



Superior Tool Service, Inc.
*Industrial Tool & Cutter Grinding
Manufacturing & Resharpener*

Product Catalog

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Forms are available on our web site for custom made tools at:

www.superiortoolservice.com

***Voice (800) 428-TOOL (-8665) Fax (316) 945-8490
3939 W. Harry Street, Wichita KS 67213***



Superior Tool Service, Inc.

3939 W. Harry St., Wichita KS 67213

(316) 945-8488 (800)428-TOOL (-8665)

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Patriot-IV Carbide End Mill

For Titanium, Stainless Steel and Heat Treated Steel

Variable helix, variable spiral, 4 flute, optional TiAlN coating

Set screw flats available on request

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAlN coated</u>	<u>EDP #</u>
1/2"	1.5	4"	.000	no	170-500-4-000
1/2"	1.5	4"	.010-.120	no	170-500-4-RAD
1/2"	1.5	4"	Ball	no	170-500-4-BALL
1/2"	1.5	4"	.000	yes	170-500-4-000-C
1/2"	1.5	4"	.010-.120	yes	170-500-4-RAD-C
1/2"	1.5	4"	Ball	yes	170-500-4-BALL-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAlN coated</u>	<u>EDP #</u>
3/4"	1.5	4"	.000	no	170-750-4-000
3/4"	1.5	4"	.010-.250	no	170-750-4-RAD
3/4"	1.5	4"	Ball	no	170-750-4-BALL
3/4"	1.5	4"	.000	yes	170-750-4-000-C
3/4"	1.5	4"	.010-.250	yes	170-750-4-RAD-C
3/4"	1.5	4"	Ball	yes	170-750-4-BALL-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAlN coated</u>	<u>EDP #</u>
1"	1.5	4"	.000	no	170-100-4-000
1"	1.5	4"	.010-.250	no	170-100-4-RAD
1"	1.5	4"	Ball	no	170-100-4-BALL
1"	1.5	4"	.000	yes	170-100-4-000-C
1"	1.5	4"	.010-.250	yes	170-100-4-RAD-C
1"	1.5	4"	Ball	yes	170-100-4-BALL-C



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Patriot-VI Carbide End Mill

For Titanium, Stainless Steel and Heat Treated Steel

Variable helix, variable spiral, 6 flute, optional TiAlN coating

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAlN</u>	<u>EDP #</u>
1/2"	1.25	4"	.000	no	180-500-6-000
1/2"	1.25	4"	.010 to .120	no	180-500-6-RAD
1/2"	1.25	4"	Ball	no	180-500-6-BALL
1/2"	1.25	4"	.000	yes	180-500-6-000-C
1/2"	1.25	4"	.010 to .120	yes	180-500-6-RAD-C
1/2"	1.25	4"	Ball	yes	180-500-6-BALL-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAlN coated</u>	<u>EDP #</u>
3/4"	1.25	4"	.000	no	180-750-6-000
3/4"	1.25	4"	.010-.250	no	180-750-6-RED
3/4"	1.25	4"	Ball	no	180-750-6-BALL
3/4"	1.25	4"	.000	yes	180-750-6-000-C
3/4"	1.25	4"	.010-.250	yes	180-750-6-RAD-C
3/4"	1.25	4"	Ball	yes	180-750-6-BALL-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAlN coated</u>	<u>EDP #</u>
1"	1.25	4"	.000	no	180-100-6-000
1"	1.25	4"	.010-.250	no	180-100-6-RAD
1"	1.25	4"	Ball	no	180-100-6-BALL
1"	1.25	4"	.000	yes	180-100-6-000-C
1"	1.25	4"	.010-.250	yes	180-100-6-RAD-C
1"	1.25	4"	Ball	yes	180-100-6-BALL-C



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Patriot-X Carbide End Mill

For Inconel, Titanium & Stainless Steel
 Variable helix, variable spiral, 10 flute , optional TiAIN coating

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius</u>	<u>TiAIN coated</u>	<u>10 flt EDP #</u>
3/4"	1.25	4"	.000	no	185-750-10-000
3/4"	1.25	4"	.015 x 45° chamfer	no	185-750-10-030
3/4"	1.25	4"	.000	yes	185-750-10-000-C
3/4"	1.25	4"	.015 x 45° chamfer	yes	185-750-10-030-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius</u>	<u>TiAIN coated</u>	<u>10 flt EDP #</u>
1"	1.25	4"	.000	no	185-100-10-000
1"	1.25	4"	.030	no	185-100-10-030
1"	1.25	4"	.060	no	185-100-10-060
1"	1.25	4"	.000	yes	185-100-10-000-C
1"	1.25	4"	.030	yes	185-100-10-030-C
1"	1.25	4"	.060	yes	185-100-10-060-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius</u>	<u>TiAIN coated</u>	<u>10 flt EDP #</u>
1-1/4"	1.25	4"	.000	no	185-125-10-000
1-1/4"	1.25	4"	.030	no	185-125-10-030
1-1/4"	1.25	4"	.060	no	185-125-10-060
1-1/4"	1.25	4"	.000	yes	185-125-10-000-C
1-1/4"	1.25	4"	.030	yes	185-125-10-030-C
1-1/4"	1.25	4"	.060	yes	185-125-10-060-C



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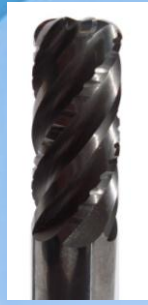
Patriot-XX Carbide End Mill

For Inconel, Titanium & Stainless Steel
Variable helix, variable spiral, 20 flute, optional TiAIN coating

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius</u>	<u>TiAIN coated</u>	<u>20 flt EDP #</u>
3/4"	1.25	4"	.000	no	188-750-20-000
3/4"	1.25	4"	.030	no	188-750-20-030
3/4"	1.25	4"	.060	no	188-750-20-060
3/4"	1.25	4"	.000	yes	188-750-20-000-C
3/4"	1.25	4"	.030	yes	188-750-20-030-C
3/4"	1.25	4"	.060	yes	188-750-20-060-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius</u>	<u>TiAIN coated</u>	<u>20 flt EDP #</u>
1"	1.25	4"	.000	no	188-100-20-000
1"	1.25	4"	.030	no	188-100-20-030
1"	1.25	4"	.060	no	188-100-20-060
1"	1.25	4"	.000	yes	188-100-20-000-C
1"	1.25	4"	.030	yes	188-100-20-030-C
1"	1.25	4"	.060	yes	188-100-20-060-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius</u>	<u>TiAIN coated</u>	<u>20 flt EDP #</u>
1-1/4"	1.25	4"	.000	no	188-125-20-000
1-1/4"	1.25	4"	.030	no	188-125-20-030
1-1/4"	1.25	4"	.060	no	188-125-20-060
1-1/4"	1.25	4"	.000	yes	188-125-20-000-C
1-1/4"	1.25	4"	.030	yes	188-125-20-030-C
1-1/4"	1.25	4"	.060	yes	188-125-20-060-C



