

SPECIALS  
AVAILABLE  
UPON  
REQUEST

# BLACK DIAMOND CVD END MILLS

## B R O C H U R E



**MWI**

Carbon & Graphite Solutions

# GENERAL INFORMATION

Most items are in stock and available for immediate shipping.

The *Black Diamond* brand are premium end mills with the following features:

H6 Tolerance on the shanks (+0.0000", -0.0005") for controlled T.I.R. (1/3 of industry standards)

Proprietary geometry for increased tool life, increased surface finishes and reduced harmonics

Nitro 3 – A new generation of Diamond (CVD) Coating. This coating provides for long tool life and a new generation of productivity

## FEEDS

## SPEEDS

### Applications

Graphite Machining
Medical and Optical
Ceramics
Plastics
Engraving
Aluminum

### Tool Dia.    Roughing    Finishing

1/64	.0005	.0002
1/32	.0008	.0004
1/16	.0015	.0005
3/32	.002	.001
1/8	.002	.001
3/16	.003	.0015
1/4	.004	.002
3/8	.0065	.003
1/2	.008	.008

### Cutting Speed for Graphite (sfm)

Soft	1,000-2,215
Medium	750-1,500
Hard	500-1,300

**CAUTION:** Balanced holders should be used for spindle speeds exceeding 10,000 RPM. Most applications allow for maximum spindle speeds.

**CAUTION:** Feeds and Speeds above are general guidelines and may change with application.

## BLACK DIAMOND CVD END MILL BENEFITS



Longer life on finished tools

Higher productivity from increased feeds & speeds

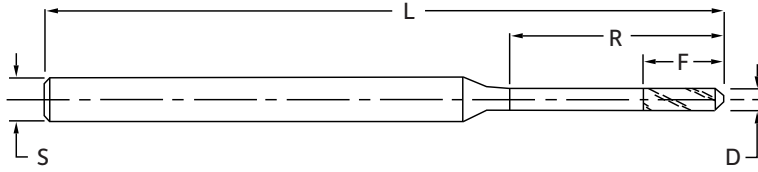
Improved overall cost of tooling

Decreased down time for tool changes

No harmonics



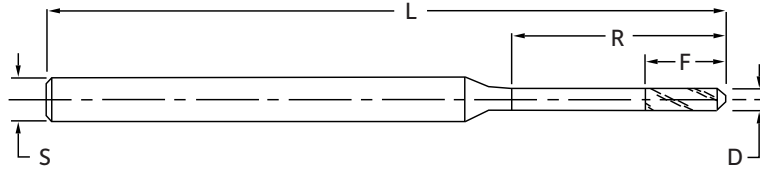
# FRACTIONAL END MILLS



(D)	(S)	(F)	(L)	(R)	P/N	P/N	P/N
Flute Dia.	Shank Dia.	LOC	OAL	Reach	DIAMOND-SE	DIAMOND-R*	DIAMOND-B
					2/4FL SQUARE	2/4FL RADIUS	2/4FL BALL NOSE
1/64	1/8	.047	2"	NONE	A0-S-2FL or (-4FL)	--	A0-B-2FL or (-4FL)
1/64	1/8	.047	1-1/2"	NONE	A0-S-2FL or (-4FL)	--	--
1/64	1/8	.047	1-1/2"	.100	A.100-S-2FL or (-4FL)	--	A.100-B-2FL or (-4FL)
1/64	1/8	.047	1-1/2"	.150	A.150-S-2FL or (-4FL)	A.150-.003CR-2FL	A.150-B-2FL or (-4FL)
1/64	1/8	.047	2"	.250	A.25-S-2FL or (-4FL)	--	A.25-B-2FL or (-4FL)
1/64	1/8	.047	1-1/2"	.400	A.4-S-2FL or (-4FL)	--	A.4-B-2FL or (-4FL)
1/64	1/8	.047	2"	.500	A.5-S-2FL or (-4FL)	--	A.5-B-2FL or (-4FL)
1/32	1/8	.093	2"	NONE	B0-S	B0-005cr	B0-B
1/32	1/8	.093	1-1/2"	NONE	B0-S-1.5	B0-005cr-1.5	B0-B-1.5
1/32	1/8	.093	3"	NONE	B0-S-3	B0-005cr-3	B0-B-3
1/32	1/8	.250	2"	NONE	B.25-SA	--	B.25-BA
1/32	1/8	.093	2"	.250	B.25-S	B.25-.005cr	B.25-B
1/32	1/8	.093	2"	.3125	B.3125-S	--	B.3125-B
1/32	1/8	.093	3"	.375	B.375-S-3	--	B.375-B-3
1/32	1/8	.093	2"	.400	B.4-S	B.4-.005cr	B.4-B
1/32	1/8	.093	2"	.500	B.5-S	B.5-.005cr	B.5-B
1/32	1/8	.093	3"	.500	B.5-S-3	--	B.5-B-3
1/32	1/8	.093	2"	.625	B.625-S	B.625-.005cr	B.625-B
1/32	1/8	.093	2"	.750	B.75-S	B.75-.005cr	B.75-B
1/32	1/8	.093	2"	.900	B.9-S	B.9-.005cr	B.9-B
1/32	1/8	.093	2"	1.0	B1.0-S	--	B1-B
3/64	1/8	.141	3"	NONE	C.0-S	C.0-R*	C.0-B
3/64	1/8	.141	2"	.500	C.5-S	C.5-R*	C.5-B
3/64	1/8	.141	1-1/2"	NONE	C0-S-1.5	--	--
3/64	1/8	.141	3"	.500	C.5-S-3	--	C.5-B-3
3/64	1/8	.141	2"	.750	C.75-S	C.75-R*	C.75-B
3/64	1/8	.141	3"	.750	C.75-S-3	--	C75-B-3
3/64	1/8	.141	3"	1.0	C1.0-S	C1.0-R*	C1.0-B
1/16	1/8	.141	1-1/2"	NONE	D0-S-1.5	--	--
1/16	1/8	.141	3"	NONE	D0-S-3	--	--
1/16	1/8	.250	2"	NONE	D.25-S	D.25-R*	D.25B-B
1/16	1/8	.093	2"	.500	D.5-S	D.5-R*	D.5-B
1/16	1/8	.1875	3"	.500	D.5-S-3	--	D.5-B-3

