



# RICHARDS MICRO-TOOL

## Setting Higher Standards in Precision Miniature Cutting Tools

Miniature End Mills · Micro Drills · Specialty Cutting Tools



MANUFACTURING  
SINCE

**1961**

**2000+ NEW  
PRODUCTS!**

**NOW OFFERING:  
END MILLS & SPECIALTY TOOLS WITH ALTiN COATING  
TAPERED RIB CUTTERS**

Richards Micro-Tool

American Made... in America's Hometown!

ISO 13485 Certified



**ARCH™**  
GLOBAL PRECISION

AMERICAN MANUFACTURING, SERVING THE WORLD

**MATERIAL TYPE:**

**CARBIDE**

CARBIDE:  
PAGES 5 - 98

**HSS / COB**

HSS/ Cobalt  
PAGES 99-122

**COATING TYPE:**

TITANIUM BASED FOR HIGH PERFORMANCE APPLICATIONS

**ALTIN COATED**

ALUMINUM TITANIUM NITRIDE

**TIALN COATED**

TITANIUM ALUMINUM NITRIDE

**TIN COATED**

TITANIUM NITRIDE

**TIALN NANO COATED**

TITANIUM ALUMINUM  
NITRIDE NANO

**TICN COATED**

TITANIUM CARBIDE  
NITRIDE

DIAMOND BASED FOR GRAPHITES & COMPOSITE MATERIAL CUTTING

**AMORPHOUS DIAMOND**

**CVD COATED**

CRYSTALLINE DIAMOND

**DLC COATED**

DIAMOND-LIKE CARBON

OTHER:

**HARD MILL**

FOR MORE INFO ON COATINGS WE OFFER, SEE PAGE 127 FOR COATINGS GUIDE

**END FEATURE:**



SQUARE  
END



BALL  
END



CORNER  
RADIUS



ANGLED  
EDGE



CORNER  
ROUNDING

**MEASUREMENT:**



DECIMAL

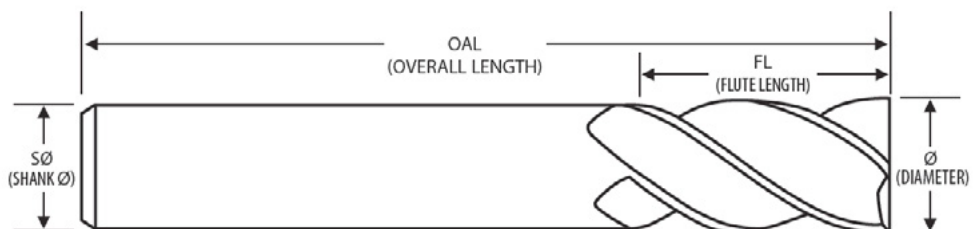


FRACTIONAL









METRIC

**READING OUR  
DIMENSIONS:**



# APPLICATION INDEX

Richards Micro Tool offers a wide variety of end mills, some are best used for certain types of materials. Here's what works best for cutting some commonly used materials.

MATERIAL APPLICATION	APPLICATION SPECIFIC TOOL TYPES	FEATURED COATING FOR PERFORMANCE	PAGE NUMBERS
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Graphite & Peek Materials	Diamond Coated End Mills AD, -A-, -CVD- series 	AD CVD DLC	Offered throughout Carbide Section 7 - 98
Stainless Steels	Q Mills 884 and 885 series 	TICN ALTIN TIALN	53, 54
Titanium	60 Deg. Helix 12000 series 	ALTIN	52
Tool Steel 30RC - 64RC	Hard Mill End Mills 879HM series  Tapered Rib Cutters 734X and 735XB series 	Hard Mill TIALN Nano	44, 60, 65, 66

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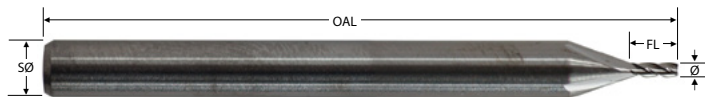
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# SQUARE END, STANDARD

## DECIMAL .005" - .045"

Same Sizes  
Continued

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Diameter Tolerance: +/- .0005



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED				ALTiN COATED		
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
.005"	.015"	.125"	1.50"	874-.005	--	--	\$26.81	874-E-.005	--	\$31.16
.006"	.018"	.125"	1.50"	874-.006	--	--	\$26.81	874-E-.006	--	\$31.16
.007"	.021"	.125"	1.50"	874-.007	--	--	\$26.81	874-E-.007	--	\$31.16
.008"	.024"	.125"	1.50"	874-.008	--	--	\$26.81	874-E-.008	--	\$31.16
.009"	.027"	.125"	1.50"	874-.009	--	--	\$26.81	874-E-.009	--	\$31.16
.010"	.030"	.125"	1.50"	874-.010	887-.010	875-.010	\$21.65	874-E-.010	875-E-.010	\$26.04
.011"	.033"	.125"	1.50"	874-.011	887-.011	875-.011	\$21.65	874-E-.011	875-E-.011	\$26.04
.012"	.036"	.125"	1.50"	874-.012	887-.012	875-.012	\$21.65	874-E-.012	875-E-.012	\$26.04
.013"	.039"	.125"	1.50"	874-.013	887-.013	875-.013	\$21.65	874-E-.013	875-E-.013	\$26.04
.014"	.042"	.125"	1.50"	874-.014	887-.014	875-.014	\$21.65	874-E-.014	875-E-.014	\$26.04
.015"	.045"	.125"	1.50"	874-.015	887-.015	875-.015	\$19.22	874-E-.015	875-E-.015	\$23.62
.0156" (1/64")	.0468"	.125"	1.50"	874-1560	887-1560	875-1560	\$19.22	--	--	
.016"	.048"	.125"	1.50"	874-.016	--	875-.016	\$19.22	874-E-.016	875-E-.016	\$23.62
.017"	.051"	.125"	1.50"	874-.017	--	875-.017	\$19.22	874-E-.017	875-E-.017	\$23.62
.018"	.054"	.125"	1.50"	874-.018	887-.018	875-.018	\$19.22	874-E-.018	875-E-.018	\$23.62
.019"	.057"	.125"	.150"	874-.019	--	875-.019	\$19.22	874-E-.019	875-E-.019	\$23.62
.0197" (.5 mm)	.0591"	.125"	1.50"	874-0197	887-0197	875-0197	\$19.22	--	--	
.020"	.060"	.125"	1.50"	874-.020	887-.020	875-.020	\$18.35	874-E-.020	875-E-.020	\$22.75
.021"	.063"	.125"	1.50"	874-.021	--	875-.021	\$18.35	874-E-.021	875-E-.021	\$22.75
.022"	.066"	.125"	1.50"	874-.022	--	875-.022	\$18.35	874-E-.022	875-E-.022	\$22.75
.023"	.069"	.125"	1.50"	874-.023	887-.023	875-.023	\$18.35	874-E-.023	875-E-.023	\$22.75
.024"	.072"	.125"	1.50"	874-.024	887-.024	875-.024	\$18.35	874-E-.024	875-E-.024	\$22.75
.025"	.075"	.125"	1.50"	874-.025	887-.025	875-.025	\$16.91	874-E-.025	875-E-.025	\$21.31
.026"	.078"	.125"	1.50"	874-.026	887-.026	875-.026	\$16.91	874-E-.026	875-E-.026	\$21.31
.027"	.081"	.125"	1.50"	874-.027	--	875-.027	\$16.91	874-E-.027	875-E-.027	\$21.31
.028"	.084"	.125"	1.50"	874-.028	--	875-.028	\$16.91	874-E-.028	875-E-.028	\$21.31
.029"	.087"	.125"	1.50"	874-.029	887-.029	875-.029	\$16.91	874-E-.029	875-E-.029	\$21.31
.030"	.090"	.125"	1.50"	874-.030	887-.030	875-.030	\$16.91	874-E-.030	875-E-.030	\$21.31
.031" (1/32")	.093"	.125"	1.50"	874-.031	887-.031	875-.031	\$16.91	874-E-.031	875-E-.031	\$21.31
.032"	.096"	.125"	1.50"	874-.032	--	875-.032	\$16.91	874-E-.032	875-E-.032	\$21.31
.033"	.099"	.125"	1.50"	874-.033	887-.033	875-.033	\$16.91	874-E-.033	875-E-.033	\$21.31
.034"	.102"	.125"	1.50"	874-.034	--	875-.034	\$16.91	874-E-.034	875-E-.034	\$21.31
.035"	.105"	.125"	1.50"	874-.035	887-.035	875-.035	\$14.27	874-E-.035	875-E-.035	\$18.67
.036"	.108"	.125"	1.50"	874-.036	--	875-.036	\$14.27	874-E-.036	875-E-.036	\$18.67
.037"	.111"	.125"	1.50"	874-.037	--	875-.037	\$14.27	874-E-.037	875-E-.037	\$18.67
.038"	.114"	.125"	1.50"	874-.038	--	875-.038	\$14.27	874-E-.038	875-E-.038	\$18.67
.039"	.117"	.125"	.150"	874-.039	--	875-.039	\$14.27	874-E-.039	875-E-.039	\$18.67
.0394" (1.0 mm)	.1182"	.125"	1.50"	874-0394	887-0394	875-0394	\$14.27	874-E-0394	875-E-0394	\$17.70
.040"	.120"	.125"	1.50"	874-.040	887-.040	875-.040	\$14.27	874-E-.040	875-E-.040	\$18.67
.041"	.123"	.125"	1.50"	874-.041	--	875-.041	\$14.27	874-E-.041	875-E-.041	\$18.67
.042"	.126"	.125"	1.50"	874-.042	--	875-.042	\$14.27	874-E-.042	875-E-.042	\$18.67
.043"	.129"	.125"	1.50"	874-.043	--	875-.043	\$14.27	874-E-.043	875-E-.043	\$18.67
.044"	.132"	.125"	1.50"	874-.044	--	875-.044	\$14.27	874-E-.044	875-E-.044	\$18.67
.045"	.135"	.125"	1.50"	874-.045	887-.045	875-.045	\$14.27	874-E-.045	875-E-.045	\$18.67



# SQUARE END, STANDARD

## DECIMAL .005" - .045"

- ALTiN/ TIALN coatings for high performance applications
- Amorphous Diamond Coating for Graphites/ Composite Materials



**CARBIDE**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIALN COATED				AMORPHOUS DIAMOND COATED			
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	3 FLUTE	4 FLUTE	PRICE
.005"	.015"	.125"	1.50"	874-C-.005	--	--	\$31.16	874-A-.005	--	--	\$43.42
.006"	.018"	.125"	1.50"	874-C-.006	--	--	\$31.16	874-A-.006	--	--	\$43.42
.007"	.021"	.125"	1.50"	874-C-.007	--	--	\$31.16	874-A-.007	--	--	\$43.42
.008"	.024"	.125"	1.50"	874-C-.008	--	--	\$31.16	874-A-.008	--	--	\$43.42
.009"	.027"	.125"	1.50"	874-C-.009	--	--	\$31.16	874-A-.009	--	--	\$43.42
.010"	.030"	.125"	1.50"	874-C-.010	887-C-.010	875-C-.010	\$26.04	874-A-.010	887-A-.010	875-A-.010	\$33.18
.011"	.033"	.125"	1.50"	874-C-.011	887-C-.011	875-C-.011	\$26.04	874-A-.011	--	875-A-.011	\$33.18
.012"	.036"	.125"	1.50"	874-C-.012	887-C-.012	875-C-.012	\$26.04	874-A-.012	--	875-A-.012	\$33.18
.013"	.039"	.125"	1.50"	874-C-.013	887-C-.013	875-C-.013	\$26.04	874-A-.013	--	875-A-.013	\$33.18
.014"	.042"	.125"	1.50"	874-C-.014	887-C-.014	875-C-.014	\$26.04	874-A-.014	--	875-A-.014	\$33.18
.015"	.045"	.125"	1.50"	874-C-.015	887-C-.015	875-C-.015	\$23.62	874-A-.015	887-A-.015	875-A-.015	\$30.76
.0156" (1/64")	.0468"	.125"	1.50"	874-C-1560	887-C-1560	875-C-1560	\$23.62	--	--	--	
.016"	.048"	.125"	1.50"	874-C-.016	--	875-C-.016	\$23.62	874-A-.016	--	875-A-.016	\$30.76
.017"	.051"	.125"	1.50"	874-C-.017	--	875-C-.017	\$23.62	874-A-.017	--	875-A-.017	\$30.76
.018"	.054"	.125"	1.50"	874-C-.018	887-C-.018	875-C-.018	\$23.62	874-A-.018	--	875-A-.018	\$30.76
.019"	.057"	.125"	.150"	874-C-.019	--	875-C-.019	\$23.62	874-A-.019	--	875-A-.019	\$30.76
.0197" (.5 mm)	.0591"	.125"	1.50"	874-C-0197	887-C-0197	875-C-0197	\$23.62	--	--	--	
.020"	.060"	.125"	1.50"	874-C-.020	887-C-.020	875-C-.020	\$22.75	874-A-.020	887-A-.020	875-A-.020	\$29.88
.021"	.063"	.125"	1.50"	874-C-.021	--	875-C-.021	\$22.75	874-A-.021	--	875-A-.021	\$29.88
.022"	.066"	.125"	1.50"	874-C-.022	--	875-C-.022	\$22.75	874-A-.022	--	875-A-.022	\$29.88
.023"	.069"	.125"	1.50"	874-C-.023	887-C-.023	875-C-.023	\$22.75	874-A-.023	--	875-A-.023	\$29.88
.024"	.072"	.125"	1.50"	874-C-.024	887-C-.024	875-C-.024	\$22.75	874-A-.024	--	875-A-.024	\$29.88
.025"	.075"	.125"	1.50"	874-C-.025	887-C-.025	875-C-.025	\$21.31	874-A-.025	887-A-.025	875-A-.025	\$28.44
.026"	.078"	.125"	1.50"	874-C-.026	--	875-C-.026	\$21.31	874-A-.026	--	875-A-.026	\$28.44
.027"	.081"	.125"	1.50"	874-C-.027	--	875-C-.027	\$21.31	874-A-.027	--	875-A-.027	\$28.44
.028"	.084"	.125"	1.50"	874-C-.028	--	875-C-.028	\$21.31	874-A-.028	--	875-A-.028	\$28.44
.029"	.087"	.125"	1.50"	874-C-.029	887-C-.029	875-C-.029	\$21.31	874-A-.029	--	875-A-.029	\$28.44
.030"	.090"	.125"	1.50"	874-C-.030	887-C-.030	875-C-.030	\$21.31	874-A-.030	887-A-.030	875-A-.030	\$28.44
.031" (1/32")	.093"	.125"	1.50"	874-C-.031	887-C-.031	875-C-.031	\$21.31	874-A-.031	887-A-.031	875-A-.031	\$28.44
.032"	.096"	.125"	1.50"	874-C-.032	--	875-C-.032	\$21.31	874-A-.032	--	875-A-.032	\$28.44
.033"	.099"	.125"	.150"	874-C-.033	--	875-C-.033	\$21.31	874-A-.033	--	875-A-.033	\$28.44
.034"	.102"	.125"	1.50"	874-C-.034	--	875-C-.034	\$21.31	874-A-.034	--	875-A-.034	\$28.44
.035"	.105"	.125"	1.50"	874-C-.035	887-C-.035	875-C-.035	\$18.67	874-A-.035	887-A-.035	875-A-.035	\$25.82
.036"	.108"	.125"	1.50"	874-C-.036	--	875-C-.036	\$18.67	874-A-.036	--	875-A-.036	\$25.82
.037"	.111"	.125"	1.50"	874-C-.037	--	875-C-.037	\$18.67	874-A-.037	--	875-A-.037	\$25.82
.038"	.114"	.125"	1.50"	874-C-.038	--	875-C-.038	\$18.67	874-A-.038	--	875-A-.038	\$25.82
.039"	.117"	.125"	1.50"	874-C-.039	--	875-C-.039	\$18.67	874-A-.039	--	875-A-.039	\$25.82
.0394" (1.0 mm)	.1182"	.125"	1.50"	874-C-0394	887-C-0394	875-C-0394	\$18.67	874-A-0394	--	875-A-0394	\$25.82
.040"	.120"	.125"	1.50"	874-C-.040	887-C-.040	875-C-.040	\$18.67	874-A-.040	887-A-.040	875-A-.040	\$25.82
.041"	.123"	.125"	1.50"	874-C-.041	--	875-C-.041	\$18.67	874-A-.041	--	875-A-.041	\$25.82
.042"	.126"	.125"	1.50"	874-C-.042	--	875-C-.042	\$18.67	874-A-.042	--	875-A-.042	\$25.82
.043"	.129"	.125"	1.50"	874-C-.043	--	875-C-.043	\$18.67	874-A-.043	--	875-A-.043	\$25.82
.044"	.132"	.125"	1.50"	874-C-.044	--	875-C-.044	\$18.67	874-A-.044	--	875-A-.044	\$25.82
.045"	.135"	.125"	1.50"	874-C-.045	887-C-.045	875-C-.045	\$18.67	874-A-.045	887-A-.045	875-A-.045	\$25.82



# SQUARE END, STANDARD

## DECIMAL .046" - .1772"

Same Sizes Continued

· Continued from Previous Pages



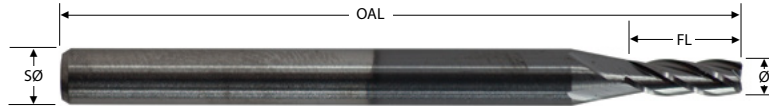
**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	UNCOATED				ALTIM COATED		
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
.046"	.138"	.125"	1.50"	874-.046	--	875-.046	\$14.27	874-E-.046	875-E-.046	\$18.67
.047" (3/64")	.141"	.125"	1.50"	874-.047	887-.047	875-.047	\$14.27	874-E-.047	875-E-.047	\$18.67
.048"	.144"	.125"	1.50"	874-.048	--	875-.048	\$14.27	874-E-.048	875-E-.048	\$18.67
.049"	.147"	.125"	1.50"	874-.049	--	875-.049	\$14.27	874-E-.049	875-E-.049	\$18.67
.0492" (1.25mm)	.1476"	.125"	1.50"	874-0492	887-0492	875-0492	\$14.27	874-E-0492	--	\$18.67
.050"	.150"	.125"	1.50"	874-.050	887-.050	875-.050	\$14.27	874-E-.050	875-E-.050	\$18.67
.051"	.153"	.125"	1.50"	874-.051	--	875-.051	\$14.27	874-E-.051	875-E-.051	\$18.67
.052"	.156"	.125"	1.50"	874-.052	--	875-.052	\$14.27	874-E-.052	875-E-.052	\$18.67
.053"	.159"	.125"	1.50"	874-.053	--	875-.053	\$14.27	874-E-.053	875-E-.053	\$18.67
.054"	.162"	.125"	1.50"	874-.054	--	875-.054	\$14.27	874-E-.054	875-E-.054	\$18.67
.055"	.165"	.125"	1.50"	874-.055	887-.055	875-.055	\$14.27	874-E-.055	875-E-.055	\$18.67
.056"	.168"	.125"	1.50"	874-.056	--	875-.056	\$14.27	874-E-.056	875-E-.056	\$18.67
.057"	.171"	.125"	1.50"	874-.057	--	875-.057	\$14.27	874-E-.057	875-E-.057	\$18.67
.058"	.174"	.125"	1.50"	874-.058	--	875-.058	\$14.27	874-E-.058	875-E-.058	\$18.67
.059"	.177"	.125"	1.50"	874-.059	--	875-.059	\$14.27	874-E-.059	875-E-.059	\$18.67
.0591" (1.5 mm)	.1773"	.125"	1.50"	874-0591	887-0591	875-0591	\$14.27	874-E-0591	875-E-0591	\$18.67
.060"	.180"	.125"	1.50"	874-.060	887-.060	875-.060	\$14.27	874-E-.060	875-E-.060	\$18.67
.062" (1/16")	.1875"	.125"	1.50"	874-.062	887-.062	875-.062	\$12.74	874-E-.062	875-E-.062	\$17.13
.0630" (1.6 mm)	.189"	.125"	1.50"	874-0630	887-0630	875-0630	\$12.74	--	--	
.064"	.192"	.125"	1.50"	874-.064	887-.064	875-.064	\$12.74	--	--	
.065"	.195"	.125"	1.50"	874-.065	887-.065	875-.065	\$12.74	874-E-.065	875-E-.065	\$17.13
.070"	.210"	.125"	1.50"	874-.070	887-.070	875-.070	\$12.74	874-E-.070	875-E-.070	\$17.13
.0709" (1.8 mm)	.2127"	.125"	1.50"	874-0709	887-0709	875-0709	\$12.74	--	--	
.075"	.225"	.125"	1.50"	874-.075	887-.075	875-.075	\$12.74	874-E-.075	875-E-.075	\$17.13
.078" (5/64")	.2343"	.125"	1.50"	874-.078	887-.078	875-.078	\$12.74	874-E-.078	875-E-.078	\$17.13
.0787" (2.0 mm)	.2361"	.125"	1.50"	874-0787	887-0787	875-0787	\$12.74	--	--	
.080"	.240"	.125"	1.50"	874-.080	887-.080	875-.080	\$12.74	874-E-.080	875-E-.080	\$17.13
.085"	.255"	.125"	1.50"	874-.085	887-.085	875-.085	\$12.74	874-E-.085	875-E-.085	\$17.13
.0866" (2.2 mm)	.2598"	.125"	1.50"	874-0866	887-0866	875-0866	\$12.74	--	--	
.090"	.270"	.125"	1.50"	874-.090	887-.090	875-.090	\$12.74	874-E-.090	875-E-.090	\$17.13
.093" (3/32")	.2814"	.125"	1.50"	874-.093	887-.093	875-.093	\$12.74	874-E-.093	875-E-.093	\$17.13
.095"	.285"	.125"	1.50"	874-.095	887-.095	875-.095	\$12.74	874-E-.095	875-E-.095	\$17.13
.0984" (2.5 mm)	.2952"	.125"	1.50"	874-0984	887-0984	875-0984	\$12.74	--	--	
.100"	.300"	.125"	1.50"	874-.100	887-.100	875-.100	\$12.74	874-E-.100	875-E-.100	\$17.13
.103"	.309"	.125"	1.50"	874-.103	887-.103	875-.103	\$12.74	--	--	
.105"	.315"	.125"	1.50"	874-.105	--	875-.105	\$12.74	874-E-.105	875-E-.105	\$17.13
.1102" (2.8 mm)	.3306"	.125"	1.50"	874-1102	887-1102	875-1102	\$12.74	874-E-1102	875-E-1102	\$17.13
.115"	.345"	.125"	1.50"	874-.115	--	875-.115	\$12.74	874-E-.115	875-E-.115	\$17.13
.1181" (3.0 mm)	.3543"	.125"	1.50"	874-1181	887-1181	875-1181	\$12.74	874-E-1181	875-E-1181	\$17.13
.120"	.360"	.125"	1.50"	874-.120	887-.120	875-.120	\$12.74	874-E-.120	875-E-.120	\$17.13
.1378" (3.5 mm)	.4134"	.1875"	2.00"	874-1378	887-1378	875-1378	\$13.95	--	--	
.1772" (4.5 mm)	.5316"	.1875"	2.00"	874-1772	887-1772	875-1772	\$13.95	--	--	



# SQUARE END, STANDARD

## DECIMAL .046" - .1772"



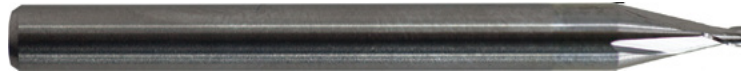
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIALN COATED				AMORPHOUS DIAMOND			
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	3 FLUTE	4 FLUTE	PRICE
.046"	.138"	.125"	1.50"	874-C-.046	--	875-C-.046	\$18.67	874-A-.046	--	875-A-.046	\$25.82
.047" (3/64")	.141"	.125"	1.50"	874-C-.047	887-C-.047	875-C-.047	\$18.67	874-A-.047	887-A-.047	875-A-.047	\$25.82
.048"	.144"	.125"	1.50"	874-C-.048	--	875-C-.048	\$18.67	874-A-.048	--	875-A-.048	\$25.82
.049"	.147"	.125"	1.50"	874-C-.049	--	875-C-.049	\$18.67	874-A-.049	--	875-A-.049	\$25.82
.0492" (1.25 mm)	.1476"	.125"	1.50"	874-C-0492	887-C-0492	875-C-0492	\$18.67	874-A-0492	--	--	\$25.82
.050"	.150"	.125"	1.50"	874-C-.050	887-C-.050	875-C-.050	\$18.67	874-A-.050	887-A-.050	875-A-.050	\$25.82
.051"	.153"	.125"	1.50"	874-C-.051	--	875-C-.051	\$18.67	874-A-.051	--	875-A-.051	\$25.82
.052"	.156"	.125"	1.50"	874-C-.052	--	875-C-.052	\$18.67	874-A-.052	--	875-A-.052	\$25.82
.053"	.159"	.125"	1.50"	874-C-.053	--	875-C-.053	\$18.67	874-A-.053	--	875-A-.053	\$25.82
.054"	.162"	.125"	1.50"	874-C-.054	--	875-C-.054	\$18.67	874-A-.054	--	875-A-.054	\$25.82
.055"	.165"	.125"	1.50"	874-C-.055	887-C-.055	875-C-.055	\$18.67	874-A-.055	887-A-.055	875-A-.055	\$25.82
.056"	.168"	.125"	1.50"	874-C-.056	--	875-C-.056	\$18.67	874-A-.056	--	875-A-.056	\$25.82
.057"	.171"	.125"	1.50"	874-C-.057	--	875-C-.057	\$18.67	874-A-.057	--	875-A-.057	\$25.82
.058"	.174"	.125"	1.50"	874-C-.058	--	875-C-.058	\$18.67	874-A-.058	--	875-A-.058	\$25.82
.059"	.177"	.125"	1.50"	874-C-.059	--	875-C-.059	\$18.67	874-A-.059	--	875-A-.059	\$25.82
.0591" (1.5 mm)	.1773"	.125"	1.50"	874-C-0591	887-C-0591	875-C-0591	\$18.67	874-A-0591	--	875-A-0591	\$25.82
.060"	.180"	.125"	1.50"	874-C-.060	887-C-.060	875-C-.060	\$18.67	874-A-.060	887-A-.060	875-A-.060	\$25.82
.062" (1/16")	.1875"	.125"	1.50"	874-C-.062	887-C-.062	875-C-.062	\$17.13	874-A-.062	887-A-.062	875-A-.062	\$24.29
.0630" (1.6 mm)	.189"	.125"	1.50"	874-C-0630	887-C-0630	875-C-0630	\$17.13	--	--	--	
.065"	.195"	.125"	1.50"	874-C-.065	887-C-.065	875-C-.065	\$17.13	874-A-.065	887-A-.065	875-A-.065	\$24.29
.070"	.210"	.125"	1.50"	874-C-.070	887-C-.070	875-C-.070	\$17.13	874-A-.070	887-A-.070	875-A-.070	\$24.29
.0709" (1.8 mm)	.2127"	.125"	1.50"	874-C-0709	887-C-0709	875-C-0709	\$17.13	--	--	--	
.075"	.225"	.125"	1.50"	874-C-.075	887-C-.075	875-C-.075	\$17.13	874-A-.075	--	875-A-.075	\$24.29
.078" (5/64")	.2343"	.125"	1.50"	874-C-.078	887-C-.078	875-C-.078	\$17.13	874-A-.078	887-A-.078	875-A-.078	\$24.29
.0787" (2.0 mm)	.2361"	.125"	1.50"	874-C-0787	887-C-0787	875-C-0787	\$17.13	--	--	--	
.080"	.240"	.125"	1.50"	874-C-.080	887-C-.080	875-C-.080	\$17.13	874-A-.080	887-A-.080	875-A-.080	\$24.29
.085"	.255"	.125"	1.50"	874-C-.085	887-C-.085	875-C-.085	\$17.13	874-A-.085	--	875-A-.085	\$24.29
.0866" (2.2 mm)	.2598"	.125"	1.50"	874-C-0866	887-C-0866	875-C-0866	\$17.13	--	--	--	
.090"	.270"	.125"	1.50"	874-C-.090	887-C-.090	875-C-.090	\$17.13	874-A-.090	887-A-.090	875-A-.090	\$24.29
.093" (3/32")	.2814"	.125"	1.50"	874-C-.093	887-C-.093	875-C-.093	\$17.13	874-A-.093	887-A-.093	875-A-.093	\$24.29
.095"	.285"	.125"	1.50"	874-C-.095	887-C-.095	875-C-.095	\$17.13	874-A-.095	--	875-A-.095	\$24.29
.0984" (2.5 mm)	.2952"	.125"	1.50"	874-C-0984	887-C-0984	875-C-0984	\$17.13	--	--	--	
.100"	.300"	.125"	1.50"	874-C-.100	887-C-.100	875-C-.100	\$17.13	874-A-.100	887-A-.100	875-A-.100	\$24.29
.105"	.315"	.125"	1.50"	--	--	--		874-A-.105	--	875-A-.105	\$24.29
.1102" (2.8 mm)	.3306"	.125"	1.50"	874-C-1102	887-C-1102	875-C-1102	\$17.13	874-A-1102	--	875-A-1102	\$24.29
.115"	.345"	.125"	1.50"	--	--	--		874-A-115	--	875-A-115	\$24.29
.1181" (3.0 mm)	.3543"	.125"	1.50"	874-C-1181	887-C-1181	875-C-1181	\$17.13	874-A-1181	--	875-A-1181	\$24.29
.120"	.360"	.125"	1.50"	874-C-.120	887-C-.120	875-C-.120	\$17.13	874-A-.120	--	875-A-.120	\$24.29
.1378" (3.5 mm)	.4134"	.1875"	2.00"	874-C-1378	887-C-1378	875-C-1378	\$18.67	--	--	--	
.1772" (4.5 mm)	.5316"	.1875"	2.00"	874-C-1772	887-C-1772	875-C-1772	\$18.67	--	--	--	

# SQUARE END, STUB

## DECIMAL .005" - .040"

Same Sizes  
Continued

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTIN for High Performance
- Diameter Tolerance: +/- .0005



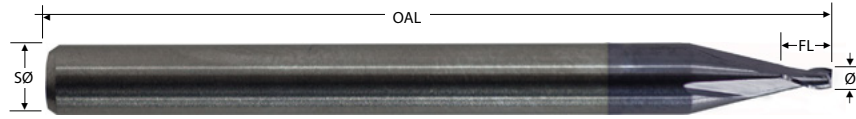
**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED			ALTIN COATED	
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.008"	.125"	1.50"	878-.005	--	\$26.81	878-E-.005	\$31.16
.006"	.009"	.125"	1.50"	878-.006	--	\$26.81	878-E-.006	\$31.16
.007"	.011"	.125"	1.50"	878-.007	--	\$26.81	878-E-.007	\$31.16
.008"	.012"	.125"	1.50"	878-.008	--	\$26.81	878-E-.008	\$31.16
.009"	.014"	.125"	1.50"	878-.009	--	\$26.81	878-E-.009	\$31.16
.010"	.015"	.125"	1.50"	878-.010	879-.010	\$21.65	878-E-.010	\$26.04
.011"	.017"	.125"	1.50"	878-.011	879-.011	\$21.65	878-E-.011	\$26.04
.012"	.018"	.125"	1.50"	878-.012	879-.012	\$21.65	878-E-.012	\$26.04
.013"	.020"	.125"	1.50"	878-.013	879-.013	\$21.65	878-E-.013	\$26.04
.014"	.021"	.125"	1.50"	878-.014	879-.014	\$21.65	878-E-.014	\$26.04
.015"	.023"	.125"	1.50"	878-.015	879-.015	\$19.22	878-E-.015	\$23.62
.0156" (1/64")	.023"	.125"	1.50"	878-1560	879-1560	\$19.22	--	
.016"	.024"	.125"	1.50"	878-.016	879-.016	\$19.22	878-E-.016	\$23.62
.017"	.026"	.125"	1.50"	878-.017	879-.017	\$19.22	878-E-.017	\$23.62
.018"	.027"	.125"	1.50"	878-.018	879-.018	\$19.22	878-E-.018	\$23.62
.019"	.029"	.125"	1.50"	878-.019	879-.019	\$19.22	878-E-.019	\$23.62
.0197" (.5 mm)	.030"	.125"	1.50"	878-0197	879-0197	\$19.22	--	
.020"	.030"	.125"	1.50"	878-.020	879-.020	\$18.35	878-E-.020	\$22.75
.021"	.032"	.125"	1.50"	878-.021	879-.021	\$18.35	878-E-.021	\$22.75
.022"	.033"	.125"	1.50"	878-.022	879-.022	\$18.35	878-E-.022	\$22.75
.023"	.035"	.125"	1.50"	878-.023	879-.023	\$18.35	878-E-.023	\$22.75
.024"	.036"	.125"	1.50"	878-.024	879-.024	\$18.35	878-E-.024	\$22.75
.025"	.038"	.125"	1.50"	878-.025	879-.025	\$16.91	878-E-.025	\$21.31
.026"	.039"	.125"	1.50"	878-.026	879-.026	\$16.91	878-E-.026	\$21.31
.027"	.041"	.125"	1.50"	878-.027	879-.027	\$16.91	878-E-.027	\$21.31
.028"	.042"	.125"	1.50"	878-.028	879-.028	\$16.91	878-E-.028	\$21.31
.029"	.044"	.125"	1.50"	878-.029	879-.029	\$16.91	878-E-.029	\$21.31
.030"	.045"	.125"	1.50"	878-.030	879-.030	\$16.91	878-E-.030	\$21.31
.031" (1/32")	.047"	.125"	1.50"	878-.031	879-.031	\$16.91	878-E-.031	\$21.31
.032"	.048"	.125"	1.50"	878-.032	879-.032	\$16.91	878-E-.032	\$21.31
.033"	.050"	.125"	1.50"	878-.033	879-.033	\$16.91	878-E-.033	\$21.31
.034"	.051"	.125"	1.50"	878-.034	879-.034	\$16.91	878-E-.034	\$18.67
.035"	.052"	.125"	1.50"	878-.035	879-.035	\$14.27	878-E-.035	\$18.67
.036"	.054"	.125"	1.50"	878-.036	879-.036	\$14.27	878-E-.036	\$18.67
.037"	.055"	.125"	1.50"	878-.037	879-.037	\$14.27	878-E-.037	\$18.67
.038"	.057"	.125"	1.50"	878-.038	879-.038	\$14.27	878-E-.038	\$18.67
.039"	.059"	.125"	1.50"	878-.039	879-.039	\$14.27	878-E-.039	\$18.67
.0394" (1.0 mm)	.059"	.125"	1.50"	878-0394	879-0394	\$14.27	878-E-0394	\$18.67
.040"	.060"	.125"	1.50"	878-.040	879-.040	\$14.27	878-E-.040	\$18.67

# SQUARE END, STUB

## DECIMAL .005"-.040"

- ALTiN/ TIALN coatings for high performance applications
- Amorphous Diamond Coating for Graphites/ Composite Materials



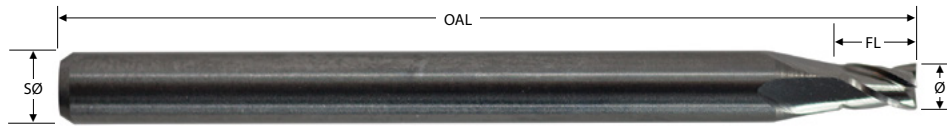
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	TIALN COATED			AMORPHOUS DIAMOND		
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
.005"	.008"	.125"	1.50"	878-C-.005	--	\$31.16	878-A-.005	--	\$43.42
.006"	.009"	.125"	1.50"	878-C-.006	--	\$31.16	878-A-.006	--	\$43.42
.007"	.011"	.125"	1.50"	878-C-.007	--	\$31.16	878-A-.007	--	\$43.42
.008"	.012"	.125"	1.50"	878-C-.008	--	\$31.16	878-A-.008	--	\$43.42
.009"	.014"	.125"	1.50"	878-C-.009	--	\$31.16	878-A-.009	--	\$43.42
.010"	.015"	.125"	1.50"	878-C-.010	879-C-.010	\$26.04	878-A-.010	879-A-.010	\$33.18
.011"	.017"	.125"	1.50"	878-C-.011	879-C-.011	\$26.04	878-A-.011	879-A-.011	\$33.18
.012"	.018"	.125"	1.50"	878-C-.012	879-C-.012	\$26.04	878-A-.012	879-A-.012	\$33.18
.013"	.020"	.125"	1.50"	878-C-.013	879-C-.013	\$26.04	878-A-.013	879-A-.013	\$33.18
.014"	.021"	.125"	1.50"	878-C-.014	879-C-.014	\$26.04	878-A-.014	879-A-.014	\$33.18
.015"	.023"	.125"	1.50"	878-C-.015	879-C-.015	\$23.62	878-A-.015	879-A-.015	\$30.76
.016"	.024"	.125"	1.50"	878-C-.016	879-C-.016	\$23.62	878-A-.016	879-A-.016	\$30.76
.017"	.026"	.125"	1.50"	878-C-.017	879-C-.017	\$23.62	878-A-.017	879-A-.017	\$30.76
.018"	.027"	.125"	.150"	878-C-.018	879-C-.018	\$23.62	878-A-.018	879-A-.018	\$30.76
.019"	.029"	.125"	1.50"	878-C-.019	879-C-.019	\$23.62	878-A-.019	879-A-.019	\$30.76
.020"	.030"	.125"	1.50"	878-C-.020	879-C-.020	\$22.75	878-A-.020	879-A-.020	\$29.88
.021"	.032"	.125"	1.50"	878-C-.021	879-C-.021	\$22.75	878-A-.021	879-A-.021	\$29.88
.022"	.033"	.125"	1.50"	878-C-.022	879-C-.022	\$22.75	878-A-.022	879-A-.022	\$29.88
.023"	.035"	.125"	1.50"	878-C-.023	879-C-.023	\$22.75	878-A-.023	879-A-.023	\$29.88
.024"	.036"	.125"	1.50"	878-C-.024	879-C-.024	\$22.75	878-A-.024	879-A-.024	\$29.88
.025"	.038"	.125"	1.50"	878-C-.025	879-C-.025	\$21.31	878-A-.025	879-A-.025	\$28.44
.026"	.039"	.125"	1.50"	878-C-.026	879-C-.026	\$21.31	878-A-.026	879-A-.026	\$28.44
.027"	.041"	.125"	1.50"	878-C-.027	879-C-.027	\$21.31	878-A-.027	879-A-.027	\$28.44
.028"	.042"	.125"	1.50"	878-C-.028	879-C-.028	\$21.31	878-A-.028	879-A-.028	\$28.44
.029"	.044"	.125"	1.50"	878-C-.029	879-C-.029	\$21.31	878-A-.029	879-A-.029	\$28.44
.030"	.045"	.125"	1.50"	878-C-.030	879-C-.030	\$21.31	878-A-.030	879-A-.030	\$28.44
.031"	.047"	.125"	1.50"	878-C-.031	879-C-.031	\$21.31	878-A-.031	879-A-.031	\$28.44
.032"	.048"	.125"	1.50"	878-C-.032	879-C-.032	\$21.31	878-A-.032	879-A-.032	\$28.44
.033"	.050"	.125"	1.50"	878-C-.033	879-C-.033	\$21.31	878-A-.033	879-A-.033	\$28.44
.034"	.051"	.125"	1.50"	878-C-.034	879-C-.034	\$21.31	878-A-.034	879-A-.034	\$28.44
.035"	.052"	.125"	1.50"	878-C-.035	879-C-.035	\$18.67	878-A-.035	879-A-.035	\$25.82
.036"	.054"	.125"	1.50"	878-C-.036	879-C-.036	\$18.67	878-A-.036	879-A-.036	\$25.82
.037"	.055"	.125"	1.50"	878-C-.037	879-C-.037	\$18.67	878-A-.037	879-A-.037	\$25.82
.038"	.057"	.125"	1.50"	878-C-.038	879-C-.038	\$18.67	878-A-.038	879-A-.038	\$25.82
.039"	.059"	.125"	1.50"	878-C-.039	879-C-.039	\$18.67	878-A-.039	879-A-.039	\$25.82
.040"	.060"	.125"	1.50"	878-C-.040	879-C-.040	\$18.67	878-A-.040	879-A-.040	\$25.82



# SQUARE END, STUB DECIMAL .045" - .1378"

Same Sizes  
Continued ➔

· Continued from Previous Pages



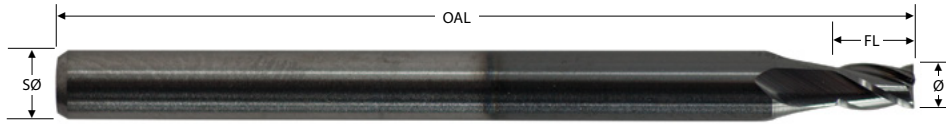
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED			ALTIN COATED <span style="color: yellow; font-weight: bold;">NEW!</span>	
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	PRICE
.045"	.068"	.125"	1.50"	878-.045	879-.045	\$14.27	878-E-.045	\$18.67
.047" (3/64")	.071"	.125"	1.50"	878-.047	879-.047	\$14.27	878-E-.047	\$18.67
.0492" (1.25 mm)	.074"	.125"	1.50"	878-0492	879-0492	\$14.27	--	
.050"	.075"	.125"	1.50"	878-.050	879-.050	\$14.27	878-E-.050	\$18.67
.055"	.083"	.125"	1.50"	878-.055	879-.055	\$14.27	878-E-.055	\$18.67
.0591" (1.5 mm)	.089"	.125"	1.50"	878-0591	879-0591	\$14.27	--	
.060"	.090"	.125"	1.50"	878-.060	879-.060	\$14.27	878-E-.060	\$18.67
.062" (1/16")	.093"	.125"	1.50"	878-.062	879-.062	\$12.74	878-E-.062	\$17.13
.0630" (1.6 mm)	.095"	.125"	1.50"	878-0630	879-0630	\$12.74	--	
.065"	.098"	.125"	1.50"	878-.065	879-.065	\$12.74	878-E-.065	\$17.13
.070"	.105"	.125"	1.50"	878-.070	879-.070	\$12.74	878-E-.070	\$17.13
.0709" (1.8 mm)	.106"	.125"	1.50"	878-0709	879-0709	\$12.74	--	
.074"	.111"	.125"	1.50"	878-.074	879-.074	\$12.74	--	
.075"	.113"	.125"	1.50"	878-.075	879-.075	\$12.74	878-E-.075	\$17.13
.078" (5/64")	.117"	.125"	1.50"	878-.078	879-.078	\$12.74	878-E-.078	\$17.13
.0787" (2.0 mm)	.118"	.125"	1.50"	878-0787	879-0787	\$12.74	--	
.080"	.120"	.125"	1.50"	878-.080	879-.080	\$12.74	878-E-.080	\$17.13
.085"	.128"	.125"	1.50"	878-.085	879-.085	\$12.74	878-E-.085	\$17.13
.0866" (2.2 mm)	.130"	.125"	1.50"	878-0866	879-0866	\$12.74	--	
.090"	.135"	.125"	1.50"	878-.090	879-.090	\$12.74	878-E-.090	\$17.13
.093" (3/32")	.140"	.125"	1.50"	878-.093	879-.093	\$12.74	878-E-.093	\$17.13
.095"	.143"	.125"	1.50"	878-.095	879-.095	\$12.74	878-E-.095	\$17.13
.0984" (2.5 mm)	.148"	.125"	1.50"	878-0984	879-0984	\$12.74	--	
.100"	.150"	.125"	1.50"	878-.100	879-.100	\$12.74	878-E-.100	\$17.13
.105"	.158"	.125"	1.50"	878-.105	879-.105	\$12.74	878-E-.105	\$17.13
.1102" (2.8 mm)	.166"	.125"	1.50"	878-1102	879-1102	\$12.74	878-E-1102	\$17.13
.115"	.172"	.125"	1.50"	878-.115	879-.115	\$12.74	878-E-.115	\$17.13
.1181" (3.0 mm)	.177"	.125"	1.50"	878-1181	879-1181	\$12.74	878-E-1181	\$17.13
.120"	.180"	.125"	1.50"	878-.120	879-.120	\$12.74	878-E-.120	\$16.24
.1378" (3.5 mm)	.207"	.1875"	2.00"	878-1378	879-1378	\$13.95	--	

Continued with  
AD Coating

# SQUARE END, STUB

## DECIMAL .045" - .120"

CARBIDE

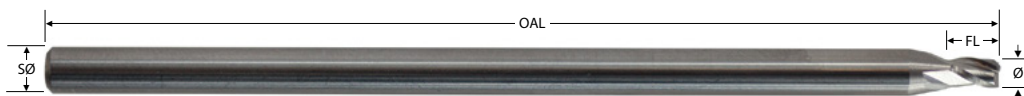


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	AMORPHOUS DIAMOND		
				2 FLUTE	4 FLUTE	PRICE
.045"	.068"	.125"	1.50"	878-A-.045	879-A-.045	\$25.82
.047" (3/64")	.071"	.125"	1.50"	878-A-.047	879-A-.047	\$25.82
.050"	.075"	.125"	1.50"	878-A-.050	879-A-.050	\$25.82
.055"	.083"	.125"	1.50"	878-A-.055	879-A-.055	\$25.82
.060"	.090"	.125"	1.50"	878-A-.060	879-A-.060	\$25.82
.062" (1/16")	.093"	.125"	1.50"	878-A-.062	879-A-.062	\$24.29
.065"	.098"	.125"	1.50"	878-A-.065	879-A-.065	\$24.29
.070"	.105"	.125"	1.50"	878-A-.070	879-A-.070	\$24.29
.075"	.113"	.125"	1.50"	878-A-.075	879-A-.075	\$24.29
.078" (5/64")	.117"	.125"	1.50"	878-A-.078	879-A-.078	\$24.29
.080"	.120"	.125"	1.50"	878-A-.080	879-A-.080	\$24.29
.085"	.128"	.125"	1.50"	878-A-.085	879-A-.085	\$24.29
.090"	.135"	.125"	1.50"	878-A-.090	879-A-.090	\$24.29
.093" (3/32")	.140"	.125"	1.50"	878-A-.093	879-A-.093	\$24.29
.100"	.150"	.125"	1.50"	878-A-.100	879-A-.100	\$24.29
.105"	.158"	.125"	1.50"	878-A-.105	879-A-.105	\$24.29
.115"	.172"	.125"	1.50"	878-A-.115	879-A-.115	\$24.29
.1181" (3.0 mm)	.177"	.125"	1.50"	878-A-1181	879-A-1181	\$24.29
.120"	.180"	.125"	1.50"	878-A-.120	879-A-.120	\$24.29

# SQUARE END, LONG SHANK, STUB

## DECIMAL .010" - .250"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- Diameter Tolerance:  
 .005" to .124": +/- .0005  
 .125" to .375": +0.000/ -.002



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.010"	.015"	.125"	2.50"	888X-.010	\$22.97	888X-E-.010	\$27.37	888X-A-.010	\$34.50
.015"	.023"	.125"	2.50"	888X-.015	\$20.54	888X-E-.015	\$24.95	888X-A-.015	\$32.08
.020"	.030"	.125"	2.50"	888X-.020	\$19.67	888X-E-.020	\$24.06	888X-A-.020	\$31.20
.025"	.037"	.125"	2.50"	888X-.025	\$18.23	888X-E-.025	\$22.63	888X-A-.025	\$29.76
.030"	.045"	.125"	2.50"	888X-.030	\$18.23	888X-E-.030	\$22.63	888X-A-.030	\$29.76
.031"	.047"	.125"	2.50"	888X-.031	\$18.23	888X-E-.031	\$22.63	888X-A-.031	\$29.76
.035"	.053"	.125"	2.50"	888X-.035	\$18.23	888X-E-.035	\$22.63	888X-A-.035	\$29.76
.039"	.058"	.125"	2.50"	888X-.039	\$18.23	888X-E-.039	\$22.63	888X-A-.039	\$29.76
.040"	.060"	.125"	2.50"	888X-.040	\$17.57	888X-E-.040	\$22.63	888X-A-.040	\$29.76
.045"	.068"	.125"	2.50"	888X-.045	\$17.57	888X-E-.045	\$21.97	888X-A-.045	\$29.76
.047"	.071"	.125"	2.50"	888X-.047	\$17.57	888X-E-.047	\$21.97	888X-A-.047	\$29.76
.050"	.075"	.125"	2.50"	888X-.050	\$17.57	888X-E-.050	\$21.97	888X-A-.050	\$29.10
.055"	.083"	.125"	2.50"	888X-.055	\$17.57	888X-E-.055	\$21.97	888X-A-.055	\$29.10
.060"	.090"	.125"	2.50"	888X-.060	\$17.57	888X-E-.060	\$21.97	888X-A-.060	\$29.10
.062"	.093"	.125"	2.50"	888X-.062	\$17.57	888X-E-.062	\$21.97	888X-A-.062	\$29.10
.065"	.098"	.125"	2.50"	888X-.065	\$17.57	888X-E-.065	\$21.97	888X-A-.065	\$29.10
.070"	.105"	.125"	2.50"	888X-.070	\$17.57	888X-E-.070	\$21.97	888X-A-.070	\$29.10
.075"	.113"	.125"	2.50"	888X-.075	\$17.57	888X-E-.075	\$21.97	888X-A-.075	\$29.10
.078"	.117"	.125"	2.50"	888X-.078	\$17.57	888X-E-.078	\$21.97	888X-A-.078	\$29.10
.080"	.120"	.125"	2.50"	888X-.080	\$17.57	888X-E-.080	\$21.97	888X-A-.080	\$29.10
.085"	.128"	.125"	2.50"	888X-.085	\$17.57	888X-E-.085	\$21.97	888X-A-.085	\$29.10
.090"	.135"	.125"	2.50"	888X-.090	\$17.57	888X-E-.090	\$21.97	888X-A-.090	\$29.10
.093"	.140"	.125"	2.50"	888X-.093	\$17.57	888X-E-.093	\$21.97	888X-A-.093	\$29.10
.095"	.143"	.125"	2.50"	888X-.095	\$17.57	888X-E-.095	\$21.97	888X-A-.095	\$29.10
.100"	.150"	.125"	2.50"	888X-.100	\$17.57	888X-E-.100	\$21.97	888X-A-.100	\$29.10
.125"	.1875"	.125"	2.50"	888X-.125	\$17.57	888X-E-.125	\$21.97	888X-A-.125	\$29.10
.187"	.281"	.1875"	3.00"	888X-.187	\$23.27	888X-E-.187	\$28.00	888X-A-.187	\$39.21
.250"	.375"	.250"	4.00"	888X-.250	\$27.45	888X-E-.250	\$35.15	888X-A-.250	\$45.59

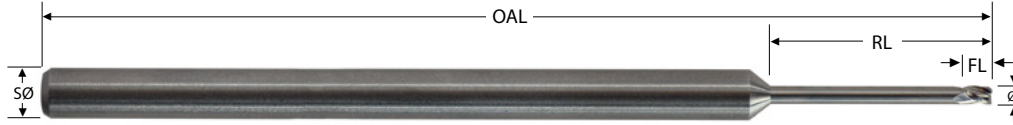
**NEW!**



# SQUARE END, LONG SHANK, LONG REACH, STUB

## DECIMAL .010" - .035"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- Rake Angle: Positive
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites/ Composite Materials
- Diameter Tolerance: .005" to .124": +/- .0005



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.010"	.015"	.125"	2.50"	.050" (5X)	888X-RL5-.010	\$40.42	888X-E-RL5-.010	\$44.82	888X-A-RL5-.010	\$51.87
.010"	.015"	.125"	2.50"	.080" (8X)	888X-RL8-.010	\$40.42	888X-E-RL8-.010	\$44.82	888X-A-RL8-.010	\$51.87
.010"	.015"	.125"	2.50"	.125" (12X)	888X-RL12-.010	\$42.62	888X-E-RL12-.010	\$47.02	888X-A-RL12-.010	\$54.06
.010"	.015"	.125"	2.50"	.150" (15X)	888X-RL15-.010	\$49.33	888X-E-RL15-.010	\$53.73	888X-A-RL15-.010	\$60.76
.015" (1/64")	.023"	.125"	2.50"	.045" (3X)	888X-RL3-.015	\$33.51	888X-E-RL3-.015	\$37.91	888X-A-RL3-.015	\$45.04
.015" (1/64")	.023"	.125"	2.50"	.078" (5X)	888X-RL5-.015	\$33.51	888X-E-RL5-.015	\$37.91	888X-A-RL5-.015	\$45.04
.015" (1/64")	.023"	.125"	2.50"	.125" (8X)	888X-RL8-.015	\$33.51	888X-E-RL8-.015	\$37.91	888X-A-RL8-.015	\$45.04
.015" (1/64")	.023"	.125"	2.50"	.1875" (12X)	888X-RL12-.015	\$34.72	888X-E-RL12-.015	\$39.12	888X-A-RL12-.015	\$46.25
.015" (1/64")	.023"	.125"	2.50"	.225" (15X)	888X-RL15-.015	\$39.44	888X-E-RL15-.015	\$43.84	888X-A-RL15-.015	\$50.98
.015" (1/64")	.023"	.125"	2.50"	.300" (20X)	888X-RL20-.015	\$46.03	888X-E-RL20-.015	\$50.43	888X-A-RL20-.015	\$57.57
.020"	.030"	.125"	2.50"	.100" (5X)	888X-RL5-.020	\$32.19	888X-E-RL5-.020	\$36.59	888X-A-RL5-.020	\$43.72
.020"	.030"	.125"	2.50"	.160" (8X)	888X-RL8-.020	\$32.19	888X-E-RL8-.020	\$36.59	888X-A-RL8-.020	\$43.72
.020"	.030"	.125"	2.50"	.250" (12X)	888X-RL12-.020	\$33.40	888X-E-RL12-.020	\$37.80	888X-A-RL12-.020	\$44.93
.020"	.030"	.125"	2.50"	.300" (15X)	888X-RL15-.020	\$37.90	888X-E-RL15-.020	\$42.51	888X-A-RL15-.020	\$49.55
.020"	.030"	.125"	2.50"	.400" (20X)	888X-RL20-.020	\$44.49	888X-E-RL20-.020	\$48.89	888X-A-RL20-.020	\$56.03
.025"	.037"	.125"	2.50"	.125" (5X)	888X-RL5-.025	\$30.87	888X-E-RL5-.025	\$35.27	888X-A-RL5-.025	\$42.40
.025"	.037"	.125"	2.50"	.200" (8X)	888X-RL8-.025	\$30.87	888X-E-RL8-.025	\$35.27	888X-A-RL8-.025	\$42.40
.025"	.037"	.125"	2.50"	.3125" (12X)	888X-RL12-.025	\$31.97	888X-E-RL12-.025	\$36.37	888X-A-RL12-.025	\$43.50
.025"	.037"	.125"	2.50"	.375" (15X)	888X-RL15-.025	\$37.24	888X-E-RL15-.025	\$41.64	888X-A-RL15-.025	\$48.77
.025"	.037"	.125"	2.50"	.500" (20X)	888X-RL20-.025	\$37.24	888X-E-RL20-.025	\$41.64	888X-A-RL20-.025	\$48.77
.030"	.045"	.125"	2.50"	.150" (5X)	888X-RL5-.030	\$30.87	888X-E-RL5-.030	\$35.27	888X-A-RL5-.030	\$42.40
.030"	.045"	.125"	2.50"	.250" (8X)	888X-RL8-.030	\$30.87	888X-E-RL8-.030	\$35.27	888X-A-RL8-.030	\$42.40
.030"	.045"	.125"	2.50"	.375" (12X)	888X-RL12-.030	\$31.97	888X-E-RL12-.030	\$36.37	888X-A-RL12-.030	\$43.50
.030"	.045"	.125"	2.50"	.450" (15X)	888X-RL15-.030	\$37.24	888X-E-RL15-.030	\$41.64	888X-A-RL15-.030	\$48.77
.031" (1/32")	.047"	.125"	2.50"	.093" (3X)	888X-RL3-.031	\$30.87	888X-E-RL3-.031	\$35.27	888X-A-RL3-.031	\$42.40
.031" (1/32")	.047"	.125"	2.50"	.155" (5X)	888X-RL5-.031	\$30.87	888X-E-RL5-.031	\$35.27	888X-A-RL5-.031	\$42.40
.031" (1/32")	.047"	.125"	2.50"	.250" (8X)	888X-RL8-.031	\$30.87	888X-E-RL8-.031	\$36.37	888X-A-RL8-.031	\$42.40
.031" (1/32")	.047"	.125"	2.50"	.375" (12X)	888X-RL12-.031	\$31.97	888X-E-RL12-.031	\$36.37	888X-A-RL12-.031	\$43.50
.031" (1/32")	.047"	.125"	2.50"	.470" (15X)	888X-RL15-.031	\$37.24	888X-E-RL15-.031	\$41.64	888X-A-RL15-.031	\$48.77
.031" (1/32")	.047"	.125"	2.50"	.625" (20X)	888X-RL20-.031	\$43.84	888X-E-RL20-.031	\$48.23	888X-A-RL20-.031	\$55.37
.035"	.052"	.125"	2.50"	.187" (5X)	888X-RL5-.035	\$30.87	888X-E-RL5-.035	\$35.27	888X-A-RL5-.035	\$42.40
.035"	.052"	.125"	2.50"	.280" (8X)	888X-RL8-.035	\$30.87	888X-E-RL8-.035	\$35.27	888X-A-RL8-.035	\$42.40
.035"	.052"	.125"	2.50"	.425" (12X)	888X-RL12-.035	\$31.97	888X-E-RL12-.035	\$36.37	888X-A-RL12-.035	\$43.50
.035"	.052"	.125"	2.50"	.525" (15X)	888X-RL15-.035	\$37.24	888X-E-RL15-.035	\$41.64	888X-A-RL15-.035	\$48.77
.035"	.052"	.125"	2.50"	.700" (20X)	888X-RL20-.035	\$43.84	888X-E-RL20-.035	\$48.23	888X-A-RL20-.035	\$55.37

# SQUARE END, LONG SHANK, LONG REACH, STUB

## DECIMAL .040" - .075"

· Continued from Previous Page



**NEW!**

**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.040"	.060"	.125"	2.50"	.200" (5X)	888X-RL5-.040	\$30.87	888X-E-RL5-.040	\$35.27	888X-A-RL5-.040	\$42.40
.040"	.060"	.125"	2.50"	.325" (8X)	888X-RL8-.040	\$30.87	888X-E-RL8-.040	\$35.27	888X-A-RL8-.040	\$42.40
.040"	.060"	.125"	2.50"	.480" (12X)	888X-RL12-.040	\$31.97	888X-E-RL12-.040	\$36.37	888X-A-RL12-.040	\$43.50
.040"	.060"	.125"	2.50"	.600" (15X)	888X-RL15-.040	\$37.24	888X-E-RL15-.040	\$41.64	888X-A-RL15-.040	\$48.77
.040"	.060"	.125"	2.50"	.800" (20X)	888X-RL20-.040	\$43.84	888X-E-RL20-.040	\$48.23	888X-A-RL20-.040	\$55.37
.045"	.067"	.125"	2.50"	.225" (5X)	888X-RL5-.045	\$30.20	888X-E-RL5-.045	\$34.60	888X-A-RL5-.045	\$41.75
.045"	.067"	.125"	2.50"	.375" (8X)	888X-RL8-.045	\$30.20	888X-E-RL8-.045	\$34.60	888X-A-RL8-.045	\$41.75
.045"	.067"	.125"	2.50"	.550" (12X)	888X-RL12-.045	\$31.20	888X-E-RL12-.045	\$35.60	888X-A-RL12-.045	\$42.74
.045"	.067"	.125"	2.50"	.680" (15X)	888X-RL15-.045	\$35.26	888X-E-RL15-.045	\$39.66	888X-A-RL15-.045	\$46.80
.045"	.067"	.125"	2.50"	.900" (20X)	888X-RL20-.045	\$41.20	888X-E-RL20-.045	\$45.60	888X-A-RL20-.045	\$52.73
.047" (3/64")	.071"	.125"	2.50"	.141" (3X)	888X-RL3-.047	\$30.20	888X-E-RL3-.047	\$34.60	888X-A-RL3-.047	\$41.75
.047" (3/64")	.071"	.125"	2.50"	.250" (5X)	888X-RL5-.047	\$30.20	888X-E-RL5-.047	\$34.60	888X-A-RL5-.047	\$41.75
.047" (3/64")	.071"	.125"	2.50"	.375" (8X)	888X-RL8-.047	\$30.20	888X-E-RL8-.047	\$34.60	888X-A-RL8-.047	\$41.75
.047" (3/64")	.071"	.125"	2.50"	.570" (12X)	888X-RL12-.047	\$31.20	888X-E-RL12-.047	\$35.60	888X-A-RL12-.047	\$42.74
.047" (3/64")	.071"	.125"	2.50"	.710" (15X)	888X-RL15-.047	\$35.26	888X-E-RL15-.047	\$39.66	888X-A-RL15-.047	\$46.80
.047" (3/64")	.071"	.125"	2.50"	.950" (20X)	888X-RL20-.047	\$41.20	888X-E-RL20-.047	\$45.60	888X-A-RL20-.047	\$52.73
.050"	.075"	.125"	2.50"	.250" (5X)	888X-RL5-.050	\$30.20	888X-E-RL5-.050	\$34.60	888X-A-RL5-.050	\$41.75
.050"	.075"	.125"	2.50"	.400" (8X)	888X-RL8-.050	\$30.20	888X-E-RL8-.050	\$34.60	888X-A-RL8-.050	\$41.75
.050"	.075"	.125"	2.50"	.600" (12X)	888X-RL12-.050	\$31.20	888X-E-RL12-.050	\$35.60	888X-A-RL12-.050	\$42.74
.050"	.075"	.125"	2.50"	.750" (15X)	888X-RL15-.050	\$35.26	888X-E-RL15-.050	\$39.66	888X-A-RL15-.050	\$46.80
.055"	.083"	.125"	2.50"	.275" (5X)	888X-RL5-.055	\$30.20	888X-E-RL5-.055	\$34.60	888X-A-RL5-.055	\$41.75
.055"	.083"	.125"	2.50"	.450" (8X)	888X-RL8-.055	\$30.20	888X-E-RL8-.055	\$34.60	888X-A-RL8-.055	\$41.75
.055"	.083"	.125"	2.50"	.660" (12X)	888X-RL12-.055	\$31.20	888X-E-RL12-.055	\$35.60	888X-A-RL12-.055	\$42.74
.055"	.083"	.125"	2.50"	.825" (15X)	888X-RL15-.055	\$35.26	888X-E-RL15-.055	\$39.66	888X-A-RL15-.055	\$46.80
.060"	.090"	.125"	2.50"	.312" (5X)	888X-RL5-.060	\$30.20	888X-E-RL5-.060	\$34.60	888X-A-RL5-.060	\$41.75
.060"	.090"	.125"	2.50"	.500" (8X)	888X-RL8-.060	\$30.20	888X-E-RL8-.060	\$34.60	888X-A-RL8-.060	\$41.75
.060"	.090"	.125"	2.50"	.720" (12X)	888X-RL12-.060	\$31.20	888X-E-RL12-.060	\$35.60	888X-A-RL12-.060	\$42.74
.060"	.090"	.125"	2.50"	.900" (15X)	888X-RL15-.060	\$35.26	888X-E-RL15-.060	\$39.66	888X-A-RL15-.060	\$46.80
.062" (1/16")	.093"	.125"	2.50"	.186" (3X)	888X-RL3-.062	\$30.20	888X-E-RL3-.062	\$34.60	888X-A-RL3-.062	\$41.75
.062" (1/16")	.093"	.125"	2.50"	.312" (5X)	888X-RL5-.062	\$30.20	888X-E-RL5-.062	\$34.60	888X-A-RL5-.062	\$41.75
.062" (1/16")	.093"	.125"	2.50"	.500" (8X)	888X-RL8-.062	\$30.20	888X-E-RL8-.062	\$34.60	888X-A-RL8-.062	\$41.75
.062" (1/16")	.093"	.125"	2.50"	.750" (12X)	888X-RL12-.062	\$31.20	888X-E-RL12-.062	\$35.60	888X-A-RL12-.062	\$42.74
.062" (1/16")	.093"	.125"	2.50"	.950" (15X)	888X-RL15-.062	\$35.26	888X-E-RL15-.062	\$39.66	888X-A-RL15-.062	\$46.80
.062" (1/16")	.093"	.125"	2.50"	1.250" (20X)	888X-RL20-.062	\$41.20	888X-E-RL20-.062	\$45.60	888X-A-RL20-.062	\$52.73
.065"	.098"	.125"	2.50"	.325" (5X)	888X-RL5-.065	\$30.20	888X-E-RL5-.065	\$34.60	888X-A-RL5-.065	\$41.75
.065"	.098"	.125"	2.50"	.525" (8X)	888X-RL8-.065	\$30.20	888X-E-RL8-.065	\$34.60	888X-A-RL8-.065	\$41.75
.065"	.098"	.125"	2.50"	.800" (12X)	888X-RL12-.065	\$31.20	888X-E-RL12-.065	\$35.60	888X-A-RL12-.065	\$42.74
.070"	.105"	.125"	2.50"	.375" (5X)	888X-RL5-.070	\$30.20	888X-E-RL5-.070	\$34.60	888X-A-RL5-.070	\$41.75
.070"	.105"	.125"	2.50"	.570" (8X)	888X-RL8-.070	\$30.20	888X-E-RL8-.070	\$34.60	888X-A-RL8-.070	\$41.75
.070"	.105"	.125"	2.50"	.850" (12X)	888X-RL12-.070	\$31.20	888X-E-RL12-.070	\$35.60	888X-A-RL12-.070	\$42.74
.075"	.113"	.125"	2.50"	.375" (5X)	888X-RL5-.075	\$30.20	888X-E-RL5-.075	\$34.60	888X-A-RL5-.075	\$41.75
.075"	.113"	.125"	2.50"	.625" (8X)	888X-RL8-.075	\$30.20	888X-E-RL8-.075	\$34.60	888X-A-RL8-.075	\$41.75
.075"	.113"	.125"	2.50"	.900" (12X)	888X-RL12-.075	\$31.20	888X-E-RL12-.075	\$35.60	888X-A-RL12-.075	\$42.74

