	1-1/2"	74125TL	\$32.25	74125BTL	\$37.50



4-FLUTE - STUB LENGTH

Square & Ball End - UNCOATED - .010" to .125"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	1/8"	1-1/2"	85010	\$24.00	85010B	\$33.75
.012"	.018"	1/8"	1-1/2"	85012	\$24.00	85012B	\$33.75
.015"	.022"	1/8"	1-1/2"	85015	\$19.00	85015B	\$25.75
.018"	.027"	1/8"	1-1/2"	85018	\$19.75	85018B	\$26.00
.020"	.030"	1/8"	1-1/2"	85020	\$18.25	85020B	\$24.75
.022"	.033"	1/8"	1-1/2"	85022	\$19.00	85022B	\$25.25
.025"	.037"	1/8"	1-1/2"	85025	\$16.75	85025B	\$22.50
.027"	.041"	1/8"	1-1/2"	85027	\$17.50	85027B	\$23.00
.030"	.045"	1/8"	1-1/2"	85030	\$16.75	85030B	\$20.25
.031"	.046"	1/8"	1-1/2"	85031	\$16.75	85031B	\$20.25
.035"	.052"	1/8"	1-1/2"	85035	\$14.25	85035B	\$18.50
.040"	.060"	1/8"	1-1/2"	85040	\$14.25	85040B	\$18.50
.045"	.067"	1/8"	1-1/2"	85045	\$14.25	85045B	\$18.50
.047"	.070"	1/8"	1-1/2"	85047	\$14.25	85047B	\$18.50
.050"	.075"	1/8"	1-1/2"	85050	\$14.25	85050B	\$18.50
.055"	.082"	1/8"	1-1/2"	85055	\$14.25	85055B	\$18.50
.060"	.090"	1/8"	1-1/2"	85060	\$14.25	85060B	\$18.50
.062"	.093"	1/8"	1-1/2"	85062	\$14.25	85062B	\$18.50
.065"	.098"	1/8"	1-1/2"	85065	\$14.25	85065B	\$18.50
.070"	.105"	1/8"	1-1/2"	85070	\$14.25	85070B	\$18.50
.075"	.113"	1/8"	1-1/2"	85075	\$14.25	85075B	\$18.50
.078"	.117"	1/8"	1-1/2"	85078	\$14.25	85078B	\$18.50
.080"	.120"	1/8"	1-1/2"	85080	\$14.25	85080B	\$18.50
.085"	.128"	1/8"	1-1/2"	85085	\$14.25	85085B	\$18.50
.090"	.135"	1/8"	1-1/2"	85090	\$14.25	85090B	\$18.50
.093"	.187"	1/8"	1-1/2"	85093	\$14.25	85093B	\$18.50
.100"	.150"	1/8"	1-1/2"	85100	\$14.25	85100B	\$18.50
.125"	.250"	1/8"	1-1/2"	85125	\$12.50	85125B	\$16.75

4-FLUTE - STUB LENGTH



Square & Ball End - AITiN COATED - .010" to .125"



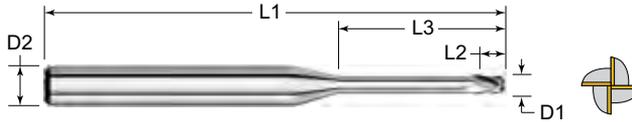
Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price End	Tool Number	Price End
.010"	.015"	1/8"	1-1/2"	85010TL	\$28.25	85010BTL	\$37.75
.012"	.018"	1/8"	1-1/2"	85012TL	\$28.25	85012BTL	\$37.75
.015"	.022"	1/8"	1-1/2"	85015TL	\$23.25	85015BTL	\$30.00
.018"	.027"	1/8"	1-1/2"	85018TL	\$24.00	85018BTL	\$30.25
.020"	.030"	1/8"	1-1/2"	85020TL	\$22.50	85020BTL	\$29.00
.022"	.033"	1/8"	1-1/2"	85022TL	\$23.00	85022BTL	\$29.50
.025"	.037"	1/8"	1-1/2"	85025TL	\$20.75	85025BTL	\$26.75
.027"	.041"	1/8"	1-1/2"	85027TL	\$21.75	85027BTL	\$27.25
.030"	.045"	1/8"	1-1/2"	85030TL	\$20.75	85030BTL	\$24.50
.031"	.046"	1/8"	1-1/2"	85031TL	\$20.75	85031BTL	\$24.50
.035"	.052"	1/8"	1-1/2"	85035TL	\$18.50	85035BTL	\$23.75
.040"	.060"	1/8"	1-1/2"	85040TL	\$18.50	85040BTL	\$22.75
.045"	.067"	1/8"	1-1/2"	85045TL	\$18.50	85045BTL	\$22.75
.047"	.070"	1/8"	1-1/2"	85047TL	\$18.50	85047BTL	\$22.75
.050"	.075"	1/8"	1-1/2"	85050TL	\$18.50	85050BTL	\$22.75
.055"	.082"	1/8"	1-1/2"	85055TL	\$18.50	85055BTL	\$22.75
.060"	.090"	1/8"	1-1/2"	85060TL	\$18.50	85060BTL	\$22.75
.062"	.093"	1/8"	1-1/2"	85062TL	\$18.50	85062BTL	\$22.75
.065"	.098"	1/8"	1-1/2"	85065TL	\$18.50	85065BTL	\$22.75
.070"	.105"	1/8"	1-1/2"	85070TL	\$18.50	85070BTL	\$22.75
.075"	.113"	1/8"	1-1/2"	85075TL	\$18.50	85075BTL	\$22.75
.078"	.117"	1/8"	1-1/2"	85078TL	\$18.50	85078BTL	\$22.75
.080"	.120"	1/8"	1-1/2"	85080TL	\$18.50	85080BTL	\$22.75
.085"	.128"	1/8"	1-1/2"	85085TL	\$18.50	85085BTL	\$22.75
.090"	.135"	1/8"	1-1/2"	85090TL	\$18.50	85090BTL	\$22.75
.093"	.140"	1/8"	1-1/2"	85093TL	\$18.50	85093BTL	\$22.75
.100"	.150"	1/8"	1-1/2"	85100TL	\$18.50	85100BTL	\$22.75
.125"	.250"	1/8"	1-1/2"	85125TL	\$16.75	85125BTL	\$20.75



4-FLUTE - STUB LENGTH - LONG REACH

Square & Ball End - UNCOATED - .010" to .047"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	.075"	1/8"	1-1/2"	76410	\$39.50	76410B	\$51.50
.010"	.015"	.100"	1/8"	1-1/2"	76410-1	\$41.50	76410B-1	\$53.50
.012"	.018"	.075"	1/8"	1-1/2"	76402	\$37.00	76402B	\$48.00
.015"	.022"	.100"	1/8"	1-1/2"	76415	\$32.25	76415B	\$41.25
.015"	.022"	.145"	1/8"	1-1/2"	76415-1	\$32.25	76415B-1	\$41.25
.015"	.022"	.190"	1/8"	1-1/2"	76415-2	\$34.50	76415B-2	\$43.50
.018"	.027"	.125"	1/8"	1-1/2"	76418	\$32.25	76418B	\$41.25
.020"	.030"	.120"	1/8"	1-1/2"	76420	\$31.25	76420B	\$38.00
.020"	.030"	.165"	1/8"	1-1/2"	76420-1	\$31.25	76420B-1	\$38.00
.020"	.030"	.200"	1/8"	1-1/2"	76420-2	\$33.25	76420B-2	\$41.25
.020"	.030"	.250"	1/8"	1-1/2"	76420-3	\$33.25	76420B-3	\$41.25
.025"	.037"	.150"	1/8"	1-1/2"	76425	\$29.25	76425B	\$36.75
.025"	.037"	.205"	1/8"	1-1/2"	76425-1	\$29.25	76425B-1	\$36.75
.025"	.037"	.310"	1/8"	1-1/2"	76425-2	\$31.50	76425B-2	\$39.00
.030"	.045"	.180"	1/8"	1-1/2"	76430	\$29.25	76430B	\$36.25
.030"	.045"	.275"	1/8"	1-1/2"	76430-1	\$31.50	76430B-1	\$38.50
.031"	.046"	.187"	1/8"	1-1/2"	76431	\$29.25	76431B	\$36.25
.031"	.046"	.250"	1/8"	1-1/2"	76431-1	\$29.25	76431B-1	\$36.25
.031"	.046"	.312"	1/8"	1-1/2"	76431-2	\$31.50	76431B-2	\$38.25
.031"	.046"	.375"	1/8"	1-1/2"	76431-3	\$31.50	76431B-3	\$38.25
.035"	.052"	.210"	1/8"	1-1/2"	76435	\$29.25	76435B	\$36.25
.035"	.052"	.320"	1/8"	1-1/2"	76435-1	\$31.50	76435B-1	\$38.25
.040"	.060"	.220"	1/8"	1-1/2"	76440	\$29.25	76440B	\$36.25
.040"	.060"	.350"	1/8"	1-1/2"	76440-1	\$31.50	76440B-1	\$38.25
.045"	.067"	.270"	1/8"	1-1/2"	76445	\$28.25	76445B	\$34.00
.045"	.067"	.350"	1/8"	1-1/2"	76445-1	\$28.25	76445B-1	\$34.00
.045"	.067"	.405"	1/8"	1-1/2"	76445-2	\$30.25	76445B-2	\$36.00
.047"	.070"	.280"	1/8"	1-1/2"	76447	\$28.25	76447B	\$34.00
.047"	.070"	.350"	1/8"	1-1/2"	76447-1	\$28.25	76447B-1	\$34.00
.047"	.070"	.450"	1/8"	1-1/2"	76447-2	\$30.25	76447B-2	\$36.00

Continued Next Page

4-FLUTE - STUB LENGTH - LONG REACH



Continued from previous page:

Square & Ball End - UNCOATED Size Range: .050" to .125"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.050"	.075"	.300"	1/8"	1-1/2"	76450	\$28.25	76450B	\$34.00
.050"	.075"	.400"	1/8"	1-1/2"	76450-1	\$28.25	76450B-1	\$34.00
.050"	.075"	.500"	1/8"	1-1/2"	76450-2	\$31.00	76450B-2	\$37.00
.055"	.082"	.330"	1/8"	1-1/2"	76455	\$28.25	76455B	\$34.00
.055"	.082"	.500"	1/8"	1-1/2"	76455-1	\$31.00	76455B-1	\$37.00
.060"	.090"	.360"	1/8"	1-1/2"	76460	\$28.25	76460B	\$34.00
.060"	.090"	.500"	1/8"	1-1/2"	76460-1	\$31.00	76460B-1	\$37.00
.062"	.093"	.375"	1/8"	1-1/2"	76462	\$28.25	76462B	\$34.00
.062"	.093"	.500"	1/8"	1-1/2"	76462-1	\$28.25	76462B-1	\$34.00
.062"	.093"	.600"	1/8"	1-1/2"	76462-2	\$31.00	76462B-2	\$37.00
.065"	.098"	.390"	1/8"	1-1/2"	76465	\$28.25	76465B	\$34.00
.065"	.098"	.500"	1/8"	1-1/2"	76465-1	\$28.25	76465B-1	\$34.00
.070"	.105"	.420"	1/8"	1-1/2"	76470	\$28.25	76470B	\$34.00
.075"	.113"	.450"	1/8"	1-1/2"	76475	\$28.25	76475B	\$34.00
.078"	.117"	.470"	1/8"	1-1/2"	76478	\$28.25	76478B	\$34.00
.080"	.120"	.480"	1/8"	1-1/2"	76480	\$28.25	76480B	\$34.00
.085"	.127"	.510"	1/8"	1-1/2"	76485	\$28.25	76485B	\$34.00
.090"	.135"	.540"	1/8"	1-1/2"	76490	\$28.25	76490B	\$34.00
.093"	.140"	.560"	1/8"	1-1/2"	76493	\$28.25	76493B	\$34.00
.100"	.150"	.600"	1/8"	1-1/2"	76400	\$28.25	76400B	\$34.00
.125"	.250"	.600"	1/8"	1-1/2"	76412	\$28.25	76412B	\$34.00

Special long reach end mills quoted on request. Minimum 3 pieces per size.

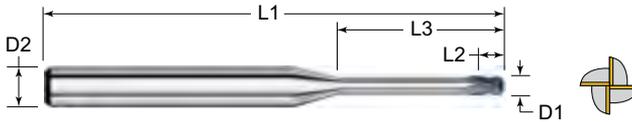
Ships within 24-48 hours.

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - STUB LENGTH - LONG REACH

Square & Ball End - AITiN COATED - .010" to .047"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.010"	.015"	.075"	1/8"	1-1/2"	76510	\$41.50	76510B	\$52.90
.010"	.015"	.100"	1/8"	1-1/2"	76510-1	\$43.50	76510B-1	\$54.90
.012"	.018"	.075"	1/8"	1-1/2"	76502	\$39.20	76502B	\$49.70
.015"	.022"	.100"	1/8"	1-1/2"	76515	\$34.65	76515B	\$43.25
.015"	.022"	.145"	1/8"	1-1/2"	76515-1	\$34.65	76515B-1	\$43.25
.015"	.022"	.190"	1/8"	1-1/2"	76515-2	\$36.65	76515B-2	\$45.25
.018"	.027"	.125"	1/8"	1-1/2"	76518	\$34.65	76518B	\$43.25
.020"	.030"	.120"	1/8"	1-1/2"	76520	\$33.55	76520B	\$40.00
.020"	.030"	.165"	1/8"	1-1/2"	76520-1	\$33.55	76520B-1	\$40.00
.020"	.030"	.200"	1/8"	1-1/2"	76520-2	\$35.50	76520B-2	\$43.10
.020"	.030"	.250"	1/8"	1-1/2"	76520-3	\$35.50	76520B-3	\$43.10
.025"	.037"	.150"	1/8"	1-1/2"	76525	\$31.85	76525B	\$38.95
.025"	.037"	.205"	1/8"	1-1/2"	76525-1	\$31.85	76525B-1	\$38.95
.025"	.037"	.310"	1/8"	1-1/2"	76525-2	\$34.85	76525B-2	\$40.95
.030"	.045"	.180"	1/8"	1-1/2"	76530	\$31.85	76530B	\$38.30
.030"	.045"	.275"	1/8"	1-1/2"	76530-1	\$33.85	76530B-1	\$40.50
.031"	.046"	.187"	1/8"	1-1/2"	76531	\$31.85	76531B	\$38.30
.031"	.046"	.250"	1/8"	1-1/2"	76531-1	\$31.85	76531B-1	\$38.30
.031"	.046"	.312"	1/8"	1-1/2"	76531-2	\$33.85	76531B-2	\$39.30
.031"	.046"	.375"	1/8"	1-1/2"	76531-3	\$33.85	76531B-3	\$40.30
.035"	.052"	.210"	1/8"	1-1/2"	76535	\$31.85	76535B	\$38.30
.035"	.052"	.320"	1/8"	1-1/2"	76535-1	\$33.85	76535B-1	\$40.30
.040"	.060"	.220"	1/8"	1-1/2"	76540	\$31.85	76540B	\$38.30
.040"	.060"	.350"	1/8"	1-1/2"	76540-1	\$33.85	76540B-1	\$40.30
.045"	.067"	.270"	1/8"	1-1/2"	76545	\$30.75	76545B	\$36.15
.045"	.067"	.350"	1/8"	1-1/2"	76545-1	\$30.75	76545B-1	\$36.15
.045"	.067"	.405"	1/8"	1-1/2"	76545-2	\$32.75	76545B-2	\$38.15
.047"	.070"	.280"	1/8"	1-1/2"	76547	\$30.75	76547B	\$36.15
.047"	.070"	.350"	1/8"	1-1/2"	76547-1	\$30.75	76547B-1	\$36.15
.047"	.070"	.450"	1/8"	1-1/2"	76547-2	\$32.75	76547B-2	\$38.15

Continued Next Page

4-FLUTE - STUB LENGTH - LONG REACH



Continued from previous page:

Square & Ball End - AITiN COATED Size Range: .050" to .125"



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.050"	.075"	.300"	1/8"	1-1/2"	76550	\$30.75	76550B	\$36.15
.050"	.075"	.400"	1/8"	1-1/2"	76550-1	\$30.75	76550B-1	\$36.15
.050"	.075"	.500"	1/8"	1-1/2"	76550-2	\$33.50	76550B-2	\$39.15
.055"	.082"	.330"	1/8"	1-1/2"	76555	\$30.75	76555B	\$32.15
.055"	.082"	.500"	1/8"	1-1/2"	76555-1	\$33.50	76555B-1	\$39.15
.060"	.090"	.360"	1/8"	1-1/2"	76560	\$30.75	76560B	\$36.15
.060"	.090"	.500"	1/8"	1-1/2"	76560-1	\$33.50	76560B-1	\$39.15
.062"	.093"	.375"	1/8"	1-1/2"	76562	\$30.75	76562B	\$36.15
.062"	.093"	.500"	1/8"	1-1/2"	76562-1	\$30.75	76562B-1	\$36.15
.062"	.093"	.600"	1/8"	1-1/2"	76562-2	\$33.50	76562B-2	\$39.15
.065"	.098"	.390"	1/8"	1-1/2"	76565	\$30.75	76565B	\$36.15
.065"	.098"	.500"	1/8"	1-1/2"	76565-1	\$30.75	76565B-1	\$36.15
.070"	.105"	.420"	1/8"	1-1/2"	76570	\$30.75	76570B	\$36.15
.075"	.113"	.450"	1/8"	1-1/2"	76575	\$30.75	76575B	\$36.15
.078"	.117"	.470"	1/8"	1-1/2"	76578	\$30.75	76578B	\$36.15
.080"	.120"	.480"	1/8"	1-1/2"	76580	\$30.75	76580B	\$36.15
.085"	.127"	.510"	1/8"	1-1/2"	76585	\$30.75	76585B	\$36.15
.090"	.135"	.540"	1/8"	1-1/2"	76590	\$30.75	76590B	\$36.15
.093"	.140"	.560"	1/8"	1-1/2"	76593	\$30.75	76593B	\$36.15
.100"	.150"	.600"	1/8"	1-1/2"	76500	\$30.75	76500B	\$36.15
.125"	.250"	.600"	1/8"	1-1/2"	76512	\$30.75	76512B	\$36.15

Special long reach end mills quoted on request. Minimum 3 pieces per size.

Ships within 24-48 hours.

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - CORNER RADIUS

UNCOATED & **ALTIN COATED** - .015" to .075"



Corner radius helps prevent chipping at corners at high feeds and speeds.

Length of Cut = 3 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	UNCOATED		ALTIN COATED	
					TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
.015"	.003"	.045"	1/8"	1-1/2"	89915-003	\$38.50	89015-003	\$42.75
.020"	.005"	.060"	1/8"	1-1/2"	89920-005	\$34.25	89020-005	\$38.50
.025"	.005"	.075"	1/8"	1-1/2"	89925-005	\$34.25	89025-005	\$38.50
.030"	.005"	.090"	1/8"	1-1/2"	89930-005	\$30.25	89030-005	\$34.50
.030"	.010"	.090"	1/8"	1-1/2"	89930-010	\$30.25	89030-010	\$34.50
.031" (1/32)	.005"	.093"	1/8"	1-1/2"	89931-005	\$30.25	89031-005	\$34.50
.031" (1/32)	.010"	.093"	1/8"	1-1/2"	89931-010	\$30.25	89031-010	\$34.50
.035"	.005"	.105"	1/8"	1-1/2"	89935-005	\$26.00	89035-005	\$30.25
.035"	.010"	.105"	1/8"	1-1/2"	89935-010	\$26.00	89035-010	\$30.25
.040"	.005"	.120"	1/8"	1-1/2"	89940-005	\$22.75	89040-005	\$27.00
.040"	.010"	.120"	1/8"	1-1/2"	89940-010	\$22.75	89040-010	\$27.00
.045"	.005"	.135"	1/8"	1-1/2"	89945-005	\$22.75	89045-005	\$27.00
.045"	.010"	.135"	1/8"	1-1/2"	89945-010	\$22.75	89045-010	\$27.00
.045"	.015"	.135"	1/8"	1-1/2"	89945-015	\$22.75	89045-015	\$27.00
.047" (3/64)	.005"	.141"	1/8"	1-1/2"	89947-005	\$22.75	89047-005	\$27.00
.047" (3/64)	.010"	.141"	1/8"	1-1/2"	89947-010	\$22.75	89047-010	\$27.00
.047" (3/64)	.015"	.141"	1/8"	1-1/2"	89947-015	\$22.75	89047-015	\$27.00
.050"	.005"	.150"	1/8"	1-1/2"	89950-005	\$22.75	89050-005	\$27.00
.050"	.010"	.150"	1/8"	1-1/2"	89950-010	\$22.75	89050-010	\$27.00
.050"	.015"	.150"	1/8"	1-1/2"	89950-015	\$22.75	89050-015	\$27.00
.060"	.005"	.180"	1/8"	1-1/2"	89960-005	\$22.75	89060-005	\$27.00
.060"	.010"	.180"	1/8"	1-1/2"	89960-010	\$22.75	89060-010	\$27.00
.060"	.015"	.180"	1/8"	1-1/2"	89960-015	\$22.75	89060-015	\$27.00
.062" (1/16)	.005"	.186"	1/8"	1-1/2"	89962-005	\$22.75	89062-005	\$27.00
.062" (1/16)	.010"	.186"	1/8"	1-1/2"	89962-010	\$22.75	89062-010	\$27.00
.062" (1/16)	.015"	.186"	1/8"	1-1/2"	89962-015	\$22.75	89062-015	\$27.00
.075"	.005"	.225"	1/8"	1-1/2"	89975-005	\$22.75	89075-005	\$27.00
.075"	.010"	.225"	1/8"	1-1/2"	89975-010	\$22.75	89075-010	\$27.00
.075"	.015"	.225"	1/8"	1-1/2"	89975-015	\$22.75	89075-015	\$27.00

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4-FLUTE – CORNER RADIUS



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Corner Radius UNCOATED & AITiN COATED Size Range: .078" to .250"

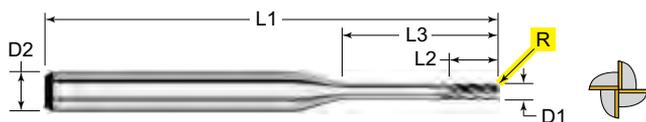


D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	UNCOATED		ALTiN COATED	
					TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
.078" (5/64)	.005"	.234"	1/8"	1-1/2"	89978-005	\$22.75	89078-005	\$27.00
.078" (5/64)	.010"	.234"	1/8"	1-1/2"	89978-010	\$22.75	89078-010	\$27.00
.078" (5/64)	.015"	.234"	1/8"	1-1/2"	89978-015	\$22.75	89078-015	\$27.00
.090"	.005"	.270"	1/8"	1-1/2"	89990-005	\$22.75	89090-005	\$27.00
.090"	.010"	.270"	1/8"	1-1/2"	89990-010	\$22.75	89090-010	\$27.00
.090"	.015"	.270"	1/8"	1-1/2"	89990-015	\$22.75	89090-015	\$27.00
.093" (3/32)	.005"	.279"	1/8"	1-1/2"	89993-005	\$22.75	89093-005	\$27.00
.093" (3/32)	.010"	.279"	1/8"	1-1/2"	89993-010	\$22.75	89093-010	\$27.00
.093" (3/32)	.015"	.279"	1/8"	1-1/2"	89993-015	\$22.75	89093-015	\$27.00
.100"	.005"	.300"	1/8"	1-1/2"	89910-005	\$22.75	89100-005	\$27.00
.100"	.010"	.300"	1/8"	1-1/2"	89910-010	\$22.75	89100-010	\$27.00
.100"	.015"	.300"	1/8"	1-1/2"	89910-015	\$22.75	89100-015	\$27.00
.125" (1/8)	.005"	.500"	1/8"	1-1/2"	89912-005	\$22.75	89125-005	\$27.00
.125" (1/8)	.010"	.500"	1/8"	1-1/2"	89912-010	\$22.75	89125-010	\$27.00
.125" (1/8)	.015"	.500"	1/8"	1-1/2"	89912-015	\$22.75	89125-015	\$27.00
.125" (1/8)	.020"	.500"	1/8"	1-1/2"	89912-020	\$22.75	89125-020	\$27.00
.125" (1/8)	.030"	.500"	1/8"	1-1/2"	89912-030	\$22.75	89125-030	\$27.00
.187" (3/16)	.010"	.625"	3/16"	2"	89987-010	\$22.75	89187-010	\$26.75
.187" (3/16)	.015"	.625"	3/16"	2"	89987-015	\$22.75	89187-015	\$26.75
.187" (3/16)	.030"	.625"	3/16"	2"	89987-030	\$22.75	89187-030	\$26.75
.250" (1/4)	.010"	.750"	1/4"	2-1/2"	89900-010	\$23.75	89250-010	\$30.00
.250" (1/4)	.015"	.750"	1/4"	2-1/2"	89900-015	\$23.75	89250-015	\$30.00
.250" (1/4)	.030"	.750"	1/4"	2-1/2"	89900-030	\$23.75	89250-030	\$30.00
.250" (1/4)	.045"	.750"	1/4"	2-1/2"	89900-045	\$23.75	89250-045	\$30.00
.250" (1/4)	.060"	.750"	1/4"	2-1/2"	89900-060	\$23.75	89250-060	\$30.00



4-FLUTE - LONG REACH - CORNER RADIUS

Standard OAL - Decimal - UNCOATED - .031" to .125"



Minimum
3 Tools
Each Size



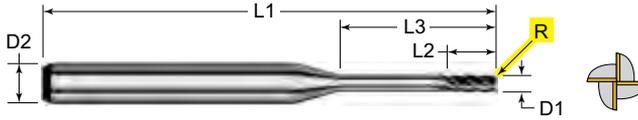
Length of Cut 3 x Diameter - Center Cutting - Micro Grain Carbide
Corner radius helps prevent chipping at corners at high feeds and speeds.

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031" (1/32)	.005"	.093"	.156"	1/8"	1-1/2"	86131-005	\$36.75
.031" (1/32)	.005"	.093"	.250"	1/8"	1-1/2"	86132-005	\$39.75
.031" (1/32)	.010"	.093"	.156"	1/8"	1-1/2"	86133-010	\$36.75
.031" (1/32)	.010"	.093"	.250"	1/8"	1-1/2"	86134-010	\$39.75
.047" (3/64)	.005"	.141"	.250"	1/8"	1-1/2"	86147-005	\$36.75
.047" (3/64)	.005"	.141"	.375"	1/8"	1-1/2"	86148-005	\$39.75
.047" (3/64)	.010"	.141"	.250"	1/8"	1-1/2"	86149-010	\$36.75
.047" (3/64)	.010"	.141"	.375"	1/8"	1-1/2"	86140-010	\$39.75
.062" (1/16)	.005"	.186"	.312"	1/8"	1-1/2"	86162-005	\$36.75
.062" (1/16)	.005"	.186"	.500"	1/8"	1-1/2"	86163-005	\$39.75
.062" (1/16)	.010"	.186"	.312"	1/8"	1-1/2"	86164-010	\$36.75
.062" (1/16)	.010"	.186"	.500"	1/8"	1-1/2"	86165-010	\$39.75
.078" (5/64)	.005"	.234"	.406"	1/8"	1-1/2"	86178-005	\$36.75
.078" (5/64)	.005"	.234"	.500"	1/8"	1-1/2"	86179-005	\$37.50
.078" (5/64)	.005"	.234"	.625"	1/8"	1-1/2"	86170-005	\$39.75
.078" (5/64)	.010"	.234"	.406"	1/8"	1-1/2"	86171-010	\$36.75
.078" (5/64)	.010"	.234"	.500"	1/8"	1-1/2"	86172-010	\$37.50
.078" (5/64)	.010"	.234"	.625"	1/8"	1-1/2"	86173-010	\$39.75
.093" (3/32)	.005"	.279"	.500"	1/8"	1-1/2"	86193-005	\$37.50
.093" (3/32)	.005"	.279"	.625"	1/8"	1-1/2"	86194-005	\$39.75
.093" (3/32)	.010"	.279"	.500"	1/8"	1-1/2"	86195-010	\$37.50
.093" (3/32)	.010"	.279"	.625"	1/8"	1-1/2"	86196-010	\$39.75
.125" (1/8)	.005"	.500"	.625"	1/8"	1-1/2"	86112-005	\$36.75
.125" (1/8)	.010"	.500"	.625"	1/8"	1-1/2"	86112-010	\$36.75
.125" (1/8)	.015"	.500"	.625"	1/8"	1-1/2"	86112-015	\$36.75
.125" (1/8)	.020"	.500"	.625"	1/8"	1-1/2"	86112-020	\$36.75
.125" (1/8)	.030"	.500"	.625"	1/8"	1-1/2"	86112-030	\$36.75
.125" (1/8)	.005"	.500"	.750"	1/8"	1-1/2"	86113-005	\$38.75
.125" (1/8)	.010"	.500"	.750"	1/8"	1-1/2"	86113-010	\$38.75
.125" (1/8)	.015"	.500"	.750"	1/8"	1-1/2"	86113-015	\$38.75
.125" (1/8)	.020"	.500"	.750"	1/8"	1-1/2"	86113-020	\$38.75
.125" (1/8)	.030"	.500"	.750"	1/8"	1-1/2"	86113-030	\$38.75

4-FLUTE - LONG REACH - CORNER RADIUS



Standard OAL - Decimal - AITiN COATED - .031" to .125"



Minimum
3 Tools
Each Size

**Shipped
Within 24-48
Hours**

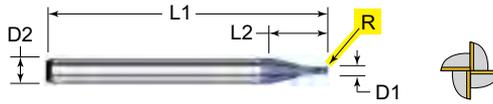
Length of Cut 3 x Diameter - Center Cutting - Micro Grain Carbide
Corner radius helps prevent chipping at corners at high feeds and speeds.

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031" (1/32)	.005"	.093"	.156"	1/8"	1-1/2"	86231-005	\$40.95
.031" (1/32)	.005"	.093"	.250"	1/8"	1-1/2"	86232-005	\$43.95
.031" (1/32)	.010"	.093"	.156"	1/8"	1-1/2"	86233-010	\$40.95
.031" (1/32)	.010"	.093"	.250"	1/8"	1-1/2"	86234-010	\$43.95
.047" (3/64)	.005"	.141"	.250"	1/8"	1-1/2"	86247-005	\$40.95
.047" (3/64)	.005"	.141"	.375"	1/8"	1-1/2"	86248-005	\$43.95
.047" (3/64)	.010"	.141"	.250"	1/8"	1-1/2"	86249-010	\$40.95
.047" (3/64)	.010"	.141"	.375"	1/8"	1-1/2"	86240-010	\$43.95
.062" (1/16)	.005"	.186"	.312"	1/8"	1-1/2"	86262-005	\$40.95
.062" (1/16)	.005"	.186"	.500"	1/8"	1-1/2"	86263-005	\$43.95
.062" (1/16)	.010"	.186"	.312"	1/8"	1-1/2"	86264-010	\$40.95
.062" (1/16)	.010"	.186"	.500"	1/8"	1-1/2"	86265-010	\$43.95
.078" (5/64)	.005"	.234"	.406"	1/8"	1-1/2"	86278-005	\$40.95
.078" (5/64)	.005"	.234"	.500"	1/8"	1-1/2"	86279-005	\$41.70
.078" (5/64)	.005"	.234"	.625"	1/8"	1-1/2"	86270-005	\$43.95
.078" (5/64)	.010"	.234"	.406"	1/8"	1-1/2"	86271-010	\$40.95
.078" (5/64)	.010"	.234"	.500"	1/8"	1-1/2"	86272-010	\$41.70
.078" (5/64)	.010"	.234"	.625"	1/8"	1-1/2"	86273-010	\$43.95
.093" (3/32)	.005"	.279"	.500"	1/8"	1-1/2"	86293-005	\$41.70
.093" (3/32)	.005"	.279"	.625"	1/8"	1-1/2"	86294-005	\$43.95
.093" (3/32)	.010"	.279"	.500"	1/8"	1-1/2"	86295-010	\$41.70
.093" (3/32)	.010"	.279"	.625"	1/8"	1-1/2"	86296-010	\$43.95
.125" (1/8)	.005"	.500"	.625"	1/8"	1-1/2"	86212-005	\$40.95
.125" (1/8)	.010"	.500"	.625"	1/8"	1-1/2"	86212-010	\$40.95
.125" (1/8)	.015"	.500"	.625"	1/8"	1-1/2"	86212-015	\$40.95
.125" (1/8)	.020"	.500"	.625"	1/8"	1-1/2"	86212-020	\$40.95
.125" (1/8)	.030"	.500"	.625"	1/8"	1-1/2"	86212-030	\$40.95
.125" (1/8)	.005"	.500"	.750"	1/8"	1-1/2"	86213-005	\$42.95
.125" (1/8)	.010"	.500"	.750"	1/8"	1-1/2"	86213-010	\$42.95
.125" (1/8)	.015"	.500"	.750"	1/8"	1-1/2"	86213-015	\$42.95
.125" (1/8)	.020"	.500"	.750"	1/8"	1-1/2"	86213-020	\$42.95
.125" (1/8)	.030"	.500"	.750"	1/8"	1-1/2"	86213-030	\$42.95



4-FLUTE - STUB LENGTH - CORNER RADIUS

Decimal - AITiN COATED - .015" to .062"



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

Corner radius helps prevent chipping at corners at high feeds and speeds.

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.003"	.023"	1/8"	1-1/2"	89415-003	\$42.75
.020"	.005"	.030"	1/8"	1-1/2"	89420-005	\$38.50
.025"	.005"	.038"	1/8"	1-1/2"	89425-005	\$38.50
.030"	.005"	.045"	1/8"	1-1/2"	89430-005	\$34.50
.030"	.010"	.045"	1/8"	1-1/2"	89430-010	\$34.50
.031" (1/32)	.005"	.047"	1/8"	1-1/2"	89431-005	\$34.50
.031" (1/32)	.010"	.047"	1/8"	1-1/2"	89431-010	\$34.50
.035"	.005"	.053"	1/8"	1-1/2"	89435-005	\$30.25
.035"	.010"	.053"	1/8"	1-1/2"	89435-010	\$30.25
.040"	.005"	.060"	1/8"	1-1/2"	89440-005	\$27.00
.040"	.010"	.060"	1/8"	1-1/2"	89440-010	\$27.00
.045"	.005"	.068"	1/8"	1-1/2"	89445-005	\$27.00
.045"	.010"	.068"	1/8"	1-1/2"	89445-010	\$27.00
.045"	.015"	.068"	1/8"	1-1/2"	89445-015	\$27.00
.047" (3/64)	.005"	.071"	1/8"	1-1/2"	89447-005	\$27.00
.047" (3/64)	.010"	.071"	1/8"	1-1/2"	89447-010	\$27.00
.047" (3/64)	.015"	.071"	1/8"	1-1/2"	89447-015	\$27.00
.050"	.005"	.075"	1/8"	1-1/2"	89450-005	\$27.00
.050"	.010"	.075"	1/8"	1-1/2"	89450-010	\$27.00
.050"	.015"	.075"	1/8"	1-1/2"	89450-015	\$27.00
.060"	.005"	.090"	1/8"	1-1/2"	89460-005	\$27.00
.060"	.010"	.090"	1/8"	1-1/2"	89460-010	\$27.00
.060"	.015"	.090"	1/8"	1-1/2"	89460-015	\$27.00
.062" (1/16)	.005"	.093"	1/8"	1-1/2"	89462-005	\$27.00
.062" (1/16)	.010"	.093"	1/8"	1-1/2"	89462-010	\$27.00
.062" (1/16)	.015"	.093"	1/8"	1-1/2"	89462-015	\$27.00

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4-FLUTE – STUB LENGTH – CORNER RADIUS



Continued from previous page:

Decimal - Corner Radius

AlTiN COATED

Size Range: .065" to .125"

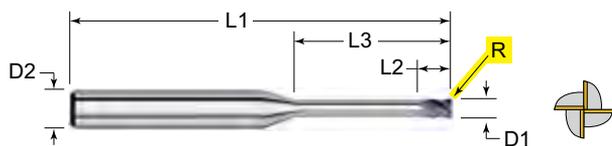


D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.065"	.005"	.098"	1/8"	1-1/2"	89465-005	\$27.00
.065"	.010"	.098"	1/8"	1-1/2"	89465-010	\$27.00
.065"	.015"	.098"	1/8"	1-1/2"	89465-015	\$27.00
.070"	.005"	.105"	1/8"	1-1/2"	89470-005	\$27.00
.070"	.010"	.105"	1/8"	1-1/2"	89470-010	\$27.00
.070"	.015"	.105"	1/8"	1-1/2"	89470-015	\$27.00
.075"	.005"	.113"	1/8"	1-1/2"	89475-005	\$27.00
.075"	.010"	.113"	1/8"	1-1/2"	89475-010	\$27.00
.075"	.015"	.113"	1/8"	1-1/2"	89475-015	\$27.00
.078" (5/64)	.005"	.117"	1/8"	1-1/2"	89478-005	\$27.00
.078" (5/64)	.010"	.117"	1/8"	1-1/2"	89478-010	\$27.00
.078" (5/64)	.015"	.117"	1/8"	1-1/2"	89478-015	\$27.00
.090"	.005"	.135"	1/8"	1-1/2"	89490-005	\$27.00
.090"	.010"	.135"	1/8"	1-1/2"	89490-010	\$27.00
.090"	.015"	.135"	1/8"	1-1/2"	89490-015	\$27.00
.093" (3/32)	.005"	.140"	1/8"	1-1/2"	89493-005	\$27.00
.093" (3/32)	.010"	.140"	1/8"	1-1/2"	89493-010	\$27.00
.093" (3/32)	.015"	.140"	1/8"	1-1/2"	89493-015	\$27.00
.100"	.005"	.150"	1/8"	1-1/2"	89410-005	\$27.00
.100"	.010"	.150"	1/8"	1-1/2"	89410-010	\$27.00
.100"	.015"	.150"	1/8"	1-1/2"	89410-015	\$27.00
.125" (1/8)	.005"	.250"	1/8"	1-1/2"	89412-005	\$27.00
.125" (1/8)	.010"	.250"	1/8"	1-1/2"	89412-010	\$27.00
.125" (1/8)	.015"	.250"	1/8"	1-1/2"	89412-015	\$27.00
.125" (1/8)	.020"	.250"	1/8"	1-1/2"	89412-020	\$27.00
.125" (1/8)	.030"	.250"	1/8"	1-1/2"	89412-030	\$27.00



4-FLUTE - STUB - LG REACH - CORNER RAD

Decimal - AITiN COATED - .015" to .062"



Minimum
3 Tools
Each Size



Length of Cut 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide
Corner radius helps prevent chipping at corners at high feeds and speeds.

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.003"	.023"	.125"	1/8"	1-1/2"	79415-003	\$56.50
.020"	.005"	.030"	.150"	1/8"	1-1/2"	79420-005	\$55.00
.025"	.005"	.038"	.200"	1/8"	1-1/2"	79425-005	\$55.00
.030"	.005"	.045"	.200"	1/8"	1-1/2"	79430-005	\$45.00
.030"	.010"	.045"	.200"	1/8"	1-1/2"	79430-010	\$45.00
.031" (1/32)	.005"	.047"	.250"	1/8"	1-1/2"	79431-005	\$45.00
.031" (1/32)	.010"	.047"	.250"	1/8"	1-1/2"	79431-010	\$45.00
.035"	.005"	.053"	.250"	1/8"	1-1/2"	79435-005	\$42.75
.035"	.010"	.053"	.250"	1/8"	1-1/2"	79435-010	\$42.75
.040"	.005"	.060"	.250"	1/8"	1-1/2"	79440-005	\$41.25
.040"	.010"	.060"	.250"	1/8"	1-1/2"	79440-010	\$41.25
.045"	.005"	.068"	.275"	1/8"	1-1/2"	79445-005	\$41.25
.045"	.010"	.068"	.275"	1/8"	1-1/2"	79445-010	\$41.25
.045"	.015"	.068"	.275"	1/8"	1-1/2"	79445-015	\$41.25
.047" (3/64)	.005"	.071"	.300"	1/8"	1-1/2"	79447-005	\$41.25
.047" (3/64)	.010"	.071"	.300"	1/8"	1-1/2"	79447-010	\$41.25
.047" (3/64)	.015"	.071"	.300"	1/8"	1-1/2"	79447-015	\$41.25
.050"	.005"	.075"	.350"	1/8"	1-1/2"	79450-005	\$41.25
.050"	.010"	.075"	.350"	1/8"	1-1/2"	79450-010	\$41.25
.050"	.015"	.075"	.350"	1/8"	1-1/2"	79450-015	\$41.25
.060"	.005"	.090"	.400"	1/8"	1-1/2"	79460-005	\$41.25
.060"	.010"	.090"	.400"	1/8"	1-1/2"	79460-010	\$41.25
.060"	.015"	.090"	.400"	1/8"	1-1/2"	79460-015	\$41.25
.062" (1/16)	.005"	.093"	.400"	1/8"	1-1/2"	79462-005	\$41.25
.062" (1/16)	.010"	.093"	.400"	1/8"	1-1/2"	79462-010	\$41.25
.062" (1/16)	.015"	.093"	.400"	1/8"	1-1/2"	79462-015	\$41.25

Continued Next Page



Continued from previous page:

Decimal - Corner Radius

AITiN COATED

Size Range: .065" to .125"



D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.065"	.005"	.098"	.450"	1/8"	1-1/2"	79465-005	\$41.25
.065"	.010"	.098"	.450"	1/8"	1-1/2"	79465-010	\$41.25
.065"	.015"	.098"	.450"	1/8"	1-1/2"	79465-015	\$41.25
.070"	.005"	.105"	.500"	1/8"	1-1/2"	79470-005	\$41.25
.070"	.010"	.105"	.500"	1/8"	1-1/2"	79470-010	\$41.25
.070"	.015"	.105"	.500"	1/8"	1-1/2"	79470-015	\$41.25
.075"	.005"	.113"	.500"	1/8"	1-1/2"	79475-005	\$41.25
.075"	.010"	.113"	.500"	1/8"	1-1/2"	79475-010	\$41.25
.075"	.015"	.113"	.500"	1/8"	1-1/2"	79475-015	\$41.25
.078" (5/64)	.005"	.117"	.500"	1/8"	1-1/2"	79478-005	\$41.25
.078" (5/64)	.010"	.117"	.500"	1/8"	1-1/2"	79478-010	\$41.25
.078" (5/64)	.015"	.117"	.500"	1/8"	1-1/2"	79478-015	\$41.25
.090"	.005"	.135"	.550"	1/8"	1-1/2"	79490-005	\$41.25
.090"	.010"	.135"	.550"	1/8"	1-1/2"	79490-010	\$41.25
.090"	.015"	.135"	.550"	1/8"	1-1/2"	79490-015	\$41.25
.093" (3/32)	.005"	.140"	.550"	1/8"	1-1/2"	79493-005	\$41.25
.093" (3/32)	.010"	.140"	.550"	1/8"	1-1/2"	79493-010	\$41.25
.093" (3/32)	.015"	.140"	.550"	1/8"	1-1/2"	79493-015	\$41.25
.100"	.005"	.150"	.550"	1/8"	1-1/2"	79410-005	\$41.25
.100"	.010"	.150"	.550"	1/8"	1-1/2"	79410-010	\$41.25
.100"	.015"	.150"	.550"	1/8"	1-1/2"	79410-015	\$41.25
.125" (1/8)	.005"	.250"	.600"	1/8"	1-1/2"	79412-005	\$41.25
.125" (1/8)	.010"	.250"	.600"	1/8"	1-1/2"	79412-010	\$41.25
.125" (1/8)	.015"	.250"	.600"	1/8"	1-1/2"	79412-015	\$41.25
.125" (1/8)	.020"	.250"	.600"	1/8"	1-1/2"	79412-020	\$41.25
.125" (1/8)	.030"	.250"	.600"	1/8"	1-1/2"	79412-030	\$41.25

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - TiCN COATED

Square & Ball End - TiCN COATED - .015" to .125"



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	1/8"	1-1/2"	86015	\$23.75	86015B	\$30.50
.020"	.060"	1/8"	1-1/2"	86020	\$22.75	86020B	\$29.50
.025"	.075"	1/8"	1-1/2"	86025	\$21.50	86025B	\$27.25
.030"	.090"	1/8"	1-1/2"	86030	\$21.00	86030B	\$25.50
.031"	.093"	1/8"	1-1/2"	86031	\$21.00	86031B	\$25.50
.031"	.125"	1/8"	1-1/2"	86031L	\$21.00	86031LB	\$25.50
.035"	.105"	1/8"	1-1/2"	86035	\$19.25	86035B	\$23.75
.040"	.120"	1/8"	1-1/2"	86040	\$19.25	86040B	\$23.75
.045"	.135"	1/8"	1-1/2"	86045	\$19.25	86045B	\$23.75
.047"	.141"	1/8"	1-1/2"	86047	\$19.25	86047B	\$23.75
.050"	.150"	1/8"	1-1/2"	86050	\$19.25	86050B	\$23.75
.055"	.165"	1/8"	1-1/2"	86055	\$19.25	86055B	\$23.75
.060"	.180"	1/8"	1-1/2"	86060	\$18.75	86060B	\$23.25
.062"	.186"	1/8"	1-1/2"	86062	\$18.75	86062B	\$23.25
.062"	.250"	1/8"	1-1/2"	86062L	\$18.75	86062LB	\$23.25
.065"	.195"	1/8"	1-1/2"	86065	\$18.75	86065B	\$23.25
.070"	.210"	1/8"	1-1/2"	86070	\$18.75	86070B	\$23.25
.075"	.225"	1/8"	1-1/2"	86075	\$18.75	86075B	\$23.25
.078"	.234"	1/8"	1-1/2"	86078	\$18.75	86078B	\$23.25
.080"	.240"	1/8"	1-1/2"	86080	\$18.75	86080B	\$23.25
.090"	.270"	1/8"	1-1/2"	86090	\$18.75	86090B	\$23.25
.093"	.279"	1/8"	1-1/2"	86093	\$18.75	86093B	\$23.25
.093"	.375"	1/8"	1-1/2"	86093L	\$18.75	86093LB	\$23.25
.100"	.300"	1/8"	1-1/2"	86100	\$18.75	86100B	\$23.25
.125"	.500"	1/8"	1-1/2"	86125	\$18.75	86125B	\$23.25

Special long reach TiCN coated end mills quoted on request. Minimum 6 pieces per size.

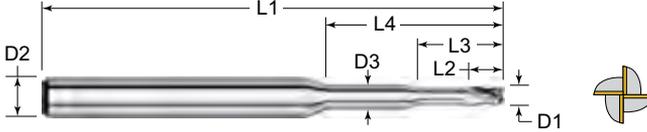
Ships within 24-48 hours.

Tools are custom manufactured to order and are nonreturnable.

4-FLUTE - MULTI-STEP - LONG REACH



Square & Ball End - UNCOATED - .010" to .031"



Minimum
3 Tools
Each Size

Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

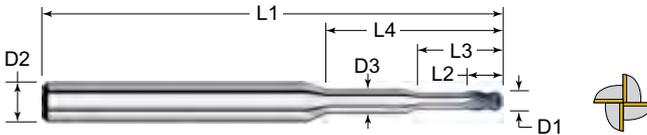
D1 Cutter Dia.	L2 Length of Cut	L3 Reach From Tip	L4 Reach From Tip	D3 Neck Dia.	D2 Shank Dia.	L1 Over All Length	SQUARE END		BALL END	
							Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	.075"	.150"	.030"	1/8"	1-1/2"	74410	\$50.75	74410B	\$62.75
.015"	.045"	.125"	.225"	.040"	1/8"	1-1/2"	74415	\$42.50	74415B	\$49.25
.020"	.060"	.165"	.265"	.040"	1/8"	1-1/2"	74420	\$41.25	74420B	\$48.00
.025"	.075"	.205"	.305"	.050"	1/8"	1-1/2"	74425	\$40.25	74425B	\$45.75
.030"	.090"	.250"	.350"	.060"	1/8"	1-1/2"	74430	\$39.00	74430B	\$43.50
.031"	.125"	.250"	.350"	.062"	1/8"	1-1/2"	74431	\$39.00	74431B	\$43.50

Tools are custom manufactured to order and are non-returnable. Tools ship in 24-48 Hours.

Designed for deep pocket milling where there is sufficient clearance for a larger secondary neck. Multi neck design increases the reach capabilities for standard reach tools. Special sizes available-see below for no charge alterations.

NOTE: *Reach 'L4' and diameter 'D3' may be altered to customer specifications at no additional charge if it falls within the parameters setup by engineering at Microcut. Send your request by using the form below and Microcut will advise if your tool meets our criteria for no-charge alterations.

Square & Ball End - AITiN COATED - .010" to .031"

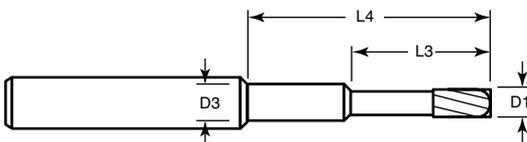


Minimum
3 Tools
Each Size

Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Dia.	L2 Length of Cut	L3 Reach From Tip	L4 Reach From Tip	D3 Neck Dia.	D2 Shank Dia.	L1 Over All Length	SQUARE END		BALL END	
							Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	.075"	.150"	.030"	1/8"	1-1/2"	74310	\$57.50	74310B	\$68.50
.015"	.045"	.125"	.225"	.040"	1/8"	1-1/2"	74315	\$47.00	74315B	\$53.75
.020"	.060"	.165"	.265"	.040"	1/8"	1-1/2"	74320	\$45.75	74320B	\$52.50
.025"	.075"	.205"	.305"	.050"	1/8"	1-1/2"	74325	\$44.75	74325B	\$50.25
.030"	.090"	.250"	.350"	.060"	1/8"	1-1/2"	74330	\$43.50	74330B	\$48.00
.031"	.125"	.250"	.350"	.062"	1/8"	1-1/2"	74331	\$43.50	74331B	\$48.00

ORDER SPECIAL Multi-Step LONG REACH END MILLS



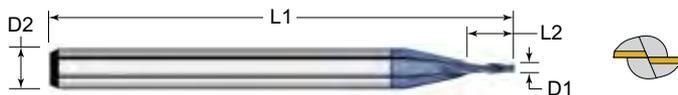
1. Specify: Square End or Ball End.
2. Diameter (D1): _____ From above charts.
3. Reach (L3): _____
4. Reach (L4): _____
5. Neck Diameter (D3): _____
6. Quantity (Minimum 3): _____

Tools are custom manufactured to order and are non-returnable. Tools ship in 24-48 Hours.



2-FLUTE - METRIC

Square End - UNCOATED & AITIN COATED - 0.2mm to 3.0mm

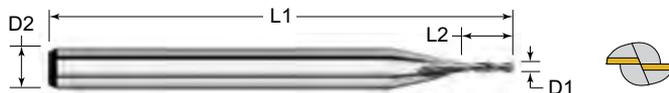


Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		AITIN COATED	
				Tool Number	Price Each	Tool Number	Price Each
0.2	0.4	3	38	51202	\$37.75	51302	\$45.25
0.3	0.9	3	38	51203	\$33.25	51303	\$39.50
0.4	1.2	3	38	51204	\$23.75	51304	\$30.00
0.5	1.5	3	38	51205	\$22.75	51305	\$29.00
0.6	1.8	3	38	51206	\$22.75	51306	\$28.00
0.7	2.1	3	38	51207	\$20.50	51307	\$25.75
0.8	2.4	3	38	51208	\$20.50	51308	\$25.75
0.9	2.7	3	38	51209	\$20.50	51309	\$25.75
1.0	3.0	3	38	51210	\$15.25	51310	\$19.50
1.5	4.5	3	38	51215	\$15.25	51315	\$19.50
2.0	9.0	3	38	51220	\$15.25	51320	\$19.50
2.5	12.0	3	38	51225	\$15.25	51325	\$19.50
3.0	12.0	3	38	51230	\$13.25	51330	\$17.50

Most Miniature metric cutting diameters are also available on 1/8" diameter shanks. Call for exact specifications.