**\*Reach** = Indicate your desired radius part #  
(ex: P/N D.75-R(or .015) = 1/16" dia., .75 Reach with .015r)  
4Radius available (.005, .010, .015, .020, .030, .060)  
Flutes: If 2 flutes desired, put (-2FL) at end of P/N  
**SPECIALS AVAILABLE UPON REQUEST!**

# FRACTIONAL END MILLS



(D)	(S)	(F)	(L)	(R)	P/N (-4FL)	P/N	P/N
Flute Dia.	Shank Dia.	LOC	OAL	Reach	DIAMOND-SE	DIAMOND-R*	DIAMOND-B
					2/4FL SQUARE	2/4FL RADIUS	2/4FL BALL NOSE
1/16	1/8	.250	2"	.500	--	D.5-010CR	D.5-B
1/16	1/8	.500	2"	NONE	D.5-SA	--	D.5-BA
1/16	1/8	.250	2"	.625	D.625-S	D.625010CR	D.625-B
1/16	1/8	.093	2"	.750	D.75-S	D.75-010CR	D.75-B
1/16	1/8	.1875	3"	.750	D.75-S-3	D.75-010CR-3	D.75-B-3
1/16	1/8	.1875	2"	.800	D.800-S	D.800-010CR	D.800-B
1/16	1/8	.250	3"	1.0	D1-S	D1- R*-3	D1-B
3/32	1/8	.093	3"	NONE	E0-S-3	E0- R*-3	E0-B-3
3/32	1/8	.375	3"	NONE	E.375-S-3	E.375-R*-3	E.375-B
3/32	1/8	.375	1-1/2"	NONE	E0-S-1.5	--	E0-B-1.5
3/32	1/8	.281	3"	.500	E.5-S-3	E.5-010CR	E.5-B-3
3/32	1/8	.375	3"	1.0	E1-S	E1-010CR	E1.0-B-3
1/8	1/8	.500	1-1/2"	NONE	F0-SA-1.5	--	F0-BA-1.5
1/8	1/8	.500	2"	NONE	F0-SA-2	F0- R*A-2	F0-BA-2
1/8	1/8	.500	3"	NONE	F0-SA-3	F0-R*A-3	F0-BA-3
1/8	1/8	.1875	3"	.750	F.75-S	F.75-R*	F.75-B
1/8	1/8	.1875	3"	1.0	F1-S	F1- R*	F1-B
1/8	1/8	.250	3"	1.0	F1-S-3SP	F1-R*-3SP	F1-B-3SP
1/8	1/8	.375	3"	1.0	F1-S-3	F1-R*-3	F1-B-3
1/8	1/8	.125	3"	1.5	F1.5-S	F1.5-R*	F1.5-B
1/8	1/8	.1875	3"	2.0	F2-S	F2- R*	F2-B
1/8	1/8	.375	3"	2.0	F2-S-3SP	F2-R*-3SP	F2-B-3SP
1/8	1/8	.125	4"	2.0	--	--	F2-B-4
1/8	1/8	.125	4"	NONE	F0-S-4SP	--	F0-B-4SP
1/8	1/8	.125	4"	1.0	F1-S-4SP	F1-R*-4SP	F1-B-4SP
3/16	3/16	.625	3"	NONE	G.625-S	G.625-R*	G.625-B
3/16	3/16	.1875	3"	.750	G.75-S	G.75-R*	G.75-B
3/16	3/16	.1875	3"	1.0	G1-S	G1-R*	G1.0-B
3/16	3/16	.500	3"	.750	G.75-SA	G.75-RA*	G.75-BA
3/16	3/16	.625	2"	NONE	G.625-S-2	G.625- R*	G.625-B-2
3/16	3/16	.375	4"	1.500	G1.5-S-4SP	--	G1.5-B-4SP
3/16	3/16	.750	4"	1.75	G1.75-S-4SP	--	G1.75-B-4SP
1/4	1/4	.750	2-1/2"	NONE	H.75-S-2.5	H.75-R*-2.5	H.75-B-2.5