# SQUARE END, LONG SHANK, LONG REACH, STUB

## DECIMAL .078" - .250"

· Continued from Previous Page

· Diameter Tolerance: .005" to .124": +/- .0005  
.125" to .375": +0.000/ -.002



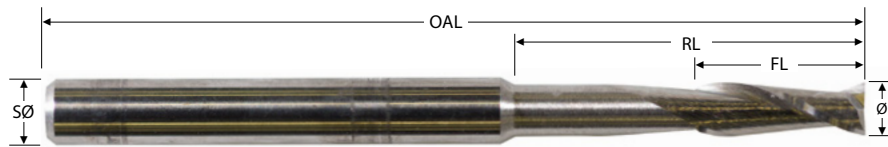
CARBIDE

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.078" (5/64")	.117"	.125"	2.50"	.234" (3X)	888X-RL3-.078	\$30.20	888X-E-RL3-.078	\$34.60	888X-A-RL3-.078	\$41.75
.078" (5/64")	.117"	.125"	2.50"	.400" (5X)	888X-RL5-.078	\$30.20	888X-E-RL5-.078	\$34.60	888X-A-RL5-.078	\$41.75
.078" (5/64")	.117"	.125"	2.50"	.625" (8X)	888X-RL8-.078	\$30.20	888X-E-RL8-.078	\$34.60	888X-A-RL8-.078	\$41.75
.078" (5/64")	.117"	.125"	2.50"	.940" (12X)	888X-RL12-.078	\$31.20	888X-E-RL12-.078	\$35.60	888X-A-RL12-.078	\$42.74
.078" (5/64")	.117"	.125"	2.50"	1.187" (15X)	888X-RL15-.078	\$35.26	888X-E-RL15-.078	\$39.66	888X-A-RL15-.078	\$46.80
.078" (5/64")	.117"	.125"	3.00"	1.562" (20X)	888X-RL20-.078	\$41.20	888X-E-RL20-.078	\$45.60	888X-A-RL20-.078	\$52.73
.080"	.120"	.125"	2.50"	.400" (5X)	888X-RL5-.080	\$30.20	888X-E-RL5-.080	\$34.60	888X-A-RL5-.080	\$41.75
.080"	.120"	.125"	2.50"	.650" (8X)	888X-RL8-.080	\$30.20	888X-E-RL8-.080	\$34.60	888X-A-RL8-.080	\$41.75
.080"	.120"	.125"	2.50"	.960" (12X)	888X-RL12-.080	\$31.20	888X-E-RL12-.080	\$35.60	888X-A-RL12-.080	\$42.74
.085"	.128"	.125"	2.50"	.425" (5X)	888X-RL5-.085	\$30.20	888X-E-RL5-.085	\$34.60	888X-A-RL5-.085	\$41.75
.085"	.128"	.125"	2.50"	.700" (8X)	888X-RL8-.085	\$30.20	888X-E-RL8-.085	\$34.60	888X-A-RL8-.085	\$41.75
.085"	.128"	.125"	2.50"	1.020" (12X)	888X-RL12-.085	\$30.20	888X-E-RL12-.085	\$35.60	888X-A-RL12-.085	\$42.74
.090"	.135"	.125"	2.50"	.450" (5X)	888X-RL5-.090	\$31.20	888X-E-RL5-.090	\$34.60	888X-A-RL5-.090	\$41.75
.090"	.135"	.125"	2.50"	.750" (8X)	888X-RL8-.090	\$37.36	888X-E-RL8-.090	\$34.60	888X-A-RL8-.090	\$41.75
.090"	.135"	.125"	2.50"	1.080" (12X)	888X-RL12-.090	\$43.50	888X-E-RL12-.090	\$35.60	888X-A-RL12-.090	\$42.74
.093" (3/32")	.140"	.125"	2.50"	.270" (3X)	888X-RL3-.093	\$30.20	888X-E-RL3-.093	\$34.60	888X-A-RL3-.093	\$41.75
.093" (3/32")	.140"	.125"	2.50"	.500" (5X)	888X-RL5-.093	\$30.20	888X-E-RL5-.093	\$34.60	888X-A-RL5-.093	\$41.75
.093" (3/32")	.140"	.125"	2.50"	.750" (8X)	888X-RL8-.093	\$30.20	888X-E-RL8-.093	\$34.60	888X-A-RL8-.093	\$41.75
.093" (3/32")	.140"	.125"	2.50"	1.125" (12X)	888X-RL12-.093	\$31.20	888X-E-RL12-.093	\$35.60	888X-A-RL12-.093	\$42.74
.093" (3/32")	.140"	.125"	3.00"	1.400" (15X)	888X-RL15-.093	\$37.36	888X-E-RL15-.093	\$41.75	888X-A-RL15-.093	\$48.89
.093" (3/32")	.140"	.125"	4.00"	1.875" (20X)	888X-RL20-.093	\$43.50	888X-E-RL20-.093	\$47.90	888X-A-RL20-.093	\$55.04
.095"	.143"	.125"	2.50"	.500" (5X)	888X-RL5-.095	\$30.20	888X-E-RL5-.095	\$34.60	888X-A-RL5-.095	\$41.75
.095"	.143"	.125"	2.50"	.750" (8X)	888X-RL8-.095	\$30.20	888X-E-RL8-.095	\$34.60	888X-A-RL8-.095	\$41.75
.095"	.143"	.125"	2.50"	1.150" (12X)	888X-RL12-.095	\$31.20	888X-E-RL12-.095	\$35.60	888X-A-RL12-.095	\$42.74
.100"	.150"	.125"	2.50"	.500" (5X)	888X-RL5-.100	\$30.20	888X-E-RL5-.100	\$34.60	888X-A-RL5-.100	\$41.75
.100"	.150"	.125"	2.50"	.800" (8X)	888X-RL8-.100	\$30.20	888X-E-RL8-.100	\$34.60	888X-A-RL8-.100	\$41.75
.100"	.150"	.125"	2.50"	1.200" (12X)	888X-RL12-.100	\$31.20	888X-E-RL12-.100	\$35.60	888X-A-RL12-.100	\$48.77
.125" (1/8")	.1875"	.125"	2.50"	.625" (5X)	888X-RL5-.125	\$30.20	888X-E-RL5-.125	\$34.60	888X-A-RL5-.125	\$41.75
.125" (1/8")	.1875"	.125"	2.50"	1.000" (8X)	888X-RL8-.125	\$30.20	888X-E-RL8-.125	\$34.60	888X-A-RL8-.125	\$41.75
.125" (1/8")	.1875"	.125"	3.00"	1.500" (12X)	888X-RL12-.125	\$32.84	888X-E-RL12-.125	\$37.24	888X-A-RL12-.125	\$50.43
.125" (1/8")	.1875"	.125"	3.00"	1.875" (15X)	888X-RL15-.125	\$37.36	888X-E-RL15-.125	\$41.75	888X-A-RL15-.125	\$54.93
.125" (1/8")	.1875"	.125"	4.00"	2.500" (20X)	888X-RL20-.125	\$43.50	888X-E-RL20-.125	\$47.90	888X-A-RL20-.125	\$61.08
.187" (3/16")	.281"	.1875"	3.00"	1.000" (5X)	888X-RL5-.187	\$35.92	888X-E-RL5-.187	\$40.32	888X-A-RL5-.187	\$51.85
.187" (3/16")	.281"	.1875"	3.00"	1.500" (8X)	888X-RL8-.187	\$35.92	888X-E-RL8-.187	\$40.32	888X-A-RL8-.187	\$51.85
.187" (3/16")	.281"	.1875"	4.00"	2.250" (12X)	888X-RL12-.187	\$38.45	888X-E-RL12-.187	\$42.84	888X-A-RL12-.187	\$55.47
.187" (3/16")	.281"	.1875"	4.00"	2.812" (15X)	888X-RL15-.187	\$41.08	888X-E-RL15-.187	\$45.48	888X-A-RL15-.187	\$58.11
.250" (1/4")	.375"	.250"	4.00"	1.250" (5X)	888X-RL5-.250	\$40.10	888X-E-RL5-.250	\$40.32	888X-A-RL5-.250	\$58.23
.250" (1/4")	.375"	.250"	4.00"	2.000" (8X)	888X-RL8-.250	\$40.10	888X-E-RL8-.250	\$44.50	888X-A-RL8-.250	\$58.23
.250" (1/4")	.375"	.250"	6.00"	3.000" (12X)	888X-RL12-.250	\$49.87	888X-E-RL12-.250	\$54.27	888X-A-RL12-.250	\$76.24
.250" (1/4")	.375"	.250"	6.00"	3.750" (15X)	888X-RL15-.250	\$49.87	888X-E-RL15-.250	\$54.27	888X-A-RL15-.250	\$76.24

# SQUARE END, LONG REACH

## DECIMAL .005" - .100"

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +/- .0005



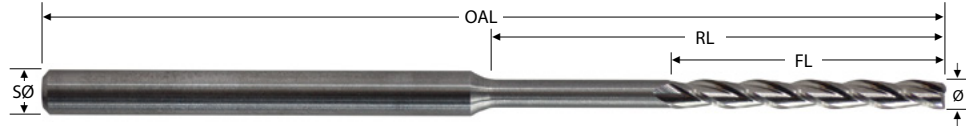
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (RL)	UNCOATED		PRICE
					2 FLUTE	4 FLUTE	
.005"	.015"	.125"	1.50"	.047"	874-.005RL	--	\$43.94
.010"	.030"	.125"	1.50"	.080"	874-RL.010X.080	875-RL.010X.080	\$39.11
.010"	.030"	.125"	1.50"	.0937"	874-.010RL	875-.010RL	\$39.11
.015"	.045"	.125"	1.50"	.125"	874-.015RL	875-.015RL	\$32.19
.020"	.060"	.125"	1.50"	.170"	874-RL.020X.170	875-RL.020X.170	\$30.87
.020"	.060"	.125"	1.50"	.1875"	874-.020RL	875-.020RL	\$30.87
.025"	.075"	.125"	1.50"	.213"	874-RL.025X.213	875-RL.025X.213	\$29.55
.025"	.075"	.125"	1.50"	.250"	874-.025RL	875-.025RL	\$29.55
.030"	.090"	.125"	1.50"	.250"	874-.030RL	875-.030RL	\$29.55
.030"	.090"	.125"	1.50"	.270"	874-RL.030X.270	875-RL.030X.270	\$29.55
.031"	.093"	.125"	1.50"	.279"	874-RL.031X.279	875-RL.031X.279	\$29.55
.035"	.105"	.125"	1.50"	.250"	874-.035RL	875-.035RL	\$29.55
.035"	.105"	.125"	1.50"	.315"	874-RL.035X.315	875-RL.035X.315	\$29.55
.040"	.120"	.125"	1.50"	.250"	874-.040RL	875-.040RL	\$29.55
.040"	.120"	.125"	1.50"	.360"	874-RL.040X.360	875-RL.040X.360	\$29.55
.045"	.135"	.125"	1.50"	.405"	874-RL.045X.405	875-RL.045X.405	\$28.89
.045"	.135"	.125"	1.50"	.500"	874-.045RL	875-.045RL	\$28.89
.047"	.141"	.125"	1.50"	.423"	874-RL.047X.423	875-RL.047X.423	\$28.89
.050"	.150"	.125"	1.50"	.500"	874-.050RL	875-.050RL	\$28.89
.055"	.165"	.125"	1.50"	.500"	874-.055RL	875-.055RL	\$28.89
.060"	.180"	.125"	1.50"	.500"	874-.060RL	875-.060RL	\$28.89
.062"	.186"	.125"	1.50"	.500"	874-RL.062X.500	875-RL.062X.500	\$28.89
.065"	.195"	.125"	1.50"	.500"	874-.065RL	875-.065RL	\$28.89
.070"	.210"	.125"	1.50"	.500"	874-.070RL	875-.070RL	\$28.89
.078"	.234"	.125"	1.50"	.500"	874-RL.078X.500	875-RL.078X.500	\$28.89
.080"	.240"	.125"	1.50"	.500"	874-.080RL	875-.080RL	\$28.89
.090"	.270"	.125"	1.50"	.500"	874-.090RL	875-.090RL	\$28.89
.090"	.270"	.125"	1.50"	.625"	874-RL.090X.625	875-RL.090X.625	\$28.89
.093"	.279"	.125"	1.50"	.625"	874-RL.093X.625	875-RL.093X.625	\$28.89
.095"	.285"	.125"	1.50"	.625"	874-RL.095X.625	875-RL.095X.625	\$28.89
.100"	.300"	.125"	1.50"	.500"	874-.100RL	875-.100RL	\$28.89
.100"	.300"	.125"	1.50"	.625"	874-RL.100X.625	875-RL.100X.625	\$28.89



# SQUARE END, LONG FLUTE, LONG REACH

## DECIMAL .010" - .250"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites/ Composite Materials
- Diameter Tolerance: .005" to .124": +/- .0005  
.125" to .375": +0.000/ -.002



DIAMETER (Ø)	FLUTE LENGTH (X DIAMETER) (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.010"	.050" (5X)	.125"	2.50"	.100" (10X)	887X-F5R10-.010	\$41.52	--		887X-A-F5R10-.010	\$53.07
.015" (1/64")	.075" (5X)	.125"	2.50"	.150" (10X)	887X-F5R10-.015	\$34.60	--		887X-A-F5R10-.015	\$46.14
.020"	.100" (5X)	.125"	2.50"	.200" (10X)	887X-F5R10-.020	\$33.29	887X-E-F5R10-.020	\$37.68	887X-A-F5R10-.020	\$44.82
.025"	.125" (5X)	.125"	2.50"	.250" (10X)	887X-F5R10-.025	\$31.97	887X-E-F5R10-.025	\$36.37	887X-A-F5R10-.025	\$43.50
.030"	.150" (5X)	.125"	2.50"	.300" (10X)	887X-F5R10-.030	\$31.97	887X-E-F5R10-.030	\$36.37	887X-A-F5R10-.030	\$43.50
.031" (1/32")	.155" (5X)	.125"	2.50"	.300" (10X)	887X-F5R10-.031	\$31.97	887X-E-F5R10-.031	\$36.37	887X-A-F5R10-.031	\$43.50
.035"	.175" (5X)	.125"	2.50"	.350" (10X)	887X-F5R10-.035	\$31.97	887X-E-F5R10-.035	\$36.37	887X-A-F5R10-.035	\$43.50
.040"	.200" (5X)	.125"	2.50"	.400" (10X)	887X-F5R10-.040	\$31.97	887X-E-F5R10-.040	\$36.37	887X-A-F5R10-.040	\$43.50
.045"	.225" (5X)	.125"	2.50"	.450" (10X)	887X-F5R10-.045	\$31.30	887X-E-F5R10-.045	\$35.70	887X-A-F5R10-.045	\$42.84
.047" (3/64")	.250" (5X)	.125"	2.50"	.500" (10X)	887X-F5R10-.047	\$31.30	887X-E-F5R10-.047	\$35.70	887X-A-F5R10-.047	\$42.84
.050"	.300" (6X)	.125"	2.50"	.600" (12X)	887X-FR-.050 X .600	\$31.30	887X-E-FR-.050 X .600	\$35.70	887X-A-FR-.050 X .600	\$42.84
.055"	.385" (7X)	.125"	2.50"	.770" (14X)	887X-FR-.055 X .770	\$31.30	887X-E-FR-.055 X .770	\$35.70	887X-A-FR-.055 X .770	\$42.84
.060"	.500" (8.3X)	.125"	2.50"	1.00" (16X)	887X-FR-.060 X 1.00	\$31.30	887X-E-FR-.060 X 1.00	\$35.70	887X-A-FR-.060 X 1.00	\$42.84
.062" (1/16")	.500" (8X)	.125"	2.50"	1.00" (16X)	887X-FR-.062 X 1.00	\$31.30	--		887X-A-FR-.062 X 1.00	\$42.84
.065"	.500" (7.7X)	.125"	2.50"	1.00" (15X)	887X-FR-.065 X 1.00	\$31.30	887X-E-FR-.065 X 1.00	\$35.70	887X-A-FR-.065 X 1.00	\$42.84
.070"	.500" (7.1X)	.125"	2.50"	1.00" (14X)	887X-FR-.070 X 1.00	\$31.30	887X-E-FR-.070 X 1.00	\$35.70	887X-A-FR-.070 X 1.00	\$42.84
.075"	.500" (6.7X)	.125"	2.50"	1.00" (13X)	887X-FR-.075 X 1.00	\$31.30	887X-E-FR-.075 X 1.00	\$35.70	887X-A-FR-.075 X 1.00	\$42.84
.078" (5/64")	.500" (6.4X)	.125"	2.50"	1.00" (12X)	887X-FR-.078 X 1.00	\$31.30	887X-E-FR-.078 X 1.00	\$35.70	887X-A-FR-.078 X 1.00	\$42.84
.080"	.750" (9.4X)	.125"	2.50"	1.25" (15X)	887X-FR-.080 X 1.25	\$31.30	887X-E-FR-.080 X 1.25	\$35.70	887X-A-FR-.080 X 1.25	\$42.84
.085"	.750" (8.8X)	.125"	2.50"	1.25" (14X)	887X-FR-.085 X 1.25	\$31.30	887X-E-FR-.085 X 1.25	\$35.70	887X-A-FR-.085 X 1.25	\$42.84
.090"	.750" (8.3X)	.125"	2.50"	1.25" (14X)	887X-FR-.090 X 1.25	\$31.30	887X-E-FR-.090 X 1.25	\$35.70	887X-A-FR-.090 X 1.25	\$42.84
.093" (3/32")	.750" (8.1X)	.125"	2.50"	1.25" (13X)	887X-FR-.093 X 1.25	\$31.30	887X-E-FR-.093 X 1.25	\$35.70	887X-A-FR-.093 X 1.25	\$42.84
.095"	.750" (7.9X)	.125"	2.50"	1.25" (13X)	887X-FR-.095 X 1.25	\$31.30	887X-E-FR-.095 X 1.25	\$35.70	887X-A-FR-.095 X 1.25	\$42.84
.100"	.750" (7.5X)	.125"	2.50"	1.25" (12X)	887X-FR-.100 X 1.25	\$31.30	887X-E-FR-.100 X 1.25	\$35.70	887X-A-FR-.100 X 1.25	\$42.84
.125" (1/8")	1.00" (8X)	.125"	2.50"	1.50" (12X)	887X-FR-.125 X 1.50	\$31.30	887X-E-FR-.125 X 1.50	\$35.70	887X-A-FR-.125 X 1.50	\$42.84
.187" (3/16")	1.125" (6X)	.1875"	3.00"	1.625" (8X)	887X-FR-.187 X 1.625	\$37.02	887X-E-FR-.187 X 1.625	\$41.42	887X-A-FR-.187 X 1.625	\$52.95
.250" (1/4")	1.50" (6X)	.250"	4.00"	2.00" (8X)	887X-FR-.250 X 2.0	\$41.20	--		887X-A-FR-.250 X 2.0	\$59.32

# SQUARE END, EXTRA LONG FLUTE

## DECIMAL .031" - .250"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites/ Composites
- Diameter Tolerance: .005" to .124": +/- .0005  
.125" to .375": +0.000/ -.002

### 12X FLUTE LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.031" (1/32")	.375" (12X)	.125"	2.50"	887X-LF12-.031	\$53.07	887X-E-LF12-.031	\$57.46	887X-A-LF12-.031	\$64.60
.047" (3/64")	.570" (12X)	.125"	2.50"	887X-LF12-.047	\$49.33	887X-E-LF12-.047	\$53.73	887X-A-LF12-.047	\$60.86
.062" (1/16")	.750" (12X)	.125"	2.50"	887X-LF12-.062	\$41.63	887X-E-LF12-.062	\$46.03	887X-A-LF12-.062	\$53.17
.078" (5/64")	.940" (12X)	.125"	2.50"	887X-LF12-.078	\$41.63	887X-E-LF12-.078	\$46.03	887X-A-LF12-.078	\$53.17
.093" (3/32")	1.125" (12X)	.125"	2.50"	887X-LF12-.093	\$41.63	887X-E-LF12-.093	\$46.03	887X-A-LF12-.093	\$53.17
.125" (1/8")	1.50" (12X)	.125"	3.00"	887X-LF12-.125	\$43.94	887X-E-LF12-.125	\$48.34	887X-A-LF12-.125	\$58.24

### 15X FLUTE LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.062" (1/16")	.950" (15X)	.125"	2.50"	887X-LF15-.062	\$56.91	887X-E-LF15-.062	\$61.31	887X-A-LF15-.062	\$68.45
.078" (5/64")	1.187" (15X)	.125"	2.50"	887X-LF15-.078	\$56.91	887X-E-LF15-.078	\$61.31	887X-A-LF15-.078	\$68.45
.093" (3/32")	1.400" (15X)	.125"	3.00"	887X-LF15-.093	\$59.21	887X-E-LF15-.093	\$63.61	887X-A-LF15-.093	\$76.79
.125" (1/8")	1.875" (15X)	.125"	3.00"	887X-LF15-.125	\$59.21	887X-E-LF15-.125	\$63.61	887X-A-LF15-.125	\$76.79

### 4 FLUTE, 12X FLUTE LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				4 FLUTE	PRICE	4 FLUTE	PRICE	4 FLUTE	PRICE
.156" (5/32")	1.875" (12X)	.1875"	4.00"	875X-LF12-.156	\$56.24	875X-E-LF12-.156	\$60.67	875X-A-LF12-.156	\$73.28
.187" (3/16")	2.25" (12X)	.1875"	4.00"	875X-LF12-.187	\$56.24	875X-E-LF12-.187	\$60.67	875X-A-LF12-.187	\$72.18
.250" (1/4")	3.00" (12X)	.250"	6.00"	875X-LF12-.250	\$61.74	875X-E-LF12-.250	\$66.17	875X-A-LF12-.250	\$84.57

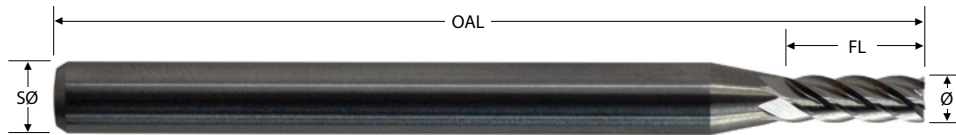


# SQUARE END, MULTI FLUTE/ HIGH HELIX

## DECIMAL .015" - .100"

- Helix: 35 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Diameter Tolerance: +/- .0005

### MULTI FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	UNCOATED		ALTiN COATED	
				5 FLUTE	PRICE	5 FLUTE	PRICE
.031"	.090"	.125"	1.50"	889MF-.031	\$26.26	889MF-E-.031	\$31.70
.040"	.120"	.125"	1.50"	889MF-.040	\$26.26	889MF-E-.040	\$31.70
.047"	.141"	.125"	1.50"	889MF-.047	\$26.26	889MF-E-.047	\$31.70
.050"	.150"	.125"	1.50"	889MF-.050	\$26.26	889MF-E-.050	\$31.70
.060"	.180"	.125"	1.50"	889MF-.060	\$27.35	889MF-E-.060	\$31.70
.062"	.186"	.125"	1.50"	889MF-.062	\$24.39	889MF-E-.062	\$29.84
.070"	.210"	.125"	1.50"	889MF-.070	\$24.39	889MF-E-.070	\$29.84
.078"	.234"	.125"	1.50"	889MF-.078	\$24.39	889MF-E-.078	\$29.84
.080"	.240"	.125"	1.50"	889MF-.080	\$24.39	889MF-E-.080	\$29.84
.093"	.279"	.125"	1.50"	889MF-.093	\$24.39	889MF-E-.093	\$29.84
.100"	.300"	.125"	1.50"	889MF-.100	\$24.39	889MF-E-.100	\$29.84

NEW!

### HIGH HELIX

- Helix: 45 Degrees
- Diameter Tolerance: +/- .0005
- Best for Aluminum & Non-Ferrous Materials



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
.015"	.045"	.125"	1.50"	874HH-.015	\$25.60
.031"	.090"	.125"	1.50"	874HH-.031	\$18.64
.047"	.141"	.125"	1.50"	874HH-.047	\$18.64
.062"	.106"	.125"	1.50"	874HH-.062	\$16.69
.078"	.210"	.125"	1.50"	874HH-.078	\$16.29
.093"	.249"	.125"	1.50"	874HH-.093	\$16.29

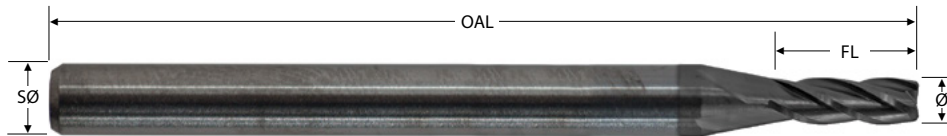
# SQUARE END, STANDARD & STUB, CVD COATED

## DECIMAL .015" - .093"

- Use: Graphites/ Composites
- Rake Angle: Positive
- Extended Tool Life
- Center Cutting: Yes
- Helix: 30 Degrees
- Crystalline Diamond Coated
- Hand: RHS/ RHC
- Diameter Tolerance: +/-0.001



### STANDARD



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	CVD COATED	
				4 FLUTE	PRICE
.015"	.045"	.125"	1.50"	875-CVD-.015	\$73.38
.020"	.060"	.125"	1.50"	875-CVD-.020	\$73.38
.031" (1/32")	.093"	.125"	1.50"	875-CVD-.031	\$73.38
.047" (3/64")	.141"	.125"	1.50"	875-CVD-.047	\$73.38
.062" (1/16")	.1875"	.125"	1.50"	875-CVD-.062	\$71.30
.093" (3/32")	.279"	.125"	1.50"	875-CVD-.093	\$71.30

### LONG SHANK, STUB



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	CVD COATED	
				3 FLUTE	PRICE
.015"	.023"	.125"	2.50"	888X-CVD-.015	\$82.93
.020"	.030"	.125"	2.50"	888X-CVD-.020	\$82.93
.031" (1/32")	.047"	.125"	2.50"	888X-CVD-.031	\$82.93
.047" (3/64")	.071"	.125"	2.50"	888X-CVD-.047	\$82.93
.062" (1/16")	.093"	.125"	2.50"	888X-CVD-.062	\$81.08
.093" (3/32")	.140"	.125"	2.50"	888X-CVD-.093	\$81.08

# SQUARE END, LONG REACH, CVD COATED

## DECIMAL .015" - .093"

· Crystalline Diamond Coated

CARBIDE



### LONG REACH, STUB



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (X DIAMETER) (RL)	CVD COATED	
					3 FLUTE	PRICE
.015" (1/64")	.023"	.125"	2.50"	.078" (5X)	888X-R5CVD-.015	\$101.94
.015" (1/64")	.023"	.125"	2.50"	.125" (8X)	888X-R8CVD-.015	\$101.94
.015" (1/64")	.023"	.125"	2.50"	.1875" (12X)	888X-R12CVD-.015	\$104.70
.020"	.030"	.125"	2.50"	.100" (5X)	888X-R5CVD-.020	\$101.94
.020"	.030"	.125"	2.50"	.160" (8X)	888X-R8CVD-.020	\$101.94
.020"	.030"	.125"	2.50"	.250" (12X)	888X-R12CVD-.020	\$104.70
.031" (1/32")	.047"	.125"	2.50"	.155" (5X)	888X-R5CVD-.031	\$101.94
.031" (1/32")	.047"	.125"	2.50"	.250" (8X)	888X-R8CVD-.031	\$101.94
.031" (1/32")	.047"	.125"	2.50"	.375" (12X)	888X-R12CVD-.031	\$104.70
.047" (3/64")	.071"	.125"	2.50"	.250" (5X)	888X-R5CVD-.047	\$101.94
.047" (3/64")	.071"	.125"	2.50"	.375" (8X)	888X-R8CVD-.047	\$101.94
.047" (3/64")	.071"	.125"	2.50"	.570" (12X)	888X-R12CVD-.047	\$104.70
.062" (1/16")	.093"	.125"	2.50"	.312" (5X)	888X-R5CVD-.062	\$90.85
.062" (1/16")	.093"	.125"	2.50"	.500" (8X)	888X-R8CVD-.062	\$90.85
.062" (1/16")	.093"	.125"	2.50"	.750" (12X)	888X-R12CVD-.062	\$93.59
.093" (3/32")	.140"	.125"	2.50"	.500" (5X)	888X-R5CVD-.093	\$90.85
.093" (3/32")	.140"	.125"	2.50"	.750" (8X)	888X-R8CVD-.093	\$90.85
.093" (3/32")	.140"	.125"	2.50"	1.125" (12X)	888X-R12CVD-.093	\$93.59

### 5X FLUTE, 10X REACH



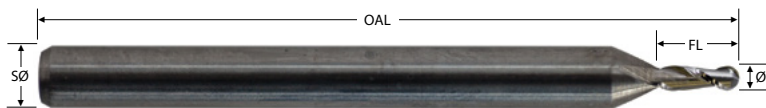
DIAMETER (Ø)	FLUTE LENGTH (X DIAMETER) (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (X DIAMETER) (RL)	CVD COATED	
					4 FLUTE	PRICE
.015"	.075" (5X)	.125"	2.50"	.156" (10X)	875X-F5R10CVD-.015	\$116.77
.031"	.155" (5X)	.125"	2.50"	.312" (10X)	875X-F5R10CVD-.031	\$116.77
.047"	.235" (5X)	.125"	2.50"	.480" (10X)	875X-F5R10CVD-.047	\$116.77
.062"	.312" (5X)	.125"	2.50"	.625" (10X)	875X-F5R10CVD-.062	\$104.58
.078"	.390" (5X)	.125"	2.50"	.800" (10X)	875X-F5R10CVD-.078	\$104.58
.093"	.465" (5X)	.125"	2.50"	.950" (10X)	875X-F5R10CVD-.093	\$104.58

# BALL END, STANDARD

## DECIMAL .005" - .044"

Same Sizes  
Continued

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Diameter Tolerance: +/- .0005



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED			ALTiN COATED	
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.015"	.125"	1.50"	882-.005	--	\$39.66	882-E-.005	\$43.94
.006"	.018"	.125"	1.50"	882-.006	--	\$39.66	882-E-.006	\$43.94
.007"	.021"	.125"	1.50"	882-.007	--	\$39.66	882-E-.007	\$43.94
.008"	.024"	.125"	1.50"	882-.008	--	\$39.66	882-E-.008	\$43.94
.009"	.027"	.125"	1.50"	882-.009	--	\$39.66	882-E-.009	\$43.94
.010"	.030"	.125"	1.50"	882-.010	883-.010	\$32.52	882-E-.010	\$36.91
.011"	.033"	.125"	1.50"	882-.011	883-.011	\$32.52	882-E-.011	\$36.91
.012"	.036"	.125"	1.50"	882-.012	883-.012	\$32.52	882-E-.012	\$36.91
.013"	.039"	.125"	1.50"	882-.013	883-.013	\$32.52	882-E-.013	\$36.91
.014"	.042"	.125"	1.50"	882-.014	883-.014	\$32.52	882-E-.014	\$36.91
.015"	.045"	.125"	1.50"	882-.015	883-.015	\$26.04	882-E-.015	\$30.43
.0156" (1/64")	.0468"	.125"	1.50"	882-1560	883-1560	\$26.04	--	
.016"	.048"	.125"	1.50"	882-.016	883-.016	\$26.04	882-E-.016	\$30.43
.017"	.051"	.125"	1.50"	882-.017	883-.017	\$26.04	882-E-.017	\$30.43
.018"	.054"	.125"	1.50"	882-.018	883-.018	\$26.04	882-E-.018	\$30.43
.019"	.057"	.125"	1.50"	882-.019	883-.019	\$26.04	882-E-.019	\$30.43
.0197" (.5 mm)	.0591"	.125"	1.50"	882-0197	883-0197	\$25.05	--	
.020"	.060"	.125"	1.50"	882-.020	883-.020	\$25.05	882-E-.020	\$29.45
.021"	.063"	.125"	1.50"	882-.021	883-.021	\$25.05	882-E-.021	\$29.45
.022"	.066"	.125"	1.50"	882-.022	883-.022	\$25.05	882-E-.022	\$29.45
.023"	.069"	.125"	1.50"	882-.023	883-.023	\$25.05	882-E-.023	\$29.45
.024"	.072"	.125"	1.50"	882-.024	883-.024	\$25.05	882-E-.024	\$29.45
.025"	.075"	.125"	1.50"	882-.025	883-.025	\$22.75	882-E-.025	\$27.12
.026"	.078"	.125"	1.50"	882-.026	883-.026	\$22.75	882-E-.026	\$27.12
.027"	.081"	.125"	1.50"	882-.027	883-.027	\$22.75	882-E-.027	\$27.12
.028"	.084"	.125"	1.50"	882-.028	883-.028	\$22.75	882-E-.028	\$27.12
.029"	.087"	.125"	1.50"	882-.029	883-.029	\$22.75	882-E-.029	\$27.12
.030"	.090"	.125"	1.50"	882-.030	883-.030	\$20.54	882-E-.030	\$24.94
.0312" (1/32")	.093"	.125"	1.50"	882-.031	883-.031	\$20.54	882-E-.031	\$24.94
.032"	.096"	.125"	1.50"	882-.032	883-.032	\$20.54	882-E-.032	\$24.94
.033"	.099"	.125"	1.50"	882-.033	883-.033	\$20.54	882-E-.033	\$24.94
.034"	.102"	.125"	1.50"	882-.034	883-.034	\$20.54	882-E-.034	\$24.94
.035"	.105"	.125"	1.50"	882-.035	883-.035	\$19.33	882-E-.035	\$23.73
.036"	.108"	.125"	1.50"	882-.036	883-.036	\$19.33	882-E-.036	\$23.73
.037"	.111"	.125"	1.50"	882-.037	883-.037	\$19.33	882-E-.037	\$23.73
.038"	.114"	.125"	1.50"	882-.038	883-.038	\$19.33	882-E-.038	\$23.73
.039"	.117"	.125"	1.50"	882-.039	883-.039	\$19.33	882-E-.039	\$23.73
.0394" (1.0 mm)	.1182"	.125"	1.50"	882-0394	883-0394	\$19.33	882-E-0394	\$23.73
.040"	.120"	.125"	1.50"	882-.040	883-.040	\$19.33	882-E-.040	\$23.73
.041"	.123"	.125"	1.50"	882-.041	883-.041	\$19.33	882-E-.041	\$23.73
.042"	.126"	.125"	1.50"	882-.042	883-.042	\$19.33	882-E-.042	\$23.73
.043"	.129"	.125"	1.50"	882-.043	883-.043	\$19.33	882-E-.043	\$23.73
.044"	.132"	.125"	1.50"	882-.044	883-.044	\$19.33	882-E-.044	\$23.73

# BALL END, STANDARD

## DECIMAL .005" - .044"

- ALTiN/ TiAlN coatings for high performance applications
- Amorphous Diamond Coating for Graphites/ Composite Materials



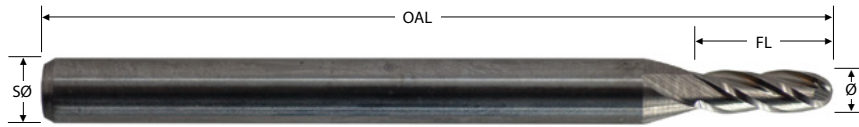
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIALN COATED			AMORPHOUS DIAMOND		
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
.005"	.015"	.125"	1.50"	882-C-.005	--	\$43.94	882-A-.005	--	\$50.90
.006"	.018"	.125"	1.50"	882-C-.006	--	\$43.94	882-A-.006	--	\$50.90
.007"	.021"	.125"	1.50"	882-C-.007	--	\$43.94	882-A-.007	--	\$50.90
.008"	.024"	.125"	1.50"	882-C-.008	--	\$43.94	882-A-.008	--	\$50.90
.009"	.027"	.125"	1.50"	882-C-.009	--	\$43.94	882-A-.009	--	\$50.90
.010"	.030"	.125"	1.50"	882-C-.010	883-C-.010	\$36.91	882-A-.010	883-A-.010	\$44.06
.011"	.033"	.125"	1.50"	882-C-.011	883-C-.011	\$36.91	882-A-.011	883-A-.011	\$44.06
.012"	.036"	.125"	1.50"	882-C-.012	883-C-.012	\$36.91	882-A-.012	883-A-.012	\$44.06
.013"	.039"	.125"	1.50"	882-C-.013	883-C-.013	\$36.91	882-A-.013	883-A-.013	\$44.06
.014"	.042"	.125"	1.50"	882-C-.014	883-C-.014	\$36.91	882-A-.014	883-A-.014	\$44.06
.015"	.045"	.125"	1.50"	882-C-.015	883-C-.015	\$30.43	882-A-.015	883-A-.015	\$37.58
.0156" (1/64")	.0468"	.125"	1.50"	882-C-1560	883-C-1560	\$30.43	--	--	
.016"	.048"	.125"	1.50"	882-C-.016	883-C-.016	\$30.43	882-A-.016	883-A-.016	\$37.58
.017"	.051"	.125"	1.50"	882-C-.017	883-C-.017	\$30.43	882-A-.017	883-A-.017	\$37.58
.018"	.054"	.125"	1.50"	882-C-.018	883-C-.018	\$30.43	882-A-.018	883-A-.018	\$37.58
.019"	.057"	.125"	1.50"	882-C-.019	883-C-.019	\$30.43	882-A-.019	883-A-.019	\$37.58
.0197" (.5 mm)	.0591"	.125"	1.50"	882-C-0197	883-C-0197	\$29.45	--	--	
.020"	.060"	.125"	1.50"	882-C-.020	883-C-.020	\$29.45	882-A-.020	883-A-.020	\$36.58
.021"	.063"	.125"	1.50"	882-C-.021	883-C-.021	\$29.45	882-A-.021	883-A-.021	\$36.58
.022"	.066"	.125"	1.50"	882-C-.022	883-C-.022	\$29.45	882-A-.022	883-A-.022	\$36.58
.023"	.069"	.125"	1.50"	882-C-.023	883-C-.023	\$29.45	882-A-.023	883-A-.023	\$36.58
.024"	.072"	.125"	1.50"	882-C-.024	883-C-.024	\$29.45	882-A-.024	883-A-.024	\$36.58
.025"	.075"	.125"	1.50"	882-C-.025	883-C-.025	\$27.12	882-A-.025	883-A-.025	\$34.28
.026"	.078"	.125"	1.50"	882-C-.026	883-C-.026	\$27.12	882-A-.026	883-A-.026	\$34.28
.027"	.081"	.125"	1.50"	882-C-.027	883-C-.027	\$27.12	882-A-.027	883-A-.027	\$34.28
.028"	.084"	.125"	1.50"	882-C-.028	883-C-.028	\$27.12	882-A-.028	883-A-.028	\$34.28
.029"	.087"	.125"	1.50"	882-C-.029	883-C-.029	\$27.12	882-A-.029	883-A-.029	\$34.28
.030"	.090"	.125"	1.50"	882-C-.030	883-C-.030	\$24.94	882-A-.030	883-A-.030	\$32.08
.031"(1/32")	.093"	.125"	1.50"	882-C-.031	883-C-.031	\$24.94	882-A-.031	883-A-.031	\$32.08
.032"	.096"	.125"	1.50"	882-C-.032	883-C-.032	\$24.94	882-A-.032	883-A-.032	\$32.08
.033"	.099"	.125"	1.50"	882-C-.033	883-C-.033	\$24.94	882-A-.033	883-A-.033	\$32.08
.034"	.102"	.125"	1.50"	882-C-.034	883-C-.034	\$24.94	882-A-.034	883-A-.034	\$32.08
.035"	.105"	.125"	1.50"	882-C-.035	883-C-.035	\$23.73	882-A-.035	883-A-.035	\$30.87
.036"	.108"	.125"	1.50"	882-C-.036	883-C-.036	\$23.73	882-A-.036	883-A-.036	\$30.87
.037"	.111"	.125"	1.50"	882-C-.037	883-C-.037	\$23.73	882-A-.037	883-A-.037	\$30.87
.038"	.114"	.125"	1.50"	882-C-.038	883-C-.038	\$23.73	882-A-.038	883-A-.038	\$30.87
.039"	.117"	.125"	1.50"	882-C-.039	883-C-.039	\$23.73	882-A-.039	883-A-.039	\$30.87
.0394" (1.0 mm)	.1182"	.125"	1.50"	882-C-0394	883-C-0394	\$23.73	882-A-0394	883-A-0394	\$30.87
.040"	.120"	.125"	1.50"	882-C-.040	883-C-.040	\$23.73	882-A-.040	883-A-.040	\$30.87
.041"	.123"	.125"	1.50"	882-C-.041	883-C-.041	\$23.73	882-A-.041	883-A-.041	\$30.87
.042"	.126"	.125"	1.50"	882-C-.042	883-C-.042	\$23.73	882-A-.042	883-A-.042	\$30.87
.043"	.129"	.125"	1.50"	882-C-.043	883-C-.043	\$23.73	882-A-.043	883-A-.043	\$30.87
.044"	.132"	.125"	1.50"	882-C-.044	883-C-.044	\$23.73	882-A-.044	883-A-.044	\$30.87

# BALL END, STANDARD

## DECIMAL .045" - .1772"

Same Sizes Continued

· Continued from previous pages



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED			ALTIM COATED	
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	PRICE
.045"	.135"	.125"	1.50"	882-.045	883-.045	\$19.33	882-E-.045	\$23.73
.046"	.138"	.125"	1.50"	882-.046	883-.046	\$19.33	882-E-.046	\$23.73
.0468" (3/64")	.141"	.125"	1.50"	882-.047	883-.047	\$19.33	882-E-.047	\$23.73
.048"	.144"	.125"	1.50"	882-.048	883-.048	\$19.33	882-E-.048	\$23.73
.049"	.147"	.125"	1.50"	882-.049	883-.049	\$19.33	882-E-.049	\$23.73
.0492" (1.25 mm)	.1476"	.125"	1.50"	882-0492	883-0492	\$19.33	882-E-0492	\$23.73
.050"	.150"	.125"	1.50"	882-.050	883-.050	\$19.33	882-E-.050	\$23.73
.051"	.153"	.125"	1.50"	882-.051	883-.051	\$19.33	882-E-.051	\$23.73
.052"	.156"	.125"	1.50"	882-.052	883-.052	\$19.33	882-E-.052	\$23.73
.053"	.159"	.125"	1.50"	882-.053	883-.053	\$19.33	882-E-.053	\$23.73
.054"	.162"	.125"	1.50"	882-.054	883-.054	\$19.33	882-E-.054	\$23.73
.055"	.165"	.125"	1.50"	882-.055	883-.055	\$19.33	882-E-.055	\$23.73
.056"	.168"	.125"	1.50"	882-.056	883-.056	\$19.33	882-E-.056	\$23.73
.057"	.171"	.125"	1.50"	882-.057	883-.057	\$19.33	882-E-.057	\$23.73
.058"	.174"	.125"	1.50"	882-.058	883-.058	\$19.33	882-E-.058	\$23.73
.059"	.177"	.125"	1.50"	882-.059	883-.059	\$19.33	882-E-.059	\$23.73
.0591" (1.5 mm)	.1773"	.125"	1.50"	882-0591	883-0591	\$19.33	882-E-0591	\$23.73
.060"	.180"	.125"	1.50"	882-.060	883-.060	\$19.33	882-E-.060	\$23.73
.062" (1/16")	.1875"	.125"	1.50"	882-.062	883-.062	\$18.90	882-E-.062	\$23.28
.0630" (1.6 mm)	.189"	.125"	1.50"	882-0630	883-0630	\$18.90	--	
.064"	.192"	.125"	1.50"	882-.064	883-.064	\$18.90	--	
.065"	.195"	.125"	1.50"	882-.065	883-.065	\$18.90	882-E-.065	\$23.28
.070"	.210"	.125"	1.50"	882-.070	883-.070	\$18.90	882-E-.070	\$23.28
.0709" (1.8 mm)	.2127"	.125"	1.50"	882-0709	883-0709	\$18.90	--	
.075"	.225"	.125"	1.50"	882-.075	883-.075	\$18.90	882-E-.075	\$23.28
.0781" (5/64")	.2343"	.125"	1.50"	882-.078	883-.078	\$18.90	882-E-.078	\$23.28
.0787" (2.0 mm)	.2361"	.125"	1.50"	882-0787	883-0787	\$18.90	--	
.080"	.240"	.125"	1.50"	882-.080	883-.080	\$18.90	882-E-.080	\$23.28
.085"	.255"	.125"	1.50"	882-.085	883-.085	\$18.90	882-E-.085	\$23.28
.0866" (2.2 mm)	.2598"	.125"	1.50"	882-0866	883-0866	\$18.90	--	
.090"	.270"	.125"	1.50"	882-.090	883-.090	\$18.90	882-E-.090	\$23.28
.0938" (3/32")	.2814"	.125"	1.50"	882-.093	883-.093	\$18.90	882-E-.093	\$23.28
.095"	.285"	.125"	1.50"	882-.095	883-.095	\$18.90	882-E-.095	\$23.28
.0984" (2.5 mm)	.2952"	.125"	1.50"	882-0984	883-0984	\$18.90	--	
.100"	.300"	.125"	1.50"	882-.100	883-.100	\$18.90	882-E-.100	\$23.28
.105"	.315"	.125"	1.50"	882-.105	883-.105	\$18.90	882-E-.105	\$23.28
.1102" (2.8 mm)	.3306"	.125"	1.50"	882-1102	883-1102	\$18.90	882-E-1102	\$23.28
.115"	.345"	.125"	1.50"	882-.115	883-.115	\$18.90	882-E-.115	\$23.28
.1181" (3.0 mm)	.3543"	.125"	1.50"	882-1181	883-1181	\$18.90	882-E-1181	\$23.28
.120"	.360"	.125"	1.50"	882-.120	883-.120	\$18.90	882-E-.120	\$23.28
.1378" (3.5 mm)	.4134"	.1875"	2.00"	882-1378	883-1378	\$20.11	--	
.1772" (4.5 mm)	.5316"	.1875"	2.00"	882-1772	883-1772	\$20.11	--	

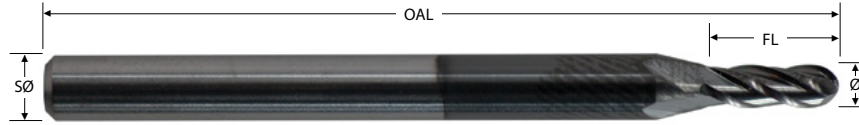




# BALL END, STANDARD

## DECIMAL .045" - .1772"

· Continued from previous pages



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIALN COATED			AMORPHOUS DIAMOND		
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
.045"	.135"	.125"	1.50"	882-C-.045	883-C-.045	\$23.73	882-A-.045	883-A-.045	\$30.87
.046"	.138"	.125"	1.50"	882-C-.046	883-C-.046	\$23.73	882-A-.046	883-A-.046	\$30.87
.047"(3/64")	.141"	.125"	1.50"	882-C-.047	883-C-.047	\$23.73	882-A-.047	883-A-.047	\$30.87
.048"	.144"	.125"	1.50"	882-C-.048	883-C-.048	\$23.73	882-A-.048	883-A-.048	\$30.87
.049"	.147"	.125"	1.50"	882-C-.049	883-C-.049	\$23.73	882-A-.049	883-A-.049	\$30.87
.0492" (1.25 mm)	.1476"	.125"	1.50"	882-C-0492	883-C-0492	\$23.73	882-A-0492	883-A-0492	\$30.87
.050"	.150"	.125"	1.50"	882-C-.050	883-C-.050	\$23.73	882-A-.050	883-A-.050	\$30.87
.051"	.153"	.125"	1.50"	882-C-.051	883-C-.051	\$23.73	882-A-.051	883-A-.051	\$30.87
.052"	.156"	.125"	1.50"	882-C-.052	883-C-.052	\$23.73	882-A-.052	883-A-.052	\$30.87
.053"	.156"	.125"	1.50"	882-C-.053	883-C-.053	\$23.73	882-A-.053	883-A-.053	\$30.87
.054"	.161"	.125"	1.50"	882-C-.054	883-C-.054	\$23.73	882-A-.054	883-A-.054	\$30.87
.055"	.165"	.125"	1.50"	882-C-.055	883-C-.055	\$23.73	882-A-.055	883-A-.055	\$30.87
.056"	.168"	.125"	1.50"	882-C-.056	883-C-.056	\$23.73	882-A-.056	883-A-.056	\$30.87
.057"	.171"	.125"	1.50"	882-C-.057	883-C-.057	\$23.73	882-A-.057	883-A-.057	\$30.87
.058"	.174"	.125"	1.50"	882-C-.058	883-C-.058	\$23.73	882-A-.058	883-A-.058	\$30.87
.059"	.177"	.125"	1.50"	882-C-.059	883-C-.059	\$23.73	882-A-.059	883-A-.059	\$30.87
.0591" (1.5 mm)	.1773"	.125"	1.50"	882-C-0591	883-C-0591	\$23.73	882-A-0591	883-A-0591	\$30.87
.060"	.180"	.125"	1.50"	882-C-.060	883-C-.060	\$23.73	882-A-.060	883-A-.060	\$30.87
.062" (1/16")	.1875"	.125"	1.50"	882-C-.062	883-C-.062	\$23.28	882-A-.062	883-A-.062	\$30.43
.0630" (1.6 mm)	.189"	.125"	1.50"	882-C-0630	883-C-0630	\$23.73	--	--	
.065"	.195"	.125"	1.50"	882-C-.065	883-C-.065	\$23.28	882-A-.065	883-A-.065	\$30.43
.070"	.210"	.125"	1.50"	882-C-.070	883-C-.070	\$23.28	882-A-.070	883-A-.070	\$30.43
.0709" (1.8mm)	.2127"	.125"	1.50"	882-C-0709	883-C-0709	\$23.28	--	--	
.075"	.225"	.125"	1.50"	882-C-.075	883-C-.075	\$23.28	882-A-.075	883-A-.075	\$30.43
.0781" (5/64")	.2343"	.125"	1.50"	882-C-.078	883-C-.078	\$23.28	882-A-.078	883-A-.078	\$30.43
.0787" (2.0 mm)	.2361"	.125"	1.50"	882-C-0787	883-C-0787	\$23.28	--	--	
.080"	.240"	.125"	1.50"	882-C-.080	883-C-.080	\$23.28	882-A-.080	883-A-.080	\$30.43
.085"	.255"	.125"	1.50"	882-C-.085	883-C-.085	\$23.28	882-A-.085	883-A-.085	\$30.43
.0866" (2.2 mm)	.2598"	.125"	1.50"	882-C-0866	883-C-0866	\$23.28	--	--	
.090"	.270"	.125"	1.50"	882-C-.090	883-C-.090	\$23.28	882-A-.090	883-A-.090	\$30.43
.0938" (3/32")	.2814"	.125"	1.50"	882-C-.093	883-C-.093	\$23.28	882-A-.093	883-A-.093	\$30.43
.095"	.285"	.125"	1.50"	882-C-.095	883-C-.095	\$23.28	882-A-.095	883-A-.095	\$30.43
.0984" (2.5 mm)	.2952"	.125"	1.50"	882-C-0984	883-C-0984	\$23.28	--	--	
.100"	.300"	.125"	1.50"	882-C-.100	883-C-.100	\$23.28	882-A-.100	883-A-.100	\$30.43
.1102" (2.8 mm)	.3306"	.125"	1.50"	882-C-1102	883-C-1102	\$23.28	882-A-1102	883-A-1102	\$30.43
.1181" (3.0 mm)	.3543"	.125"	1.50"	882-C-1181	883-C-1181	\$23.28	882-A-1181	883-A-1181	\$30.43
.120"	.360"	.125"	1.50"	882-C-.120	883-C-.120	\$23.28	882-A-.120	883-A-.120	\$30.43
.1378" (3.5 mm)	.4134"	.1875"	2.00"	882-C-1378	883-C-1378	\$24.82	--	--	
.1772" (4.5 mm)	.5316"	.1875"	2.00"	882-C-1772	883-C-1772	\$24.82	--	--	



# BALL END, STUB

## DECIMAL .005" - .040"

Same Sizes  
Continued

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- Rake Angle: Positive
- Uncoated for General Purpose
- ALTiN Coated for High Performance
- Diameter Tolerance: +/- .0005



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED			ALTiN COATED	
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.008"	.125"	1.50"	876-.005	--	\$39.66	876-E-.005	\$43.94
.006"	.009"	.125"	1.50"	876-.006	--	\$39.66	876-E-.006	\$43.94
.007"	.011"	.125"	1.50"	876-.007	--	\$39.66	876-E-.007	\$43.94
.008"	.012"	.125"	1.50"	876-.008	--	\$39.66	876-E-.008	\$43.94
.009"	.014"	.125"	1.50"	876-.009	--	\$39.66	876-E-.009	\$43.94
.010"	.015"	.125"	1.50"	876-.010	880-.010	\$32.52	876-E-.010	\$36.91
.011"	.017"	.125"	1.50"	876-.011	880-.011	\$32.52	876-E-.011	\$36.91
.012"	.018"	.125"	1.50"	876-.012	880-.012	\$32.52	876-E-.012	\$36.91
.013"	.020"	.125"	1.50"	876-.013	880-.013	\$32.52	876-E-.013	\$36.91
.014"	.021"	.125"	1.50"	876-.014	880-.014	\$32.52	876-E-.014	\$36.91
.015"	.023"	.125"	1.50"	876-.015	880-.015	\$26.04	876-E-.015	\$30.43
.0156" (1/64")	.023"	.125"	1.50"	876-1560	880-1560	\$26.04	--	
.016"	.024"	.125"	1.50"	876-.016	880-.016	\$26.04	876-E-.016	\$30.43
.017"	.026"	.125"	1.50"	876-.017	880-.017	\$26.04	876-E-.017	\$30.43
.018"	.027"	.125"	1.50"	876-.018	880-.018	\$26.04	876-E-.018	\$30.43
.019"	.028"	.125"	1.50"	876-.019	880-.019	\$26.04	876-E-.019	\$30.43
.0197" (.5 mm)	.030"	.125"	1.50"	876-0197	880-0197	\$25.05	--	
.020"	.030"	.125"	1.50"	876-.020	880-.020	\$25.05	876-E-.020	\$29.45
.021"	.031"	.125"	1.50"	876-.021	880-.021	\$25.05	876-E-.021	\$29.45
.022"	.033"	.125"	1.50"	876-.022	880-.022	\$25.05	876-E-.022	\$29.45
.023"	.034"	.125"	1.50"	876-.023	880-.023	\$25.05	876-E-.023	\$29.45
.024"	.036"	.125"	1.50"	876-.024	880-.024	\$25.05	876-E-.024	\$29.45
.025"	.038"	.125"	1.50"	876-.025	880-.025	\$22.75	876-E-.025	\$27.12
.026"	.039"	.125"	1.50"	876-.026	880-.026	\$22.75	876-E-.026	\$27.12
.027"	.041"	.125"	1.50"	876-.027	880-.027	\$22.75	876-E-.027	\$27.12
.028"	.042"	.125"	1.50"	876-.028	880-.028	\$22.75	876-E-.028	\$27.12
.029"	.044"	.125"	1.50"	876-.029	880-.029	\$22.75	876-E-.029	\$27.12
.030"	.045"	.125"	1.50"	876-.030	880-.030	\$20.54	876-E-.030	\$24.94
.031" (1/32")	.047"	.125"	1.50"	876-.031	880-.031	\$20.54	876-E-.031	\$24.94
.032"	.048"	.125"	1.50"	876-.032	880-.032	\$20.54	876-E-.032	\$24.94
.033"	.050"	.125"	1.50"	876-.033	880-.033	\$20.54	876-E-.033	\$24.94
.034"	.051"	.125"	1.50"	876-.034	880-.034	\$20.54	876-E-.034	\$24.94
.035"	.053"	.125"	1.50"	876-.035	880-.035	\$19.33	876-E-.035	\$23.73
.036"	.054"	.125"	1.50"	876-.036	880-.036	\$19.33	876-E-.036	\$23.73
.037"	.056"	.125"	1.50"	876-.037	880-.037	\$19.33	876-E-.037	\$23.73
.038"	.058"	.125"	1.50"	876-.038	880-.038	\$19.33	876-E-.038	\$23.73
.039"	.059"	.125"	1.50"	876-.039	880-.039	\$19.33	876-E-.039	\$23.73
.0394" (1.0 mm)	.059"	.125"	1.50"	876-0394	880-0394	\$19.33	876-E-0394	\$23.73
.040"	.060"	.125"	1.50"	876-.040	880-.040	\$19.33	876-E-.040	\$23.73

# BALL END, STUB

## DECIMAL .005" - .040"

- ALTIN/ TIALN coatings for high performance applications
- Amorphous Diamond Coating for Graphites/ Composite Materials



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIALN COATED			AMORPHOUS DIAMOND		
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
.005"	.008"	.125"	1.50"	876-C-.005	--	\$43.94	876-A-.005	--	\$50.90
.006"	.009"	.125"	1.50"	876-C-.006	--	\$43.94	876-A-.006	--	\$50.90
.007"	.011"	.125"	1.50"	876-C-.007	--	\$43.94	876-A-.007	--	\$50.90
.008"	.012"	.125"	1.50"	876-C-.008	--	\$43.94	876-A-.008	--	\$50.90
.009"	.014"	.125"	1.50"	876-C-.009	--	\$43.94	876-A-.009	--	\$50.90
.010"	.015"	.125"	1.50"	876-C-.010	880-C-.010	\$36.91	876-A-.010	880-A-.010	\$44.06
.011"	.017"	.125"	1.50"	876-C-.011	880-C-.011	\$36.91	876-A-.011	880-A-.011	\$44.06
.012"	.018"	.125"	1.50"	876-C-.012	880-C-.012	\$36.91	876-A-.012	880-A-.012	\$44.06
.013"	.020"	.125"	1.50"	876-C-.013	880-C-.013	\$36.91	876-A-.013	880-A-.013	\$44.06
.014"	.021"	.125"	1.50"	876-C-.014	880-C-.014	\$36.91	876-A-.014	880-A-.014	\$44.06
.015"	.023"	.125"	1.50"	876-C-.015	880-C-.015	\$30.43	876-A-.015	880-A-.015	\$37.58
.016"	.024"	.125"	1.50"	876-C-.016	880-C-.016	\$30.43	876-A-.016	880-A-.016	\$37.58
.017"	.026"	.125"	1.50"	876-C-.017	880-C-.017	\$30.43	876-A-.017	880-A-.017	\$37.58
.018"	.027"	.125"	1.50"	876-C-.018	880-C-.018	\$30.43	876-A-.018	880-A-.018	\$37.58
.019"	.029"	.125"	1.50"	876-C-.019	880-C-.019	\$30.43	876-A-.019	880-A-.019	\$37.58
.020"	.030"	.125"	1.50"	876-C-.020	880-C-.020	\$29.45	876-A-.020	880-A-.020	\$37.58
.021"	.032"	.125"	1.50"	876-C-.021	880-C-.021	\$29.45	876-A-.021	880-A-.021	\$36.58
.022"	.033"	.125"	1.50"	876-C-.022	880-C-.022	\$29.45	876-A-.022	880-A-.022	\$36.58
.023"	.035"	.125"	1.50"	876-C-.023	880-C-.023	\$29.45	876-A-.023	880-A-.023	\$36.58
.024"	.036"	.125"	1.50"	876-C-.024	880-C-.024	\$29.45	876-A-.024	880-A-.024	\$36.58
.025"	.038"	.125"	1.50"	876-C-.025	880-C-.025	\$27.12	876-A-.025	880-A-.025	\$34.28
.026"	.039"	.125"	1.50"	876-C-.026	880-C-.026	\$27.12	876-A-.026	880-A-.026	\$34.28
.027"	.041"	.125"	1.50"	876-C-.027	880-C-.027	\$27.12	876-A-.027	880-A-.027	\$34.28
.028"	.042"	.125"	1.50"	876-C-.028	880-C-.028	\$27.12	876-A-.028	880-A-.028	\$34.28
.029"	.044"	.125"	1.50"	876-C-.029	880-C-.029	\$27.12	876-A-.029	880-A-.029	\$34.28
.030"	.045"	.125"	1.50"	876-C-.030	880-C-.030	\$24.94	876-A-.030	880-A-.030	\$34.28
.031"	.047"	.125"	1.50"	876-C-.031	880-C-.031	\$24.94	876-A-.031	880-A-.031	\$32.08
.032"	.048"	.125"	1.50"	876-C-.032	880-C-.032	\$24.94	876-A-.032	880-A-.032	\$32.08
.033"	.050"	.125"	1.50"	876-C-.033	880-C-.033	\$24.94	876-A-.033	880-A-.033	\$32.08
.034"	.051"	.125"	1.50"	876-C-.034	880-C-.034	\$24.94	876-A-.034	880-A-.034	\$32.08
.035"	.052"	.125"	1.50"	876-C-.035	880-C-.035	\$23.73	876-A-.035	880-A-.035	\$30.87
.036"	.054"	.125"	1.50"	876-C-.036	880-C-.036	\$23.73	876-A-.036	880-A-.036	\$30.87
.037"	.055"	.125"	1.50"	876-C-.037	880-C-.037	\$23.73	876-A-.037	880-A-.037	\$30.87
.038"	.057"	.125"	1.50"	876-C-.038	880-C-.038	\$23.73	876-A-.038	880-A-.038	\$30.87
.039"	.059"	.125"	1.50"	876-C-.039	880-C-.039	\$23.73	876-A-.039	880-A-.039	\$30.87
.040"	.060"	.125"	1.50"	876-C-.040	880-C-.040	\$23.73	876-A-.040	880-A-.040	\$30.87

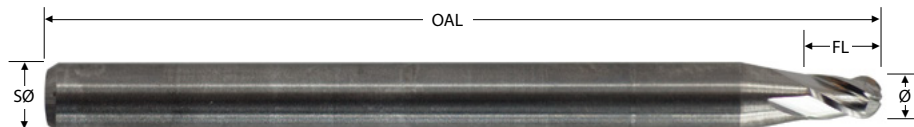


# BALL END, STUB

## DECIMAL .045"-.1378"

Same Sizes  
Continued

· Continued from previous pages



NEW!