Ball End - UNCOATED & AITIN COATED 1.0mm to 3.0mm



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		AITIN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1.0	3.0	3	38	51210B	\$19.50	51310B	\$23.75
1.5	4.5	3	38	51215B	\$19.50	51315B	\$23.75
2.0	9.0	3	38	51220B	\$19.50	51320B	\$23.75
2.5	12.0	3	38	51225B	\$19.50	51325B	\$23.75
3.0	12.0	3	38	51230B	\$17.50	51330B	\$21.75

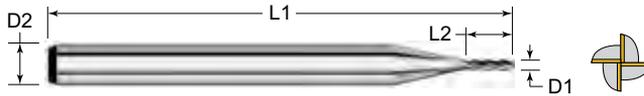


See
Metric End Mill
Extension Holders
on page 87.

4-FLUTE - METRIC



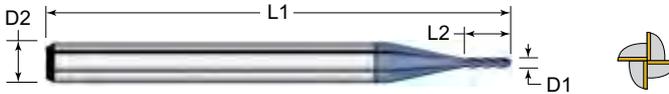
Square End - UNCOATED & AITIN COATED 0.5mm to 6.0mm



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		ALTIM COATED	
				Tool Number	Price Each	Tool Number	Price Each
0.5	1.5	3	38	51405	\$22.75	51505	\$29.00
1.0	3.0	3	38	51410	\$15.25	51510	\$19.50
1.5	4.5	3	38	51415	\$15.25	51515	\$19.50
2.0	9.0	3	38	51420	\$15.25	51520	\$19.50
2.5	12.0	3	38	51425	\$15.25	51525	\$19.50
3.0	12.0	3	38	51430	\$13.25	51530	\$17.50
3.5	12.0	4	51	51435	\$18.50	51535	\$23.75
4.0	14.0	4	51	51440	\$18.50	51540	\$23.75
4.5	14.0	5	51	51445	\$20.50	51545	\$25.75
5.0	20.0	5	51	51450	\$20.50	51550	\$25.75
6.0	20.0	6	63	51460	\$23.75	51560	\$29.00

Ball End - UNCOATED & AITIN COATED 0.5mm to 6.0mm



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

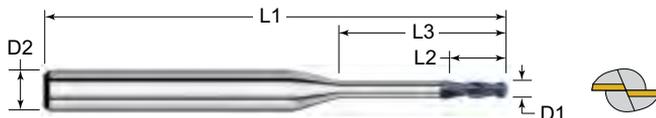
D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		ALTIM COATED	
				Tool Number	Price Each	Tool Number	Price Each
0.5	1.5	3	38	51405B	\$30.00	51505B	\$34.25
1.0	3.0	3	38	51410B	\$19.50	51510B	\$23.75
1.5	4.5	3	38	51415B	\$19.50	51515B	\$23.75
2.0	9.0	3	38	51420B	\$19.50	51520B	\$23.75
2.5	12.0	3	38	51425B	\$19.50	51525B	\$23.75
3.0	12.0	3	38	51430B	\$17.50	51530B	\$21.75
3.5	12.0	4	51	51435B	\$22.75	51535B	\$28.00
4.0	14.0	4	51	51440B	\$22.75	51540B	\$28.00
4.5	14.0	5	51	51445B	\$24.75	51545B	\$30.00
5.0	20.0	5	51	51450B	\$24.75	51550B	\$30.00
6.0	20.0	6	63	51460B	\$28.00	51560B	\$34.25

Most Miniature metric cutting diameters are also available on 1/8" diameter shanks. Call for exact specifications.



2-FLUTE - METRIC - LONG REACH

Square End - UNCOATED & AITIN COATED



Minimum
3 Tools
Each Size

Shipped
Within 24-48
Hours

Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	L3 Reach From Tip (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		ALITIN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1	3.0	9	3	38	51810	\$25.75	51810TL	\$30.00
1.5	6.0	12	3	38	51815	\$25.75	51815TL	\$30.00
2	9.0	15	3	38	51820	\$25.75	51820TL	\$30.00
2.5	12.0	16	3	38	51825	\$25.75	51825TL	\$30.00
3	12.0	16	3	38	51830	\$23.75	51830TL	\$28.00

Ball End - UNCOATED & AITIN COATED

D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	L3 Reach From Tip (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		ALITIN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1	3.0	9	3	38	51810B	\$30.00	51810BTL	\$34.25
1.5	6.0	12	3	38	51815B	\$30.00	51815BTL	\$34.25
2	9.0	15	3	38	51820B	\$30.00	51820BTL	\$34.25
2.5	12.0	16	3	38	51825B	\$30.00	51825BTL	\$34.25
3	12.0	16	3	38	51830B	\$28.00	51830BTL	\$32.25



METRIC - LONG REACH - 4-FLUTE

Square End - UNCOATED & AITIN COATED

D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	L3 Reach From Tip (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		ALITIN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1	3.0	9	3	38	51910	\$27.00	51910TL	\$31.00
1.5	6.0	12	3	38	51915	\$27.00	51915TL	\$31.00
2	9.0	15	3	38	51920	\$28.00	51920TL	\$32.25
2.5	12.0	16	3	38	51925	\$28.00	51925TL	\$32.25
3	12.0	16	3	38	51930	\$28.00	51930TL	\$32.25

Ball End - UNCOATED & AITIN COATED

D1 Cutter Diameter (mm)	L2 Length of Cut (mm)	L3 Reach From Tip (mm)	D2 Shank Diameter (mm)	L1 Over All Length (mm)	NOT COATED		ALITIN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1	3.0	9	3	38	51910B	\$31.00	51910BTL	\$35.25
1.5	6.0	12	3	38	51915B	\$31.00	51915BTL	\$35.25
2	9.0	15	3	38	51920B	\$32.25	51920BTL	\$36.25
2.5	12.0	16	3	38	51925B	\$32.25	51925BTL	\$36.25
3	12.0	16	3	38	51930B	\$32.25	51930BTL	\$36.25

Other metric long reach sizes, quoted on request. Call for exact specifications.

**Shipped within 24-48 hours. Minimum order 3 tools each size.
Tools are custom manufactured to order and are nonreturnable.**

END MILL EXTENSION HOLDERS

End Mill Extension Holders

I.D. CONCENTRIC WITHIN .0003"- I.D. HOLE SIZE +.00015/-0



I.D. Hole Size	Shank Diameter	Over All Length	Tool Number	Price Each
.1250"	3/8"	3-1/4"	ACH1250	\$209.50
.1250"	3/8"	6"	ACH1250L	\$285.50
.1875"	1/2"	3-1/2"	ACH1875	\$199.50
.1875"	1/2"	5"	ACH1875L	\$220.50
.2500"	5/8"	4-1/4"	ACH2500	\$199.50
.2500"	5/8"	6"	ACH2500L	\$225.50

End Mill Extension Holders Millimeter Sizes

I.D. CONCENTRIC WITHIN .0003"- I.D. HOLE SIZE +.00015/-0



I.D. Hole Size	Shank Diameter	Over All Length	Tool Number	Price Each
.1181" (3mm)	3/8"	3-1/4"	ACH1181	\$219.50
.1575" (4mm)	1/2"	3-1/2"	ACH1575	\$219.50
.2362" (6mm)	5/8"	4-1/4"	ACH2362	\$229.00

ABRASION RESISTANT TOOL COATINGS



TiCN

Cutting carbon steel, alloy steel and cast iron; cold forming & stamping tools.



ZrN

Hard coating for machining a variety of non-ferrous materials.



AlTiN

High performance coating for dry and semi-dry machining of all aerospace materials at high speeds.



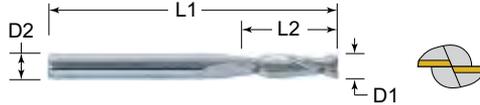
Diamond

(Amorphous) Thin film coating for graphite, nonferrous materials and epoxy.



2-FLUTE - STANDARD FRACTIONAL

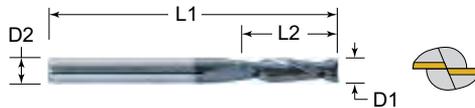
Square & Ball End - UNCOATED - 1/64" to 1/2"



Standard Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool End	Price Each
1/64"	3/64"	1/8"	1-1/2"	52015	\$19.00	52015B	\$26.00
1/32"	1/8"	1/8"	1-1/2"	52031	\$12.00	52031B	\$14.25
3/64"	1/8"	1/8"	1-1/2"	52047	\$12.00	52047B	\$14.25
1/16"	1/4"	1/8"	1-1/2"	52062	\$12.00	52062B	\$14.25
5/64"	1/4"	1/8"	1-1/2"	52078	\$12.00	52078B	\$14.25
3/32"	3/8"	1/8"	1-1/2"	52093	\$12.00	52093B	\$14.25
7/64"	3/8"	1/8"	1-1/2"	52109	\$12.00	52109B	\$14.25
1/8"	1/2"	1/8"	1-1/2"	52125	\$12.00	52125B	\$14.25
9/64"	9/16"	3/16"	2"	52140	\$13.00	52140B	\$16.50
5/32"	9/16"	3/16"	2"	52156	\$13.00	52156B	\$16.50
3/16"	5/8"	3/16"	2"	52187	\$13.00	52187B	\$16.50
1/4"	3/4"	1/4"	2-1/2"	52250	\$14.25	52250B	\$19.00
5/16"	13/16"	5/16"	2-1/2"	52312	\$19.00	52312B	\$23.75
3/8"	1"	3/8"	2-1/2"	52375	\$22.50	52375B	\$27.25
1/2"	1"	1/2"	3"	52500	\$37.25	52500B	\$49.25

Square & Ball End - AITiN COATED - 1/64" to 1/2"



D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
1/64"	3/64"	1/8"	1-1/2"	52015TL	\$23.75	52015BTL	\$30.75
1/32"	1/8"	1/8"	1-1/2"	52031TL	\$15.50	52031BTL	\$17.75
3/64"	1/8"	1/8"	1-1/2"	52047TL	\$15.50	52047BTL	\$17.75
1/16"	1/4"	1/8"	1-1/2"	52062TL	\$15.50	52062BTL	\$17.75
5/64"	1/4"	1/8"	1-1/2"	52078TL	\$15.50	52078BTL	\$17.75
3/32"	3/8"	1/8"	1-1/2"	52093TL	\$15.50	52093BTL	\$17.75
7/64"	3/8"	1/8"	1-1/2"	52109TL	\$15.50	52109BTL	\$17.75
1/8"	1/2"	1/8"	1-1/2"	52125TL	\$15.50	52125BTL	\$17.75
9/64"	9/16"	3/16"	2"	52140TL	\$17.75	52140BTL	\$22.50
5/32"	9/16"	3/16"	2"	52156TL	\$17.75	52156BTL	\$22.50
3/16"	5/8"	3/16"	2"	52187TL	\$17.75	52187BTL	\$22.50
1/4"	3/4"	1/4"	2-1/2"	52250TL	\$20.25	52250BTL	\$26.00
5/16"	13/16"	5/16"	2-1/2"	52312TL	\$23.75	52312BTL	\$32.00
3/8"	1"	3/8"	2-1/2"	52375TL	\$27.25	52375BTL	\$38.00
1/2"	1"	1/2"	3"	52500TL	\$47.25	52500BTL	\$67.50

4-FLUTE - STANDARD FRACTIONAL



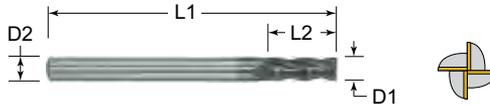
Square & Ball End - UNCOATED - 1/64" to 1/2"



Standard Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool End	Price Each
1/64"	3/64"	1/8"	1-1/2"	54015	\$19.00	54015B	\$26.00
1/32"	1/8"	1/8"	1-1/2"	54031	\$12.00	54031B	\$14.25
3/64"	1/8"	1/8"	1-1/2"	54047	\$12.00	54047B	\$14.25
1/16"	1/4"	1/8"	1-1/2"	54062	\$12.00	54062B	\$14.25
5/64"	1/4"	1/8"	1-1/2"	54078	\$12.00	54078B	\$14.25
3/32"	3/8"	1/8"	1-1/2"	54093	\$12.00	54093B	\$14.25
7/64"	3/8"	1/8"	1-1/2"	54109	\$12.00	54109B	\$14.25
1/8"	1/2"	1/8"	1-1/2"	54125	\$12.00	54125B	\$14.25
9/64"	9/16"	3/16"	2"	54140	\$13.00	54140B	\$16.50
5/32"	9/16"	3/16"	2"	54156	\$13.00	54156B	\$16.50
3/16"	5/8"	3/16"	2"	54187	\$13.00	54187B	\$16.50
1/4"	3/4"	1/4"	2-1/2"	54250	\$14.25	54250B	\$19.00
5/16"	13/16"	5/16"	2-1/2"	54312	\$19.00	54312B	\$23.75
3/8"	1"	3/8"	2-1/2"	54375	\$22.50	54375B	\$27.25
1/2"	1"	1/2"	3"	54500	\$37.25	54500B	\$49.25

Square & Ball End - AITiN COATED - 1/64" to 1/2"

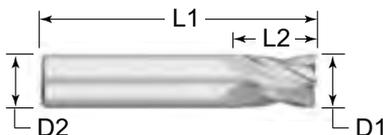


D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool End	Price Each
1/64"	3/64"	1/8"	1-1/2"	54015TL	\$23.75	54015BTL	\$30.75
1/32"	1/8"	1/8"	1-1/2"	54031TL	\$15.50	54031BTL	\$17.75
3/64"	1/8"	1/8"	1-1/2"	54047TL	\$15.50	54047BTL	\$17.75
1/16"	1/4"	1/8"	1-1/2"	54062TL	\$15.50	54062BTL	\$17.75
5/64"	1/4"	1/8"	1-1/2"	54078TL	\$15.50	54078BTL	\$17.75
3/32"	3/8"	1/8"	1-1/2"	54093TL	\$15.50	54093BTL	\$17.75
7/64"	3/8"	1/8"	1-1/2"	54109TL	\$15.50	54109BTL	\$17.75
1/8"	1/2"	1/8"	1-1/2"	54125TL	\$15.50	54125BTL	\$17.75
9/64"	9/16"	3/16"	2"	54140TL	\$17.75	54140BTL	\$22.50
5/32"	9/16"	3/16"	2"	54156TL	\$17.75	54156BTL	\$22.50
3/16"	5/8"	3/16"	2"	54187TL	\$17.75	54187BTL	\$22.50
1/4"	3/4"	1/4"	2-1/2"	54250TL	\$20.25	54250BTL	\$26.00
5/16"	13/16"	5/16"	2-1/2"	54312TL	\$23.75	54312BTL	\$32.00
3/8"	1"	3/8"	2-1/2"	54375TL	\$27.25	54375BTL	\$38.00
1/2"	1"	1/2"	3"	54500TL	\$47.25	54500BTL	\$67.50



4-FLUTE - STUB FRACTIONAL

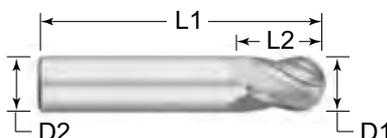
Square End - Single End - UNCOATED - 1/32" to 1/2"



Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END	
				TOOL NUMBER	PRICE EACH
1/32"	1/16"	1/8"	1-1/2"	4031	\$9.75
3/64"	3/32"	1/8"	1-1/2"	4047	\$9.75
1/16"	1/8"	1/8"	1-1/2"	4062	\$9.75
5/64"	1/8"	1/8"	1-1/2"	4078	\$12.50
3/32"	3/16"	1/8"	1-1/2"	4093	\$8.50
1/8"	1/4"	1/8"	1-1/2"	4125	\$8.50
5/32"	5/16"	3/16"	2"	4156	\$11.50
3/16"	3/8"	3/16"	2"	4187	\$11.50
7/32"	7/16"	3/16"	2"	4218	\$14.50
1/4"	1/2"	1/4"	2"	4250	\$13.50
5/16"	1/2"	5/16"	2"	4312	\$17.50
3/8"	5/8"	3/8"	2"	4375	\$20.50
1/2"	5/8"	1/2"	2-1/2"	4500	\$28.50

Ball End - Single End - UNCOATED - 1/32" to 1/2"



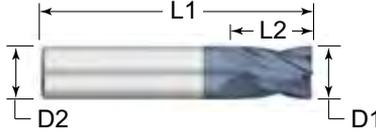
Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	BALL END	
				TOOL NUMBER	PRICE EACH
1/32"	1/16"	1/8"	1-1/2"	4031B	\$12.75
3/64"	3/32"	1/8"	1-1/2"	4047B	\$12.75
1/16"	1/8"	1/8"	1-1/2"	4062B	\$12.75
5/64"	1/8"	1/8"	1-1/2"	4078B	\$15.50
3/32"	3/16"	1/8"	1-1/2"	4093B	\$10.50
1/8"	1/4"	1/8"	1-1/2"	4125B	\$10.50
5/32"	5/16"	3/16"	2"	4156B	\$15.00
3/16"	3/8"	3/16"	2"	4187B	\$15.00
7/32"	7/16"	3/16"	2"	4218B	\$18.75
1/4"	1/2"	1/4"	2"	4250B	\$17.75
5/16"	1/2"	5/16"	2"	4312B	\$22.50
3/8"	5/8"	3/8"	2"	4375B	\$26.50
1/2"	5/8"	1/2"	2-1/2"	4500B	\$36.50

4-FLUTE - STUB FRACTIONAL



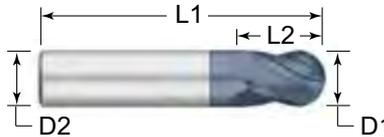
Square End - Single End - AITiN COATED - 1/32" to 1/2"



Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END	
				TOOL NUMBER	PRICE EACH
1/32"	1/16"	1/8"	1-1/2"	4031TL	\$12.75
3/64"	3/32"	1/8"	1-1/2"	4047TL	\$12.75
1/16"	1/8"	1/8"	1-1/2"	4062TL	\$12.75
5/64"	1/8"	1/8"	1-1/2"	4078TL	\$15.50
3/32"	3/16"	1/8"	1-1/2"	4093TL	\$11.50
1/8"	1/4"	1/8"	1-1/2"	4125TL	\$11.50
5/32"	5/16"	3/16"	2"	4156TL	\$15.50
3/16"	3/8"	3/16"	2"	4187TL	\$15.50
7/32"	7/16"	3/16"	2"	4218TL	\$18.50
1/4"	1/2"	1/4"	2"	4250TL	\$17.50
5/16"	1/2"	5/16"	2"	4312TL	\$20.25
3/8"	5/8"	3/8"	2"	4375TL	\$24.75
1/2"	5/8"	1/2"	2-1/2"	4500TL	\$36.50

Ball End - Single End - AITiN COATED - 1/32" to 1/2"



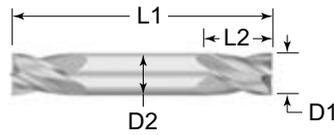
Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	BALL END	
				TOOL NUMBER	PRICE EACH
1/32"	1/16"	1/8"	1-1/2"	4031BTL	\$16.50
3/64"	3/32"	1/8"	1-1/2"	4047BTL	\$16.50
1/16"	1/8"	1/8"	1-1/2"	4062BTL	\$16.50
5/64"	1/8"	1/8"	1-1/2"	4078BTL	\$19.50
3/32"	3/16"	1/8"	1-1/2"	4093BTL	\$14.50
1/8"	1/4"	1/8"	1-1/2"	4125BTL	\$14.50
5/32"	5/16"	3/16"	2"	4156BTL	\$19.50
3/16"	3/8"	3/16"	2"	4187BTL	\$19.50
7/32"	7/16"	3/16"	2"	4218BTL	\$23.50
1/4"	1/2"	1/4"	2"	4250BTL	\$22.50
5/16"	1/2"	5/16"	2"	4312BTL	\$25.75
3/8"	5/8"	3/8"	2"	4375BTL	\$30.75
1/2"	5/8"	1/2"	2-1/2"	4500BTL	\$46.50



4-FLUTE - STUB FRACTIONAL

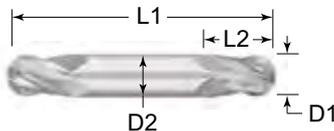
Square End - Double End - UNCOATED - 1/16" to 1/2"



Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END	
				TOOL NUMBER	PRICE EACH
1/16"	1/8"	1/8"	1-1/2"	4062S	\$14.50
3/32"	3/16"	1/8"	1-1/2"	4093S	\$15.50
1/8"	1/4"	1/8"	1-1/2"	4125S	\$12.50
5/32"	5/16"	3/16"	2"	4156S	\$17.50
3/16"	3/8"	3/16"	2"	4187S	\$17.50
1/4"	1/2"	1/4"	2-1/2"	4250S	\$23.50
5/16"	1/2"	5/16"	2-1/2"	4312S	\$30.50
3/8"	9/16"	3/8"	2-1/2"	4375S	\$34.00
1/2"	5/8"	1/2"	3"	4500S	\$54.50

Ball End - Double End - UNCOATED - 1/16" to 1/2"



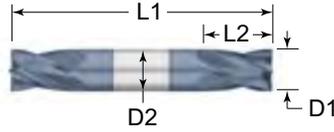
Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	BALL END	
				TOOL NUMBER	PRICE EACH
1/16"	1/8"	1/8"	1-1/2"	4062SB	\$18.50
3/32"	3/16"	1/8"	1-1/2"	4093SB	\$19.50
1/8"	1/4"	1/8"	1-1/2"	4125SB	\$16.50
5/32"	5/16"	3/16"	2"	4156SB	\$21.75
3/16"	3/8"	3/16"	2"	4187SB	\$21.75
1/4"	1/2"	1/4"	2-1/2"	4250SB	\$28.50
5/16"	1/2"	5/16"	2-1/2"	4312SB	\$38.50
3/8"	9/16"	3/8"	2-1/2"	4375SB	\$42.50
1/2"	5/8"	1/2"	3"	4500SB	\$66.50

4-FLUTE - STUB FRACTIONAL



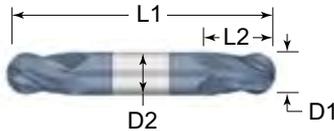
Square End - Double End - AITiN COATED - 1/16" to 1/2"



Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END	
				TOOL NUMBER	PRICE EACH
1/16"	1/8"	1/8"	1-1/2"	4062ST	\$20.00
3/32"	3/16"	1/8"	1-1/2"	4093ST	\$20.75
1/8"	1/4"	1/8"	1-1/2"	4125ST	\$16.75
5/32"	5/16"	3/16"	2"	4156ST	\$22.50
3/16"	3/8"	3/16"	2"	4187ST	\$22.50
1/4"	1/2"	1/4"	2-1/2"	4250ST	\$30.50
5/16"	1/2"	5/16"	2-1/2"	4312ST	\$37.50
3/8"	9/16"	3/8"	2-1/2"	4375ST	\$41.00
1/2"	5/8"	1/2"	3"	4500ST	\$69.75

Ball End - Double End - AITiN COATED - 1/16" to 1/2"



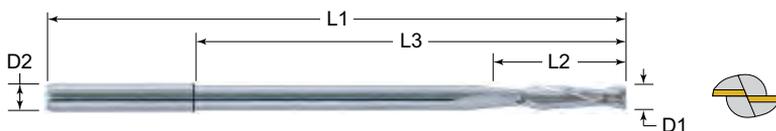
Stub Length of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter +000/-002	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	BALL END	
				TOOL NUMBER	PRICE EACH
1/16"	1/8"	1/8"	1-1/2"	4062SBT	\$25.50
3/32"	3/16"	1/8"	1-1/2"	4093SBT	\$25.75
1/8"	1/4"	1/8"	1-1/2"	4125SBT	\$21.50
5/32"	5/16"	3/16"	2"	4156SBT	\$28.00
3/16"	3/8"	3/16"	2"	4187SBT	\$28.00
1/4"	1/2"	1/4"	2-1/2"	4250SBT	\$38.50
5/16"	1/2"	5/16"	2-1/2"	4312SBT	\$45.50
3/8"	9/16"	3/8"	2-1/2"	4375SBT	\$52.50
1/2"	5/8"	1/2"	3"	4500SBT	\$88.50



2-FLUTE - EXTRA LONG RCH - FRACTIONAL

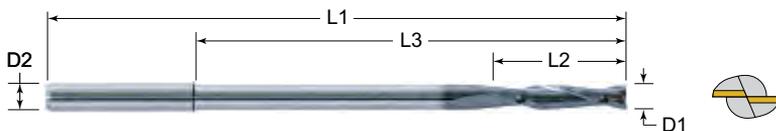
Square & Ball End - UNCOATED - 1/8" to 1/4"



Neck diameters are reduced for clearance

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	3/4"	1-1/4"	1/8"	3"	55025S	\$31.25	55025SB	\$35.75
1/8"	3/4"	1-1/2"	1/8"	3"	55025	\$32.25	55025B	\$36.75
1/8"	1"	1-5/8"	1/8"	3"	55025L	\$33.50	55025LB	\$38.00
3/16"	3/4"	1-3/8"	3/16"	2-1/2"	55087S	\$30.00	55087SB	\$34.50
3/16"	1"	2-5/8"	3/16"	4"	55087	\$33.50	55087B	\$38.00
1/4"	1"	2-1/4"	1/4"	4"	55050S	\$39.00	55050SB	\$44.75
1/4"	1-1/2"	4-1/4"	1/4"	6"	55050	\$49.25	55050B	\$55.00

Square & Ball End - ALTiN COATED - 1/8" to 1/2"

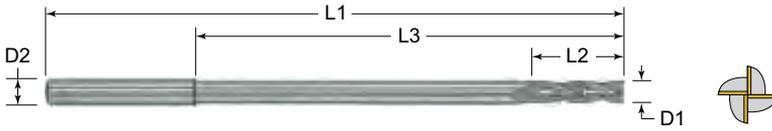


Neck diameters are reduced for clearance

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	3/4"	1-1/4"	1/8"	3"	55125S	\$37.00	55125SB	\$41.50
1/8"	3/4"	1-1/2"	1/8"	3"	55125	\$38.00	55125B	\$42.50
1/8"	1"	1-5/8"	1/8"	3"	55125L	\$39.00	55125LB	\$43.50
3/16"	3/4"	1-3/8"	3/16"	2-1/2"	55187S	\$36.75	55187SB	\$41.25
3/16"	1"	2-5/8"	3/16"	4"	55187	\$40.25	55187B	\$44.75
1/4"	1"	2-1/4"	1/4"	4"	55250S	\$45.75	55250SB	\$51.50
1/4"	1-1/2"	4-1/4"	1/4"	6"	55250	\$56.00	55250B	\$61.75
5/16"	1-1/2"	4-1/4"	5/16"	6"	55312	\$74.00	55312B	\$82.00
3/8"	1-1/2"	4-3/8"	3/8"	6"	55375	\$85.25	55375B	\$91.00
1/2"	1-1/2"	4"	1/2"	6"	55500	\$112.75	55500B	\$124.00



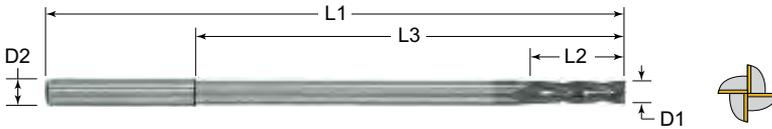
Square & Ball End - UNCOATED - 1/8" to 1/4"



Neck diameters are reduced for clearance

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	3/4"	1-1/4"	1/8"	3"	56025S	\$31.25	56025SB	\$35.75
1/8"	3/4"	1-1/2"	1/8"	3"	56025	\$32.25	56025B	\$36.75
1/8"	1"	1-5/8"	1/8"	3"	56025L	\$33.50	56025LB	\$38.00
3/16"	3/4"	1-3/8"	3/16"	2-1/2"	56087S	\$30.00	56087SB	\$34.50
3/16"	1"	2-5/8"	3/16"	4"	56087	\$33.50	56087B	\$38.00
1/4"	1"	2-1/4"	1/4"	4"	56050S	\$39.00	56050SB	\$44.75
1/4"	1-1/2"	4-1/4"	1/4"	6"	56050	\$49.25	56050B	\$55.00

Square & Ball End - ALTiN COATED - 1/8" to 1/2"



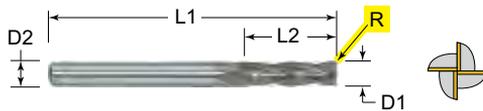
Neck diameters are reduced for clearance

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	3/4"	1-1/4"	1/8"	3"	56125S	\$37.00	56125SB	\$41.50
1/8"	3/4"	1-1/2"	1/8"	3"	56125	\$38.00	56125B	\$42.50
1/8"	1"	1-5/8"	1/8"	3"	56125L	\$39.00	56125LB	\$43.50
3/16"	3/4"	1-3/8"	3/16"	2-1/2"	56187S	\$36.75	56187SB	\$41.25
3/16"	1"	2-5/8"	3/16"	4"	56187	\$40.25	56187B	\$44.75
1/4"	1"	2-1/4"	1/4"	4"	56250S	\$45.75	56250SB	\$51.50
1/4"	1-1/2"	4-1/4"	1/4"	6"	56250	\$56.00	56250B	\$61.75
5/16"	1-1/2"	4-1/4"	5/16"	6"	56312	\$74.00	56312B	\$82.00
3/8"	1-1/2"	4-3/8"	3/8"	6"	56375	\$85.25	56375B	\$91.00
1/2"	1-1/2"	4"	1/2"	6"	56500	\$112.75	56500B	\$124.00

4-FLUTE – FRACTIONAL – CORNER RAD



Corner Radius - **AITIN COATED** - 1/8" to 1/2"



Fractional Sizes 1/8" to 1/2" with Corner Radius – Center Cutting – Micro Grain Carbide

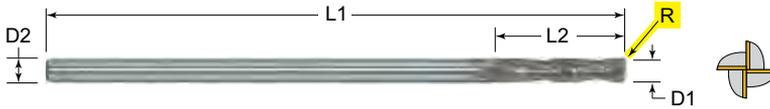
D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	.005"	1/2"	1/8"	1-1/2"	89125-005	\$21.50
1/8"	.010"	1/2"	1/8"	1-1/2"	89125-010	\$21.50
1/8"	.015"	1/2"	1/8"	1-1/2"	89125-015	\$21.50
1/8"	.020"	1/2"	1/8"	1-1/2"	89125-020	\$21.50
1/8"	.030"	1/2"	1/8"	1-1/2"	89125-030	\$21.50
3/16"	.015"	5/8"	3/16"	2"	89187-015	\$23.50
3/16"	.020"	5/8"	3/16"	2"	89187-020	\$23.50
3/16"	.030"	5/8"	3/16"	2"	89187-030	\$23.50
1/4"	.015"	3/4"	1/4"	2-1/2"	89250-015	\$26.50
1/4"	.020"	3/4"	1/4"	2-1/2"	89250-020	\$26.50
1/4"	.030"	3/4"	1/4"	2-1/2"	89250-030	\$26.50
1/4"	.045"	3/4"	1/4"	2-1/2"	89250-045	\$26.50
1/4"	.060"	3/4"	1/4"	2-1/2"	89250-060	\$26.50
5/16"	.015"	13/16"	5/16"	2-1/2"	89312-015	\$31.50
5/16"	.020"	13/16"	5/16"	2-1/2"	89312-020	\$31.50
5/16"	.030"	13/16"	5/16"	2-1/2"	89312-030	\$31.50
5/16"	.045"	13/16"	5/16"	2-1/2"	89312-045	\$31.50
5/16"	.060"	13/16"	5/16"	2-1/2"	89312-060	\$37.25
3/8"	.015"	1"	3/8"	2-1/2"	89375-015	\$39.75
3/8"	.020"	1"	3/8"	2-1/2"	89375-020	\$39.75
3/8"	.030"	1"	3/8"	2-1/2"	89375-030	\$39.75
3/8"	.045"	1"	3/8"	2-1/2"	89375-045	\$39.75
3/8"	.060"	1"	3/8"	2-1/2"	89375-060	\$39.75
1/2"	.015"	1"	1/2"	3"	89500-015	\$59.75
1/2"	.020"	1"	1/2"	3"	89500-020	\$59.75
1/2"	.030"	1"	1/2"	3"	89500-030	\$59.75
1/2"	.045"	1"	1/2"	3"	89500-045	\$59.75
1/2"	.060"	1"	1/2"	3"	89500-060	\$59.75
1/2"	.125"	1"	1/2"	3"	89500-125	\$59.75

Special Cutting Tool Quotations

Microcut's capability to produce standard cutting tools is replicated by its ability to produce Special Cutting Tools. Quality, competitive pricing, and on-time delivery has been a Microcut trademark for 20 years. Microcut's workforce experience in producing special Micro Tools dates back over 40 years and makes us one of the most experienced Micro Tool companies in the U.S.A. Submit your special tool B/P to us by fax at 781-582-8095 or email to sales@microcutUSA.com and we will quote it through the distributor of your choice that services your facility.



Corner Radius - **AITiN COATED** - 1/8" to 1/4"



Fractional Sizes 1/8" to 1/4" with Corner Radius - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	.015	3/4"	1/8"	2-1/4"	89700-015	\$22.50
1/8"	.020	3/4"	1/8"	2-1/4"	89700-020	\$22.50
1/8"	.030	3/4"	1/8"	2-1/4"	89700-030	\$22.50
1/8"	.015	1"	1/8"	3"	89701-015	\$26.75
1/8"	.020	1"	1/8"	3"	89701-020	\$26.75
1/8"	.030	1"	1/8"	3"	89701-030	\$26.75
3/16"	.015	3/4"	3/16"	2-1/2"	89702-015	\$24.50
3/16"	.020	3/4"	3/16"	2-1/2"	89702-020	\$24.50
3/16"	.030	3/4"	3/16"	2-1/2"	89702-030	\$24.50
3/16"	.015	1-1/8"	3/16"	3"	89703-015	\$29.25
3/16"	.020	1-1/8"	3/16"	3"	89703-020	\$29.25
3/16"	.030	1-1/8"	3/16"	3"	89703-030	\$29.25
1/4"	.015	1-1/8"	1/4"	3"	89704-015	\$34.50
1/4"	.020	1-1/8"	1/4"	3"	89704-020	\$34.50
1/4"	.030	1-1/8"	1/4"	3"	89704-030	\$34.50
1/4"	.015	1"	1/4"	4"	89705-015	\$35.75
1/4"	.020	1"	1/4"	4"	89705-020	\$35.75
1/4"	.030	1"	1/4"	4"	89705-030	\$35.75
1/4"	.045	1"	1/4"	4"	89705-045	\$35.75
1/4"	.060	1"	1/4"	4"	89705-060	\$35.75
1/4"	.015	1-1/2"	1/4"	6"	89706-015	\$34.50
1/4"	.020	1-1/2"	1/4"	6"	89706-020	\$34.50
1/4"	.030	1-1/2"	1/4"	6"	89706-030	\$34.50
1/4"	.045	1-1/2"	1/4"	6"	89706-045	\$35.75
1/4"	.060	1-1/2"	1/4"	6"	89706-060	\$35.75



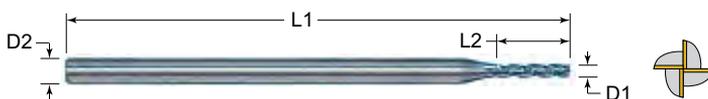
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4-FLUTE - LONG FLUTE

Square & Ball End - UNCOATED - 1/64" to 1/2"



Length of Cut as Specified - Center Cutting - Micro Grain Carbide - Made in USA

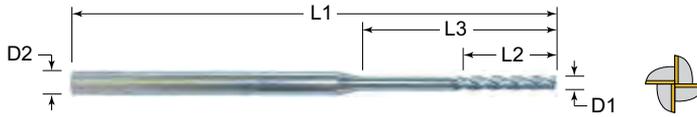
D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.075"	1/8"	2-1/2"	LF4015	\$30.90	LF4015B	\$36.90
.020"	.100"	1/8"	2-1/2"	LF4020	\$26.50	LF4020B	\$32.50
.025"	.125"	1/8"	2-1/2"	LF4025	\$25.90	LF4025B	\$30.90
.030"	.150"	1/8"	2-1/2"	LF4030	\$25.50	LF4030B	\$30.50
.031" (1/32)	.150"	1/8"	2-1/2"	LF4031	\$25.50	LF4031B	\$30.50
.031" (1/32)	.250"	1/8"	2-1/2"	LF4031L	\$45.50	LF4031LB	\$52.50
.035"	.175"	1/8"	2-1/2"	LF4035	\$25.50	LF4035B	\$30.50
.040"	.200"	1/8"	2-1/2"	LF4040	\$25.50	LF4040B	\$30.50
.045"	.250"	1/8"	2-1/2"	LF4045	\$25.50	LF4045B	\$30.50
.047" (3/64)	.250"	1/8"	2-1/2"	LF4047	\$25.50	LF4047B	\$30.50
.047" (3/64)	.375"	1/8"	2-1/2"	LF4047L	\$46.50	LF4047LB	\$53.50
.050"	.300"	1/8"	2-1/2"	LF4050	\$25.50	LF4050B	\$30.50
.055"	.375"	1/8"	2-1/2"	LF4055	\$25.50	LF4055B	\$30.50
.060"	.500"	1/8"	2-1/2"	LF4060	\$25.50	LF4060B	\$30.50
.062" (1/16)	.312"	1/8"	2-1/2"	LF4062S	\$23.50	LF4062SB	\$27.50
.062" (1/16)	.500"	1/8"	2-1/2"	LF4062	\$25.50	LF4062B	\$29.50
.062" (1/16)	.750"	1/8"	2-1/2"	LF4062L	\$43.50	LF4062LB	\$49.50
.065"	.500"	1/8"	2-1/2"	LF4065	\$25.50	LF4065B	\$29.50
.070"	.500"	1/8"	2-1/2"	LF4070	\$25.50	LF4070B	\$29.50
.075"	.500"	1/8"	2-1/2"	LF4075	\$25.50	LF4075B	\$29.50
.078" (5/64)	.500"	1/8"	2-1/2"	LF4078	\$25.50	LF4078B	\$29.50
.078" (5/64)	.750"	1/8"	2-1/2"	LF4078L	\$36.50	LF4078LB	\$42.50
.090"	.500"	1/8"	2-1/2"	LF4090	\$24.50	LF4090B	\$28.50
.093" (3/32)	.500"	1/8"	2-1/2"	LF4093	\$24.50	LF4093B	\$28.50
.093" (3/32)	.750"	1/8"	2-1/2"	LF4093L	\$26.50	LF4093LB	\$30.50
.100"	.625"	1/8"	2-1/2"	LF4100	\$24.50	LF4100B	\$28.50
1/8"	.750"	1/8"	3"	LF4125	\$16.50	LF4125B	\$19.50
1/8"	1.000"	1/8"	3"	LF4125L	\$18.50	LF4125LB	\$21.50
3/16"	1.125"	3/16"	3"	LF4187	\$17.50	LF4187B	\$20.50
1/4"	1.125"	1/4"	3"	LF4250	\$21.50	LF4250B	\$25.50
1/4"	1.500"	1/4"	4"	LF4250L	\$23.50	LF4250LB	\$29.50
5/16"	1.625"	5/16"	4"	LF4312	\$29.50	LF4312B	\$35.50
3/8"	1.125"	3/8"	3"	LF4375	\$28.50	LF4375B	\$33.50
3/8"	1.750"	3/8"	4"	LF4375L	\$34.50	LF4375LB	\$39.50
1/2"	2.000"	1/2"	4"	LF4500	\$49.50	LF4500B	\$57.50

Cutting Dia. Tolerance: Decimal Sizes: +/- .0005" Fractional Sizes: +000/-.002"

4-FLUTE - LONG FLUTE - LONG REACH



Square & Ball End - UNCOATED - .015" to .125"



Length of Cut as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.075"	.150"	1/8"	2-1/2"	LF3015	\$36.90	LF3015B	\$42.90
.020"	.100"	.200"	1/8"	2-1/2"	LF3020	\$32.50	LF3020B	\$38.50
.020"	.100"	.250"	1/8"	2-1/2"	LF3020L	\$34.50	LF3020LB	\$40.50
.025"	.125"	.250"	1/8"	2-1/2"	LF3025	\$31.90	LF3025B	\$36.90
.030"	.150"	.250"	1/8"	2-1/2"	LF3030	\$31.50	LF3030B	\$35.50
.030"	.150"	.300"	1/8"	2-1/2"	LF3030L	\$33.50	LF3030LB	\$37.50
.031" (1/32)	.150"	.250"	1/8"	2-1/2"	LF3031	\$31.50	LF3031B	\$35.50
.031" (1/32)	.150"	.300"	1/8"	2-1/2"	LF3031L	\$33.50	LF3031LB	\$37.50
.035"	.175"	.300"	1/8"	2-1/2"	LF3035	\$31.50	LF3035B	\$35.50
.035"	.175"	.350"	1/8"	2-1/2"	LF3035L	\$33.50	LF3035LB	\$37.50
.040"	.200"	.350"	1/8"	2-1/2"	LF3040	\$31.50	LF3040B	\$35.50
.040"	.200"	.400"	1/8"	2-1/2"	LF3040L	\$33.50	LF3040LB	\$37.50
.045"	.250"	.400"	1/8"	2-1/2"	LF3045	\$31.50	LF3045B	\$35.50
.045"	.250"	.450"	1/8"	2-1/2"	LF3045L	\$33.50	LF3045LB	\$37.50
.047" (3/64)	.250"	.400"	1/8"	2-1/2"	LF3047	\$31.50	LF3047B	\$35.50
.047" (3/64)	.250"	.500"	1/8"	2-1/2"	LF3047L	\$33.50	LF3047LB	\$37.50
.050"	.300"	.500"	1/8"	2-1/2"	LF3050	\$31.50	LF3050B	\$35.50
.055"	.375"	.600"	1/8"	2-1/2"	LF3055	\$31.50	LF3055B	\$35.50
.060"	.500"	.750"	1/8"	2-1/2"	LF3060	\$31.50	LF3060B	\$35.50
.060"	.500"	1.00"	1/8"	2-1/2"	LF3060L	\$33.50	LF3060LB	\$37.50
.062" (1/16)	.312"	.625"	1/8"	2-1/2"	LF3062S	\$31.50	LF3062BS	\$35.50
.062" (1/16)	.500"	.750"	1/8"	2-1/2"	LF3062	\$31.50	LF3062B	\$35.50
.062" (1/16)	.500"	1.00"	1/8"	2-1/2"	LF3062L	\$33.50	LF3062LB	\$37.50
.065"	.500"	.750"	1/8"	2-1/2"	LF3065	\$31.50	LF3065B	\$35.50
.070"	.500"	.750"	1/8"	2-1/2"	LF3070	\$31.50	LF3070B	\$35.50
.075"	.500"	.750"	1/8"	2-1/2"	LF3075	\$31.50	LF3075B	\$35.50
.078" (5/64)	.500"	.750"	1/8"	2-1/2"	LF3078	\$31.50	LF3078B	\$35.50
.078" (5/64)	.500"	1.00"	1/8"	2-1/2"	LF3078L	\$33.50	LF3078LB	\$37.50
.090"	.500"	.750"	1/8"	2-1/2"	LF3090S	\$31.50	LF3090BS	\$35.50
.090"	.500"	1.00"	1/8"	2-1/2"	LF3090	\$33.50	LF3090B	\$37.50
.093" (3/32)	.500"	.750"	1/8"	2-1/2"	LF3093S	\$31.50	LF3093BS	\$35.50
.093" (3/32)	.500"	1.00"	1/8"	2-1/2"	LF3093	\$33.50	LF3093B	\$37.50
.125" (1/8)	.750"	1.25"	1/8"	3"	LF3125	\$30.90	LF3125B	\$34.90
.125" (1/8)	1.00"	1.50"	1/8"	3"	LF3125L	\$32.90	LF3125LB	\$36.90



4-FLUTE - LONG FLUTE

Square & Ball End - AITiN COATED - 1/64" to 1/2"



Length of Cut as Specified – Center Cutting – Micro Grain Carbide – Made in USA

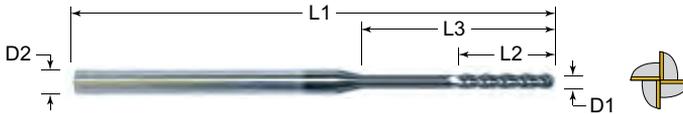
D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.075"	1/8"	2-1/2"	LF5015	\$35.30	LF5015B	\$41.30
.020"	.100"	1/8"	2-1/2"	LF5020	\$30.90	LF5020B	\$36.90
.025"	.125"	1/8"	2-1/2"	LF5025	\$30.30	LF5025B	\$35.30
.030"	.150"	1/8"	2-1/2"	LF5030	\$29.90	LF5030B	\$34.90
.031" (1/32)	.150"	1/8"	2-1/2"	LF5031	\$29.90	LF5031B	\$34.90
.031" (1/32)	.250"	1/8"	2-1/2"	LF5031L	\$49.90	LF5031LB	\$56.90
.035"	.175"	1/8"	2-1/2"	LF5035	\$29.90	LF5035B	\$34.90
.040"	.200"	1/8"	2-1/2"	LF5040	\$29.90	LF5040B	\$34.90
.045"	.250"	1/8"	2-1/2"	LF5045	\$29.90	LF5045B	\$34.90
.047" (3/64)	.250"	1/8"	2-1/2"	LF5047	\$29.90	LF5047B	\$34.90
.047" (3/64)	.375"	1/8"	2-1/2"	LF5047L	\$50.90	LF5047LB	\$57.90
.050"	.300"	1/8"	2-1/2"	LF5050	\$29.90	LF5050B	\$34.90
.055"	.375"	1/8"	2-1/2"	LF5055	\$29.90	LF5055B	\$34.90
.060"	.500"	1/8"	2-1/2"	LF5060	\$29.90	LF5060B	\$34.90
.062" (1/16)	.312"	1/8"	2-1/2"	LF5062S	\$27.90	LF5062SB	\$31.90
.062" (1/16)	.500"	1/8"	2-1/2"	LF5062	\$29.90	LF5062B	\$33.90
.062" (1/16)	.750"	1/8"	2-1/2"	LF5062L	\$47.90	LF5062LB	\$53.90
.065"	.500"	1/8"	2-1/2"	LF5065	\$29.90	LF5065B	\$33.90
.070"	.500"	1/8"	2-1/2"	LF5070	\$29.90	LF5070B	\$33.90
.075"	.500"	1/8"	2-1/2"	LF5075	\$29.90	LF5075B	\$33.90
.078" (5/64)	.500"	1/8"	2-1/2"	LF5078	\$29.90	LF5078B	\$33.90
.078" (5/64)	.750"	1/8"	2-1/2"	LF5078L	\$40.90	LF5078LB	\$46.90
.090"	.500"	1/8"	2-1/2"	LF5090	\$28.90	LF5090B	\$32.90
.093" (3/32)	.500"	1/8"	2-1/2"	LF5093	\$28.90	LF5093B	\$32.90
.093" (3/32)	.750"	1/8"	2-1/2"	LF5093L	\$30.90	LF5093LB	\$34.90
.100"	.625"	1/8"	2-1/2"	LF5100	\$28.90	LF5100B	\$32.90
.125"	.750"	1/8"	3"	LF5125	\$20.90	LF5125B	\$23.90
.125"	1.00"	1/8"	3"	LF5125L	\$22.90	LF5125LB	\$25.90
3/16"	1.125"	3/16"	3"	LF5187	\$23.50	LF5187B	\$26.50
1/4"	1.125"	1/4"	3"	LF5250	\$27.50	LF5250B	\$31.50
1/4"	1.500"	1/4"	4"	LF5250L	\$29.50	LF5250LB	\$33.50
5/16"	1.625"	5/16"	4"	LF5312	\$37.50	LF5312B	\$43.50
3/8"	1.125"	3/8"	3"	LF5375	\$37.50	LF5375B	\$43.50
3/8"	1.750"	3/8"	4"	LF5375L	\$42.50	LF5375LB	\$49.50
1/2"	2.000"	1/2"	4"	LF5500	\$64.50	LF5500B	\$72.50

Cutting Dia. Tolerance: Decimal Sizes: +/- .0005" Fractional Sizes: +000/-.002"

4-FLUTE - LONG FLUTE - LONG REACH



Square & Ball End - AITiN Coated - .015" to .125"



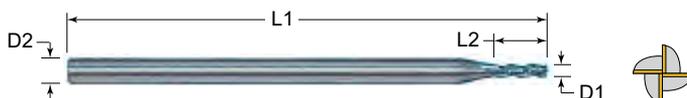
Length of Cut as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.075"	.150"	1/8"	2-1/2"	LF6015	\$41.30	LF6015B	\$47.30
.020"	.100"	.200"	1/8"	2-1/2"	LF6020	\$36.90	LF6020B	\$42.90
.020"	.100"	.250"	1/8"	2-1/2"	LF6020L	\$38.90	LF6020LB	\$44.90
.025"	.125"	.250"	1/8"	2-1/2"	LF6025	\$36.30	LF6025B	\$41.30
.030"	.150"	.250"	1/8"	2-1/2"	LF6030	\$35.90	LF6030B	\$39.90
.030"	.150"	.300"	1/8"	2-1/2"	LF6030L	\$37.90	LF6030LB	\$41.90
.031" (1/32)	.150"	.250"	1/8"	2-1/2"	LF6031	\$35.90	LF6031B	\$39.90
.031" (1/32)	.150"	.300"	1/8"	2-1/2"	LF6031L	\$37.90	LF6031LB	\$41.90
.035"	.175"	.300"	1/8"	2-1/2"	LF6035	\$35.90	LF6035B	\$39.90
.035"	.175"	.350"	1/8"	2-1/2"	LF6035L	\$37.90	LF6035LB	\$41.90
.040"	.200"	.350"	1/8"	2-1/2"	LF6040	\$35.90	LF6040B	\$39.90
.040"	.200"	.400"	1/8"	2-1/2"	LF6040L	\$37.90	LF6040LB	\$41.90
.045"	.250"	.400"	1/8"	2-1/2"	LF6045	\$35.90	LF6045B	\$39.90
.045"	.250"	.450"	1/8"	2-1/2"	LF6045L	\$37.90	LF6045LB	\$41.90
.047" (3/64)	.250"	.400"	1/8"	2-1/2"	LF6047	\$35.90	LF6047B	\$39.90
.047" (3/64)	.250"	.500"	1/8"	2-1/2"	LF6047L	\$37.90	LF6047LB	\$41.90
.050"	.300"	.500"	1/8"	2-1/2"	LF6050	\$35.90	LF6050B	\$39.90
.055"	.375"	.600"	1/8"	2-1/2"	LF6055	\$35.90	LF6055B	\$39.90
.060"	.500"	.750"	1/8"	2-1/2"	LF6060	\$35.90	LF6060B	\$39.90
.060"	.500"	1.00"	1/8"	2-1/2"	LF6060L	\$37.90	LF6060LB	\$41.90
.062" (1/16)	.312"	.625"	1/8"	2-1/2"	LF6062S	\$35.90	LF6062BS	\$39.90
.062" (1/16)	.500"	.750"	1/8"	2-1/2"	LF6062	\$35.90	LF6062B	\$39.90
.062" (1/16)	.500"	1.00"	1/8"	2-1/2"	LF6062L	\$37.90	LF6062LB	\$41.90
.065"	.500"	.750"	1/8"	2-1/2"	LF6065	\$35.90	LF6065B	\$39.90
.070"	.500"	.750"	1/8"	2-1/2"	LF6070	\$35.90	LF6070B	\$39.90
.075"	.500"	.750"	1/8"	2-1/2"	LF6075	\$35.90	LF6075B	\$39.90
.078" (5/64)	.500"	.750"	1/8"	2-1/2"	LF6078	\$35.90	LF6078B	\$39.90
.078" (5/64)	.500"	1.00"	1/8"	2-1/2"	LF6078L	\$37.90	LF6078LB	\$41.90
.090"	.500"	.750"	1/8"	2-1/2"	LF6090S	\$35.90	LF6090BS	\$39.90
.090"	.500"	1.00"	1/8"	2-1/2"	LF6090	\$37.90	LF6090B	\$41.90
.093" (3/32)	.500"	.750"	1/8"	2-1/2"	LF6093S	\$35.90	LF6093BS	\$39.90
.093" (3/32)	.500"	1.00"	1/8"	2-1/2"	LF6093	\$37.90	LF6093B	\$41.90
.125" (1/8)	.750"	1.25"	1/8"	3"	LF6125	\$35.30	LF6125B	\$39.30
.125" (1/8)	1.00"	1.50"	1/8"	3"	LF6125L	\$37.30	LF6125LB	\$41.30



4-FLUTE - STUB - LONG SHANK

Square & Ball End - UNCOATED - .015" to .125"



Length of Cut = 2 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015"	.030"	1/8"	2-1/2"	SF4015	\$27.25	SF4015B	\$31.50
.020"	.040"	1/8"	2-1/2"	SF4020	\$25.25	SF4020B	\$29.50
.025"	.050"	1/8"	2-1/2"	SF4025	\$24.25	SF4025B	\$28.25
.030"	.060"	1/8"	2-1/2"	SF4030	\$23.00	SF4030B	\$27.25
.031"	.062"	1/8"	2-1/2"	SF4031	\$23.00	SF4031B	\$27.25
.035"	.070"	1/8"	2-1/2"	SF4035	\$23.00	SF4035B	\$27.25
.040"	.080"	1/8"	2-1/2"	SF4040	\$23.00	SF4040B	\$27.25
.045"	.090"	1/8"	2-1/2"	SF4045	\$23.00	SF4045B	\$27.25
.047"	.094"	1/8"	2-1/2"	SF4047	\$23.00	SF4047B	\$27.25
.050"	.100"	1/8"	2-1/2"	SF4050	\$23.00	SF4050B	\$27.25
.060"	.120"	1/8"	2-1/2"	SF4060	\$23.00	SF4060B	\$27.25
.062"	.125"	1/8"	2-1/2"	SF4062	\$23.00	SF4062B	\$27.25
.065"	.130"	1/8"	2-1/2"	SF4065	\$23.00	SF4065B	\$27.25
.070"	.140"	1/8"	2-1/2"	SF4070	\$23.00	SF4070B	\$27.25
.075"	.150"	1/8"	2-1/2"	SF4075	\$23.00	SF4075B	\$27.25
.078"	.156"	1/8"	2-1/2"	SF4078	\$23.00	SF4078B	\$27.25
.090"	.180"	1/8"	2-1/2"	SF4090	\$23.00	SF4090B	\$27.25
.093"	.186"	1/8"	2-1/2"	SF4093	\$23.00	SF4093B	\$27.25
.125"	.250"	1/8"	2-1/2"	SF4125	\$23.00	SF4125B	\$27.25

Need Carbide Micro Drills for non-ferrous materials? See pages 160 to 161.

