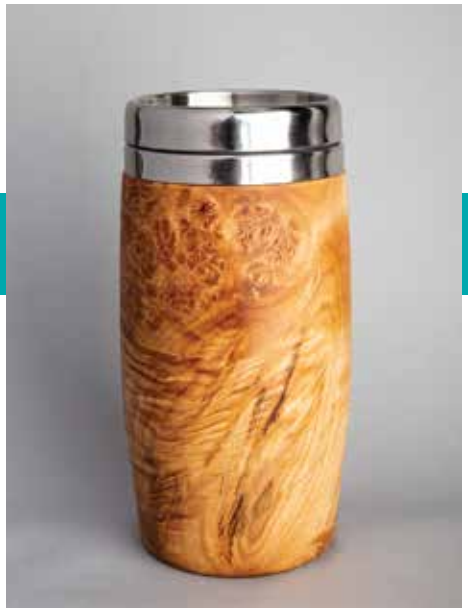

KIT PROJECT

TURN YOUR OWN TRAVEL MUG

Kurt Hertzog

There are many kits available that allow you to turn a variety of kitchen and personal items. A fun and easily made kit available from a number of sources is the stainless steel travel mug. My personal preference is for the Wood River Travel Mug marketed by Woodcraft (*Photo 1*). The kit consists of a 16-ounce stainless steel mug insert with a threaded lid. At the simplest, the task is to encase the insert in a wood vessel to personalize it. Turning a travel mug can be a lot of fun, and there are many ways to customize the project while accomplishing this relatively straightforward task.

Prepare the blank

Woodcraft offers several turning blanks dimensioned and drilled for this kit, though I prefer to select my own—in this case a piece of maple burl. Any of the species of wood suitable for turning will work for this flexible project, but whatever you choose, interesting grain will reward your efforts. The blank should be well seasoned; otherwise, the mug could crack or sit unevenly, or the wood could become separated from the metal insert.

The easiest way to make the wood shell for the mug is to turn an endgrain vessel. Because the completed vessel will have a thin wall, other grain orientations can be problematic. The blank needs to be long enough to accommodate your chucking method and provide sufficient diameter for the rim (*Photo 2*). The manufacturer recommends starting with a blank 4" (10cm) square and 8" (20cm) long. An extra bit of length offers an opportunity to recover from any turning or hollowing errors by re-truing the end and hollowing deeper.

My preferred holding method is to turn a tenon on the bottom end of the blank and mount the tenon in contracting chuck jaws. Mounting the blank on a faceplate is another option, but make sure there is adequate clearance between the end of the screws and the bottom of the mug.

I start by mounting the blank between centers and rounding the stock to a diameter slightly larger than the mug insert. This is a rough-turning step, as there will be a later opportunity to refine the exterior. After rounding, I form a tenon to fit my scroll chuck jaws. A crisp shoulder on the tenon helps secure the blank firmly in the jaws. With the tenon established, I remount the blank in the scroll chuck.

Hollow the mug

There are a variety of techniques to hollow the blank. The recess for the mug insert needs to be about 6" (15cm) deep, and the average gouge or scraper hanging that far over the toolrest is challenging to control. I find that drilling out most of the waste material is the easiest method, followed by contouring the inner profile with a deep-hollowing rig.

I use Forstner bits to drill my blank (*Photo 3*). Because these bits are not designed for endgrain cutting, they struggle with the task and easily overheat. The most effective method I have found is to start with a small Forstner bit as a pilot drill and progressively work up to the desired size. My largest Forstner bit is 2⅜" (6cm), which leaves ample material for me to do a final shaping of the interior. Slow lathe speed and gentle forward pressure with the tailstock quill work best. After a short advance, I retract the bit, clear the shavings, and let the bit cool. Because most Forstner bit sets are not the highest quality, frequent sharpening is essential. I had to sharpen the cutting edge of each bit several times with a diamond hone before I completed the drilling process.

At this point, I have an undersized hole that is deep enough to accommodate the blank and with sufficient material to tuck up under the rolled lip of the mug insert (*Photo 4*).

Refine interior, turn outer profile

The top end of the blank must be trued and perpendicular to the axis of rotation. This step produces a cleanly cut surface that will later be shaped to fit under the lip of the stainless mug.

Rather than making a template or doing a lot of measuring, I use the mug insert as a trial-and-error fitting master.

To do the interior cutting, I use a mini-hollowing rig (*Photo 5*). I progressively open the inner diameter from the lip to the bottom, testing with the mug as I go. The objective is a good slip fit for the insert, so it is worth slowing down at this step and working to get the fit right. Keep in mind, though, that the interior of the wood blank will never be seen again after the insert is glued in place, so a good fit is far more important than an impeccable surface off the tool.