\*Reach = Indicate your desired radius part #

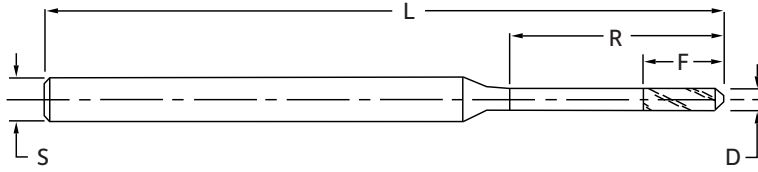
(ex: P/N D.75-R(or .015) = 1/16" dia., .75 Reach with .015r)

4Radius available (.005, .010, .015, .020, .030, .060)

Flutes: If 2 flutes desired, put (-2FL) at end of P/N

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# FRACTIONAL END MILLS



(D)	(S)	(F)	(L)	(R)	P/N	P/N	P/N
Flute Dia.	Shank Dia.	LOC	OAL	Reach	DIAMOND-SE	DIAMOND-R*	DIAMOND-B
					4 Flute	4 Flute RADIUS	4 Flute BALL NOSE
1/4	1/4	.250	4"	0.750	H.75-S	H.75- R*	H.75-B
1/4	1/4	.875	4"	1.0	H1-S	H1-R*	H1-B
1/4	1/4	.875	4"	2.0	H2-S-SP	H2-R*SP	H2.-B-SP
1/4	1/4	.250	4"	2.0	H2.0-S	H2.0-R*	H2.0-B
1/4	1/4	.875	4"	2.5	H2.5-S	H2.5-R*	H2.5-B
1/4	1/4	1.50	6"	2.5	H2.5-S-6	--	H2.5-B-6
3/8	3/8	.375	4"	1	I.375-S	I.375-R*	I.375-B
3/8	3/8	.375	4"	1.125	--	--	I1.125-B
3/8	3/8	.875	2.5"	NONE	I.875-S-2.5	--	I.875-B-2.5
3/8	3/8	1.375	4"	NONE	I1.375-S-4	--	I1.375-B-4
3/8	3/8	1.375	6"	NONE	I1.375-S-6	--	I1.375-B-6
3/8	3/8	1	4"	1	I1-S	I1.0-R*	1.0-B
3/8	3/8	1	6"	1	I1-S-6	I1-6- R*	I1-B-6
1/2	1/2	1	3"	NONE	J1-S-3	--	J1-B-3
1/2	1/2	1.250	4"	1.25	J1.25-S	J1.25- R*	J1.25-B
1/2	1/2	2	4"	NONE	J2-S-4	--	J2-B-4
1/2	1/2	1.375	6"	NONE	J1.375-S-S	--	J1.375-B-6
1/2	1/2	1.500	6"	1.500	J1.5-S-6	J1.5-6- R*	J1.5-B-6
1/2	1/2	.500	6"	1.500	J.5XR-S-6	J.5XR-R*-6	J.5XR-B-6

