

NAPGLADU

Delivering Productivity

Solid Carbide Shank Cutting Tools Endmills & Burs





With a base of solid experience, the latest in technological advancements and a focus on the needs of the customer, NAP Gladu surpasses its goal of providing more than just a cutting tool. We are your application engineers, engineering department, problem solvers and partners in the drive to success.

Technology: The Competitive Edge

Interactive design...application engineering...problem solving: NAP Gladu dramatically expands your capabilities. With one of the most sophisticated engineering departments in the industry, NAP Gladu is able to provide solutions to your most challenging tooling needs. Our network of computer-controlled systems is capable of direct electronic feeds from off-site locations ... including yours. This enables us to measure tool patterns with precision for exact pattern duplication every time. When it comes to designing and manufacturing tooling for your specific application, NAP Gladu uses its experience, knowledge and technical expertise to ensure that you get tooling that meets or exceeds your expectations -- guaranteed.

Service: Speed & Precision

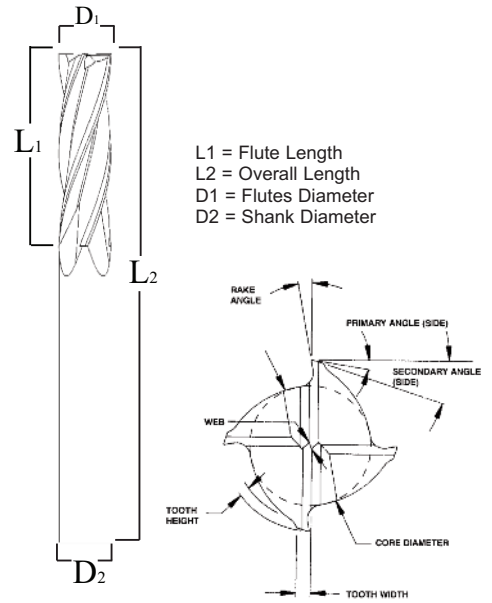
NAP Gladu offers unmatched reliability in the delivery of new and serviced tools. Customers depend on us for fast turnaround times. What's more, they can count on NAP Gladu to do the job right the first time, every time.

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Materials	2 Flute	3 Flute	4 Flute	6 Flute	Straight
Aluminum		▶		▶	
Brass, Bronze	▶		▶		▶
Fiberglass				▶	
Iron	▶		▶	▶	
Plastics		▶		▶	
Steel: Nickel, Chrome	▶		▶	▶	▶
Steel: Carbon	▶		▶	▶	▶
Steel: 39-48Rc	▶		▶	▶	▶
Steel: 46-86Rc	▶		▶	▶	▶
Steel: Stainless	▶		▶	▶	▶
Steel: Weldments	▶		▶	▶	▶
Titanium	▶		▶		▶
Zinc		▶			



LIST OF BASIC ENDMILL USES:

- Face Milling:** For Small Face areas of a relatively shallow depth of cut. The surface finish produced can be scratchy.
- Keyways:** Normally two separate Endmills are required to produce a high quality keyway.
- Woodruff Keyways:** This is a straight plunge operation that is normally produced with a single cutter.
- Specialty Cutting:** Which includes the milling of tapered surfaces such as "T" shaped slots and dove tailed production.
- Finishing/Profiling:** To finish the inside/outside shape on a part with a parallel side wall.
- Cavity Die Work:** Generally involves plunging and finishing pocket cuts in die steel. Cavity work requires the production of three dimensional shapes. A Ball type endmill is used as the finishing cutter in this application.

MILLING PROCEDURE IDENTIFICATION:

- Climb Milling:** Cutter direction for a milling operation. The cutter is climbing into the workspace, relieving the feed force requirements. This application is the first choice for CNC machining because of extended tool life. This is also known as Down-Milling.
- Conventional Milling:** Cutter direction for a milling operation. In this application the cutter has the tendency to push the work piece away from the part, which increases the required feed force. This application is the first choice for manual machining. This is also known as Up-Milling.
- End Milling:** Metal removal process that is achieved by feeding a work-piece into a revolving cutting.
- Peripheral Milling:** The machine edge surface of a part. Peripheral milling is accomplished by presenting the work-piece to the circumference or the periphery of the milling center.
- Plunge Cut:** Axial feeding into the work-piece. CNC machine movement in the Z-axis direction. Direct plunging into the face of a work-piece. Requires a center-cutting endmill.
- Ramp Cut:** Axial feeding into the work-piece. CNC machine movement in the Z-axis direction and an addition axis (X or Y). Angle plunge into the face of a work-piece, feeding in other than axial direction. Requires a center cutting endmill.

“Make Your Tools Last Longer with Titanium Base Coatings”

With today's technologies, your tools can last longer and run harder than ever before.

NAP GLADU offers a full range of Titanium based coatings
Titanium Nitride, Titanium Aluminum Nitride and many more.

Why Consider Coatings?

- High Speed tool life increase 3 to 30 times.
- Carbide tool life increase 2 to 5 times. Disposition temperatures as low as 480°-840° (250°-450°C). This protects the Carbide's Binding Agents from deterioration, with comparison against CVD process applied at more than 1,850°F or (1,000°C)
- Isolates the tools from the work-piece and avoids edge build-up and tool catering.
- Reduced friction against work-piece and chips, reduced spindle torque and less vibration with improved finishes. Feed & speed enhancement from 10 to 50%.
- Reduces or eliminates coolants (with specific coatings)
- Repeatable, stable performance of the coatings between batches.

Application Chart

Materials	TiN	TiCN	TiALN	ALTiN
Aluminum, Low Silicon<10%		▶	▶	
Aluminum, High Silicon>10%		▶	▶	
Copper, Copper Alloys	▶	▶	▶	▶
Ductile, Malleable Cast Iron	▶	▶	▶	▶
Carbon Steel, 1000 Series	▶	▶	▶	▶
Alloy Steel, 4 to 9000 Series	▶	▶	▶	▶
Tool Steel	▶	▶	▶	▶
SS Steel, 300 Series	▶	▶	▶	▶
SS Steel, 400 Series	▶	▶	▶	▶
SS PH Series	▶	▶	▶	▶
Titanium, Titanium Alloys	▶	▶	▶	▶
Nickel, Nickel Alloys, Cobalt	▶	▶	▶	▶
Wood, Paper	▶	▶	▶	▶
Composites, Plastics	▶	▶	▶	▶

Titanium Nitride (TiN) Coating is bright gold in color with a surface hardness reaching 81Rc and a .4 coefficient of friction. Titanium Nitride is the most common PVD hard coating in use today. TiN has an excellent combination of performance properties, attractive appearance and safety (meets FDA requirements for surgical tools and implants as well as food contact applications). TiN has very good corrosion resistance, heat transmission and excellent wear resistance with wide range of materials including iron based materials, hardened steels and stainless. Forming operations can expect a decrease in galling and welding of work-piece material with a corresponding improvement in surface finish of the formed part. Increase tool life can be 3 to 8 times with increased speeds & feeds (finished parts per hour); a serious consideration. Longer tool life or greater speeds & feeds depend on the application, coolant and other variables.



Hardness: 2800HV

Coating Thickness: 2-4 Microns

Thermal Stability: 550°C or 1000°F

Titanium Carbonitride (TiCN) Coating is medium gray or bronze in color with hardness reaching 90Rc and a .3 coefficient of friction. TiCN Coating has up to 750°F. thermal stability. TiCN offers improved wear resistance to abrasive, adhesive or difficult-to-machining materials such as, cast iron, aluminum alloys, tool steels, copper, inconel and titanium alloys. As with TiN, feeds and speeds can be increased and tool life can improve as much as 800% depending on the application, coolant and other conditions.



Hardness: 3000 HV

Coating Thickness: 2-4 Microns

Thermal Stability: 400°C or 750°F

Titanium Aluminum (TiALN) Coating is purple/black in color with surface hardness in the upper 80Rc range with coefficient less than Titanium Nitride (TiN). TiALN coating is high performance coating which excels at machining abrasive and difficult to machine materials such as cast iron, aluminum alloys, tool steels and nickel alloys, TiALN's improved ductility makes it an excellent choice for interrupted cutting operations. Its superior oxidation resistance provides unparalleled performance in high temperature machining, TiALN coating does not exhibit edge brittleness and can be used for interrupted cuts without chipping. TiALN coating should be targeted at applications that generate the highest heat level at the tools cutting edge.



Hardness: 2800HV

Coating Thickness: 2-4 Microns

Thermal Stability: 750°C or 1350°F

NAPGLADU

Delivering Productivity

Fractional Section





SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	3 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiALN	3 FL SQ TiALN	4 FL SQ TiALN
1/32 x 3/32 x 1/8 x 1-1/2	ES01-0007	ES01-0008	ES01-0009A	ES01-0723	ES01-0724	ES01-0725
3/64 x 1/8 x 1/8 x 1-1/2	ES01-0010	ES01-0011	ES01-0012A	ES01-0726	ES01-0727	ES01-0728
1/16 x 1/4 x 1/8 x 1-1/2	ES01-0002A	ES01-0003	ES01-0001Q	ES01-0730	ES01-0731	ES01-0729Q
5/64 x 1/4 x 1/8 x 1-1/2	ES01-0031	ES01-0032	ES01-0033A	ES01-0735	ES01-0736	ES01-0737
3/32 x 3/8 x 1/8 x 1-1/2	ES01-0026Q	ES01-0027	ES01-0025Q	ES01-0742	ES01-0743	ES01-0741
7/64 x 3/8 x 1/8 x 1-1/2	ES01-0034	ES01-0035	ES01-0036	ES01-0747	ES01-0748	ES01-0749
1/8 x 1/2 x 1/8 x 1-1/2	ES01-0050Q	ES01-0051	ES01-0049Q	ES01-0754Q	ES01-0755	ES01-0753Q
9/64 x 9/16 x 3/16 x 2	ES01-0055	ES01-0056	ES01-0057	ES01-0759	ES01-0760	ES01-0761
5/32 x 9/16 x 3/16 x 2	ES01-0068	ES01-0069	ES01-0067A	ES01-0766	ES01-0767	ES01-0765
11/64 x 9/16 x 3/16 x 2	ES01-0064	ES01-0065	ES01-0066	ES01-0762	ES01-0763	ES01-0764
3/16 x 5/8 x 3/16 x 2	ES01-0086Q	ES01-0088	ES01-0085Q	ES01-0778	ES01-0779	ES01-0777Q
13/64 x 5/8 x 1/4 x 2-1/2	ES01-0092	ES01-0093	ES01-0094	ES01-0774	ES01-0775	ES01-0776
7/32 x 5/8 x 1/4 x 2-1/2	ES01-0120	ES01-0121	ES01-0119	ES01-0790	ES01-0791	ES01-0789
15/64 x 3/4 x 1/4 x 2-1/2	ES01-0125	ES01-0126	ES01-0127	ES01-0795	ES01-0796	ES01-0797
1/4 x 3/4 x 1/4 x 2-1/2	ES01-0138Q	ES01-0140	ES01-0137Q	ES01-0802Q	ES01-0803	ES01-0801Q
17/64 x 7/8 x 5/16 x 2-1/2	ES01-0144	ES01-0145	ES01-0146	ES01-0807	ES01-0808	ES01-0809
9/32 x 7/8 x 5/16 x 2-1/2	ES01-0147	ES01-0148	ES01-0149A	ES01-0810	ES01-0811	ES01-0812
19/64 x 7/8 x 5/16 x 2-1/2	ES01-0150	ES01-0151	ES01-0152	ES01-0813	ES01-0814	ES01-0815
5/16 x 7/8 x 5/16 x 2-1/2	ES01-0178Q	ES01-0180	ES01-0177Q	ES01-0826	ES01-0827	ES01-0825Q
21/64 x 7/8 x 3/8 x 2-1/2	ES01-0164	ES01-0171	ES01-0176	ES01-0831	ES01-0832	ES01-0833
11/32 x 7/8 x 3/8 x 2-1/2	ES01-0179	ES01-0184	ES01-0185	ES01-0834	ES01-0835	ES01-0836
23/64 x 7/8 x 3/8 x 2-1/2	ES01-0186	ES01-0187	ES01-0188	ES01-0837	ES01-0838	ES01-0839
3/8 x 7/8 x 3/8 x 2-1/2	ES01-0248Q	ES01-0249	ES01-0247Q	ES01-0850Q	ES01-0851	ES01-0849A
25/64 x 7/8 x 7/16 x 2-1/2	ES01-0244	ES01-0245	ES01-0246	ES01-0855	ES01-0856	ES01-0857
13/32 x 7/8 x 7/16 x 2-1/2	ES01-0241	ES01-0242	ES01-0243	ES01-0858	ES01-0859	ES01-0860
27/64 x 7/8 x 7/16 x 2-1/2	ES01-0253	ES01-0254	ES01-0255	ES01-0861	ES01-0862	ES01-0863
7/16 x 1 x 7/16 x 2-1/2	ES01-0308	ES01-0310	ES01-0307A	ES01-0874	ES01-0875	ES01-0873
29/64 x 1 x 1/2 x 3	ES01-0314	ES01-0315	ES01-0316	ES01-0879	ES01-0880	ES01-0881
15/32 x 1 x 1/2 x 3	ES01-0317	ES01-0318	ES01-0319	ES01-0882	ES01-0883	ES01-0884
31/64 x 1 x 1/2 x 3	ES01-0320	ES01-0321	ES01-0322	ES01-0885	ES01-0886	ES01-0887
1/2 x 1 x 1/2 x 3	ES01-0372	ES01-0374	ES01-0371Q	ES01-0898Q	ES01-0899	ES01-0897Q
9/16 x 1-1/4 x 9/16 x 3-1/2	ES01-0379	ES01-0380	ES01-0378	ES01-0904	ES01-0905	ES01-0903
5/8 x 1-1/4 x 5/8 x 3-1/2	ES01-0430	ES01-0432	ES01-0429A	ES01-0910	ES01-0911	ES01-0909
11/16 x 1-1/2 x 3/4 x 4	ES01-0423	ES01-0428	ES01-0431	ES01-0915	ES01-0916	ES01-0917
3/4 x 1-1/2 x 3/4 x 4	ES01-0452	ES01-0454	ES01-0451Q	ES01-0922	ES01-0923	ES01-0921
7/8 x 1-1/2 x 7/8 x 4	ES01-0480	ES01-0482	ES01-0479	ES01-0928	ES01-0929	ES01-0927
1 x 1-1/2 x 1 x 4	ES01-0502	ES01-0503	ES01-0501	ES01-0934	ES01-0935	ES01-0933
1-1/4 x 2 x 1-1/4 x 4-1/2	ES01-0507	ES01-0508	ES01-0509	ES01-0939	ES01-0940	ES01-0941

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A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.



BALL END

ODxLOCxShankODxOAL	2 FL BALL Uncoated	3 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiAlN	3 FL BALL TiAlN	4 FL BALL TiAlN
1/32 x 3/32 x 1/8 x 1-1/2	ES01-0013	ES01-0014	ES01-0015A	ES01-0717	ES01-0718	ES01-0719
3/64 x 1/8 x 1/8 x 1-1/2	ES01-0016	ES01-0017	ES01-0018	ES01-0720	ES01-0721	ES01-0722
1/16 x 1/4 x 1/8 x 1-1/2	ES01-0005A	ES01-0006	ES01-0004A	ES01-0733	ES01-0734	ES01-0732
5/64 x 1/4 x 1/8 x 1-1/2	ES01-0019	ES01-0020	ES01-0021	ES01-0738	ES01-0739	ES01-0740
3/32 x 3/8 x 1/8 x 1-1/2	ES01-0029	ES01-0030	ES01-0028A	ES01-0745	ES01-0746	ES01-0744
7/64 x 3/8 x 1/8 x 1-1/2	ES01-0037	ES01-0038	ES01-0039	ES01-0750	ES01-0751	ES01-0752
1/8 x 1/2 x 1/8 x 1-1/2	ES01-0053A	ES01-0054	ES01-0052A	ES01-0757	ES01-0758	ES01-0756Q
9/64 x 9/16 x 3/16 x 2	ES01-0058	ES01-0059	ES01-0060	ES01-0771	ES01-0772	ES01-0773
5/32 x 9/16 x 3/16 x 2	ES01-0071	ES01-0072	ES01-0070	ES01-0769	ES01-0770	ES01-0768
11/64 x 9/16 x 3/16 x 2	ES01-0087	ES01-0095	ES01-0097	ES01-0783	ES01-0784	ES01-0785
3/16 x 5/8 x 3/16 x 2	ES01-0090A	ES01-0091	ES01-0089A	ES01-0781	ES01-0782	ES01-0780
13/64 x 5/8 x 1/4 x 2-1/2	ES01-0106	ES01-0113	ES01-0118	ES01-0786	ES01-0787	ES01-0788
7/32 x 5/8 x 1/4 x 2-1/2	ES01-0123	ES01-0124	ES01-0122	ES01-0793	ES01-0794	ES01-0792
15/64 x 3/4 x 1/4 x 2-1/2	ES01-0128	ES01-0129	ES01-0130	ES01-0798	ES01-0799	ES01-0800
1/4 x 3/4 x 1/4 x 2-1/2	ES01-0142A	ES01-0143	ES01-0141Q	ES01-0805	ES01-0806	ES01-0804
17/64 x 7/8 x 5/16 x 2-1/2	ES01-0153	ES01-0154	ES01-0155	ES01-0816	ES01-0817	ES01-0818
9/32 x 7/8 x 5/16 x 2-1/2	ES01-0156	ES01-0157	ES01-0158	ES01-0819	ES01-0820	ES01-0821
19/64 x 7/8 x 5/16 x 2-1/2	ES01-0159	ES01-0160	ES01-0161	ES01-0822	ES01-0823	ES01-0824
5/16 x 7/8 x 5/16 x 2-1/2	ES01-0182	ES01-0183	ES01-0181A	ES01-0829	ES01-0830	ES01-0828
21/64 x 7/8 x 3/8 x 2-1/2	ES01-0189	ES01-0190	ES01-0191	ES01-0840	ES01-0841	ES01-0842
11/32 x 7/8 x 3/8 x 2-1/2	ES01-0192	ES01-0193	ES01-0194	ES01-0843	ES01-0844	ES01-0845
23/64 x 7/8 x 3/8 x 2-1/2	ES01-0195	ES01-0196	ES01-0197	ES01-0846	ES01-0847	ES01-0848
3/8 x 7/8 x 3/8 x 2-1/2	ES01-0251	ES01-0252	ES01-0250Q	ES01-0853	ES01-0854	ES01-0852
25/64 x 7/8 x 7/16 x 2-1/2	ES01-0256	ES01-0257	ES01-0258	ES01-0864	ES01-0865	ES01-0866
13/32 x 7/8 x 7/16 x 2-1/2	ES01-0259	ES01-0260	ES01-0261	ES01-0867	ES01-0868	ES01-0869
27/64 x 7/8 x 7/16 x 2-1/2	ES01-0262	ES01-0263	ES01-0264	ES01-0870	ES01-0871	ES01-0872
7/16 x 1 x 7/16 x 2-1/2	ES01-0312	ES01-0313	ES01-0311	ES01-0877	ES01-0878	ES01-0876
29/64 x 1 x 1/2 x 3	ES01-0323	ES01-0324	ES01-0325	ES01-0888	ES01-0889	ES01-0890
15/32 x 1 x 1/2 x 3	ES01-0326	ES01-0327	ES01-0328	ES01-0891	ES01-0892	ES01-0893
31/64 x 1 x 1/2 x 3	ES01-0329	ES01-0330	ES01-0331	ES01-0894	ES01-0895	ES01-0896
1/2 x 1 x 1/2 x 3	ES01-0376	ES01-0377	ES01-0375Q	ES01-0901	ES01-0902	ES01-0900
9/16 x 1-1/4 x 9/16 x 3-1/2	ES01-0382	ES01-0383	ES01-0381	ES01-0907	ES01-0908	ES01-0906
5/8 x 1-1/4 x 5/8 x 3-1/2	ES01-0434	ES01-0435	ES01-0433	ES01-0913	ES01-0914	ES01-0912
11/16 x 1-1/2 x 3/4 x 4	ES01-0438	ES01-0445	ES01-0450	ES01-0918	ES01-0919	ES01-0920
3/4 x 1-1/2 x 3/4 x 4	ES01-0456	ES01-0457	ES01-0455	ES01-0925	ES01-0926	ES01-0924
7/8 x 1-1/2 x 7/8 x 4	ES01-0484	ES01-0485	ES01-0483	ES01-0931	ES01-0932	ES01-0930
1 x 1-1/2 x 1 x 4	ES01-0505	ES01-0506	ES01-0504	ES01-0937	ES01-0938	ES01-0936
1-1/4 x 2 x 1-1/4 x 4-1/2	ES01-0510	ES01-0511	ES01-0512	ES01-0942	ES01-0943	ES01-0944

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See page 6 for other coatings available.



SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiALN	4 FL SQ TiALN
1/8 x 5/8 x 1/8 x 2	ES02-0002	ES02-0001	ES02-0014	ES02-0013
1/8 x 3/4 x 1/8 x 2	ES02-0023	ES02-0024	ES02-0017	ES02-0018
1/8 x 1 x 1/8 x 3	ES02-0025	ES02-0026A	ES02-0019	ES02-0020
3/16 x 3/4 x 3/16 x 2-1/2	ES02-0027	ES02-0028	ES02-0021	ES02-0022
3/16 x 1-1/8 x 3/16 x 3	ES02-0034	ES02-0033	ES02-0046	ES02-0045
3/16 x 1 x 3/16 x 4	ES02-0029	ES02-0030	ES02-0049	ES02-0050
1/4 x 1-1/8 x 1/4 x 3	ES02-0031A	ES02-0032A	ES02-0051	ES02-0052
1/4 x 1 x 1/4 x 4	ES02-0066	ES02-0065	ES02-0078	ES02-0077
1/4 x 1-1/2 x 1/4 x 4	ES02-0082	ES02-0081	ES02-0094	ES02-0093
1/4 x 1-1/2 x 1/4 x 6	ES02-0097	ES02-0098	ES02-0101	ES02-0102
5/16 x 1-1/8 x 5/16 x 3	ES02-0099	ES02-0100	ES02-0103	ES02-0104
5/16 x 1 x 5/16 x 4	ES02-0114	ES02-0113	ES02-0126	ES02-0125
5/16 x 1-5/8 x 5/16 x 4	ES02-0130	ES02-0129	ES02-0142	ES02-0141
5/16 x 1-1/2 x 5/16 x 6	ES02-0061	ES02-0062	ES02-0147	ES02-0148
3/8 x 1-1/8 x 3/8 x 3	ES02-0063A	ES02-0064A	ES02-0151	ES02-0152Q
3/8 x 1-3/4 x 3/8 x 4	ES02-0378	ES02-0377	ES02-0390	ES02-0389
3/8 x 2 x 3/8 x 4	ES02-0146	ES02-0145	ES02-0158	ES02-0157
3/8 x 1-1/2 x 3/8 x 6	ES02-0165	ES02-0166	ES02-0177	ES02-0178
3/8 x 3 x 3/8 x 6	ES02-0167	ES02-0168	ES02-0179	ES02-0180
7/16 x 1 x 7/16 x 4	ES02-0169	ES02-0170	ES02-0181	ES02-0182
7/16 x 2 x 7/16 x 4	ES02-0171	ES02-0172	ES02-0183	ES02-0184
7/16 x 1-1/2 x 7/16 x 6	ES02-0173	ES02-0174	ES02-0185	ES02-0186
7/16 x 3 x 7/16 x 6	ES02-0175	ES02-0176	ES02-0187	ES02-0188
1/2 x 1 x 1/2 x 4	ES02-0266	ES02-0265	ES02-0278	ES02-0277
1/2 x 2 x 1/2 x 4	ES02-0394	ES02-0393A	ES02-0406	ES02-0405
1/2 x 1-1/2 x 1/2 x 6	ES02-0282	ES02-0281	ES02-0296	ES02-0295Q
1/2 x 3 x 1/2 x 6	ES02-0410	ES02-0409	ES02-0422	ES02-0421
5/8 x 2-1/4 x 5/8 x 5	ES02-0425A	ES02-0426A	ES02-0427	ES02-0428Q
5/8 x 3 x 5/8 x 6	ES02-0442	ES02-0441	ES02-0454	ES02-0453Q
3/4 x 2-1/4 x 3/4 x 5	ES02-0457A	ES02-0458A	ES02-0459	ES02-0460
3/4 x 3 x 3/4 x 6	ES02-0474	ES02-0473	ES02-0486	ES02-0485
1 x 2 x 1 x 6	ES02-0489	ES02-0490	ES02-0495	ES02-0496
1 x 3 x 1 x 6	ES02-0491A	ES02-0492A	ES02-0497	ES02-0498
1 x 4 x 1 x 6	ES02-0493	ES02-0494	ES02-0499	ES02-0500

Q = Quick Ship (Stock Item) Although we normally stock items, we do not have an unlimited supply. Please call to confirm quantities on hand before ordering.

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.



BALL END

ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiAlN	4 FL BALL TiAlN
1/8 x 5/8 x 1/8 x 2	ES02-0004	ES02-0003	ES02-0016	ES02-0015
1/8 x 3/4 x 1/8 x 2	ES02-0189	ES02-0190	ES02-0195	ES02-0196
1/8 x 1 x 1/8 x 3	ES02-0191	ES02-0192	ES02-0197	ES01-0198
3/16 x 3/4 x 3/16 x 2-1/2	ES02-0193	ES02-0194	ES02-0199	ES02-0200
3/16 x 1-1/8 x 3/16 x 3	ES02-0036	ES02-0035	ES02-0048	ES02-0047
3/16 x 1 x 3/16 x 4	ES02-0053	ES02-0054	ES02-0057	ES02-0058
1/4 x 1-1/8 x 1/4 x 3	ES02-0055A	ES02-0056A	ES02-0059	ES02-0060
1/4 x 1 x 1/4 x 4	ES02-0068	ES02-0067	ES02-0080	ES02-0079
1/4 x 1-1/2 x 1/4 x 4	ES02-0084	ES02-0083	ES02-0096	ES02-0095
1/4 x 1-1/2 x 1/4 x 6	ES02-0105	ES02-0106	ES02-0109	ES02-0110
5/16 x 1-1/8 x 5/16 x 3	ES02-0107	ES02-0108	ES02-0111	ES02-0112
5/16 x 1 x 5/16 x 4	ES02-0116	ES02-0115	ES02-0128	ES02-0127
5/16 x 1-5/8 x 5/16 x 4	ES02-0132	ES02-0131	ES02-0144	ES02-0143
5/16 x 1-1/2 x 5/16 x 6	ES02-0155	ES02-0156	ES02-0161	ES02-0162
3/8 x 1-1/8 x 3/8 x 3	ES02-0159A	ES02-0160A	ES02-0163	ES02-0164
3/8 x 1-3/4 x 3/8 x 4	ES02-0380	ES02-0379	ES02-0392	ES02-0391
3/8 x 2 x 3/8 x 4	ES02-0538	ES02-0537	ES02-0544	ES02-0543
3/8 x 1-1/2 x 3/8 x 6	ES02-0201	ES02-0202	ES02-0213	ES02-0214
3/8 x 3 x 3/8 x 6	ES02-0203	ES02-0204	ES02-0215	ES02-0216
7/16 x 1 x 7/16 x 4	ES02-0205	ES02-0206	ES02-0217	ES02-0218
7/16 x 2 x 7/16 x 4	ES02-0207	ES02-0208	ES02-0219	ES02-0220
7/16 x 1-1/2 x 7/16 x 6	ES02-0209	ES02-0210	ES02-0221	ES02-0222
7/16 x 3 x 7/16 x 6	ES02-0211	ES02-0212	ES02-0223	ES02-0224
1/2 x 1 x 1/2 x 4	ES02-0268	ES02-0267	ES02-0280	ES02-0279
1/2 x 2 x 1/2 x 4	ES02-0396	ES02-0395	ES02-0408	ES02-0407
1/2 x 1-1/2 x 1/2 x 6	ES02-0284	ES02-0283	ES02-0294	ES02-0293
1/2 x 3 x 1/2 x 6	ES02-0412	ES02-0411	ES02-0424	ES02-0423
5/8 x 2-1/4 x 5/8 x 5	ES02-0429A	ES02-0430A	ES02-0431	ES02-0432
5/8 x 3 x 5/8 x 6	ES02-0444	ES02-0443	ES02-0456	ES02-0455
3/4 x 2-1/4 x 3/4 x 5	ES02-0461A	ES02-0462A	ES02-0463	ES02-0464
3/4 x 3 x 3/4 x 6	ES02-0476	ES02-0475	ES02-0488	ES02-0487
1 x 2 x 1 x 6	ES02-0501	ES02-0502	ES02-0507	ES02-0508
1 x 3 x 1 x 6	ES02-0503A	ES02-0504A	ES02-0509	ES02-0510
1 x 4 x 1 x 6	ES02-0505	ES02-0506	ES02-0511	ES02-0512

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See page 6 for other coatings available.



SQUARE END

ODxLOCxShankODxOAL	Part No. Uncoated	Part No. TiAlN
3/16 x 5/8 x 3/16 x 2	ES03-0400	ES03-0401
1/4 x 3/4 x 1/4 x 2-1/2	ES03-0402	ES03-0403
5/16 x 7/8 x 5/16 x 2-1/2	ES03-0404	ES03-0405
3/8 x 1 x 3/8 x 2-1/2	ES03-0406	ES03-0407A
7/16 x 1 x 7/16 x 2-1/2	ES03-0408	ES03-0409
1/2 x 1 x 1/2 x 3	ES03-0410	ES03-0411
5/8 x 1-1/4 x 5/8 x 3-1/2	ES03-0412	ES03-0413
3/4 x 1-1/2 x 3/4 x 4	ES03-0414	ES03-0415
7/8 x 1-1/2 x 7/8 x 4	ES03-0416	ES03-0417

3/8 Common Shank Double End Endmills



SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiAlN	4 FL SQ TiAlN
1/8 x 3/8 x 3/8 x 3	ES03-0450	ES03-0451	ES03-0452	ES03-0453
3/16 x 1/2 x 3/8 x 3	ES03-0454	ES03-0455	ES03-0456	ES03-0457
7/32 x 9/16 x 3/8 x 3	ES03-0458	ES03-0459	ES03-0460	ES03-0461
1/4 x 5/8 x 3/8 x 3	ES03-0462	ES03-0463	ES03-0464	ES03-0465
5/16 x 3/4 x 3/8 x 3-1/2	ES03-0466	ES03-0467	ES03-0468	ES03-0469
3/8 x 3/4 x 3/8 x 3-1/2	ES03-0470	ES03-0471	ES03-0472	ES03-0473

BALL END



ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiAlN	4 FL BALL TiAlN
1/8 x 3/8 x 3/8 x 3	ES03-0474	ES03-0475	ES03-0476	ES03-0477
3/16 x 1/2 x 3/8 x 3	ES03-0478	ES03-0479	ES03-0480	ES03-0481
7/32 x 9/16 x 3/8 x 3	ES03-0482	ES03-0483	ES03-0484	ES03-0485
1/4 x 5/8 x 3/8 x 3	ES03-0486	ES03-0487	ES03-0488	ES03-0489
5/16 x 3/4 x 3/8 x 3-1/2	ES03-0490	ES03-0491	ES03-0492	ES03-0493
3/8 x 3/4 x 3/8 x 3-1/2	ES03-0494	ES03-0495	ES03-0496	ES03-0497

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SQUARE END



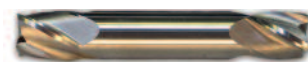
ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiAlN	4 FL SQ TiAlN
1/32 x 1/16 x 1/8 x 1-1/2	ES03-0001	ES03-0002	ES03-0003	ES03-0004
3/64 x 3/32 x 1/8 x 1-1/2	ES03-0005	ES03-0006	ES03-0007	ES03-0008
1/16 x 1/8 x 1/8 x 1-1/2	ES03-0009	ES03-0010	ES03-0011	ES03-0012
3/32 x 3/16 x 1/8 x 1-1/2	ES03-0013	ES03-0014	ES03-0015	ES03-0016
1/8 x 1/4 x 1/8 x 1-1/2	ES03-0082	ES03-0081	ES03-0094	ES03-0093
5/32 x 5/16 x 3/16 x 2	ES03-0077	ES03-0078	ES03-0079	ES03-0080
3/16 x 3/8 x 3/16 x 2	ES03-0098	ES03-0097	ES03-0110	ES03-0109
7/32 x 7/16 x 1/4 x 2	ES03-0113	ES03-0114	ES03-0115	ES03-0116
1/4 x 1/2 x 1/4 x 2	ES03-0130	ES03-0129	ES03-0142	ES03-0141
5/16 x 1/2 x 5/16 x 2	ES03-0146	ES03-0145	ES03-0158	ES03-0157
3/8 x 5/8 x 3/8 x 2	ES03-0162	ES03-0161	ES03-0182	ES03-0181
7/16 x 5/8 x 7/16 x 3	ES03-0165	ES03-0166	ES03-0167	ES03-0168
1/2 x 5/8 x 1/2 x 2-1/2	ES03-0186	ES03-0185	ES03-0206	ES03-0205
5/8 x 3/4 x 5/8 x 3	ES03-0189	ES03-0190	ES03-0191	ES03-0192
3/4 x 1 x 3/4 x 3	ES03-0193	ES03-0194	ES03-0209	ES03-0210
1 x 1 x 1 x 3	ES03-0211	ES03-0212	ES03-0213	ES03-0214

BALL END



ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiAlN	4 FL BALL TiAlN
1/32 x 1/16 x 1/8 x 1-1/2	ES03-0061	ES03-0062	ES03-0063	ES03-0064
3/64 x 3/32 x 1/8 x 1-1/2	ES03-0065	ES03-0066	ES03-0067	ES03-0068
1/16 x 1/8 x 1/8 x 1-1/2	ES03-0069	ES03-0070	ES03-0071	ES03-0072
3/32 x 3/16 x 1/8 x 1-1/2	ES03-0073	ES03-0074	ES03-0075	ES03-0076
1/8 x 1/4 x 1/8 x 1-1/2	ES03-0084	ES03-0083	ES03-0096	ES03-0095
5/32 x 5/16 x 3/16 x 2	ES03-0117	ES03-0118	ES03-0119	ES03-0120
3/16 x 3/8 x 3/16 x 2	ES03-0100	ES03-0099	ES03-0112	ES03-0111
7/32 x 7/16 x 1/4 x 2	ES03-0121	ES03-0122	ES03-0123	ES03-0124
1/4 x 1/2 x 1/4 x 2	ES03-0132	ES03-0131	ES03-0144	ES03-0143
5/16 x 1/2 x 5/16 x 2	ES03-0148	ES03-0147	ES03-0160	ES03-0159
3/8 x 5/8 x 3/8 x 2	ES03-0164	ES03-0163	ES03-0184	ES03-0183
7/16 x 5/8 x 7/16 x 3	ES03-0169	ES03-0170	ES03-0171	ES03-0172
1/2 x 5/8 x 1/2 x 2-1/2	ES03-0188	ES03-0187	ES03-0208	ES03-0207
5/8 x 3/4 x 5/8 x 3	ES03-0195	ES03-0196	ES03-0215	ES03-0216
3/4 x 1 x 3/4 x 3	ES03-0217	ES03-0218	ES03-0219	ES03-0220
1 x 1 x 1 x 3	ES03-0221	ES03-0222	ES03-0223	ES03-0224

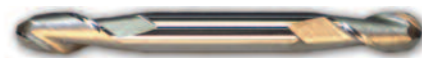
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See page 6 for other coatings available.



SQUARE END

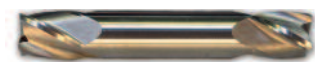
ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiALN	4 FL SQ TiALN
1/32 x 3/32 x 1/8 x 2	ES04-0049	ES04-0050	ES04-0051	ES04-0052
3/64 x 1/8 x 1/8 x 2	ES04-0053	ES04-0054	ES04-0055	ES04-0056
1/16 x 3/16 x 1/8 x 2	ES04-0057	ES04-0058	ES04-0059	ES04-0060
3/32 x 1/4 x 1/8 x 2	ES04-0061	ES04-0062	ES04-0063	ES04-0064
1/8 x 3/8 x 1/8 x 2	ES04-0066	ES04-0065	ES04-0078	ES04-0077
5/32 x 7/16 x 3/16 x 2-1/2	ES04-0081	ES04-0082	ES04-0083	ES04-0084
3/16 x 1/2 x 3/16 x 2-1/2	ES04-0098	ES04-0097	ES04-0110	ES04-0109
7/32 x 9/16 x 1/4 x 2-1/2	ES04-0085	ES04-0086	ES04-0087	ES04-0088
1/4 x 5/8 x 1/4 x 2-1/2	ES04-0130	ES04-0129	ES04-0142	ES04-0141
5/16 x 3/4 x 5/16 x 3-1/2	ES04-0146	ES04-0145	ES04-0158	ES04-0157
3/8 x 3/4 x 3/8 x 3-1/2	ES04-0162	ES04-0161	ES04-0174	ES04-0173
7/16 x 7/8 x 7/16 x 4	ES04-0189	ES04-0190	ES04-0191	ES04-0192
1/2 x 1 x 1/2 x 4	ES04-0194	ES04-0193	ES04-0206	ES04-0205
9/16 x 1-1/4 x 9/16 x 6	ES04-0209	ES04-0210	ES04-0211	ES04-0212
5/8 x 1-1/4 x 5/8 x 6	ES04-0226	ES04-0225	ES04-0238	ES04-0237
3/4 x 1-1/2 x 3/4 x 6	ES04-0242	ES04-0241	ES04-0254	ES04-0253
7/8 x 1-1/2 x 7/8 x 6	ES04-0257	ES04-0258	ES04-0259	ES04-0260
1 x 1-1/2 x 1 x 6	ES04-0261	ES04-0262	ES04-0263	ES04-0264

BALL END



ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiALN	4 FL BALL TiALN
1/32 x 3/32 x 1/8 x 2	ES04-0033	ES04-0034	ES04-0035	ES04-0036
3/64 x 1/8 x 1/8 x 2	ES04-0037	ES04-0038	ES04-0039	ES04-0040
1/16 x 3/16 x 1/8 x 2	ES04-0041	ES04-0042	ES04-0043	ES04-0044
3/32 x 1/4 x 1/8 x 2	ES04-0045	ES04-0046	ES04-0047	ES04-0048
1/8 x 3/8 x 1/8 x 2	ES04-0068	ES04-0067	ES04-0080	ES04-0079
5/32 x 7/16 x 3/16 x 2-1/2	ES04-0089	ES04-0090	ES04-0091	ES04-0092
3/16 x 1/2 x 3/16 x 2-1/2	ES04-0100	ES04-0099	ES04-0112	ES04-0111
7/32 x 9/16 x 1/4 x 2-1/2	ES04-0113	ES04-0114	ES04-0115	ES04-0116
1/4 x 5/8 x 1/4 x 2-1/2	ES04-0132	ES04-0131	ES04-0144	ES04-0143
5/16 x 3/4 x 5/16 x 3-1/2	ES04-0148	ES04-0147	ES04-0160	ES04-0159
3/8 x 3/4 x 3/8 x 3-1/2	ES04-0164	ES04-0163	ES04-0176	ES04-0175
7/16 x 7/8 x 7/16 x 4	ES04-0177	ES04-0178	ES04-0179	ES04-0180
1/2 x 1 x 1/2 x 4	ES04-0196	ES04-0195	ES04-0208	ES04-0207
9/16 x 1-1/4 x 9/16 x 6	ES04-0213	ES04-0214	ES04-0215	ES04-0216
5/8 x 1-1/4 x 5/8 x 6	ES04-0228	ES04-0227	ES04-0240	ES04-0239
3/4 x 1-1/2 x 3/4 x 6	ES04-0244	ES04-0243	ES04-0256	ES04-0255
7/8 x 1-1/2 x 7/8 x 6	ES04-0265	ES04-0266	ES04-0267	ES04-0268
1 x 1-1/2 x 1 x 6	ES04-0269	ES04-0270	ES04-0271	ES04-0272

See page 6 for other coatings available.



SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiAlN	4 FL SQ TiAlN
1/32 x 1/16 x 1/8 x 1-1/2	ES04-0500	ES04-0501	ES04-0502	ES04-0503
3/64 x 3/32 x 1/8 x 1-1/2	ES04-0504	ES04-0505	ES04-0506	ES04-0507
1/16 x 1/8 x 1/8 x 1-1/2	ES04-0508	ES04-0509	ES04-0510	ES04-0511
3/32 x 3/16 x 1/8 x 1-1/2	ES04-0512	ES04-0513	ES04-0514	ES04-0515
1/8 x 1/4 x 1/8 x 1-1/2	ES04-0516	ES04-0517A	ES04-0518	ES04-0519
5/32 x 5/16 x 3/16 x 2	ES04-0520	ES04-0521	ES04-0522	ES04-0523
3/16 x 3/8 x 3/16 x 2	ES04-0524	ES04-0525A	ES04-0526	ES04-0527
7/32 x 1/2 x 1/4 x 2-1/2	ES04-0528	ES04-0529	ES04-0530	ES04-0531
1/4 x 1/2 x 1/4 x 2-1/2	ES04-0532	ES04-0533A	ES04-0534	ES04-0535
5/16 x 1/2 x 5/16 x 2-1/2	ES04-0536	ES04-0537	ES04-0538	ES04-0539
3/8 x 1/2 x 3/8 x 2-1/2	ES04-0540	ES04-0541	ES04-0542	ES04-0543
7/16 x 1/2 x 7/16 x 2-1/2	ES04-0544	ES04-0545	ES04-0546	ES04-0547
1/2 x 5/8 x 1/2 x 3	ES04-0548	ES04-0549	ES04-0550	ES04-0551
5/8 x 3/4 x 5/8 x 4	ES04-0552	ES04-0553	ES04-0554	ES04-0555
3/4 x 1 x 3/4 x 4	ES04-0556	ES04-0557	ES04-0558	ES04-0559



BALL END

ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiAlN	4 FL BALL TiAlN
1/32 x 1/16 x 1/8 x 1-1/2	ES04-0600	ES04-0601	ES04-0602	ES04-0603
3/64 x 3/32 x 1/8 x 1-1/2	ES04-0604	ES04-0605	ES04-0606	ES04-0607
1/16 x 1/8 x 1/8 x 1-1/2	ES04-0608	ES04-0609	ES04-0610	ES04-0611
3/32 x 3/16 x 1/8 x 1-1/2	ES04-0612	ES04-0613	ES04-0614	ES04-0615
1/8 x 1/4 x 1/8 x 1-1/2	ES04-0616	ES04-0617	ES04-0618	ES04-0619
5/32 x 5/16 x 3/16 x 2	ES04-0620	ES04-0621	ES04-0622	ES04-0623
3/16 x 3/8 x 3/16 x 2	ES04-0624	ES04-0625	ES04-0626	ES04-0627
7/32 x 1/2 x 1/4 x 2-1/2	ES04-0628	ES04-0629	ES04-0630	ES04-0631
1/4 x 1/2 x 1/4 x 2-1/2	ES04-0632	ES04-0633	ES04-0634	ES04-0635
5/16 x 1/2 x 5/16 x 2-1/2	ES04-0636	ES04-0637	ES04-0638	ES04-0639
3/8 x 1/2 x 3/8 x 2-1/2	ES04-0640	ES04-0641	ES04-0642	ES04-0643
7/16 x 1/2 x 7/16 x 2-1/2	ES04-0644	ES04-0645	ES04-0646	ES04-0647
1/2 x 5/8 x 1/2 x 3	ES04-0648	ES04-0649	ES04-0650	ES04-0651
5/8 x 3/4 x 5/8 x 4	ES04-0652	ES04-0653	ES04-0654	ES04-0655
3/4 x 1 x 3/4 x 4	ES04-0656	ES04-0657	ES04-0658	ES04-0659

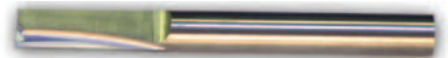
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See page 6 for other coatings available.



SQUARE END

ODxLOCxShankODxOAL	.015 2 FL	.015 4 FL	.020 2 FL	.020 4 FL	.030 2 FL	.030 4 FL	.045 2 FL	.045 4 FL	.060 2 FL	.060 4 FL
1/8 x 1/2 x 1/8 x 1-1/2	ES05-0002	ES05-0001	ES05-0004	ES05-0003	ES05-0006	ES05-0005	ES05-0008	ES05-0007	ES05-0010	ES05-0009
3/16 x 5/8 x 3/16 x 2	ES05-0012	ES05-0011	ES05-0014	ES05-0013	ES05-0016	ES05-0015	ES05-0018	ES05-0017	ES05-0020	ES05-0019
1/4 x 3/4 x 1/4 x 2-1/2	ES05-0022	ES05-0021	ES05-0024	ES05-0023	ES05-0026	ES05-0025	ES05-0028	ES05-0027	ES05-0030	ES05-0029
5/16 x 13/16 x 5/16 x 2-1/2	ES05-0032	ES05-0031	ES05-0034	ES05-0033	ES05-0036	ES05-0035	ES05-0038	ES05-0037	ES05-0040	ES05-0039
3/8 x 1 x 3/8 x 2-1/2	ES05-0042	ES05-0041	ES05-0044	ES05-0043	ES05-0046	ES05-0045	ES05-0048	ES05-0047	ES05-0050	ES05-0049
1/2 x 1 x 1/2 x 3	ES05-0052	ES05-0051	ES05-0054	ES05-0053	ES05-0056	ES05-0055	ES05-0058	ES05-0057	ES05-0060	ES05-0059
5/8 x 1-1/4 x 5/8 x 3-1/2	ES05-0062	ES05-0061	ES05-0064	ES05-0063	ES05-0066	ES05-0065	ES05-0068	ES05-0067	ES05-0070	ES05-0069
3/4 x 1-1/2 x 3/4 x 4	ES05-0072	ES05-0071	ES05-0074	ES05-0073	ES05-0076	ES05-0075	ES05-0078	ES05-0077	ES05-0080	ES05-0079

Straight Flute Endmills



SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiAlN	4 FL SQ TiAlN
1/8 x 1/2 x 1/8 x 1-1/2	ES05-0081	ES05-0082	ES05-0083	ES05-0084
3/16 x 5/8 x 3/16 x 2	ES05-0085	ES05-0086	ES05-0087	ES05-0088
7/32 x 5/8 x 1/4 x 2-1/2	ES05-0089	ES05-0090	ES05-0091	ES05-0092
1/4 x 3/4 x 1/4 x 2-1/2	ES05-0093	ES05-0094	ES05-0095	ES05-0096
5/16 x 13/16 x 5/16 x 2-1/2	ES05-0097	ES05-0098	ES05-0099	ES05-0100
3/8 x 1 x 3/8 x 2-1/2	ES05-0101	ES05-0102	ES05-0103	ES05-0104
1/2 x 1 x 1/2 x 3	ES05-0105	ES05-0106	ES05-0107	ES05-0108
5/8 x 1-1/4 x 5/8 x 3-1/2	ES05-0109	ES05-0110	ES05-0111	ES05-0112

BALL END

ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiAlN	4 FL BALL TiAlN
1/8 x 1/2 x 1/8 x 1-1/2	ES05-0113	ES05-0114	ES05-0115	ES05-0116
3/16 x 5/8 x 3/16 x 2	ES05-0117	ES05-0118	ES05-0119	ES05-0120
7/32 x 5/8 x 1/4 x 2-1/2	ES05-0121	ES05-0122	ES05-0123	ES05-0124
1/4 x 3/4 x 1/4 x 2-1/2	ES05-0125	ES05-0126	ES05-0127	ES05-0128
5/16 x 13/16 x 5/16 x 2-1/2	ES05-0129	ES05-0130	ES05-0131	ES05-0132
3/8 x 1 x 3/8 x 2-1/2	ES05-0133	ES05-0134	ES05-0135	ES05-0136
1/2 x 1 x 1/2 x 3	ES05-0137	ES05-0138	ES05-0139	ES05-0140
5/8 x 1-1/4 x 5/8 x 3-1/2	ES05-0141	ES05-0142	ES05-0143	ES05-0144

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.

MEDIUM PITCH ROUGHER

For maximum stock removal of mild, stainless, and hardened steels and alloys.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
1/4 x 3/4 x 1/4 x 2-1/2	3	ES08-0001	3	ES08-0010
5/16 x 3/4 x 5/16 x 2-1/2	3	ES08-0013	3	ES08-0022
3/8 x 7/8 x 3/8 x 2-1/2	3	ES08-0025	3	ES08-0034
1/2 x 1 x 1/2 x 3	4	ES08-0037	4	ES08-0046
5/8 x 1-1/4 x 5/8 x 3-1/2	4	ES08-0049	4	ES08-0058
3/4 x 1-1/2 x 3/4 x 4	4	ES08-0061	4	ES08-0070
1 x 1-1/2 x 1 x 4	5	ES08-0073	5	ES08-0082

FINE PITCH ROUGHER

For maximum stock removal of titanium, inconel, waspaloy and other advanced materials.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
1/4 x 3/4 x 1/4 x 2-1/2	3	ES08-0002	3	ES08-0011
5/16 x 3/4 x 5/16 x 2-1/2	3	ES08-0014	3	ES08-0023
3/8 x 7/8 x 3/8 x 2-1/2	3	ES08-0026	3	ES08-0035
1/2 x 1 x 1/2 x 3	4	ES08-0038	4	ES08-0047
5/8 x 1-1/4 x 5/8 x 3-1/2	4	ES08-0050	4	ES08-0059
3/4 x 1-1/2 x 3/4 x 4	4	ES08-0062	4	ES08-0071
1 x 1-1/2 x 1 x 4	6	ES08-0074	6	ES08-0083

COARSE PITCH ROUGHER

For maximum stock removal of aluminum, brass, bronze, and other lightweight alloys.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
1/4 x 3/4 x 1/4 x 2-1/2	3	ES08-0003	3	ES08-0012
5/16 x 3/4 x 5/16 x 2-1/2	3	ES08-0015	3	ES08-0024
3/8 x 7/8 x 3/8 x 2-1/2	3	ES08-0027	3	ES08-0036
1/2 x 1 x 1/2 x 3	3	ES08-0039	3	ES08-0048
5/8 x 1-1/4 x 5/8 x 3-1/2	3	ES08-0051	3	ES08-0060
3/4 x 1-1/2 x 3/4 x 4	3	ES08-0063	3	ES08-0072
1 x 1-1/2 x 1 x 4	3	ES08-0075	3	ES08-0084

Rougher Use: Rougher or Hoggers are useful for rapid removal of large amounts of material. The Chip Breaker design allows for more cutting fluid to the cutting edge and dissipates heat better. There is a wide range of variations in rougher profile forms for different material groups. The coarser the pitch of the roughing edge, the more material removed the rougher the finish will be. In addition most roughers have eccentric relief so regrinding can be only done on the face of the flute.

60° 3 FLUTE HIGH HELIX TWISTERMILL

Designed for high speed milling of inconel, titanium, stainless, and steel alloys.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
1/4 x 3/4 x 1/4 x 2-1/2	3	ES07-0002	3	ES07-0008
5/16 x 13/16 x 5/16 x 2-1/2	3	ES07-0010	3	ES07-0016
3/8 x 1 x 3/8 x 2-1/2	3	ES07-0018	3	ES07-0024
1/2 x 1 x 1/2 x 3	3	ES07-0026	3	ES07-0032
5/8 x 1-1/4 x 5/8 x 3-1/2	3	ES07-0034	3	ES07-0040
3/4 x 1-1/2 x 3/4 x 4	3	ES07-0042	3	ES07-0048

55° 2 FLUTE HIGH HELIX ALUMAZIPS

Designed for high speed milling of aluminum.

ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
1/8 x 1/2 x 1/8 x 1-1/2	2	ES07-0049	2	ES07-0050
5/32 x 9/16 x 5/32 x 2	2	ES07-0051	2	ES07-0052
3/16 x 3/4 x 3/16 x 2	2	ES07-0053	2	ES07-0054
1/4 x 3/4 x 1/4 x 2-1/2	2	ES07-0055	2	ES07-0056
5/16 x 3/4 x 5/16 x 2-1/2	2	ES07-0057	2	ES07-0058
3/8 x 7/8 x 3/8 x 2-1/2	2	ES07-0059	2	ES07-0060
1/2 x 1 x 1/2 x 3	2	ES07-0061	2	ES07-0062
9/16 x 1-1/4 x 9/16 x 3	2	ES07-0063	2	ES07-0064
5/8 x 1-1/4 x 3/4 x 3-1/2	2	ES07-0065	2	ES07-0066
3/4 x 1-1/2 x 3/4 x 4	2	ES07-0067	2	ES07-0068
1 x 1-1/2 x 1 x 4	2	ES07-0069	2	ES07-0070

45° 2 FLUTE HIGH HELIX HYPERMILL

Designed for high speed milling of aluminum.

ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
1/4 x 1 x 1/4 x 2-1/2	2	ES07-0001	2	ES07-0007
5/16 x 1 x 5/16 x 2-1/2	2	ES07-0009	2	ES07-0015
3/8 x 1 x 3/8 x 2-1/2	2	ES07-0017	2	ES07-0023
1/2 x 1-1/4 x 1/2 x 3	2	ES07-0025	2	ES07-0031
5/8 x 1-5/8 x 5/8 x 3-1/2	2	ES07-0033	2	ES07-0039
3/4 x 1-3/4 x 3/4 x 4	2	ES07-0041	2	ES07-0047

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.

ODxApprox. Flute LengthxOAL	Part No. Square	Part No. Ball
1/4 x 5 x 1/8 x 3/4 x 3	ES07-0500	ES07-0550
1/4 x 7 x 1/8 x 1/2 x 3	ES07-0501	ES07-0551
1/4 x 10 x 3/32 x 1/2 x 3	ES07-0502	ES07-0552
3/8 x 5 x 1/8 x 1-1/2 x 3-1/2	ES07-0503	ES07-0553
3/8 x 7 x 1/8 x 3/4 x 3-1/2	ES07-0504	ES07-0554
3/8 x 10 x 1/8 x 3/4 x 3-1/2	ES07-0505	ES07-0555
1/2 x 5 x 1/4 x 1-1/4 x 4	ES07-0506	ES07-0556
1/2 x 7 x 3/16 x 1-1/4 x 4	ES07-0507	ES07-0557
1/2 x 10 x 1/8 x 1 x 4	ES07-0508	ES07-0558



2 Flute Drill Mills

ODxApprox. Flute LengthxOAL	2 FL SQ Uncoated	2 FL SQ TiAlN
1/8 x 1/2 x 1/8 x 1-1/2	ES07-0600	ES07-0601
3/16 x 5/8 x 3/16 x 2	ES07-0602	ES07-0603
1/4 x 3/4 x 1/4 x 2-1/2	ES07-0604	ES07-0605
5/16 x 7/8 x 5/16 x 2-1/2	ES07-0606	ES07-0607
3/8 x 7/8 x 3/8 x 2-1/2	ES07-0608	ES07-0609
7/16 x 1 x 7/16 x 2-1/2	ES07-0610	ES07-0611
1/2 x 1 x 1/2 x 3	ES07-0612	ES07-0613
5/8 x 1-1/4 x 5/8 x 3-1/2	ES07-0614	ES07-0615
3/4 x 1-1/2 x 3/4 x 4	ES07-0616	ES07-0617



Engraving Tools

ODxApprox. Flute LengthxOAL	Part No. Single End	Part No. Double End
1/8 x 1-1/2 x 3/8	ES07-0700	ES07-0710
1/8 x 2 x 3/8	ES07-0701	ES07-0711
3/16 x 2 x 1/2	ES07-0702	ES07-0712
1/4 x 2 x 1/2	ES07-0703	ES07-0713
1/4 x 2-1/2 x 1/2	ES07-0704	ES07-0714
1/4 x 3 x 1/2	ES07-0705	ES07-0715
5/16 x 2-1/2 x 1/2	ES07-0706	ES07-0716
3/8 x 2-1/2 x 1/2	ES07-0707	ES07-0717
7/16 x 3 x 1/2	ES07-0708	ES07-0718
1/2 x 3 x 1/2	ES07-0709	ES07-0719



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See page 6 for other coatings available.

ODxOAL	Part No.	ODxOAL	Part No.	ODxOAL	Part No.
.0925 x 1-1/2	ES11-0001	1/4 x 2	ES11-0009	3/8 x 4	ES11-0017
3/32 x 1-1/2	ES11-0002	1/4 x 2-1/2	ES11-0010	1/2 x 3	ES11-0018
3/32 x 2	ES11-0003	1/4 x 3	ES11-0011	1/2 x 4	ES11-0019
1/8 x 1-1/2	ES11-0004	1/4 x 12	ES11-0012	1/2 x 6	ES11-0020
1/8 x 2	ES11-0005	5/16 x 2-1/2	ES11-0013	5/8 x 3-1/2	ES11-0021
1/8 x 3	ES11-0006	5/16 x 3	ES11-0014	5/8 x 6	ES11-0022
1/8 x 12	ES11-0007	3/8 x 2-1/2	ES11-0015	3/4 x 4	ES11-0023
3/16 x 2	ES11-0008	3/8 x 3	ES11-0016	3/4 x 6	ES11-0024

Carbide Countersinks

Brazed to steel shank



Dimensions	Flutes	Part No. 60°	Part No. 82°	Part No. 90°
1/8 x 1/8 x 1-1/2	1	ES31-0001	ES31-0002	ES31-0003
1/8 x 1/8 x 1-1/2	3	ES31-0004	ES31-0005	ES31-0006
1/8 x 1/8 x 1-1/2	6	ES31-0007	ES31-0008	ES31-0009
3/16 x 3/16 x 2	1	ES31-0010	ES31-0011	ES31-0012
3/16 x 3/16 x 2	3	ES31-0013	ES31-0014	ES31-0015
3/16 x 3/16 x 2	6	ES31-0016	ES31-0017	ES31-0018
1/4 x 1/4 x 2	1	ES31-0019	ES31-0020	ES31-0021
1/4 x 1/4 x 2	3	ES31-0022	ES31-0023	ES31-0024
1/4 x 1/4 x 2	6	ES31-0025	ES31-0026	ES31-0027
3/8 x 1/4 x 2-5/8	1	ES31-0028	ES31-0029	ES31-0030
3/8 x 1/4 x 2-5/8	3	ES31-0031	ES31-0032	ES31-0033
3/8 x 1/4 x 2-5/8	6	ES31-0034	ES31-0035	ES31-0036
1/2 x 1/4 x 2-7/8	1	ES31-0037	ES31-0038	ES31-0039
1/2 x 1/4 x 2-7/8	3	ES31-0040	ES31-0041	ES31-0042
1/2 x 1/4 x 2-7/8	6	ES31-0043	ES31-0044	ES31-0045
5/8 x 3/8 x 3	1	ES31-0046	ES31-0047	ES31-0048
5/8 x 3/8 x 3	3	ES31-0049	ES31-0050	ES31-0051
5/8 x 3/8 x 3	6	ES31-0052	ES31-0053	ES31-0054
3/4 x 1/2 x 3	1	ES31-0055	ES31-0056	ES31-0057
3/4 x 1/2 x 3	3	ES31-0058	ES31-0059	ES31-0060
3/4 x 1/2 x 3	6	ES31-0061	ES31-0062	ES31-0063
1 x 1/2 x 3-1/4	1	ES31-0064	ES31-0065	ES31-0066
1 x 1/2 x 3-1/4	3	ES31-0067	ES31-0068	ES31-0069
1 x 1/2 x 3-1/4	6	ES31-0070	ES31-0071	ES31-0072

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See page 6 for other coatings available.



2 FLUTE - 118° FOUR FACET POINT

Description	Part No.
70 .0280 x 5/16 x .0280 x 1-1/4	ES12-0001
69 .0292 x 5/16 x .0292 x 1-1/4	ES12-0002
68 .0310 x 5/16 x .0310 x 1-1/4	ES12-0003
1/32 x 5/16 x 1/32 x 1-1/4	ES12-0004
67 .0320 x 5/16 x .0320 x 1-1/4	ES12-0005
66 .0330 x 5/16 x .0330 x 1-1/4	ES12-0006
65 .0350 x 5/8 x .0350 x 1-1/2	ES12-0007
64 .0360 x 5/8 x .0360 x 1-1/2	ES12-0008
63 .0370 x 5/8 x .0370 x 1-1/2	ES12-0009
62 .0380 x 5/8 x .0380 x 1-1/2	ES12-0010
61 .0390 x 5/8 x .0390 x 1-1/2	ES12-0011
.0394 x 5/8 x .0394 x 1-1/2	ES12-0012
60 .0400 x 3/4 x .0400 x 1-1/2	ES12-0013
59 .0410 x 3/4 x .0410 x 1-1/2	ES12-0014
58 .0420 x 3/4 x .0420 x 1-1/2	ES12-0015
57 .0430 x 3/4 x .0430 x 1-1/2	ES12-0016
56 .0465 x 3/4 x .0465 x 1-1/2	ES12-0017
3/64 x 3/4 x 3/64 x 1-1/2	ES12-0018
55 .0520 x 3/4 x .0520 x 1-1/2	ES12-0019
54 .0550 x 3/4 x .0550 x 1-1/2	ES12-0020
.0591 x 3/4 x .0591 x 1-1/2	ES12-0021
53 .0595 x 3/4 x .0595 x 1-1/2	ES12-0022
1/16 x 3/4 x 1/16 x 1-1/2	ES12-0023
52 .0635 x 3/4 x .0635 x 1-1/2	ES12-0024
51 .0670 x 3/4 x .0670 x 1-1/2	ES12-0025
50 .0700 x 7/8 x .0700 x 1-3/4	ES12-0026
49 .0730 x 7/8 x .0730 x 1-3/4	ES12-0027
48 .0760 x 7/8 x .0760 x 1-3/4	ES12-0028
5/64 x 7/8 x 5/64 x 1-3/4 2FL	ES12-0029
47 .0785 x 7/8 x .0785 x 1-3/4	ES12-0030
.0787 x 7/8 x .0787 x 1-3/4	ES12-0031
46 .0810 x 7/8 x .0810 x 1-3/4	ES12-0032
45 .0820 x 7/8 x .0820 x 1-3/4	ES12-0033
44 .0860 x 1 x .0860 x 2	ES12-0034
43 .0890 x 1 x .0890 x 2	ES12-0035
42 .0935 x 1 x .0935 x 2	ES12-0036
3/32 x 1 x 3/32 x 2	ES12-0037
41 .0960 x 1 x .0960 x 2	ES12-0038
40 .0980 x 1 x .0980 x 2	ES12-0039
.0984 x 1 x .0984 x 2	ES12-0040

Description	Part No.
39 .0995 x 1-1/4 x .0995 x 2-1/4	ES12-0041
38 .1015 x 1-1/4 x .1015 x 2-1/4	ES12-0043
37 .1040 x 1-1/4 x .1040 x 2-1/4	ES12-0044
36 .1065 x 1-1/4 x .1065 x 2-1/4	ES12-0045
7/64 x 1-1/4 x 7/64 x 2-1/4	ES12-0046
35 .1100 x 1-1/4 x .1100 x 2-1/4	ES12-0047
34 .1110 x 1-1/4 x .1110 x 2-1/4	ES12-0048
33 .1130 x 1-1/4 x .1130 x 2-1/4	ES12-0049
32 .1160 x 1-1/4 x .1160 x 2-1/4	ES12-0050
.1181 x 1-1/4 x .1181 x 2-1/4	ES12-0051
31 .1200 x 1-1/4 x .1200 x 2-1/4	ES12-0052
1/8 x 1-1/4 x 1/8 x 2-1/4	ES12-0053
30 .1285 x 1-3/8 x .1285 x 2-1/2	ES12-0054
29 .1360 x 1-3/8 x .1285 x 2-1/2	ES12-0055
.1378 x 1-3/8 x .1378 x 2-1/2	ES12-0056
28 .1405 x 1-3/8 x .1405 x 2-1/2	ES12-0057
9/64 x 1-3/8 x 9/64 x 2-1/2	ES12-0058
27 .1440 x 1-3/8 x .1440 x 2-1/2	ES12-0059
26 .1470 x 1-3/8 x .1470 x 2-1/2	ES12-0060
25 .1495 x 1-3/8 x .1495 x 2-1/2	ES12-0061
24 .1520 x 1-3/8 x .1520 x 2-1/2	ES12-0062
23 .1540 x 1-3/8 x .1540 x 2-1/2	ES12-0063
5/32 x 1-3/8 x 5/32 x 2-1/2	ES12-0064
22 .1570 x 1-3/8 x .1570 x 2-1/2	ES12-0065
.1575 x 1-3/8 x .1575 x 2-1/2	ES12-0066
21 .1590 x 1-3/8 x .1590 x 2-1/2	ES12-0067
20 .1610 x 1-3/8 x .1610 x 2-1/2	ES12-0068
19 .1660 x 1-5/8 x .1660 x 2-3/4	ES12-0069
18 .1695 x 1-5/8 x .1695 x 2-3/4	ES12-0070
11/64 x 1-5/8 x 11/64 x 2-3/4	ES12-0071
17 .1730 x 1-5/8 x .1730 x 2-3/4	ES12-0072
16 .1770 x 1-5/8 x .1770 x 2-3/4	ES12-0073
.1772 x 1-5/8 x .1772 x 2-3/4	ES12-0074
15 .1800 x 1-5/8 x .1800 x 2-3/4	ES12-0075
14 .1820 x 1-5/8 x .1820 x 2-3/4	ES12-0076
13 .1850 x 1-5/8 x .1850 x 2-3/4	ES12-0077
3/16 x 1-5/8 x 3/16 x 2-3/4	ES12-0078
12 .1890 x 1-5/8 x .1890 x 2-3/4	ES12-0079
11 .1910 x 1-5/8 x .1910 x 2-3/4	ES12-0080
10 .1935 x 1-5/8 x .1935 x 2-3/4	ES12-0081

Coolant Holes are available! Contact your Local Account Executive or Sales Representative

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See page 6 for other coatings available.



2 FLUTE - 118° FOUR FACET POINT

Description	Part No.	Description	Part No.
9 .1960 x 1-3/4 x .1960 x 3	ES12-0082	Q .3320 x 2-3/8 x .3320 x 4	ES12-0122
.1968 x 1-3/4 x .1968 x 3	ES12-0083	.3346 x 2-3/8 x .3346 x 4	ES12-0123
8 .1990 x 1-3/4 x .1990 x 3	ES12-0084	R .3390 x 2-3/8 x .3390 x 4	ES12-0124
7 .2010 x 1-3/4 x .2010 x 3	ES12-0085	11/32 x 2-3/8 x 11/32 x 4	ES12-0125
13/64 x 1-3/4 x 13/64 x 3	ES12-0086	S .3480 x 2-3/8 x .3480 x 4	ES12-0126
6 .2040 x 1-3/4 x .2040 x 3	ES12-0087	.3543 x 2-3/4 x .3543 x 4-1/4	ES12-0127
5 .2055 x 1-3/4 x .2055 x 3	ES12-0088	T .3580 x 2-3/4 x .3580 x 4-1/4	ES12-0128
4 .2090 x 1-3/4 x .2090 x 3	ES12-0089	23/64 x 2-3/4 x 23/64 x 4-1/4	ES12-0129
3 .2130 x 1-3/4 x .2130 x 3	ES12-0090	U .3680 x 2-3/4 x .3680 x 4-1/4	ES12-0130
.2165 x 1-3/4 x .2165 x 3	ES12-0091	.3740 x 2-3/4 x .3740 x 4-1/4	ES12-0131
7/32 x 1-3/4 x 7/32 x 3	ES12-0092	3/8 x 2-3/4 x 3/8 x 4-1/4	ES12-0132
2 .2210 x 1-3/4 x .2210 x 3	ES12-0093	V .3770 x 2-3/4 x .3770 x 4-1/4	ES12-0133
1 .2280 x 1-3/4 x .2280 x 3	ES12-0094	W .3860 x 2-7/8 x .3860 x 4-1/2	ES12-0134
A .2340 x 2 x .2340 x 3-1/4	ES12-0095	25/64 x 2-7/8 x 25/64 x 4-1/2	ES12-0135
15/64 x 2 x 15/64 x 3-1/4	ES12-0096	.3937 x 2-7/8 x .3937 x 4-1/2	ES12-0136
.2362 x 2 x .2362 x 3-1/4	ES12-0097	X .3970 x 2-7/8 x .3970 x 4-1/2	ES12-0137
B .2380 x 2 x .2380 x 3-1/4	ES12-0098	Y .4040 x 2-7/8 x .4040 x 4-1/2	ES12-0138
C .2420 x 2 x .2420 x 3-1/4	ES12-0099	13/32 x 2-7/8 x 13/32 x 4-1/2	ES12-0139
D .2460 x 2 x .2460 x 3-1/4	ES12-0100	Z .4130 x 2-7/8 x .4130 x 4-1/2	ES12-0140
E 1/4 x 2 x 1/4 x 3-1/4	ES12-0101	.4134 x 2-7/8 x .4134 x 4-1/2	ES12-0141
.2559 x 2 x .2559 x 3-1/4	ES12-0102	27/64 x 2-7/8 x 27/64 x 4-1/2	ES12-0142
F .2570 x 2 x .2570 x 3-1/4	ES12-0103	.4331 x 2-7/8 x .4331 x 4-1/2	ES12-0143
G .2610 x 2-1/8 x .2610 x 3-1/2	ES12-0104	7/16 x 2-7/8 x 7/16 x 4-1/2	ES12-0144
17/64 x 2-1/8 x 17/64 x 3-1/2	ES12-0105	.4527 x 3 x .4527 x 4-3/4	ES12-0145
H .2660 x 2-1/8 x .2660 x 3-1/2	ES12-0106	29/64 x 3 x 29/64 x 4-3/4	ES12-0146
I .2720 x 2-1/8 x .2720 x 3-1/2	ES12-0107	15/32 x 3 x 15/32 x 4-3/4	ES12-0147
.2756 x 2-1/8 x .2756 x 3-1/2	ES12-0108	.4724 x 3 x .4724 x 4-3/4	ES12-0148
J .2770 x 2-1/8 x .2770 x 3-1/2	ES12-0109	31/64 x 3 x 31/64 x 4-3/4	ES12-0149
K .2810 x 2-1/8 x .2810 x 3-1/2	ES12-0110	.4921 x 3 x .4921 x 4-3/4	ES12-0150
9/32 x 2-1/8 x 9/32 x 3-1/2	ES12-0111	1/2 x 3 x 1/2 x 4-3/4	ES12-0151
L .2900 x 2-1/8 x .2900 x 3-1/2	ES12-0112	17/32 x 4 x 17/32 x 6	ES12-0152
M .2950 x 2-3/8 x .2950 x 4	ES12-0113	9/16 x 4 x 9/16 x 6	ES12-0153
.2953 x 2-3/8 x .2953 x 4	ES12-0114	19/32 x 4 x 19/32 x 6	ES12-0154
19/64 x 2-3/8 x 19/64 x 4	ES12-0115	5/8 x 4 x 5/8 x 6	ES12-0155
N .3020 x 2-3/8 x .2030 x 4	ES12-0116	21/32 x 4 x 21/32 x 6	ES12-0156
5/16 x 2-3/8 x 5/16 x 4	ES12-0117	11/16 x 4 x 11/16 x 6	ES12-0157
.3150 x 2-3/8 x .3150 x 4	ES12-0118	23/32 x 4 x 23/32 x 6	ES12-0158
O .3160 x 2-3/8 x .3160 x 4	ES12-0119	3/4 x 4 x 3/4 x 6	ES12-0159
P .3230 x 2-3/8 x .3230 x 4	ES12-0120	7/8 x 4 x 7/8 x 6	ES12-0160
21/64 x 2-3/8 x 21/64 x 4	ES12-0121	1 x 4 x 1 x 6	ES12-0042

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3 FLUTE - 130° HIGH PERFORMANCE POINT

Description	Part No.	Description	Part No.
1/8 x 1-1/4 x 1/8 x 2-1/4	ES12-0500	10 .1935 x 1-5/8 x .1935 x 2-3/4	ES12-0528
30 .1285 x 1-3/8 x .1285 x 2-1/2	ES12-0501	9 .1960 x 1-3/4 x .1960 x 3	ES12-0529
29 .1360 x 1-3/8 x .1285 x 2-1/2	ES12-0502	.1968 x 1-3/4 x .1968 x 3	ES12-0530
.1378 x 1-3/8 x .1378 x 2-1/2	ES12-0503	8 .1990 x 1-3/4 x .1990 x 3	ES12-0531
28 .1405 x 1-3/8 x .1405 x 2-1/2	ES12-0504	7 .2010 x 1-3/4 x .2010 x 3	ES12-0532
9/64 x 1-3/8 x 9/64 x 2-1/2	ES12-0505	13/64 x 1-3/4 x 13/64 x 3	ES12-0533
27 .1440 x 1-3/8 x .1440 x 2-1/2	ES12-0506	6 .2040 x 1-3/4 x .2040 x 3	ES12-0534
26 .1470 x 1-3/8 x .1470 x 2-1/2	ES12-0507	5 .2055 x 1-3/4 x .2055 x 3	ES12-0535
25 .1495 x 1-3/8 x .1495 x 2-1/2	ES12-0508	4 .2090 x 1-3/4 x .2090 x 3	ES12-0536
24 .1520 x 1-3/8 x .1520 x 2-1/2	ES12-0509	3 .2130 x 1-3/4 x .2130 x 3	ES12-0537
23 .1540 x 1-3/8 x .1540 x 2-1/2	ES12-0510	.2165 x 1-3/4 x .2165 x 3	ES12-0538
5/32 x 1-3/8 x 5/32 x 2-1/2	ES12-0511	7/32 x 1-3/4 x 7/32 x 3	ES12-0539
22 .1570 x 1-3/8 x .1570 x 2-1/2	ES12-0512	2 .2210 x 1-3/4 x .2210 x 3	ES12-0540
.1575 x 1-3/8 x .1575 x 2-1/2	ES12-0513	1 .2280 x 1-3/4 x .2280 x 3	ES12-0541
21 .1590 x 1-3/8 x .1590 x 2-1/2	ES12-0514	A .2340 x 2 x .2340 x 3-1/4	ES12-0542
20 .1610 x 1-3/8 x .1610 x 2-1/2	ES12-0515	15/64 x 2 x 15/64 x 3-1/4	ES12-0543
19 .1660 x 1-5/8 x .1660 x 2-3/4	ES12-0516	.2362 x 2 x .2362 x 3-1/4	ES12-0544
18 .1695 x 1-5/8 x .1695 x 2-3/4	ES12-0517	B .2380 x 2 x .2380 x 3-1/4	ES12-0545
11/64 x 1-5/8 x 11/64 x 2-3/4	ES12-0518	C .2420 x 2 x .2420 x 3-1/4	ES12-0546
17 .1730 x 1-5/8 x .1730 x 2-3/4	ES12-0519	D .2460 x 2 x .2460 x 3-1/4	ES12-0547
16 .1770 x 1-5/8 x .1770 x 2-3/4	ES12-0520	E 1/4 x 2 x 1/4 x 3-1/4	ES12-0548
.1772 x 1-5/8 x .1772 x 2-3/4	ES12-0521	.2559 x 2 x .2559 x 3-1/4	ES12-0549
15 .1800 x 1-5/8 x .1800 x 2-3/4	ES12-0522	F .2570 x 2 x .2570 x 3-1/4	ES12-0550
14 .1820 x 1-5/8 x .1820 x 2-3/4	ES12-0523	G .2610 x 2-1/8 x .2610 x 3-1/2	ES12-0551
13 .1850 x 1-5/8 x .1850 x 2-3/4	ES12-0524	17/64 x 2-1/8 x 17/64 x 3-1/2	ES12-0552
3/16 x 1-5/8 x 3/16 x 2-3/4	ES12-0525	H .2660 x 2-1/8 x .2660 x 3-1/2	ES12-0553
12 .1890 x 1-5/8 x .1890 x 2-3/4	ES12-0526	I .2720 x 2-1/8 x .2720 x 3-1/2	ES12-0554
11 .1910 x 1-5/8 x .1910 x 2-3/4	ES12-0527	.2756 x 2-1/8 x .2756 x 3-1/2	ES12-0555

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3 FLUTE - 130° HIGH PERFORMANCE POINT

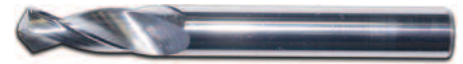


Description	Part No.	Description	Part No.
J .2770 x 2-1/8 x .2770 x 3-1/2	ES12-0556	.3937 x 2-7/8 x .3937 x 4-1/2	ES12-0583
K .2810 x 2-1/8 x .2810 x 3-1/2	ES12-0557	X .3970 x 2-7/8 x .3970 x 4-1/2	ES12-0584
9/32 x 2-1/8 x 9/32 x 3-1/2	ES12-0558	Y .4040 x 2-7/8 x .4040 x 4-1/2	ES12-0585
L .2900 x 2-1/8 x .2900 x 3-1/2	ES12-0559	13/32 x 2-7/8 x 13/32 x 4-1/2	ES12-0586
M .2950 x 2-3/8 x .2950 x 4	ES12-0560	Z .4130 x 2-7/8 x .4130 x 4-1/2	ES12-0587
.2953 x 2-3/8 x .2953 x 4	ES12-0561	.4134 x 2-7/8 x .4134 x 4-1/2	ES12-0588
19/64 x 2-3/8 x 19/64 x 4	ES12-0562	27/64 x 2-7/8 x 27/64 x 4-1/2	ES12-0589
N .3020 x 2-3/8 x .2030 x 4	ES12-0563	.4331 x 2-7/8 x .4331 x 4-1/2	ES12-0590
5/16 x 2-3/8 x 5/16 x 4	ES12-0564	7/16 x 2-7/8 x 7/16 x 4-1/2	ES12-0591
.3150 x 2-3/8 x .3150 x 4	ES12-0565	.4527 x 3 x .4527 x 4-3/4	ES12-0592
O .3160 x 2-3/8 x .3160 x 4	ES12-0566	29/64 x 3 x 29/64 x 4-3/4	ES12-0593
P .3230 x 2-3/8 x .3230 x 4	ES12-0567	15/32 x 3 x 15/32 x 4-3/4	ES12-0594
21/64 x 2-3/8 x 21/64 x 4	ES12-0568	.4724 x 3 x .4724 x 4-3/4	ES12-0595
Q .3320 x 2-3/8 x .3320 x 4	ES12-0569	31/64 x 3 x 31/64 x 4-3/4	ES12-0596
.3346 x 2-3/8 x .3346 x 4	ES12-0570	.4921 x 3 x .4921 x 4-3/4	ES12-0597
R .3390 x 2-3/8 x .3390 x 4	ES12-0571	1/2 x 3 x 1/2 x 4-3/4	ES12-0598
11/32 x 2-3/8 x 11/32 x 4	ES12-0572	17/32 x 4 x 17/32 x 6	ES12-0599
S .3480 x 2-3/8 x .3480 x 4	ES12-0573	9/16 x 4 x 9/16 x 6	ES12-0600
.3543 x 2-3/4 x .3543 x 4-1/4	ES12-0574	19/32 x 4 x 19/32 x 6	ES12-0601
T .3580 x 2-3/4 x .3580 x 4-1/4	ES12-0575	5/8 x 4 x 5/8 x 6	ES12-0602
23/64 x 2-3/4 x 23/64 x 4-1/4	ES12-0576	21/32 x 4 x 21/32 x 6	ES12-0603
U .3680 x 2-3/4 x .3680 x 4-1/4	ES12-0577	11/16 x 4 x 11/16 x 6	ES12-0604
.3740 x 2-3/4 x .3740 x 4-1/4	ES12-0578	23/32 x 4 x 23/32 x 6	ES12-0605
3/8 x 2-3/4 x 3/8 x 4-1/4	ES12-0579	3/4 x 4 x 3/4 x 6	ES12-0606
V .3770 x 2-3/4 x .3770 x 4-1/4	ES12-0580	7/8 x 4 x 7/8 x 6	ES12-0607
W .3860 x 2-7/8 x .3860 x 4-1/2	ES12-0581	1 x 4 x 1 x 6	ES12-0608
25/64 x 2-7/8 x 25/64 x 4-1/2	ES12-0582		

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See page 6 for other coatings available.