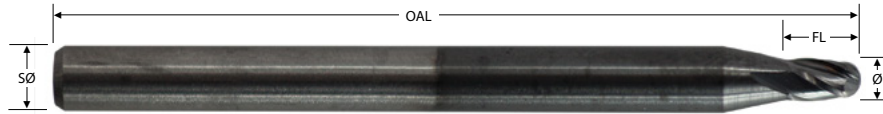
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED			ALTIM COATED	
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	PRICE
.045"	.068"	.125"	1.50"	876-.045	880-.045	\$19.33	876-E-.045	\$23.73
.047" (3/64")	.071"	.125"	1.50"	876-.047	880-.047	\$19.33	876-E-.047	\$23.73
.0492" (1.25 mm)	.074"	.125"	1.50"	876-0492	880-0492	\$19.33	--	
.050"	.075"	.125"	1.50"	876-.050	880-.050	\$19.33	876-E-.050	\$23.73
.055"	.083"	.125"	1.50"	876-.055	880-.055	\$19.33	876-E-.055	\$23.73
.0591" (1.5 mm)	.089"	.125"	1.50"	876-0591	880-0591	\$19.33	--	
.060"	.090"	.125"	1.50"	876-.060	880-.060	\$19.33	876-E-.060	\$23.73
.062" (1/16")	.093"	.125"	1.50"	876-.062	880-.062	\$18.90	876-E-.062	\$23.28
.0630" (1.6 mm)	.095"	.125"	1.50"	876-0630	880-0630	\$18.90	--	
.065"	.098"	.125"	1.50"	876-.065	880-.065	\$18.90	876-E-.065	\$23.28
.070"	.105"	.125"	1.50"	876-.070	880-.070	\$18.90	876-E-.070	\$23.28
.0709" (1.8 mm)	.106"	.125"	1.50"	876-0709	880-0709	\$18.90	--	
.075"	.113"	.125"	1.50"	876-.075	880-.075	\$18.90	876-E-.075	\$23.28
.078" (5/64")	.117"	.125"	1.50"	876-.078	880-.078	\$18.90	876-E-.078	\$23.28
.0787" (2.0 mm)	.118"	.125"	1.50"	876-0787	880-0787	\$23.28	--	
.080"	.120"	.125"	1.50"	876-.080	880-.080	\$18.90	876-E-.080	\$23.28
.085"	.128"	.125"	1.50"	876-.085	880-.085	\$18.90	876-E-.085	\$23.28
.0866" (2.2 mm)	.130"	.125"	1.50"	876-0866	880-0866	\$18.90	--	
.090"	.135"	.125"	1.50"	876-.090	880-.090	\$18.90	876-E-.090	\$23.28
.093" (3/32")	.140"	.125"	1.50"	876-.093	880-.093	\$18.90	--	
.095"	.143"	.125"	1.50"	876-.095	880-.095	\$18.90	876-E-.095	\$23.28
.0984" (2.5 mm)	.148"	.125"	1.50"	876-0984	880-0984	\$18.90	--	
.100"	.150"	.125"	1.50"	876-.100	880-.100	\$18.90	876-E-.100	\$23.28
.1102" (2.8 mm)	.166"	.125"	1.50"	876-1102	880-1102	\$18.90	--	
.1181" (3.0 mm)	.177"	.125"	1.50"	876-1181	880-1181	\$18.90	876-E-1181	\$23.28
.120"	.180"	.125"	1.50"	876-.120	880-.120	\$18.90	--	
.1378" (3.5 mm)	.207"	.1875"	2.00"	876-1378	880-1378	\$20.11	--	

Continued with  
AD Coating

# BALL END, STUB

## DECIMAL .045" - .100"

CARBIDE

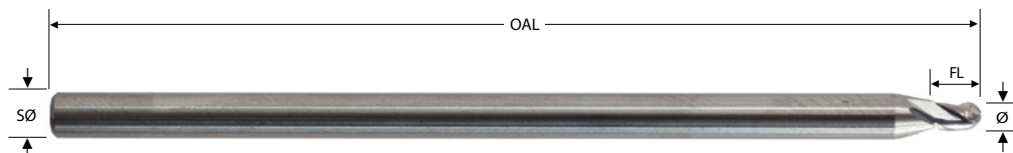


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	AMORPHOUS DIAMOND		
				2 FLUTE	4 FLUTE	PRICE
.045"	.068"	.125"	1.50"	876-A-.045	880-A-.045	\$30.87
.047"	.071"	.125"	1.50"	876-A-.047	880-A-.047	\$30.87
.050"	.075"	.125"	1.50"	876-A-.050	880-A-.050	\$30.87
.055"	.083"	.125"	1.50"	876-A-.055	880-A-.055	\$30.87
.060"	.090"	.125"	1.50"	876-A-.060	880-A-.060	\$30.87
.062"	.093"	.125"	1.50"	876-A-.062	880-A-.062	\$30.43
.065"	.098"	.125"	1.50"	876-A-.065	880-A-.065	\$30.43
.070"	.105"	.125"	1.50"	876-A-.070	880-A-.070	\$30.43
.078"	.117"	.125"	1.50"	876-A-.078	880-A-.078	\$30.43
.080"	.120"	.125"	1.50"	876-A-.080	880-A-.080	\$30.43
.090"	.135"	.125"	1.50"	876-A-.090	880-A-.090	\$30.43
.093"	.140"	.125"	1.50"	876-A-.093	880-A-.093	\$30.43
.100"	.150"	.125"	1.50"	876-A-.100	880-A-.100	\$30.43

# BALL END, LONG SHANK, STUB

## DECIMAL .010" - .250"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: .005" to .124": +/- .0005  
.125" to .375": +0.000/ -.002



**NEW!**

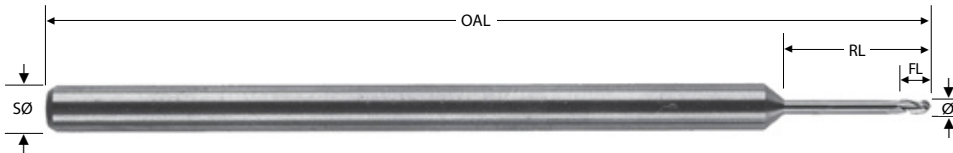
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	UNCOATED		ALTIM COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.010"	.015"	.125"	2.50"	888XB-.010	\$33.40	888XB-E-.010	\$37.80	888XB-A-.010	\$44.93
.015"	.023"	.125"	2.50"	888XB-.015	\$30.54	888XB-E-.015	\$34.94	888XB-A-.015	\$42.07
.020"	.030"	.125"	2.50"	888XB-.020	\$29.55	888XB-E-.020	\$33.95	888XB-A-.020	\$41.08
.025"	.037"	.125"	2.50"	888XB-.025	\$23.73	888XB-E-.025	\$28.13	888XB-A-.025	\$35.26
.030"	.045"	.125"	2.50"	888XB-.030	\$23.73	888XB-E-.030	\$28.13	888XB-A-.030	\$35.26
.031"	.047"	.125"	2.50"	888XB-.031	\$23.73	888XB-E-.031	\$28.13	888XB-A-.031	\$35.26
.035"	.053"	.125"	2.50"	888XB-.035	\$23.73	888XB-E-.035	\$28.13	888XB-A-.035	\$35.26
.040"	.060"	.125"	2.50"	888XB-.040	\$23.73	888XB-E-.040	\$28.13	888XB-A-.040	\$35.26
.045"	.068"	.125"	2.50"	888XB-.045	\$22.84	888XB-E-.045	\$27.24	888XB-A-.045	\$34.37
.047"	.071"	.125"	2.50"	888XB-.047	\$22.84	888XB-E-.047	\$27.24	888XB-A-.047	\$34.37
.050"	.075"	.125"	2.50"	888XB-.050	\$22.84	888XB-E-.050	\$27.24	888XB-A-.050	\$34.37
.055"	.083"	.125"	2.50"	888XB-.055	\$22.84	888XB-E-.055	\$27.24	888XB-A-.055	\$34.37
.060"	.090"	.125"	2.50"	888XB-.060	\$22.84	888XB-E-.060	\$27.24	888XB-A-.060	\$34.37
.062"	.093"	.125"	2.50"	888XB-.062	\$22.84	888XB-E-.062	\$27.24	888XB-A-.062	\$34.37
.065"	.098"	.125"	2.50"	888XB-.065	\$22.84	888XB-E-.065	\$27.24	888XB-A-.065	\$34.37
.070"	.105"	.125"	2.50"	888XB-.070	\$22.84	888XB-E-.070	\$27.24	888XB-A-.070	\$34.37
.075"	.113"	.125"	2.50"	888XB-.075	\$22.84	888XB-E-.075	\$27.24	888XB-A-.075	\$34.37
.078"	.117"	.125"	2.50"	888XB-.078	\$22.84	888XB-E-.078	\$27.24	888XB-A-.078	\$34.37
.080"	.120"	.125"	2.50"	888XB-.080	\$22.84	888XB-E-.080	\$27.24	888XB-A-.080	\$34.37
.085"	.128"	.125"	2.50"	888XB-.085	\$22.84	888XB-E-.085	\$27.24	888XB-A-.085	\$34.37
.090"	.135"	.125"	2.50"	888XB-.090	\$22.84	888XB-E-.090	\$27.24	888XB-A-.090	\$34.37
.093"	.140"	.125"	2.50"	888XB-.093	\$22.84	888XB-E-.093	\$27.24	888XB-A-.093	\$34.37
.095"	.143"	.125"	2.50"	888XB-.095	\$22.84	888XB-E-.095	\$27.24	888XB-A-.095	\$34.37
.100"	.150"	.125"	2.50"	888XB-.100	\$22.84	888XB-E-.100	\$27.24	888XB-A-.100	\$34.37
.125"	.1875"	.125"	2.50"	888XB-.125	\$22.84	888XB-E-.125	\$27.24	888XB-A-.125	\$34.37
.187"	.281"	.1875"	3.00"	888XB-.187	\$26.46	888XB-E-.187	\$31.20	888XB-A-.187	\$38.01
.250"	.375"	.250"	4.00"	888XB-.250	\$30.64	888XB-E-.250	\$38.33	888XB-A-.250	\$42.18



# BALL END, LONG SHANK, LONG REACH, STUB

## DECIMAL .010" - .035"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites/ Composites
- Diameter Tolerance: .005" to .124": +/- .0005



**CARBIDE**



**NEW!**

**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.010"	.015"	.125"	2.50"	.050" (5X)	888XB-RL5-.010	\$50.86	888XB-E-RL5-.010	\$55.25	888XB-A-RL5-.010	\$62.40
.010"	.015"	.125"	2.50"	.080" (8X)	888XB-RL8-.010	\$50.86	888XB-E-RL8-.010	\$55.25	888XB-A-RL8-.010	\$62.40
.010"	.015"	.125"	2.50"	.125" (12X)	888XB-RL12-.010	\$53.07	888XB-E-RL12-.010	\$57.46	888XB-A-RL12-.010	\$64.60
.010"	.015"	.125"	2.50"	.150" (15X)	888XB-RL15-.010	\$59.65	888XB-E-RL15-.010	\$64.05	888XB-A-RL15-.010	\$71.18
.015" (1/64")	.023"	.125"	2.50"	.045" (3X)	888XB-RL3-.015	\$43.50	888XB-E-RL3-.015	\$47.90	888XB-A-RL3-.015	\$55.04
.015" (1/64")	.023"	.125"	2.50"	.078" (5X)	888XB-RL5-.015	\$43.50	888XB-E-RL5-.015	\$47.90	888XB-A-RL5-.015	\$55.04
.015" (1/64")	.023"	.125"	2.50"	.125" (8X)	888XB-RL8-.015	\$43.50	888XB-E-RL8-.015	\$47.90	888XB-A-RL8-.015	\$55.04
.015" (1/64")	.023"	.125"	2.50"	.1875" (12X)	888XB-RL12-.015	\$44.59	888XB-E-RL12-.015	\$48.99	888XB-A-RL12-.015	\$56.14
.015" (1/64")	.023"	.125"	2.50"	.225" (15X)	888XB-RL15-.015	\$49.33	888XB-E-RL15-.015	\$53.73	888XB-A-RL15-.015	\$60.86
.015" (1/64")	.023"	.125"	2.50"	.300" (20X)	888XB-RL20-.015	\$54.71	888XB-E-RL20-.015	\$59.11	888XB-A-RL20-.015	\$66.24
.020"	.030"	.125"	2.50"	.100" (5X)	888XB-RL5-.020	\$42.07	888XB-E-RL5-.020	\$46.47	888XB-A-RL5-.020	\$53.62
.020"	.030"	.125"	2.50"	.160" (8X)	888XB-RL8-.020	\$42.07	888XB-E-RL8-.020	\$46.47	888XB-A-RL8-.020	\$53.62
.020"	.030"	.125"	2.50"	.250" (12X)	888XB-RL12-.020	\$43.28	888XB-E-RL12-.020	\$47.68	888XB-A-RL12-.020	\$54.82
.020"	.030"	.125"	2.50"	.300" (15X)	888XB-RL15-.020	\$47.79	888XB-E-RL15-.020	\$52.19	888XB-A-RL15-.020	\$59.43
.020"	.030"	.125"	2.50"	.400" (20X)	888XB-RL20-.020	\$54.37	888XB-E-RL20-.020	\$59.11	888XB-A-RL20-.020	\$65.92
.025"	.037"	.125"	2.50"	.125" (5X)	888XB-RL5-.025	\$36.36	888XB-E-RL5-.025	\$40.75	888XB-A-RL5-.025	\$47.90
.025"	.037"	.125"	2.50"	.200" (8X)	888XB-RL8-.025	\$36.36	888XB-E-RL8-.025	\$40.75	888XB-A-RL8-.025	\$47.90
.025"	.037"	.125"	2.50"	.3125" (12X)	888XB-RL12-.025	\$37.46	888XB-E-RL12-.025	\$41.86	888XB-A-RL12-.025	\$48.99
.025"	.037"	.125"	2.50"	.375" (15X)	888XB-RL15-.025	\$42.74	888XB-E-RL15-.025	\$47.14	888XB-A-RL15-.025	\$54.27
.030"	.045"	.125"	2.50"	.150" (5X)	888XB-RL5-.030	\$36.36	888XB-E-RL5-.030	\$40.75	888XB-A-RL5-.030	\$47.90
.030"	.045"	.125"	2.50"	.250" (8X)	888XB-RL8-.030	\$36.36	888XB-E-RL8-.030	\$40.75	888XB-A-RL8-.030	\$47.90
.030"	.045"	.125"	2.50"	.375" (12X)	888XB-RL12-.030	\$37.46	888XB-E-RL12-.030	\$41.86	888XB-A-RL12-.030	\$48.99
.030"	.045"	.125"	2.50"	.450" (15X)	888XB-RL15-.030	\$42.74	888XB-E-RL15-.030	\$47.14	888XB-A-RL15-.030	\$54.27
.031" (1/32")	.047"	.125"	2.50"	.093" (3X)	888XB-RL3-.031	\$36.36	888XB-E-RL3-.031	\$40.75	888XB-A-RL3-.031	\$47.90
.031" (1/32")	.047"	.125"	2.50"	.155" (5X)	888XB-RL5-.031	\$36.36	888XB-E-RL5-.031	\$40.75	888XB-A-RL5-.031	\$47.90
.031" (1/32")	.047"	.125"	2.50"	.250" (8X)	888XB-RL8-.031	\$36.36	888XB-E-RL8-.031	\$40.75	888XB-A-RL8-.031	\$47.90
.031" (1/32")	.047"	.125"	2.50"	.375" (12X)	888XB-RL12-.031	\$37.46	888XB-E-RL12-.031	\$41.86	888XB-A-RL12-.031	\$48.99
.031" (1/32")	.047"	.125"	2.50"	.470" (15X)	888XB-RL15-.031	\$42.74	888XB-E-RL15-.031	\$47.14	888XB-A-RL15-.031	\$54.27
.031" (1/32")	.047"	.125"	2.50"	.625" (20X)	888XB-RL20-.031	\$49.33	888XB-E-RL20-.031	\$59.11	888XB-A-RL20-.031	\$60.86
.035"	.052"	.125"	2.50"	.187" (5X)	888XB-RL5-.035	\$36.36	888XB-E-RL5-.035	\$40.75	888XB-A-RL5-.035	\$47.90
.035"	.052"	.125"	2.50"	.280" (8X)	888XB-RL8-.035	\$36.36	888XB-E-RL8-.035	\$40.75	888XB-A-RL8-.035	\$47.90
.035"	.052"	.125"	2.50"	.425" (12X)	888XB-RL12-.035	\$37.46	888XB-E-RL12-.035	\$41.86	888XB-A-RL12-.035	\$48.99
.035"	.052"	.125"	2.50"	.525" (15X)	888XB-RL15-.035	\$42.74	888XB-E-RL15-.035	\$47.14	888XB-A-RL15-.035	\$54.27

# BALL END, LONG SHANK, LONG REACH, STUB

## DECIMAL .040" - .075"

· Continued from Previous Page

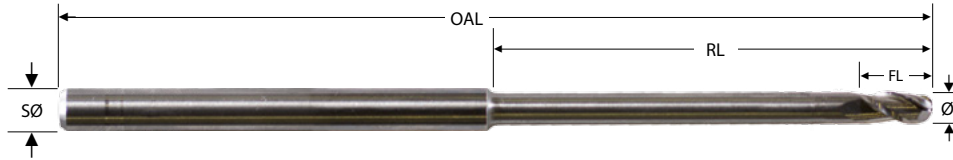


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.040"	.060"	.125"	2.50"	.200" (5X)	888XB-RL5-.040	\$36.36	888XB-E-RL5-.040	\$40.75	888XB-A-RL5-.040	\$47.90
.040"	.060"	.125"	2.50"	.325" (8X)	888XB-RL8-.040	\$36.36	888XB-E-RL8-.040	\$40.75	888XB-A-RL8-.040	\$40.77
.040"	.060"	.125"	2.50"	.480" (12X)	888XB-RL12-.040	\$37.46	888XB-E-RL12-.040	\$41.86	888XB-A-RL12-.040	\$48.99
.040"	.060"	.125"	2.50"	.600" (15X)	888XB-RL15-.040	\$42.74	888XB-E-RL15-.040	\$47.14	888XB-A-RL15-.040	\$54.27
.040"	.060"	.125"	2.50"	.800" (20X)	888XB-RL20-.040	\$49.33	888XB-E-RL20-.040	\$59.11	888XB-A-RL20-.040	\$60.86
.045"	.067"	.125"	2.50"	.225" (5X)	888XB-RL5-.045	\$35.48	888XB-E-RL5-.045	\$39.88	888XB-A-RL5-.045	\$47.02
.045"	.067"	.125"	2.50"	.375" (8X)	888XB-RL8-.045	\$35.48	888XB-E-RL8-.045	\$39.88	888XB-A-RL8-.045	\$47.02
.045"	.067"	.125"	2.50"	.550" (12X)	888XB-RL12-.045	\$36.47	888XB-E-RL12-.045	\$40.86	888XB-A-RL12-.045	\$48.99
.045"	.067"	.125"	2.50"	.680" (15X)	888XB-RL15-.045	\$40.53	888XB-E-RL15-.045	\$44.93	888XB-A-RL15-.045	\$52.07
.047" (3/64")	.071"	.125"	2.50"	.141" (3X)	888XB-RL3-.047	\$35.48	888XB-E-RL3-.047	\$39.88	888XB-A-RL3-.047	\$47.02
.047" (3/64")	.071"	.125"	2.50"	.250" (5X)	888XB-RL5-.047	\$35.48	888XB-E-RL5-.047	\$39.88	888XB-A-RL5-.047	\$47.02
.047" (3/64")	.071"	.125"	2.50"	.375" (8X)	888XB-RL8-.047	\$35.48	888XB-E-RL8-.047	\$39.88	888XB-A-RL8-.047	\$47.02
.047" (3/64")	.071"	.125"	2.50"	.570" (12X)	888XB-RL12-.047	\$36.47	888XB-E-RL12-.047	\$40.86	888XB-A-RL12-.047	\$48.01
.047" (3/64")	.071"	.125"	2.50"	.710" (15X)	888XB-RL15-.047	\$40.53	888XB-E-RL15-.047	\$44.93	888XB-A-RL15-.047	\$52.07
.047" (3/64")	.071"	.125"	2.50"	.950" (20X)	888XB-RL20-.047	\$46.47	888XB-E-RL20-.047	\$50.87	888XB-A-RL20-.047	\$58.00
.050"	.075"	.125"	2.50"	.250" (5X)	888XB-RL5-.050	\$35.48	888XB-E-RL5-.050	\$39.88	888XB-A-RL5-.050	\$47.02
.050"	.075"	.125"	2.50"	.400" (8X)	888XB-RL8-.050	\$35.48	888XB-E-RL8-.050	\$39.88	888XB-A-RL8-.050	\$47.02
.050"	.075"	.125"	2.50"	.600" (12X)	888XB-RL12-.050	\$36.47	888XB-E-RL12-.050	\$40.86	888XB-A-RL12-.050	\$48.01
.055"	.083"	.125"	2.50"	.275" (5X)	888XB-RL5-.055	\$35.48	888XB-E-RL5-.055	\$39.88	888XB-A-RL5-.055	\$47.02
.055"	.083"	.125"	2.50"	.450" (8X)	888XB-RL8-.055	\$35.48	888XB-E-RL8-.055	\$39.88	888XB-A-RL8-.055	\$47.02
.055"	.083"	.125"	2.50"	.660" (12X)	888XB-RL12-.055	\$36.47	888XB-E-RL12-.055	\$40.86	888XB-A-RL12-.055	\$48.01
.060"	.090"	.125"	2.50"	.312" (5X)	888XB-RL5-.060	\$35.48	888XB-E-RL5-.060	\$39.88	888XB-A-RL5-.060	\$47.02
.060"	.090"	.125"	2.50"	.500" (8X)	888XB-RL8-.060	\$35.48	888XB-E-RL8-.060	\$39.88	888XB-A-RL8-.060	\$47.02
.060"	.090"	.125"	2.50"	.720" (12X)	888XB-RL12-.060	\$36.47	888XB-E-RL12-.060	\$40.86	888XB-A-RL12-.060	\$48.01
.060"	.090"	.125"	2.50"	.900" (15X)	888XB-RL15-.060	\$40.53	888XB-E-RL15-.060	\$44.93	888XB-A-RL15-.060	\$52.07
.062" (1/16")	.093"	.125"	2.50"	.186" (3X)	888XB-RL3-.062	\$35.48	888XB-E-RL3-.062	\$39.88	888XB-A-RL3-.062	\$47.02
.062" (1/16")	.093"	.125"	2.50"	.312" (5X)	888XB-RL5-.062	\$35.48	888XB-E-RL5-.062	\$39.88	888XB-A-RL5-.062	\$47.02
.062" (1/16")	.093"	.125"	2.50"	.500" (8X)	888XB-RL8-.062	\$35.48	888XB-E-RL8-.062	\$39.88	888XB-A-RL8-.062	\$47.02
.062" (1/16")	.093"	.125"	2.50"	.750" (12X)	888XB-RL12-.062	\$36.47	888XB-E-RL12-.062	\$40.86	888XB-A-RL12-.062	\$48.01
.062" (1/16")	.093"	.125"	2.50"	.950" (15X)	888XB-RL15-.062	\$40.53	888XB-E-RL15-.062	\$44.93	888XB-A-RL15-.062	\$52.07
.062" (1/16")	.093"	.125"	2.50"	1.250" (20X)	888XB-RL20-.062	\$46.47	888XB-E-RL20-.062	\$50.87	888XB-A-RL20-.062	\$58.00
.065"	.098"	.125"	2.50"	.325" (5X)	888XB-RL5-.065	\$35.48	888XB-E-RL5-.065	\$39.88	888XB-A-RL5-.065	\$47.02
.065"	.098"	.125"	2.50"	.525" (8X)	888XB-RL8-.065	\$35.48	888XB-E-RL8-.065	\$39.88	888XB-A-RL8-.065	\$47.02
.070"	.105"	.125"	2.50"	.375" (5X)	888XB-RL5-.070	\$35.48	888XB-E-RL5-.070	\$39.88	888XB-A-RL5-.070	\$47.02
.070"	.105"	.125"	2.50"	.570" (8X)	888XB-RL8-.070	\$35.48	888XB-E-RL8-.070	\$39.88	888XB-A-RL8-.070	\$47.02
.075"	.113"	.125"	2.50"	.375" (5X)	888XB-RL5-.075	\$35.48	888XB-E-RL5-.075	\$39.88	888XB-A-RL5-.075	\$47.02
.075"	.113"	.125"	2.50"	.625" (8X)	888XB-RL8-.075	\$35.48	888XB-E-RL8-.075	\$39.88	888XB-A-RL8-.075	\$47.02

# BALL END, LONG SHANK, LONG REACH, STUB

## DECIMAL .078"-.250"

- Continued from Previous Pages
- Diameter Tolerance: .005" to .124": +/- .0005  
.125" to .375": +0.000/ -.002

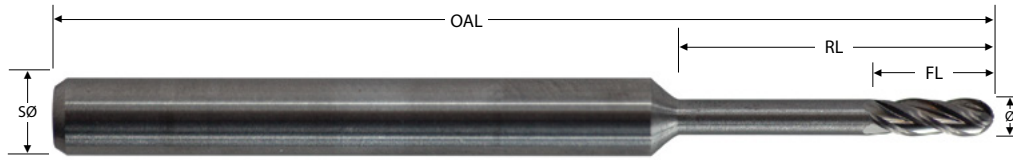


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.078" (5/64")	.117"	.125"	2.50"	.234" (3X)	888XB-RL3-.078	\$35.48	888XB-E-RL3-.078	\$39.88	888XB-A-RL3-.078	\$47.02
.078" (5/64")	.117"	.125"	2.50"	.400" (5X)	888XB-RL5-.078	\$35.48	888XB-E-RL5-.078	\$39.88	888XB-A-RL5-.078	\$47.02
.078" (5/64")	.117"	.125"	2.50"	.625" (8X)	888XB-RL8-.078	\$35.48	888XB-E-RL8-.078	\$39.88	888XB-A-RL8-.078	\$47.02
.078" (5/64")	.117"	.125"	2.50"	.940" (12X)	888XB-RL12-.078	\$36.47	888XB-E-RL12-.078	\$40.86	888XB-A-RL12-.078	\$48.01
.078" (5/64")	.117"	.125"	2.50"	1.187" (15X)	888XB-RL15-.078	\$40.53	888XB-E-RL15-.078	\$44.93	888XB-A-RL15-.078	\$52.07
.078" (5/64")	.117"	.125"	3.00"	1.562" (20X)	888XB-RL20-.078	\$46.47	888XB-E-RL20-.078	\$50.87	888XB-A-RL20-.078	\$64.05
.080"	.120"	.125"	2.50"	.400" (5X)	888XB-RL5-.080	\$35.48	888XB-E-RL5-.080	\$39.88	888XB-A-RL5-.080	\$47.02
.080"	.120"	.125"	2.50"	.650" (8X)	888XB-RL8-.080	\$35.48	888XB-E-RL8-.080	\$39.88	888XB-A-RL8-.080	\$47.02
.085"	.128"	.125"	2.50"	.425" (5X)	888XB-RL5-.085	\$35.48	888XB-E-RL5-.085	\$39.88	888XB-A-RL5-.085	\$47.02
.085"	.128"	.125"	2.50"	.700" (8X)	888XB-RL8-.085	\$35.48	888XB-E-RL8-.085	\$39.88	888XB-A-RL8-.085	\$47.02
.090"	.135"	.125"	2.50"	.450" (5X)	888XB-RL5-.090	\$35.48	888XB-E-RL5-.090	\$39.88	888XB-A-RL5-.090	\$47.02
.090"	.135"	.125"	2.50"	.750" (8X)	888XB-RL8-.090	\$35.48	888XB-E-RL8-.090	\$39.88	888XB-A-RL8-.090	\$47.02
.093" (3/32")	.140"	.125"	2.50"	.270" (3X)	888XB-RL3-.093	\$35.48	888XB-E-RL3-.093	\$39.88	888XB-A-RL3-.093	\$47.02
.093" (3/32")	.140"	.125"	2.50"	.500" (5X)	888XB-RL5-.093	\$35.48	888XB-E-RL5-.093	\$39.88	888XB-A-RL5-.093	\$47.02
.093" (3/32")	.140"	.125"	2.50"	.750" (8X)	888XB-RL8-.093	\$35.48	888XB-E-RL8-.093	\$39.88	888XB-A-RL8-.093	\$47.02
.093" (3/32")	.140"	.125"	2.50"	1.125" (12X)	888XB-RL12-.093	\$36.47	888XB-E-RL12-.093	\$40.86	888XB-A-RL12-.093	\$48.01
.093" (3/32")	.140"	.125"	3.00"	1.400" (15X)	888XB-RL15-.093	\$42.62	888XB-E-RL15-.093	\$47.02	888XB-A-RL15-.093	\$54.15
.093" (3/32")	.140"	.125"	4.00"	1.875" (20X)	888XB-RL20-.093	\$49.11	888XB-E-RL20-.093	\$53.51	888XB-A-RL20-.093	\$66.69
.095"	.143"	.125"	2.50"	.500" (5X)	888XB-RL5-.095	\$35.48	888XB-E-RL5-.095	\$39.88	888XB-A-RL5-.095	\$47.02
.095"	.143"	.125"	2.50"	.750" (8X)	888XB-RL8-.095	\$35.48	888XB-E-RL8-.095	\$39.88	888XB-A-RL8-.095	\$47.02
.100"	.150"	.125"	2.50"	.500" (5X)	888XB-RL5-.100	\$35.48	888XB-E-RL5-.100	\$39.88	888XB-A-RL5-.100	\$47.02
.100"	.150"	.125"	2.50"	.800" (8X)	888XB-RL8-.100	\$35.48	888XB-E-RL8-.100	\$39.88	888XB-A-RL8-.100	\$47.02
.125" (1/8")	.1875"	.125"	2.50"	.625" (5X)	888XB-RL5-.125	\$35.48	888XB-E-RL5-.125	\$39.88	888XB-A-RL5-.125	\$47.02
.125" (1/8")	.1875"	.125"	2.50"	1.000" (8X)	888XB-RL8-.125	\$35.48	888XB-E-RL8-.125	\$39.88	888XB-A-RL8-.125	\$47.02
.125" (1/8")	.1875"	.125"	3.00"	1.500" (12X)	888XB-RL12-.125	\$38.12	888XB-E-RL12-.125	\$42.52	888XB-A-RL12-.125	\$55.69
.125" (1/8")	.1875"	.125"	3.00"	1.875" (15X)	888XB-RL15-.125	\$42.62	888XB-E-RL15-.125	\$47.02	888XB-A-RL15-.125	\$54.15
.125" (1/8")	.1875"	.125"	4.00"	2.500" (20X)	888XB-RL20-.125	\$49.11	888XB-E-RL20-.125	\$53.51	888XB-A-RL20-.125	\$66.69
.187" (3/16")	.281"	.1875"	3.00"	1.000" (5X)	888XB-RL5-.187	\$39.11	888XB-E-RL5-.187	\$43.50	888XB-A-RL5-.187	\$55.04
.187" (3/16")	.281"	.1875"	3.00"	1.500" (8X)	888XB-RL8-.187	\$39.11	888XB-E-RL8-.187	\$43.50	888XB-A-RL8-.187	\$55.04
.187" (3/16")	.281"	.1875"	4.00"	2.250" (12X)	888XB-RL12-.187	\$41.63	888XB-E-RL12-.187	\$46.03	888XB-A-RL12-.187	\$58.67
.187" (3/16")	.281"	.1875"	4.00"	2.812" (15X)	888XB-RL15-.187	\$44.27	888XB-E-RL15-.187	\$48.67	888XB-A-RL15-.187	\$61.31
.250" (1/4")	.375"	.250"	4.00"	1.250" (5X)	888XB-RL5-.250	\$43.28	888XB-E-RL5-.250	\$47.68	888XB-A-RL5-.250	\$61.41
.250" (1/4")	.375"	.250"	4.00"	2.000" (8X)	888XB-RL8-.250	\$43.28	888XB-E-RL8-.250	\$47.68	888XB-A-RL8-.250	\$61.41
.250" (1/4")	.375"	.250"	6.00"	3.000" (12X)	888XB-RL12-.250	\$48.45	888XB-E-RL12-.250	\$52.84	888XB-A-RL12-.250	\$74.82
.250" (1/4")	.375"	.250"	6.00"	3.750" (15X)	888XB-RL15-.250	\$53.07	888XB-E-RL15-.250	\$57.46	888XB-A-RL15-.250	\$79.43

# BALL END, LONG REACH

## DECIMAL .005" - .100"

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +/- .0005



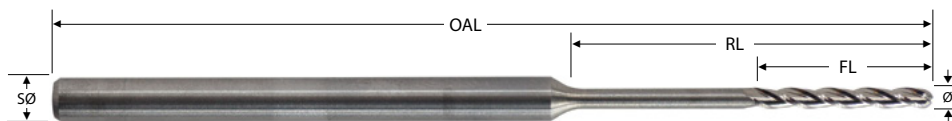
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (RL)	UNCOATED		
					2 FLUTE	4 FLUTE	PRICE
.005"	.015"	.125"	1.50"	.047"	882-.005RL	--	\$62.07
.010"	.030"	.125"	1.50"	.080"	882-RL.010X.080	883-RL.010X.080	\$54.92
.010"	.030"	.125"	1.50"	.0937"	882-.010RL	883-.010RL	\$54.92
.015"	.045"	.125"	1.50"	.125"	882-.015RL	883-.015RL	\$44.06
.020"	.060"	.125"	1.50"	.170"	882-RL.020X.170	883-RL.020X.170	\$42.40
.020"	.060"	.125"	1.50"	.1875"	882-.020RL	883-.020RL	\$42.40
.025"	.075"	.125"	1.50"	.213"	882-RL.025X.213	883-RL.025X.213	\$38.78
.025"	.075"	.125"	1.50"	.250"	882-.025RL	883-.025RL	\$38.78
.030"	.090"	.125"	1.50"	.250"	882-.030RL	883-.030RL	\$38.78
.030"	.090"	.125"	1.50"	.270"	882-RL.030X.270	883-RL.030X.270	\$38.78
.031"	.093"	.125"	1.50"	.279"	882-RL.031X.279	883-RL.031X.279	\$38.78
.035"	.105"	.125"	1.50"	.250"	882-.035RL	883-.035RL	\$38.78
.035"	.105"	.125"	1.50"	.315"	882-RL.035X.315	883-RL.035X.315	\$38.78
.040"	.120"	.125"	1.50"	.250"	882-.040RL	883-.040RL	\$38.78
.040"	.120"	.125"	1.50"	.360"	882-RL.040X.360	883-RL.040X.360	\$38.78
.045"	.135"	.125"	1.50"	.405"	882-RL.045X.405	883-RL.045X.405	\$37.46
.045"	.135"	.125"	1.50"	.500"	882-.045RL	883-.045RL	\$37.46
.047"	.141"	.125"	1.50"	.423"	882-RL.047X.423	883-RL.047X.423	\$37.46
.050"	.150"	.125"	1.50"	.500"	882-.050RL	883-.050RL	\$37.46
.055"	.165"	.125"	1.50"	.500"	882-.055RL	883-.055RL	\$37.46
.060"	.180"	.125"	1.50"	.500"	882-.060RL	883-.060RL	\$37.46
.062"	.186"	.125"	1.50"	.500"	882-RL.062X.500	883-RL.062X.500	\$37.46
.065"	.195"	.125"	1.50"	.500"	882-.065RL	883-.065RL	\$37.46
.070"	.210"	.125"	1.50"	.500"	882-.070RL	883-.070RL	\$37.46
.078"	.234"	.125"	1.50"	.500"	882-RL.078X.500	883-RL.078X.500	\$37.46
.080"	.240"	.125"	1.50"	.500"	882-.080RL	883-.080RL	\$37.46
.090"	.270"	.125"	1.50"	.500"	882-.090RL	883-.090RL	\$37.46
.090"	.270"	.125"	1.50"	.625"	882-RL.090X.625	883-RL.090X.625	\$37.46
.093"	.279"	.125"	1.50"	.625"	882-RL.093X.625	883-RL.093X.625	\$37.46
.095"	.285"	.125"	1.50"	.625"	882-RL.095X.625	883-RL.095X.625	\$37.46
.100"	.300"	.125"	1.50"	.500"	882-.100RL	883-.100RL	\$37.46
.100"	.300"	.125"	1.50"	.625"	882-RL.100X.625	883-RL.100X.625	\$37.46



# BALL END, LONG FLUTE, LONG REACH

## DECIMAL .010" - .250"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites/ Composites
- Diameter Tolerance: .005" to .124": +/- .0005  
.125" to .375": +0.000/ -.002



DIAMETER (Ø)	FLUTE LENGTH (X DIAMETER) (FL)	SHANK DIA. (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.010"	.050" (5X)	.125"	2.50"	.100" (10X)	887XB-F5R10-.010	\$51.41	887XB-E-F5R10-.010	\$55.81	887XB-A-F5R10-.010	\$62.95
.015" (1/64")	.075" (5X)	.125"	2.50"	.150" (10X)	887XB-F5R10-.015	\$44.06	887XB-E-F5R10-.015	\$48.46	887XB-A-F5R10-.015	\$55.59
.020"	.100" (5X)	.125"	2.50"	.200" (10X)	887XB-F5R10-.020	\$42.62	887XB-E-F5R10-.020	\$47.02	887XB-A-F5R10-.020	\$54.15
.025"	.125" (5X)	.125"	2.50"	.250" (10X)	887XB-F5R10-.025	\$36.91	887XB-E-F5R10-.025	\$41.30	887XB-A-F5R10-.025	\$48.46
.030"	.150" (5X)	.125"	2.50"	.300" (10X)	887XB-F5R10-.030	\$36.91	887XB-E-F5R10-.030	\$41.30	887XB-A-F5R10-.030	\$48.46
.031" (1/32")	.155" (5X)	.125"	2.50"	.300" (10X)	887XB-F5R10-.031	\$36.91	887XB-E-F5R10-.031	\$41.30	887XB-A-F5R10-.031	\$48.46
.035"	.175" (5X)	.125"	2.50"	.350" (10X)	887XB-F5R10-.035	\$36.91	887XB-E-F5R10-.035	\$41.30	887XB-A-F5R10-.035	\$48.46
.040"	.200" (5X)	.125"	2.50"	.400" (10X)	887XB-F5R10-.040	\$36.91	887XB-E-F5R10-.040	\$41.30	887XB-A-F5R10-.040	\$48.46
.045"	.225" (5X)	.125"	2.50"	.450" (10X)	887XB-F5R10-.045	\$36.04	887XB-E-F5R10-.045	\$40.44	887XB-A-F5R10-.045	\$47.57
.047" (3/64")	.250" (5X)	.125"	2.50"	.500" (10X)	887XB-F5R10-.047	\$36.04	887XB-E-F5R10-.047	\$40.44	887XB-A-F5R10-.047	\$47.57
.050"	.300" (6X)	.125"	2.50"	.600" (12X)	887XB-FR-.050 X .600	\$36.04	887XB-E-FR-.050 X .600	\$40.44	887XB-A-FR-.050 X .600	\$47.57
.055"	.385" (7X)	.125"	2.50"	.770" (14X)	887XB-FR-.055 X .770	\$36.04	887XB-E-FR-.055 X .770	\$40.44	887XB-A-FR-.055 X .770	\$47.57
.060"	.500" (8.3X)	.125"	2.50"	1.00" (16X)	887XB-FR-.060 X 1.00	\$36.04	887XB-E-FR-.060 X 1.00	\$40.44	887XB-A-FR-.060 X 1.00	\$47.57
.062" (1/16")	.500" (8X)	.125"	2.50"	1.00" (16X)	887XB-FR-.062 X 1.00	\$36.04	887XB-E-FR-.062 X 1.00	\$40.44	887XB-A-FR-.062 X 1.00	\$47.57
.065"	.500" (7.7X)	.125"	2.50"	1.00" (15X)	887XB-FR-.065 X 1.00	\$36.04	887XB-E-FR-.065 X 1.00	\$40.44	887XB-A-FR-.065 X 1.00	\$47.57
.070"	.500" (7.1X)	.125"	2.50"	1.00" (14X)	887XB-FR-.070 X 1.00	\$36.04	887XB-E-FR-.070 X 1.00	\$40.44	887XB-A-FR-.070 X 1.00	\$47.57
.075"	.500" (6.7X)	.125"	2.50"	1.00" (13X)	887XB-FR-.075 X 1.00	\$36.04	887XB-E-FR-.075 X 1.00	\$40.44	887XB-A-FR-.075 X 1.00	\$47.57
.078" (5/64")	.500" (6.4X)	.125"	2.50"	1.00" (12X)	887XB-FR-.078 X 1.00	\$36.04	887XB-E-FR-.078 X 1.00	\$40.44	887XB-A-FR-.078 X 1.00	\$47.57
.080"	.750" (9.4X)	.125"	2.50"	1.25" (15X)	887XB-FR-.080 X 1.25	\$36.04	887XB-E-FR-.080 X 1.25	\$40.44	887XB-A-FR-.080 X 1.25	\$47.57
.085"	.750" (8.8X)	.125"	2.50"	1.25" (14X)	887XB-FR-.085 X 1.25	\$36.04	887XB-E-FR-.085 X 1.25	\$40.44	887XB-A-FR-.085 X 1.25	\$47.57
.090"	.750" (8.3X)	.125"	2.50"	1.25" (14X)	887XB-FR-.090 X 1.25	\$36.04	887XB-E-FR-.090 X 1.25	\$40.44	887XB-A-FR-.090 X 1.25	\$47.57
.093" (3/32")	.750" (8.1X)	.125"	2.50"	1.25" (13X)	887XB-FR-.093 X 1.25	\$36.04	887XB-E-FR-.093 X 1.25	\$40.44	887XB-A-FR-.093 X 1.25	\$47.57
.095"	.750" (7.9X)	.125"	2.50"	1.25" (13X)	887XB-FR-.095 X 1.25	\$36.04	887XB-E-FR-.095 X 1.25	\$40.44	887XB-A-FR-.095 X 1.25	\$47.57
.100"	.750" (7.5X)	.125"	2.50"	1.25" (12X)	887XB-FR-.100 X 1.25	\$36.04	887XB-E-FR-.100 X 1.25	\$40.44	887XB-A-FR-.100 X 1.25	\$47.57
.125" (1/8")	1.00" (8X)	.125"	2.50"	1.50" (12X)	887XB-FR-.125 X 1.50	\$36.04	887XB-E-FR-.125 X 1.50	\$40.44	887XB-A-FR-.125 X 1.50	\$47.57
.187" (3/16")	1.125" (6X)	.1875"	3.00"	1.625" (8X)	887XB-FR-.187 X 1.625	\$38.99	887XB-E-FR-.187 X 1.625	\$43.94	887XB-A-FR-.187 X 1.625	\$55.59
.250" (1/4")	1.50" (6X)	.250"	4.00"	2.00" (8X)	887XB-FR-.250 X 2.0	\$43.84	887XB-E-FR-.250 X 2.0	\$48.99	887XB-A-FR-.250 X 2.0	\$61.96

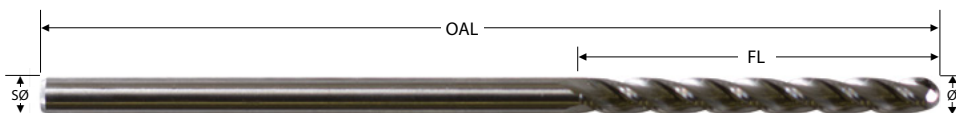
# BALL END, EXTRA LONG FLUTE

## DECIMAL .031" - .125"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites/ Composites
- Diameter Tolerance: .005" to .124": +/- .0005  
.125" to .375": +0.000/ -.002



### 12X FLUTE LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.031" (1/32")	.375" (12X)	.125"	2.50"	887XB-LF12-.031	\$60.86	887XB-E-LF12-.031	\$65.26	887XB-A-LF12-.031	\$72.40
.047" (3/64")	.570" (12X)	.125"	2.50"	887XB-LF12-.047	\$56.57	887XB-E-LF12-.047	\$60.97	887XB-A-LF12-.047	\$68.11
.062" (1/16")	.750" (12X)	.125"	2.50"	887XB-LF12-.062	\$47.68	887XB-E-LF12-.062	\$52.07	887XB-A-LF12-.062	\$59.22
.078" (5/64")	.940" (12X)	.125"	2.50"	887XB-LF12-.078	\$47.68	887XB-E-LF12-.078	\$52.07	887XB-A-LF12-.078	\$59.22
.093" (3/32")	1.125" (12X)	.125"	2.50"	887XB-LF12-.093	\$47.68	887XB-E-LF12-.093	\$52.07	887XB-A-LF12-.093	\$59.22
.125" (1/8")	1.50" (12X)	.125"	3.00"	887XB-LF12-.125	\$49.33	887XB-E-LF12-.125	\$53.73	887XB-A-LF12-.125	\$66.91

### 15X FLUTE LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
.062" (1/16")	.950" (15X)	.125"	2.50"	887XB-LF15-.062	\$65.26	887XB-E-LF15-.062	\$69.65	887XB-A-LF15-.062	\$76.79
.078" (5/64")	1.187" (15X)	.125"	2.50"	887XB-LF15-.078	\$65.26	887XB-E-LF15-.078	\$69.65	887XB-A-LF15-.078	\$76.79
.093" (3/32")	1.400" (15X)	.125"	3.00"	887XB-LF15-.093	\$66.68	887XB-E-LF15-.093	\$71.40	887XB-A-LF15-.093	\$84.26
.125" (1/8")	1.875" (15X)	.125"	3.00"	887XB-LF15-.125	\$66.68	887XB-E-LF15-.125	\$71.40	887XB-A-LF15-.125	\$84.26





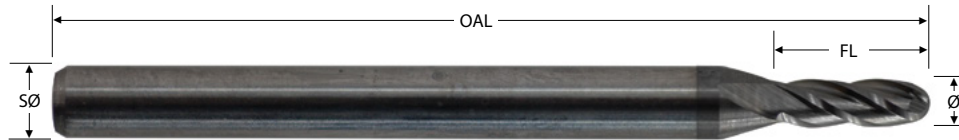
**American Made... In America's Hometown!**  
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# BALL END, STANDARD & STUB, CVD COATED

## DECIMAL .015" - .093"

- Use: Graphites/ Composites
- Rake Angle: Positive
- Extended Tool Life
- Center Cutting: Yes
- Helix: 30 Degrees
- Crystalline Diamond Coated
- Hand: RHS/ RHC
- Diameter Tolerance: +/-0.001

### STANDARD



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	CVD COATED	
				4 FLUTE	PRICE
.015"	.045"	.125"	1.50"	883-CVD-.015	\$79.97
.020"	.060"	.125"	1.50"	883-CVD-.020	\$79.97
.031" (1/32")	.093"	.125"	1.50"	883-CVD-.031	\$79.97
.047" (3/64")	.141"	.125"	1.50"	883-CVD-.047	\$79.97
.062" (1/16")	.1875"	.125"	1.50"	883-CVD-.062	\$75.70
.093" (3/32")	.279"	.125"	1.50"	883-CVD-.093	\$75.70

### LONG SHANK, STUB



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	CVD COATED	
				3 FLUTE	PRICE
.015"	.023"	.125"	2.50"	888XB-CVD-.015	\$89.53
.020"	.030"	.125"	2.50"	888XB-CVD-.020	\$89.53
.031"	.047"	.125"	2.50"	888XB-CVD-.031	\$89.53
.047"	.071"	.125"	2.50"	888XB-CVD-.047	\$89.53
.062"	.093"	.125"	2.50"	888XB-CVD-.062	\$85.24
.093"	.140"	.125"	2.50"	888XB-CVD-.093	\$85.24

# BALL END, LONG REACH, CVD COATED

## DECIMAL .015" - .093"

· Crystalline Diamond Coated

CARBIDE

### LONG REACH, STUB



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (X DIAMETER) (RL)	CVD COATED	
					3 FLUTE	PRICE
.015" (1/64")	.023"	.125"	2.50"	.078" (5X)	888XB-R5CVD-.015	\$106.66
.015" (1/64")	.023"	.125"	2.50"	.125" (8X)	888XB-R8CVD-.015	\$106.66
.015" (1/64")	.023"	.125"	2.50"	.1875" (12X)	888XB-R12CVD-.015	\$109.41
.020"	.030"	.125"	2.50"	.100" (5X)	888XB-R5CVD-.020	\$106.66
.020"	.030"	.125"	2.50"	.160" (8X)	888XB-R8CVD-.020	\$106.66
.020"	.030"	.125"	2.50"	.250" (12X)	888XB-R12CVD-.020	\$109.41
.031" (1/32")	.047"	.125"	2.50"	.155" (5X)	888XB-R5CVD-.031	\$106.66
.031" (1/32")	.047"	.125"	2.50"	.250" (8X)	888XB-R8CVD-.031	\$106.66
.031" (1/32")	.047"	.125"	2.50"	.375" (12X)	888XB-R12CVD-.031	\$109.41
.047" (3/64")	.071"	.125"	2.50"	.250" (5X)	888XB-R5CVD-.047	\$106.66
.047" (3/64")	.071"	.125"	2.50"	.375" (8X)	888XB-R8CVD-.047	\$106.66
.047" (3/64")	.071"	.125"	2.50"	.570" (12X)	888XB-R12CVD-.047	\$109.41
.062" (1/16")	.093"	.125"	2.50"	.312" (5X)	888XB-R5CVD-.062	\$93.48
.062" (1/16")	.093"	.125"	2.50"	.500" (8X)	888XB-R8CVD-.062	\$93.48
.062" (1/16")	.093"	.125"	2.50"	.750" (12X)	888XB-R12CVD-.062	\$96.23
.093" (3/32")	.140"	.125"	2.50"	.500" (5X)	888XB-R5CVD-.093	\$93.48
.093" (3/32")	.140"	.125"	2.50"	.750" (8X)	888XB-R8CVD-.093	\$93.48
.093" (3/32")	.140"	.125"	2.50"	1.125" (12X)	888XB-R12CVD-.093	\$96.23



### 5X FLUTE, 10X REACH



DIAMETER (Ø)	FLUTE LENGTH (X DIAMETER) (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (X DIAMETER) (RL)	CVD COATED	
					4 FLUTE	PRICE
.015"	.075" (5X)	.125"	2.50"	.156" (10X)	875XB-F5R10CVD-.015	\$124.79
.031"	.155" (5X)	.125"	2.50"	.312" (10X)	875XB-F5R10CVD-.031	\$124.79
.047"	.235" (5X)	.125"	2.50"	.480" (10X)	875XB-F5R10CVD-.047	\$124.79
.062"	.312" (5X)	.125"	2.50"	.625" (10X)	875XB-F5R10CVD-.062	\$109.74
.078"	.390" (5X)	.125"	2.50"	.800" (10X)	875XB-F5R10CVD-.078	\$109.74
.093"	.465" (5X)	.125"	2.50"	.950" (10X)	875XB-F5R10CVD-.093	\$109.74

# CORNER RADIUS, STANDARD

## DECIMAL .020" - .100"

Same Sizes →  
Continued

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +/- .0005



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED 4 FLUTE				PRICE
				.005" CR	.010" CR	.015" CR	.020" CR	
.020"	.060"	.125"	1.50"	875-CR5-.020	--	--	--	\$37.67
.025"	.075"	.125"	1.50"	875-CR5-.025	--	--	--	\$34.28
.030"	.090"	.125"	1.50"	875-CR5-.030	875-CR10-.030	--	--	\$31.97
.031"	.093"	.125"	1.50"	875-CR5-.031	875-CR10-.031	--	--	\$31.97
.035"	.105"	.125"	1.50"	875-CR5-.035	875-CR10-.035	--	--	\$26.81
.040"	.120"	.125"	1.50"	875-CR5-.040	875-CR10-.040	--	--	\$20.33
.045"	.135"	.125"	1.50"	875-CR5-.045	875-CR10-.045	875-CR15-.045	--	\$20.33
.047"	.141"	.125"	1.50"	875-CR5-.047	875-CR10-.047	875-CR15-.047	--	\$20.33
.050"	.150"	.125"	1.50"	875-CR5-.050	875-CR10-.050	875-CR15-.050	--	\$20.33
.055"	.165"	.125"	1.50"	875-CR5-.055	875-CR10-.055	875-CR15-.055	--	\$20.33
.060"	.180"	.125"	1.50"	875-CR5-.060	875-CR10-.060	875-CR15-.060	--	\$20.33
.062"	.186"	.125"	1.50"	875-CR5-.062	875-CR10-.062	875-CR15-.062	875-CR20-.062	\$20.33
.065"	.195"	.125"	1.50"	875-CR5-.065	875-CR10-.065	875-CR15-.065	--	\$20.33
.070"	.210"	.125"	1.50"	875-CR5-.070	875-CR10-.070	875-CR15-.070	--	\$20.33
.075"	.225"	.125"	1.50"	875-CR5-.075	875-CR10-.075	875-CR15-.075	--	\$20.33
.078"	.234"	.125"	1.50"	875-CR5-.078	875-CR10-.078	875-CR15-.078	875-CR20-.078	\$20.33
.080"	.240"	.125"	1.50"	875-CR5-.080	875-CR10-.080	875-CR15-.080	--	\$20.33
.085"	.255"	.125"	1.50"	875-CR5-.085	875-CR10-.085	875-CR15-.085	--	\$20.33
.090"	.270"	.125"	1.50"	875-CR5-.090	875-CR10-.090	875-CR15-.090	--	\$20.33
.093"	.279"	.125"	1.50"	875-CR5-.093	875-CR10-.093	875-CR15-.093	875-CR20-.093	\$20.33
.095"	.285"	.125"	1.50"	875-CR5-.095	875-CR10-.095	875-CR15-.095	--	\$20.33
.100"	.300"	.125"	1.50"	875-CR5-.100	875-CR10-.100	875-CR15-.100	--	\$20.33

· ALTiN Coated for High Performance Applications

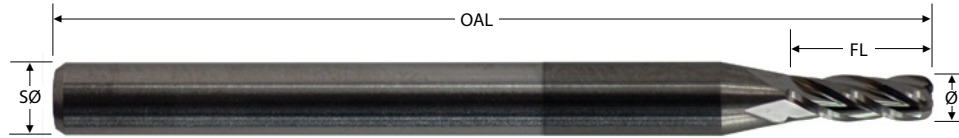
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	ALTiN COATED 4 FLUTE			PRICE
				.005" CR	.010" CR	.015" CR	
.020"	.060"	.125"	1.50"	875-E-CR5-.020	--	--	\$42.94
.025"	.075"	.125"	1.50"	875-E-CR5-.025	--	--	\$39.37
.030"	.090"	.125"	1.50"	875-E-CR5-.030	--	--	\$36.94
.031"	.093"	.125"	1.50"	875-E-CR5-.031	--	--	\$36.94
.035"	.105"	.125"	1.50"	875-E-CR5-.035	--	--	\$31.53
.040"	.120"	.125"	1.50"	875-E-CR5-.040	875-E-CR10-.040	--	\$24.72
.045"	.135"	.125"	1.50"	875-E-CR5-.045	875-E-CR10-.045	--	\$24.72
.047"	.141"	.125"	1.50"	875-E-CR5-.047	875-E-CR10-.047	875-E-CR15-.047	\$24.72
.050"	.150"	.125"	1.50"	875-E-CR5-.050	875-E-CR10-.050	875-E-CR15-.050	\$24.72
.055"	.165"	.125"	1.50"	875-E-CR5-.055	--	--	\$24.72
.060"	.180"	.125"	1.50"	875-E-CR5-.060	875-E-CR10-.060	875-E-CR15-.060	\$24.72
.070"	.210"	.125"	1.50"	875-E-CR5-.070	875-E-CR10-.070	875-E-CR15-.070	\$24.72
.080"	.240"	.125"	1.50"	875-E-CR5-.080	875-E-CR10-.080	875-E-CR15-.080	\$24.72
.090"	.270"	.125"	1.50"	875-E-CR5-.090	875-E-CR10-.090	875-E-CR15-.090	\$24.72
.100"	.300"	.125"	1.50"	875-E-CR5-.100	875-E-CR10-.100	875-E-CR15-.100	\$24.72

**NEW!**

# CORNER RADIUS, AMORPHOUS DIAMOND COATED

## DECIMAL .020" - .100"

- Use: Graphites/ Composites
- Rake Angle: Positive
- Helix: 30 Degrees
- Center Cutting: Yes
- Hand: RHS/ RHC
- Diameter Tolerance: +/- .0005



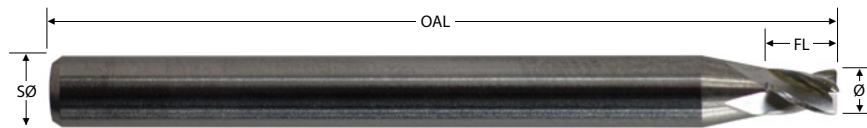
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	AMORPHOUS DIAMOND 4 FLUTE				PRICE
				.005" CR	.010" CR	.015" CR	.020" CR	
.020"	.060"	.125"	1.50"	875A-CR5-.020	--	--	--	\$49.22
.025"	.075"	.125"	1.50"	875A-CR5-.025	--	--	--	\$45.81
.030"	.090"	.125"	1.50"	875A-CR5-.030	875A-CR10-.030	--	--	\$43.50
.031"	.093"	.125"	1.50"	875A-CR5-.031	875A-CR10-.031	--	--	\$43.50
.035"	.105"	.125"	1.50"	875A-CR5-.035	875A-CR10-.035	--	--	\$38.34
.040"	.120"	.125"	1.50"	875A-CR5-.040	875A-CR10-.040	--	--	\$31.86
.045"	.135"	.125"	1.50"	875A-CR5-.045	875A-CR10-.045	875A-CR15-.045	--	\$31.86
.047"	.141"	.125"	1.50"	875A-CR5-.047	875A-CR10-.047	875A-CR15-.047	--	\$31.86
.050"	.150"	.125"	1.50"	875A-CR5-.050	875A-CR10-.050	875A-CR15-.050	--	\$31.86
.055"	.165"	.125"	1.50"	875A-CR5-.055	875A-CR10-.055	875A-CR15-.055	--	\$31.86
.060"	.180"	.125"	1.50"	875A-CR5-.060	875A-CR10-.060	875A-CR15-.060	--	\$31.86
.062"	.186"	.125"	1.50"	875A-CR5-.062	875A-CR10-.062	875A-CR15-.062	875A-CR20-.062	\$31.86
.065"	.195"	.125"	1.50"	875A-CR5-.065	875A-CR10-.065	875A-CR15-.065	--	\$31.86
.070"	.210"	.125"	1.50"	875A-CR5-.070	875A-CR10-.070	875A-CR15-.070	--	\$31.86
.075"	.225"	.125"	1.50"	875A-CR5-.075	875A-CR10-.075	875A-CR15-.075	--	\$31.86
.078"	.234"	.125"	1.50"	875A-CR5-.078	875A-CR10-.078	875A-CR15-.078	875A-CR20-.078	\$31.86
.080"	.240"	.125"	1.50"	875A-CR5-.080	875A-CR10-.080	875A-CR15-.080	--	\$31.86
.085"	.255"	.125"	1.50"	875A-CR5-.085	875A-CR10-.085	875A-CR15-.085	--	\$31.86
.090"	.270"	.125"	1.50"	875A-CR5-.090	875A-CR10-.090	875A-CR15-.090	--	\$31.86
.093"	.279"	.125"	1.50"	875A-CR5-.093	875A-CR10-.093	875A-CR15-.093	875A-CR20-.093	\$31.86
.095"	.285"	.125"	1.50"	875A-CR5-.095	875A-CR10-.095	875A-CR15-.095	--	\$31.86
.100"	.300"	.125"	1.50"	875A-CR5-.100	875A-CR10-.100	875A-CR15-.100	--	\$31.86



# CORNER RADIUS, STUB

## DECIMAL .020" - .093"

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +/- .0005



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	UNCOATED 4 FLUTE			
				.005" CR	.010" CR	.015" CR	PRICE
.020"	.030"	.125"	1.50"	879-CR5-.020	--	--	\$37.67
.025"	.038"	.125"	1.50"	879-CR5-.025	--	--	\$34.28
.031" (1/32")	.047"	.125"	1.50"	879-CR5-.031	--	--	\$31.97
.047" (3/64")	.071"	.125"	1.50"	879-CR5-.047	879-CR10-.047	--	\$20.33
.062" (1/16")	.093"	.125"	1.50"	879-CR5-.062	879-CR10-.062	879-CR15-.062	\$20.33
.078" (5/64")	.117"	.125"	1.50"	879-CR5-.078	879-CR10-.078	879-CR15-.078	\$20.33
.093" (3/32")	.140"	.125"	1.50"	879-CR5-.093	879-CR10-.093	879-CR15-.093	\$20.33

· TIALN Coated for High Performance Applications

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	TIALN COATED 4 FLUTE			
				.005" CR	.010" CR	.015" CR	PRICE
.020"	.030"	.125"	1.50"	879C-CR5-.020	--	--	\$42.07
.025"	.038"	.125"	1.50"	879C-CR5-.025	--	--	\$38.68
.031" (1/32")	.047"	.125"	1.50"	879C-CR5-.031	--	--	\$36.36
.047" (3/64")	.071"	.125"	1.50"	879C-CR5-.047	879C-CR10-.047	--	\$24.72
.062" (1/16")	.093"	.125"	1.50"	879C-CR5-.062	879C-CR10-.062	879C-CR15-.062	\$24.72
.078" (5/64")	.117"	.125"	1.50"	879C-CR5-.078	879C-CR10-.078	879C-CR15-.078	\$24.72
.093" (3/32")	.140"	.125"	1.50"	879C-CR5-.093	879C-CR10-.093	879C-CR15-.093	\$24.72

· Amorphous Diamond Coated for Graphites/ Composite Materials

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	AMORPHOUS DIAMOND 4 FLUTE			
				.005" CR	.010" CR	.015" CR	PRICE
.020"	.030"	.125"	1.50"	879-A-CR5-.020	--	--	\$49.22
.025"	.038"	.125"	1.50"	879-A-CR5-.025	--	--	\$45.82
.031" (1/32")	.047"	.125"	1.50"	879-A-CR5-.031	--	--	\$43.50
.047" (3/64")	.071"	.125"	1.50"	879-A-CR5-.047	879-A-CR10-.047	--	\$31.86
.062" (1/16")	.093"	.125"	1.50"	879-A-CR5-.062	879-A-CR10-.062	879-A-CR15-.062	\$31.86
.078" (5/64")	.117"	.125"	1.50"	879-A-CR5-.078	879-A-CR10-.078	879-A-CR15-.078	\$31.86
.093" (3/32")	.140"	.125"	1.50"	879-A-CR5-.093	879-A-CR10-.093	879-A-CR15-.093	\$31.86

