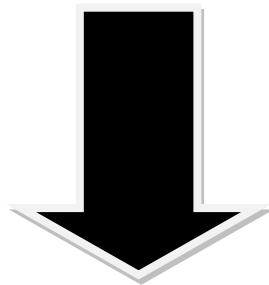


ENDMILL STANDARD CATALOG 2019



Standard Square Endmills

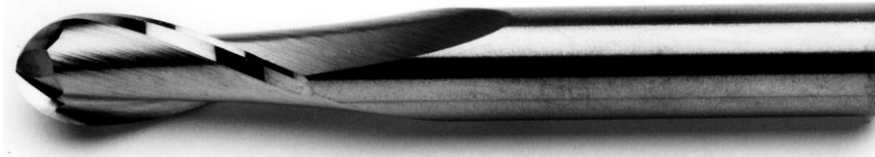


Cutting Diameter	Shank Diameter	Flute Length	Overall Length	2 Flute EDP#	3 Flute EDP#	4 Flute EDP#
1/32	1/8	3/32	1-1/2	S2-2	S3-2	S4-2
3/64	1/8	3/16	1-1/2	S2-3	S3-3	S4-3
1/16	1/8	1/4	1-1/2	S2-4	S3-4	S4-4
5/64	1/8	1/4	1-1/2	S2-5	S3-5	S4-5
3/32	1/8	3/8	1-1/2	S2-6	S3-6	S4-6
7/64	1/8	3/8	1-1/2	S2-7	S3-7	S4-7
1/8	1/8	1/2	1-1/2	S2-8	S3-8	S4-8
9/64	3/16	9/16	2	S2-9	S3-9	S4-9
5/32	3/16	9/16	2	S2-10	S3-10	S4-10
11/64	3/16	9/16	2	S2-11	S3-11	S4-11
3/16	3/16	9/16	2	S2-12	S3-12	S4-12
13/64	1/4	5/8	2-1/2	S2-13	S3-13	S4-13
7/32	1/4	5/8	2-1/2	S2-14	S3-14	S4-14
15/64	1/4	3/4	2-1/2	S2-15	S3-15	S4-15
1/4	1/4	3/4	2-1/2	S2-16	S3-16	S4-16
17/64	5/16	3/4	2-1/2	S2-17	S3-17	S4-17
9/32	5/16	3/4	2-1/2	S2-18	S3-18	S4-18
19/64	5/16	3/4	2-1/2	S2-19	S3-19	S4-19
5/16	5/16	3/4	2-1/2	S2-20	S3-20	S4-20
21/64	3/8	7/8	2-1/2	S2-21	S3-21	S4-21
11/32	3/8	7/8	2-1/2	S2-22	S3-22	S4-22
23/64	3/8	7/8	2-1/2	S2-23	S3-23	S4-23
3/8	3/8	7/8	2-1/2	S2-24	S3-24	S4-24
25/64	7/16	7/8	2-1/2	S2-25	S3-25	S4-25
13/32	7/16	7/8	2-1/2	S2-26	S3-26	S4-26
27/64	7/16	7/8	2-1/2	S2-27	S3-27	S4-27
7/16	7/16	1	2-1/2	S2-28	S3-28	S4-28
29/64	1/2	1	3	S2-29	S3-29	S4-29
15/32	1/2	1	3	S2-30	S3-30	S4-30
31/64	1/2	1	3	S2-31	S3-31	S4-31
1/2	1/2	1	3	S2-32	S3-32	S4-32
9/16	9/16	1-1/4	3-1/2	S2-36	S3-36	S4-36
5/8	5/8	1-1/4	3-1/2	S2-40	S3-40	S4-40
3/4	3/4	1-1/2	4	S2-48	S3-48	S4-48

TOLERANCES: Cutting Diameter up to .500" +.0 -.002 Over .500" +.0 -.003 Shank Diameter +.0 -.0005