Designed for drilling in a wide variety of materials, including brass, aluminum, aluminum alloys, copper, and plastics.

- Size Range: .00197" (.05mm) - .0787" (2.0mm)
- Cutter Diameter Tolerance: +0/-0.0003"
- 1/8" Shank - 1-1/2" OAL



4-FLUTE - STUB - LONG SHANK



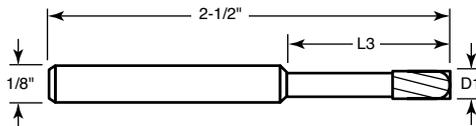
Square & Ball End - AITiN COATED - .015" to .125"



Length of Cut = 2 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015"	.030"	1/8"	2-1/2"	SF5015	\$31.50	SF5015B	\$35.75
.020"	.040"	1/8"	2-1/2"	SF5020	\$29.50	SF5020B	\$33.50
.025"	.050"	1/8"	2-1/2"	SF5025	\$27.25	SF5025B	\$31.50
.030"	.060"	1/8"	2-1/2"	SF5030	\$27.25	SF5030B	\$31.50
.031"	.062"	1/8"	2-1/2"	SF5031	\$27.25	SF5031B	\$31.50
.035"	.070"	1/8"	2-1/2"	SF5035	\$27.25	SF5035B	\$31.50
.040"	.080"	1/8"	2-1/2"	SF5040	\$27.25	SF5040B	\$31.50
.045"	.090"	1/8"	2-1/2"	SF5045	\$27.25	SF5045B	\$31.50
.047"	.094"	1/8"	2-1/2"	SF5047	\$27.25	SF5047B	\$31.50
.050"	.100"	1/8"	2-1/2"	SF5050	\$27.25	SF5050B	\$31.50
.060"	.120"	1/8"	2-1/2"	SF5060	\$27.25	SF5060B	\$31.50
.062"	.125"	1/8"	2-1/2"	SF5062	\$27.25	SF5062B	\$31.50
.065"	.130"	1/8"	2-1/2"	SF5065	\$27.25	SF5065B	\$31.50
.070"	.140"	1/8"	2-1/2"	SF5070	\$27.25	SF5070B	\$31.50
.075"	.150"	1/8"	2-1/2"	SF5075	\$27.25	SF5075B	\$31.50
.078"	.156"	1/8"	2-1/2"	SF5078	\$27.25	SF5078B	\$31.50
.090"	.180"	1/8"	2-1/2"	SF5090	\$27.25	SF5090B	\$31.50
.093"	.186"	1/8"	2-1/2"	SF5093	\$27.25	SF5093B	\$31.50
.125"	.250"	1/8"	2-1/2"	SF5125	\$27.25	SF5125B	\$31.50

ORDER SPECIAL Square & Ball End 4-Flute Stub LONG REACH MILLS



To order special long reach 4-flute stub end mills please specify:

1. Specify: Square End or Ball End.
2. Diameter (D1): _____ From above chart.
3. Overall Reach (L3): _____
4. Quantity (Minimum 6): _____

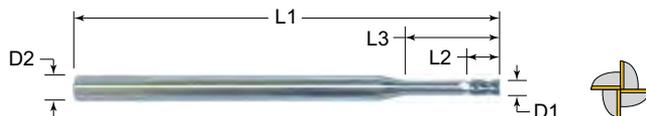
**Special Reaches
Shipped
within
24-48 Hours!**

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - STUB - LG SHANK - LG REACH

Square & Ball End - UNCOATED - .015" TO .047"



Length of Cut = 2 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.030"	.100"	1/8"	2-1/2"	SF3015-1	\$33.25	SF3015B-1	\$41.50
.015"	.030"	.125"	1/8"	2-1/2"	SF3015-2	\$33.25	SF3015B-2	\$41.50
.015"	.030"	.150"	1/8"	2-1/2"	SF3015-3	\$33.25	SF3015B-3	\$41.50
.015"	.030"	.175"	1/8"	2-1/2"	SF3015-4	\$34.25	SF3015B-4	\$42.75
.015"	.030"	.200"	1/8"	2-1/2"	SF3015-5	\$37.50	SF3015B-5	\$45.75
.020"	.040"	.100"	1/8"	2-1/2"	SF3020-1	\$31.50	SF3020B-1	\$38.75
.020"	.040"	.150"	1/8"	2-1/2"	SF3020-2	\$31.50	SF3020B-2	\$38.75
.020"	.040"	.200"	1/8"	2-1/2"	SF3020-3	\$33.25	SF3020B-3	\$41.00
.020"	.040"	.250"	1/8"	2-1/2"	SF3020-4	\$33.25	SF3020B-4	\$41.00
.025"	.050"	.125"	1/8"	2-1/2"	SF3025-1	\$30.50	SF3025B-1	\$34.75
.025"	.050"	.200"	1/8"	2-1/2"	SF3025-2	\$30.50	SF3025B-2	\$34.75
.025"	.050"	.250"	1/8"	2-1/2"	SF3025-3	\$30.50	SF3025B-3	\$34.75
.030"	.060"	.150"	1/8"	2-1/2"	SF3030-1	\$30.50	SF3030B-1	\$34.75
.030"	.060"	.200"	1/8"	2-1/2"	SF3030-2	\$30.50	SF3030B-2	\$34.75
.030"	.060"	.250"	1/8"	2-1/2"	SF3030-3	\$30.50	SF3030B-3	\$34.75
.030"	.060"	.300"	1/8"	2-1/2"	SF3030-4	\$31.50	SF3030B-4	\$35.75
.031"	.062"	.150"	1/8"	2-1/2"	SF3031-1	\$30.50	SF3031B-1	\$34.75
.031"	.062"	.200"	1/8"	2-1/2"	SF3031-2	\$30.50	SF3031B-2	\$34.75
.031"	.062"	.250"	1/8"	2-1/2"	SF3031-3	\$30.50	SF3031B-3	\$34.75
.031"	.062"	.300"	1/8"	2-1/2"	SF3031-4	\$31.50	SF3031B-4	\$35.75
.035"	.070"	.175"	1/8"	2-1/2"	SF3035-1	\$30.50	SF3035B-1	\$34.75
.035"	.070"	.225"	1/8"	2-1/2"	SF3035-2	\$30.50	SF3035B-2	\$34.75
.035"	.070"	.280"	1/8"	2-1/2"	SF3035-3	\$30.50	SF3035B-3	\$34.75
.035"	.070"	.350"	1/8"	2-1/2"	SF3035-4	\$31.50	SF3035B-4	\$35.75
.040"	.080"	.200"	1/8"	2-1/2"	SF3040-1	\$30.50	SF3040B-1	\$34.75
.040"	.080"	.260"	1/8"	2-1/2"	SF3040-2	\$30.50	SF3040B-2	\$34.75
.040"	.080"	.325"	1/8"	2-1/2"	SF3040-3	\$30.50	SF3040B-3	\$34.75
.040"	.080"	.400"	1/8"	2-1/2"	SF3040-4	\$31.00	SF3040B-4	\$35.25
.045"	.090"	.225"	1/8"	2-1/2"	SF3045-1	\$30.00	SF3045B-1	\$34.25
.045"	.090"	.300"	1/8"	2-1/2"	SF3045-2	\$30.00	SF3045B-2	\$34.25
.045"	.090"	.375"	1/8"	2-1/2"	SF3045-3	\$30.00	SF3045B-3	\$34.25
.045"	.090"	.450"	1/8"	2-1/2"	SF3045-4	\$31.00	SF3045B-4	\$35.25
.047"	.094"	.250"	1/8"	2-1/2"	SF3047-1	\$30.00	SF3047B-1	\$34.25
.047"	.094"	.310"	1/8"	2-1/2"	SF3047-2	\$30.00	SF3047B-2	\$34.25
.047"	.094"	.375"	1/8"	2-1/2"	SF3047-3	\$30.00	SF3047B-3	\$34.25
.047"	.094"	.450"	1/8"	2-1/2"	SF3047-4	\$30.00	SF3047B-4	\$34.25
.047"	.094"	.500"	1/8"	2-1/2"	SF3047-5	\$31.00	SF3047B-5	\$35.25

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4-FLUTE - STUB - LG SHANK - LG REACH



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Square & Ball End - Uncoated Size Range: .050" to .125"



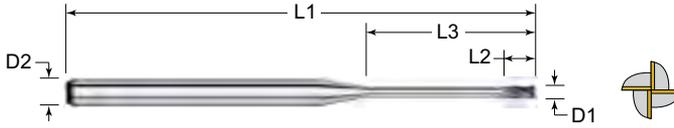
Tools feature an undercut neck
for clearance.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.050"	.100"	.250"	1/8"	2-1/2"	SF3050-1	\$30.00	SF3050B-1	\$34.25
.050"	.100"	.400"	1/8"	2-1/2"	SF3050-2	\$30.00	SF3050B-2	\$34.25
.050"	.100"	.500"	1/8"	2-1/2"	SF3050-3	\$31.00	SF3050B-3	\$35.25
.060"	.120"	.300"	1/8"	2-1/2"	SF3060-1	\$30.00	SF3060B-1	\$34.25
.060"	.120"	.400"	1/8"	2-1/2"	SF3060-2	\$30.00	SF3060B-2	\$34.25
.060"	.120"	.500"	1/8"	2-1/2"	SF3060-3	\$30.00	SF3060B-3	\$34.25
.062"	.125"	.325"	1/8"	2-1/2"	SF3062-1	\$30.00	SF3062B-1	\$34.25
.062"	.125"	.400"	1/8"	2-1/2"	SF3062-2	\$30.00	SF3062B-2	\$34.25
.062"	.125"	.475"	1/8"	2-1/2"	SF3062-3	\$30.00	SF3062B-3	\$34.25
.062"	.125"	.550"	1/8"	2-1/2"	SF3062-4	\$30.00	SF3062B-4	\$34.25
.062"	.125"	.625"	1/8"	2-1/2"	SF3062-5	\$31.00	SF3062B-5	\$35.25
.065"	.130"	.350"	1/8"	2-1/2"	SF3065-1	\$30.00	SF3065B-1	\$34.25
.065"	.130"	.500"	1/8"	2-1/2"	SF3065-2	\$30.00	SF3065B-2	\$34.25
.065"	.130"	.650"	1/8"	2-1/2"	SF3065-3	\$31.00	SF3065B-3	\$35.25
.070"	.140"	.350"	1/8"	2-1/2"	SF3070-1	\$30.00	SF3070B-1	\$34.25
.070"	.140"	.450"	1/8"	2-1/2"	SF3070-2	\$30.00	SF3070B-2	\$34.25
.070"	.140"	.550"	1/8"	2-1/2"	SF3070-3	\$30.00	SF3070B-3	\$34.25
.070"	.140"	.650"	1/8"	2-1/2"	SF3070-4	\$31.00	SF3070B-4	\$35.25
.075"	.150"	.375"	1/8"	2-1/2"	SF3075-1	\$30.00	SF3075B-1	\$34.25
.075"	.150"	.475"	1/8"	2-1/2"	SF3075-2	\$30.00	SF3075B-2	\$34.25
.075"	.150"	.625"	1/8"	2-1/2"	SF3075-3	\$30.00	SF3075B-3	\$34.25
.075"	.150"	.750"	1/8"	2-1/2"	SF3075-4	\$31.00	SF3075B-4	\$35.25
.078"	.156"	.400"	1/8"	2-1/2"	SF3078-1	\$30.00	SF3078B-1	\$34.25
.078"	.156"	.500"	1/8"	2-1/2"	SF3078-2	\$30.00	SF3078B-2	\$34.25
.078"	.156"	.625"	1/8"	2-1/2"	SF3078-3	\$30.00	SF3078B-3	\$34.25
.078"	.156"	.750"	1/8"	2-1/2"	SF3078-4	\$31.00	SF3078B-4	\$35.25
.090"	.180"	.450"	1/8"	2-1/2"	SF3090-1	\$30.00	SF3090B-1	\$34.25
.090"	.180"	.550"	1/8"	2-1/2"	SF3090-2	\$30.00	SF3090B-2	\$34.25
.090"	.180"	.650"	1/8"	2-1/2"	SF3090-3	\$30.00	SF3090B-3	\$34.25
.090"	.180"	.750"	1/8"	2-1/2"	SF3090-4	\$31.00	SF3090B-4	\$35.25
.093"	.186"	.500"	1/8"	2-1/2"	SF3093-1	\$30.00	SF3093B-1	\$34.25
.093"	.186"	.600"	1/8"	2-1/2"	SF3093-2	\$30.00	SF3093B-2	\$34.25
.093"	.186"	.750"	1/8"	2-1/2"	SF3093-3	\$30.00	SF3093B-3	\$34.25
.093"	.186"	.900"	1/8"	2-1/2"	SF3093-4	\$31.00	SF3093B-4	\$35.25
.125"	.250"	.750"	1/8"	2-1/2"	SF3125-1	\$30.00	SF3125B-1	\$34.25
.125"	.250"	1.000"	1/8"	2-1/2"	SF3125-2	\$30.00	SF3125B-2	\$34.25



4-FLUTE - STUB - LG SHANK - LG REACH

Square & Ball End - **AITiN COATED** - .015" TO .047"



Length of Cut as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.030"	.100"	1/8"	2-1/2"	SF6015-1	\$37.50	SF6015B-1	\$45.75
.015"	.030"	.125"	1/8"	2-1/2"	SF6015-2	\$37.50	SF6015B-2	\$45.75
.015"	.030"	.150"	1/8"	2-1/2"	SF6015-3	\$37.50	SF6015B-3	\$45.75
.015"	.030"	.175"	1/8"	2-1/2"	SF6015-4	\$38.50	SF6015B-4	\$46.75
.015"	.030"	.200"	1/8"	2-1/2"	SF6015-5	\$41.50	SF6015B-5	\$50.00
.020"	.040"	.100"	1/8"	2-1/2"	SF6020-1	\$35.75	SF6020B-1	\$43.00
.020"	.040"	.150"	1/8"	2-1/2"	SF6020-2	\$35.75	SF6020B-2	\$43.00
.020"	.040"	.200"	1/8"	2-1/2"	SF6020-3	\$37.50	SF6020B-3	\$45.25
.020"	.040"	.250"	1/8"	2-1/2"	SF6020-4	\$37.50	SF6020B-4	\$45.25
.025"	.050"	.125"	1/8"	2-1/2"	SF6025-1	\$34.75	SF6025B-1	\$38.75
.025"	.050"	.200"	1/8"	2-1/2"	SF6025-2	\$34.75	SF6025B-2	\$38.75
.025"	.050"	.250"	1/8"	2-1/2"	SF6025-3	\$34.75	SF6025B-3	\$38.75
.030"	.060"	.150"	1/8"	2-1/2"	SF6030-1	\$34.75	SF6030B-1	\$38.75
.030"	.060"	.200"	1/8"	2-1/2"	SF6030-2	\$34.75	SF6030B-2	\$38.75
.030"	.060"	.250"	1/8"	2-1/2"	SF6030-3	\$34.75	SF6030B-3	\$38.75
.030"	.060"	.300"	1/8"	2-1/2"	SF6030-4	\$35.75	SF6030B-4	\$40.00
.031"	.062"	.150"	1/8"	2-1/2"	SF6031-1	\$34.75	SF6031B-1	\$38.75
.031"	.062"	.200"	1/8"	2-1/2"	SF6031-2	\$34.75	SF6031B-2	\$38.75
.031"	.062"	.250"	1/8"	2-1/2"	SF6031-3	\$34.75	SF6031B-3	\$38.75
.031"	.062"	.300"	1/8"	2-1/2"	SF6031-4	\$35.75	SF6031B-4	\$40.00
.035"	.070"	.175"	1/8"	2-1/2"	SF6035-1	\$34.75	SF6035B-1	\$38.75
.035"	.070"	.225"	1/8"	2-1/2"	SF6035-2	\$34.75	SF6035B-2	\$38.75
.035"	.070"	.280"	1/8"	2-1/2"	SF6035-3	\$34.75	SF6035B-3	\$38.75
.035"	.070"	.350"	1/8"	2-1/2"	SF6035-4	\$35.75	SF6035B-4	\$40.00
.040"	.080"	.200"	1/8"	2-1/2"	SF6040-1	\$34.75	SF6040B-1	\$38.75
.040"	.080"	.260"	1/8"	2-1/2"	SF6040-2	\$34.75	SF6040B-2	\$38.75
.040"	.080"	.325"	1/8"	2-1/2"	SF6040-3	\$34.75	SF6040B-3	\$38.75
.040"	.080"	.400"	1/8"	2-1/2"	SF6040-4	\$35.25	SF6040B-4	\$39.50
.045"	.090"	.225"	1/8"	2-1/2"	SF6045-1	\$34.25	SF6045B-1	\$38.50
.045"	.090"	.300"	1/8"	2-1/2"	SF6045-2	\$34.25	SF6045B-2	\$38.50
.045"	.090"	.375"	1/8"	2-1/2"	SF6045-3	\$34.25	SF6045B-3	\$38.50
.045"	.090"	.450"	1/8"	2-1/2"	SF6045-4	\$35.25	SF6045B-4	\$39.50
.047"	.094"	.250"	1/8"	2-1/2"	SF6047-1	\$34.25	SF6047B-1	\$38.50
.047"	.094"	.310"	1/8"	2-1/2"	SF6047-2	\$34.25	SF6047B-2	\$38.50
.047"	.094"	.375"	1/8"	2-1/2"	SF6047-3	\$34.25	SF6047B-3	\$38.50
.047"	.094"	.450"	1/8"	2-1/2"	SF6047-4	\$34.25	SF6047B-4	\$38.50
.047"	.094"	.500"	1/8"	2-1/2"	SF6047-5	\$35.25	SF6047B-5	\$39.50

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4-FLUTE - STUB - LG SHANK - LG REACH



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Square & Ball End - AITiN COATED Size Range: .050" to .125"



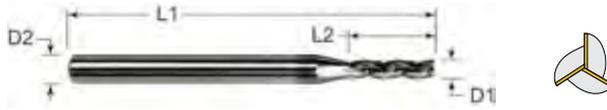
Tools feature an undercut neck for clearance.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.050"	.100"	.250"	1/8"	2-1/2"	SF6050-1	\$34.25	SF6050B-1	\$38.50
.050"	.100"	.400"	1/8"	2-1/2"	SF6050-2	\$34.25	SF6050B-2	\$38.50
.050"	.100"	.500"	1/8"	2-1/2"	SF6050-3	\$35.25	SF6050B-3	\$38.50
.060"	.120"	.300"	1/8"	2-1/2"	SF6060-1	\$34.25	SF6060B-1	\$38.50
.060"	.120"	.400"	1/8"	2-1/2"	SF6060-2	\$34.25	SF6060B-2	\$38.50
.060"	.120"	.500"	1/8"	2-1/2"	SF6060-3	\$34.25	SF6060B-3	\$38.50
.062"	.125"	.325"	1/8"	2-1/2"	SF6062-1	\$34.25	SF6062B-1	\$38.50
.062"	.125"	.400"	1/8"	2-1/2"	SF6062-2	\$34.25	SF6062B-2	\$38.50
.062"	.125"	.475"	1/8"	2-1/2"	SF6062-3	\$34.25	SF6062B-3	\$38.50
.062"	.125"	.550"	1/8"	2-1/2"	SF6062-4	\$34.25	SF6062B-4	\$38.50
.062"	.125"	.625"	1/8"	2-1/2"	SF6062-5	\$35.25	SF6062B-5	\$39.50
.065"	.130"	.350"	1/8"	2-1/2"	SF6065-1	\$34.25	SF6065B-1	\$38.50
.065"	.130"	.500"	1/8"	2-1/2"	SF6065-2	\$34.25	SF6065B-2	\$38.50
.065"	.130"	.650"	1/8"	2-1/2"	SF6065-3	\$35.25	SF6065B-3	\$39.50
.070"	.140"	.350"	1/8"	2-1/2"	SF6070-1	\$34.25	SF6070B-1	\$38.50
.070"	.140"	.450"	1/8"	2-1/2"	SF6070-2	\$34.25	SF6070B-2	\$38.50
.070"	.140"	.550"	1/8"	2-1/2"	SF6070-3	\$34.25	SF6070B-3	\$38.50
.070"	.140"	.650"	1/8"	2-1/2"	SF6070-4	\$35.25	SF6070B-4	\$39.50
.075"	.150"	.375"	1/8"	2-1/2"	SF6075-1	\$34.25	SF6075B-1	\$38.50
.075"	.150"	.475"	1/8"	2-1/2"	SF6075-2	\$34.25	SF6075B-2	\$38.50
.075"	.150"	.625"	1/8"	2-1/2"	SF6075-3	\$34.25	SF6075B-3	\$38.50
.075"	.150"	.750"	1/8"	2-1/2"	SF6075-4	\$35.25	SF6075B-4	\$39.50
.078"	.156"	.400"	1/8"	2-1/2"	SF6078-1	\$34.25	SF6078B-1	\$38.50
.078"	.156"	.500"	1/8"	2-1/2"	SF6078-2	\$34.25	SF6078B-2	\$38.50
.078"	.156"	.625"	1/8"	2-1/2"	SF6078-3	\$34.25	SF6078B-3	\$38.50
.078"	.156"	.750"	1/8"	2-1/2"	SF6078-4	\$35.25	SF6078B-4	\$39.50
.090"	.180"	.450"	1/8"	2-1/2"	SF6090-1	\$34.25	SF6090B-1	\$38.50
.090"	.180"	.550"	1/8"	2-1/2"	SF6090-2	\$34.25	SF6090B-2	\$38.50
.090"	.180"	.650"	1/8"	2-1/2"	SF6090-3	\$34.25	SF6090B-3	\$38.50
.090"	.180"	.750"	1/8"	2-1/2"	SF6090-4	\$35.25	SF6090B-4	\$39.50
.093"	.186"	.500"	1/8"	2-1/2"	SF6093-1	\$34.25	SF6093B-1	\$38.50
.093"	.186"	.600"	1/8"	2-1/2"	SF6093-2	\$34.25	SF6093B-2	\$38.50
.093"	.186"	.750"	1/8"	2-1/2"	SF6093-3	\$34.25	SF6093B-3	\$38.50
.093"	.186"	.900"	1/8"	2-1/2"	SF6093-4	\$35.25	SF6093B-4	\$39.50
.125"	.250"	.750"	1/8"	2-1/2"	SF6125-1	\$34.25	SF6125B-1	\$38.50
.125"	.250"	1.000"	1/8"	2-1/2"	SF6125-2	\$34.25	SF6125B-2	\$38.50



3-FLUTE - VARIABLE HELIX

Standard Length - Square & Ball - **AlTiN COATED** - .015" to .125"



Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
.015"	.045"	1/8"	1-1/2"	59615	\$34.50	59615B	\$38.50
.020"	.060"	1/8"	1-1/2"	59620	\$31.50	59620B	\$35.50
.025"	.075"	1/8"	1-1/2"	59625	\$31.50	59625B	\$35.50
.031"	.093"	1/8"	1-1/2"	59631	\$25.50	59631B	\$29.50
.035"	.105"	1/8"	1-1/2"	59635	\$25.50	59635B	\$29.50
.040"	.120"	1/8"	1-1/2"	59640	\$25.50	59640B	\$29.50
.047"	.141"	1/8"	1-1/2"	59647	\$24.50	59647B	\$28.50
.062"	.186"	1/8"	1-1/2"	59662	\$24.50	59662B	\$28.50
.078"	.234"	1/8"	1-1/2"	59678	\$24.50	59678B	\$28.50
.093"	.279"	1/8"	1-1/2"	59693	\$24.50	59693B	\$28.50
.125"(1/8")	.375"	1/8"	1-1/2"	59612	\$24.50	59612B	\$28.50

CUTTER DIAMETER TOLERANCE: DECIMAL SIZES +/- .0005" - FRACTIONAL SIZES: +000"/-.002"

Locate Your Distributor

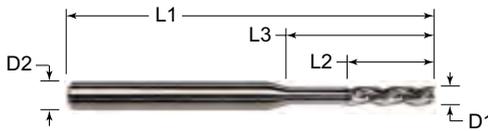


Microcut products are sold by cutting tool distributors in the U.S. and Canada. These distributors are selected because of their expertise in cutting tools and are available to assist you in your standard and special cutting tools. It's easy to locate a local distributor. Just visit our website at www.microcutUSA.com and select "Locate a Distributor". Enter your Zip code, or select your state in the U.S. or province in Canada and choose a distributor that can process your order quickly and forward it on to the Microcut Sales Dept. We will process your order and ship the tools directly to you on the same day from our warehouse, or manufacture the specialty product as listed in the catalog within the lead time published or quoted.

3-FLUTE - VARIABLE HELIX - LONG REACH



Long Reach - Square & Ball - AITiN COATED - .015" to .125"



Minimum
3 Tools
Each Size



Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
.015"	.045"	.080"	1/8"	1-1/2"	3315-080	\$42.90	3415-080	\$46.90
.015"	.045"	.125"	1/8"	1-1/2"	3315-125	\$44.90	3415-125	\$48.90
.020"	.060"	.100"	1/8"	1-1/2"	3320-100	\$41.50	3420-100	\$45.50
.020"	.060"	.150"	1/8"	1-1/2"	3320-150	\$41.50	3420-150	\$45.50
.025"	.075"	.125"	1/8"	1-1/2"	3325-125	\$41.50	3425-125	\$45.50
.025"	.075"	.175"	1/8"	1-1/2"	3325-175	\$41.50	3425-175	\$45.50
.031"	.093"	.150"	1/8"	1-1/2"	3331-150	\$36.90	3431-150	\$40.90
.031"	.093"	.200"	1/8"	1-1/2"	3331-200	\$36.90	3431-200	\$40.90
.031"	.093"	.250"	1/8"	1-1/2"	3331-250	\$37.90	3431-250	\$41.90
.035"	.105"	.200"	1/8"	1-1/2"	3335-200	\$36.90	3435-200	\$40.90
.035"	.105"	.250"	1/8"	1-1/2"	3335-250	\$37.90	3435-250	\$41.90
.040"	.120"	.200"	1/8"	1-1/2"	3340-200	\$36.90	3440-200	\$40.90
.040"	.120"	.275"	1/8"	1-1/2"	3340-275	\$37.90	3440-275	\$41.90
.047"	.141"	.250"	1/8"	1-1/2"	3347-250	\$36.90	3447-250	\$40.90
.047"	.141"	.350"	1/8"	1-1/2"	3347-350	\$36.90	3447-350	\$40.90
.062"	.186"	.400"	1/8"	1-1/2"	3362-400	\$34.50	3462-400	\$38.50
.062"	.186"	.500"	1/8"	1-1/2"	3362-500	\$34.50	3462-500	\$40.50
.062"	.186"	.600"	1/8"	1-1/2"	3362-600	\$36.50	3462-600	\$40.50
.078"	.234"	.400"	1/8"	1-1/2"	3378-400	\$34.50	3478-400	\$38.50
.078"	.234"	.500"	1/8"	1-1/2"	3378-500	\$34.50	3478-500	\$38.50
.078"	.234"	.600"	1/8"	1-1/2"	3378-600	\$36.50	3478-600	\$40.50
.093"	.279"	.500"	1/8"	1-1/2"	3393-500	\$36.50	3493-500	\$40.50
.093"	.279"	.600"	1/8"	1-1/2"	3393-600	\$36.50	3493-600	\$40.50
.125"(1/8")	.375"	.650"	1/8"	1-1/2"	3325-650	\$34.50	3425-650	\$38.50

Tools are custom manufactured to order and are nonreturnable.



3-FLUTE - VARIABLE HELIX - CORNER RAD

Stub & Standard LOC - AITiN COATED - .015" to .125"



Corner radius helps prevent chipping at corners at high feeds and speeds.

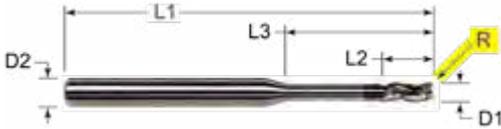
Multiple Lengths of Cut - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.023"	.003"	1/8"	1-1/2"	59705	\$36.25
.015"	.045"	.003"	1/8"	1-1/2"	59715	\$38.50
.020"	.030"	.005"	1/8"	1-1/2"	59702	\$33.25
.020"	.060"	.005"	1/8"	1-1/2"	59720	\$33.25
.025"	.038"	.005"	1/8"	1-1/2"	59725	\$33.25
.025"	.075"	.005"	1/8"	1-1/2"	59735	\$33.25
.031"	.046"	.005"	1/8"	1-1/2"	59701	\$27.00
.031"	.093"	.005"	1/8"	1-1/2"	59731	\$27.00
.040"	.060"	.005"	1/8"	1-1/2"	59704	\$27.00
.040"	.120"	.005"	1/8"	1-1/2"	59740	\$27.00
.047"	.070"	.005"	1/8"	1-1/2"	59707	\$27.00
.047"	.141"	.005"	1/8"	1-1/2"	59747	\$27.00
.062"	.093"	.005"	1/8"	1-1/2"	59762	\$25.75
.062"	.186"	.005"	1/8"	1-1/2"	59772	\$25.75
.062"	.093"	.010"	1/8"	1-1/2"	59782	\$25.75
.062"	.186"	.010"	1/8"	1-1/2"	59792	\$25.75
.078"	.117"	.005"	1/8"	1-1/2"	59708	\$25.75
.078"	.234"	.005"	1/8"	1-1/2"	59718	\$25.75
.078"	.117"	.010"	1/8"	1-1/2"	59728	\$25.75
.078"	.234"	.010"	1/8"	1-1/2"	59778	\$25.75
.093"	.139"	.005"	1/8"	1-1/2"	59703	\$25.75
.093"	.279"	.005"	1/8"	1-1/2"	59723	\$25.75
.093"	.139"	.010"	1/8"	1-1/2"	59733	\$25.75
.093"	.279"	.010"	1/8"	1-1/2"	59793	\$25.75
.125"	.187"	.015"	1/8"	1-1/2"	59712	\$25.75
.125"	.375"	.015"	1/8"	1-1/2"	59722	\$25.75

3-FLUTE - STUB - CORNER RAD - LONG RCH



Stub - Corner Radius - AITiN COATED - .015" to .125"



Minimum
3 Tools
Each Size

**Shipped
Within 24-48
Hours**

Flute Length = 1.5 x Diameter or as specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	L3 Reach From Tip	D2 Shank Dia.	L1 Over All Length	Tool Number	Price Each
.015"	.023"	.003"	.080"	1/8"	1-1/2"	59705-080	\$45.25
.015"	.023"	.003"	.125"	1/8"	1-1/2"	59705-125	\$47.25
.020"	.030"	.005"	.100"	1/8"	1-1/2"	59702-100	\$43.75
.020"	.030"	.005"	.150"	1/8"	1-1/2"	59702-150	\$43.75
.025"	.038"	.005"	.125"	1/8"	1-1/2"	59725-125	\$43.75
.025"	.038"	.005"	.175"	1/8"	1-1/2"	59725-175	\$43.75
.031"	.046"	.005"	.150"	1/8"	1-1/2"	59701-150	\$38.75
.031"	.046"	.005"	.200"	1/8"	1-1/2"	59701-200	\$38.75
.031"	.046"	.005"	.250"	1/8"	1-1/2"	59701-250	\$40.00
.040"	.060"	.005"	.200"	1/8"	1-1/2"	59704-200	\$38.75
.040"	.060"	.005"	.275"	1/8"	1-1/2"	59704-275	\$38.75
.047"	.070"	.005"	.250"	1/8"	1-1/2"	59707-250	\$38.75
.047"	.070"	.005"	.350"	1/8"	1-1/2"	59707-350	\$38.75
.062"	.093"	.005"	.400"	1/8"	1-1/2"	59762-400	\$36.25
.062"	.093"	.005"	.500"	1/8"	1-1/2"	59762-500	\$36.25
.062"	.093"	.005"	.600"	1/8"	1-1/2"	59762-600	\$38.50
.062"	.093"	.010"	.400"	1/8"	1-1/2"	59782-400	\$36.25
.062"	.093"	.010"	.500"	1/8"	1-1/2"	59782-500	\$36.25
.062"	.093"	.010"	.600"	1/8"	1-1/2"	59782-600	\$38.50
.078"	.117"	.005"	.400"	1/8"	1-1/2"	59708-400	\$36.25
.078"	.117"	.005"	.500"	1/8"	1-1/2"	59708-500	\$36.25
.078"	.117"	.005"	.600"	1/8"	1-1/2"	59708-600	\$38.50
.078"	.117"	.010"	.400"	1/8"	1-1/2"	59728-400	\$36.25
.078"	.117"	.010"	.500"	1/8"	1-1/2"	59728-500	\$36.25
.078"	.117"	.010"	.600"	1/8"	1-1/2"	59728-600	\$38.50
.093"	.139"	.005"	.500"	1/8"	1-1/2"	59703-500	\$36.25
.093"	.139"	.005"	.650"	1/8"	1-1/2"	59703-650	\$38.50
.093"	.139"	.010"	.500"	1/8"	1-1/2"	59733-500	\$36.25
.093"	.139"	.010"	.650"	1/8"	1-1/2"	59733-650	\$38.50
.125"(1/8")	.187"	.015"	.650"	1/8"	1-1/2"	59712-650	\$38.50

Tools are custom manufactured to order and are nonreturnable.



3-FLT - VARIABLE HELIX - LG SHK - LG FLT

Square & Ball End - AITiN COATED - .015" to .125"



Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
.015" (1/64)	.075"	1/8"	2-1/2"	LV2015	\$36.25	LV2015B	\$40.75
.020"	.100"	1/8"	2-1/2"	LV2020	\$31.75	LV2020B	\$38.00
.025"	.125"	1/8"	2-1/2"	LV2025	\$30.25	LV2025B	\$34.00
.031" (1/32)	.156"	1/8"	2-1/2"	LV2031	\$29.25	LV2031B	\$33.50
.040"	.200"	1/8"	2-1/2"	LV2040	\$29.25	LV2040B	\$33.50
.045"	.225"	1/8"	2-1/2"	LV2045	\$29.25	LV2045B	\$33.50
.047" (3/64)	.250"	1/8"	2-1/2"	LV2047	\$29.25	LV2047B	\$33.50
.060"	.310"	1/8"	2-1/2"	LV2060S	\$27.00	LV2060SB	\$30.75
.060"	.500"	1/8"	2-1/2"	LV2060	\$29.25	LV2060B	\$28.50
.062" (1/16)	.312"	1/8"	2-1/2"	LV2062S	\$27.00	LV2062SB	\$30.75
.062" (1/16)	.500"	1/8"	2-1/2"	LV2062	\$29.25	LV2062B	\$33.00
.078" (5/64)	.500"	1/8"	2-1/2"	LV2078	\$28.25	LV2078B	\$33.00
.093" (3/32)	.500"	1/8"	2-1/2"	LV2093	\$28.25	LV2093B	\$33.00
.118" (3mm)	.625"	1/8"	2-1/2"	LV2018	\$28.25	LV2018B	\$33.00
.125" (1/8)	.625"	1/8"	2-1/2"	LV2012S	\$27.00	LV2012SB	\$30.75
.125" (1/8)	.750"	1/8"	2-1/2"	LV2012	\$28.25	LV2012B	\$32.00

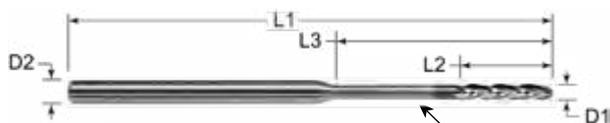


Microcut continues to lead the way in new product development for today's CNC tooling requirements.

3-FLT - VAR HELIX - LG RCH - LG FLT - LG SHK



Square & Ball End - AITiN COATED - 2-1/2" OAL - .015" to .125"



Tools feature an undercut neck for clearance.



Minimum
3 Tools
Each Size



Center Cutting – Micro Grain Carbide – Made in USA

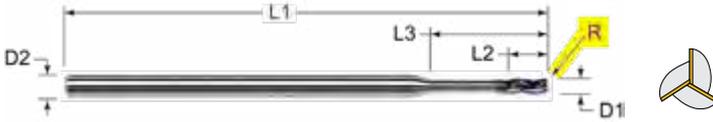
D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.075"	.125"	1/8"	2-1/2"	3515-125	\$41.75	3615-125	\$48.50
.015" (1/64)	.075"	.175"	1/8"	2-1/2"	3515-175	\$41.75	3615-175	\$48.50
.020"	.100"	.150"	1/8"	2-1/2"	3520-150	\$37.50	3620-150	\$44.00
.020"	.100"	.200"	1/8"	2-1/2"	3520-200	\$39.50	3620-200	\$46.25
.025"	.125"	.200"	1/8"	2-1/2"	3525-200	\$36.25	3625-200	\$40.75
.025"	.125"	.250"	1/8"	2-1/2"	3525-250	\$37.50	3625-250	\$41.75
.031" (1/32)	.150"	.250"	1/8"	2-1/2"	3531-250	\$36.25	3631-250	\$40.75
.031" (1/32)	.150"	.300"	1/8"	2-1/2"	3531-300	\$39.50	3631-300	\$44.00
.040"	.200"	.350"	1/8"	2-1/2"	3540-350	\$36.25	3640-350	\$40.75
.040"	.200"	.400"	1/8"	2-1/2"	3540-400	\$36.25	3640-400	\$40.75
.045"	.225"	.350"	1/8"	2-1/2"	3545-350	\$36.25	3645-350	\$40.75
.045"	.225"	.400"	1/8"	2-1/2"	3545-400	\$36.25	3645-400	\$40.75
.047" (3/64)	.250"	.400"	1/8"	2-1/2"	3547-400	\$36.25	3647-400	\$40.75
.047" (3/64)	.250"	.500"	1/8"	2-1/2"	3547-500	\$40.75	3647-500	\$45.00
.060"	.500"	.650"	1/8"	2-1/2"	3560-650	\$36.25	3660-650	\$40.75
.060"	.500"	.750"	1/8"	2-1/2"	3560-750	\$36.25	3660-750	\$40.75
.062" (1/16)	.500"	.650"	1/8"	2-1/2"	3562-650	\$36.25	3662-650	\$40.75
.062" (1/16)	.500"	.750"	1/8"	2-1/2"	3562-750	\$36.25	3662-750	\$40.75
.062" (1/16)	.500"	.850"	1/8"	2-1/2"	3562-850	\$38.50	3662-850	\$43.00
.062" (1/16)	.500"	1.00"	1/8"	2-1/2"	3562-100	\$40.75	3662-100	\$45.00
.078" (5/64)	.500"	.750"	1/8"	2-1/2"	3578-750	\$36.25	3678-750	\$40.75
.078" (5/64)	.500"	.850"	1/8"	2-1/2"	3578-850	\$38.50	3678-850	\$43.00
.078" (5/64)	.500"	1.00"	1/8"	2-1/2"	3578-100	\$40.75	3678-100	\$45.00
.093" (3/32)	.500"	.750"	1/8"	2-1/2"	3593-750	\$36.25	3693-750	\$40.75
.093" (3/32)	.500"	.850"	1/8"	2-1/2"	3593-850	\$38.50	3693-850	\$43.00
.093" (3/32)	.500"	1.00"	1/8"	2-1/2"	3593-100	\$40.75	3693-100	\$45.00
.125" (1/8)	.750"	1.25"	1/8"	2-1/2"	3512-125	\$36.25	3612-125	\$40.75
.125" (1/8)	.750"	1.50"	1/8"	2-1/2"	3512-150	\$40.75	3612-150	\$45.00

Tools are custom manufactured to order and are nonreturnable.



3-FLT - VHLX - STUB - CRN RAD - LG RCH & SHK

Stub - Corner Radius - AITiN COATED - .015" to .078"



Minimum
3 Tools
Each Size

Shipped
Within 24-48
Hours

Flute Length = 1.5 x Diameter or as specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter +/- .0005"	R Corner Radius +/- .001"	L2 Length of Cut +.010"-.000"	L3 Reach From Tip	D2 Shank Dia.	L1 Over All Length	Tool Number	Price Each
.015"	.003"	.023"	.080"	1/8"	2-1/2"	3015-080	\$49.50
.015"	.003"	.023"	.125"	1/8"	2-1/2"	3015-125	\$49.50
.020"	.005"	.030"	.100"	1/8"	2-1/2"	3020-100	\$44.00
.020"	.005"	.030"	.150"	1/8"	2-1/2"	3020-150	\$44.00
.025"	.005"	.038"	.100"	1/8"	2-1/2"	3025-100	\$44.00
.025"	.005"	.038"	.150"	1/8"	2-1/2"	3025-150	\$44.00
.031"	.005"	.046"	.150"	1/8"	2-1/2"	3031-150	\$41.75
.031"	.005"	.046"	.200"	1/8"	2-1/2"	3031-200	\$41.75
.031"	.005"	.046"	.250"	1/8"	2-1/2"	3031-250	\$41.75
.047"	.005"	.070"	.200"	1/8"	2-1/2"	3047-200	\$40.75
.047"	.005"	.070"	.250"	1/8"	2-1/2"	3047-250	\$40.75
.047"	.005"	.070"	.300"	1/8"	2-1/2"	3047-300	\$40.75
.047"	.005"	.070"	.350"	1/8"	2-1/2"	3047-350	\$40.75
.047"	.005"	.070"	.400"	1/8"	2-1/2"	3047-400	\$41.75
.047"	.005"	.070"	.450"	1/8"	2-1/2"	3047-450	\$41.75
.047"	.010"	.070"	.200"	1/8"	2-1/2"	3147-200	\$40.75
.047"	.010"	.070"	.250"	1/8"	2-1/2"	3147-250	\$40.75
.047"	.010"	.070"	.300"	1/8"	2-1/2"	3147-300	\$40.75
.047"	.010"	.070"	.350"	1/8"	2-1/2"	3147-350	\$40.75
.047"	.010"	.070"	.400"	1/8"	2-1/2"	3147-400	\$41.75
.047"	.010"	.070"	.450"	1/8"	2-1/2"	3147-450	\$41.75
.062"	.005"	.094"	.300"	1/8"	2-1/2"	3062-300	\$40.75
.062"	.005"	.094"	.400"	1/8"	2-1/2"	3062-400	\$40.75
.062"	.005"	.094"	.500"	1/8"	2-1/2"	3062-500	\$40.75
.062"	.005"	.094"	.600"	1/8"	2-1/2"	3062-600	\$41.75
.062"	.005"	.094"	.750"	1/8"	2-1/2"	3062-750	\$41.75
.062"	.010"	.094"	.300"	1/8"	2-1/2"	3162-300	\$40.75
.062"	.010"	.094"	.400"	1/8"	2-1/2"	3162-400	\$40.75
.062"	.010"	.094"	.500"	1/8"	2-1/2"	3162-500	\$40.75
.062"	.010"	.094"	.600"	1/8"	2-1/2"	3162-600	\$41.75
.062"	.010"	.094"	.750"	1/8"	2-1/2"	3162-750	\$41.75
.078"	.005"	.117"	.300"	1/8"	2-1/2"	3078-300	\$40.75
.078"	.005"	.117"	.400"	1/8"	2-1/2"	3078-400	\$40.75
.078"	.005"	.117"	.500"	1/8"	2-1/2"	3078-500	\$40.75
.078"	.005"	.117"	.600"	1/8"	2-1/2"	3078-600	\$40.75
.078"	.005"	.117"	.750"	1/8"	2-1/2"	3078-750	\$41.75

Continued Next Page



Continued from previous page:

Stub - Corner Radius

AITIN COATED

Size Range: .078" to .125"



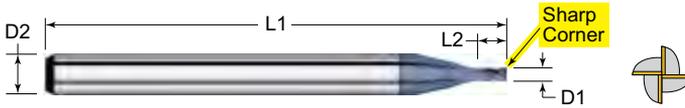
D1 Cutter Diameter +/- .0005"	R Corner Radius +/- .001"	L2 Length of Cut +.010"- .000"	L3 Reach From Tip	D2 Shank Dia.	L1 Over All Length	Tool Number	Price Each
.078"	.010"	.117"	.300"	1/8"	2-1/2"	3178-300	\$40.75
.078"	.010"	.117"	.400"	1/8"	2-1/2"	3178-400	\$40.75
.078"	.010"	.117"	.500"	1/8"	2-1/2"	3178-500	\$40.75
.078"	.010"	.117"	.600"	1/8"	2-1/2"	3178-600	\$41.75
.078"	.010"	.117"	.750"	1/8"	2-1/2"	3178-750	\$41.75
.093"	.005"	.139"	.500"	1/8"	2-1/2"	3093-500	\$40.75
.093"	.005"	.139"	.600"	1/8"	2-1/2"	3093-600	\$40.75
.093"	.005"	.139"	.700"	1/8"	2-1/2"	3093-700	\$40.75
.093"	.005"	.139"	.800"	1/8"	2-1/2"	3093-800	\$41.75
.093"	.005"	.139"	.900"	1/8"	2-1/2"	3093-900	\$41.75
.093"	.005"	.139"	1.00"	1/8"	2-1/2"	3093-100	\$43.00
.093"	.010"	.139"	.500"	1/8"	2-1/2"	3193-500	\$40.75
.093"	.010"	.139"	.600"	1/8"	2-1/2"	3193-600	\$40.75
.093"	.010"	.139"	.700"	1/8"	2-1/2"	3193-700	\$40.75
.093"	.010"	.139"	.800"	1/8"	2-1/2"	3193-800	\$41.75
.093"	.010"	.139"	.900"	1/8"	2-1/2"	3193-900	\$41.75
.093"	.010"	.139"	1.00"	1/8"	2-1/2"	3193-100	\$43.00
.093"	.015"	.139"	.500"	1/8"	2-1/2"	3293-500	\$40.75
.093"	.015"	.139"	.600"	1/8"	2-1/2"	3293-600	\$40.75
.093"	.015"	.139"	.700"	1/8"	2-1/2"	3293-700	\$40.75
.093"	.015"	.139"	.800"	1/8"	2-1/2"	3293-800	\$41.75
.093"	.015"	.139"	.900"	1/8"	2-1/2"	3293-900	\$41.75
.093"	.015"	.139"	1.00"	1/8"	2-1/2"	3293-100	\$43.00
.125"	.005"	.187"	.650"	1/8"	2-1/2"	3012-650	\$40.75
.125"	.005"	.187"	.750"	1/8"	2-1/2"	3012-750	\$40.75
.125"	.005"	.187"	.850"	1/8"	2-1/2"	3012-850	\$41.75
.125"	.005"	.187"	1.000"	1/8"	2-1/2"	3012-100	\$41.75
.125"	.005"	.187"	1.250"	1/8"	2-1/2"	3012-125	\$44.00
.125"	.010"	.187"	.650"	1/8"	2-1/2"	3112-650	\$40.75
.125"	.010"	.187"	.750"	1/8"	2-1/2"	3112-750	\$40.75
.125"	.010"	.187"	.850"	1/8"	2-1/2"	3112-850	\$41.75
.125"	.010"	.187"	1.000"	1/8"	2-1/2"	3112-100	\$41.75
.125"	.010"	.187"	1.250"	1/8"	2-1/2"	3112-125	\$44.00
.125"	.015"	.187"	.650"	1/8"	2-1/2"	3212-650	\$40.75
.125"	.015"	.187"	.750"	1/8"	2-1/2"	3212-750	\$40.75
.125"	.015"	.187"	.850"	1/8"	2-1/2"	3212-850	\$41.75
.125"	.015"	.187"	1.000"	1/8"	2-1/2"	3212-100	\$41.75
.125"	.015"	.187"	1.250"	1/8"	2-1/2"	3212-125	\$44.00

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - VARIABLE HELIX

Stub Length - Sharp Corner - AITiN COATED - .015" to .250"



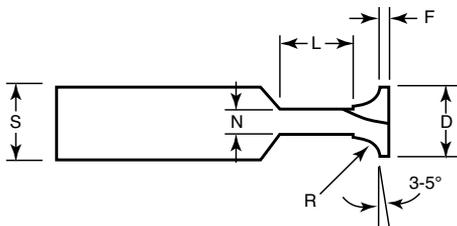
Center Cutting - Micro Grain Carbide - Made in USA

CUTTER DIAMETER TOLERANCE: DECIMAL SIZES +/- .0005" - FRACTIONAL SIZES: +000"/-002"

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.023"	1/8"	1-1/2"	59015S	\$36.25
.020"	.030"	1/8"	1-1/2"	59020S	\$33.25
.025"	.038"	1/8"	1-1/2"	59025S	\$33.25
.031"	.046"	1/8"	1-1/2"	59031S	\$27.00
.035"	.052"	1/8"	1-1/2"	59035S	\$27.00
.040"	.060"	1/8"	1-1/2"	59040S	\$27.00
.047"	.070"	1/8"	1-1/2"	59047S	\$27.00
.062"	.093"	1/8"	1-1/2"	59062S	\$25.75
.078"	.117"	1/8"	1-1/2"	59078S	\$25.75
.093"	.139"	1/8"	1-1/2"	59093S	\$25.75
.125"(1/8")	.250"	1/8"	1-1/2"	59125S	\$25.75
.187"(3/16")	.375"	3/16"	2"	59187S	\$28.25
.250"(1/4")	.375"	1/4"	2"	59250S	\$35.25

NEED SPECIAL LONG REACH BACK CORNER MILLS?

See page 127 for available stock sizes which can be modified to your specification.



1. Tool Number to add reach: _____

2. Neck Length (L): _____

The only option is to change the neck length "L". All other dimensions are as page 145.

3. Quantity (Minimum 3): _____

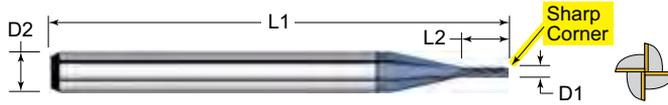
Special Neck Lengths Ship in 24 to 48 Hours!

Tools are custom manufactured to order and are nonreturnable.