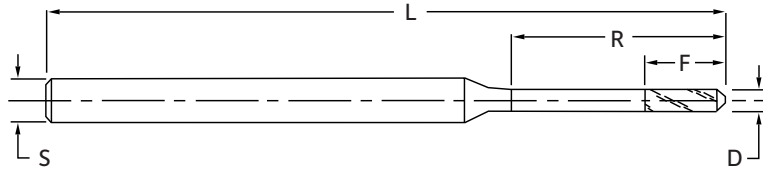


**\*Reach** = Indicate your desired radius part #  
 (ex: P/N D.75-R (or .015) = 1/16" dia., .75 Reach with .015r)  
 Radius available (.005, .010, .015, .020, .030, .060)  
 Flutes: If 2 flutes desired, put (-2FL) at end of P/N  
**SPECIALS AVAILABLE UPON REQUEST!**



# MINI SERIES

## BALL-STUB, UP TO 30X DIAMETER REACH



### Tolerances

All 1/8" Shanks have  
an H6 Tolerance

$$D \pm 0.0005''$$

$$S + 0.0000'' - 0.0002''$$

$$L \pm 0.005''$$



### Tool Dia Roughing Finishing

1/64	0.0005	0.0002
1/32	0.0008	0.0004
1/16	0.0015	0.0005
3/32	0.002	0.001
1/8	0.002	0.001
3/16	0.003	0.0015
1/4	0.004	0.002
3/8	0.0065	0.003
1/2	0.008	0.004

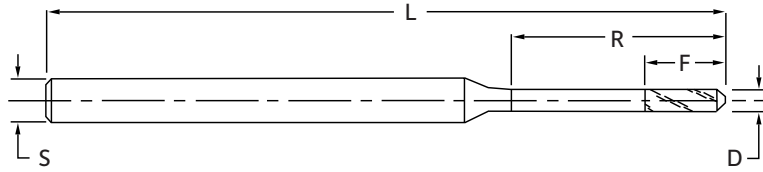
(D)	(F)	(R)	2FL	4FL
Cutter	Flute	Overall	AMORPHOUS	
Dia.	Length	Reach	DIAMOND	
.005	.007	NONE	MMB2-005	NO COATING
.005	.015	NONE	MMB2-005-R.015	NO COATING
.005	.008	.025	MMB2-005-R.025	NO COATING
.005	.008	.050	MMB2-005-R.050	NO COATING
.006	.009	NONE	MMB2-006	NO COATING
.006	.009	.018	MMB2-006-R.018	NO COATING
.006	.009	.030	MMB2-006-R.030	NO COATING
.006	.009	.050	MMB2-006-R.050	NO COATING
.006	.009	.100	MMB2-006-R.100	NO COATING
.007	.010	NONE	MMB2-007	NO COATING
.007	.010	.021	MMB2-007-R.021	NO COATING
.007	.010	.050	MMB2-007-R.050	NO COATING
.007	.010	.100	MMB2-007-R.100	NO COATING
.008	.012	NONE	MMB2-008	MMB4-008
.008	.024	NONE	MMB2-008-R.024	MMB4-008-R.024
.008	.012	.040	MMB2-008-R.040	MMB4-008-R.040
.008	.012	.080	MMB2-008-R.080	MMB4-008-R.080
.008	.012	.120	MMB2-008-R.120	MMB4-008-R.120
.010	.015	NONE	MMB2-010	MMB4-010
.010	.030	NONE	MMB2-010-R.030	MMB4-010-R.030
.010	.015	.050	MMB2-010-R.050	MMB4-010-R.050
.010	.015	.100	MMB2-010-R.100	MMB4-010-R.100
.010	.015	.150	MMB2-010-R.150	MMB4-010-R.150
.010	.015	.200	MMB2-010-R.200	MMB4-010-R.200
.010	.015	.250	MMB2-010-R.250	MMB4-010-R.250
.015	.023	NONE	MMB2-015	MMB4-015
.015	.045	NONE	MMB2-015-R.045	MMB4-015-R.045
.015	.023	.100	MMB2-015-R.100	MMB4-015-R.100
.015	.023	.150	MMB2-015-R.150	MMB4-015-R.150
.015	.023	.200	MMB2-015-R.200	MMB4-015-R.200
.015	.023	.250	MMB2-015-R.250	MMB4-015-R.250
.015	.023	.300	MMB2-015-R.300	MMB4-015-R.300
.015	.023	.400	MMB2-015-R.400	MMB4-015-R.400
.015	.023	.500	MMB2-015-R.500	MMB4-015-R.500
.020	.030	NONE	MMB2-020	MMB4-020

Reach available up to 30x Dia.