All tools can be quoted with wear-resistance coatings

Standard Ball Endmills



Cutting Diameter	Shank Diameter	Flute Length	Overall Length	2 Flute EDP#	3 Flute EDP#	4 Flute EDP#
1/32	1/8	3/32	1-1/2	B2-2	B3-2	B4-2
3/64	1/8	3/16	1-1/2	B2-3	B3-3	B4-3
1/16	1/8	1/4	1-1/2	B2-4	B3-4	B4-4
5/64	1/8	1/4	1-1/2	B2-5	B3-5	B4-5
3/32	1/8	3/8	1-1/2	B2-6	B3-6	B4-6
7/64	1/8	3/8	1-1/2	B2-7	B3-7	B4-7
1/8	1/8	1/2	1-1/2	B2-8	B3-8	B4-8
9/64	3/16	9/16	2	B2-9	B3-9	B4-9
5/32	3/16	9/16	2	B2-10	B3-10	B4-10
11/64	3/16	9/16	2	B2-11	B3-11	B4-11
3/16	3/16	9/16	2	B2-12	B3-12	B4-12
13/64	1/4	5/8	2-1/2	B2-13	B3-13	B4-13
7/32	1/4	5/8	2-1/2	B2-14	B3-14	B4-14
15/64	1/4	3/4	2-1/2	B2-15	B3-15	B4-15
1/4	1/4	3/4	2-1/2	B2-16	B3-16	B4-16
17/64	5/16	3/4	2-1/2	B2-17	B3-17	B4-17
9/32	5/16	3/4	2-1/2	B2-18	B3-18	B4-18
19/64	5/16	3/4	2-1/2	B2-19	B3-19	B4-19
5/16	5/16	3/4	2-1/2	B2-20	B3-20	B4-20
21/64	3/8	7/8	2-1/2	B2-21	B3-21	B4-21
11/32	3/8	7/8	2-1/2	B2-22	B3-22	B4-22
23/64	3/8	7/8	2-1/2	B2-23	B3-23	B4-23
3/8	3/8	7/8	2-1/2	B2-24	B3-24	B4-24
25/64	7/16	7/8	2-1/2	B2-25	B3-25	B4-25
13/32	7/16	7/8	2-1/2	B2-26	B3-26	B4-26
27/64	7/16	7/8	2-1/2	B2-27	B3-27	B4-27
7/16	7/16	1	2-1/2	B2-28	B3-28	B4-28
29/64	1/2	1	3	B2-29	B3-29	B4-29
15/32	1/2	1	3	B2-30	B3-30	B4-30
31/64	1/2	1	3	B2-31	B3-31	B4-31
1/2	1/2	1	3	B2-32	B3-32	B4-32
9/16	9/16	1-1/4	3-1/2	B2-36	B3-36	B4-36
5/8	5/8	1-1/4	3-1/2	B2-40	B3-40	B4-40
3/4	3/4	1-1/2	4	B2-48	B3-48	B4-48

TOLERANCES: Cutting Diameter up to .500" +.0 -.002 Over .500" +0 -.003 Shank Diameter + .0 - .0005

All tools can be quoted with wear-resistance coatings

Extra Long End Mills



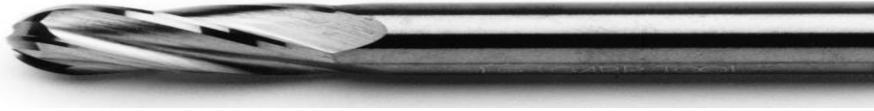
Manufactured from premium *micro grain* carbide