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Rebel Cutter Carbide End Mill

For Steel - Finish/Rougher

Variable helix, variable spiral, 4 chip breaker flutes, optional TiAIN coating

Description

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAIN</u>	<u>EDP #</u>
1/2"	1.25	4"	.000	no	160-500-4-000
1/2"	1.25	4"	.010-.120	no	160-500-4-RAD
1/2"	1.25	4"	Ball	no	160-500-4-Ball
1/2"	1.25	4"	.000	yes	160-500-4-000-C
1/2"	1.25	4"	.010-.120	yes	160-500-4-RAD-C
1/2"	1.25	4"	Ball	yes	160-500-4-120-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAIN coated</u>	<u>EDP #</u>
3/4"	1.25	4"	.000	no	160-750-4-000
3/4"	1.25	4"	.010-.250	no	160-750-4-RAD
3/4"	1.25	4"	Ball	no	160-750-4-Ball
3/4"	1.25	4"	.000	yes	160-750-4-000-C
3/4"	1.25	4"	.010-.250	yes	160-750-4-RAD-C
3/4"	1.25	4"	Ball	yes	160-750-4-Ball-C

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>TiAIN coated</u>	<u>EDP #</u>
1"	1.25	4"	.000	no	160-100-4-000
1"	1.25	4"	.010-.250	no	160-100-4-RAD
1"	1.25	4"	Ball	no	160-100-4-Ball
1"	1.25	4"	.000	yes	160-100-4-000-C
1"	1.25	4"	.010-.250	yes	160-100-4-RAD-C
1"	1.25	4"	Ball	yes	160-100-4-Ball-C



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Liberty Cutter Carbide End Mill

For Aluminum using Hi Speed Machining applications

Variable helix, variable spiral, 2 or 3 flute, polished rod, optional Diamond-like Carbon coating

<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>Coated</u>	<u>EDP # 2 flute</u>	<u>EDP # 3 flute</u>
1/2"	1.25	4"	.000	no	190-500-2-000	190-500-3-000
1/2"	1.25	4"	.010-.120	no	190-500-2-RAD	190-500-3-RAD
1/2"	1.25	4"	Ball	no	190-500-2-Ball	190-500-3-Ball-C
1/2"	1.25	4"	.000	yes	190-500-2-000-C	190-500-3-000-C
1/2"	1.25	4"	.010-.120	yes	190-500-2-RAD-C	190-500-3-RAD-C
1/2"	1.25	4"	Ball	yes	190-500-2-Ball-C	190-500-3-Ball-C
<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>Coated</u>	<u>EDP # 2 flute</u>	<u>EDP # 3 flute</u>
3/4"	1.25	4"	.000	no	190-750-2-000	190-750-3-000
3/4"	1.25	4"	.010-.250	no	190-750-2-RAD	190-750-3-RAD
3/4"	1.25	4"	Ball	no	190-750-2-Ball	190-750-3-Ball
3/4"	1.25	4"	.000	yes	190-750-2-000-C	190-750-3-000-C
3/4"	1.25	4"	.010-.250	yes	190-750-2-RAD-C	190-750-3-RAD-C
3/4"	1.25	4"	Ball	yes	190-750-2-Ball-C	190-750-3-Ball-C
<u>Dia.</u>	<u>LOC</u>	<u>OAL</u>	<u>Radius or Chamfer</u>	<u>Coated</u>	<u>EDP # 2 flute</u>	<u>EDP # 3 flute</u>
1"	1.25	4"	.000	no	190-100-2-000	190-100-3-000
1"	1.25	4"	.010-.250	no	190-100-2-RAD	190-100-3-RAD
1"	1.25	4"	Ball	no	190-100-2-Ball	190-100-3-Ball
1"	1.25	4"	.000	yes	190-100-2-000-C	190-100-3-000-C
1"	1.25	4"	.010-.250	yes	190-100-2-RAD-C	190-100-3-RAD-C
1"	1.25	4"	Ball	yes	190-100-2-Ball-C	190-100-3-Ball-C



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Solid Carbide Tapered Drill Reamers

