

## Making Threaded Wood Chucks

Materials you will need:

6/4 or 8/4 slab of maple or other hard close-grained wood

3/4 or 1-inch thick cross-grain slab

1 inch 8 tap or 1-1/4 inch 8 tap (Beal, Enco, MSC, etc)

Four-jaw chuck with #2 jaws

Jacobs Chuck

7/8 inch or 1-1/4 inch Forstner or spade bit

Lathe with a spindle lock

Starting with a 6/4 or 8/4 slab of maple or other hard close-grained wood, cut a 2-3/4 inch to 3-inch diameter cross-grain disc. Mount between centers and turn a small tenon on one side. The tenon should be a large enough diameter that when mounted in the four-jaw chuck, there is a clear space between the inside faces at the base of the jaws of at least 1-1/4 inches. This space allows for the drill bit and tap to protrude thru the bottom of the wood safely. Secure the blank in the jaws and level the face. Mark the center with the point of a skew. Using a Jacobs chuck in the tailstock, drill a 7/8-inch hole (1-1/8 inch for a 1-1/4 X 8 chuck) thru the blank. The drill should go all the way thru the blank. You can see the drill come thru if you watch the bottom of the tenon thru the jaws as it spins.

Cut a 1-inch plus diameter by 3/16-inch deep rabbet at the end of the hole on the face (1-1/4 inch plus for a 1-1/4 X 8 chuck). This rabbet is for the unthreaded portion of the spindle on the headstock. Ease the edges on the face and at the inside edge of the drilled hole.

Lock the tailstock. Wax the tap with beeswax or another lubricating medium. Insert the tap into the hole and bring the tailstock up to support and align the end of the tap. Advance the tailstock to slightly push the tap into the hole. Rotate the tap with an open end wrench on the square end near the tailstock. As you rotate the tap, advance the tailstock to keep a slight pressure on the tap. Run the tap all the way thru the blank. Back off the tap with the wrench, retracting the tailstock as you go.

Remove the blank from the four-jaw chuck and remove the four-jaw chuck from the headstock. Thread the blank, face first, onto the spindle. It should fully seat with the face against the base of the spindle. With a 6- or 8-quarter thick blank, the headstock spindle should not protrude through the blank. Face off the blank to be completely flat, and true the sides into a cylinder of whatever size you require. To make removal easier, texture the sides of the blank with grooves using a Sorby texturing tool or other device.

Using Tightbond or other PVA glue, secure a 3/4-inch thick disc of cross-grain, close-grained wood to the face (PVA glue will not fail with a slight catch later). This disc can be whatever size you like, but should be at least the same diameter as the threaded blank. This is the wood to which you will be gluing your work later. Each time you use the chuck you will reface this sacrificial piece until you have used it up and must glue on another. Once the glue has cured, true the face and sides, putting a slight 45-degree bevel on the new face. With a Jacobs chuck, drill a

hole in the center of the face which is slightly larger than a coat-hanger wire. Do not use any finish on the chuck.

To use the chuck, sand or turn a flat face on the work piece to sit against the chuck. Mark the center of the bottom of the work. Put a circular bead of thick CA glue on the chuck face and spray the work with accelerator. Using a straight piece of coat-hanger through the center hole in the chuck and touching the center point you marked on the work, slide the chuck down the coat-hanger onto the work and hold tightly for at least a minute. The coat-hanger will automatically center the chuck. Test the bond before any cutting.

To remove the work piece, insert a chisel into the CA glue joint and lightly tap to separate. The CA has a weak bond in this direction and should separate easily. An alternate strategy is to glue the work to the chuck with PVA glue and brown paper or newsprint. Using this method you would have to let the glue set up overnight.

Using these wood chucks allows you to remove the work from the lathe for drying or other finishing work with the ability to remount the work at the same center on the original or another lathe. The sacrificial face can also be configured as a jam chuck or used to hold an off-center piece. The chucks are easy enough to make that you can always have a few on hand. A chuck like this can also be made to fit the threaded end of a live center (tap is  $\frac{3}{4}$  inch by 10) to use when finishing spheres or as non-marking soft center. There are some disadvantages; these are wood and subject to wear. They might get a bit loose after a few hard uses. While CA and PVA are reliable glues, you should be aware of their limitations.

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#### Attached Photos

- Threading the Chuck
- Detail of Recess
- Centering Chuck on the Workpiece
- Completed Chuck in Use