Cutting Diameter	Shank Diameter	Flute Length	Overall Length	2 Flute EDP#	4 Flute EDP#
1/8	1/8	3/4	2	S2-8-EL-.75-2	S4-8-EL-.75-2
1/8	1/8	1	3	S2-8-EL-1-3	S4-8-EL-1-3
3/16	3/16	1	4	S2-12-EL-1-4	S4-12-EL-1-4
1/4	1/4	1	4	S2-16-EL-1-4	S4-16-EL-1-4
1/4	1/4	1.5	4	S2-16-EL-1.5-4	S4-16-EL-1.5-4
1/4	1/4	1.5	6	S2-16-EL-1.5-6	S4-16-EL-1.5-6
5/16	5/16	1	4	S2-20-EL-1-4	S4-20-EL-1-4
5/16	5/16	1.5	4	S2-20-EL-1.5-4	S4-20-EL-1.5-4
5/16	5/16	1.5	6	S2-20-EL-1.5-6	S4-20-EL-1.5-6
3/8	3/8	1	4	S2-24-EL-1-4	S4-24-EL-1-4
3/8	3/8	2	4	S2-24-EL-2-4	S4-24-EL-2-4
3/8	3/8	2	6	S2-24-EL-2-6	S4-24-EL-2-6
3/8	3/8	3	6	S2-24-EL-3-6	S4-24-EL-3-6
7/16	7/16	1	4	S2-28-EL-1-4	S4-28-EL-1-4
7/16	7/16	2	4	S2-28-EL-2-4	S4-28-EL-2-4
7/16	7/16	1	6	S2-28-EL-1-6	S4-28-EL-1-6
7/16	7/16	2	6	S2-28-EL-2-6	S4-28-EL-2-6
7/16	7/16	3	6	S2-28-EL-3-6	S4-28-EL-3-6
1/2	1/2	1	4	S2-32-EL-1-4	S4-32-EL-1-4
1/2	1/2	2	4	S2-32-EL-2-4	S4-32-EL-2-4
1/2	1/2	1	6	S2-32-EL-1-6	S4-32-EL-1-6
1/2	1/2	2	6	S2-32-EL-2-6	S4-32-EL-2-6
1/2	1/2	3	6	S2-32-EL-3-6	S4-32-EL-3-6
5/8	5/8	2	6	S2-40-EL-2-6	S4-40-EL-2-6
5/8	5/8	3	6	S2-40-EL-3-6	S4-40-EL-3-6
3/4	3/4	2	6	S2-48-EL-2-6	S4-48-EL-2-6
3/4	3/4	3	6	S2-48-EL-3-6	S4-48-EL-3-6

TOLERANCES: Cutting Diameter up to .500" +0 -.002 Over .500" +0 -.003 Shank Diameter +.0 -.0005

All tools can be quoted with wear-resistance coatings

Extra Long Ball End Mills



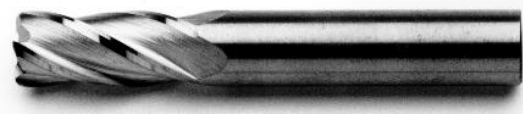
Manufactured from premium *micro grain* carbide

