

Acorn Box

by Walt Wager

I make many kinds of boxes, and I can assign them into one of two categories: loose-fit lids and tight-fit lids. Loose-fit lids are for dresser top boxes that hold loose change or jewelry where you only need one hand to lift the lid from the box. Tight-fit lids screw onto the box or fit snugly enough that both hands are needed to remove the lid. This acorn box is the tight-fit variety.

Choose a blank

The box described here starts with a 3"-square × 6" (8cm × 15cm) blank secured between centers (**Photo 1**). These boxes can be any size, and small ones make great holiday ornaments. In general, you are going to want a blank about twice as long as it is square, with the grain running parallel to the lathe bed.

Turn a cylinder

Rough the blank to round using a spindle roughing gouge. With a parting tool, cut a tenon to fit your chuck jaws on both ends of the blank. This step is facilitated by a homemade tenon gauge (**Photo 2**).



Shape the blank



1, 2. Round your blank between centers and form a tenon on one end. A shopmade gauge guarantees the tenon will fit the chuck jaws.



Part the blank

Part the blank into two pieces, about one third of the way in from the tailstock end (**Photo 3**). The longer piece will become the acorn nut (the box) and the shorter piece will become the acorn cap (the lid). In this case the shorter blank is parted 2" (5cm) from the end. Set the shorter piece aside for now.

Set the body diameter

Mount the longer piece in a scroll chuck. Use a bedan or parting tool to reduce the diameter at the tailstock end (**Photo 4**). Note that you're creating two diameters. The smallest diameter at the top of the blank will be the tenon, or lip that receives the cap. The slightly larger diameter will be the widest point of the acorn. The cap extends over the body, so for good proportions the body diameter should be only slightly larger than the diameter of the tenon; in this example, 2-1/4" (57mm) for the tenon, and 2-1/2" (64mm) for the body. Reduce the rest of the cylinder to approximately the same diameter you just established for the body (**Photo 5**).

Shape the acorn

Start shaping the acorn with a spindle gouge, leaving at least 1-1/2" (4cm) of material at the bottom to support the acorn as you hollow it (**Photo 6**).

Separate box from cap

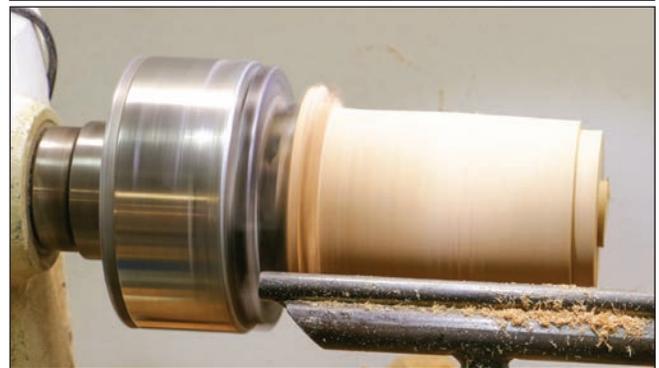
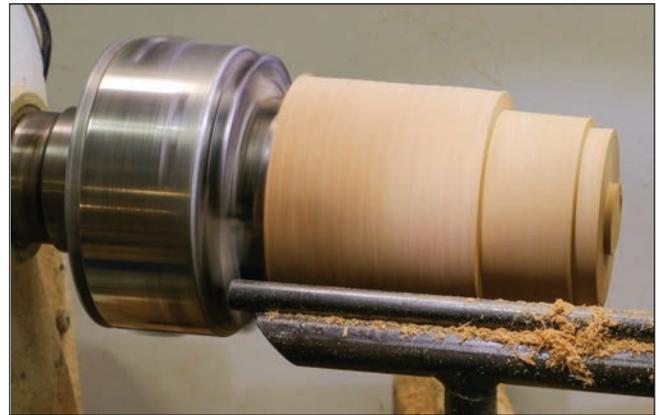
3. Use a parting tool to separate the top from the base, parting-off about 1/3 of the length to create the acorn cap.