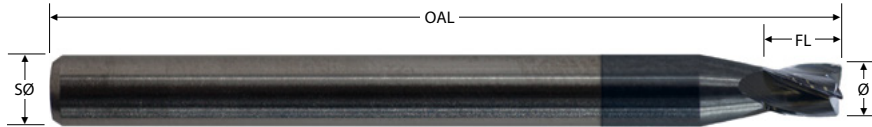
**NEW!**



# HARD MILL

## DECIMAL .015" - .093"

- Use: Tool Steels/ High Rc
- Helix: 18 Degrees
- Hand: RHS/ RHC
- Rake Angle: Neutral
- Corner Radius Stub
- Hard Mill Coated
- Center Cutting: Yes
- Diameter Tolerance: +0.000 /-.001



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	CORNER RADIUS	HARD MILL COATED	
					4 FLUTE	PRICE
.015"	.023"	.125"	1.50"	.002"	879HM-.015	\$61.74
.031"	.047"	.125"	1.50"	.003"	879HM-.031	\$54.60
.047"	.071"	.125"	1.50"	.005"	879HM-.047	\$54.60
.062"	.093"	.125"	1.50"	.006"	879HM-.062	\$54.60
.078"	.117"	.125"	1.50"	.008"	879HM-.078	\$54.60
.093"	.140"	.125"	1.50"	.009"	879HM-.093	\$54.60

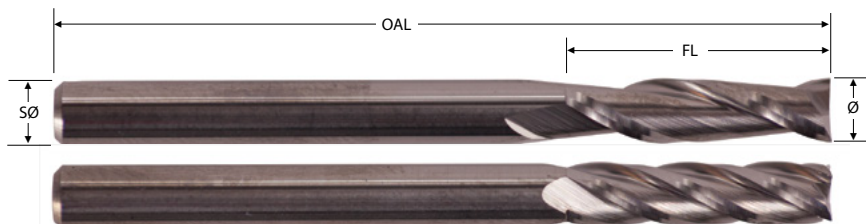
# SQUARE END, STANDARD & STUB

Same Sizes Continued

## FRACTIONAL 1/32" - 1/2"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Diameter Tolerance: 1/32" to 1/4": +0.000/ -.002  
5/16" to 1/2": +0.000/ -.003

### STANDARD



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED				ALTiN COATED		
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/32"	3/32"	.125"	1.50"	874-0031	13001	875-0031	\$16.49	--	--	
3/64"	9/64"	.125"	1.50"	874-0046	13002	875-0046	\$13.93	--	--	
1/16"	3/16"	.125"	1.50"	874-0062	13003	875-0062	\$12.43	--	--	
5/64"	3/16"	.125"	1.50"	874-0078	13004	875-0078	\$12.43	--	--	
3/32"	3/8"	.125"	1.50"	874-0093	13005	875-0093	\$12.43	--	--	
7/64"	7/16"	.125"	1.50"	874-0109	13006	875-0109	\$12.74	--	--	
1/8"	1/2"	.125"	1.50"	874-0125	13007	875-0125	\$12.74	874-E-0125	875-E-0125	\$17.13
9/64"	1/2"	.1875"	2.00"	874-0140	13008	875-0140	\$13.95	874-E-0140	875-E-0140	\$18.67
5/32"	9/16"	.1875"	2.00"	874-0156	13009	875-0156	\$13.95	874-E-0156	875-E-0156	\$18.67
11/64"	5/8"	.1875"	2.00"	874-0171	13010	875-0171	\$13.95	--	875-E-0171	\$18.35
3/16"	5/8"	.1875"	2.00"	874-0187	13011	875-0187	\$13.95	874-E-0187	875-E-0187	\$18.35
13/64"	5/8"	.250"	2.50"	874-0203	13012	875-0203	\$15.37	--	875-E-0203	\$19.77
7/32"	5/8"	.250"	2.50"	874-0219	13013	875-0219	\$15.37	874-E-0219	875-E-0219	\$19.77
15/64"	5/8"	.250"	2.50"	874-0234	13014	875-0234	\$15.37	--	875-E-0234	\$19.77
1/4"	3/4"	.250"	2.50"	874-0250	13015	875-0250	\$15.37	874-E-0250	875-E-0250	\$21.97
5/16"	13/16"	.3125"	2.50"	874-0312	13019	875-0312	\$21.75	874-E-0312	875-E-0312	\$35.74
3/8"	1"	.375"	2.50"	874-0375	13023	875-0375	\$29.76	874-E-0375	875-E-0375	\$43.76
1/2"	1"	.500"	3.00"	874-0500	--	875-0500	\$61.74	874-E-0500	875-E-0500	\$77.71

**NEW!**

### STUB



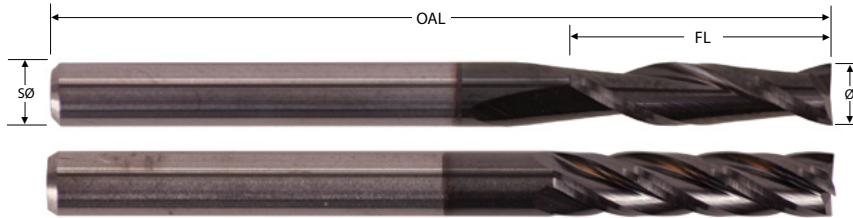
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED		
				2 FLUTE	4 FLUTE	PRICE
1/32"	1/16"	.125"	1.50"	878-0031	879-0031	\$16.49
3/64"	1/16"	.125"	1.50"	878-0046	879-0046	\$13.93
1/16"	1/8"	.125"	1.50"	878-0062	879-0062	\$12.43
3/32"	3/16"	.125"	1.50"	878-0093	879-0093	\$12.43
1/8"	1/4"	.125"	1.50"	878-0125	879-0125	\$12.74
5/32"	3/8"	.1875"	2.00"	878-0156	879-0156	\$13.95
3/16"	3/8"	.1875"	2.00"	878-0187	879-0187	\$13.95
1/4"	1/2"	.250"	2.00"	878-0250	879-0250	\$15.37

# SQUARE END, STANDARD & STUB

## FRACTIONAL 1/32" - 1/2"

- ALTiN/ TIALN coatings for high performance applications
- Amorphous Diamond Coating for Graphites/ Composite Materials

### STANDARD



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	TIALN COATED				AMORPHOUS DIAMOND		
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/32"	3/32"	.125"	1.50"	874-C-0031	13001-C	875-C-0031	\$20.78	AD12001	AD14001	\$27.74
3/64"	9/64"	.125"	1.50"	874-C-0046	13002-C	875-C-0046	\$18.21	AD12002	AD14002	\$25.17
1/16"	3/16"	.125"	1.50"	874-C-0062	13003-C	875-C-0062	\$16.70	AD12003	AD14003	\$23.67
5/64"	3/16"	.125"	1.50"	874-C-0078	13004-C	875-C-0078	\$16.70	AD12004	AD14004	\$23.67
3/32"	3/8"	.125"	1.50"	874-C-0093	13005-C	875-C-0093	\$16.70	AD12005	AD14005	\$23.67
7/64"	7/16"	.125"	1.50"	--	--	--		AD12006	AD14006	\$24.29
1/8"	1/2"	.125"	1.50"	874-C-0125	13007-C	875-C-0125	\$17.13	AD12007	AD14007	\$24.29
9/64"	1/2"	.1875"	2.00"	--	--	--		AD12008	AD14008	\$29.88
5/32"	9/16"	.1875"	2.00"	--	--	--		AD12009	AD14009	\$29.88
3/16"	5/8"	.1875"	2.00"	--	--	--		AD12011	AD14011	\$29.88
1/4"	3/4"	.250"	2.50"	--	--	--		AD12015	AD14015	\$33.51
3/8"	1"	.375"	2.50"	--	--	--		AD12023	AD14023	\$64.94
1/2"	1"	.500"	3.00"	--	--	--		AD12031	AD14031	\$103.24

### STUB



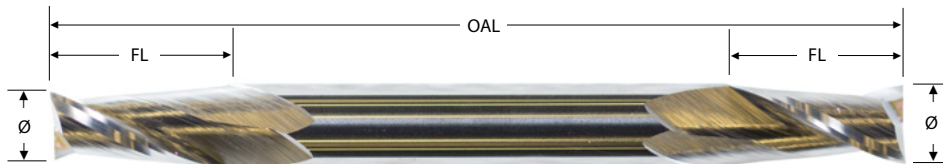
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	TIALN COATED		
				2 FLUTE	4 FLUTE	PRICE
1/32"	1/16"	.125"	1.50"	878-C-0031	879-C-0031	\$20.78
3/64"	1/16"	.125"	1.50"	878-C-0046	879-C-0046	\$18.21
1/16"	1/8"	.125"	1.50"	878-C-0062	879-C-0062	\$16.70
3/32"	3/16"	.125"	1.50"	878-C-0093	879-C-0093	\$16.70
1/8"	1/4"	.125"	1.50"	878-C-0125	879-C-0125	\$17.13



# SQUARE END, DOUBLE END, STUB

## FRACTIONAL 1/32" - 3/8"

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance:  
     1/32" to 1/4": +0.000/ -.002  
     5/16" to 3/8": +0.000/ -.003

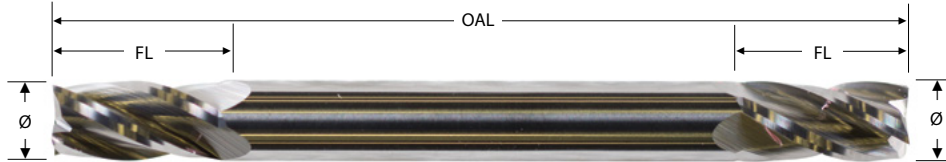


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/32"	1/16"	.125"	1.50"	872-0031	\$18.84
3/64"	1/16"	.125"	1.50"	872-0046	\$18.84
1/16"	1/8"	.125"	1.50"	872-0062	\$17.95
5/64"	1/8"	.125"	1.50"	872-0078	\$17.95
3/32"	3/16"	.125"	1.50"	872-0093	\$17.95
7/64"	1/4"	.125"	1.50"	872-0109	\$17.95
1/8"	1/4"	.125"	1.50"	872-0125	\$17.95
9/64"	5/16"	.1875"	2.00"	872-0140	\$24.36
5/32"	5/16"	.1875"	2.00"	872-0156	\$24.36
11/64"	3/8"	.1875"	2.00"	872-0171	\$24.36
3/16"	3/8"	.1875"	2.00"	872-0187	\$24.36
7/32"	1/2"	.250"	2.50"	872-0219	\$30.20
1/4"	1/2"	.250"	2.50"	872-0250	\$30.20
5/16"	1/2"	.3125"	2.50"	872-0312	\$41.73
3/8"	1/2"	.375"	2.50"	872-0375	\$44.62

# SQUARE END, DOUBLE END, STUB

## FRACTIONAL 1/32" - 3/8"

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance:
  - 1/32" to 1/4": +0.000/ -.002
  - 5/16" to 3/8": +0.000/ -.003



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				4 FLUTE	PRICE
1/32"	1/16"	.125"	1.50"	873-0031	\$19.81
3/64"	1/16"	.125"	1.50"	873-0046	\$19.81
1/16"	1/8"	.125"	1.50"	873-0062	\$18.85
5/64"	1/8"	.125"	1.50"	873-0078	\$18.85
3/32"	3/16"	.125"	1.50"	873-0093	\$18.85
7/64"	1/4"	.125"	1.50"	873-0109	\$18.85
1/8"	1/4"	.125"	1.50"	873-0125	\$18.85
9/64"	5/16"	.1875"	2.00"	873-0140	\$25.54
5/32"	5/16"	.1875"	2.00"	873-0156	\$25.54
11/64"	3/8"	.1875"	2.00"	873-0171	\$25.54
3/16"	3/8"	.1875"	2.00"	873-0187	\$25.54
7/32"	1/2"	.250"	2.50"	873-0219	\$31.68
1/4"	1/2"	.250"	2.50"	873-0250	\$31.68
5/16"	1/2"	.3125"	2.50"	873-0312	\$43.84
3/8"	1/2"	.375"	2.50"	873-0375	\$46.83

# SQUARE END, LONG FLUTE

## FRACTIONAL 1/64" - 1/2"

- Helix: 35 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites/ Composites
- Diameter Tolerance: *Under 1/8": +0.000/- .001*  
*1/8" and above: +0.000/- .002*

### 3 FLUTE G MILLS



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
1/64"	.078"	.125"	2.50"	3-0156	\$30.99	3-0156-E	\$37.44	AD3-0156	\$42.52
1/32"	.156"	.125"	2.50"	3-0312	\$24.39	3-0312-E	\$30.85	AD3-0312	\$35.92
3/64"	.250"	.125"	2.50"	3-0469	\$23.73	3-0469-E	\$30.18	AD3-0469	\$35.26
1/16"	.500"	.125"	2.50"	3-0625	\$24.29	3-0625-E	\$30.74	AD3-0625	\$35.82
5/64"	.500"	.125"	2.50"	3-0781	\$21.75	3-0781-E	\$28.21	AD3-0781	\$33.29
3/32"	.750"	.125"	2.50"	3-0938	\$24.29	3-0938-E	\$30.74	AD3-0938	\$35.82
1/8"	1.000"	.125"	3.00"	3-1250	\$22.85	3-1250-E	\$29.31	AD3-1250	\$34.38

### 2 & 4 FLUTE

- Helix: 30 Degrees
- Diameter Tolerance: +0.000/- .002



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	UNCOATED			ALTiN COATED		AMORPHOUS DIAMOND	
				2 FLUTE	4 FLUTE	PRICE	4 FLUTE	PRICE	4 FLUTE	PRICE
1/8"	.750"	.125"	2.25"	16201	17201	\$20.06	--	--	--	--
1/8"	1.000"	.125"	3.00"	16202	17202	\$22.43	--	--	--	--
3/16"	.750"	.1875"	2.50"	16203	17203	\$23.54	--	--	--	--
3/16"	1.125"	.1875"	3.00"	16204	17204	\$23.84	17204-E	\$28.51	AD4-1875	\$41.93
1/4"	1.125"	.250"	3.00"	16205	17205	\$33.68	--	--	--	--
1/4"	1.000"	.250"	4.00"	16206	17206	\$35.50	--	--	--	--
1/4"	1.500"	.250"	4.00"	16207	17207	\$41.20	17207-E	\$49.43	AD4-2500	\$52.12
1/4"	1.500"	.250"	6.00"	16208	17208	\$46.58	17208-E	\$55.89	--	--
5/16"	1.125"	.3125"	3.00"	16209	17209	\$38.00	--	--	--	--
5/16"	1.625"	.3125"	4.00"	16210	17210	\$38.90	17210-E	\$46.58	AD17210	\$73.78
3/8"	1.125"	.375"	3.00"	16211	17211	\$43.59	--	--	--	--
3/8"	1.000"	.375"	4.00"	16212	17212	\$50.90	--	--	--	--
3/8"	1.750"	.375"	4.00"	16213	17213	\$41.30	17213-E	\$50.09	AD17213	\$76.19
3/8"	1.500"	.375"	6.00"	16214	17214	\$80.76	--	--	--	--
1/2"	2.000"	.500"	4.00"	16218	17218	\$58.45	17218-E	\$70.53	AD17218	\$126.02



# SQUARE END, LONG REACH G MILLS

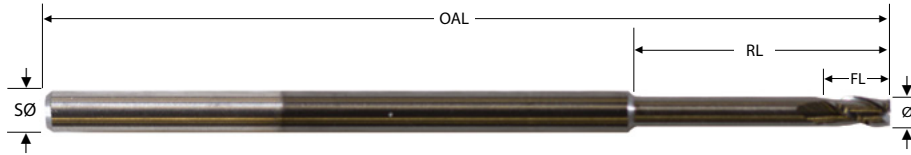
## FRACTIONAL 1/64" - 1/4"

- Helix: 35 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes

- Rake Angle: Positive
- Diameter Tolerance:

Under 1/8": +0.000/-0.001  
1/8" and above: +0.000/-0.002

### LONG REACH, STUB



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE
1/32"	1/16"	.125"	2.50"	.250" (8X)	3-0312RS	\$27.92	AD3-0312RS	\$41.55
1/32"	1/16"	.125"	2.50"	.375" (12X)	--		AD3-0312XRS	\$53.39
1/32"	1/16"	.125"	2.50"	.500" (16X)	--		AD3-0312XLRS	\$59.77
1/16"	1/8"	.125"	2.50"	.500" (8X)	3-0625RS	\$27.92	AD3-0625RS	\$41.74
1/16"	1/8"	.125"	2.50"	.750" (12X)	--		AD3-0625XRS	\$42.74
1/16"	1/8"	.125"	2.50"	1.00" (16X)	--		AD3-0625XLRS	\$46.80
3/32"	3/16"	.125"	2.50"	.750" (8X)	3-0938RS	\$27.92	AD3-0938RS	\$41.74
3/32"	3/16"	.125"	2.50"	1.00" (11X)	--		AD3-0938XRS	\$53.39
3/32"	3/16"	.125"	2.50"	1.25" (13X)	--		AD3-0938XLRS	\$42.74

### LONG REACH, LONG FLUTE



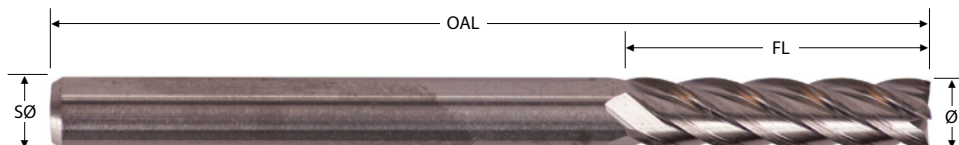
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (X DIAMETER) (RL)	AMORPHOUS DIAMOND	
					3 FLUTE	PRICE
1/64"	5/64" (5X)	.125"	2.50"	.150" (10X)	AD3-0156XR	\$59.21
1/64"	5/64" (5X)	.125"	2.50"	.250" (16X)	AD3-0156XLR	\$66.86
1/32"	5/32" (5X)	.125"	2.50"	.250" (8X)	AD3-0312XR	\$47.75
1/32"	5/32" (5X)	.125"	2.50"	.375" (12X)	AD3-0312XLR	\$59.77
3/64"	1/4" (5X)	.125"	2.50"	.375" (8X)	AD3-0469XR	\$47.75
3/64"	1/4" (5X)	.125"	2.50"	.500" (11X)	AD3-0469XLR	\$59.77
1/16"	1/2" (8X)	.125"	2.50"	.750" (12X)	AD3-0625XR	\$47.75
1/16"	1/2" (8X)	.125"	2.50"	1.00" (16X)	AD3-0625XLR	\$59.77
5/64"	1/2" (6X)	.125"	2.50"	.750" (10X)	AD3-0781XR	\$47.75
5/64"	1/2" (6X)	.125"	2.50"	1.00" (13X)	AD3-0781XLR	\$59.77
3/32"	3/4" (8X)	.125"	2.50"	1.00" (11X)	AD3-0938XR	\$47.75
3/32"	3/4" (8X)	.125"	2.50"	1.25" (13X)	AD3-0938XLR	\$59.77
1/8"	1" (8X)	.125"	3.00"	1.25" (10X)	AD3-1250XR	\$47.75
1/8"	1" (8X)	.125"	3.00"	1.50" (12X)	AD3-1250XLR	\$59.77
(Ø)	(FL)	(SØ)	(OAL)	(RL)	4 FLUTE	PRICE
3/16"	1-1/8" (6X)	.1875"	3.00"	1.50" (8X)	AD4-1875XR	\$56.00
3/16"	1-1/8" (6X)	.1875"	3.00"	1.75" (9X)	AD4-1875XLR	\$63.58
1/4"	1-1/2" (6X)	.250"	4.00"	2.00" (8X)	AD4-2500XR	\$69.40
1/4"	1-1/2" (6X)	.250"	4.00"	2.50" (10X)	AD4-2500XLR	\$78.32



# SQUARE END, MULTI FLUTE

## FRACTIONAL 1/32" - 1/4"

- Helix: 35 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Diameter Tolerance: +0/-0.001



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	UNCOATED		ALTiN COATED	
				5 FLUTE	PRICE	5 FLUTE	PRICE
1/32"	3/32"	.125"	1.50"	889MF-0031	\$25.60	--	
3/64"	9/64"	.125"	1.50"	889MF-0046	\$25.60	--	
1/16"	3/16"	.125"	1.50"	889MF-0062	\$23.77	--	
5/64"	3/16"	.125"	1.50"	889MF-0078	\$23.77	--	
3/32"	3/8"	.125"	1.50"	889MF-0093	\$23.77	--	
1/8"	1/2"	.125"	1.50"	889MF-0125	\$22.85	889MF-E-0125	\$28.31
3/16"	5/8"	.1875"	2.00"	889MF-0187	\$26.92	889MF-E-0187	\$32.36
1/4"	3/4"	.250"	2.50"	889MF-0250	\$35.92	889MF-E-0250	\$41.36

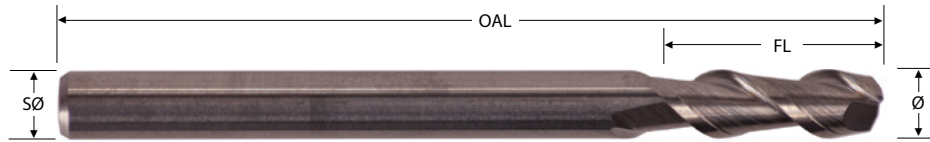
**NEW!**

# SQUARE END, HIGH HELIX

## FRACTIONAL 1/32" - 3/8"

- Helix: 45 & 60 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Use: Aluminum & Non-Ferrous Materials
- Diameter Tolerance: 2 Flutes: +0.000/ -.001  
3 Flutes: +0.000/ -.002

### 45 DEG. HELIX 1/32" - 3/8"



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/32"	3/32"	.125"	1.50"	874HH-0031	\$18.64
3/64"	9/64"	.125"	1.50"	874HH-0046	\$18.64
1/16"	3/16"	.125"	1.50"	874HH-0062	\$16.15
5/64"	3/16"	.125"	1.50"	874HH-0078	\$16.29
3/32"	3/8"	.125"	1.50"	874HH-0093	\$16.29
1/8"	3/8"	.125"	1.50"	874HH-0125	\$16.15
3/16"	5/8"	.1875"	2.00"	874HH-0187	\$18.23
1/4"	3/4"	.250"	2.50"	874HH-0250	\$22.75



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	UNCOATED		ALTIM COATED	
				3 FLUTE	PRICE	3 FLUTE	PRICE
1/8"	1/2"	.125"	1.50"	12499	\$22.49	12599	\$28.08
3/16"	5/8"	.1875"	2.00"	12500	\$26.92	12600	\$33.62
1/4"	3/4"	.250"	2.50"	12501	\$28.85	12601	\$36.06
5/16"	13/16"	.3125"	2.50"	12502	\$34.90	12602	\$43.59
3/8"	7/8"	.375"	2.50"	12503	\$46.69	12603	\$58.38

### 60 DEG. HELIX 1/8" - 3/8"

Use: Titanium & High Temperature Alloys



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	UNCOATED		ALTIM COATED	
				3 FLUTE	PRICE	3 FLUTE	PRICE
1/8"	1/2"	.125"	1.50"	12699	\$22.49	12799	\$28.08
3/16"	5/8"	.1875"	2.00"	12700	\$26.92	12800	\$33.62
1/4"	3/4"	.250"	2.50"	12701	\$28.85	12801	\$36.06
5/16"	13/16"	.3125"	2.50"	12702	\$34.90	12802	\$43.59
3/8"	7/8"	.375"	2.50"	12703	\$46.69	12803	\$58.38

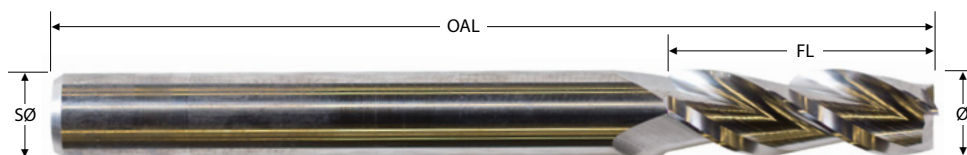
# Q MILLS, STANDARD & STUB

## FRACTIONAL 1/32" - 1/4"

- High Performance
- Helix: 35 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- TiCN Coating for Higher Performance
- Diameter Tolerance: +0.000/ -.001



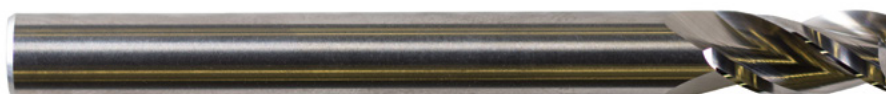
### STANDARD



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		TICN COATED	
				3 FLUTE	PRICE	3 FLUTE	PRICE
1/32"	3/32"	.250"	2.50"	885-SS0031	\$22.31	885-T1-SS0031	\$28.33
3/64"	9/64"	.250"	2.50"	885-SS0046	\$22.31	885-T1-SS0046	\$28.33
1/16"	3/16"	.250"	2.50"	885-SS0062	\$22.03	885-T1-SS0062	\$28.05
5/64"	3/16"	.250"	2.50"	885-SS0078	\$22.03	885-T1-SS0078	\$28.05
3/32"	3/8"	.250"	2.50"	885-SS0093	\$22.03	885-T1-SS0093	\$28.05
7/64"	7/16"	.250"	2.50"	885-SS0109	\$22.03	885-T1-SS0109	\$28.05
1/8"	1/2"	.250"	2.50"	885-SS0125	\$22.03	885-T1-SS0125	\$28.05
5/32"	9/16"	.250"	2.50"	885-SS0156	\$16.30	885-T1-SS0156	\$22.30
3/16"	5/8"	.250"	2.50"	885-SS0187	\$16.30	885-T1-SS0187	\$22.30
7/32"	5/8"	.250"	2.50"	885-SS0219	\$27.54	885-T1-SS0219	\$33.57
1/4"	3/4"	.250"	2.50"	885-SS0250	\$23.62	885-T1-SS0250	\$29.65

**NEW!**

### STUB



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		TICN COATED	
				3 FLUTE	PRICE	3 FLUTE	PRICE
1/32"	1/16"	.250"	2.50"	884-SS0031	\$16.30	884-T1-SS0031	\$22.30
3/64"	3/32"	.250"	2.50"	884-SS0046	\$16.30	884-T1-SS0046	\$22.30
1/16"	1/8"	.250"	2.50"	884-SS0062	\$16.07	884-T1-SS0062	\$22.07
5/64"	1/8"	.250"	2.50"	884-SS0078	\$16.07	884-T1-SS0078	\$22.07
3/32"	3/16"	.250"	2.50"	884-SS0093	\$16.07	884-T1-SS0093	\$22.07
7/64"	3/16"	.250"	2.50"	884-SS0109	\$16.07	884-T1-SS0109	\$22.07
1/8"	1/4"	.250"	2.50"	884-SS0125	\$16.07	884-T1-SS0125	\$22.07
5/32"	3/8"	.250"	2.50"	884-SS0156	\$18.91	884-T1-SS0156	\$24.93
3/16"	3/8"	.250"	2.50"	884-SS0187	\$18.91	884-T1-SS0187	\$24.93
7/32"	3/8"	.250"	2.50"	884-SS0219	\$17.31	884-T1-SS0219	\$23.33
1/4"	1/2"	.250"	2.50"	884-SS0250	\$17.31	884-T1-SS0250	\$23.33

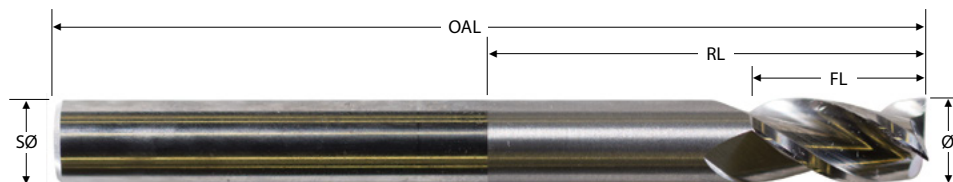
**NEW!**

# QSR & QB MILLS

## FRACTIONAL 1/32" - 1/4"

- High Performance
- Helix: 35 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +0.000/ -.001

### STUB, REACHED



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		TICN COATED	
					3 FLUTE	PRICE	3 FLUTE	PRICE
1/32"	1/16"	.250"	2.50"	.155" (5X)	884-SS0031LBS	\$32.76	884-T1-SS0031LBS	\$38.79
3/64"	3/32"	.250"	2.50"	.230" (5X)	884-SS0046LBS	\$32.76	884-T1-SS0046LBS	\$38.79
1/16"	1/8"	.250"	2.50"	.312" (5X)	884-SS0062LBS	\$29.23	884-T1-SS0062LBS	\$35.27
5/64"	1/8"	.250"	2.50"	.390" (5X)	884-SS0078LBS	\$29.23	884-T1-SS0078LBS	\$35.27
3/32"	3/16"	.250"	2.50"	.465" (5X)	884-SS0093LBS	\$29.23	884-T1-SS0093LBS	\$35.27
7/64"	3/16"	.250"	2.50"	.545" (5X)	884-SS0109LBS	\$25.44	884-T1-SS0109LBS	\$31.46
1/8"	1/4"	.250"	2.50"	.625" (5X)	884-SS0125LBS	\$25.44	884-T1-SS0125LBS	\$31.46
5/32"	3/8"	.250"	2.50"	.780" (5X)	884-SS0156LBS	\$28.90	884-T1-SS0156LBS	\$34.94
3/16"	3/8"	.250"	2.50"	.9375" (5X)	884-SS0187LBS	\$28.90	884-T1-SS0187LBS	\$34.94
7/32"	3/8"	.250"	2.50"	1.093" (5X)	884-SS0219LBS	\$29.58	884-T1-SS0219LBS	\$35.62
1/4"	1/2"	.250"	2.50"	1.250" (5X)	884-SS0250LBS	\$29.58	884-T1-SS0250LBS	\$35.62

### BALL, STANDARD



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		TICN COATED	
				3 FLUTE	PRICE	3 FLUTE	PRICE
1/32"	3/32"	.250"	2.50"	885B-SS0031	\$29.07	885B-T1-SS0031	\$35.10
1/16"	3/16"	.250"	2.50"	885B-SS0062	\$28.27	885B-T1-SS0062	\$34.31
3/32"	3/8"	.250"	2.50"	885B-SS0093	\$27.60	885B-T1-SS0093	\$33.62
1/8"	1/2"	.250"	2.50"	885B-SS0125	\$27.60	885B-T1-SS0125	\$33.62
3/16"	5/8"	.250"	2.50"	885B-SS0187	\$27.60	885B-T1-SS0187	\$33.62
1/4"	3/4"	.250"	2.50"	885B-SS0250	\$27.60	885B-T1-SS0250	\$33.62

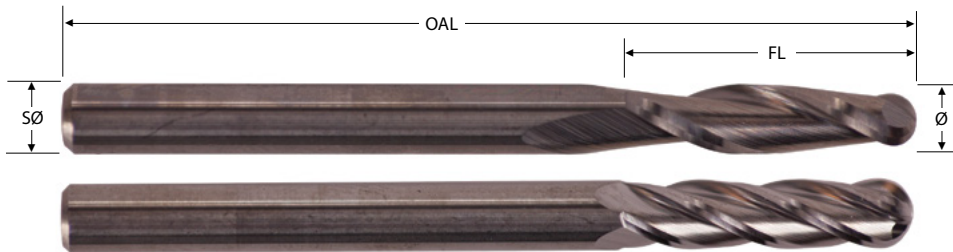
# BALL END, STANDARD & STUB

Same Sizes Continued

## FRACTIONAL 1/32" - 1/2"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Diameter Tolerance: 1/32" to 1/4": +0.000/ -.002  
5/16" to 3/8": +0.000/ -.003

### STANDARD



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED				ALTiN COATED		
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/32"	3/32"	.125"	1.50"	882-0031	13001BN	883-0031	\$20.02	--	883-E-0031	\$24.32
3/64"	9/64"	.125"	1.50"	882-0046	13002BN	883-0046	\$18.85	--	883-E-0046	\$23.13
1/16"	3/16"	.125"	1.50"	882-0062	13003BN	883-0062	\$18.42	--	883-E-0062	\$22.71
5/64"	3/16"	.125"	1.50"	882-0078	13004BN	883-0078	\$18.42	--	883-E-0078	\$22.71
3/32"	3/8"	.125"	1.50"	882-0093	13005BN	883-0093	\$18.42	--	883-E-0093	\$22.71
7/64"	7/16"	.125"	1.50"	882-0109	13006BN	883-0109	\$18.90	--	883-E-0109	\$23.29
1/8"	1/2"	.125"	1.50"	882-0125	13007BN	883-0125	\$18.90	882-E-0125	883-E-0125	\$23.28
9/64"	1/2"	.1875"	2.00"	882-0140	13008BN	883-0140	\$20.11	882-E-0140	883-E-0140	\$30.03
5/32"	9/16"	.1875"	2.00"	882-0156	13009BN	883-0156	\$20.11	882-E-0156	883-E-0156	\$24.82
11/64"	5/8"	.1875"	2.00"	882-0171	13010BN	883-0171	\$20.11	--	--	
3/16"	5/8"	.1875"	2.00"	882-0187	13011BN	883-0187	\$20.11	882-E-0187	883-E-0187	\$24.82
13/64"	5/8"	.250"	2.50"	882-0203	13012BN	883-0203	\$22.63	--	--	
7/32"	5/8"	.250"	2.50"	882-0219	13013BN	883-0219	\$22.63	882-E-0219	883-E-0219	\$29.22
15/64"	5/8"	.250"	2.50"	882-0234	13014BN	883-0234	\$22.63	--	--	
1/4"	3/4"	.250"	2.50"	882-0250	13015BN	883-0250	\$22.63	882-E-0250	883-E-0250	\$29.22
5/16"	13/16"	.3125"	2.50"	882-0312	13019BN	883-0312	\$31.85	--	--	
3/8"	1"	.375"	2.50"	882-0375	13023BN	883-0375	\$36.25	--	--	
1/2"	1"	.500"	3.00"	882-0500	--	883-0500	\$74.37	--	883-E-0500	\$89.12

### STUB



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED			ALTiN COATED	
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	PRICE
1/32"	1/16"	.125"	1.50"	876-0031	880-0031	\$20.02	--	
3/64"	1/16"	.125"	1.50"	876-0046	880-0046	\$18.85	--	
1/16"	1/8"	.125"	1.50"	876-0062	880-0062	\$18.42	--	
3/32"	3/16"	.125"	1.50"	876-0093	880-0093	\$18.42	--	
1/8"	1/4"	.125"	1.50"	876-0125	880-0125	\$18.90	876-E-0125	\$23.28
5/32"	3/8"	.1875"	2.00"	876-0156	880-0156	\$20.11	876-E-0156	\$30.03
3/16"	3/8"	.1875"	2.00"	876-0187	880-0187	\$20.11	876-E-0187	\$24.82
1/4"	1/2"	.250"	2.00"	876-0250	880-0250	\$22.63	876-E-0250	\$29.22

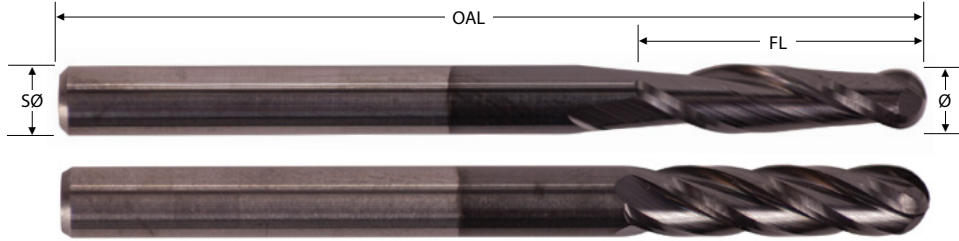


# BALL END, STANDARD & STUB

## FRACTIONAL 1/32" - 1/2"

- ALTiN/ TIALN coatings for high performance applications
- Amorphous Diamond Coating for Graphites/ Composite Materials

### STANDARD



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIALN COATED				AMORPHOUS DIAMOND		
				2 FLUTE	3 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/32"	3/32"	.125"	1.50"	882-C-0031	13001BN-C	883-C-0031	\$24.32	AD12001BN	AD14001BN	\$31.27
3/64"	9/64"	.125"	1.50"	882-C-0046	13002BN-C	883-C-0046	\$23.13	AD12002BN	AD14002BN	\$30.10
1/16"	3/16"	.125"	1.50"	882-C-0062	13003BN-C	883-C-0062	\$22.71	AD12003BN	AD14003BN	\$29.67
5/64"	3/16"	.125"	1.50"	882-C-0078	13004BN-C	883-C-0078	\$22.71	AD12004BN	AD14004BN	\$29.67
3/32"	3/8"	.125"	1.50"	882-C-0093	13005BN-C	883-C-0093	\$22.71	AD12005BN	AD14005BN	\$29.67
7/64"	7/16"	.125"	1.50"	--	--	--		AD12006BN	AD14006BN	\$30.43
1/8"	1/2"	.125"	1.50"	882-C-0125	13007BN-C	883-C-0125	\$23.28	AD12007BN	AD14007BN	\$30.43
9/64"	1/2"	.1875"	2.00"	--	--	--		AD12008BN	AD14008BN	\$36.04
5/32"	9/16"	.1875"	2.00"	--	--	--		AD12009BN	AD14009BN	\$36.04
3/16"	5/8"	.1875"	2.00"	--	--	--		AD12011BN	AD14011BN	\$36.04
1/4"	3/4"	.250"	2.50"	--	--	--		AD12015BN	AD14015BN	\$40.75
3/8"	1"	.375"	2.50"	--	--	--		AD12023BN	AD14023BN	\$71.41
1/2"	1"	.500"	3.00"	--	--	--		AD12031BN	AD14031BN	\$115.88

### STUB



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIALN COATED			AMORPHOUS DIAMOND		
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/32"	1/16"	.125"	1.50"	876-C-0031	880-C-0031	\$24.32	--	--	
3/64"	1/16"	.125"	1.50"	876-C-0046	880-C-0046	\$23.13	--	--	
1/16"	1/8"	.125"	1.50"	876-C-0062	880-C-0062	\$22.71	--	--	
3/32"	3/16"	.125"	1.50"	876-C-0093	880-C-0093	\$22.71	--	--	
1/8"	1/4"	.125"	1.50"	876-C-0125	880-C-0125	\$23.28	876-A-0125	880-A-0125	\$30.43
3/16"	3/8"	.1875"	2.00"	--	--		876-A-0187	880-A-0187	\$36.04
1/4"	1/2"	.250"	2.00"	--	--		876-A-0250	880-A-0250	\$40.75

**NEW!**



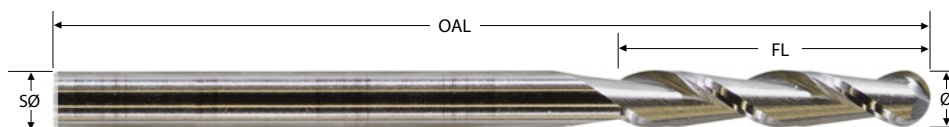
# BALL END, LONG FLUTE

## FRACTIONAL 1/8"-1/2"

- Use: General Purpose
- Hand: RHS/ RHC
- Helix: 30 Degrees
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +0.000/ -.002



### 2 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/8"	.750"	.125"	2.25"	16301	\$20.06
1/8"	1.000"	.125"	3.00"	16302	\$22.43
3/16"	.750"	.1875"	2.50"	16303	\$23.54
3/16"	1.125"	.1875"	3.00"	16304	\$25.43
1/4"	1.125"	.250"	3.00"	16305	\$33.68
1/4"	1.000"	.250"	4.00"	16306	\$35.50
1/4"	1.500"	.250"	4.00"	16307	\$34.46
1/4"	1.500"	.250"	6.00"	16308	\$46.58
5/16"	1.125"	.3125"	3.00"	16309	\$38.00
5/16"	1.625"	.3125"	4.00"	16310	\$46.97
3/8"	1.125"	.375"	3.00"	16311	\$43.59
3/8"	1.000"	.375"	4.00"	16312	\$50.90
3/8"	1.750"	.375"	4.00"	16313	\$53.34
3/8"	1.500"	.375"	6.00"	16314	\$80.76
1/2"	2.000"	.500"	4.00"	16318	\$78.79

# BALL END, LONG FLUTE

## FRACTIONAL 1/64"-1/2"

- Hand: RHS/ RHC
- Helix: 35 Degrees
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Amorphous Diamond for Graphites, Composites
- Diameter Tolerance: +0.000/ -.001

CARBIDE



### 3 FLUTE G MILLS



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
1/64"	.078"	.125"	2.50"	3-0156B	\$35.48	3-0156B-E	\$41.94	AD3-0156B	\$47.01
1/32"	.156"	.125"	2.50"	3-0312B	\$27.90	3-0312B-E	\$32.30	AD3-0312B	\$39.44
3/64"	.250"	.125"	2.50"	3-0469B	\$27.12	3-0469B-E	\$33.59	AD3-0469B	\$38.68
1/16"	.500"	.125"	2.50"	3-0625B	\$27.79	3-0625B-E	\$34.26	AD3-0625B	\$39.33
5/64"	.500"	.125"	2.50"	3-0781B	\$24.82	3-0781B-E	\$29.22	AD3-0781B	\$36.36
3/32"	.750"	.125"	2.50"	3-0938B	\$27.79	3-0938B-E	\$32.19	AD3-0938B	\$39.33
1/8"	1.000"	.125"	3.00"	3-1250B	\$25.38	3-1250B-E	\$29.77	AD3-1250B	\$36.91

### 4 FLUTE

- Helix: 30 Degrees
- Diameter Tolerance: +0.000/ -.002



**NEW!**

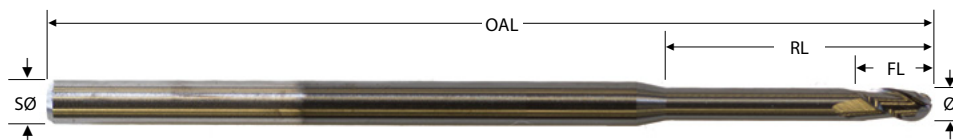
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTiN COATED		AMORPHOUS DIAMOND	
				4 FLUTE	PRICE	4 FLUTE	PRICE	4 FLUTE	PRICE
1/8"	.750"	.125"	2.25"	17301	\$23.87	--		--	
1/8"	1.000"	.125"	3.00"	17302	\$26.70	--		--	
3/16"	.750"	.1875"	2.50"	17303	\$27.47	--		--	
3/16"	1.125"	.1875"	3.00"	17304	\$27.12	17304-E	\$31.86	AD4-1875B	\$43.05
1/4"	1.125"	.250"	3.00"	17305	\$38.60	--		--	
1/4"	1.000"	.250"	4.00"	17306	\$42.59	--		--	
1/4"	1.500"	.250"	4.00"	17307	\$30.54	17307-E	\$38.23	AD4-2500B	\$48.67
1/4"	1.500"	.250"	6.00"	17308	\$47.69	--		--	
5/16"	1.125"	.3125"	3.00"	17309	\$45.37	--		--	
5/16"	1.625"	.3125"	4.00"	17310	\$41.74	17310-E	\$49.44	AD17310	\$76.62
3/8"	1.125"	.375"	3.00"	17311	\$52.34	--		--	
3/8"	1.000"	.375"	4.00"	17312	\$64.14	--		--	
3/8"	1.750"	.375"	4.00"	17313	\$52.62	17313-E	\$61.41	AD17313	\$87.50
3/8"	1.500"	.375"	6.00"	17314	\$85.96	--		--	
1/2"	2.000"	.500"	4.00"	17318	\$65.15	17318-E	\$77.24	--	

# BALL END, LONG REACH G MILLS

## FRACTIONAL 1/64" - 1/4"

- Helix: 35 Degrees
- Center Cutting: Yes
- Amorphous Diamond for Graphites/ Composite Materials

### STUB, LONG REACH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	REACH LENGTH (X DIAMETER) (RL)	UNCOATED		AMORPHOUS DIAMOND	
					3 FLUTE	PRICE	3 FLUTE	PRICE
1/32"	1/16"	.125"	2.50"	.250" (8X)	3-0312RSB	\$30.47	AD3-0312RSB	\$47.90
1/32"	1/16"	.125"	2.50"	.375" (12X)	--		AD3-0312XRSB	\$48.99
1/32"	1/16"	.125"	2.50"	.500" (16X)	--		AD3-0312XLRSB	\$54.27
1/16"	1/8"	.125"	2.50"	.500" (8X)	3-0625RSB	\$39.88	AD3-0625RSB	\$47.01
1/16"	1/8"	.125"	2.50"	.750" (12X)	--		AD3-0625XRSB	\$48.01
1/16"	1/8"	.125"	2.50"	1.00" (16X)	--		AD3-0625XLRSB	\$52.07
3/32"	3/16"	.125"	2.50"	.750" (8X)	3-0938RSB	\$30.47	AD3-0938RSB	\$47.01
3/32"	3/16"	.125"	2.50"	1.00" (11X)	--		AD3-0938XRSB	\$55.95
3/32"	3/16"	.125"	2.50"	1.25" (13X)	--		AD3-0938XLRSB	\$62.31

### LONG FLUTE, LONG REACH



DIAMETER (Ø)	FLUTE LENGTH (X DIAMETER) (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (X DIAMETER) (RL)	AMORPHOUS DIAMOND	
					3 FLUTE	PRICE
1/64"	5/64" (5X)	.125"	2.50"	.150" (10X)	AD3-0156XRB	\$61.76
1/64"	5/64" (5X)	.125"	2.50"	.250" (16X)	AD3-0156XLRB	\$73.23
1/32"	5/32" (5X)	.125"	2.50"	.250" (12X)	AD3-0312XRB	\$50.29
1/32"	5/32" (5X)	.125"	2.50"	.375" (16X)	AD3-0312XLRB	\$55.95
3/64"	1/4" (5X)	.125"	2.50"	.375" (8X)	AD3-0469XRB	\$50.29
3/64"	1/4" (5X)	.125"	2.50"	.500" (11X)	AD3-0469XLRB	\$55.95
1/16"	1/2" (8X)	.125"	2.50"	.750" (12X)	AD3-0625XRB	\$50.29
1/16"	1/2" (8X)	.125"	2.50"	1.00" (16X)	AD3-0625XLRB	\$55.95
5/64"	1/2" (6X)	.125"	2.50"	.750" (10X)	AD3-0781XRB	\$50.29
5/64"	1/2" (6X)	.125"	2.50"	1.00" (13X)	AD3-0781XLRB	\$55.95
3/32"	3/4" (8X)	.125"	2.50"	1.00" (11X)	AD3-0938XRB	\$50.29
3/32"	3/4" (8X)	.125"	2.50"	1.25" (13X)	AD3-0938XLRB	\$55.95
1/8"	1" (8X)	.125"	3.00"	1.25" (10X)	AD3-1250XRB	\$50.29
1/8"	1" (8X)	.125"	3.00"	1.50" (12X)	AD3-1250XLRB	\$55.95
(Ø)	(FL)	(SØ)	(OAL)	(RL)	4 FLUTE	PRICE
3/16"	1-1/8" (6X)	.1875"	3.00"	1.50" (8X)	AD4-1875XRB	\$55.59
3/16"	1-1/8" (6X)	.1875"	3.00"	1.75" (9X)	AD4-1875XLRB	\$67.40
1/4"	1-1/2" (6X)	.250"	4.00"	2.00" (8X)	AD4-2500XRB	\$74.49
1/4"	1-1/2" (6X)	.250"	4.00"	2.50" (10X)	AD4-2500XLRB	\$83.42

# CORNER RADIUS, STANDARD & STUB

## FRACTIONAL 1/32" - 3/8"

- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- ALTiN for High Performance
- Diameter Tolerance: 1/32" to 1/4": +0.000/ -.002  
5/16" to 3/8": +0.000/ -.003

### STANDARD



NEW!

NEW!

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	CORNER RADIUS	UNCOATED			ALTiN COATED		AMORPHOUS DIAMOND	
					2 FLUTE	4 FLUTE	PRICE	4 FLUTE	PRICE	4 FLUTE	PRICE
1/8"	1/2"	.125"	1.50"	.010"	12007CR.010	14007CR.010	\$20.33	14007-E-CR.010	\$24.73	AD14007CR.010	\$31.86
1/8"	1/2"	.125"	1.50"	.015"	12007CR.015	14007CR.015	\$20.33	14007-E-CR.015	\$24.73	AD14007CR.015	\$31.86
1/8"	1/2"	.125"	1.50"	.020"	12007CR.020	14007CR.020	\$20.33	14007-E-CR.020	\$24.73	AD14007CR.020	\$31.86
3/16"	5/8"	.1875"	2.00"	.010"	12011CR.010	14011CR.010	\$22.75	14011-E-CR.010	\$27.15	AD14011CR.010	\$38.68
3/16"	5/8"	.1875"	2.00"	.015"	12011CR.015	14011CR.015	\$22.75	14011-E-CR.015	\$28.25	AD14011CR.015	\$38.68
3/16"	5/8"	.1875"	2.00"	.030"	12011CR.030	14011CR.030	\$22.75	14011-E-CR.030	\$29.36	AD14011CR.030	\$38.68
1/4"	3/4"	.250"	2.50"	.015"	12015CR.015	14015CR.015	\$27.68	14015-E-CR.015	\$35.41	AD14015CR.015	\$45.82
1/4"	3/4"	.250"	2.50"	.020"	12015CR.020	14015CR.020	\$27.68	14015-E-CR.020	\$36.48	AD14015CR.020	\$45.82
1/4"	3/4"	.250"	2.50"	.030"	12015CR.030	14015CR.030	\$27.68	14015-E-CR.030	\$36.48	AD14015CR.030	\$45.82
1/4"	3/4"	.250"	2.50"	.045"	12015CR.045	14015CR.045	\$27.68	14015-E-CR.045	\$36.48	AD14015CR.045	\$45.82
1/4"	3/4"	.250"	2.50"	.060"	12015CR.060	14015CR.060	\$27.68	14015-E-CR.060	\$36.48	AD14015CR.060	\$45.82
5/16"	13/16"	.3125"	2.50"	.015"	12019CR.015	14019CR.015	\$34.94	--		--	
5/16"	13/16"	.3125"	2.50"	.020"	12019CR.020	14019CR.020	\$34.94	--		--	
5/16"	13/16"	.3125"	2.50"	.030"	12019CR.030	14019CR.030	\$34.94	14019-E-CR.030	\$43.73	--	
5/16"	13/16"	.3125"	2.50"	.045"	12019CR.045	14019CR.045	\$34.94	14019-E-CR.045	\$43.73	--	
5/16"	13/16"	.3125"	2.50"	.060"	12019CR.060	14019CR.060	\$34.94	14019-E-CR.060	\$43.73	--	
3/8"	1"	.375"	2.50"	.015"	12023CR.015	14023CR.015	\$42.18	--		--	
3/8"	1"	.375"	2.50"	.030"	12023CR.030	14023CR.030	\$42.18	14023-E-CR.030	\$50.98	AD14023CR.030	\$62.87
3/8"	1"	.375"	2.50"	.045"	12023CR.045	14023CR.045	\$42.18	14023-E-CR.045	\$50.98	--	
3/8"	1"	.375"	2.50"	.060"	12023CR.060	14023CR.060	\$42.18	14023-E-CR.060	\$50.98	AD14023CR.060	\$62.87

### HARD MILL, STUB

- Helix: 18 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- Use: Tool Steels/ High Rc
- Rake Angle: Neutral
- Diameter Tolerance: +0.000 /-.001



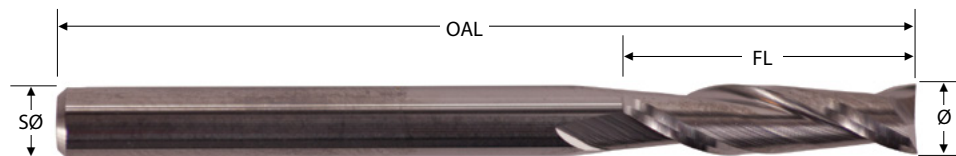
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	CORNER RADIUS	HARD MILL COATED	
					4 FLUTE	PRICE
1/32"	1/16"	.125"	1.50"	.003"	879HM-0031	\$53.24
3/64"	1/16"	.125"	1.50"	.005"	879HM-0046	\$53.24
1/16"	1/8"	.125"	1.50"	.006"	879HM-0062	\$53.24
5/64"	1/8"	.125"	1.50"	.008"	879HM-0078	\$53.24
3/32"	3/16"	.125"	1.50"	.009"	879HM-0093	\$53.24
1/8"	1/4"	.125"	1.50"	.013"	879HM-0125	\$61.69
3/16"	3/8"	.1875"	2.00"	.019"	879HM-0187	\$61.69
1/4"	1/2"	.250"	2.50"	.025"	879HM-0250	\$61.69



# SQUARE END, STANDARD

## METRIC .5 mm - 12 mm

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +0/ -.05 mm



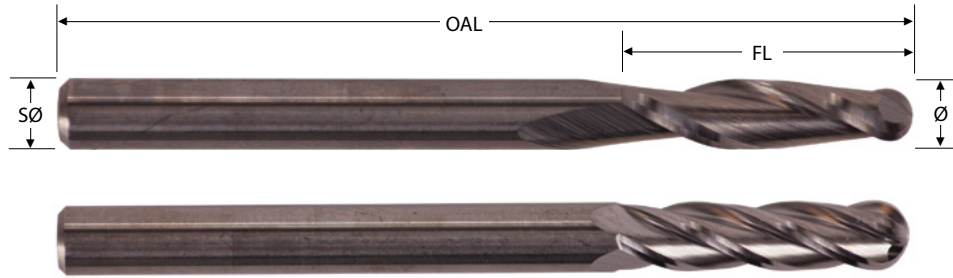
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED		
				2 FLUTE	4 FLUTE	PRICE
.50 mm	1.5 mm	3 mm	38 mm	41001	43001	\$14.96
1.0 mm	3 mm	3 mm	38 mm	41002	43002	\$13.57
1.5 mm	4.5 mm	3 mm	38 mm	41003	43003	\$12.85
2.0 mm	6 mm	3 mm	38 mm	41004	43004	\$11.91
2.5 mm	8 mm	3 mm	38 mm	41005	43005	\$11.91
3.0 mm	10 mm	3 mm	38 mm	41006	43006	\$11.91
3.5 mm	12 mm	4 mm	50 mm	41007	43007	\$15.56
4.0 mm	12 mm	4 mm	50 mm	41008	43008	\$15.56
4.5 mm	14 mm	5 mm	50 mm	41009	43009	\$19.67
5.0 mm	15 mm	5 mm	50 mm	41010	43010	\$19.67
6 mm	18 mm	6 mm	63 mm	41011	43011	\$19.67
7 mm	20 mm	8 mm	63 mm	41012	43012	\$20.88
8 mm	20 mm	8 mm	63 mm	41013	43013	\$20.88
9 mm	22 mm	10 mm	63 mm	41014	43014	\$34.56
10 mm	22 mm	10 mm	63 mm	41015	43015	\$34.56
12 mm	25 mm	12 mm	75 mm	41016	43016	\$49.96



# BALL END, STANDARD

## METRIC .5 mm - 12 mm

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +0/ -.05 mm



CARBIDE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED		
				2 FLUTE	4 FLUTE	PRICE
.50 mm	1.5 mm	3 mm	38 mm	42001	44001	\$19.27
1.0 mm	3 mm	3 mm	38 mm	42002	44002	\$19.27
1.5 mm	4.5 mm	3 mm	38 mm	42003	44003	\$19.27
2.0 mm	6 mm	3 mm	38 mm	42004	44004	\$16.95
2.5 mm	8 mm	3 mm	38 mm	42005	44005	\$16.95
3.0 mm	10 mm	3 mm	38 mm	42006	44006	\$16.95
3.5 mm	12 mm	4 mm	50 mm	42007	44007	\$22.10
4.0 mm	12 mm	4 mm	50 mm	42008	44008	\$22.10
4.5 mm	14 mm	5 mm	50 mm	42009	44009	\$27.97
5.0 mm	15 mm	5 mm	50 mm	42010	44010	\$27.97
6 mm	18 mm	6 mm	63 mm	42011	44011	\$27.97
7 mm	20 mm	8 mm	63 mm	42012	44012	\$29.74
8 mm	20 mm	8 mm	63 mm	42013	44013	\$29.74
9 mm	22 mm	10 mm	63 mm	42014	44014	\$49.08
10 mm	22 mm	10 mm	63 mm	42015	44015	\$49.08
12 mm	25 mm	12 mm	75 mm	42016	44016	\$70.84

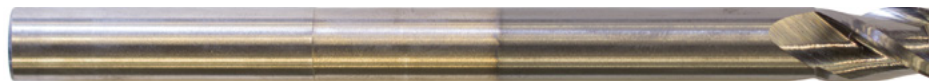
# SQUARE END G MILLS

## METRIC .4 mm - 12 mm

- Helix: 35 Degrees
- Diameter Tolerance:  $+.000"/-0.001"$
- Amorphous Diamond Coated "G" Mills are specifically designed for machining graphite electrodes.
- "G" Mills have been shown to be a cost effective solution in producing graphite electrodes by lowering tooling costs and improving productivity.



