# Collet Chuck Usage

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www.penturners.org

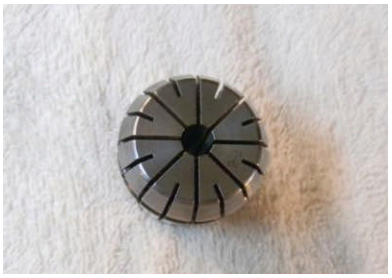
There have been several questions asked on the forums about collets and collet chucks. This introduction will help to describe types of Collet chucks and usage.

There are several "families" of ER collets, ER-8, ER-16, ER-25, ER-32, ER-40, and ER-50 are most common. The number is related to the maximum size collet for that family. Collets are not interchangeable between families. A collet intended for ER-32 chuck will not fit an ER-16 chuck. There are other sizes not as common as these. DA, TG and other collet types also exist. For pen making purposes, the ER-32 size is preferred.

There are three main kinds of Collet chucks. Shown below on the left, the first one threads onto the headstock threads. The second one in the center is inserted into the taper of the headstock. It only allows stock to be inserted into the collet to a depth of about 2.5", but some are hollow and a pen mandrel can fit into the center. You should always use the tail stock or a drawbar to keep the taper from coming loose. The last one on the right consists of a backplate that threads onto the headstock and a separate Collet Chuck that bolts to the backplate. This one is most often used on metal lathes and is most common in the UK. The left and right collet chucks allow stock to pass thru the center of the collet and chuck.



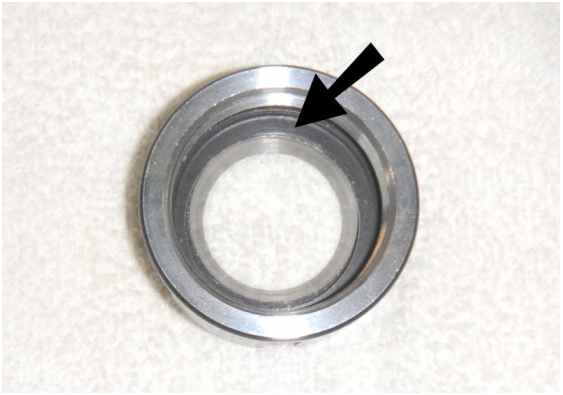
The photos below show the collet nut and an ER-32 collet. Notice the groove in the collet? It will allow you to remove the collet from the chuck. More on that later.

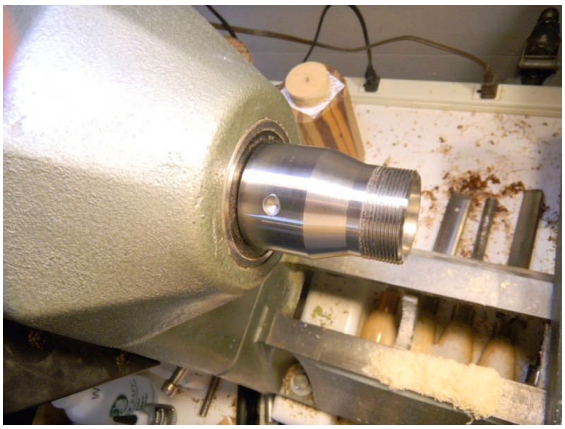

Collets come in both Imperial/fractional and metric sizes. They have a clamping range of minus 1/16" (~1mm) ie, a 1/2" collet will hold a workpiece from 7/16" to 1/2". ER-32 collets range from 1/8" to 3/4", (3mm-20mm) although some places will have sizes up to 13/16". An 18 piece metric set will cover the entire range of sizes. Fractional collet sets with fewer collets will have gaps in the coverage usually above 1/2" where you will not be able to clamp a workpiece.

This is a detail of the collet nut. Notice there are at least two different kinds of collet nuts. The nut on the right uses a hook wrench, the other uses a tommy bar or pin wrench. On the right is shown a hook wrench and and adjustable pin wrench. You may also find nuts with a hex end like a standard nut. For those who need such details the nut on the left is called a castellated nut. Collet nuts have a standard thread and dimensions, so any collet nut will fit any collet chuck of the same family size.

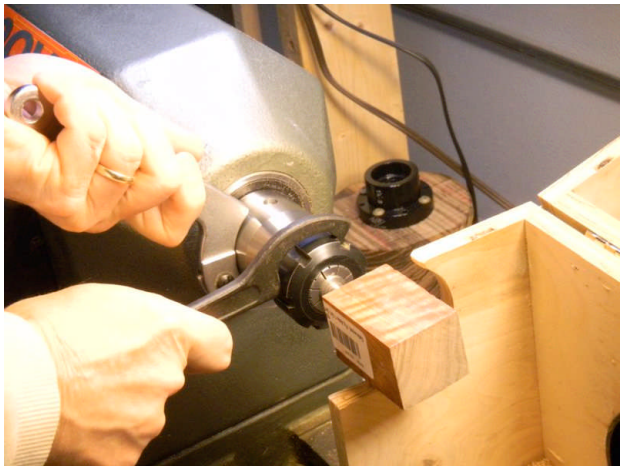
To use the collet, you MUST first insert it into the nut. Inside the nut is a ring shown by the arrow. The groove in the collet snaps onto the ring in the nut. It should hold the collet rather loosely, but the collet may come loose. The order of assembly is, collet goes into nut, nut and collet goes onto chuck, workpiece goes into collet.



Now insert the collet and nut into the chuck.



To tighten the nut on the chuck, use the wrenches to turn the nut and chuck in opposite directions. On the left I am tightening the collet, on the right I am loosening the collet. To release the workpiece from the collet, turn the collet several turns in the loose direction and it will "pop" loose. Remember the groove in the collet and the ring in the hut? This is why they are there. Here I have a closed end mandrel for a bottle stopper on the lathe.



http://www.discount-tools.com/ER32-collets.cfm sells individual collets and larger than 3/4" collets. Ebay has metric collet sets that may be cheaper and are usable for pen making, but may not be accurate enough for metalworking.

Corrections – 1/20/2012 fixed a collet size typo on page 3.

Any critiques or constructive suggestions are welcome.