2 FLUTE

27° HELIX

ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TIN
0.1065 x 5/8 x 0.1065 x 2	2	ES12-0700	2	ES12-0701
0.1130 x 5/8 x 0.1130 x 2	2	ES12-0702	2	ES12-0703
1/8 x 5/8 x 1/8 x 2	2	ES12-0704	2	ES12-0705
0.1360 x 5/8 x 0.1360 x 2	2	ES12-0706	2	ES12-0707
9/64 x 5/8 x 9/64 x 2	2	ES12-0708	2	ES12-0709
0.1495 x 3/4 x 0.1495 x 2-1/2	2	ES12-0710	2	ES12-0711
5/32 x 3/4 x 5/32 x 2-1/2	2	ES12-0712	2	ES12-0713
0.1570 x 3/4 x 0.1570 x 2-1/2	2	ES12-0714	2	ES12-0715
11/64 x 3/4 x 11/64 x 2-1/2	2	ES12-0716	2	ES12-0717
3/16 x 3/4 x 3/16 x 2-1/2	2	ES12-0718	2	ES12-0719
13/64 x 3/4 x 13/64 x 2-1/2	2	ES12-0720	2	ES12-0721
0.2130 x 1 x 0.2130 x 2-1/2	2	ES12-0722	2	ES12-0723
7/32 x 1 x 7/32 x 2-1/2	2	ES12-0724	2	ES12-0725
15/64 x 1 x 15/64 x 2-1/2	2	ES12-0726	2	ES12-0727
1/4 x 1 x 1/4 x 2-1/2	2	ES12-0728A	2	ES12-0729
0.2570 x 1 x 0.2570 x 2-1/2	2	ES12-0730	2	ES12-0731
17/64 x 1 x 17/64 x 2-1/2	2	ES12-0732	2	ES12-0733
0.2720 x 1 x 0.2720 x 2-1/2	2	ES12-0734	2	ES12-0735
0.2786 x 1-1/4 x 0.2756 x 2-1/2	2	ES12-0736	2	ES12-0737
9/32 x 1 x 9/32 x 2-1/2	2	ES12-0738	2	ES12-0739
19/64 x 1-1/4 x 19/64 x 2-3/4	2	ES12-0740	2	ES12-0741
5/16 x 1-1/4 x 5/16 x 2-3/4	2	ES12-0742A	2	ES12-0743
21/64 x 1-1/4 x 21/64 x 2-3/4	2	ES12-0744	2	ES12-0745
11/32 x 1-1/4 x 11/32 x 3	2	ES12-0746	2	ES12-0747
23/64 x 1-1/4 x 23/64 x 3	2	ES12-0748	2	ES12-0749
3/8 x 1-1/4 x 3/8 x 3	2	ES12-0750	2	ES12-0751
25/64 x 1-1/4 x 25/64 x 3	2	ES12-0752A	2	ES12-0753
13/32 x 1-1/4 x 13/32 x 3	2	ES12-0754	2	ES12-0755
27/64 x 1-1/4 x 27/64 x 3	2	ES12-0756	2	ES12-0757
7/16 x 1-1/4 x 7/16 x 3	2	ES12-0758	2	ES12-0759
29/64 x 1-1/4 x 29/64 x 3	2	ES12-0760	2	ES12-0761
15/32 x 1-1/4 x 15/32 x 3	2	ES12-0762	2	ES12-0763
31/64 x 1-1/4 x 31/64 x 3	2	ES12-0764	2	ES12-0765
1/2 x 1-1/4 x 1/2 x 3	2	ES12-0766	2	ES12-0767
9/16 x 1-1/4 x 9/16 x 3-1/2	2	ES12-0768	2	ES12-0769
5/8 x 1-1/2 x 5/8 x 3-1/2	2	ES12-0770	2	ES12-0771
3/4 x 1-1/2 x 3/4 x 4	2	ES12-0772	2	ES12-0773

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NAPGLADU

Delivering Productivity

NC Spotting Drills

ODxLOFxShankODxOAL	Point Angle	Part No.
1/8 x 3/8 x 1/8 x 2	90°	ES06-0001
3/16 x 3/4 x 3/16 x 3	90°	ES06-0002
1/4 x 3/4 x 1/4 x 3	90°	ES06-0003
3/8 x 1 x 3/8 x 3	90°	ES06-0004
1/2 x 1 x 1/2 x 4	90°	ES06-0005

ODxLOFxShankODxOAL	Point Angle	Part No.
1/8 x 3/8 x 1/8 x 2	120°	ES06-0006
3/16 x 3/4 x 3/16 x 3	120°	ES06-0007
1/4 x 3/4 x 1/4 x 3	120°	ES06-0008
3/8 x 1 x 3/8 x 3	120°	ES06-0009
1/2 x 1 x 1/2 x 4	120°	ES06-0010

Solid Carbide Centerdrills

Dimensions	Size No.	Part No. 60°	Part No. 82°	Part No. 90°
3/64 x 1/8 x 1-1/2	1	ES10-0001	ES10-0009	ES10-0017
5/64 x 3/16 x 2	2	ES10-0002A	ES10-0010	ES10-0018
7/64 x 1/4 x 2	3	ES10-0003A	ES10-0011	ES10-0019
1/8 x 5/16 x 2-1/8	4	ES10-0004A	ES10-0012	ES10-0020
3/16 x 7/16 x 2-3/4	5	ES10-0005	ES10-0013	ES10-0021
7/32 x 1/2 x 3	6	ES10-0006	ES10-0014	ES10-0022
1/4 x 5/8 x 3-1/8	7	ES10-0007	ES10-0015	ES10-0023
5/16 x 3/4 x 3-3/8	8	ES10-0008	ES10-0016	ES10-0024



Spade Drills



ODxLOFxOAL	Part No. Uncoated	Part No. TiN	Part No. TiCN
1/8 x 7/16 x 1-1/2	ES09-0001	ES09-0002	ES09-0003
3/16 x 9/16 x 2	ES09-0004	ES09-0005	ES09-0006
1/4 x 11/16 x 2	ES09-0007	ES09-0008	ES09-0009
5/16 x 7/8 x 2-1/2	ES09-0010	ES09-0011	ES09-0012
3/8 x 1 x 2-1/2	ES09-0013	ES09-0014	ES09-0015
1/2 x 1-1/8 x 2-1/2	ES09-0016	ES09-0017	ES09-0018
SETS*	ES09-0019	ES09-0020	ES09-0021

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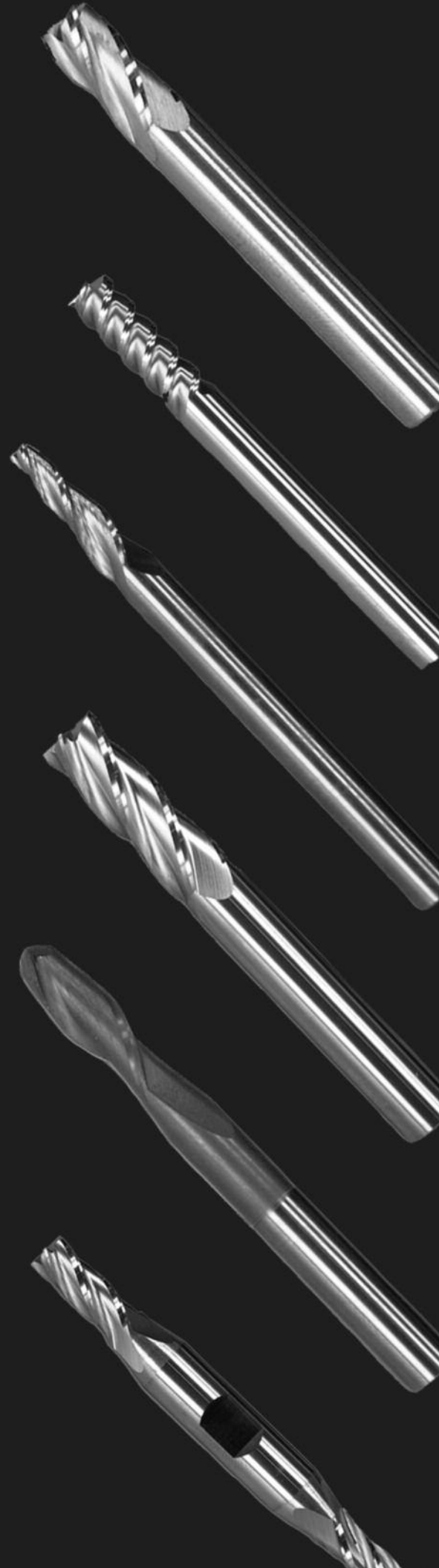
45 DEGREE CUT CHAMFER STRAIGHT FLUTE REAMER

Description	Part No.	Description	Part No.
42 .0935 x 1/2 x .0781 x 2	ES13-0014	9 .1960 x 1 x .1875 x 3	ES13-0059
3/32 x 1/2 x .0781 x 2	ES13-0015	5mm .1968 x 1 x .1875 x 3	ES13-0060
41 .0960 x 1/2 x .0781 x 2	ES13-0016	8 .1990 x 1 x .1875 x 3	ES13-0061
40 .0980 x 5/8 x .0938 x 2-1/4	ES13-0017	7 .2010 x 1 x .1875 x 3	ES13-0062
2.5mm .0984 x 5/8 x .0938 x 2-1/4	ES13-0018	13/64 x 1 x .1875 x 3	ES13-0063
39 .0995 x 5/8 x .0938 x 2-1/4	ES13-0019	6 .2040 x 1 x .1875 x 3	ES13-0064
38 .1015 x 5/8 x .0938 x 2-1/4	ES13-0020	5 .2055 x 1 x .1875 x 3	ES13-0065
37 .1040 x 5/8 x .0938 x 2-1/4	ES13-0021	4 .2090 x 1 x .1875 x 3	ES13-0066
36 .1065 x 5/8 x .0938 x 2-1/4	ES13-0022	3 .2130 x 1 x .1875 x 3	ES13-0067
7/64 x 5/8 x .0938 x 2-1/4	ES13-0023	5.5mm .2165 x 1 x .1875 x 3	ES13-0068
35 .1100 x 5/8 x .0938 x 2-1/4	ES13-0024	7/32 x 1 x .1875 x 3	ES13-0069
34 .1110 x 5/8 x .0938 x 2-1/4	ES13-0025	2 .2210 x 1 x .1875 x 3	ES13-0070
33 .1130 x 5/8 x .1094 x 2-1/4	ES13-0026	1 .2280 x 1 x .2188 x 3	ES13-0071
32 .1160 x 5/8 x .1094 x 2-1/4	ES13-0027	15/64 x 1 x .2188 x 3	ES13-0072
3mm .1181 x 5/8 x .1094 x 2-1/4	ES13-0028	6mm .2362 x 1 x .2188 x 3	ES13-0073
31 .1200 x 5/8 x .1094 x 2-1/4	ES13-0029	1/4 x 1 x .2188 x 3	ES13-0074
1/8 x 5/8 x .1094 x 2-1/4	ES13-0030	6.5mm .2559 x 1-1/8 x .2500 x 3-1/4	ES13-0075
30 .1285 x 3/4 x .1250 x 2-1/2	ES13-0031	17/64 x 1-1/8 x .2500 x 3-1/4	ES13-0076
29 .1360 x 3/4 x .1250 x 2-1/2	ES13-0032	7mm .2756 x 1-1/8 x .2500 x 3-1/4	ES13-0077
3.5mm .1378 x 3/4 x .1250 x 2-1/2	ES13-0033	9/32 x 1-1/8 x .2500 x 3-1/4	ES13-0078
28 .1405 x 3/4 x .1250 x 2-1/2	ES13-0034	7.5mm .2953 x 1-1/8 x .2812 x 3-1/4	ES13-0079
9/64 x 3/4 x .1250 x 2-1/2	ES13-0035	19/64 x 1-1/8 x .2812 x 3-1/4	ES13-0080
27 .1440 x 3/4 x .1250 x 2-1/2	ES13-0036	5/16 x 1-1/8 x .2812 x 3-1/4	ES13-0081
26 .1470 x 3/4 x .1406 x 2-1/2	ES13-0037	8mm .3150 x 1-1/8 x .2812 x 3-1/4	ES13-0082
25 .1495 x 3/4 x .1406 x 2-1/2	ES13-0038	21/64 x 1-1/4 x .3125 x 3-1/2	ES13-0083
24 .1520 x 3/4 x .1406 x 2-1/2	ES13-0039	8.5mm .3346 x 1-1/4 x .3125 x 3-1/2	ES13-0084
23 .1540 x 3/4 x .1406 x 2-1/2	ES13-0040	11/32 x 1-1/4 x .3125 x 3-1/2	ES13-0085
5/32 x 3/4 x .1406 x 2-1/2	ES13-0041	9mm .3543 x 1-1/4 x .3438 x 3-1/2	ES13-0086
22 .1570 x 3/4 x .1406 x 2-1/2	ES13-0042	23/64 x 1-1/4 x .3438 x 3-1/2	ES13-0087
4mm .1575 x 3/4 x .1406 x 2-1/2	ES13-0043	9.5mm .3740 x 1-1/4 x .3438 x 3-1/2	ES13-0088
21 .1590 x 3/4 x .1406 x 2-1/2	ES13-0044	3/8 x 1-1/4 x .3438 x 3-1/2	ES13-0089
20 .1610 x 7/8 x .1562 x 2-3/4	ES13-0045	25/64 x 1-1/2 x .3750 x 4	ES13-0090
19 .1660 x 7/8 x .1562 x 2-3/4	ES13-0046	10mm .3937 x 1-1/2 x .3750 x 4	ES13-0091
18 .1695 x 7/8 x .1562 x 2-3/4	ES13-0047	13/32 x 1-1/2 x .3750 x 4	ES13-0092
11/64 x 7/8 x .1562 x 2-3/4	ES13-0048	10.5mm .4134 x 1-1/2 x .4062 x 4	ES13-0093
17 .1730 x 7/8 x .1562 x 2-3/4	ES13-0049	27/64 x 1-1/2 x .4062 x 4	ES13-0094
16 .1770 x 7/8 x .1562 x 2-3/4	ES13-0050	11mm .4331 x 1-1/2 x .4062 x 4	ES13-0095
4.5mm .1772 x 7/8 x .1562 x 2-3/4	ES13-0051	7/16 x 1-1/2 x .4062 x 4	ES13-0096
15 .1800 x 7/8 x .1719 x 2-3/4	ES13-0052	11.5mm .4528 x 1-1/2 x .4375 x 4	ES13-0097
14 .1820 x 7/8 x .1719 x 2-3/4	ES13-0053	29/64 x 1-1/2 x .4375 x 4	ES13-0098
13 .1850 x 7/8 x .1719 x 2-3/4	ES13-0054	15/32 x 1-1/2 x .4375 x 4	ES13-0099
3/16 x 7/8 x .1719 x 2-3/4	ES13-0055	12mm .4724 x 1-1/2 x .4375 x 4	ES13-0100
12 .1890 x 7/8 x .1719 x 2-3/4	ES13-0056	31/64 x 1-1/2 x .4688 x 4	ES13-0101
11 .1910 x 7/8 x .1719 x 2-3/4	ES13-0057	12.5mm .4921 x 1-1/2 x .4688 x 4	ES13-0102
10 .1935 x 1 x .1875 x 3	ES13-0058	1/2 x 1-1/2 x .4688 x 4	ES13-0103

NAPGLADU

Delivering Productivity

Metric Section





SQUARE END

ODxLOCxShankODxOAL	2 FL SQ	3 FL SQ	4 FL SQ	2 FL SQ	3 FL SQ	4 FL SQ
	Uncoated	Uncoated	Uncoated	TiALN	TiALN	TiALN
1 x 3 x 3 x 38	ES32-0001	ES32-0002	ES32-0003A	ES32-0004	ES32-0005	ES32-0006A
1.5 x 5 x 3 x 38	ES32-0007A	ES32-0008	ES32-0009A	ES32-0010	ES32-0011	ES32-0012
2 x 6 x 3 x 38	ES32-0013A	ES32-0014	ES32-0015A	ES32-0016	ES32-0017	ES32-0018A
2.5 x 7 x 3 x 38	ES32-0019	ES32-0020	ES32-0021A	ES32-0022	ES32-0023	ES32-0024
3 x 12 x 3 x 38	ES32-0025A	ES32-0026	ES32-0027A	ES32-0028	ES32-0029	ES32-0030A
3.5 x 12 x 4 x 50	ES32-0031	ES32-0032	ES32-0033	ES32-0034	ES32-0035	ES32-0036
4 x 14 x 4 x 50	ES32-0037	ES32-0038	ES32-0039A	ES32-0040	ES32-0041	ES32-0042A
4.5 x 14 x 5 x 50	ES32-0043	ES32-0044	ES32-0045	ES32-0046	ES32-0047	ES32-0048
5 x 16 x 5 x 50	ES32-0049	ES32-0050	ES32-0051A	ES32-0052	ES32-0053	ES32-0054A
6 x 19 x 6 x 63	ES32-0055	ES32-0056	ES32-0057A	ES32-0058	ES32-0059	ES32-0060A
7 x 19 x 8 x 63	ES32-0061	ES32-0062	ES32-0063	ES32-0064	ES32-0065	ES32-0066
8 x 19 x 8 x 63	ES32-0067	ES32-0068	ES32-0069A	ES32-0070	ES32-0071	ES32-0072A
9 x 22 x 10 x 70	ES32-0073	ES32-0074	ES32-0075	ES32-0076	ES32-0077	ES32-0078
10 x 22 x 10 x 70	ES32-0079	ES32-0080	ES32-0081A	ES32-0082	ES32-0083	ES32-0084A
11 x 25 x 11 x 70	ES32-0085	ES32-0086	ES32-0087	ES32-0088	ES32-0089	ES32-0090
12 x 25 x 12 x 75	ES32-0091	ES32-0092	ES32-0093A	ES32-0094	ES32-0095	ES32-0096A
14 x 30 x 14 x 88	ES32-0097	ES32-0098	ES32-0099	ES32-0100	ES32-0101	ES32-0102
16 x 32 x 16 x 88	ES32-0103	ES32-0104	ES32-0105	ES32-0106	ES32-0107	ES32-0108A
18 x 36 x 18 x 100	ES32-0109	ES32-0110	ES32-0111	ES32-0112	ES32-0113	ES32-0114
20 x 38 x 20 x 100	ES32-0115	ES32-0116	ES32-0117	ES32-0118	ES32-0119	ES32-0120
22 x 38 x 22 x 100	ES32-0121	ES32-0122	ES32-0123	ES32-0124	ES32-0125	ES32-0126
25 x 38 x 25 x 100	ES32-0127	ES32-0128	ES32-0129	ES32-0130	ES32-0131	ES32-0132

BALL END



ODxLOCxShankODxOAL	2 FL BALL	4 FL BALL	2 FL BALL	4 FL BALL
	Uncoated	Uncoated	TiALN	TiALN
1 x 3 x 3 x 38	ES32-0200A	ES32-0201	ES32-0202	ES32-0203
1.5 x 5 x 3 x 38	ES32-0204	ES32-0205	ES32-0206	ES32-0207
2 x 6 x 3 x 38	ES32-0208A	ES32-0209A	ES32-0210	ES32-0211
2.5 x 7 x 3 x 38	ES32-0212	ES32-0213	ES32-0214	ES32-0215
3 x 12 x 3 x 38	ES32-0216A	ES32-0217A	ES32-0218	ES32-0219
3.5 x 12 x 4 x 50	ES32-0220	ES32-0221	ES32-0222	ES32-0223
4 x 14 x 4 x 50	ES32-0224A	ES32-0225A	ES32-0226	ES32-0227
4.5 x 14 x 5 x 50	ES32-0228	ES32-0229	ES32-0230	ES32-0231
5 x 16 x 5 x 50	ES32-0232A	ES32-0233	ES32-0234	ES32-0235
6 x 19 x 6 x 63	ES32-0236A	ES32-0237A	ES32-0238A	ES32-0239
7 x 19 x 8 x 63	ES32-0240	ES32-0241	ES32-0242	ES32-0243
8 x 19 x 8 x 63	ES32-0244A	ES32-0245A	ES32-0246	ES32-0247
9 x 22 x 10 x 70	ES32-0248	ES32-0249	ES32-0250	ES32-0251
10 x 22 x 10 x 70	ES32-0252A	ES32-0253	ES32-0254	ES32-0255
11 x 25 x 11 x 70	ES32-0256	ES32-0257	ES32-0258	ES32-0259
12 x 25 x 12 x 75	ES32-0260	ES32-0261	ES32-0262	ES32-0263
14 x 30 x 14 x 88	ES32-0264	ES32-0265	ES32-0266	ES32-0267
16 x 32 x 16 x 88	ES32-0268	ES32-0269	ES32-0270	ES32-0271
18 x 36 x 18 x 100	ES32-0272	ES32-0273	ES32-0274	ES32-0275
20 x 38 x 20 x 100	ES32-0276	ES32-0277	ES32-0278	ES32-0279
22 x 38 x 22 x 100	ES32-0280	ES32-0281	ES32-0282	ES32-0283
25 x 38 x 25 x 100	ES32-0284	ES32-0285	ES32-0286	ES32-0287



SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiALN	4 FL SQ TiALN
3 x 25 x 3 x 65	ES33-0001	ES33-0002	ES33-0003	ES33-0004
4 x 25 x 4 x 65	ES33-0005	ES33-0006	ES33-0007	ES33-0008
5 x 25 x 5 x 75	ES33-0009	ES33-0010	ES33-0011	ES33-0012
6 x 25 x 6 x 75	ES33-0013	ES33-0014	ES33-0015	ES33-0016
8 x 25 x 8 x 75	ES33-0017	ES33-0018	ES33-0019	ES33-0020
10 x 38 x 10 x 100	ES33-0021	ES33-0022	ES33-0023	ES33-0024
12 x 50 x 12 x 100	ES33-0025	ES33-0026	ES33-0027	ES33-0028
14 x 56 x 14 x 125	ES33-0029	ES33-0030	ES33-0031	ES33-0032
16 x 75 x 16 x 150	ES33-0033	ES33-0034	ES33-0035	ES33-0036
18 x 75 x 18 x 150	ES33-0037	ES33-0038	ES33-0039	ES33-0040
20 x 75 x 20 x 150	ES33-0041	ES33-0042	ES33-0043	ES33-0044
25 x 75 x 25 x 150	ES33-0045	ES33-0046	ES33-0047	ES33-0048



BALL END

ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiALN	4 FL BALL TiALN
3 x 25 x 3 x 65	ES33-0100	ES33-0101	ES33-0102	ES33-0103
4 x 25 x 4 x 65	ES33-0104	ES33-0105	ES33-0106	ES33-0107
5 x 25 x 5 x 75	ES33-0108	ES33-0109	ES33-0110	ES33-0111
6 x 25 x 6 x 75	ES33-0112	ES33-0113	ES33-0114	ES33-0115
8 x 25 x 8 x 75	ES33-0116	ES33-0117	ES33-0118	ES33-0119
10 x 38 x 10 x 100	ES33-0120	ES33-0121	ES33-0122	ES33-0123
12 x 50 x 12 x 100	ES33-0124	ES33-0125	ES33-0126	ES33-0127
14 x 56 x 14 x 125	ES33-0128	ES33-0129	ES33-0130	ES33-0131
16 x 75 x 16 x 150	ES33-0132	ES33-0133	ES33-0134	ES33-0135
18 x 75 x 18 x 150	ES33-0136	ES33-0137	ES33-0138	ES33-0139
20 x 75 x 20 x 150	ES33-0140	ES33-0141	ES33-0142	ES33-0143
25 x 75 x 25 x 150	ES33-0144	ES33-0145	ES33-0146	ES33-0147

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.

SQUARE & BALL END



ODxLOCxShankODxOAL	2 FL SQUARE	4 FL SQUARE	2 FL BALL	4 FL BALL
6 x 38 x 6 x 100	ES34-0001	ES34-0002	ES34-0051	ES34-0052
6 x 75 x 6 x 150	ES33-0003	ES34-0004	ES34-0053	ES34-0054
6 x 75 x 8 x 200	ES33-0005	ES33-0006	ES34-0055	ES34-0056
8 x 42 x 8 x 100	ES33-0007	ES33-0008	ES34-0057	ES34-0058
8 x 75 x 8 x 150	ES34-0009	ES34-0010	ES34-0059	ES34-0060
8 x 75 x 8 x 200	ES34-0011	ES34-0012	ES34-0061	ES34-0062
8 x 75 x 10 x 200	ES34-0013	ES34-0014	ES34-0063	ES34-0064
10 x 75 x 10 x 150	ES34-0015	ES34-0016	ES34-0065	ES34-0066
10 x 75 x 10 x 200	ES34-0017	ES34-0018	ES34-0067	ES34-0068
12 x 75 x 12 x 150	ES34-0019	ES34-0020	ES34-0069	ES34-0070
12 x 75 x 12 x 200	ES34-0021	ES34-0022	ES34-0071	ES34-0072
14 x 62 x 14 x 125	ES34-0023	ES34-0024	ES34-0073	ES34-0074
14 x 75 x 14 x 150	ES34-0025	ES34-0026	ES34-0075	ES34-0076
14 x 75 x 16 x 200	ES34-0027	ES34-0028	ES34-0077	ES34-0078
16 x 75 x 16 x 200	ES34-0029	ES34-0030	ES34-0079	ES34-0080
18 x 75 x 18 x 200	ES34-0031	ES34-0032	ES34-0081	ES34-0082
20 x 75 x 20 x 200	ES34-0033	ES34-0034	ES34-0083	ES34-0084

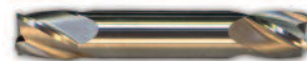
6 Flute Endmills

SQUARE END

ODxLOCxShankODxOAL	Part No. Uncoated	Part No. TiALN
3 x 12 x 3 x 38	ES34-0200	ES34-0201
4 x 14 x 4 x 50	ES34-0202	ES34-0203
5 x 16 x 5 x 50	ES34-0204	ES34-0205
6 x 19 x 6 x 63	ES34-0206	ES34-0207
7 x 19 x 8 x 63	ES34-0208	ES34-0209
8 x 21 x 8 x 63	ES34-0210	ES34-0211
9 x 22 x 10 x 70	ES34-0212	ES34-0213
10 x 25 x 10 x 70	ES34-0214	ES34-0215
11 x 25 x 11 x 70	ES34-0216	ES34-0217
12 x 25 x 12 x 75	ES34-0218	ES34-0219
14 x 30 x 14 x 88	ES34-0220	ES34-0221
16 x 32 x 16 x 88	ES34-0222	ES34-0223
18 x 35 x 18 x 100	ES34-0224	ES34-0225
20 x 38 x 20 x 100	ES34-0226	ES34-0227
22 x 38 x 22 x 100	ES34-0228	ES34-0229
25 x 38 x 25 x 100	ES34-0230	ES34-0231



A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)
See page 6 for other coatings available.

SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiALN	4 FL SQ TiALN
3 x 9 x 3 x 50	ES35-0001	ES35-0002	ES35-0003	ES35-0004
4 x 10 x 4 x 63	ES35-0005	ES35-0006	ES35-0007	ES35-0008
5 x 12 x 5 x 63	ES35-0009	ES35-0010	ES35-0011	ES35-0012
6 x 16 x 6 x 63	ES35-0013	ES35-0014	ES35-0015	ES35-0016
8 x 18 x 8 x 75	ES35-0017	ES35-0018	ES35-0019	ES35-0020
10 x 18 x 10 x 75	ES35-0021	ES35-0022	ES35-0023	ES35-0024
12 x 25 x 12 x 100	ES35-0025	ES35-0026	ES35-0027	ES35-0028
16 x 32 x 16 x 150	ES35-0029	ES35-0030	ES35-0031	ES35-0032

BALL END

ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiALN	4 FL BALL TiALN
3 x 9 x 3 x 50	ES35-0101	ES35-0102	ES35-0103	ES35-0104
4 x 10 x 4 x 63	ES35-0105	ES35-0106	ES35-0107	ES35-0108
5 x 12 x 5 x 63	ES35-0109	ES35-0110	ES35-0111	ES35-0112
6 x 16 x 6 x 63	ES35-0113	ES35-0114	ES35-0115	ES35-0116
8 x 18 x 8 x 75	ES35-0117	ES35-0118	ES35-0119	ES35-0120
10 x 18 x 10 x 75	ES35-0121	ES35-0122	ES35-0123	ES35-0124
12 x 25 x 12 x 100	ES35-0125	ES35-0126	ES35-0127	ES35-0128
16 x 32 x 16 x 150	ES35-0129	ES35-0130	ES35-0131	ES35-0132

2 Flute Drill Mills

ODxLOCxShankODxOAL	2 FL SQ Uncoated	2 FL SQ TiALN
3 x 12 x 3 x 38	ES35-0201	ES35-0202
5 x 16 x 5 x 50	ES35-0203	ES35-0204
6 x 19 x 6 x 63	ES35-0205	ES35-0206
8 x 19 x 8 x 63	ES35-0207	ES35-0208
10 x 22 x 10 x 70	ES35-0209	ES35-0210
12 x 25 x 12 x 75	ES35-0211	ES35-0212
16 x 32 x 16 x 88	ES35-0213	ES35-0214
18 x 36 x 18 x 100	ES35-0215	ES35-0216



A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)
See page 6 for other coatings available.

SQUARE END



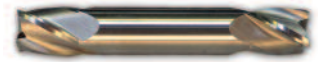
ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiALN	4 FL SQ TiALN
1 x 2 x 3 x 38	ES36-0001	ES36-0002	ES36-0003	ES36-0004
1.5 x 3 x 3 x 38	ES36-0005	ES36-0006	ES36-0007	ES36-0008
2 x 4 x 3 x 38	ES36-0009	ES36-0010	ES36-0011	ES36-0012
2.5 x 5 x 3 x 38	ES36-0013	ES36-0014	ES36-0015	ES36-0016
3 x 6 x 3 x 38	ES36-0017	ES36-0018	ES36-0019	ES36-0020
3.5 x 7 x 4 x 50	ES36-0021	ES36-0022	ES36-0023	ES36-0024
4 x 8 x 4 x 50	ES36-0025	ES36-0026	ES36-0027	ES36-0028
4.5 x 9 x 5 x 50	ES36-0029	ES36-0030	ES36-0031	ES36-0032
5 x 10 x 5 x 50	ES36-0033	ES36-0034	ES36-0035	ES36-0036
6 x 12 x 6 x 50	ES36-0037	ES36-0038	ES36-0039	ES36-0040
8 x 12 x 8 x 50	ES36-0041	ES36-0042	ES36-0043	ES36-0044
10 x 14 x 10 x 50	ES36-0045	ES36-0046	ES36-0047	ES36-0048
12 x 16 x 12 x 63	ES36-0049	ES36-0050	ES36-0051	ES36-0052

BALL END



ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiALN	4 FL BALL TiALN
1 x 2 x 3 x 38	ES36-0101	ES36-0102	ES36-0103	ES36-0104
1.5 x 3 x 3 x 38	ES36-0105	ES36-0106	ES36-0107	ES36-0108
2 x 4 x 3 x 38	ES36-0109	ES36-0110	ES36-0111	ES36-0112
2.5 x 5 x 3 x 38	ES36-0113	ES36-0114	ES36-0115	ES36-0116
3 x 6 x 3 x 38	ES36-0117	ES36-0118	ES36-0119	ES36-0120
3.5 x 7 x 4 x 50	ES36-0121	ES36-0122	ES36-0123	ES36-0124
4 x 8 x 4 x 50	ES36-0125	ES36-0126	ES36-0127	ES36-0128
4.5 x 9 x 5 x 50	ES36-0129	ES36-0130	ES36-0131	ES36-0132
5 x 10 x 5 x 50	ES36-0133	ES36-0134	ES36-0135	ES36-0136
6 x 12 x 6 x 50	ES36-0137	ES36-0138	ES36-0139	ES36-0140
8 x 12 x 8 x 50	ES36-0141	ES36-0142	ES36-0143	ES36-0144
10 x 14 x 10 x 50	ES36-0145	ES36-0146	ES36-0147	ES36-0148
12 x 16 x 12 x 63	ES36-0149	ES36-0150	ES36-0151	ES36-0152

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)
See page 6 for other coatings available.



SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiALN	4 FL SQ TiALN
1 x 2 x 3 x 38	ES37-0001	ES37-0002	ES37-0003	ES37-0004
1.5 x 3 x 3 x 38	ES37-0005	ES37-0006	ES37-0007	ES37-0008
2 x 4 x 3 x 38	ES37-0009	ES37-0010	ES37-0011	ES37-0012
2.5 x 5 x 3 x 38	ES37-0013	ES37-0014	ES37-0015	ES37-0016
3 x 6 x 3 x 38	ES37-0017	ES37-0018	ES37-0019	ES37-0020
3.5 x 7 x 4 x 50	ES37-0021	ES37-0022	ES37-0023	ES37-0024
4 x 8 x 4 x 50	ES37-0025	ES37-0026	ES37-0027	ES37-0028
4.5 x 10 x 5 x 50	ES37-0029	ES37-0030	ES37-0031	ES37-0032
5 x 10 x 5 x 50	ES37-0033	ES37-0034	ES37-0035	ES37-0036
6 x 12 x 6 x 63	ES37-0037	ES37-0038	ES37-0039	ES37-0040
8 x 12 x 8 x 63	ES37-0041	ES37-0042	ES37-0043	ES37-0044
10 x 12 x 10 x 70	ES37-0045	ES37-0046	ES37-0047	ES37-0048
12 x 16 x 12 x 75	ES37-0049	ES37-0050	ES37-0051	ES37-0052

BALL END



ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiALN	4 FL BALL TiALN
1 x 2 x 3 x 38	ES37-0101	ES37-0102	ES37-0103	ES37-0104
1.5 x 3 x 3 x 38	ES37-0105	ES37-0106	ES37-0107	ES37-0108
2 x 4 x 3 x 38	ES37-0109	ES37-0110	ES37-0111	ES37-0112
2.5 x 5 x 3 x 38	ES37-0113	ES37-0114	ES37-0115	ES37-0116
3 x 6 x 3 x 38	ES37-0117	ES37-0118	ES37-0119	ES37-0120
3.5 x 7 x 4 x 50	ES37-0121	ES37-0122	ES37-0123	ES37-0124
4 x 8 x 4 x 50	ES37-0125	ES37-0126	ES37-0127	ES37-0128
4.5 x 10 x 5 x 50	ES37-0129	ES37-0130	ES37-0131	ES37-0132
5 x 10 x 5 x 50	ES37-0133	ES37-0134	ES37-0135	ES37-0136
6 x 12 x 6 x 63	ES37-0137	ES37-0138	ES37-0139	ES37-0140
8 x 12 x 8 x 63	ES37-0141	ES37-0142	ES37-0143	ES37-0144
10 x 12 x 10 x 70	ES37-0145	ES37-0146	ES37-0147	ES37-0148
12 x 16 x 12 x 75	ES37-0149	ES37-0150	ES37-0151	ES37-0152

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.

4 FLUTE

ODxLOCxShankODxOAL	.25mm 4 FL	.50mm 4 FL	.75mm 4 FL	1.00mm 4 FL	1.25mm 4 FL	1.50mm 4 FL
4 x 14 x 4 x 50	ES38-0001	ES38-0002	ES38-0003	ES38-0004	--	--
6 x 19 x 6 x 63	ES38-0005	ES38-0006	ES38-0007	ES38-0008	ES38-0009	ES38-0010
8 x 19 x 8 x 63	ES38-0011	ES38-0012	ES38-0013	ES38-0014	ES38-0015	ES38-0016
10 x 25 x 10 x 70	ES38-0017	ES38-0018	ES38-0019	ES38-0020	ES38-0021	ES38-0022
12 x 25 x 12 x 75	ES38-0023	ES38-0024	ES38-0025	ES38-0026	ES38-0027	ES38-0028
16 x 32 x 16 x 88	ES38-0029	ES38-0030	ES38-0031	ES38-0032	ES38-0033	ES38-0034
20 x 38 x 20 x 100	ES38-0035	ES38-0036	ES38-0037	ES38-0038	ES38-0039	ES38-0040

2 FLUTE

ODxLOCxShankODxOAL	.25mm 2 FL	.50mm 2 FL	.75mm 2 FL	1.00mm 2 FL	1.25mm 2 FL	1.50mm 2 FL
4 x 14 x 4 x 50	ES38-0101	ES38-0102	ES38-0103	ES38-0104	--	--
6 x 19 x 6 x 63	ES38-0105	ES38-0106	ES38-0107	ES38-0108	ES38-0109	ES38-0110
8 x 19 x 8 x 63	ES38-0111	ES38-0112	ES38-0113	ES38-0114	ES38-0115	ES38-0116
10 x 25 x 10 x 70	ES38-0117	ES38-0118	ES38-0119	ES38-0120	ES38-0121	ES38-0122
12 x 25 x 12 x 75	ES38-0123	ES38-0124	ES38-0125	ES38-0126	ES38-0127	ES38-0128
16 x 32 x 16 x 88	ES38-0129	ES38-0130	ES38-0131	ES38-0132	ES38-0133	ES38-0134
20 x 38 x 20 x 100	ES38-0135	ES38-0136	ES38-0137	ES38-0138	ES38-0139	ES38-0140

Straight Flute Endmills

SQUARE END

ODxLOCxShankODxOAL	2 FL SQ Uncoated	4 FL SQ Uncoated	2 FL SQ TiAlN	4 FL SQ TiAlN
3 x 12 x 3 x 38	ES38-0501	ES38-0502	ES38-0503	ES38-0504
4 x 14 x 4 x 50	ES38-0505	ES38-0506	ES38-0507	ES38-0508
5 x 16 x 5 x 50	ES38-0509	ES38-0510	ES38-0511	ES38-0512
6 x 19 x 6 x 63	ES38-0513	ES38-0514	ES38-0515	ES38-0516
8 x 19 x 8 x 63	ES38-0517	ES38-0518	ES38-0519	ES38-0520
10 x 22 x 10 x 70	ES38-0521	ES38-0522	ES38-0523	ES38-0524
12 x 25 x 12 x 75	ES38-0525	ES38-0526	ES38-0527	ES38-0528
16 x 32 x 16 x 88	ES38-0529	ES38-0530	ES38-0531	ES38-0532

BALL END

ODxLOCxShankODxOAL	2 FL BALL Uncoated	4 FL BALL Uncoated	2 FL BALL TiAlN	4 FL BALL TiAlN
3 x 12 x 3 x 38	ES38-0601	ES38-0602	ES38-0603	ES38-0604
4 x 14 x 4 x 50	ES38-0605	ES38-0606	ES38-0607	ES38-0608
5 x 16 x 5 x 50	ES38-0609	ES38-0610	ES38-0611	ES38-0612
6 x 19 x 6 x 63	ES38-0613	ES38-0614	ES38-0615	ES38-0616
8 x 19 x 8 x 63	ES38-0617	ES38-0618	ES38-0619	ES38-0620
10 x 22 x 10 x 70	ES38-0621	ES38-0622	ES38-0623	ES38-0624
12 x 25 x 12 x 75	ES38-0625	ES38-0626	ES38-0627	ES38-0628
16 x 32 x 16 x 88	ES38-0629	ES38-0630	ES38-0631	ES38-0632

MEDIUM PITCH ROUGHER

For maximum stock removal of mild, stainless, and hardened steels and alloys.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
6 x 19 x 6 x 63	3	ES39-0001	3	ES39-0002
8 x 19 x 8 x 63	3	ES39-0003	3	ES39-0004
10 x 22 x 10 x 63	3	ES39-0005	3	ES39-0006
12 x 25 x 12 x 75	4	ES39-0007	4	ES39-0008
16 x 32 x 16 x 88	4	ES39-0009	4	ES39-0010
20 x 38 x 20 x 100	4	ES39-0011	4	ES39-0012
25 x 38 x 25 x 100	5	ES39-0013	5	ES39-0014

FINE PITCH ROUGHER

For maximum stock removal of titanium, inconel, waspaloy and other advanced materials.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
6 x 19 x 6 x 63	3	ES39-0051	3	ES39-0052
8 x 19 x 8 x 63	3	ES39-0053	3	ES39-0054
10 x 22 x 10 x 63	3	ES39-0055	3	ES39-0056
12 x 25 x 12 x 75	4	ES39-0057	4	ES39-0058
16 x 32 x 16 x 88	4	ES39-0059	4	ES39-0060
20 x 38 x 20 x 100	4	ES39-0061	4	ES39-0062
25 x 38 x 25 x 100	6	ES39-0063	6	ES39-0064

COARSE PITCH ROUGHER

For maximum stock removal of aluminum, brass, bronze, and other lightweight alloys.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
6 x 19 x 6 x 63	3	ES39-0101	3	ES39-0102
8 x 19 x 8 x 63	3	ES39-0103	3	ES39-0104
10 x 22 x 10 x 63	3	ES39-0105	3	ES39-0106
12 x 25 x 12 x 75	3	ES39-0107	3	ES39-0108
16 x 32 x 16 x 88	3	ES39-0109	3	ES39-0110
20 x 38 x 20 x 100	3	ES39-0111	3	ES39-0112
25 x 38 x 25 x 100	3	ES39-0113	3	ES39-0114

Rougher Use: Rougher or Hoggers are useful for rapid removal of large amounts of material. The Chip Breaker design allows for more cutting fluid to the cutting edge and dissipates heat better. There is a wide range of variations in rougher profile forms for different material groups. The coarser the pitch of the roughing edge, the more material removed the rougher the finish will be. In addition most roughers have eccentric relief so regrinding can be only done on the face of the flute.

60° 3 FLUTE HIGH HELIX TWISTERMILL

Designed for high speed milling of inconel, titanium, stainless, and steel alloys.



ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
6 x 20 x 6 x 63	3	ES40-0001	3	ES40-0002
8 x 22 x 8 x 63	3	ES40-0003	3	ES40-0004
10 x 25 x 10 x 70	3	ES40-0005	3	ES40-0006
12 x 25 x 12 x 75	3	ES40-0007	3	ES40-0008
16 x 30 x 16 x 88	3	ES40-0009	3	ES40-0010
20 x 38 x 20 x 100	3	ES40-0011	3	ES40-0012

55° 2 FLUTE HIGH HELIX ALUMAZIPS

Designed for high speed milling of aluminum.

ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
3 x 12 x 3 x 38	2	ES40-0101	2	ES40-0102
4 x 14 x 4 x 50	2	ES40-0103	2	ES40-0104
5 x 19 x 5 x 50	2	ES40-0105	2	ES40-0106
6 x 19 x 6 x 63	2	ES40-0107	2	ES40-0108
8 x 19 x 8 x 63	2	ES40-0109	2	ES40-0110
10 x 22 x 10 x 70	2	ES40-0111	2	ES40-0112
12 x 25 x 12 x 83	2	ES40-0113	2	ES40-0114
14 x 30 x 14 x 83	2	ES40-0115	2	ES40-0116
16 x 32 x 16 x 88	2	ES40-0117	2	ES40-0118
20 x 38 x 20 x 100	2	ES40-0119	2	ES40-0120
25 x 38 x 25 x 100	2	ES40-0121	2	ES40-0122

45° 2 FLUTE HIGH HELIX HYPERMILL

Designed for high speed milling of aluminum.