### STUB, 8X REACH LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (RL)	AMORPHOUS DIAMOND	
					3 FLUTE	PRICE
.40 mm	.60 mm	3 mm	75 mm	3.2 mm	61001	\$56.66
.50 mm	.75 mm	3 mm	75 mm	4 mm	61002	\$56.66
.60 mm	.90 mm	3 mm	75 mm	4.8 mm	61003	\$56.66
.80 mm	1.2 mm	3 mm	75 mm	6.4 mm	61004	\$45.20
1 mm	1.5 mm	3 mm	75 mm	8 mm	61005	\$45.20
1.5 mm	2.25 mm	3 mm	75 mm	12 mm	61006	\$45.20
2 mm	3 mm	3 mm	75 mm	16 mm	61007	\$45.20
2.5 mm	3.75 mm	3 mm	75 mm	20 mm	61008	\$45.20
3 mm	4.5 mm	3 mm	75 mm	24 mm	61009	\$45.20
4 mm	6 mm	4 mm	75 mm	32 mm	61010	\$49.02
6 mm	9 mm	6 mm	100 mm	48 mm	61011	\$66.24
8 mm	12 mm	8 mm	100 mm	64 mm	61012	\$95.54
10 mm	15 mm	10 mm	120 mm	80 mm	61013	\$139.13
12 mm	18 mm	12 mm	150 mm	96 mm	61014	\$165.61

### 5X FLUTE LENGTH, 10X REACH LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (RL)	AMORPHOUS DIAMOND	
					3 FLUTE	PRICE
.40 mm	2 mm	3 mm	75 mm	4 mm	51001	\$49.02
.50 mm	2.5 mm	3 mm	75 mm	5 mm	51002	\$49.02
.60 mm	3 mm	3 mm	75 mm	6 mm	51003	\$49.02
.80 mm	4 mm	3 mm	75 mm	8 mm	51004	\$39.16
1 mm	5 mm	3 mm	75 mm	10 mm	51005	\$39.16
1.2 mm	6 mm	3 mm	75 mm	12 mm	51006	\$39.16
1.5 mm	7.5 mm	3 mm	75 mm	15 mm	51007	\$39.16
2 mm	10 mm	3 mm	75 mm	20 mm	51008	\$39.16
2.5 mm	12.5 mm	3 mm	75 mm	25 mm	51009	\$39.16
3 mm	15 mm	3 mm	75 mm	30 mm	51010	\$39.16
4 mm	20 mm	4 mm	75 mm	40 mm	51011	\$42.65
6 mm	30 mm	6 mm	100 mm	60 mm	51012	\$57.60
8 mm	40 mm	8 mm	100 mm	70 mm	51013	\$82.81
10 mm	50 mm	10 mm	120 mm	80 mm	51014	\$125.45
12 mm	60 mm	12 mm	150 mm	85 mm	51015	\$152.87

# BALL END G MILLS

## METRIC .4 mm - 12 mm

· Helix: 35 Degrees

· Diameter Tolerance: +.000”/- .001”

### STUB, 8X REACH LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (RL)	AMORPHOUS DIAMOND	
					3 FLUTE	PRICE
.40 mm	.60 mm	3 mm	75 mm	3.2 mm	62001	\$63.70
.50 mm	.75 mm	3 mm	75 mm	4 mm	62002	\$63.70
.60 mm	.90 mm	3 mm	75 mm	4.8 mm	62003	\$63.70
.80 mm	1.2 mm	3 mm	75 mm	6.4 mm	62004	\$47.75
1 mm	1.5 mm	3 mm	75 mm	8 mm	62005	\$47.75
1.5 mm	2.25 mm	3 mm	75 mm	12 mm	62006	\$47.75
2 mm	3 mm	3 mm	75 mm	16 mm	62007	\$47.75
2.5 mm	3.75 mm	3 mm	75 mm	20 mm	62008	\$47.75
3 mm	4.5 mm	3 mm	75 mm	24 mm	62009	\$47.75
4 mm	6 mm	4 mm	75 mm	32 mm	62010	\$53.17
6 mm	9 mm	6 mm	100 mm	48 mm	62011	\$71.95
8 mm	12 mm	8 mm	100 mm	64 mm	62012	\$102.85
10 mm	15 mm	10 mm	120 mm	80 mm	62013	\$146.50
12 mm	18 mm	12 mm	150 mm	96 mm	62014	\$184.72

### 5X FLUTE LENGTH, 10X REACH LENGTH



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	REACH LENGTH (RL)	AMORPHOUS DIAMOND	
					3 FLUTE	PRICE
.40 mm	2 mm	3 mm	75 mm	4 mm	52001	\$56.05
.50 mm	2.5 mm	3 mm	75 mm	5 mm	52002	\$56.05
.60 mm	3 mm	3 mm	75 mm	6 mm	52003	\$56.05
.80 mm	4 mm	3 mm	75 mm	8 mm	52004	\$41.93
1 mm	5 mm	3 mm	75 mm	10 mm	52005	\$41.93
1.2 mm	6 mm	3 mm	75 mm	12 mm	52006	\$41.93
1.5 mm	7.5 mm	3 mm	75 mm	15 mm	52007	\$41.93
2 mm	10 mm	3 mm	75 mm	20 mm	52008	\$41.93
2.5 mm	12.5 mm	3 mm	75 mm	25 mm	52009	\$41.93
3 mm	15 mm	3 mm	75 mm	30 mm	52010	\$41.93
4 mm	20 mm	4 mm	75 mm	40 mm	52011	\$46.47
6 mm	30 mm	6 mm	100 mm	60 mm	52012	\$63.04
8 mm	40 mm	8 mm	100 mm	70 mm	52013	\$96.21
10 mm	50 mm	10 mm	120 mm	80 mm	52014	\$140.14
12 mm	60 mm	12 mm	150 mm	85 mm	52015	\$171.98

# BALL TAPERED RIB CUTTERS

**NEW!**

## DECIMAL .020" - .060"

- Use: Precision Finishing of Ferrous Materials
- Designed with a Long Flute design for Deep Cavity Machining of a variety of Materials
- TIALN Nano Coating for Higher Performance, Extended Tool Life, and Improved Chip Flow
- Diameter Tolerance: +0/-.001

### LONG FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	TAPER	UNCOATED		TIALN NANO COATED	
					4 FLUTE	PRICE	4 FLUTE	PRICE
.020"	.140"	.1875"	3.00"	0°	733XB-000G-020F	\$62.34	733XB-F-000G-020F	\$68.54
.030"	.210"	.1875"	3.00"	0°	733XB-000G-030F	\$58.11	733XB-F-000G-030F	\$64.83
.040"	.280"	.1875"	3.00"	0°	733XB-000G-040F	\$59.24	733XB-F-000G-040F	\$65.96
.050"	.350"	.1875"	3.00"	0°	733XB-000G-050F	\$59.24	733XB-F-000G-050F	\$65.96
.060"	.420"	.1875"	3.00"	0°	733XB-000G-060F	\$58.11	733XB-F-000G-060F	\$64.83
.020"	.140"	.1875"	3.00"	.5°	735XB-005G-020F	\$62.34	735XB-F-005G-020F	\$68.54
.030"	.210"	.1875"	3.00"	.5°	735XB-005G-030F	\$58.11	735XB-F-005G-030F	\$64.83
.040"	.280"	.1875"	3.00"	.5°	735XB-005G-040F	\$59.24	735XB-F-005G-040F	\$65.96
.050"	.350"	.1875"	3.00"	.5°	735XB-005G-050F	\$59.24	735XB-F-005G-050F	\$65.96
.060"	.420"	.1875"	3.00"	.5°	735XB-005G-060F	\$58.11	735XB-F-005G-060F	\$64.83
.020"	.140"	.1875"	3.00"	1°	735XB-010G-020F	\$62.34	735XB-F-010G-020F	\$68.54
.030"	.210"	.1875"	3.00"	1°	735XB-010G-030F	\$58.11	735XB-F-010G-030F	\$64.83
.040"	.280"	.1875"	3.00"	1°	735XB-010G-040F	\$59.24	735XB-F-010G-040F	\$65.96
.050"	.350"	.1875"	3.00"	1°	735XB-010G-050F	\$59.24	735XB-F-010G-050F	\$65.96
.060"	.420"	.1875"	3.00"	1°	735XB-010G-060F	\$58.11	735XB-F-010G-060F	\$64.83

### EXTRA LONG FLUTE

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	TAPER	UNCOATED		TIALN NANO COATED	
					4 FLUTE	PRICE	4 FLUTE	PRICE
.020"	.280"	.1875"	3.00"	0°	733XB-000O-020F	\$58.11	733XB-F-000O-020F	\$68.54
.030"	.410"	.1875"	3.00"	0°	733XB-000O-030F	\$59.24	733XB-F-000O-030F	\$64.83
.040"	.560"	.1875"	3.00"	0°	733XB-000O-040F	\$59.24	733XB-F-000O-040F	\$65.96
.050"	.700"	.1875"	3.00"	0°	733XB-000O-050F	\$58.11	733XB-F-000O-050F	\$65.96
.060"	.840"	.1875"	3.00"	0°	733XB-000O-060F	\$58.11	733XB-F-000O-060F	\$64.83
.020"	.280"	.1875"	3.00"	.5°	735XB-005O-020F	\$59.24	735XB-F-005O-020F	\$68.54
.030"	.410"	.1875"	3.00"	.5°	735XB-005O-030F	\$59.24	735XB-F-005O-030F	\$64.83
.040"	.560"	.1875"	3.00"	.5°	735XB-005O-040F	\$58.11	735XB-F-005O-040F	\$65.96
.050"	.700"	.1875"	3.00"	.5°	735XB-005O-050F	\$58.11	735XB-F-005O-050F	\$65.96
.060"	.840"	.1875"	3.00"	.5°	735XB-005O-060F	\$59.24	735XB-F-005O-060F	\$64.83
.020"	.280"	.1875"	3.00"	1°	735XB-010O-020F	\$59.24	735XB-F-010O-020F	\$68.54
.030"	.410"	.1875"	3.00"	1°	735XB-010O-030F	\$58.11	735XB-F-010O-030F	\$64.83
.040"	.560"	.1875"	3.00"	1°	735XB-010O-040F	\$59.24	735XB-F-010O-040F	\$65.96
.050"	.700"	.1875"	3.00"	1°	735XB-010O-050F	\$59.24	735XB-F-010O-050F	\$65.96
.060"	.840"	.1875"	3.00"	1°	735XB-010O-060F	\$58.11	735XB-F-010O-060F	\$64.83

# CORNER RADIUS TAPERED RIB CUTTERS

## DECIMAL .030"-.060"

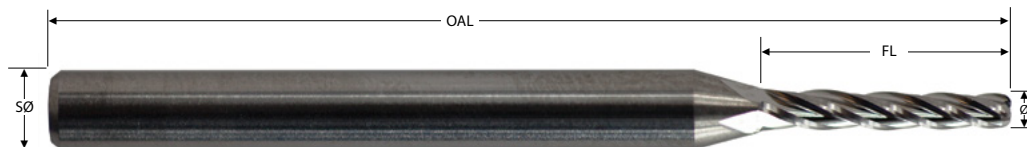
**NEW!**

**CARBIDE**

· .010" Corner Radius

· Diameter Tolerance: +0/-.001

### LONG FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TAPER	UNCOATED 4 FLUTE		TIALN NANO COATED 4 FLUTE	
					.010" CR	PRICE	.010" CR	PRICE
.030"	.210"	.1875"	3.00"	0°	732XCR10-000G-030F	\$58.11	732XCR10-F-000G-030F	\$64.83
.040"	.280"	.1875"	3.00"	0°	732XCR10-000G-040F	\$59.24	732XCR10-F-000G-040F	\$65.96
.050"	.350"	.1875"	3.00"	0°	732XCR10-000G-050F	\$59.24	732XCR10-F-000G-050F	\$65.96
.060"	.420"	.1875"	3.00"	0°	732XCR10-000G-060F	\$58.11	732XCR10-F-000G-060F	\$64.83
.030"	.210"	.1875"	3.00"	.5°	734XCR10-005G-030F	\$58.11	734XCR10-F-005G-030F	\$64.83
.040"	.280"	.1875"	3.00"	.5°	734XCR10-005G-040F	\$59.24	734XCR10-F-005G-040F	\$65.96
.050"	.350"	.1875"	3.00"	.5°	734XCR10-005G-050F	\$59.24	734XCR10-F-005G-050F	\$65.96
.060"	.420"	.1875"	3.00"	.5°	734XCR10-005G-060F	\$58.11	734XCR10-F-005G-060F	\$64.83
.030"	.210"	.1875"	3.00"	1°	734XCR10-010G-030F	\$58.11	734XCR10-F-010G-030F	\$64.83
.040"	.280"	.1875"	3.00"	1°	734XCR10-010G-040F	\$59.24	734XCR10-F-010G-040F	\$65.96
.050"	.350"	.1875"	3.00"	1°	734XCR10-010G-050F	\$59.24	734XCR10-F-010G-050F	\$65.96
.060"	.420"	.1875"	3.00"	1°	734XCR10-010G-060F	\$58.11	734XCR10-F-010G-060F	\$64.83

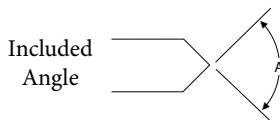
### EXTRA LONG FLUTE

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TAPER	UNCOATED 4 FLUTE		TIALN NANO COATED 4 FLUTE	
					.010" CR	PRICE	.010" CR	PRICE
.030"	.410"	.1875"	3.00"	0°	732XCR10-000O-030F	\$58.11	732XCR10-F-000O-030F	\$64.83
.040"	.560"	.1875"	3.00"	0°	732XCR10-000O-040F	\$59.24	732XCR10-F-000O-040F	\$65.96
.050"	.700"	.1875"	3.00"	0°	732XCR10-000O-050F	\$59.24	732XCR10-F-000O-050F	\$65.96
.060"	.840"	.1875"	3.00"	0°	732XCR10-000O-060F	\$58.11	732XCR10-F-000O-060F	\$64.83
.030"	.410"	.1875"	3.00"	.5°	734XCR10-005O-030F	\$58.11	734XCR10-F-005O-030F	\$64.83
.040"	.560"	.1875"	3.00"	.5°	734XCR10-005O-040F	\$59.24	734XCR10-F-005O-040F	\$65.96
.050"	.700"	.1875"	3.00"	.5°	734XCR10-005O-050F	\$59.24	734XCR10-F-005O-050F	\$65.96
.060"	.840"	.1875"	3.00"	.5°	734XCR10-005O-060F	\$58.11	734XCR10-F-005O-060F	\$64.83
.030"	.410"	.1875"	3.00"	1°	734XCR10-010O-030F	\$58.11	734XCR10-F-010O-030F	\$64.83
.040"	.560"	.1875"	3.00"	1°	734XCR10-010O-040F	\$59.24	734XCR10-F-010O-040F	\$65.96
.050"	.700"	.1875"	3.00"	1°	734XCR10-010O-050F	\$59.24	734XCR10-F-010O-050F	\$65.96
.060"	.840"	.1875"	3.00"	1°	734XCR10-010O-060F	\$58.11	734XCR10-F-010O-060F	\$64.83

# 82 - 100 DEG. NC SPOT DRILLS

## DECIMAL .005" - .125"

- Ground only on CNC equipment utilizing the latest in grinding wheel technology, our solid carbide NC Spotting Drill will outperform HSS and Cobalt.
- Tight tolerances applied to short overall lengths with short flute design translate to greater rigidity and strength for the end user.



**NEW!**

DRILL DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	ANGLE (A)	UNCOATED		ALTIM COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE
.030"	.090"	.125"	1.50"	82°	701-0300.82	\$23.84	701-E-0300.82	\$28.23
.060"	.180"	.125"	1.50"	82°	701-0600.82	\$21.43	701-E-0600.82	\$25.83
.125"	.375"	.125"	1.50"	82°	701-1250.82	\$19.33	701-E-1250.82	\$23.73
.005"	.025"	.125"	1.50"	90°	701-0050.90	\$37.24	701-E-0050.90	\$41.64
.010"	.035"	.125"	1.50"	90°	701-0100.90	\$29.76	701-E-0100.90	\$34.17
.015"	.045"	.125"	1.50"	90°	701-0150.90	\$29.76	701-E-0150.90	\$34.17
.020"	.050"	.125"	1.50"	90°	701-0200.90	\$25.49	701-E-0200.90	\$29.89
.025"	.075"	.125"	1.50"	90°	701-0250.90	\$25.49	701-E-0250.90	\$29.89
.030"	.090"	.125"	1.50"	90°	701-0300.90	\$23.84	701-E-0300.90	\$28.23
.0312"	.090"	.125"	1.50"	90°	701-0312.90	\$23.84	701-E-0312.90	\$28.23
.040"	.120"	.125"	1.50"	90°	701-0400.90	\$21.65	701-E-0400.90	\$26.05
.045"	.135"	.125"	1.50"	90°	701-0450.90	\$21.65	701-E-0450.90	\$26.05
.047"	.141"	.125"	1.50"	90°	701-0470.90	\$21.65	701-E-0470.90	\$26.05
.050"	.150"	.125"	1.50"	90°	701-0500.90	\$21.65	701-E-0500.90	\$26.05
.060"	.180"	.125"	1.50"	90°	701-0600.90	\$21.43	701-E-0600.90	\$25.83
.0625"	.200"	.125"	1.50"	90°	701-0625.90	\$21.43	701-E-0625.90	\$25.83
.078"	.234"	.125"	1.50"	90°	701-0780.90	\$21.43	701-E-0780.90	\$25.83
.090"	.270"	.125"	1.50"	90°	701-0900.90	\$20.33	701-E-0900.90	\$24.73
.093"	.279"	.125"	1.50"	90°	701-0930.90	\$20.33	701-E-0930.90	\$24.73
.100"	.300"	.125"	1.50"	90°	701-1000.90	\$20.33	701-E-1000.90	\$24.73
.118"	.354"	.125"	1.50"	90°	701-1180.90	\$20.33	701-E-1180.90	\$24.73
.125"	.375"	.125"	1.50"	90°	701-1250.90	\$19.33	701-E-1250.90	\$23.73
.030"	.090"	.125"	1.50"	100°	701-0300.100	\$23.84	701-E-0300.100	\$28.23
.060"	.180"	.125"	1.50"	100°	701-0600.100	\$21.43	701-E-0600.100	\$25.83
.125"	.375"	.125"	1.50"	100°	701-1250.100	\$19.33	701-E-1250.100	\$23.73





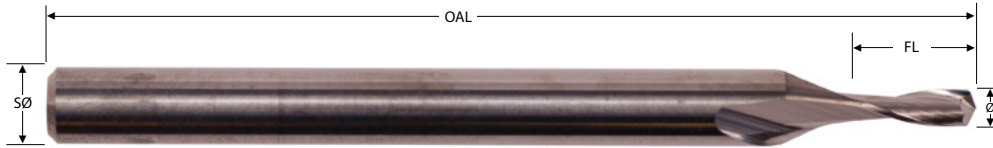
# 120 - 150 DEG. NC SPOT DRILLS

DECIMAL .005" - .125"

· Type 1: On center tip design



TYPE 1  
FRONT  
VIEW



**NEW!**

DRILL DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE
.010"	.030"	.125"	1.50"	120°	701-0100.120	\$29.76	701-E-0100.120	\$34.17
.015"	.045"	.125"	1.50"	120°	701-0150.120	\$29.76	701-E-0150.120	\$34.17
.020"	.050"	.125"	1.50"	120°	701-0200.120	\$25.49	701-E-0200.120	\$29.89
.030"	.090"	.125"	1.50"	120°	701-0300.120	\$23.84	701-E-0300.120	\$28.23
.0312"	.090"	.125"	1.50"	120°	701-0312.120	\$23.84	701-E-0312.120	\$28.23
.045"	.135"	.125"	1.50"	120°	701-0450.120	\$21.65	701-E-0450.120	\$26.05
.047"	.141"	.125"	1.50"	120°	701-0470.120	\$21.65	701-E-0470.120	\$26.05
.060"	.180"	.125"	1.50"	120°	701-0600.120	\$21.43	701-E-0600.120	\$25.83
.0625"	.186"	.125"	1.50"	120°	701-0625.120	\$21.43	701-E-0625.120	\$25.83
.078"	.234"	.125"	1.50"	120°	701-0780.120	\$21.43	701-E-0780.120	\$25.83
.090"	.270"	.125"	1.50"	120°	701-0900.120	\$20.33	701-E-0900.120	\$24.73
.093"	.279"	.125"	1.50"	120°	701-0930.120	\$20.33	701-E-0930.120	\$24.73
.125"	.375"	.125"	1.50"	120°	701-1250.120	\$19.33	701-E-1250.120	\$23.73
.005"	.025"	.125"	1.50"	130°	701-0050.130	\$37.24	701-E-0050.130	\$41.64
.010"	.035"	.125"	1.50"	130°	701-0100.130	\$29.76	701-E-0100.130	\$34.17
.015"	.045"	.125"	1.50"	130°	701-0150.130	\$29.76	701-E-0150.130	\$34.17
.020"	.050"	.125"	1.50"	130°	701-0200.130	\$25.49	701-E-0200.130	\$29.89
.0312"	.090"	.125"	1.50"	130°	701-0312.130	\$23.84	701-E-0312.130	\$28.23
.0625"	.200"	.125"	1.50"	130°	701-0625.130	\$21.43	701-E-0625.130	\$25.83
.0938"	.279"	.125"	1.50"	130°	701-0938.130	\$20.33	701-E-0938.130	\$22.52
.010"	.030"	.125"	1.50"	140°	701-0100.140	\$29.76	701-E-0100.140	\$34.17
.015"	.045"	.125"	1.50"	140°	701-0150.140	\$29.76	701-E-0150.140	\$34.17
.020"	.050"	.125"	1.50"	140°	701-0200.140	\$25.49	701-E-0200.140	\$29.89
.030"	.090"	.125"	1.50"	140°	701-0300.140	\$23.84	701-E-0300.140	\$28.23
.0312"	.090"	.125"	1.50"	140°	701-0312.140	\$23.84	701-E-0312.140	\$28.23
.045"	.135"	.125"	1.50"	140°	701-0450.140	\$21.65	701-E-0450.140	\$26.05
.047"	.141"	.125"	1.50"	140°	701-0470.140	\$21.65	701-E-0470.140	\$26.05
.060"	.180"	.125"	1.50"	140°	701-0600.140	\$21.43	701-E-0600.140	\$25.83
.0625"	.186"	.125"	1.50"	140°	701-0625.140	\$21.43	701-E-0625.140	\$25.83
.078"	.234"	.125"	1.50"	140°	701-0780.140	\$21.43	701-E-0780.140	\$25.83
.090"	.270"	.125"	1.50"	140°	701-0900.140	\$20.33	701-E-0900.140	\$24.73
.093"	.279"	.125"	1.50"	140°	701-0930.140	\$20.33	701-E-0930.140	\$24.73
.125"	.375"	.125"	1.50"	140°	701-1250.140	\$19.33	701-E-1250.140	\$23.73
.030"	.090"	.125"	1.50"	150°	701-0300.150	\$23.84	701-E-0300.150	\$28.23
.060"	.180"	.125"	1.50"	150°	701-0600.150	\$21.43	701-E-0600.150	\$25.83
.125"	.375"	.125"	1.50"	150°	701-1250.150	\$19.33	701-E-1250.150	\$23.73



# TYPE 2, 90 - 140 DEG. NC SPOT DRILLS

## FRACTIONAL 1/8" - 1/2"

- Type 2: Ahead of center tip design
- Suited for larger drilling applications



TYPE 2  
FRONT  
VIEW

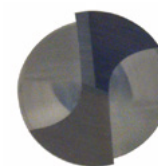


**NEW!**

DRILL DIA. (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE
1/8"	.375"	.125"	1.50"	90°	701-T1250.90	\$19.33	701-E-T1250.90	\$23.73
1/8"	.375"	.125"	4.00"	90°	701L-T1250.90	\$27.35	701L-E-T1250.90	\$32.85
3/16"	.625"	.187"	2.00"	90°	701-T1870.90	\$22.52	701-E-T1870.90	\$27.25
3/16"	.625"	.187"	4.00"	90°	701L-T1870.90	\$33.62	701L-E-T1870.90	\$40.22
1/4"	.750"	.250"	2.50"	90°	701-T2500.90	\$27.68	701-E-T2500.90	\$34.28
1/4"	.750"	.250"	6.00"	90°	701L-T2500.90	\$45.38	701L-E-T2500.90	\$54.15
1/8"	.375"	.125"	1.50"	120°	701-T1250.120	\$19.33	701-E-T1250.120	\$23.73
3/16"	.625"	.187"	2.00"	120°	701-T1870.120	\$22.52	701-E-T1870.120	\$27.25
1/4"	.750"	.250"	2.50"	120°	701-T2500.120	\$27.68	701-E-T2500.120	\$34.28
1/8"	.375"	.125"	1.50"	140°	701-T1250.140	\$19.33	701-E-T1250.140	\$23.73
3/16"	.625"	.187"	2.00"	140°	701-T1870.140	\$22.52	701-E-T1870.140	\$27.25
1/4"	.750"	.250"	2.50"	140°	701-T2500.140	\$27.68	701-E-T2500.140	\$34.28



## FOUR - FACET SPOT DRILLS



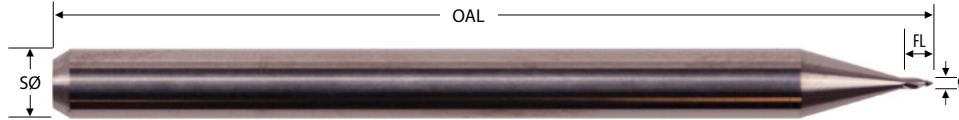
FRONT  
VIEW

DRILL DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	ANGLE (A)	UNCOATED	
					2 FLUTE	PRICE
1/8"	.312"	.125"	1.50"	90°	701-012590	\$19.33
3/16"	.500"	.1875"	2.00"	90°	701-018790	\$22.52
1/4"	.625"	.250"	2.50"	90°	701-025090	\$27.68
5/16"	.750"	.3125"	2.50"	90°	701-031290	\$34.84
3/8"	.937"	.375"	2.50"	90°	701-037590	\$39.87
1/2"	1.25"	.500"	3.00"	90°	701-050090	\$62.33
1/8"	.312"	.125"	1.50"	120°	701-0125120	\$19.33
3/16"	.500"	.1875"	2.00"	120°	701-0187120	\$22.52
1/4"	.625"	.250"	2.50"	120°	701-0250120	\$27.68
5/16"	.750"	.3125"	2.50"	120°	701-0312120	\$34.84
3/8"	.937"	.375"	2.50"	120°	701-0375120	\$39.87
1/2"	1.25"	.500"	3.00"	120°	701-0500120	\$62.33

# 90 - 130 DEG. NC SPOT DRILLS

## METRIC .15MM - 3MM

### 90 DEG. NC SPOT DRILL



DRILL DIA. (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	ANGLE (A)	UNCOATED	
					2 FLUTE	PRICE
.15 mm	.65 mm	3 mm	38 mm	90°	702-0059.90	\$36.47
.25 mm	.9 mm	3 mm	38 mm	90°	702-0098.90	\$29.76
.40 mm	1.15 mm	3 mm	38 mm	90°	702-0157.90	\$29.76
.50 mm	1.3 mm	3 mm	38 mm	90°	702-0197.90	\$25.49
1 mm	2.3 mm	3 mm	38 mm	90°	702-0394.90	\$23.84
1.5 mm	5 mm	3 mm	38 mm	90°	702-0591.90	\$21.65
2 mm	5 mm	3 mm	38 mm	90°	702-0787.90	\$21.43
3 mm	5 mm	3 mm	38 mm	90°	702-1181.90	\$20.33



### 130 DEG. NC SPOT DRILL



DRILL DIA. (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	ANGLE (A)	UNCOATED	
					2 FLUTE	PRICE
.15 mm	.65 mm	3 mm	38 mm	130°	702-0059.130	\$36.47
.25 mm	.9 mm	3 mm	38 mm	130°	702-0098.130	\$29.76
.40 mm	1.15 mm	3 mm	38 mm	130°	702-0157.130	\$29.76
.50 mm	1.3 mm	3 mm	38 mm	130°	702-0197.130	\$25.49
1 mm	2.3 mm	3 mm	38 mm	130°	702-0394.130	\$23.84
1.5 mm	5 mm	3 mm	38 mm	130°	702-0591.130	\$21.65
2 mm	5 mm	3 mm	38 mm	130°	702-0787.130	\$21.43
3 mm	5 mm	3 mm	38 mm	130°	702-1181.130	\$20.33

## CIRCUIT BOARD DRILLS

## DECIMAL .004" - .025"

- Use: Micro Drilling
- Helix: 20 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- Engineered for small diameter hole drilling
- All drills are on 1/8" shanks, 1.5" overall length
- Diameter tolerance: +0"/-0.0003"
- Coatings and reach lengths priced upon request

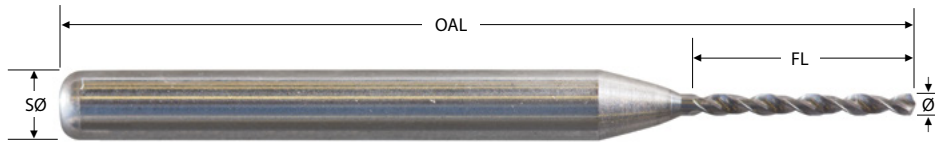
DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	METRIC SIZE	POINT ANGLE	SHANK DIA. (SØ)	OAL	UNCOATED	
							2 FLUTE	PRICE
.0040"	.0700"	# 102	.10	118° DP	.125"	1.50"	RS3170040	\$30.99
.0050"	.0700"	# 99	.13	118° DP	.125"	1.50"	RS3170050	\$30.99
.0059"	.1200"	# 97	.15	118° DP	.125"	1.50"	RS3170059	\$28.39
.0063"	.1200"	# 96	.16	118° DP	.125"	1.50"	RS3170063	\$28.39
.0067"	.1200"	# 95	.17	118° DP	.125"	1.50"	RS3170067	\$28.39
.0071"	.1500"	# 94	.18	118° DP	.125"	1.50"	RS3170071	\$24.30
.0075"	.1500"	# 93	.19	118° DP	.125"	1.50"	RS3170075	\$24.30
.0079"	.1500"	# 92	.20	118° DP	.125"	1.50"	RS3170079	\$18.58
.0083"	.1500"	# 91	.21	118° DP	.125"	1.50"	RS3170083	\$18.58
.0087"	.1500"	# 90	.22	118° DP	.125"	1.50"	RS3170087	\$18.58
.0091"	.2200"	# 89	.23	118° DP	.125"	1.50"	RS3170091	\$18.01
.0095"	.2200"	# 88	.24	118° DP	.125"	1.50"	RS3170095	\$18.01
.0098"	.2200"	.25mm	.25	118° DP	.125"	1.50"	RS3170098	\$18.01
.0100"	.2200"	# 87	.25	118° DP	.125"	1.50"	RS3170100	\$18.01
.0105"	.2200"	# 86	.27	118° DP	.125"	1.50"	RS3170105	\$18.01
.0110"	.2200"	# 85	.28	118° DP	.125"	1.50"	RS3170110	\$18.01
.0115"	.2200"	# 84	.29	118° DP	.125"	1.50"	RS3170115	\$14.97
.0118"	.2800"	.30mm	.30	118° DP	.125"	1.50"	RS3170118	\$14.97
.0120"	.2800"	# 83	.305	118° DP	.125"	1.50"	RS3170120	\$14.97
.0125"	.2800"	# 82	.32	118° DP	.125"	1.50"	RS3170125	\$11.71
.0130"	.2800"	# 81	.33	130° DP	.125"	1.50"	RS3170130	\$11.71
.0135"	.2800"	# 80	.34	130° DP	.125"	1.50"	RS3170135	\$8.40
.0138"	.2800"	.35mm	.35	130° DP	.125"	1.50"	RS3170138	\$8.40
.0145"	.2800"	# 79	.37	130° DP	.125"	1.50"	RS3170145	\$8.40
.0156"	.2950"	1/64"	.396	130° DP	.125"	1.50"	RS3170156	\$8.16
.0157"	.2950"	.40mm	.40	130° DP	.125"	1.50"	RS3170157	\$8.16
.0160"	.2950"	# 78	.41	130° DP	.125"	1.50"	RS3170160	\$7.60
.0177"	.2950"	.45mm	.45	130° DP	.125"	1.50"	RS3170177	\$7.60
.0180"	.2950"	# 77	.46	130° DP	.125"	1.50"	RS3170180	\$7.60
.0197"	.3100"	.50mm	.50	130° DP	.125"	1.50"	RS3170197	\$7.60
.0200"	.3100"	# 76	.51	130° DP	.125"	1.50"	RS3170200	\$7.25
.0210"	.3100"	# 75	.53	130° DP	.125"	1.50"	RS3170210	\$7.25
.0217"	.3400"	.55mm	.55	130° DP	.125"	1.50"	RS3170217	\$7.25
.0225"	.3400"	# 74	.57	130° DP	.125"	1.50"	RS3170225	\$7.25
.0236"	.3400"	.60mm	.60	130° DP	.125"	1.50"	RS3170236	\$7.25
.0240"	.3400"	# 73	.61	130° DP	.125"	1.50"	RS3170240	\$7.25
.0250"	.3400"	# 72	.64	130° DP	.125"	1.50"	RS3170250	\$7.25

\* SOLD IN MULTIPLES OF 5 \*

# CIRCUIT BOARD DRILLS

## DECIMAL .0256" - .0571"

• Continued from Previous Page



DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	METRIC SIZE	POINT ANGLE	SHANK DIA. (SØ)	OAL	UNCOATED	
							2 FLUTE	PRICE
.0256"	.3400"	.65mm	.65	130° DP	.125"	1.50"	RS3170256	\$7.25
.0260"	.3400"	# 71	.66	130° DP	.125"	1.50"	RS3170260	\$7.25
.0276"	.4000"	.70mm	.70	130° DP	.125"	1.50"	RS3170276	\$7.25
.0280"	.4000"	# 70	.71	130° DP	.125"	1.50"	RS3170280	\$7.25
.0292"	.4000"	# 69	.74	130° DP	.125"	1.50"	RS3170292	\$7.25
.0295"	.4000"	.75mm	.75	130° DP	.125"	1.50"	RS3170295	\$7.25
.0310"	.4000"	# 68	.787	130° DP	.125"	1.50"	RS3170310	\$7.25
.0312"	.4000"	1/32"	.79	130° DP	.125"	1.50"	RS3170312	\$7.25
.0315"	.4000"	.80mm	.80	130° DP	.125"	1.50"	RS3170315	\$7.25
.0320"	.4000"	# 67	.81	130° DP	.125"	1.50"	RS3170320	\$7.25
.0330"	.4000"	# 66	.84	130° DP	.125"	1.50"	RS3170330	\$7.25
.0335"	.4000"	.85mm	.85	130° DP	.125"	1.50"	RS3170335	\$7.25
.0350"	.4000"	# 65	.89	130° DP	.125"	1.50"	RS3170350	\$7.25
.0354"	.4000"	.90mm	.90	130° DP	.125"	1.50"	RS3170354	\$7.25
.0360"	.4000"	# 64	.91	130° DP	.125"	1.50"	RS3170360	\$7.25
.0370"	.4000"	# 63	.94	130° DP	.125"	1.50"	RS3170370	\$7.25
.0374"	.4000"	.95mm	.95	130° DP	.125"	1.50"	RS3170374	\$7.25
.0380"	.4000"	# 62	.97	130° DP	.125"	1.50"	RS3170380	\$7.25
.0390"	.4000"	# 61	.99	130° DP	.125"	1.50"	RS3170390	\$7.25
.0394"	.4000"	1.0mm	1.00	130° DP	.125"	1.50"	RS3170394	\$7.25
.0400"	.4000"	# 60	1.02	130° DP	.125"	1.50"	RS3170400	\$7.25
.0410"	.4000"	# 59	1.04	130° DP	.125"	1.50"	RS3170410	\$7.25
.0413"	.4000"	1.05mm	1.05	130° DP	.125"	1.50"	RS3170413	\$7.25
.0420"	.4000"	# 58	1.07	130° DP	.125"	1.50"	RS3170420	\$7.25
.0430"	.4000"	# 57	1.09	130° DP	.125"	1.50"	RS3170430	\$7.25
.0433"	.4000"	1.10mm	1.10	130° DP	.125"	1.50"	RS3170433	\$7.25
.0440"	.4000"	1.12mm	1.12	130° DP	.125"	1.50"	RS3170440	\$7.25
.0453"	.4000"	1.15mm	1.15	130° DP	.125"	1.50"	RS3170453	\$7.25
.0465"	.4000"	# 56	1.18	130° DP	.125"	1.50"	RS3170465	\$7.25
.0469"	.4000"	3/64"	1.19	130° DP	.125"	1.50"	RS3170469	\$7.25
.0472"	.4000"	1.20mm	1.20	130° DP	.125"	1.50"	RS3170472	\$7.25
.0492"	.4000"	1.25mm	1.25	130° DP	.125"	1.50"	RS3170492	\$7.25
.0512"	.4000"	1.30mm	1.30	130° DP	.125"	1.50"	RS3170512	\$7.25
.0520"	.4000"	# 55	1.32	130° DP	.125"	1.50"	RS3170520	\$7.25
.0531"	.4000"	1.35mm	1.35	130° DP	.125"	1.50"	RS3170531	\$7.25
.0550"	.4000"	# 54	1.397	130° DP	.125"	1.50"	RS3170550	\$7.25
.0551"	.4000"	1.40mm	1.40	130° DP	.125"	1.50"	RS3170551	\$7.25
.0571"	.4000"	1.45mm	1.45	130° DP	.125"	1.50"	RS3170571	\$7.25

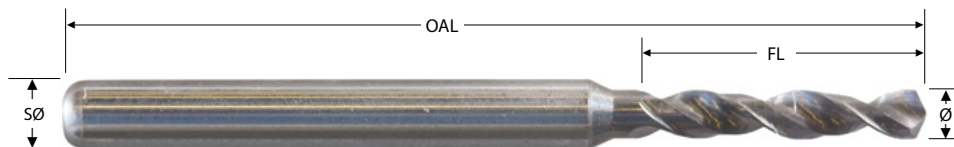
**\* SOLD IN MULTIPLES OF 5 \***



# CIRCUIT BOARD DRILLS

## DECIMAL .0591" - .0925"

• Continued from Previous Pages



DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	METRIC SIZE	POINT ANGLE	SHANK DIA. (SØ)	OAL	UNCOATED	
							2 FLUTE	PRICE
.0591"	.4000"	1.50mm	1.50	130° DP	.125"	1.50"	RS3170591	\$7.25
.0595"	.4000"	# 53	1.51	130° DP	.125"	1.50"	RS3170595	\$7.25
.0610"	.4000"	1.55mm	1.55	130° DP	.125"	1.50"	RS3170610	\$7.25
.0625"	.4000"	1/16"	1.59	130° DP	.125"	1.50"	RS3170625	\$7.25
.0630"	.4000"	1.60mm	1.60	130° DP	.125"	1.50"	RS3170630	\$7.71
.0635"	.4000"	# 52	1.61	130° DP	.125"	1.50"	RS3170635	\$7.71
.0650"	.4000"	1.65mm	1.65	130° DP	.125"	1.50"	RS3170650	\$7.71
.0669"	.4000"	1.70mm	1.699	130° DP	.125"	1.50"	RS3170669	\$7.71
.0670"	.4000"	# 51	1.70	130° DP	.125"	1.50"	RS3170670	\$7.71
.0689"	.4000"	1.75mm	1.75	130° DP	.125"	1.50"	RS3170689	\$7.71
.0700"	.4000"	# 50	1.78	130° DP	.125"	1.50"	RS3170700	\$7.71
.0709"	.4000"	1.80mm	1.80	130° DP	.125"	1.50"	RS3170709	\$7.71
.0728"	.4000"	1.85mm	1.85	130° DP	.125"	1.50"	RS3170728	\$7.71
.0730"	.4000"	# 49	1.85	130° DP	.125"	1.50"	RS3170730	\$7.71
.0748"	.4000"	1.90mm	1.90	130° DP	.125"	1.50"	RS3170748	\$7.71
.0760"	.4000"	# 48	1.93	130° DP	.125"	1.50"	RS3170760	\$7.71
.0768"	.4000"	1.95mm	1.95	130° DP	.125"	1.50"	RS3170768	\$7.71
.0781"	.4000"	5/64"	1.98	130° DP	.125"	1.50"	RS3170781	\$7.71
.0785"	.4000"	# 47	1.99	130° DP	.125"	1.50"	RS3170785	\$7.71
.0787"	.4000"	2.0mm	2.00	130° DP	.125"	1.50"	RS3170787	\$7.71
.0807"	.4000"	2.05mm	2.05	130° DP	.125"	1.50"	RS3170807	\$7.71
.0810"	.4000"	# 46	2.06	130° DP	.125"	1.50"	RS3170810	\$7.71
.0820"	.4000"	# 45	2.08	130° DP	.125"	1.50"	RS3170820	\$7.71
.0827"	.4000"	2.10mm	2.10	130° DP	.125"	1.50"	RS3170827	\$7.71
.0846"	.4000"	2.15mm	2.15	130° DP	.125"	1.50"	RS3170846	\$7.71
.0860"	.4000"	# 44	2.18	130° DP	.125"	1.50"	RS3170860	\$7.71
.0866"	.4000"	2.20mm	2.20	130° DP	.125"	1.50"	RS3170866	\$7.71
.0886"	.4000"	2.25mm	2.25	130° DP	.125"	1.50"	RS3170886	\$7.71
.0890"	.4000"	# 43	2.26	130° DP	.125"	1.50"	RS3170890	\$7.71
.0906"	.4000"	2.30mm	2.30	130° DP	.125"	1.50"	RS3170906	\$7.71
.0925"	.4000"	2.35mm	2.35	130° DP	.125"	1.50"	RS3170925	\$7.71

\* SOLD IN MULTIPLES OF 5 \*





# CIRCUIT BOARD DRILLS

## DECIMAL .0935" - .1250"

- Use: Micro Drilling
- Helix: 20 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes

- Engineered for small diameter hole drilling
- All drills are on 1/8" shanks, 1.5" overall length
- Diameter tolerance: +0"/-0.0003"
- Coatings and reach lengths priced upon request



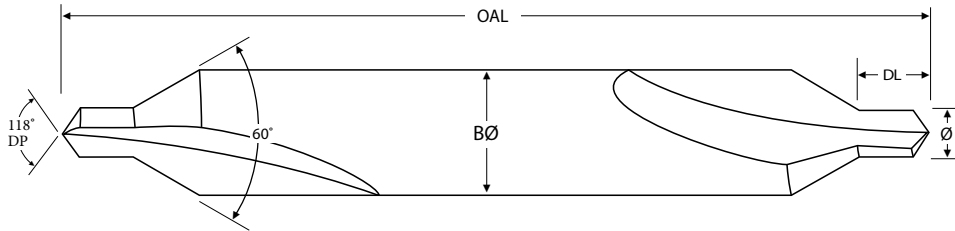
DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	METRIC SIZE	POINT ANGLE	SHANK DIA. (SØ)	OAL	UNCOATED	
							2 FLUTE	PRICE
.0935"	.4000"	# 42	2.37	130° DP	.125"	1.50"	RS3170935	\$7.71
.0938"	.4000"	3/32"	2.38	130° DP	.125"	1.50"	RS3170938	\$7.71
.0945"	.4000"	2.40mm	2.40	130° DP	.125"	1.50"	RS3170945	\$7.71
.0960"	.4000"	# 41	2.44	130° DP	.125"	1.50"	RS3170960	\$7.71
.0965"	.4000"	2.45mm	2.45	130° DP	.125"	1.50"	RS3170965	\$7.71
.0980"	.4000"	# 40	2.49	130° DP	.125"	1.50"	RS3170980	\$7.71
.0984"	.4000"	2.50mm	2.50	130° DP	.125"	1.50"	RS3170984	\$7.71
.0995"	.4000"	# 39	2.53	130° DP	.125"	1.50"	RS3170995	\$7.71
.1004"	.4000"	2.55mm	2.55	130° DP	.125"	1.50"	RS3171004	\$7.71
.1015"	.4000"	# 38	2.58	130° DP	.125"	1.50"	RS3171015	\$7.71
.1024"	.4000"	2.60mm	2.60	130° DP	.125"	1.50"	RS3171024	\$7.71
.1040"	.4000"	# 37	2.64	130° DP	.125"	1.50"	RS3171040	\$7.71
.1043"	.4000"	2.65mm	2.65	130° DP	.125"	1.50"	RS3171043	\$7.71
.1063"	.4000"	2.70mm	2.70	130° DP	.125"	1.50"	RS3171063	\$7.71
.1065"	.4000"	# 36	2.71	130° DP	.125"	1.50"	RS3171065	\$7.71
.1083"	.4000"	2.75mm	2.75	130° DP	.125"	1.50"	RS3171083	\$7.71
.1094"	.4000"	7/64"	2.78	130° DP	.125"	1.50"	RS3171094	\$7.71
.1100"	.4000"	# 35	2.79	130° DP	.125"	1.50"	RS3171100	\$7.71
.1102"	.4000"	2.80mm	2.80	130° DP	.125"	1.50"	RS3171102	\$7.71
.1110"	.4000"	# 34	2.82	130° DP	.125"	1.50"	RS3171110	\$7.71
.1122"	.4000"	2.85mm	2.85	130° DP	.125"	1.50"	RS3171122	\$7.71
.1130"	.4000"	# 33	2.87	130° DP	.125"	1.50"	RS3171130	\$7.71
.1142"	.4000"	2.90mm	2.90	130° DP	.125"	1.50"	RS3171142	\$7.71
.1160"	.4000"	# 32	2.946	130° DP	.125"	1.50"	RS3171160	\$7.71
.1161"	.4000"	2.95mm	2.95	130° DP	.125"	1.50"	RS3171161	\$7.71
.1181"	.4000"	3.00mm	3.00	130° DP	.125"	1.50"	RS3171181	\$7.71
.1200"	.4000"	# 31	3.05	130° DP	.125"	1.50"	RS3171200	\$7.71
.1201"	.4000"	3.05mm	3.05	130° DP	.125"	1.50"	RS3171201	\$7.71
.1220"	.4000"	3.10mm	3.10	130° DP	.125"	1.50"	RS3171220	\$7.71
.1240"	.4000"	3.15mm	3.15	130° DP	.125"	1.50"	RS3171240	\$7.71
.1250"	.4000"	1/8"	3.18	130° DP	.125"	1.50"	RS3171250	\$7.71

\* SOLD IN MULTIPLES OF 5 \*

# 60 DEG. DRILL/ COUNTERSINKS

## DECIMAL .010" - .3125"

- Type: Double End
- Flute Length: Standard
- Helix: 0 Degrees
- 118° Drill Point
- Hand: RHC
- Rake Angle: Neutral
- Center Cutting: Yes
- Diameter Tolerance: +/-0.0015



**NEW!**

SIZE	DRILL Ø (Ø)	DRILL LENGTH (DL)	BODY Ø (BØ)	OAL	UNCOATED		ALTiN COATED		TiAlN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
#00000 x 60°	.010"	.010"	.125"	1.50"	601-0100	\$35.04	601-E-0100	\$40.53	601C-0100	\$40.53
#0000 x 60°	.015"	.015"	.125"	1.50"	601-0150	\$30.65	601-E-0150	\$36.14	601C-0150	\$36.14
#000 x 60°	.020"	.020"	.125"	1.50"	601-0200	\$23.51	601-E-0200	\$29.00	601C-0200	\$29.00
#00 x 60°	.025"	.025"	.125"	1.50"	601-0250	\$18.12	601-E-0250	\$23.62	601C-0250	\$23.62
#0 x 60°	.031"	.031"	.125"	1.50"	601-0310	\$18.12	601-E-0310	\$23.62	601C-0310	\$23.62
#1 x 60°	.047"	.047"	.125"	1.50"	601-0001	\$15.16	601-E-0001	\$20.65	601C-0001	\$20.65
#2 x 60°	.078"	.078"	.1875"	2.00"	601-0002	\$23.51	601-E-0002	\$29.88	601C-0002	\$29.88
#3 x 60°	.109"	.109"	.250"	2.00"	601-0003	\$26.59	601-E-0003	\$33.18	601C-0003	\$33.18
#4 x 60°	.125"	.125"	.3125"	2.125"	601-0004	\$36.14	601-E-0004	\$42.74	601C-0004	\$42.74
#5 x 60°	.1875"	.1875"	.4375"	2.75"	601-0005	\$54.49	601-E-0005	\$65.47	601C-0005	\$65.47
#6 x 60°	.219"	.219"	.500"	3.00"	601-0006	\$76.02	--	--	601C-0006	\$107.80
#7 x 60°	.250"	.250"	.625"	3.75"	601-0007	\$169.78	--	--	601C-0007	\$215.84
#8 x 60°	.3125"	.3125"	.750"	4.00"	601-0008	\$231.53	--	--	601C-0008	\$285.93

# 82 - 90 DEG. DRILL/ COUNTERSINKS

## DECIMAL .010" - .3125"

- Type: Double End
- Flute Length: Standard
- Helix: 0 Degrees
- 118° Drill Point
- Hand: RHC
- Rake Angle: Neutral
- Center Cutting: Yes
- Diameter Tolerance: +/-0.0015

**CARBIDE**

**NEW!**

SIZE	DRILL Ø (Ø)	DRILL LENGTH (DL)	BODY Ø (BØ)	OAL	UNCOATED		ALTIM COATED		TIALN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
#00000 x 82°	.010"	.010"	.125"	1.50"	681-0100	\$35.04	681-E-0100	\$40.53	681C-0100	\$40.53
#0000 x 82°	.015"	.015"	.125"	1.50"	681-0150	\$30.65	681-E-0150	\$36.14	681C-0150	\$36.14
#000 x 82°	.020"	.020"	.125"	1.50"	681-0200	\$23.51	681-E-0200	\$29.00	681C-0200	\$29.00
#00 x 82°	.025"	.025"	.125"	1.50"	681-0250	\$18.12	681-E-0250	\$23.62	681C-0250	\$23.62
#0 x 82°	.031"	.031"	.125"	1.50"	681-0310	\$18.12	681-E-0310	\$23.62	681C-0310	\$23.62
#1 x 82°	.047"	.047"	.125"	1.50"	681-0001	\$15.16	681-E-0001	\$20.65	681C-0001	\$20.65
#2 x 82°	.078"	.078"	.1875"	2.00"	681-0002	\$23.51	681-E-0002	\$29.88	681C-0002	\$29.88
#3 x 82°	.109"	.109"	.250"	2.00"	681-0003	\$26.59	681-E-0003	\$33.18	681C-0003	\$33.18
#4 x 82°	.125"	.125"	.3125"	2.125"	681-0004	\$36.14	681-E-0004	\$42.74	681C-0004	\$42.74
#5 x 82°	.1875"	.1875"	.4375"	2.75"	681-0005	\$54.49	681-E-0005	\$65.47	681C-0005	\$65.47
#6 x 82°	.219"	.219"	.500"	3.00"	681-0006	\$76.02	--	--	681C-0006	\$107.80
#7 x 82°	.250"	.250"	.625"	3.75"	681-0007	\$169.78	--	--	681C-0007	\$215.84
#8 x 82°	.3125"	.3125"	.750"	4.00"	681-0008	\$231.53	--	--	681C-0008	\$285.93



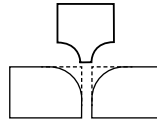
**NEW!**

SIZE	DRILL Ø (Ø)	DRILL LENGTH (DL)	BODY Ø (BØ)	OAL	UNCOATED		ALTIM COATED		TIALN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
#00000 x 90°	.010"	.010"	.125"	1.50"	691-0100	\$35.04	691-E-0100	\$40.53	691C-0100	\$40.53
#0000 x 90°	.015"	.015"	.125"	1.50"	691-0150	\$30.65	691-E-0150	\$36.14	691C-0150	\$36.14
#000 x 90°	.020"	.020"	.125"	1.50"	691-0200	\$23.51	691-E-0200	\$29.00	691C-0200	\$29.00
#00 x 90°	.025"	.025"	.125"	1.50"	691-0250	\$18.12	691-E-0250	\$23.62	691C-0250	\$23.62
#0 x 90°	.031"	.031"	.125"	1.50"	691-0310	\$18.12	691-E-0310	\$23.62	691C-0310	\$23.62
#1 x 90°	.047"	.047"	.125"	1.50"	691-0001	\$15.16	691-E-0001	\$20.65	691C-0001	\$20.65
#2 x 90°	.078"	.078"	.1875"	2.00"	691-0002	\$23.51	691-E-0002	\$29.88	691C-0002	\$29.88
#3 x 90°	.109"	.109"	.250"	2.00"	691-0003	\$26.59	691-E-0003	\$33.18	691C-0003	\$33.18
#4 x 90°	.125"	.125"	.3125"	2.125"	691-0004	\$36.14	691-E-0004	\$42.74	691C-0004	\$42.74
#5 x 90°	.188"	.188"	.438"	2.75"	691-0005	\$54.49	691-E-0005	\$65.47	691C-0005	\$65.47
#6 x 90°	.219"	.219"	.500"	3.00"	691-0006	\$76.02	--	--	691C-0006	\$107.80
#7 x 90°	.250"	.250"	.625"	3.75"	691-0007	\$169.78	--	--	691C-0007	\$215.84
#8 x 90°	.3125"	.3125"	.750"	4.00"	691-0008	\$231.53	--	--	691C-0008	\$285.93

# CORNER ROUNDING END MILLS, FLARED

## DECIMAL .005" - .030"

- 5 Degree Flares at Shoulder and Pilot
- Application: End Cutting
- 2 Flute .008"-.046" Pilot Diameter
- ALTiN/ TiAlN for Higher Performance



Small pilots for narrow spaces

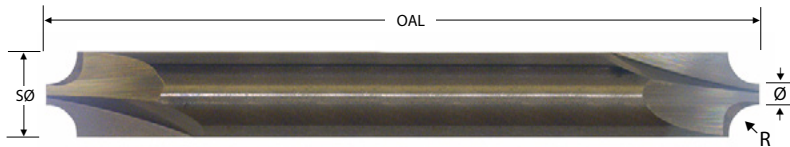
**NEW!**

RADIUS (R)	PILOT Ø (Ø)	SHANK Ø (SØ)	OAL	UNCOATED		ALTiN COATED		TiAlN COATED	
				2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.008"	.125"	1.50"	839F-2.005X.008	\$43.28	839F-E-2.005X.008	\$48.89	839CF-2.005X.008	\$48.89
.005"	.020"	.125"	1.50"	839F-2.005X.020	\$38.34	839F-E-2.005X.020	\$43.84	839CF-2.005X.020	\$43.84
.005"	.046"	.125"	1.50"	839F-2.005X.046	\$35.37	839F-E-2.005X.046	\$40.98	839CF-2.005X.046	\$40.98
.005"	.046"	.1875"	<b>4.00"</b>	839FL-2.005X.046	\$59.43	839FL-E-2.005X.046	\$64.38	839CFL-2.005X.046	\$64.38
.006"	.020"	.125"	1.50"	839F-2.006X.020	\$38.34	839F-E-2.006X.020	\$43.84	839CF-2.006X.020	\$43.84
.006"	.046"	.125"	1.50"	839F-2.006X.046	\$35.37	839F-E-2.006X.046	\$40.98	839CF-2.006X.046	\$40.98
.007"	.020"	.125"	1.50"	839F-2.007X.020	\$38.34	839F-E-2.007X.020	\$43.84	839CF-2.007X.020	\$43.84
.007"	.046"	.125"	1.50"	839F-2.007X.046	\$35.37	839F-E-2.007X.046	\$40.98	839CF-2.007X.046	\$40.98
.008"	.008"	.125"	1.50"	839F-2.008X.008	\$43.28	839F-E-2.008X.008	\$48.89	839CF-2.008X.008	\$48.89
.008"	.020"	.125"	1.50"	839F-2.008X.020	\$38.34	839F-E-2.008X.020	\$43.84	839CF-2.008X.020	\$43.84
.008"	.046"	.125"	1.50"	839F-2.008X.046	\$35.37	839F-E-2.008X.046	\$40.98	839CF-2.008X.046	\$40.98
.008"	.046"	.1875"	<b>4.00"</b>	839FL-2.008X.046	\$59.43	839FL-E-2.008X.046	\$64.38	839CFL-2.008X.046	\$64.38
.009"	.020"	.125"	1.50"	839F-2.009X.020	\$38.34	839F-E-2.009X.020	\$43.84	839CF-2.009X.020	\$43.84
.009"	.046"	.125"	1.50"	839F-2.009X.046	\$35.37	839F-E-2.009X.046	\$40.98	839CF-2.009X.046	\$40.98
.010"	.008"	.125"	1.50"	839F-2.010X.008	\$43.28	839F-E-2.010X.008	\$48.89	839CF-2.010X.008	\$48.89
.010"	.020"	.125"	1.50"	839F-2.010X.020	\$38.34	839F-E-2.010X.020	\$43.84	839CF-2.010X.020	\$43.84
.010"	.046"	.125"	1.50"	839F-2.010X.046	\$35.37	839F-E-2.010X.046	\$40.98	839CF-2.010X.046	\$40.98
.010"	.046"	.1875"	<b>4.00"</b>	839FL-2.010X.046	\$59.43	839FL-E-2.010X.046	\$64.38	839CFL-2.010X.046	\$64.38
.011"	.020"	.125"	1.50"	839F-2.011X.020	\$38.34	839F-E-2.011X.020	\$43.84	839CF-2.011X.020	\$43.84
.011"	.046"	.125"	1.50"	839F-2.011X.046	\$35.37	839F-E-2.011X.046	\$40.98	839CF-2.011X.046	\$40.98
.012"	.020"	.125"	1.50"	839F-2.012X.020	\$38.34	839F-E-2.012X.020	\$43.84	839CF-2.012X.020	\$43.84
.012"	.046"	.125"	1.50"	839F-2.012X.046	\$35.37	839F-E-2.012X.046	\$40.98	839CF-2.012X.046	\$40.98
.013"	.020"	.125"	1.50"	839F-2.013X.020	\$38.34	839F-E-2.013X.020	\$43.84	839CF-2.013X.020	\$43.84
.013"	.046"	.125"	1.50"	839F-2.013X.046	\$35.37	839F-E-2.013X.046	\$40.98	839CF-2.013X.046	\$40.98
.014"	.020"	.125"	1.50"	839F-2.014X.020	\$38.34	839F-E-2.014X.020	\$43.84	839CF-2.014X.020	\$43.84
.014"	.046"	.125"	1.50"	839F-2.014X.046	\$35.37	839F-E-2.014X.046	\$40.98	839CF-2.014X.046	\$40.98
.015"	.008"	.125"	1.50"	839F-2.015X.008	\$43.28	839F-E-2.015X.008	\$48.89	839CF-2.015X.008	\$48.89
.015"	.020"	.125"	1.50"	839F-2.015X.020	\$38.34	839F-E-2.015X.020	\$43.84	839CF-2.015X.020	\$43.84
.015"	.046"	.125"	1.50"	839F-2.015X.046	\$35.37	839F-E-2.015X.046	\$40.98	839CF-2.015X.046	\$40.98
.015"	.046"	.1875"	<b>4.00"</b>	839FL-2.015X.046	\$59.43	839FL-E-2.015X.046	\$64.38	839CFL-2.015X.046	\$64.38
.018"	.046"	.125"	1.50"	839F-2.018X.046	\$35.37	839F-E-2.018X.046	\$40.98	839CF-2.018X.046	\$40.98
.020"	.008"	.125"	1.50"	839F-2.020X.008	\$43.28	839F-E-2.020X.008	\$48.89	839CF-2.020X.008	\$48.89
.020"	.020"	.125"	1.50"	839F-2.020X.020	\$38.34	839F-E-2.020X.020	\$43.84	839CF-2.020X.020	\$43.84
.020"	.046"	.125"	1.50"	839F-2.020X.046	\$35.37	839F-E-2.020X.046	\$40.98	839CF-2.020X.046	\$40.98
.020"	.046"	.1875"	<b>4.00"</b>	839FL-2.020X.046	\$59.43	839FL-E-2.020X.046	\$64.38	839CFL-2.020X.046	\$64.38
.022"	.046"	.125"	1.50"	839F-2.022X.046	\$35.37	839F-E-2.022X.046	\$40.98	839CF-2.022X.046	\$40.98
.025"	.020"	.125"	1.50"	839F-2.025X.020	\$38.34	839F-E-2.025X.020	\$43.84	839CF-2.025X.020	\$43.84
.025"	.046"	.125"	1.50"	839F-2.025X.046	\$35.37	839F-E-2.025X.046	\$40.98	839CF-2.025X.046	\$40.98
.025"	.046"	.1875"	<b>4.00"</b>	839FL-2.025X.046	\$59.43	839FL-E-2.025X.046	\$64.38	839CFL-2.025X.046	\$64.38
.027"	.046"	.125"	1.50"	839F-2.027X.046	\$35.37	839F-E-2.027X.046	\$40.98	839CF-2.027X.046	\$40.98
.030"	.020"	.125"	1.50"	839F-2.030X.020	\$38.34	839F-E-2.030X.020	\$43.84	839CF-2.030X.020	\$43.84
.030"	.046"	.125"	1.50"	839F-2.030X.046	\$35.37	839F-E-2.030X.046	\$40.98	839CF-2.030X.046	\$40.98
.030"	.046"	.1875"	<b>4.00"</b>	839FL-2.030X.046	\$59.43	839FL-E-2.030X.046	\$64.38	839CFL-2.030X.046	\$64.38



# CORNER ROUNDING END MILLS, FLARED

## DECIMAL .031" - .156"



**CARBIDE**

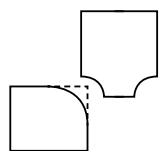
RADIUS (R)	PILOT Ø (Ø)	SHANK Ø (SØ)	OAL	UNCOATED		ALTiN COATED <b>NEW!</b>		TiAlN COATED	
				2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
.031"	.020"	.125"	1.50"	839F-2.031X.020	\$38.34	839F-E-2.031X.020	\$43.84	839CF-2.031X.020	\$43.84
.031"	.046"	.125"	1.50"	839F-2.031X.046	\$35.37	839F-E-2.031X.046	\$40.98	839CF-2.031X.046	\$40.98
.031"	.046"	.1875"	4.00"	839FL-2.031X.046	\$59.43	839FL-E-2.031X.046	\$64.38	839CFL-2.031X.046	\$64.38
.032"	.046"	.125"	1.50"	839F-2.032X.046	\$35.37	839F-E-2.032X.046	\$40.98	839CF-2.032X.046	\$40.98
.035"	.020"	.125"	1.50"	839F-2.035X.020	\$38.34	839F-E-2.035X.020	\$43.84	839CF-2.035X.020	\$43.84
.035"	.046"	.125"	1.50"	839F-2.035X.046	\$35.37	839F-E-2.035X.046	\$40.98	839CF-2.035X.046	\$40.98
.035"	.046"	.1875"	4.00"	839FL-2.035X.046	\$59.43	839FL-E-2.035X.046	\$64.38	839CFL-2.035X.046	\$64.38
.039"	.020"	.125"	1.50"	839F-2.039X.020	\$38.34	839F-E-2.039X.020	\$43.84	839CF-2.039X.020	\$43.84
.039"	.046"	.125"	1.50"	839F-2.039X.046	\$35.37	839F-E-2.039X.046	\$40.98	839CF-2.039X.046	\$40.98
.039"	.046"	.1875"	4.00"	839FL-2.039X.046	\$59.43	839FL-E-2.039X.046	\$64.38	839CFL-2.039X.046	\$64.38
.039"	.100"	.1875"	2.00"	839F-2.039X.100	\$45.38	839F-E-2.039X.100	\$51.75	839CF-2.039X.100	\$51.75
.043"	.046"	.1875"	2.00"	839F-2.043X.046	\$45.38	839F-E-2.043X.046	\$51.75	839CF-2.043X.046	\$51.75
.047"	.020"	.125"	1.50"	839F-2.047X.020	\$38.34	839F-E-2.047X.020	\$43.84	839CF-2.047X.020	\$43.84
.047"	.046"	.1875"	2.00"	839F-2.047X.046	\$45.38	839F-E-2.047X.046	\$49.54	839CF-2.047X.046	\$49.54
.047"	.046"	.1875"	4.00"	839FL-2.047X.046	\$59.43	839FL-E-2.047X.046	\$64.38	839CFL-2.047X.046	\$64.38
.047"	.125"	.250"	2.00"	839F-2.047X.125	\$51.97	839F-E-2.047X.125	\$60.86	839CF-2.047X.125	\$60.86
.050"	.020"	.125"	1.50"	839F-2.050X.020	\$38.34	839F-E-2.050X.020	\$43.84	839CF-2.050X.020	\$43.84
.050"	.046"	.1875"	2.00"	839F-2.050X.046	\$45.38	839F-E-2.050X.046	\$49.54	839CF-2.050X.046	\$49.54
.050"	.046"	.250"	4.00"	839FL-2.050X.046	\$70.42	839FL-E-2.050X.046	\$79.31	839CFL-2.050X.046	\$79.31
.050"	.125"	.250"	2.00"	839F-2.050X.125	\$51.97	839F-E-2.050X.125	\$60.86	839CF-2.050X.125	\$60.86
.055"	.046"	.1875"	2.00"	839F-2.055X.046	\$45.38	839F-E-2.055X.046	\$49.54	839CF-2.055X.046	\$49.54
.060"	.020"	.1875"	2.00"	839F-2.060X.020	\$46.91	839F-E-2.060X.020	\$49.54	839CF-2.060X.020	\$49.54
.060"	.046"	.1875"	2.00"	839F-2.060X.046	\$45.38	839F-E-2.060X.046	\$45.76	839CF-2.060X.046	\$45.76
.060"	.046"	.250"	4.00"	839FL-2.060X.046	\$70.42	839FL-E-2.060X.046	\$79.31	839CFL-2.060X.046	\$79.31
.060"	.125"	.250"	2.00"	839F-2.060X.125	\$51.97	839F-E-2.060X.125	\$60.86	839CF-2.060X.125	\$60.86
.062"	.020"	.1875"	2.00"	839F-2.062X.020	\$46.91	839F-E-2.062X.020	\$47.31	839CF-2.062X.020	\$47.31
.062"	.046"	.1875"	2.00"	839F-2.062X.046	\$45.38	839F-E-2.062X.046	\$45.76	839CF-2.062X.046	\$45.76
.062"	.046"	.250"	4.00"	839FL-2.062X.046	\$70.42	839FL-E-2.062X.046	\$79.31	839CFL-2.062X.046	\$79.31
.062"	.125"	.250"	2.00"	839F-2.062X.125	\$51.97	839F-E-2.062X.125	\$60.86	839CF-2.062X.125	\$60.86
.072"	.046"	.250"	2.00"	839F-2.072X.046	\$51.97	839F-E-2.072X.046	\$60.86	839CF-2.072X.046	\$60.86
.078"	.046"	.250"	2.00"	839F-2.078X.046	\$51.97	839F-E-2.078X.046	\$60.86	839CF-2.078X.046	\$60.86
.078"	.046"	.250"	4.00"	839FL-2.078X.046	\$70.42	839FL-E-2.078X.046	\$79.31	839CFL-2.078X.046	\$79.31
.089"	.045"	.250"	2.00"	839F-2.089X.045	\$51.97	839F-E-2.089X.045	\$60.86	839CF-2.089X.045	\$60.86
.093"	.045"	.250"	2.00"	839F-2.093X.045	\$51.97	839F-E-2.093X.045	\$60.86	839CF-2.093X.045	\$60.86
.093"	.045"	.3125"	4.00"	839FL-2.093X.045	\$92.83	839FL-E-2.093X.045	\$105.13	839CFL-2.093X.045	\$105.13
.100"	.045"	.250"	2.00"	839F-2.100X.045	\$51.97	839F-E-2.100X.045	\$60.86	839CF-2.100X.045	\$60.86
.100"	.045"	.3125"	4.00"	839FL-2.100X.045	\$92.83	839FL-E-2.100X.045	\$105.13	839CFL-2.100X.045	\$105.13
.109"	.058"	.3125"	2.50"	839F-2.109X.058	\$76.68	839F-E-2.109X.058	\$87.77	839CF-2.109X.058	\$87.77
.118"	.058"	.3125"	2.50"	839F-2.118X.058	\$76.68	839F-E-2.118X.058	\$87.77	839CF-2.118X.058	\$87.77
.125"	.058"	.3125"	2.50"	839F-2.125X.058	\$76.68	839F-E-2.125X.058	\$87.77	839CF-2.125X.058	\$87.77
.125"	.058"	.375"	4.00"	839FL-2.125X.058	\$107.87	839FL-E-2.125X.058	\$115.79	839CFL-2.125X.058	\$115.79
.140"	.058"	.375"	2.50"	839F-2.140X.058	\$92.50	839F-E-2.140X.058	\$105.90	839CF-2.140X.058	\$105.90
.156"	.058"	.375"	2.50"	839F-2.156X.058	\$92.50	839F-E-2.156X.058	\$105.90	839CF-2.156X.058	\$105.90