4-FLUTE - VARIABLE HELIX



Standard Length - Sharp Corner - AITiN COATED - .015" to .250"



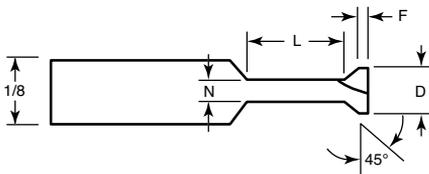
Center Cutting - Micro Grain Carbide - Made in USA

CUTTER DIAMETER TOLERANCE: DECIMAL SIZES +/- .0005" - FRACTIONAL SIZES: +000"/-002"

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.045"	1/8"	1-1/2"	59015	\$36.25
.020"	.060"	1/8"	1-1/2"	59020	\$33.25
.025"	.075"	1/8"	1-1/2"	59025	\$33.25
.031"	.093"	1/8"	1-1/2"	59031	\$27.00
.035"	.105"	1/8"	1-1/2"	59035	\$27.00
.040"	.120"	1/8"	1-1/2"	59040	\$27.00
.047"	.141"	1/8"	1-1/2"	59047	\$27.00
.062"	.186"	1/8"	1-1/2"	59062	\$25.75
.078"	.234"	1/8"	1-1/2"	59078	\$25.75
.093"	.279"	1/8"	1-1/2"	59093	\$25.75
.125"(1/8")	.500"	1/8"	2"	59125	\$25.75
.187"(3/16")	.562"	3/16"	2"	59187	\$28.25
.250"(1/4")	.750"	1/4"	2-1/2"	59250	\$35.25

NEED SPECIAL LONG REACH BACK CHAMFER MILLS?

See page 127 for available stock sizes which can be modified to your specification.



1. Tool Number to add reach: _____

2. Neck Length (L): _____

The only option is to change the neck length "L".
All other dimensions are as page 145.

3. Quantity (Minimum 3): _____

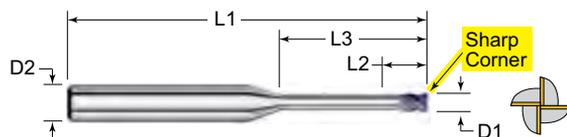
Special Neck Lengths Ship in 24 to 48 Hours!

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - VARIABLE HELIX - LONG REACH

Stub Flute - Sharp Corner - AITiN COATED - .015" to .125"



Minimum
3 Tools
Each Size

**Shipped
Within 24-48
Hours**

4-Flute - Center Cutting - Micro Grain Carbide - Made in USA

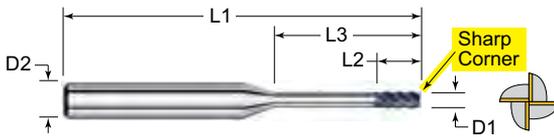
D1 Cutter Diameter	L2 Length of Cut	L3 Length of Reach	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.023"	.080"	1/8"	1-1/2"	59415S-080	\$45.25
.015"	.023"	.125"	1/8"	1-1/2"	59415S-125	\$47.25
.020"	.030"	.100"	1/8"	1-1/2"	59420S-100	\$43.75
.020"	.030"	.150"	1/8"	1-1/2"	59420S-150	\$43.75
.025"	.038"	.125"	1/8"	1-1/2"	59425S-125	\$43.75
.025"	.038"	.175"	1/8"	1-1/2"	59425S-175	\$43.75
.031"	.046"	.150"	1/8"	1-1/2"	59431S-150	\$38.75
.031"	.046"	.200"	1/8"	1-1/2"	59431S-200	\$38.75
.031"	.046"	.250"	1/8"	1-1/2"	59431S-250	\$40.00
.035"	.052"	.200"	1/8"	1-1/2"	59435S-200	\$38.75
.035"	.052"	.250"	1/8"	1-1/2"	59435S-250	\$40.00
.040"	.060"	.200"	1/8"	1-1/2"	59440S-200	\$38.75
.047"	.070"	.250"	1/8"	1-1/2"	59447S-250	\$38.75
.047"	.070"	.350"	1/8"	1-1/2"	59447S-350	\$38.75
.062"	.093"	.400"	1/8"	1-1/2"	59462S-400	\$36.25
.062"	.093"	.500"	1/8"	1-1/2"	59462S-500	\$36.25
.062"	.093"	.600"	1/8"	1-1/2"	59462S-600	\$38.50
.078"	.117"	.400"	1/8"	1-1/2"	59478S-400	\$36.25
.078"	.117"	.500"	1/8"	1-1/2"	59478S-500	\$36.25
.078"	.117"	.600"	1/8"	1-1/2"	59478S-600	\$38.50
.093"	.139"	.500"	1/8"	1-1/2"	59493S-500	\$38.50
.093"	.139"	.600"	1/8"	1-1/2"	59493S-600	\$38.50
.125"(1/8")	.250"	.500"	1/8"	1-1/2"	59425S-500	\$36.25
.125"(1/8")	.250"	.650"	1/8"	1-1/2"	59425S-650	\$38.50

Tools are custom manufactured to order and are nonreturnable.

4-FLUTE - VARIABLE HELIX - LONG REACH



Standard Flute - Sharp Corner - AITiN COATED - .015" to .125"



Minimum
3 Tools
Each Size

**Shipped
Within 24-48
Hours**

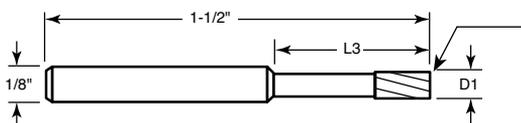
Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	L3 Length of Reach	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.045"	.080"	1/8"	1-1/2"	59415-080	\$45.25
.015"	.045"	.125"	1/8"	1-1/2"	59415-125	\$47.25
.020"	.060"	.100"	1/8"	1-1/2"	59420-100	\$43.75
.020"	.060"	.150"	1/8"	1-1/2"	59420-150	\$43.75
.025"	.075"	.125"	1/8"	1-1/2"	59425-125	\$43.75
.025"	.075"	.175"	1/8"	1-1/2"	59425-175	\$43.75
.031"	.093"	.150"	1/8"	1-1/2"	59431-150	\$38.75
.031"	.093"	.200"	1/8"	1-1/2"	59431-200	\$38.75
.031"	.093"	.250"	1/8"	1-1/2"	59431-250	\$40.00
.035"	.105"	.200"	1/8"	1-1/2"	59435-200	\$38.75
.035"	.105"	.250"	1/8"	1-1/2"	59435-250	\$40.00
.040"	.120"	.200"	1/8"	1-1/2"	59440-200	\$38.75
.047"	.141"	.250"	1/8"	1-1/2"	59447-250	\$38.75
.047"	.141"	.350"	1/8"	1-1/2"	59447-350	\$38.75
.062"	.186"	.400"	1/8"	1-1/2"	59462-400	\$36.25
.062"	.186"	.500"	1/8"	1-1/2"	59462-500	\$36.25
.062"	.186"	.600"	1/8"	1-1/2"	59462-600	\$38.50
.078"	.234"	.400"	1/8"	1-1/2"	59478-400	\$36.25
.078"	.234"	.500"	1/8"	1-1/2"	59478-500	\$36.25
.078"	.234"	.600"	1/8"	1-1/2"	59478-600	\$38.50
.093"	.279"	.500"	1/8"	1-1/2"	59493-500	\$38.50
.093"	.279"	.600"	1/8"	1-1/2"	59493-600	\$38.50
.125"(1/8")	.500"	.650"	1/8"	2"	59425-650	\$36.25
.125"(1/8")	.500"	.750"	1/8"	2"	59425-750	\$38.50

Tools are custom manufactured to order and are nonreturnable.

ORDER SPECIAL 4-Flute Square End Variable Helix LONG REACH END MILLS

To order special long reach end mills please specify:



1. Diameter (D1): _____ From above chart.
2. Overall Reach (L3): _____
3. Specify:
 - Sharp Corner
 - Corner Radius (See page 123)
4. Quantity (Minimum 6): _____

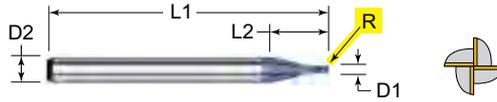
Special Reaches Shipped within 24-48 Hours!

Tools are custom manufactured to order and are nonreturnable.



4-FLT - VARIABLE HELIX - CORNER RAD

Stub Length - AITiN COATED - .015" to .500"



Length of Cut as Specified - Center Cutting - Micro Grain Carbide - Made in USA

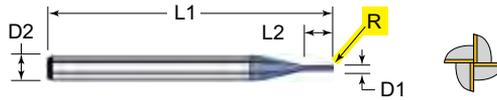
D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.023"	.003"	1/8"	1-1/2"	59215S	\$36.25
.020"	.030"	.005"	1/8"	1-1/2"	59220S	\$33.25
.025"	.038"	.005"	1/8"	1-1/2"	59205S	\$33.25
.031"	.046"	.005"	1/8"	1-1/2"	59231S	\$27.00
.035"	.052"	.005"	1/8"	1-1/2"	59235S	\$27.00
.040"	.060"	.005"	1/8"	1-1/2"	59240S	\$27.00
.047"	.070"	.005"	1/8"	1-1/2"	59247S	\$27.00
.062"	.093"	.005"	1/8"	1-1/2"	59262S	\$25.75
.078"	.117"	.005"	1/8"	1-1/2"	59278S	\$25.75
.093"	.139"	.010"	1/8"	1-1/2"	59293S	\$25.75
.125"	.250"	.010"	1/8"	1-1/2"	59225S	\$25.75
.187"	.375"	.015"	3/16"	1-1/2"	59287S	\$29.25
.250"	.375"	.015"	1/4"	2"	59255S	\$33.25
.312"	.437"	.015"	5/16"	2"	59212S	\$44.75
.375"	.500"	.015"	3/8"	2"	59275S	\$49.00
.500"	.625"	.030"	1/2"	2-1/2"	59200S	\$73.00



Microcut offers specialty cutting tool solutions to meet your requirements for both standard and custom products.



Corner Radius - Standard Flute - AITiN COATED - .015" to .500"



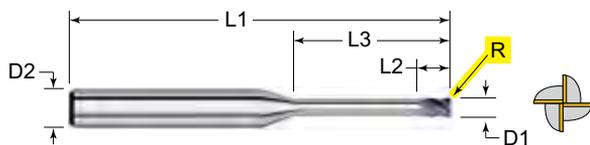
Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.045"	.003"	1/8"	1-1/2"	59215	\$36.25
.020"	.060"	.005"	1/8"	1-1/2"	59220	\$33.25
.025"	.075"	.005"	1/8"	1-1/2"	59205	\$33.25
.031"	.093"	.005"	1/8"	1-1/2"	59231	\$27.00
.035"	.105"	.005"	1/8"	1-1/2"	59235	\$27.00
.040"	.120"	.005"	1/8"	1-1/2"	59240	\$27.00
.047"	.140"	.005"	1/8"	1-1/2"	59247	\$27.00
.062"	.187"	.005"	1/8"	1-1/2"	59262	\$25.75
.078"	.234"	.005"	1/8"	1-1/2"	59278	\$25.75
.093"	.279"	.010"	1/8"	1-1/2"	59293	\$25.75
.125"	.500"	.010"	1/8"	1-1/2"	59225	\$25.75
.125"	.500"	.015"	1/8"	1-1/2"	59225-1	\$25.75
.125"	.500"	.020"	1/8"	1-1/2"	59225-2	\$25.75
.187"	.625"	.010"	3/16"	2"	59287-1	\$27.75
.187"	.625"	.015"	3/16"	2"	59287	\$27.75
.187"	.625"	.020"	3/16"	2"	59287-2	\$27.75
.250"	.750"	.015"	1/4"	2-1/2"	59255	\$32.25
.250"	.750"	.030"	1/4"	2-1/2"	59255-1	\$32.25
.312"	.812"	.015"	5/16"	2-1/2"	59212	\$36.75
.312"	.812"	.030"	5/16"	2-1/2"	59212-2	\$36.75
.375"	1.00"	.015"	3/8"	2-1/2"	59275	\$47.00
.375"	1.00"	.030"	3/8"	2-1/2"	59275-1	\$47.00
.500"	1.00"	.015"	1/2"	3"	59200-1	\$71.75
.500"	1.00"	.030"	1/2"	3"	59200	\$71.75
.500"	1.00"	.060"	1/2"	3"	59200-2	\$71.75



4-FLT - VAR HELIX - CORNER RAD - LG RCH

Long Reach - Stub Length - AITiN COATED



Minimum
3 Tools
Each Size



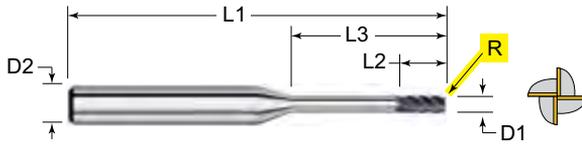
Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	L3 Length of Reach	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.023"	.003"	.080"	1/8"	1-1/2"	59515S-080	\$45.25
.015"	.023"	.003"	.125"	1/8"	1-1/2"	59515S-125	\$47.25
.020"	.030"	.005"	.100"	1/8"	1-1/2"	59520S-100	\$43.75
.020"	.030"	.005"	.150"	1/8"	1-1/2"	59520S-150	\$43.75
.025"	.038"	.005"	.125"	1/8"	1-1/2"	59525S-125	\$43.75
.025"	.038"	.005"	.175"	1/8"	1-1/2"	59525S-175	\$43.75
.031"	.046"	.005"	.150"	1/8"	1-1/2"	59531S-150	\$38.75
.031"	.046"	.005"	.200"	1/8"	1-1/2"	59531S-200	\$38.75
.031"	.046"	.005"	.250"	1/8"	1-1/2"	59531S-250	\$40.00
.035"	.052"	.005"	.200"	1/8"	1-1/2"	59535S-200	\$38.75
.035"	.052"	.005"	.250"	1/8"	1-1/2"	59535S-250	\$40.00
.040"	.060"	.005"	.200"	1/8"	1-1/2"	59540S-200	\$38.75
.040"	.060"	.005"	.250"	1/8"	1-1/2"	59540S-250	\$38.75
.047"	.070"	.005"	.250"	1/8"	1-1/2"	59547S-250	\$38.75
.047"	.070"	.005"	.350"	1/8"	1-1/2"	59547S-350	\$38.75
.062"	.093"	.005"	.400"	1/8"	1-1/2"	59562S-400	\$36.25
.062"	.093"	.005"	.500"	1/8"	1-1/2"	59562S-500	\$36.25
.062"	.093"	.005"	.600"	1/8"	1-1/2"	59562S-600	\$38.50
.078"	.117"	.005"	.400"	1/8"	1-1/2"	59578S-400	\$36.25
.078"	.117"	.005"	.500"	1/8"	1-1/2"	59578S-500	\$36.25
.078"	.117"	.005"	.600"	1/8"	1-1/2"	59578S-600	\$38.50
.093"	.139"	.010"	.500"	1/8"	1-1/2"	59593S-500	\$38.50
.093"	.139"	.010"	.600"	1/8"	1-1/2"	59593S-600	\$38.50
.125"(1/8")	.250"	.010"	.500"	1/8"	1-1/2"	59525S-500	\$36.25
.125"(1/8")	.250"	.010"	.650"	1/8"	1-1/2"	59525S-650	\$38.50

Tools are custom manufactured to order and are nonreturnable.



Long Reach - Standard Length - AITiN COATED



Minimum
3 Tools
Each Size

Shipped
Within 24-48
Hours

Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	L3 Length of Reach	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.045"	.003"	.125"	1/8"	1-1/2"	59515-125	\$45.25
.015"	.045"	.003"	.187"	1/8"	1-1/2"	59515-187	\$47.25
.020"	.060"	.005"	.165"	1/8"	1-1/2"	59520-165	\$43.75
.020"	.060"	.005"	.200"	1/8"	1-1/2"	59520-200	\$43.75
.025"	.075"	.005"	.200"	1/8"	1-1/2"	59525-200	\$43.75
.025"	.075"	.005"	.250"	1/8"	1-1/2"	59525-250	\$43.75
.031"	.093"	.005"	.200"	1/8"	1-1/2"	59531-200	\$38.75
.031"	.093"	.005"	.250"	1/8"	1-1/2"	59531-250	\$38.75
.031"	.093"	.005"	.300"	1/8"	1-1/2"	59531-300	\$40.00
.035"	.105"	.005"	.200"	1/8"	1-1/2"	59535-200	\$38.75
.035"	.105"	.005"	.250"	1/8"	1-1/2"	59535-250	\$40.00
.040"	.120"	.005"	.250"	1/8"	1-1/2"	59540-250	\$38.75
.040"	.120"	.005"	.300"	1/8"	1-1/2"	59540-300	\$38.75
.040"	.120"	.005"	.350"	1/8"	1-1/2"	59540-350	\$38.75
.047"	.141"	.005"	.250"	1/8"	1-1/2"	59547-250	\$38.75
.047"	.141"	.005"	.350"	1/8"	1-1/2"	59547-350	\$38.75
.047"	.141"	.005"	.450"	1/8"	1-1/2"	59547-450	\$38.75
.062"	.186"	.005"	.400"	1/8"	1-1/2"	59562-400	\$36.25
.062"	.186"	.005"	.500"	1/8"	1-1/2"	59562-500	\$36.25
.062"	.186"	.005"	.600"	1/8"	1-1/2"	59562-600	\$38.50
.078"	.234"	.005"	.400"	1/8"	1-1/2"	59578-400	\$36.25
.078"	.234"	.005"	.500"	1/8"	1-1/2"	59578-500	\$36.25
.078"	.234"	.005"	.600"	1/8"	1-1/2"	59578-600	\$38.50
.093"	.279"	.010"	.500"	1/8"	1-1/2"	59593-500	\$38.50
.093"	.279"	.010"	.650"	1/8"	1-1/2"	59593-650	\$38.50
.125"(1/8")	.500"	.010"	.650"	1/8"	1-1/2"	59525-650	\$38.50

Tools are custom manufactured to order and are nonreturnable.

2-FLUTE – MINIATURE BALL PROFILE CUTTERS

Ball End - AITiN COATED

Designed for Deep Cavity Profiling in tough materials.

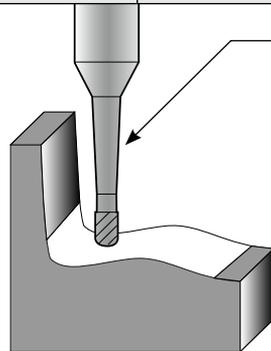
TAPERED NECK REDUCES DEFLECTION.



Length of Cut = 1.5 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	L3 Over All Reach	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.047"	.500"	1/4"	3"	17031-500	\$51.50
.031"	.047"	.750"	1/4"	3"	17031-750	\$55.50
.031"	.047"	1.00"	1/4"	3"	17031-100	\$59.25
.047"	.071"	.500"	1/4"	3"	17047-500	\$51.50
.047"	.071"	.750"	1/4"	3"	17047-750	\$55.50
.047"	.071"	1.00"	1/4"	3"	17047-100	\$59.25
.062"	.094"	.500"	1/4"	3"	17062-500	\$51.50
.062"	.094"	.750"	1/4"	3"	17062-750	\$55.50
.062"	.094"	1.00"	1/4"	3"	17062-100	\$59.25
.078"	.118"	.750"	1/4"	3"	17078-750	\$51.50
.078"	.118"	1.00"	1/4"	3"	17078-100	\$55.50
.078"	.118"	1.25"	1/4"	3"	17078-125	\$59.25
.093"	.140"	.750"	1/4"	3"	17093-750	\$51.50
.093"	.140"	1.00"	1/4"	3"	17093-100	\$55.50
.093"	.140"	1.25"	1/4"	3"	17093-125	\$59.25
.125"	.187"	.750"	1/4"	3"	17125-750	\$51.50
.125"	.187"	1.00"	1/4"	3"	17125-100	\$55.50
.125"	.187"	1.25"	1/4"	3"	17125-125	\$59.25

Note: Miniature profile cutters are designed to mill deep cavities in molds. The tapered neck is available in various lengths to provide the most rigid tool for each application. Since interference with the cavity wall is a possibility (see diagram), we suggest the application be verified with CAD by your programmer.

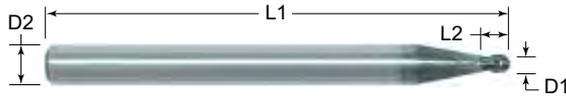


Neck is reduced behind the cutter diameter for a length of one diameter.

2-FLUTE - BALL MILLS FOR DIES & MOLDS

Ball End - nACo COATED

For hard milling in mold & die steels 40-60 RC. New "nACo" coating for extreme durability at high temperature. Short flute length with reduced neck for maximum rigidity. Use with air mist coolant.



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.031"	1/8"	3"	58704	\$29.00
.047"	.047"	1/8"	3"	58706	\$29.00
.062"	.062"	1/8"	3"	58708	\$29.00
.078"	.078"	1/8"	3"	58710	\$29.00
.093"	.093"	1/8"	3"	58712	\$29.00
.125"	.125"	1/8"	3"	58714	\$29.00
.187"	.187"	3/16"	3"	58716	\$33.75
.250"	.250"	1/4"	3"	58718	\$45.75

Long Reach - Ball End - nACo COATED

Minimum order 3 tools each size.



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.031"	.093"	1/8"	3"	58724	\$43.25
.031"	.031"	.156"	1/8"	3"	58726	\$43.25
.031"	.031"	.250"	1/8"	3"	58728	\$46.75
.047"	.047"	.141"	1/8"	3"	58730	\$43.25
.047"	.047"	.250"	1/8"	3"	58732	\$43.25
.047"	.047"	.375"	1/8"	3"	58734	\$46.75
.062"	.062"	.187"	1/8"	3"	58736	\$43.25
.062"	.062"	.312"	1/8"	3"	58738	\$43.25
.062"	.062"	.500"	1/8"	3"	58740	\$46.75
.078"	.078"	.234"	1/8"	3"	58742	\$43.25
.078"	.078"	.406"	1/8"	3"	58744	\$43.25
.078"	.078"	.625"	1/8"	3"	58746	\$46.75
.093"	.093"	.281"	1/8"	3"	58748	\$43.25
.093"	.093"	.500"	1/8"	3"	58750	\$43.25
.093"	.093"	.750"	1/8"	3"	58752	\$46.75
.125"	.125"	.375"	1/8"	3"	58754	\$43.25
.125"	.125"	.625"	1/8"	3"	58756	\$43.25
.125"	.125"	1.000"	1/8"	3"	58758	\$46.75
.187"	.187"	.375"	3/16"	3"	58760	\$48.00
.187"	.187"	.570"	3/16"	3"	58762	\$50.50
.187"	.187"	1.000"	3/16"	3"	58764	\$54.00
.250"	.250"	.500"	1/4"	3"	58766	\$58.75
.250"	.250"	.750"	1/4"	3"	58768	\$61.00
.250"	.250"	1.250"	1/4"	3"	58770	\$64.50

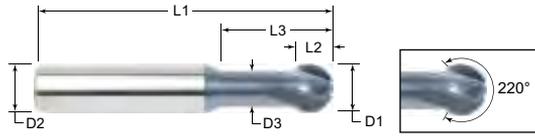
Long reach tools are manufactured to order and are nonreturnable.

TOLL FREE 866-426-3300
FAX 781-582-8095

Microcut

220 DEGREE SPHERICAL BALL END MILLS

Standard & Long Reach - Ball End - AITIN COATED
 Designed for undercutting & machining mold cavities • 220 Degree Spherical Ball



Available in standard length, long shank, plus long and extra long reach
 Length of Cut as Specified - Center Cutting - Micro Grain Carbide - Made in USA

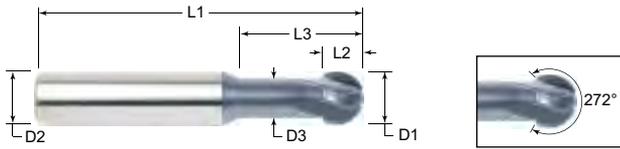
D1 Cutter Diameter	L2 Length of Cut	D3 Neck Diameter	L3 Reach From Tip	No. of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/16"	.040"	.048"	.187"	2	1/8"	1-1/2"	13062	\$32.50
1/16"	.040"	.048"	.250"	2	1/8"	1-1/2"	13062LR	\$36.75
1/16"	.040"	.048"	.187"	4	1/8"	1-1/2"	13062-4	\$32.50
1/16"	.040"	.048"	.250"	4	1/8"	1-1/2"	13062LR-4	\$36.75
3/32"	.060"	.077"	.210"	2	1/8"	1-1/2"	13093	\$32.50
3/32"	.060"	.077"	.250"	2	1/8"	1-1/2"	13093LRS	\$36.75
3/32"	.060"	.077"	.400"	2	1/8"	1-1/2"	13093LR	\$38.75
3/32"	.060"	.077"	.210"	4	1/8"	1-1/2"	13093-4	\$32.50
3/32"	.060"	.077"	.250"	4	1/8"	1-1/2"	13093LRS-4	\$36.75
3/32"	.060"	.077"	.400"	4	1/8"	1-1/2"	13093LR-4	\$38.75
1/8"	.088"	.095"	.230"	4	1/8"	1-1/2"	13125	\$29.90
1/8"	.088"	.095"	.230"	4	1/8"	3"	13125L	\$32.00
1/8"	.088"	.095"	.500"	4	1/8"	1-1/2"	13125LR	\$36.75
1/8"	.088"	.095"	1.000"	4	1/8"	3"	13125XR	\$40.90
1/8"	.088"	.095"	1.500"	4	1/8"	3"	13125LXR	\$47.25
3/16"	.130"	.141"	.275"	4	3/16"	2"	13187	\$34.25
3/16"	.130"	.141"	.275"	4	3/16"	3"	13187L	\$36.25
3/16"	.130"	.141"	.500"	4	3/16"	2"	13187LR	\$37.25
3/16"	.130"	.141"	.625"	4	3/16"	2"	13187LRS	\$39.50
3/16"	.130"	.141"	1.125"	4	3/16"	3"	13187XR	\$44.75
1/4"	.175"	.187"	.320"	4	1/4"	2-1/2"	13250	\$41.50
1/4"	.175"	.187"	.320"	4	1/4"	4"	13250L	\$46.75
1/4"	.175"	.187"	.750"	4	1/4"	2-1/2"	13250LRS	\$53.50
1/4"	.175"	.187"	1.000"	4	1/4"	2-1/2"	13250LR	\$55.50
1/4"	.175"	.187"	1.500"	4	1/4"	4"	13250XR	\$59.75
1/4"	.175"	.187"	2.000"	4	1/4"	4"	13250XLR	\$66.00
3/8"	.255"	.281"	.400"	4	3/8"	2-1/2"	13375	\$62.50
3/8"	.255"	.281"	.400"	4	3/8"	4"	13375L	\$67.75
3/8"	.255"	.281"	1.000"	4	3/8"	2-1/2"	13375LR	\$76.50
3/8"	.255"	.281"	1.500"	4	3/8"	4"	13375LRS	\$87.00
3/8"	.255"	.281"	1.750"	4	3/8"	4"	13375XR	\$91.25
1/2"	.360"	.375"	.525"	4	1/2"	3"	13500	\$88.75
1/2"	.360"	.375"	.600"	4	1/2"	6"	13500L	\$139.00
1/2"	.360"	.375"	1.000"	4	1/2"	3"	13500LRS	\$107.75
1/2"	.360"	.375"	1.300"	4	1/2"	3"	13500LR	\$116.00
1/2"	.360"	.375"	2.300"	4	1/2"	6"	13500XR	\$160.00

Special long reach with reduced neck diameters quoted on request.

272 DEGREE SPHERICAL BALL END MILLS

Standard & Long Reach - Ball End - AITiN COATED

Designed for undercutting & machining mold cavities - 272 Degree Spherical Ball



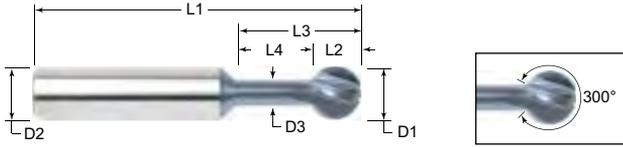
Length of Cut as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D3 Neck Diameter	L3 Reach From Tip	No. of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/16"	.054"	.040"	.115"	2	1/8"	1-1/2"	13662-115	\$36.25
1/16"	.054"	.040"	.175"	2	1/8"	1-1/2"	13662-175	\$36.25
1/16"	.054"	.040"	.250"	2	1/8"	1-1/2"	13662-250	\$36.25
3/32"	.081"	.062"	.150"	2	1/8"	1-1/2"	13693-150	\$36.25
3/32"	.081"	.062"	.200"	2	1/8"	1-1/2"	13693-200	\$36.25
3/32"	.081"	.062"	.275"	2	1/8"	1-1/2"	13693-275	\$36.25
3/32"	.081"	.062"	.350"	2	1/8"	1-1/2"	13693-350	\$36.25
1/8"	.108"	.084"	.175"	4	1/8"	2"	13625-175	\$32.25
1/8"	.108"	.084"	.250"	4	1/8"	2"	13625-250	\$32.25
1/8"	.108"	.084"	.400"	4	1/8"	2"	13625-400	\$32.25
1/8"	.108"	.084"	.625"	4	1/8"	2"	13625-625	\$34.25
1/8"	.108"	.084"	.750"	4	1/8"	2"	13625-750	\$37.50
3/16"	.163"	.125"	.250"	4	3/16"	2"	13687-250	\$37.50
3/16"	.163"	.125"	.400"	4	3/16"	2"	13687-400	\$37.50
3/16"	.163"	.125"	.550"	4	3/16"	2"	13687-550	\$38.50
3/16"	.163"	.125"	.675"	4	3/16"	2"	13687-675	\$41.50
3/16"	.163"	.125"	.800"	4	3/16"	2"	13687-800	\$46.75
1/4"	.217"	.170"	.300"	4	1/4"	2-1/2"	13650-300	\$49.25
1/4"	.217"	.170"	.450"	4	1/4"	2-1/2"	13650-450	\$49.25
1/4"	.217"	.170"	.625"	4	1/4"	2-1/2"	13650-625	\$51.50
1/4"	.217"	.170"	.750"	4	1/4"	2-1/2"	13650-750	\$51.50
1/4"	.217"	.170"	1.000"	4	1/4"	2-1/2"	13650-100	\$55.75
1/4"	.217"	.170"	1.375"	4	1/4"	4"	13650-137	\$59.75
1/4"	.217"	.170"	1.750"	4	1/4"	4"	13650-175	\$65.00
5/16"	.272"	.215"	.500"	4	5/16"	2-1/2"	13612-500	\$65.75
5/16"	.272"	.215"	.750"	4	5/16"	2-1/2"	13612-750	\$70.00
5/16"	.272"	.215"	1.00"	4	5/16"	2-1/2"	13612-100	\$72.00
3/8"	.322"	.280"	.450"	4	3/8"	2-1/2"	13675-450	\$72.00
3/8"	.322"	.280"	.750"	4	3/8"	2-1/2"	13675-750	\$74.25
3/8"	.322"	.280"	1.000"	4	3/8"	2-1/2"	13675-100	\$76.25
3/8"	.322"	.280"	1.500"	4	3/8"	4"	13675-150	\$88.75
3/8"	.322"	.280"	2.000"	4	3/8"	4"	13675-200	\$91.00
1/2"	.425"	.325"	.625"	4	1/2"	3"	13600-625	\$100.50
1/2"	.425"	.325"	1.000"	4	1/2"	3"	13600-100	\$103.50
1/2"	.425"	.325"	1.500"	4	1/2"	3"	13600-150	\$107.75

300 DEGREE SPHERICAL BALL END MILLS

Standard & Long Reach - Ball End - AITiN COATED

Designed for undercutting & machining mold cavities - 300 Degree Spherical Ball

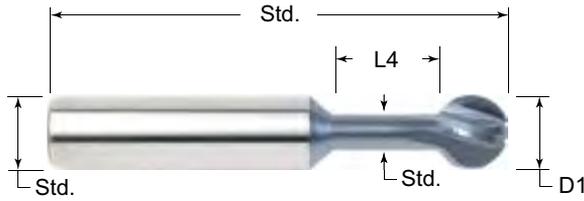


Length of Cut as Specified - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D3 Neck Diameter	L4 Neck Length	L3 Reach From Tip	No. of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/16"	.057"	.024"	.078"	.135"	2	1/8"	1-1/2"	13762-135	\$42.50
1/16"	.057"	.024"	.125"	.182"	2	1/8"	1-1/2"	13762-182	\$42.50
1/16"	.057"	.024"	.150"	.207"	2	1/8"	1-1/2"	13762-207	\$42.50
5/64"	.072"	.031"	.093"	.165"	2	1/8"	1-1/2"	13778-165	\$42.50
5/64"	.072"	.031"	.156"	.228"	2	1/8"	1-1/2"	13778-228	\$42.50
3/32"	.086"	.038"	.125"	.211"	2	1/8"	1-1/2"	13793-211	\$42.50
3/32"	.086"	.038"	.156"	.242"	2	1/8"	1-1/2"	13793-241	\$42.50
3/32"	.086"	.038"	.218"	.304"	2	1/8"	1-1/2"	13793-304	\$42.50
3/32"	.086"	.038"	.281"	.367"	2	1/8"	1-1/2"	13793-367	\$42.50
1/8"	.116"	.053"	.093"	.209"	4	1/8"	1-1/2"	13725-209	\$35.50
1/8"	.116"	.053"	.125"	.241"	4	1/8"	1-1/2"	13725-241	\$37.50
1/8"	.116"	.053"	.187"	.303"	4	1/8"	1-1/2"	13725-303	\$40.50
1/8"	.116"	.053"	.281"	.397"	4	1/8"	1-1/2"	13725-397	\$44.50
1/8"	.116"	.053"	.375"	.491"	4	1/8"	1-1/2"	13725-491	\$48.50
3/16"	.174"	.082"	.125"	.299"	4	3/16"	2"	13787-299	\$44.50
3/16"	.174"	.082"	.250"	.424"	4	3/16"	2"	13787-424	\$48.50
3/16"	.174"	.082"	.325"	.499"	4	3/16"	2"	13787-499	\$52.50
3/16"	.174"	.082"	.437"	.611"	4	3/16"	2"	13787-611	\$55.50
3/16"	.174"	.082"	.625"	.799"	4	3/16"	2"	13787-799	\$58.50
1/4"	.233"	.112"	.187"	.420"	4	1/4"	2-1/2"	13750-420	\$58.50
1/4"	.233"	.112"	.375"	.608"	4	1/4"	2-1/2"	13750-608	\$63.50
1/4"	.233"	.112"	.500"	.733"	4	1/4"	2-1/2"	13750-733	\$69.50
1/4"	.233"	.112"	.625"	.858"	4	1/4"	2-1/2"	13750-858	\$76.50
1/4"	.233"	.112"	.750"	.983"	4	1/4"	2-1/2"	13750-983	\$80.50
5/16"	.291"	.143"	.250"	.541"	4	5/16"	2-1/2"	13712-541	\$78.50
5/16"	.291"	.143"	.437"	.728"	4	5/16"	2-1/2"	13712-728	\$86.50
5/16"	.291"	.143"	.750"	1.041"	4	5/16"	2-1/2"	13712-041	\$96.50
3/8"	.349"	.172"	.250"	.599"	4	3/8"	2-1/2"	13775-599	\$85.50
3/8"	.349"	.172"	.500"	.849"	4	3/8"	2-1/2"	13775-849	\$92.50
3/8"	.349"	.172"	.687"	1.036"	4	3/8"	2-1/2"	13775-036	\$102.50
3/8"	.349"	.172"	1.000"	1.349"	4	3/8"	3"	13775-349	\$112.50

SPECIAL SPHERICAL LONG REACH MILLS

ORDER SPECIAL LONG REACH SPHERICAL END MILLS



To order special long reach spherical end mills please specify:

1. Diameter (D1): _____ From charts on pages 126-128.
2. Neck Length (L4): _____
3. Choose Degree of Ball: 220° 272° 300°.
4. Quantity (Minimum 3): _____

Tools are custom manufactured to order and are nonreturnable.



**Special Reaches
Shipped
within
24-48 Hours!**

ABRASION RESISTANT TOOL COATINGS



TiCN

Cutting carbon steel, alloy steel and cast iron; cold forming & stamping tools.



ZrN

Hard coating for machining a variety of non-ferrous materials.



AlTiN

High performance coating for dry and semi-dry machining of all aerospace materials at high speeds.



Diamond

(Amorphous) Thin film coating for graphite, nonferrous materials and epoxy.

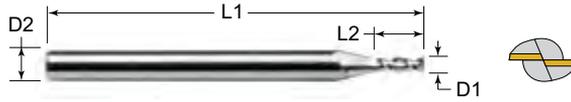


Locate Your Local Distributor

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2-FLUTE - MICRO END MILLS FOR ALUMINUM

45° Helix - Square End - Ball End - UNCOATED .031" to .125" Diameter



For faster chip removal and improved finish.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.031"	.093"	1/8"	1-1/2"	80031	\$18.55	80031B	\$21.75
.035"	.105"	1/8"	1-1/2"	80035	\$18.55	80035B	\$21.75
.040"	.120"	1/8"	1-1/2"	80040	\$18.55	80040B	\$21.75
.045"	.135"	1/8"	1-1/2"	80045	\$18.55	80045B	\$21.75
.047"	.141"	1/8"	1-1/2"	80047	\$18.55	80047B	\$21.75
.050"	.150"	1/8"	1-1/2"	80050	\$18.55	80050B	\$21.75
.060"	.180"	1/8"	1-1/2"	80060	\$18.55	80060B	\$21.75
.062"	.187"	1/8"	1-1/2"	80062	\$16.15	80062B	\$20.45
.070"	.210"	1/8"	1-1/2"	80070	\$16.15	80070B	\$20.45
.075"	.225"	1/8"	1-1/2"	80075	\$16.15	80075B	\$20.45
.078"	.234"	1/8"	1-1/2"	80078	\$16.15	80078B	\$20.45
.090"	.270"	1/8"	1-1/2"	80090	\$16.15	80090B	\$20.45
.093"	.279"	1/8"	1-1/2"	80093	\$16.15	80093B	\$20.45
.125"	.500"	1/8"	1-1/2"	80125	\$15.60	80125B	\$19.90



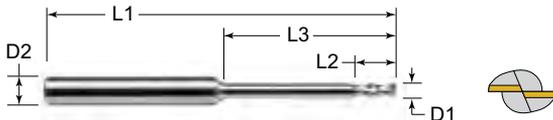
ZRN COATED Zirconium Nitride

Zirconium coating has a low affinity for non ferrous materials. Helps prevent buildup and chip packing on cutting edges & flutes. Use in aluminum, aluminum and magnesium alloys, brass, copper and bronze.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.031"	.093"	1/8"	1-1/2"	80031Z	\$23.40	80031BZ	\$26.60
.035"	.105"	1/8"	1-1/2"	80035Z	\$23.40	80035BZ	\$26.60
.040"	.120"	1/8"	1-1/2"	80040Z	\$23.40	80040BZ	\$26.60
.045"	.135"	1/8"	1-1/2"	80045Z	\$23.40	80045BZ	\$26.60
.047"	.141"	1/8"	1-1/2"	80047Z	\$23.40	80047BZ	\$26.60
.050"	.150"	1/8"	1-1/2"	80050Z	\$23.40	80050BZ	\$26.60
.060"	.180"	1/8"	1-1/2"	80060Z	\$23.40	80060BZ	\$26.60
.062"	.187"	1/8"	1-1/2"	80062Z	\$20.95	80062BZ	\$25.25
.070"	.210"	1/8"	1-1/2"	80070Z	\$20.95	80070BZ	\$25.25
.075"	.225"	1/8"	1-1/2"	80075Z	\$20.95	80075BZ	\$25.25
.078"	.234"	1/8"	1-1/2"	80078Z	\$20.95	80078BZ	\$25.25
.090"	.270"	1/8"	1-1/2"	80090Z	\$20.95	80090BZ	\$25.25
.093"	.279"	1/8"	1-1/2"	80093Z	\$20.95	80093BZ	\$25.25
.125"	.500"	1/8"	1-1/2"	80125Z	\$20.45	80125BZ	\$24.75

2-FLUTE - LONG REACH MILLS FOR ALUMINUM

45° Helix - Square End - Ball End - UNCOATED .031" to .125" Diameter



Shipped
Within 24-48
Hours

For faster chip removal and improved finish. **MINIMUM 3 PIECES PER SIZE**

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.031"	.093"	.250"	1/8"	1-1/2"	70031	\$31.45	70031B	\$34.65
.035"	.105"	.285"	1/8"	1-1/2"	70035	\$31.45	70035B	\$34.65
.040"	.120"	.350"	1/8"	1-1/2"	70040	\$31.45	70040B	\$34.65
.045"	.135"	.400"	1/8"	1-1/2"	70045	\$31.45	70045B	\$34.65
.047"	.141"	.400"	1/8"	1-1/2"	70047	\$31.45	70047B	\$34.65
.050"	.150"	.450"	1/8"	1-1/2"	70050	\$31.45	70050B	\$34.65
.060"	.180"	.500"	1/8"	1-1/2"	70060	\$31.45	70060B	\$34.65
.062"	.187"	.500"	1/8"	1-1/2"	70062	\$29.05	70062B	\$33.35
.070"	.210"	.500"	1/8"	1-1/2"	70070	\$29.05	70070B	\$33.35
.075"	.225"	.500"	1/8"	1-1/2"	70075	\$29.05	70075B	\$33.35
.078"	.234"	.500"	1/8"	1-1/2"	70078	\$29.05	70078B	\$33.35
.090"	.270"	.600"	1/8"	1-1/2"	70090	\$29.05	70090B	\$33.35
.093"	.279"	.600"	1/8"	1-1/2"	70093	\$29.05	70093B	\$33.35
.125"	.500"	.650"	1/8"	1-1/2"	70125	\$29.05	70125B	\$33.35



D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.031"	.093"	.250"	1/8"	1-1/2"	70031Z	\$36.30	70031BZ	\$39.50
.035"	.105"	.285"	1/8"	1-1/2"	70035Z	\$36.30	70035BZ	\$39.50
.040"	.120"	.350"	1/8"	1-1/2"	70040Z	\$36.30	70040BZ	\$39.50
.045"	.135"	.400"	1/8"	1-1/2"	70045Z	\$36.30	70045BZ	\$39.50
.047"	.141"	.400"	1/8"	1-1/2"	70047Z	\$36.30	70047BZ	\$39.50
.050"	.150"	.450"	1/8"	1-1/2"	70050Z	\$36.30	70050BZ	\$39.50
.060"	.180"	.500"	1/8"	1-1/2"	70060Z	\$36.30	70060BZ	\$39.50
.062"	.187"	.500"	1/8"	1-1/2"	70062Z	\$33.85	70062BZ	\$38.15
.070"	.210"	.500"	1/8"	1-1/2"	70070Z	\$33.85	70070BZ	\$38.15
.075"	.225"	.500"	1/8"	1-1/2"	70075Z	\$33.85	70075BZ	\$38.15
.078"	.234"	.500"	1/8"	1-1/2"	70078Z	\$33.85	70078BZ	\$38.15
.090"	.270"	.600"	1/8"	1-1/2"	70090Z	\$33.85	70090BZ	\$38.15
.093"	.279"	.600"	1/8"	1-1/2"	70093Z	\$33.85	70093BZ	\$38.15
.125"	.500"	.650"	1/8"	1-1/2"	70125Z	\$33.85	70125BZ	\$38.15

Tools are custom manufactured to order and are nonreturnable.
Special reaches quoted on request.

TOLL FREE 866-426-3300
FAX 781-582-8095

Microcut

Standard Length - UNCOATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	1/2"	1/8"	1-1/2"	62125	\$15.50
3/16"	5/8"	3/16"	2"	62187	\$19.75
1/4"	3/4"	1/4"	2-1/2"	62250	\$28.50
5/16"	13/16"	5/16"	2-1/2"	62312	\$30.50
3/8"	1"	3/8"	2-1/2"	62375	\$32.50
1/2"	1-1/4"	1/2"	3"	62500	\$49.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Standard Length - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	1/2"	1/8"	1-1/2"	62125Z	\$17.75
3/16"	5/8"	3/16"	2"	62187Z	\$24.50
1/4"	3/4"	1/4"	2-1/2"	62250Z	\$34.25
5/16"	13/16"	5/16"	2-1/2"	62312Z	\$36.50
3/8"	1"	3/8"	2-1/2"	62375Z	\$38.50
1/2"	1-1/4"	1/2"	3"	62500Z	\$56.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Standard Length - Corner Radius - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	.010"	1/2"	1/8"	1-1/2"	62125RZ	\$21.50
3/16"	.010"	5/8"	3/16"	2"	62187RZ	\$28.75
1/4"	.020"	3/4"	1/4"	2-1/2"	62250RZ	\$38.25
5/16"	.020"	13/16"	5/16"	2-1/2"	62312RZ	\$41.50
3/8"	.020"	1"	3/8"	2-1/2"	62375RZ	\$43.50
1/2"	.040"	1-1/4"	1/2"	3"	62500RZ	\$64.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Radius Tolerance: +001/-001"

Zirconium has no affinity for the materials mentioned above.
Tools plus cut and can be run at 20-40% higher speed and feed rates.

2-FLUTE - 45 DEGREE HELIX MILLS 1/8" TO 1/2"

Long Length - UNCOATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	3/4"	1/8"	2-1/4"	62125L	\$23.75
3/16"	3/4"	3/16"	2-1/2"	62187L	\$27.50
1/4"	1-1/4"	1/4"	3"	62250L	\$38.50
5/16"	1-3/8"	5/16"	3"	62312L	\$45.50
3/8"	1-1/2"	3/8"	4"	62375L	\$56.50
1/2"	2"	1/2"	4"	62500L	\$74.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Long Length - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	3/4"	1/8"	2-1/4"	62125ZL	\$29.75
3/16"	3/4"	3/16"	2-1/2"	62187ZL	\$34.50
1/4"	1-1/4"	1/4"	3"	62250ZL	\$47.50
5/16"	1-3/8"	5/16"	3"	62312ZL	\$57.50
3/8"	1-1/2"	3/8"	4"	62375ZL	\$68.50
1/2"	2"	1/2"	4"	62500ZL	\$91.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Long Length - Corner Radius - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	.010"	3/4"	1/8"	2-1/4"	62125LRZ	\$35.50
3/16"	.010"	3/4"	3/16"	2-1/2"	62187LRZ	\$41.50
1/4"	.020"	1-1/4"	1/4"	3"	62250LRZ	\$52.50
5/16"	.020"	1-3/8"	5/16"	3"	62312LRZ	\$64.50
3/8"	.020"	1-1/2"	3/8"	4"	62375LRZ	\$76.50
1/2"	.040"	2"	1/2"	4"	62500LRZ	\$99.50

Radius Tolerance: +001/-001"

Zirconium has no affinity for the materials mentioned above.
Tools zirconium cut and can be run at 20-40% higher speed and feed rates.

3-FLUTE - 45 DEGREE HELIX MILLS 1/8" TO 1/2"

Standard Length - UNCOATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	1/2"	1/8"	1-1/2"	63125	\$15.50
3/16"	5/8"	3/16"	2"	63187	\$19.75
1/4"	3/4"	1/4"	2-1/2"	63250	\$28.50
5/16"	13/16"	5/16"	2-1/2"	63312	\$30.50
3/8"	1"	3/8"	2-1/2"	63375	\$32.50
1/2"	1-1/4"	1/2"	3"	63500	\$49.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Standard Length - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	1/2"	1/8"	1-1/2"	63125Z	\$17.75
3/16"	5/8"	3/16"	2"	63187Z	\$24.50
1/4"	3/4"	1/4"	2-1/2"	63250Z	\$34.25
5/16"	13/16"	5/16"	2-1/2"	63312Z	\$36.50
3/8"	1"	3/8"	2-1/2"	63375Z	\$38.50
1/2"	1-1/4"	1/2"	3"	63500Z	\$56.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Standard Length - Corner Radius - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	.010"	1/2"	1/8"	1-1/2"	63125RZ	\$21.50
3/16"	.010"	5/8"	3/16"	2"	63187RZ	\$28.75
1/4"	.020"	3/4"	1/4"	2-1/2"	63250RZ	\$38.25
5/16"	.020"	13/16"	5/16"	2-1/2"	63312RZ	\$41.50
3/8"	.020"	1"	3/8"	2-1/2"	63375RZ	\$43.50
1/2"	.040"	1-1/4"	1/2"	3"	63500RZ	\$64.50

Radius Tolerance: +001/-001"

Zirconium has no affinity for the materials mentioned above.
Tools plus cut and can be run at 20-40% higher speed and feed rates.

3-FLUTE - 45 DEGREE HELIX MILLS 1/8" TO 1/2"

Long Length - UNCOATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	3/4"	1/8"	2-1/4"	63125L	\$23.75
3/16"	3/4"	3/16"	2-1/2"	63187L	\$27.50
1/4"	1-1/4"	1/4"	3"	63250L	\$38.50
5/16"	1-3/8"	5/16"	3"	63312L	\$45.50
3/8"	1-1/2"	3/8"	4"	63375L	\$56.50
1/2"	2"	1/2"	4"	63500L	\$74.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Long Length - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	3/4"	1/8"	2-1/4"	63125ZL	\$29.75
3/16"	3/4"	3/16"	2-1/2"	63187ZL	\$34.50
1/4"	1-1/4"	1/4"	3"	63250ZL	\$47.50
5/16"	1-3/8"	5/16"	3"	63312ZL	\$57.50
3/8"	1-1/2"	3/8"	4"	63375ZL	\$68.50
1/2"	2"	1/2"	4"	63500ZL	\$91.50

Diameter Tolerance: 1/8"-1/2" +000/-002"

Long Length - Corner Radius - ZRN COATED - 45 Degree Helix

FOR ALUMINUM, BRASS, BRONZE AND COPPER



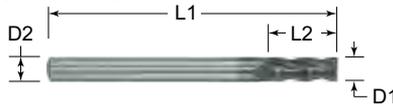
D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	.010"	3/4"	1/8"	2-1/4"	63125LRZ	\$35.50
3/16"	.010"	3/4"	3/16"	2-1/2"	63187LRZ	\$41.50
1/4"	.020"	1-1/4"	1/4"	3"	63250LRZ	\$52.50
5/16"	.020"	1-3/8"	5/16"	3"	63312LRZ	\$64.50
3/8"	.020"	1-1/2"	3/8"	4"	63375LRZ	\$76.50
1/2"	.040"	2"	1/2"	4"	63500LRZ	\$99.50

Radius Tolerance: +001/-001"

Zirconium has no affinity for the materials mentioned above.
Tools plus cut and can be run at 20-40% higher speed and feed rates.

5-FLUTE - 45° HELIX END MILLS

Stub & Standard Length - Square End - AITiN COATED - 1/32" to 1/2"



Heavy Core with Corner Chamfer or Radius on all sizes. Carbide End Mills for Hardened Steel to 50 RC.

D1 Cutter Diameter	L2 Stub Length of Cut	L2 Standard Length of Cut	R Corner Chamfer/ Radius	D2 Shank Dia.	L1 Over All Length Stub / Std.	STUB LENGTH		STANDARD LTH	
						TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
.031"	.062"	.093"	.005" CHFR	1/8"	1-1/2"	57031S	\$27.25	57031	\$29.50
.047"	.094"	.141"	.005" CHFR	1/8"	1-1/2"	57047S	\$27.25	57047	\$29.50
.062"	.125"	.186"	.007" CHFR	1/8"	1-1/2"	57062S	\$25.00	57062	\$27.25
.078"	.156"	.234"	.007" CHFR	1/8"	1-1/2"	57078S	\$25.00	57078	\$27.25
.093"	.186"	.267"	.007" CHFR	1/8"	1-1/2"	57093S	\$25.00	57093	\$27.25
.125"	.250"	.500"	.010" RAD	1/8"	1-1/2"	57125S	\$19.25	57125	\$21.50
.187"	.375"	.750"	.010" RAD	3/16"	2" / 2-1/2"	57187S	\$20.50	57187	\$26.00
.250"	.500"	.750"	.020" RAD	1/4"	2" / 2-1/2"	57250S	\$22.75	57250	\$28.25
.312"	.500"	.875"	.020" RAD	5/16"	2" / 2-1/2"	57312S	\$28.25	57312	\$32.75
.375"	.625"	.875"	.020" RAD	3/8"	2" / 2-1/2"	57375S	\$39.50	57375	\$44.00
.500"	.625"	1.250"	.040" RAD	1/2"	2-1/2" / 3"	57500S	\$52.00	57500	\$79.00

MINIATURE DIE SINKING BALL END MILLS

3, 5, & 7 Degree Tapered Neck - AITiN COATED

2 STRAIGHT FLUTES

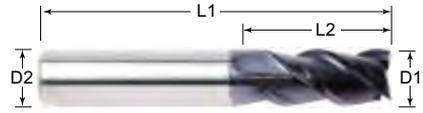


D1 Cutter Diameter	Degrees Per Side	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	3	.875"	.125"	2"	59931-3	\$22.50
.062"	3	.562"	.125"	2"	59962-3	\$22.50
.093"	3	.875"	.187"	2"	59993-3	\$30.00
.125"	3	1.00"	.250"	2-1/2"	59125-3	\$40.25
.031"	5	.500"	.125"	2"	59931-5	\$22.50
.062"	5	.312"	.125"	2"	59962-5	\$22.50
.093"	5	.500"	.187"	2"	59993-5	\$30.00
.125"	5	.680"	.250"	2-1/2"	59125-5	\$40.25
.031"	7	.375"	.125"	1-1/2"	59931-7	\$22.50
.062"	7	.250"	.125"	1-1/2"	59962-7	\$22.50
.093"	7	.375"	.187"	2"	59993-7	\$30.00
.125"	7	.500"	.250"	2-1/2"	59125-7	\$40.25

3-FLUTE - 45° & 60° HELIX END MILLS

Standard Length - **AlTiN COATED** 45 & 60 Degree Helix

Profile and finishing in all exotic material and stainless steel.