**SPECIAL REACHES AND FLUTE LENGTHS AVAILABLE UPON REQUEST!**

# MINI SERIES

## BALL-STUB, UP TO 30X DIAMETER REACH



### Cutting Speed For Graphite (sfm)

Soft: 1,000-2,125

Medium: 750-1,500

Hard: 500-1,300



(D)	(F)	(R)	2FL	4FL
Cutter	Flute	Overall	AMORPHOUS	
Dia.	Length	Reach	DIAMOND	
.020	.060	NONE	MMB2-020-R.060	MMB4-020-R.060
.020	.030	.100	MMB2-020-R.100	MMB4-020-R.100
.020	.030	.200	MMB2-020-R.200	MMB4-020-R.200
.020	.030	.300	MMB2-020-R.300	MMB4-020-R.300
.020	.030	.400	MMB2-020-R.400	MMB4-020-R.400
.020	.030	.500	MMB2-020-R.500	MMB4-020-R.500
.025	.0375	NONE	MMB2-025	MMB4-025
.025	.075	NONE	MMB2-025-R.75	MMB4-025-R.075
.025	.0375	.125	MMB2-025-R.125	MMB4-025-R.125
.025	.0375	.250	MMB2-025-R.250	MMB4-025-R.250
.025	.0375	.500	MMB2-025-R.500	MMB4-025-R.500
.025	.0375	.625	MMB2-025-R.625	MMB4-025-R.625
.03125	.047	.100	MMB2-031-R.100	MMB4-031-R.100
.03125	.047	.250	MMB2-031-R.250	MMB4-031-R.250
.03125	.047	.500	MMB2-0310R.500	MMB4-031-R.500

# MINI SERIES

## SQUARE UP TO 30X DIAMETER REACH

### Features

Miniature and Micro

Stub and Standard Flute

Special Diameters

Special long reaches

T.I.R. Controlled to  
1/3 Industry standards

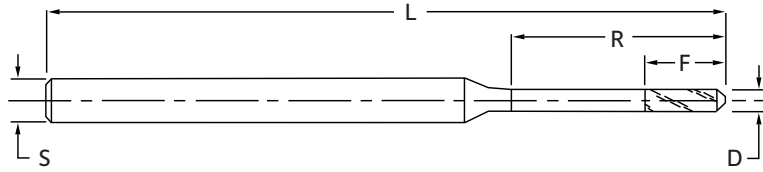
(D)	(F)	(R)	2FL	4FL
Cutter	Flute	Overall	AMORPHOUS	
Dia.	Length	Reach	DIAMOND	
.002	.003	NONE	MMS-002	NO COATING
.005	.007	NONE	MMS2-005	NO COATING
.005	.015	NONE	MMS2-005-R.015	NO COATING
.005	.008	.025	MMS2-005-R.025	NO COATING
.005	.008	.050	MMS2-005-R.050	NO COATING
.006	.009	NONE	MMS2-006	NO COATING
.006	.009	.030	MMS2-006-R.030	NO COATING
.006	.009	.060	MMS2-006-R.060	NO COATING
.006	.009	.100	MMS2-006-R.100	NO COATING

Reach available up to 30x Dia.

**SPECIAL DIAMETERS, REACHES AND FLUTE LENGTHS AVAILABLE UPON REQUEST!**

# MINI SERIES

SQUARE UP TO 30X DIAMETER REACH



## Applications

Graphite Machining

Medical and Optical

Ceramics

Plastics

Engraving

Aluminum



(D)	(F)	(R)	2FL	4FL
Cutter	Flute	Overall	Amorphous	
Dia.	Length	Reach	Diamond	
.008	.012	NONE	MMS2-008	MMS4-008
.008	.024	NONE	MMS-008-R.024	MMS4-008-R024
.008	.012	.040	MMS2-008-R.040	MMS4-008-R.040
.008	.012	.080	MMS2-008-R.080	MMS4-008-R.080
.008	.012	.120	MMS2-008-R.120	MMS4-008-R.120
.010	.015	NONE	MMS2-010	MMS4-010
.010	.030	NONE	MMS2-010-R.030	MMS4-010-R.030
.010	.015	.050	MMS2-010-R.050	MMS4-010-R.050
.010	.015	.100	MMS2-010-R.100	MMS4-010-R.100
.010	.015	.150	MMS2-010-R.150	MMS4-010-R.150
.010	.015	.200	MMS2-010-R.200	MMS4-010-R.200
.010	.015	.250	MMS2-010-R.250	MMS4-010-R.250
.015	.023	NONE	MMS2-015	MMS4-015
.015	.045	NONE	MMS2-015-R.045	MMS4-015-R.045
.015	.023	.075	MMS2-015-R.075	MMS4-015-R.075
.015	.023	.150	MMS2-015-R.150	MMS4-015R.150
.015	.023	.200	MMS2-015-R.200	MMS4-015-R.200
.015	.023	.250	MMS2-015-R.250	MMS4-015-R.250
.015	.023	.300	MMS2-015-R.300	MMS4-015-R.300
.015	.023	.400	MMS2-015-R.400	MMS4-015-R.400
.020	.030	NONE	MMS2-020	MMS4-020
.020	.060	NONE	MMS2-020-R.060	MMS4-020-R.060
.020	.030	.100	MMS2-020-R.100	MMS4-020-R.100
.020	.030	.200	MMS2-020-R.200	MMS4-020-R.200
.020	.030	.300	MMS2-020-R.300	MMS4-020-R.300
.020	.030	.400	MMS2-020-R.400	MMS4-020-R.400
.020	.030	.500	MMS2-020-R.500	MMS4-020-R.500
.025	.0375	NONE	MMS2-025	MMS4-025
.025	.075	NONE	MMS2-025-R.75	MMS4-025-R.075
.025	.0375	.125	MMS2-025-R.125	MMS4-025-R.125
.025	.0375	.250	MMS2-025-R.250	MMS4-025-R.250