# CORNER ROUNDING END MILLS, FLARED

**DECIMAL .005" - .125"**



Large Pilots for Profiling and increased durability



**NEW!**

RADIUS (R)	PILOT Ø (Ø)	SHANK Ø (SØ)	OAL	UNCOATED		ALTiN COATED		TiAlN COATED	
				4 FLUTE	PRICE	4 FLUTE	PRICE	4 FLUTE	PRICE
.005"	.058"	.125"	1.50"	839F-4.005X.058	\$46.69	839F-E-4.005X.058	\$52.40	839CF-4.005X.058	\$52.40
.005"	.249"	.375"	2.50"	839F-4.005X.249	\$54.71	839F-E-4.005X.249	\$67.89	839CF-4.005X.249	\$67.89
.008"	.058"	.125"	1.50"	839F-4.008X.058	\$46.69	839F-E-4.008X.058	\$52.40	839CF-4.008X.058	\$52.40
.008"	.249"	.375"	2.50"	839F-4.008X.249	\$54.71	839F-E-4.008X.249	\$67.78	839CF-4.008X.249	\$67.78
.010"	.058"	.125"	1.50"	839F-4.010X.058	\$46.69	839F-E-4.010X.058	\$52.40	839CF-4.010X.058	\$52.40
.010"	.249"	.375"	2.50"	839F-4.010X.249	\$54.71	839F-E-4.010X.249	\$67.89	839CF-4.010X.249	\$67.89
.015"	.058"	.125"	1.50"	839F-4.015X.058	\$46.69	839F-E-4.015X.058	\$52.40	839CF-4.015X.058	\$52.40
.015"	.107"	.1875"	2.00"	839F-4.015X.107	\$50.86	839F-E-4.015X.107	\$57.44	839CF-4.015X.107	\$57.44
.015"	.249"	.375"	2.50"	839F-4.015X.249	\$54.71	839F-E-4.015X.249	\$67.89	839CF-4.015X.249	\$67.89
.020"	.058"	.125"	1.50"	839F-4.020X.058	\$46.69	839F-E-4.020X.058	\$52.40	839CF-4.020X.058	\$52.40
.020"	.107"	.1875"	2.00"	839F-4.020X.107	\$50.86	839F-E-4.020X.107	\$57.44	839CF-4.020X.107	\$57.44
.020"	.249"	.375"	2.50"	839F-4.020X.249	\$54.71	839F-E-4.020X.249	\$67.89	839CF-4.020X.249	\$67.89
.025"	.058"	.125"	1.50"	839F-4.025X.058	\$46.69	839F-E-4.025X.058	\$52.40	839CF-4.025X.058	\$52.40
.025"	.107"	.1875"	2.00"	839F-4.025X.107	\$50.86	839F-E-4.025X.107	\$57.44	839CF-4.025X.107	\$57.44
.025"	.249"	.375"	2.50"	839F-4.025X.249	\$54.71	839F-E-4.025X.249	\$67.89	839CF-4.025X.249	\$67.89
.030"	.058"	.125"	1.50"	839F-4.030X.058	\$46.69	839F-E-4.030X.058	\$52.40	839CF-4.030X.058	\$52.40
.030"	.107"	.1875"	2.00"	839F-4.030X.107	\$50.86	839F-E-4.030X.107	\$57.44	839CF-4.030X.107	\$57.44
.030"	.249"	.375"	2.50"	839F-4.030X.249	\$60.20	839F-E-4.030X.249	\$73.71	839CF-4.030X.249	\$73.71
.031"	.058"	.125"	1.50"	839F-4.031X.058	\$46.69	839F-E-4.031X.058	\$52.40	839CF-4.031X.058	\$52.40
.031"	.107"	.1875"	2.00"	839F-4.031X.107	\$50.86	839F-E-4.031X.107	\$57.44	839CF-4.031X.107	\$57.44
.031"	.249"	.375"	2.50"	839F-4.031X.249	\$60.20	839F-E-4.031X.249	\$73.71	839CF-4.031X.249	\$73.71
.032"	.249"	.375"	2.50"	839F-4.032X.249	\$60.20	839F-E-4.032X.249	\$73.71	839CF-4.032X.249	\$73.71
.035"	.249"	.375"	2.50"	839F-4.035X.249	\$60.20	839F-E-4.035X.249	\$73.71	839CF-4.035X.249	\$73.71
.039"	.058"	.1875"	2.00"	839F-4.039X.058	\$52.51	839F-E-4.039X.058	\$59.10	839CF-4.039X.058	\$59.10
.039"	.249"	.375"	2.50"	839F-4.039X.249	\$60.20	839F-E-4.039X.249	\$73.71	839CF-4.039X.249	\$73.71
.043"	.249"	.375"	2.50"	839F-4.043X.249	\$72.72	839F-E-4.043X.249	\$86.24	839CF-4.043X.249	\$86.24
.047"	.058"	.1875"	2.00"	839F-4.047X.058	\$52.51	839F-E-4.047X.058	\$59.10	839CF-4.047X.058	\$59.10
.047"	.107"	.250"	2.00"	839F-4.047X.107	\$62.94	839F-E-4.047X.107	\$71.74	839CF-4.047X.107	\$71.74
.047"	.249"	.375"	2.50"	839F-4.047X.249	\$72.72	839F-E-4.047X.249	\$86.24	839CF-4.047X.249	\$86.24
.050"	.058"	.1875"	2.00"	839F-4.050X.058	\$52.51	839F-E-4.050X.058	\$59.10	839CF-4.050X.058	\$59.10
.050"	.107"	.250"	2.00"	839F-4.050X.107	\$66.47	839F-E-4.050X.107	\$75.47	839CF-4.050X.107	\$75.47
.050"	.249"	.375"	2.50"	839F-4.050X.249	\$72.72	839F-E-4.050X.249	\$86.24	839CF-4.050X.249	\$86.24
.060"	.058"	.1875"	2.00"	839F-4.060X.058	\$52.51	839F-E-4.060X.058	\$59.10	839CF-4.060X.058	\$59.10
.060"	.107"	.250"	2.00"	839F-4.060X.107	\$66.47	839F-E-4.060X.107	\$75.47	839CF-4.060X.107	\$75.47
.062"	.058"	.1875"	2.00"	839F-4.062X.058	\$52.51	839F-E-4.062X.058	\$59.10	839CF-4.062X.058	\$59.10
.062"	.107"	.250"	2.00"	839F-4.062X.107	\$66.47	839F-E-4.062X.107	\$75.47	839CF-4.062X.107	\$75.47
.078"	.058"	.250"	2.00"	839F-4.078X.058	\$66.47	839F-E-4.078X.058	\$75.47	839CF-4.078X.058	\$75.47
.078"	.107"	.3125"	2.50"	839F-4.078X.107	\$76.68	839F-E-4.078X.107	\$87.77	839CF-4.078X.107	\$87.77
.093"	.058"	.250"	2.00"	839F-4.093X.058	\$66.47	839F-E-4.093X.058	\$75.47	839CF-4.093X.058	\$75.47
.093"	.107"	.3125"	2.50"	839F-4.093X.107	\$76.68	839F-E-4.093X.107	\$87.77	839CF-4.093X.107	\$87.77
.100"	.107"	.3125"	2.50"	839F-4.100X.107	\$76.68	839F-E-4.100X.107	\$87.77	839CF-4.100X.107	\$87.77
.118"	.107"	.375"	2.50"	839F-4.118X.107	\$93.93	839F-E-4.118X.107	\$107.54	839CF-4.118X.107	\$107.54
.125"	.107"	.375"	2.50"	839F-4.125X.107	\$93.93	839F-E-4.125X.107	\$107.54	839CF-4.125X.107	\$107.54





# CORNER ROUNDING END MILLS, FLARED, REACHED

## DECIMAL .005" - .030"

CARBIDE



RADIUS (R)	PILOT DIA. (Ø)	SHANK DIA. (SØ)	NECK DIA. (NØ)	OAL	REACH LENGTH	UNCOATED		ALTiN COATED		TiAlN COATED	
						2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.010"	.125"	.031"	1.50"	.156"	838F-2.005X.010-1	\$31.74	838F-E-2.005X.010-1	\$36.41	838CF-2.005X.010-1	\$36.41
.005"	.010"	.125"	.031"	1.50"	.250"	838F-2.005X.010-2	\$31.74	838F-E-2.005X.010-2	\$36.41	838CF-2.005X.010-2	\$36.41
.005"	.010"	.125"	.031"	1.50"	.375"	838F-2.005X.010-3	\$31.74	838F-E-2.005X.010-3	\$36.41	838CF-2.005X.010-3	\$36.41
.005"	.020"	.125"	.031"	1.50"	.156"	838F-2.005X.020-1	\$31.74	838F-E-2.005X.020-1	\$36.41	838CF-2.005X.020-1	\$36.41
.005"	.020"	.125"	.031"	1.50"	.250"	838F-2.005X.020-2	\$31.74	838F-E-2.005X.020-2	\$36.41	838CF-2.005X.020-2	\$36.41
.005"	.020"	.125"	.031"	1.50"	.375"	838F-2.005X.020-3	\$32.74	838F-E-2.005X.020-3	\$36.41	838CF-2.005X.020-3	\$36.41
.005"	.020"	.125"	.062"	1.50"	.312"	838F-2.005X.020-4	\$31.74	838F-E-2.005X.020-4	\$36.41	838CF-2.005X.020-4	\$36.41
.005"	.020"	.125"	.062"	1.50"	.500"	838F-2.005X.020-5	\$31.74	838F-E-2.005X.020-5	\$36.41	838CF-2.005X.020-5	\$36.41
.005"	.020"	.125"	.062"	2.00"	.750"	838F-2.005X.020-6	\$32.74	838F-E-2.005X.020-6	\$36.41	838CF-2.005X.020-6	\$36.41
.005"	.020"	.125"	.093"	2.00"	.750"	838F-2.005X.020-7	\$36.47	838F-E-2.005X.020-7	\$36.41	838CF-2.005X.020-7	\$36.41
.005"	.020"	.125"	.093"	2.00"	1.125"	838F-2.005X.020-8	\$36.47	838F-E-2.005X.020-8	\$36.41	838CF-2.005X.020-8	\$36.41
.008"	.010"	.125"	.031"	1.50"	.156"	838F-2.008X.010-1	\$31.74	838F-E-2.008X.010-1	\$36.41	838CF-2.008X.010-1	\$36.41
.008"	.010"	.125"	.031"	1.50"	.250"	838F-2.008X.010-2	\$31.74	838F-E-2.008X.010-2	\$36.41	838CF-2.008X.010-2	\$36.41
.008"	.010"	.125"	.031"	1.50"	.375"	838F-2.008X.010-3	\$31.74	838F-E-2.008X.010-3	\$36.41	838CF-2.008X.010-3	\$36.41
.010"	.010"	.125"	.031"	1.50"	.156"	838F-2.010X.010-1	\$31.74	838F-E-2.010X.010-1	\$36.41	838CF-2.010X.010-1	\$36.41
.010"	.010"	.125"	.031"	1.50"	.250"	838F-2.010X.010-2	\$31.74	838F-E-2.010X.010-2	\$36.41	838CF-2.010X.010-2	\$36.41
.010"	.010"	.125"	.031"	1.50"	.375"	838F-2.010X.010-3	\$32.74	838F-E-2.010X.010-3	\$36.41	838CF-2.010X.010-3	\$36.41
.010"	.020"	.125"	.062"	1.50"	.312"	838F-2.010X.020-4	\$31.74	838F-E-2.010X.020-4	\$36.41	838CF-2.010X.020-4	\$36.41
.010"	.020"	.125"	.062"	1.50"	.500"	838F-2.010X.020-5	\$31.74	838F-E-2.010X.020-5	\$36.41	838CF-2.010X.020-5	\$36.41
.010"	.020"	.125"	.062"	2.00"	.750"	838F-2.010X.020-6	\$32.74	838F-E-2.010X.020-6	\$36.41	838CF-2.010X.020-6	\$36.41
.010"	.020"	.125"	.093"	2.00"	.750"	838F-2.010X.020-7	\$36.47	838F-E-2.010X.020-7	\$41.15	838CF-2.010X.020-7	\$41.15
.010"	.020"	.125"	.093"	2.00"	1.125"	838F-2.010X.020-8	\$36.47	838F-E-2.010X.020-8	\$41.15	838CF-2.010X.020-8	\$41.15
.015"	.020"	.125"	.062"	1.50"	.312"	838F-2.015X.020-4	\$31.74	838F-E-2.015X.020-4	\$36.41	838CF-2.015X.020-4	\$36.41
.015"	.020"	.125"	.062"	1.50"	.500"	838F-2.015X.020-5	\$31.74	838F-E-2.015X.020-5	\$36.41	838CF-2.015X.020-5	\$36.41
.015"	.020"	.125"	.062"	2.00"	.750"	838F-2.015X.020-6	\$32.74	838F-E-2.015X.020-6	\$36.41	838CF-2.015X.020-6	\$36.41
.015"	.020"	.125"	.093"	2.00"	.750"	838F-2.015X.020-7	\$36.47	838F-E-2.015X.020-7	\$41.15	838CF-2.015X.020-7	\$41.15
.015"	.020"	.125"	.093"	2.00"	1.125"	838F-2.015X.020-8	\$36.47	838F-E-2.015X.020-8	\$41.15	838CF-2.015X.020-8	\$41.15
.020"	.020"	.125"	.062"	1.50"	.312"	838F-2.020X.020-4	\$31.74	838F-E-2.020X.020-4	\$36.41	838CF-2.020X.020-4	\$36.41
.020"	.020"	.125"	.062"	1.50"	.500"	838F-2.020X.020-5	\$31.74	838F-E-2.020X.020-5	\$36.41	838CF-2.020X.020-5	\$36.41
.020"	.020"	.125"	.062"	2.00"	.750"	838F-2.020X.020-6	\$32.74	838F-E-2.020X.020-6	\$36.41	838CF-2.020X.020-6	\$36.41
.020"	.020"	.125"	.093"	2.00"	.750"	838F-2.020X.020-7	\$36.47	838F-E-2.020X.020-7	\$41.15	838CF-2.020X.020-7	\$41.15
.020"	.020"	.125"	.093"	2.00"	1.125"	838F-2.020X.020-8	\$36.47	838F-E-2.020X.020-8	\$41.15	838CF-2.020X.020-8	\$41.15
.025"	.020"	.125"	.093"	2.00"	.750"	838F-2.025X.020-7	\$36.47	838F-E-2.025X.020-7	\$41.15	838CF-2.025X.020-7	\$41.15
.025"	.020"	.125"	.093"	2.00"	1.125"	838F-2.025X.020-8	\$36.47	838F-E-2.025X.020-8	\$41.15	838CF-2.025X.020-8	\$41.15
.030"	.020"	.125"	.093"	2.00"	.750"	838F-2.030X.020-7	\$36.47	838F-E-2.030X.020-7	\$41.15	838CF-2.030X.020-7	\$41.15
.030"	.020"	.125"	.093"	2.00"	1.125"	838F-2.030X.020-8	\$36.47	838F-E-2.030X.020-8	\$41.15	838CF-2.030X.020-8	\$41.15

NEW!



# CORNER ROUNDING END MILLS

## DECIMAL .005" - .156"

Same Sizes Continued

- Application: End Cutting
- Diameter Tolerance: +/- .0005"
- TIN, ALTiN, and TiAlN coating for High Performance



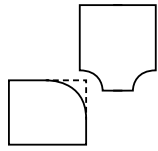
RADIUS (R)	PILOT Ø (Ø)	SHANK Ø (SØ)	OAL	UNCOATED		TIN COATED <span style="font-size: small;">NEW!</span>		ALTiN COATED <span style="font-size: small;">NEW!</span>	
				2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.047"	.125"	1.50"	839-2.005X.047	\$28.66	839-T-2.005X.047	\$34.11	839-E-2.005X.047	\$34.16
.008"	.047"	.125"	1.50"	839-2.008X.047	\$28.66	839-T-2.008X.047	\$34.11	839-E-2.008X.047	\$34.16
.010"	.047"	.125"	1.50"	839-2.010X.047	\$28.66	839-T-2.010X.047	\$34.11	839-E-2.010X.047	\$34.16
.012"	.047"	.125"	1.50"	839-2.012X.047	\$28.66	839-T-2.012X.047	\$34.11	839-E-2.012X.047	\$34.16
.015"	.047"	.125"	1.50"	839-2.015X.047	\$28.66	839-T-2.015X.047	\$34.11	839-E-2.015X.047	\$34.16
.018"	.047"	.125"	1.50"	839-2.018X.047	\$28.66	839-T-2.018X.047	\$34.11	839-E-2.018X.047	\$34.16
.020"	.047"	.125"	1.50"	839-2.020X.047	\$28.66	839-T-2.020X.047	\$34.11	839-E-2.020X.047	\$34.16
.022"	.047"	.125"	1.50"	839-2.022X.047	\$28.66	839-T-2.022X.047	\$34.11	839-E-2.022X.047	\$34.16
.025"	.047"	.125"	1.50"	839-2.025X.047	\$28.66	839-T-2.025X.047	\$34.11	839-E-2.025X.047	\$34.16
.027"	.047"	.125"	1.50"	839-2.027X.047	\$28.66	839-T-2.027X.047	\$34.11	839-E-2.027X.047	\$34.16
.030"	.047"	.125"	1.50"	839-2.030X.047	\$28.66	839-T-2.030X.047	\$34.11	839-E-2.030X.047	\$34.16
.031"	.047"	.125"	1.50"	839-2.031X.047	\$28.66	839-T-2.031X.047	\$34.11	839-E-2.031X.047	\$34.16
.032"	.047"	.125"	1.50"	839-2.032X.047	\$28.66	839-T-2.032X.047	\$34.11	839-E-2.032X.047	\$34.16
.035"	.047"	.125"	1.50"	839-2.035X.047	\$28.66	839-T-2.035X.047	\$34.11	839-E-2.035X.047	\$34.16
.039"	.047"	.125"	1.50"	839-2.039X.047	\$28.66	839-T-2.039X.047	\$34.11	839-E-2.039X.047	\$34.16
.043"	.047"	.1875"	2.00"	839-2.043X.047	\$37.58	839-T-2.043X.047	\$43.87	839-E-2.043X.047	\$43.94
.047"	.047"	.1875"	2.00"	839-2.047X.047	\$37.58	839-T-2.047X.047	\$43.87	839-E-2.047X.047	\$43.94
.050"	.047"	.1875"	2.00"	839-2.050X.047	\$37.58	839-T-2.050X.047	\$43.87	839-E-2.050X.047	\$43.94
.055"	.047"	.1875"	2.00"	839-2.055X.047	\$37.58	839-T-2.055X.047	\$43.87	839-E-2.055X.047	\$43.94
.060"	.047"	.1875"	2.00"	839-2.060X.047	\$38.34	839-T-2.060X.047	\$44.65	839-E-2.060X.047	\$44.71
.062"	.047"	.1875"	2.00"	839-2.062X.047	\$38.34	839-T-2.062X.047	\$44.65	839-E-2.062X.047	\$44.71
.067"	.047"	.1875"	2.00"	839-2.067X.047	\$38.34	839-T-2.067X.047	\$44.65	839-E-2.067X.047	\$44.71
.072"	.047"	.250"	2.00"	839-2.072X.047	\$44.16	839-T-2.072X.047	\$52.87	839-E-2.072X.047	\$52.95
.078"	.047"	.250"	2.00"	839-2.078X.047	\$44.16	839-T-2.078X.047	\$52.87	839-E-2.078X.047	\$52.95
.089"	.047"	.250"	2.00"	839-2.089X.047	\$44.16	839-T-2.089X.047	\$52.87	839-E-2.089X.047	\$52.95
.093"	.047"	.250"	2.00"	839-2.093X.047	\$44.16	839-T-2.093X.047	\$52.87	839-E-2.093X.047	\$52.95
.100"	.047"	.250"	2.00"	839-2.100X.047	\$44.16	839-T-2.100X.047	\$52.87	839-E-2.100X.047	\$52.95
.104"	.060"	.3125"	2.50"	839-2.104X.060	\$61.31	839-T-2.104X.060	\$72.17	839-E-2.104X.060	\$72.28
.109"	.060"	.3125"	2.50"	839-2.109X.060	\$61.31	839-T-2.109X.060	\$72.17	839-E-2.109X.060	\$72.28
.118"	.060"	.3125"	2.50"	839-2.118X.060	\$62.40	839-T-2.118X.060	\$73.27	839-E-2.118X.060	\$73.38
.125"	.060"	.3125"	2.50"	839-2.125X.060	\$62.40	839-T-2.125X.060	\$73.27	839-E-2.125X.060	\$73.38
.140"	.060"	.375"	2.50"	839-2.140X.060	\$71.52	839-T-2.140X.060	\$84.56	839-E-2.140X.060	\$84.70
.156"	.060"	.375"	2.50"	839-2.156X.060	\$77.45	839-T-2.156X.060	\$90.48	839-E-2.156X.060	\$90.62
(R)	(Ø)	(SØ)	OAL	4 FLUTE	PRICE	4 FLUTE	PRICE	4 FLUTE	PRICE
.010"	.250"	.375"	2.50"	839-4.010X.250	\$49.33	839-T-4.010X.250	\$62.41	839-E-4.010X.250	\$62.51
.015"	.250"	.375"	2.50"	839-4.015X.250	\$49.33	839-T-4.015X.250	\$62.41	839-E-4.015X.250	\$62.51
.020"	.250"	.375"	2.50"	839-4.020X.250	\$49.33	839-T-4.020X.250	\$62.41	839-E-4.020X.250	\$62.51
.025"	.250"	.375"	2.50"	839-4.025X.250	\$49.33	839-T-4.025X.250	\$62.41	839-E-4.025X.250	\$62.51
.030"	.250"	.375"	2.50"	839-4.030X.250	\$54.05	839-T-4.030X.250	\$67.12	839-E-4.030X.250	\$67.22
.031"	.250"	.375"	2.50"	839-4.031X.250	\$54.05	839-T-4.031X.250	\$67.12	839-E-4.031X.250	\$67.22
.039"	.250"	.375"	2.50"	839-4.039X.250	\$54.05	839-T-4.039X.250	\$67.12	839-E-4.039X.250	\$67.22
.047"	.250"	.375"	2.50"	839-4.047X.250	\$54.05	839-T-4.047X.250	\$67.12	839-E-4.047X.250	\$67.22
.050"	.250"	.375"	2.50"	839-4.050X.250	\$54.05	839-T-4.050X.250	\$67.12	839-E-4.050X.250	\$67.22



Continued with  
AD/ TIALN

# CORNER ROUNDING END MILLS

## DECIMAL .005" - .156"



Large Pilots for Profiling  
and increased durability



**NEW!**

RADIUS (R)	PILOT DIA. (Ø)	SHANK DIA. (SØ)	OAL	TIALN COATED		AMORPHOUS DIAMOND	
				2 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.047"	.125"	1.50"	839C-2.005X.047	\$34.16	839-A-2.005X.047	\$45.64
.008"	.047"	.125"	1.50"	839C-2.008X.047	\$34.16	839-A-2.008X.047	\$45.64
.010"	.047"	.125"	1.50"	839C-2.010X.047	\$34.16	839-A-2.010X.047	\$45.64
.012"	.047"	.125"	1.50"	839C-2.012X.047	\$34.16	839-A-2.012X.047	\$45.64
.015"	.047"	.125"	1.50"	839C-2.015X.047	\$34.16	839-A-2.015X.047	\$45.64
.018"	.047"	.125"	1.50"	839C-2.018X.047	\$34.16	839-A-2.018X.047	\$45.64
.020"	.047"	.125"	1.50"	839C-2.020X.047	\$34.16	839-A-2.020X.047	\$45.64
.022"	.047"	.125"	1.50"	839C-2.022X.047	\$34.16	839-A-2.022X.047	\$45.64
.025"	.047"	.125"	1.50"	839C-2.025X.047	\$34.16	839-A-2.025X.047	\$45.64
.027"	.047"	.125"	1.50"	839C-2.027X.047	\$34.16	839-A-2.027X.047	\$45.64
.030"	.047"	.125"	1.50"	839C-2.030X.047	\$34.16	839-A-2.030X.047	\$45.64
.031"	.047"	.125"	1.50"	839C-2.031X.047	\$34.16	839-A-2.031X.047	\$45.64
.032"	.047"	.125"	1.50"	839C-2.032X.047	\$34.16	839-A-2.032X.047	\$45.64
.035"	.047"	.125"	1.50"	839C-2.035X.047	\$34.16	839-A-2.035X.047	\$45.64
.039"	.047"	.125"	1.50"	839C-2.039X.047	\$34.16	839-A-2.039X.047	\$45.64
.043"	.047"	.1875"	2.00"	839C-2.043X.047	\$43.94	839-A-2.043X.047	\$45.64
.047"	.047"	.1875"	2.00"	839C-2.047X.047	\$43.94	839-A-2.047X.047	\$61.10
.050"	.047"	.1875"	2.00"	839C-2.050X.047	\$43.94	839-A-2.050X.047	\$61.10
.055"	.047"	.1875"	2.00"	839C-2.055X.047	\$43.94	839-A-2.055X.047	\$61.10
.060"	.047"	.1875"	2.00"	839C-2.060X.047	\$44.71	839-A-2.060X.047	\$61.85
.062"	.047"	.1875"	2.00"	839C-2.062X.047	\$44.71	839-A-2.062X.047	\$61.85
.067"	.047"	.1875"	2.00"	839C-2.067X.047	\$44.71	839-A-2.067X.047	\$63.70
.072"	.047"	.250"	2.00"	839C-2.072X.047	\$52.95	839-A-2.072X.047	\$73.16
.078"	.047"	.250"	2.00"	839C-2.078X.047	\$52.95	839-A-2.078X.047	\$70.96
.089"	.047"	.250"	2.00"	839C-2.089X.047	\$52.95	839-A-2.089X.047	\$73.16
.093"	.047"	.250"	2.00"	839C-2.093X.047	\$52.95	839-A-2.093X.047	\$70.96
.100"	.047"	.250"	2.00"	839C-2.100X.047	\$52.95	839-A-2.100X.047	\$70.96
.104"	.060"	.3125"	2.50"	839C-2.104X.060	\$72.28	839-A-2.104X.060	\$91.13
.109"	.060"	.3125"	2.50"	839C-2.109X.060	\$72.28	839-A-2.109X.060	\$90.07
.118"	.060"	.3125"	2.50"	839C-2.118X.060	\$73.38	839-A-2.118X.060	\$89.16
.125"	.060"	.3125"	2.50"	839C-2.125X.060	\$73.38	839-A-2.125X.060	\$89.16
.140"	.060"	.375"	2.50"	839C-2.140X.060	\$84.70	839-A-2.140X.060	\$99.81
.156"	.060"	.375"	2.50"	839C-2.156X.060	\$90.62	839-A-2.156X.060	\$103.82
(R)	(Ø)	(SØ)	OAL	4 FLUTE	PRICE	4 FLUTE	PRICE
.010"	.250"	.375"	2.50"	839C-4.010X.250	\$62.51	839-A-4.010X.250	\$65.47
.015"	.250"	.375"	2.50"	839C-4.015X.250	\$62.51	839-A-4.015X.250	\$65.47
.020"	.250"	.375"	2.50"	839C-4.020X.250	\$62.51	839-A-4.020X.250	\$65.47
.025"	.250"	.375"	2.50"	839C-4.025X.250	\$62.51	839-A-4.025X.250	\$65.47
.030"	.250"	.375"	2.50"	839C-4.030X.250	\$67.22	839-A-4.030X.250	\$69.86
.031"	.250"	.375"	2.50"	839C-4.031X.250	\$67.22	839-A-4.031X.250	\$69.86
.039"	.250"	.375"	2.50"	839C-4.039X.250	\$67.22	839-A-4.039X.250	\$69.86
.047"	.250"	.375"	2.50"	839C-4.047X.250	\$67.22	839-A-4.047X.250	\$69.86
.050"	.250"	.375"	2.50"	839C-4.050X.250	\$67.22	839-A-4.050X.250	\$69.86

**CARBIDE**

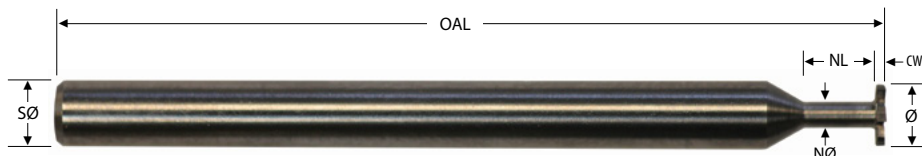


# KEYSEAT CUTTERS, 6 FLUTE

## DECIMAL .0625" - .1875"

Keyseat Cutters can be used for milling grooves, keyseats, and slots, and are ideal for non-ferrous applications

- ALTIN/TIALN for Higher Performance
- Diameter Tolerance (+0/-.001")
- Cutter Width Tolerance (+.0005")



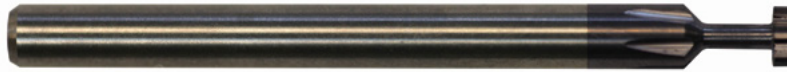
**NEW!**

DIAMETER (Ø)	CUTTER WIDTH (CW)	NECK LENGTH (NL)	NECK DIA. (NØ)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTIN COATED		TIALN COATED	
						6 FLUTE	PRICE	6 FLUTE	PRICE	6 FLUTE	PRICE
.0625"	.0156"	.0937"	.0312"	.125"	2.00"	809-00-0156	\$39.66	809-E-00-0156	\$44.06	809C-00-0156	\$44.06
.0625"	.0312"	.0937"	.0312"	.125"	2.00"	809-00-0312	\$39.66	809-E-00-0312	\$44.06	809C-00-0312	\$44.06
.0625"	.0394"	.0937"	.0312"	.125"	2.00"	809-00-0394	\$39.66	809-E-00-0394	\$44.06	809C-00-0394	\$44.06
.0625"	.0469"	.0937"	.0312"	.125"	2.00"	809-00-0469	\$39.66	809-E-00-0469	\$44.06	809C-00-0469	\$44.06
.0625"	.0625"	.0937"	.0312"	.125"	2.00"	809-00-0625	\$39.66	809-E-00-0625	\$44.06	809C-00-0625	\$44.06
.0781"	.0156"	.125"	.0394"	.125"	2.00"	809-01-0156	\$39.21	809-E-01-0156	\$43.61	809C-01-0156	\$43.61
.0781"	.0312"	.125"	.0394"	.125"	2.00"	809-01-0312	\$39.21	809-E-01-0312	\$43.61	809C-01-0312	\$43.61
.0781"	.0394"	.125"	.0394"	.125"	2.00"	809-01-0394	\$39.21	809-E-01-0394	\$43.61	809C-01-0394	\$43.61
.0781"	.0469"	.125"	.0394"	.125"	2.00"	809-01-0469	\$39.21	809-E-01-0469	\$43.61	809C-01-0469	\$43.61
.0781"	.0625"	.125"	.0394"	.125"	2.00"	809-01-0625	\$39.21	809-E-01-0625	\$43.61	809C-01-0625	\$43.61
.0937"	.0156"	.157"	.0469"	.125"	2.00"	809-02-0156	\$38.78	809-E-02-0156	\$43.17	809C-02-0156	\$43.17
.0937"	.0312"	.157"	.0469"	.125"	2.00"	809-02-0312	\$38.78	809-E-02-0312	\$43.17	809C-02-0312	\$43.17
.0937"	.0394"	.157"	.0469"	.125"	2.00"	809-02-0394	\$38.78	809-E-02-0394	\$43.17	809C-02-0394	\$43.17
.0937"	.0469"	.157"	.0469"	.125"	2.00"	809-02-0469	\$38.78	809-E-02-0469	\$43.17	809C-02-0469	\$43.17
.0937"	.0625"	.157"	.0469"	.125"	2.00"	809-02-0625	\$38.78	809-E-02-0625	\$43.17	809C-02-0625	\$43.17
.125"	.0156"	.188"	.0625"	.125"	2.00"	809-03-0156	\$37.24	809-E-03-0156	\$41.63	809C-03-0156	\$41.63
.125"	.0312"	.188"	.0625"	.125"	2.00"	809-03-0312	\$37.24	809-E-03-0312	\$41.63	809C-03-0312	\$41.63
.125"	.0394"	.188"	.0625"	.125"	2.00"	809-03-0394	\$37.24	809-E-03-0394	\$41.63	809C-03-0394	\$41.63
.125"	.0469"	.188"	.0625"	.125"	2.00"	809-03-0469	\$37.24	809-E-03-0469	\$41.63	809C-03-0469	\$41.63
.125"	.0625"	.188"	.0625"	.125"	2.00"	809-03-0625	\$37.24	809-E-03-0625	\$41.63	809C-03-0625	\$41.63
.125"	.0937"	.188"	.0625"	.125"	2.00"	809-03-0937	\$37.24	809-E-03-0937	\$41.63	809C-03-0937	\$41.63
.125"	.125"	.188"	.0625"	.125"	2.00"	809-03-1250	\$37.24	809-E-03-1250	\$41.63	809C-03-1250	\$41.63
.1875"	.0156"	.285"	.0937"	.1875"	2.00"	809-10-0156	\$38.56	809-E-10-0156	\$43.28	809C-10-0156	\$43.28
.1875"	.0312"	.285"	.0937"	.1875"	2.00"	809-10-0312	\$38.56	809-E-10-0312	\$43.28	809C-10-0312	\$43.28
.1875"	.0394"	.285"	.0937"	.1875"	2.00"	809-10-0394	\$38.56	809-E-10-0394	\$43.28	809C-10-0394	\$43.28
.1875"	.0469"	.285"	.0937"	.1875"	2.00"	809-10-0469	\$38.56	809-E-10-0469	\$43.28	809C-10-0469	\$43.28
.1875"	.0625"	.285"	.0937"	.1875"	2.00"	809-10-0625	\$38.56	809-E-10-0625	\$43.28	809C-10-0625	\$43.28
.1875"	.0937"	.285"	.0937"	.1875"	2.00"	809-10-0937	\$38.56	809-E-10-0937	\$43.28	809C-10-0937	\$43.28
.1875"	.125"	.285"	.0937"	.1875"	2.00"	809-10-1250	\$38.56	809-E-10-1250	\$43.28	809C-10-1250	\$43.28
.1875"	.1875"	.285"	.0937"	.1875"	2.00"	809-10-1875	\$38.56	809-E-10-1875	\$43.28	809C-10-1875	\$43.28



# KEYSEAT CUTTERS, 6 & 8 FLUTE

DECIMAL .125" - .375"



**6 FLUTE, 1/4" SHANK DIAMETER**

DIAMETER (Ø)	CUTTER WIDTH (CW)	NECK LENGTH (NL)	NECK DIA. (NØ)	SHANK DIA. (SØ)	OAL	UNCOATED		TIALN COATED	
						6 FLUTE	PRICE	6 FLUTE	PRICE
.125"	.0156"	.157"	.0625"	.250"	2.00"	809-20-0156	\$43.72	809C-20-0156	\$50.31
.125"	.0312"	.157"	.0625"	.250"	2.00"	809-20-0312	\$43.72	809C-20-0312	\$50.31
.125"	.0394"	.157"	.0625"	.250"	2.00"	809-20-0394	\$43.72	809C-20-0394	\$50.31
.125"	.0469"	.157"	.0625"	.250"	2.00"	809-20-0469	\$43.72	809C-20-0469	\$50.31
.125"	.0625"	.157"	.0625"	.250"	2.00"	809-20-0625	\$43.72	809C-20-0625	\$50.31
.125"	.0937"	.157"	.0625"	.250"	2.00"	809-20-0937	\$43.72	809C-20-0937	\$50.31
.125"	.125"	.157"	.0625"	.250"	2.00"	809-20-1250	\$43.72	809C-20-1250	\$50.31
.1875"	.0156"	.250"	.0937"	.250"	2.00"	809-21-0156	\$43.72	809C-21-0156	\$50.31
.1875"	.0312"	.250"	.0937"	.250"	2.00"	809-21-0312	\$43.72	809C-21-0312	\$50.31
.1875"	.0394"	.250"	.0937"	.250"	2.00"	809-21-0394	\$43.72	809C-21-0394	\$50.31
.1875"	.0469"	.250"	.0937"	.250"	2.00"	809-21-0469	\$43.72	809C-21-0469	\$50.31
.1875"	.0625"	.250"	.0937"	.250"	2.00"	809-21-0625	\$43.72	809C-21-0625	\$50.31
.1875"	.0937"	.250"	.0937"	.250"	2.00"	809-21-0937	\$43.72	809C-21-0937	\$50.31
.1875"	.125"	.250"	.0937"	.250"	2.00"	809-21-1250	\$43.72	809C-21-1250	\$50.31
.1875"	.1875"	.250"	.0937"	.250"	2.00"	809-21-1875	\$43.72	809C-21-1875	\$50.31

## 8 FLUTE

DIAMETER (Ø)	CUTTER WIDTH (CW)	NECK LENGTH (NL)	NECK DIA. (NØ)	SHANK DIA. (SØ)	OAL	UNCOATED		ALTIN COATED <span style="color: yellow;">NEW!</span>		TIALN COATED	
						8 FLUTE	PRICE	8 FLUTE	PRICE	8 FLUTE	PRICE
.250"	.0156"	.250"	.125"	.250"	2.00"	809-22-0156	\$43.72	809-E-22-0156	\$50.31	809C-22-0156	\$50.31
.250"	.0312"	.250"	.125"	.250"	2.00"	809-22-0312	\$43.72	809-E-22-0312	\$50.31	809C-22-0312	\$50.31
.250"	.0394"	.250"	.125"	.250"	2.00"	809-22-0394	\$43.72	809-E-22-0394	\$50.31	809C-22-0394	\$50.31
.250"	.0469"	.250"	.125"	.250"	2.00"	809-22-0469	\$43.72	809-E-22-0469	\$50.31	809C-22-0469	\$50.31
.250"	.0625"	.250"	.125"	.250"	2.00"	809-22-0625	\$43.72	809-E-22-0625	\$50.31	809C-22-0625	\$50.31
.250"	.125"	.250"	.125"	.250"	2.00"	809-22-1250	\$43.72	809-E-22-1250	\$50.31	809C-22-1250	\$50.31
.250"	.1875"	.250"	.125"	.250"	2.00"	809-22-1875	\$43.72	809-E-22-1875	\$50.31	809C-22-1875	\$50.31
.250"	.250"	.250"	.125"	.250"	2.00"	809-22-2500	\$43.72	809-E-22-2500	\$50.31	809C-22-2500	\$50.31
.3125"	.0156"	.250"	.157"	.375"	2.00"	809-30-0156	\$58.45	809-E-30-0156	\$66.14	809C-30-0156	\$66.14
.3125"	.0312"	.250"	.157"	.375"	2.00"	809-30-0312	\$58.45	809-E-30-0312	\$66.14	809C-30-0312	\$66.14
.3125"	.0394"	.250"	.157"	.375"	2.00"	809-30-0394	\$58.45	809-E-30-0394	\$66.14	809C-30-0394	\$66.14
.3125"	.0469"	.250"	.157"	.375"	2.00"	809-30-0469	\$58.45	809-E-30-0469	\$66.14	809C-30-0469	\$66.14
.3125"	.0625"	.250"	.157"	.375"	2.00"	809-30-0625	\$58.45	809-E-30-0625	\$66.14	809C-30-0625	\$66.14
.3125"	.0787"	.250"	.157"	.375"	2.00"	809-30-0787	\$58.45	809-E-30-0787	\$66.14	809C-30-0787	\$66.14
.3125"	.0937"	.250"	.157"	.375"	2.00"	809-30-0937	\$58.45	809-E-30-0937	\$66.14	809C-30-0937	\$66.14
.375"	.0156"	.250"	.188"	.375"	2.00"	809-31-0156	\$67.99	809-E-31-0156	\$76.79	809C-31-0156	\$76.79
.375"	.0312"	.250"	.188"	.375"	2.00"	809-31-0312	\$65.58	809-E-31-0312	\$74.38	809C-31-0312	\$74.38
.375"	.0394"	.250"	.188"	.375"	2.00"	809-31-0394	\$65.58	809-E-31-0394	\$74.38	809C-31-0394	\$74.38
.375"	.0469"	.250"	.188"	.375"	2.00"	809-31-0469	\$65.58	809-E-31-0469	\$74.38	809C-31-0469	\$74.38
.375"	.0625"	.250"	.188"	.375"	2.00"	809-31-0625	\$65.58	809-E-31-0625	\$74.38	809C-31-0625	\$74.38
.375"	.0787"	.250"	.188"	.375"	2.00"	809-31-0787	\$65.58	809-E-31-0787	\$74.38	809C-31-0787	\$74.38
.375"	.0937"	.250"	.188"	.375"	2.00"	809-31-0937	\$65.58	809-E-31-0937	\$74.38	809C-31-0937	\$74.38
.375"	.125"	.250"	.188"	.375"	2.00"	809-31-1250	\$65.58	809-E-31-1250	\$74.38	809C-31-1250	\$74.38



# DRILL POINT MILLS

## FRACTIONAL 1/32" - 3/4"

Same Sizes Continued →

- Use: General Purpose
- Helix: 30 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Cutter Type: Drill Mill
- Diameter Tolerance:
  - Up to 1/8": +0.000/-0.001
  - 1/8" and above: +0.000/-0.002

### 60 DEGREE DRILL MILLS



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED		
				2 FLUTE	4 FLUTE	PRICE
1/32"	.125"	.125"	1.50"	874DM60-0031	875DM60-0031	\$20.78
1/16"	.1875"	.125"	1.50"	874DM60-0062	875DM60-0062	\$20.78
3/32"	.375"	.125"	1.50"	874DM60-0093	875DM60-0093	\$20.78
1/8"	.500"	.125"	1.50"	874DM60-0125	875DM60-0125	\$20.78
3/16"	.625"	.1875"	2.00"	874DM60-0187	875DM60-0187	\$22.02
1/4"	.750"	.250"	2.50"	874DM60-0250	875DM60-0250	\$23.84
5/16"	.8125"	.3125"	2.50"	874DM60-0312	875DM60-0312	\$25.18
3/8"	1.00"	.375"	2.50"	874DM60-0375	875DM60-0375	\$31.45
7/16"	1.00"	.4375"	2.75"	874DM60-0437	875DM60-0437	\$40.75
1/2"	1.00"	.500"	3.00"	874DM60-0500	875DM60-0500	\$49.24
5/8"	1.25"	.625"	3.50"	874DM60-0625	875DM60-0625	\$95.57
3/4"	1.50"	.750"	4.00"	874DM60-0750	875DM60-0750	\$139.00

### 90 DEGREE DRILL MILLS



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED		
				2 FLUTE	4 FLUTE	PRICE
1/32"	.125"	.125"	1.50"	874DM90-0031	875DM90-0031	\$20.78
1/16"	.1875"	.125"	1.50"	874DM90-0062	875DM90-0062	\$20.78
3/32"	.375"	.125"	1.50"	874DM90-0093	875DM90-0093	\$20.78
1/8"	.500"	.125"	1.50"	874DM90-0125	875DM90-0125	\$20.78
3/16"	.625"	.1875"	2.00"	874DM90-0187	875DM90-0187	\$22.02
1/4"	.750"	.250"	2.50"	874DM90-0250	875DM90-0250	\$23.84
5/16"	.8125"	.3125"	2.50"	874DM90-0312	875DM90-0312	\$25.18
3/8"	1.00"	.375"	2.50"	874DM90-0375	875DM90-0375	\$31.45
7/16"	1.00"	.4375"	2.75"	874DM90-0437	875DM90-0437	\$40.75
1/2"	1.00"	.500"	3.00"	874DM90-0500	875DM90-0500	\$49.24
5/8"	1.25"	.625"	3.50"	874DM90-0625	875DM90-0625	\$95.57
3/4"	1.50"	.750"	4.00"	874DM90-0750	875DM90-0750	\$139.00





# COATED DRILL POINT MILLS

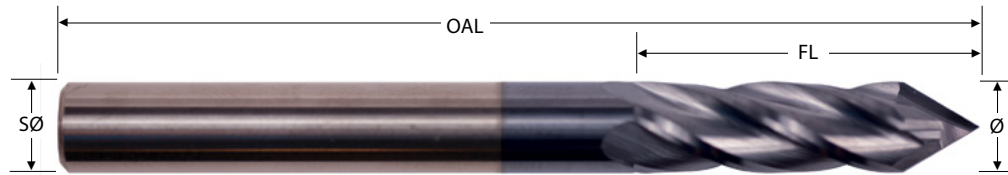
## FRACTIONAL 1/32" - 3/4"

**NEW!**

**CARBIDE**

- Now Available in more sizes
- Cutter Type: Drill Mill
- TIN Coating for High Performance
- ALTIN Coating for Best Performance

### 60 DEGREE COATED DRILL MILLS



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIN COATED		ALTIN COATED		
				4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/32"	.125"	.125"	1.50"	875-T-DM60-0031	\$22.83	874-E-DM60-0031	875-E-DM60-0031	\$24.05
1/16"	.1875"	.125"	1.50"	875-T-DM60-0062	\$22.83	874-E-DM60-0062	875-E-DM60-0062	\$24.05
3/32"	.375"	.125"	1.50"	875-T-DM60-0093	\$22.83	874-E-DM60-0093	875-E-DM60-0093	\$24.05
1/8"	.500"	.125"	1.50"	875-T-DM60-0125	\$22.83	874-E-DM60-0125	875-E-DM60-0125	\$24.05
3/16"	.625"	.1875"	2.00"	875-T-DM60-0187	\$24.53	874-E-DM60-0187	875-E-DM60-0187	\$25.60
1/4"	.750"	.250"	2.50"	875-T-DM60-0250	\$25.89	874-E-DM60-0250	875-E-DM60-0250	\$27.65
5/16"	.8125"	.3125"	2.50"	875-T-DM60-0312	\$28.08	874-E-DM60-0312	875-E-DM60-0312	\$29.67
3/8"	1.00"	.375"	2.50"	875-T-DM60-0375	\$34.60	874-E-DM60-0375	875-E-DM60-0375	\$36.80
7/16"	1.00"	.4375"	2.75"	875-T-DM60-0437	\$43.56	874-E-DM60-0437	875-E-DM60-0437	\$46.05
1/2"	1.00"	.500"	3.00"	875-T-DM60-0500	\$52.75	874-E-DM60-0500	875-E-DM60-0500	\$55.88
5/8"	1.25"	.625"	3.50"	875-T-DM60-0625	\$101.47	874-E-DM60-0625	875-E-DM60-0625	\$105.69
3/4"	1.50"	.750"	4.00"	875-T-DM60-0750	\$145.45	874-E-DM60-0750	875-E-DM60-0750	\$149.42



### 90 DEGREE COATED DRILL MILLS

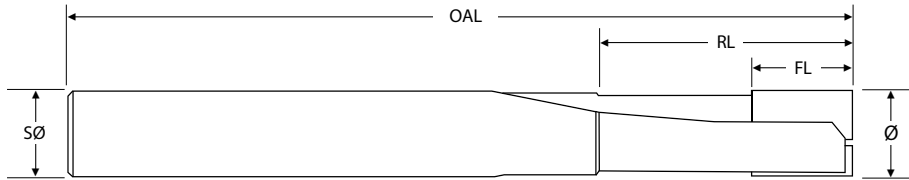


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	TIN COATED		ALTIN COATED		
				4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/32"	.125"	.125"	1.50"	875-T-DM90-0031	\$22.83	874-E-DM90-0031	875-E-DM90-0031	\$24.05
1/16"	.1875"	.125"	1.50"	875-T-DM90-0062	\$22.83	874-E-DM90-0062	875-E-DM90-0062	\$24.05
3/32"	.375"	.125"	1.50"	875-T-DM90-0093	\$22.83	874-E-DM90-0093	875-E-DM90-0093	\$24.05
1/8"	.500"	.125"	1.50"	875-T-DM90-0125	\$22.83	874-E-DM90-0125	875-E-DM90-0125	\$24.05
3/16"	.625"	.1875"	2.00"	875-T-DM90-0187	\$24.53	874-E-DM90-0187	875-E-DM90-0187	\$25.60
1/4"	.750"	.250"	2.50"	875-T-DM90-0250	\$25.89	874-E-DM90-0250	875-E-DM90-0250	\$27.65
5/16"	.8125"	.3125"	2.50"	875-T-DM90-0312	\$28.08	874-E-DM90-0312	875-E-DM90-0312	\$29.67
3/8"	1.00"	.375"	2.50"	875-T-DM90-0375	\$34.60	874-E-DM90-0375	875-E-DM90-0375	\$36.80
7/16"	1.00"	.4375"	2.75"	875-T-DM90-0437	\$43.56	874-E-DM90-0437	875-E-DM90-0437	\$46.05
1/2"	1.00"	.500"	3.00"	875-T-DM90-0500	\$52.75	874-E-DM90-0500	875-E-DM90-0500	\$55.88
5/8"	1.25"	.625"	3.50"	875-T-DM90-0625	\$101.47	874-E-DM90-0625	875-E-DM90-0625	\$105.69
3/4"	1.50"	.750"	4.00"	875-T-DM90-0750	\$145.45	874-E-DM90-0750	875-E-DM90-0750	\$149.42

# SQUARE PCD END MILLS

## FRACTIONAL 3/32" - 3/4"

- Polycrystalline Diamond Brazed
- Center Cutting: Yes
- Abrasion Resistance/ Low Temp.
- Best for non-ferrous materials
- Diameter Tolerance (+0/-0.001")



DIAMETER	FLUTE LENGTH	REACH LENGTH	SHANK DIAMETER	OVERALL LENGTH	PCD BRAZED	
(Ø)	(FL)	(RL)	(SØ)	(OAL)	1 FLUTE	PRICE
3/32"	3/16"	3/8"	1/8"	1-1/2"	740-093	\$164.77
1/8"	1/4"	1/2"	1/8"	1-1/2"	740-125	\$164.77
(Ø)	(FL)	(RL)	(SØ)	(OAL)	2 FLUTE	PRICE
3/16"	1/4"	5/8"	3/16"	2"	740-187	\$225.55
1/4"	1/4"	3/4"	1/4"	2-1/2"	740-250	\$242.49
3/8"	1/4"	15/16"	3/8"	2-1/2"	740-375	\$280.38
1/2"	1/4"	1"	1/2"	3"	740-500	\$325.17
5/8"	3/8"	1"	5/8"	3-1/2"	740-625	\$459.35
3/4"	3/8"	1-1/8"	3/4"	4"	740-750	\$535.34

# PCD END MILLS

## FRACTIONAL 3/32" - 1/2"

CARBIDE

X/X

### BALL END



DIAMETER (Ø)	FLUTE LENGTH (FL)	REACH LENGTH (RL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	PCD BRAZED	
					1 FLUTE	PRICE
3/32"	3/16"	3/8"	1/8"	1-1/2"	742-093	\$200.36
1/8"	1/4"	1/2"	1/8"	1-1/2"	742-125	\$200.36
(Ø)	(FL)	(RL)	(SØ)	(OAL)	2 FLUTE	PRICE
3/16"	1/4"	5/8"	3/16"	2"	742-187	\$268.56
1/4"	5/16"	3/4"	1/4"	2-1/2"	742-250	\$299.99
3/8"	7/16"	15/16"	3/8"	2-1/2"	742-375	\$318.70
1/2"	1/2"	1"	1/2"	3"	742-500	\$366.86

BALL

### CORNER RADIUS



DIAMETER (Ø)	FLUTE LENGTH (FL)	REACH LENGTH (RL)	SHANK DIA. (SØ)	CORNER RADIUS	OAL	PCD BRAZED	
						1 FLUTE	PRICE
3/32"	3/16"	3/8"	1/8"	.010"	1-1/2"	741-093	\$200.36
1/8"	1/4"	1/2"	1/8"	.015"	1-1/2"	741-125	\$200.36
(Ø)	(FL)	(RL)	(SØ)	CORNER RADIUS	OAL	2 FLUTE	PRICE
3/16"	1/4"	5/8"	3/16"	.015"	2"	741-187	\$259.20
1/4"	1/4"	3/4"	1/4"	.030"	2-1/2"	741-250	\$276.14
3/8"	1/4"	15/16"	3/8"	.030"	2-1/2"	741-375	\$314.03
1/2"	1/4"	1"	1/2"	.030"	3"	741-500	\$358.83

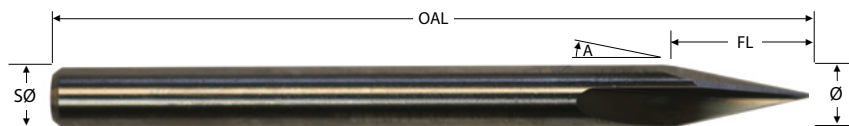
CORNER RADIUS

# CHAMFER MILLS

## FRACTIONAL 1/8" - 1/2"

- Helix: 0 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Uncoated for General Purpose
- ALTiN/ TiAlN for High Performance
- Diameter Tolerance: +0/ -.0005

### 2 FLUTE, 15 - 55 DEGREE CUT



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
1/8"	.215"	1/8"	1.50"	15°	818-230-125	\$17.35	818-E-230-125	\$21.75	818C-230-125	\$21.75
3/16"	.350"	3/16"	2.00"	15°	818-230-187	\$22.85	818-E-230-187	\$27.57	818C-230-187	\$27.57
1/4"	.448"	1/4"	2.50"	15°	818-230-250	\$32.74	818-E-230-250	\$39.33	818C-230-250	\$39.33
3/8"	.700"	3/8"	2.50"	15°	818-230-375	\$43.84	818-E-230-375	\$52.62	818C-230-375	\$52.62
1/2"	.933"	1/2"	3.00"	15°	818-230-500	\$73.82	818-E-230-500	\$85.91	818C-230-500	\$85.91
1/8"	.158"	1/8"	1.50"	20°	818-240-125	\$17.35	818-E-240-125	\$21.75	818C-240-125	\$21.75
3/16"	.258"	3/16"	2.00"	20°	818-240-187	\$22.85	818-E-240-187	\$27.57	818C-240-187	\$27.57
1/4"	.330"	1/4"	2.50"	20°	818-240-250	\$32.74	818-E-240-250	\$39.33	818C-240-250	\$39.33
3/8"	.515"	3/8"	2.50"	20°	818-240-375	\$43.84	818-E-240-375	\$52.62	818C-240-375	\$52.62
1/8"	.139"	1/8"	1.50"	22.5°	818-245-125	\$17.35	818-E-245-125	\$21.75	818C-245-125	\$21.75
3/16"	.226"	3/16"	2.00"	22.5°	818-245-187	\$21.75	818-E-245-187	\$26.48	818C-245-187	\$26.48
1/8"	.123"	1/8"	1.50"	25°	818-250-125	\$17.35	818-E-250-125	\$21.75	818C-250-125	\$21.75
3/16"	.201"	3/16"	2.00"	25°	818-250-187	\$21.75	818-E-250-187	\$26.48	818C-250-187	\$26.48
1/8"	.100"	1/8"	1.50"	30°	818-260-125	\$16.53	818-E-260-125	\$20.67	818C-260-125	\$20.67
3/16"	.162"	3/16"	2.00"	30°	818-260-187	\$22.85	818-E-260-187	\$27.57	818C-260-187	\$27.57
1/4"	.208"	1/4"	2.50"	30°	818-260-250	\$26.65	818-E-260-250	\$31.98	818C-260-250	\$31.98
3/8"	.325"	3/8"	2.50"	30°	818-260-375	\$34.01	818-E-260-375	\$40.82	818C-260-375	\$40.82
1/2"	.433"	1/2"	3.00"	30°	818-260-500	\$57.08	818-E-260-500	\$66.78	818C-260-500	\$66.78
1/8"	.089"	1/8"	1.50"	35°	818-270-125	\$17.35	818-E-270-125	\$21.75	818C-270-125	\$21.75
1/8"	.074"	1/8"	1.50"	40°	818-280-125	\$17.35	818-E-280-125	\$21.75	818C-280-125	\$21.75
1/8"	.066"	1/8"	1.50"	41°	818-282-125	\$16.53	818-E-282-125	\$20.67	818C-282-125	\$20.67
3/16"	.108"	3/16"	2.00"	41°	818-282-187	\$22.85	818-E-282-187	\$26.48	818C-282-187	\$26.48
1/4"	.138"	1/4"	2.50"	41°	818-282-250	\$26.65	818-E-282-250	\$31.98	818C-282-250	\$31.98
3/8"	.210"	3/8"	2.50"	41°	818-282-375	\$34.01	818-E-282-375	\$40.82	818C-282-375	\$40.82
1/2"	.280"	1/2"	3.00"	41°	818-282-500	\$57.08	818-E-282-500	\$66.78	818C-282-500	\$66.78
1/8"	.058"	1/8"	1.50"	45°	818-290-125	\$16.53	818-E-290-125	\$20.67	818C-290-125	\$20.67
3/16"	.094"	3/16"	2.00"	45°	818-290-187	\$22.85	818-E-290-187	\$27.57	818C-290-187	\$27.57
1/4"	.120"	1/4"	2.50"	45°	818-290-250	\$26.65	818-E-290-250	\$31.98	818C-290-250	\$31.98
3/8"	.188"	3/8"	2.50"	45°	818-290-375	\$34.01	818-E-290-375	\$40.82	818C-290-375	\$40.82
1/2"	.250"	1/2"	3.00"	45°	818-290-500	\$57.08	818-E-290-500	\$66.78	818C-290-500	\$66.78
1/8"	.048"	1/8"	1.50"	50°	818-2100-125	\$16.53	818-E-2100-125	\$20.67	818C-2100-125	\$20.67
1/4"	.100"	1/4"	2.50"	50°	818-2100-250	\$26.66	818-E-2100-250	\$31.99	818C-2100-250	\$31.99
3/8"	.153"	3/8"	2.50"	50°	818-2100-375	\$34.00	818-E-2100-375	\$40.81	818C-2100-375	\$40.81
1/2"	.205"	1/2"	3.00"	50°	818-2100-500	\$57.08	818-E-2100-500	\$66.78	818C-2100-500	\$66.78
1/8"	.044"	1/8"	1.50"	55°	818-2110-125	\$17.35	818-E-2110-125	\$21.75	818C-2110-125	\$21.75



# CHAMFER MILLS

## FRACTIONAL 1/8" - 1/2"

### 2 FLUTE, 60 - 75 DEGREE CUT



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
1/8"	.033"	1/8"	1.50"	60°	818-2120-125	\$20.67	818-E-2120-125	\$20.67	818C-2120-125	\$20.67
3/16"	.054"	3/16"	2.00"	60°	818-2120-187	\$27.57	818-E-2120-187	\$27.57	818C-2120-187	\$27.57
1/4"	.065"	1/4"	2.50"	60°	818-2120-250	\$31.99	818-E-2120-250	\$31.99	818C-2120-250	\$31.99
3/8"	.105"	3/8"	2.50"	60°	818-2120-375	\$40.81	818-E-2120-375	\$40.81	818C-2120-375	\$40.81
1/2"	.140"	1/2"	3.00"	60°	818-2120-500	\$66.78	818-E-2120-500	\$66.78	818C-2120-500	\$66.78
1/8"	.029"	1/8"	1.50"	65°	818-2130-125	\$21.75	818-E-2130-125	\$21.75	818C-2130-125	\$21.75
1/8"	.023"	1/8"	1.50"	70°	818-2140-125	\$21.75	818-E-2140-125	\$21.75	818C-2140-125	\$21.75
1/8"	.015"	1/8"	1.50"	75°	818-2150-125	\$21.75	818-E-2150-125	\$21.75	818C-2150-125	\$21.75
3/16"	.025"	3/16"	2.50"	75°	818-2150-187	\$27.57	818-E-2150-187	\$27.57	818C-2150-187	\$27.57
3/8"	.050"	3/8"	2.50"	75°	818-2150-375	\$52.62	818-E-2150-375	\$52.62	818C-2150-375	\$52.62
1/2"	.065"	1/2"	3.00"	75°	818-2150-500	\$81.84	818-E-2150-500	\$81.84	818C-2150-500	\$81.84

### 4 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		TiAlN COATED	
					4 FLUTE	PRICE	4 FLUTE	PRICE
1/8"	.100"	1/8"	1.50"	30°	818-460-125	\$16.53	818C-460-125	\$20.67
1/4"	.208"	1/4"	2.50"	30°	818-460-250	\$26.66	818C-460-250	\$31.99
3/8"	.325"	3/8"	2.50"	30°	818-460-375	\$34.00	818C-460-375	\$40.81
1/2"	.433"	1/2"	3.00"	30°	818-460-500	\$57.08	818C-460-500	\$66.78
1/8"	.066"	1/8"	1.50"	41°	818-482-125	\$16.53	818C-482-125	\$20.67
1/4"	.138"	1/4"	2.50"	41°	818-482-250	\$26.66	818C-482-250	\$31.99
3/8"	.210"	3/8"	2.50"	41°	818-482-375	\$34.00	818C-482-375	\$40.81
1/2"	.280"	1/2"	3.00"	41°	818-482-500	\$57.08	818C-482-500	\$66.78
1/8"	.058"	1/8"	1.50"	45°	818-490-125	\$16.53	818C-490-125	\$20.67
1/4"	.120"	1/4"	2.50"	45°	818-490-250	\$26.66	818C-490-250	\$31.99
3/8"	.188"	3/8"	2.50"	45°	818-490-375	\$34.00	818C-490-375	\$40.81
1/2"	.250"	1/2"	3.00"	45°	818-490-500	\$57.08	818C-490-500	\$66.78
1/8"	.047"	1/8"	1.50"	50°	818-4100-125	\$16.53	818C-4100-125	\$20.67
1/4"	.100"	1/4"	2.50"	50°	818-4100-250	\$26.66	818C-4100-250	\$31.99
3/8"	.150"	3/8"	2.50"	50°	818-4100-375	\$34.00	818C-4100-375	\$40.81
1/2"	.205"	1/2"	3.00"	50°	818-4100-500	\$57.08	818C-4100-500	\$66.78
1/8"	.033"	1/8"	1.50"	60°	818-4120-125	\$16.53	818C-4120-125	\$20.67
1/4"	.065"	1/4"	2.50"	60°	818-4120-250	\$26.66	818C-4120-250	\$31.99
3/8"	.105"	3/8"	2.50"	60°	818-4120-375	\$34.00	818C-4120-375	\$40.81
1/2"	.140"	1/2"	3.00"	60°	818-4120-500	\$57.08	818C-4120-500	\$66.78



# TIPPED OFF CHAMFER MILLS

## FRACTIONAL 1/4" - 1/2"

- Helix: 0 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Flat Tip Chamfer Mills can be used for profiling and larger chamfering applications

### 3 FLUTE



**NEW!**

DIAMETER (Ø)	TIP Ø	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
						3 FLUTE	PRICE	3 FLUTE	PRICE	3 FLUTE	PRICE
1/4"	.06"	.355"	1/4"	2.50"	15°	818-T330-250	\$32.74	818-E-T330-250	\$45.59	818C-T330-250	\$45.59
3/8"	.06"	.588"	3/8"	2.50"	15°	818-T330-375	\$43.84	818-E-T330-375	\$52.62	818C-T330-375	\$52.62
1/4"	.06"	.261"	1/4"	2.50"	20°	818-T340-250	\$32.74	818-E-T340-250	\$39.33	818C-T340-250	\$39.33
3/8"	.06"	.433"	3/8"	2.50"	20°	818-T340-375	\$43.84	818-E-T340-375	\$52.62	818C-T340-375	\$52.62
1/4"	.06"	.229"	1/4"	2.50"	22.5°	818-T345-250	\$32.74	818-E-T345-250	\$39.33	818C-T345-250	\$39.33
3/8"	.06"	.386"	3/8"	2.50"	22.5°	818-T345-375	\$42.18	818-E-T345-375	\$50.97	818C-T345-375	\$50.97
1/4"	.06"	.204"	1/4"	2.50"	25°	818-T350-250	\$32.74	818-E-T350-250	\$39.33	818C-T350-250	\$39.33
3/8"	.06"	.343"	3/8"	2.50"	25°	818-T350-375	\$42.18	818-E-T350-375	\$50.97	818C-T350-375	\$50.97
1/4"	.06"	.165"	1/4"	2.50"	30°	818-T360-250	\$32.74	818-E-T360-250	\$39.33	818C-T360-250	\$39.33
3/8"	.06"	.273"	3/8"	2.50"	30°	818-T360-375	\$43.84	818-E-T360-375	\$52.62	818C-T360-375	\$52.62
1/4"	.06"	.109"	1/4"	2.50"	41°	818-T382-250	\$32.74	818-E-T382-250	\$39.33	818C-T382-250	\$39.33
3/8"	.06"	.184"	3/8"	2.50"	41°	818-T382-375	\$42.18	818-E-T382-375	\$50.97	818C-T382-375	\$50.97
1/4"	.06"	.095"	1/4"	2.50"	45°	818-T390-250	\$32.74	818-E-T390-250	\$39.33	818C-T390-250	\$39.33
3/8"	.06"	.158"	3/8"	2.50"	45°	818-T390-375	\$43.84	818-E-T390-375	\$52.62	818C-T390-375	\$52.62
1/4"	.06"	.080"	1/4"	2.50"	50°	818-T3100-250	\$32.74	818-E-T3100-250	\$39.33	818C-T3100-250	\$39.33
1/4"	.06"	.055"	1/4"	2.50"	60°	818-T3120-250	\$32.74	818-E-T3120-250	\$39.33	818C-T3120-250	\$39.33
3/8"	.06"	.091"	3/8"	2.50"	60°	818-T3120-375	\$43.84	818-E-T3120-375	\$52.62	818C-T3120-375	\$52.62
1/4"	.06"	.125"	1/4"	2.50"	75°	818-T3150-250	\$32.74	818-E-T3150-250	\$39.33	818C-T3150-250	\$39.33