ODxLOCxShankODxOAL	No. of Flutes	Part No. Uncoated	No. of Flutes	Part No. TiALN
6 x 25 x 6 x 63	2	ES40-0201	2	ES40-0202
8 x 25 x 8 x 63	2	ES40-0203	2	ES40-0204
10 x 25 x 10 x 70	2	ES40-0205	2	ES40-0206
12 x 32 x 12 x 75	2	ES40-0207	2	ES40-0208
16 x 42 x 16 x 88	2	ES40-0209	2	ES40-0210
20 x 48 x 20 x 100	2	ES40-0211	2	ES40-0212

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)
See page 6 for other coatings available.

2 FLUTE

27° HELIX



Description	Part No. Uncoated	Part No. TIN
3 x 33 x 3 x 61	ES41-0001	ES41-0002
3.1 x 36 x 3.1 x 65	ES41-0003	ES41-0004
3.2 x 36 x 3.2 x 65	ES41-0005	ES41-0006
3.3 x 36 x 3.3 x 65	ES41-0007	ES41-0008
3.4 x 39 x 3.4 x 70	ES41-0009	ES41-0010
3.5 x 39 x 3.5 x 70	ES41-0011	ES41-0012
3.6 x 39 x 3.6 x 70	ES41-0013	ES41-0014
3.7 x 39 x 3.7 x 70	ES41-0015	ES41-0016
3.8 x 43 x 3.8 x 75	ES41-0017	ES41-0018
3.9 x 43 x 3.9 x 75	ES41-0019	ES41-0020
4 x 43 x 4 x 75	ES41-0021	ES41-0022
4.1 x 43 x 4.1 x 75	ES41-0023	ES41-0024
4.2 x 43 x 4.2 x 75	ES41-0025	ES41-0026
4.3 x 47 x 4.3 x 80	ES41-0027	ES41-0028
4.4 x 47 x 4.4 x 80	ES41-0029	ES41-0030
4.5 x 47 x 4.5 x 80	ES41-0031	ES41-0032
4.6 x 47 x 4.6 x 80	ES41-0033	ES41-0034
4.7 x 47 x 4.7 x 80	ES41-0035	ES41-0036
4.8 x 52 x 4.8 x 86	ES41-0037	ES41-0038
4.9 x 52 x 4.9 x 86	ES41-0039	ES41-0040
5 x 52 x 5 x 86	ES41-0041	ES41-0042
5.1 x 52 x 5.1 x 86	ES41-0043	ES41-0044
5.2 x 52 x 5.2 x 86	ES41-0045	ES41-0046
5.3 x 52 x 5.3 x 86	ES41-0047	ES41-0048
5.4 x 57 x 5.4 x 93	ES41-0049	ES41-0050
5.5 x 57 x 5.5 x 93	ES41-0051	ES41-0052
5.6 x 57 x 5.6 x 93	ES41-0053	ES41-0054
5.7 x 57 x 5.7 x 93	ES41-0055	ES41-0056
5.8 x 57 x 5.8 x 93	ES41-0057	ES41-0058
5.9 x 57 x 5.9 x 93	ES41-0059	ES41-0060
6 x 57 x 6 x 93	ES41-0061	ES41-0062
6.1 x 63 x 6.1 x 101	ES41-0063	ES41-0064
6.2 x 63 x 6.2 x 101	ES41-0065	ES41-0066
6.3 x 63 x 6.3 x 101	ES41-0067	ES41-0068
6.4 x 63 x 6.4 x 101	ES41-0069	ES41-0070
6.5 x 63 x 6.5 x 101	ES41-0071	ES41-0072
6.6 x 63 x 6.6 x 101	ES41-0073	ES41-0074
6.7 x 63 x 6.7 x 101	ES41-0075	ES41-0076

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.

2 FLUTE

27° HELIX



Description	Part No. Uncoated	Part No. TiN
6.8 x 69 x 6.8 x 109	ES41-0077	ES41-0078
6.9 x 69 x 6.9 x 109	ES41-0079	ES41-0080
7 x 69 x 7 x 109	ES41-0081	ES41-0082
7.1 x 69 x 7.1 x 109	ES41-0083	ES41-0084
7.2 x 69 x 7.2 x 109	ES41-0085	ES41-0086
7.3 x 69 x 7.3 x 109	ES41-0087	ES41-0088
7.4 x 69 x 7.4 x 109	ES41-0089	ES41-0090
7.5 x 69 x 7.5 x 109	ES41-0091	ES41-0092
7.6 x 75 x 7.6 x 117	ES41-0093	ES41-0094
7.7 x 75 x 7.7 x 117	ES41-0095	ES41-0096
7.8 x 75 x 7.8 x 117	ES41-0097	ES41-0098
7.9 x 75 x 7.9 x 117	ES41-0099	ES41-0100
8 x 75 x 8 x 117	ES41-0101	ES41-0102
8.1 x 75 x 8.1 x 117	ES41-0103	ES41-0104
8.2 x 75 x 8.2 x 117	ES41-0105	ES41-0106
8.3 x 75 x 8.3 x 117	ES41-0107	ES41-0108
8.4 x 75 x 8.4 x 117	ES41-0109	ES41-0110
8.5 x 75 x 8.5 x 117	ES41-0111	ES41-0112
8.6 x 81 x 8.6 x 125	ES41-0113	ES41-0114
8.7 x 81 x 8.7 x 125	ES41-0115	ES41-0116
8.8 x 81 x 8.8 x 125	ES41-0117	ES41-0118
8.9 x 81 x 8.9 x 125	ES41-0119	ES41-0120
9 x 81 x 9 x 125	ES41-0121	ES41-0122
9.1 x 81 x 9.1 x 125	ES41-0123	ES41-0124
9.2 x 81 x 9.2 x 125	ES41-0125	ES41-0126
9.3 x 81 x 9.3 x 125	ES41-0127	ES41-0128
9.4 x 81 x 9.4 x 125	ES41-0129	ES41-0130
9.5 x 81 x 9.5 x 125	ES41-0131	ES41-0132
9.6 x 87 x 9.6 x 133	ES41-0133	ES41-0134
9.7 x 87 x 9.7 x 133	ES41-0135	ES41-0136
9.8 x 87 x 9.8 x 133	ES41-0137	ES41-0138
9.9 x 87 x 9.9 x 133	ES41-0139	ES41-0140
10 x 87 x 10 x 133	ES41-0141	ES41-0142
10.2 x 87 x 10.2 x 133	ES41-0143	ES41-0144
10.5 x 87 x 10.5 x 133	ES41-0145	ES41-0146
11 x 94 x 11 x 142	ES41-0147	ES41-0148
11.5 x 94 x 11.5 x 142	ES41-0149	ES41-0150
12 x 101 x 12 x 151	ES41-0151	ES41-0152

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)
See page 6 for other coatings available.

2 FLUTE**25° HELIX****118° FOUR FACET POINT**

Description	Part No. Uncoated	Part No. TiN
3.1 x 16 x 3.1 x 46	ES42-0001	ES42-0002
3.2 x 18 x 3.2 x 49	ES42-0003	ES42-0004
3.3 x 18 x 3.3 x 49	ES42-0005	ES42-0006
3.4 x 20 x 3.4 x 52	ES42-0007	ES42-0008
3.5 x 20 x 3.5 x 52	ES42-0009	ES42-0010
3.6 x 20 x 3.6 x 52	ES42-0011	ES42-0012
3.7 x 20 x 3.7 x 52	ES42-0013	ES42-0014
3.8 x 22 x 3.8 x 55	ES42-0015	ES42-0016
3.9 x 22 x 3.9 x 55	ES42-0017	ES42-0018
4 x 22 x 4 x 55	ES42-0019	ES42-0020
4.1 x 22 x 4.1 x 55	ES42-0021	ES42-0022
4.2 x 22 x 4.2 x 55	ES42-0023	ES42-0024
4.3 x 24 x 4.3 x 58	ES42-0025	ES42-0026
4.4 x 24 x 4.4 x 58	ES42-0027	ES42-0028
4.5 x 24 x 4.5 x 58	ES42-0029	ES42-0030
4.6 x 24 x 4.6 x 58	ES42-0031	ES42-0032
4.7 x 24 x 4.7 x 58	ES42-0033	ES42-0034
4.8 x 26 x 4.8 x 62	ES42-0035	ES42-0036
4.9 x 26 x 4.9 x 62	ES42-0037	ES42-0038
5 x 26 x 5 x 62	ES42-0039	ES42-0040
5.1 x 26 x 5.1 x 62	ES42-0041	ES42-0042
5.2 x 26 x 5.2 x 62	ES42-0043	ES42-0044
5.3 x 26 x 5.3 x 62	ES42-0045	ES42-0046
5.4 x 28 x 5.4 x 66	ES42-0047	ES42-0048
5.5 x 28 x 5.5 x 66	ES42-0049	ES42-0050
5.6 x 28 x 5.6 x 66	ES42-0051	ES42-0052
5.7 x 28 x 5.7 x 66	ES42-0053	ES42-0054
5.8 x 28 x 5.8 x 66	ES42-0055	ES42-0056
5.9 x 28 x 5.9 x 66	ES42-0057	ES42-0058
6 x 28 x 6 x 66	ES42-0059	ES42-0060
6.1 x 31 x 6.1 x 70	ES42-0061	ES42-0062
6.2 x 31 x 6.2 x 70	ES42-0063	ES42-0064
6.3 x 31 x 6.3 x 70	ES42-0065	ES42-0066
6.4 x 31 x 6.4 x 70	ES42-0067	ES42-0068
6.5 x 31 x 6.5 x 70	ES42-0069	ES42-0070
6.6 x 31 x 6.6 x 70	ES42-0071	ES42-0072
6.7 x 31 x 6.7 x 70	ES42-0073	ES42-0074
6.8 x 34 x 6.8 x 74	ES42-0075	ES42-0076
6.9 x 34 x 6.9 x 74	ES42-0077	ES42-0078
7 x 34 x 7 x 74	ES42-0079	ES42-0080
7.3 x 34 x 7.3 x 74	ES42-0085	ES42-0086
7.4 x 34 x 7.4 x 74	ES42-0087	ES42-0088
7.5 x 34 x 7.5 x 74	ES42-0089	ES42-0090
7.6 x 37 x 7.6 x 79	ES42-0091	ES42-0092
7.7 x 37 x 7.7 x 79	ES42-0093	ES42-0094

2 FLUTE

25° HELIX

118° FOUR FACET POINT



Description	Part No. Uncoated	Part No. TiN
7.8 x 37 x 7.8 x 79	ES42-0095	ES42-0096
7.9 x 37 x 7.9 x 79	ES42-0097	ES42-0098
8 x 37 x 8 x 79	ES42-0099	ES42-0100
8.1 x 37 x 8.1 x 79	ES42-0101	ES42-0102
8.2 x 37 x 8.2 x 79	ES42-0103	ES42-0104
8.3 x 37 x 8.3 x 79	ES42-0105	ES42-0106
8.4 x 37 x 8.4 x 79	ES42-0107	ES42-0108
8.5 x 37 x 8.5 x 79	ES42-0109	ES42-0110
8.6 x 40 x 8.6 x 84	ES42-0111	ES42-0112
8.7 x 40 x 8.7 x 84	ES42-0113	ES42-0114
8.8 x 40 x 8.8 x 84	ES42-0115	ES42-0116
8.9 x 40 x 8.9 x 84	ES42-0117	ES42-0118
9 x 40 x 9 x 84	ES42-0119	ES42-0120
9.1 x 40 x 9.1 x 84	ES42-0121	ES42-0122
9.2 x 40 x 9.2 x 84	ES42-0123	ES42-0124
9.3 x 40 x 9.3 x 84	ES42-0125	ES42-0126
9.4 x 40 x 9.4 x 84	ES42-0127	ES42-0128
9.5 x 40 x 9.5 x 84	ES42-0129	ES42-0130
9.6 x 43 x 9.6 x 89	ES42-0131	ES42-0132
9.7 x 43 x 9.7 x 89	ES42-0133	ES42-0134
9.8 x 43 x 9.8 x 89	ES42-0135	ES42-0136
9.9 x 43 x 9.9 x 89	ES42-0137	ES42-0138
10 x 43 x 10 x 89	ES42-0139	ES42-0140
10.1 x 43 x 10.1 x 89	ES42-0141	ES42-0142
10.2 x 43 x 10.2 x 89	ES42-0143	ES42-0144
10.3 x 43 x 10.3 x 89	ES42-0145	ES42-0146
10.4 x 43 x 10.4 x 89	ES42-0147	ES42-0148
10.5 x 43 x 10.5 x 89	ES42-0149	ES42-0150
10.6 x 43 x 10.6 x 89	ES42-0151	ES42-0152
10.7 x 43 x 10.7 x 89	ES42-0153	ES42-0154
10.8 x 43 x 10.8 x 89	ES42-0155	ES42-0156
11 x 47 x 11 x 95	ES42-0157	ES42-0158
11.2 x 47 x 11.2 x 95	ES42-0159	ES42-0160
11.5 x 47 x 11.5 x 95	ES42-0161	ES42-0162
11.8 x 47 x 11.8 x 95	ES42-0163	ES42-0164
12 x 51 x 12 x 102	ES42-0165	ES42-0166
12.5 x 51 x 12.5 x 102	ES42-0167	ES42-0168
13 x 51 x 13 x 102	ES42-0169	ES42-0170
13.5 x 51 x 13.5 x 102	ES42-0171	ES42-0172
14 x 56 x 14 x 111	ES42-0173	ES42-0174
14.5 x 56 x 14.5 x 111	ES42-0175	ES42-0176
15 x 56 x 15 x 111	ES42-0177	ES42-0178
15.5 x 58 x 15.5 x 115	ES42-0179	ES42-0180
16 x 58 x 16 x 115	ES42-0181	ES42-0182
16.5 x 60 x 16.5 x 119	ES42-0183	ES42-0184

2 FLUTE

25° HELIX

118° FOUR FACET POINT



Description	Part No. Uncoated	Part No. TiN
17 x 60 x 17 x 119	ES42-0185	ES42-0186
17.5 x 62 x 17.5 x 123	ES42-0187	ES42-0188
18 x 62 x 18 x 123	ES42-0189	ES42-0190
18.5 x 64 x 18.5 x 127	ES42-0191	ES42-0192
19 x 64 x 19 x 127	ES42-0193	ES42-0194
19.5 x 66 x 19.5 x 131	ES42-0195	ES42-0196
20 x 66 x 20 x 131	ES42-0197	ES42-0198

Stub Length Drills

2 FLUTE

27° HELIX

Description	Part No.	Description	Part No.
3 x 12 x 3 x 46	ES43-0001	5.5 x 21 x 5.5 x 66	ES43-0026
3.1 x 14 x 3.1 x 49	ES43-0002	5.6 x 21 x 5.6 x 66	ES43-0027
3.2 x 14 x 3.2 x 49	ES43-0003	5.7 x 21 x 5.7 x 66	ES43-0028
3.3 x 14 x 3.3 x 49	ES43-0004	5.8 x 21 x 5.8 x 66	ES43-0029
3.4 x 15 x 3.4 x 52	ES43-0005	5.9 x 21 x 5.9 x 66	ES43-0030
3.5 x 15 x 3.5 x 52	ES43-0006	6 x 21 x 6 x 66	ES43-0031
3.6 x 15 x 3.6 x 52	ES43-0007	6.1 x 23 x 6.1 x 70	ES43-0032
3.7 x 15 x 3.7 x 52	ES43-0008	6.2 x 23 x 6.2 x 70	ES43-0033
3.8 x 17 x 3.8 x 55	ES43-0009	6.3 x 23 x 6.3 x 70	ES43-0034
3.9 x 17 x 3.9 x 55	ES43-0010	6.4 x 23 x 6.4 x 70	ES43-0035
4 x 17 x 4 x 55	ES43-0011	6.5 x 23 x 6.5 x 70	ES43-0036
4.1 x 17 x 4.1 x 55	ES43-0012	7 x 25 x 7 x 74	ES43-0037
4.2 x 17 x 4.2 x 55	ES43-0013	7.5 x 25 x 7.5 x 74	ES43-0038
4.3 x 18 x 4.3 x 58	ES43-0014A	8 x 27 x 8 x 79	ES43-0039
4.4 x 18 x 4.4 x 58	ES43-0015	8.5 x 27 x 8.5 x 79	ES43-0040
4.5 x 18 x 4.5 x 58	ES43-0016	9 x 29 x 9 x 84	ES43-0041
4.6 x 18 x 4.6 x 58	ES43-0017	9.5 x 29 x 9.5 x 84	ES43-0042
4.7 x 18 x 4.7 x 58	ES43-0018	10 x 31 x 10 x 89	ES43-0043
4.8 x 20 x 4.8 x 62	ES43-0019	10.5 x 31 x 10.5 x 89	ES43-0044
4.9 x 20 x 4.9 x 62	ES43-0020	11 x 33 x 11 x 95	ES43-0045
5 x 20 x 5 x 62	ES43-0021	11.5 x 33 x 11.5 x 95	ES43-0046
5.1 x 20 x 5.1 x 62	ES43-0022A	12 x 35 x 12 x 102	ES43-0047
5.2 x 50 x 5.2 x 62	ES43-0023A	12.5 x 35 x 12.5 x 102	ES43-0048
5.3 x 20 x 5.3 x 62	ES43-0024	13 x 35 x 13 x 102	ES43-0049
5.4 x 21 x 5.4 x 66	ES43-0025	14 x 37 x 14 x 107	ES43-0050

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

See page 6 for other coatings available.

ODxLOFxShankODxOAL	Point Angle	Part No.
3 x 10 x 3 x 38	90°	ES44-0001
4 x 18 x 4 x 63	90°	ES44-0002
6 x 20 x 6 x 63	90°	ES44-0003
10 x 25 x 10 x 75	90°	ES44-0004
12 x 25 x 12 x 75	90°	ES44-0005

ODxLOFxShankODxOAL	Point Angle	Part No.
3 x 10 x 3 x 38	120°	ES44-0006
4 x 18 x 4 x 63	120°	ES44-0007
6 x 20 x 6 x 63	120°	ES44-0008
10 x 25 x 10 x 75	120°	ES44-0009
12 x 25 x 12 x 75	120°	ES44-0010

Solid Carbide Centerdrills

Dimensions	Size No.	Part No. 60°	Part No. 82°	Part No. 90°
1.2 x 3.18 x 38	M1	ES44-0051	ES44-0061	ES44-0071
2 x 4.75 x 50	M2	ES44-0052	ES44-0062	ES44-0072
2.8 x 6.3 x 50	M3	ES44-0053	ES44-0063	ES44-0073
3.15 x 8 x 56	M4	ES44-0054	ES44-0064	ES44-0074
4 x 11.1 x 70	M5	ES44-0055	ES44-0065	ES44-0075
5 x 12.7 x 75	M6	ES44-0056	ES44-0066	ES44-0076
6 x 15.9 x 81	M7	ES44-0057	ES44-0067	ES44-0077
8 x 19 x 85	M8	ES44-0058	ES44-0068	ES44-0078



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See page 6 for other coatings available.

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Mold and Die



CORNER RADIUS ENDMILL NECKED



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
1/8 x 1/8 x 1/8 x 2-1/4	4	ES300-0001	.020	.115 x 1/2
1/8 x 1/8 x 1/8 x 2-1/4	4	ES300-0002	.015	.115 x 1/2
1/8 x 1/8 x 1/8 x 2-1/4	4	ES300-0003Q	.020	.115 x 1/2
3/16 x 3/16 x 3/16 x 2-1/2	4	ES300-0004	.010	.175 x 1/2
3/16 x 3/16 x 3/16 x 2-1/2	4	ES300-0005	.020	.175 x 1/2
3/16 x 3/16 x 3/16 x 2-1/2	4	ES300-0006	.030	.175 x 1/2
1/4 x 1/4 x 1/4 x 2-1/2	6	ES300-0007	.010	.230 x 3/4
1/4 x 1/4 x 1/4 x 2-1/2	6	ES300-0008	.020	.230 x 3/4
1/4 x 1/4 x 1/4 x 2-1/2	6	ES300-0009Q	.030	.230 x 3/4
1/4 x 1/4 x 1/4 x 3	6	ES300-0010	.030	.230 x 3/4
3/8 x 3/8 x 3/8 x 3	6	ES300-0011	.010	.345 x 1
3/8 x 3/8 x 3/8 x 3	6	ES300-0012	.020	.345 x 1
3/8 x 3/8 x 3/8 x 3	6	ES300-0013Q	.030	.345 x 1
1/2 x 1/2 x 1/2 x 3-1/2	6	ES300-0014	.015	.460 x 1
1/2 x 1/2 x 1/2 x 3-1/2	6	ES300-0015	.030	.460 x 1
1/2 x 1/2 x 1/2 x 3-1/2	6	ES300-0016Q	.060	.460 x 1
1/2 x 1/2 x 1/2 x 4	6	ES300-0017	.060	.460 x 1

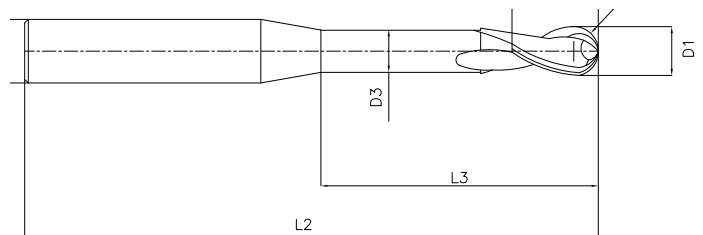
CORNER RADIUS LONG LENGTH ENDMILL NECKED



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
1/8 x 1/8 x 1/8 x 4	4	ES301-0001	.010	.115 x 1-1/4
1/8 x 1/8 x 1/8 x 4	4	ES301-0002	.015	.115 x 1-1/4
1/8 x 1/8 x 1/8 x 4	4	ES301-0003	.020	.115 x 1-1/4
3/16 x 3/16 x 3/16 x 4	4	ES301-0004	.010	.175 x 1-1/2
3/16 x 3/16 x 3/16 x 4	4	ES301-0005	.020	.175 x 1-1/2
3/16 x 3/16 x 3/16 x 4	4	ES301-0006	.030	.175 x 1-1/2
1/4 x 1/4 x 1/4 x 6	6	ES301-0007	.010	.230 x 2
1/4 x 1/4 x 1/4 x 6	6	ES301-0008	.020	.230 x 2
1/4 x 1/4 x 1/4 x 6	6	ES301-0009	.030	.230 x 2
3/8 x 3/8 x 3/8 x 6	6	ES301-0010	.010	.345 x 2-1/4
3/8 x 3/8 x 3/8 x 6	6	ES301-0011	.020	.345 x 2-1/4
3/8 x 3/8 x 3/8 x 6	6	ES301-0012	.030	.345 x 2-1/4
1/2 x 1/2 x 1/2 x 6	6	ES301-0013	.015	.460 x 2-1/2
1/2 x 1/2 x 1/2 x 6	6	ES301-0014	.030	.460 x 2-1/2
1/2 x 1/2 x 1/2 x 6	6	ES301-0015	.060	.460 x 2-1/2

Tolerances:

D1: .0393 to .3937	- .0005	R: .0393 to .3937	- .0002
	- .0011		- .0008
D1: .1182 to .2362	- .0007	R: .1182 to .2362	- .0003
	- .0014		- .0011
D1: .2362 to .3937	- .0009	R: .2362 to .3937	- .0005
	- .0018		- .0013
D1: .3938 to .7086	- .0012	R: .3938 to .7086	- .0006
	- .0023		- .0016
D1: .7087 to 1.181	- .0015	R: .7087 to 1.181	- .0007
	- .0028		- .0020
D2: h6		L2: + .030	
			- .000
D3: ± .003		L3: + .020	
			- .010



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BALL NOSE ENDMILL NECKED



ODxLOCxShankODxOAL	No. of Flutes	TiAlN Part No.	Under Cut Neck
1/32 x 1/32 x 1/8 x 2-1/2	2	ES302-0001	.027 x 3/32
1/16 x 1/16 x 1/8 x 2-1/2	2	ES302-0002	.053 x 3/16
1/16 x 1/16 x 1/4 x 2	2	ES302-0003	.053 x 3/16
1/16 x 1/16 x 1/4 x 2-1/2	2	ES302-0004	.053 x 3/16
5/64 x 1/8 x 1/8 x 2	2	ES302-0005	.067 x 3/16
1/8 x 1/8 x 1/8 x 3	2	ES302-0006	.115 x 3/8
1/8 x 1/8 x 1/4 x 2-1/4	2	ES302-0007	.115 x 3/8
1/8 x 1/8 x 1/4 x 3	2	ES302-0008	.115 x 3/8
3/16 x 3/16 x 3/16 x 3	2	ES302-0009Q	.175 x 9/16
3/16 x 3/16 x 3/16 x 4	2	ES302-0010	.175 x 9/16
3/16 x 3/16 x 1/4 x 2-1/4	2	ES302-0011	.175 x 9/16
3/16 x 3/16 x 1/4 x 3	2	ES302-0012	.175 x 9/16
1/4 x 1/4 x 1/4 x 2-1/4	2	ES302-0013	.230 x 3/4
1/4 x 1/4 x 1/4 x 3	2	ES302-0014	.230 x 1-1/2
5/16 x 5/16 x 5/16 x 3	2	ES302-0015	.285 x 1
3/8 x 3/8 x 3/8 x 2-1/2	2	ES302-0016Q	.345 x 5/8
3/8 x 3/8 x 3/8 x 3-1/2	2	ES302-0017	.345 x 1-1/8
1/2 x 1/2 x 1/2 x 3	2	ES302-0018	.460 x 3/4
1/2 x 1/2 x 1/2 x 4	2	ES302-0019	.460 x 1-1/4
5/8 x 5/8 x 5/8 x 4-1/2	2	ES302-0020	.575 x 1-1/8

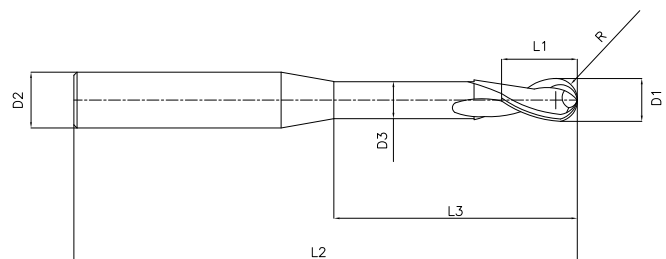
BALL NOSE LONG LENGTH ENDMILL NECKED



ODxLOCxShankODxOAL	No. of Flutes	TiAlN Part No.	Under Cut Neck
1/8 x 1/8 x 1/4 x 4	2	ES303-0001	.115 x 3/8
3/16 x 3/16 x 1/4 x 4	2	ES303-0002	.175 x 9/16
1/4 x 1/4 x 1/4 x 6	2	ES303-0003	.230 x 3/4
5/16 x 5/16 x 5/16 x 6	2	ES303-0004	.288 x 15/16
3/8 x 3/8 x 3/8 x 6	2	ES303-0005	.345 x 1-1/8
7/16 x 7/16 x 7/16 x 6	2	ES303-0006	.403 x 1-1/4
1/2 x 1/2 x 1/2 x 6	2	ES303-0007	.460 x 1-1/2

Tolerances:

D1: .0393 to .3937	-.0005 -.0011	R: .0393 to .3937	-.0002 -.0008
D1: .1182 to .2362	-.0007 -.0014	R: .1182 to .2362	-.0003 -.0011
D1: .2362 to .3937	-.0009 -.0018	R: .2362 to .3937	-.0005 -.0013
D1: .3938 to .7086	-.0012 -.0023	R: .3938 to .7086	-.0006 -.0016
D1: .7087 to 1.181	-.0015 -.0028	R: .7087 to 1.181	-.0007 -.0020
D2: h6		L2: ± .060	
D3: ± .003		L3: + .020 -.010	
L1: + .030 -.000			



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2 FLUTE BALL NOSE ENDMILL



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1/32 x 1/32 x 1/8 x 2-1/4	2	ES304-0001	
1/16 x 1/16 x 1/8 x 2-1/4	2	ES304-0002	
1/8 x 1/8 x 1/8 x 2-1/4	2	ES304-0003Q	
3/16 x 3/16 x 3/16 x 2-1/4	2	ES304-0004	
1/4 x 1/4 x 1/4 x 2-1/4	2	ES304-0005Q	
1/4 x 1/4 x 1/4 x 4	2	ES304-0006	
5/16 x 5/16 x 5/16 x 2-1/2	2	ES304-0007	
3/8 x 3/8 x 3/8 x 3	2	ES304-0008	
3/8 x 3/8 x 3/8 x 4	2	ES304-0009	
1/2 x 1/2 x 1/2 x 3-1/2	2	ES304-0010	
1/2 x 1/2 x 1/2 x 4	2	ES304-0011	

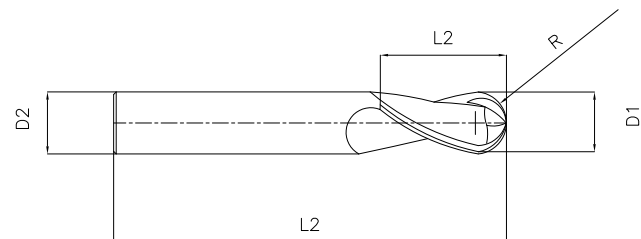
4 FLUTE BALL NOSE ENDMILL



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1/8 x 1/2 x 1/8 x 2-1/4	4	ES305-0001	
3/16 x 5/8 x 3/16 x 2-1/4	4	ES305-0002	
1/4 x 3/4 x 1/4 x 2-1/2	4	ES305-0003	
5/16 x 1 x 5/16 x 2-1/2	4	ES305-0004	
3/8 x 1 x 3/8 x 3	4	ES305-0005	
7/16 x 7/16 x 3	4	ES305-0006	
1/2 x 1-1/4 x 1/2 x 3-1/2	4	ES305-0007	
5/8 x 1-1/4 x 5/8 x 3-1/2	4	ES305-0008	
3/4 x 1-1/2 x 3/4 x 4	4	ES305-0009	

Tolerances:

D1: .0393 to .3937	-.0005 -.0011	R: .0393 to .3937	-.0002 -.0008
D1: .1182 to .2362	-.0007 -.0014	R: .1182 to .2362	-.0003 -.0011
D1: .2362 to .3937	-.0009 -.0018	R: .2362 to .3937	-.0005 -.0013
D1: .3938 to .7086	-.0012 -.0023	R: .3938 to .7086	-.0006 -.0016
D1: .7087 to 1.181	-.0015 -.0028	R: .7087 to 1.181	-.0007 -.0020
L1: +.030 -.000		L2: ± .060	
D2: h6			



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BALL NOSE ENDMILL 2XD LONG LENGTH - MICROCUT-LB2



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1 x 1.2 x 3 x 60	2	ES306-0001	0.95 x 2.0
1.2 x 1.4 x 3 x 60	2	ES306-0002	1.15 x 2.4
1.5 x 1.8 x 3 x 60	2	ES306-0003	1.45 x 3.0
2 x 2.4 x 3 x 60	2	ES306-0004	1.95 x 4
3 x 3.6 x 3 x 60	2	ES306-0005	2.95 x 6

BALL NOSE ENDMILL 3XD - MICROCUT-B3



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1.0 x 1.2 x 3 x 50	2	ES307-0001	0.95 x 3
1.2 x 1.8 x 3 x 50	2	ES307-0002	1.45 x 4.5
2.0 x 2.4 x 3 x 50	2	ES307-0003	1.95 x 6
2.5 x 3 x 3 x 50	2	ES307-0004	2.45 x 7.5
3.0 x 3.6 x 3 x 50	2	ES307-0005	2.95 x 9

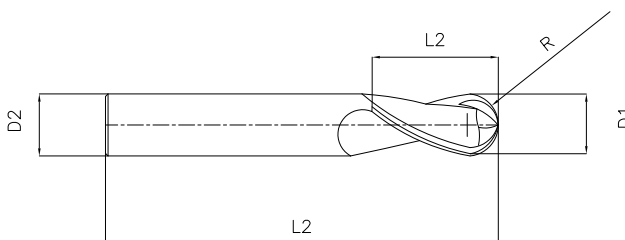
BALL NOSE ENDMILL 3XD HIGH STRENGTH - MICROCUT-B3H



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1.0 x 1.2 x 3 x 50	2	ES308-0001	0.95 x 3
1.2 x 1.8 x 3 x 50	2	ES308-0002	1.45 x 4.5
2.0 x 2.4 x 3 x 50	2	ES308-0003	1.95 x 6
2.5 x 3 x 3 x 50	2	ES308-0004	2.45 x 7.5
3.0 x 3.6 x 3 x 50	2	ES308-0005Q	2.95 x 9

Tolerances:

D1: .0393 to .3937	-.0005 -.0011	R: .0393 to .3937	-.0002 -.0008
D1: .1182 to .2362	-.0007 -.0014	R: .1182 to .2362	-.0003 -.0011
D1: .2362 to .3937	-.0009 -.0018	R: .2362 to .3937	-.0005 -.0013
D1: .3938 to .7086	-.0012 -.0023	R: .3938 to .7086	-.0006 -.0016
D1: .7087 to 1.181	-.0015 -.0028	R: .7087 to 1.181	-.0007 -.0020
L1: +.030 -.000		L2: ±.060	
D2: h6			



Q = Quick Ship (Stock Item) Although we normally stock items, we do not have an unlimited supply. Please call to confirm quantities on hand before ordering.

BALL NOSE ENDMILL 5XD - MICROCUT-B5



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1.0 x 1.2 x 3 x 50	2	ES309-0001Q	0.95 x 5
1.2 x 1.4 x 3 x 50	2	ES309-0002	1.15 x 6
1.5 x 1.8 x 3 x 50	2	ES309-0003	1.45 x 7.5
1.8 x 2.2 x 3 x 50	2	ES309-0004	1.75 x 9
2 x 2.4 x 3 x 50	2	ES309-0005Q	1.95 x 10
2.3 x 2.8 x 3 x 50	2	ES309-0006	2.25 x 11.5
2.5 x 3 x 3 x 50	2	ES309-0007	2.45 x 12.5
2.8 x 3.4 x 3 x 50	2	ES309-0008	2.75 x 14
3 x 3.6 x 3 x 50	2	ES309-0009	2.95 x 15

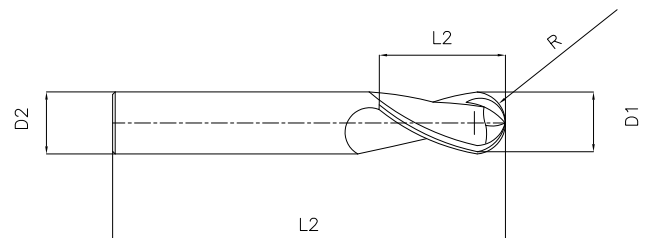
BALL NOSE ENDMILL 5XD HIGH STRENGTH - MICROCUT-B5H



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1 x 1.2 x 3 x 50	2	ES310-0001	.95 x 5
1.2 x 1.4 x 3 x 50	2	ES310-0002	1.15 x 6
1.5 x 1.8 x 3 x 50	2	ES310-0003	1.45 x 7.5
1.8 x 2.2 x 3 x 50	2	ES310-0004	1.75 x 9
2 x 2.4 x 3 x 50	2	ES310-0005	1.95 x 10
2.3 x 2.8 x 3 x 50	2	ES310-0006	2.25 x 11.5
2.5 x 3 x 3 x 50	2	ES310-0007	2.45 x 12.5
2.8 x 3.4 x 3 x 50	2	ES310-0008	2.75 x 14
3 x 3.6 x 3 x 50	2	ES310-0009	2.95 x 15

Tolerances:

D1: .0393 to .3937	- .0005 - .0011	R: .0393 to .3937	- .0002 - .0008
D1: .1182 to .2362	- .0007 - .0014	R: .1182 to .2362	- .0003 - .0011
D1: .2362 to .3937	- .0009 - .0018	R: .2362 to .3937	- .0005 - .0013
D1: .3938 to .7086	- .0012 - .0023	R: .3938 to .7086	- .0006 - .0016
D1: .7087 to 1.181	- .0015 - .0028	R: .7087 to 1.181	- .0007 - .0020
L1: + .030 - .000		L2: ± .060	
D2: h6			



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BALL NOSE ENDMILL 8XD - MICROCUT-B8



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1 x 1.2 x 3 x 50	2	ES311-0001	0.95 x 8
1.2 x 1.4 x 3 x 50	2	ES311-0002	1.15 x 9.6
1.5 x 1.8 x 3 x 60	2	ES311-0003Q	1.45 x 12
2 x 2.4 x 3 x 60	2	ES311-0004	1.95 x 16
2.5 x 3 x 3 x 60	2	ES311-0005	2.45 x 20
3 x 3.6 x 3 x 60	2	ES311-0006	2.95 x 24

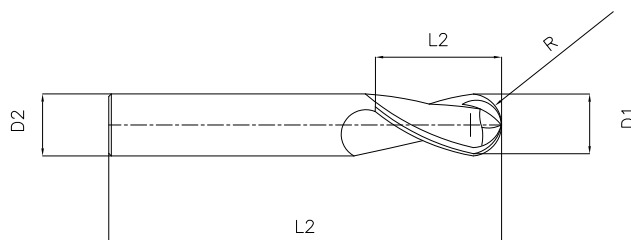
BALL NOSE ENDMILL 8XD HIGH STRENGTH - MICROCUT-B8H



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1 x 1.2 x 3 x 50	2	ES312-0001	0.95 x 8
1.2 x 1.4 x 3 x 50	2	ES312-0002	1.15 x 9.6
1.5 x 1.8 x 3 x 60	2	ES312-0003	1.45 x 12
2 x 2.4 x 3 x 60	2	ES312-0004	1.95 x 16
2.5 x 3 x 3 x 60	2	ES312-0005	2.45 x 20
3 x 3.6 x 3 x 60	2	ES312-0006	2.95 x 24

Tolerances:

D1: .0393 to .3937	- .0005 - .0011	R: .0393 to .3937	- .0002 - .0008
D1: .1182 to .2362	- .0007 - .0014	R: .1182 to .2362	- .0003 - .0011
D1: .2362 to .3937	- .0009 - .0018	R: .2362 to .3937	- .0005 - .0013
D1: .3938 to .7086	- .0012 - .0023	R: .3938 to .7086	- .0006 - .0016
D1: .7087 to 1.181	- .0015 - .0028	R: .7087 to 1.181	- .0007 - .0020
L1: + .030 - .000		L2: ± .060	
D2: h6			



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CORNER RADIUS ENDMILL 3XD - MICROCUT-T3



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
3 x 3.6 x 3 x 50	2	ES313-0001	.20mm	2.95 x 9

CORNER RADIUS ENDMILL 3XD HIGH STRENGTH - MICROCUT-T3



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
3 x 3.6 x 3 x 50	2	ES314-0001	.20mm	2.95 x 9

CORNER RADIUS ENDMILL 5XD - MICROCUT-T5



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
3 x 3.6 x 3 x 50	2	ES315-0001	.20mm	2.95 x 15

CORNER RADIUS ENDMILL 5XD HIGH STRENGTH - MICROCUT-T5



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
3 x 3.6 x 3 x 50	2	ES316-0001	.20mm	2.95 x 15

CORNER RADIUS ENDMILL 8XD - MICROCUT-T8



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
3 x 3.6 x 3 x 60	2	ES317-0001	.20mm	2.95 x 24

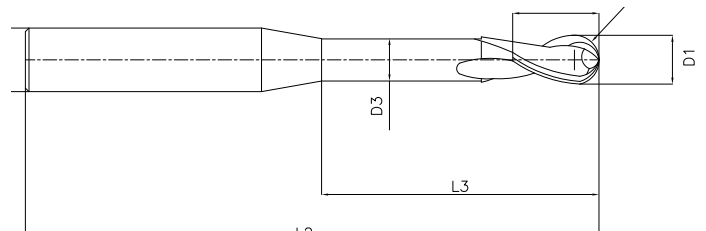
CORNER RADIUS ENDMILL 8XD HIGH STRENGTH - MICROCUT-T8



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
3 x 3.6 x 3 x 60	2	ES318-0001	.20mm	2.95 x 24

Tolerances:

D1: .0393 to .3937	-.0005 -.0011	R: .0393 to .3937	-.0002 -.0008
D1: .1182 to .2362	-.0007 -.0014	R: .1182 to .2362	-.0003 -.0011
D1: .2362 to .3937	-.0009 -.0018	R: .2362 to .3937	-.0005 -.0013
D1: .3938 to .7086	-.0012 -.0023	R: .3938 to .7086	-.0006 -.0016
D1: .7087 to 1.181	-.0015 -.0028	R: .7087 to 1.181	-.0007 -.0020
D2: h6		L2: +.030 -.000	
D3: ± .003		L3: +.020 -.010	
L1: ± .060			