Hollow the interior

Using a 1/2" (13mm) or 3/4" (19mm) Forstner-style bit, drill a hole to establish the internal depth of the box. Drilling the hole makes hollowing the endgrain much easier. Determine the depth of the hole by laying the bit along

Establish box diameter



4, 5. Use a parting tool to cut a tenon at the box top and establish the slightly-larger box diameter.

Shape the acorn



6. With a spindle gouge, begin to shape the box into an acorn form.





side the shaped acorn (**Photo 7**). Here the hole is 1-3/4" (45mm) deep. Mark a reference line on the outside of the form to indicate the interior depth.

Secure the bit in a tailstock-mounted drill chuck. Slow the lathe speed to about 300 rpm and hold onto the chuck as you advance the drill into the endgrain. Still holding onto the chuck, back the bit out after about each inch of progress to clear the flutes of wood chips (**Photo 8**).

Angle the flute of a spindle gouge (I use a 1/2" spindle gouge) so that the flute points to about 10 o'clock. Working from the bottom, pull the gouge along the cut towards the outer rim (**Photo 9**). Take shallow cuts. The lathe speed is approximately 1200 rpm.

Continue the cuts from the center to the left edge of the box. The final thickness of the box at the tenon is about 1/16" (**Photo 10**). The body thickness is about 1/8".

It helps to mark the outside of the acorn with a line that represents the inside bottom of the box as a guide to reduce the likelihood of cutting through the bottom.

Finish shaping the exterior

Use a spindle gouge to cut away some of the waste on the bottom so you can continue to shape the acorn (**Photo 11**).

Use your fingers or a caliper to judge the thickness of the box, and the shape at the bottom (**Photo 12**).

Before further reducing the bottom, I use a negative rake scraper to smooth the inside of the box (**Photo 13**).

9, 10. Use a spindle gouge to hollow the interior, cutting from the center towards the left edge. Aim for a body thickness of about 1/8".

Hole for hollowing



7, 8. Hold a drill bit against the box side to determine how deep to drill and make a reference mark (not shown). Use a drill chuck to establish the hole, frequently backing out to clear chips.

Hollow the interior





Finish shaping the exterior



11, 12, 13. Shape the box exterior, aiming for a classic acorn form. Check the wall thickness periodically, using your fingers as calipers (lathe off!). Refine the interior with a negative rake scraper.

Sand the interior

Resist the temptation to sand the interior of small boxes with abrasives wrapped or pressed against your fingers—this creates a scenario for injury. Instead, a shopmade sanding stick will do the job and not risk your digits (**Photos 14, 15**). Make a sanding stick by gluing a strip

Sand the interior



14, 15. Use a sanding tool to finish the interior. Sticking your fingers in a rotating box this small with a piece of abrasive is inviting injury.

of foam and then a strip of abrasive to a short length of wood. Slow the lathe to avoid overheating and possibly cracking the wood.

Complete the exterior

Sand the exterior of your acorn, focusing your efforts on the area from your bottom reference mark to the top. If you sand away your reference mark, add a new one after you are finished sanding.

Return to the 1/2" spindle gouge and shape the bottom of the acorn, from your bottom reference mark down to the tip (**Photos 16, 17**). Aim to shape the bottom tip of the acorn down to 1/2" diameter. Sand the bottom of the box, removing any tool marks and blending the upper and lower areas.





Shape the lower box



16, 17. Shape the bottom of the box with a spindle gouge, leaving about a 1/2" connecting the waste material. Sand and blend the lower surfaces.

Part-off

Rather than risking the piece ending up on the floor, I cut off the box with a sharp Japanese-style saw and the lathe off (**Photo 18**).

Shape the tip

Reverse the box, gently clamping the tenon in the scroll chuck, and finish the bottom in a gentle ogee curve to a point (**Photos 19, 20**).

Hollow the cap

Measure the outside diameter of the box tenon, or lip, using a caliper (**Photo 21**).