4 flute, straight flute with .75 to 1.5 flute length

<u>Decimal</u>	<u>3" OAL</u>	<u>EDP#</u>	<u>4" OAL</u>	<u>EDP#</u>	<u>6" OAL</u>	<u>EDP#</u>
0.0860	\$ 35.27	640-086-3 TDR	\$ 39.29	640-086-4 TDR	\$ 46.67	640-086-6 TDR
0.0890	\$ 35.27	640-089-3 TDR	\$ 39.29	640-089-4 TDR	\$ 46.67	640-089-6 TDR
0.0935	\$ 35.27	640-0935-3 TDR	\$ 39.29	640-0935-4 TDR	\$ 46.67	640-0935-6 TDR
0.0938	\$ 35.27	640-0938-3 TDR	\$ 39.29	640-0938-4 TDR	\$ 46.67	640-0938-6 TDR
0.0960	\$ 35.27	640-0960-3 TDR	\$ 39.29	640-0960-4 TDR	\$ 46.67	640-0960-6 TDR
0.0980	\$ 35.27	640-098-3 TDR	\$ 39.29	640-098-4 TDR	\$ 46.67	640-098-6 TDR
0.0984	\$ 35.27	640-0984-3 TDR	\$ 39.29	640-0984-4 TDR	\$ 46.67	640-0984-6 TDR
0.0995	\$ 35.27	640-0995-3 TDR	\$ 39.29	640-0995-4 TDR	\$ 46.67	640-0995-6 TDR
0.1015	\$ 35.27	640-1015-3 TDR	\$ 39.29	640-1015-4 TDR	\$ 46.67	640-1015-6 TDR
0.1040	\$ 35.27	640-1040-3 TDR	\$ 39.29	640-1040-4 TDR	\$ 46.67	640-1040-6 TDR
0.1065	\$ 35.27	640-1065-3 TDR	\$ 39.29	640-1065-4 TDR	\$ 46.67	640-1065-6 TDR
0.1094	\$ 35.27	640-1094-3 TDR	\$ 39.29	640-1094-4 TDR	\$ 46.67	640-1094-6 TDR
0.1100	\$ 35.27	640-1100-3 TDR	\$ 39.29	640-1100-4 TDR	\$ 46.67	640-1100-6 TDR
0.1110	\$ 35.27	640-1110-3 TDR	\$ 39.29	640-1110-4 TDR	\$ 46.67	640-1110-6 TDR
0.1130	\$ 35.27	640-113-3 TDR	\$ 39.29	640-113-4 TDR	\$ 46.67	640-113-6 TDR
0.1160	\$ 35.27	640-116-3 TDR	\$ 39.29	640-116-4 TDR	\$ 46.67	640-116-6 TDR
0.1181	\$ 35.27	640-1181-3 TDR	\$ 39.29	640-1181-4 TDR	\$ 46.67	640-1181-6 TDR
0.1200	\$ 35.27	640-120-3 TDR	\$ 39.29	640-120-4 TDR	\$ 46.67	640-120-6 TDR
0.1250	\$ 35.27	640-125-3 TDR	\$ 39.29	640-125-4 TDR	\$ 46.67	640-125-6 TDR
0.1285	\$ 35.95	640-1285-3 TDR	\$ 40.14	640-1285-4 TDR	\$ 48.52	640-1285-6 TDR
0.1360	\$ 35.95	640-136-3 TDR	\$ 40.14	640-136-4 TDR	\$ 48.52	640-136-6 TDR
0.1378	\$ 35.95	640-1378-3 TDR	\$ 40.14	640-1378-4 TDR	\$ 48.52	640-1378-6 TDR
0.1405	\$ 36.95	640-1405-3 TDR	\$ 41.48	640-1405-4 TDR	\$ 50.55	640-1405-6 TDR
0.1406	\$ 36.95	640-1406-3 TDR	\$ 41.48	640-1406-4 TDR	\$ 50.55	640-1406-6 TDR
0.1440	\$ 36.95	640-144-3 TDR	\$ 41.48	640-144-4 TDR	\$ 50.55	640-144-6 TDR
0.1470	\$ 36.95	640-147-3 TDR	\$ 41.48	640-147-4 TDR	\$ 50.55	640-147-6 TDR
0.1495	\$ 37.35	640-1495-3 TDR	\$ 42.00	640-1495-4 TDR	\$ 51.29	640-1495-6 TDR
0.1520	\$ 37.35	640-152-3 TDR	\$ 42.00	640-152-4 TDR	\$ 51.29	640-152-6 TDR
0.1540	\$ 37.35	640-154-3 TDR	\$ 42.00	640-154-4 TDR	\$ 51.29	640-154-6 TDR
0.1562	\$ 37.35	640-1562-3 TDR	\$ 42.00	640-1562-4 TDR	\$ 51.29	640-1562-6 TDR
0.1570	\$ 37.35	640-157-3 TDR	\$ 42.00	640-157-4 TDR	\$ 51.29	640-157-6 TDR
0.1575	\$ 37.35	640-1575-3 TDR	\$ 42.00	640-1575-4 TDR	\$ 51.29	640-1575-6 TDR
0.1590	\$ 38.53	640-1590-3 TDR	\$ 43.55	640-1590-4 TDR	\$ 53.60	640-1590-6 TDR
0.1610	\$ 38.53	640-161-3 TDR	\$ 43.55	640-161-4 TDR	\$ 53.60	640-161-6 TDR
0.1660	\$ 38.53	640-166-3 TDR	\$ 43.55	640-166-4 TDR	\$ 53.60	640-166-6 TDR
0.1695	\$ 38.53	640-1695-3 TDR	\$ 43.55	640-1695-4 TDR	\$ 53.60	640-1695-6 TDR
0.1720	\$ 38.53	640-172-3 TDR	\$ 43.55	640-172-4 TDR	\$ 53.60	640-172-6 TDR
0.1730	\$ 38.53	640-173-3 TDR	\$ 43.55	640-173-4 TDR	\$ 53.60	640-173-6 TDR