Increase SFM up to 40% when using these 3-Flute Series of High Performance 45 and 60-Degree Helix End Mills.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	45 DEGREE		60 DEGREE	
				TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
1/8"	.500"	1/8"	1-1/2"	60125	\$19.75	61125	\$19.75
3/16"	.625"	3/16"	2"	60187	\$22.00	61187	\$22.00
1/4"	.750"	1/4"	2-1/2"	60250	\$24.50	61250	\$24.50
5/16"	.812"	5/16"	2-1/2"	60312	\$28.00	61312	\$28.00
3/8"	1.00"	3/8"	2-1/2"	60375	\$37.25	61375	\$37.25
1/2"	1.25"	1/2"	3"	60500	\$63.25	61500	\$63.25

6-FLUTE - 45° HELIX END MILLS

Carbide End Mills for Hardened Steel over 50 RC. **AlTiN Coated**. Heavy Core combined with Corner Radius for improved life. For Light Finishing Cuts Only in hardened materials.



D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	.500"	.010"	1/8"	1-1/2"	58125	\$23.75
3/16"	.625"	.010"	3/16"	2"	58187	\$30.75
1/4"	.750"	.015"	1/4"	2-1/2"	58250	\$43.75
5/16"	.812"	.020"	5/16"	2-1/2"	58312	\$54.50
3/8"	1.00"	.020"	3/8"	2-1/2"	58375	\$62.75
1/2"	1.00"	.025"	1/2"	3"	58500	\$100.50

FINE PITCH ROUGHERS - 1/4" to 1/2"

Standard Length - UNCOATED & AlTiN COATED

Designed to remove the maximum amount of material with a minimum amount of chatter or vibration.

Works well in hardened steels, alloyed steel, titanium, stainless and nickel based alloys.



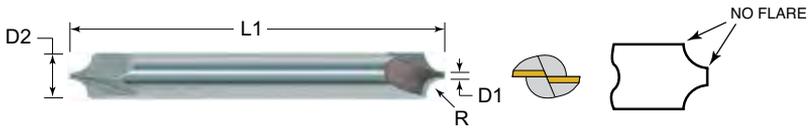
D1 Cutter Diameter	L2 Length of Cut	Number of Flutes	D2 Shank Diameter	L1 Over All Length	UNCOATED		ALTiN COATED	
					TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
1/4"	3/4"	4	1/4"	2-1/2"	16250	\$29.50	15250	\$37.25
5/16"	13/16"	4	5/16"	2-1/2"	16312	\$41.50	15312	\$52.75
3/8"	7/8"	4	3/8"	2-1/2"	16375	\$48.50	15375	\$61.00
1/2"	1-1/4"	4	1/2"	3"	16500	\$59.25	15500	\$75.25

Long Length - UNCOATED & AlTiN COATED

D1 Cutter Diameter	L2 Length of Cut	Number of Flutes	D2 Shank Diameter	L1 Over All Length	UNCOATED		ALTiN COATED	
					TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
1/4"	1-1/2"	4	1/4"	4"	16250L	\$42.75	15250L	\$54.00
5/16"	1-1/2"	4	5/16"	4"	16312L	\$54.50	15312L	\$70.50
3/8"	1-3/4"	4	3/8"	4"	16375L	\$68.75	15375L	\$85.75
1/2"	2"	4	1/2"	4"	16500L	\$78.00	15500L	\$109.50

CORNER ROUNDING MILLS - NO FLARE

2-Flute - UNCOATED - .005" - .047" Radius



Double Ended - End Cutting - Micro Grain Carbide - Made in USA

Forms precision radius on outside edges of parts. CNC Ground - 2 Flute - Double End - Rigid Solid Carbide Shank.
Tolerance on Radius is +/- .0005". No Flare on Radius. Special radii quoted on request.

R Radius	D1 Pilot Diameter	D2 Shank Diameter	L1 Overall Length	UNCOATED	
				Tool Number	Price Each
.005"	.020"	1/8"	1-1/2"	99005-02	\$36.25
.005"	3/64"	1/8"	1-1/2"	99005	\$28.00
.007"	3/64"	1/8"	1-1/2"	99007	\$28.00
.010"	.020"	1/8"	1-1/2"	99010-02	\$36.25
.010"	3/64"	1/8"	1-1/2"	99010	\$28.00
.012"	3/64"	1/8"	1-1/2"	99012	\$28.00
.015"	.020"	1/8"	1-1/2"	99015-02	\$36.25
.015"	3/64"	1/8"	1-1/2"	99015	\$28.00
.020"	.020"	1/8"	1-1/2"	99020-02	\$36.25
.020"	3/64"	1/8"	1-1/2"	99020	\$28.00
.025"	.020"	1/8"	1-1/2"	99025-02	\$36.25
.025"	3/64"	1/8"	1-1/2"	99025	\$28.00
.030"	3/64"	1/8"	1-1/2"	99030	\$28.00
.031"	.020"	1/8"	1-1/2"	99031-02	\$36.25
.031"	3/64"	1/8"	1-1/2"	99031	\$28.00
.032"	3/64"	1/8"	1-1/2"	99032	\$30.00
.035"	3/64"	1/8"	1-1/2"	99035	\$30.00
.039"	3/64"	1/8"	1-1/2"	99039	\$30.00
.040"	3/64"	1/8"	1-1/2"	99040	\$30.00
.043"	3/64"	3/16"	2"	99043	\$36.25
.045"	3/64"	3/16"	2"	99045	\$36.25
.047"	3/64"	3/16"	2"	99047	\$36.25

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CORNER ROUNDING MILLS – NO FLARE

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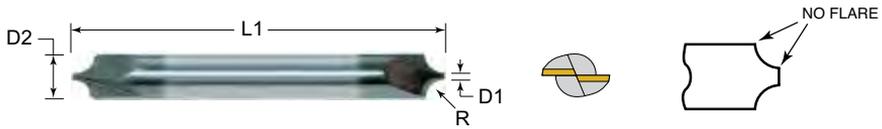
2-Flute - Corner Rounding UNCOATED Size Range: .050" to .375"



R Radius	D1 Pilot Diameter	D2 Shank Diameter	L1 Overall Length	UNCOATED	
				Tool Number	Price Each
.050"	3/64"	3/16"	2"	99050	\$36.25
.055"	3/64"	3/16"	2"	99055	\$36.25
.060"	3/64"	3/16"	2"	99060	\$36.75
.062"	3/64"	3/16"	2"	99062	\$36.75
.065"	3/64"	3/16"	2"	99065	\$36.75
.070"	3/64"	3/16"	2"	99070	\$41.00
.075"	3/64"	1/4"	2"	99075	\$41.00
.078"	3/64"	1/4"	2"	99078	\$41.75
.080"	3/64"	1/4"	2"	99080	\$41.75
.090"	3/64"	1/4"	2"	99090	\$41.75
.094"	3/64"	1/4"	2"	99094	\$43.75
.098"	3/64"	1/4"	2"	99098	\$43.75
.100"	3/64"	1/4"	2"	99100	\$43.75
.109"	.060"	5/16"	2-1/2"	99109	\$57.25
.118"	.060"	5/16"	2-1/2"	99118	\$57.25
.125"	.060"	5/16"	2-1/2"	99125	\$59.50
.140"	.060"	3/8"	2-1/2"	99140	\$70.00
.156"	.060"	3/8"	2-1/2"	99156	\$74.25
.187"	.060"	7/16"	2-1/2"	99187	\$125.50
.250"	.110"	5/8"	3-1/2"	99250	\$223.25
.375"	.250"	1"	4"	99375	\$385.00

CORNER ROUNDING MILLS - NO FLARE

2 Flute - TiCN COATED & AITiN COATED - .005" - .045" Radius



Double Ended - End Cutting - Micro Grain Carbide - Made in USA

Forms precision radius on outside edges of parts. CNC Ground - 2 Flute - Double End - Rigid Solid Carbide Shank.
Tolerance on Radius is +/- .0005". No Flare on Radius. Special radii quoted on request.

R Radius	D1 Pilot Diameter	D2 Shank Diameter	L1 Overall Length	TiCN COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.005"	.020"	1/8"	1-1/2"	-	-	99005-02TL	\$43.75
.005"	3/64"	1/8"	1-1/2"	99005TC	\$35.50	99005TL	\$35.50
.007"	3/64"	1/8"	1-1/2"	99007TC	\$35.50	99007TL	\$35.50
.010"	.020"	1/8"	1-1/2"	-	-	99010-02TL	\$43.75
.010"	3/64"	1/8"	1-1/2"	99010TC	\$35.50	99010TL	\$35.50
.012"	3/64"	1/8"	1-1/2"	99012TC	\$35.50	99012TL	\$35.50
.015"	.020"	1/8"	1-1/2"	-	-	99015-02TL	\$43.75
.015"	3/64"	1/8"	1-1/2"	99015TC	\$35.50	99015TL	\$35.50
.020"	.020"	1/8"	1-1/2"	-	-	99020-02TL	\$43.75
.020"	3/64"	1/8"	1-1/2"	99020TC	\$35.50	99020TL	\$35.50
.025"	.020"	1/8"	1-1/2"	-	-	99025-02TL	\$43.75
.025"	3/64"	1/8"	1-1/2"	99025TC	\$35.50	99025TL	\$35.50
.030"	3/64"	1/8"	1-1/2"	99030TC	\$35.50	99030TL	\$35.50
.031"	.020"	1/8"	1-1/2"	-	-	99031-02TL	\$43.75
.031"	3/64"	1/8"	1-1/2"	99031TC	\$35.50	99031TL	\$35.50
.032"	3/64"	1/8"	1-1/2"	99032TC	\$35.50	99032TL	\$35.50
.035"	3/64"	1/8"	1-1/2"	99035TC	\$35.50	99035TL	\$35.50
.039"	3/64"	1/8"	1-1/2"	99039TC	\$35.50	99039TL	\$35.50
.040"	3/64"	1/8"	1-1/2"	99040TC	\$35.50	99040TL	\$35.50
.043"	3/64"	3/16"	2"	99043TC	\$44.00	99043TL	\$44.00
.045"	3/64"	3/16"	2"	99045TC	\$44.00	99045TL	\$44.00

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CORNER ROUNDING MILLS – NO FLARE

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2-Flute - Corner Rounding
TiCN COATED & AITiN COATED
Size Range: .047" to .250"



R Radius	D1 Pilot Diameter	D2 Shank Diameter	L1 Overall Length	TiCN COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.047"	3/64"	3/16"	2"	99047TC	\$44.00	99047TL	\$44.00
.050"	3/64"	3/16"	2"	99050TC	\$44.00	99050TL	\$44.00
.055"	3/64"	3/16"	2"	99055TC	\$44.00	99055TL	\$44.00
.060"	3/64"	3/16"	2"	99060TC	\$44.00	99060TL	\$44.00
.062"	3/64"	3/16"	2"	99062TC	\$44.00	99062TL	\$44.00
.065"	3/64"	3/16"	2"	99065TC	\$44.00	99065TL	\$44.00
.070"	3/64"	3/16"	2"	99070TC	\$44.00	99070TL	\$44.00
.075"	3/64"	1/4"	2"	99075TC	\$50.25	99075TL	\$50.25
.078"	3/64"	1/4"	2"	99078TC	\$50.25	99078TL	\$50.25
.080"	3/64"	1/4"	2"	99080TC	\$50.25	99080TL	\$50.25
.090"	3/64"	1/4"	2"	99090TC	\$50.25	99090TL	\$50.25
.094"	3/64"	1/4"	2"	99094TC	\$53.25	99094TL	\$53.25
.098"	3/64"	1/4"	2"	99098TC	\$53.25	99098TL	\$53.25
.100"	3/64"	1/4"	2"	99100TC	\$53.25	99100TL	\$53.25
.109"	.060"	5/16"	2-1/2"	99109TC	\$68.25	99109TL	\$68.25
.118"	.060"	5/16"	2-1/2"	99118TC	\$68.25	99118TL	\$68.25
.125"	.060"	5/16"	2-1/2"	99125TC	\$68.25	99125TL	\$68.25
.140"	.060"	3/8"	2-1/2"	99140TC	\$80.50	99140TL	\$80.50
.156"	.060"	3/8"	2-1/2"	99156TC	\$86.75	99156TL	\$86.75
.187"	.060"	7/16"	2-1/2"	99187TC	\$140.00	99187TL	\$140.00
.250"	.110"	5/8"	3-1/2"	N/A	N/A	99250TL	\$240.50

CORNER ROUNDING MILLS - NO FLARE

4-Flute - UNCOATED & AITiN COATED



Double Ended End Cutting - Micro Grain Carbide

DEPTH OF CUT = RADIUS PLUS .005" - RADIUS TOLERANCE ±.0005"

Multiple flutes improve performance in hard to machine alloyed steels and mold steels.

R Radius	D1 Pilot Diameter	D2 Shank Diameter	L1 Overall Length	UNCOATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/64" (.0156)	7/64"	3/16"	2"	98015	\$44.50	98015TL	\$51.50
.5mm (.020)	7/64"	3/16"	2"	98020	\$44.50	98020TL	\$51.50
1/32" (.0312)	7/64"	3/16"	2"	98031	\$44.50	98031TL	\$51.50
1mm (.040)	7/64"	3/16"	2"	98040	\$44.50	98040TL	\$51.50
3/64" (.0469)	7/64"	1/4"	2"	98046	\$52.50	98046TL	\$62.50
1/16" (.0625)	7/64"	1/4"	2"	98062	\$52.50	98062TL	\$62.50
5/64" (.0781)	3/32"	1/4"	2"	98078	\$52.50	98078TL	\$62.50
3/32" (.0937)	1/8"	5/16"	2-1/2"	98093	\$66.50	98093TL	\$81.50
1/8" (.1250)	1/8"	3/8"	2-1/2"	98125	\$94.50	98125TL	\$110.50

3° FLARED - CORNER ROUNDING MILLS

4-Flute - UNCOATED & AITiN COATED



Double Ended - End Cutting - Micro Grain Carbide

DEPTH OF CUT = RADIUS PLUS .005" - RADIUS TOLERANCE ±.0005"

Multiple flutes improve performance in hard to machine alloyed steels and mold steels.

3° flare on pilot and shoulder help avoid steps in workpiece.

R Radius	D1 Pilot Diameter	D2 Shank Diameter	L1 Overall Length	UNCOATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/64" (.0156)	7/64"	3/16"	2"	98015FL	\$52.50	98015FLT	\$59.50
.5mm (.020)	7/64"	3/16"	2"	98020FL	\$52.50	98020FLT	\$59.50
1/32" (.0312)	7/64"	3/16"	2"	98031FL	\$52.50	98031FLT	\$59.50
1mm (.040)	7/64"	3/16"	2"	98040FL	\$52.50	98040FLT	\$59.50
3/64" (.0469)	7/64"	1/4"	2"	98046FL	\$64.50	98046FLT	\$74.50
1/16" (.0625)	7/64"	1/4"	2"	98062FL	\$64.50	98062FLT	\$74.50
5/64" (.0781)	3/32"	1/4"	2"	98078FL	\$64.50	98078FLT	\$74.50
3/32" (.0937)	1/8"	5/16"	2-1/2"	98093FL	\$78.50	98093FLT	\$93.50
1/8" (.1250)	1/8"	3/8"	2-1/2"	98125FL	\$104.50	98125FLT	\$122.50

3° FLARED – CORNER ROUNDING MILLS

2-Flute - UNCOATED & AITiN COATED

DEPTH OF CUT = RADIUS PLUS .005"

RADIUS TOLERANCE $\pm .0005$ "



NEW: available with multiple pilot diameters

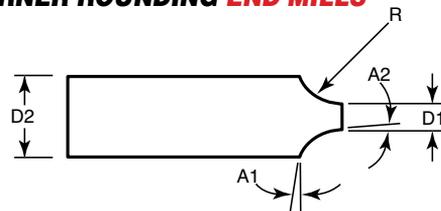
Double Ended - End Cutting - Micro Grain Carbide

R Radius	D1 Pilot Diameter	D2 Shank Diameter	L1 Overall Length	UNCOATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.005"	.020"	1/8"	1-1/2"	99205FL	\$39.50	99205FLT	\$45.50
.005"	.047"	1/8"	1-1/2"	99005FL	\$34.75	99005FLT	\$41.25
.010"	.020"	1/8"	1-1/2"	99210FL	\$39.50	99210FLT	\$45.50
.010"	.047"	1/8"	1-1/2"	99010FL	\$34.75	99010FLT	\$41.25
.015"	.020"	1/8"	1-1/2"	99215FL	\$39.50	99215FLT	\$45.50
.015"	.047"	1/8"	1-1/2"	99015FL	\$34.75	99015FLT	\$41.25
.020"	.020"	1/8"	1-1/2"	99220FL	\$39.50	99220FLT	\$45.50
.020"	.047"	1/8"	1-1/2"	99020FL	\$34.75	99020FLT	\$41.25
.025"	.020"	1/8"	1-1/2"	99225FL	\$39.50	99225FLT	\$45.50
.025"	.047"	1/8"	1-1/2"	99025FL	\$34.75	99025FLT	\$41.25
.030"	.020"	1/8"	1-1/2"	99230FL	\$39.50	99230FLT	\$45.50
.030"	.047"	1/8"	1-1/2"	99030FL	\$34.75	99030FLT	\$41.25
.031"	.020"	1/8"	1-1/2"	99231FL	\$39.50	99231FLT	\$45.50
.031"	.047"	1/8"	1-1/2"	99031FL	\$34.75	99031FLT	\$41.25
.035"	.047"	1/8"	1-1/2"	99035FL	\$34.75	99035FLT	\$41.25
.040"	.047"	3/16"	1-1/2"	99040FL	\$41.50	99040FLT	\$49.10
.043"	.047"	3/16"	2"	99043FL	\$41.90	99043FLT	\$49.50
.047"	.047"	3/16"	2"	99047FL	\$41.90	99047FLT	\$49.50
.060"	.047"	3/16"	2"	99060FL	\$41.90	99060FLT	\$49.50
.062"	.047"	3/16"	2"	99062FL	\$41.90	99062FLT	\$49.50
.078"	.047"	1/4"	2"	99078FL	\$49.50	99078FLT	\$59.10
.093"	.047"	1/4"	2"	99093FL	\$49.50	99093FLT	\$59.10
.125"	.062"	5/16"	2-1/2"	99125FL	\$76.90	99125FLT	\$87.50

ORDER SPECIAL 2-FLUTE CORNER ROUNDING END MILLS

Please specify:

- Single End or Double End.
- Radius (R): _____
- Pilot (D1): _____
- Flare Angle (A1): _____
- Flare Angle (A2): _____
- Shank Diameter (D2): _____
- Quantity (Minimum 6): _____
- Overall Length: Mfg. Standard



**Special 2-Flute
Corner Rounding End Mills**

Tools are custom manufactured to order and are nonreturnable.

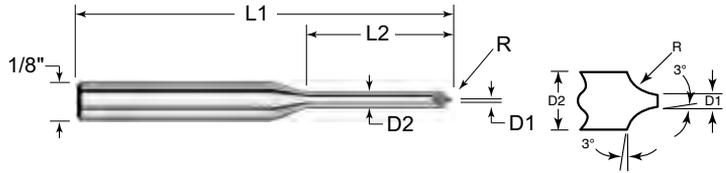
Miniature Long Reach Corner Rounding End Mills

UNCOATED & AITiN COATED

Single Ended - End Cutting - Micro Grain Carbide - Made in USA

**.005" - .030" Radius with 3 Degree
Flares on top and bottom Radius
1/8" Shank - 2 Flutes**

*Available with
multiple pilot diameters*



R Radius	D1 Pilot Diameter	D2 Neck Diameter	L2 Reach From Tip	L1 Overall Length	UNCOATED		AITiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.005"	.010"	.030"	.150"	1-1/2"	99405-150	\$33.50	99705-150	\$37.90
.005"	.010"	.030"	.250"	1-1/2"	99405-250	\$33.50	99705-250	\$37.90
.005"	.010"	.030"	.375"	1-1/2"	99405-375	\$34.50	99705-375	\$38.90
.005"	.020"	.031"	.150"	1-1/2"	99505-150	\$33.50	99805-150	\$37.90
.005"	.020"	.031"	.250"	1-1/2"	99505-250	\$33.50	99805-250	\$37.90
.005"	.020"	.031"	.375"	1-1/2"	99505-375	\$34.50	99805-375	\$38.90
.005"	.020"	.060"	.250"	1-1/2"	99605-250	\$33.50	99905-250	\$37.90
.005"	.020"	.060"	.375"	1-1/2"	99605-375	\$33.50	99905-375	\$37.90
.005"	.020"	.060"	.500"	1-1/2"	99605-500	\$33.50	99905-500	\$37.90
.005"	.020"	.060"	.625"	1-1/2"	99605-625	\$34.50	99905-625	\$38.90
.005"	.020"	.060"	.750"	2"	99605-750	\$34.50	99905-750	\$38.90
.010"	.010"	.031"	.150"	1-1/2"	99510-150	\$33.50	99810-150	\$37.90
.010"	.010"	.031"	.250"	1-1/2"	99510-250	\$33.50	99810-250	\$37.90
.010"	.010"	.031"	.375"	1-1/2"	99510-375	\$34.50	99810-375	\$38.90
.010"	.020"	.060"	.250"	1-1/2"	99610-250	\$33.50	99910-250	\$37.90
.010"	.020"	.060"	.375"	1-1/2"	99610-375	\$33.50	99910-375	\$37.90
.010"	.020"	.060"	.500"	1-1/2"	99610-500	\$33.50	99910-500	\$37.90
.010"	.020"	.060"	.625"	1-1/2"	99610-625	\$34.50	99910-625	\$38.90
.010"	.020"	.060"	.750"	2"	99610-750	\$35.40	99910-750	\$39.90
.015"	.020"	.060"	.250"	1-1/2"	99515-250	\$33.50	99815-250	\$37.90
.015"	.020"	.060"	.375"	1-1/2"	99515-375	\$33.50	99815-375	\$37.90
.015"	.020"	.060"	.500"	1-1/2"	99515-500	\$33.50	99815-500	\$37.90
.015"	.020"	.060"	.625"	1-1/2"	99515-625	\$34.50	99815-625	\$38.90
.015"	.020"	.060"	.750"	2"	99515-750	\$35.40	99815-750	\$39.90
.020"	.020"	.062"	.250"	1-1/2"	99520-250	\$33.50	99820-250	\$37.90
.020"	.020"	.062"	.375"	1-1/2"	99520-375	\$33.50	99820-375	\$37.90
.020"	.020"	.062"	.500"	1-1/2"	99520-500	\$33.50	99820-500	\$37.90
.020"	.020"	.062"	.625"	1-1/2"	99520-625	\$34.50	99820-625	\$38.90
.020"	.020"	.062"	.750"	2"	99520-750	\$35.40	99820-750	\$39.90
.025"	.020"	.078"	.375"	1-1/2"	99525-375	\$33.50	99825-375	\$37.90
.025"	.020"	.078"	.500"	1-1/2"	99525-500	\$33.50	99825-500	\$37.90
.025"	.020"	.078"	.625"	1-1/2"	99525-625	\$34.50	99825-625	\$38.90
.030"	.020"	.090"	.625"	1-1/2"	99530-625	\$34.50	99830-625	\$38.90
.030"	.020"	.090"	.750"	2"	99530-750	\$36.50	99830-750	\$40.90

Special Reach Lengths and Neck Diameters available on above sizes. Submit your request to sales@microcutUSA.com. Minimum quantity is 6 tools per size. Special Tools ship in 24-48 Hours.

BACK RADIUS AND CHAMFERING TOOLS

Micro-Sized Carbide Back Radius Form Tools



Used to form radius on the backside of slots, drilled holes and part projections. Cuts on the Radius and 3-5 Degree flare angles only. Circular Interpolate the back side many hole diameters. AlTiN Coated for wear resistance. See page 100 for special long reach options.

RADIUS +/- .0005"	HEAD DIA. "D"	NECK DIA. "N"	*NECK LENGTH "L"	C/L RADIUS FROM TIP	NON CUTTING FLAT "F"	NO. OF FLUTES	SHANK DIA. "S"	OAL	AITiN COATED	
									TOOL NUMBER	PRICE EACH
.010"	.078"	.050"	.275"	.030"	.020"	3	1/8"	1-1/2"	99310	\$57.50
.010"	.175"	.140"	.531"	.070"	.060"	3	3/16"	2"	99310L	\$64.50
.015"	.090"	.056"	.300"	.035"	.020"	3	1/8"	1-1/2"	99315	\$57.50
.015"	.175"	.135"	.531"	.080"	.060"	3	3/16"	2"	99315L	\$64.50
.020"	.114"	.070"	.375"	.040"	.020"	3	1/8"	1-1/2"	99320	\$57.50
.020"	.175"	.125"	.531"	.080"	.060"	3	3/16"	2"	99320L	\$64.50
.031"	.175"	.100"	.531"	.090"	.060"	3	3/16"	2"	99331	\$64.50
.062"	.300"	.160"	.775"	.125"	.060"	3	5/16"	2-1/2"	99362	\$84.50

*Neck length is measured from behind the cutter head.

Miniature Carbide Back Chamfering Tools



Used to chamfer or de-burr the backside of slots, thru holes and part projections. Cuts on the 45 Degree angle only. Flute face designed to evacuate chips for smooth finish. Circular Interpolate the back side of most common hole diameters, and or de-burr a variety of part configurations.

See page 101 for special long reach options.

1/8" Shank – 1-1/2" Overall Length

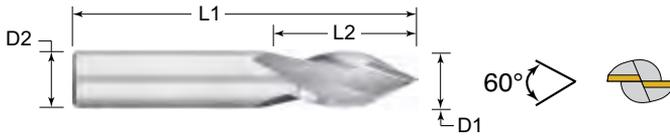
CUTTER DIA. "D"	LENGTH OF CUT (AXIAL)	MAX BACK CHAMFER	NECK DIA. "N"	NON CUTTING FLAT "F"	*NECK LENGTH "L"	NO. OF FLTS	UNCOATED		AITiN COATED	
							TOOL NUMBER	PRICE EACH	TOOL NUMBER	PRICE EACH
.026"	.004"	.004x45 Deg	.016"	.008"	.140"	3	11026	\$45.75	11026TL	\$52.00
.036"	.006"	.005x45 Deg	.024"	.010"	.175"	3	11036	\$45.75	11036TL	\$52.00
.046"	.007"	.006x45 Deg	.032"	.015"	.200"	3	11046	\$43.75	11046TL	\$50.00
.056"	.008"	.007x45 Deg	.040"	.015"	.300"	3	11056	\$43.75	11056TL	\$50.00
.086"	.010"	.009x45 Deg	.075"	.020"	.375"	3	11086	\$40.50	11086TL	\$46.75
.116"	.013"	.012x45 Deg	.090"	.030"	.575"	3	11116	\$38.50	11116TL	\$44.75

*Neck length is measured from behind the cutter head.

60° DRILL POINT MILLS - 2 & 4-FLUTE

2-Flute - 60° Included Point - UNCOATED & AITiN COATED

CENTER CUTTING FOR DRILLING AND MILLING APPLICATIONS

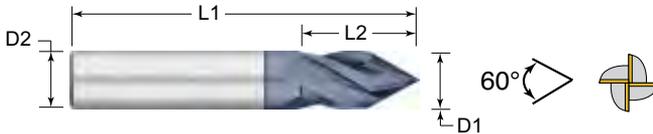


Recommended for non-ferrous materials.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/32"	1/8"	1/8"	1-1/2"	96030	\$24.25	96030TL	\$28.50
3/64"	9/64"	1/8"	1-1/2"	96045	\$24.25	96045TL	\$28.50
1/16"	3/16"	1/8"	1-1/2"	96060	\$24.25	96060TL	\$28.50
3/32"	3/8"	1/8"	1-1/2"	96094	\$24.25	96094TL	\$28.50
1/8"	1/2"	1/8"	1-1/2"	96125	\$24.25	96125TL	\$28.50
3/16"	5/8"	3/16"	2"	96187	\$27.50	96187TL	\$33.00
1/4"	3/4"	1/4"	2-1/2"	96250	\$30.75	96250TL	\$37.50
5/16"	13/16"	5/16"	2-1/2"	96312	\$38.50	96312TL	\$47.25
3/8"	1"	3/8"	2-1/2"	96375	\$44.00	96375TL	\$54.00
1/2"	1"	1/2"	3"	96500	\$77.00	96500TL	\$85.75

4-Flute - 60° Included Point - UNCOATED & AITiN COATED

CENTER CUTTING FOR DRILLING AND MILLING APPLICATIONS



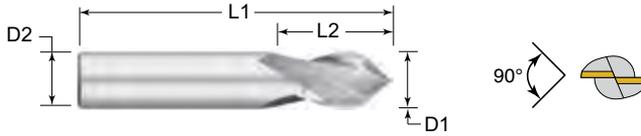
For cutting mild steel, stainless steel, and alloyed steels.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/32"	1/8"	1/8"	1-1/2"	97030	\$24.25	97030TL	\$28.50
3/64"	9/64"	1/8"	1-1/2"	97045	\$24.25	97045TL	\$28.50
1/16"	3/16"	1/8"	1-1/2"	97060	\$24.25	97060TL	\$28.50
3/32"	3/8"	1/8"	1-1/2"	97094	\$24.25	97094TL	\$28.50
1/8"	1/2"	1/8"	1-1/2"	97125	\$24.25	97125TL	\$28.50
3/16"	5/8"	3/16"	2"	97187	\$27.50	97187TL	\$33.00
1/4"	3/4"	1/4"	2-1/2"	97250	\$30.75	97250TL	\$37.50
5/16"	13/16"	5/16"	2-1/2"	97312	\$38.50	97312TL	\$47.25
3/8"	1"	3/8"	2-1/2"	97375	\$44.00	97375TL	\$54.00
1/2"	1"	1/2"	3"	97500	\$77.00	97500TL	\$85.75

90° DRILL POINT MILLS - 2 & 4-FLUTE

2-Flute - 90° Included Point - UNCOATED & AITiN COATED

CENTER CUTTING FOR DRILLING AND MILLING APPLICATIONS

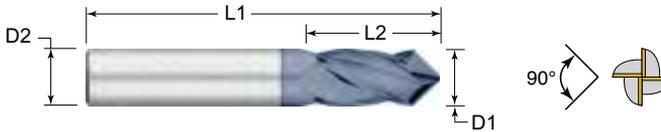


For cutting mild steel, stainless steel, and alloyed steels.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/32"	1/8"	1/8"	1-1/2"	92030	\$24.25	92030TL	\$28.50
3/64"	9/64"	1/8"	1-1/2"	92045	\$24.25	92045TL	\$28.50
1/16"	3/16"	1/8"	1-1/2"	92060	\$24.25	92060TL	\$28.50
3/32"	3/8"	1/8"	1-1/2"	92094	\$24.25	92094TL	\$28.50
1/8"	1/2"	1/8"	1-1/2"	92125	\$24.25	92125TL	\$28.50
3/16"	5/8"	3/16"	2"	92187	\$27.50	92187TL	\$33.00
1/4"	3/4"	1/4"	2-1/2"	92250	\$30.75	92250TL	\$37.50
5/16"	13/16"	5/16"	2-1/2"	92312	\$38.50	92312TL	\$47.25
3/8"	1"	3/8"	2-1/2"	92375	\$44.00	92375TL	\$54.00
1/2"	1"	1/2"	3"	92500	\$77.00	92500TL	\$85.75
5/8"	1-1/4"	5/8"	3-1/2"	92625	\$138.25	92625TL	\$160.25
3/4"	1-1/2"	3/4"	4"	92750	\$192.00	92750TL	\$219.50

4-Flute - 90° Included Point - UNCOATED & AITiN COATED

CENTER CUTTING FOR DRILLING AND MILLING APPLICATIONS



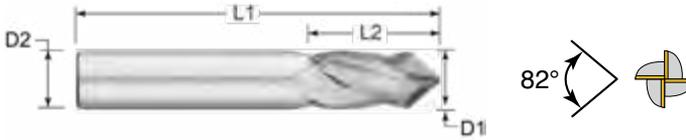
For cutting mild steel, stainless steel, and alloyed steels.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/32"	1/8"	1/8"	1-1/2"	94030	\$24.25	94030TL	\$28.50
3/64"	9/64"	1/8"	1-1/2"	94045	\$24.25	94045TL	\$28.50
1/16"	3/16"	1/8"	1-1/2"	94060	\$24.25	94060TL	\$28.50
3/32"	3/8"	1/8"	1-1/2"	94094	\$24.25	94094TL	\$28.50
1/8"	1/2"	1/8"	1-1/2"	94125	\$24.25	94125TL	\$28.50
3/16"	5/8"	3/16"	2"	94187	\$27.50	94187TL	\$33.00
1/4"	3/4"	1/4"	2-1/2"	94250	\$30.75	94250TL	\$37.50
5/16"	13/16"	5/16"	2-1/2"	94312	\$38.50	94312TL	\$47.25
3/8"	1"	3/8"	2-1/2"	94375	\$44.00	94375TL	\$54.00
1/2"	1"	1/2"	3"	94500	\$77.00	94500TL	\$85.75
5/8"	1-1/4"	5/8"	3-1/2"	94625	\$138.25	94625TL	\$160.25
3/4"	1-1/2"	3/4"	4"	94750	\$192.00	94750TL	\$219.50

82° & 120° DRILL POINT MILLS - 4-FLUTE

4-Flute - 82° Included Point - UNCOATED & AITiN COATED

CENTER CUTTING FOR DRILLING AND MILLING APPLICATIONS

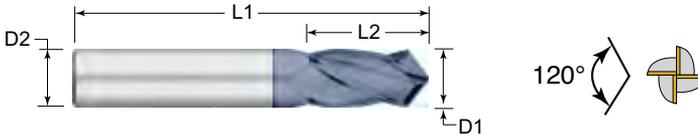


For cutting mild steel, stainless steel, and alloyed steels.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/16"	3/16"	1/8"	1-1/2"	98260	\$24.25	98260TL	\$28.50
3/32"	3/8"	1/8"	1-1/2"	98294	\$24.25	98294TL	\$28.50
1/8"	1/2"	1/8"	1-1/2"	98225	\$24.25	98225TL	\$28.50
3/16"	5/8"	3/16"	2"	98287	\$27.50	98287TL	\$33.00
1/4"	3/4"	1/4"	2-1/2"	98250	\$30.75	98250TL	\$37.50
5/16"	13/16"	5/16"	2-1/2"	98212	\$38.50	98212TL	\$47.25
3/8"	1"	3/8"	2-1/2"	98275	\$44.00	98275TL	\$54.00
1/2"	1"	1/2"	3"	98200	\$77.00	98200TL	\$85.75

4-Flute - 120° Included Point - UNCOATED & AITiN COATED

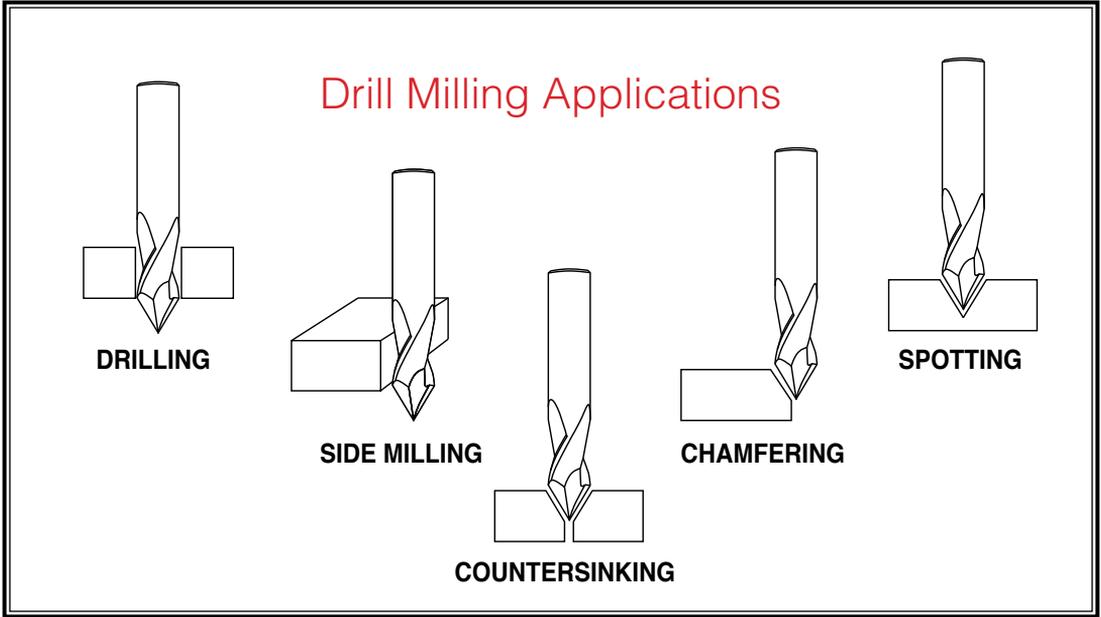
CENTER CUTTING FOR DRILLING AND MILLING APPLICATIONS



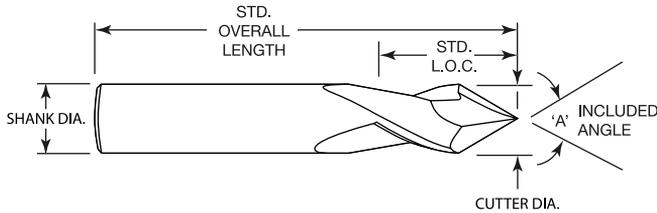
For cutting mild steel, stainless steel, and alloyed steels.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/32"	3/32"	1/8"	1-1/2"	95030	\$27.50	95030TL	\$32.00
3/64"	9/64"	1/8"	1-1/2"	95045	\$27.50	95045TL	\$32.00
1/16"	3/16"	1/8"	1-1/2"	95060	\$27.50	95060TL	\$32.00
3/32"	3/8"	1/8"	1-1/2"	95094	\$27.50	95094TL	\$32.00
1/8"	1/2"	1/8"	1-1/2"	95125	\$27.50	95125TL	\$32.00
3/16"	5/8"	3/16"	2"	95187	\$29.75	95187TL	\$35.25
1/4"	3/4"	1/4"	2-1/2"	95250	\$38.50	95250TL	\$45.00
5/16"	13/16"	5/16"	2-1/2"	95312	\$41.75	95312TL	\$49.50
3/8"	1"	3/8"	2-1/2"	95375	\$51.75	95375TL	\$65.00
1/2"	1"	1/2"	3"	95500	\$80.25	95500TL	\$93.50

ORDER SPECIAL DRILL POINT MILLS



ORDER SPECIAL DRILL MILLS



Please specify the following dimensions:

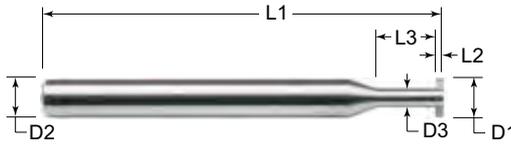
1. Cutter Diameter: _____ (Note: Must be same as Shank Diameter 1/8 inch and above.*)
2. Included Angle (A): _____
3. Number of Flutes: 2 or 4
4. Uncoated or *AlTiN Coated *Allow 2 Weeks Extra for AlTiN Coating
5. Quantity (Minimum 6): _____

Note: The maximum cutter diameter we manufacture is .500".

* Shank Diameter, Overall Length, and Length of Cut are our manufacturing standards listed on our Series 52000 and 54000 (See pages 88 and 89).

MINIATURE KEYSEAT CUTTERS – 4-FLUTE

Micrograin Carbide - UNCOATED & AITiN COATED



1/16" to 3/32" DIAMETER

D1 Cutter Diameter	L2 Cutter Width	D3 Neck Diameter	L3 Neck Length	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
						Tool Number	Price Each	Tool Number	Price Each
1/16"	.015"	.031"	3/32"	1/8"	1-1/2"	28400	\$39.50	28400TL	\$43.80
1/16"	.031"	.031"	3/32"	1/8"	1-1/2"	28405	\$39.50	28405TL	\$43.80
1/16"	.047"	.031"	3/32"	1/8"	1-1/2"	28410	\$39.50	28410TL	\$43.80
1/16"	.062"	.031"	3/32"	1/8"	1-1/2"	28415	\$39.50	28415TL	\$43.80
5/64"	.015"	.040"	1/8"	1/8"	1-1/2"	28500	\$39.10	28500TL	\$43.40
5/64"	.031"	.040"	1/8"	1/8"	1-1/2"	28505	\$39.10	28505TL	\$43.40
5/64"	.047"	.040"	1/8"	1/8"	1-1/2"	28510	\$39.10	28510TL	\$43.40
5/64"	.062"	.040"	1/8"	1/8"	1-1/2"	28515	\$39.10	28515TL	\$43.40
3/32"	.015"	.047"	5/32"	1/8"	1-1/2"	28600	\$38.65	28600TL	\$42.95
3/32"	.031"	.047"	5/32"	1/8"	1-1/2"	28605	\$38.65	28605TL	\$42.95
3/32"	.047"	.047"	5/32"	1/8"	1-1/2"	28610	\$38.65	28610TL	\$42.95
3/32"	.062"	.047"	5/32"	1/8"	1-1/2"	28615	\$38.65	28615TL	\$42.95

MINIATURE KEYSEAT CUTTERS – 6-FLUTE

Order Special Width Keyseat Cutters

1/8", 3/16" AND 1/4" DIAMETERS. MIN. 3 TOOLS PER SIZE



D1 Cutter Dia.	L2 Cutter Width	D3 Neck Dia.	L3 Neck Length	D2 Shank Dia.	L1 Over All Length	NOT COATED		AITiN COATED	
						Tool Number	Price Each	Tool Number	Price Each
1/8"	.015-.125"	.062"	3/16"	1/8"	1-1/2"	28000SP	\$79.45	28000SPT	\$92.35
3/16"	.015-.187"	.093"	9/32"	3/16"	2"	28100SP	\$83.75	28100SPT	\$96.65
1/4"	.015-.250"	.125"	3/8"	1/4"	2-1/2"	28300SP	\$88.05	28300SPT	\$104.15

Tool Number: Add Decimal Size to Tool No. in chart.

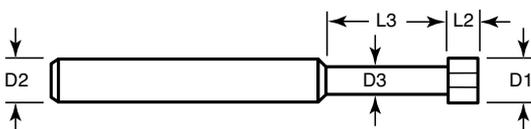
Example: 28100SPT-114 is for a 3/16" Dia. X .114" Cutter Width.

Longer neck tools quoted on request.

Delivery: 7-10 days for uncoated tools. Add 1 additional week for AITiN Coating.

ORDER SPECIAL 6-FLUTE KEYSEAT CUTTERS

To order special Keyseat Cutters please specify:



1. Shank Dia. (D2): _____
2. Cutter Dia. (D1): _____
3. Flute Length (L2): _____
4. Neck Length (L3): _____
5. Neck Dia. (D3): _____
6. Quantity (Min. 6): _____
7. Overall Length: Mfg. Standard

MINIATURE KEYSEAT CUTTERS – 6-FLUTE

Micrograin Carbide - UNCOATED & AITIN COATED



1/8", 3/16", 1/4" Diameter

Available with multiple neck lengths

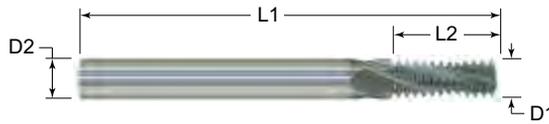
Neck length measured from behind cutter head.



D1 Cutter Diameter	L2 Cutter Width	D3 Neck Diameter	L3 Neck Length	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITIN COATED	
						Tool Number	Price Each	Tool Number	Price Each
1/8"	.015"	.062"	3/16"	1/8"	1-1/2"	28000	\$36.95	28000TL	\$41.25
1/8"	.015"	.062"	3/8"	1/8"	1-1/2"	28000L	\$43.40	28000LT	\$47.70
1/8"	.031"	.062"	3/16"	1/8"	1-1/2"	28005	\$36.95	28005TL	\$41.25
1/8"	.031"	.062"	3/8"	1/8"	1-1/2"	28005L	\$43.40	28005LT	\$47.70
1/8"	.047"	.062"	3/16"	1/8"	1-1/2"	28010	\$36.95	28010TL	\$41.25
1/8"	.047"	.062"	3/8"	1/8"	1-1/2"	28010L	\$43.40	28010LT	\$47.70
1/8"	.062"	.062"	3/16"	1/8"	1-1/2"	28015	\$36.95	28015TL	\$41.25
1/8"	.062"	.062"	3/8"	1/8"	1-1/2"	28015L	\$43.40	28015LT	\$47.70
1/8"	.093"	.062"	3/16"	1/8"	1-1/2"	28020	\$36.95	28020TL	\$41.25
1/8"	.093"	.062"	3/8"	1/8"	1-1/2"	28020L	\$43.40	28020LT	\$47.70
1/8"	.125"	.062"	3/16"	1/8"	1-1/2"	28025	\$36.95	28025TL	\$41.25
1/8"	.125"	.062"	3/8"	1/8"	1-1/2"	28025L	\$43.40	28025LT	\$47.70
3/16"	.015"	.093"	9/32"	3/16"	2"	28100	\$39.35	28100TL	\$43.85
3/16"	.015"	.093"	1/2"	3/16"	2"	28100L	\$48.75	28100LT	\$54.15
3/16"	.031"	.093"	9/32"	3/16"	2"	28105	\$39.35	28105TL	\$43.85
3/16"	.031"	.093"	1/2"	3/16"	2"	28105L	\$48.75	28105LT	\$54.15
3/16"	.047"	.093"	9/32"	3/16"	2"	28110	\$39.35	28110TL	\$43.85
3/16"	.047"	.093"	1/2"	3/16"	2"	28110L	\$48.75	28110LT	\$54.15
3/16"	.062"	.093"	9/32"	3/16"	2"	28115	\$39.35	28115TL	\$43.85
3/16"	.062"	.093"	1/2"	3/16"	2"	28115L	\$48.75	28115LT	\$54.15
3/16"	.093"	.093"	5/16"	3/16"	2"	28120	\$39.35	28120TL	\$43.85
3/16"	.093"	.093"	9/16"	3/16"	2"	28120L	\$48.75	28120LT	\$54.15
3/16"	.125"	.093"	5/16"	3/16"	2"	28125	\$39.35	28125TL	\$43.85
3/16"	.125"	.093"	9/16"	3/16"	2"	28125L	\$48.75	28125LT	\$54.15
3/16"	.187"	.093"	5/16"	3/16"	2"	28130	\$39.35	28130TL	\$43.85
3/16"	.187"	.093"	9/16"	3/16"	2"	28130L	\$48.75	28130LT	\$54.15
1/4"	.015"	.125"	3/8"	1/4"	2-1/2"	28300	\$42.30	28300TL	\$48.75
1/4"	.015"	.125"	3/4"	1/4"	2-1/2"	28300L	\$52.25	28300LT	\$58.70
1/4"	.031"	.125"	3/8"	1/4"	2-1/2"	28305	\$42.30	28305TL	\$48.75
1/4"	.031"	.125"	3/4"	1/4"	2-1/2"	28305L	\$52.25	28305LT	\$58.70
1/4"	.047"	.125"	3/8"	1/4"	2-1/2"	28310	\$42.30	28310TL	\$48.75
1/4"	.047"	.125"	3/4"	1/4"	2-1/2"	28310L	\$52.25	28310LT	\$58.70
1/4"	.062"	.125"	3/8"	1/4"	2-1/2"	28315	\$42.30	28315TL	\$48.75
1/4"	.062"	.125"	3/4"	1/4"	2-1/2"	28315L	\$52.25	28315LT	\$58.70
1/4"	.125"	.125"	3/8"	1/4"	2-1/2"	28320	\$42.30	28320TL	\$48.75
1/4"	.125"	.125"	3/4"	1/4"	2-1/2"	28320L	\$52.25	28320LT	\$58.70
1/4"	.187"	.125"	3/8"	1/4"	2-1/2"	28325	\$42.30	28325TL	\$48.75
1/4"	.187"	.125"	3/4"	1/4"	2-1/2"	28325L	\$52.25	28325LT	\$58.70
1/4"	.250"	.125"	3/8"	1/4"	2-1/2"	28330	\$42.30	28330TL	\$48.75
1/4"	.250"	.125"	3/4"	1/4"	2-1/2"	28330L	\$52.25	28330LT	\$58.70

HELICAL THREAD MILLS – 3, 4 & 5-FLUTE

Un Thread Form - AITiN COATED



Length of Cut as Specified – Micro Grain Carbide – Made in USA
 Designed for internal and external threads. Tools cut right hand or left hand.
 AITiN Coated for maximum wear resistance. CNC ground.

Thread Size	D1 Cutter Diameter	D2 Shank Diameter	L2 Length of Cut	No. of Flutes	L1 Over All Length	TOOL NUMBER	PRICE EACH
#2-56	.065"	1/8"	.125"	3	2"	44002	\$84.00
#4-40	.085"	1/8"	.175"	3	2"	44004	\$85.75
#6-32	.100"	1/8"	.218"	3	2"	44006	\$88.00
#8-32	.115"	1/8"	.250"	3	2"	44008	\$94.00
#10-24	.120"	1/8"	.312"	3	2"	44009	\$98.25
#10-32	.120"	1/8"	.312"	3	2"	44010	\$98.25
1/4-20	.180"	3/16"	.500"	3	2-1/2"	44101	\$116.25
1/4-28	.180"	3/16"	.500"	3	2-1/2"	44102	\$116.25
5/16-18	.235"	1/4"	.625"	3	2-1/2"	44201	\$126.50
5/16-24	.235"	1/4"	.625"	3	2-1/2"	44202	\$144.50
3/8-16	.285"	5/16"	.750"	4	3"	44301	\$172.75
3/8-24	.285"	5/16"	.750"	4	3"	44302	\$172.75
7/16-14	.340"	3/8"	.875"	4	3"	44401	\$172.75
7/16-20	.340"	3/8"	.875"	4	3"	44402	\$185.50
1/2-13	.350"	3/8"	.875"	4	3-1/2"	44501	\$191.75
1/2-20	.350"	3/8"	.875"	4	3-1/2"	44502	\$191.75
9/16-12	.370"	3/8"	.875"	4	3-1/2"	44601	\$191.75
9/16-18	.370"	3/8"	.875"	4	3-1/2"	44602	\$191.75
5/8-11	.495"	1/2"	1.25"	4	3-1/2"	44701	\$237.00
3/4-10	.495"	1/2"	1.25"	4	3-1/2"	44801	\$239.00
3/4-12	.495"	1/2"	1.25"	4	3-1/2"	44802	\$239.00
3/4-16	.495"	1/2"	1.25"	4	3-1/2"	44803	\$243.25
7/8-9	.620"	5/8"	1.25"	5	3-1/2"	44901	\$342.00
7/8-14	.620"	5/8"	1.25"	5	3-1/2"	44902	\$243.25
1-8	.620"	5/8"	1.375"	5	4"	44950	\$346.00

THREADMILLS - CALCULATION FORMULAS

Use these formulas to calculate:

Feed Rate Adjustment: $\frac{(\text{Thread Major Diameter to Be Cut}) - (\text{Threadmill Dia.})}{(\text{Thread Major Dia. to Be Cut})} \times \text{Linear Feed Rate}$

RPM: $\frac{3.8}{(\text{Threadmill Diameter})} \times \text{SFM}$

Linear IPM: (Inches Per Tooth) X (Number of Flutes) X RPM

HELICAL THREAD MILLS - 3, 4 & 5-FLUTE

N.P.T. - AITiN COATED



Length of Cut as Specified - Micro Grain Carbide - Made in USA

Designed for internal and external threads. Tools cut right hand or left hand.
AITiN Coated for maximum wear resistance. CNC ground-Micrograin Carbide.