### 4 FLUTE



**NEW!**

DIAMETER (Ø)	TIP Ø	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
						4 FLUTE	PRICE	4 FLUTE	PRICE	4 FLUTE	PRICE
1/2"	.08"	.784"	1/2"	3.00"	15°	818-T430-500	\$65.15	818-E-T430-500	\$77.23	818C-T430-500	\$77.23
1/2"	.08"	.577"	1/2"	3.00"	20°	818-T440-500	\$65.15	818-E-T440-500	\$77.23	818C-T440-500	\$77.23
1/2"	.08"	.513"	1/2"	3.00"	22.5°	818-T445-500	\$61.40	818-E-T445-500	\$73.49	818C-T445-500	\$73.49
1/2"	.08"	.546"	1/2"	3.00"	25°	818-T450-500	\$61.40	818-E-T450-500	\$73.49	818C-T450-500	\$73.49
1/2"	.08"	.364"	1/2"	3.00"	30°	818-T460-500	\$61.40	818-E-T460-500	\$73.49	818C-T460-500	\$73.49
1/2"	.08"	.242"	1/2"	3.00"	41°	818-T482-500	\$61.40	818-E-T482-500	\$73.49	818C-T482-500	\$73.49
1/2"	.08"	.210"	1/2"	3.00"	45°	818-T490-500	\$61.40	818-E-T490-500	\$73.49	818C-T490-500	\$73.49
1/2"	.08"	.173"	1/2"	3.00"	50°	818-T4100-500	\$61.40	818-E-T4100-500	\$73.49	818C-T4100-500	\$73.49
1/2"	.08"	.121"	1/2"	3.00"	60°	818-T4120-500	\$61.40	818-E-T4120-500	\$73.49	818C-T4120-500	\$73.49
1/2"	.08"	.056"	1/2"	3.00"	75°	818-T4150-500	\$61.40	818-E-T4150-500	\$73.49	818C-T4150-500	\$73.49

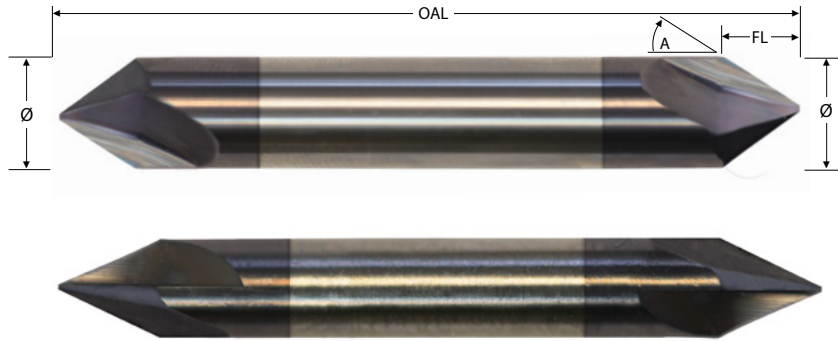




# DOUBLE END CHAMFER MILLS

## FRACTIONAL 1/8" - 1/2"

- Helix: 0 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Uncoated for General Purpose
- TIALN for High Performance
- Diameter Tolerance: +0/ -.0005



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	ANGLE (A)	UNCOATED			TIALN COATED		
					2 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/8"	.100"	1/8"	2.00"	30°	819-260-125	819-460-125	\$26.29	819C-260-125	819C-460-125	\$32.86
3/16"	.162"	3/16"	2.50"	30°	819-260-187	819-460-187	\$31.57	819C-260-187	819C-460-187	\$39.46
1/4"	.216"	1/4"	2.50"	30°	819-260-250	819-460-250	\$39.32	819C-260-250	819C-460-250	\$49.14
5/16"	.270"	5/16"	2.50"	30°	819-260-312	819-460-312	\$50.30	819C-260-312	819C-460-312	\$62.88
3/8"	.324"	3/8"	2.50"	30°	819-260-375	819-460-375	\$61.32	819C-260-375	819C-460-375	\$76.65
1/2"	.432"	1/2"	3.00"	30°	819-260-500	819-460-500	\$101.72	819C-260-500	819C-460-500	\$142.40
1/8"	.065"	1/8"	2.00"	41°	819-282-125	819-482-125	\$26.29	819C-282-125	819C-482-125	\$32.86
3/16"	.108"	3/16"	2.50"	41°	819-282-187	819-482-187	\$31.57	819C-282-187	819C-482-187	\$39.46
1/4"	.135"	1/4"	2.50"	41°	819-282-250	819-482-250	\$39.32	819C-282-250	819C-482-250	\$49.14
5/16"	.170"	5/16"	2.50"	41°	819-282-312	819-482-312	\$50.30	819C-282-312	819C-482-312	\$62.88
3/8"	.205"	3/8"	2.50"	41°	819-282-375	819-482-375	\$61.32	819C-282-375	819C-482-375	\$76.65
1/2"	.280"	1/2"	3.00"	41°	819-282-500	819-482-500	\$101.72	819C-282-500	819C-482-500	\$142.40
1/8"	.058"	1/8"	2.00"	45°	819-290-125	819-490-125	\$26.29	819C-290-125	819C-490-125	\$32.86
3/16"	.094"	3/16"	2.50"	45°	819-290-187	819-490-187	\$31.57	819C-290-187	819C-490-187	\$39.46
1/4"	.120"	1/4"	2.50"	45°	819-290-250	819-490-250	\$39.32	819C-290-250	819C-490-250	\$49.14
5/16"	.154"	5/16"	2.50"	45°	819-290-312	819-490-312	\$50.30	819C-290-312	819C-490-312	\$62.88
3/8"	.188"	3/8"	2.50"	45°	819-290-375	819-490-375	\$61.32	819C-290-375	819C-490-375	\$76.65
1/2"	.250"	1/2"	3.00"	45°	819-290-500	819-490-500	\$101.72	819C-290-500	819C-490-500	\$142.40
1/8"	.047"	1/8"	2.00"	50°	819-2100-125	819-4100-125	\$26.29	819C-2100-125	819C-4100-125	\$32.86
3/16"	.073"	3/16"	2.50"	50°	819-2100-187	819-4100-187	\$31.57	819C-2100-187	819C-4100-187	\$39.46
1/4"	.100"	1/4"	2.50"	50°	819-2100-250	819-4100-250	\$39.32	819C-2100-250	819C-4100-250	\$49.14
5/16"	.125"	5/16"	2.50"	50°	819-2100-312	819-4100-312	\$50.30	819C-2100-312	819C-4100-312	\$62.88
3/8"	.150"	3/8"	2.50"	50°	819-2100-375	819-4100-375	\$61.32	819C-2100-375	819C-4100-375	\$76.65
1/2"	.205"	1/2"	3.00"	50°	819-2100-500	819-4100-500	\$101.72	819C-2100-500	819C-4100-500	\$142.40
1/8"	.031"	1/8"	2.00"	60°	819-2120-125	819-4120-125	\$26.29	819C-2120-125	819C-4120-125	\$32.86
3/16"	.050"	3/16"	2.50"	60°	819-2120-187	819-4120-187	\$31.57	819C-2120-187	819C-4120-187	\$39.46
1/4"	.066"	1/4"	2.50"	60°	819-2120-250	819-4120-250	\$39.32	819C-2120-250	819C-4120-250	\$49.14
5/16"	.085"	5/16"	2.50"	60°	819-2120-312	819-4120-312	\$50.30	819C-2120-312	819C-4120-312	\$62.88
3/8"	.105"	3/8"	2.50"	60°	819-2120-375	819-4120-375	\$61.32	819C-2120-375	819C-4120-375	\$76.65
1/2"	.140"	1/2"	3.00"	60°	819-2120-500	819-4120-500	\$101.72	819C-2120-500	819C-4120-500	\$142.40



# ENGRAVING CUTTERS, POINTED END

## FRACTIONAL 1/8"

Same Sizes Continued →

- Use: Engraving labels
- Helix: 0 Degrees
- Ground to a point
- Applicable with a wide range of materials, wider angles used for metals, smaller tips used for softer materials

### TYPE 1: 10-20 DEGREE INCLUDED ANGLE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SPLIT LENGTH (SL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		ALTIM COATED	
						1 FLUTE	PRICE	1 FLUTE	PRICE
1/8"	.080"	.200"	1/8"	1.50"	10°	706-110-P125	\$16.37	706-E-110-P125	\$20.76
1/8"	.080"	.200"	1/8"	1.50"	15°	706-115-P125	\$16.37	706-E-115-P125	\$20.76
1/8"	.080"	.200"	1/8"	1.50"	20°	706-120-P125	\$16.37	706-E-120-P125	\$20.76

**NEW!**

### TYPE 2: 30-120 DEGREE INCLUDED ANGLE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SPLIT LENGTH (SL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	UNCOATED		ALTIM COATED	
						1 FLUTE	PRICE	1 FLUTE	PRICE
1/8"	.233"	.375"	1/8"	1.50"	30°	706-130-P125	\$11.65	706-E-130-P125	\$16.04
1/8"	.172"	.375"	1/8"	1.50"	40°	706-140-P125	\$11.65	706-E-140-P125	\$16.04
1/8"	.151"	.375"	1/8"	1.50"	45°	706-145-P125	\$11.65	706-E-145-P125	\$16.04
1/8"	.134"	.375"	1/8"	1.50"	50°	706-150-P125	\$11.65	706-E-150-P125	\$16.04
1/8"	.108"	.375"	1/8"	1.50"	60°	706-160-P125	\$11.65	706-E-160-P125	\$16.04
1/8"	.072"	.375"	1/8"	1.50"	82°	706-182-P125	\$11.65	706-E-182-P125	\$16.04
1/8"	.063"	.375"	1/8"	1.50"	90°	706-190-P125	\$11.65	706-E-190-P125	\$16.04
1/8"	.052"	.375"	1/8"	1.50"	100°	706-1100-P125	\$11.65	706-E-1100-P125	\$16.04
1/8"	.036"	.375"	1/8"	1.50"	120°	706-1120-P125	\$11.65	706-E-1120-P125	\$16.04

**NEW!**

# ENGRAVING CUTTERS, POINTED END

## FRACTIONAL 1/8"

- ALTIN/ TIALN coatings for high performance applications
- Amorphous Diamond Coating for Graphites/ Composite Materials

### TYPE 1: 10-20 DEGREE INCLUDED ANGLE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SPLIT LENGTH (SL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	TIALN COATED		AMORPHOUS DIAMOND	
						1 FLUTE	PRICE	1 FLUTE	PRICE
1/8"	.080"	.200"	1/8"	1.50"	10°	706C-110-P125	\$20.76	706-A-110-P125	\$31.91
1/8"	.080"	.200"	1/8"	1.50"	15°	706C-115-P125	\$20.76	706-A-115-P125	\$31.91
1/8"	.080"	.200"	1/8"	1.50"	20°	706C-120-P125	\$20.76	706-A-120-P125	\$31.91



### TYPE 2: 30-120 DEGREE INCLUDED ANGLE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SPLIT LENGTH (SL)	SHANK DIA. (SØ)	OAL	ANGLE (A)	TIALN COATED		AMORPHOUS DIAMOND	
						1 FLUTE	PRICE	1 FLUTE	PRICE
1/8"	.233"	.375"	1/8"	1.50"	30°	706C-130-P125	\$16.04	706A-130-P125	\$23.18
1/8"	.172"	.375"	1/8"	1.50"	40°	706C-140-P125	\$16.04	706A-140-P125	\$23.18
1/8"	.151"	.375"	1/8"	1.50"	45°	706C-145-P125	\$16.04	706-A-145-P125	\$23.18
1/8"	.134"	.375"	1/8"	1.50"	50°	706C-150-P125	\$16.04	706-A-150-P125	\$23.18
1/8"	.108"	.375"	1/8"	1.50"	60°	706C-160-P125	\$16.04	706A-160-P125	\$23.18
1/8"	.072"	.375"	1/8"	1.50"	82°	706C-182-P125	\$16.04	706-A-182-P125	\$23.18
1/8"	.063"	.375"	1/8"	1.50"	90°	706C-190-P125	\$16.04	706A-190-P125	\$23.18
1/8"	.052"	.375"	1/8"	1.50"	100°	706C-1100-P125	\$16.04	706-A-1100-P125	\$23.18
1/8"	.036"	.375"	1/8"	1.50"	120°	706C-1120-P125	\$16.04	706-A-1120-P125	\$23.18

# ENGRAVING CUTTERS, FLAT END

## FRACTIONAL 1/8"

- Produces flat bottom in grooves
- Tipped off end provides extra strength for cutting



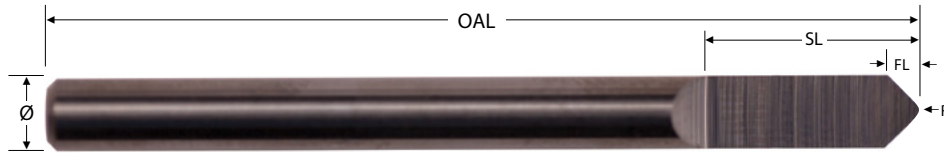
**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SPLIT LENGTH (SL)	TIP WIDTH (TW)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
						1 FLUTE	PRICE	1 FLUTE	PRICE	1 FLUTE	PRICE
1/8"	.224"	.375"	.005"	1.50"	30°	706-130-F1125	\$13.74	706-E-130-F1125	\$18.12	706C-130-F1125	\$18.12
1/8"	.165"	.375"	.005"	1.50"	40°	706-140-F1125	\$13.74	706-E-140-F1125	\$18.12	706C-140-F1125	\$18.12
1/8"	.104"	.375"	.005"	1.50"	60°	706-160-F1125	\$13.74	706-E-160-F1125	\$18.12	706C-160-F1125	\$18.12
1/8"	.060"	.375"	.005"	1.50"	90°	706-190-F1125	\$13.74	706-E-190-F1125	\$18.12	706C-190-F1125	\$18.12
1/8"	.215"	.375"	.010"	1.50"	30°	706-130-F2125	\$13.74	706-E-130-F2125	\$18.12	706C-130-F2125	\$18.12
1/8"	.158"	.375"	.010"	1.50"	40°	706-140-F2125	\$13.74	706-E-140-F2125	\$18.12	706C-140-F2125	\$18.12
1/8"	.100"	.375"	.010"	1.50"	60°	706-160-F2125	\$13.74	706-E-160-F2125	\$18.12	706C-160-F2125	\$18.12
1/8"	.058"	.375"	.010"	1.50"	90°	706-190-F2125	\$13.74	706-E-190-F2125	\$18.12	706C-190-F2125	\$18.12
1/8"	.205"	.375"	.015"	1.50"	30°	706-130-F3125	\$13.74	706-E-130-F3125	\$18.12	706C-130-F3125	\$18.12
1/8"	.151"	.375"	.015"	1.50"	40°	706-140-F3125	\$13.74	706-E-140-F3125	\$18.12	706C-140-F3125	\$18.12
1/8"	.095"	.375"	.015"	1.50"	60°	706-160-F3125	\$13.74	706-E-160-F3125	\$18.12	706C-160-F3125	\$18.12
1/8"	.055"	.375"	.015"	1.50"	90°	706-190-F3125	\$13.74	706-E-190-F3125	\$18.12	706C-190-F3125	\$18.12
1/8"	.196"	.375"	.020"	1.50"	30°	706-130-F4125	\$13.74	706-E-130-F4125	\$18.12	706C-130-F4125	\$18.12
1/8"	.144"	.375"	.020"	1.50"	40°	706-140-F4125	\$13.74	706-E-140-F4125	\$18.12	706C-140-F4125	\$18.12
1/8"	.091"	.375"	.020"	1.50"	60°	706-160-F4125	\$13.74	706-E-160-F4125	\$18.12	706C-160-F4125	\$18.12
1/8"	.053"	.375"	.020"	1.50"	90°	706-190-F4125	\$13.74	706-E-190-F4125	\$18.12	706C-190-F4125	\$18.12

# ENGRAVING CUTTERS, RADIUS END

## FRACTIONAL 1/8"

- Produces rounded bottom in grooves
- Designed for engraving labels on machine materials.



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	SPLIT LENGTH (SL)	RADIUS (R)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
						1 FLUTE	PRICE	1 FLUTE	PRICE	1 FLUTE	PRICE
1/8"	.226"	.375"	.0025"	1.50"	30°	706-130-R1125	\$19.01	706-E-130-R1125	\$23.40	706C-130-R1125	\$23.40
1/8"	.167"	.375"	.0025"	1.50"	40°	706-140-R1125	\$19.01	706-E-140-R1125	\$23.40	706C-140-R1125	\$23.40
1/8"	.106"	.375"	.0025"	1.50"	60°	706-160-R1125	\$19.01	706-E-160-R1125	\$23.40	706C-160-R1125	\$23.40
1/8"	.061"	.375"	.0025"	1.50"	90°	706-190-R1125	\$19.01	706-E-190-R1125	\$23.40	706C-190-R1125	\$23.40
1/8"	.219"	.375"	.005"	1.50"	30°	706-130-R2125	\$19.01	706-E-130-R2125	\$23.40	706C-130-R2125	\$23.40
1/8"	.162"	.375"	.005"	1.50"	40°	706-140-R2125	\$19.01	706-E-140-R2125	\$23.40	706C-140-R2125	\$23.40
1/8"	.103"	.375"	.005"	1.50"	60°	706-160-R2125	\$19.01	706-E-160-R2125	\$23.40	706C-160-R2125	\$23.40
1/8"	.060"	.375"	.005"	1.50"	90°	706-190-R2125	\$19.01	706-E-190-R2125	\$23.40	706C-190-R2125	\$23.40
1/8"	.205"	.375"	.010"	1.50"	30°	706-130-R3125	\$19.01	706-E-130-R3125	\$23.40	706C-130-R3125	\$23.40
1/8"	.152"	.375"	.010"	1.50"	40°	706-140-R3125	\$19.01	706-E-140-R3125	\$23.40	706C-140-R3125	\$23.40
1/8"	.098"	.375"	.010"	1.50"	60°	706-160-R3125	\$19.01	706-E-160-R3125	\$23.40	706C-160-R3125	\$23.40
1/8"	.058"	.375"	.010"	1.50"	90°	706-190-R3125	\$19.01	706-E-190-R3125	\$23.40	706C-190-R3125	\$23.40
1/8"	.190"	.375"	.015"	1.50"	30°	706-130-R4125	\$19.01	706-E-130-R4125	\$23.40	706C-130-R4125	\$23.40
1/8"	.143"	.375"	.015"	1.50"	40°	706-140-R4125	\$19.01	706-E-140-R4125	\$23.40	706C-140-R4125	\$23.40
1/8"	.093"	.375"	.015"	1.50"	60°	706-160-R4125	\$19.01	706-E-160-R4125	\$23.40	706C-160-R4125	\$23.40
1/8"	.056"	.375"	.015"	1.50"	90°	706-190-R4125	\$19.01	706-E-190-R4125	\$23.40	706C-190-R4125	\$23.40
1/8"	.176"	.375"	.020"	1.50"	30°	706-130-R5125	\$19.01	706-E-130-R5125	\$23.40	706C-130-R5125	\$23.40
1/8"	.128"	.375"	.020"	1.50"	40°	706-140-R5125	\$19.01	706-E-140-R5125	\$23.40	706C-140-R5125	\$23.40
1/8"	.088"	.375"	.020"	1.50"	60°	706-160-R5125	\$19.01	706-E-160-R5125	\$23.40	706C-160-R5125	\$23.40
1/8"	.054"	.375"	.020"	1.50"	90°	706-190-R5125	\$19.01	706-E-190-R5125	\$23.40	706C-190-R5125	\$23.40

**CARBIDE**



# WEB MARKING CUTTERS

## FRACTIONAL 1/8"

· Designed for engraving labels on machine materials

· 2 Flute design provides improved strength and durability over single point engraving mills



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	TIP WIDTH	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
1/8"	.224"	.005"	1.50"	30°	706-230-F1125	\$15.27	706-E-230-F1125	\$19.67	706C-230-F1125	\$19.67
1/8"	.165"	.005"	1.50"	40°	706-240-F1125	\$15.27	706-E-240-F1125	\$19.67	706C-240-F1125	\$19.67
1/8"	.104"	.005"	1.50"	60°	706-260-F1125	\$15.27	706-E-260-F1125	\$19.67	706C-260-F1125	\$19.67
1/8"	.060"	.005"	1.50"	90°	706-290-F1125	\$15.27	706-E-290-F1125	\$19.67	706C-290-F1125	\$19.67
1/8"	.035"	.005"	1.50"	120°	706-2120-F1125	\$15.27	706-E-2120-F1125	\$19.67	706C-2120-F1125	\$19.67
1/8"	.215"	.010"	1.50"	30°	706-230-F2125	\$15.27	706-E-230-F2125	\$19.67	706C-230-F2125	\$19.67
1/8"	.158"	.010"	1.50"	40°	706-240-F2125	\$15.27	706-E-240-F2125	\$19.67	706C-240-F2125	\$19.67
1/8"	.100"	.010"	1.50"	60°	706-260-F2125	\$15.27	706-E-260-F2125	\$19.67	706C-260-F2125	\$19.67
1/8"	.058"	.010"	1.50"	90°	706-290-F2125	\$15.27	706-E-290-F2125	\$19.67	706C-290-F2125	\$19.67
1/8"	.033"	.010"	1.50"	120°	706-2120-F2125	\$15.27	706-E-2120-F2125	\$19.67	706C-2120-F2125	\$19.67

· For Non-Ferrous Applications

DIAMETER (Ø)	FLUTE LENGTH (FL)	TIP WIDTH	OAL	ANGLE (A)	UNCOATED		DLC COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE
1/8"	.224"	.005"	1.50"	30°	706-230-F1125NF	\$15.27	706D-230-F1125NF	\$21.86
1/8"	.165"	.005"	1.50"	40°	706-240-F1125NF	\$15.27	706D-240-F1125NF	\$21.86
1/8"	.104"	.005"	1.50"	60°	706-260-F1125NF	\$15.27	706D-260-F1125NF	\$21.86
1/8"	.060"	.005"	1.50"	90°	706-290-F1125NF	\$15.27	706D-290-F1125NF	\$21.86
1/8"	.035"	.005"	1.50"	120°	706-2120-F1125NF	\$15.27	706D-2120-F1125NF	\$21.86



# RADIUS MARKING CUTTERS

## FRACTIONAL 1/8"



**NEW!**

DIAMETER (Ø)	FLUTE LENGTH (FL)	RADIUS (R)	OAL	ANGLE (A)	UNCOATED		ALTiN COATED		TiAlN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE	2 FLUTE	PRICE
1/8"	.218"	.005"	1.50"	30°	706-230-R1125	\$19.67	706-E-230-R1125	\$24.06	706C-230-R1125	\$24.06
1/8"	.160"	.005"	1.50"	40°	706-240-R1125	\$19.67	706-E-240-R1125	\$24.06	706C-240-R1125	\$24.06
1/8"	.103"	.005"	1.50"	60°	706-260-R1125	\$19.67	706-E-260-R1125	\$24.06	706C-260-R1125	\$24.06
1/8"	.060"	.005"	1.50"	90°	706-290-R1125	\$19.67	706-E-290-R1125	\$24.06	706C-290-R1125	\$24.06
1/8"	.035"	.005"	1.50"	120°	706-2120-R1125	\$19.67	706-E-2120-R1125	\$24.06	706C-2120-R1125	\$24.06
1/8"	.204"	.010"	1.50"	30°	706-230-R2125	\$19.67	706-E-230-R2125	\$24.06	706C-230-R2125	\$24.06
1/8"	.150"	.010"	1.50"	40°	706-240-R2125	\$19.67	706-E-240-R2125	\$24.06	706C-240-R2125	\$24.06
1/8"	.098"	.010"	1.50"	60°	706-260-R2125	\$19.67	706-E-260-R2125	\$24.06	706C-260-R2125	\$24.06
1/8"	.058"	.010"	1.50"	90°	706-290-R2125	\$19.67	706-E-290-R2125	\$24.06	706C-290-R2125	\$24.06
1/8"	.034"	.010"	1.50"	120°	706-2120-R2125	\$19.67	706-E-2120-R2125	\$24.06	706C-2120-R2125	\$24.06



# SINGLE END, SQUARE END, STANDARD

## DECIMAL .005" - .1378"

- Helix: 35 - 40 Degrees
- Rake Angle: Positive
- Center Cutting: Yes
- Hand: RHS/ RHC
- Uncoated for General Purpose
- TiCN Coated for High Performance
- Diameter Tolerance: +.000/-.001

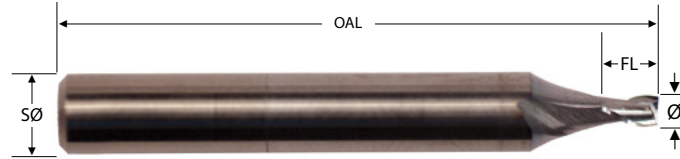


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		TiCN COATED	
				2 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.015"	.125"	1.50"	846-.005	\$20.21	846-T1-.005	\$23.20
.010"	.030"	.125"	1.50"	846-.010	\$20.21	846-T1-.010	\$23.20
.015"	.045"	.125"	1.50"	846-.015	\$16.95	846-T1-.015	\$23.20
.0156" (1/64")	.047"	.125"	1.50"	846-1560	\$16.95	--	
.0197" (.5 mm)	.059"	.125"	1.50"	846-0197	\$16.95	--	
.020"	.060"	.125"	1.50"	846-.020	\$16.45	846-T1-.020	\$19.43
.025"	.075"	.125"	1.50"	846-.025	\$16.45	--	
.030"	.090"	.125"	1.50"	846-.030	\$15.40	846-T1-.030	\$18.38
.035"	.105"	.1875"	1.50"	846-.035	\$13.46	--	
.0394" (1 mm)	.118"	.1875"	1.50"	846-0394	\$13.46	--	
.040"	.120"	.1875"	1.50"	846-.040	\$13.46	846-T1-.040	\$17.28
.045"	.135"	.1875"	1.50"	846-.045	\$13.46	--	
.0492" (1.25 mm)	.148"	.1875"	1.50"	846-0492	\$13.46	--	
.050"	.150"	.1875"	1.50"	846-.050	\$13.46	846-T1-.050	\$17.28
.055"	.165"	.1875"	1.50"	846-.055	\$13.96	--	
.0591" (1.5 mm)	.177"	.1875"	1.50"	846-0591	\$13.96	--	
.060"	.180"	.1875"	1.50"	846-.060	\$13.96	846-T1-.060	\$17.28
.0630" (1.6 mm)	.189"	.1875"	1.50"	846-0630	\$13.96	--	
.065"	.195"	.1875"	1.50"	846-.065	\$13.96	--	
.070"	.210"	.1875"	1.50"	846-.070	\$13.96	846-T1-.070	\$17.28
.0709" (1.8 mm)	.213"	.1875"	1.50"	846-0709	\$13.96	--	
.075"	.225"	.1875"	1.50"	846-.075	\$13.96	--	
.0787" (2 mm)	.236"	.1875"	1.50"	846-0787	\$13.96	--	
.080"	.240"	.1875"	1.50"	846-.080	\$13.96	846-T1-.080	\$17.28
.085"	.255"	.1875"	1.50"	846-.085	\$13.96	--	
.0866" (2.2 mm)	.260"	.1875"	1.50"	846-0866	\$13.96	--	
.090"	.270"	.1875"	1.50"	846-.090	\$14.40	846-T1-.090	\$18.22
.095"	.285"	.1875"	1.50"	846-.095	\$14.40	--	
.0984" (2.5 mm)	.295"	.1875"	1.50"	846-0984	\$14.40	--	
.100"	.300"	.1875"	1.50"	846-.100	\$14.40	846-T1-.100	\$18.22
.1102" (2.8 mm)	.331"	.1875"	1.50"	846-1102	\$14.40	--	
.1181" (3 mm)	.354"	.1875"	1.50"	846-1181	\$14.40	--	
.120"	.360"	.1875"	1.50"	846-.120	\$14.40	--	
.1378" (3.5 mm)	.414"	.1875"	1.50"	846-1378	\$14.40	--	

# SINGLE END, SQUARE END, STUB

## DECIMAL .005" - .1378"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Rake Angle: Positive
- Center Cutting: Yes
- Hand: RHS/ RHC
- Diameter Tolerance:  $+.000/-0.001$

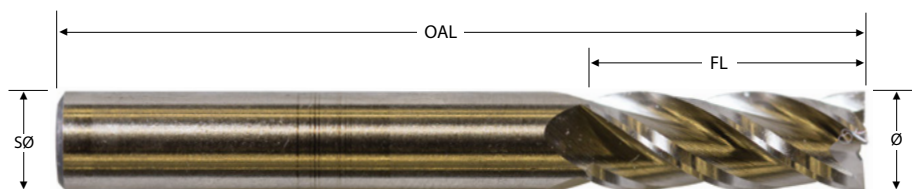


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
.005"	.008"	.125"	1.50"	856-.005	\$20.16
.010"	.015"	.125"	1.50"	856-.010	\$20.16
.015"	.023"	.125"	1.50"	856-.015	\$16.95
.0156" (1/64")	.023"	.125"	1.50"	856-1560	\$16.95
.0197" (.5 mm)	.030"	.125"	1.50"	856-0197	\$16.95
.020"	.030"	.125"	1.50"	856-.020	\$16.39
.025"	.038"	.125"	1.50"	856-.025	\$15.85
.030"	.045"	.125"	1.50"	856-.030	\$15.40
.035"	.053"	.1875"	1.50"	856-.035	\$13.41
.0394" (1 mm)	.059"	.1875"	1.50"	856-0394	\$13.41
.040"	.060"	.1875"	1.50"	856-.040	\$13.41
.045"	.068"	.1875"	1.50"	856-.045	\$13.41
.0492" (1.25 mm)	.074"	.1875"	1.50"	856-0492	\$13.41
.050"	.075"	.1875"	1.50"	856-.050	\$13.41
.055"	.083"	.1875"	1.50"	856-.055	\$13.96
.0591" (1.5 mm)	.089"	.1875"	1.50"	856-0591	\$13.96
.060"	.090"	.1875"	1.50"	856-.060	\$13.96
.0630" (1.6 mm)	.095"	.1875"	1.50"	856-0630	\$13.96
.065"	.098"	.1875"	1.50"	856-.065	\$13.96
.070"	.105"	.1875"	1.50"	856-.070	\$13.96
.0709" (1.8 mm)	.106"	.1875"	1.50"	856-0709	\$13.96
.075"	.113"	.1875"	1.50"	856-.075	\$13.96
.0787" (2 mm)	.118"	.1875"	1.50"	856-0787	\$13.96
.080"	.120"	.1875"	1.50"	856-.080	\$13.96
.085"	.128"	.1875"	1.50"	856-.085	\$13.96
.0866" (2.2 mm)	.130"	.1875"	1.50"	856-0866	\$13.96
.090"	.135"	.1875"	1.50"	856-.090	\$14.40
.095"	.143"	.1875"	1.50"	856-.095	\$14.40
.0984" (2.5 mm)	.148"	.1875"	1.50"	856-0984	\$14.40
.100"	.150"	.1875"	1.50"	856-.100	\$14.40
.1102" (2.8 mm)	.165"	.1875"	1.50"	856-1102	\$14.40
.1181" (3 mm)	.177"	.1875"	1.50"	856-1181	\$14.40
.120"	.180"	.1875"	1.50"	856-.120	\$14.40
.1378" (3.5 mm)	.207"	.1875"	1.50"	856-1378	\$14.40

# SINGLE END, SQUARE END, STANDARD

## FRACTIONAL 1/64" - 3/16"

- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- TICN Coated for High Performance
- Diameter Tolerance: *2 Flute*: +.000/-.002  
*4 Flute*: +.002/-.000  
*\*3/16"*: +000/-.0025



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK Ø (SØ)	OAL	UNCOATED			TICN COATED		
				2 FLUTE	4 FLUTE	PRICE	2 FLUTE	4 FLUTE	PRICE
1/64"	.047"	.125"	1.50"	846-1560	--	\$16.95	846-T1-1560	--	\$23.20
1/32"	3/32"	.1875"	1.50"	846-0031	853-0031	\$12.08	846-T1-0031	853-T1-0031	\$15.90
3/64"	9/64"	.1875"	1.50"	846-0046	853-0046	\$12.08	846-T1-0046	853-T1-0046	\$15.90
1/16"	3/16"	.1875"	1.50"	846-0062	853-0062	\$12.08	846-T1-0062	853-T1-0062	\$15.90
5/64"	15/64"	.1875"	1.50"	846-0078	853-0078	\$12.08	846-T1-0078	853-T1-0078	\$15.90
3/32"	9/32"	.1875"	1.50"	846-0093	853-0093	\$12.08	846-T1-0093	853-T1-0093	\$15.90
7/64"	21/64"	.1875"	1.50"	846-0109	853-0109	\$12.08	--	--	
1/8"	3/8"	.1875"	1.50"	846-0125	853-0125	\$12.08	846-T1-0125	853-T1-0125	\$15.90
9/64"	13/32"	.1875"	1.50"	846-0140	853-0140	\$12.08	--	--	
5/32"	7/16"	.1875"	1.50"	846-0156	853-0156	\$12.08	--	--	
11/64"	1/2"	.1875"	1.50"	846-0171	853-0171	\$12.08	--	--	
* 3/16"	1/2"	.1875"	1.50"	846-0187	853-0187	\$12.08	--	--	

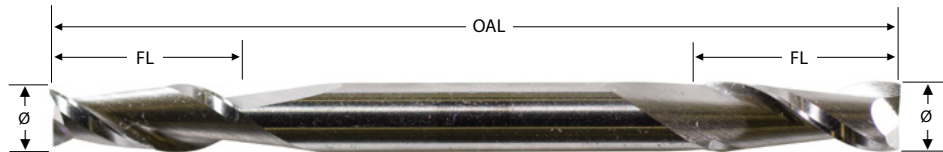
# DOUBLE END, SQUARE END, STANDARD

## FRACTIONAL 1/32" - 3/16"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- M42 Cobalt
- Center Cutting: Yes
- Diameter Tolerance:  
*2 Flute: +.000/-.002*  
*\* 3/16": +000/-.0025*



### 2 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/32"	3/32"	.1875"	2.25"	540-0031	\$20.72
3/64"	9/64"	.1875"	2.25"	540-0046	\$20.72
1/16"	3/16"	.1875"	2.25"	540-0062	\$18.28
5/64"	15/64"	.1875"	2.25"	540-0078	\$18.28
3/32"	9/32"	.1875"	2.25"	540-0093	\$18.28
7/64"	21/64"	.1875"	2.25"	540-0109	\$18.28
1/8"	3/8"	.1875"	2.25"	540-0125	\$18.28
9/64"	13/32"	.1875"	2.25"	540-0140	\$19.50
5/32"	7/16"	.1875"	2.25"	540-0156	\$19.50
11/64"	1/2"	.1875"	2.25"	540-0171	\$19.50
* 3/16"	1/2"	.1875"	2.25"	540-0187	\$19.50

### 4 FLUTE

- Diameter Tolerance: *4 Flute: +.002/-.000*  
*\*3/16": +000/-.0025*



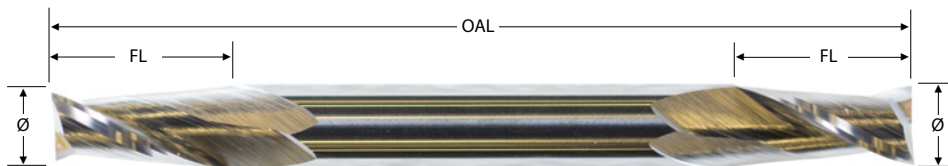
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				4 FLUTE	PRICE
1/32"	3/32"	.1875"	2.25"	547-0031	\$20.60
3/64"	9/64"	.1875"	2.25"	547-0046	\$20.60
1/16"	3/16"	.1875"	2.25"	547-0062	\$18.73
5/64"	15/64"	.1875"	2.25"	547-0078	\$18.73
3/32"	9/32"	.1875"	2.25"	547-0093	\$18.73
7/64"	21/64"	.1875"	2.25"	547-0109	\$18.73
1/8"	3/8"	.1875"	2.25"	547-0125	\$18.73
9/64"	13/32"	.1875"	2.25"	547-0140	\$19.83
5/32"	7/16"	.1875"	2.25"	547-0156	\$19.83
11/64"	1/2"	.1875"	2.25"	547-0171	\$19.83
* 3/16"	1/2"	.1875"	2.25"	547-0187	\$19.83

# DOUBLE END, SQUARE END, STUB

## FRACTIONAL 1/32" - 3/16"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- M42 Cobalt
- Center Cutting: Yes
- Diameter Tolerance:  
*2 Flute: +.000/-.002*  
*\* 3/16": +000/-.0025*

### 2 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/32"	3/64"	.1875"	2.00"	542-0031	\$18.39
3/64"	1/16"	.1875"	2.00"	542-0046	\$18.39
1/16"	3/32"	.1875"	2.00"	542-0062	\$17.28
5/64"	1/8"	.1875"	2.00"	542-0078	\$17.28
3/32"	9/64"	.1875"	2.00"	542-0093	\$17.28
7/64"	5/32"	.1875"	2.00"	542-0109	\$17.28
1/8"	3/16"	.1875"	2.00"	542-0125	\$17.28
9/64"	7/32"	.1875"	2.00"	542-0140	\$19.39
5/32"	15/64"	.1875"	2.00"	542-0156	\$19.39
11/64"	1/4"	.1875"	2.00"	542-0171	\$19.39
* 3/16"	9/32"	.1875"	2.00"	542-0187	\$19.39

### 4 FLUTE

- Diameter Tolerance: *4 Flute: +.002/-.000*  
*\*3/16": +000/-.0025*



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				4 FLUTE	PRICE
1/32"	3/64"	.1875"	2.00"	549-0031	\$19.50
3/64"	1/16"	.1875"	2.00"	549-0046	\$19.50
1/16"	3/32"	.1875"	2.00"	549-0062	\$17.72
5/64"	1/8"	.1875"	2.00"	549-0078	\$17.72
3/32"	9/64"	.1875"	2.00"	549-0093	\$17.72
7/64"	5/32"	.1875"	2.00"	549-0109	\$17.72
1/8"	3/16"	.1875"	2.00"	549-0125	\$17.72
9/64"	7/32"	.1875"	2.00"	549-0140	\$18.95
5/32"	15/64"	.1875"	2.00"	549-0156	\$18.95
11/64"	1/4"	.1875"	2.00"	549-0171	\$18.95
* 3/16"	9/32"	.1875"	2.00"	549-0187	\$18.95



# DOUBLE END, SQUARE END, LONG FLUTE

## FRACTIONAL 1/16" - 3/16"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- M42 Cobalt
- Center Cutting: Yes
- Diameter Tolerance:
  - 2 Flute:  $+0.000/-0.002$
  - \* 3/16":  $+0.000/-0.0025$



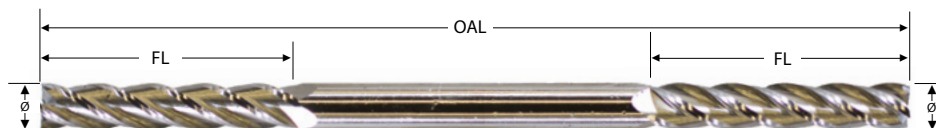
### 2 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/16"	7/32"	.1875"	2.50"	544-0062	\$22.16
3/32"	9/32"	.1875"	2.625"	544-0093	\$22.16
1/8"	3/4"	.1875"	3.125"	544-0125	\$22.16
5/32"	7/8"	.1875"	3.25"	544-0156	\$25.04
* 3/16"	1"	.1875"	3.375"	544-0187	\$25.04

### 4 FLUTE

- Diameter Tolerance:
  - 4 Flute:  $+0.002/-0.000$
  - \*3/16":  $+0.000/-0.0025$

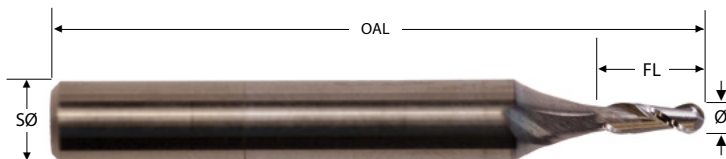


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				4 FLUTE	PRICE
1/16"	7/32"	.1875"	2.50"	551-0062	\$23.48
3/32"	9/32"	.1875"	2.625"	551-0093	\$23.48
1/8"	3/4"	.1875"	3.125"	551-0125	\$23.48
5/32"	7/8"	.1875"	3.25"	551-0156	\$25.48
* 3/16"	1"	.1875"	3.375"	551-0187	\$25.48

# SINGLE END, BALL END, STANDARD

## DECIMAL .005" - .1378"

- Helix: 35 - 40 Degrees
- Rake Angle: Positive
- Center Cutting: Yes
- Hand: RHS/ RHC
- Uncoated for General Purpose
- TiCN Coated for High Performance
- Diameter Tolerance: +.000/-.001

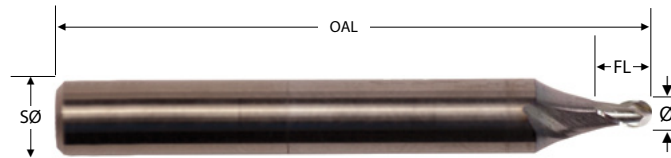


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED		TiCN COATED	
				2 FLUTE	PRICE	2 FLUTE	PRICE
.005"	.015"	.125"	1.50"	858-.005	\$23.54	858-T1-.005	\$26.52
.010"	.030"	.125"	1.50"	858-.010	\$20.77	858-T1-.010	\$23.75
.015"	.045"	.125"	1.50"	858-.015	\$21.16	858-T1-.015	\$23.61
.0156" (1/64")	.047"	.125"	1.50"	858-1560	\$21.16	858-T1-1560	\$23.61
.0197" (.5 mm)	.059"	.125"	1.50"	858-0197	\$20.44	--	
.020"	.060"	.125"	1.50"	858-.020	\$20.63	858-T1-.020	\$23.61
.025"	.075"	.125"	1.50"	858-.025	\$19.89	--	
.030"	.090"	.125"	1.50"	858-.030	\$19.27	858-T1-.030	\$23.09
.035"	.105"	.1875"	1.50"	858-.035	\$16.95	--	
.0394" (1 mm)	.118"	.1875"	1.50"	858-0394	\$16.95	--	
.040"	.120"	.1875"	1.50"	858-.040	\$16.95	858-T1-.040	\$20.77
.045"	.135"	.1875"	1.50"	858-.045	\$16.95	--	
.0492" (1.25 mm)	.148"	.1875"	1.50"	858-0492	\$16.95	--	
.050"	.150"	.1875"	1.50"	858-.050	\$16.95	858-T1-.050	\$20.77
.055"	.165"	.1875"	1.50"	858-.055	\$17.62	--	
.0591" (1.5 mm)	.177"	.1875"	1.50"	858-0591	\$17.62	--	
.060"	.180"	.1875"	1.50"	858-.060	\$17.62	858-T1-.060	\$21.44
.0630" (1.6 mm)	.189"	.1875"	1.50"	858-0630	\$17.62	--	
.065"	.195"	.1875"	1.50"	858-.065	\$17.62	--	
.070"	.210"	.1875"	1.50"	858-.070	\$17.62	858-T1-.070	\$21.44
.0709" (1.8 mm)	.213"	.1875"	1.50"	858-0709	\$17.62	--	
.075"	.225"	.1875"	1.50"	858-.075	\$17.62	--	
.0787" (2 mm)	.236"	.1875"	1.50"	858-0787	\$17.62	--	
.080"	.240"	.1875"	1.50"	858-.080	\$17.62	858-T1-.080	\$21.44
.085"	.255"	.1875"	1.50"	858-.085	\$17.62	--	
.0866" (2.2 mm)	.260"	.1875"	1.50"	858-0866	\$17.62	--	
.090"	.270"	.1875"	1.50"	858-.090	\$18.06	858-T1-.090	\$21.88
.095"	.285"	.1875"	1.50"	858-.095	\$18.06	--	
.0984" (2.5 mm)	.295"	.1875"	1.50"	858-0984	\$18.06	--	
.100"	.300"	.1875"	1.50"	858-.100	\$18.06	858-T1-.100	\$21.88
.1102" (2.8 mm)	.331"	.1875"	1.50"	858-1102	\$18.06	--	
.1181" (3 mm)	.354"	.1875"	1.50"	858-1181	\$18.06	--	
.120"	.360"	.1875"	1.50"	858-.120	\$18.06	--	
.1378" (3.5 mm)	.414"	.1875"	1.50"	858-1378	\$18.06	--	

# SINGLE END, BALL END, STUB

## DECIMAL .005" - .1378"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Diameter Tolerance: +.000/ -.001

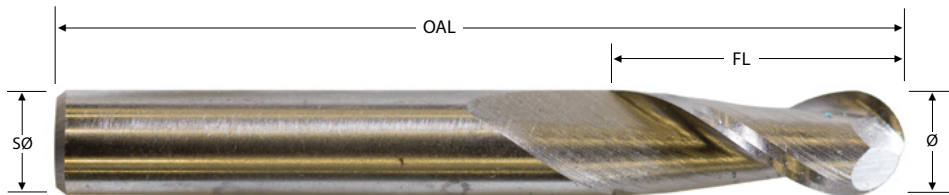


DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
.005"	.008"	.125"	1.50"	857-.005	\$25.31
.010"	.015"	.125"	1.50"	857-.010	\$25.31
.015"	.023"	.125"	1.50"	857-.015	\$21.16
.0156" (1/64")	.023"	.125"	1.50"	857-1560	\$21.16
.0197" (.5 mm)	.030"	.125"	1.50"	857-0197	\$21.16
.020"	.030"	.125"	1.50"	857-.020	\$20.60
.025"	.038"	.125"	1.50"	857-.025	\$19.89
.030"	.045"	.125"	1.50"	857-.030	\$19.27
.035"	.053"	.1875"	1.50"	857-.035	\$16.95
.0394" (1 mm)	.059"	.1875"	1.50"	857-0394	\$16.95
.040"	.060"	.1875"	1.50"	857-.040	\$16.95
.045"	.068"	.1875"	1.50"	857-.045	\$16.95
.0492" (1.25 mm)	.074"	.1875"	1.50"	857-0492	\$16.95
.050"	.075"	.1875"	1.50"	857-.050	\$16.95
.055"	.083"	.1875"	1.50"	857-.055	\$17.62
.0591" (1.5 mm)	.089"	.1875"	1.50"	857-0591	\$17.62
.060"	.090"	.1875"	1.50"	857-.060	\$17.62
.0630" (1.6 mm)	.095"	.1875"	1.50"	857-0630	\$17.62
.065"	.098"	.1875"	1.50"	857-.065	\$17.62
.070"	.105"	.1875"	1.50"	857-.070	\$17.62
.0709" (1.8 mm)	.106"	.1875"	1.50"	857-0709	\$17.62
.075"	.113"	.1875"	1.50"	857-.075	\$17.62
.0787" (2 mm)	.118"	.1875"	1.50"	857-0787	\$17.62
.080"	.120"	.1875"	1.50"	857-.080	\$17.62
.085"	.128"	.1875"	1.50"	857-.085	\$17.62
.0866" (2.2 mm)	.130"	.1875"	1.50"	857-0866	\$17.62
.090"	.135"	.1875"	1.50"	857-.090	\$18.06
.095"	.143"	.1875"	1.50"	857-.095	\$18.06
.0984" (2.5 mm)	.148"	.1875"	1.50"	857-0984	\$18.06
.100"	.150"	.1875"	1.50"	857-.100	\$18.06
.1102" (2.8 mm)	.165"	.1875"	1.50"	857-1102	\$18.06
.1181" (3 mm)	.177"	.1875"	1.50"	857-1181	\$18.06
.120"	.180"	.1875"	1.50"	857-.120	\$18.06
.1378" (3.5 mm)	.207"	.1875"	1.50"	857-1378	\$18.06

# SINGLE END, BALL END, STANDARD

## FRACTIONAL 1/32" - 3/16"

- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- Center Cutting: Yes
- Uncoated for General Purpose
- TiCN Coated for High Performance
- Diameter Tolerance: 2 Flute:  $+0.000/-0.002$   
4 Flute:  $+0.002/-0.000$   
\*3/16":  $+0.000/-0.0025$



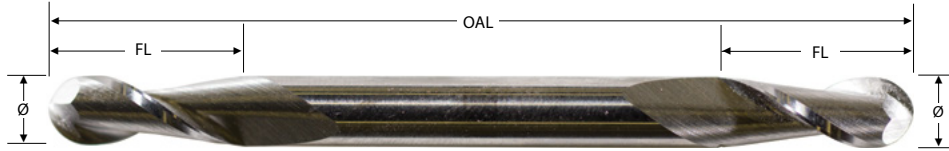
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIA. (SØ)	OAL	UNCOATED		TiCN COATED	
				2 FLUTE	PRICE	2 FLUTE	PRICE
1/32"	3/32"	.1875"	1.50"	858-0031	\$18.06	858-T1-0031	\$21.88
3/64"	9/64"	.1875"	1.50"	858-0046	\$18.06	858-T1-0046	\$21.88
1/16"	3/16"	.1875"	1.50"	858-0062	\$16.62	858-T1-0062	\$20.44
5/64"	15/64"	.1875"	1.50"	858-0078	\$16.62	858-T1-0078	\$20.44
3/32"	9/32"	.1875"	1.50"	858-0093	\$16.62	858-T1-0093	\$20.44
7/64"	21/64"	.1875"	1.50"	858-0109	\$16.62	--	
1/8"	3/8"	.1875"	1.50"	858-0125	\$16.62	858-T1-0125	\$20.44
9/64"	13/32"	.1875"	1.50"	858-0140	\$17.40	--	
5/32"	7/16"	.1875"	1.50"	858-0156	\$17.40	--	
11/64"	1/2"	.1875"	1.50"	858-0171	\$17.40	--	
* 3/16"	1/2"	.1875"	1.50"	858-0187	\$17.40	--	

# DOUBLE END, BALL END, STANDARD

## FRACTIONAL 1/32" - 3/16"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- M42 Cobalt
- Center Cutting: Yes
- Diameter Tolerance:
  - 2 Flute: +.000/-.002
  - \* 3/16": +000/-.0025

### 2 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/32"	3/32"	.1875"	2.25"	541-0031	\$28.36
3/64"	9/64"	.1875"	2.25"	541-0046	\$28.36
1/16"	3/16"	.1875"	2.25"	541-0062	\$25.92
5/64"	15/64"	.1875"	2.25"	541-0078	\$25.92
3/32"	9/32"	.1875"	2.25"	541-0093	\$25.92
7/64"	21/64"	.1875"	2.25"	541-0109	\$25.92
1/8"	3/8"	.1875"	2.25"	541-0125	\$25.92
9/64"	13/32"	.1875"	2.25"	541-0140	\$27.15
5/32"	7/16"	.1875"	2.25"	541-0156	\$27.15
11/64"	1/2"	.1875"	2.25"	541-0171	\$27.15
* 3/16"	1/2"	.1875"	2.25"	541-0187	\$27.15

### 4 FLUTE

- Diameter Tolerance:
  - 4 Flute: +.002/-.000
  - \*3/16": +000/-.0025



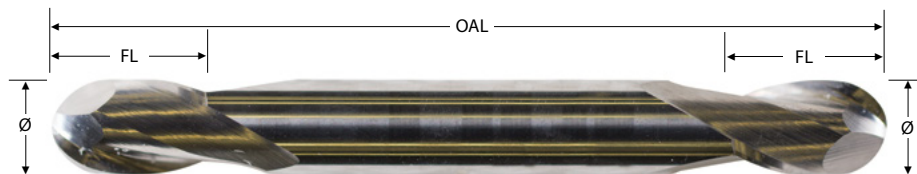
DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				4 FLUTE	PRICE
1/32"	3/32"	.1875"	2.25"	548-0031	\$37.11
3/64"	9/64"	.1875"	2.25"	548-0046	\$37.11
1/16"	3/16"	.1875"	2.25"	548-0062	\$33.79
5/64"	15/64"	.1875"	2.25"	548-0078	\$33.79
3/32"	9/32"	.1875"	2.25"	548-0093	\$33.79
7/64"	21/64"	.1875"	2.25"	548-0109	\$33.79
1/8"	3/8"	.1875"	2.25"	548-0125	\$33.79
9/64"	13/32"	.1875"	2.25"	548-0140	\$36.33
5/32"	7/16"	.1875"	2.25"	548-0156	\$36.33
11/64"	1/2"	.1875"	2.25"	548-0171	\$36.33
* 3/16"	1/2"	.1875"	2.25"	548-0187	\$36.33

# DOUBLE END, BALL END, STUB

## FRACTIONAL 1/32" - 3/16"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- M42 Cobalt
- Center Cutting: Yes
- Diameter Tolerance:  
*2 Flute: +.000/-.002*  
*\*3/16": +000/-.0025*

### 2 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/32"	3/64"	.1875"	2.00"	543-0031	\$27.15
3/64"	1/16"	.1875"	2.00"	543-0046	\$27.15
1/16"	3/32"	.1875"	2.00"	543-0062	\$24.49
5/64"	1/8"	.1875"	2.00"	543-0078	\$24.49
3/32"	9/64"	.1875"	2.00"	543-0093	\$24.49
7/64"	5/32"	.1875"	2.00"	543-0109	\$24.49
1/8"	3/16"	.1875"	2.00"	543-0125	\$24.49
9/64"	7/32"	.1875"	2.00"	543-0140	\$27.47
5/32"	15/64"	.1875"	2.00"	543-0156	\$27.47
11/64"	1/4"	.1875"	2.00"	543-0171	\$27.47
* 3/16"	9/32"	.1875"	2.00"	543-0187	\$27.47

### 4 FLUTE

- Diameter Tolerance: *4 Flute: +.002/-.000*  
*\*3/16": +000/-.0025*



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				4 FLUTE	PRICE
1/32"	3/64"	.1875"	2.00"	550-0031	\$34.56
3/64"	1/16"	.1875"	2.00"	550-0046	\$34.56
1/16"	3/32"	.1875"	2.00"	550-0062	\$31.46
5/64"	1/8"	.1875"	2.00"	550-0078	\$31.46
3/32"	9/64"	.1875"	2.00"	550-0093	\$31.46
7/64"	5/32"	.1875"	2.00"	550-0109	\$31.46
1/8"	3/16"	.1875"	2.00"	550-0125	\$31.46
9/64"	7/32"	.1875"	2.00"	550-0140	\$33.01
5/32"	15/64"	.1875"	2.00"	550-0156	\$33.01
11/64"	1/4"	.1875"	2.00"	550-0171	\$33.01
* 3/16"	9/32"	.1875"	2.00"	550-0187	\$33.01



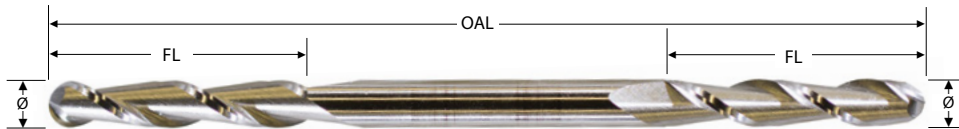
# DOUBLE END, BALL END, LONG FLUTE

## FRACTIONAL 1/16" - 3/16"

- Use: General Purpose
- Helix: 35 - 40 Degrees
- Hand: RHS/ RHC
- Rake Angle: Positive
- M42 Cobalt
- Center Cutting: Yes
- Diameter Tolerance:
  - 2 Flute:  $+.000/-0.002$
  - \*3/16":  $+000/-0.0025$



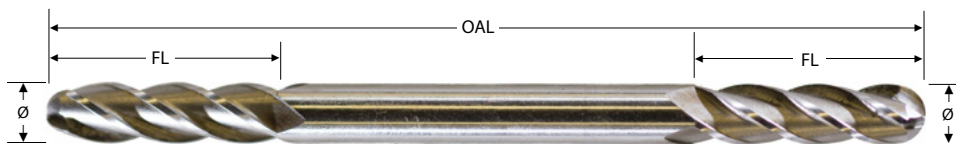
### 2 FLUTE



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				2 FLUTE	PRICE
1/16"	7/32"	.1875"	2.50"	545-0062	\$33.79
3/32"	9/32"	.1875"	2.625"	545-0093	\$33.79
1/8"	3/4"	.1875"	3.125"	545-0125	\$33.79
5/32"	7/8"	.1875"	3.25"	545-0156	\$35.23
* 3/16"	1"	.1875"	3.375"	545-0187	\$35.23

### 4 FLUTE

- Diameter Tolerance:
  - 4 Flute:  $+.002/-0.000$
  - \*3/16":  $+000/-0.0025$



DIAMETER (Ø)	FLUTE LENGTH (FL)	SHANK DIAMETER (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
				4 FLUTE	PRICE
1/16"	7/32"	.1875"	2.50"	552-0062	\$35.12
3/32"	9/32"	.1875"	2.625"	552-0093	\$35.12
1/8"	3/4"	.1875"	3.125"	552-0125	\$35.12
5/32"	7/8"	.1875"	3.25"	552-0156	\$36.56
* 3/16"	1"	.1875"	3.375"	552-0187	\$36.56

# MICRO DRILLS

## METRIC .10 mm - .45 mm

- Superior quality Twist Drills made of M42 Cobalt
- Guaranteed to meet geometry specifications
- Four facet point - Self-centering, more accurate holes, longer drill life
- Size range = 0.10 mm - 3.00 mm (.004"-.118")
- Diameter Tolerance: +0/- .006 mm
- Left hand available by special order
- 120 Degree Drill Point

DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA. (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
.10 mm	.7 mm		.0039"	1 mm	25 mm	MD010	\$12.73
.11 mm	.7 mm		.0043"	1 mm	25 mm	MD011	\$12.73
.12 mm	.7 mm		.0047"	1 mm	25 mm	MD012	\$12.73
.13 mm	1 mm		.0051"	1 mm	25 mm	MD013	\$12.73
.14 mm	1 mm		.0055"	1 mm	25 mm	MD014	\$12.73
.15 mm	1 mm	# 97	.0059"	1 mm	25 mm	MD015	\$12.73
.16 mm	1.4 mm	# 96	.0063"	1 mm	25 mm	MD016	\$12.73
.17 mm	1.4 mm	# 95	.0067"	1 mm	25 mm	MD017	\$12.73
.18 mm	1.4 mm	# 94	.0071"	1 mm	25 mm	MD018	\$12.73
.19 mm	1.4 mm	# 93	.0075"	1 mm	25 mm	MD019	\$12.73
.20 mm	1.8 mm	# 92	.0079"	1 mm	25 mm	MD020	\$8.61
.21 mm	1.8 mm	# 91	.0083"	1 mm	25 mm	MD021	\$8.61
.22 mm	1.8 mm	# 90	.0087"	1 mm	25 mm	MD022	\$8.61
.23 mm	1.8 mm	# 89	.0091"	1 mm	25 mm	MD023	\$8.61
.24 mm	1.8 mm	# 88	.0094"	1 mm	25 mm	MD024	\$8.61
.25 mm	2.2 mm		.0098"	1 mm	25 mm	MD025	\$8.61
.26 mm	2.2 mm		.0102"	1 mm	25 mm	MD026	\$8.61
.27 mm	2.2 mm	# 86	.0106"	1 mm	25 mm	MD027	\$8.61
.28 mm	2.2 mm	# 85	.0110"	1 mm	25 mm	MD028	\$8.61
.29 mm	2.2 mm	# 84	.0114"	1 mm	25 mm	MD029	\$8.61
.30 mm	2.2 mm		.0118"	1 mm	25 mm	MD030	\$8.61
.31 mm	2.8 mm		.0122"	1 mm	25 mm	MD031	\$8.61
.32 mm	2.8 mm	# 82	.0126"	1 mm	25 mm	MD032	\$8.61
.33 mm	2.8 mm	# 81	.0130"	1 mm	25 mm	MD033	\$8.61
.34 mm	2.8 mm	# 80	.0134"	1 mm	25 mm	MD034	\$8.61
.35 mm	2.8 mm		.0138"	1 mm	25 mm	MD035	\$8.61
.36 mm	2.8 mm		.0142"	1 mm	25 mm	MD036	\$8.61
.37 mm	2.8 mm	# 79	.0146"	1 mm	25 mm	MD037	\$8.61
.38 mm	2.8 mm		.0150"	1 mm	25 mm	MD038	\$8.61
.39 mm	2.8 mm		.0154"	1 mm	25 mm	MD039	\$8.61
.40 mm	3.2 mm		.0157"	1 mm	25 mm	MD040	\$8.61
.41 mm	3.2 mm	# 78	.0161"	1 mm	25 mm	MD041	\$8.61
.42 mm	3.2 mm		.0165"	1 mm	25 mm	MD042	\$8.61
.43 mm	3.2 mm		.0169"	1 mm	25 mm	MD043	\$8.61
.44 mm	3.2 mm		.0173"	1 mm	25 mm	MD044	\$8.61
.45 mm	3.2 mm		.0177"	1 mm	25 mm	MD045	\$8.61

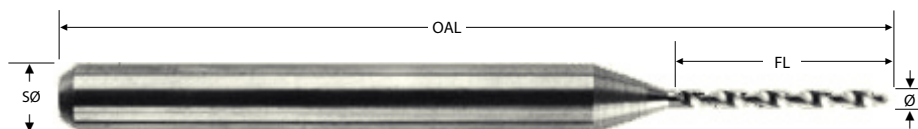


**\* SOLD IN MULTIPLES OF 5 \***

# MICRO DRILLS

## METRIC .46 mm - .80 mm

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DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA. (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
.46 mm	3.6 mm	# 77	.0181"	1 mm	25 mm	MD046	\$8.61
.47 mm	3.6 mm		.0185"	1 mm	25 mm	MD047	\$8.61
.48 mm	3.6 mm		.0189"	1 mm	25 mm	MD048	\$8.61
.49 mm	3.6 mm		.0193"	1 mm	25 mm	MD049	\$8.61
.50 mm	3.6 mm		.0197"	1 mm	25 mm	MD050	\$8.61
.51 mm	4 mm	# 76	.0201"	1.5 mm	25 mm	MD051	\$8.61
.52 mm	4 mm		.0205"	1.5 mm	25 mm	MD052	\$8.61
.53 mm	4 mm	# 75	.0209"	1.5 mm	25 mm	MD053	\$8.61
.54 mm	4 mm		.0213"	1.5 mm	25 mm	MD054	\$8.61
.55 mm	4 mm		.0217"	1.5 mm	25 mm	MD055	\$8.61
.56 mm	4.5 mm		.0220"	1.5 mm	25 mm	MD056	\$8.61
.57 mm	4.5 mm	# 74	.0224"	1.5 mm	25 mm	MD057	\$8.61
.58 mm	4.5 mm		.0228"	1.5 mm	25 mm	MD058	\$8.61
.59 mm	4.5 mm		.0232"	1.5 mm	25 mm	MD059	\$8.61
.60 mm	4.5 mm		.0236"	1.5 mm	25 mm	MD060	\$8.61
.61 mm	4.7 mm	# 73	.0240"	1.5 mm	25 mm	MD061	\$8.61
.62 mm	4.7 mm		.0244"	1.5 mm	25 mm	MD062	\$8.61
.63 mm	4.7 mm	# 72	.0248"	1.5 mm	25 mm	MD063	\$8.61
.64 mm	4.7 mm		.0252"	1.5 mm	25 mm	MD064	\$8.61
.65 mm	4.7 mm		.0256"	1.5 mm	25 mm	MD065	\$8.61
.66 mm	4.7 mm	# 71	.0260"	1.5 mm	25 mm	MD066	\$8.61
.67 mm	4.7 mm		.0264"	1.5 mm	25 mm	MD067	\$8.61
.68 mm	5.2 mm		.0268"	1.5 mm	25 mm	MD068	\$8.61
.69 mm	5.2 mm		.0272"	1.5 mm	25 mm	MD069	\$8.61
.70 mm	5.2 mm		.0276"	1.5 mm	25 mm	MD070	\$8.61
.71 mm	5.2 mm	# 70	.0280"	1.5 mm	25 mm	MD071	\$8.61
.72 mm	5.2 mm		.0283"	1.5 mm	25 mm	MD072	\$8.61
.73 mm	5.2 mm		.0287"	1.5 mm	25 mm	MD073	\$8.61
.74 mm	5.2 mm	# 69	.0291"	1.5 mm	25 mm	MD074	\$8.61
.75 mm	5.2 mm		.0295"	1.5 mm	25 mm	MD075	\$8.61
.76 mm	5.5 mm		.0299"	1.5 mm	25 mm	MD076	\$8.61
.77 mm	5.5 mm		.0303"	1.5 mm	25 mm	MD077	\$8.61
.78 mm	5.5 mm		.0307"	1.5 mm	25 mm	MD078	\$8.61
.79 mm	5.5 mm	# 68	.0311"	1.5 mm	25 mm	MD079	\$8.61
.80 mm	5.5 mm		.0315"	1.5 mm	25 mm	MD080	\$8.61

