

# THREADED ACORNS MADE EASY



CERAMIC VESSEL BY JANET LEAZENBY

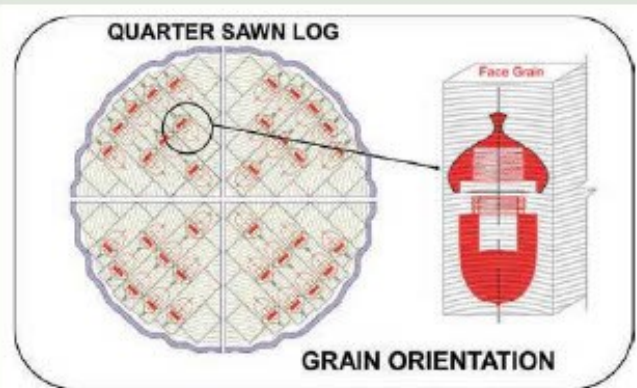
BY KEVIN FELDERHOFF

A wooden acorn is one of my favorite turning projects. My approach uses threaded lids, and the process I use is an easy introduction to threading wood. If completing this project encourages you to explore threading, hand-chasing is the more challenging version of this process, which makes use of an off-the-shelf tap and die. Being able to add a threaded lid will impress your fellow woodturners and friends. As an added benefit, my process creates interchangeable components, allowing you to mix-and-match tops and bottoms.

## Stock selection

Choosing the right piece of wood with respect to grain orientation is the critical element of this project (**Figure 1**). In addition to orientation, tight wood grain will take threads better, giving you crisp, clean threads for a better fit and smoother function. You'll want to tap and cut your threads into facegrain rather than endgrain; the threads will be stronger in that orientation.

## Grain orientation is critical



You'll want to turn these forms in facegrain orientation, which may seem odd as their length and chucking method would make you think "spindle." However, the suggested orientation creates the strongest threads.

# PROJECT: Threaded acorns made easy



I primarily use local woods including maple, walnut, mesquite, and cherry. Choosing different species of wood for the top and bottom creates a more visually dramatic acorn. Also, I have found that kiln-dried wood with zero percent moisture content is necessary for stability. Even with very low moisture content, the threads can bind in the different seasons. We will address this later in the article to ensure your threads will work correctly in all seasons.

You'll need two blanks for each acorn. The piece for the acorn cap (the box top) will be a 2-1/2" (6cm) cube. The blank for the bottom will be 2" (5cm-) square and 3" (8cm-) long.

## Rough the cap

Place the 2-1/2" cube of wood in the chuck in facegrain orientation (i.e., with the facegrain oriented towards the tailstock). Use a 1/2" bowl gouge to turn the blank down to 2-1/4" (6cm) diameter. The chuck jaws will prevent you from rounding the entire length, but that's okay—turn the portion of the blank you can access.

With a 1-3/4" (44mm-) diameter Forstner-style bit mounted in a drill chuck, drill a 1/4" (36mm-) deep recess in the end (**Photo 1**). Switch to a 1-1/8" (29mm) bit to drill a 1" (25mm-) deep hole in the blank (**Photo 2**).

## Tap the cap

I use a Beall 1-1/4" (32mm) x 8 TPI spindle tap to cut the internal threads in the cap (**Photo 3**). Before you start cutting threads, turn a small chamfer with a small skew or scraper on the top of the 1-1/8" hole to allow the tap to get a good start. Apply a little mineral oil to the wood prior to tapping; this will help reduce friction and soften the wood fibers. Bring the tailstock up with light pressure to keep the tap straight. Use a box end or adjustable wrench to turn the tap as you continue to apply even pressure with the tailstock quill. Tap the hole until you reach the bottom, then back the tap out by hand (**Photo 4**).

## Shape the top

After threading the top, I use a small bowl gouge to start shaping the outside of the acorn cap up to the face of the chuck jaws (**Photo 5**). Take care to avoid contacting the jaws or turning into the hollowed interior—you should have plenty of material to work with to avoid those mistakes. The maximum diameter of the top will be about 2-1/4"; this will give it a pleasing shape.

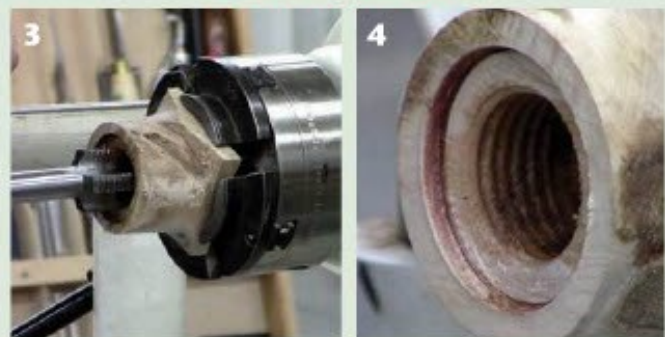
After shaping, sand the acorn cap up to the chuck jaws. Remove the top from the chuck for now—it will be reverse-chucked later to complete the form.

## Prep the cap



Bring the cap blank to round and use a drill chuck to drill stepped holes in the bottom.

## Thread the cap



Tap internal threads using a commercially available tap and pressure from your tailstock.

## Start shaping the cap



Use a spindle gouge to shape as much of the exterior of the cap as you can easily reach.

# PROJECT: Threaded acorns made easy



## Thread the bottom

Mount the 2" x 2" x 3" quarter sawn blank for the bottom in your chuck with the facegrain out and round it to 1-3/4" diameter using a 1/2" bowl gouge. Use a 1-3/8"- (35mm-) diameter hole saw to make a 1/2"- (13mm-) deep, 1.2"-diameter tenon on the end (**Photo 6**) (see sidebar).

