

**PRESTO INTERNATIONAL UK LTD**

# **TRAINING MANUAL**

## **Part 3**

### **REAMERS**

# REAMERS

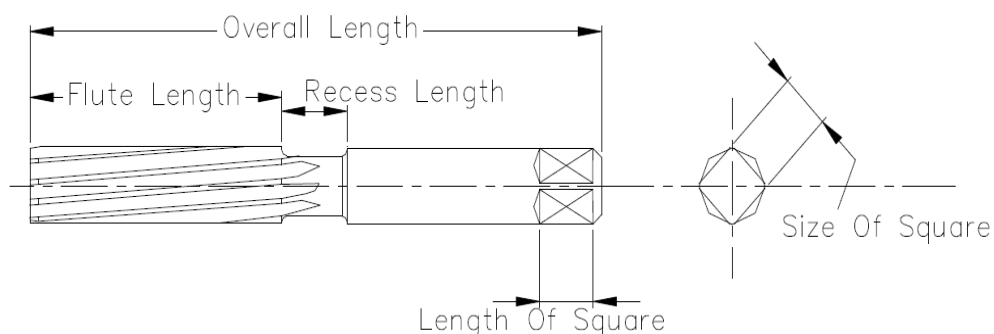
## Purpose of Reamers

A reamer produces an accurate and highly finished round hole to a much finer tolerance than that produced by a drill. Precision parts such as ball bearings and bushes are then fitted in to the reamed hole.

## How they are used

A reamer is fed in to a pre-drilled hole whilst being rotated at a much slower speed than that of a drill. The reamer is rotated in the same direction of the drill, but the spiral flutes rotate the opposite way in order to push the swarf in front of the point. This ensures that a highly accurate bore is not scarred or damaged.

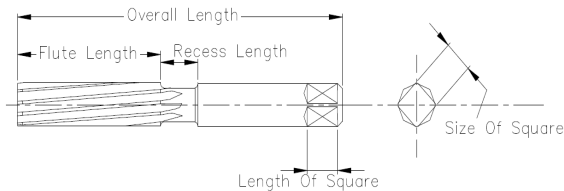
The amount of metal removed is relatively small



Most of the features of a reamer are similar to those of a drill. In addition a reamer has a cutting lead, which is tapered at the point. This varies according to hand or machine use.

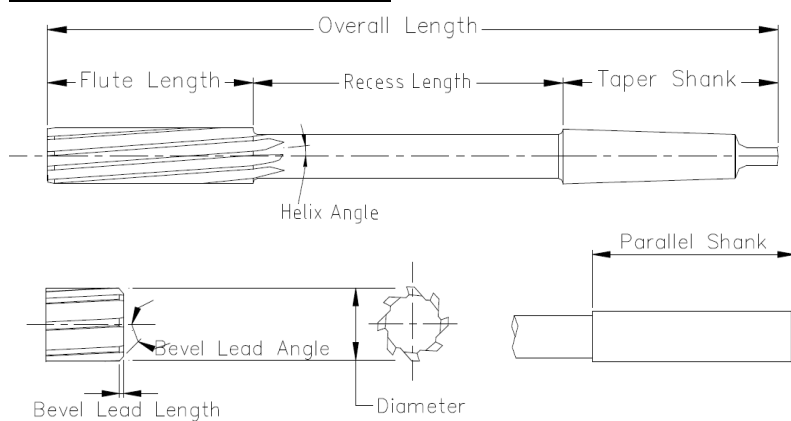
# REAMERS

## Hand Reamer



**Hand reamers always have a square end on the shank for fitting in to a Tap Wrench.**

## Machine Reamer



**Machine reamers have either a Morse Taper shank or a Straight shank but never a squared end.**

**Machine reamers are used in the same way as a drill but at much slower speeds.**

## Reamer Materials

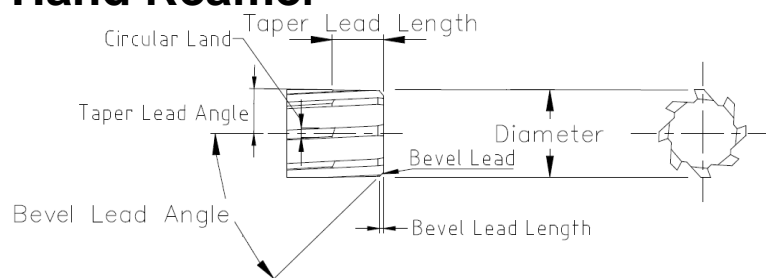
**Reamers are normally manufactured from High Speed Steel (HSS). Reamers made from Solid Carbide are also available.**