45° CHAMFER ENDMILL 3XD - MICRO CUT-C3

ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
2 x 2.4 x 3 x 60	2	ES319-0001	1.95 x 6
2.5 x 3 x 3 x 60	2	ES319-0002	2.45 x 7.5
3 x 3.6 x 3 x 60	2	ES319-0003	2.95 x 9

45° CHAMFER ENDMILL 3XD HIGH STRENGTH - MICRO CUT-C3H

ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
2 x 2.4 x 3 x 60	2	ES320-0001	1.95 x 6
2.5 x 3 x 3 x 60	2	ES320-0002	2.45 x 7.5
3 x 3.6 x 3 x 60	2	ES320-0003	2.95 x 9

45° CHAMFER ENDMILL 5XD - MICRO CUT-C5

ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
2 x 2.4 x 3 x 60	2	ES321-0001	1.95 x 10
2.3 x 2.8 x 3 x 50	2	ES321-0002	2.25 x 11.5
2.5 x 3 x 3 x 60	2	ES321-0003	2.45 x 12.5
2.8 x 3.4 x 3 x 50	2	ES321-0004	2.75 x 14
3 x 3.6 x 3 x 60	2	ES321-0005	2.95 x 9

45° CHAMFER ENDMILL 5XD HIGH STRENGTH - MICRO CUT-C5H

ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
2 x 2.4 x 3 x 60	2	ES322-0001	1.95 x 10
2.3 x 2.8 x 3 x 50	2	ES322-0002	2.25 x 11.5
2.5 x 3 x 3 x 60	2	ES322-0003	2.45 x 12.5
2.8 x 3.4 x 3 x 50	2	ES322-0004	2.75 x 14
3 x 3.6 x 3 x 60	2	ES322-0005	2.95 x 9

45° CHAMFER ENDMILL 8XD - MICRO CUT-C8

ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
2 x 2.4 x 3 x 60	2	ES323-0001	1.95 x 16
2.5 x 3 x 3 x 60	2	ES323-0002	2.45 x 20
3 x 3.6 x 3 x 60	2	ES323-0003	2.95 x 24

45° CHAMFER ENDMILL 8XD HIGH STRENGTH - MICRO CUT-C8H

ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
2 x 2.4 x 3 x 60	2	ES324-0001	1.95 x 6
2.5 x 3 x 3 x 60	2	ES324-0002	2.45 x 7.5
3 x 3.6 x 3 x 60	2	ES324-0003	2.95 x 9

CORNER RADIUS ROUGHING ENDMILL NECKED



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Corner Radius	Under Cut Neck
1/4 x 5/16 x 1/4 x 2-1/2	4	ES325-0001	.060	.230 x 1/2
5/16 x 3/8 x 5/16 x 2-1/2	4	ES325-0002	.060	.288 x 1/2
3/8 x 7/16 x 3/8 x 2-1/2	4	ES325-0003Q	.080	.345 x 1/2
7/16 x 1/2 x 7/16 x 3	4	ES325-0004	.080	.403 x 9/16
1/2 x 9/16 x 1/2 x 3	4	ES325-0005Q	.090	.460 x 5/8
5/8 x 3/4 x 5/8 x 3-1/2	4	ES325-0006	.090	.575 x 3/4
3/4 x 13/16 x 3/4 x 4	4	ES325-0007	.120	.710 x 7/8

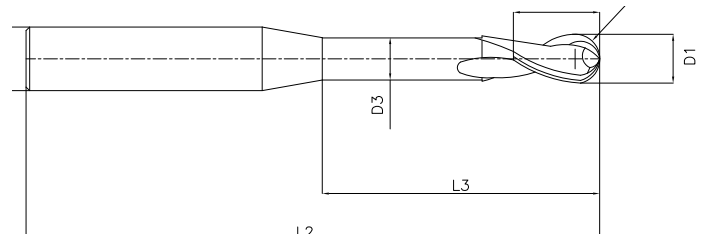
ROUGHING ENDMILL NECKED



ODxLOCxShankODxOAL	No. of Flutes	TiALN Part No.	Under Cut Neck
1/8 x 5/32 x 1/8 x 1-1/2	4	ES326-0001	.115 x 3/8
3/16 x 1/4 x 3/16 x 2	4	ES326-0002	.175 x 1/2
1/4 x 5/16 x 1/4 x 2-1/2	4	ES326-0003	.230 x 1/2
5/16 x 3/8 x 5/16 x 2-1/2	4	ES326-0004	.288 x 1/2
3/8 x 7/16 x 3/8 x 2-1/2	4	ES326-0005	.345 x 1/2
7/16 x 1/2 x 7/16 x 3	4	ES326-0006	.403 x 9/16
1/2 x 9/16 x 1/2 x 3	4	ES326-0007	.460 x 5/8
5/8 x 3/4 x 5/8 x 3-1/2	4	ES326-0008	.575 x 3/4
3/4 x 13/16 x 3/4 x 4	4	ES326-0009	.710 x 7/8

Tolerances:

D1: .0393 to .3937	-.0005 -.0011	R: .0393 to .3937	-.0002 -.0008
D1: .1182 to .2362	-.0007 -.0014	R: .1182 to .2362	-.0003 -.0011
D1: .2362 to .3937	-.0009 -.0018	R: .2362 to .3937	-.0005 -.0013
D1: .3938 to .7086	-.0012 -.0023	R: .3938 to .7086	-.0006 -.0016
D1: .7087 to 1.181	-.0015 -.0028	R: .7087 to 1.181	-.0007 -.0020
D2: h6		L2: +.030 -.000	
D3: ± .003		L3: +.020 -.010	
L1: ± .060			

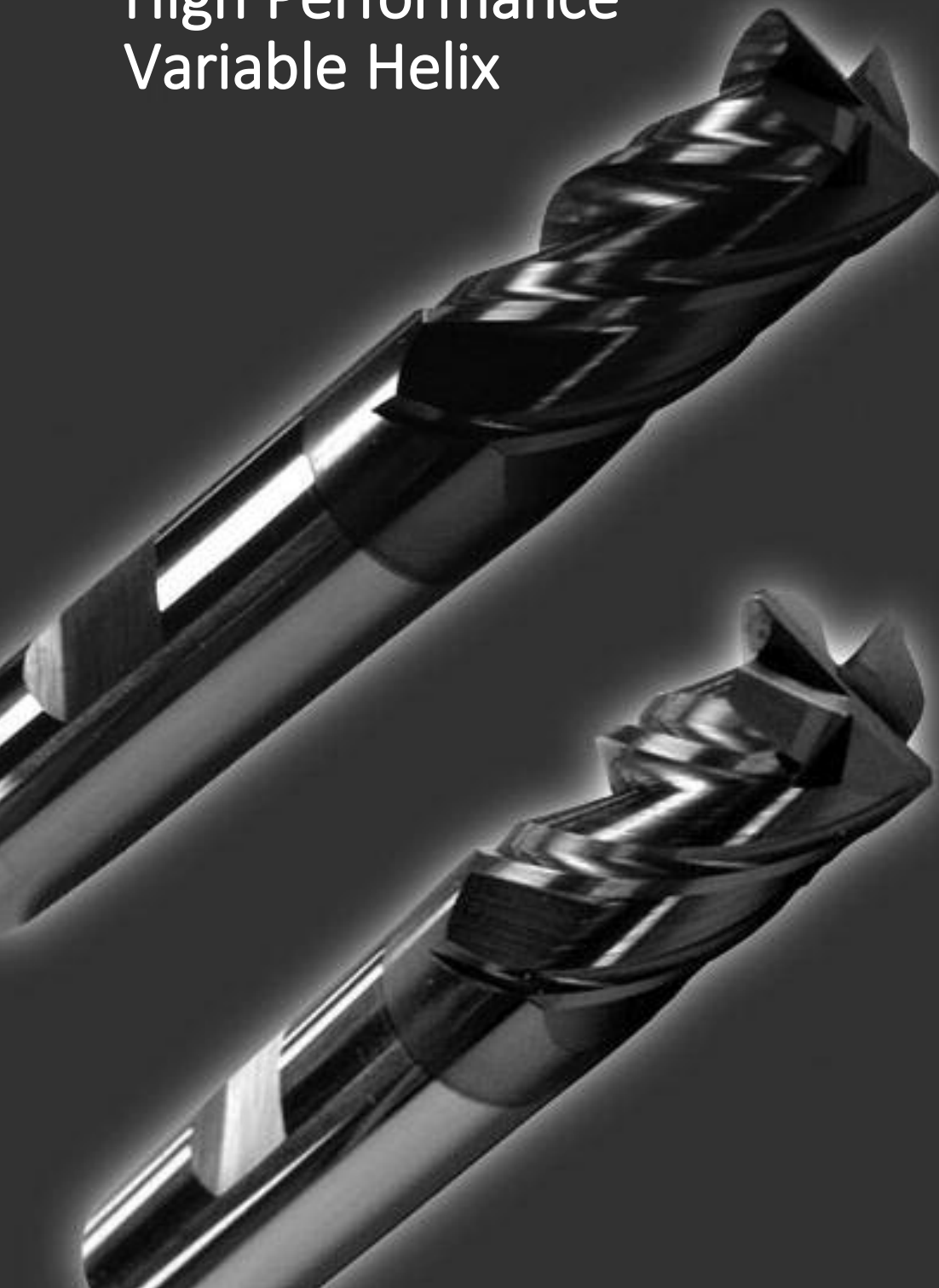


Q = Quick Ship (Stock Item) Although we normally stock items, we do not have an unlimited supply. Please call to confirm quantities on hand before ordering.

NAPGLADU

Delivering Productivity

ESX Endmills
High Performance
Variable Helix



1/4-TIALN 4FL FRACTIONAL STANDARD LENGTH

SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BULL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 3/8 x 1/8 x 1-1/2	ESX-0046	ESX-0057	.01-.015	ESX-0063
3/16 x 7/16 x 3/16 x 2	ESX-0047	ESX-0058	.01-.015	ESX-0064
1/4 x 5/8 x 1/4 x 2-1/2	ESX-0048	ESX-0059	.015-.02	ESX-0065
5/16 x 13/16 x 5/16 x 2-1/2	ESX-0049	ESX-0060	.015-.02	ESX-0066
3/8 x 7/8 x 3/8 x 2-1/2	ESX-0050	ESX-0005	.015-.02	ESX-0067
7/16 x 1 x 7/16 x 2-3/4	ESX-0051	ESX-0061	.015-.02	ESX-0068
1/2 x 1 x 1/2 x 3	ESX-0052	ESX-0007	.025-.03	ESX-0069
9/16 x 1-1/8 x 9/16 x 3-1/2	ESX-0053	ESX-0062	.025-.03	ESX-0070
5/8 x 1-1/4 x 5/8 x 3-1/2	ESX-0054	ESX-0009	.035-.04	ESX-0071
3/4 x 1-1/2 x 3/4 x 4	ESX-0055	ESX-0010	.035-.04	ESX-0072
1 x 1-1/2 x 1 x 4	ESX-0056	ESX-0011	.035-.04	ESX-0073

1/4-TIALN 4FL METRIC STANDARD LENGTH

SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BULL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
3 x 12 x 3 x 38	ESX-0074	ESX-0086	.25-.38	ESX-0098
4 x 14 x 4 x 50	ESX-0075	ESX-0087	.25-.38	ESX-0099
5 x 16 x 5 x 50	ESX-0076	ESX-0088	.25-.38	ESX-0100
6 x 19 x 6 x 63	ESX-0077	ESX-0089	.38-.51	ESX-0101
8 x 19 x 8 x 63	ESX-0078	ESX-0090	.38-.51	ESX-0102
10 x 22 x 10 x 70	ESX-0079	ESX-0091	.38-.51	ESX-0103
12 x 25 x 12 x 75	ESX-0080	ESX-0092	.64-.76	ESX-0104
14 x 25 x 14 x 88	ESX-0081	ESX-0093	.64-.76	ESX-0105
16 x 32 x 16 x 88	ESX-0082	ESX-0094	.76-.89	ESX-0106
18 x 36 x 18 x 100	ESX-0083	ESX-0095	.76-.89	ESX-0107
20 x 38 x 20 x 100	ESX-0084	ESX-0096	.76-.89	ESX-0108
25 x 38 x 25 x 100	ESX-0085	ESX-0097	.76-.89	ESX-0109

1/4-TIALN 4FL FRACTIONAL STUB LENGTH

SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BULL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/4 x 1/8 x 1-1/2	ESX-0012	ESX-0112	.01-.015	ESX-0123
5/32 x 5/16 x 3/16 x 2	ESX-0013	ESX-0113	.01-.015	ESX-0124
3/16 x 3/8 x 3/16 x 2	ESX-0014	ESX-0114	.01-.015	ESX-0125
7/32 x 7/16 x 1/4 x 2	ESX-0015	ESX-0115	.01-.015	ESX-0126
1/4 x 1/2 x 1/4 x 2	ESX-0016	ESX-0116	.015-.02	ESX-0127
5/16 x 1/2 x 5/16 x 2	ESX-0017	ESX-0117	.015-.02	ESX-0128
3/8 x 5/8 x 3/8 x 2	ESX-0018	ESX-0118	.015-.02	ESX-0129
7/16 x 5/8 x 7/16 x 2-1/2	ESX-0110	ESX-0119	.015-.02	ESX-0130
1/2 x 5/8 x 1/2 x 2-1/2	ESX-0020	ESX-0120	.025-.03	ESX-0131
5/8 x 3/4 x 5/8 x 3	ESX-0021	ESX-0121	.035-.04	ESX-0132
3/4 x 1 x 3/4 x 3	ESX-0111	ESX-0122	.035-.04	ESX-0133

1/4-TIALN 4FL METRIC STUB LENGTH

SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BULL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
3 x 6 x 3 x 38	ESX-0134	ESX-0141	.25-.38	ESX-0148
4 x 8 x 4 x 50	ESX-0135	ESX-0142	.25-.38	ESX-0149
5 x 10 x 5 x 50	ESX-0136	ESX-0143	.25-.38	ESX-0150
6 x 12 x 6 x 50	ESX-0137	ESX-0144	.38-.50	ESX-0151
8 x 12 x 8 x 50	ESX-0138	ESX-0145	.38-.50	ESX-0152
10 x 14 x 10 x 50	ESX-0139	ESX-0146	.38-.50	ESX-0153
12 x 16 x 12 x 63	ESX-0140	ESX-0147	.64-.76	ESX-0154

1/4-TIALN 4FL FRACTIONAL LONG LENGTH

SQUARE END ENDMILL

CORNER RADIUS ENDMILL

BULL NOSE ENDMILL

DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/4 x 1-1/8 x 1/4 x 3	ESX-0155	ESX-0160	.015-.02	ESX-0165
3/8 x 1-1/8 x 3/8 x 3	ESX-0156	ESX-0161	.015-.02	ESX-0166
1/2 x 2 x 1/2 x 4	ESX-0157	ESX-0162	.025-.03	ESX-0167
5/8 x 2-1/4 x 5/8 x 5	ESX-0158	ESX-0163	.03-.035	ESX-0168
3/4 x 2-1/4 x 3/4 x 5	ESX-0159	ESX-0164	.03-.035	ESX-0169

1/4-TIALN 4FL METRIC LONG LENGTH

SQUARE END ENDMILL

CORNER RADIUS ENDMILL

BULL NOSE ENDMILL

DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
3 x 20 x 3 x 65	ESX-0170	ESX-0178	.25-.38	ESX-0186
4 x 25 x 4 x 65	ESX-0171	ESX-0179	.25-.38	ESX-0187
5 x 25 x 5 x 75	ESX-0172	ESX-0180	.25-.38	ESX-0188
6 x 25 x 6 x 75	ESX-0173	ESX-0181	.38-.51	ESX-0189
8 x 25 x 8 x 75	ESX-0174	ESX-0182	.38-.51	ESX-0190
10 x 38 x 10 x 100	ESX-0175	ESX-0183	.38-.51	ESX-0191
12 x 50 x 12 x 100	ESX-0176	ESX-0184	.64-.76	ESX-0192
14 x 56 x 14 x 125	ESX-0177	ESX-0185	.64-.76	ESX-0193

SPEED & FEED RECOMMENDATIONS

Material	Surface Feet per Minute	Chip Load Per Tooth (IPT)			
		1/8	1/4	1/2	1
Aluminium Alloys	1,200	0.0010	0.0020	0.0040	0.0080
Carbon Steel	300 - 600	0.0010	0.0015	0.0030	0.0060
Cast Iron	350 - 500	0.0010	0.0015	0.0030	0.0060
Copper Alloys	500 - 900	0.0010	0.0020	0.0030	0.0060
Steel (Annealed)	350 - 500	0.0010	0.0020	0.0030	0.0050
Steel (18-24 HRC)	150 - 500	0.0004	0.0008	0.0015	0.0045
Steel (25-37 HRC)	125 - 200	0.0003	0.0005	0.0010	0.0030
Stainless Steel (Free Machining)	250 - 400	0.0005	0.0010	0.0020	0.0030
Stainless Steel (Other)	150 - 300	0.0005	0.0010	0.0020	0.0030
Inconel, Monel	60 - 100	0.0005	0.0010	0.0015	0.0030
Titanium	175 - 300	0.0005	0.0008	0.0015	0.0030

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2 FLUTE, UNCOATED

SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BALL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0001	ES46-0021	.015	ES46-0041
5/32 x 9/16 x 5/32 x 2	ES46-0002	ES46-0022	.015	ES46-0042
3/16 x 3/4 x 3/16 x 2	ES46-0003	ES46-0023	.015	ES46-0043
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0004	ES46-0024	.020	ES46-0044
1/4 x 1 x 1/4 x 2-1/2	ES46-0005	ES46-0025	.020	ES46-0045
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0006	ES46-0026	.020	ES46-0046
5/16 x 1 x 5/16 x 3	ES46-0007	ES46-0027	.020	ES46-0047
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0008	ES46-0028	.020	ES46-0048
3/8 x 1 x 3/8 x 2-1/2	ES46-0009	ES46-0029	.020	ES46-0049
7/16 x 1 x 7/16 x 2-1/2	ES46-0010	ES46-0030	.030	ES46-0050
1/2 x 1 x 1/2 x 3	ES46-0011	ES46-0031	.030	ES46-0051
1/2 x 1-1/4 x 1/2 x 3	ES46-0012	ES46-0032	.030	ES46-0052
9/16 x 1-1/4 x 9/16 x 3	ES46-0013	ES46-0033	.030	ES46-0053
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0014	ES46-0034	.040	ES46-0054
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0015	ES46-0035	.040	ES46-0055
3/4 x 1-1/2 x 3/4 x 4	ES46-0016	ES46-0036	.040	ES46-0056
3/4 x 1-3/4 x 3/4 x 4	ES46-0017	ES46-0037	.040	ES46-0057
1 x 1-1/2 x 1 x 4	ES46-0018	ES46-0038	.040	ES46-0058

2 FLUTE, COATED



SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BALL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0061	ES46-0081	.015	ES46-0101
5/32 x 9/16 x 5/32 x 2	ES46-0062	ES46-0082	.015	ES46-0102
3/16 x 3/4 x 3/16 x 2	ES46-0063	ES46-0083	.015	ES46-0103
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0064	ES46-0084	.020	ES46-0104
1/4 x 1 x 1/4 x 2-1/2	ES46-0065	ES46-0085	.020	ES46-0105
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0066	ES46-0086	.020	ES46-0106
5/16 x 1 x 5/16 x 3	ES46-0067	ES46-0087	.020	ES46-0107
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0068	ES46-0088	.020	ES46-0108
3/8 x 1 x 3/8 x 2-1/2	ES46-0069	ES46-0089	.020	ES46-0109
7/16 x 1 x 7/16 x 2-1/2	ES46-0070	ES46-0090	.030	ES46-0110
1/2 x 1 x 1/2 x 3	ES46-0071	ES46-0091	.030	ES46-0111
1/2 x 1-1/4 x 1/2 x 3	ES46-0072	ES46-0092	.030	ES46-0112
9/16 x 1-1/4 x 9/16 x 3	ES46-0073	ES46-0093	.030	ES46-0113
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0074	ES46-0094	.040	ES46-0114
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0075	ES46-0095	.040	ES46-0115
3/4 x 1-1/2 x 3/4 x 4	ES46-0076	ES46-0096	.040	ES46-0116
3/4 x 1-3/4 x 3/4 x 4	ES46-0077	ES46-0097	.040	ES46-0117
1 x 1-1/2 x 1 x 4	ES46-0078	ES46-0098	.040	ES46-0118

2 FLUTE, UNCOATED CHIPBREAKER



SQUARE END ENDMILL

CORNER RADIUS ENDMILL

BALL NOSE ENDMILL

DIAXLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0121	ES46-0141	.015	ES46-0161
5/32 x 9/16 x 5/32 x 2	ES46-0122	ES46-0142	.015	ES46-0162
3/16 x 3/4 x 3/16 x 2	ES46-0123	ES46-0143	.015	ES46-0163
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0124	ES46-0144	.020	ES46-0164
1/4 x 1 x 1/4 x 2-1/2	ES46-0125	ES46-0145	.020	ES46-0165
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0126	ES46-0146	.020	ES46-0166
5/16 x 1 x 5/16 x 3	ES46-0127	ES46-0147	.020	ES46-0167
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0128	ES46-0148	.020	ES46-0168
3/8 x 1 x 3/8 x 2-1/2	ES46-0129	ES46-0149	.020	ES46-0169
7/16 x 1 x 7/16 x 2-1/2	ES46-0130	ES46-0150	.030	ES46-0170
1/2 x 1 x 1/2 x 3	ES46-0131	ES46-0151	.030	ES46-0171
1/2 x 1-1/4 x 1/2 x 3	ES46-0132	ES46-0152	.030	ES46-0172
9/16 x 1-1/4 x 9/16 x 3	ES46-0133	ES46-0153	.030	ES46-0173
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0134	ES46-0154	.040	ES46-0174
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0135	ES46-0155	.040	ES46-0175
3/4 x 1-1/2 x 3/4 x 4	ES46-0136	ES46-0156	.040	ES46-0176
3/4 x 1-3/4 x 3/4 x 4	ES46-0137	ES46-0157	.040	ES46-0177
1 x 1-1/2 x 1 x 4	ES46-0138	ES46-0158	.040	ES46-0178

2 FLUTE, COATED CHIPBREAKER



SQUARE END ENDMILL

CORNER RADIUS ENDMILL

BALL NOSE ENDMILL

DIAXLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0181	ES46-0201	.015	ES46-0221
5/32 x 9/16 x 5/32 x 2	ES46-0182	ES46-0202	.015	ES46-0222
3/16 x 3/4 x 3/16 x 2	ES46-0183	ES46-0203	.015	ES46-0223
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0184	ES46-0204	.020	ES46-0224
1/4 x 1 x 1/4 x 2-1/2	ES46-0185	ES46-0205	.020	ES46-0225
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0186	ES46-0206	.020	ES46-0226
5/16 x 1 x 5/16 x 3	ES46-0187	ES46-0207	.020	ES46-0227
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0188	ES46-0208	.020	ES46-0228
3/8 x 1 x 3/8 x 2-1/2	ES46-0189	ES46-0209	.020	ES46-0229
7/16 x 1 x 7/16 x 2-1/2	ES46-0190	ES46-0210	.030	ES46-0230
1/2 x 1 x 1/2 x 3	ES46-0191	ES46-0211	.030	ES46-0231
1/2 x 1-1/4 x 1/2 x 3	ES46-0192	ES46-0212	.030	ES46-0232
9/16 x 1-1/4 x 9/16 x 3	ES46-0193	ES46-0213	.030	ES46-0233
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0194	ES46-0214	.040	ES46-0234
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0195	ES46-0215	.040	ES46-0235
3/4 x 1-1/2 x 3/4 x 4	ES46-0196	ES46-0216	.040	ES46-0236
3/4 x 1-3/4 x 3/4 x 4	ES46-0197	ES46-0217	.040	ES46-0237
1 x 1-1/2 x 1 x 4	ES46-0198	ES46-0218	.040	ES46-0238



3 FLUTE, UNCOATED

SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BALL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0241	ES46-0261	.015	ES46-0281
5/32 x 9/16 x 5/32 x 2	ES46-0242	ES46-0262	.015	ES46-0282
3/16 x 3/4 x 3/16 x 2	ES46-0243	ES46-0263	.015	ES46-0283
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0244	ES46-0264	.020	ES46-0284
1/4 x 1 x 1/4 x 2-1/2	ES46-0245	ES46-0265	.020	ES46-0285
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0246	ES46-0266	.020	ES46-0286
5/16 x 1 x 5/16 x 3	ES46-0247	ES46-0267	.020	ES46-0287
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0248	ES46-0268	.020	ES46-0288
3/8 x 1 x 3/8 x 2-1/2	ES46-0249	ES46-0269	.020	ES46-0289
7/16 x 1 x 7/16 x 2-1/2	ES46-0250	ES46-0270	.030	ES46-0290
1/2 x 1 x 1/2 x 3	ES46-0251	ES46-0271	.030	ES46-0291
1/2 x 1-1/4 x 1/2 x 3	ES46-0252	ES46-0272	.030	ES46-0292
9/16 x 1-1/4 x 9/16 x 3	ES46-0253	ES46-0273	.030	ES46-0293
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0254	ES46-0274	.040	ES46-0294
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0255	ES46-0275	.040	ES46-0295
3/4 x 1-1/2 x 3/4 x 4	ES46-0256	ES46-0276	.040	ES46-0296
3/4 x 1-3/4 x 3/4 x 4	ES46-0257	ES46-0277	.040	ES46-0297
1 x 1-1/2 x 1 x 4	ES46-0258	ES46-0278	.040	ES46-0298

3 FLUTE, COATED



SQUARE END ENDMILL		CORNER RADIUS ENDMILL		BALL NOSE ENDMILL
DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0301	ES46-0321	.015	ES46-0341
5/32 x 9/16 x 5/32 x 2	ES46-0302	ES46-0322	.015	ES46-0342
3/16 x 3/4 x 3/16 x 2	ES46-0303	ES46-0323	.015	ES46-0343
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0304	ES46-0324	.020	ES46-0344
1/4 x 1 x 1/4 x 2-1/2	ES46-0305	ES46-0325	.020	ES46-0345
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0306	ES46-0326	.020	ES46-0346
5/16 x 1 x 5/16 x 3	ES46-0307	ES46-0327	.020	ES46-0347
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0308	ES46-0328	.020	ES46-0348
3/8 x 1 x 3/8 x 2-1/2	ES46-0309	ES46-0329	.020	ES46-0349
7/16 x 1 x 7/16 x 2-1/2	ES46-0310	ES46-0330	.030	ES46-0350
1/2 x 1 x 1/2 x 3	ES46-0311	ES46-0331	.030	ES46-0351
1/2 x 1-1/4 x 1/2 x 3	ES46-0312	ES46-0332	.030	ES46-0352
9/16 x 1-1/4 x 9/16 x 3	ES46-0313	ES46-0333	.030	ES46-0353
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0314	ES46-0334	.040	ES46-0354
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0315	ES46-0335	.040	ES46-0355
3/4 x 1-1/2 x 3/4 x 4	ES46-0316	ES46-0336	.040	ES46-0356
3/4 x 1-3/4 x 3/4 x 4	ES46-0317	ES46-0337	.040	ES46-0357
1 x 1-1/2 x 1 x 4	ES46-0318	ES46-0338	.040	ES46-0358



3 FLUTE, UNCOATED CHIPBREAKER

SQUARE END ENDMILL

CORNER RADIUS ENDMILL

BALL NOSE ENDMILL

DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0361	ES46-0381	.015	ES46-0401
5/32 x 9/16 x 5/32 x 2	ES46-0362	ES46-0382	.015	ES46-0402
3/16 x 3/4 x 3/16 x 2	ES46-0363	ES46-0383	.015	ES46-0403
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0364	ES46-0384	.020	ES46-0404
1/4 x 1 x 1/4 x 2-1/2	ES46-0365	ES46-0385	.020	ES46-0405
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0366	ES46-0386	.020	ES46-0406
5/16 x 1 x 5/16 x 3	ES46-0367	ES46-0387	.020	ES46-0407
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0368	ES46-0388	.020	ES46-0408
3/8 x 1 x 3/8 x 2-1/2	ES46-0369	ES46-0389	.020	ES46-0409
7/16 x 1 x 7/16 x 2-1/2	ES46-0370	ES46-0390	.030	ES46-0410
1/2 x 1 x 1/2 x 3	ES46-0371	ES46-0391	.030	ES46-0411
1/2 x 1-1/4 x 1/2 x 3	ES46-0372	ES46-0392	.030	ES46-0412
9/16 x 1-1/4 x 9/16 x 3	ES46-0373	ES46-0393	.030	ES46-0413
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0374	ES46-0394	.040	ES46-0414
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0375	ES46-0395	.040	ES46-0415
3/4 x 1-1/2 x 3/4 x 4	ES46-0376	ES46-0396	.040	ES46-0416
3/4 x 1-3/4 x 3/4 x 4	ES46-0377	ES46-0397	.040	ES46-0417
1 x 1-1/2 x 1 x 4	ES46-0378	ES46-0398	.040	ES46-0418



3 FLUTE, COATED CHIPBREAKER

SQUARE END ENDMILL

CORNER RADIUS ENDMILL

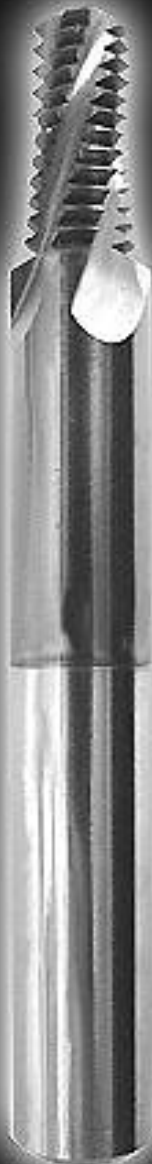
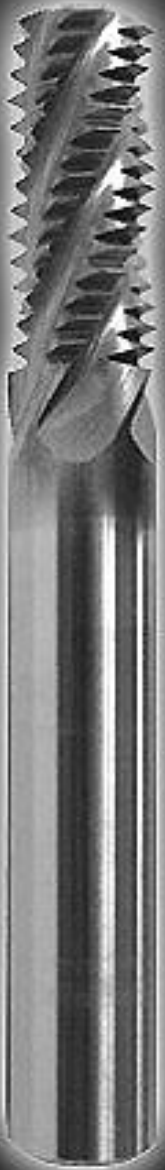
BALL NOSE ENDMILL

DIAxLOCxSHxOAL	Part No. Square	Part No. Corner Radius	CR	Part No. Ball
1/8 x 1/2 x 1/8 x 1-1/2	ES46-0421	ES46-0441	.015	ES46-0461
5/32 x 9/16 x 5/32 x 2	ES46-0422	ES46-0442	.015	ES46-0462
3/16 x 3/4 x 3/16 x 2	ES46-0423	ES46-0443	.015	ES46-0463
1/4 x 3/4 x 1/4 x 2-1/2	ES46-0424	ES46-0444	.020	ES46-0464
1/4 x 1 x 1/4 x 2-1/2	ES46-0425	ES46-0445	.020	ES46-0465
5/16 x 3/4 x 5/16 x 2-1/2	ES46-0426	ES46-0446	.020	ES46-0466
5/16 x 1 x 5/16 x 3	ES46-0427	ES46-0447	.020	ES46-0467
3/8 x 7/8 x 3/8 x 2-1/2	ES46-0428	ES46-0448	.020	ES46-0468
3/8 x 1 x 3/8 x 2-1/2	ES46-0429	ES46-0449	.020	ES46-0469
7/16 x 1 x 7/16 x 2-1/2	ES46-0430	ES46-0450	.030	ES46-0470
1/2 x 1 x 1/2 x 3	ES46-0431	ES46-0451	.030	ES46-0471
1/2 x 1-1/4 x 1/2 x 3	ES46-0432	ES46-0452	.030	ES46-0472
9/16 x 1-1/4 x 9/16 x 3	ES46-0433	ES46-0453	.030	ES46-0473
5/8 x 1-1/4 x 5/8 x 3-1/2	ES46-0434	ES46-0454	.040	ES46-0474
5/8 x 1-5/8 x 5/8 x 3-1/2	ES46-0435	ES46-0455	.040	ES46-0475
3/4 x 1-1/2 x 3/4 x 4	ES46-0436	ES46-0456	.040	ES46-0476
3/4 x 1-3/4 x 3/4 x 4	ES46-0437	ES46-0457	.040	ES46-0477
1 x 1-1/2 x 1 x 4	ES46-0438	ES46-0458	.040	ES46-0478

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Solid Carbide Threadmills





UN THREAD FORMS

Thread Size & Pitch	Part No.	Pitch	Flutes	Cut Diameter	Shank Diameter	Length of Cut	Overall Length
#6-32	ES47-0001	32	3	.095	1/8	7/32	2
#8-32	ES47-0002	32	3	.115	1/8	1/4	2
#8-36	ES47-0003	36	3	.115	1/8	1/4	2
#10-24	ES47-0004	24	3	.120	3/16	5/16	2
#10-32	ES47-0005	32	3	.120	3/16	5/16	2
1/4-20	ES47-0006	20	3	.180	3/16	1/2	2-1/2
1/4-28	ES47-0007	28	3	.180	3/16	1/2	2-1/2
5/16-18	ES47-0008	18	3	.240	1/4	5/8	2-1/2
5/16-24	ES47-0009	24	3	.240	1/4	5/8	2-1/2
3/8-16	ES47-0010	16	4	.290	5/16	3/4	3
3/8-24	ES47-0011	24	4	.290	5/16	3/4	3
7/16-14	ES47-0012	14	4	.340	3/8	7/8	3
7/16-20	ES47-0013	20	4	.340	3/8	7/8	3
1/2-13	ES47-0014	13	4	.350	3/8	7/8	3-1/2
1/2-20	ES47-0015	20	4	.350	3/8	7/8	3-1/2
9/16-12	ES47-0016	12	4	.370	1/2	7/8	3-1/2
9/16-18	ES47-0017	18	4	.370	1/2	7/8	3-1/2
5/8-11	ES47-0018	11	5	.470	1/2	1-1/4	3-1/2
5/8-18	ES47-0019	18	5	.470	1/2	1-1/4	3-1/2
3/4-10	ES47-0020	10	5	.495	1/2	1-1/4	3-1/2
3/4-12	ES47-0021	12	5	.495	1/2	1-1/4	3-1/2
3/4-16	ES47-0022	16	5	.495	1/2	1-1/4	3-1/2
7/8-9	ES47-0023	9	5	.620	5/8	1-1/4	3-1/2
7/8-14	ES47-0024	14	5	.620	5/8	1-1/4	3-1/2
1"-8	ES47-0025	8	5	.620	3/4	1-3/8	4
1"-12	ES47-0026	12	5	.620	3/4	1-3/8	4

BSPP THREADMILLS



Thread Size & Pitch	Part No.	Pitch	Flutes	Cut Diameter	Shank Diameter	Length of Cut	Overall Length
1/16, 1/8-28 BSPP	ES47-0050	28	3	.240	1/4	.572	2-1/2
1/4-19 BSPP	ES47-0051	19	4	.312	5/16	.737	3
1/2-14 BSPP	ES47-0052	14	4	.470	1/2	1.143	3-1/2
1-11 BSPP	ES47-0053	11	5	.620	5/8	1.546	4

BSPT THREADMILLS



Thread Size & Pitch	Part No.	Pitch	Flutes	Cut Diameter	Shank Diameter	Length of Cut	Overall Length
1/16, 1/8-28 BSPT	ES47-0060	28	3	.240	1/4	.401	2-1/2
1/4-19 BSPT	ES47-0061	19	4	.312	5/16	.578	3
1/2-14 BSPT	ES47-0062	14	4	.470	1/2	.785	3-1/2
1-11 BSPT	ES47-0063	11	5	.620	5/8	1.546	4

NPT THREADMILLS



Thread Size & Pitch	Part No.	Pitch	Flutes	Cut Diameter	Shank Diameter	Length of Cut	Overall Length
1/16-27 NPT	ES47-0070	27	3	.245	1/4	7/16	2-1/2
1/8-27 NPT	ES47-0071	27	4	.310	5/16	7/16	2-1/2
1/4-18 NPT	ES47-0072	18	4	.305	3/8	5/8	3
3/8-18 NPT	ES47-0073	18	4	.305	3/8	5/8	3
1/2-14 NPT	ES47-0074	14	4	.495	1/2	7/8	3-1/2
3/4-14 NPT	ES47-0075	14	4	.495	1/2	7/8	3-1/2
1-11 NPT	ES47-0076	11	5	.620	3/4	1-1/8	4

NPTF THREADMILLS



Thread Size & Pitch	Part No.	Pitch	Flutes	Cut Diameter	Shank Diameter	Length of Cut	Overall Length
1/16-27 NPTF	ES47-0080	27	3	.245	1/4	7/16	2-1/2
1/8-27 NPTF	ES47-0081	27	4	.310	5/16	7/16	2-1/2
1/4-18 NPTF	ES47-0082	18	4	.305	3/8	5/8	3
3/8-18 NPTF	ES47-0083	18	4	.305	3/8	5/8	3
1/2-14 NPTF	ES47-0084	14	4	.495	1/2	7/8	3-1/2
3/4-14 NPTF	ES47-0085	14	4	.495	1/2	7/8	3-1/2
1-11 NPTF	ES47-0086	11	5	.620	3/4	1-1/8	4

METRIC THREADMILLS



Thread Size & Pitch	Part No.	Pitch	Flutes	Cut Diameter	Shank Diameter	Length of Cut	Overall Length
M4-0.70	ES47-0101	0.7	2	.120	1/8	1/4	2
M4.5-0.75	ES47-0102	0.75	3	.120	1/8	1/4	2
M5-0.80	ES47-0103	0.80	3	.120	3/16	5/16	2
M6-1.00	ES47-0104	1	3	.170	3/16	1/2	2-1/2
M8-0.75	ES47-0105	0.75	3	.235	1/4	5/8	2-1/2
M8-1.00	ES47-0106	1	3	.235	1/4	5/8	2-1/2
M8-1.25	ES47-0107	1.25	3	.235	1/4	5/8	2-1/2
M10-1.25	ES47-0108	1.25	4	.300	5/16	3/4	3
M10-1.50	ES47-0109	1.5	4	.300	5/16	3/4	3
M12-1.00	ES47-0110	1	4	.360	3/8	7/8	3-1/2
M12-1.25	ES47-0111	1.25	4	.360	3/8	7/8	3-1/2
M12-1.75	ES47-0112	1.75	4	.360	3/8	7/8	3-1/2
M14-1.50	ES47-0113	1.5	4	.360	3/8	7/8	3-1/2
M16-2.00	ES47-0114	2	5	.470	1/2	1-1/4	3-1/2
M18-2.50	ES47-0115	2.5	5	.470	1/2	1-1/4	3-1/2
M20-3.00	ES47-0116	3	5	.470	5/8	1-1/4	3-1/2

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Solid Carbide Shank Tooling Burs and Bur Sets

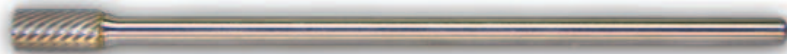




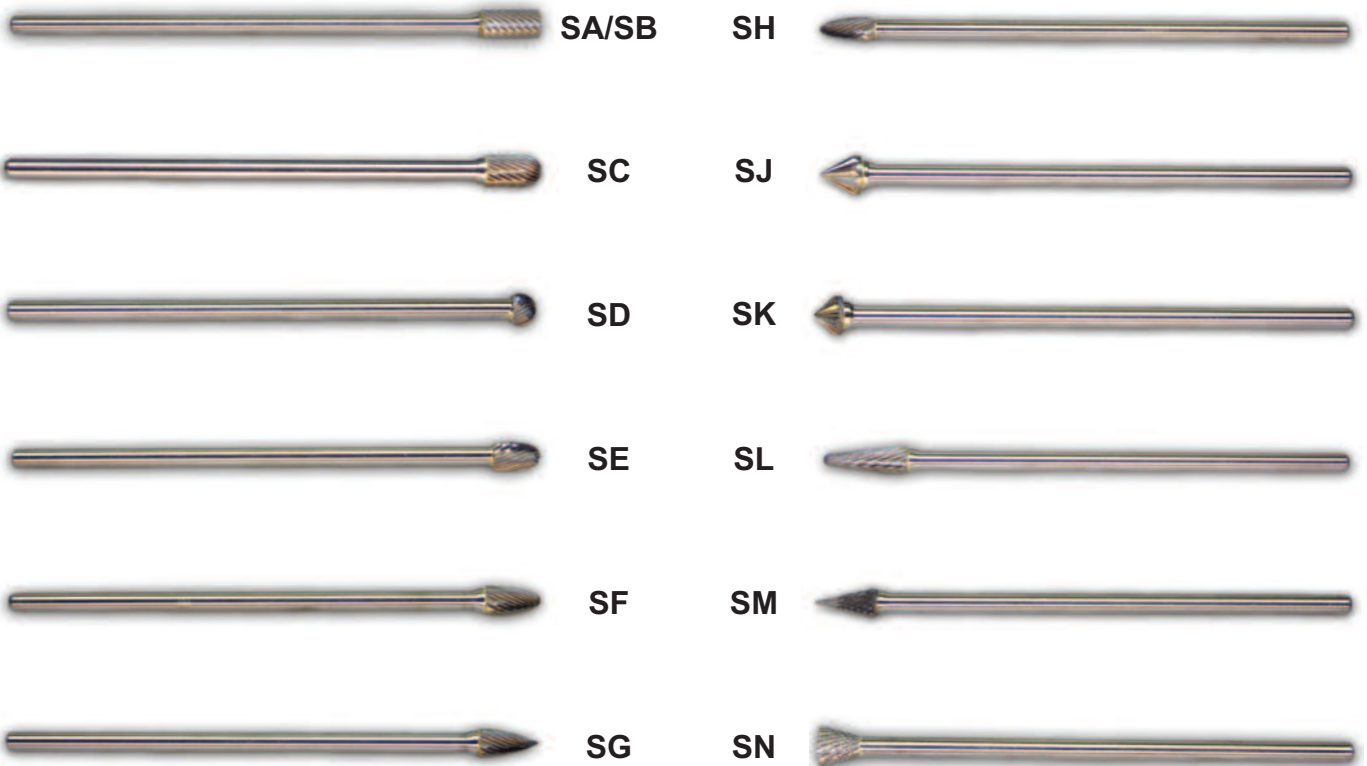
Solid Carbide Bur



Standard Bur



Standard Bur



Materials	Doublecut	Singlecut	Alumacut	Diamondcut	Chipbreaker
Aluminum			▶	▶	
Brass, Bronze, Copper	▶	▶			▶
Fiberglass				▶	
Cast Iron	▶	▶		▶	
Plastics			▶	▶	
Steel: 50-55rc	▶	▶		▶	▶
Steel: 55-60rc	▶	▶		▶	▶
Steel: Carbon	▶	▶			▶
Steel: Nickel, Chrome	▶	▶		▶	▶
Steel: Stainless	▶	▶			▶
Steel: Weldments	▶	▶			▶
Titanium	▶	▶			▶
Zinc			▶		

Speed Recommendations

The following chart is a general and approximate recommendation. Variations to achieve the desired results may be necessary. Long shank burs should be used at reduced speeds.