Cutting Diameter	Shank Diameter	Flute Length	Overall Length	2 Flute EDP#	4 Flute EDP#
1/8	1/8	3/4	2	B2-8-EL-.75-2	B4-8-EL-.75-2
1/8	1/8	1	3	B2-8-EL-1-3	B4-8-EL-1-3
3/16	3/16	1	4	B2-12-EL-1-4	B4-12-EL-1-4
1/4	1/4	1	4	B2-16-EL-1-4	B4-16-EL-1-4
1/4	1/4	1.5	4	B2-16-EL-1.5-4	B4-16-EL-1.5-4
1/4	1/4	1.5	6	B2-16-EL-1.5-6	B4-16-EL-1.5-6
5/16	5/16	1	4	B2-20-EL-1-4	B4-20-EL-1-4
5/16	5/16	1.5	4	B2-20-EL-1.5-4	B4-20-EL-1.5-4
5/16	5/16	1.5	6	B2-20-EL-1.5-6	B4-20-EL-1.5-6
3/8	3/8	1	4	B2-24-EL-1-4	B4-24-EL-1-4
3/8	3/8	2	4	B2-24-EL-2-4	B4-24-EL-2-4
3/8	3/8	2	6	B2-24-EL-2-6	B4-24-EL-2-6
3/8	3/8	3	6	B2-24-EL-3-6	B4-24-EL-3-6
7/16	7/16	1	4	B2-28-EL-1-4	B4-28-EL-1-4
7/16	7/16	2	4	B2-28-EL-2-4	B4-28-EL-2-4
7/16	7/16	1	6	B2-28-EL-1-6	B4-28-EL-1-6
7/16	7/16	2	6	B2-28-EL-2-6	B4-28-EL-2-6
7/16	7/16	3	6	B2-28-EL-3-6	B4-28-EL-3-6
1/2	1/2	1	4	B2-32-EL-1-4	B4-32-EL-1-4
1/2	1/2	2	4	B2-32-EL-2-4	B4-32-EL-2-4
1/2	1/2	1	6	B2-32-EL-1-6	B4-32-EL-1-6
1/2	1/2	2	6	B2-32-EL-2-6	B4-32-EL-2-6
1/2	1/2	3	6	B2-32-EL-3-6	B4-32-EL-3-6
5/8	5/8	2	6	B2-40-EL-2-6	B4-40-EL-2-6
5/8	5/8	3	6	B2-40-EL-3-6	B4-40-EL-3-6
3/4	3/4	2	6	B2-48-EL-2-6	B4-48-EL-2-6
3/4	3/4	3	6	B2-48-EL-3-6	B4-48-EL-3-6

TOLERANCES: Cutting Diameter up to .500" +0 -.002 Over .500" +0 -.003 Shank Diameter +.0 - .0005

All tools can be quoted with wear-resistance coatings

Corner Radius Endmills



Corner Radii are available in “in-between sizes”...Just ask for that *special* radius.

Cutting Dia./Radius	Shank Diameter	Flute Length	Overall Length	2 Flute EDP#	4 Flute EDP#
1/8 X .015	1/8	1/2	1-1/2	R2-8-.015	R4-8-.015
1/8 X .020	1/8	1/2	1-1/2	R2-8-.020	R4-8-.020
3/16 X .015	3/16	9/16	2	R2-12-.015	R4-12-.015
3/16 X .030	3/16	9/16	2	R2-12-.030	R4-12-.030
1/4 X .015	1/4	3/4	2-1/2	R2-16-.015	R4-16-.015
1/4 X .030	1/4	3/4	2-1/2	R2-16-.030	R4-16-.030
5/16 X .015	5/16	3/4	2-1/2	R2-20-.015	R4-20-.015
5/16 X .030	5/16	3/4	2-1/2	R2-20-.030	R4-20-.030
5/16 X .045	5/16	3/4	2-1/2	R2-20-.045	R4-20-.045
3/8 X .015	3/8	7/8	2-1/2	R2-24-.015	R4-24-.015
3/8 X .030	3/8	7/8	2-1/2	R2-24-.030	R4-24-.030
3/8 X .045	3/8	7/8	2-1/2	R2-24-.045	R4-24-.045
1/2 X .015	1/2	1	3	R2-32-.015	R4-32-.015
1/2 X .030	1/2	1	3	R2-32-.030	R4-32-.030
1/2 X .045	1/2	1	3	R2-32-.045	R4-32-.045
1/2 X .060	1/2	1	3	R2-32-.060	R4-32-.060
5/8 X .015	5/8	1-1/4	3-1/2	R2-40-.015	R4-40-.015
5/8 X .030	5/8	1-1/4	3-1/2	R2-40-.030	R4-40-.030
5/8 X .045	5/8	1-1/4	3-1/2	R2-40-.045	R4-40-.045
5/8 X .060	5/8	1-1/4	3-1/2	R2-40-.060	R4-40-.060
5/8 X .090	5/8	1-1/4	3-1/2	R2-40-.090	R4-40-.090
3/4 X .015	3/4	1-1/2	4	R2-48-.015	R4-48-.015
3/4 X .030	3/4	1-1/2	4	R2-48-.030	R4-48-.030
3/4 X .045	3/4	1-1/2	4	R2-48-.045	R4-48-.045
3/4 X .060	3/4	1-1/2	4	R2-48-.060	R4-48-.060
3/4 X .090	3/4	1-1/2	4	R2-48-.090	R4-48-.090
3/4 X .125	3/4	1-1/2	4	R2-48-.125	R4-48-.125