Thread Size	Pitch	D1 Cutter Diameter	D2 Shank Diameter	L2 Length of Cut	No. of Flutes	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/16	27	.245"	1/4"	.437"	3	2-1/2"	45501	\$126.75
1/8	27	.310"	5/16"	.437"	4	2-1/2"	45511	\$126.75
1/4	18	.370"	3/8"	.625"	4	3"	45502	\$171.25
3/8	18	.370"	3/8"	.625"	4	3"	45512	\$171.25
1/2	14	.495"	1/2"	.875"	4	3-1/2"	45503	\$220.00
3/4	14	.495"	1/2"	.875"	4	3-1/2"	45513	\$220.00
1	11.5	.620"	3/4"	1.125"	5	4"	45504	\$289.50

NPTF Dryseal Pipe Thread - AITiN COATED



Thread Size	Pitch	D1 Cutter Diameter	D2 Shank Diameter	L2 Length of Cut	No. of Flutes	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/16	27	.245"	1/4"	.437"	3	2-1/2"	45601	\$126.75
1/8	27	.310"	5/16"	.437"	4	2-1/2"	45611	\$126.75
1/4	18	.370"	3/8"	.625"	4	3"	45602	\$171.25
3/8	18	.370"	3/8"	.625"	4	3"	45612	\$171.25
1/2	14	.495"	1/2"	.875"	4	3-1/2"	45603	\$220.00
3/4	14	.495"	1/2"	.875"	4	3-1/2"	45613	\$220.00
1	11.5	.620"	3/4"	1.125"	5	4"	45604	\$289.50

THREADMILLS FEEDS & SPEEDS

WORKPIECE MATERIAL	SPEED SFM	TOOL CUTTING DIAMETER / FEEDRATE (inches/tooth)				
		3/16	1/4	5/16	3/8	1/2
Aluminum	800-1400	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0055
Brass	600-800	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0045
Bronze	500-600	.001-.0015	.0015-.0025	.002-.003	.003-.0045	.0035-.0045
Low Alloy Steel <25RC	350-500	.001-.0015	.0015-.0025	.002-.003	.0025-.0035	.003-.004
High Alloy Steel >25RC	250-400	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.002-.003
Stainless	150-250	.0006-.001	.001-.0015	.0015-.002	.0015-.0030	.002-.0035
Titanium	80-150	.0005-.001	.0008-.0015	.001-.002	.0015-.0025	.0015-.0025

HELICAL THREAD MILLS – 3, 4 & 5-FLUTE

Metric Thread Form - **AlTiN COATED**



Length of Cut as Specified – Micro Grain Carbide – Made in USA
 Designed for internal and external threads. Tools cut right hand or left hand.
 AlTiN Coated for maximum wear resistance.

Thread Size	Pitch	D1 Cutter Diameter	D2 Shank Diameter	L2 Length of Cut	No. of Flutes	L1 Over All Length	TOOL NUMBER	PRICE EACH
M4-0.70	0.70"	.115"	1/8"	.250"	3	2"	43909	\$104.75
M4.5-0.75	0.75"	.120"	1/8"	.250"	3	2"	43910	\$104.75
M5-0.80	0.80"	.120"	3/16"	.312"	3	2"	43911	\$104.75
M6-1.00	1.00"	.170"	3/16"	.500"	3	2-1/2"	43917	\$126.25
M8-0.75	0.75"	.235"	1/4"	.625"	3	2-1/2"	43921	\$135.25
M8-1.00	1.00"	.235"	1/4"	.625"	3	2-1/2"	43922	\$135.25
M8-1.25	1.25"	.235"	1/4"	.625"	3	2-1/2"	43923	\$135.25
M10-1.25	1.25"	.300"	5/16"	.750"	4	3"	43928	\$178.25
M10-1.50	1.50"	.300"	5/16"	.750"	4	3"	43929	\$178.25
M12-1.00	1.00"	.360"	3/8"	.875"	4	3-1/2"	43933	\$194.75
M12-1.25	1.25"	.360"	3/8"	.875"	4	3-1/2"	43934	\$194.75
M12-1.75	1.75"	.360"	3/8"	.875"	4	3-1/2"	43935	\$194.75
M14-1.50	1.50"	.360"	3/8"	.875"	4	3-1/2"	43941	\$194.75
M16-2.00	2.00"	.470"	1/2"	1.250"	5	3-1/2"	43947	\$240.00
M18-2.50	2.50"	.470"	1/2"	1.250"	5	3-1/2"	43954	\$240.00
M20-3.00	3.00"	.479"	5/8"	1.250"	5	3-1/2"	43960	\$246.75

THREADMILLS - CALCULATION FORMULAS

Use these formulas to calculate:

Feed Rate Adjustment: $\frac{(\text{Thread Major Diameter to Be Cut}) - (\text{Threadmill Dia.})}{(\text{Thread Major Dia. to Be Cut})} \times \text{Linear Feed Rate}$

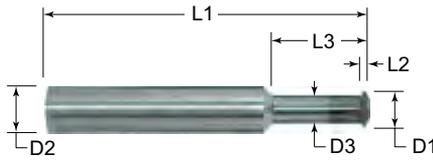
RPM: $\frac{3.8}{(\text{Threadmill Diameter})} \times \text{SFM}$

Linear IPM: (Inches Per Tooth) X (Number of Flutes) X RPM

SINGLE FORM THREAD MILLING CUTTERS

UNCOATED & AITiN COATED

Mills Any Pitch Including Metric Sizes



Suggested Starting Data:

Ferrous

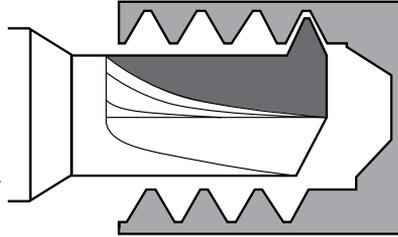
150/300 SFM; .0003/.001 IPT

Non-Ferrous

500/1K SFM; .0005/.0015 IPT

Interpolate Helix from bottom up.

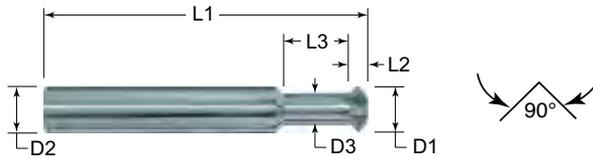
*Neck length is measured from tip of tool.



L2 Thread Size	D1 Cutter Dia.	D3 Neck Dia.	L3 Neck Length*	L1 Overall Length	D2 Shank Dia.	No. Flutes	NOT COATED		AITiN COATED	
							Tool Number	Price Each	Tool Number	Price Each
#3	.072"	.040"	.160"	2"	3/16"	1	48003	\$76.85	48003TL	\$83.30
#3	.072"	.040"	.225"	2"	3/16"	1	48203	\$85.45	48203TL	\$91.90
#4	.080"	.050"	.190"	2"	3/16"	1	48004	\$76.85	48004TL	\$83.30
#4	.080"	.050"	.290"	2"	3/16"	1	48204	\$87.60	48204TL	\$94.05
#6	.098"	.055"	.260"	2"	3/16"	2	48006	\$76.85	48006TL	\$83.30
#6	.098"	.055"	.375"	2"	3/16"	2	48206	\$87.60	48206TL	\$94.05
#8	.128"	.083"	.320"	2"	3/16"	3	48008	\$81.85	48008TL	\$88.30
#8	.128"	.083"	.500"	2"	3/16"	3	48208	\$92.60	48208TL	\$99.05
#10	.139"	.081"	.380"	2"	3/16"	3	48010	\$81.85	48010TL	\$88.30
#10	.139"	.081"	.500"	2"	3/16"	3	48210	\$92.60	48210TL	\$99.05
1/4	.188"	.124"	.400"	2"	1/4"	4	48250	\$88.60	48250TL	\$97.20
1/4	.188"	.124"	.625"	2"	1/4"	4	48252	\$101.50	48252TL	\$110.10
5/16	.247"	.175"	.500"	2-1/2"	3/8"	4	48312	\$99.45	48312TL	\$106.95
5/16	.247"	.175"	.750"	2-1/2"	3/8"	4	48314	\$115.55	48314TL	\$123.10
3/8	.300"	.218"	.600"	2-1/2"	3/8"	4	48375	\$99.45	48375TL	\$106.95
3/8	.300"	.218"	.875"	2-1/2"	3/8"	4	48377	\$115.55	48377TL	\$123.10
1/2	.420"	.300"	.800"	2-1/2"	1/2"	6	48500	\$113.40	48500TL	\$124.15
1/2	.420"	.300"	1.125"	2-1/2"	1/2"	6	48502	\$130.10	48502TL	\$140.85

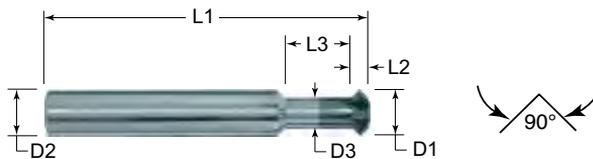
90° DOUBLE ANGLE CUTTERS

UNCOATED - Micrograin Carbide



D1 Cutter Dia.	L2 Cutter Width	D3 Neck Dia.	L3 Neck Length	No. Flutes	D2 Shank Dia.	L1 Overall Length	Tool Number	Price Each
1/16"	.031"	.031"	.093"	2	1/8"	1-1/2"	49062	\$36.50
5/64"	.039"	.039"	.118"	2	1/8"	1-1/2"	49078	\$36.50
3/32"	.047"	.047"	.141"	2	1/8"	1-1/2"	49093	\$36.50
1/8"	.062"	.062"	.250"	3	1/8"	1-1/2"	49125	\$36.50
3/16"	.093"	.093"	.312"	4	3/16"	2"	49187	\$38.50
1/4"	.125"	.125"	.375"	4	1/4"	2-1/2"	49250	\$47.50
5/16"	.156"	.156"	.500"	4	5/16"	2-1/2"	49312	\$61.50
3/8"	.187"	.187"	.625"	6	3/8"	2-1/2"	49375	\$68.50
1/2"	.250"	.250"	.750"	6	1/2"	3"	49500	\$88.50

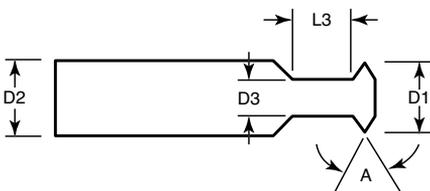
AITiN COATED - Micrograin Carbide



D1 Cutter Dia.	L2 Cutter Width	D3 Neck Dia.	L3 Neck Length	No. Flutes	D2 Shank Dia.	L1 Overall Length	Tool Number	Price Each
1/16"	.031"	.031"	.093"	2	1/8"	1-1/2"	49062TL	\$40.90
5/64"	.039"	.039"	.118"	2	1/8"	1-1/2"	49078TL	\$40.90
3/32"	.047"	.047"	.141"	2	1/8"	1-1/2"	49093TL	\$40.90
1/8"	.062"	.062"	.250"	3	1/8"	1-1/2"	49125TL	\$40.90
3/16"	.093"	.093"	.312"	4	3/16"	2"	49187TL	\$43.50
1/4"	.125"	.125"	.375"	4	1/4"	2-1/2"	49250TL	\$53.50
5/16"	.156"	.156"	.500"	4	5/16"	2-1/2"	49312TL	\$68.50
3/8"	.187"	.187"	.625"	6	3/8"	2-1/2"	49375TL	\$76.50
1/2"	.250"	.250"	.750"	6	1/2"	3"	49500TL	\$100.50

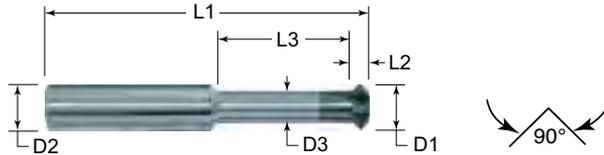
ORDER SPECIAL DOUBLE ANGLE CUTTERS

- To order special double angle cutters please specify:
1. Cutter Dia. (D1): _____
 2. Incl. Angle (A): _____
 3. Neck Length (L3): _____
(Behind Cutter)
 4. Neck Dia. (D3): _____
 5. Shank Dia. (D2): _____
 6. Overall Length: Mfg. Std.
 7. Quantity (Minimum 6): _____



90° DOUBLE ANGLE CUTTERS

90° LONG REACH CUTTERS UNCOATED & AITiN COATED MICROGRAIN CARBIDE

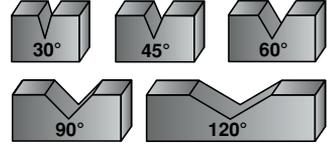
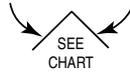
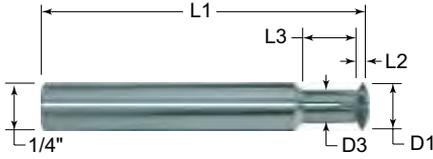


NOTE: Neck length is measured behind the cutter head.

D1 Cutter Dia.	L2 Cutter Width	D3 Neck Dia.	L3 Neck Length	No. Flutes	D2 Shank Dia.	L1 Overall Length	NOT COATED		AITiN COATED	
							Tool Number	Price Each	Tool Number	Price Each
1/16"	.031"	.031"	.156"	2	1/8"	1-1/2"	49062-156	\$39.75	49162-156	\$43.95
1/16"	.031"	.031"	.250"	2	1/8"	1-1/2"	49062-250	\$43.75	49162-250	\$47.95
1/16"	.031"	.031"	.375"	2	1/8"	1-1/2"	49062-375	\$43.75	49162-375	\$47.95
5/64"	.039"	.039"	.187"	2	1/8"	1-1/2"	49078-187	\$39.75	49178-187	\$43.95
5/64"	.039"	.039"	.312"	2	1/8"	1-1/2"	49078-312	\$43.75	49178-312	\$47.95
5/64"	.039"	.039"	.500"	2	1/8"	1-1/2"	49078-500	\$43.75	49178-500	\$47.95
3/32"	.047"	.047"	.250"	2	1/8"	1-1/2"	49093-250	\$39.75	49193-250	\$43.95
3/32"	.047"	.047"	.375"	2	1/8"	1-1/2"	49093-375	\$43.75	49193-375	\$47.95
3/32"	.047"	.047"	.500"	2	1/8"	1-1/2"	49093-500	\$43.75	49193-500	\$47.95
3/32"	.047"	.047"	.625"	2	1/8"	2-1/2"	49093-625	\$45.50	49193-625	\$50.10
3/32"	.047"	.047"	.750"	2	1/8"	2-1/2"	49093-750	\$47.50	49193-750	\$52.10
1/8"	1/16"	1/16"	.312"	3	1/8"	1-1/2"	49125-312	\$41.50	49325-312	\$45.90
1/8"	1/16"	1/16"	.500"	3	1/8"	1-1/2"	49125-500	\$43.75	49325-500	\$48.15
1/8"	1/16"	1/16"	.650"	3	1/8"	1-1/2"	49125-650	\$44.50	49325-650	\$48.70
1/8"	1/16"	1/16"	.500"	4	1/8"	2-1/2"	49225-500	\$46.50	49425-500	\$51.10
1/8"	1/16"	1/16"	.650"	4	1/8"	2-1/2"	49225-650	\$47.50	49425-650	\$52.10
1/8"	1/16"	1/16"	.750"	4	1/8"	2-1/2"	49225-750	\$48.50	49425-750	\$53.10
1/8"	1/16"	1/16"	.875"	4	1/8"	2-1/2"	49225-875	\$50.50	49425-875	\$55.10
1/8"	1/16"	1/16"	1.000"	4	1/8"	2-1/2"	49225-100	\$54.50	49425-100	\$59.10
3/16"	3/32"	3/32"	.500"	4	3/16"	2"	49187-500	\$43.50	49287-500	\$48.50
3/16"	3/32"	3/32"	.625"	4	3/16"	2"	49187-625	\$45.50	49287-625	\$50.50
3/16"	3/32"	3/32"	.750"	4	3/16"	2-1/2"	49187-750	\$47.50	49287-750	\$52.50
3/16"	3/32"	3/32"	1.000"	4	3/16"	2-1/2"	49187-100	\$51.50	49287-100	\$56.50
3/16"	3/32"	3/32"	1.250"	4	3/16"	2-1/2"	49187-125	\$53.50	49287-125	\$58.50
1/4"	1/8"	1/8"	.500"	4	1/4"	2-1/2"	49250-500	\$47.50	49350-500	\$53.50
1/4"	1/8"	1/8"	.625"	4	1/4"	2-1/2"	49250-625	\$51.50	49350-625	\$57.50
1/4"	1/8"	1/8"	.750"	4	1/4"	2-1/2"	49250-750	\$54.50	49350-750	\$60.50
1/4"	1/8"	1/8"	1.00"	4	1/4"	2-1/2"	49250-100	\$56.50	49350-100	\$62.60
5/16"	5/32"	5/32"	.750"	4	5/16"	2-1/2"	49312-750	\$60.50	49412-750	\$67.50
5/16"	5/32"	5/32"	.875"	4	5/16"	2-1/2"	49312-875	\$64.50	49412-875	\$71.50
5/16"	5/32"	5/32"	1.000"	4	5/16"	2-1/2"	49312-100	\$66.50	49412-100	\$73.50
5/16"	5/32"	5/32"	1.125"	4	5/16"	2-1/2"	49312-125	\$68.50	49412-125	\$75.50
3/8"	3/16"	3/16"	.750"	6	3/8"	2-1/2"	49375-750	\$72.50	49475-750	\$80.50
3/8"	3/16"	3/16"	1.000"	6	3/8"	2-1/2"	49375-100	\$74.50	49475-100	\$82.50
3/8"	3/16"	3/16"	1.125"	6	3/8"	2-1/2"	49375-125	\$74.50	49475-125	\$82.50
3/8"	3/16"	3/16"	1.250"	6	3/8"	3-1/2"	49375-250	\$80.50	49475-250	\$90.50
3/8"	3/16"	3/16"	1.500"	6	3/8"	3-1/2"	49375-150	\$84.50	49475-150	\$94.50
1/2"	1/4"	1/4"	1.250"	6	1/2"	3"	49500-125	\$98.50	49600-125	\$110.50
1/2"	1/4"	1/4"	1.500"	6	1/2"	3"	49500-500	\$108.50	49600-500	\$120.50

MULTI ANGLE CUTTERS

MULTI ANGLE CUTTERS UNCOATED & AITiN COATED MICROGRAIN CARBIDE 1/4" SHANK



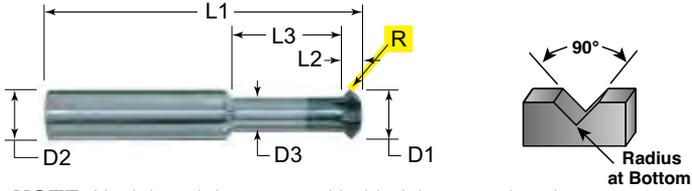
Incl'd Angle	L2 Cutter Width	D3 Neck Dia.	L3 Neck Length	No. Flutes	D1 Cutter Dia.	L1 Overall Length	NOT COATED		AITiN COATED	
							Tool Number	Price Each	Tool Number	Price Each
30°	.033"	.125"	.375"	4	1/4"	2-1/2"	49230-375	\$55.75	49230-375T	\$61.75
30°	.033"	.125"	.500"	4	1/4"	2-1/2"	49230-500	\$59.75	49230-500T	\$65.75
30°	.033"	.125"	.625"	4	1/4"	2-1/2"	49230-625	\$63.75	49230-625T	\$69.75
30°	.033"	.125"	.750"	4	1/4"	2-1/2"	49230-750	\$67.75	49230-750T	\$73.75
45°	.052"	.125"	.375"	4	1/4"	2-1/2"	49245-375	\$55.75	49245-375T	\$61.75
45°	.052"	.125"	.500"	4	1/4"	2-1/2"	49245-500	\$59.75	49245-500T	\$65.75
45°	.052"	.125"	.625"	4	1/4"	2-1/2"	49245-625	\$63.75	49245-625T	\$69.75
45°	.052"	.125"	.750"	4	1/4"	2-1/2"	49245-750	\$67.75	49245-750T	\$73.75
60°	.072"	.125"	.375"	4	1/4"	2-1/2"	49260-375	\$54.50	49260-375T	\$60.50
60°	.072"	.125"	.500"	4	1/4"	2-1/2"	49260-500	\$58.50	49260-500T	\$64.50
60°	.072"	.125"	.625"	4	1/4"	2-1/2"	49260-625	\$62.50	49260-625T	\$68.50
60°	.072"	.125"	.750"	4	1/4"	2-1/2"	49260-750	\$66.50	49260-750T	\$72.50
60°	.072"	.125"	1.00"	4	1/4"	2-1/2"	49260-100	\$69.50	49260-100T	\$75.50
90°	.125"	.125"	.375"	4	1/4"	2-1/2"	49290-375	\$47.50	49290-375T	\$53.50
90°	.125"	.125"	.500"	4	1/4"	2-1/2"	49290-500	\$47.50	49290-500T	\$53.50
90°	.125"	.125"	.625"	4	1/4"	2-1/2"	49290-625	\$51.50	49290-625T	\$57.50
90°	.125"	.125"	.750"	4	1/4"	2-1/2"	49290-750	\$54.50	49290-750T	\$60.50
90°	.125"	.125"	1.00"	4	1/4"	2-1/2"	49290-100	\$56.50	49290-100T	\$62.50
120°	.215"	.125"	.375"	4	1/4"	2-1/2"	49212-375	\$55.75	49212-375T	\$61.75
120°	.215"	.125"	.500"	4	1/4"	2-1/2"	49212-500	\$59.75	49212-500T	\$65.75
120°	.215"	.125"	.625"	4	1/4"	2-1/2"	49212-625	\$63.75	49212-625T	\$69.75
120°	.215"	.125"	.750"	4	1/4"	2-1/2"	49212-750	\$67.75	49212-750T	\$73.75

NOTE: Neck length is measured behind the cutter head.

Other neck lengths quoted on request. Minimum Order: 3 pieces per size. Ships in 24-48 Hours.

90° DOUBLE ANGLE CUTTERS W/TIP RADIUS

UNCOATED & AITiN COATED MICROGRAIN CARBIDE



NOTE: Neck length is measured behind the cutter head.

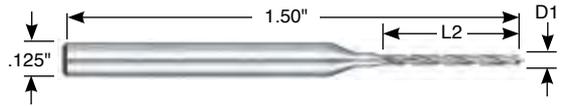
D1 Cutter Dia.	R Corner Radius	L2 Cutter Width	D3 Neck Dia.	L3 Neck Length	No. Flutes	D2 Shank Dia.	L1 Overall Length	NOT COATED		AITiN COATED	
								Tool Number	Price Each	Tool Number	Price Each
1/8"	.005"	.068"	1/16"	.250"	3	1/8"	1-1/2"	9125-250	\$48.50	9325-250	\$53.10
1/8"	.005"	.068"	1/16"	.375"	3	1/8"	1-1/2"	9125-375	\$51.50	9325-375	\$56.10
1/8"	.005"	.068"	1/16"	.500"	3	1/8"	1-1/2"	9125-500	\$55.75	9325-500	\$60.35
1/8"	.005"	.068"	1/16"	.625"	3	1/8"	1-1/2"	9125-625	\$59.75	9325-625	\$64.35
3/16"	.005"	.100"	3/32"	.312"	4	3/16"	2"	9187-312	\$50.50	9287-312	\$55.50
3/16"	.005"	.100"	3/32"	.500"	4	3/16"	2"	9187-500	\$54.50	9287-500	\$59.50
3/16"	.005"	.100"	3/32"	.625"	4	3/16"	2"	9187-625	\$56.50	9287-625	\$61.50
3/16"	.005"	.100"	3/32"	.750"	4	3/16"	2"	9187-750	\$59.50	9287-750	\$64.50
1/4"	.005"	.130"	1/8"	.375"	4	1/4"	2-1/2"	8250-375	\$59.50	8350-375	\$65.75
1/4"	.005"	.130"	1/8"	.500"	4	1/4"	2-1/2"	8250-500	\$61.50	8350-500	\$67.75
1/4"	.005"	.130"	1/8"	.625"	4	1/4"	2-1/2"	8250-625	\$63.50	8350-625	\$69.75
1/4"	.005"	.130"	1/8"	.750"	4	1/4"	2-1/2"	8250-750	\$65.50	8350-750	\$71.75
1/4"	.005"	.130"	1/8"	1.000"	4	1/4"	2-1/2"	8250-100	\$68.50	8350-100	\$74.75
1/4"	.010"	.135"	1/8"	.375"	4	1/4"	2-1/2"	9250-375	\$59.50	9350-375	\$65.75
1/4"	.010"	.135"	1/8"	.500"	4	1/4"	2-1/2"	9250-500	\$61.50	9350-500	\$67.75
1/4"	.010"	.135"	1/8"	.625"	4	1/4"	2-1/2"	9250-625	\$63.50	9350-625	\$69.75
1/4"	.010"	.135"	1/8"	.750"	4	1/4"	2-1/2"	9250-750	\$65.50	9350-750	\$71.75
1/4"	.010"	.135"	1/8"	1.000"	4	1/4"	2-1/2"	9250-100	\$68.50	9350-100	\$74.75
5/16"	.010"	5/32"	5/32"	.500"	4	5/16"	2-1/2"	9312-500	\$73.50	9412-500	\$80.75
5/16"	.010"	5/32"	5/32"	.750"	4	5/16"	2-1/2"	9312-750	\$75.50	9412-750	\$82.75
5/16"	.010"	5/32"	5/32"	1.000"	4	5/16"	2-1/2"	9312-100	\$77.50	9412-100	\$84.75
3/8"	.010"	3/16"	3/16"	.625"	6	3/8"	2-1/2"	9375-625	\$82.50	9475-625	\$90.75
3/8"	.010"	3/16"	3/16"	.750"	6	3/8"	2-1/2"	9375-750	\$82.50	9475-750	\$90.75
3/8"	.010"	3/16"	3/16"	1.000"	6	3/8"	2-1/2"	9375-100	\$84.50	9475-100	\$92.75
3/8"	.010"	3/16"	3/16"	1.125"	6	3/8"	2-1/2"	9375-125	\$84.50	9475-125	\$92.75
1/2"	.010"	1/4"	1/4"	.750"	6	1/2"	3"	9500-750	\$98.50	9600-750	\$110.50
1/2"	.010"	1/4"	1/4"	1.000"	6	1/2"	3"	9500-100	\$102.50	9600-100	\$114.50
1/2"	.010"	1/4"	1/4"	1.250"	6	1/2"	3"	9500-125	\$108.50	9600-125	\$120.50

MINIATURE CARBIDE DRILLS

Miniature Carbide Drills - Circuit Board Style

Designed for drilling non ferrous materials including brass, aluminum, copper and plastics.

Size Range: .00197" (.05mm) - .03600" (#64)
1/8" Shank x 1-1/2" OAL
130 Degree Point Angle 0.05mm to 1.60mm
150 Degree Point Angle #52 to 2.00mm



Drill Size (Fractional/Wire)	Drill Diameter (Inch) D1	Flute Length (Inch) L2	UNCOATED	
			Tool Number	Price Each
0.05mm	0.00197"	0.047"	20019	\$31.50
0.075mm	0.00295"	0.047"	20029	\$31.50
0.10mm	0.00400"	0.120"	20040	\$22.75
0.13mm	0.00500"	0.140"	20050	\$22.75
0.15mm	0.00590"	0.140"	20059	\$21.50
0.18mm	0.00700"	0.140"	20070	\$20.50
0.20mm	0.00790"	0.140"	20079	\$16.00
#89	0.00910"	0.200"	20091	\$15.50
0.25mm	0.00980"	0.200"	20098	\$15.50
0.30mm	0.01180"	0.200"	20118	\$13.75
#82	0.01250"	0.200"	20125	\$13.75
0.35mm	0.01380"	0.220"	20138	\$13.25
#79	0.01450"	0.255"	20145	\$13.25
0.40mm	0.01580"	0.255"	20158	\$12.75
0.45mm	0.01770"	0.255"	20177	\$12.75
0.50mm	0.01970"	0.280"	20197	\$12.00
#75	0.02100"	0.280"	20210	\$12.00
0.55mm	0.02170"	0.280"	20217	\$12.00
#74	0.02250"	0.280"	20225	\$12.00
0.60mm	0.02360"	0.280"	20236	\$12.00
#72	0.02500"	0.280"	20250	\$12.00
0.65mm	0.02560"	0.400"	20256	\$12.00
0.70mm	0.02760"	0.280"	20276	\$12.00
0.75mm	0.02950"	0.400"	20295	\$11.50
#68	0.03100"	0.320"	20310	\$11.50
0.80mm	0.03150"	0.320"	20315	\$11.50
#67	0.03200"	0.320"	20320	\$11.50
#66	0.03300"	0.320"	20330	\$11.50
0.85mm	0.03350"	0.320"	20335	\$11.50
0.90mm	0.03540"	0.400"	20354	\$11.50
#64	0.03600"	0.320"	20360	\$11.50

Continued Next Page

MINIATURE CARBIDE DRILLS

Continued from previous page:

Circuit Board Style - UNCOATED

Size Range: .003740" (.95mm) – .07870" (2.00mm)

1/8" Shank x 1-1/2" OAL

130 Degree Point Angle 0.05mm to 1.60mm

150 Degree Point Angle #52 to 2.00mm



Drill Size Description	Drill Diameter (Inch) D1	Flute Length (Inch) L2	UNCOATED	
			Tool Number	Price Each
0.95mm	0.03740"	0.320"	20374	\$11.50
#62	0.03800"	0.320"	20380	\$11.50
1.00mm	0.03940"	0.400"	20394	\$11.50
#60	0.04000"	0.400"	20400	\$11.50
1.05mm	0.04130"	0.400"	20413	\$11.50
#58	0.04200"	0.400"	20420	\$11.50
1.10mm	0.04330"	0.400"	20433	\$11.50
1.12mm	0.04410"	0.400"	20441	\$11.50
1.15mm	0.04530"	0.400"	20453	\$11.50
#56	0.04650"	0.400"	20465	\$11.50
1.20mm	0.04720"	0.400"	20472	\$11.50
1.25mm	0.04920"	0.400"	20492	\$11.50
1.30mm	0.05120"	0.400"	20512	\$11.50
#55	0.05200"	0.400"	20520	\$10.50
1.35mm	0.05310"	0.400"	20531	\$10.50
1.40mm	0.05510"	0.400"	20551	\$10.50
1.45mm	0.05710"	0.400"	20571	\$10.50
1.50mm	0.05910"	0.400"	20591	\$10.50
1.55mm	0.06100"	0.400"	20610	\$10.50
1.60mm	0.06300"	0.400"	20630	\$10.50
#52	0.06350"	0.400"	20635	\$10.50
1.65mm	0.06500"	0.400"	20650	\$10.00
1.70mm	0.06690"	0.400"	20669	\$10.00
1.75mm	0.06890"	0.400"	20689	\$10.00
#50	0.07000"	0.400"	20700	\$10.00
1.80mm	0.07090"	0.400"	20709	\$10.00
1.85mm	0.07280"	0.400"	20728	\$10.00
1.90mm	0.07480"	0.400"	20748	\$10.00
#48	0.07600"	0.400"	20760	\$10.00
1.95mm	0.07680"	0.400"	20768	\$10.00
2.00mm	0.07870"	0.400"	20787	\$10.00

CARBIDE MICRO DRILLS

High Performance Micro Drills

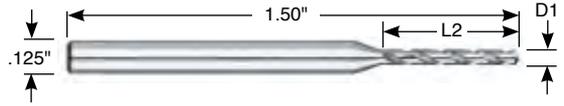
Designed for drilling in a wide variety of materials including: steels, stainless steel, titanium, alloy steels, plastic and aluminum.

Size Range: .0079" (#92) - .1250" (1/8")

Cutter Diameter Tolerance: +0/-0.0003"

135 Degree Point

AlTiN coated tools allow 2 weeks for coating - Min order for AlTiN is 10 Tools of any assorted sizes.



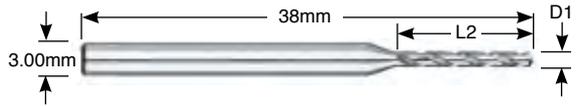
Drill Size Description	Drill Diameter D1	Flute Length L2	UNCOATED		AITIN NANO COATED	
			Tool Number	Price Each	Tool Number	Price Each
#92	.0079"	.125"	10092	\$34.00	-	-
#91	.0083"	.125"	10091	\$34.00	-	-
#90	.0087"	.125"	10090	\$34.00	-	-
#89	.0091"	.125"	10089	\$28.50	-	-
#88	.0095"	.125"	10088	\$28.50	-	-
#87	.0100"	.150"	10087	\$28.50	-	-
#86	.0105"	.150"	10086	\$22.00	-	-
#85	.0110"	.150"	10085	\$22.00	-	-
#84	.0115"	.150"	10084	\$22.00	-	-
#83	.0120"	.190"	10083	\$22.00	-	-
#82	.0125"	.190"	10082	\$17.50	10082TL	\$22.75
#81	.0130"	.190"	10081	\$17.50	10081TL	\$22.75
#80	.0135"	.190"	10080	\$16.50	10080TL	\$21.50
#79	.0145"	.190"	10079	\$16.50	10079TL	\$21.50
#78	.0160"	.190"	10078	\$16.50	10078TL	\$21.50
#77	.0180"	.250"	10077	\$16.50	10077TL	\$21.50
#76	.0200"	.250"	10076	\$14.25	10076TL	\$19.25
#75	.0210"	.250"	10075	\$14.25	10075TL	\$19.25
#74	.0225"	.250"	10074	\$14.25	10074TL	\$19.25
#73	.0240"	.250"	10073	\$14.25	10073TL	\$19.25
#72	.0250"	.250"	10072	\$14.25	10072TL	\$19.25
#71	.0260"	.250"	10071	\$14.25	10071TL	\$19.25
#70	.0280"	.320"	10070	\$14.25	10070TL	\$19.25
#69	.0292"	.320"	10069	\$14.25	10069TL	\$19.25
#68	.0310"	.400"	10068	\$14.25	10068TL	\$19.25
1/32"	.0312"	.400"	10312	\$14.25	10312TL	\$19.25
#67	.0320"	.400"	10067	\$14.25	10067TL	\$19.25
#66	.0330"	.400"	10066	\$14.25	10066TL	\$19.25
#65	.0350"	.400"	10065	\$14.25	10065TL	\$19.25
#64	.0360"	.400"	10064	\$14.25	10064TL	\$19.25
#63	.0370"	.400"	10063	\$14.25	10063TL	\$19.25
#62	.0380"	.400"	10062	\$14.25	10062TL	\$19.25
#61	.0390"	.400"	10061	\$14.25	10061TL	\$19.25
#60	.0400"	.400"	10060	\$14.25	10060TL	\$19.25
#59	.0410"	.400"	10059	\$14.25	10059TL	\$19.25
#58	.0420"	.400"	10058	\$14.25	10058TL	\$19.25
#57	.0430"	.400"	10057	\$14.25	10057TL	\$19.25
#56	.0465"	.400"	10056	\$14.25	10056TL	\$19.25
3/64"	.0469"	.400"	10471	\$14.25	10471TL	\$19.25
#55	.0520"	.400"	10055	\$14.25	10055TL	\$19.25
#54	.0550"	.400"	10054	\$14.25	10054TL	\$19.25
#53	.0595"	.400"	10053	\$14.25	10053TL	\$19.25
1/16"	.0625"	.480"	10625	\$14.25	10625TL	\$19.25
5/64"	.0781"	.480"	10781	\$14.25	10781TL	\$19.25
3/32"	.0938"	.480"	10938	\$14.25	10938TL	\$19.25
7/64"	.1094"	.480"	10109	\$14.25	10109TL	\$19.25
1/8"	.1250"	.480"	10125	\$14.25	10125TL	\$19.25

METRIC CARBIDE MICRO DRILLS

High Performance Micro Drills

Designed for drilling in a wide variety of materials including: steels, stainless steel, titanium, alloy steels, plastic and aluminum.

Size Range: .0059" (0.15mm) - .1181" (3.00mm)
Cutter Diameter Tolerance: +0/-0.008mm
135 Degree Point



AlTiN coated tools allow 2 weeks for coating - Min order for AlTiN is 10 Tools of any assorted sizes.

Drill Size D1 (mm)	Drill Diameter (inch)	Flute Length L2 (mm)	UNCOATED		AlTiN NANO COATED	
			Tool Number	Price Each	Tool Number	Price Each
0.15	.0059"	2.50	10059M	\$47.25	10059MTL	\$52.75
0.20	.0078"	2.50	10078M	\$34.00	10078MTL	\$39.50
0.25	.0098"	3.20	10098M	\$28.50	10098MTL	\$33.75
0.30	.0118"	4.80	10118M	\$17.50	10118MTL	\$22.75
0.35	.0138"	4.80	10138M	\$16.50	10138MTL	\$21.50
0.40	.0157"	4.80	10157M	\$16.50	10157MTL	\$21.50
0.45	.0177"	6.35	10177M	\$16.50	10177MTL	\$21.50
0.50	.0197"	6.35	10197M	\$14.25	10197MTL	\$19.25
0.55	.0217"	6.35	10217M	\$14.25	10217MTL	\$19.25
0.60	.0236"	6.35	10236M	\$14.25	10236MTL	\$19.25
0.65	.0256"	6.35	10256M	\$14.25	10256MTL	\$19.25
0.70	.0276"	8.10	10276M	\$14.25	10276MTL	\$19.25
0.75	.0295"	8.10	10295M	\$14.25	10295MTL	\$19.25
0.80	.0315"	10.15	10315M	\$14.25	10315MTL	\$19.25
0.85	.0335"	10.15	10335M	\$14.25	10335MTL	\$19.25
0.90	.0354"	10.15	10354M	\$14.25	10354MTL	\$19.25
0.95	.0374"	10.15	10374M	\$14.25	10374MTL	\$19.25
1.00	.0394"	10.15	10394M	\$14.25	10394MTL	\$19.25
1.50	.0590"	10.15	10591M	\$14.25	10591MTL	\$19.25
2.00	.0787"	12.18	10781M	\$14.25	10781MTL	\$19.25
2.50	.0984"	12.18	10984M	\$14.25	10984MTL	\$19.25
3.00	.1181"	12.18	11181M	\$14.25	11181MTL	\$19.25

Workpiece Material Group	Examples	Series		Tool Diameter				
		Uncoated	Coated	1/64	1/32	1/16	3/32	1/8
		SFM		IPR				
Steels	Low Carbon Steels 1018	110	150	.0004	.0008	.0015	.0023	.0030
	Alloy Steels (up to 35 Rc) 4140	90	130	.0004	.0008	.0015	.0023	.0030
	Alloy Steels (36-45 Rc) 4140	85	120	.0004	.0008	.0015	.0023	.0030
Austenitic	304 - 316	90	125	.0004	.0008	.0015	.0023	.0030
Stainless Steels	Free Machining 303	110	140	.0004	.0008	.0015	.0023	.0030
	Ferritic Martensitic 440C	80	110	.0004	.0008	.0015	.0023	.0030
Precipitation Hardened Stainless Steels	17-4 PH	45	60	.0002	.0004	.0007	.0011	.0014
Cast Irons	Gray Cast Iron A48 Class 20/G4000	110	150	.0004	.0008	.0015	.0023	.0030
	Ductile Cast Iron A536/60-40-18	110	150	.0004	.0008	.0015	.0023	.0030
Special Alloys	Titanium 6AL-4V	50	70	.0004	.0008	.0015	.0023	.0030
	High Temp Alloys - Inconel - Hastelloy Waspelly - Nickel Based Alloys - Monel	45	60	.0002	.0004	.0007	.0011	.0014
Hardened Steels	55 Rc Steel	35	50	.0002	.0004	.0007	.0011	.0014
Non-Ferrous	Plastic	175		.0005	.0010	.0020	.0030	.0040
	Aluminum (<10% Si)	175		.0005	.0010	.0020	.0030	.0040

90° & 140° SPOT DRILLS

UNCOATED & AITiN COATED

Miniature 90° "Dead Center" Spot Drills

2-FLUTE - MICROGRAIN CARBIDE



D1 Drill Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	1/8"	1-1/2"	22010	\$28.25	24010	\$34.00
.015"	.045"	1/8"	1-1/2"	22015	\$26.75	24015	\$31.50
.020"	.060"	1/8"	1-1/2"	22020	\$24.50	24020	\$29.00
.025"	.075"	1/8"	1-1/2"	22025	\$23.75	24025	\$28.50
.030"	.090"	1/8"	1-1/2"	22030	\$23.25	24030	\$28.00
.045"	.105"	1/8"	1-1/2"	22045	\$20.25	24045	\$24.75
.060"	.180"	1/8"	1-1/2"	22060	\$20.25	24060	\$24.75
.090"	.375"	1/8"	1-1/2"	22090	\$20.25	24090	\$24.75
.125"	.500"	1/8"	1-1/2"	22125	\$20.25	24125	\$24.75

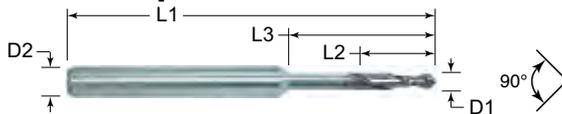
Thinned web at tip insures accuracy. Special spot drills quoted on request.

Extended Reach 90° "Dead Center" Spot Drills

2-FLUTE - MICROGRAIN CARBIDE

MINIMUM 3 PIECES PER SIZE

Neck diameter is same as cutter diameter.



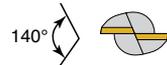
Shipped
Within 24-48
Hours

D1 Drill Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	.125"	1/8"	1-1/2"	22015LR	\$37.25	24015LR	\$42.00
.020"	.060"	.165"	1/8"	1-1/2"	22020LR	\$35.00	24020LR	\$39.75
.025"	.075"	.205"	1/8"	1-1/2"	22025LR	\$33.75	24025LR	\$38.50
.030"	.090"	.250"	1/8"	1-1/2"	22030LR	\$32.75	24030LR	\$37.25
.045"	.105"	.400"	1/8"	1-1/2"	22045LR	\$29.00	24045LR	\$33.75
.060"	.180"	.500"	1/8"	1-1/2"	22060LR	\$29.00	24060LR	\$33.75
.090"	.375"	.500"	1/8"	1-1/2"	22090LR	\$29.00	24090LR	\$33.75
.125"	.500"	.625"	1/8"	1-1/2"	22125LR	\$29.00	24125LR	\$33.75

Tools are custom manufactured to order and are nonreturnable.

Miniature 140° Spot Drills

2-FLUTE - MICROGRAIN CARBIDE



D1 Drill Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	1/8"	1-1/2"	26015	\$26.75	26215	\$31.50
.020"	.060"	1/8"	1-1/2"	26020	\$24.50	26220	\$29.00
.025"	.075"	1/8"	1-1/2"	26025	\$23.75	26225	\$28.50
.030"	.090"	1/8"	1-1/2"	26030	\$23.25	26230	\$28.00
.045"	.135"	1/8"	1-1/2"	26045	\$20.25	26245	\$24.75
.060"	.180"	1/8"	1-1/2"	26060	\$20.25	26260	\$24.75
.090"	.270"	1/8"	1-1/2"	26090	\$20.25	26290	\$24.75
.125"	.375"	1/8"	1-1/2"	26125	\$20.25	26325	\$24.75

Extended reach spot drills available on request. Minimum 3 pieces per size.

120° SPOT DRILLS & NC SPOT DRILLS

UNCOATED & AITIN COATED

Miniature 120° "Dead Center" Spot Drills

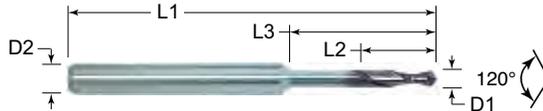
2-FLUTE - MICROGRAIN CARBIDE



D1 Drill Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITIN COATED	
				Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	1/8"	1-1/2"	23015	\$26.75	25015	\$31.50
.020"	.060"	1/8"	1-1/2"	23020	\$24.50	25020	\$29.00
.025"	.075"	1/8"	1-1/2"	23025	\$23.75	25025	\$28.50
.030"	.090"	1/8"	1-1/2"	23030	\$23.25	25030	\$28.00
.045"	.135"	1/8"	1-1/2"	23045	\$20.25	25045	\$24.75
.060"	.180"	1/8"	1-1/2"	23060	\$20.25	25060	\$24.75
.090"	.270"	1/8"	1-1/2"	23090	\$20.25	25090	\$24.75
.125"	.375"	1/8"	1-1/2"	23125	\$20.25	25125	\$24.75

Extended Reach 120° "Dead Center" Spot Drills

2-FLUTE - MICROGRAIN CARBIDE
MINIMUM 3 PIECES PER SIZE



Shipped Within 24-48 Hours

D1 Drill Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITIN COATED	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	.125"	1/8"	1-1/2"	23015LR	\$37.25	25015LR	\$42.00
.020"	.060"	.165"	1/8"	1-1/2"	23020LR	\$35.00	25020LR	\$39.75
.025"	.075"	.205"	1/8"	1-1/2"	23025LR	\$33.75	25025LR	\$38.50
.030"	.090"	.250"	1/8"	1-1/2"	23030LR	\$32.75	25030LR	\$37.25
.045"	.135"	.400"	1/8"	1-1/2"	23045LR	\$29.00	25045LR	\$33.75
.060"	.180"	.500"	1/8"	1-1/2"	23060LR	\$29.00	25060LR	\$33.75
.090"	.270"	.500"	1/8"	1-1/2"	23090LR	\$29.00	25090LR	\$33.75
.125"	.375"	.625"	1/8"	1-1/2"	23125LR	\$29.00	25125LR	\$33.75

Tools are custom manufactured to order and are nonreturnable.

Miniature NC Spotting Drills

2-FLUTE - MICROGRAIN CARBIDE - UNCOATED

1/8" - 1/4" DIA. - 90, 120 & 140 DEGREE INCLUDED POINT ANGLES



D1 Cutter Diameter	Included Angle	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITIN COATED	
				Tool Number	Price Each	Tool Number	Price Each
1/8"	90 DEG	1/8"	2"	NC125-90	\$19.00	NCT125-90	\$23.75
3/16"	90 DEG	3/16"	2"	NC187-90	\$22.50	NCT187-90	\$28.50
1/4"	90 DEG	1/4"	3"	NC250-90	\$27.25	NCT250-90	\$34.25
1/8"	120 DEG	1/8"	2"	NC125-120	\$19.00	NCT125-120	\$23.75
3/16"	120 DEG	3/16"	2"	NC187-120	\$22.50	NCT187-120	\$28.50
1/4"	120 DEG	1/4"	3"	NC250-120	\$27.25	NCT250-120	\$34.25
1/8"	140 DEG	1/8"	2"	NC125-140	\$19.00	NCT125-140	\$23.75
3/16"	140 DEG	3/16"	2"	NC187-140	\$22.50	NCT187-140	\$28.50
1/4"	140 DEG	1/4"	3"	NC250-140	\$27.25	NCT250-140	\$34.25

82° & 90° COUNTERSINKS – 6-FLUTE

UNCOATED & AITiN COATED

82° Countersinks

Double End – 6-Flutes – RHC – Micrograin Carbide



D1 Cutter Diameter	Included Angle	Maximum Tip Diameter	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	82 DEG	.025"	1/8"	1-1/2"	31125	\$25.50	31125TL	\$32.25
3/16"	82 DEG	.035"	3/16"	2"	31187	\$32.25	31187TL	\$41.25
1/4"	82 DEG	.045"	1/4"	2"	31250	\$39.00	31250TL	\$48.00
5/16"	82 DEG	.055"	5/16"	2-1/2"	31312	\$62.75	31312TL	\$74.00
3/8"	82 DEG	.060"	3/8"	2-1/2"	31375	\$75.25	31375TL	\$89.75
1/2"	82 DEG	.090"	1/2"	3"	31500	\$101.25	31500TL	\$124.00

AITiN coating for hard to machine mold steel and alloyed steel.

90° Countersinks

Double End – 6-Flutes – RHC – Micrograin Carbide



D1 Cutter Diameter	Included Angle	Maximum Tip Diameter	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	90 DEG	.025"	1/8"	1-1/2"	32125	\$25.50	32125TL	\$32.25
3/16"	90 DEG	.035"	3/16"	2"	32187	\$32.25	32187TL	\$41.25
1/4"	90 DEG	.045"	1/4"	2"	32250	\$39.00	32250TL	\$48.00
5/16"	90 DEG	.055"	5/16"	2-1/2"	32312	\$62.75	32312TL	\$74.00
3/8"	90 DEG	.060"	3/8"	2-1/2"	32375	\$75.25	32375TL	\$89.75
1/2"	90 DEG	.090"	1/2"	3"	32500	\$101.25	32500TL	\$124.00

AITiN coating for hard to machine mold steel and alloyed steel.

Special Cutting Tool Quotations

Microcut's capability to produce standard cutting tools is replicated by its ability to produce Special Cutting Tools. Quality, competitive pricing, and on-time delivery has been a Microcut trademark for 20 years. Microcut's workforce experience in producing special Micro Tools dates back over 40 years and makes us one of the most experienced Micro Tool companies in the U.S.A. Submit your special tool B/P to us by fax at 781-582-8095 or email to sales@microcutUSA.com and we will quote it through the distributor of your choice that services your facility.

COUNTERSINKS – 4-FLUTE 90° & 2-FLUTE 60°

90° "Drill Point" Countersinks UNCOATED

Drill & Countersink In One Operation – Solid Carbide – Double End – 4 Flutes
End Cutting - 90 Degree Angle Included



Save time. Tool combines two operations into one.

D1 Cutter Diameter	Included Angle	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
1/8"	90 DEG	1/8"	1-1/2"	33125	\$31.25
3/16"	90 DEG	3/16"	2"	33187	\$40.25
1/4"	90 DEG	1/4"	2"	33250	\$50.25
5/16"	90 DEG	5/16"	2-1/2"	33312	\$76.25
3/8"	90 DEG	3/8"	2-1/2"	33375	\$93.25
1/2"	90 DEG	1/2"	3"	33500	\$122.50

60° Miniature Carbide Countersinks UNCOATED & AITiN COATED

Combined Drill & Countersinks – 60 Degree Included Angle – Solid Carbide – Double End – 2 Flutes



Size	Drill Diameter	D2 Shank Diameter	L1 Over All Length	NOT COATED		AITiN COATED	
				Tool Number	Price Each	Tool Number	Price Each
00	.025"	1/8"	1-1/2"	33025CS	\$19.50	33025CST	\$23.50
0	.031"	1/8"	1-1/2"	33031CS	\$18.50	33031CST	\$24.50
1	.047"	1/8"	1-1/2"	33047CS	\$16.95	33047CST	\$20.95
2	.078"	3/16"	2"	33078CS	\$24.95	33078CST	\$31.50
3	.109"	1/4"	2"	33109CS	\$27.95	33109CST	\$35.50
4	.125"	5/16"	2-1/8"	33125CS	\$36.95	33125CST	\$45.50

Locate Your Distributor



Microcut products are sold by cutting tool distributors in the U.S. and Canada. These distributors are selected due to their expertise in cutting tools and are available to assist you in your standard and special cutting tools. It's easy to locate a local distributor. Just visit our website at www.microcutUSA.com and select "Locate a Distributor". Enter your Zip code, or select your state in the U.S. or province in Canada and choose a distributor that can process your order quickly and forward it on to the Microcut Sales Dept. We will process your order and ship the tools directly to you on the same day from our warehouse, or manufacture the specialty product as listed in the catalog within the lead time published or quoted.

COUNTERSINKS – 60°, 82° & 90° SINGLE END

60°, 82° & 90° Single End Carbide Countersinks

NOTE: For use in production machining on cast iron, steel, and alloyed steels.
3/8" & 1/2" diameter have solid carbide heads on hardened steel shanks.