Bur Diameter	RPM
3mm Solid Carbide	45,000 - 50,000
5mm Solid Carbide	35,000 - 40,000
5mm Carbide Head Brazed to 3mm Steel Shank	30,000 - 35,000
6mm Solid Carbide	30,000 - 35,000
6mm Carbide Head Brazed to 3mm Steel Shank	25,000 - 30,000
8mm Carbide Head Brazed to 6mm Steel Shank	25,000 - 30,000
10mm Carbide Head Brazed to 6mm Steel Shank	25,000 - 30,000
11mm Carbide Head Brazed to 6mm Steel Shank	20,000 - 25,000
12mm Carbide Head Brazed to 6mm Steel Shank	20,000 - 25,000
16mm Carbide Head Brazed to 6mm Steel Shank	15,000 - 20,000
18mm Carbide Head Brazed to 6mm Steel Shank	15,000 - 20,000
25mm Carbide Head Brazed to 6mm Steel Shank	12,000 - 18,000

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Fractional Section





SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SA-41*	1/16 x 1/4 x 1/8 x 1-1/2	ES14-0002	ES14-0001	ES14-0005
SA-42*	3/32 x 7/16 x 1/8 x 1-1/2	ES14-0007	ES14-0006	ES14-0010
SA-42L2*	3/32 x 7/16 x 1/8 x 2	ES14-0011	ES14-0012	ES14-0013
SA-42L3*	3/32 x 7/16 x 1/8 x 3	ES14-0016	ES14-0017	ES14-0018
SA-43*	1/8 x 9/16 x 1/8 x 1-1/2	ES14-0022	ES14-0021A	ES14-0025
SA-43L2*	1/8 x 9/16 x 1/8 x 2	ES14-0026	ES14-0027	ES14-0028
SA-43L3*	1/8 x 9/16 x 1/8 x 3	ES14-0031	ES14-0032	ES14-0033
SA-51	1/4 x 1/2 x 1/8 x 2-1/4	ES14-0037	ES14-0036	ES14-0040
SA-12*	1/8 x 5/8 x 1/4 x 2	ES14-0041	ES14-0042	ES14-0043
SA-14*	3/16 x 5/8 x 1/4 x 2	ES14-0046	ES14-0047	ES14-0048
SA-1*	1/4 x 5/8 x 1/4 x 2	ES14-0052	ES14-0051A	ES14-0055
SA-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES14-0057	ES14-0056	ES14-0060
SA-1L6X*	1/4 x 5/8 x 1/4 x 6	ES14-0061	ES14-0062	ES14-0063
SA-1A*	1/4 x 1 x 1/4 x 2	ES14-0066	ES14-0067	ES14-0068
SA-2	5/16 x 3/4 x 1/4 x 2-1/2	ES14-0072	ES14-0071	ES14-0075
SA-2A	5/16 x 1 x 1/4 x 2-3/4	ES14-0076	ES14-0077	ES14-0078
SA-3	3/8 x 3/4 x 1/4 x 2-1/2	ES14-0082	ES14-0081A	ES14-0085
SA-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES14-0087	ES14-0086	ES14-0090
SA-3A	3/8 x 1 x 1/4 x 2-3/4	ES14-0091	ES14-0092	ES14-0093
SA-3B	3/8 x 1-1/2 x 1/4 x 3-1/4	ES14-0096	ES14-0097	ES14-0098
SA-4	7/16 x 1 x 1/4 x 2-3/4	ES14-0101	ES14-0102	ES14-0103
SA-5	1/2 x 1 x 1/4 x 2-3/4	ES14-0107A	ES14-0106Q	ES14-0110
SA-5R**	1/2 x 1 x 3/8 x 2-3/4	ES14-0116	ES14-0117	ES14-0118
SA-5L6	1/2 x 1 x 1/4 x 7	ES14-0112	ES14-0111	ES14-0115
SA-6	5/8 x 1 x 1/4 x 2-3/4	ES14-0122	ES14-0121	ES14-0125
SA-6R**	5/8 x 1 x 3/8 x 2-3/4	ES14-0126	ES14-0127	ES14-0128
SA-6L6	5/8 x 1 x 1/4 x 7	ES14-0131	ES14-0132	ES14-0133
SA-16	3/4 x 3/4 x 1/4 x 2-1/2	ES14-0136	ES14-0137	ES14-0138
SA-7	3/4 x 1 x 1/4 x 2-3/4	ES14-0142	ES14-0141	ES14-0145
SA-7R**	3/4 x 1 x 3/8 x 2-3/4	ES14-0146	ES14-0147	ES14-0148
SA-9	1 x 1 x 1/4 x 2-3/4	ES14-0152	ES14-0151	ES14-0155
SA-9R**	1 x 1 x 3/8 x 2-3/4	ES14-0156	ES14-0157	ES14-0158

* Denotes Solid Carbide

** Denotes 3/8 Shank

Q = Quick Ship (Stock Item) Although we normally stock items, we do not have an unlimited supply. Please call to confirm quantities on hand before ordering.

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SA-41*	1/16 x 1/4 x 1/8 x 1-1/2	ES14-0003	ES14-0004
SA-42*	3/32 x 7/16 x 1/8 x 1-1/2	ES14-0008	ES14-0009
SA-42L2*	3/32 x 7/16 x 1/8 x 2	ES14-0014	ES14-0015
SA-42L3*	3/32 x 7/16 x 1/8 x 3	ES14-0019	ES14-0020
SA-43*	1/8 x 9/16 x 1/8 x 1-1/2	ES14-0023	ES14-0024
SA-43L2*	1/8 x 9/16 x 1/8 x 2	ES14-0029	ES14-0030
SA-43L3*	1/8 x 9/16 x 1/8 x 3	ES14-0034	ES14-0035
SA-51	1/4 x 1/2 x 1/8 x 2-1/4	ES14-0038	ES14-0039
SA-12*	1/8 x 5/8 x 1/4 x 2	ES14-0044	ES14-0045
SA-14*	3/16 x 5/8 x 1/4 x 2	ES14-0049	ES14-0050
SA-1*	1/4 x 5/8 x 1/4 x 2	ES14-0053	ES14-0054
SA-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES14-0058	ES14-0059
SA-1L6X*	1/4 x 5/8 x 1/4 x 6	ES14-0064	ES14-0065
SA-1A*	1/4 x 1 x 1/4 x 2	ES14-0069	ES14-0070
SA-2	5/16 x 3/4 x 1/4 x 2-1/2	ES14-0073	ES14-0074
SA-2A	5/16 x 1 x 1/4 x 2-3/4	ES14-0079	ES14-0080
SA-3	3/8 x 3/4 x 1/4 x 2-1/2	ES14-0083A	ES14-0084
SA-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES14-0088	ES14-0089
SA-3A	3/8 x 1 x 1/4 x 2-3/4	ES14-0094	ES14-0095
SA-3B	3/8 x 1-1/2 x 1/4 x 3-1/4	ES14-0099	ES14-0100
SA-4	7/16 x 1 x 1/4 x 2-3/4	ES14-0104	ES14-0105
SA-5	1/2 x 1 x 1/4 x 2-3/4	ES14-0108	ES14-0109
SA-5R**	1/2 x 1 x 3/8 x 2-3/4	ES14-0119	ES14-0120
SA-5L6	1/2 x 1 x 1/4 x 7	ES14-0113	ES14-0114
SA-6	5/8 x 1 x 1/4 x 2-3/4	ES14-0123	ES14-0124
SA-6R**	5/8 x 1 x 3/8 x 2-3/4	ES14-0129	ES14-0130
SA-6L6	5/8 x 1 x 1/4 x 7	ES14-0134	ES14-0135
SA-16	3/4 x 3/4 x 1/4 x 2-1/2	ES14-0139	ES14-0140
SA-7	3/4 x 1 x 1/4 x 2-3/4	ES14-0143	ES14-0144
SA-7R**	3/4 x 1 x 3/8 x 2-3/4	ES14-0149	ES14-0150
SA-9	1 x 1 x 1/4 x 2-3/4	ES14-0153	ES14-0154
SA-9R**	1 x 1 x 3/8 x 2-3/4	ES14-0159	ES14-0160

* Denotes Solid Carbide

** Denotes 3/8 Shank

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SB-41ECO [^]	1/8 x 1.5 Endcut Only	ES15-0001	~	~
SB-41*	1/16 x 1/4 x 1/8 x 1-1/2	ES15-0007	ES15-0006	ES15-0010
SB-42*	3/32 x 7/16 x 1/8 x 1-1/2	ES15-0012	ES15-0011	ES15-0015
SB-42L2*	3/32 x 7/16 x 1/8 x 2	ES15-0016	ES15-0017	ES15-0018
SB-42L3*	3/32 x 7/16 x 1/8 x 3	ES15-0021	ES15-0022	ES15-0023
SB-43*	1/8 x 9/16 x 1/8 x 1-1/2	ES15-0027	ES15-0026A	ES15-0030
SB-43L2*	1/8 x 9/16 x 1/8 x 2	ES15-0031	ES15-0032	ES15-0033
SB-43L3*	1/8 x 9/16 x 1/8 x 3	ES15-0036	ES15-0037	ES15-0038
SB-51	1/4 x 3/16 x 1/8 x 2-15/16	ES15-0042	ES15-0041	ES15-0045
SB-12*	1/8 x 5/8 x 1/4 x 2	ES15-0046	ES15-0047	ES15-0048
SB-14*	3/16 x 5/8 x 1/4 x 2	ES15-0051	ES15-0052	ES15-0053
SB-1*	1/4 x 5/8 x 1/4 x 2	ES15-0057	ES15-0056A	ES15-0060
SB-1A*	1/4 x 1 x 1/4 x 2	ES15-0062	ES15-0061	ES15-0065
SB-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES15-0067	ES15-0066	ES15-0070
SB-1L6X*	1/4 x 5/8 x 1/4 x 6	ES15-0071	ES15-0072	ES15-0073
SB-2	5/16 x 3/4 x 1/4 x 2-1/2	ES15-0077	ES15-0076	ES15-0080
SB-2A	5/16 x 1 x 1/4 x 2-3/4	ES15-0081	ES15-0082	ES15-0083
SB-3	3/8 x 3/4 x 1/4 x 2-1/2	ES15-0087	ES15-0086A	ES15-0090
SB-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES15-0091	ES15-0092	ES15-0093
SB-3A	3/8 x 1 x 1/4 x 2-3/4	ES15-0096	ES15-0097	ES15-0098
SB-3B	3/8 x 1-1/2 x 1/4 x 3-1/4	ES15-0101	ES15-0102	ES15-0103
SB-4	7/16 x 1 x 1/4 x 2-3/4	ES15-0106	ES15-0107	ES15-0108
SB-5	1/2 x 1 x 1/4 x 2-3/4	ES15-0112	ES15-0111A	ES15-0115
SB-5R**	1/2 x 1 x 3/8 x 2-3/4	ES15-0124	ES15-0125	ES15-0126
SB-5L6	1/2 x 1 x 1/4 x 7	ES15-0117	ES15-0116	ES15-0120
SB-6	5/8 x 1 x 1/4 x 2-3/4	ES15-0129	ES15-0130A	ES15-0131
SB-6R**	5/8 x 1 x 3/8 x 2-3/4	ES15-0134	ES15-0135	ES15-0136
SB-6L6	5/8 x 1 x 1/4 x 7	ES15-0139	ES15-0140	ES15-0141
SB-16	3/4 x 3/4 x 1/4 x 2-1/2	ES15-0144	ES15-0145	ES15-0149
SB-7	3/4 x 1 x 1/4 x 2-3/4	ES15-0147	ES15-0146	ES15-0153
SB7R**	3/4 x 1 x 3/8 x 2-3/4	ES15-0161	ES15-0162	ES15-0163
SB-9	1 x 1 x 1/4 x 2-3/4	ES15-0157	ES15-0156	ES15-0160
SB-9R**	1 x 1 x 3/8 x 2-3/4	ES15-0166	ES15-0167	ES15-0168

* Denotes Solid Carbide

** Denotes 3/8 Shank

^ Denotes Double End

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



ALUMACUT & DIAMONDCUT

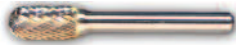
Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SB-41ECO ^{^A}	1/8 x 1.5 Endcut Only	~	~
SB-41*	1/16 x 1/4 x 1/8 x 1-1/2	ES15-0008	ES15-0009
SB-42*	3/32 x 7/16 x 1/8 x 1-1/2	ES15-0013	ES15-0014
SB-42L2*	3/32 x 7/16 x 1/8 x 2	ES15-0019	ES15-0020
SB-42L3*	3/32 x 7/16 x 1/8 x 3	ES15-0024	ES15-0025
SB-43*	1/8 x 9/16 x 1/8 x 1-1/2	ES15-0028	ES15-0029
SB-43L2*	1/8 x 9/16 x 1/8 x 2	ES15-0034	ES15-0035
SB-43L3*	1/8 x 9/16 x 1/8 x 3	ES15-0039	ES15-0040
SB-51	1/4 x 3/16 x 1/8 x 2-15/16	ES15-0043	ES15-0044
SB-12*	1/8 x 5/8 x 1/4 x 2	ES15-0049	ES15-0050
SB-14*	3/16 x 5/8 x 1/4 x 2	ES15-0054	ES15-0055
SB-1*	1/4 x 5/8 x 1/4 x 2	ES15-0058	ES15-0059
SB-1A*	1/4 x 1 x 1/4 x 2	ES15-0063	ES15-0064
SB-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES15-0068	ES15-0069
SB-1L6X*	1/4 x 5/8 x 1/4 x 6	ES15-0074	ES15-0075
SB-2	5/16 x 3/4 x 1/4 x 2-1/2	ES15-0078	ES15-0079
SB-2A	5/16 x 1 x 1/4 x 2-3/4	ES15-0084	ES15-0085
SB-3	3/8 x 3/4 x 1/4 x 2-1/2	ES15-0088	ES15-0089
SB-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES15-0094	ES15-0095
SB-3A	3/8 x 1 x 1/4 x 2-3/4	ES15-0099	ES15-0100
SB-3B	3/8 x 1-1/2 x 1/4 x 3-1/4	ES15-0104	ES15-0105
SB-4	7/16 x 1 x 1/4 x 2-3/4	ES15-0109	ES15-0110
SB-5	1/2 x 1 x 1/4 x 2-3/4	ES15-0113	ES15-0114
SB-5R**	1/2 x 1 x 3/8 x 2-3/4	ES15-0127	ES15-0128
SB-5L6	1/2 x 1 x 1/4 x 7	ES15-0118	ES15-0119
SB-6	5/8 x 1 x 1/4 x 2-3/4	ES15-0132	ES15-0133
SB-6R**	5/8 x 1 x 3/8 x 2-3/4	ES15-0137	ES15-0138
SB-6L6	5/8 x 1 x 1/4 x 7	ES15-0142	ES15-0143
SB-16	3/4 x 3/4 x 1/4 x 2-1/2	ES15-0150	ES15-0151
SB-7	3/4 x 1 x 1/4 x 2-3/4	ES15-0148	ES15-0152
SB7R**	3/4 x 1 x 3/8 x 2-3/4	ES15-0164	ES15-0165
SB-9	1 x 1 x 1/4 x 2-3/4	ES15-0158	ES15-0159
SB-9R**	1 x 1 x 3/8 x 2-3/4	ES15-0169	ES15-0170

* Denotes Solid Carbide

** Denotes 3/8 Shank

^ Denotes Double End

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SINGLECUT, DOUBLECUT & CHIPBREAK

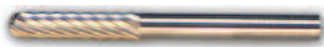
Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SC-41*	3/32 x 7/16 x 1/8 x 1-1/2	ES16-0002	ES16-0001	ES16-0005
SC-41L2*	3/32 x 7/16 x 1/8 x 2	ES16-0006	ES16-0007	ES16-0008
SC-41L3*	3/32 x 7/16 x 1/8 x 3	ES16-0011	ES16-0012	ES16-0013
SC-42*	1/8 x 9/16 x 1/8 x 1-1/2	ES16-0017Q	ES16-0016A	ES16-0020
SC-42L2*	1/8 x 9/16 x 1/8 x 2	ES16-0021	ES16-0022	ES16-0023
SC-42L3*	1/8 x 9/16 x 1/8 x 3	ES16-0026	ES16-0027	ES16-0028
SC-51	1/4 x 1/2 x 1/8 x 2	ES16-0032	ES16-0031	ES16-0035
SC-81	3/16 x 5/8 x 3/16 x 2	ES16-0037	ES16-0036	ES16-0040
SC-12*	1/8 x 5/8 x 1/4 x 2	ES16-0041	ES16-0042	ES16-0043
SC-14*	3/16 x 5/8 x 1/4 x 2	ES16-0046	ES16-0047A	ES16-0048
SC-1*	1/4 x 5/8 x 1/4 x 2	ES16-0052	ES16-0051A	ES16-0055
SC-1A*	1/4 x 1 x 1/4 x 2	ES16-0056	ES16-0057	ES16-0058
SC-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES16-0062Q	ES16-0061	ES16-0065
SC-1LX6*	1/4 x 5/8 x 1/4 x 6	ES16-0066	ES16-0067	ES16-0068
SC-2	5/16 x 3/4 x 1/4 x 2-1/2	ES16-0072	ES16-0071	ES16-0075
SC-2A	5/16 x 1 x 1/4 x 2-3/4	ES16-0076	ES16-0077	ES16-0078
SC-3	3/8 x 3/4 x 1/4 x 2-1/2	ES16-0082Q	ES16-0081A	ES16-0085
SC-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES16-0087	ES16-0086	ES16-0090
SC-3A	3/8 x 1 x 1/4 x 2-3/4	ES16-0091	ES16-0092	ES16-0093
SC-3B	3/8 x 1-1/2 x 1/4 x 3-1/4	ES16-0096	ES16-0097	ES16-0098
SC-4	7/16 x 1 x 1/4 x 2-3/4	ES16-0101	ES16-0102A	ES16-0103
SC-5	1/2 x 1 x 1/4 x 2-3/4	ES16-0107Q	ES16-0106A	ES16-0110
SC-5R**	1/2 x 1 x 3/8 x 2-2/3	ES16-0116	ES16-0117	ES16-0118
SC-5L6	1/2 x 1 x 1/4 x 7	ES16-0112	ES16-0111	ES16-0115
SC-6	5/8 x 1 x 1/4 x 2-3/4	ES16-0122	ES16-0121	ES16-0125
SC-6R**	5/8 x 1 x 3/8 x 2-3/4	ES16-0126	ES16-0127	ES16-0128
SC-6L6	5/8 x 1 x 1/4 x 7	ES16-0131	ES16-0132	ES16-0133
SC-16	3/4 x 3/4 x 1/4 x 2-1/2	ES16-0136	ES16-0137	ES16-0138
SC-7	3/4 x 1 x 1/4 x 2-3/4	ES16-0142	ES16-0141	ES16-0145
SC-7R**	3/4 x 1 x 3/8 x 2-3/4	ES16-0146	ES16-0147	ES16-0148
SC-9	1 x 1 x 1/4 x 2-3/4	ES16-0152	ES16-0151	ES16-0155
SC-9R**	1 x 1 x 3/8 x 2-3/4	ES16-0156	ES16-0157	ES16-0158

* Denotes Solid Carbide

** Denotes 3/8 Shank

Q = Quick Ship (Stock Item) Although we normally stock items, we do not have an unlimited supply. Please call to confirm quantities on hand before ordering.

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ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SC-41*	3/32 x 7/16 x 1/8 x 1-1/2	ES16-0003	ES16-0004
SC-41L2*	3/32 x 7/16 x 1/8 x 2	ES16-0009	ES16-0010
SC-41L3*	3/32 x 7/16 x 1/8 x 3	ES16-0014	ES16-0015
SC-42*	1/8 x 9/16 x 1/8 x 1-1/2	ES16-0018	ES16-0019
SC-42L2*	1/8 x 9/16 x 1/8 x 2	ES16-0024	ES16-0025
SC-42L3*	1/8 x 9/16 x 1/8 x 3	ES16-0029	ES16-0030
SC-51	1/4 x 1/2 x 1/8 x 2	ES16-0033	ES16-0034
SC-81	3/16 x 5/8 x 3/16 x 2	ES16-0038	ES16-0039
SC-12*	1/8 x 5/8 x 1/4 x 2	ES16-0044	ES16-0045
SC-14*	3/16 x 5/8 x 1/4 x 2	ES16-0049	ES16-0050
SC-1*	1/4 x 5/8 x 1/4 x 2	ES16-0053	ES16-0054
SC-1A*	1/4 x 1 x 1/4 x 2	ES16-0059	ES16-0060
SC-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES16-0063	ES16-0064
SC-1LX6*	1/4 x 5/8 x 1/4 x 6	ES16-0069	ES16-0070
SC-2	5/16 x 3/4 x 1/4 x 2-1/2	ES16-0073	ES16-0074
SC-2A	5/16 x 1 x 1/4 x 2-3/4	ES16-0079	ES16-0080
SC-3	3/8 x 3/4 x 1/4 x 2-1/2	ES16-0083A	ES16-0084
SC-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES16-0088	ES16-0089
SC-3A	3/8 x 1 x 1/4 x 2-3/4	ES16-0094	ES16-0095
SC-3B	3/8 x 1-1/2 x 1/4 x 3-1/4	ES16-0099	ES16-0100
SC-4	7/16 x 1 x 1/4 x 2-3/4	ES16-0104	ES16-0105
SC-5	1/2 x 1 x 1/4 x 2-3/4	ES16-0108A	ES16-0109
SC-5R**	1/2 x 1 x 3/8 x 2-2/3	ES16-0119	ES16-0120
SC-5L6	1/2 x 1 x 1/4 x 7	ES16-0113	ES16-0114
SC-6	5/8 x 1 x 1/4 x 2-3/4	ES16-0123	ES16-0124
SC-6R**	5/8 x 1 x 3/8 x 2-3/4	ES16-0129	ES16-0130
SC-6L6	5/8 x 1 x 1/4 x 7	ES16-0134	ES16-0135
SC-16	3/4 x 3/4 x 1/4 x 2-1/2	ES16-0139	ES16-0140
SC-7	3/4 x 1 x 1/4 x 2-3/4	ES16-0143	ES16-0144
SC-7R**	3/4 x 1 x 3/8 x 2-3/4	ES16-0149	ES16-0150
SC-9	1 x 1 x 1/4 x 2-3/4	ES16-0153	ES16-0154
SC-9R**	1 x 1 x 3/8 x 2-3/4	ES16-0159	ES16-0160

* Denotes Solid Carbide

** Denotes 3/8 Shank

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SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SD-40*	1/16 x 1/16 x 1/8 x 1-1/2	ES17-0001A	ES17-0002A	ES17-0003
SD-41*	3/32 x 3/32 x 1/8 x 1-1/2	ES17-0007	ES17-00006	ES17-0010
SD-41L2*	3/32 x 3/32 x 1/8 x 2	ES17-0011	ES17-0012	ES17-0013
SD-41L3*	3/32 x 3/32 x 1/8 x 3	ES17-0016	ES17-0017	ES17-0018
SD-42*	1/8 x 1/8 x 1/8 x 1-1/2	ES17-0022A	ES17-0021A	ES17-0025
SD-42L2*	1/8 x 1/8 x 1/8 x 2	ES17-0026	ES17-0027	ES17-0028
SD-42L3*	1/8 x 1/8 x 1/8 x 3	ES17-0031	ES17-0032	ES17-0033
SD-51	1/4 x 7/32 x 1/8 x 2	ES17-0037	ES17-0036	ES17-0040
SD-12*	1/8 x 3/32 x 1/4 x 2	ES17-0041	ES17-0042	ES17-0043
SD-14*	3/16 x 1/8 x 1/4 x 2	ES17-0046	ES17-0047A	ES17-0048
SD-1*	1/4 x 7/32 x 1/4 x 2	ES17-0052	ES17-0051A	ES17-0055
SD-1L6	1/4 x 7/32 x 1/4 x 6-3/4	ES17-0057	ES17-0056	ES17-0060
SD-1L6X*	1/4 x 7/32 x 1/4 x 6	ES17-0061	ES17-0062	ES17-0063
SD-2	5/16 x 1/4 x 1/4 x 2-1/16	ES17-0067	ES17-0066A	ES17-0070
SD-3	3/8 x 5/16 x 1/4 x 2-1/8	ES17-0072	ES17-0071A	ES17-0075
SD-3L6	3/8 x 5/16 x 1/4 x 6-3/8	ES17-0077	ES17-0076	ES17-0080
SD-4	7/16 x 3/8 x 1/4 x 2-3/16	ES17-0081	ES17-0082	ES17-0083
SD-5	1/2 x 7/16 x 1/4 x 2-1/4	ES17-0087	ES17-0086	ES17-0090
SD-5R**	1/2 x 3/8 x 1/4 x 2-1/4	ES17-0096	ES17-0097	ES17-0098
SD-5L6	1/2 x 7/16 x 1/4 x 6-1/2	ES17-0092	ES17-0091	ES17-0095
SD-6	5/8 x 9/16 x 1/4 x 2-3/8	ES17-0102	ES17-0101	ES17-0105
SD-7	3/4 x 11/16 x 1/4 x 2-1/2	ES17-0107	ES17-0106	ES17-0110
SD-7R**	3/4 x 11/16 x 3/8 x 2-1/2	ES17-0111	ES17-0112	ES17-0113
SD-9	1 x 15/16 x 1/4 x 2-3/4	ES17-0117	ES17-0116	ES17-0120
SD-9R**	1 x 15/16 x 3/8 x 2-3/4	ES17-0121	ES17-0122	ES17-0123

* Denotes Solid Carbide

** Denotes 3/8 Shank

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ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SD-40*	1/16 x 1/16 x 1/8 x 1-1/2	ES17-0004	ES17-0005
SD-41*	3/32 x 3/32 x 1/8 x 1-1/2	ES17-0008	ES17-0009
SD-41L2*	3/32 x 3/32 x 1/8 x 2	ES17-0014	ES17-0015
SD-41L3*	3/32 x 3/32 x 1/8 x 3	ES17-0019	ES17-0020
SD-42*	1/8 x 1/8 x 1/8 x 1-1/2	ES17-0023	ES17-0024
SD-42L2*	1/8 x 1/8 x 1/8 x 2	ES17-0029	ES17-0030
SD-42L3*	1/8 x 1/8 x 1/8 x 3	ES17-0034	ES17-0035
SD-51	1/4 x 7/32 x 1/8 x 2	ES17-0038	ES17-0039
SD-12*	1/8 x 3/32 x 1/4 x 2	ES17-0044	ES17-0045
SD-14*	3/16 x 1/8 x 1/4 x 2	ES17-0049	ES17-0050
SD-1*	1/4 x 7/32 x 1/4 x 2	ES17-0053	ES17-0054
SD-1L6	1/4 x 7/32 x 1/4 x 6-3/4	ES17-0058	ES17-0059
SD-1L6X*	1/4 x 7/32 x 1/4 x 6	ES17-0064	ES17-0065
SD-2	5/16 x 1/4 x 1/4 x 2-1/16	ES17-0068	ES17-0069
SD-3	3/8 x 5/16 x 1/4 x 2-1/8	ES17-0073	ES17-0074
SD-3L6	3/8 x 5/16 x 1/4 x 6-3/8	ES17-0078	ES17-0079
SD-4	7/16 x 3/8 x 1/4 x 2-3/16	ES17-0084	ES17-0085
SD-5	1/2 x 7/16 x 1/4 x 2-1/4	ES17-0088	ES17-0089
SD-5R**	1/2 x 3/8 x 1/4 x 2-1/4	ES17-0099	ES17-0100
SD-5L6	1/2 x 7/16 x 1/4 x 6-1/2	ES17-0093	ES17-0094
SD-6	5/8 x 9/16 x 1/4 x 2-3/8	ES17-0103	ES17-0104
SD-7	3/4 x 11/16 x 1/4 x 2-1/2	ES17-0108	ES17-0109
SD-7R**	3/4 x 11/16 x 3/8 x 2-1/2	ES17-0114	ES17-0115
SD-9	1 x 15/16 x 1/4 x 2-3/4	ES17-0118	ES17-0119
SD-9R**	1 x 15/16 x 3/8 x 2-3/4	ES17-0124	ES17-0125

* Denotes Solid Carbide

** Denotes 3/8 Shank

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NAPGLADU

Delivering Productivity

SE Burs - Oval Shape



SINGLECUT, DOUBLECUT & CHIPBREAK

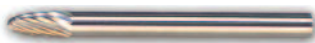
Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SE-41*	1/8 x 7/32 x 1/8 x 1-1/2	ES18-0002Q	ES18-0001A	ES18-0005
SE-41L2*	1/8 x 7/32 x 1/8 x 2	ES18-0006	ES18-0007	ES18-0008
SE-41L3*	1/8 x 7/32 x 1/8 x 3	ES18-0011	ES18-0012	ES18-0013
SE-51	1/4 x 3/8 x 1/8 x 1-3/4	ES18-0017	ES18-0016	ES18-0020
SE-11*	3/16 x 5/16 x 1/4 x 2	ES18-0021	ES18-0022	ES18-0023
SE-1*	1/4 x 3/8 x 1/4 x 2	ES18-0027	ES18-0026A	ES18-0030
SE-1L6	1/4 x 3/8 x 1/4 x 6-3/4	ES18-0032	ES18-0031	ES18-0035
SE-1L6X*	1/4 x 3/8 x 1/4 x 6	ES18-0036	ES18-0037	ES18-0038
SE-3	3/8 x 5/8 x 1/4 x 2-3/8	ES18-0042	ES18-0041A	ES18-0045
SE-3L6	3/8 x 5/8 x 1/4 x 6-5/8	ES18-0047	ES18-0046	ES18-0050
SE-5	1/2 x 7/8 x 1/4 x 2-5/8	ES18-0052	ES18-0051A	ES18-0055
SE-5L6	1/2 x 7/8 x 1/4 x 6-7/8	ES18-0057	ES18-0056	ES18-0060
SE-6	5/8 x 1 x 1/4 x 2-3/4	ES18-0062	ES18-0061	ES18-0065
SE-7	3/4 x 1 x 1/4 x 2-3/4	ES18-0067	ES18-0066	ES18-0070

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SE-41*	1/8 x 7/32 x 1/8 x 1-1/2	ES18-0003	ES18-0004
SE-41L2*	1/8 x 7/32 x 1/8 x 2	ES18-0009	ES18-0010
SE-41L3*	1/8 x 7/32 x 1/8 x 3	ES18-0014	ES18-0015
SE-51	1/4 x 3/8 x 1/8 x 1-3/4	ES18-0018	ES18-0019
SE-11*	3/16 x 5/16 x 1/4 x 2	ES18-0024	ES18-0025
SE-1*	1/4 x 3/8 x 1/4 x 2	ES18-0028	ES18-0029
SE-1L6	1/4 x 3/8 x 1/4 x 6-3/4	ES18-0033	ES18-0034
SE-1L6X*	1/4 x 3/8 x 1/4 x 6	ES18-0039	ES18-0040
SE-3	3/8 x 5/8 x 1/4 x 2-3/8	ES18-0043	ES18-0044
SE-3L6	3/8 x 5/8 x 1/4 x 6-5/8	ES18-0048	ES18-0049
SE-5	1/2 x 7/8 x 1/4 x 2-5/8	ES18-0053	ES18-0054
SE-5L6	1/2 x 7/8 x 1/4 x 6-7/8	ES18-0058	ES18-0059
SE-6	5/8 x 1 x 1/4 x 2-3/4	ES18-0063	ES18-0064
SE-7	3/4 x 1 x 1/4 x 2-3/4	ES18-0068	ES18-0069

* Denotes Solid Carbide

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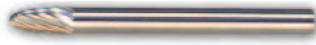
SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SF-41*	1/8 x 1/4 x 1/8 x 1-1/2	ES19-0002	ES19-0001	ES19-0005
SF-42*	1/8 x 1/2 x 1/8 x 1-1/2	ES19-0007Q	ES19-0006Q	ES19-0010
SF-42L2*	1/8 x 1/2 x 1/8 x 2	ES19-0011	ES19-0012	ES19-0013
SF-42L3*	1/8 x 1/2 x 1/8 x 3	ES19-0016	ES19-0017	ES19-0018
SF-44*	1/8 x 5/8 x 1/8 x 1-1/2	ES19-0021	ES19-0022	ES19-0023
SF-51	1/4 x 1/2 x 1/8 x 2	ES19-0027	ES19-0026A	ES19-0030
SF-12*	1/8 x 1/2 x 1/4 x 2	ES19-0031	ES19-0032	ES19-0033
SF-1*	1/4 x 5/8 x 1/4 x 2	ES19-0037	ES19-0036A	ES19-0040
SF-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES19-0042	ES19-0041	ES19-0045
SF-1L6X*	1/4 x 5/8 x 1/4 x 6	ES19-0046	ES19-0047	ES19-0048
SF-3	3/8 x 3/4 x 1/4 x 2-1/2	ES19-0052	ES19-0051Q	ES19-0055
SF-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES19-0057	ES19-0056	ES19-0060
SF-4	7/16 x 1 x 1/4 x 2-3/4	ES19-0061	ES19-0062A	ES19-0063
SF-13	1/2 x 3/4 x 1/4 x 2-1/2	ES19-0066	ES19-0067A	ES19-0068
SF-5	1/2 x 1 x 1/4 x 2-3/4	ES19-0072	ES19-0071Q	ES19-0075
SF-5R**	1/2 x 1 x 3/8 x 2-3/4	ES19-0081	ES19-0082	ES19-0083
SF-5L6	1/2 x 1 x 1/4 x 7	ES19-0077	ES19-0076A	ES19-0080
SF-6	5/8 x 1 x 1/4 x 2-3/4	ES19-0087	ES19-0086	ES19-0090
SF-6R**	5/8 x 1 x 3/8 x 2-3/4	ES19-0091	ES19-0092	ES19-0093
SF-7	3/4 x 1 x 1/4 x 2-3/4	ES19-0097	ES19-0096	ES19-0100
SF-7R**	3/4 x 1 x 3/8 x 2-3/4	ES19-0101	ES19-0102	ES19-0103
SF-14	3/4 x 1-1/4 x 1/4 x 3	ES19-0106	ES19-0107	ES19-0108
SF-14R**	3/4 x 1-1/4 x 3/8 x 3	ES19-0111	ES19-0112	ES19-0113
SF-15	3/4 x 1-1/2 x 1/4 x 3-1/4	ES19-0117	ES19-0116	ES19-0120
SF-15R**	3/4 x 1-1/2 x 3/8 x 3-1/4	ES19-0121	ES19-0122	ES19-0123
SF-16*	1-1/4 x 2 x 3/8 x 3-3/4	ES19-0126	ES19-0127	ES19-0128

* Denotes Solid Carbide

** Denotes 3/8 Shank

Q = Quick Ship (Stock Item) Although we normally stock items, we do not have an unlimited supply. Please call to confirm quantities on hand before ordering.
A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



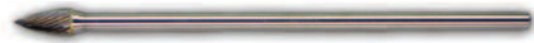
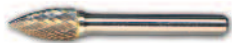
ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SF-41*	1/8 x 1/4 x 1/8 x 1-1/2	ES19-0003	ES19-0004
SF-42*	1/8 x 1/2 x 1/8 x 1-1/2	ES19-0008	ES19-0009
SF-42L2*	1/8 x 1/2 x 1/8 x 2	ES19-0014	ES19-0015
SF-42L3*	1/8 x 1/2 x 1/8 x 3	ES19-0019	ES19-0020
SF-44*	1/8 x 5/8 x 1/8 x 1-1/2	ES19-0024	ES19-0025
SF-51	1/4 x 1/2 x 1/8 x 2	ES19-0028	ES19-0029
SF-12*	1/8 x 1/2 x 1/4 x 2	ES19-0034	ES19-0035
SF-1*	1/4 x 5/8 x 1/4 x 2	ES19-0038	ES19-0039
SF-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES19-0043	ES19-0044
SF-1L6X*	1/4 x 5/8 x 1/4 x 6	ES19-0049	ES19-0050
SF-3	3/8 x 3/4 x 1/4 x 2-1/2	ES19-0053A	ES19-0054
SF-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES19-0058	ES19-0059
SF-4	7/16 x 1 x 1/4 x 2-3/4	ES19-0064	ES19-0065
SF-13	1/2 x 3/4 x 1/4 x 2-1/2	ES19-0069	ES19-0070
SF-5	1/2 x 1 x 1/4 x 2-3/4	ES19-0073A	ES19-0074
SF-5R**	1/2 x 1 x 3/8 x 2-3/4	ES19-0084	ES19-0085
SF-5L6	1/2 x 1 x 1/4 x 7	ES19-0078	ES19-0079
SF-6	5/8 x 1 x 1/4 x 2-3/4	ES19-0088	ES19-0089
SF-6R**	5/8 x 1 x 3/8 x 2-3/4	ES19-0094	ES19-0095
SF-7	3/4 x 1 x 1/4 x 2-3/4	ES19-0098	ES19-0099
SF-7R**	3/4 x 1 x 3/8 x 2-3/4	ES19-0104	ES19-0105
SF-14	3/4 x 1-1/4 x 1/4 x 3	ES19-0109	ES19-0110
SF-14R**	3/4 x 1-1/4 x 3/8 x 3	ES19-0114	ES19-0115
SF-15	3/4 x 1-1/2 x 1/4 x 3-1/4	ES19-0118	ES19-0119
SF-15R**	3/4 x 1-1/2 x 3/8 x 3-1/4	ES19-0124	ES19-0125
SF-16*	1-1/4 x 2 x 3/8 x 3-3/4	ES19-0129	ES19-0130

* Denotes Solid Carbide

** Denotes 3/8 Shank

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SG-41*	1/8 x 1/4 x 1/8 x 1-1/2	ES20-0002	ES20-0001	ES20-0005
SG-43*	1/8 x 3/8 x 1/8 x 1-1/2	ES20-0007	ES20-0006	ES20-0010
SG-44*	1/8 x 1/2 x 1/8 x 1-1/2	ES20-0011	ES20-0012	ES20-0013
SG-44L2*	1/8 x 1/2 x 1/8 x 2	ES20-0016	ES20-0017	ES20-0018
SG-44L3*	1/8 x 1/2 x 1/8 x 3	ES20-0021	ES20-0022	ES20-0023
SG-51	1/4 x 1/2 x 1/8 x 2	ES20-0027	ES20-0026	ES20-0030
SG-1*	1/4 x 5/8 x 1/4 x 2	ES20-0032	ES20-0031A	ES20-0035
SG-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES20-0037	ES20-0036	ES20-0040
SG-1L6X*	1/4 x 5/8 x 1/4 x 6	ES20-0041	ES20-0042	ES20-0043
SG-2	5/16 x 3/4 x 1/4 x 2-1/2	ES20-0046	ES20-0047	ES20-0048
SG-3	3/8 x 3/4 x 1/4 x 2-1/2	ES20-0052	ES20-0051A	ES20-0055
SG-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES20-0057	ES20-0056	ES20-0060
SG-13	1/2 x 3/4 x 1/4 x 2-1/2	ES20-0061	ES20-0062	ES20-0063
SG-5	1/2 x 1 x 1/4 x 2-3/4	ES20-0067	ES20-0066A	ES20-0070
SG-5L6	1/2 x 1 x 1/4 x 6-3/4	ES20-0072	ES20-0071	ES20-0075
SG-6	5/8 x 1 x 1/4 x 2-3/4	ES20-0077	ES20-0076	ES20-0080
SG-7	3/4 x 1 x 1/4 x 2-3/4	ES20-0082	ES20-0081	ES20-0085
SG-15	3/4 x 1-1/2 x 1/4 x 3-1/4	ES20-0086	ES20-0087	ES20-0088

