

# Cutting Tools

## Cutting Tool Material

Cutting tools are mainly made from Tungsten Carbide or High Speed Steel.

Tungsten Carbide is known as Carbide

High Speed Steel is known as HSS

Carbide is more expensive but cuts at almost double the speed of HSS. It is fragile. Carbide tools often have throw away inserts to save on the amount of carbide used.

HSS is much cheaper and comes in many types. Some HSS tools are coated to give better wear and heat resistance. Most DIY drills are HSS.

## Drills



Drills can be made from HSS or solid carbide. Some have holes through the centre to feed coolant to the cutting edge and to evacuate the chips. Modern drills can hold tight tolerances.



U Drills are drills with carbide tips and can cut large holes very fast. They require a lot of power and do not produce accurate holes.

### **Spot Drills**



Used mainly to start a drill so it does not wander from position. They can also remove sharp edges from the top of drilled holes. From 2mm to 20mm

It is best for the spot drill to be the same point angle as the drill.

## Centre Drills

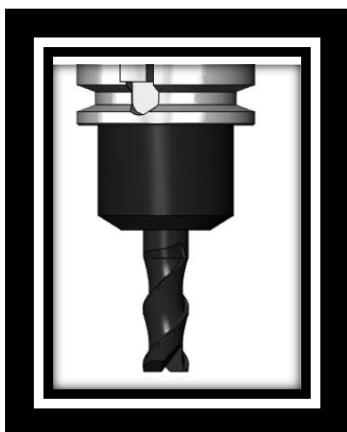


These produce holes specifically for long parts that need the support of a centre. They are also used on the ends of shafts that require grinding between centres.

They have a pilot to give clearance to the centre. Not recommended for general drilling.

From 2mm to 20mm

## Endmills



Modern endmills cut on the side and ends and can cut downwards like a drill. They can be solid carbide or HSS.

Always be sure to use the correct flute length. Do not have too much overhang as this will cause poor finish and chatter.

Can machine pockets, slots and outside shapes of parts.

From very small to around 25mm then tipped endmills tend to be used.

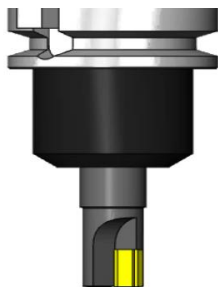
## **Facemills**



Used to machine the top face of a part to give a smooth flat finish.

Range from 50mm to 200mm. Large ones require a lot of power. These have throw away carbide inserts

## **Throw-Away Tipped Endmills**



Cut on the bottom and sides. Cannot machine downwards like a drill.  
Can cut slots pockets and sides of parts. From 6mm to 50mm

## Reamers



Used when a good finish and tight tolerance hole is required. A small amount of metal is left in the hole by a drill to be finished by the reamer.

These can be HSS or carbide, more expensive ones have burnishing pads and adjustable inserts.

Can hold size to within .01mm or better.

## Taps



CNC Machines use machine taps to quickly cut screw threads.

Hand taps come in sets of three and require a tap wrench to use them.



## **Turning Tools**



Most modern turning tools use throw away inserts