# REAMERS

## Cutting Action of Reamers

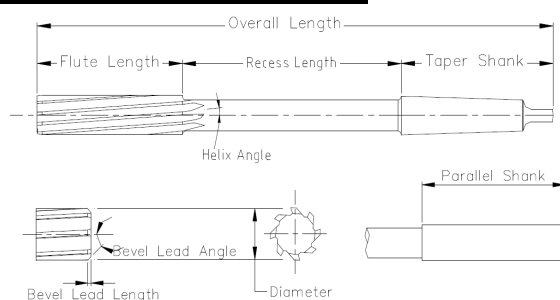
The most important element of a reamer is the Taper Lead. The angle of the Taper Lead varies according to whether it is a Hand or Machine reamer.

### Hand Reamer



The taper lead on a hand reamer is ground at an angle of  $2^\circ$  and extends for approx 12mm from the point.

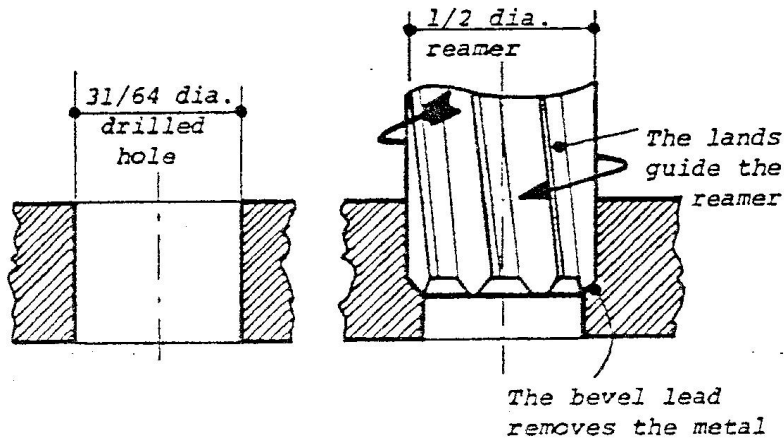
### Machine Reamer



The point on a machine reamer is ground at  $45^\circ$  without a taper lead. This is often referred to as the Bevel Lead. A taper lead is not required in a machine reamer as it is held more securely.

# REAMERS

## Cutting Action



This drawing illustrates the cutting action of a reamer. Note that it is only the leading part of the reamer which makes the cut, the land serving only to guide and centre the reamer. This drawing shows a machine reamer – if this was a hand reamer, the cutting portion would extend further from the point to the end of the  $2^\circ$  taper.

## Removal of Material

Since a reamer is essentially a finishing tool, it is only required to remove a small amount of metal from the pre-drilled hole.

The amount removed varies from approx.  $1/100^{\text{th}}$  in smaller diameters up to approx.  $1/32^{\text{nd}}$  of an inch on larger diameters.

Generally we calculate that a reamer would remove approx. 3% of the hole diameter.

# REAMERS

## Other Types of Reamers

### Hand Taper Pin Reamer



**Straight shank with square end. Flutes are either straight (as above) or spiral. Taper pins are used for fixing small parts together.**

### Socket Finishing Reamer



**Used for finishing the bores of taper sockets and drill sleeves. Supplied with Morse Taper dimensions.**

### Spiral Flute Reamer



**Supplied in hand or machine form with 4 or 6 flutes**

# REAMERS

## Bridge Reamer



**Bridge reamers used for aligning and opening out holes in structural steel work**

## Expanding Reamer



**The cutting diameter of an expanding reamer can be adjusted over a range of approx 1/16" (1.6mm) making it ideal for jobbing work. The six cutting blades are moved along the body between two adjustable screwed collars. The required diameter is set by measuring across two opposite blades, with a micrometer. Replacement blades are available. The principle of an adjustable reamer is based on the action of two tapered faces sliding along each other.**

# REAMERS



**The reamer body has tapered seats as shown above with a corresponding taper machined on the base of each cutting blade.**

**As the blade slides along the tapered seat, the outer cutting edges increase or decrease according to the directions of the movement.**