<u>Decimal</u>	<u>3" OAL</u>	<u>EDP #</u>	<u>4" OAL</u>	<u>EDP #</u>	<u>6" OAL</u>	<u>EDP #</u>
0.1772	\$ 39.06	640-1772-3 TDR	\$ 44.24	640-1772-4 TDR	\$ 54.60	640-1772-3 TDR
0.1800	\$ 39.06	640-180-3 TDR	\$ 44.24	640-180-4 TDR	\$ 54.60	640-180-6 TDR
0.1820	\$ 39.06	640-182-3 TDR	\$ 44.24	640-182-4 TDR	\$ 54.60	640-182-6 TDR
0.1850	\$ 39.06	640-1850-3 TDR	\$ 44.24	640-1850-4 TDR	\$ 54.60	640-1850-6 TDR
0.1875	\$ 39.06	640-1875-3 TDR	\$ 44.24	640-1875-4 TDR	\$ 54.60	640-1875-6 TDR
0.1890	\$ 39.06	640-1890-3 TDR	\$ 44.24	640-1890-4 TDR	\$ 54.60	640-1890-6 TDR
0.1910	\$ 39.06	640-191-3 TDR	\$ 44.24	640-191-4 TDR	\$ 54.60	640-191-6 TDR
0.1935	\$ 39.06	640-1935-3 TDR	\$ 44.24	640-1935-4 TDR	\$ 54.60	640-1935-6 TDR
0.1960	\$ 39.06	640-196-3 TDR	\$ 44.24	640-196-4 TDR	\$ 54.60	640-196-6 TDR
0.1969	\$ 39.06	640-1969-3 TDR	\$ 44.24	640-1969-4 TDR	\$ 54.60	640-1969-6 TDR
0.1990	\$ 39.59	640-199-3 TDR	\$ 45.11	640-199-4 TDR	\$ 55.88	640-199-6 TDR
0.2010	\$ 39.59	640-201-3 TDR	\$ 45.11	640-201-4 TDR	\$ 55.88	640-201-6 TDR
0.2030	\$ 39.59	640-203-3 TDR	\$ 45.11	640-203-4 TDR	\$ 55.88	640-203-6 TDR
0.2040	\$ 39.59	640-204-3 TDR	\$ 45.11	640-204-4 TDR	\$ 55.88	640-204-6 TDR
0.2055	\$ 39.59	640-2055-3 TDR	\$ 45.11	640-2055-4 TDR	\$ 55.88	640-2055-6 TDR
0.2090	\$ 39.59	640-209-3 TDR	\$ 45.11	640-209-4 TDR	\$ 55.88	640-209-6 TDR
0.2130	\$ 39.59	640-2130-3 TDR	\$ 45.11	640-2130-4 TDR	\$ 55.88	640-2130-6 TDR
0.2165	\$ 39.59	640-2165-3 TDR	\$ 45.11	640-2165-4 TDR	\$ 55.88	640-2165-6 TDR
0.2187	\$ 39.59	640-2187-3 TDR	\$ 45.11	640-2187-4 TDR	\$ 55.88	640-2187-6 TDR
0.2210	\$ 39.59	640-221-3 TDR	\$ 45.11	640-221-4 TDR	\$ 55.88	640-221-6 TDR
0.2280	\$ 39.59	640-228-3 TDR	\$ 45.11	640-228-4 TDR	\$ 55.88	640-228-6 TDR
0.2340	\$ 39.59	640-234-3 TDR	\$ 45.11	640-234-4 TDR	\$ 55.88	640-234-6 TDR
0.2344	\$ 39.59	640-2344-3 TDR	\$ 45.11	640-2344-4 TDR	\$ 55.88	640-2344-6 TDR
0.2362	\$ 39.59	640-2362-3 TDR	\$ 45.11	640-2362-4 TDR	\$ 55.88	640-2362-6 TDR
0.2380	\$ 40.78	640-238-3 TDR	\$ 46.47	640-238-4 TDR	\$ 57.85	640-238-6 TDR
0.2420	\$ 40.78	640-242-3 TDR	\$ 46.47	640-242-4 TDR	\$ 57.85	640-242-6 TDR
0.2460	\$ 40.78	640-246-3 TDR	\$ 46.47	640-246-4 TDR	\$ 57.85	640-246-6 TDR
0.2500	\$ 45.00	640-250-3 TDR	\$ 50.85	640-250-4 TDR	\$ 62.55	640-250-6 TDR
0.2559	\$ 46.77	640-2559-3 TDR	\$ 53.20	640-2559-4 TDR	\$ 66.05	640-2559-6 TDR
0.2570	\$ 46.77	640-257-3 TDR	\$ 53.20	640-257-4 TDR	\$ 66.05	640-257-6 TDR
0.2610	\$ 46.77	640-261-3 TDR	\$ 53.20	640-261-4 TDR	\$ 66.05	640-261-6 TDR
0.2656	\$ 46.77	640-2656-3 TDR	\$ 53.20	640-2650-4 TDR	\$ 66.05	640-2720-6 TDR
0.2660	\$ 46.77	640-266-3 TDR	\$ 53.20	640-266-4 TDR	\$ 66.05	640-266-6 TDR
0.2720	\$ 46.77	640-272-3 TDR	\$ 53.20	640-272-4 TDR	\$ 66.05	640-272-6 TDR
0.2756	\$ 46.77	640-2756-3 TDR	\$ 53.20	640-2756-4 TDR	\$ 66.05	640-2756-6 TDR
0.2770	\$ 50.07	640-277-3 TDR	\$ 57.56	640-277-4 TDR	\$ 72.55	640-277-6 TDR
0.2810	\$ 50.07	640-281-3 TDR	\$ 57.56	640-281-4 TDR	\$ 72.55	640-281-6 TDR
0.2812	\$ 50.07	640-2812-3 TDR	\$ 57.56	640-2812-4 TDR	\$ 72.55	640-2812-6 TDR
0.2900	\$ 50.07	640-290-3 TDR	\$ 57.56	640-290-4 TDR	\$ 72.55	640-290-6 TDR
0.2950	\$ 50.07	640-295-3 TDR	\$ 57.56	640-295-4 TDR	\$ 72.55	640-295-6 TDR
0.2953	\$ 50.07	640-2953-3 TDR	\$ 57.56	640-2953-4 TDR	\$ 72.55	640-2953-6 TDR
0.2969	\$ 50.07	640-2969-3 TDR	\$ 57.56	640-2969-4 TDR	\$ 72.55	640-2969-6 TDR
0.3020	\$ 50.27	640-302-3 TDR	\$ 57.81	640-302-4 TDR	\$ 72.89	640-302-6 TDR
0.3125	\$ 50.27	640-3125-3 TDR	\$ 57.81	640-3125-4 TDR	\$ 72.89	640-3125-6 TDR
0.3150	\$ 50.27	640-315-3 TDR	\$ 57.81	640-315-4 TDR	\$ 72.89	640-315-6 TDR
0.3160	\$ 50.27	640-316-3 TDR	\$ 57.81	640-316-4 TDR	\$ 72.89	640-316-6 TDR
0.3230	\$ 54.03	640-323-3 TDR	\$ 62.78	640-323-4 TDR	\$ 80.27	640-323-6 TDR

<u>Decimal</u>	<u>3" OAL</u>	<u>EDP #</u>	<u>4" OAL</u>	<u>EDP #</u>	<u>6" OAL</u>	<u>EDP #</u>
0.3280	\$ 54.03	640-328-3 TDR	\$ 62.78	640-328-4 TDR	\$ 80.27	640-328-6 TDR
0.3346	\$ 54.03	640-3346-3 TDR	\$ 62.78	640-3346-4 TDR	\$ 80.27	640-3346-6 TDR
0.3390	\$ 54.03	640-339-3 TDR	\$ 62.78	640-339-4 TDR	\$ 80.27	640-339-6 TDR
0.3438	\$ 54.03	640-3438-3 TDR	\$ 62.78	640-3438-4 TDR	\$ 80.27	640-3438-6 TDR
0.3480	\$ 54.03	640-348-3 TDR	\$ 62.78	640-348-4 TDR	\$ 80.27	640-348-6 TDR
0.3543	\$ 54.29	640-3543-3 TDR	\$ 63.10	640-3543-4 TDR	\$ 80.73	640-3543-6 TDR
0.3580	\$ 56.25	640-358-3 TDR	\$ 65.72	640-358-4 TDR	\$ 84.66	640-358-6 TDR
0.3594	\$ 56.25	640-3594-3 TDR	\$ 65.72	640-3594-4 TDR	\$ 84.66	640-3594-6 TDR
0.3680	\$ 56.25	640-368-3 TDR	\$ 65.72	640-368-4 TDR	\$ 84.66	640-368-6 TDR
0.3740	\$ 56.25	640-374-3 TDR	\$ 65.72	640-374-4 TDR	\$ 84.66	640-374-6 TDR
0.3750	\$ 71.23	640-375-3 TDR	\$ 81.38	640-375-4 TDR	\$ 101.70	640-375-6 TDR
0.3770	\$ 71.23	640-377-3 TDR	\$ 81.38	640-377-4 TDR	\$ 101.70	640-377-6 TDR
0.3860	\$ 71.23	640-386-3 TDR	\$ 81.38	640-386-4 TDR	\$ 101.70	640-386-6 TDR
0.3906	\$ 71.23	640-3906-3 TDR	\$ 81.38	640-3906-4 TDR	\$ 101.70	640-3906-6 TDR
0.3937	\$ 71.23	640-3937-3 TDR	\$ 81.38	640-3937-4 TDR	\$ 101.70	640-3937-6 TDR
0.4040	\$ 73.70	640-404-3 TDR	\$ 84.65	640-404-4 TDR	\$ 106.55	640-404-6 TDR
0.4062	\$ 73.70	640-4062-3 TDR	\$ 84.65	640-4062-4 TDR	\$ 106.55	640-4062-6 TDR
0.4120	\$ 73.70	640-412-3 TDR	\$ 84.65	640-412-4 TDR	\$ 106.55	640-412-6 TDR
0.4134	\$ 73.70	640-4134-3 TDR	\$ 84.65	640-4134-4 TDR	\$ 106.55	640-4134-6 TDR
0.4219	\$ 76.01	640-4219-3 TDR	\$ 87.72	640-4219-4 TDR	\$ 111.13	640-4219-6 TDR
0.4331	\$ 76.01	640-4331-3 TDR	\$ 87.72	640-4331-4 TDR	\$ 111.13	640-4331-6 TDR
0.4375	\$ 99.74	640-4375-3 TDR	\$ 112.99	640-4375-4 TDR	\$ 139.77	640-4375-6 TDR
0.4528	\$ 99.74	640-4528-3 TDR	\$ 112.99	640-4528-4 TDR	\$ 139.77	640-4528-6 TDR
0.4531	\$ 99.74	640-4531-3 TDR	\$ 112.99	640-4531-4 TDR	\$ 139.77	640-4531-6 TDR
0.4688	\$ 99.74	640-4688-3 TDR	\$ 112.99	640-4688-4 TDR	\$ 139.77	640-4688-6 TDR
0.4724	\$ 99.74	640-4724-3 TDR	\$ 112.99	640-4724-4 TDR	\$ 139.77	640-4724-6 TDR
0.4843	\$ 105.00	640-4843-3 TDR	\$ 120.10	640-4843-4 TDR	\$ 150.25	640-4843-6 TDR
0.5000	\$ 105.00	640-500-3 TDR	\$ 120.10	640-500-4 TDR	\$ 150.25	640-500-6 TDR