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SG-41*	1/8 x 1/4 x 1/8 x 1-1/2	ES20-0003	ES20-0004
SG-43*	1/8 x 3/8 x 1/8 x 1-1/2	ES20-0008	ES20-0009
SG-44*	1/8 x 1/2 x 1/8 x 1-1/2	ES20-0014	ES20-0015
SG-44L2*	1/8 x 1/2 x 1/8 x 2	ES20-0019	ES20-0020
SG-44L3*	1/8 x 1/2 x 1/8 x 3	ES20-0024	ES20-0025
SG-51	1/4 x 1/2 x 1/8 x 2	ES20-0028	ES20-0029
SG-1*	1/4 x 5/8 x 1/4 x 2	ES20-0033	ES20-0034
SG-1L6	1/4 x 5/8 x 1/4 x 6-3/4	ES20-0038	ES20-0039
SG-1L6X*	1/4 x 5/8 x 1/4 x 6	ES20-0044	ES20-0045
SG-2	5/16 x 3/4 x 1/4 x 2-1/2	ES20-0049	ES20-0050
SG-3	3/8 x 3/4 x 1/4 x 2-1/2	ES20-0053	ES20-0054
SG-3L6	3/8 x 3/4 x 1/4 x 6-3/4	ES20-0058	ES20-0059
SG-13	1/2 x 3/4 x 1/4 x 2-1/2	ES20-0064	ES20-0065
SG-5	1/2 x 1 x 1/4 x 2-3/4	ES20-0068	ES20-0069
SG-5L6	1/2 x 1 x 1/4 x 6-3/4	ES20-0073	ES20-0074
SG-6	5/8 x 1 x 1/4 x 2-3/4	ES20-0078	ES20-0079
SG-7	3/4 x 1 x 1/4 x 2-3/4	ES20-0083	ES20-0084
SG-15	3/4 x 1-1/2 x 1/4 x 3-1/4	ES20-0089	ES20-0090

* Denotes Solid Carbide



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SH-41*	1/8 x 1/4 x 1/8 x 1-1/2	ES21-0002	ES21-0001	ES21-0005
SH-41L2*	1/8 x 1/4 x 1/8 x 2	ES21-0006	ES21-0007	ES21-0008
SH-41L3*	1/8 x 1/4 x 1/8 x 3	ES21-0011	ES21-0012	ES21-0013
SH-1*	1/4 x 1/2 x 1/4 x 2	ES21-0017	ES21-0016	ES21-0020
SH-1L6	1/4 x 1/2 x 1/4 x 6-3/4	ES21-0022	ES21-0021	ES21-0025
SH-1L6X*	1/4 x 1/2 x 1/4 x 6	ES21-0026	ES21-0027	ES21-0028
SH-2	5/16 x 3/4 x 1/4 x 2-1/2	ES21-0032	ES21-0031	ES21-0035
SH-2L6	5/16 x 3/4 x 1/4 x 6	ES21-0037	ES21-0036	ES21-0040
SH-5	1/2 x 1-1/4 x 1/4 x 4	ES21-0042	ES21-0041	ES21-0045
SH-5L6	1/2 x 1-1/4 x 1/4 x 7-1/4	ES21-0047	ES21-0046	ES21-0050
SH-6	5/8 x 1-7/16 x 1/4 x 4-3/16	ES21-0052	ES21-0051	ES21-0055
SH-7	3/4 x 1-5/8 x 1/4 x 3-3/8	ES21-0057	ES21-0056	ES21-0060

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SH-41*	1/8 x 1/4 x 1/8 x 1-1/2	ES21-0003	ES21-0004
SH-41L2*	1/8 x 1/4 x 1/8 x 2	ES21-0009	ES21-0010
SH-41L3*	1/8 x 1/4 x 1/8 x 3	ES21-0014	ES21-0015
SH-1*	1/4 x 1/2 x 1/4 x 2	ES21-0018	ES21-0019
SH-1L6	1/4 x 1/2 x 1/4 x 6-3/4	ES21-0023	ES21-0024
SH-1L6X*	1/4 x 1/2 x 1/4 x 6	ES21-0029	ES21-0030
SH-2	5/16 x 3/4 x 1/4 x 2-1/2	ES21-0033	ES21-0034
SH-2L6	5/16 x 3/4 x 1/4 x 6	ES21-0038	ES21-0039
SH-5	1/2 x 1-1/4 x 1/4 x 4	ES21-0043	ES21-0044
SH-5L6	1/2 x 1-1/4 x 1/4 x 7-1/4	ES21-0048	ES21-0049
SH-6	5/8 x 1-7/16 x 1/4 x 4-3/16	ES21-0053	ES21-0054
SH-7	3/4 x 1-5/8 x 1/4 x 3-3/8	ES21-0058	ES21-0059

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SJ-42*	1/8 x 3/32 x 1/8 x 1-1/2	ES22-0002	ES22-0003	ES22-0004
SJ-42DE*^	1/8 x 3/32 x 1/8 x 1-1/2	ES22-0007	ES22-0008	ES22-0009
SJ-81	3/16 x 3/16 x 3/16 x 2	ES22-0012	ES22-0013	ES22-0014
SJ-1*	1/4 x 3/16 x 1/4 x 2	ES22-0017	ES22-0018	ES22-0019
SJ-1DE*^	1/4 x 3/16 x 1/4 x 2	ES22-0022	ES22-0023	ES22-0024
SJ-2	5/16 x 5/16 x 1/4 x 2-1/16	ES22-0027	ES22-0028	ES22-0029
SJ-3	3/8 x 5/16 x 1/4 x 2-1/16	ES22-0032	ES22-0033	ES22-0034
SJ-5	1/2 x 7/16 x 1/4 x 2-3/16	ES22-0037	ES22-0038	ES22-0039
SJ-6	5/8 x 9/16 x 1/4 x 2-5/16	ES22-0042	ES22-0043	ES22-0044
SJ-7	3/4 x 11/16 x 1/4 x 2-7/16	ES22-0047	ES22-0048	ES22-0049
SJ-9	1 x 15/16 x 1/4 x 2-9/16	ES22-0052	ES22-0053	ES22-0054

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SJ-42*	1/8 x 3/32 x 1/8 x 1-1/2	ES22-0005	ES22-0006
SJ-42DE*^	1/8 x 3/32 x 1/8 x 1-1/2	ES22-0010	ES22-0011
SJ-81	3/16 x 3/16 x 3/16 x 2	ES22-0015	ES22-0016
SJ-1*	1/4 x 3/16 x 1/4 x 2	ES22-0020	ES22-0021
SJ-1DE*^	1/4 x 3/16 x 1/4 x 2	ES22-0025	ES22-0026
SJ-2	5/16 x 5/16 x 1/4 x 2-1/16	ES22-0030	ES22-0031
SJ-3	3/8 x 5/16 x 1/4 x 2-1/16	ES22-0035	ES22-0036
SJ-5	1/2 x 7/16 x 1/4 x 2-3/16	ES22-0040	ES22-0041
SJ-6	5/8 x 9/16 x 1/4 x 2-5/16	ES22-0045	ES22-0046
SJ-7	3/4 x 11/16 x 1/4 x 2-7/16	ES22-0050	ES22-0051
SJ-9	1 x 15/16 x 1/4 x 2-9/16	ES22-0055	ES22-0056

* Denotes Solid Carbide

^ Denotes Double End

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SK-42*	1/8 x 1/16 x 1/8 x 1-1/2	ES23-0002	ES23-0003	ES23-0004
SK-42DE*^	1/8 x 1/16 x 1/8 x 1-1/2	ES23-0007	ES23-0008	ES23-0009
SK-1*	1/4 x 1/8 x 1/4 x 2	ES23-0012	ES23-0013	ES23-0014
SK-1DE*^	1/4 x 1/8 x 1/4 x 2	ES23-0017	ES23-0018	ES23-0019
SK-2	5/16 x 3/16 x 1/4 x 1-15/16	ES23-0022	ES23-0023	ES23-0024
SK-3	3/8 x 3/16 x 1/4 x 1-15/16	ES23-0027	ES23-0028	ES23-0029
SK-4	7/16 x 1/4 x 1/4 x 2	ES23-0032	ES23-0033	ES23-0034
SK-5	1/2 x 1/4 x 1/4 x 2	ES23-0037	ES23-0038	ES23-0039
SK-6	5/8 x 5/16 x 1/4 x 2-1/16	ES23-0042	ES23-0043	ES23-0044
SK-7	3/4 x 3/8 x 1/4 x 2-1/8	ES23-0047	ES23-0048	ES23-0049
SK-9	1 x 1/2 x 1/4 x 2-1/4	ES23-0052	ES23-0053	ES23-0054

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SK-42*	1/8 x 1/16 x 1/8 x 1-1/2	ES23-0005	ES23-0006
SK-42DE*^	1/8 x 1/16 x 1/8 x 1-1/2	ES23-0010	ES23-0011
SK-1*	1/4 x 1/8 x 1/4 x 2	ES23-0015	ES23-0016
SK-1DE*^	1/4 x 1/8 x 1/4 x 2	ES23-0020	ES23-0021
SK-2	5/16 x 3/16 x 1/4 x 1-15/16	ES23-0025	ES23-0026
SK-3	3/8 x 3/16 x 1/4 x 1-15/16	ES23-0030	ES23-0031
SK-4	7/16 x 1/4 x 1/4 x 2	ES23-0035	ES23-0036
SK-5	1/2 x 1/4 x 1/4 x 2	ES23-0040	ES23-0041
SK-6	5/8 x 5/16 x 1/4 x 2-1/16	ES23-0045	ES23-0046
SK-7	3/4 x 3/8 x 1/4 x 2-1/8	ES23-0050	ES23-0051
SK-9	1 x 1/2 x 1/4 x 2-1/4	ES23-0055	ES23-0056

* Denotes Solid Carbide

^ Denotes Double End

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	DEG	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SL-41*	1/8 x 3/8 x 1/8 x 1-1/2	8°	ES24-0002	ES24-0001	ES24-0005
SL-42*	1/8 x 1/2 x 1/8 x 1-1/2	8°	ES24-0006A	ES24-0007A	ES24-0008
SL-1*	1/4 x 5/8 x 1/4 x 2	14°	ES24-0012	ES24-0011A	ES24-0015
SL-1L6	1/4 x 5/8 x 1/4 x 6-3/4	14°	ES24-0017	ES24-0016	ES24-0020
SL-1L6X*	1/4 x 5/8 x 1/4 x 6	14°	ES24-0021	ES24-0022	ES24-0023
SL-2	5/16 x 7/8 x 1/4 x 2-5/8	14°	ES24-0027	ES24-0026	ES24-0030
SL-3	3/8 x 1-1/16 x 1/4 x 2-13/16	14°	ES24-0032	ES24-0031Q	ES24-0035
SL-3L6	3/8 x 1-1/16 x 1/4 x 7-1/16	14°	ES24-0037	ES24-0036	ES24-0040
SL-4	1/2 x 1-1/8 x 1/4 x 2-7/8	14°	ES24-0042	ES24-0041Q	ES24-0045
SL-4L6	1/2 x 1-1/8 x 1/4 x 7-1/8	14°	ES24-0047	ES24-0046	ES24-0050
SL-5	5/8 x 1-3/16 x 1/4 x 2-15/16	14°	ES24-0051	ES24-0052	ES24-0053
SL-6	5/8 x 1-5/16 x 1/4 x 3-1/16	14°	ES24-0057	ES24-0056	ES24-0060
SL-7	3/4 x 1-1/2 x 1/4 x 3-1/4	14°	ES24-0062	ES24-0061	ES24-0065

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	DEG	Part No. Alumacut	Part No. Diamondcut
SL-41*	1/8 x 3/8 x 1/8 x 1-1/2	8°	ES24-0003	ES24-0004
SL-42*	1/8 x 1/2 x 1/8 x 1-1/2	8°	ES24-0009	ES24-0010
SL-1*	1/4 x 5/8 x 1/4 x 2	14°	ES24-0013	ES24-0014
SL-1L6	1/4 x 5/8 x 1/4 x 6-3/4	14°	ES24-0018	ES24-0019
SL-1L6X*	1/4 x 5/8 x 1/4 x 6	14°	ES24-0024	ES24-0025
SL-2	5/16 x 7/8 x 1/4 x 2-5/8	14°	ES24-0028	ES24-0029
SL-3	3/8 x 1-1/16 x 1/4 x 2-13/16	14°	ES24-0033	ES24-0034
SL-3L6	3/8 x 1-1/16 x 1/4 x 7-1/16	14°	ES24-0038	ES24-0039
SL-4	1/2 x 1-1/8 x 1/4 x 2-7/8	14°	ES24-0043A	ES24-0044
SL-4L6	1/2 x 1-1/8 x 1/4 x 7-1/8	14°	ES24-0048	ES24-0049
SL-5	5/8 x 1-3/16 x 1/4 x 2-15/16	14°	ES24-0054	ES24-0055
SL-6	5/8 x 1-5/16 x 1/4 x 3-1/16	14°	ES24-0058	ES24-0059
SL-7	3/4 x 1-1/2 x 1/4 x 3-1/4	14°	ES24-0063	ES24-0064

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	DEG	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SM-41*	1/8 x 11/32 x 1/8 x 1-1/2	12°	ES25-0002	ES25-0001	ES25-0005
SM-42*	1/8 x 7/16 x 1/8 x 1-1/2	14°	ES25-0007	ES25-0006	ES25-0010
SM-42L2*	1/8 x 7/16 x 1/8 x 2	14°	ES25-0011	ES25-0012	ES25-0013
SM-42L3*	1/8 x 7/16 x 1/8 x 3	14°	ES25-0016	ES25-0017	ES25-0018
SM-43*	1/8 x 5/8 x 1/8 x 1-1/2	7°	ES25-0022	ES25-0021	ES25-0025
SM-43L2*	1/8 x 5/8 x 1/8 x 2	7°	ES25-0026	ES25-0027	ES25-0028
SM-43L3*	1/8 x 5/8 x 1/8 x 3	7°	ES25-0031	ES25-0032	ES25-0033
SM-51	1/4 x 1/2 x 1/8 x 2-1/8	22°	ES25-0037	ES25-0036	ES25-0040
SM-81	3/16 x 1/2 x 3/16 x 2	16°	ES25-0041	ES25-0042	ES25-0043
SM-1*	1/4 x 1/2 x 1/4 x 2	22°	ES25-0047	ES25-0046	ES25-0050
SM-1L6	1/4 x 1/2 x 1/4 x 6-3/4	22°	ES25-0052	ES25-0051	ES25-0055
SM-1L6X*	1/4 x 1/2 x 1/4 x 6	22°	ES25-0056	ES25-0057	ES25-0058
SM-2	1/4 x 3/4 x 1/4 x 2	14°	ES25-0062	ES25-0061	ES25-0065
SM-2L6	1/4 x 3/4 x 1/4 x 6-3/4	14°	ES25-0066	ES25-0067	ES25-0068
SM-3*	1/4 x 1 x 1/4 x 2	8°	ES25-0072	ES25-0071A	ES25-0075
SM-3A*	1/4 x 1-1/4 x 1/4 x 2	8°	ES25-0076	ES25-0077	ES25-0078
SM-3B	5/16 x 3/4 x 1/4 x 2-1/2	22°	ES25-0081	ES25-0082	ES25-0083
SM-4	3/8 x 5/8 x 1/4 x 2-3/8	28°	ES25-0087	ES25-0086A	ES25-0090
SM-4L6	3/8 x 5/8 x 1/4 x 6-5/8	28°	ES25-0097	ES25-0096	ES25-0100
SM-4A	3/8 x 1 x 1/4 x 2-3/4	10°	ES25-0091	ES25-0092	ES25-0093
SM-5	1/2 x 7/8 x 1/4 x 2-5/8	28°	ES25-0102	ES25-0101A	ES25-0105
SM-5L6	1/2 x 7/8 x 1/4 x 6-7/8	28°	ES25-0107	ES25-0106	ES25-0110
SM-6	5/8 x 1 x 1/4 x 2-3/4	31°	ES25-0112	ES25-0111	ES25-0115

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	DEG	Part No. Alumacut	Part No. Diamondcut
SM-41*	1/8 x 11/32 x 1/8 x 1-1/2	12°	ES25-0003	ES25-0004
SM-42*	1/8 x 7/16 x 1/8 x 1-1/2	14°	ES25-0008	ES25-0009
SM-42L2*	1/8 x 7/16 x 1/8 x 2	14°	ES25-0014	ES25-0015
SM-42L3*	1/8 x 7/16 x 1/8 x 3	14°	ES25-0019	ES25-0020
SM-43*	1/8 x 5/8 x 1/8 x 1-1/2	7°	ES25-0023	ES25-0024
SM-43L2*	1/8 x 5/8 x 1/8 x 2	7°	ES25-0029	ES25-0030
SM-43L3*	1/8 x 5/8 x 1/8 x 3	7°	ES25-0034	ES25-0035
SM-51	1/4 x 1/2 x 1/8 x 2-1/8	22°	ES25-0038	ES25-0039
SM-81	3/16 x 1/2 x 3/16 x 2	16°	ES25-0044	ES25-0045
SM-1*	1/4 x 1/2 x 1/4 x 2	22°	ES25-0048	ES25-0049
SM-1L6	1/4 x 1/2 x 1/4 x 6-3/4	22°	ES25-0053	ES25-0054
SM-1L6X*	1/4 x 1/2 x 1/4 x 6	22°	ES25-0059	ES25-0060
SM-2	1/4 x 3/4 x 1/4 x 2	14°	ES25-0063	ES25-0064
SM-2L6	1/4 x 3/4 x 1/4 x 6-3/4	14°	ES25-0069	ES25-0070
SM-3*	1/4 x 1 x 1/4 x 2	8°	ES25-0073	ES25-0074
SM-3A*	1/4 x 1-1/4 x 1/4 x 2	8°	ES25-0079	ES25-0080
SM-3B	5/16 x 3/4 x 1/4 x 2-1/2	22°	ES25-0084	ES25-0085
SM-4	3/8 x 5/8 x 1/4 x 2-3/8	28°	ES25-0088	ES25-0089
SM-4L6	3/8 x 5/8 x 1/4 x 6-5/8	28°	ES25-0098	ES25-0099
SM-4A	3/8 x 1 x 1/4 x 2-3/4	10°	ES25-0094	ES25-0095
SM-5	1/2 x 7/8 x 1/4 x 2-5/8	28°	ES25-0103	ES25-0104
SM-5L6	1/2 x 7/8 x 1/4 x 6-7/8	28°	ES25-0108	ES25-0109
SM-6	5/8 x 1 x 1/4 x 2-3/4	31°	ES25-0113	ES25-0114

* Denotes Solid Carbide

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SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	DEG	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SN-41*	3/32 x 1/8 x 1/8 x 1-1/2	10°	ES26-0001	ES26-0002	ES26-0003
SN-42*	1/8 x 3/16 x 1/8 x 1-1/2	10°	ES26-0007	ES26-0006	ES26-0010
SN-42L2*	1/8 x 3/16 x 1/8 x 2	10°	ES26-0011	ES26-0012	ES26-0013
SN-42L3*	1/8 x 3/16 x 1/8 x 3	10°	ES26-0016	ES26-0017	ES26-0018
SN-51	1/4 x 1/4 x 1/8 x 1-3/4	10°	ES26-0022	ES26-0021	ES26-0025
SN-1*	1/4 x 5/16 x 1/4 x 2	10	ES26-0027	ES26-0026	ES26-0030
SN-1L6	1/4 x 5/16 x 1/4 x 6-3/4	10°	ES26-0031	ES26-0032	ES26-0033
SN-2	3/8 x 3/8 x 1/4 x 2-1/8	13°	ES26-0036	ES26-0037	ES26-0038
SN-3	1/2 x 1/2 x 1/4 x 2-1/4	16°	ES26-0042	ES26-0041	ES36-0045
SN-4	1/2 x 1/2 x 1/4 x 2-1/4	28°	ES26-0047	ES26-0046	ES26-0050
SN-4L6	1/2 x 1/2 x 1/4 x 6-1/2	28°	ES26-0052	ES26-0051	ES26-0055
SN-5	5/8 x 5/8 x 1/4 x 2-3/8	19°	ES26-0057	ES26-0056	ES26-0060
SN-6	5/8 x 3/4 x 1/4 x 2-1/2	18°	ES26-0062	ES26-0061	ES26-0065
SN-7	3/4 x 5/8 x 1/4 x 2-3/8	30°	ES26-0067	ES26-0066	ES26-0070

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	DEG	Part No. Alumacut	Part No. Diamondcut
SN-41*	3/32 x 1/8 x 1/8 x 1-1/2	10°	ES26-0004	ES26-0005
SN-42*	1/8 x 3/16 x 1/8 x 1-1/2	10°	ES26-0008	ES26-0009
SN-42L2*	1/8 x 3/16 x 1/8 x 2	10°	ES26-0014	ES26-0015
SN-42L3*	1/8 x 3/16 x 1/8 x 3	10°	ES26-0019	ES26-0020
SN-51	1/4 x 1/4 x 1/8 x 1-3/4	10°	ES26-0023	ES26-0024
SN-1*	1/4 x 5/16 x 1/4 x 2	10	ES26-0028	ES26-0029
SN-1L6	1/4 x 5/16 x 1/4 x 6-3/4	10°	ES26-0034	ES26-0035
SN-2	3/8 x 3/8 x 1/4 x 2-1/8	13°	ES26-0039	ES26-0040
SN-3	1/2 x 1/2 x 1/4 x 2-1/4	16°	ES26-0043	ES26-0044
SN-4	1/2 x 1/2 x 1/4 x 2-1/4	28°	ES26-0048	ES26-0049
SN-4L6	1/2 x 1/2 x 1/4 x 6-1/2	28°	ES26-0053	ES26-0054
SN-5	5/8 x 5/8 x 1/4 x 2-3/8	19°	ES26-0058	ES26-0059
SN-6	5/8 x 3/4 x 1/4 x 2-1/2	18°	ES26-0063	ES26-0064
SN-7	3/4 x 5/8 x 1/4 x 2-3/8	30°	ES26-0068	ES26-0069

* Denotes Solid Carbide

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STANDARD & COARSE



ODxLOCxShankODxOAL	Part No. Standard	Part No. Coarse
1/8 x 1/2 x 1/8 x 1-1/2	ES29-0001	ES29-0002
5/32 x 1/2 x 3/16 x 2	ES29-0003	ES29-0004
3/16 x 5/8 x 3/16 x 2	ES29-0005	ES29-0006
1/4 x 3/4 x 1/4 x 2	ES29-0007	ES29-0008
5/16 x 13/16 x 5/16 x 2-1/2	ES29-0009	ES29-0010
3/8 x 1 x 3/8 x 2-1/2	ES29-0011	ES29-0012
7/16 x 1 x 7/16 x 3	ES29-0013	ES29-0014
1/2 x 1 x 1/2 x 3	ES29-0015	ES29-0016

Piloted Diemills

DOUBLECUT & SINGLECUT



ODxLOCxShankODxOAL	Part No. Doublecut	Part No. Singlecut
1/8 x 1 x 1/8 x 3	ES30-0001	ES30-0002
3/16 x 2 x 3/16 x 3	ES30-0003	ES30-0004
1/4 x 1-1/4 x 1/4 x 3	ES30-0005	ES30-0006
3/8 x 2 x 3/8 x 4	ES30-0007	ES30-0008
1/2 x 2 x 1/2 x 4	ES30-0009	ES30-0010

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Fiberglass Routers

PLAIN, DRILLEND, MILLEND, BUREND & FISH TAIL



Item	ODxLOCxShankODxOAL	Part No. Plain	Part No. Drillend	Part No. Millend	Part No. Burend
FGR1	1/16 x 3/16 x 1/8 x 1-1/2	ES28-0001	ES28-0002	ES28-0003	ES28-0004
FGR1-1	3/32 x 3/8 x 1/8 x 1-1/2	ES28-0006	ES28-0007	ES28-0008	ES28-0009
FGR2	1/8 x 1/2 x 1/8 x 1-1/2	ES28-0011	ES28-0012	ES28-0013	ES28-0014
FGR3	3/16 x 5/8 x 3/16 x 2	ES28-0016	ES28-0017	ES28-0018	ES28-0019
FGR4	3/16 x 5/8 x 1/4 x 2	ES28-0021	ES28-0022	ES28-0023	ES28-0024
FGR5	1/4 x 3/4 x 1/4 x 2	ES28-0026	ES28-0027	ES28-0028	ES28-0029
FGR6	1/4 x 3/4 x 1/4 x 2-1/2	ES28-0031	ES28-0032	ES28-0033	ES28-0034
FGR6-0	1/4 x 1 x 1/4 x 2-1/2	ES28-0036	ES28-0037	ES28-0038	ES28-0039
FGR6-1	1/4 x 3/4 x 1/4 x 3	ES28-0041	ES28-0042	ES28-0043	ES28-0044
FGR6-2	1/4 x 1 x 1/4 x 3	ES28-0046	ES28-0047	ES28-0048	ES28-0049
FGR6-3	1/4 x 1/2 x 1/4 x 3	ES28-0051	ES28-0052	ES28-0053	ES28-0054
FGR7	5/16 x 1 x 5/16 x 2-1/2	ES28-0056	ES28-0057	ES28-0058	ES28-0059
FGR8	3/8 x 1 x 3/8 x 2-1/2	ES28-0061	ES28-0062	ES28-0063	ES28-0064
FGR9	1/2 x 1 x 1/2 x 3	ES28-0066	ES28-0067	ES28-0068	ES28-0069

Tire Burs

ROUND SHANK & TRI-SHANK



ODxLOCxShankODxOAL	Part No. Round Shank	Part No. Tri-Shank
3/16 x 1 x 3/16 x 2	ES45-0001	ES45-0002
3/16 x 2 x 3/16 x 3	ES45-0003	ES45-0004
7/32 x 2 x 1/4 x 3	ES45-0005	ES45-0006
1/4 x 2 x 1/4 x 3	ES45-0007	ES45-0008
5/16 x 1-1/2 x 5/16 x 3	ES45-0009	ES45-0010
5/16 x 2 x 5/16 x 4	ES45-0011	ES45-0012
3/8 x 3 x 3/8 x 4-1/2	ES45-0013	ES45-0014
1/2 x 3 x 3/8 x 5 (Brazed Shank)	ES45-0015	ES45-0016

Home Improvement Burs

Item	Application	ODxLOCxShankODxOAL
ES45-0100	Tile	1/8 x 1 x 1/8 x 2
ES45-0101	Tile	1/4 x 1 x 1/4 x 2
ES45-0102	Drywall	1/4 x 1-1/4 x 1/4 x 2-1/16
ES45-0103	Grout	3/32 x 9/16 x 1/8 x 1-1/2



TC1D



TC4D



DW-2

SINGLECUT & DOUBLECUT

Item	Burs Included	Part No. Singlecut	Part No. Doublecut
M100	SA43,SA42,SC42,SC41,SD42,SE41,SF41,SG41,SH41,SJ41,SL42,SN42	ES27-0002	ES27-0001
M110	SA51,SB51,SC51,SD51,SE51,SF51,SG51,SM51,SN51	ES27-0005	ES27-0004
M120	SA1,SC1,SD1,SE1,SF1,SG1,SH1,SJ1,SK1,SL1,SM1,SN1	ES27-0008	ES27-0007
M130	SA1, SA3, SC1, SC3, SD1, SD3, SF1, SF3	ES27-0011	ES27-0010
M135	SB1, SB3, SC1, SC3, SD1, SD3, SF1, SF3	ES27-0015	ES27-0014
M140	SA3, SA5, SC3, SC5, SD3, SD5, SF3, SF5	ES27-0019	ES27-0018
M145	SB3, SB5, SC3, SC5, SD3, SD5, SF3, SF5	ES27-0023	ES27-0022
M150	SA5, SC3, SC5, SD5, SF3, SF5, SG3, SL4	ES27-0027	ES27-0026
M155	SB5, SC3, SC5, SD5, SF3, SF5, SG3, SL4	ES27-0031	ES27-0030
M640	SC3L6, SD3L6, SF3L6, SF5L6	ES27-0035	ES27-0034

48-PIECE COUNTERTOP DISPLAY

Showcases 48 pieces of our popular burs. The burs are showcased in a high quality acrylic lexan display with locking back panel.

Description	Part No.
48 Piece Bur Display	ES45-0200
48 Piece Bur Display Without 1/8th Shank Burs	ES45-0201
Bur Set Without Plastic Display	ES45-0202

THE SET INCLUDES:

Doublecut Burs (1/8 Shank)

SA-51DC, SB-51DC, SC-51DC, SD-51DC, SE-51DC, SF-51DC, SG-51DC, SM-51DC, SN-51DC

Doublecut Burs (1/4 Shank)

SA-1DC, SA-3DC, SA-5DC, SC-1DC, SC-3DC, SC-5DC, SD-1DC, SD-3DC, SD-5DC, SE-1DC, SE-3DC, SE-5DC, SF-1DC, SF-3DC, SF-5DC, SG-1DC, SG-3DC, SG-5DC, SL-4DC, SL-3DC, SL-1DC, SM-5DC, SM-4DC, SM-3DC

Alumacut Burs (1/4 Shank)

SA-1FM, SA-3FM, SA-5FM, SC-1FM, SC-3FM, SC-5FM, SD-5FM, SD-3FM, SE-5FM, SE-3FM, SF-5FM, SF-3FM, SF-1FM, SL-4FM, SL-3FM

ADDITIONAL BUR SETS

Description	No. of Pieces	Part No.
Plastic Pouch 6 Inch Shank Set - Includes SD-3L6DC, SF-5L6DC, SF-3L6DC, and SC-3L6DC	4	ES45-0300
Tire Bur Set - Includes 270, 271, and 271/38 in Clamshell Case	3	ES45-0301
Tire Bur Set - Includes 270, 270P, 271, and 271P in Clamshell Case	4	ES45-0302
24 Piece Display - Includes SA-5DC, SA-3DC, SA-1DC, SC-5DC, SC-3DC, SC-1DC, SD-5DC, SD-3DC, SD-1DC, SE-5DC, SE-3DC, SE-1DC, SF-5DC, SF-3DC, SF-1DC, SG-5DC, SG-3DC, SG-1DC, SL-4DC, SL-3DC, SL-1DC, SM-5DC, SM-4DC, SM-3DC	24	ES45-0303
15 Piece Alumacut Display - Includes SA-1FM, SA-3FM, SA-5FM, SC-1FM, SC-3FM, SC-5FM, SD-3FM, SD-5FM, SE-3FM, SE-5FM, SF-1M, SF-3FM, SF-5FM, SL-3FM, SL-4FM Similar to 24 Piece Display but with 15 Holes.	15	ES45-0304
18 Piece 6 inch Shank Bur Display - Includes SC-5L6DC, SC-3L6DC, SC-1L6DC, SE-5L6DC, SE-3L6DC, SE-1L6DC, SF-5L6DC, SF-3L6DC, SF-1L6DC, SC-5L6FM, SC-3L6FM, SC-1L6FM, SE-5L6FM, SE-3L6FM, SE-1L6FM, SF-5L6FM, SF-3L6FM, SF-1L6FM	18	ES45-0305

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Metric Section





SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SA-41M*	1.5 x 6 x 3 x 38	ES14-0501A	ES14-0502A	ES14-0503
SA-42M*	2.5 x 11 x 3 x 38	ES14-0506A	ES14-0507A	ES14-0508
SA-43M*	3 x 14 x 3 x 38	ES14-0511A	ES14-0512A	ES14-0513
SA-51M	6.3 x 12.7 x 3 x 50	ES14-0516	ES14-0517	ES14-0518
SA-12M*	3 x 12.7 x 6 x 60	ES14-0521	ES14-0522	ES14-0523
SA-14M*	5 x 16 x 6 x 50	ES14-0526	ES14-0527	ES14-0528
SA-1M*	6 x 16 x 6 x 50	ES14-0531A	ES14-0532A	ES14-0533
SA-1ML6	6 x 12.7 x 6 x 162	ES14-0536	ES14-0537	ES14-0538
SA-1MA*	6 x 25 x 6 x 50	ES14-0541	ES14-0542	ES14-0543
SA-2M	8 x 19 x 6 x 63	ES14-0546	ES14-0547	ES14-0548
SA-2MA	8 x 25 x 6 x 64	ES14-0551	ES14-0552	ES14-0553
SA-3M	9.5 x 19 x 6 x 63	ES14-0556	ES14-0557	ES14-0558
SA-3ML6	9.5 x 19 x 6 x 169	ES14-0561	ES14-0562	ES14-0563
SA-3MA	9.5 x 25 x 6 x 69	ES14-0566	ES14-0567	ES14-0568
SA-3MB	9.5 x 38 x 6 x 70	ES14-0571	ES14-0572	ES14-0573
SA-4M	11 x 25 x 6 x 69	ES14-0576	ES14-0577	ES14-0578
SA-5M	12.7 x 25 x 6 x 69	ES14-0581	ES14-0582A	ES14-0583
SA-5ML6	12.7 x 25 x 6 x 175	ES14-0586	ES14-0587	ES14-0588
SA-6M	16 x 25 x 6 x 69	ES14-0591	ES14-0592	ES14-0593
SA-7M	19 x 25 x 6 x 69	ES14-0596	ES14-0597	ES14-0598
SA-9M	25 x 25 x 6 x 69	ES14-0601	ES14-0602	ES14-0603

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SA-41M*	1.5 x 6 x 3 x 38	ES14-0504	ES14-0505
SA-42M*	2.5 x 11 x 3 x 38	ES14-0509	ES14-0510
SA-43M*	3 x 14 x 3 x 38	ES14-0514	ES14-0515
SA-51M	6.3 x 12.7 x 3 x 50	ES14-0519	ES14-0520
SA-12M*	3 x 12.7 x 6 x 60	ES14-0524	ES14-0525
SA-14M*	5 x 16 x 6 x 50	ES14-0529	ES14-0530
SA-1M*	6 x 16 x 6 x 50	ES14-0534	ES14-0535
SA-1ML6	6 x 12.7 x 6 x 162	ES14-0539	ES14-0540
SA-1MA*	6 x 25 x 6 x 50	ES14-0544	ES14-0545
SA-2M	8 x 19 x 6 x 63	ES14-0549	ES14-0550
SA-2MA	8 x 25 x 6 x 64	ES14-0554	ES14-0555
SA-3M	9.5 x 19 x 6 x 63	ES14-0559	ES14-0560
SA-3ML6	9.5 x 19 x 6 x 169	ES14-0564	ES14-0565
SA-3MA	9.5 x 25 x 6 x 69	ES14-0569	ES14-0570
SA-3MB	9.5 x 38 x 6 x 70	ES14-0574	ES14-0575
SA-4M	11 x 25 x 6 x 69	ES14-0579	ES14-0580
SA-5M	12.7 x 25 x 6 x 69	ES14-0584	ES14-0585
SA-5ML6	12.7 x 25 x 6 x 175	ES14-0589	ES14-0590
SA-6M	16 x 25 x 6 x 69	ES14-0594	ES14-0595
SA-7M	19 x 25 x 6 x 69	ES14-0599	ES14-0600
SA-9M	25 x 25 x 6 x 69	ES14-0604	ES14-0605



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SB-41MECO* ^A	3 x 38 Endcut Only	ES15-0501	~	~
SB-41M*	1.5 x 6 x 3 x 38	ES15-0502A	ES15-0503A	ES15-0504
SB-42M*	2.5 x 11 x 3 x 38	ES15-0507A	ES15-0508A	ES15-0509
SB-43M*	3 x 14 x 3 x 38	ES15-0512A	ES15-0513A	ES15-0514
SB-51M	6.3 x 4.7 x 3 x 43	ES15-0517	ES15-0518	ES15-0519
SB-12M*	3 x 12.7 x 6 x 60	ES15-0522	ES15-0523	ES15-0524
SB-14M*	5 x 16 x 6 x 50	ES15-0527	ES15-0528	ES15-0529
SB-1M*	6 x 16 x 6 x 50	ES15-0532A	ES15-0533A	ES15-0534
SB-1MA*	6 x 25 x 6 x 50	ES15-0537	ES15-0538	ES15-0539
SB-1ML6	6 x 12.7 x 6 x 162	ES15-0542	ES15-0543	ES15-0544
SB-2M	8 x 19 x 6 x 63	ES15-0547	ES15-0548	ES15-0549
SB-2MA	8 x 25 x 6 x 64	ES15-0552	ES15-0553	ES15-0554
SB-3M	9.5 x 19 x 6 x 63	ES15-0557	ES15-0558	ES15-0559
SB-3ML6	9.5 x 19 x 6 x 169	ES15-0562	ES15-0563	ES15-0564
SB-3MA	9.5 x 25 x 6 x 69	ES15-0567	ES15-0568	ES15-0569
SB-3BM	9.5 x 38 x 6 x 70	ES15-0572	ES15-0573	ES15-0574
SB-4M	11 x 25 x 6 x 69	ES15-0577	ES15-0578	ES15-0579
SB-5M	12.7 x 25 x 6 x 69	ES15-0582A	ES15-0583A	ES15-0584
SB-5ML6	12.7 x 25 x 6 x 175	ES15-0587	ES15-0588	ES15-0589
SB-6M	16 x 25 x 6 x 69	ES15-0592	ES15-0593	ES15-0594
SB-7M	19 x 25 x 6 x 69	ES15-0597	ES15-0598	ES15-0599
SB-9M	25 x 25 x 6 x 69	ES15-0602	ES15-0603	ES15-0604

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SB-41M*	1.5 x 6 x 3 x 38	ES15-0505	ES15-0506
SB-42M*	2.5 x 11 x 3 x 38	ES15-0510	ES15-0511
SB-43M*	3 x 14 x 3 x 38	ES15-0515	ES15-0516
SB-51M	6.3 x 4.7 x 3 x 43	ES15-0520	ES15-0521
SB-12M*	3 x 12.7 x 6 x 60	ES15-0525	ES15-0526
SB-14M*	5 x 16 x 6 x 50	ES15-0530	ES15-0531
SB-1M*	6 x 16 x 6 x 50	ES15-0535	ES15-0536
SB-1MA*	6 x 25 x 6 x 50	ES15-0540	ES15-0541
SB-1ML6	6 x 12.7 x 6 x 162	ES15-0545	ES15-0546
SB-2M	8 x 19 x 6 x 63	ES15-0550	ES15-0551
SB-2MA	8 x 25 x 6 x 64	ES15-0555	ES15-0556
SB-3M	9.5 x 19 x 6 x 63	ES15-0560	ES15-0561
SB-3ML6	9.5 x 19 x 6 x 169	ES15-0565	ES15-0566
SB-3MA	9.5 x 25 x 6 x 69	ES15-0570	ES15-0571
SB-3BM	9.5 x 38 x 6 x 70	ES15-0575	ES15-0576
SB-4M	11 x 25 x 6 x 69	ES15-0580	ES15-0581
SB-5M	12.7 x 25 x 6 x 69	ES15-0585	ES15-0586
SB-5ML6	12.7 x 25 x 6 x 175	ES15-0590	ES15-0591
SB-6M	16 x 25 x 6 x 69	ES15-0595	ES15-0596
SB-7M	19 x 25 x 6 x 69	ES15-0600	ES15-0601
SB-9M	25 x 25 x 6 x 69	ES15-0605	ES15-0606

* Denotes Solid Carbide^A Denotes Double End

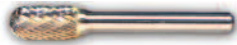


SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SC-41M*	2.5 x 11 x 3 x 38	ES16-0501A	ES16-0502A	ES16-0503
SC-42M*	3 x 14 x 3 x 38	ES16-0506A	ES16-0507A	ES16-0508
SC-42ML2*	3 x 14 x 3 x 50	ES16-0511	ES16-0512	ES16-0513
SC-42ML3*	3 x 14 x 3 x 75	ES16-0516	ES16-0517	ES16-0518
SC-51M	6.3 x 12.7 x 3 x 50	ES16-0521	ES16-0522	ES16-0523
SC-12M*	3 x 16 x 6 x 60	ES16-0526	ES16-0527	ES16-0528
SC-14M*	5 x 16 x 6 x 50	ES16-0531	ES16-0532	ES16-0533
SC-1M*	6 x 16 x 6 x 50	ES16-0536A	ES16-0537A	ES16-0538
SC-1MA*	6 x 25 x 6 x 50	ES16-0541	ES16-0542	ES16-0543
SC-1ML6	6 x 12.7 x 6 x 162	ES16-0546	ES16-0547	ES16-0548
SC-2M	8 x 19 x 6 x 63	ES16-0551	ES16-0552	ES16-0553
SC-2MA	8 x 25 x 6 x 64	ES16-0556	ES16-0557	ES16-0558
SC-3M	9.5 x 19 x 6 x 63	ES16-0561	ES16-0562	ES16-0563
SC-3ML6	9.5 x 19 x 6 x 169	ES16-0566	ES16-0567	ES16-0568
SC-3MA	9.5 x 25 x 6 x 69	ES16-0571	ES16-0572	ES16-0573
SC-4M	11 x 25 x 6 x 69	ES16-0576	ES16-0577	ES16-0578
SC-5M	12.7 x 25 x 6 x 69	ES16-0581A	ES16-0582A	ES16-0583
SC-5ML6	12.7 x 25 x 6 x 175	ES16-0586	ES16-0587	ES16-0588
SC-6M	16 x 25 x 6 x 69	ES16-0591	ES16-0592	ES16-0593
SC-7M	19 x 25 x 6 x 69	ES16-0596	ES16-0597	ES16-0598
SC-9M	25 x 25 x 6 x 69	ES16-0601	ES16-0602	ES16-0603