UNCOATED

SINGLE FLUTE



Countersink Diameter	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER			PRICE EACH
			60 DEGREE	82 DEGREE	90 DEGREE	
1/8"	1/8"	1-1/2"	30161	30181	30191	\$15.25
3/16"	3/16"	2"	30161-1	30181-1	30191-1	\$16.50
1/4"	1/4"	2"	30162	30182	30192	\$18.75
3/8"	1/4"	2-1/2"	30163	30183	30193	\$33.25
1/2"	1/4"	2-1/2"	30164	30184	30194	\$41.75

3 FLUTE - SINGLE END



Countersink Diameter	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER			PRICE EACH
			60 DEGREE	82 DEGREE	90 DEGREE	
1/8"	1/8"	1-1/2"	30261	30361	30391	\$15.25
3/16"	3/16"	2"	30261-1	30361-1	30391-1	\$16.50
1/4"	1/4"	2"	30262	30362	30392	\$18.75
3/8"	1/4"	2-1/2"	30263	30363	30393	\$33.25
1/2"	1/4"	2-1/2"	30264	30364	30394	\$41.75

6 FLUTE - SINGLE END



Countersink Diameter	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER			PRICE EACH
			60 DEGREE	82 DEGREE	90 DEGREE	
1/8"	1/8"	1-1/2"	30461	30661	30991	\$15.25
3/16"	3/16"	2"	30461-1	30661-1	30991-1	\$16.50
1/4"	1/4"	2"	30462	30662	30992	\$18.75
3/8"	1/4"	2-1/2"	30463	30663	30993	\$33.25
1/2"	1/4"	2-1/2"	30464	30664	30994	\$41.75

45°, 60° & 66° DOVETAIL CUTTERS

45° & 60° Dovetail Cutters

Solid Micrograin Carbide – RHC

UNCOATED



D1 Cutter Diameter (Nominal or to the theoretical sharp corner)	Corner Radius	Depth of Cut		No. of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER		PRICE EACH
		45°	60°				45°	60°	
3/16"	None	.046"	.094"	2	3/16"	2"	42187	43187	\$76.20
3/16"	.010"	.046"	.094"	2	3/16"	2"	42187R	43187R	\$88.50
1/4"	None	.062"	.125"	3	1/4"	2"	42250	43250	\$81.60
1/4"	.010"	.062"	.125"	3	1/4"	2"	42250R	43250R	\$93.75
5/16"	None	.090"	.150"	3	5/16"	2-1/2"	42312	43312	\$86.95
5/16"	.010"	.090"	.150"	3	5/16"	2-1/2"	42312R	43312R	\$99.50
3/8"	None	.125"	.187"	3	3/8"	2-1/2"	42375	43375	\$97.70
3/8"	.010"	.125"	.187"	3	3/8"	2-1/2"	42375R	43375R	\$109.75

66° Dovetail Cutters For O-Ring Grooves

UNCOATED



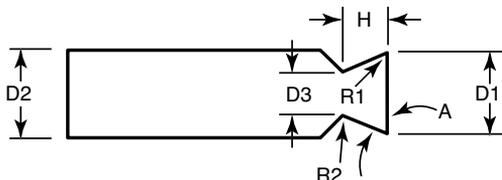
D1 O-Ring Dia.	D3 Neck Dia.*	Slot Depth	Top Radius	Bottom Radius	Actual Cutter Dia. Over Radius	No. of Flutes	D2 Shank Dia.	L1 Over All Length	TOOL NUMBER	PRICE EACH
.070"	.057" .052"	.051"	.005"	.015"	.0862"	1	3/16"	2"	41062 41062US	\$85.60
.103"	.085" .077"	.082"	.010"	.015"	.1418"	2	3/16"	2"	41093 41093US	\$85.60
.139"	.115" .105"	.112"	.010"	.031"	.1812"	2	1/4"	2"	41125 41125US	\$89.75
.210"	.173" .161"	.172"	.015"	.031"	.2927"	3	5/16"	2-1/2"	41187 41187US	\$104.00
.275"	.233" .218"	.232"	.015"	.062"	.3726"	3	3/8"	2-1/2"	41250 41250US	\$124.50
.375"	.317" .302"	.317"	.020"	.094"	.4978"	4	1/2"	2-1/2"	41375 41375US	\$159.50

Tool numbers with US suffix have reduced neck diameters as shown in table.

* Neck diameter is measured to the theoretical sharp corner.

ORDER SPECIAL DOVETAIL CUTTERS

Special Multiple Flute Dovetail Cutters



Please specify:

1. Neck (D3): _____
2. Radius or Sharp Corner (R1): _____
3. Radius or Sharp Corner (R2): _____
4. Height (H): _____
5. Angle Per Side (A): _____
6. Cutter Diameter (D1): _____
7. Shank Diameter (D2): _____
8. Number of Flutes: _____
9. Quantity (Minimum 6): _____

ENGRAVING CUTTERS

Carbide Engraving Cutters - 30, 45, 60 & 90 Degree

Ground to a Point - Relieved for Right Hand Cut - Micro Grain Carbide

UNCOATED & AITIN COATED



Ground to a Point

Incl. Angle	D1 Cutter Dia.	L2 Length Of Cut	D2 Shank Dia.	L3 Split Length	L1 Over All Length	NOT COATED		AITIN COATED	
						Tool Number	Price Each	Tool Number	Price Each
30°	1/8"	.230"	1/8"	3/8"	1-1/2"	36125-30	\$14.50	36125TL-30	\$19.00
30°	3/16"	.350"	3/16"	7/16"	2"	36187-30	\$17.95	36187TL-30	\$22.95
30°	1/4"	.465"	1/4"	9/16"	2"	36250-30	\$21.95	36250TL-30	\$28.95
45°	1/8"	.150"	1/8"	3/8"	1-1/2"	36125-45	\$14.50	36125TL-45	\$19.00
45°	3/16"	.225"	3/16"	3/8"	2"	36187-45	\$17.95	36187TL-45	\$22.95
45°	1/4"	.300"	1/4"	3/8"	2"	36250-45	\$21.95	36250TL-45	\$28.95
60°	1/8"	.106"	1/8"	3/8"	1-1/2"	36125-60	\$14.50	36125TL-60	\$19.00
60°	3/16"	.160"	3/16"	3/8"	2"	36187-60	\$17.95	36187TL-60	\$22.95
60°	1/4"	.215"	1/4"	3/8"	2-1/2"	36250-60	\$21.95	36250TL-60	\$28.95
90°	1/8"	.062"	1/8"	3/8"	1-1/2"	39125-90	\$14.50	39125TL-90	\$19.00
90°	3/16"	.094"	3/16"	3/8"	2"	39187-90	\$17.95	39187TL-90	\$22.95
90°	1/4"	.125"	1/4"	3/8"	2-1/2"	39250-90	\$21.95	39250TL-90	\$28.95

Flat Tip Engraving Cutters - 30, 45, 60 & 90 Degree

Single End - .010" Tip Diameter - Right Hand Cut

Tipped off end provides extra strength and improves cutting. Leaves .010" flat at bottom of groove.

UNCOATED & AITIN COATED



Flat Tip End Cutting

Incl. Angle	D1 Cutter Dia.	L2 Length Of Cut	D2 Shank Dia.	L3 Split Length	L1 Over All Length	NOT COATED		AITIN COATED	
						Tool Number	Price Each	Tool Number	Price Each
30°	1/8"	.215"	1/8"	3/8"	1-1/2"	34125-30	\$16.50	34125TL-30	\$21.00
30°	3/16"	.330"	3/16"	7/16"	2"	34187-30	\$19.95	34187TL-30	\$24.95
30°	1/4"	.445"	1/4"	1/2"	2"	34250-30	\$23.95	34250TL-30	\$30.95
45°	1/8"	.140"	1/8"	3/8"	1-1/2"	34125-45	\$16.50	34125TL-45	\$21.00
45°	3/16"	.215"	3/16"	7/16"	2"	34187-45	\$19.95	34187TL-45	\$24.95
45°	1/4"	.290"	1/4"	1/2"	2"	34250-45	\$23.95	34250TL-45	\$30.95
60°	1/8"	.100"	1/8"	3/8"	1-1/2"	34125-60	\$16.50	34125TL-60	\$21.00
60°	3/16"	.150"	3/16"	7/16"	2"	34187-60	\$19.95	34187TL-60	\$24.95
60°	1/4"	.205"	1/4"	1/2"	2"	34250-60	\$23.95	34250TL-60	\$30.95
90°	1/8"	.056"	1/8"	3/8"	1-1/2"	35125-90	\$16.50	35125TL-90	\$21.00
90°	3/16"	.088"	3/16"	7/16"	2"	35187-90	\$19.95	35187TL-90	\$24.95
90°	1/4"	.120"	1/4"	1/2"	2"	35250-90	\$23.95	35250TL-90	\$30.95

HEAVY DUTY ENGRAVING CUTTERS

2 Flute - 30 Degree Included



Designed to mill hard to machine materials in ferrous and non-ferrous materials. Heavy duty tip design.
End Cutting produces flat at bottom of groove. See chart for width of flat produced.
Micrograin Carbide • Available uncoated or AlTiN coated for increased wear resistance.

D1 Cutter Diameter	Flat Dim at Bottom	D2 Shank Diameter	Length of Cut	L1 Over All Length	NOT COATED		AlTiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	.005"	1/8"	.220"	1-1/2"	38025	\$17.50	38025TL	\$22.75
3/16"	.010"	3/16"	.328"	2"	38087	\$22.75	38087TL	\$29.00
1/4"	.010"	1/4"	.445"	2-1/2"	38050	\$30.00	38050TL	\$37.75

2 Flute - 45 Degree Included



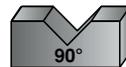
D1 Cutter Diameter	Flat Dim at Bottom	D2 Shank Diameter	Length of Cut	L1 Over All Length	NOT COATED		AlTiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	.005"	1/8"	.145"	1-1/2"	38325	\$17.50	38325TL	\$22.75
3/16"	.010"	3/16"	.215"	2"	38387	\$22.75	38387TL	\$29.00
1/4"	.010"	1/4"	.290"	2-1/2"	38350	\$30.00	38350TL	\$37.75

2 Flute - 60 Degree Included

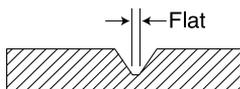


D1 Cutter Diameter	Flat Dim at Bottom	D2 Shank Diameter	Length of Cut	L1 Over All Length	NOT COATED		AlTiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	.005"	1/8"	.100"	1-1/2"	38125	\$17.50	38125TL	\$22.75
3/16"	.010"	3/16"	.150"	2"	38187	\$22.75	38187TL	\$29.00
1/4"	.015"	1/4"	.202"	2-1/2"	38250	\$30.00	38250TL	\$37.75

2 Flute - 90 Degree Included



D1 Cutter Diameter	Flat Dim at Bottom	D2 Shank Diameter	Length of Cut	L1 Over All Length	NOT COATED		AlTiN COATED	
					Tool Number	Price Each	Tool Number	Price Each
1/8"	.010"	1/8"	.056"	1-1/2"	37125	\$17.50	37125TL	\$22.75
3/16"	.020"	3/16"	.085"	2"	37187	\$22.75	37187TL	\$29.00
1/4"	.030"	1/4"	.110"	2-1/2"	37250	\$30.00	37250TL	\$37.75



End Cutting - Produces flat in bottom of groove.
See chart for width of flat produced.

SINGLE END CHAMFER CUTTERS

Carbide Single End Chamfer Cutters

UNCOATED



Designed to machine accurate chamfers and countersink angles. Rigid design insures smooth finishes. 1/8" size will plunge cut to center. Other sizes are non-end cutting. Special angles quoted on request.

D2 Shank Dia.	D1 Cutter Dia.	Angle Per Side	Incl'd Angle	T Tip Dia.	No. Flutes	L1 Overall Length	Tool Number	Price Each
1/8"	1/8"	15	30	.010"	2	1-1/2"	62015	\$16.50
1/8"	1/8"	30	60	.010"	2	1-1/2"	62030	\$16.50
1/8"	1/8"	45	90	.010"	2	1-1/2"	62045	\$16.50
1/8"	1/8"	60	120	.010"	2	1-1/2"	62060	\$16.50
1/4"	1/4"	15	30	.045"	3	2-1/2"	63015	\$29.75
1/4"	1/4"	30	60	.045"	3	2-1/2"	63030	\$29.75
1/4"	1/4"	45	90	.045"	3	2-1/2"	63045	\$29.75
1/4"	1/4"	60	120	.045"	3	2-1/2"	63060	\$29.75
3/8"	3/8"	15	30	.060"	4	2-1/2"	64015	\$42.50
3/8"	3/8"	30	60	.060"	4	2-1/2"	64030	\$42.50
3/8"	3/8"	45	90	.060"	4	2-1/2"	64045	\$42.50
3/8"	3/8"	60	120	.060"	4	2-1/2"	64060	\$42.50
1/2"	1/2"	15	30	.075"	4	3"	65015	\$66.00
1/2"	1/2"	30	60	.075"	4	3"	65030	\$61.50
1/2"	1/2"	45	90	.075"	4	3"	65045	\$61.50
1/2"	1/2"	60	120	.075"	4	3"	65060	\$61.50

Carbide Single End Chamfer Cutters

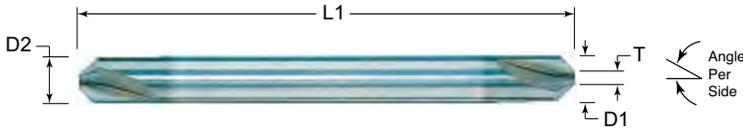
AlTiN COATED



D2 Shank Dia.	D1 Cutter Dia.	Angle Per Side	Incl'd Angle	T Tip Dia.	No. Flutes	L1 Overall Length	Tool Number	Price Each
1/8"	1/8"	15	30	.010"	2	1-1/2"	62015TL	\$21.00
1/8"	1/8"	30	60	.010"	2	1-1/2"	62030TL	\$21.00
1/8"	1/8"	45	90	.010"	2	1-1/2"	62045TL	\$21.00
1/8"	1/8"	60	120	.010"	2	1-1/2"	62060TL	\$21.00
1/4"	1/4"	15	30	.045"	3	2-1/2"	63015TL	\$36.25
1/4"	1/4"	30	60	.045"	3	2-1/2"	63030TL	\$36.25
1/4"	1/4"	45	90	.045"	3	2-1/2"	63045TL	\$36.25
1/4"	1/4"	60	120	.045"	3	2-1/2"	63060TL	\$36.25
3/8"	3/8"	15	30	.060"	4	2-1/2"	64015TL	\$51.25
3/8"	3/8"	30	60	.060"	4	2-1/2"	64030TL	\$51.25
3/8"	3/8"	45	90	.060"	4	2-1/2"	64045TL	\$51.25
3/8"	3/8"	60	120	.060"	4	2-1/2"	64060TL	\$51.25
1/2"	1/2"	15	30	.075"	4	3"	65015TL	\$82.00
1/2"	1/2"	30	60	.075"	4	3"	65030TL	\$76.50
1/2"	1/2"	45	90	.075"	4	3"	65045TL	\$76.50
1/2"	1/2"	60	120	.075"	4	3"	65060TL	\$76.50

DOUBLE END CHAMFER CUTTERS

Carbide Double End Chamfer Cutters UNCOATED & AITiN COATED



Designed to machine accurate chamfers and countersink angles. Rigid design insures smooth finishes.
1/8" size will plunge cut to center. Other sizes are non-end cutting. Special angles quoted on request.

D1 Cutter Dia.	Angle Per Side	Incl'd Angle	T Tip Dia.	No. Flutes	D2 Shank Dia.	L1 Overall Length	NOT COATED		AITiN COATED	
							Tool Number	Price Each	Tool Number	Price Each
1/8"	30	60	.010"	2	1/8"	1-1/2"	66030	\$30.75	66030TL	\$37.50
1/8"	45	90	.010"	2	1/8"	1-1/2"	66045	\$30.75	66045TL	\$37.50
1/8"	60	120	.010"	2	1/8"	1-1/2"	66060	\$30.75	66060TL	\$37.50
1/8"	30	60	.020"	4	1/8"	1-1/2"	66130	\$30.75	66130TL	\$37.50
1/8"	45	90	.020"	4	1/8"	1-1/2"	66145	\$30.75	66145TL	\$37.50
1/8"	60	120	.020"	4	1/8"	1-1/2"	66160	\$30.75	66160TL	\$37.50
3/16"	30	60	.030"	4	3/16"	2-1/2"	66230	\$38.00	66230TL	\$46.75
3/16"	45	90	.030"	4	3/16"	2-1/2"	66245	\$38.00	66245TL	\$46.75
3/16"	60	120	.030"	4	3/16"	2-1/2"	66260	\$38.00	66260TL	\$46.75
1/4"	30	60	.045"	3	1/4"	2-1/2"	67030	\$50.25	67030TL	\$62.25
1/4"	45	90	.045"	3	1/4"	2-1/2"	67045	\$50.25	67045TL	\$62.25
1/4"	60	120	.045"	3	1/4"	2-1/2"	67060	\$50.25	67060TL	\$62.25
1/4"	30	60	.045"	4	1/4"	2-1/2"	67130	\$50.25	67130TL	\$62.25
1/4"	45	90	.045"	4	1/4"	2-1/2"	67145	\$50.25	67145TL	\$62.25
1/4"	60	120	.045"	4	1/4"	2-1/2"	67160	\$50.25	67160TL	\$62.25
5/16"	30	60	.045"	4	5/16"	2-1/2"	67230	\$60.50	67230TL	\$77.00
5/16"	45	90	.045"	4	5/16"	2-1/2"	67245	\$60.50	67245TL	\$77.00
5/16"	60	120	.045"	4	5/16"	2-1/2"	67260	\$60.50	67260TL	\$77.00
3/8"	30	60	.060"	4	3/8"	2-1/2"	68030	\$76.50	68030TL	\$94.25
3/8"	45	90	.060"	4	3/8"	2-1/2"	68045	\$76.50	68045TL	\$94.25
3/8"	60	120	.060"	4	3/8"	2-1/2"	68060	\$76.50	68060TL	\$94.25
1/2"	30	60	.075"	4	1/2"	3"	69030	\$109.50	69030TL	\$140.25
1/2"	45	90	.075"	4	1/2"	3"	69045	\$109.50	69045TL	\$140.25
1/2"	60	120	.075"	4	1/2"	3"	69060	\$109.50	69060TL	\$140.25

SPIRAL 3 & 5 FLUTE CHAMFER CUTTERS

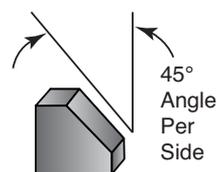
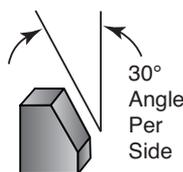
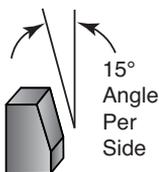
Carbide Spiral Flute - Single End Chamfer Cutters

Flat Tip - Non End Cutting - Solid Carbide

UNCOATED



Angle Per Side	Incl'd Angle	D1 Cutter Dia.	T Tip Dia.	L2 Length of Cut	D2 Shank Dia.	No. Flutes	L1 Overall Length	Tool Number	Price Each
15	30	1/4"	.060"	.355"	1/4"	3	2-1/2"	60015-355	\$35.50
15	30	1/4"	.060"	.355"	1/4"	5	2-1/2"	60215-355	\$37.50
15	30	3/8"	.070"	.570"	3/8"	3	2-1/2"	60015-570	\$46.50
15	30	3/8"	.070"	.570"	3/8"	5	2-1/2"	60025-570	\$48.50
30	60	1/8"	.040"	.075"	1/8"	3	1-1/2"	60030-075	\$20.90
30	60	1/8"	.040"	.075"	1/8"	5	1-1/2"	60230-075	\$22.90
30	60	3/16"	.050"	.120"	3/16"	3	2"	60030-120	\$27.90
30	60	3/16"	.050"	.120"	3/16"	5	2"	60230-120	\$29.90
30	60	1/4"	.060"	.165"	1/4"	3	2-1/2"	60030-165	\$35.50
30	60	1/4"	.060"	.165"	1/4"	5	2-1/2"	60230-165	\$37.50
30	60	3/8"	.070"	.265"	3/8"	3	2-1/2"	60030-265	\$46.50
30	60	3/8"	.070"	.265"	3/8"	5	2-1/2"	60230-265	\$46.50
45	90	1/8"	.040"	.042"	1/8"	3	1-1/2"	60045-042	\$20.90
45	90	1/8"	.040"	.042"	1/8"	5	1-1/2"	60245-042	\$22.90
45	90	3/16"	.050"	.070"	3/16"	3	2"	60045-070	\$27.90
45	90	3/16"	.050"	.070"	3/16"	5	2"	60245-070	\$29.90
45	90	1/4"	.060"	.095"	1/4"	3	2-1/2"	60045-095	\$35.50
45	90	1/4"	.060"	.095"	1/4"	5	2-1/2"	60245-095	\$37.50
45	90	3/8"	.070"	.154"	3/8"	3	2-1/2"	60045-154	\$46.50
45	90	3/8"	.070"	.154"	3/8"	5	2-1/2"	60245-154	\$46.50
45	90	1/2"	.080"	.210"	1/2"	3	3"	60045-210	\$66.50
45	90	1/2"	.080"	.210"	1/2"	5	3"	60245-210	\$66.50

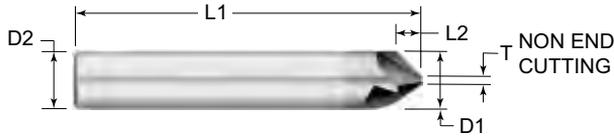


SPIRAL 3 & 5 FLUTE CHAMFER CUTTERS

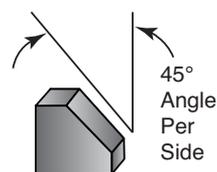
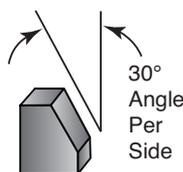
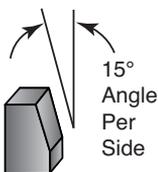
Carbide Spiral Flute - Single End Chamfer Cutters

Flat Tip - Non End Cutting - Solid Carbide

AITiN COATED



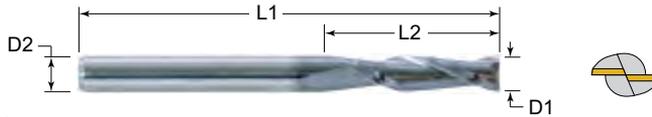
Angle Per Side	Incl'd Angle	D1 Cutter Dia.	T Tip Dia.	L2 Length of Cut	D2 Shank Dia.	No. Flutes	L1 Overall Length	Tool Number	Price Each
15	30	1/4"	.060"	.355"	1/4"	3	2-1/2"	60315-355	\$41.50
15	30	1/4"	.060"	.355"	1/4"	5	2-1/2"	60415-355	\$43.50
15	30	3/8"	.070"	.570"	3/8"	3	2-1/2"	60315-570	\$54.50
15	30	3/8"	.070"	.570"	3/8"	5	2-1/2"	60415-570	\$56.50
30	60	1/8"	.040"	.075"	1/8"	3	1-1/2"	60330-075	\$24.90
30	60	1/8"	.040"	.075"	1/8"	5	1-1/2"	60430-075	\$26.90
30	60	3/16"	.050"	.120"	3/16"	3	2"	60330-120	\$32.40
30	60	3/16"	.050"	.120"	3/16"	5	2"	60430-120	\$34.40
30	60	1/4"	.060"	.165"	1/4"	3	2-1/2"	60330-165	\$41.50
30	60	1/4"	.060"	.165"	1/4"	5	2-1/2"	60430-165	\$43.50
30	60	3/8"	.070"	.265"	3/8"	3	2-1/2"	60330-265	\$54.50
30	60	3/8"	.070"	.265"	3/8"	5	2-1/2"	60430-265	\$54.50
45	90	1/8"	.040"	.042"	1/8"	3	1-1/2"	60345-042	\$24.90
45	90	1/8"	.040"	.042"	1/8"	5	1-1/2"	60445-042	\$26.90
45	90	3/16"	.050"	.070"	3/16"	3	2"	60345-070	\$32.40
45	90	3/16"	.050"	.070"	3/16"	5	2"	60445-070	\$34.40
45	90	1/4"	.060"	.095"	1/4"	3	2-1/2"	60345-095	\$41.50
45	90	1/4"	.060"	.095"	1/4"	5	2-1/2"	60445-095	\$43.50
45	90	3/8"	.070"	.154"	3/8"	3	2-1/2"	60345-154	\$54.50
45	90	3/8"	.070"	.154"	3/8"	5	2-1/2"	60445-154	\$54.50
45	90	1/2"	.080"	.210"	1/2"	3	3"	60345-210	\$77.50
45	90	1/2"	.080"	.210"	1/2"	5	3"	60445-210	\$77.50



MINIATURE PLASTIC CUTTING END MILLS

Square End - 2-Flute - Micrograin Carbide

UNCOATED & **AMORPHOUS DIAMOND COATED**



Designed specifically for milling mechanical plastics.

For use in Polyurethane, Polycarbonate, ABS, Delrin, Nylon, PEEK, and Acrylics.

2-Flute upcut open design for fast and effective chip removal.

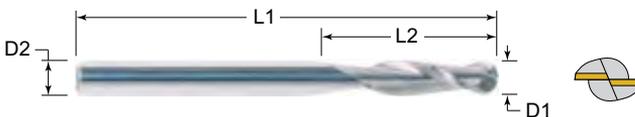
Center cutting end designed for plunging into solid material.

Available with Multiple shank diameters on some sizes.



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Overall Length	UNCOATED		DIAMOND COATED	
				Tool Number	Price Each	Tool Number	Price Each
.031"	.093"	1/8"	1-1/2"	14112	\$30.75	14212	\$46.25
.031"	.156"	1/8"	1-1/2"	14114	\$38.50	14214	\$54.00
.062"	.250"	1/8"	1-1/2"	14120	\$26.50	14220	\$41.75
.062"	.375"	1/8"	2-1/2"	14124	\$29.25	14224	\$44.75
.062"	.500"	1/4"	2"	14128	\$35.75	14228	\$54.50
.093"	.500"	1/8"	2-1/2"	14133	\$26.50	14233	\$41.75
.093"	.750"	1/4"	2-1/2"	14135	\$38.00	14235	\$57.75
.125"	.500"	1/8"	1-1/2"	14140	\$26.50	14240	\$41.75
.125"	.750"	1/8"	2-1/2"	14145	\$31.50	14245	\$49.00
.125"	1.00"	1/4"	2-1/2"	14150	\$38.00	14250	\$57.75
.187"	.562"	3/16"	2"	14155	\$33.00	14255	\$57.25
.250"	.750"	1/4"	2-1/2"	14160	\$38.50	14260	\$62.75
.250"	1.25"	1/4"	3"	14165	\$46.25	14265	\$73.75

Ball End - 2-Flute - UNCOATED



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Overall Length	UNCOATED	
				Tool Number	Price Each
.031"	.093"	1/8"	1-1/2"	14312	\$35.75
.062"	.250"	1/8"	1-1/2"	14320	\$30.25
.062"	.375"	1/8"	2-1/2"	14324	\$34.75
.062"	.500"	1/4"	2"	14328	\$42.50
.093"	.500"	1/8"	2-1/2"	14333	\$32.50
.093"	.750"	1/4"	2-1/2"	14335	\$45.75
.125"	.500"	1/8"	1-1/2"	14340	\$30.25
.125"	.750"	1/8"	2-1/2"	14345	\$38.00
.125"	1.00"	1/4"	2-1/2"	14350	\$45.75
.187"	.562"	3/16"	2"	14355	\$39.50
.250"	.750"	1/4"	2-1/2"	14360	\$46.25
.250"	1.25"	1/4"	3"	14365	\$54.00

Special long reach end mills quoted on request.
Minimum 3 pieces per size.

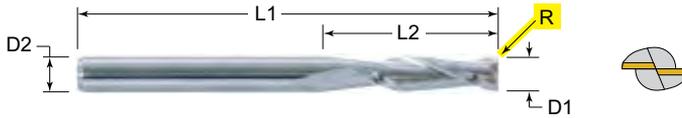


**Ships within
24-48 hours.**

**See Order Form
on next page.**

MINIATURE PLASTIC CUTTING END MILLS

Corner Radius - 2-Flute - Micrograin Carbide UNCOATED

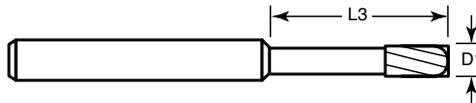


Designed for milling applications in pockets where the bottom must be smooth.
Available with multiple corner radii. See chart below

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Overall Length	UNCOATED	
					Tool Number	Price Each
.062"	.005"	.250"	1/8"	1-1/2"	14620	\$30.25
.062"	.010"	.250"	1/8"	1-1/2"	14621	\$30.25
.093"	.010"	.500"	1/8"	1-1/2"	14633	\$30.25
.093"	.015"	.500"	1/8"	1-1/2"	14634	\$30.25
.125"	.010"	.500"	1/8"	1-1/2"	14640	\$30.25
.125"	.020"	.500"	1/8"	1-1/2"	14642	\$30.25
.125"	.030"	.500"	1/8"	1-1/2"	14644	\$30.25
.187"	.015"	.562"	3/16"	2"	14655	\$39.50
.187"	.030"	.562"	3/16"	2"	14657	\$39.50
.250"	.015"	.750"	1/4"	2-1/2"	14660	\$47.25
.250"	.030"	.750"	1/4"	2-1/2"	14662	\$47.25

ORDER SPECIAL Square & Ball End or Corner Radius LONG REACH PLASTIC CUTTING END MILLS

To order special long reach end mills please specify:



1. Specify: Square End or Ball End or Corner Radius.
2. Shank Diameter (D2): _____
3. Cutter Diameter (D1): _____
4. Corner Radius (R) (From page 115 top): _____
5. Overall Reach (L3): _____
6. Quantity (Minimum 6): _____
7. 2-Flute only.

Special Reaches Shipped within 24-48 Hours!

Tools are custom manufactured to order and are nonreturnable.

PLASTIC & ALUMINUM ROUTERS

Plastic Cutting Carbide Routers

**SINGLE FLUTE - UPCUT STYLE
CUTS HARD & SOFT PLASTIC
MICROGRAIN CARBIDE**

UNCOATED



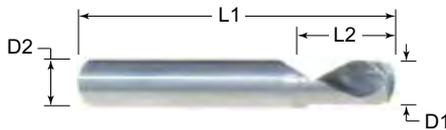
Use in Acrylics, Polycarbonate, Polystyrene, ABS, Nylon, PVC & similar.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.062"	.250"	1/4"	2"	14050	\$37.25
.125"	.250"	1/4"	2"	14055	\$37.25
.125"	.500"	1/4"	2"	14060	\$37.25
.187"	.375"	1/4"	2"	14070	\$37.25
.187"	.625"	1/4"	2"	14075	\$37.25
.250"	.375"	1/4"	2"	14080	\$35.75
.250"	.750"	1/4"	2-1/2"	14085	\$37.25
.250"	1.250"	1/4"	3"	14090	\$45.00

Aluminum Routers

**SINGLE FLUTE - UPCUT SPIRAL
CUTS ALUMINUM PLATE & SHEET**

UNCOATED



Ultra High Performance Design. Used for high speed machining of aluminum plate and single or multi-sheet aluminum. Designed for CNC mills, machining centers and CNC routers.

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.062"	.250"	1/8"	1-1/2"	14510	\$37.25
.093"	.250"	1/8"	2"	14520	\$38.50
.125"	.250"	1/8"	1-1/2"	14525	\$38.50
.125"	.500"	1/4"	2"	14530	\$48.25
.187"	.625"	1/4"	2"	14535	\$49.50
.250"	.375"	1/4"	2"	14540	\$48.25
.250"	.750"	1/4"	2-1/2"	14550	\$52.00
.250"	1.250"	1/4"	3"	14560	\$76.50

SHEAR HOG® & INSERTS FOR ALUMINUM

Shear Hog® For Aluminum

THRU SPINDLE COOLANT HOLE.
INCLUDES INSERTS AND WRENCH.



Cutter Diameter	Number of Flutes	Ramp Angle	Shank Diameter	Over All Length	TOOL NUMBER	PRICE EACH
.750"	1	CTR CUT	3/4"	4.0"	MCH-0750	\$269.00
1.00"	1	CTR CUT	3/4"	3.5"	MCH-1000	\$269.00
1.25"	2	8 DEG	3/4"	3.5"	MCH-1250	\$299.00
1.50"	2	8 DEG	3/4"	4.0"	MCH-1500	\$339.00
2.00"	3	4 DEG	3/4"	4.5"	MCH-2000	\$389.00
2.00"	3	4 DEG	1"	5.0"	MCH-2100	\$399.00

Hi-Shear Polished Carbide Inserts For Aluminum

Corner Radius	TOOL NUMBER	PRICE EACH
.010"	MCH-431	\$26.50
.030"	MCH-432	\$26.50
.060"	MCH-434	\$26.50



ABRASION RESISTANT TOOL COATINGS



TiCN

Cutting carbon steel, alloy steel and cast iron; cold forming & stamping tools.



ZrN

Hard coating for machining a variety of non-ferrous materials.



AlTiN

High performance coating for dry and semi-dry machining of all aerospace materials at high speeds.



Diamond

(Amorphous) Thin film coating for graphite, nonferrous materials and epoxy.

WOOD ROUTER BITS

Downcut Bits - 2 Flute - Solid Carbide - Woodworking



Downcut routers push the chip downward and work best when profiling the entire thickness of the material or shallow cuts in pockets where chip evacuation is not a problem.

Cutter Diameter	Flute Length	Overall Length	Shank Diameter	No. Flutes	Type	Tool Number	Price Each
1/8"	1/2"	2-1/2"	1/4"	2	Plunge	DC-1002	\$23.50
3/16"	1/2"	2-1/2"	1/4"	2	Plunge	DC-1004	\$23.50
3/16"	5/8"	2-1/2"	1/4"	2	Plunge	DC-1005	\$24.50
1/4"	3/4"	2-1/2"	1/4"	2	Plunge	DC-1008	\$22.50
1/4"	1"	2-1/2"	1/4"	2	Plunge	DC-1009	\$24.50
1/4"	1-1/8"	3"	1/4"	2	Plunge	DC-1011	\$27.50
3/8"	1"	2-1/2"	3/8"	2	Plunge	DC-1014	\$31.50
3/8"	1-1/4"	3"	3/8"	2	Plunge	DC-1016	\$42.50
1/2"	1"	3"	1/2"	2	Plunge	DC-1020	\$52.50
1/2"	2"	4"	1/2"	2	Plunge	DC-1022	\$69.50

Upcut Bits - 2 Flute - Solid Carbide - Woodworking



Upcut Routers evacuate the chip upwards toward the spindle and should be used in pocket cutting or profiling edges.

Cutter Diameter	Flute Length	Overall Length	Shank Diameter	No. Flutes	Type	Tool Number	Price Each
1/8"	1/2"	2"	1/4"	2	Plunge	UC-2102	\$23.50
3/16"	5/8"	2-1/2"	1/4"	2	Plunge	UC-2105	\$23.50
1/4"	3/4"	2-1/2"	1/4"	2	Plunge	UC-2108	\$22.50
1/4"	1"	2-1/2"	1/4"	2	Plunge	UC-2109	\$24.50
1/4"	1-1/8"	3"	1/4"	2	Plunge	UC-2111	\$27.50
3/8"	7/8"	2-1/2"	3/8"	2	Plunge	UC-2115	\$31.50
3/8"	1-1/4"	3"	3/8"	2	Plunge	UC-2118	\$42.50
1/2"	1"	3"	1/2"	2	Plunge	UC-2120	\$52.50
1/2"	2"	4"	1/2"	2	Plunge	UC-2122	\$69.50

WOOD ROUTER BITS

Compression Bits - 1 & 2 Flute - Solid Carbide - Woodworking



Compression Router Bits work well on laminated stock when profiling the entire thickness of the material. Routers are designed to pull up on the bottom laminate and push down on the top laminate, leaving a clean cut on both the top and bottom sides of laminated wood products.

Cutter Diameter	Flute Length	Overall Length	Shank Diameter	No. Flutes	Type	Tool Number	Price Each
1/4"	7/8"	2-1/2"	1/4"	1	Standard	CR-3255	\$39.50
3/8"	1"	3"	3/8"	2	Plunge	CR-3258	\$40.50
3/8"	1-1/4"	3"	3/8"	2	Plunge	CR-3260	\$42.50

Compression Bit



Upcut Bit



Downcut Bit



2-FLUTE – DIAMOND – DECIMAL



SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Decimal Miniature End Mills

HIGH PERFORMANCE DESIGN



Length of Cut = 3 x Diameter or as Specified – Center Cutting – Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	1/8"	1-1/2"	GRX1010	\$40.30	GRX2010	\$46.75
.015"	.045"	1/8"	1-1/2"	GRX1015	\$37.10	GRX2015	\$42.45
.020"	.060"	1/8"	1-1/2"	GRX1020	\$30.65	GRX2020	\$34.95
.025"	.075"	1/8"	1-1/2"	GRX1025	\$29.55	GRX2025	\$33.85
.030"	.090"	1/8"	1-1/2"	GRX1030	\$29.55	GRX2030	\$33.85
.031"	.125"	1/8"	1-1/2"	GRX1031	\$29.55	GRX2031	\$33.85
.035"	.105"	1/8"	1-1/2"	GRX1035	\$29.55	GRX2035	\$33.85
.040"	.120"	1/8"	1-1/2"	GRX1040	\$29.55	GRX2040	\$33.85
.045"	.135"	1/8"	1-1/2"	GRX1045	\$29.55	GRX2045	\$33.85
.047"	.141"	1/8"	1-1/2"	GRX1047	\$29.55	GRX2047	\$33.85
.050"	.150"	1/8"	1-1/2"	GRX1050	\$29.55	GRX2050	\$33.85
.055"	.165"	1/8"	1-1/2"	GRX1055	\$29.55	GRX2055	\$33.85
.060"	.180"	1/8"	1-1/2"	GRX1060	\$29.55	GRX2060	\$33.85
.062"	.250"	1/8"	1-1/2"	GRX1062	\$29.55	GRX2062	\$33.85
.065"	.195"	1/8"	1-1/2"	GRX1065	\$29.55	GRX2065	\$33.85
.070"	.210"	1/8"	1-1/2"	GRX1070	\$29.55	GRX2070	\$33.85
.075"	.225"	1/8"	1-1/2"	GRX1075	\$29.55	GRX2075	\$33.85
.078"	.234"	1/8"	1-1/2"	GRX1078	\$29.55	GRX2078	\$33.85
.090"	.270"	1/8"	1-1/2"	GRX1090	\$29.55	GRX2090	\$33.85
.093"	.375"	1/8"	1-1/2"	GRX1093	\$29.55	GRX2093	\$33.85
.100"	.300"	1/8"	1-1/2"	GRX1100	\$29.55	GRX2100	\$33.85
.125"	.500"	1/8"	1-1/2"	GRX1125	\$29.55	GRX2125	\$33.85

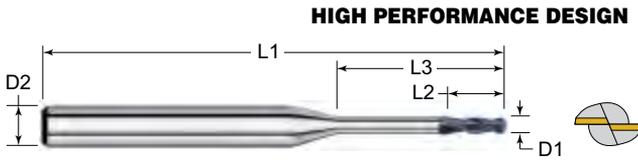
Amorphous diamond coated end mills are engineered for machining graphite, aluminum, nonferrous metals, plastics and composite materials.

2-FLUTE – DIAMOND – LONG REACH



SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Long Reach Decimal Miniature End Mills



Minimum
3 Tools
Each Size

**SHIPPED
WITHIN
24 - 48
HOURS**

Length of Cut = 3 x Diameter or as Specified – Center Cutting – Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	.125"	1/8"	1-1/2"	GRX8015	\$47.85	GRX9015	\$53.20
.020"	.060"	.165"	1/8"	1-1/2"	GRX8020	\$41.40	GRX9020	\$45.70
.025"	.075"	.205"	1/8"	1-1/2"	GRX8025	\$40.30	GRX9025	\$44.60
.030"	.090"	.250"	1/8"	1-1/2"	GRX8030	\$40.30	GRX9030	\$44.60
.031"	.125"	.250"	1/8"	1-1/2"	GRX8031	\$40.30	GRX9031	\$44.60
.035"	.105"	.285"	1/8"	1-1/2"	GRX8035	\$40.30	GRX9035	\$44.60
.040"	.120"	.350"	1/8"	1-1/2"	GRX8040	\$39.50	GRX9040	\$43.80
.045"	.135"	.400"	1/8"	1-1/2"	GRX8045	\$39.50	GRX9045	\$43.80
.047"	.141"	.400"	1/8"	1-1/2"	GRX8047	\$39.50	GRX9047	\$43.80
.050"	.150"	.450"	1/8"	1-1/2"	GRX8050	\$39.50	GRX9050	\$43.80
.055"	.165"	.450"	1/8"	1-1/2"	GRX8055	\$39.50	GRX9055	\$43.80
.060"	.180"	.500"	1/8"	1-1/2"	GRX8060	\$38.60	GRX9060	\$42.90
.062"	.250"	.500"	1/8"	1-1/2"	GRX8062	\$38.60	GRX9062	\$42.90
.065"	.195"	.500"	1/8"	1-1/2"	GRX8065	\$38.60	GRX9065	\$42.90
.070"	.210"	.500"	1/8"	1-1/2"	GRX8070	\$38.60	GRX9070	\$42.90
.075"	.225"	.500"	1/8"	1-1/2"	GRX8075	\$38.60	GRX9075	\$42.90
.078"	.234"	.500"	1/8"	1-1/2"	GRX8078	\$38.60	GRX9078	\$42.90
.090"	.270"	.600"	1/8"	1-1/2"	GRX8090	\$38.60	GRX9090	\$42.90
.093"	.375"	.600"	1/8"	1-1/2"	GRX8093	\$38.60	GRX9093	\$42.90
.100"	.300"	.600"	1/8"	1-1/2"	GRX8100	\$38.60	GRX9100	\$42.90
.125"	.500"	.650"	1/8"	1-1/2"	GRX8125	\$38.60	GRX9125	\$42.90

Tools are custom manufactured to order and are nonreturnable.

Amorphous diamond coated end mills are engineered for machining graphite, aluminum, nonferrous metals, plastics and composite materials.



4-FLUTE – DIAMOND – DECIMAL

SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Decimal End Mills Sized .010" to .500"



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.010"	.030"	1/8"	1-1/2"	GRX010	\$40.30	GRX010B	\$46.75
.015"	.045"	1/8"	1-1/2"	GRX015	\$37.10	GRX015B	\$42.45
.020"	.060"	1/8"	1-1/2"	GRX020	\$30.65	GRX020B	\$34.95
.025"	.075"	1/8"	1-1/2"	GRX025	\$29.55	GRX025B	\$33.85
.030"	.090"	1/8"	1-1/2"	GRX030	\$29.55	GRX030B	\$33.85
.031"	.125"	1/8"	1-1/2"	GRX031	\$29.55	GRX031B	\$33.85
.035"	.105"	1/8"	1-1/2"	GRX035	\$29.55	GRX035B	\$33.85
.040"	.120"	1/8"	1-1/2"	GRX040	\$29.55	GRX040B	\$33.85
.045"	.135"	1/8"	1-1/2"	GRX045	\$29.55	GRX045B	\$33.85
.047"	.141"	1/8"	1-1/2"	GRX047	\$29.55	GRX047B	\$33.85
.050"	.150"	1/8"	1-1/2"	GRX050	\$29.55	GRX050B	\$33.85
.055"	.165"	1/8"	1-1/2"	GRX055	\$29.55	GRX055B	\$33.85
.060"	.180"	1/8"	1-1/2"	GRX060	\$29.55	GRX060B	\$33.85
.062"	.250"	1/8"	1-1/2"	GRX062	\$29.55	GRX062B	\$33.85
.065"	.195"	1/8"	1-1/2"	GRX065	\$29.55	GRX065B	\$33.85
.070"	.210"	1/8"	1-1/2"	GRX070	\$29.55	GRX070B	\$33.85
.075"	.225"	1/8"	1-1/2"	GRX075	\$29.55	GRX075B	\$33.85
.078"	.234"	1/8"	1-1/2"	GRX078	\$29.55	GRX078B	\$33.85
.090"	.270"	1/8"	1-1/2"	GRX090	\$29.55	GRX090B	\$33.85
.093"	.375"	1/8"	1-1/2"	GRX093	\$29.55	GRX093B	\$33.85
.100"	.300"	1/8"	1-1/2"	GRX100	\$29.55	GRX100B	\$33.85
.109"	.375"	1/8"	1-1/2"	GRX109	\$29.55	GRX109B	\$33.85
.125"	.500"	1/8"	1-1/2"	GRX125	\$29.55	GRX125B	\$33.85
.187"	.625"	3/16"	2"	GRX187	\$34.95	GRX187B	\$38.15
.250"	.750"	1/4"	2-1/2"	GRX250	\$41.40	GRX250B	\$44.60
.312"	.812"	5/16"	2-1/2"	GRX312	\$53.20	GRX312B	\$57.50
.375"	1.00"	3/8"	2-1/2"	GRX375	\$63.95	GRX375B	\$69.35
.500"	1.00"	1/2"	3"	GRX500	\$96.20	GRX500B	\$103.75

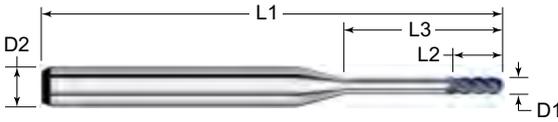
Amorphous diamond coated end mills are engineered for machining graphite, aluminum, nonferrous metals, plastics and composite materials.

4-FLT – DIAMOND – FRACTIONAL LG RCH



SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Long Reach Decimal Miniature End Mills



Minimum
3 Tools
Each Size



Length of Cut = 3 x Diameter or as Specified – Center Cutting – Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.045"	.125"	1/8"	1-1/2"	GRX3015	\$47.85	GRX3015B	\$53.20
.020"	.060"	.165"	1/8"	1-1/2"	GRX3020	\$41.40	GRX3020B	\$45.70
.025"	.075"	.205"	1/8"	1-1/2"	GRX3025	\$40.30	GRX3025B	\$45.70
.030"	.090"	.250"	1/8"	1-1/2"	GRX3030	\$40.30	GRX3030B	\$45.70
.031"	.125"	.250"	1/8"	1-1/2"	GRX3031	\$40.30	GRX3031B	\$44.60
.035"	.105"	.285"	1/8"	1-1/2"	GRX3035	\$39.50	GRX3035B	\$43.80
.040"	.120"	.350"	1/8"	1-1/2"	GRX3040	\$39.50	GRX3040B	\$43.80
.045"	.135"	.400"	1/8"	1-1/2"	GRX3045	\$39.50	GRX3045B	\$43.80
.047"	.141"	.400"	1/8"	1-1/2"	GRX3047	\$39.50	GRX3047B	\$43.80
.050"	.150"	.450"	1/8"	1-1/2"	GRX3050	\$39.50	GRX3050B	\$43.80
.055"	.165"	.450"	1/8"	1-1/2"	GRX3055	\$39.50	GRX3055B	\$43.80
.060"	.180"	.500"	1/8"	1-1/2"	GRX3060	\$38.60	GRX3060B	\$42.90
.062"	.250"	.500"	1/8"	1-1/2"	GRX3062	\$38.60	GRX3062B	\$42.90
.065"	.195"	.500"	1/8"	1-1/2"	GRX3065	\$38.60	GRX3065B	\$42.90
.070"	.210"	.500"	1/8"	1-1/2"	GRX3070	\$38.60	GRX3070B	\$42.90
.075"	.225"	.500"	1/8"	1-1/2"	GRX3075	\$38.60	GRX3075B	\$42.90
.078"	.234"	.500"	1/8"	1-1/2"	GRX3078	\$38.60	GRX3078B	\$42.90
.090"	.270"	.600"	1/8"	1-1/2"	GRX3090	\$38.60	GRX3090B	\$42.90
.093"	.375"	.600"	1/8"	1-1/2"	GRX3093	\$38.60	GRX3093B	\$42.90
.100"	.300"	.600"	1/8"	1-1/2"	GRX3100	\$38.60	GRX3100B	\$42.90
.109"	.375"	.650"	1/8"	1-1/2"	GRX3109	\$38.60	GRX3109B	\$42.90
.125"	.500"	.650"	1/8"	1-1/2"	GRX3125	\$38.60	GRX3125B	\$42.90

Tools are custom manufactured to order and are nonreturnable.

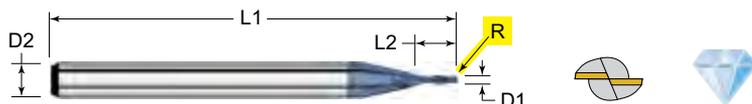
Amorphous diamond coated end mills are engineered for machining graphite, aluminum, nonferrous metals, plastics and composite materials.



2-FLUTE - DIAMOND - CORNER RADIUS

Corner Radius - **AMORPHOUS DIAMOND COATED**

Decimal End Mills Sized .015" to .125"



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.003"	.045"	1/8"	1-1/2"	GX215-003	\$52.15
.020"	.005"	.060"	1/8"	1-1/2"	GX220-005	\$47.85
.025"	.005"	.075"	1/8"	1-1/2"	GX225-005	\$47.85
.030"	.005"	.090"	1/8"	1-1/2"	GX230-005	\$41.65
.031" (1/32)	.005"	.093"	1/8"	1-1/2"	GX231-005	\$41.65
.035"	.005"	.105"	1/8"	1-1/2"	GX235-005	\$41.65
.040"	.005"	.120"	1/8"	1-1/2"	GX240-005	\$39.25
.045"	.005"	.135"	1/8"	1-1/2"	GX245-005	\$39.25
.047" (3/64)	.005"	.141"	1/8"	1-1/2"	GX247-005	\$39.25
.050"	.005"	.150"	1/8"	1-1/2"	GX250-005	\$39.25
.060"	.005"	.180"	1/8"	1-1/2"	GX260-005	\$39.25
.060"	.010"	.180"	1/8"	1-1/2"	GX260-010	\$39.25
.062" (1/16)	.005"	.186"	1/8"	1-1/2"	GX262-005	\$39.25
.062" (1/16)	.010"	.186"	1/8"	1-1/2"	GX262-010	\$39.25
.075"	.005"	.225"	1/8"	1-1/2"	GX275-005	\$39.25
.075"	.010"	.225"	1/8"	1-1/2"	GX275-010	\$39.25
.078" (5/64)	.005"	.234"	1/8"	1-1/2"	GX278-005	\$39.25
.078" (5/64)	.010"	.234"	1/8"	1-1/2"	GX278-010	\$39.25
.093" (3/32)	.005"	.279"	1/8"	1-1/2"	GX293-005	\$39.25
.093" (3/32)	.010"	.279"	1/8"	1-1/2"	GX293-010	\$39.25
.125" (1/8)	.010"	1/2"	1/8"	1-1/2"	GX225-010	\$34.95
.125" (1/8)	.015"	1/2"	1/8"	1-1/2"	GX225-015	\$34.95
.125" (1/8)	.020"	1/2"	1/8"	1-1/2"	GX225-020	\$34.95

Corner radius helps prevent chipping at corners at high feeds and speeds.

Special Cutting Tool Quotations

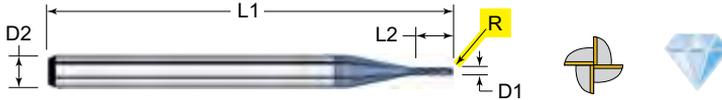
Microcut's capability to produce standard cutting tools is replicated by its ability to produce Special Cutting Tools. Quality, competitive pricing, and on-time delivery has been a Microcut trademark for 20 years. Microcut's workforce experience in producing special Micro Tools dates back over 40 years and makes us one of the most experienced Micro Tool companies in the U.S.A. Submit your special tool B/P to us by fax at 781-582-8095 or email to sales@microcutUSA.com and we will quote it through A&M Industrial.