These are also available custom made to your diameter and over all length with only a short lead time. We also offer coating, TiAlN, DLC or Diamond.



Superior Tool Service, Inc.
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Solid Carbide Double Margin Drill for Composite

Item

1/4" x 3" OAL Double margin Carbide drill
5/16" x 3" OAL Double margin Carbide drill
3/8" x 3" OAL Double margin Carbide drill
1/2" x 3" OAL Double margin Carbide drill

EDP #

240-250-3
240-312-3
240-375-3
240-500-3

**Call for Quote on Custom Made
Double Margin Carbide Drills
Diameters from 1/4" through 1/2"
OAL from 3" to 12"**



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Carbide Spiral Burr Tools for Carbon Graphite & CFRP

These are made from solid carbide and are left hand spiral, right hand cut but can be made LHS/LHC, RHS/RHC or RHS/LHC. Also available with TiCN, TiAlN, AlCrN or DLC coating We also make these with a "fine finish" which will leave a smoother edge

Item

7/32" x 3" OAL Carbide spiral Burr tool
 1/4" x 3" OAL Carbide Spiral Burr tool
 1/4" x 4" OAL Carbide Spiral Burr tool
 1/4" x 6" OAL Carbide Spiral Burr tool
 3/8" x 3" OAL Carbide Spiral Burr tool
 3/8" x 4" OAL Carbide Spiral Burr tool
 3/8" x 6" OAL Carbide Spiral Burr tool
 1/2" x 3" OAL Carbide Spiral Burr tool
 3/4" x 4" OAL Carbide Spiral Burr Tool

EDP #

260-2188-3 Burr
 260-250-3 Burr
 260-250-4 Burr
 260-250-6 Burr
 260-375-3 Burr
 260-375-4 Burr
 260-375-6 Burr
 260-500-3 Burr
 260-750-4 Burr

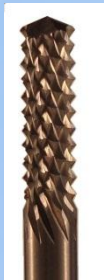
1/2" x 3" OAL Carbide Spiral Burr tool- fine finish

260-500-3 Burr Finisher

1/2" x 3" OAL Carbide Spiral Burr tool- fine finish RHS

260-500-3 Burr Finisher RHS

All our burr tools can be manufactured to your diameter and overall length with only a short lead time.



SOLID CARBIDE DIAMOND BURR TOOLS

These are in the standard diamond burr shape and come with a drill point for plunging They can be made without the drill point and can be coated with TiCN, TiAlN, AlCrN or DLC.

Item

1/4" x 2.5" OAL Carbide Diamond Plunge Burr
 3/8" x 2.5" OAL Carbide Diamond Plunge Burr
 3/8" x 3" OAL Carbide Diamond Plunge Burr
 1/2" x 3" OAL Carbide Diamond Plunge Burr

EDP #

260-250-2.5 Diamond Plunge Burr
 260-375-2.5 Diamond Plunge Burr
 260-375-3 Diamond Plunge Burr
 260-500-3 Diamond Plunge Burr



Superior Tool Service, Inc.