Secure the blank that will become the box cap in the scroll chuck and use a pencil to transfer the tenon diameter to the end of the blank. This marks the inside diameter of the cap. Use a spindle gouge to start hollowing the cap as you did with the acorn (**Photo 22**). Hollow to the inside diameter mark, creating a recess about 1/8" deep.

18, 19, 20. Part-off the box with a fine-toothed saw. Gently clamp the top tenon in the scroll chuck and finish shaping the tip into a point.

Part, then shape the tip





Hollow the top



21, 22. Transfer the outer diameter of the box tenon to the underside of the cap. Hollow to the inside of your mark, creating a 1/8"-deep recess.

Check the fit

With the lathe off, check the fit of the box tenon in the cap. The top for this box is a friction-fit, so take the time to get it just right (**Photo 23**). If the recess is too narrow, cut it wider until the tenon on the acorn just fits. A skew presented flat on its side and cutting with the long point is a great way to sneak up on this fit.

If the fit is loose, make another cut from the center with the spindle gouge, stopping short of the too-wide previous opening. Use this new dimension to sneak up on a better fit. Make the recess about 1/8" deeper than the tenon is long.

Round the outside bottom of the cap to form a half-bead that appears to wrap over the top of the acorn form (**Photo 24**).

Make a second recess about 1/8"-deep in the inside lip of the cap so that the edge of the cap fits over the exterior of the acorn (**Photo 25**).

Shape the cap to overlay the box



23, 24. Check the fit of the box to the lid; the goal is a good friction fit. Shape the outer edge of the cap so that it appears to wrap over the box.

Cut a 2nd recess



25. Cut another recess in the top to allow the tenon to seat deeper in the cap. This will enhance the appearance of the lid wrapping over the acorn box.





This allows the curved exterior of the top of the acorn to fit within the cap, and allows the tenon on the top of the acorn to fully seat against the bottom of the mortise in the cap.

Shape the cap interior

Use a negative rake scraper to create a concave dome and smooth the inside of the cap (**Photo 26**).

Shape cap interior



26. Use a scraper—negative rake if possible—to shape the interior into a satisfying concave curve.

Form the outer cap

Measure and transfer the interior depth to the outside of the blank (**Photo 27**). Using a spindle gouge, begin shaping the top of the cap (**Photo 28**). Use a parting tool to create space to reach the top. You are essentially turning one large bead to form the acorn cap. When you are happy with the shape, sand the outer surface.

Texture the cap

To better evoke the appearance of an acorn, the cap needs some texturing. I find that a knurling tool is perfect for the task (**Photo 29**). In the past I've also used pyrography to add texture and color.

Finish inside the cap

Check the fit of the cap again and make any necessary final adjustments—I rarely need to change anything at this stage, but this is the

Shape the exterior



27, 28, 29, 30. Transfer the interior depth to the outside and shape the outside of the cap. This is essentially a large bead form. A knurling tool is great for adding acorn cap-like texture, but pyrography works too. Sand and finish the interior.

last chance before finishing. Sand the inside of the cap, taking care to avoid sanding the recess where the tenon fits, as you can easily sand the opening out-of-round and spoil the fit (**Photo 30**).

Complete the cap top

Reverse the cap in the scroll chuck by expanding the jaws into the recess. Finish





shaping the top of the cap using the spindle gouge (**Photo 31**).

Complete the texturing and add a finish of your choice. Here the top was painted with a brown acrylic paint (see opening image). After the paint dried, I sprayed the box and cap with acrylic lacquer and then buffed the exterior to a semi-gloss finish.

Walt Wager is a 19-year member of the AAW and North Florida Woodturners. His work can be seen on his web site waltwager.com. He can be reached at waltwager@gmail.com.



An acorn box pair. Smaller boxes of this design make elegant Christmas tree ornaments.

Refine the finial



31. Reverse-chuck the cap with the jaws in expansion mode and refine the top of the acorn before finishing.



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