Square up the shoulder from the hole saw with a parting tool to a 1/2"- (13mm-) wide and add a chamfer with a skew or scraper to the smaller 1.2" diameter. The chamfer will help the 1-1/4" x 8 TPI thread die to get a good start. Apply a little mineral oil on the wood prior to cutting the threads.

Bring the tailstock up and maintain light pressure on the die to keep it straight while cutting threads. Be cautious with the pressure and if you feel a lot of resistance, back the die out to break the chip and continue tapping until the die bottoms-out on the shoulder. A small shopmade handle makes the die easier to hold and control (**Photo 7**).

Undercut the last thread with a 1/8" (3mm) parting tool and cut the threads to about 3/8" (10mm) in length (**Photo 8**). Test fit the top and bottom and make sure the two shoulders are resting against each other. If there is some resistance and the two shoulders are not resting together, you will need to identify and correct the issue. Typically, either the undercut below the bottom of the threads is not deep enough or the threads on the bottom are too long. Make small adjustments until the two shoulders rest against each other and there is no resistance when screwing on the cap.

## Modified Hole Saw

Your hole saw will need to cut a precise 1.2"- (30mm-) diameter hole. I have found that some hole saws have so much set to their teeth that the kerf removes too much material. Make a test cut or two with your hole saw using scrap material and measure the interior diameter. If the hole saw is removing too much material, use a Dremel-style tool with a small grinding-stone bit to remove some of the set from the interior teeth. Alternate removing a little metal followed by a test cut until you sneak up on the desired diameter.



## Thread the bottom



6 After bringing the bottom to round, use a hole saw to create a spigot on the end. Shape a perpendicular shoulder at the base of the spigot.



7 Cut a slight chamfer on the end of the spigot and use a die to cut threads on the spigot. You'll also need to undercut the last thread with a narrow parting tool.



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### Finish shaping the cap



Thread the cap onto the bottom and finish shaping it. Use the tailstock for support up until the last cuts on the tip. A shopmade cap on the live center prevents marring the top of the acorn.

### Top of the cap

When you have a good fit, leave the top screwed to the bottom and bring the tailstock up for support, then shape the top of the acorn (**Photo 9**). Remove the tailstock back to finish the top part of the acorn, being careful to take light cuts (**Photo 10**). Sand the top.

As an added design element, consider carving, scalloping, or otherwise texturing the top. This will give your box an extra bit of character.

### Complete the bottom

Set the top aside and drill a 7/8" - (22mm-) diameter hole about 1-1/4" (32mm) deep in the bottom. Shape the exterior of the acorn box to the jaws of the chuck and then sand the sides and top of the form (**Photo 11**).

Remove the acorn bottom from the chuck and mount a threaded chuck in its place (see sidebar). Screw the bottom of the acorn onto a shopmade threaded chuck (see sidebar). threaded chuck (**Photo 12**). Bring the tailstock up for support and shape the bottom of the acorn box with a small spindle gouge. Move the tailstock away to finish shaping the bottom, being careful not to remove too much wood at one time. After shaping, sand the bottom.

### Finish the bottom



Remove the cap and shape as much of the exterior of the acorn as you can reach. You will need to reverse chuck it (see sidebar) to finish shaping and sanding the tip.

# PROJECT: Threaded acorns made easy



## Threaded Chuck

You will need to make a threaded chuck using your 1-1/4" x 8 TPI tap. Using standard threads and consistently sized components will make your lids interchangeable, and you will have a universal chuck for future acorn boxes.

Use a blank that is a little wider than your acorn bottom. Bring it to round and round-off the outside corner to remove any sharp edge from the equation and give you better access to your acorn. Drill and tap the end. My chuck is tapped on both ends so that I can thread it directly on the lathe spindle.

## Managing Moisture Content

With seasonal moisture fluctuation, your acorn may shrink or swell, and your threads may not work as smoothly as they once did. This situation can be corrected by placing the acorns in a toaster oven for two hours at 175°F (80°C) after turning is complete. With blanks this small, the temperature will bring your moisture content down to 0%. Remove the acorns from the oven and re-chase the threads. This will remove a small amount of wood and loosen the fit. This step will allow your threads to be loose enough to work smoothly throughout the seasons.



## Finishing

Like many turning projects, finishing options with these small boxes are quite flexible (**Photos 13 - 14**). I like to use mineral oil and wax on the inside of the acorn so the threads are lubricated but not clogged with, for example, varnish. For the outside, wax, oil finish, spray finish or friction polish would be fine. I do like to complete my finishing routine with the Beall Buffing System. ■

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## Completed acorn

13



14



The undercut top neatly disguises the threads in the completed acorn.

## RESOURCES

To see the author's companion instructional video, visit one of the links at right.



[tiny.cc/Acorns1](https://tiny.cc/Acorns1)



[tiny.cc/Acorns2](https://tiny.cc/Acorns2)



# Woodturning FUNdamentals

is an informative digital publication and online learning portal aimed at new turners. Whether you're starting a new hobby or plan to become a pro, the projects, techniques, tips, videos, and resources in *Woodturning FUNdamentals* will help you build essential knowledge and skills. The AAW publishes *Woodturning FUNdamentals* digitally, four times each year and free to members.



KEVIN FELDERHOFF

Taps to create threads in wood are available in numerous sizes and can greatly expand your bag of woodworking tricks. Taps that correspond to the size and pitch of your lathe's drive spindle will allow you to make jigs that will thread right onto your lathe (see Ernie Newman's article, starting on **page 34**). You can use the same tap to thread a small box lid (see Kevin Felderhoff's article, starting on **page 20**).