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Decimal

Solid Carbide Drills for drilling Composite

EDP

0.0465	CARBIDE #56 Jobber length TWIST DRILL w/ Composite tip	220-0465
0.0469	CARBIDE 3/64 Jobber length TWIST DRILL w/ Composite tip	220-0469
0.0520	CARBIDE #55 Jobber length TWIST DRILL w/ Composite tip	220-0520
0.0550	CARBIDE #54 Jobber length TWIST DRILL w/ Composite tip	220-0550
0.0591	CARBIDE 1.5MM Jobber length TWIST DRILL w/ Composite tip	220-0591
0.0595	CARBIDE #53 Jobber length TWIST DRILL w/ Composite tip	220-0595
0.0625	CARBIDE 1/16 Jobber length TWIST DRILL w/ Composite tip	220-0625
0.0635	CARBIDE #52 Jobber length TWIST DRILL w/ Composite tip	220-0635
0.0670	CARBIDE #51 Jobber length TWIST DRILL w/ Composite tip	220-0670
0.0700	CARBIDE #50 Jobber length TWIST DRILL w/ Composite tip	220-0700
0.0730	CARBIDE #49 Jobber length TWIST DRILL w/ Composite tip	220-0730
0.0760	CARBIDE #48 Jobber length TWIST DRILL w/ Composite tip	220-0760
0.0781	CARBIDE 5/64 Jobber length TWIST DRILL w/ Composite tip	220-0781
0.0785	CARBIDE #47 Jobber length TWIST DRILL w/ Composite tip	220-0785
0.0787	CARBIDE 2.0MM Jobber length TWIST DRILL w/ Composite tip	220-0787
0.0810	CARBIDE #46 Jobber length TWIST DRILL w/ Composite tip	220-0810
0.0820	CARBIDE #45 Jobber length TWIST DRILL w/ Composite tip	220-0820
0.0860	CARBIDE #44 Jobber length TWIST DRILL w/ Composite tip	220-0860
0.0890	CARBIDE #43 Jobber length TWIST DRILL w/ Composite tip	220-0890
0.0935	CARBIDE #42 Jobber length TWIST DRILL w/ Composite tip	220-0935
0.0938	CARBIDE 3/32 Jobber length TWIST DRILL w/ Composite tip	220-0938
0.0960	CARBIDE #41 Jobber length TWIST DRILL w/ Composite tip	220-0960
0.0980	CARBIDE #40 Jobber length TWIST DRILL w/ Composite tip	220-0980
0.0984	CARBIDE 2.5MM Jobber length TWIST DRILL w/ Composite tip	220-0984
0.0995	CARBIDE #39 Jobber length TWIST DRILL w/ Composite tip	220-0995
0.1015	CARBIDE #38 Jobber length TWIST DRILL w/ Composite tip	220-1015
0.1040	CARBIDE #37 Jobber length TWIST DRILL w/ Composite tip	220-1040
0.1065	CARBIDE #36 Jobber length TWIST DRILL w/ Composite tip	220-1065
0.1094	CARBIDE 7/64 Jobber length TWIST DRILL w/ Composite tip	220-1094
0.1100	CARBIDE #35 Jobber length TWIST DRILL w/ Composite tip	220-1100
0.1110	CARBIDE #34 Jobber length TWIST DRILL w/ Composite tip	220-1110
0.1130	CARBIDE #33 Jobber length TWIST DRILL w/ Composite tip	220-1130
0.1160	CARBIDE #32 Jobber length TWIST DRILL w/ Composite tip	220-1160
0.1181	CARBIDE 3.0MM Jobber length TWIST DRILL w/ Composite tip	220-1181
0.1200	CARBIDE #31 Jobber length TWIST DRILL w/ Composite tip	220-1200
0.1250	CARBIDE 1/8 Jobber length TWIST DRILL w/ Composite tip	220-1250
0.1285	CARBIDE #30 Jobber length TWIST DRILL w/ Composite tip	220-1285
0.1360	CARBIDE #29 Jobber length TWIST DRILL w/ Composite tip	220-1360
0.1378	CARBIDE 3.5MM Jobber length TWIST DRILL w/ Composite tip	220-1378

0.1405	CARBIDE #28 Jobber length TWIST DRILL w/ Composite tip	220-1405
0.1406	CARBIDE 9/64 Jobber length TWIST DRILL w/ Composite tip	220-1406
0.1440	CARBIDE #27 Jobber length TWIST DRILL w/ Composite tip	220-1440
0.1520	CARBIDE #24 Jobber length TWIST DRILL w/ Composite tip	220-1520
0.1540	CARBIDE #23 Jobber length TWIST DRILL w/ Composite tip	220-1540
0.1562	CARBIDE 5/32 Jobber length TWIST DRILL w/ Composite tip	220-1562
0.1570	CARBIDE #22 Jobber length TWIST DRILL w/ Composite tip	220-1570
0.1575	CARBIDE 4.0MM Jobber length TWIST DRILL w/ Composite tip	220-1575
0.1590	CARBIDE #21 Jobber length TWIST DRILL w/ Composite tip	220-1590
0.1610	CARBIDE #20 Jobber length TWIST DRILL w/ Composite tip	220-1610
0.1660	CARBIDE #19 Jobber length TWIST DRILL w/ Composite tip	220-1660
0.1695	CARBIDE #18 Jobber length TWIST DRILL w/ Composite tip	220-1695
0.1719	CARBIDE 11/64 Jobber length TWIST DRILL w/ Composite tip	220-1719
0.1730	CARBIDE #17 Jobber length TWIST DRILL w/ Composite tip	220-1730
0.1770	CARBIDE #16 Jobber length TWIST DRILL w/ Composite tip	220-1770
0.1772	CARBIDE 4.5MM Jobber length TWIST DRILL w/ Composite tip	220-1772
0.1800	CARBIDE #15 Jobber length TWIST DRILL w/ Composite tip	220-1800
0.1820	CARBIDE #14 Jobber length TWIST DRILL w/ Composite tip	220-1820
0.1850	CARBIDE #13 Jobber length TWIST DRILL w/ Composite tip	220-1850
0.1875	CARBIDE 3/16 Jobber length TWIST DRILL w/ Composite tip	220-1875
0.1890	CARBIDE #12 Jobber length TWIST DRILL w/ Composite tip	220-1890
0.1910	CARBIDE #11 Jobber length TWIST DRILL w/ Composite tip	220-1910
0.1935	CARBIDE #10 Jobber length TWIST DRILL w/ Composite tip	220-1935
0.1960	CARBIDE #9 Jobber length TWIST DRILL w/ Composite tip	220-1960
0.1969	CARBIDE 5.0MM Jobber length TWIST DRILL w/ Composite tip	220-1968
0.1990	CARBIDE #8 Jobber length TWIST DRILL w/ Composite tip	220-1990
0.2010	CARBIDE #7 Jobber length TWIST DRILL w/ Composite tip	220-2010
0.2031	CARBIDE 13/64 Jobber length TWIST DRILL w/ Composite tip	220-2031
0.2040	CARBIDE #6 Jobber length TWIST DRILL w/ Composite tip	220-2040
0.2055	CARBIDE #5 Jobber length TWIST DRILL w/ Composite tip	220-2055
0.2090	CARBIDE #4 Jobber length TWIST DRILL w/ Composite tip	220-2090
0.2130	CARBIDE #3 Jobber length TWIST DRILL w/ Composite tip	220-2130
0.2165	CARBIDE 5.5MM Jobber length TWIST DRILL w/ Composite tip	220-2165
0.2188	CARBIDE 7/32 Jobber length TWIST DRILL w/ Composite tip	220-2188
0.2210	CARBIDE #2 Jobber length TWIST DRILL w/ Composite tip	220-2210
0.2280	CARBIDE #1 Jobber length TWIST DRILL w/ Composite tip	220-2280
0.2340	CARBIDE Ltr A Jobber length TWIST DRILL w/ Composite tip	220-2340
0.2344	CARBIDE 15/64 Jobber length TWIST DRILL w/ Composite tip	220-2344
0.2362	CARBIDE 6.0MM Jobber length TWIST DRILL w/ Composite tip	220-2362
0.2380	CARBIDE Ltr B Jobber length TWIST DRILL w/ Composite tip	220-2380
0.2420	CARBIDE Ltr C Jobber length TWIST DRILL w/ Composite tip	220-2420
0.2460	CARBIDE Ltr D Jobber length TWIST DRILL w/ Composite tip	220-2460
0.2500	CARBIDE 1/4 (Ltr E) Jobber length TWIST DRILL w/ Composite tip	220-2500
0.2559	CARBIDE 6.5MM Jobber length TWIST DRILL w/ Composite tip	220-2559