**\* SOLD IN MULTIPLES OF 5 \***

# MICRO DRILLS

## METRIC .81 mm - 1.20 mm

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DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
.81 mm	5.5 mm	# 67	.0319"	1.5 mm	25 mm	MD081	\$8.61
.82 mm	5.5 mm		.0323"	1.5 mm	25 mm	MD082	\$8.61
.83 mm	5.5 mm		.0327"	1.5 mm	25 mm	MD083	\$8.61
.84 mm	5.5 mm	# 66	.0331"	1.5 mm	25 mm	MD084	\$8.61
.85 mm	5.5 mm		.0335"	1.5 mm	25 mm	MD085	\$8.61
.86 mm	6 mm		.0339"	1.5 mm	25 mm	MD086	\$8.61
.87 mm	6 mm		.0343"	1.5 mm	25 mm	MD087	\$8.61
.88 mm	6 mm		.0346"	1.5 mm	25 mm	MD088	\$8.61
.89 mm	6 mm	# 65	.0350"	1.5 mm	25 mm	MD089	\$8.61
.90 mm	6 mm		.0354"	1.5 mm	25 mm	MD090	\$8.61
.91 mm	6 mm	# 64	.0358"	1.5 mm	25 mm	MD091	\$8.61
.92 mm	6 mm		.0362"	1.5 mm	25 mm	MD092	\$8.61
.93 mm	6 mm		.0366"	1.5 mm	25 mm	MD093	\$8.61
.94 mm	6 mm	# 63	.0370"	1.5 mm	25 mm	MD094	\$8.61
.95 mm	6 mm		.0374"	1.5 mm	25 mm	MD095	\$8.61
.96 mm	6.5 mm	# 62	.0378"	1.5 mm	25 mm	MD096	\$8.61
.97 mm	6.5 mm		.0382"	1.5 mm	25 mm	MD097	\$8.61
.98 mm	6.5 mm		.0386"	1.5 mm	25 mm	MD098	\$8.61
.99 mm	6.5 mm	# 61	.0390"	1.5 mm	25 mm	MD099	\$8.61
1.00 mm	6.5 mm		.0394"	1.5 mm	25 mm	MD100	\$8.61
1.01 mm	6.5 mm	# 60	.0398"	1.5 mm	25 mm	MD101	\$8.61
1.02 mm	6.5 mm		.0402"	1.5 mm	25 mm	MD102	\$8.61
1.03 mm	6.5 mm		.0406"	1.5 mm	25 mm	MD103	\$8.61
1.04 mm	6.5 mm	# 59	.0409"	1.5 mm	25 mm	MD104	\$8.61
1.05 mm	6.5 mm		.0413"	1.5 mm	25 mm	MD105	\$8.61
1.06 mm	7 mm		.0417"	1.5 mm	25 mm	MD106	\$8.61
1.07 mm	7 mm	# 58	.0421"	1.5 mm	25 mm	MD107	\$8.61
1.08 mm	7 mm		.0425"	1.5 mm	25 mm	MD108	\$8.61
1.09 mm	7 mm	# 57	.0429"	1.5 mm	25 mm	MD109	\$8.61
1.10 mm	7 mm		.0433"	1.5 mm	25 mm	MD110	\$8.61
1.11 mm	7 mm		.0437"	1.5 mm	25 mm	MD111	\$8.61
1.12 mm	7 mm		.0441"	1.5 mm	25 mm	MD112	\$8.61
1.13 mm	7 mm		.0445"	1.5 mm	25 mm	MD113	\$8.61
1.14 mm	7 mm		.0449"	1.5 mm	25 mm	MD114	\$8.61
1.15 mm	7 mm		.0453"	1.5 mm	25 mm	MD115	\$8.61
1.16 mm	7.5 mm		.0457"	1.5 mm	25 mm	MD116	\$8.61
1.17 mm	7.5 mm		.0461"	1.5 mm	25 mm	MD117	\$8.61
1.18 mm	7.5 mm	# 56	.0465"	1.5 mm	25 mm	MD118	\$8.61
1.19 mm	7.5 mm	3/64	.0469"	1.5 mm	25 mm	MD119	\$8.61
1.20 mm	7.5 mm		.0472"	1.5 mm	25 mm	MD120	\$8.61

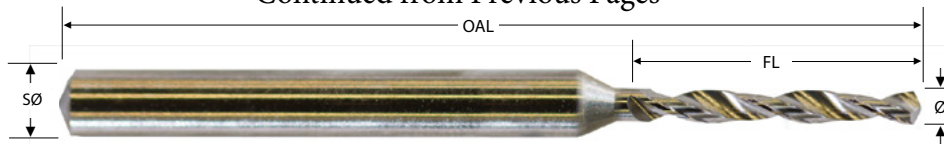
**\* SOLD IN MULTIPLES OF 5 \***



# MICRO DRILLS

## METRIC 1.21 mm - 1.60 mm

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DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
1.21 mm	7.5 mm		.0476"	1.5 mm	25 mm	MD121	\$8.61
1.22 mm	7.5 mm		.0480"	1.5 mm	25 mm	MD122	\$8.61
1.23 mm	7.5 mm		.0484"	1.5 mm	25 mm	MD123	\$8.61
1.24 mm	7.5 mm		.0488"	1.5 mm	25 mm	MD124	\$8.61
1.25 mm	7.5 mm		.0492"	1.5 mm	25 mm	MD125	\$8.61
1.26 mm	7.5 mm		.0496"	1.5 mm	25 mm	MD126	\$8.61
1.27 mm	7.5 mm		.0500"	1.5 mm	25 mm	MD127	\$8.61
1.28 mm	7.5 mm		.0504"	1.5 mm	25 mm	MD128	\$8.61
1.29 mm	7.5 mm		.0508"	1.5 mm	25 mm	MD129	\$8.61
1.30 mm	7.5 mm		.0512"	1.5 mm	25 mm	MD130	\$8.61
1.31 mm	8.5 mm		.0516"	1.5 mm	25 mm	MD131	\$8.61
1.32 mm	8.5 mm	# 55	.0520"	1.5 mm	25 mm	MD132	\$8.61
1.33 mm	8.5 mm		.0524"	1.5 mm	25 mm	MD133	\$8.61
1.34 mm	8.5 mm		.0528"	1.5 mm	25 mm	MD134	\$8.61
1.35 mm	8.5 mm		.0531"	1.5 mm	25 mm	MD135	\$8.61
1.36 mm	8.5 mm		.0535"	1.5 mm	25 mm	MD136	\$8.61
1.37 mm	8.5 mm		.0539"	1.5 mm	25 mm	MD137	\$8.61
1.38 mm	8.5 mm		.0543"	1.5 mm	25 mm	MD138	\$8.61
1.39 mm	8.5 mm		.0547"	1.5 mm	25 mm	MD139	\$8.61
1.40 mm	8.5 mm	# 54	.0551"	1.5 mm	25 mm	MD140	\$8.61
1.41 mm	8.5 mm		.0555"	1.5 mm	25 mm	MD141	\$8.61
1.42 mm	8.5 mm		.0559"	1.5 mm	25 mm	MD142	\$8.61
1.43 mm	8.5 mm		.0563"	1.5 mm	25 mm	MD143	\$8.61
1.44 mm	8.5 mm		.0567"	1.5 mm	25 mm	MD144	\$8.61
1.45 mm	8.5 mm		.0571"	1.5 mm	25 mm	MD145	\$8.61
1.46 mm	8.5 mm		.0575"	1.5 mm	25 mm	MD146	\$8.61
1.47 mm	8.5 mm		.0579"	1.5 mm	25 mm	MD147	\$8.61
1.48 mm	8.5 mm		.0583"	1.5 mm	25 mm	MD148	\$8.61
1.49 mm	8.5 mm		.0587"	1.5 mm	25 mm	MD149	\$8.61
1.50 mm	10 mm		.0591"	2 mm	35 mm	MD150	\$8.61
1.51 mm	10 mm	# 53	.0594"	2 mm	35 mm	MD151	\$9.74
1.52 mm	10 mm		.0598"	2 mm	35 mm	MD152	\$9.74
1.53 mm	10 mm		.0602"	2 mm	35 mm	MD153	\$9.74
1.54 mm	10 mm		.0606"	2 mm	35 mm	MD154	\$9.74
1.55 mm	10 mm		.0610"	2 mm	35 mm	MD155	\$9.74
1.56 mm	10 mm		.0614"	2 mm	35 mm	MD156	\$9.74
1.57 mm	10 mm		.0618"	2 mm	35 mm	MD157	\$9.74
1.58 mm	10 mm		.0622"	2 mm	35 mm	MD158	\$9.74
1.59 mm	10 mm	1/16	.0626"	2 mm	35 mm	MD159	\$9.74
1.60 mm	10 mm		.0630"	2 mm	35 mm	MD160	\$9.74

**\* SOLD IN MULTIPLES OF 5 \***



# MICRO DRILLS

## METRIC 1.61 mm - 1.95 mm

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DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA. (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
1.61 mm	10 mm	# 52	.0634"	2 mm	35 mm	MD161	\$9.74
1.62 mm	10 mm		.0638"	2 mm	35 mm	MD162	\$9.74
1.63 mm	10 mm		.0642"	2 mm	35 mm	MD163	\$9.74
1.64 mm	10 mm		.0646"	2 mm	35 mm	MD164	\$9.74
1.65 mm	10 mm		.0650"	2 mm	35 mm	MD165	\$9.74
1.66 mm	10 mm		.0654"	2 mm	35 mm	MD166	\$9.74
1.67 mm	10 mm		.0657"	2 mm	35 mm	MD167	\$9.74
1.68 mm	10 mm		.0661"	2 mm	35 mm	MD168	\$9.74
1.69 mm	10 mm		.0665"	2 mm	35 mm	MD169	\$9.74
1.70 mm	10 mm	# 51	.0669"	2 mm	35 mm	MD170	\$9.74
1.71 mm	10 mm		.0673"	2 mm	35 mm	MD171	\$9.74
1.72 mm	10 mm		.0677"	2 mm	35 mm	MD172	\$9.74
1.73 mm	10 mm		.0681"	2 mm	35 mm	MD173	\$9.74
1.74 mm	10 mm		.0685"	2 mm	35 mm	MD174	\$9.74
1.75 mm	10 mm		.0689"	2 mm	35 mm	MD175	\$9.74
1.76 mm	10 mm		.0693"	2 mm	35 mm	MD176	\$9.74
1.77 mm	11 mm		.0697"	2 mm	35 mm	MD177	\$9.74
1.78 mm	11 mm	# 50	.0701"	2 mm	35 mm	MD178	\$9.74
1.79 mm	11 mm		.0705"	2 mm	35 mm	MD179	\$9.74
1.80 mm	11 mm		.0709"	2 mm	35 mm	MD180	\$9.74
1.81 mm	11 mm		.0713"	2 mm	35 mm	MD181	\$9.74
1.82 mm	11 mm		.0717"	2 mm	35 mm	MD182	\$9.74
1.83 mm	11 mm		.0720"	2 mm	35 mm	MD183	\$9.74
1.84 mm	11 mm		.0724"	2 mm	35 mm	MD184	\$9.74
1.85 mm	11 mm	# 49	.0728"	2 mm	35 mm	MD185	\$9.74
1.86 mm	11 mm		.0732"	2 mm	35 mm	MD186	\$9.74
1.87 mm	11 mm		.0736"	2 mm	35 mm	MD187	\$9.74
1.88 mm	11 mm		.0740"	2 mm	35 mm	MD188	\$9.74
1.89 mm	11 mm		.0744"	2 mm	35 mm	MD189	\$9.74
1.90 mm	11 mm		.0748"	2 mm	35 mm	MD190	\$9.74
1.91 mm	11 mm		.0752"	2 mm	35 mm	MD191	\$9.74
1.92 mm	11 mm		.0756"	2 mm	35 mm	MD192	\$9.74
1.93 mm	11 mm	# 48	.0760"	2 mm	35 mm	MD193	\$9.74
1.94 mm	11 mm		.0764"	2 mm	35 mm	MD194	\$9.74
1.95 mm	11 mm		.0768"	2 mm	35 mm	MD195	\$9.74

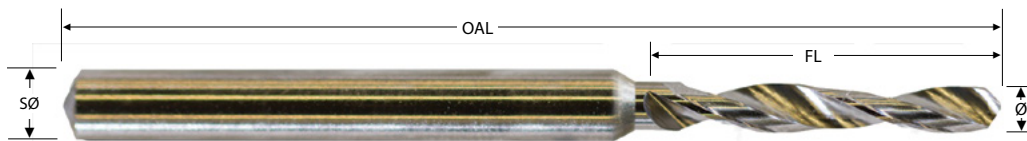
**\* SOLD IN MULTIPLES OF 5 \***



# MICRO DRILLS

## METRIC 1.96 mm - 2.30 mm

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DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA. (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
1.96 mm	11 mm		.0772"	2 mm	35 mm	MD196	\$9.74
1.97 mm	11 mm		.0776"	2 mm	35 mm	MD197	\$9.74
1.98 mm	11 mm	5/64	.0780"	2 mm	35 mm	MD198	\$9.74
1.99 mm	11 mm	# 47	.0783"	2 mm	35 mm	MD199	\$9.74
2.00 mm	11 mm		.0787"	2 mm	35 mm	MD200	\$9.74
2.01 mm	12 mm		.0791"	2.5 mm	35 mm	MD201	\$9.74
2.02 mm	12 mm		.0795"	2.5 mm	35 mm	MD202	\$9.74
2.03 mm	12 mm		.0799"	2.5 mm	35 mm	MD203	\$9.74
2.04 mm	12 mm		.0803"	2.5 mm	35 mm	MD204	\$9.74
2.05 mm	12 mm		.0807"	2.5 mm	35 mm	MD205	\$9.74
2.06 mm	12 mm	# 46	.0811"	2.5 mm	35 mm	MD206	\$9.74
2.07 mm	12 mm		.0815"	2.5 mm	35 mm	MD207	\$9.74
2.08 mm	12 mm	# 45	.0819"	2.5 mm	35 mm	MD208	\$9.74
2.09 mm	12 mm		.0823"	2.5 mm	35 mm	MD209	\$9.74
2.10 mm	12 mm		.0827"	2.5 mm	35 mm	MD210	\$9.74
2.11 mm	12 mm		.0831"	2.5 mm	35 mm	MD211	\$9.74
2.12 mm	12 mm		.0835"	2.5 mm	35 mm	MD212	\$9.74
2.13 mm	12 mm		.0839"	2.5 mm	35 mm	MD213	\$9.74
2.14 mm	12 mm		.0843"	2.5 mm	35 mm	MD214	\$9.74
2.15 mm	12 mm		.0846"	2.5 mm	35 mm	MD215	\$9.74
2.16 mm	12 mm		.0850"	2.5 mm	35 mm	MD216	\$9.74
2.17 mm	12 mm		.0854"	2.5 mm	35 mm	MD217	\$9.74
2.18 mm	12 mm	# 44	.0858"	2.5 mm	35 mm	MD218	\$9.74
2.19 mm	12 mm		.0862"	2.5 mm	35 mm	MD219	\$9.74
2.20 mm	12 mm		.0866"	2.5 mm	35 mm	MD220	\$9.74
2.21 mm	14 mm		.0870"	2.5 mm	35 mm	MD221	\$9.74
2.22 mm	14 mm		.0874"	2.5 mm	35 mm	MD222	\$9.74
2.23 mm	14 mm		.0878"	2.5 mm	35 mm	MD223	\$9.74
2.24 mm	14 mm		.0882"	2.5 mm	35 mm	MD224	\$9.74
2.25 mm	14 mm		.0886"	2.5 mm	35 mm	MD225	\$9.74
2.26 mm	14 mm	# 43	.0890"	2.5 mm	35 mm	MD226	\$9.74
2.27 mm	14 mm		.0894"	2.5 mm	35 mm	MD227	\$9.74
2.28 mm	14 mm		.0898"	2.5 mm	35 mm	MD228	\$9.74
2.29 mm	14 mm		.0902"	2.5 mm	35 mm	MD229	\$9.74
2.30 mm	14 mm		.0906"	2.5 mm	35 mm	MD230	\$9.74



**\* SOLD IN MULTIPLES OF 5 \***

# MICRO DRILLS

## METRIC 2.31 mm - 2.65 mm

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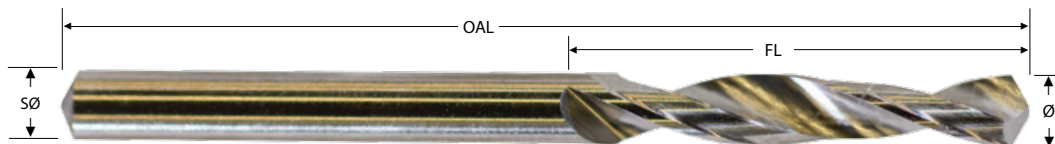
DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
2.31 mm	14 mm		.0909"	2.5 mm	35 mm	MD231	\$9.74
2.32 mm	14 mm		.0913"	2.5 mm	35 mm	MD232	\$9.74
2.33 mm	14 mm		.0917"	2.5 mm	35 mm	MD233	\$9.74
2.34 mm	14 mm		.0921"	2.5 mm	35 mm	MD234	\$9.74
2.35 mm	14 mm		.0925"	2.5 mm	35 mm	MD235	\$9.74
2.36 mm	14 mm		.0929"	2.5 mm	35 mm	MD236	\$9.74
2.37 mm	14 mm		.0933"	2.5 mm	35 mm	MD237	\$9.74
2.38 mm	14 mm	3/32	.0937"	2.5 mm	35 mm	MD238	\$9.74
2.39 mm	14 mm		.0941"	2.5 mm	35 mm	MD239	\$9.74
2.40 mm	14 mm		.0945"	2.5 mm	35 mm	MD240	\$9.74
2.41 mm	14 mm		.0949"	2.5 mm	35 mm	MD241	\$9.74
2.42 mm	14 mm		.0953"	2.5 mm	35 mm	MD242	\$9.74
2.43 mm	14 mm		.0957"	2.5 mm	35 mm	MD243	\$9.74
2.44 mm	14 mm	# 41	.0961"	2.5 mm	35 mm	MD244	\$9.74
2.45 mm	14 mm		.0965"	2.5 mm	35 mm	MD245	\$9.74
2.46 mm	14 mm		.0969"	2.5 mm	35 mm	MD246	\$9.74
2.47 mm	14 mm		.0972"	2.5 mm	35 mm	MD247	\$9.74
2.48 mm	14 mm		.0976"	2.5 mm	35 mm	MD248	\$9.74
2.49 mm	14 mm	# 40	.0980"	2.5 mm	35 mm	MD249	\$9.74
2.50 mm	14 mm		.0984"	2.5 mm	35 mm	MD250	\$9.74
2.51 mm	16 mm		.0988"	3 mm	40 mm	MD251	\$9.74
2.52 mm	16 mm		.0992"	3 mm	40 mm	MD252	\$9.74
2.53 mm	16 mm	# 39	.0996"	3 mm	40 mm	MD253	\$9.74
2.54 mm	16 mm		.1000"	3 mm	40 mm	MD254	\$9.74
2.55 mm	16 mm		.1004"	3 mm	40 mm	MD255	\$9.74
2.56 mm	16 mm		.1008"	3 mm	40 mm	MD256	\$9.74
2.57 mm	16 mm		.1012"	3 mm	40 mm	MD257	\$9.74
2.58 mm	16 mm	# 38	.1016"	3 mm	40 mm	MD258	\$9.74
2.59 mm	16 mm		.1020"	3 mm	40 mm	MD259	\$9.74
2.60 mm	16 mm		.1024"	3 mm	40 mm	MD260	\$9.74
2.61 mm	16 mm		.1028"	3 mm	40 mm	MD261	\$9.74
2.62 mm	16 mm		.1031"	3 mm	40 mm	MD262	\$9.74
2.63 mm	16 mm		.1035"	3 mm	40 mm	MD263	\$9.74
2.64 mm	16 mm	# 37	.1039"	3 mm	40 mm	MD264	\$9.74
2.65 mm	16 mm		.1043"	3 mm	40 mm	MD265	\$9.74

**\* SOLD IN MULTIPLES OF 5 \***

# MICRO DRILLS

## METRIC 2.66 mm - 3.00 mm

· Continued from Previous Pages



DIAMETER (Ø)	FLUTE LENGTH (FL)	WIRE SIZE	DIA (INCH) (Ø)	SHANK DIA. (SØ)	OVERALL LENGTH (OAL)	UNCOATED	
						2 FLUTE	PRICE
2.66 mm	16 mm		.1047"	3 mm	40 mm	MD266	\$9.74
2.67 mm	16 mm		.1051"	3 mm	40 mm	MD267	\$9.74
2.68 mm	16 mm		.1055"	3 mm	40 mm	MD268	\$9.74
2.69 mm	16 mm		.1059"	3 mm	40 mm	MD269	\$9.74
2.70 mm	16 mm	# 36	.1063"	3 mm	40 mm	MD270	\$9.74
2.71 mm	16 mm		.1067"	3 mm	40 mm	MD271	\$9.74
2.72 mm	16 mm		.1071"	3 mm	40 mm	MD272	\$9.74
2.73 mm	16 mm		.1075"	3 mm	40 mm	MD273	\$9.74
2.74 mm	16 mm		.1079"	3 mm	40 mm	MD274	\$9.74
2.75 mm	16 mm		.1083"	3 mm	40 mm	MD275	\$9.74
2.76 mm	16 mm		.1087"	3 mm	40 mm	MD276	\$9.74
2.77 mm	16 mm		.1091"	3 mm	40 mm	MD277	\$9.74
2.78 mm	18 mm	7/64	.1094"	3 mm	40 mm	MD278	\$9.74
2.79 mm	18 mm	# 35	.1098"	3 mm	40 mm	MD279	\$9.74
2.80 mm	18 mm		.1102"	3 mm	40 mm	MD280	\$9.74
2.81 mm	18 mm		.1106"	3 mm	40 mm	MD281	\$9.74
2.82 mm	18 mm	# 34	.1110"	3 mm	40 mm	MD282	\$9.74
2.83 mm	18 mm		.1114"	3 mm	40 mm	MD283	\$9.74
2.84 mm	18 mm		.1118"	3 mm	40 mm	MD284	\$9.74
2.85 mm	18 mm		.1122"	3 mm	40 mm	MD285	\$9.74
2.86 mm	18 mm		.1126"	3 mm	40 mm	MD286	\$9.74
2.87 mm	18 mm	# 33	.1130"	3 mm	40 mm	MD287	\$9.74
2.88 mm	18 mm		.1134"	3 mm	40 mm	MD288	\$9.74
2.89 mm	18 mm		.1138"	3 mm	40 mm	MD289	\$9.74
2.90 mm	18 mm		.1142"	3 mm	40 mm	MD290	\$9.74
2.91 mm	18 mm		.1146"	3 mm	40 mm	MD291	\$9.74
2.92 mm	18 mm		.1150"	3 mm	40 mm	MD292	\$9.74
2.93 mm	18 mm		.1154"	3 mm	40 mm	MD293	\$9.74
2.94 mm	18 mm		.1157"	3 mm	40 mm	MD294	\$9.74
2.95 mm	18 mm	# 32	.1161"	3 mm	40 mm	MD295	\$9.74
2.96 mm	18 mm		.1165"	3 mm	40 mm	MD296	\$9.74
2.97 mm	18 mm		.1169"	3 mm	40 mm	MD297	\$9.74
2.98 mm	18 mm		.1173"	3 mm	40 mm	MD298	\$9.74
2.99 mm	18 mm		.1177"	3 mm	40 mm	MD299	\$9.74
3.00 mm	18 mm		.1181"	3 mm	40 mm	MD300	\$9.74

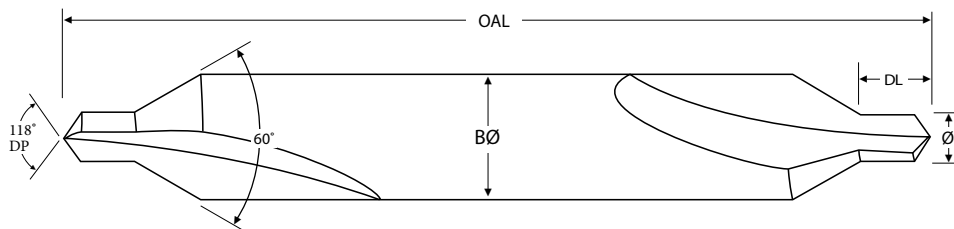


**\* SOLD IN MULTIPLES OF 5 \***

# COBALT DRILL/ COUNTERSINKS

## DECIMAL .010" - .3125"

- Helix: 24 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- 118° Drill Point
- Uncoated for General Purpose
- TiCN Coated for High Performance
- Diameter Tolerance: +/-0.0015

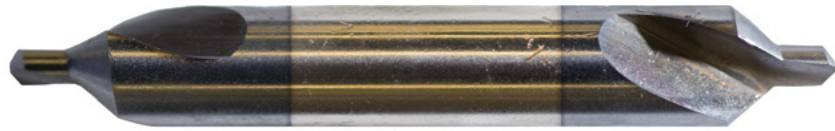


SIZE	DRILL DIAMETER (Ø)	DRILL LENGTH (DL)	BODY DIA. (BØ)	OAL	UNCOATED		TiCN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE
#00000 x 60°	Ø .010"	.010"	Ø 1/8"	1-1/4"	501-0100	\$36.42	501T1-0100	\$40.32
#0000 x 60°	Ø .015"	.015"	Ø 1/8"	1-1/4"	501-0150	\$35.40	501T1-0150	\$39.29
#000 x 60°	Ø .020"	.020"	Ø 1/8"	1-1/4"	501-0200	\$24.04	501T1-0200	\$27.94
#00 x 60°	Ø .025"	.025"	Ø 1/8"	1-1/4"	501-0250	\$24.04	501T1-0250	\$27.94
#0 x 60°	Ø .031"	.031"	Ø 1/8"	1-1/4"	501-0310	\$24.04	501T1-0310	\$27.94
#1-0 x 60°	Ø .040"	.040"	Ø 1/8"	1-1/4"	501-0400	\$39.74	--	
#1 x 60°	Ø 3/64" (.047")	3/64"	Ø 1/8"	1-1/4"	501-0001	\$13.04	501T1-0001	\$16.93
#2 x 60°	Ø 5/64" (.078")	5/64"	Ø 3/16"	1-7/8"	501-0002	\$13.46	501T1-0002	\$18.40
#3 x 60°	Ø 7/64" (.109")	7/64"	Ø 1/4"	2"	501-0003	\$13.89	501T1-0003	\$21.59
#4 x 60°	Ø 1/8" (.125")	1/8"	Ø 5/16"	2-1/8"	501-0004	\$14.46	501T1-0004	\$29.68
#4½ x 60°	Ø 9/64" (.141")	9/64"	Ø 3/8"	2-1/2"	501-0045	\$21.50	--	
#5 x 60°	Ø 3/16" (.1875")	3/16"	Ø 7/16"	2-3/4"	501-0005	\$22.81	501T1-0005	\$41.59
#6 x 60°	Ø 7/32" (.219")	7/32"	Ø 1/2"	3"	501-0006	\$35.37	501T1-0006	\$54.14
#7 x 60°	Ø 1/4" (.250")	1/4"	Ø 5/8"	3-1/4"	501-0007	\$53.22	501T1-0007	\$80.46
#8 x 60°	Ø 5/16" (.3125")	5/16"	Ø 3/4"	3-1/2"	501-0008	\$75.35	501T1-0008	\$107.50

# COBALT DRILL/ COUNTERSINKS

## DECIMAL .010" - .3125"

- Use: General Purpose
- Helix: 24 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- 118° Drill Point
- Diameter Tolerance: +/-0.0015



SIZE	DRILL DIAMETER (Ø)	DRILL LENGTH (DL)	BODY DIA. (BØ)	OAL	UNCOATED		TICN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE
#00000 x 82°	Ø .010"	.010"	Ø 1/8"	1-1/4"	181-0100	\$32.00	181T1-0100	\$35.90
#0000 x 82°	Ø .015"	.015"	Ø 1/8"	1-1/4"	181-0150	\$32.00	181T1-0150	\$35.90
#000 x 82°	Ø .020"	.020"	Ø 1/8"	1-1/4"	181-0200	\$20.50	181T1-0200	\$24.39
#00 x 82°	Ø .025"	.025"	Ø 1/8"	1-1/4"	181-0250	\$20.50	181T1-0250	\$24.39
#0 x 82°	Ø .031"	.031"	Ø 1/8"	1-1/4"	181-0310	\$20.50	181T1-0310	\$24.39
#1 x 82°	Ø 3/64" (.047")	3/64"	Ø 1/8"	1-1/4"	181-0001	\$9.18	181T1-0001	\$13.08
#2 x 82°	Ø 5/64" (.078")	5/64"	Ø 3/16"	1-7/8"	181-0002	\$9.40	181T1-0002	\$14.35
#3 x 82°	Ø 7/64" (.109")	7/64"	Ø 1/4"	2"	181-0003	\$9.73	181T1-0003	\$17.43
#4 x 82°	Ø 1/8" (.125")	1/8"	Ø 5/16"	2-1/8"	181-0004	\$10.12	181T1-0004	\$25.32
#4½ x 82°	Ø 9/64" (.141")	9/64"	Ø 3/8"	2-1/2"	181-0045	\$13.85	--	
#5 x 82°	Ø 3/16" (.1875")	3/16"	Ø 7/16"	2-3/4"	181-0005	\$15.41	181T1-0005	\$34.18
#6 x 82°	Ø 7/32" (.219")	7/32"	Ø 1/2"	3"	181-0006	\$23.34	181T1-0006	\$42.12
#7 x 82°	Ø 1/4" (.250")	1/4"	Ø 5/8"	3-1/4"	181-0007	\$33.02	181T1-0007	\$60.26
#8 x 82°	Ø 5/16" (.3125")	5/16"	Ø 3/4"	3-1/2"	181-0008	\$46.30	181T1-0008	\$78.46



SIZE	DRILL DIAMETER (Ø)	DRILL LENGTH (DL)	BODY DIA. (BØ)	OAL	UNCOATED		TICN COATED	
					2 FLUTE	PRICE	2 FLUTE	PRICE
#00000 x 90°	Ø .010"	.010"	Ø 1/8"	1-1/4"	191-0100	\$32.00	191T1-0100	\$35.90
#0000 x 90°	Ø .015"	.015"	Ø 1/8"	1-1/4"	191-0150	\$32.00	191T1-0150	\$35.90
#000 x 90°	Ø .020"	.020"	Ø 1/8"	1-1/4"	191-0200	\$20.50	191T1-0200	\$24.39
#00 x 90°	Ø .025"	.025"	Ø 1/8"	1-1/4"	191-0250	\$20.50	191T1-0250	\$24.39
#0 x 90°	Ø .031"	.031"	Ø 1/8"	1-1/4"	191-0310	\$20.50	191T1-0310	\$24.39
#1 x 90°	Ø 3/64" (.047")	3/64"	Ø 1/8"	1-1/4"	191-0001	\$9.18	191T1-0001	\$13.08
#2 x 90°	Ø 5/64" (.078")	5/64"	Ø 3/16"	1-7/8"	191-0002	\$9.40	191T1-0002	\$14.35
#3 x 90°	Ø 7/64" (.109")	7/64"	Ø 1/4"	2"	191-0003	\$9.73	191T1-0003	\$17.43
#4 x 90°	Ø 1/8" (.125")	1/8"	Ø 5/16"	2-1/8"	191-0004	\$10.12	191T1-0004	\$25.32
#4½ x 90°	Ø 9/64" (.141")	9/64"	Ø 3/8"	2-1/2"	191-0045	\$13.85	--	
#5 x 90°	Ø 3/16" (.1875")	3/16"	Ø 7/16"	2-3/4"	191-0005	\$15.41	191T1-0005	\$34.18
#6 x 90°	Ø 7/32" (.219")	7/32"	Ø 1/2"	3"	191-0006	\$23.34	191T1-0006	\$42.12
#7 x 90°	Ø 1/4" (.250")	1/4"	Ø 5/8"	3-1/4"	191-0007	\$33.02	191T1-0007	\$60.26
#8 x 90°	Ø 5/16" (.3125")	5/16"	Ø 3/4"	3-1/2"	191-0008	\$46.30	191T1-0008	\$78.46

# HSS DRILL/ COUNTERSINKS

## DECIMAL .010" - .3125"

- Use: General Purpose
- Helix: 24 Degrees
- Hand: RHS/ RHC
- Center Cutting: Yes
- 118° Drill Point
- Diameter Tolerance: +/-0.0015



SIZE	DRILL DIAMETER (Ø)	DRILL LENGTH (DL)	BODY DIA. (BØ)	OVERALL LENGTH (OAL)	UNCOATED	
					2 FLUTE	PRICE
#00000 x 60°	Ø .010"	.010"	Ø 1/8"	1-1/4"	801-0100	\$9.26
#0000 x 60°	Ø .015"	.015"	Ø 1/8"	1-1/4"	801-0150	\$8.49
#000 x 60°	Ø .020"	.020"	Ø 1/8"	1-1/4"	801-0200	\$8.05
#00 x 60°	Ø .025"	.025"	Ø 1/8"	1-1/4"	801-0250	\$8.05
#0 x 60°	Ø .031"	.031"	Ø 1/8"	1-1/4"	801-0310	\$8.05
#1-0 x 60°	Ø .040"	.040"	Ø 1/8"	1-1/4"	801-0400	\$14.45
#1 x 60°	Ø 3/64" (.047")	3/64"	Ø 1/8"	1-1/4"	801-0001	\$5.61
#2 x 60°	Ø 5/64" (.078")	5/64"	Ø 3/16"	1-7/8"	801-0002	\$5.88
#3 x 60°	Ø 7/64" (.109")	7/64"	Ø 1/4"	2"	801-0003	\$6.13
#4 x 60°	Ø 1/8" (.125")	1/8"	Ø 5/16"	2-1/8"	801-0004	\$6.32
#4½ x 60°	Ø 9/64" (.141")	9/64"	Ø 3/8"	2-1/2"	801-0045	\$8.67
#5 x 60°	Ø 3/16" (.1875")	3/16"	Ø 7/16"	2-3/4"	801-0005	\$9.98
#6 x 60°	Ø 7/32" (.219")	7/32"	Ø 1/2"	3"	801-0006	\$15.03
#7 x 60°	Ø 1/4" (.250")	1/4"	Ø 5/8"	3-1/4"	801-0007	\$22.81
#8 x 60°	Ø 5/16" (.3125")	5/16"	Ø 3/4"	3-1/2"	801-0008	\$31.32

SIZE	DRILL DIAMETER (Ø)	DRILL LENGTH (DL)	BODY DIA. (BØ)	OVERALL LENGTH (OAL)	UNCOATED	
					2 FLUTE	PRICE
#000 x 60°	Ø .020"	.020"	Ø 3/32"	1-1/8"	801-3200	\$9.26
#00 x 60°	Ø .025"	.025"	Ø 3/32"	1-1/8"	801-3250	\$9.26
#0 x 60°	Ø .031"	.031"	Ø 3/32"	1-1/8"	801-3310	\$9.26

## RADIAL DRILL AND COUNTERSINK



SIZE	DRILL DIAMETER (Ø)	RADIUS	BODY DIA. (BØ)	OVERALL LENGTH (OAL)	FORM LENGTH	UNCOATED	
						2 FLUTE	PRICE
#00000	Ø .010"	.070"	Ø 1/8"	1-1/4"	.068"	804-0100	\$8.87
#0000	Ø .015"	.085"	Ø 1/8"	1-1/4"	.083"	804-0150	\$8.87
#000	Ø .020"	9/64"	Ø 1/8"	1-1/4"	3/32"	804-0200	\$8.87
#00	Ø .025"	9/64"	Ø 1/8"	1-1/4"	7/64"	804-0250	\$8.87
#0	Ø .031"	9/64"	Ø 1/8"	1-1/4"	1/8"	804-0310	\$8.87
#1	Ø 3/64" (.047")	9/64"	Ø 1/8"	1-1/4"	1/8"	804-0001	\$6.93
#2	Ø 5/64" (.078")	7/32"	Ø 3/16"	1-7/8"	3/16"	804-0002	\$7.35
#3	Ø 7/64" (.109")	13/64"	Ø 1/4"	2"	1/4"	804-0003	\$7.97
#4	Ø 1/8" (.125")	1/4"	Ø 5/16"	2-1/8"	9/32"	804-0004	\$8.94
#5	Ø 3/16" (.1875")	5/16"	Ø 7/16"	2-3/4"	25/64"	804-0005	\$12.44





# HSS DRILL/ COUNTERSINKS

## FRACTIONAL 3/64" - 5/16"

### BELL TYPE DRILL AND COUNTERSINK



SIZE	DRILL DIAMETER	DRILL LENGTH	BODY DIA.	OVERALL LENGTH	UNCOATED	
	(Ø)	(DL)	(BØ)	(OAL)	2 FLUTE	PRICE
#11 x 60°	Ø 3/64" (.047")	3/64"	Ø 1/8"	1-1/4"	802-0011	\$6.68
#12 x 60°	Ø 1/16" (.0625")	1/16"	Ø 3/16"	1-7/8"	802-0012	\$7.02
#13 x 60°	Ø 3/32" (.0938")	3/32"	Ø 1/4"	2"	802-0013	\$7.12
#14 x 60°	Ø 7/64" (.109")	7/64"	Ø 5/16"	2-1/8"	802-0014	\$7.35
#15 x 60°	Ø 5/32" (.156")	5/32"	Ø 7/16"	2-3/4"	802-0015	\$11.19
#16 x 60°	Ø 3/16" (.1875")	3/16"	Ø 1/2"	3"	802-0016	\$17.25
#17 x 60°	Ø 7/32" (.219")	7/32"	Ø 5/8"	3-1/4"	802-0017	\$26.71
#18 x 60°	Ø 1/4" (.250")	1/4"	Ø 3/4"	3-1/2"	802-0018	\$35.40



### LONG SERIES DRILL AND COUNTERSINK



SIZE	DRILL DIAMETER	DRILL LENGTH	BODY DIAMETER	OVERALL LENGTH	UNCOATED	
	(Ø)	(DL)	(BØ)	(OAL)	2 FLUTE	PRICE
#1 x 60°	Ø 3/64" (.047")	3/64"	Ø 1/8"	3"	803-0013	\$13.57
#1 x 60°	Ø 3/64" (.047")	3/64"	Ø 1/8"	4"	803-0014	\$14.17
#1 x 60°	Ø 3/64" (.047")	3/64"	Ø 1/8"	5"	803-0015	\$19.69
#1 x 60°	Ø 3/64" (.047")	3/64"	Ø 1/8"	6"	803-0016	\$25.77
#2 x 60°	Ø 5/64" (.078")	5/64"	Ø 3/16"	3"	803-0023	\$13.74
#2 x 60°	Ø 5/64" (.078")	5/64"	Ø 3/16"	4"	803-0024	\$15.53
#2 x 60°	Ø 5/64" (.078")	5/64"	Ø 3/16"	5"	803-0025	\$19.90
#2 x 60°	Ø 5/64" (.078")	5/64"	Ø 3/16"	6"	803-0026	\$25.88
#3 x 60°	Ø 7/64" (.109")	7/64"	Ø 1/4"	3"	803-0033	\$14.35
#3 x 60°	Ø 7/64" (.109")	7/64"	Ø 1/4"	4"	803-0034	\$16.35
#3 x 60°	Ø 7/64" (.109")	7/64"	Ø 1/4"	5"	803-0035	\$21.51
#3 x 60°	Ø 7/64" (.109")	7/64"	Ø 1/4"	6"	803-0036	\$26.11
#4 x 60°	Ø 1/8" (.125")	1/8"	Ø 5/16"	4"	803-0044	\$18.12
#4 x 60°	Ø 1/8" (.125")	1/8"	Ø 5/16"	5"	803-0045	\$23.18
#4 x 60°	Ø 1/8" (.125")	1/8"	Ø 5/16"	6"	803-0046	\$26.75
#4½ x 60°	Ø 9/64" (.141")	9/64"	Ø 3/8"	4"	803-0454	\$20.38
#4½ x 60°	Ø 9/64" (.141")	9/64"	Ø 3/8"	5"	803-0455	\$24.10
#4½ x 60°	Ø 9/64" (.141")	9/64"	Ø 3/8"	6"	803-0456	\$29.05
#5 x 60°	Ø 3/16" (.1875")	3/16"	Ø 7/16"	4"	803-0054	\$23.80
#5 x 60°	Ø 3/16" (.1875")	3/16"	Ø 7/16"	5"	803-0055	\$27.59
#5 x 60°	Ø 3/16" (.1875")	3/16"	Ø 7/16"	6"	803-0056	\$30.95
#6 x 60°	Ø 7/32" (.219")	7/32"	Ø 1/2"	5"	803-0065	\$29.63
#6 x 60°	Ø 7/32" (.219")	7/32"	Ø 1/2"	6"	803-0066	\$35.82
#7 x 60°	Ø 1/4" (.250")	1/4"	Ø 5/8"	6"	803-0076	\$66.73
#8 x 60°	Ø 5/16" (.3125")	5/16"	Ø 3/4"	6"	803-0086	\$72.07

# SERIES ID

**SQUARE:** 12000, 13000, 16000, 17000, 3-0000, 41000, 43000, 51000, 540, 542, 544, 547, 549, 551, 61000, 740, 809, 874, 875, 878, 879, 887, 888, 846, 856

**BALL:** 13000BN, 3-0000B, 42000, 44000, 52000, 541, 543, 545, 548, 550, 552, 62000, 733XB, 735XB, 742, 876, 880, 882, 883, 875XB, 887XB, 888XB

**CORNER RADIUS:** 12000CR, 14000CR, 875-CR, 879-CR, 741, 732XCR10, 734XCR10

**ANGLED END:** 181, 191, 501, 701, 702, 706, 802, 803, 818, 819, 839, 874DM, 875DM

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# TERMS AND CONDITIONS

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1. Buyer shall pay Richards Micro-Tool (RMT) according to terms. Standard payment terms are net 30 days from invoice date. All invoiced amounts shall be invoiced and paid in U.S. dollars via check, money order, or electronic transfer. DO NOT SEND CASH.
2. Minimum purchase is \$25.00. **Prices and specifications are subject to change without notice.**
3. All shipments are F.O.B. Shipping Point with freight prepaid or collect, whichever is applicable. The title and risk of loss shall pass to the customer at shipping point upon delivery of the goods to the carrier.
4. RMT's products are warranted to be free of defects in material and workmanship. This warranty is in lieu of any and all warranties, expressed and/or implied; Seller makes no warranty of merchantability of the goods. THERE ARE NO OTHER WARRANTIES. The measure of RMT'S liability for breach of the aforesaid warranty shall be limited to a replacement of goods or return of the purchase price, THERE SHALL BE NO OTHER LIABILITY HEREUNDER, CONSEQUENTIAL OR OTHERWISE.
5. Claims for shortage in weight or count will only be honored by RMT if presented within five (5) working days after receipt of goods by the customer.
6. RMT's return policy is as follows: Authorization for all returns must first be secured from RMT Customer Service. A Return Merchandise Authorization (RMA) number will be issued to permit shipment back to RMT in Plymouth, MA. The RMA number does not constitute acceptance of the return, only that RMT has given permission for the customer to return the merchandise. Eligible items for return must have been ordered in the preceding six (6) month period. Items not listed in our catalog are considered special orders, including any modified, reached, or coated, and are not eligible for return. Orders for special items cannot be cancelled once accepted.

All products must be returned in the original boxes, tubes or packages in undamaged condition, in the current manufacturing design and in condition suitable for resale. RMT reminds our customers that returned shipments must be handled very carefully, as you are shipping precision cutting tools. Care must be taken to pack merchandise so as to avoid damage during return shipment. If, after inspection, parts are determined to be acceptable for return, a credit memo will be issued.

The credit memo will be equal to the number of approved parts returned multiplied by the unit price of the parts. All returns are subject to a 25% restocking fee. This fee covers the expense of receiving, inspection, repackaging, and other costs associated with returned goods. If replacement parts are needed, an order of the same or greater value must be placed at the time the credit memo is issued.

Richards Micro-Tool does not sell, rent, or give away any information that you provide us to other organizations, including, but is not limited to names, addresses, e-mail addresses, telephone numbers or any credit card information. This information is only used internally to process your order, track sales, and to contact customers by email with special offers.

# TECHNICAL INFORMATION

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## We Keep You Ahead of the Technology Curve

Richards Micro Tool is where ingenuity, technology and more than 50 years of experience combine to provide the finest cutting implements.

Richards is committed to quality and conformance excellence. Rest assured whether supplying a standard cutting tool or manufacturing to an OEM's drawing, Richards understands the importance of quality and adherence to specifications.

Craftsmanship and state of the art technology go into every one of our cutting tools to provide performance that exceeds industry standards. For example take a hard look at the finish of our products, which in turn assists creating a superior product finish.

All cutting tools are produced to ISO 9001 requirements in a climate controlled manufacturing facility. In addition, Richards was certified to ISO 13485 in June 2010 for the production, and distribution of Medical & Dental rotary cutting instruments.

Richards' exclusive Design Assist Team can provide the solutions that represents the best value for you and your customer. Our team has manufactured various t-slot cutters, dovetail cutters, half-round tools, reamers, combination & piloted-type tools, counterbores, hollow mills, back-spotface cutters, boring bars, and grooving tools.

Contact your local distributor for additional information; or visit [www.richardsmicrotool.com](http://www.richardsmicrotool.com).

You can also contact us toll-free at 800-233-9956,  
or via fax at (508) 747-4339.

Email: [info@richardsmicrotool.com](mailto:info@richardsmicrotool.com) for quote requests and product info,  
[sales@richardsmicrotool.com](mailto:sales@richardsmicrotool.com) for purchase orders.

# COATINGS GUIDE

## TIN COATED

### TiN (Titanium Nitride)

- General Purpose coating for machining iron based materials.
- Less expensive alternative to TiAlN and AlTiN.
- Thickness: 2 - 5 microns
- Hardness HV .05: 2,300

## TICN COATED

### TiCN (Titanium Carbon Nitride)

- High performance coating where high speeds and feed rates are desired
- Improved durability for interrupted cuts
- Works well with aluminum, brass, and bronze applications
- Thickness: 2 - 4 microns
- Hardness HV .05: 3,000

## TIALN COATED

### TiAlN (Titanium Aluminum Nitride)

- High performance coating for ferrous materials
- Excellent heat resistance and hardness
- Best results in DRY milling applications
- Works well in hardened materials, titanium alloys, stainless steels and cast irons
- Thickness: 2 - 5 microns
- Hardness HV .05: 3,300

## ALTiN COATED

### AlTiN (Aluminum Titanium Nitride)

- High performance coating for ferrous materials
- Excellent heat resistance and hardness
- Best results in DRY milling applications
- Works well in hardened materials, titanium alloys, stainless steels and cast irons
- Thickness: 2 - 5 microns
- Hardness HV .05: 3,000

## TIALN NANO COATED

### TITANIUM ALUMINUM NITRIDE NANO

- Improved Coating Adhesion
- Extended Tool Life in Difficult Machining.
- Improved Chip Flow Reduces Buildup on Cutters
- Hardness (GPa) 33+/- 3

## HARD MILL

### 'HARDMILL'

- Proprietary coating blend designed specifically for extended life machining hardened materials
- Hardness HV .05: 3,300

## AMORPHOUS DIAMOND

### AD (Amorphous Diamond)

- Amorphous Diamond is a smooth, hard, flexible, thin film coating
- Maintains sharper edge than CVD
- Excellent for machining graphite, carbon fiber and non-ferrous materials where machining forms a grit rather than a chip.
- Thickness: .5 - 2 microns
- Hardness HV .05: 5,000

## CVD COATED

### CVD (Crystalline Diamond)

- Crystalline Diamond grown directly on the cutting tool
- Excellent for machining graphite, carbon fiber, green ceramics and non-ferrous materials where machining forms a grit rather than a chip.
- Up to 50x the tool life as AD
- Thickness: 6 - 10 microns
- Hardness HV .05: 10,000

## DLC COATED

### DLC (Diamond Like Carbon)

- Thin carbon based amorphous coating, best for non-ferrous materials.
- Hardness HV .05: 2,800

## PCD BRAZED

### PCD (Polycrystalline Diamond)

- Manufactured as a wafer brazed to a carbide body
- High abrasion resistance and hardness
- Best for non-ferrous applications
- Hardness HV .05: 10,000



## SPEEDS & FEEDS INFO

Modern milling cutters capable of operating at higher feeds and speeds, and moving more cubic inches of metal per minute, require greater machine rigidity and more power.

Therefore it is important to determine that enough power is available to handle the desired depth and width of cut at the higher feeds and speeds.

T= Number of teeth in cutter	f= Feet per tooth in inches
D= Cutter diameter in inches	W= Width of cut
RPM= Revolutions per minute	d= Depth of cut
SFM= Surface feet per minute	HP= Motor horsepower
F= Feed in inches per minute	C= Machinability constant.

TO FIND	HAVING	FORMULA
Speed of Cutter in Surface Feet Per Minute (SFM)	Diameter of Cutter and Revolutions Per Minute D + RPM	$SFM = \frac{3.1416 \times D \times RPM}{12}$ or $SFM = D \times .26 \times RPM$
Revolutions Per Minute (RPM)	Surface Feet Per Minute and Diameter of Cutter SFM + D	$RPM = \frac{SFM \times 12}{3.1416 \times D}$ $RPM = \frac{SFM \times 3.82}{3.1416 \times D}$
Feed in Inches Per Minute (FPT) or (f)	Feed Per Tooth, Number of Teeth, and Revolutions Per Minute f + T + RPM	$F = f \times T \times RPM$
Feed per tooth in Inches (FPT) or (f)	Feed in Inches Per Minute, Number of Teeth Revolutions F + T + RPM	$f = \frac{F}{T \times RPM}$
Horsepower (HP)	Depth of cut, Width of Cut, Feed Inches Per Minute and Machinability Constant d + W + F + C	$HP = \frac{d \times W \times F}{C}$ $HP = \frac{d \times W \times T \times f \times RPM}{C}$

Machinability constant values for various materials are based on removing one cubic inch of metal per minute per horsepower with 60% power efficiency at the spindle nose and a 25% allowance for cutter dulling.

Aluminum, Magnesium, Dural	4.0 plus
Brass	2.5
Soft Bronze, Coper	2.0
Cast Iron	1.5
Steel up to 150 Brinell, Malleable Iron	75
Steel, 300 Brinell, Hard Bronze	6
Steel, 400 Brinell	5

# END MILL SPEEDS AND FEEDS

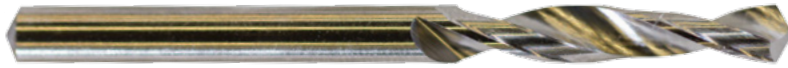


**Speed:** May be varied to suit conditions and type of operation in order to achieve best results.

**Feed:** Must consider material and depth of cut, tool diameter, number of flutes, and length. Tool material — HSS, Cobalt, and Carbide.

MATERIALS	SURFACE SPEED - SURFACE FEET/ MINUTE (SFM)		END MILL DIAMETER - INCHES PER TOOTH (IPT)		
	HSS/ Cobalt	Carbide	Up to 1/16"	1/16" - 1/8"	1/8" - 1/4"
Aluminum & Aluminum Alloys	200 - 600	600 - 1300	.0004 - .0008	.0008 - .0015	.0020 - .0060
Brass/ Bronze	100 - 200	400 - 700	.0003 - .0008	.0004 - .0012	.0010 - .0030
Cast Iron (Soft Grey)	100 - 130	200 - 500	.0004 - .001	.0008 - .002	.0015 - .0045
Cast Iron (Grey)	60 - 90	100 - 400	.0003 - .0008	.0006 - .0015	.0010 - .0040
Cast Iron (Ductile)	55 - 85	80 - 300	.0003 - .0008	.0006 - .0015	.0010 - .0030
Cast Iron (Malleable)	100 - 200	250 - 500	.0002 - .0004	.0004 - .0012	.0010 - .0030
Copper	60 - 80	200 - 500	.0002 - .0004	.0004 - .0010	.0008 - .002
Fiber	-	125 - 200	.0005 - .001	.0008 - .0015	.001 - .002
Graphite	-	125 - 200	.0005 - .001	.0008 - .0015	.001 - .002
Magnesium	125 - 250	400 - 700	.0004 - .0008	.0006 - .0015	.0015 - .0035
Nickel	15 - 20	60 - 120	.0002 - .0004	.0004 - .0010	.0008 - .0015
Plastic	150 - 450	300 - 900	.0003 - .001	.0008 - .002	.002 - .004
Plastic Glass Filled	75 - 250	150 - 600	.0005 - .001	.0008 - .0015	.001 - .002
Rubber	150 - 250	-	.0003 - .001	.0008 - .002	.002 - .003
Stainless Steel (< 25 Rc)	60 - 80	250 - 500	.0003 - .001	.0008 - .002	.002 - .003
Stainless Steel (300 Series)	30 - 60	200 - 400	.0003 - .001	.0008 - .002	.002 - .003
Stainless Steel (400 Series)	20 - 40	150 - 300	.0005 - .001	.0008 - .0015	.001 - .0025
Stainless Steel (PH)	30 - 60	50 - 200	.0005 - .001	.0008 - .0015	.001 - .0025
Steel Low Carbon	75 - 100	150 - 250	.0004 - .0008	.0006 - .0015	.0010 - .0040
Steel Med. Carbon	55 - 85	80 - 150	.0005 - .0015	.0010 - .0030	.002 - .005
Titanium	40 - 60	90 - 130	.0003 - .0006	.0004 - .0008	.0008 - .0015
Tool Steel	40 - 60	100 - 300	.0003 - .0008	.0004 - .0012	.001 - .003
Wood	80 - 100	100 - 400	.0005 - .001	.001 - .002	.002 - .003
Zinc	150 - 175	300 - 350	.0003 - .001	.0008 - .002	.002 - .003

# DRILL SPEEDS AND FEEDS



**Speed:** Factors affecting optimum Drill speeds depend on:

- Depth of Hole
- Drill Machine Type
- Hardness of Material
- Hole Finish
- Coolant
- Hole Location

**Feed:** Factors effecting feed rates are drill diameters, machineability of material, and depth of hole. Small drills, harder materials, and hole depths in excess of 3 – 4 times diameter require adjustment to suggested drill feed rates.

MATERIALS	SURFACE SPEED - SURFACE FEET/ MINUTE(SFM)		DRILL DIAMETER - INCHES PER REVOLUTION (IPR)		
	HSS/ Cobalt	Carbide	Up to 1/16"	1/16" - 1/8"	1/8" - 1/4"
Aluminum & Aluminum Alloys	150 - 300	200 - 350	.0004 - .0008	.0008 - .0015	.0020 - .0060
Brass/ Bronze	80 - 175	125 - 300	.0003 - .0008	.0004 - .0012	.0010 - .0030
Cast Iron (Soft Grey)	100 - 130	200 - 400	.0004 - .001	.0008 - .002	.0015 - .0045
Cast Iron (Grey)	70 - 100	175 - 300	.0003 - .0008	.0006 - .0015	.0010 - .0040
Cast Iron (Ductile)	60 - 90	175 - 300	.0003 - .0008	.0006 - .0015	.0010 - .0030
Cast Iron (Malleable)	40 - 80	75 - 180	.0002 - .0004	.0004 - .0012	.0010 - .0030
Copper	80 - 175	125 - 300	.0002 - .0004	.0004 - .0010	.0008 - .002
Fiber	-	175 - 250	.0005 - .001	.0008 - .0015	.001 - .002
Graphite	-	175 - 250	.0005 - .001	.0008 - .0015	.001 - .002
Magnesium	125 - 250	200 - 300	.0004 - .0008	.0006 - .0015	.0015 - .0035
Nickel	15 - 30	100 - 150	.0002 - .0004	.0004 - .0010	.0008 - .0015
Plastic	45 - 75	150 - 300	.0003 - .001	.0008 - .002	.002 - .004
Plastic Glass Filled	40 - 80	75 - 180	.0005 - .001	.0008 - .0015	.001 - .002
Rubber	45 - 75	-	.0003 - .001	.0008 - .002	.002 - .003
Stainless Steel (< 25 Rc)	40 - 60	100 - 300	.0003 - .001	.0008 - .002	.002 - .003
Stainless Steel (300 Series)	50 - 70	50 - 100	.0003 - .001	.0008 - .002	.002 - .003
Stainless Steel (400 Series)	30 - 50	100 - 300	.0005 - .001	.0008 - .0015	.001 - .0025
Stainless Steel (PH)	20 - 40	50 - 100	.0005 - .001	.0008 - .0015	.001 - .0025
Steel Low Carbon	80 - 120	125 - 300	.0004 - .0008	.0006 - .0015	.0010 - .0040
Steel Med. Carbon	70 - 110	100 - 180	.0005 - .0015	.0010 - .0030	.002 - .005
Titanium	20 - 60	30 - 100	.0003 - .0006	.0004 - .0008	.0008 - .0015
Tool Steel	20 - 60	50 - 100	.0003 - .0008	.0004 - .0012	.001 - .003
Wood	50 - 125	100 - 300	.0005 - .001	.001 - .002	.002 - .003
Zinc	125 - 150	250 - 300	.0003 - .001	.0008 - .002	.002 - .003

# TROUBLESHOOTING GUIDE

Problem/ Cause	Solution
<b>Excessive Wear</b>	
Speed is too fast	Decrease spindle speed, try coolant.
Hard work material	Use Coating (TiN, TiCN, TiALN).
Tool is rubbing	Determine appropriate relief for application.
Incorrect primary relief	Determine appropriate relief for application.
Recutting chips	Change feed and speed, change chip size or clear chips add coolant or air pressure.
Material defect of workpiece	Use consistent hardness material.
Improper rake or relief	Resharpener cutter to correct geometry to suit cutting conditions.
Insufficient performance of end mill	Use high-performance material end mill. Try to use coated end mill (TiN, TiCN, TiALN, etc.).
Unsuitable cutting fluid	Select proper cutting fluid. Correct lubricating system.
Improper time of resharpening	Provide timely resharpening.
Incorrect resharpening	Improve surface roughness on resharpening. Prevent overheat of cutter grinding. Remove build-up edge and weld deposit.

<b>Unacceptable Tool Life</b>	
Excessive friction	Regrind at earlier stage.
Hard work material	Use Coating (TiN, TiCN, TiALN, etc.).
Material too hard	Provide proper annealing. Reduce feed and use high- performance for end mill.
Incorrect feed	Define proper feed.
Insufficient coolant	Use proper cutting fluid.
Incorrect resharpening	Resharpener cutter to correct geometry to suit cutting conditions.
Less number of resharpening	Regrind relief angle smaller. Provide proper resharpening amount.
Improper time of resharpening	Provide timely resharpening (earlier).

<b>Chipped Cutting Edges</b>	
Feed rate excessive	Reduce feed rate
Lack of rigidity (machine & holder)	Use better machine or tool holder or change parameters.

<b>Rough Surface Finish</b>	
Excessive feed rate	Reduce feed rate.
Cutting speed is too slow (not shearing)	Increase RPM.
Excessive wear	Regrind at earlier stage.
Recutting chips	Change feed and speed, change chip size or clear chips add coolant or air pressure.
Chatter	Increase rigidity of workpiece fixture.
Reduce cutting speed	Consider conventional (up-cut) milling. Use Shortest possible length of tool, consider using special long reach holder.
Uneven hardness of workpiece	Use even hardness material.
Insufficient rake and relief	Resharpener cutter to correct geometry to suit cutting conditions.
Edge Build-up	Remove build-up edge and cold welding. Check deterioration of cutting fluid.
Dull cutting edge	Provide timely resharpening.
Excessive speed	Reduce cutting speed.
Improper or lack of cutting fluid	Change cutting fluid or lubricating system.

<b>Lack of Dimensional Accuracy</b>	
<b>Cut is too heavy</b>	Decrease width and depth of cut.
<b>Lack of rigidity (machine &amp; holder)</b>	Repair machine or holder.
<b>Rigidity is unacceptable (piecepart)</b>	Change machine or tool holder or change parameters.
<b>Too few flutes</b>	Use multiflute end mills.

<b>Chip Packing</b>	
<b>Cut is too heavy</b>	Decrease width and depth of cut.
<b>Not enough chip clearance</b>	Use end mill with fewer flutes.
<b>Not enough coolant</b>	Use higher coolant pressure and reposition nozzle to point of cut or use air pressure.

<b>Tool Breakage</b>	
<b>Excessive feed</b>	Reduce feed rate.
<b>Oversize chip</b>	Decrease width and depth-of-cut.
<b>Overhang of tool</b>	Hold shanks deeper, use shorter end mill.

<b>Workpiece Burrs</b>	
<b>Excessive wear</b>	Regrind at earlier stage.
<b>Incorrect feed and speed rates</b>	Decrease width and depth-of-cut.

<b>Squeal and Chattering</b>	
<b>Feed and speed too fast</b>	Correct feed and speed.
<b>Lack of rigidity (machine &amp; holder)</b>	Use better machine or tool holder or change parameters.
<b>Piece part lacks rigidity</b>	Improve clamping rigidity.
<b>Excessive cut</b>	Decrease width and depth of cut.
<b>Overhang of tool is excessive</b>	Hold shank deeper, use shorter end mill.
<b>Lack of relief</b>	Decrease relief angle, make margin; hone primary with stone.

<b>Torn Finish</b>	
<b>Uneven wear on teeth</b>	Remove wear by regrinding.
<b>Cold welding on teeth (galling)</b>	Remove cold welding. Change cutting fluid.
<b>Chipped teeth</b>	Handle end mill carefully.

<b>Uneven Finish</b>	
<b>Too few flutes</b>	Try multi flute end mill, 2 Flute, 3 Flute, 4 Flute.
<b>Helix angle too high</b>	Use lower helix angle mill.

<b>Breakage</b>	
<b>Lack of rigidity in set-up</b>	Check component or fixture for security and rigidity.
<b>Dull cutting edge</b>	Provide resharpening.
<b>Careless handling</b>	Handle end mill carefully.
<b>Recutting Chips</b>	Remove chips by air-jet cutting fluid.

<b>Chipping or Cracking</b>	
<b>Chatter</b>	Increase rigidity of workpiece fixture.
<b>Material defect or workpiece</b>	Use even hardness material. Remove abnormal parts such as scale, sandtumbling etc.
<b>Feed too high</b>	Reduce feed speed
<b>Dull Cutting Edge</b>	Providing resharpening
<b>Deterioration of cutting fluid</b>	Provide new cutting fluid



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