TOLERANCES: Cutting Diameter up to .500” +0 -.002 Over .500” +0 -.003 Shank Diameter +.0 -.0005

All tools can be quoted with wear-resistance coatings

Tapered Endmills – Square End



Taper	Tip Diameter	Shank Diameter	Flute Length	Overall Length	3 Flute EDP#
1	0.125	1/4	1-1/2	3	TS-1-16
1.5	0.125	1/4	1-1/2	3	TS-1.5-16
2	0.125	1/4	1-1/2	3	TS-2-16
3	0.125	1/4	1	3	TS-3-16
5	0.125	1/4	5/8	3	TS-5-16
7	0.125	1/4	1/2	3	TS-7-16
1	0.187	3/8	1-3/4	4	TS-1-24
1.5	0.187	3/8	1-3/4	4	TS-1.5-24
2	0.187	3/8	1-3/4	4	TS-2-24
3	0.187	3/8	1-3/4	4	TS-3-24
5	0.187	3/8	1	4	TS-5-24
7	0.187	3/8	3/4	4	TS-7-24
3	0.250	1/2	2	4	TS-3-32
5	0.250	1/2	1-3/8	4	TS-5-32
7	0.250	1/2	1	4	TS-7-32

Tapered End Mills – Ball End

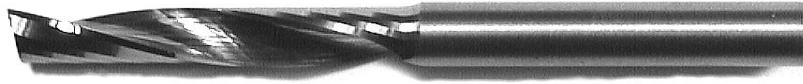


Taper	Tip Radius	Shank Diameter	Flute Length	Overall Length	3 Flute EDP#
1	0.062	1/4	1-1/2	3	TB-1-16
1.5	0.062	1/4	1-1/2	3	TB-1.5-16
2	0.062	1/4	1-1/2	3	TB-2-16
3	0.062	1/4	1	3	TB-3-16
5	0.062	1/4	5/8	3	TB-5-16
7	0.062	1/4	1/2	3	TB-7-16
1	0.093	3/8	1-3/4	4	TB-1-24
1.5	0.093	3/8	1-3/4	4	TB-1.5-24
2	0.093	3/8	1-3/4	4	TB-2-24
3	0.093	3/8	1-3/4	4	TB-3-24
5	0.093	3/8	1	4	TB-5-24
7	0.093	3/8	3/4	4	TB-7-24
3	0.125	1/2	2	4	TB-3-32
5	0.125	1/2	1-3/8	4	TB-5-32
7	0.125	1/2	1	4	TB-7-32

TOLERANCES: Cutting Diameter up to .500" +0 -.002 Over .500" +0 -.003 Shank Diameter +.0 -.0005
 All tools can be quoted with wear-resistance coatings

All tools can be quoted with wear-resistance coatings

One Flute End Mills



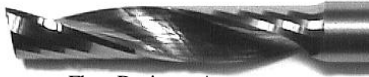
WOW! This uniquely designed one flute tool is engineered for machining many diverse materials such as aluminum, acrylic, plastic, wood, sign foam and MDF. The special end tooth configuration allows very aggressive drill-type penetration when a new hole or cut is started. Helical flute geometry gives much smoother “cuts” and surface finishes, while allowing for a much higher chip evacuation when milling a groove. These tools are manufactured using high-grade micro grained tungsten carbide with a transverse rupture strength in excess of 500,000 psi! This material and special end design gives superb strength and life to the corner and cutting edges.