0.2570	CARBIDE Ltr F Jobber length TWIST DRILL w/ Composite tip	220-2570
0.2610	CARBIDE Ltr G Jobber length TWIST DRILL w/ Composite tip	220-2610
0.2656	CARBIDE 17/64 Jobber length TWIST DRILL w/ Composite tip	220-2656
0.2660	CARBIDE Ltr H Jobber length TWIST DRILL w/ Composite tip	220-2660
0.2720	CARBIDE Ltr I Jobber length TWIST DRILL w/ Composite tip	220-2720
0.2756	CARBIDE 7.0MM Jobber length TWIST DRILL w/ Composite tip	220-2756
0.2770	CARBIDE Ltr J Jobber length TWIST DRILL w/ Composite tip	220-2770
0.2810	CARBIDE Ltr K Jobber length TWIST DRILL w/ Composite tip	220-2810
0.2812	CARBIDE 9/32 Jobber length TWIST DRILL w/ Composite tip	220-2812
0.2900	CARBIDE Ltr L Jobber length TWIST DRILL w/ Composite tip	220-2900
0.2950	CARBIDE Ltr M Jobber length TWIST DRILL w/ Composite tip	220-2950
0.2953	CARBIDE 7.5MM Jobber length TWIST DRILL w/ Composite tip	220-2953
0.2969	CARBIDE 19/64 Jobber length TWIST DRILL w/ Composite tip	220-2969
0.3020	CARBIDE Ltr N Jobber length TWIST DRILL w/ Composite tip	220-3020
0.3125	CARBIDE 5/16 Jobber length TWIST DRILL w/ Composite tip	220-3125
0.3150	CARBIDE 8.0MM Jobber length TWIST DRILL w/ Composite tip	220-3150
0.3160	CARBIDE Ltr O Jobber length TWIST DRILL w/ Composite tip	220-3160
0.3230	CARBIDE Ltr P Jobber length TWIST DRILL w/ Composite tip	220-3230
0.3281	CARBIDE 21/64 Jobber length TWIST DRILL w/ Composite tip	220-3281
0.3320	CARBIDE Ltr Q Jobber length TWIST DRILL w/ Composite tip	220-3320
0.3346	CARBIDE 8.5MM Jobber length TWIST DRILL w/ Composite tip	220-3346
0.3390	CARBIDE Ltr R Jobber length TWIST DRILL w/ Composite tip	220-3390
0.3438	CARBIDE 11/32 Jobber length TWIST DRILL w/ Composite tip	220-3438
0.3480	CARBIDE Ltr S Jobber length TWIST DRILL w/ Composite tip	220-3480
0.3543	CARBIDE 9.0MM Jobber length TWIST DRILL w/ Composite tip	220-3543
0.3580	CARBIDE Ltr T Jobber length TWIST DRILL w/ Composite tip	220-3580
0.3594	CARBIDE 23/64 Jobber length TWIST DRILL w/ Composite tip	220-3594
0.3680	CARBIDE Ltr U Jobber length TWIST DRILL w/ Composite tip	220-3680
0.3740	CARBIDE 9.5MM Jobber length TWIST DRILL w/ Composite tip	220-3740
0.3750	CARBIDE 3/8 Jobber length TWIST DRILL w/ Composite tip	220-3750
0.3770	CARBIDE Ltr V Jobber length TWIST DRILL w/ Composite tip	220-3770
0.3860	CARBIDE Ltr W Jobber length TWIST DRILL w/ Composite tip	220-3860
0.3906	CARBIDE 25/64 Jobber length TWIST DRILL w/ Composite tip	220-3906
0.3937	CARBIDE 10.0MM Jobber length TWIST DRILL w/ Composite tip	220-3937
0.3970	CARBIDE Ltr X Jobber length TWIST DRILL w/ Composite tip	220-3970
0.4040	CARBIDE Ltr Y Jobber length TWIST DRILL w/ Composite tip	220-4040
0.4062	CARBIDE 13/32 Jobber length TWIST DRILL w/ Composite tip	220-4062
0.4120	CARBIDE Ltr Z Jobber length TWIST DRILL w/ Composite tip	220-4130
0.4134	CARBIDE 10.5MM Jobber length TWIST DRILL w/ Composite tip	220-4134
0.4219	CARBIDE 27/64 Jobber length TWIST DRILL w/ Composite tip	220-4219
0.4331	CARBIDE 11.0MM Jobber length TWIST DRILL w/ Composite tip	220-4331
0.4375	CARBIDE 7/16 Jobber length TWIST DRILL w/ Composite tip	220-4375
0.4528	CARBIDE 11.5MM Jobber length TWIST DRILL w/ Composite tip	220-4528
0.4531	CARBIDE 29/64 Jobber length TWIST DRILL w/ Composite tip	220-4531
0.4688	CARBIDE 15/32 Jobber length TWIST DRILL w/ Composite tip	220-4688

0.4724	CARBIDE 12.0MM Jobber length TWIST DRILL w/ Composite tip	220-4724
0.4844	CARBIDE 31/64 Jobber length TWIST DRILL w/ Composite tip	220-4844
0.5000	CARBIDE 1/2 Jobber length TWIST DRILL w/ Composite tip	220-5000

These drills are also available in 6" or 12" OAL. Custom diameters and lengths are also available with only a short lead time.



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Carbide drills with composite tip on 1/4-28 threaded hex shank

