



Overview

Reamers are cutting tools used to enlarge and finish a hole previously created by an earlier process. A **chucking reamer** modifies a hole previously formed by using a drill press, lathe or milling machine. **Aligning reamers, bridge reamers, car reamers** and some **tapered reamers** are generally designed for hand-held applications where extreme precision is not required.

In precision work, drilling and reaming a hole to size is the most economical way to ensure accuracy and fit for universal interchangeability. Reamers are often used to prepare holes for dowel pins, locating pins, shoulder bolts, shafts and bearings.

Reamer Selection

There are many factors that influence the selection of a specific reamer for a task or material. For example, if the material is free-cutting, reamers of a lighter construction can be used.

But if the material is hard or tough, adequate provisions and designs must be used to meet these conditions. A few of the variables that affect a reamer's cutting action include:

- Amount of stock to be removed
- Speed
- Feed rates

Stock Removal

For machine reaming, the drill size generally used to prepare the hole is one fractional drill size smaller than the reamer. For example, to prepare a hole for a 1/2" reamer, drill a 31/64" hole. For hand reaming, stock allowances can be as low as 0.001" to 0.003" because of the difficulty of forcing the reamer through the stock.

Speed

The best speed to run a reamer is approximately 2/3 the speed used for drilling the same material, but not so high that chatter results.

Feed Rate

Reaming feeds are usually much higher than drilling feeds. Use the highest feed rate possible while maintaining the required hole finish and accuracy. A recommended starting point is 0.0015" to 0.004" of feed per revolution.



Chucking Reamers

Chucking reamers are used to make the final cut. Unlike a standard twist drill bit, a reamer forms a hole that is exactly round with a diameter accurate to 0.001". Chucking reamers are clamped in the tailstock chuck or a drill press chuck and advanced into the work as in a drilling operation.



High Speed Steel (HSS) Chucking Reamers combine good tool life and productivity with minimal cost. They work well in free-cutting and carbon steels, and soft, non-ferrous materials.

Cobalt Chucking Reamers offer better wear resistance, higher hardness and toughness than HSS. They produce very little chipping under severe cutting conditions, allowing the tool to run 10% faster than HSS. With the right point angle and helix, cobalt is the most cost-effective for machining cast iron, heat-treated steels and titanium alloys.

Taper Shank Chucking Reamers are used in applications similar to standard chucking reamers. They are manufactured with a Morse Taper shank.

Solid Carbide Chucking Reamers are used for high-performance applications. Carbide runs faster and withstands higher temperatures while providing good wear resistance. Carbide is brittle and tends to chip when conditions are not ideal. Heavy feed rates are more suitable for HSS and cobalt tools. These reamers are used in abrasive and tough-to-machine materials such as cast iron, non-ferrous alloys, glass, plastics and composites.

Drill Length Chucking Reamers are shorter than standard length reamers and provide extra rigidity and strength in tough materials.

Carbide-Tipped Chucking Reamers are used for hole reaming in cast iron, heat-treated steels and other hard metals.



Expansion Chucking Reamers have longitudinal cuts between some of the flutes and are hollowed out and threaded to receive a tapered screw plug. The diameter of the reamer is increased by screwing in the tapered plug. The expansion feature permits the reamer to be resharpened many times to the original diameter, saving the cost of replacement. Maximum recommended expansion is around 0.010".



Jobber Reamers are designed for machine use where long flutes are required.



Silver & Deming Reamers are ideal for Bridgeport and hand-held applications.



Finishing Reamers are used for accurate reaming of Morse Taper holes and for removing nicks or burrs in machine spindles.



Hand Reamers are used for the final hole sizing. They have a square at the end of the shank, similar to a hand tap. They are generally driven by a tap wrench or adjustable hand wrench depending upon whether the work of the reamer is rotating and can also be driven by many tap/reamer chucks and heads which use the square end for positive drive. Constructed with a tapered leading edge on the cutting head to help the user push the tool into the workpiece.



Expansion Hand Reamers are designed to ream odd-size holes and are easily adjustable to enlarge holes by a few thousandths. They are used in maintenance garages and shops where occasional hole enlarging is needed.

Tapered Reamers

Tapered reamers are used on previously formed holes in steel plate that are undersized and rough, and where it is necessary to ream holes in assemblies to obtain proper alignment and size for accepting rivets, bits, etc.



Bridge Reamers are used extensively in ship and bridge building and boiler manufacturing where steel plates and shapes have punched or drilled holes that are undersized and rough.



Car Reamers are designed for reaming structural steel plate commonly found in railroad car, truck frame, bridge building repair and pressure vessel manufacturing. Short flute and overall length permit use in cramped quarters or where a bridge reamer would be too long.



1/2" Shank Aligning Reamers are used when two holes must be reamed in line with each other with the use of a pilot. The sleeve is seated in one hole and guides the reamer as it reams the other hole.



Hex Shank Aligning Reamers are used for portable pneumatic tools where the shorter length permits use in limited-access areas.



Taper Pin Reamers are used for machining reaming of holes for taper pins. They have a taper of 1/4" per foot (standard taper pin sizes #7/0 to #10). They are designed to ream holes into which standard taper pins will fit. Helical Taper Pin Reamers have high-spiral construction so chips do not pack in the flutes.

Other Reamers



Stub Screw Machine Reamers have a shorter overall length. They are designed for use in screw machine work where short travel and rigid set-ups are necessary.



Shell Reamers are similar to the cutting portion of a chucking reamer. They are supplied without a shank and have a hole through the center. Shell reamers are fluted almost their entire length and have a tapered hole which fits on a tapered arbor. The slots in the reamer engage lugs on the arbor providing ample strength of drive. They are used to prepare a hole for tapping with a taper pipe tap. There are a variety of different types of taper pipe taps including; NPTF, Dryseal, and ANPT.



Pipe Reamers are used for reaming holes to be tapped with taper pipe taps.