MADE IN  USA

Reach available up to 30x Dia.

**SPECIAL DIAMETERS, REACHES AND FLUTE LENGTHS UPON REQUEST!**

**CAUTION:** Balanced holders should be used for spindle speeds exceeding 10,000 RPM.

Most applications allow for maximum spindle speeds.

Speeds and feeds data is for general guidelines and may change with application.



# SHREDDER STYLE CUTTER



			(F) LOC	(R) Reach	(L) OAL
Item #:	J2.5-S-SHREDDER	1/2" SQUARE	2"	2.5"	4"
Item #:	J2.5-B-SHREDDER	1/2" BALL	2"	2.5"	4"
Item #:	I2.5-S-SHREDDER	3/8" SQUARE	2"	2.5"	4"
Item #:	I2.5-B-SHREDDER	3/8" BALL	2"	2.5"	4"
Item #:	M12-S-SHREDDER	12mm SQUARE	50mm	75mm	100mm
Item #:	M12-B-SHREDDER	12mm BALL	50mm	75mm	100mm



# TRUE VARIABLE HARMONICS



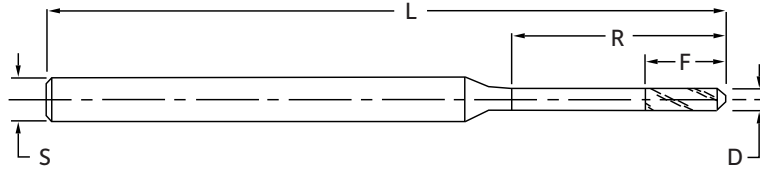
Patented geometry

Perfectly balanced reducing spindle wear

More rigid core

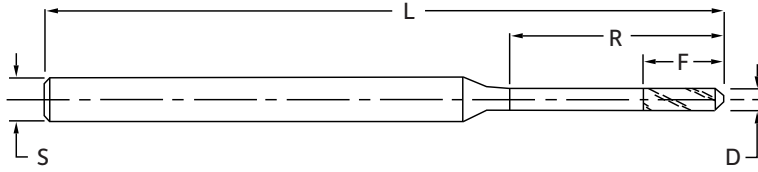
H6 Tolerance

# METRIC - 3mm SHANK



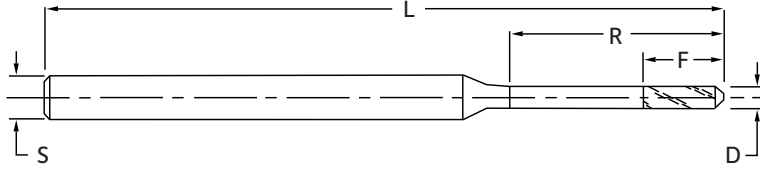
(D)	(S)	(F)	(L)	(R)	DIAMOND-SE	DIAMOND- R*	DIAMOND-B
Flute Dia.	Shank Dia.	LOC	OAL	Reach	SQUARE P/N-4FL	CORNER RADIUS P/N-4FL	BALL NOSE P/N-4FL
0.4	3	0.4	50	4	M04001	M04003 (.05R)	M04005
0.4	3	0.4	50	6	M04002	M04004 (.05R)	M04006
0.5	3	0.7	50	6	M05001	M05005 (.05R)	M05009
0.5	3	0.7	50	9	M05002	M05006 (.05R)	M05010
0.5	3	0.7	50	12	M05003	M05007 (.05R)	M05011
0.5	3	0.7	50	15	M05004	M05008 (.05R)	M05012
0.8	3	1	50	4	M08001	M08005 (.08R)	M08010
0.8	3	1	50	8	M08002	M08006 (.08R)	M08011
0.8	3	1	50	12	M08003	M08007 (.08R)	M08012
0.8	3	1	50	16	M08003	M08008 (.08R)	M08013
0.8	3	1	50	20	M08004	M08009 (.08R)	M08014
1	3	1	50	5	M10001	M10006 (.10R)	M10011
1	3	1	50	10	M10002	M10007 (.10R)	M10012
1	3	1	50	15	M10003	M10008 (.10R)	M10013
1	3	1	50	20	M10004	M10009 (.10R)	M10014
1	3	1	50	25	M10005	M10010 (.10R)	M10015
1.5	3	2	50	5	M15001	M15006 (.15R)	M15011
1.5	3	2	50	10	M15002	M15007 (.15R)	M15012
1.5	3	2	50	15	M15003	M15008 (.15R)	M15013
1.5	3	2	50	20	M15004	M15009 (.15R)	M15014
1.5	3	2	50	25	M15005	M15010 (.15R)	M15015
3	3	3	65	10	M30001	M30005 (.30R)	M03008
3	3	3	65	15	M30002	M30006 (.30R)	M03009