4-FLUTE – DIAMOND – CORNER RADIUS



Corner Radius - **AMORPHOUS DIAMOND COATED**

Decimal End Mills Sized .015" to .125"



Length of Cut = 3 x Diameter or as Specified – Center Cutting – Micro Grain Carbide

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.015"	.003"	.045"	1/8"	1-1/2"	GX415-003	\$52.15
.020"	.005"	.060"	1/8"	1-1/2"	GX420-005	\$47.85
.025"	.005"	.075"	1/8"	1-1/2"	GX425-005	\$47.85
.030"	.005"	.090"	1/8"	1-1/2"	GX430-005	\$41.65
.031" (1/32)	.005"	.093"	1/8"	1-1/2"	GX431-005	\$41.65
.035"	.005"	.105"	1/8"	1-1/2"	GX435-005	\$41.65
.040"	.005"	.120"	1/8"	1-1/2"	GX440-005	\$39.25
.045"	.005"	.135"	1/8"	1-1/2"	GX445-005	\$39.25
.047" (3/64)	.005"	.141"	1/8"	1-1/2"	GX447-005	\$39.25
.050"	.005"	.150"	1/8"	1-1/2"	GX450-005	\$39.25
.060"	.005"	.180"	1/8"	1-1/2"	GX460-005	\$39.25
.060"	.010"	.180"	1/8"	1-1/2"	GX460-010	\$39.25
.062" (1/16)	.005"	.186"	1/8"	1-1/2"	GX462-005	\$39.25
.062" (1/16)	.010"	.186"	1/8"	1-1/2"	GX462-010	\$39.25
.075"	.005"	.225"	1/8"	1-1/2"	GX475-005	\$39.25
.075"	.010"	.225"	1/8"	1-1/2"	GX475-010	\$39.25
.078" (5/64)	.005"	.234"	1/8"	1-1/2"	GX478-005	\$39.25
.078" (5/64)	.010"	.234"	1/8"	1-1/2"	GX478-010	\$39.25
.093" (3/32)	.005"	.279"	1/8"	1-1/2"	GX493-005	\$39.25
.093" (3/32)	.010"	.279"	1/8"	1-1/2"	GX493-010	\$39.25
.125" (1/8)	.010"	1/2"	1/8"	1-1/2"	GX425-010	\$34.95
.125" (1/8)	.015"	1/2"	1/8"	1-1/2"	GX425-015	\$34.95
.125" (1/8)	.020"	1/2"	1/8"	1-1/2"	GX425-020	\$34.95

Corner radius helps prevent chipping at corners at high feeds and speeds.

Locate Your Distributor



Microcut products are sold by cutting tool distributors in the U.S. and Canada. These distributors are selected due to their expertise in cutting tools and are available to assist you in your standard and special cutting tools.

Please contact A&M Industrial for more information or to place an order.



3-FLT - DIAMOND - LG FLT & SHK - DECIMAL

SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Decimal Long Flute, Long Shank End Mills



Length of Cut = 3 x Diameter or as Specified - Center Cutting - Micro Grain Carbide

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.075"	1/8"	2-1/2"	GL1015	\$48.25	GL1015B	\$52.55
.020"	.100"	1/8"	2-1/2"	GL1020	\$43.95	GL1020B	\$48.25
.025"	.125"	1/8"	2-1/2"	GL1025	\$41.80	GL1025B	\$46.10
.030"	.150"	1/8"	2-1/2"	GL1030	\$41.80	GL1030B	\$46.10
.031" (1/32)	.150"	1/8"	2-1/2"	GL1031	\$40.75	GL1031B	\$45.05
.035"	.175"	1/8"	2-1/2"	GL1035	\$41.80	GL1035B	\$46.10
.040"	.200"	1/8"	2-1/2"	GL1040	\$40.75	GL1040B	\$45.05
.045"	.225"	1/8"	2-1/2"	GL1045	\$41.80	GL1045B	\$46.10
.047" (3/64)	.250"	1/8"	2-1/2"	GL1047	\$40.75	GL1047B	\$45.05
.050"	.250"	1/8"	2-1/2"	GL1050	\$41.80	GL1050B	\$46.10
.060"	.500"	1/8"	2-1/2"	GL1060	\$41.80	GL1060B	\$46.10
.062" (1/16)	.312"	1/8"	2-1/2"	GL1062S	\$40.75	GL1062SB	\$45.05
.062" (1/16)	.500"	1/8"	2-1/2"	GL1062	\$40.75	GL1062B	\$45.05
.065"	.500"	1/8"	2-1/2"	GL1065	\$41.80	GL1065B	\$46.10
.070"	.500"	1/8"	2-1/2"	GL1070	\$40.75	GL1070B	\$45.05
.075"	.500"	1/8"	2-1/2"	GL1075	\$41.80	GL1075B	\$46.10
.078" (5/64)	.500"	1/8"	2-1/2"	GL1078	\$40.75	GL1078B	\$45.05
.093" (3/32)	.500"	1/8"	2-1/2"	GL1093	\$40.75	GL1093B	\$45.05
.093" (3/32)	.750"	1/8"	2-1/2"	GL1093L	\$42.90	GL1093LB	\$47.20
.125" (1/8)	.625"	1/8"	2-1/2"	GL1125S	\$40.75	GL1125SB	\$45.05
.125" (1/8)	.750"	1/8"	2-1/2"	GL1125	\$40.75	GL1125B	\$45.05
.125" (1/8)	1.00"	1/8"	2-1/2"	GL1125L	\$40.75	GL1125LB	\$45.05

Need Carbide Micro Drills? See pages 162 to 163.

Designed for drilling in a wide variety of materials including: steels, stainless steel, titanium, alloy steels, plastic and aluminum.

- Size Range: .0079" (#92) - .1250" (1/8")
- Cutter Diameter Tolerance: +0/-.0003"
- 135 Degree Point





SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Decimal Long Flute, Long Reach End Mills



Minimum
3 Tools
Each Size

**SHIPPED
WITHIN
24 - 48
HOURS**

2-1/2" OAL – Center Cutting – Micro Grain Carbide – Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015" (1/64)	.075"	.125"	1/8"	2-1/2"	GL15-125	\$56.45	GLB15-125	\$60.75
.015" (1/64)	.075"	.150"	1/8"	2-1/2"	GL15-150	\$56.45	GLB15-150	\$60.75
.020"	.100"	.150"	1/8"	2-1/2"	GL20-150	\$52.55	GLB20-150	\$56.85
.020"	.100"	.200"	1/8"	2-1/2"	GL20-200	\$52.55	GLB20-200	\$56.85
.025"	.125"	.200"	1/8"	2-1/2"	GL25-200	\$50.40	GLB25-200	\$54.70
.025"	.125"	.250"	1/8"	2-1/2"	GL25-250	\$50.40	GLB25-250	\$54.70
.031" (1/32)	.150"	.250"	1/8"	2-1/2"	GL31-250	\$48.25	GLB31-250	\$52.55
.031" (1/32)	.150"	.300"	1/8"	2-1/2"	GL31-300	\$48.25	GLB31-300	\$52.55
.040"	.200"	.350"	1/8"	2-1/2"	GL40-350	\$48.25	GLB40-350	\$52.55
.047" (3/64)	.250"	.400"	1/8"	2-1/2"	GL47-400	\$46.10	GLB47-400	\$50.40
.047" (3/64)	.250"	.500"	1/8"	2-1/2"	GL47-500	\$48.25	GLB47-500	\$52.55
.062" (1/16)	.500"	.650"	1/8"	2-1/2"	GL62-650	\$46.10	GLB62-650	\$50.40
.062" (1/16)	.500"	.750"	1/8"	2-1/2"	GL62-750	\$47.20	GLB62-750	\$51.50
.062" (1/16)	.500"	.850"	1/8"	2-1/2"	GL62-850	\$48.25	GLB62-850	\$52.55
.062" (1/16)	.500"	1.000"	1/8"	2-1/2"	GL62-100	\$49.35	GLB62-100	\$53.65
.070"	.500"	.750"	1/8"	2-1/2"	GL70-750	\$47.20	GLB70-750	\$51.50
.078" (5/64)	.500"	.750"	1/8"	2-1/2"	GL78-750	\$47.20	GLB78-750	\$51.50
.078" (5/64)	.500"	.850"	1/8"	2-1/2"	GL78-850	\$48.25	GLB78-850	\$52.55
.078" (5/64)	.500"	1.000"	1/8"	2-1/2"	GL78-100	\$49.35	GLB78-100	\$53.65
.093" (3/32)	.500"	.750"	1/8"	2-1/2"	GL93-750	\$47.20	GLB93-750	\$51.50
.093" (3/32)	.500"	.850"	1/8"	2-1/2"	GL93-850	\$48.25	GLB93-850	\$52.55
.093" (3/32)	.500"	1.000"	1/8"	2-1/2"	GL93-100	\$49.35	GLB93-100	\$53.65
.125" (1/8)	.750"	1.25"	1/8"	2-1/2"	GL125-125	\$47.20	GLB125-125	\$51.50

Don't see the reach you want?? Call customer service.

Shorter reaches available at No Extra Charge and ship in 24-48 Hours.

Longer Reaches need to be quoted by our Sales Department and ship in 24-48 hours after receipt of order.

Minimum quantity is 3 tools per size.

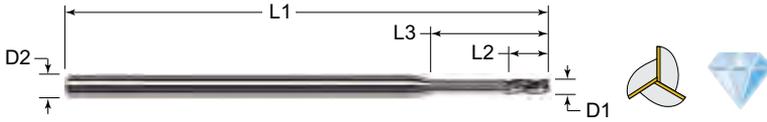
Tools are custom manufactured to order and are nonreturnable.



3-FLT - DIAMOND - STUB FLT - LG SHK & RCH

SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Stub Flute, Long Shank, Long Reach End Mills



Minimum
3 Tools
Each Size

**SHIPPED
WITHIN
24-48
HOURS**

2-1/2" OAL - Center Cutting - Micro Grain Carbide - Made in USA

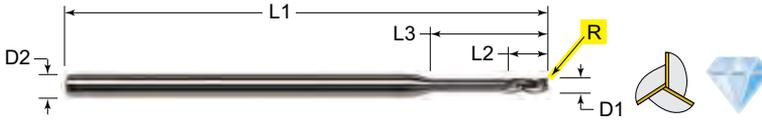
Tools are custom manufactured to order and are nonreturnable.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.022"	.075"	1/8"	2-1/2"	GS15-075	\$47.85	GB15-075	\$54.30
.015"	.022"	.100"	1/8"	2-1/2"	GS15-100	\$47.85	GB15-100	\$54.30
.015"	.022"	.125"	1/8"	2-1/2"	GS15-125	\$50.00	GB15-125	\$56.45
.015"	.022"	.150"	1/8"	2-1/2"	GS15-150	\$50.00	GB15-150	\$56.45
.020"	.030"	.100"	1/8"	2-1/2"	GS20-100	\$46.10	GB20-100	\$52.55
.020"	.030"	.150"	1/8"	2-1/2"	GS20-150	\$46.10	GB20-150	\$52.55
.020"	.030"	.200"	1/8"	2-1/2"	GS20-200	\$48.25	GB20-200	\$54.70
.025"	.037"	.125"	1/8"	2-1/2"	GS25-125	\$46.10	GB25-125	\$52.55
.025"	.037"	.200"	1/8"	2-1/2"	GS25-200	\$46.10	GB25-200	\$52.55
.025"	.037"	.250"	1/8"	2-1/2"	GS25-250	\$48.25	GB25-250	\$54.70
.031"	.046"	.150"	1/8"	2-1/2"	GS31-150	\$46.10	GB31-150	\$50.40
.031"	.046"	.200"	1/8"	2-1/2"	GS31-200	\$46.10	GB31-200	\$50.40
.031"	.046"	.250"	1/8"	2-1/2"	GS31-250	\$48.25	GB31-250	\$52.55
.031"	.046"	.300"	1/8"	2-1/2"	GS31-300	\$48.25	GB31-300	\$52.55
.040"	.060"	.200"	1/8"	2-1/2"	GS40-200	\$46.10	GB40-200	\$50.40
.040"	.060"	.300"	1/8"	2-1/2"	GS40-300	\$48.25	GB40-300	\$52.55
.040"	.060"	.400"	1/8"	2-1/2"	GS40-400	\$48.25	GB40-400	\$52.55
.047"	.070"	.250"	1/8"	2-1/2"	GS47-250	\$46.10	GB47-250	\$50.40
.047"	.070"	.350"	1/8"	2-1/2"	GS47-350	\$48.25	GB47-350	\$52.55
.047"	.070"	.450"	1/8"	2-1/2"	GS47-450	\$48.25	GB47-450	\$52.55
.062"	.093"	.300"	1/8"	2-1/2"	GS62-300	\$43.95	GB62-300	\$48.25
.062"	.093"	.400"	1/8"	2-1/2"	GS62-400	\$43.95	GB62-400	\$48.25
.062"	.093"	.500"	1/8"	2-1/2"	GS62-500	\$46.10	GB62-500	\$50.40
.062"	.093"	.600"	1/8"	2-1/2"	GS62-600	\$46.10	GB62-600	\$50.40
.062"	.093"	.750"	1/8"	2-1/2"	GS62-750	\$48.25	GB62-750	\$52.55
.070"	.105"	.300"	1/8"	2-1/2"	GS70-300	\$43.95	GB70-300	\$48.25
.070"	.105"	.400"	1/8"	2-1/2"	GS70-400	\$43.95	GB70-400	\$48.25
.070"	.105"	.500"	1/8"	2-1/2"	GS70-500	\$46.10	GB70-500	\$50.40
.078"	.117"	.400"	1/8"	2-1/2"	GS78-400	\$43.95	GB78-400	\$48.25
.078"	.117"	.500"	1/8"	2-1/2"	GS78-500	\$43.95	GB78-500	\$48.25
.078"	.117"	.600"	1/8"	2-1/2"	GS78-600	\$46.10	GB78-600	\$50.40
.078"	.117"	.750"	1/8"	2-1/2"	GS78-750	\$46.10	GB78-750	\$50.40
.093"	.139"	.400"	1/8"	2-1/2"	GS93-400	\$43.95	GB93-400	\$48.25
.093"	.139"	.500"	1/8"	2-1/2"	GS93-500	\$43.95	GB93-500	\$48.25
.093"	.139"	.600"	1/8"	2-1/2"	GS93-600	\$43.95	GB93-600	\$48.25
.093"	.139"	.750"	1/8"	2-1/2"	GS93-750	\$46.10	GB93-750	\$50.40
.093"	.139"	1.000"	1/8"	2-1/2"	GS93-100	\$46.10	GB93-100	\$50.40
.125"	.187"	.750"	1/8"	2-1/2"	GS125-750	\$43.95	GB125-750	\$48.25
.125"	.187"	1.000"	1/8"	2-1/2"	GS125-100	\$46.10	GB125-100	\$50.40



Corner Radius - **AMORPHOUS DIAMOND COATED**

Stub Corner Radius, Long Shank, Long Reach End Mills



Minimum
3 Tools
Each Size

**SHIPPED
WITHIN
24-48
HOURS**

2-1/2" OAL - Center Cutting - Micro Grain Carbide - Made in USA

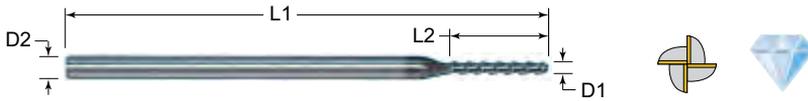
Tools are custom manufactured to order and are nonreturnable.

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.005"	.046"	.150"	1/8"	2-1/2"	GR1031	\$48.25
.031"	.005"	.046"	.250"	1/8"	2-1/2"	GR1031L	\$48.25
.031"	.005"	.046"	.300"	1/8"	2-1/2"	GR1031XL	\$50.40
.040"	.005"	.060"	.200"	1/8"	2-1/2"	GR1040	\$48.25
.047"	.005"	.070"	.250"	1/8"	2-1/2"	GR1047	\$48.25
.047"	.005"	.070"	.350"	1/8"	2-1/2"	GR1047L	\$50.40
.062"	.005"	.094"	.300"	1/8"	2-1/2"	GR1062S	\$48.25
.062"	.005"	.094"	.500"	1/8"	2-1/2"	GR1062	\$50.40
.062"	.010"	.094"	.300"	1/8"	2-1/2"	GR1062L-010	\$48.25
.062"	.010"	.094"	.500"	1/8"	2-1/2"	GR1062XL-010	\$50.40
.070"	.005"	.105"	.350"	1/8"	2-1/2"	GR1070	\$46.10
.078"	.005"	.117"	.400"	1/8"	2-1/2"	GR1078	\$46.10
.078"	.005"	.117"	.500"	1/8"	2-1/2"	GR1078L	\$46.10
.078"	.005"	.117"	.600"	1/8"	2-1/2"	GR1078XL	\$50.40
.078"	.010"	.117"	.400"	1/8"	2-1/2"	GR1078-010	\$46.10
.078"	.010"	.117"	.500"	1/8"	2-1/2"	GR1078L-010	\$46.10
.078"	.010"	.117"	.600"	1/8"	2-1/2"	GR1078XL-010	\$50.40
.093"	.005"	.139"	.500"	1/8"	2-1/2"	GR1093	\$46.10
.093"	.005"	.139"	.750"	1/8"	2-1/2"	GR1093L	\$48.25
.093"	.005"	.139"	1.00"	1/8"	2-1/2"	GR1093XL	\$50.40
.093"	.010"	.139"	.500"	1/8"	2-1/2"	GR1093-010	\$46.10
.093"	.010"	.139"	.750"	1/8"	2-1/2"	GR1093L-010	\$48.25
.093"	.010"	.139"	1.000"	1/8"	2-1/2"	GR1093XL-010	\$50.40
.125"	.005"	.187"	.750"	1/8"	2-1/2"	GR1125	\$46.10
.125"	.005"	.187"	1.000"	1/8"	2-1/2"	GR1125L	\$48.25
.125"	.010"	.187"	.750"	1/8"	2-1/2"	GR1125-010	\$46.10
.125"	.010"	.187"	1.000"	1/8"	2-1/2"	GR1125L-010	\$48.25

4-FLUTE – DIAMOND – LONG FLUTE

SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Decimal End Mills Sized .015" to .062"



Center Cutting – Micro Grain Carbide – Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015"	.075"	1/8"	2-1/2"	GRX4015	\$42.75	GRX5015	\$48.10
.020"	.100"	1/8"	2-1/2"	GRX4020	\$39.25	GRX5020	\$42.45
.025"	.125"	1/8"	2-1/2"	GRX4025	\$37.10	GRX5025	\$40.30
.030"	.150"	1/8"	2-1/2"	GRX4030	\$36.50	GRX5030	\$39.70
.031"	.150"	1/8"	2-1/2"	GRX4031	\$36.50	GRX5031	\$39.70
.031"	.250"	1/8"	2-1/2"	GRX4031L	\$53.70	GRX5031L	\$62.30
.035"	.175"	1/8"	2-1/2"	GRX4035	\$36.50	GRX5035	\$39.70
.040"	.200"	1/8"	2-1/2"	GRX4040	\$36.50	GRX5040	\$39.70
.045"	.250"	1/8"	2-1/2"	GRX4045	\$36.50	GRX5045	\$39.70
.047"	.250"	1/8"	2-1/2"	GRX4047	\$36.50	GRX5047	\$39.70
.047"	.375"	1/8"	2-1/2"	GRX4047L	\$47.25	GRX5047L	\$52.60
.050"	.300"	1/8"	2-1/2"	GRX4050	\$36.50	GRX5050	\$39.70
.055"	.375"	1/8"	2-1/2"	GRX4055	\$36.50	GRX5055	\$39.70
.060"	.500"	1/8"	2-1/2"	GRX4060	\$36.50	GRX5060	\$39.70
.062"	.312"	1/8"	2-1/2"	GRX4062S	\$33.25	GRX5062S	\$34.95
.062"	.500"	1/8"	2-1/2"	GRX4062	\$36.50	GRX5062	\$39.70
.062"	.750"	1/8"	2-1/2"	GRX4062L	\$49.40	GRX5062L	\$53.70

Special reaches for deep pocket milling quoted on request.

GRX Diamond end mills for machining Graphite, Aluminum, abrasive plastics and composites.

"GRX" series of amorphous diamond coated mills lower tooling costs and improve productivity over uncoated carbide.

Continued Next Page

4-FLUTE – DIAMOND – LONG FLUTE



Continued from previous page:

Decimal End Mills Size Range: .065" – .500"



D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.065"	.500"	1/8"	2-1/2"	GRX4065	\$36.50	GRX5065	\$39.70
.070"	.500"	1/8"	2-1/2"	GRX4070	\$36.50	GRX5070	\$39.70
.075"	.500"	1/8"	2-1/2"	GRX4075	\$36.50	GRX5075	\$39.70
.078"	.500"	1/8"	2-1/2"	GRX4078	\$36.50	GRX5078	\$39.70
.078"	.750"	1/8"	2-1/2"	GRX4078L	\$49.40	GRX5078L	\$53.70
.090"	.500"	1/8"	2-1/2"	GRX4090	\$36.50	GRX5090	\$39.70
.093"	.500"	1/8"	2-1/2"	GRX4093	\$36.50	GRX5093	\$39.70
.093"	.750"	1/8"	2-1/2"	GRX4093L	\$38.65	GRX5093L	\$42.95
.125"	.750"	1/8"	3"	GRX4125	\$36.50	GRX5125	\$39.70
.125"	1.00"	1/8"	3"	GRX4125L	\$38.15	GRX5125L	\$42.95
.187"	1.125"	3/16"	3"	GRX4187	\$42.45	GRX5187	\$45.70
.250"	1.500"	1/4"	4"	GRX4250	\$48.90	GRX5250	\$53.20
.375"	1.750"	3/8"	4"	GRX4375	\$71.50	GRX5375	\$76.85
.500"	2.000"	1/2"	4"	GRX4500	\$117.70	GRX5500	\$128.45

Special reaches for deep pocket milling quoted on request.

Special Cutting Tool Quotations

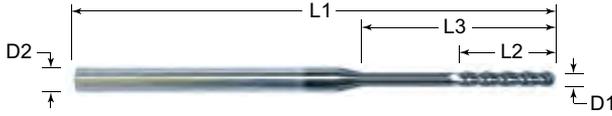
Microcut's capability to produce standard cutting tools is replicated by its ability to produce Special Cutting Tools. Quality, competitive pricing, and on-time delivery has been a Microcut trademark for 20 years. Microcut's workforce experience in producing special Micro Tools dates back over 40 years and makes us one of the most experienced Micro Tool companies in the U.S.A. Submit your special tool B/P to us by fax at 781-582-8095 or email to sales@microcutUSA.com and we will quote it through A&M Industrial.



4-FLUTE - LONG FLUTE - LONG REACH

SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Long Flute & Long Reach End Mills



**SHIPPED
WITHIN
24-48
HOURS**

Minimum
3 Tools
Each Size

Center Cutting - Micro Grain Carbide - Made in USA

High Performance thin film Diamond coated carbide end mills for Extra Deep Machining of graphite, aluminum, and composite materials.

All end mills have reduced neck diameters to prevent work piece contact.

Special reaches for deep pocket milling quoted on request.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
1/64" (.0156)	.075"	.150"	1/8"	2-1/2"	GRX4515	\$48.10	GRX5515	\$53.50
.020"	.100"	.200"	1/8"	2-1/2"	GRX4520	\$44.60	GRX5520	\$47.85
.025"	.125"	.250"	1/8"	2-1/2"	GRX4525	\$41.40	GRX5525	\$45.10
.030"	.150"	.300"	1/8"	2-1/2"	GRX4530	\$41.40	GRX5530	\$45.10
1/32" (.0312)	.150"	.300"	1/8"	2-1/2"	GRX4531	\$41.40	GRX5531	\$45.10
.035"	.175"	.350"	1/8"	2-1/2"	GRX4535	\$41.40	GRX5535	\$45.10
.040"	.200"	.400"	1/8"	2-1/2"	GRX4540	\$41.40	GRX5540	\$45.10
.045"	.250"	.450"	1/8"	2-1/2"	GRX4545	\$41.10	GRX5545	\$44.60
3/64" (.0469)	.250"	.500"	1/8"	2-1/2"	GRX4547	\$41.10	GRX5547	\$44.60
.050"	.300"	.500"	1/8"	2-1/2"	GRX4550	\$41.10	GRX5550	\$44.60
.055"	.375"	.500"	1/8"	2-1/2"	GRX4555	\$41.10	GRX5555	\$44.60
.060"	.500"	.750"	1/8"	2-1/2"	GRX4560S	\$41.10	GRX5560S	\$44.60
.060"	.500"	1.00"	1/8"	2-1/2"	GRX4560	\$45.40	GRX5560	\$48.90
1/16" (.0625)	.500"	.750"	1/8"	2-1/2"	GRX4562S	\$41.10	GRX5562S	\$44.60
1/16" (.0625)	.500"	1.00"	1/8"	2-1/2"	GRX4562	\$45.40	GRX5562	\$48.90

Continued Next Page

4-FLUTE – LONG FLUTE – LONG REACH



Continued from previous page:

Long Flute & Long Reach End Mills Size Range: .065" – .2500"



Amorphous diamond coated end mills are engineered for machining graphite, aluminum, nonferrous metals, plastics and composite materials.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.065"	.500"	.750"	1/8"	2-1/2"	GRX4565	\$41.10	GRX5565	\$44.60
.070"	.500"	.750"	1/8"	2-1/2"	GRX4570	\$41.10	GRX5570	\$44.60
.075"	.500"	.750"	1/8"	2-1/2"	GRX4575S	\$41.10	GRX5575S	\$44.60
.075	.500"	1.00"	1/8"	2-1/2"	GRX4575	\$45.40	GRX5575	\$48.90
5/64" (.0781)	.500"	.750"	1/8"	2-1/2"	GRX4578S	\$41.10	GRX5578S	\$44.60
5/64" (.0781)	.500"	1.00"	1/8"	2-1/2"	GRX4578	\$45.40	GRX5578	\$48.90
.090"	.500"	.750"	1/8"	2-1/2"	GRX4590S	\$41.10	GRX5590S	\$44.60
.090"	.500"	1.00"	1/8"	2-1/2"	GRX4590	\$45.40	GRX5590	\$48.90
3/32" (.0937)	.500"	.750"	1/8"	2-1/2"	GRX4593S	\$41.10	GRX5593S	\$44.60
3/32" (.0937)	.500"	1.00"	1/8"	2-1/2"	GRX4593L	\$45.40	GRX5593L	\$48.90
3/32" (.0937)	.500"	1.25"	1/8"	2-1/2"	GRX4593	\$45.40	GRX5593	\$48.90
1/8" (.1250)	.750"	1.50"	1/8"	3"	GRX45125	\$41.10	GRX55125	\$44.60
3/16" (.1875)	1.125"	1.625"	3/16"	3"	GRX45187	\$48.90	GRX55187	\$52.60
1/4" (.2500)	1.500"	2.00"	1/4"	4"	GRX45250	\$55.85	GRX55250	\$58.00

Tools are custom manufactured to order and are nonreturnable.



4-FLUTE - DIAMOND - STUB

SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Stub Long Shank Miniature End Mills



Length of Cut = 2 x Diameter - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
				Tool Number	Price Each	Tool Number	Price Each
.015"	.030"	1/8"	2-1/2"	GRX6515	\$41.65	GRX7515	\$47.05
.020"	.040"	1/8"	2-1/2"	GRX6520	\$38.15	GRX7520	\$41.40
.025"	.050"	1/8"	2-1/2"	GRX6525	\$36.00	GRX7525	\$39.25
.030"	.060"	1/8"	2-1/2"	GRX6530	\$35.40	GRX7530	\$38.65
.031"	.062"	1/8"	2-1/2"	GRX6531	\$35.40	GRX7531	\$38.65
.035"	.070"	1/8"	2-1/2"	GRX6535	\$35.40	GRX7535	\$38.65
.040"	.080"	1/8"	2-1/2"	GRX6540	\$35.40	GRX7540	\$38.65
.045"	.090"	1/8"	2-1/2"	GRX6545	\$35.40	GRX7545	\$38.65
.047"	.094"	1/8"	2-1/2"	GRX6547	\$35.40	GRX7547	\$38.65
.050"	.100"	1/8"	2-1/2"	GRX6550	\$35.40	GRX7550	\$38.65
.060"	.120"	1/8"	2-1/2"	GRX6560	\$35.40	GRX7560	\$38.65
.062"	.125"	1/8"	2-1/2"	GRX6562	\$35.40	GRX7562	\$38.65
.065"	.130"	1/8"	2-1/2"	GRX6565	\$35.40	GRX7565	\$38.65
.070"	.140"	1/8"	2-1/2"	GRX6570	\$35.40	GRX7570	\$38.65
.075"	.150"	1/8"	2-1/2"	GRX6575	\$35.40	GRX7575	\$38.65
.078"	.156"	1/8"	2-1/2"	GRX6578	\$35.40	GRX7578	\$38.65
.090"	.180"	1/8"	2-1/2"	GRX6590	\$35.40	GRX7590	\$38.65
.093"	.186"	1/8"	2-1/2"	GRX6593	\$35.40	GRX7593	\$38.65
.125"	.250"	1/8"	2-1/2"	GRX65125	\$35.40	GRX75125	\$38.65

Long Reach - Stub Length end mills are available on the next page.
Special reaches quoted on request and ship within 24-48 hours.

Minimum order 3 pieces per size.

RUN FAST.....RUN DEEP.....RUN LONG

GRX Mills for Machining Graphite Electrodes

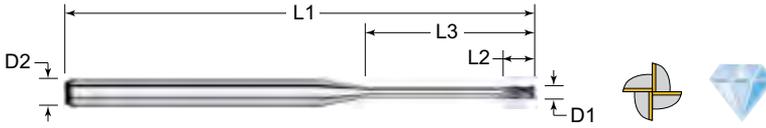
Microcut's "GRX" series of amorphous diamond coated end mills improve productivity over uncoated carbide. High performance Diamond Coated carbide end mills are for **extra deep machining** of graphite, aluminum, and composite materials. Stocked in a size range of .015" to .125" diameter and also available with extended reach capabilities.





SQUARE & BALL END - AMORPHOUS DIAMOND COATED

Stub Long Reach Miniature End Mills



**SHIPPED
WITHIN
24 - 48
HOURS**

Minimum
3 Tools
Each Size

Length of Cut = 2 x Diameter – Center Cutting – Micro Grain Carbide – Made in USA

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	D2 Shank Diameter	L1 Over All Length	SQUARE END		BALL END	
					Tool Number	Price Each	Tool Number	Price Each
.015"	.030"	.100"	1/8"	2-1/2"	GRX6015S	\$43.25	GRX7015S	\$51.85
.015"	.030"	.150"	1/8"	2-1/2"	GRX6015	\$43.25	GRX7015	\$51.85
.020"	.040"	.175"	1/8"	2-1/2"	GRX6020	\$41.85	GRX7020	\$50.45
.025"	.050"	.200"	1/8"	2-1/2"	GRX6025	\$41.85	GRX7025	\$50.45
.030"	.060"	.250"	1/8"	2-1/2"	GRX6030	\$40.30	GRX7030	\$45.70
.031"	.062"	.150"	1/8"	2-1/2"	GRX6031S	\$40.30	GRX7031S	\$45.70
.031"	.062"	.250"	1/8"	2-1/2"	GRX6031	\$40.30	GRX7031	\$45.70
.035"	.070"	.280"	1/8"	2-1/2"	GRX6035	\$40.30	GRX7035	\$44.00
.040"	.080"	.325"	1/8"	2-1/2"	GRX6040	\$40.30	GRX7040	\$44.00
.045"	.090"	.360"	1/8"	2-1/2"	GRX6045	\$40.30	GRX7045	\$44.00
.047"	.094"	.250"	1/8"	2-1/2"	GRX6047	\$39.70	GRX7047	\$44.00
.047"	.094"	.375"	1/8"	2-1/2"	GRX6047L	\$39.70	GRX7047L	\$44.00
.050"	.100"	.400"	1/8"	2-1/2"	GRX6050	\$39.70	GRX7050	\$44.00
.060"	.120"	.500"	1/8"	2-1/2"	GRX6060	\$39.70	GRX7060	\$44.00
.062"	.125"	.500"	1/8"	2-1/2"	GRX6062	\$39.70	GRX7062	\$44.00
.062"	.125"	.750"	1/8"	2-1/2"	GRX6062L	\$44.00	GRX7062L	\$48.30
.062"	.125"	1.00"	1/8"	2-1/2"	GRX6062XL	\$48.30	GRX7062XL	\$52.60
.065"	.130"	.500"	1/8"	2-1/2"	GRX6065	\$39.70	GRX7065	\$44.00
.070"	.140"	.500"	1/8"	2-1/2"	GRX6070	\$39.70	GRX7070	\$44.00
.075"	.150"	.500"	1/8"	2-1/2"	GRX6075	\$39.70	GRX7075	\$44.00
.078"	.156"	.500"	1/8"	2-1/2"	GRX6078	\$39.70	GRX7078	\$44.00
.078"	.156"	.750"	1/8"	2-1/2"	GRX6078L	\$44.00	GRX7078L	\$48.30
.078"	.156"	1.00"	1/8"	2-1/2"	GRX6078XL	\$48.30	GRX7078XL	\$52.60
.090"	.180"	.500"	1/8"	2-1/2"	GRX6090	\$39.70	GRX7090	\$44.00
.093"	.186"	.500"	1/8"	2-1/2"	GRX6093	\$39.70	GRX7093	\$44.00
.093"	.186"	.750"	1/8"	2-1/2"	GRX6093L	\$44.00	GRX7093L	\$48.30
.093"	.186"	1.00"	1/8"	2-1/2"	GRX6093XL	\$48.30	GRX7093XL	\$52.60
.125"	.250"	1.25"	1/8"	2-1/2"	GRX6125	\$44.00	GRX7125	\$48.30

Tools are custom manufactured to order and are nonreturnable.



CVD ULTRA FINE DIAMOND END MILLS

New CVD ULTRA FINE Diamond End Mills

SQUARE END - 4-FLUTE



Standard - Center Cutting - Micro Grain Carbide - Made in USA

Chemical Vapor Deposition (CVD) results in the ability to deposit pure diamond on a special grades of tungsten carbide substrate. This process allows for tighter manufacturing tolerances and superior tool life compared to other less expensive CVD diamond coating applications. CVD Ultra-Fine by Microcut results in longer tool life, greatly improved workpiece surface finishes, and improved productivity, resulting in lower tooling costs.

Microcut's CVD Ultra-Fine Diamond Tools, the most wear resistant CVD diamond cutting tools.

D1 Cutter Diameter	L2 Length of Cut	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.093"	4	1/8"	1-1/2"	77031	\$56.75
.031"	.093"	4	1/8"	3"	77031L	\$89.90
.062"	.187"	4	1/8"	1-1/2"	77062	\$63.75
.062"	.187"	4	1/8"	3"	77062L	\$89.90
.093"	.375"	4	1/8"	1-1/2"	77093	\$63.75
.093"	.281"	4	1/8"	3"	77093L	\$89.90
.125"	.500"	4	1/8"	1-1/2"	77125	\$69.90
.125"	1.00"	4	1/8"	3"	77125L	\$92.75
.187"	.625"	4	3/16"	2-1/2"	77187	\$76.90
.250"	.750"	4	1/4"	2-1/2"	77250	\$84.75
.250"	1.25"	4	1/4"	3"	77250L	\$125.75

BALL END - 4-FLUTE



D1 Cutter Diameter	L2 Length of Cut	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.093"	4	1/8"	1-1/2"	77031B	\$63.75
.031"	.093"	4	1/8"	3"	77031LB	\$95.90
.062"	.187"	4	1/8"	1-1/2"	77062B	\$69.75
.062"	.187"	4	1/8"	3"	77062LB	\$95.90
.093"	.375"	4	1/8"	1-1/2"	77093B	\$69.75
.093"	.281"	4	1/8"	3"	77093LB	\$95.90
.125"	.500"	4	1/8"	1-1/2"	77125B	\$75.90
.125"	1.00"	4	1/8"	3"	77125LB	\$98.75
.187"	.625"	4	3/16"	2-1/2"	77187B	\$95.90
.250"	.750"	4	1/4"	2-1/2"	77250B	\$90.75
.250"	1.25"	4	1/4"	3"	77250LB	\$132.75

CVD ULTRA FINE DIAMOND END MILLS



New CVD ULTRA FINE Diamond End Mills LONG REACH - SQUARE END - 4-FLUTE



Minimum
3 Tools
Each Size

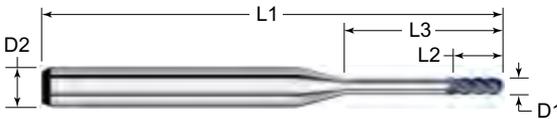
**SHIPPED
WITHIN
24 - 48
HOURS**

Standard - Center Cutting - Micro Grain Carbide - Made in USA

Tools are custom manufactured to order and are nonreturnable.

D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.093"	.250"	4	1/8"	1-1/2"	78001	\$71.75
.031"	.093"	.400"	4	1/8"	3"	78004	\$94.75
.031"	.093"	.625"	4	1/8"	3"	78007	\$94.75
.062"	.187"	.500"	4	1/8"	1-1/2"	78009	\$78.75
.062"	.187"	.500"	4	1/8"	3"	78012	\$94.75
.062"	.187"	.750"	4	1/8"	3"	78015	\$94.75
.062"	.187"	1.00"	4	1/8"	3"	78018	\$104.75
.093"	.375"	.600"	4	1/8"	1-1/2"	78021	\$78.75
.093"	.281"	1.00"	4	1/8"	3"	78024	\$94.75
.125"	.500"	.650"	4	1/8"	1-1/2"	78027	\$79.90
.125"	.375"	.750"	4	1/8"	3"	78030	\$94.75
.125"	.375"	1.00"	4	1/8"	3"	78033	\$94.75
.125"	.375"	1.50"	4	1/8"	3"	78036	\$99.75
.125"	.375"	2.00"	4	1/8"	3"	78039	\$110.75
.187"	.625"	1.00"	4	3/16"	2-1/2"	78041	\$91.90
.250"	1.25"	1.75"	4	1/4"	3"	78044	\$139.75

LONG REACH - BALL END - 4-FLUTE



Minimum
3 Tools
Each Size

**SHIPPED
WITHIN
24 - 48
HOURS**

Tools are custom manufactured to order and are nonreturnable.

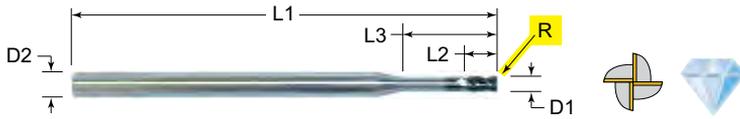
D1 Cutter Diameter	L2 Length of Cut	L3 Reach From Tip	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.093"	.250"	4	1/8"	1-1/2"	78001B	\$78.75
.031"	.093"	.400"	4	1/8"	3"	78004B	\$99.75
.031"	.093"	.625"	4	1/8"	3"	78007B	\$99.75
.062"	.187"	.500"	4	1/8"	1-1/2"	78009B	\$84.75
.062"	.187"	.500"	4	1/8"	3"	78012B	\$99.75
.062"	.187"	.750"	4	1/8"	3"	78015B	\$99.75
.062"	.187"	1.00"	4	1/8"	3"	78018B	\$109.75
.093"	.375"	.600"	4	1/8"	1-1/2"	78021B	\$84.75
.093"	.281"	1.00"	4	1/8"	3"	78024B	\$99.75
.125"	.500"	.650"	4	1/8"	1-1/2"	78027B	\$85.90
.125"	.375"	.750"	4	1/8"	3"	78030B	\$99.75
.125"	.375"	1.00"	4	1/8"	3"	78033B	\$99.75
.125"	.375"	1.50"	4	1/8"	3"	78036B	\$104.75
.125"	.375"	2.00"	4	1/8"	3"	78039B	\$116.75
.187"	.625"	1.00"	4	3/16"	2-1/2"	78041B	\$110.90
.250"	1.25"	1.75"	4	1/4"	3"	78044B	\$149.75



CVD ULTRA FINE DIAMOND END MILLS

New CVD ULTRA FINE Diamond End Mills

CORNER RADIUS - LONG REACH - EXTENDED SHANK



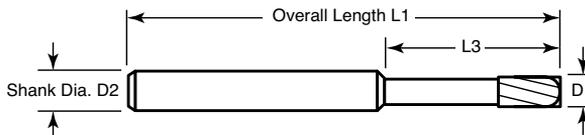
Standard - Center Cutting - Micro Grain Carbide - Made in USA

Chemical Vapor Deposition (CVD) results in the ability to deposit pure diamond on special grades of tungsten carbide substrate. This process allows for tighter manufacturing tolerances and superior tool life compared to other less expensive CVD diamond coating applications. CVD Ultra-Fine by Microcut results in longer tool life, greatly improved workpiece surface finishes, and improved productivity, resulting in lower tooling costs.

Microcut's CVD Ultra-Fine Diamond Tools, the most wear resistant CVD diamond cutting tools.

D1 Cutter Diameter	R Corner Radius	L2 Length of Cut	L3 Reach From Tip	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
.031"	.005"	.093"	.250"	4	1/8"	3"	78201	\$99.75
.031"	.005"	.093"	.400"	4	1/8"	3"	78205	\$99.75
.047"	.010"	.141"	.300"	4	1/8"	3"	78209	\$99.75
.047"	.010"	.141"	.600"	4	1/8"	3"	78213	\$99.75
.062"	.010"	.187"	.500"	4	1/8"	3"	78217	\$99.75
.062"	.010"	.187"	.750"	4	1/8"	3"	78221	\$99.75
.062"	.010"	.187"	1.00"	4	1/8"	3"	78225	\$104.75
.093"	.010"	.281"	.750"	4	1/8"	3"	78229	\$99.75
.093"	.010"	.281"	1.00"	4	1/8"	3"	78233	\$99.75
.125"	.010"	.375"	.750"	4	1/8"	3"	78237	\$99.75
.125"	.010"	.375"	1.00"	4	1/8"	3"	78241	\$104.75
.125"	.010"	.375"	1.50"	4	1/8"	3"	78245	\$109.75

ORDER SPECIAL LONG REACH CVD DIAMOND COATED END MILLS



To order special long reach CVD end mills please specify:

- Specify: Square End Ball End Corner Radius.
- Corner Radius from CVD chart Page 176: _____
- Diameter (D1) from CVD specifications: _____
- Overall Reach (L3): _____
- Overall Length (L1): _____
- Quantity (Minimum 3 Per Size): _____

**Special Reaches
Shipped
within
24-48 Hours!**

Tools are custom manufactured to order and are nonreturnable.

STRAIGHT FLUTE PCD DIAMOND



PCD Brazed on Carbide Shank

SQUARE END



2 Straight Flutes - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
3/32"	3/16"	1	1/8"	1-1/2"	PC1093	\$189.50
1/8"	1/4"	1	1/8"	1-1/2"	PC2125	\$189.50
3/16"	1/4"	2	3/16"	2"	PC2187	\$209.50
1/4"	1/4"	2	1/4"	2-1/2"	PC2250	\$229.50
3/8"	1/4"	2	3/8"	2-1/2"	PC2375	\$279.50
1/2"	1/4"	2	1/2"	3"	PC2500	\$359.50

BALL END



2 Straight Flutes - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
3/32"	3/16"	1	1/8"	1-1/2"	PC1093B	\$229.50
1/8"	1/4"	1	1/8"	1-1/2"	PC2125B	\$229.50
3/16"	1/4"	2	3/16"	2"	PC2187B	\$249.50
1/4"	5/16"	2	1/4"	2-1/2"	PC2250B	\$259.50

CORNER RADIUS

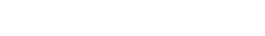


2 Straight Flutes - Center Cutting - Micro Grain Carbide - Made in USA

D1 Cutter Diameter	L2 Length of Cut	R Corner Radius	Number of Flutes	D2 Shank Diameter	L1 Over All Length	TOOL NUMBER	PRICE EACH
3/32"	3/16"	.010"	1	1/8"	1-1/2"	PC1093R	\$229.50
1/8"	1/4"	.015"	1	1/8"	1-1/2"	PC2125R	\$229.50
3/16"	1/4"	.015"	2	3/16"	2"	PC2187R	\$249.50
1/4"	1/4"	.030"	2	1/4"	2-1/2"	PC2250R	\$259.50
3/8"	1/4"	.030"	2	3/8"	2-1/2"	PC2375R	\$329.50
1/2"	1/4"	.030"	2	1/2"	3"	PC2500R	\$379.50

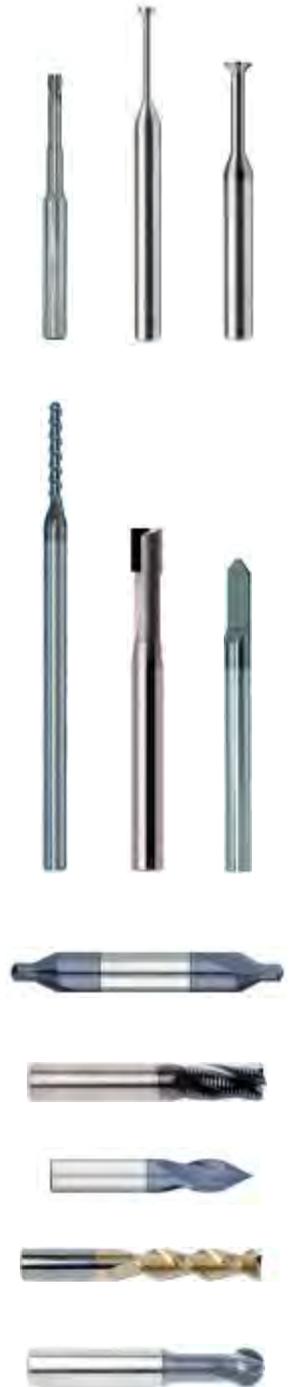
PCD is a thin wafer of diamond plate that is brazed on to a solid carbide preformed blank. The diamond plate is formed into different shapes by wire EDM and cutting edges are ground and polished to achieve an extremely sharp and accurate cutting edge. PCD diamond is used to cut Abrasive Plastics, Carbon Fiber, Graphite, Copper, Aluminum, Magnesium, and other nonferrous materials. All shapes are ground to cut to center for plunging into solid material.

TOOL SERIES LOOK-UP BY PRODUCT NUMBER

	SERIES	PAGE	SERIES	PAGE	SERIES	PAGE
	1100-000	44-47	30400	168	54000TL	89
	1200-000	44-47	30600	168	54000B & BTL	89
	2100-000	48-51	30900	168	55000	94
	2200-000	48-51	31000	166	55000B	94
	2300-2800-000	57-59	31000TL	166	56000	95
	3000-000	114-115	32000	166	56000B	95
	3100-000	114-115	32000TL	166	57000 & S	136
	3200-000	115	33000	167	58000	137
	3300-000	109	33000CS & CST	167	58700	125
	3400-000	109	34000 & TL	170	59000	116-117
	3500-000	113	35000 & TL	170	59100	116-117
	3600-000	113	36000 & TL	170	59200	120-121
	4000 & B	90	37000 & TL	171	59250	116-117
	4000S & SB	92	38000 & TL	171	59400-000	118-119
	4000ST & SBT	93	39000 & TL	170	59500-000	122-123
	4000TL & BTL	91	41000	169	59600 & B	108
	4100-000	52-53	41000US	169	59700	110
	4200-000	52-53	42000	169	59700-000	111
	4300-000	54-55	43000	169	59900	136
	8000-000	159	43900	154	60000	137
	9000-000	159	44000	152	60000-000	174
	10000	162	45500	153	60200-000	174
	10000TL	162	45600	153	60300-000	175
	10000M & MTL	163	48000	155	60400-000	175
	11000	145	48000TL	155	61000	137
	11000TL	145	49000	156	62000 & Z	132
	13000	126	49000TL	156	62000RZ	132
	13600	127	49000-000	157	62000L & ZL	133
	13700	128	49200-000	158	62000LRZ	133
	14000	178	51200	84	62015 & TL	172
	14100	176	51200B	84	63000 & Z	134
	14200	176	51300	84	63000RZ	134
	14300	176	51300B	84	63000L & ZL	135
	14500	178	51400	85	63000LRZ	135
	14600	177	51400B	85	63015 & TL	172
	15000 & L	137	51500	85	64015 & TL	172
	16000 & L	137	51500B	85	65015 & TL	172
	17000-000	124	51800	86	66000 & TL	173
	20000	160-161	51800B	86	67000 & TL	173
	22000 & LR	164	51800TL	86	68000 & TL	173
	23000 & LR	165	51800BTL	86	69000 & TL	173
	24000 & LR	164	51900	86	70000	131
	25000 & LR	165	51900B	86	70000B	131
	26000	164	51900TL	86	70000Z	131
	26200	164	51900BTL	86	70000BZ	131
	28000 & TL	150-151	52000	88	72000	12-13
	28000SP & SPT	150	52000B	88	72000B	12-13
	30100	168	52000TL	88	72000TL	16-17
	30200	168	52000BTL	88	72000BTL	16-17
	30300	168	54000	89	74000 & B	64-65

TOOL SERIES LOOK-UP BY PRODUCT NUMBER

SERIES	PAGE	SERIES	PAGE	SERIES	PAGE
74000TL	66-67	86600-000	26-27	GRX2000	182
74000BTL	66-67	86700-000	26-27	GRX8000	183
74300	83	86800-000	28	GRX9000	183
74300B	83	86900-000	29	GRX000 & B	184
74400	83	88000 & B	62-63	GRX3000 & B	185
74400B	83	89000-000	74-75	GRX4000	192-193
76200	20-21	89100-000	75, 96	GRX4500	194-195
76200B	20-21	89200-000	75, 96	GRX5000	192-193
76300	24-25	89300-000	96	GRX5500	194-195
76300B	24-25	89400-000	78-79	GRX6000	197
76400	70-71	89500-000	96	GRX6500	196
76400B	70-71	89700-000	97	GRX7000	197
76500	72-73	89900-000	74-75	GRX7500	196
76500B	72-73	92000	147	GS00-000	190
77000 & L	198	92000TL	147	GX200-000	186
77000B & LB	198	94000	147	GX400-000	187
78000	199	94000TL	147	LF1000	34-35
78000B	199	95000	148	LF1000B	34-35
78200	200	95000TL	148	LF1100	38-39
79400-000	80-81	96000	146	LF1100B	38-39
80000	130	96000TL	146	LF2000 & B	36-37
80000B	130	97000	146	LF2100	40-41
80000Z	130	97000TL	146	LF2100B	40-41
80000BZ	130	98000	142	LF3000 & B	99
81000	18-19	98000TL	142	LF4000 & B	98
81000B	18-19	98000FL	142	LF5000 & B	100
81000TL	22-23	98000FLT	142	LF6000 & B	101
81000BTL	22-23	98200	148	LV2000 & B	112
82000	8-11	98200 TL	148	MCH-400	179
82000B	8-11	99000	138-139	MCH-0000	179
82000TL	14-15	99000FL	143	NC000-00	165
82000BTL	14-15	99000FLT	143	NCT000-00	165
83000	30	99000TC	140-141	PC0000	201
83100	32	99000TL	140-141	PC0000B	201
83200	31	99300	145	PC0000R	201
83300	31	99400-000	144	SF1000	42
83400	30	99500-000	144	SF1000B	42
83500	32	99600-000	144	SF2000	43
83600	33	99700-000	144	SF2000B	43
83700	33	99800-000	144	SF3000	104-105
84000	60-61	99900-000	144	SF3000B	104-105
84000B	60-61	ACH1000	87	SF4000	102
85000	68	CR-6000	181	SF4000B	102
85000B	68	DC-4100	180	SF5000	103
85000TL	69	GL00-000	189	SF5000B	103
85000BTL	69	GLB00-000	189	SF6000	106-107
86000	82	GB00-000	190	SF6000B	106-107
86000B	82	GL 1000 & B	188	SR1000	56
86100-000	76	GR1000	191	SR2000	56
86200-000	77	GRX1000	182	UC-5100	180



Microcut

Sharp Ideas for Carbide Cutting Tools

Many new tool sizes and new product lines including:

2-Flute Long Reach End Mills with Corner Radius



4-Flute - Single & Double End - Stub Flute - Square & Ball End Mills



Wood Router Bits



3-Flute & 5-Flute Spiral Flute Chamfer Cutters



300 Degree Spherical Ball End Mills