Description	EDP #
#40 (.098) carbide drill x 1/2" LOC on 1/4-28 threaded HSS hex shank	988-9845 40x.5
#40 (.098) carbide drill x 1" LOC on 1/4-28 threaded HSS hex shank	988-9848 40x1
#40 (.098) carbide drill x 1-1/2" LOC on 1/4-28 threaded HSS hex shank	988-9849 40x1.5
#30 (.1285) carbide drill x 1/2" LOC on 1/4-28 threaded HSS hex shank	988-9850 30 x.5
#30 (.1285) carbide drill x 1" LOC on 1/4-28 threaded HSS hex shank	988-9851 30x1
#30 (.1285) carbide drill x 1-1/2" LOC on 1/4-28 threaded HSS hex shank	988-9852 30x1.5
#21 (.1590) carbide drill x 1/2" LOC on 1/4-28 threaded HSS hex shank	988-9853 21x.5
#21 (.1590) carbide drill x 1" LOC on 1/4-28 threaded HSS hex shank	988-9854 21x1
#21 (.1590) carbide drill x 1-1/2" LOC on 1/4-28 threaded HSS hex shank	988-9855 21x1.5
#20 (.1610) carbide drill x 1.5 LOC on 1/4-28 threaded HSS hex shank	988-9874 20x1.5
#20 (.1610) carbide drill x .5 LOC on 1/4-28 threaded HSS hex shank	988-9875 20 x .5
#20 (.1610) carbide drill x 1.0 LOC on 1/4-28 threaded HSS hex shank	988-9876 20x1
.164 dia. carbide drill with 1/2" LOC on 1/4-28 HSS threaded hex shank	988-9871 .164 x .5
.164 dia. carbide drill with 1" LOC on 1/4-28 HSS threaded hex shank	988-9872 .164 x 1
.164 dia. carbide drill with 1-1/2" LOC on 1/4-28 HSS threaded hex shank	988-9873 .164 x 1.5
#19 (.1660) carbide drill x 1/2" LOC on 1/4-28 threaded HSS hex shank	988-9856 19x.5
#19 (.1660) carbide drill x 1" LOC on 1/4-28 threaded HSS hex shank	988-9857 19x1
#19 (.1660) carbide drill x 1-1/2" LOC on 1/4-28 threaded HSS hex shank	988-9858 19x1.5
#10 (.1935) carbide drill x 1/2" LOC on 1/4-28 threaded HSS hex shank	988-9859 10x.5
#10 (.1925) carbide drill x 1" LOC on 1/4-28 threaded HSS hex shank	988-9860 10x1
#10 (.1935) carbide drill x 1-1/2" LOC on 1/4-28 threaded HSS hex shank	988-9861 10x1.5
#8 (.1990) carbide drill x 1/2" LOC on 1/4-28 threaded HSS hex shank	988-9862 8x.5
#8 (.1990) carbide drill x 1" LOC on 1/4-28 threaded HSS hex shank	988-9863 8x1
#8 (.1990) carbide drill x 1-1/2" LOC on 1/4-28 threaded HSS hex shank	988-9864 8x1.5
3/16" (.1875) carbide drill x 1-1/2" LOC on 1/4-28 threaded HSS hex shank	988-9878 3/16" x 1.5

These items also come available on a quick change shank at no additional charge



We offer them long or extra long on quick change shank. Contact us for price & delivery





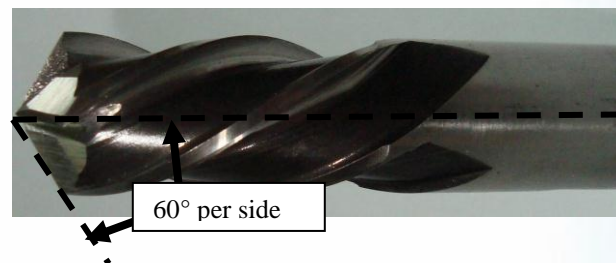
Superior Tool Service, Inc. Customer Guide to our Services

This guide was created to help our customers get the most for their money and to avoid costly mistakes on our part as well as theirs. Precision tool grinding and machined part manufacturing have a lot of similarities, one of which is we both need good and accurate sketches or prints to do our work to the customer's satisfaction the first time, every time. We have years of experience in making cutting tools of all types and sizes, for a wide variety of machinery, from a 5 axis CNC machine to a drill press and everything in between. While this is one of our greatest strengths, it also creates a few challenges. The first is tool orientation to the part. So many times we get a print that shows a great view of the area to be cut but nothing to show the tool orientation with the part.

Second, when someone says "standard length" in our business we really don't have a "standard". We manufacture many lengths of tools. What's standard to one person may not be standard to another. We prefer to be told what length you need, that way we will be sure you get what you want. Third, please use \pm tolerance on your dimensions whenever possible.

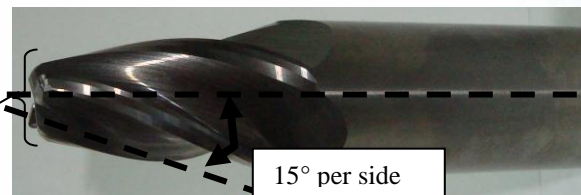
Another area of great confusion is angle cutting tools. There are more mistakes made on this than any other item in our shop. Here are some ways to eliminate the confusion: The best way to call out an angle (also the most standardized through our industry) is "included angles". What this means is both sides of the tool are included in the call out. For example a tool with 45° angle on both sides is a 90° included tool (ICL). The angle is measured from the centerline of the tool to the cutting edge, then the other side is *included*, making it 90° ICL. The centerline is an imaginary line that passes through the center of the shank, lengthwise from end to end. You may also have a called out tip diameter so be sure to tell us that too.

This tool is 120° ICL
(60° per side, called from centerline)



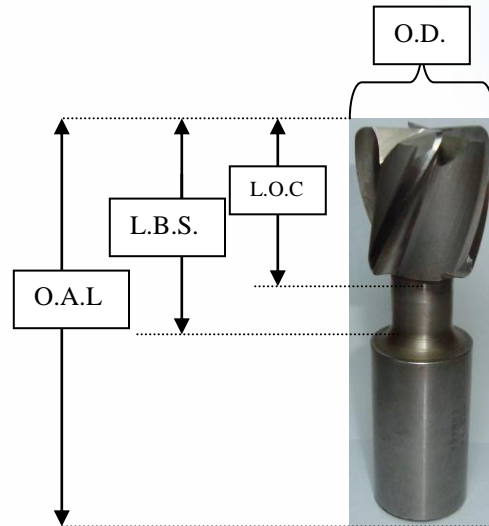
This tool is 30° ICL
(15° per side, called from centerline
with a .350 tip diameter and radius)

.350 tip
diameter



Standard Abbreviations & Cutting Tool Nomenclature for End Mills

O.A.L. = Over all length
 L.O.C. = Length of cut (flute length)
 L.B.S. = Length before shank (usually relief)
 Flt. = Flute (2 flt. /4flt)
 R. or Rad. = Radius
 E.M. = End mill (Hi Speed Steel)
 C.E.M. = Carbide end mill
 CCEM = Crest cut roughing end mill
 REM = Roughing end mill
 O.D. = Outside diameter
 Dia. = Diameter
 B.R. = Ball Radius
 R/C = Resharpen complete (Outside diameter & end of tool)
 D.E. = Double ended.
 EX = Excessive (wear)
 I.D. = Inside diameter.
 C/O = Cut off
 ICL = Included angle



Back Tapered =
(or dovetail)



Plug Tapered =



L.H.C. = Left hand cutting (Left Hand Spiral)
 R.H.C. = Right hand cutting (If you ask for an end mill we assume it is right hand cut unless you specify otherwise)
 L.H.S/R.H.C = Left hand spiral & Right hand cut (Down cut)