3	3	3	65	20	M30003	M30006 (.30R)	M03010
3	3	3	65	25	M30004	M30007 (.30R)	M03011
6	6	6	100	30	M60001	M60004 (.60R)	M06007
6	6	18	100	30	M60002	M60005 (.60R)	M06008
6	6	18	100	60	M60003	M60006 (.60R)	M06009
10	10	25	100	30	M10X001	M10X005 (.05R)	M10X009
10	10	25	100	60	M10X002	M10X006 (.05R)	M10X010
10	10	25	100	30	M10X003	M10X007 (1.0R)	M10X011
10	10	25	100	60	M10X004	M10X008 (1.0R)	M10X012

# METRIC - 4mm SHANK



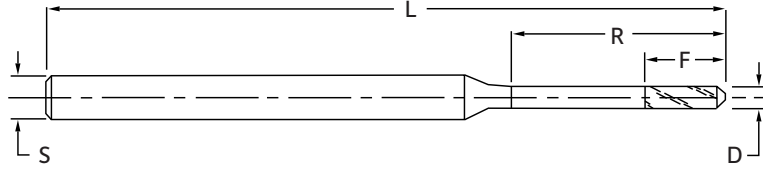
(D) Flute Dia.	(S) Shank Dia.	(F) LOC	(L) OAL	(R) Reach	DIAMOND-SE		DIAMOND-B	
					SQUARE		BALL NOSE	
					P/N-2FL	P/N-4FL	P/N-2FL	P/N-4FL
0.5	4	1	50	3	--	--	AG00501003	--
0.5	4	1	50	6	AGE00501006	--	AG00501006	--
0.5	4	1	50	10	--	--	AG00501010	--
0.6	4	1.2	50	3	--	--	AG0061203	--
0.6	4	1.2	50	6	AGE00601206	--	AG0061206	--
0.6	4	1.2	50	10	AGE0061210	--	AG0061210	--
0.8	4	1.6	50	4	--	--	AG0080164	--
0.8	4	2	50	6	AGE00802006	--	AG0080166	--
0.8	4	1.6	50	8	--	--	AG0080168	--
1	4	3	60	NONE	--	--	AGB504010	--
1	4	3	60	6	--	--	AG0100306	--
1	4	3	60	8	AGE0100308	--	AG0100308	--
1	4	3	60	10	AGE0100310	--	AG0100310	AGB50401010
1	4	3	60	12	AGE0100312	--	AG0100312	--
1	4	3	60	14	--	--	AG0100314	AGB50401015
1	4	3	60	16	--	--	AG0100316	--
1	4	3	60	18	--	--	AG0100318	--
1	4	3	60	20	--	--	AG0100320	AGB50401020
1	4	3	60	25	--	--	--	AGB50401025
1	4	3	80	30	--	--	--	AGB50401030
1.2	4	4	70	10	--	--	AG0120410	--
1.5	4	3	60	NONE	--	--	--	AGB504015
1.5	4	5	60	10	--	--	AG0150510	AGB50401510
1.5	4	4	60	12	AGE0150412	--	AG0150512	--
1.5	4	5	60	16	--	--	AG0150516	AGB50401515
1.5	4	5	60	20	--	--	AG0150520	AGB50401520
1.5	4	5	70	25	--	--	AG0150525	AGB50401525
1.5	4	5	70	30	--	--	AG0150530	AGB50401530
2	4	6	50	NONE	--	AGE504020	--	AGB504020
2	4	8	50	NONE	--	AGE50402008	--	--
2	4	10	50	NONE	--	AGE50402010	--	--
2	4	6	80	10	--	--	AGB50402010	--
2	4	6	60	12	AGE0200612	--	AG0200812	--
2	4	6	60	16	--	--	AG0200816	AGB50402015
2	4	6	60	20	--	--	AG0200820	AGB50402025
2	4	6	80	25	--	--	AG0200825	AGB50402025
2	4	6	80	30	--	--	AG0200830	AGB50402030
2	4	8	80	35	--	--	AG0200835	AGB50402035

