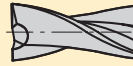


End Mill Technical Information

END STYLES

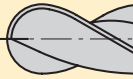
Square End

Most common end style. End-cutting teeth designed to drill and plunge cut to start slots.



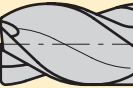
Ball Nose

Used to create compound curved shapes such as forming molds.



Corner Radius

Ideal for mold applications. Tops of flutes are rounded to reduce chipping.



END MILL TYPES

Regular Length

Most commonly used for a variety of milling applications.

Stub Length

Provides maximum rigidity and reduces deflection.

Extended and Extra-Long Cut

Longest overall length for milling deep and hard-to-reach areas.

Long Neck

Neck is relieved and extended to provide additional clearance for cutting.

Rib Processing

Used for deep rib grooving.

Roughing/Finishing

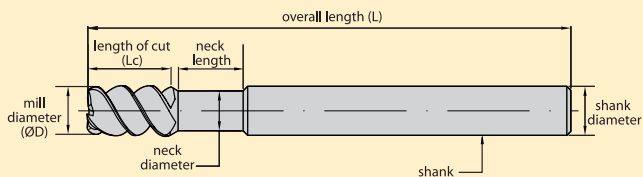
Provides increased metal removal rates while leaving a fine finish.

Roughing, Coarse Pitch

Designed for slotting and profiling in most materials. Provides increased metal removal rates.

Roughing, Fine Pitch

Designed to evenly distribute cutting forces and reduce radial cutting pressure. Allows for increased metal removal rates and better finish.



MATERIALS AND SURFACE TREATMENTS

High Speed Steel (HSS)

Used for a variety of applications on ferrous and nonferrous materials. Adds abrasion and heat resistance for longer end mill life.

Cobalt

Provides higher abrasion and heat resistance for used on harder materials such as stainless steel and armor.

Carbide

Designed for high volume cutting of difficult-to-machine materials such as cast iron, nonferrous metals and abrasive materials.

Bright Finish

Surface is untreated, but flutes are polished for increased chip removal.

TiN Coated

Titanium nitride coating lengthens tool life and allows higher speeds with added lubricity. For ferrous and nonmetallic materials.

TiCN Coated

Titanium carbonitride coating has a higher hardness value than TiN providing excellent heat resistance for more abrasive materials. Lower oxidation temperature limits use to workpiece materials where moderate temperatures are generated at the cutting edge.

TiAlN Coated

Titanium aluminum nitride coating is most effective where accelerated feeds and speeds are required. For use on ferrous materials, high temperature alloys, titanium, and stainless steels.

Modified TiAlN

Designed for increased resistance to heat and oxidation wear when compared to standard TiAlN coating.

EXO[®] — For machining steels and alloys up to 55 HRC.

WXL[®] — For machining steels and alloys up to 50 HRC and nonferrous materials.

WXS[®] — Multilayer coating for machining materials up to 65 Rc.

CVD Diamond Coated

Carbide substrate with diamond coating. Ideal for die, mold, and aerospace applications. For nonferrous materials such as aluminum, copper, and graphite.

CUTTING TYPES

Center-Cutting

Ideal for ramping, plunging, and machining bottom surfaces.

Noncenter-Cutting

Ideal for side cutting. End cutting edges do not go to the center of the end mill.

NUMBER OF FLUTES

2-Flute

Tools have more chip capacity and are designed for deep slotting and pocketing.

3-Flute

Tools have more chip capacity and are designed for deep slotting and pocketing. Larger cross-section provides more rigidity.

4-Flute and Multiflute

Tools last longer and are designed for medium slotting and pocketing, producing a finer finish.