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SC-41M*	2.5 x 11 x 3 x 38	ES16-0504	ES16-0505
SC-42M*	3 x 14 x 3 x 38	ES16-0509	ES16-0510
SC-42ML2*	3 x 14 x 3 x 50	ES16-0514	ES16-0515
SC-42ML3*	3 x 14 x 3 x 75	ES16-0519	ES16-0520
SC-51M	6.3 x 12.7 x 3 x 50	ES16-0524	ES16-0525
SC-12M*	3 x 16 x 6 x 60	ES16-0529	ES16-0530
SC-14M*	5 x 16 x 6 x 50	ES16-0534	ES16-0535
SC-1M*	6 x 16 x 6 x 50	ES16-0539	ES16-0540
SC-1MA*	6 x 25 x 6 x 50	ES16-0544	ES16-0545
SC-1ML6	6 x 12.7 x 6 x 162	ES16-0549	ES16-0550
SC-2M	8 x 19 x 6 x 63	ES16-0554	ES16-0555
SC-2MA	8 x 25 x 6 x 64	ES16-0559	ES16-0560
SC-3M	9.5 x 19 x 6 x 63	ES16-0564	ES16-0565
SC-3ML6	9.5 x 19 x 6 x 169	ES16-0566	ES16-0570
SC-3MA	9.5 x 25 x 6 x 69	ES16-0574	ES16-0575
SC-4M	11 x 25 x 6 x 69	ES16-0579	ES16-0580
SC-5M	12.7 x 25 x 6 x 69	ES16-0584	ES16-0585
SC-5ML6	12.7 x 25 x 6 x 175	ES16-0589	ES16-0590
SC-6M	16 x 25 x 6 x 69	ES16-0594	ES16-0595
SC-7M	19 x 25 x 6 x 69	ES16-0599	ES16-0600
SC-9M	25 x 25 x 6 x 69	ES16-0604	ES16-0605

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAKER

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SD-41M*	2.5 x 2.3 x 3 x 38	ES17-0501A	ES17-0502A	ES17-0503
SD-42M*	3 x 2.5 x 3 x 38	ES17-0506A	ES17-0507A	ES17-0508
SD-42ML2*	3 x 2.5 x 3 x 50	ES17-0511	ES17-0512	ES17-0513
SD-42ML3*	3 x 2.5 x 3 x 75	ES17-0516	ES17-0517	ES17-0518
SD-51M	6.3 x 5 x 3 x 44	ES17-0521	ES17-0522	ES17-0523
SD-12M*	3 x 2 x 6 x 50	ES17-0526	ES17-0527	ES17-0528
SD-14M*	5 x 4 x 6 x 50	ES17-0531	ES17-0532	ES17-0533
SD-1M*	6 x 5 x 6 x 50	ES17-0536A	ES17-0537A	ES17-0538
SD-1ML6	6 x 5 x 6 x 155	ES17-0541	ES17-0542	ES17-0543
SD-2M	8 x 6.4 x 6 x 50	ES17-0546	ES17-0547	ES17-0548
SD-3M	9.5 x 8 x 6 x 52	ES17-0551	ES17-0552	ES17-0553
SD-3ML6	9.5 x 8 x 6 x 158	ES17-0556	ES17-0557	ES17-0558
SD-4M	11 x 9.5 x 6 x 54	ES17-0561	ES17-0562	ES17-0563
SD-5M	12.7 x 11 x 6 x 55	ES17-0566A	ES17-0567A	ES17-0568
SD-5ML6	12.7 x 11 x 6 x 161	ES17-0571	ES17-0572	ES17-0573
SD-6M	16 x 14 x 6 x 58	ES17-0576	ES17-0577	ES17-0578
SD-7M	19 x 16 x 6 x 62	ES17-0581	ES17-0582	ES17-0583
SD-9M	25 x 21 x 6 x 72	ES17-0586	ES17-0587	ES17-0588

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SD-41M*	2.5 x 2.3 x 3 x 38	ES17-0504	ES17-0505
SD-42M*	3 x 2.5 x 3 x 38	ES17-0509	ES17-0510
SD-42ML2*	3 x 2.5 x 3 x 50	ES17-0514	ES17-0515
SD-42ML3*	3 x 2.5 x 3 x 75	ES17-0519	ES17-0520
SD-51M	6.3 x 5 x 3 x 44	ES17-0524	ES17-0525
SD-12M*	3 x 2 x 6 x 50	ES17-0529	ES17-0530
SD-14M*	5 x 4 x 6 x 50	ES17-0534	ES17-0535
SD-1M*	6 x 5 x 6 x 50	ES17-0539	ES17-0540
SD-1ML6	6 x 5 x 6 x 155	ES17-0544	ES17-0545
SD-2M	8 x 6.4 x 6 x 50	ES17-0549	ES17-0550
SD-3M	9.5 x 8 x 6 x 52	ES17-0554	ES17-0555
SD-3ML6	9.5 x 8 x 6 x 158	ES17-0559	ES17-0560
SD-4M	11 x 9.5 x 6 x 54	ES17-0564	ES17-0565
SD-5M	12.7 x 11 x 6 x 55	ES17-0569	ES17-0570
SD-5ML6	12.7 x 11 x 6 x 161	ES17-0574	ES17-0575
SD-6M	16 x 14 x 6 x 58	ES17-0579	ES17-0580
SD-7M	19 x 16 x 6 x 62	ES17-0584	ES17-0585
SD-9M	25 x 21 x 6 x 72	ES17-0589	ES17-0590

* Denotes Solid Carbide A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SE-41M*	3 x 5.5 x 3 x 38	ES18-0501	ES18-0502A	ES18-0503
SE-41ML2*	3 x 5.5 x 3 x 50	ES18-0506	ES18-0507	ES18-0508
SE-41ML3*	3 x 5.5 x 3 x 75	ES18-0511	ES18-0512	ES18-0513
SE-51M	6.3 x 9.5 x 3 x 47	ES18-0516	ES18-0517	ES18-0518
SE-1M*	6 x 9.5 x 6 x 50	ES18-0521	ES18-0522A	ES18-0523
SE-1ML6	6 x 9.5 x 6 x 160	ES18-0526	ES18-0527	ES18-0528
SE-3M	9.5 x 16 x 6 x 60	ES18-0531	ES18-0532	ES18-0533
SE-3ML6	9.5 x 16 x 6 x 166	ES18-0536	ES18-0537	ES18-0538
SE-5M	12.7 x 22 x 6 x 66	ES18-0541	ES18-0542	ES18-0543
SE-5ML6	12.7 x 22 x 6 x 172	ES18-0546	ES18-0547	ES18-0548
SE-6M	16 x 25 x 6 x 69	ES18-0551	ES18-0552	ES18-0553
SE-7M	19 x 25 x 6 x 69	ES18-0556	ES18-0557	ES18-0558

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SE-41M*	3 x 5.5 x 3 x 38	ES18-0504	ES18-0505
SE-41ML2*	3 x 5.5 x 3 x 50	ES18-0509	ES18-0510
SE-41ML3*	3 x 5.5 x 3 x 75	ES18-0514	ES18-0515
SE-51M	6.3 x 9.5 x 3 x 47	ES18-0519	ES18-0520
SE-1M*	6 x 9.5 x 6 x 50	ES18-0524	ES18-0525
SE-1ML6	6 x 9.5 x 6 x 160	ES18-0529	ES18-0530
SE-3M	9.5 x 16 x 6 x 60	ES18-0534	ES18-0535
SE-3ML6	9.5 x 16 x 6 x 166	ES18-0539	ES18-0540
SE-5M	12.7 x 22 x 6 x 66	ES18-0544	ES18-0545
SE-5ML6	12.7 x 22 x 6 x 172	ES18-0549	ES18-0550
SE-6M	16 x 25 x 6 x 69	ES18-0554	ES18-0555
SE-7M	19 x 25 x 6 x 69	ES18-0559	ES18-0560

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SF-41M*	3 x 6 x 3 x 38	ES19-0501A	ES19-0502A	ES19-0503
SF-42M*	3 x 12.7 x 3 x 38	ES19-0506A	ES19-0507A	ES19-0508
SF-42ML2*	3 x 12.7 x 3 x 50	ES19-0511	ES19-0512	ES19-0513
SF-42ML3*	3 x 12.7 x 3 x 75	ES19-0516	ES19-0517	ES19-0518
SF-51M	6.3 x 12.7 x 3 x 50	ES19-0521	ES19-0522	ES19-0523
SF-1M*	6 x 16 x 6 x 50	ES19-0526A	ES19-0527A	ES19-0528
SF-1ML6	6 x 16 x 6 x 163	ES19-0531	ES19-0532	ES19-0533
SF-3M	9.5 x 19 x 6 x 63	ES19-0536	ES19-0537	ES19-0538
SF-3ML6	9.5 x 19 x 6 x 169	ES19-0541	ES19-0542	ES19-0543
SF-4M	11 x 25 x 6 x 69	ES19-0546	ES19-0547	ES19-0548
SF-13M	12.7 x 19 x 6 x 63	ES19-0551	ES19-0552	ES19-0553
SF-5M	12.7 x 25 x 6 x 69	ES19-0556A	ES19-0557A	ES19-0558
SF-5ML6	12.7 x 25 x 6 x 175	ES19-0561	ES19-0562	ES19-0563
SF-6M	16 x 25 x 6 x 69	ES19-0566	ES19-0567	ES19-0568
SF-7M	19 x 25 x 6 x 69	ES19-0571	ES19-0572	ES19-0573
SF-14M	19 x 32 x 6 x 76	ES19-0576	ES19-0577	ES19-0578
SF15M	19 x 38 x 6 x 82	ES19-0581	ES19-0582	ES19-0583

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SF-41M*	3 x 6 x 3 x 38	ES19-0504	ES19-0505
SF-42M*	3 x 12.7 x 3 x 38	ES19-0509	ES19-0510
SF-42ML2*	3 x 12.7 x 3 x 50	ES19-0514	ES19-0515
SF-42ML3*	3 x 12.7 x 3 x 75	ES19-0519	ES19-0520
SF-51M	6.3 x 12.7 x 3 x 50	ES19-0524	ES19-0525
SF-1M*	6 x 16 x 6 x 50	ES19-0529	ES19-0530
SF-1ML6	6 x 16 x 6 x 163	ES19-0534	ES19-0535
SF-3M	9.5 x 19 x 6 x 63	ES19-0539	ES19-0540
SF-3ML6	9.5 x 19 x 6 x 169	ES19-0544	ES19-0545
SF-4M	11 x 25 x 6 x 69	ES19-0549	ES19-0550
SF-13M	12.7 x 19 x 6 x 63	ES19-0554	ES19-0555
SF-5M	12.7 x 25 x 6 x 69	ES19-0559	ES19-0560
SF-5ML6	12.7 x 25 x 6 x 175	ES19-0564	ES19-0565
SF-6M	16 x 25 x 6 x 69	ES19-0569	ES19-0570
SF-7M	19 x 25 x 6 x 69	ES19-0574	ES19-0575
SF-14M	19 x 32 x 6 x 76	ES19-0579	ES19-0580
SF15M	19 x 38 x 6 x 82	ES19-0584	ES19-0585

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SG-41M*	3 x 6 x 3 x 38	ES20-0501A	ES20-0502A	ES20-0503
SG-43M*	3 x 9.5 x 3 x 38	ES20-0506A	ES20-0507A	ES20-0508
SG-44M*	3 x 12.7 x 3 x 38	ES20-0511A	ES20-0512A	ES20-0513
SG-44ML2*	3 x 12.7 x 3 x 50	ES20-0516	ES20-0517	ES20-0518
SG-44ML3*	3 x 12.7 x 3 x 75	ES20-0521	ES20-0522	ES20-0523
SG-51M	6.3 x 12.7 x 3 x 50	ES20-0526	ES20-0527	ES20-0528
SG-1M*	6 x 16 x 6 x 50	ES20-0531	ES20-0532A	ES20-0533
SG-1ML6	6 x 12.7 x 6 x 163	ES20-0536	ES20-0537	ES20-0538
SG-2M	8 x 19 x 6 x 63	ES20-0541	ES20-0542	ES20-0543
SG-3M	9.5 x 19 x 6 x 63	ES20-0546	ES20-0547	ES20-0548
SG-3ML6	9.5 x 19 x 6 x 169	ES20-0551	ES20-0552	ES20-0553
SG-13M	12.7 x 19 x 6 x 63	ES20-0556	ES20-0557	ES20-0558
SG-5M	12.7 x 25 x 6 x 69	ES20-0561	ES20-0562A	ES20-0563
SG-5ML6	12.7 x 25 x 6 x 175	ES20-0566	ES20-0567	ES20-0568
SG-6M	16 x 25 x 6 x 69	ES20-0571	ES20-0572	ES20-0573
SG-7M	19 x 25 x 6 x 69	ES20-0576	ES20-0577	ES20-0578

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SG-41M*	3 x 6 x 3 x 38	ES20-0504	ES20-0505
SG-43M*	3 x 9.5 x 3 x 38	ES20-0509	ES20-0510
SG-44M*	3 x 12.7 x 3 x 38	ES20-0514	ES20-0515
SG-44ML2*	3 x 12.7 x 3 x 50	ES20-0519	ES20-0520
SG-44ML3*	3 x 12.7 x 3 x 75	ES20-0524	ES20-0525
SG-51M	6.3 x 12.7 x 3 x 50	ES20-0529	ES20-0530
SG-1M*	6 x 16 x 6 x 50	ES20-0534	ES20-0535
SG-1ML6	6 x 12.7 x 6 x 163	ES20-0539	ES20-0540
SG-2M	8 x 19 x 6 x 63	ES20-0544	ES20-0545
SG-3M	9.5 x 19 x 6 x 63	ES20-0549	ES20-0550
SG-3ML6	9.5 x 19 x 6 x 169	ES20-0554	ES20-0555
SG-13M	12.7 x 19 x 6 x 63	ES20-0559	ES20-0560
SG-5M	12.7 x 25 x 6 x 69	ES20-0564	ES20-0565
SG-5ML6	12.7 x 25 x 6 x 175	ES20-0569	ES20-0570
SG-6M	16 x 25 x 6 x 69	ES20-0574	ES20-0575
SG-7M	19 x 25 x 6 x 69	ES20-0579	ES20-0580

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SH-41M*	3 x 6.3 x 3 x 38	ES21-0501A	ES21-0502	ES21-0503
SH-41ML2*	3 x 6.3 x 3 x 50	ES21-0506	ES21-0507	ES21-0508
SH-41ML3*	3 x 6.3 x 3 x 75	ES21-0511	ES21-0512	ES21-0513
SH-1M*	6 x 9.5 x 6 x 50	ES21-0516	ES21-0517A	ES21-0518
SH-1ML6	6 x 9.5 x 6 x 160	ES21-0521	ES21-0522	ES21-0523
SH-2M	8 x 19 x 6 x 63	ES21-0526	ES21-0527	ES21-0528
SH-2ML6	8 x 19 x 6 x 169	ES21-0531	ES21-0532	ES21-0533
SH-5M	12.7 x 32 x 6 x 76	ES21-0536	ES21-0537	ES21-0538
SH-5ML6	12.7 x 32 x 6 x 182	ES21-0541	ES21-0542	ES21-0543
SH-6M	16 x 36 x 6 x 80	ES21-0546	ES21-0547	ES21-0548
SH-7M	19 x 41 x 6 x 85	ES21-0551	ES21-0552	ES21-0553

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SH-41M*	3 x 6.3 x 3 x 38	ES21-0504	ES21-0505
SH-41ML2*	3 x 6.3 x 3 x 50	ES21-0509	ES21-0510
SH-41ML3*	3 x 6.3 x 3 x 75	ES21-0514	ES21-0515
SH-1M*	6 x 9.5 x 6 x 50	ES21-0519	ES21-0520
SH-1ML6	6 x 9.5 x 6 x 160	ES21-0524	ES21-0525
SH-2M	8 x 19 x 6 x 63	ES21-0529	ES21-0530
SH-2ML6	8 x 19 x 6 x 169	ES21-0534	ES21-0535
SH-5M	12.7 x 32 x 6 x 76	ES21-0539	ES21-0540
SH-5ML6	12.7 x 32 x 6 x 182	ES21-0544	ES21-0545
SH-6M	16 x 36 x 6 x 80	ES21-0549	ES21-0550
SH-7M	19 x 41 x 6 x 85	ES21-0554	ES21-0555

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SJ-42M*	3 x 2.5 x 3 x 38	ES22-0501	ES22-0502	ES22-0503
SJ-42MDE*^A	3 x 2.5 x 3 x 38	ES22-0506	ES22-0507	ES22-0508
SJ-1M*	6 x 4 x 6 x 50	ES22-0511	ES22-0512	ES22-0513
SJ-1MDE*^A	6 x 4 x 6 x 50	ES22-0516	ES22-0517	ES22-0518
SJ-3M	9.5 x 8 x 6 x 55	ES22-0521	ES22-0522	ES22-0523
SJ-5M	12.7 x 11 x 6 x 58	ES22-0526	ES22-0527	ES22-0528
SJ-6M	16 x 14.5 x 6 x 61	ES22-0531	ES22-0532	ES22-0533
SJ-7M	19 x 17.5 x 6 x 65	ES22-0536	ES22-0537	ES22-0538
SJ-9M	25 x 24.5 x 6 x 68	ES22-0541	ES22-0542	ES22-0543

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SJ-42M*	3 x 2.5 x 3 x 38	ES22-0504	ES22-0505
SJ-42MDE*^A	3 x 2.5 x 3 x 38	ES22-0509	ES22-0510
SJ-1M*	6 x 4 x 6 x 50	ES22-0514	ES22-0515
SJ-1MDE*^A	6 x 4 x 6 x 50	ES22-0519	ES22-0520
SJ-3M	9.5 x 8 x 6 x 55	ES22-0524	ES22-0525
SJ-5M	12.7 x 11 x 6 x 58	ES22-0529	ES22-0530
SJ-6M	16 x 14.5 x 6 x 61	ES22-0534	ES22-0535
SJ-7M	19 x 17.5 x 6 x 65	ES22-0539	ES22-0540
SJ-9M	25 x 24.5 x 6 x 68	ES22-0544	ES22-0545

* Denotes Solid Carbide

^ Denotes Double End

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SK-42M*	3 x 1.5 x 3 x 38	ES23-0501	ES23-0502	ES23-0503
SK-42MDE*^A	3 x 1.5 x 3 x 38	ES23-0506	ES23-0507	ES23-0508
SK-1M*	6 x 3 x 6 x 50	ES23-0511	ES23-0512	ES23-0513
SK-1MDE*^A	6 x 3 x 6 x 50	ES23-0516	ES23-0517	ES23-0518
SK-3M	9.5 x 4.7 x 6 x 52	ES23-0521	ES23-0522	ES23-0523
SK-5M	12.7 x 6.3 x 6 x 54	ES23-0526	ES23-0527	ES23-0528
SK-6M	16 x 8 x 6 x 57	ES23-0531	ES23-0532	ES23-0533
SK-7M	19 x 9.5 x 6 x 58	ES23-0536	ES23-0537	ES23-0538
SK-9M	25 x 12.7 x 6 x 60	ES23-0541	ES23-0542	ES23-0543

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	Part No. Alumacut	Part No. Diamondcut
SK-42M*	3 x 1.5 x 3 x 38	ES23-0504	ES23-0505
SK-42MDE*^A	3 x 1.5 x 3 x 38	ES23-0509	ES23-0510
SK-1M*	6 x 3 x 6 x 50	ES23-0514	ES23-0515
SK-1MDE*^A	6 x 3 x 6 x 50	ES23-0519	ES23-0520
SK-3M	9.5 x 4.7 x 6 x 52	ES23-0524	ES23-0525
SK-5M	12.7 x 6.3 x 6 x 54	ES23-0529	ES23-0530
SK-6M	16 x 8 x 6 x 57	ES23-0534	ES23-0535
SK-7M	19 x 9.5 x 6 x 58	ES23-0539	ES23-0540
SK-9M	25 x 12.7 x 6 x 60	ES23-0544	ES23-0545

* Denotes Solid Carbide

^ Denotes Double End

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	DEG	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SL-41M*	3 x 9.5 x 3 x 38	8°	ES24-0501	ES24-0502	ES24-0503
SL-42M*	3 x 12.7 x 3 x 38	8°	ES24-0506	ES24-0507	ES24-0508
SL-1M*	6 x 16 x 6 x 50	14°	ES24-0511	ES24-0512	ES24-0513
SL-1ML6	6 x 16 x 6 x 166	14°	ES24-0516	ES24-0517	ES24-0518
SL-2M	8 x 22 x 6 x 69	14°	ES24-0521	ES24-0522	ES24-0523
SL-3M	9.5 x 27 x 6 x 74	14°	ES24-0526	ES24-0527	ES24-0528
SL-3ML6	9.5 x 27 x 6 x 177	14°	ES24-0531	ES24-0532	ES24-0533
SL-4M	12.7 x 28 x 6 x 76	14°	ES24-0536	ES24-0537A	ES24-0538
SL-4ML6	12.7 x 28 x 6 x 178	14°	ES24-0541	ES24-0542	ES24-0543
SL-5M	16 x 30 x 6 x 77	14°	ES24-0546	ES24-0547	ES24-0548
SL-6M	16 x 33 x 6 x 80	14°	ES24-0551	ES24-0552	ES24-0553
SL-7M	19 x 38 x 6 x 85	14°	ES24-0556	ES24-0557	ES24-0558

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	DEG	Part No. Alumacut	Part No. Diamondcut
SL-41M*	3 x 9.5 x 3 x 38	8°	ES24-0504	ES24-0505
SL-42M*	3 x 12.7 x 3 x 38	8°	ES24-0509	ES24-0510
SL-1M*	6 x 16 x 6 x 50	14°	ES24-0514	ES24-0515
SL-1ML6	6 x 16 x 6 x 166	14°	ES24-0519	ES24-0520
SL-2M	8 x 22 x 6 x 69	14°	ES24-0524	ES24-0525
SL-3M	9.5 x 27 x 6 x 74	14°	ES24-0529	ES24-0530
SL-3ML6	9.5 x 27 x 6 x 177	14°	ES24-0534	ES24-0535
SL-4M	12.7 x 28 x 6 x 76	14°	ES24-0539	ES24-0540
SL-4ML6	12.7 x 28 x 6 x 178	14°	ES24-0544	ES24-0545
SL-5M	16 x 30 x 6 x 77	14°	ES24-0549	ES24-0550
SL-6M	16 x 33 x 6 x 80	14°	ES24-0554	ES24-0555
SL-7M	19 x 38 x 6 x 85	14°	ES24-0559	ES24-0560

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

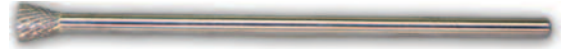
Item	ODxLOCxShankODxOAL	DEG	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SM-41M*	3 x 8.9 x 3 x 38	12°	ES25-0501	ES25-0502	ES25-0503
SM-42M*	3 x 11 x 3 x 38	14°	ES25-0506	ES25-0507	ES25-0508
SM-42ML2*	3 x 11 x 3 x 50	14°	ES25-0511	ES25-0512	ES25-0513
SM-42ML3*	3 x 11 x 3 x 75	14°	ES25-0516	ES25-0517	ES25-0518
SM-43M*	3 x 16 x 3 x 38	7°	ES25-0521	ES25-0522	ES25-0523
SM-51M	6.3 x 12.7 x 3 x 54	22°	ES25-0526	ES25-0527	ES25-0528
SM-1M*	6 x 12.7 x 6 x 50	22°	ES25-0531	ES25-0532	ES25-0533
SM-2M	6 x 19 x 6 x 50	14°	ES25-0536	ES25-0537	ES25-0538
SM-3M*	6 x 25 x 6 x 50	8°	ES25-0541	ES25-0542	ES25-0543
SM-4M	9.5 x 16 x 6 x 63	28°	ES25-0546	ES25-0547	ES25-0548
SM-5M	12.7 x 22 x 6 x 69	28°	ES25-0551	ES25-0552	ES25-0553
SM-6M	16 x 25 x 6 x 73	31°	ES25-0556	ES25-0557	ES25-0558

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	DEG	Part No. Alumacut	Part No. Diamondcut
SM-41M*	3 x 8.9 x 3 x 38	12°	ES25-0504	ES25-0505
SM-42M*	3 x 11 x 3 x 38	14°	ES25-0509	ES25-0510
SM-42ML2*	3 x 11 x 3 x 50	14°	ES25-0514	ES25-0515
SM-42ML3*	3 x 11 x 3 x 75	14°	ES25-0519	ES25-0520
SM-43M*	3 x 16 x 3 x 38	7°	ES25-0524	ES25-0525
SM-51M	6.3 x 12.7 x 3 x 54	22°	ES25-0529	ES25-0530
SM-1M*	6 x 12.7 x 6 x 50	22°	ES25-0534	ES25-0535
SM-2M	6 x 19 x 6 x 50	14°	ES25-0539	ES25-0540
SM-3M*	6 x 25 x 6 x 50	8°	ES25-0544	ES25-0545
SM-4M	9.5 x 16 x 6 x 63	28°	ES25-0549	ES25-0550
SM-5M	12.7 x 22 x 6 x 69	28°	ES25-0554	ES25-0555
SM-6M	16 x 25 x 6 x 73	31°	ES25-0559	ES25-0560

* Denotes Solid Carbide

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



SINGLECUT, DOUBLECUT & CHIPBREAK

Item	ODxLOCxShankODxOAL	DEG	Part No. Singlecut	Part No. Doublecut	Part No. Chipbreak
SN-41M*	2.5 x 3 x 3 x 38	10°	ES26-0501	ES26-0502	ES26-0503
SN-42M*	3 x 4 x 3 x 38	10°	ES26-0506	ES26-0507	ES26-0508
SN-51M	6.3 x 6 x 3 x 44	10	ES26-0511	ES26-0512	ES26-0513
SN-1M*	6 x 8 x 6 x 50	10°	ES26-0516	ES26-0517	ES26-0518
SN-2M	9.5 x 9.5 x 6 x 53	13°	ES26-0521	ES26-0522	ES26-0523
SN-4M	12.7 x 12.7 x 6 x 57	28°	ES26-0526	ES26-0527	ES26-0528
SN-6M	16 x 19 x 6 x 63	18°	ES26-0531	ES26-0532	ES26-0533
SN-7M	19 x 16 x 6 x 60	30°	ES26-0536	ES26-0537	ES26-0538

ALUMACUT & DIAMONDCUT

Item	ODxLOCxShankODxOAL	DEG	Part No. Alumacut	Part No. Diamondcut
SN-41M*	2.5 x 3 x 3 x 38	10°	ES26-0504	ES26-0505
SN-42M*	3 x 4 x 3 x 38	10°	ES26-0509	ES26-0510
SN-51M	6.3 x 6 x 3 x 44	10°	ES26-0514	ES26-0515
SN-1M*	6 x 8 x 6 x 50	10°	ES26-0519	ES26-0520
SN-2M	9.5 x 9.5 x 6 x 53	13°	ES26-0524	ES26-0525
SN-4M	12.7 x 12.7 x 6 x 57	28°	ES26-0529	ES26-0530
SN-6M	16 x 19 x 6 x 63	18°	ES26-0534	ES26-0535
SN-7M	19 x 16 x 6 x 60	30°	ES26-0539	ES26-0540

* Denotes Solid Carbide

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STANDARD & COARSE

ODxLOCxShankODxOAL	Part No. Standard	Part No. Coarse
3 x 12 x 3 x 38	ES29-0501	ES29-0502
4 x 12 x 4 x 50	ES29-0503	ES29-0504
5 x 16 x 5 x 50	ES29-0505	ES29-0506
6 x 18 x 6 x 50	ES29-0507	ES29-0508
8 x 22 x 8 x 63	ES29-0509	ES29-0510
10 x 25 x 10 x 63	ES29-0511	ES29-0512

Piloted Diemills**DOUBLECUT & SINGLECUT**

ODxLOCxShankODxOAL	Part No. Doublecut	Part No. Singlecut
3 x 25 x 3 x 75	ES30-0501	ES30-0502
5 x 32 x 5 x 75	ES30-0503	ES30-0504
6 x 32 x 6 x 75	ES30-0505	ES30-0506
10 x 50 x 10 x 100	ES30-0507	ES30-0508
12 x 50 x 12 x 100	ES30-0509	ES30-0510

Tire Burs**ROUND SHANK & TRI-SHANK**

ODxLOCxShankODxOAL	Part No. Round Shank	Part No. Tri-Shank
3 x 14 x 3 x 38	ES45-0501	ES45-0502
6 x 50 x 6 x 75	ES45-0503	ES45-0504
8 x 53 x 8 x 100	ES45-0505	ES45-0506
10 x 75 x 10 x 100	ES45-0507	ES45-0508

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)



PLAIN, DRILLEND, MILLEND & BUREND

Item	ODxLOCxShankODxOAL	Part No. Plain	Part No. Drillend	Part No. Millend	Part No. Burend
FGRM1	1.5 x 5 x 3 x 38	ES28-0501	ES28-0502	ES28-0503	ES28-0504
FGRM1-1	2 x 10 x 3 x 38	ES28-0505	ES28-0506	ES28-0507	ES28-0508
FGRM2	3 x 12 x 3 x 38	ES28-0509	ES28-0510	ES28-0511	ES28-0512
FGRM3	5 x 16 x 5 x 50	ES28-0513	ES28-0514	ES28-0515	ES28-0516
FGRM4	5 x 16 x 6 x 50	ES28-0517	ES28-0518	ES28-0519	ES28-0520
FGRM5	6 x 18 x 6 x 50	ES28-0521	ES28-0522	ES28-0523	ES28-0524
FGRM6	6 x 18 x 6 x 63	ES28-0525	ES28-0526	ES28-0527	ES28-0528
FGRM6-0	6 x 25 x 6 x 63	ES28-0529	ES28-0530	ES28-0531	ES28-0532
FGRM6-1	6 x 18 x 6 x 75	ES28-0533	ES28-0534	ES28-0535	ES28-0536
FGRM6-2	6 x 25 x 6 x 75	ES28-0537	ES28-0538	ES28-0539	ES28-0540
FGRM6-3	6 x 38 x 6 x 75	ES28-0541	ES28-0542	ES28-0543	ES28-0544
FGRM7	8 x 25 x 8 x 63	ES28-0545	ES28-0546	ES28-0547	ES28-0548
FGRM8	10 x 25 x 10 x 63	ES28-0549	ES28-0550	ES28-0551	ES28-0552
FGRM9	12 x 25 x 12 x 75	ES28-0553	ES28-0554	ES28-0555	ES28-0556

Bur Sets

SINGLECUT & DOUBLECUT

Item	Burs Included	Part No. Singlecut	Part No. Doublecut
M100	SA43,SA42,SC42,SC41,SD42,SE41,SF41,SG41,SH41,SJ41,SL42,SN42	ES27-0003	~
M110	SA51,SB51,SC51,SD51,SE51,SF51,SG51,SM51,SN51	ES27-0006	~
M120	SA1,SC1,SD1,SE1,SF1,SG1,SH1,SJ1,SK1,SL1,SM1,SN1	ES27-0009	~
M130	SA1, SA3, SC1, SC3, SD1, SD3, SF1, SF3	ES27-0013	ES27-0012
M135	SB1, SB3, SC1, SC3, SD1, SD3, SF1, SF3	ES27-0017	ES27-0016
M140	SA3, SA5, SC3, SC5, SD3, SD5, SF3, SF5	ES27-0021	ES27-0020
M145	SB3, SB5, SC3, SC5, SD3, SD5, SF3, SF5	ES27-0025	ES27-0024
M150	SA5, SC3, SC5, SD5, SF3, SF5, SG3, SL4	ES27-0029	ES27-0028
M155	SB5, SC3, SC5, SD5, SF3, SF5, SG3, SL4	ES27-0033	ES27-0032
M640	SC3L6, SD3L6, SF3L6, SF5L6	ES27-0037	ES27-0036

A = Available Item Shipped within 5 working days. All others not identified are Extended Delivery (4 Weeks Delivery)

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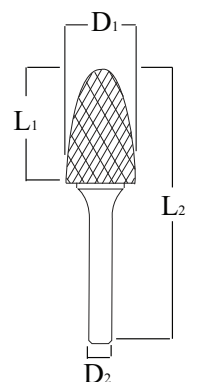
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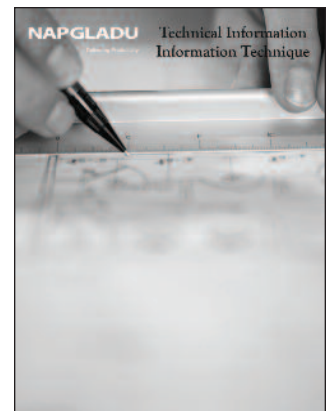
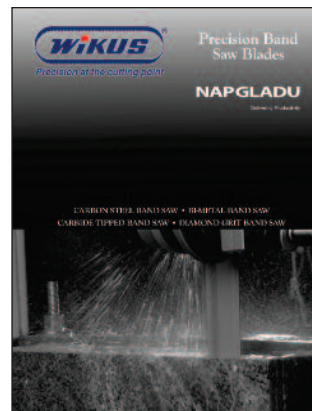
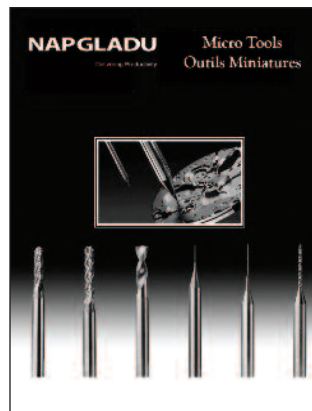
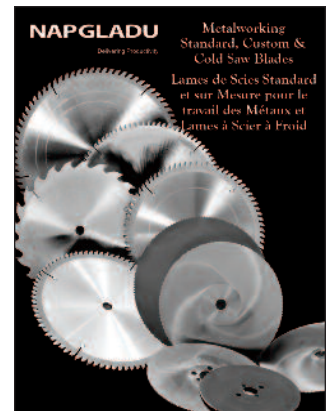
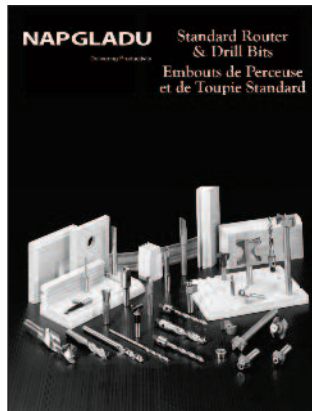
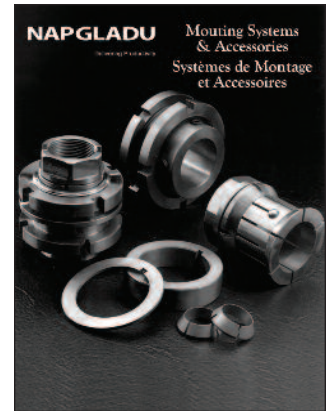
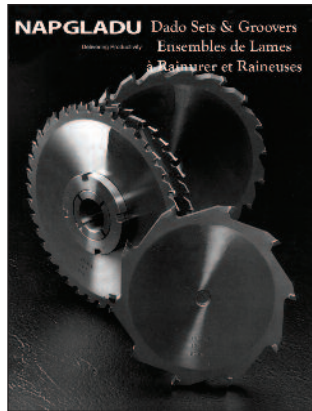
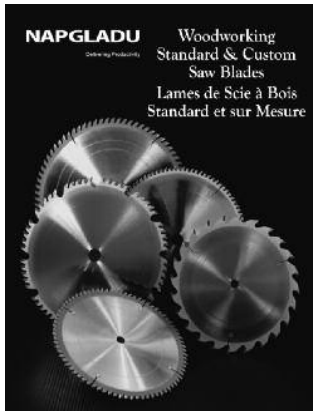
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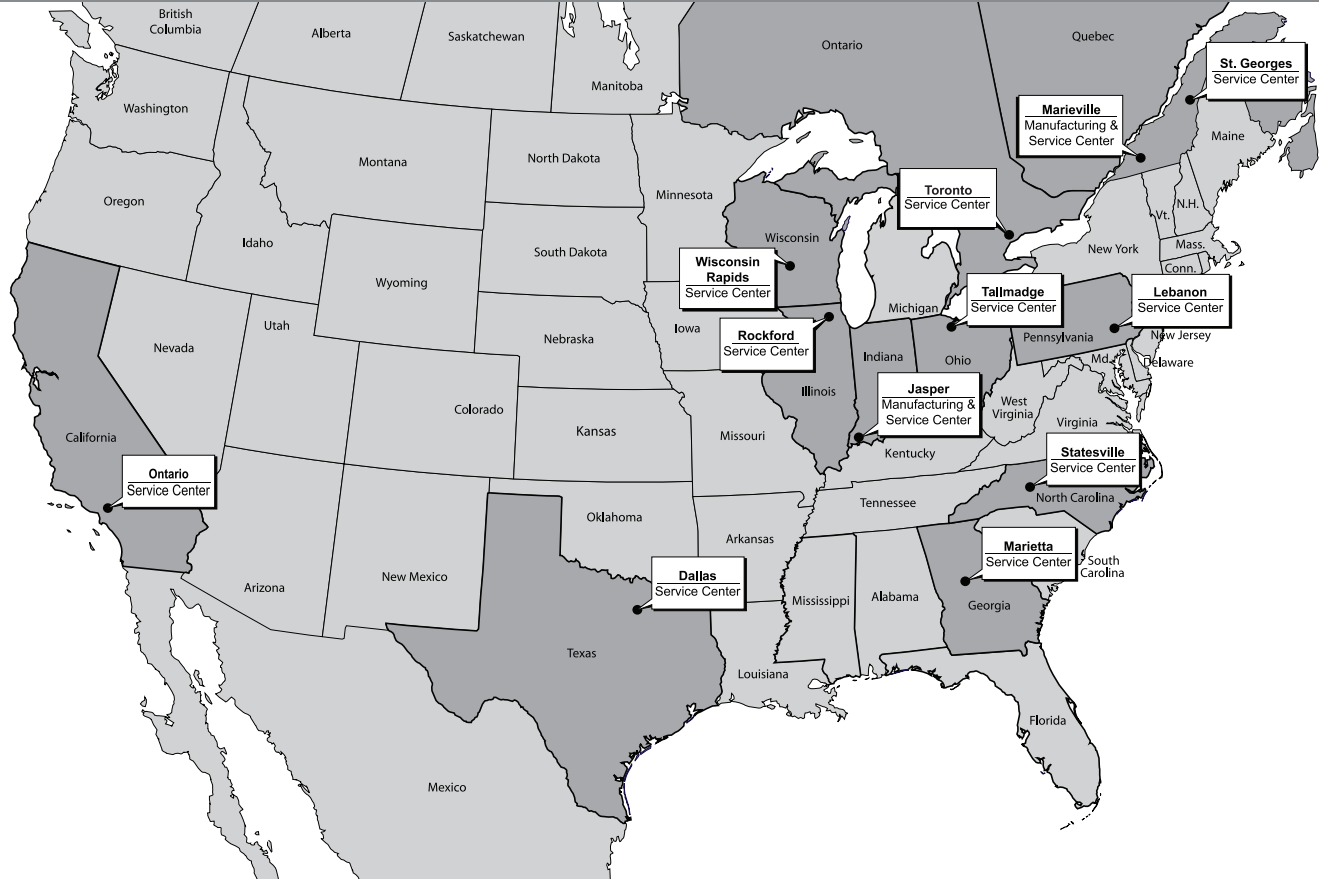
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Attn: Customer Service Department
Phone (800) 634-TOOL (8665)

Type of Tool		
Bur Bits Page No. _____ Tool No. _____ Shape _____ Cut Type _____	Dimensions: Cut Diameter Cutting Edge Length Shank Diameter Overall Length	Diagram # _____ D ₁ _____ L ₁ _____ D ₂ _____ L ₂ _____
Additional Information: 		#1 Bur Bit Diagram  <p>The diagram shows a #1 bur bit with a diamond-shaped cutting tip. Dimension D₁ is the diameter of the tip, L₁ is the length of the tip, D₂ is the diameter of the shank, and L₂ is the length of the shank.</p>



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