# METRIC - 4mm SHANK



(D) Flute Dia.	(S) Shank Dia.	(F) LOC	(L) OAL	(R) Reach	DIAMOND-SE		DIAMOND- R*		DIAMOND-B	
					SQUARE		CORNER RADIUS		BALL NOSE	
					P/N-2FL	P/N-4FL	P/N-2FL	P/N-4FL	P/N-2FL	P/N-4FL
2	4	6	100	40					AG0200840	AGB50402040
2	4	4	60	NONE			AGR502020225SP(.2CR)	AGR05040202525SP(.2CR)		
3	4	9	60	NONE	AGE504030		AGR504030230SP(.2CR)			AGB504030
3	4	3	65	10			AGR502030100 (.2CR)			
3	4	3	65	15			AGR502030150 (.2CR)			
3	4	3	65	20			AGR502030200 (.2CR)			
3	4	3	75	25			AGR502030250 (.2CR)			
3	4	3	75	30			AGR502030300 (.2CR)			
3	4	9	100	15						AGB50403015
3	4	9	100	20						AGB50403020
3	4	9	100	25						AGB50403025
3	4	9	100	30						AGB50403030
3	4	9	100	40						AGB50403040
3	4	9	100	50						AGB50403050
3	4	12	60	NONE	AGE0301012					
3	4	16	60	16	AGE0301016					IM-AGB5040301560SP
3	6	16	60	16	AGE0301016S6					AG0301216
3	6	12	70	20						AG0301220
3	6	12	70	25						AG0301225
3	6	12	70	30						AG0301230
3	6	12	70	35						AG0301235
3	4	9	60	20						IM-AGB5040302060WP
3	4	9	60	25						IM-AGB5040302560SP
3	4	9	60	30						IM-AGB5040303060SP
4	4	8	60	NONE			AGR50404225SP(.2CR)			
4	4	8	100	NONE			AGR50404230SP(.2CR)			
4	4	12	80	NONE						AGB504040080
4	4	12	110	NONE						AGB504040110
4	4	12	150	NONE						AGB504040150
4	6	12	60	12	AGE04012S					
4	6	12	60	16	AGE0401216					
4	6	12	60	20	AGE0401220					AG0401520
5	6	15	60	20	AGE0501520					AG0501520
5	5	15	80	25						AGB504050080
5	5	15	110	25						AGB504050110
6	6	20	90	NONE						AGB504060090
6	6	30	150	50	AGE0603050					AG0503050L

# METRIC - 6mm SHANK



## For Radius Tools

When placing order,

please indicate

radius size

R1 = 0.010" R4 = 0.030"

R2 = 0.015" R5 = 0.060"

R3 = 0.020"

(D) Flute Dia.	(S) Shank Dia.	(F) LOC	(L) OAL	(R) Reach	BALL NOSE P/N 2FL
3	6	12	60	16	G0301216-2FL
3	6	12	70	20	G0301220-2FL
3	6	12	70	25	G0301225-2FL
3	6	12	80	30	G0301230-2FL
3	6	12	80	35	G0301235-2FL
3	6	12	90	40	G0301240-2FL
3	6	12	90	45	G0301245-2FL
3	6	15	100	25	G0301525-2FL
4	6	15	60	20	G0401520-2FL
4	6	15	70	25	G0401525-2FL
4	6	15	80	30	G0401530-2FL
4	6	15	80	35	G0401535-2FL
4	6	15	90	40	G0401540-2FL
4	6	15	90	45	G0401545-2FL
4	6	15	100	50	G0401550-2FL
5	6	30	100	50	G0503050-2FL
5	6	30	150	50	G0503050L-2FL
6	6	20	150	--	G06020L-2FL
6	6	20	100	--	G06020M-2FL
6	6	20	70	--	G06020S-2FL
6	6	30	100	50	G0603050-2FL
6	6	30	150	50	G0603050L-2F



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