Cutting Diameter	Shank Diameter	Cutting Length	Overall Length	EDP Number
0.0625	0.125	0.312	2.0	S1-4
0.0937	0.125	0.437	2.0	S1-6
0.1250	0.125	0.560	2.0	S1-8
0.0625	0.250	0.312	2.0	S1-4/16
0.0937	0.250	0.437	2.0	S1-6/16
0.1250	0.250	0.560	2.0	S1-8/16
0.1875	0.250	0.560	2.0	S1-12/16
0.1875	0.250	0.810	2.0	S1-12/16-M
0.1875	0.250	1.060	2.5	S1-12/16-L
0.2500	0.250	0.625	2.0	S1-16
0.2500	0.250	0.810	2.0	S1-16-M
0.2500	0.250	1.060	2.0	S1-16-L
0.2500	0.250	1.560	3.0	S1-16-EL
0.3750	0.375	1.060	3.0	S1-24
0.3750	0.375	2.060	4.0	S1-24-EL

TOLERANCES: Cutting Diameter up to .500” +.0 -.002 Over .500” +0 -.003 Shank Diameter +.0 -.0005

All tools can be quoted with wear-resistant coatings.

One Flute Engraver Mills



Flute Design – Appearance

1/8" Shank x 4-1/2" Long		
Cutting Diameter	Flute Length	EDP#
0.0625	3/16	GS1-4/8
0.0781	3/16	GS1-5/8
0.0937	1/4	GS1-6/8
0.1250	3/8	GS1-8/8
11/64" Shank x 6-1/2" Long		
0.0625	3/16	GS1-4/11
0.0781	3/16	GS1-5/11
0.0937	1/4	GS1-6/11
0.1250	3/8	GS1-8/11
0.1718	1/2	GS1-11/11
1/4" Shank x 6-1/2" Long		
0.0625	3/16	GS1-4/16
0.0781	3/16	GS1-5/16
0.0937	1/4	GS1-6/16
0.1250	3/8	GS1-8/16
0.1718	1/2	GS1-11/16
0.1875	1/2	GS1-12/16
0.2500	5/8	GS1-16/16
Cutter Head Knobs are NOT Included		

TOLERANCES: Cutting Diameter up to .500" +0 -.002 Over .500" +0 -.003 Shank Diameter +.0 - .0005

All tools can be quoted with wear-resistant coatings.

Square End Engraver Mills



1/8" Shank x 4-1/2" Long			
Cutting Diameter	Flute Length	Two Flute EDP#	Four Flute EDP#
0.0625	3/16	GS2-4/8	GS4-4/8
0.0781	3/16	GS2-5/8	GS4-5/8
0.0937	1/4	GS2-6/8	GS4-6/8
0.1250	3/8	GS2-8/8	GS4-8/8
11/64" Shank x 6-1/2" Long			
0.0625	3/16	GS2-4/11	GS4-4/11
0.0781	3/16	GS2-5/11	GS4-5/11
0.0937	1/4	GS2-6/11	GS4-6/11
0.1250	3/8	GS2-8/11	GS4-8/11
0.1718	1/2	GS2-11/11	GS4-11/11
1/4" Shank x 6-1/2" Long			
0.0625	3/16	GS2-4/16	GS4-4/16
0.0781	3/16	GS2-5/16	GS4-5/16
0.0937	1/4	GS2-6/16	GS4-6/16
0.1250	3/8	GS2-8/16	GS4-8/16
0.1718	1/2	GS2-11/16	GS4-11/16
0.1875	1/2	GS2-12/16	GS4-12/16
0.2500	5/8	GS2-16/16	GS4-16/16
Cutter Head Knobs are NOT Included			

TOLERANCES: Cutting Diameter up to .500" +.0 -.002 Over .500" +0 -.003 Shank Diameter +.0 -.0005

All tools can be quoted with wear-resistant coatings.