When the insert slides into the blank all the way to the rim, I know I will need about ⅛" (3mm) additional depth (*Photo 6*). This will allow the top of the wood sleeve to fit under the lip of the stainless insert. With the depth achieved, I carefully thin and shape the top of the blank until it slips under the rim (*Photo 7*). A snug fit between the rim insert and the top of the blank will ensure a good glue bond, which in turn will seal the one seam where liquids will try to invade the wood.

At this point, I use the tailstock with a cone attachment to support the blank with the mug insert in place but not glued (*Photo 8*). I take the opportunity to remove some of the excess outer diameter and fine-tune the interface at the stainless insert seating. I also complete as much of the exterior sanding as possible. I have found that turning the exterior down until it is flush with the outer diameter of the stainless insert rim produces a too-thin wall. I aim for an outer diameter that is just wider than the steel rim, with a pleasing transition that is thick enough to retain some strength.

Gather the raw materials

1 A stainless steel insert kit for a travel mug is the basis for this project; this particular example is offered by Woodcraft.

2 The blank must be long enough to accommodate faceplate or chuck mounting, room to part-off, final wall thickness, and a little more than 6" depth for the insert.

Rough-hollow the interior

3 Remove the bulk of the waste material from the interior of the blank with a series of Forstner bits, stopping just short of the diameter of the insert.

4 Measure the depth of the hollowed interior. You may need an extension for your Forstner bits that will allow you to drill just deeper than 6".

Fit the insert

5 The author uses a deep-hollowing rig to open the inner diameter to accept the mug insert. The challenge with this hollowing task is to overcome the need to work far beyond a standard toolrest.

6 Work incrementally from the top-to-bottom of the blank, stopping frequently to test fit the insert.

Glue the insert

With the blank still mounted on the lathe, it is time to glue the stainless insert into the body using the tailstock as a convenient clamp. I use the tapered cone on my tailstock with a few strips of painter's tape to prevent scratching the insert. The insert should be clean to form a good bond with the adhesive. A quick wipe of the outside of the insert with a mild solvent such as denatured alcohol removes dirt and oils.

I use five-minute epoxy to fasten the insert to the body. You get one quick chance at this stage, so make sure you mix more than enough epoxy. Far better to throw some unused epoxy away than to try to hurry and mix more while the first batch is about to cure. To minimize the opportunity for adhesive runout, I spread the epoxy on the inner walls of the turned body at least an inch down from the rim. I am modestly generous with the epoxy, as the excess will be ▸

Install the insert

Turn a lip on the top of the blank to fit under the curled rim of the kit insert.

A large cone center on the tailstock supports the blank during the final shaping of the exterior. Note the painter's tape, which prevents the live center from scratching the mug insert.

Use the tailstock to exert pressure on the insert while the adhesive cures.

pushed down towards the bottom of the vessel when the insert is pressed home.

Once the epoxy is spread, I place the insert into the sleeve until it is fully seated. The thinned top rim of the wood sleeve should be fully under the metal rim of the insert. I perform a slight twisting motion of the mug as I seat the insert and spread the adhesive. The tailstock provides pressure on the insert and keeps it fully seated while the adhesive cures (*Photo 9*).

Final turning and finishing

Once the epoxy has cured, the outside of the mug can be completed. While following the shape of the insert will produce a pleasing tapered form, I take a different approach for two reasons.

An Insulated Mug

This project can be easily adapted to yield an insulated mug. With this variation, a snugly fitted insert is not necessary, and in fact a little space between the insert and wood wall is desirable. Add spray insulating foam to the void between the insert and wood sleeve during the assembly stage. The key is to use low-expansion foam, usually labeled for insulating windows and doors. As with the glue-up described in this article, use the tailstock to clamp the insert in place while the foam cures so that the foam does not push the insert out of the body. No other adhesive would be required.

Another approach to an insulated mug is to start with an already insulated stainless mug, rather than the kit insert used for this project. I found several candidates in the housewares department of my local discount store. These are virtually identical to the kit mug, though slightly larger. A vessel could be turned and one of these mugs glued into place. One advantage of this route is that it dispenses with the need to fit the undercut rim of the kit mug. Depending on where you shop, a high quality stainless steel insulated mug will cost the same or even a bit less than the kit.

I want to keep a relatively large base for stability. I also want to keep as much of the figured wood as possible. I opt for a slight bell shape that I think shows off the figure of the wood and is a pleasing form for a coffee mug. A real crisis would be to turn a mug that does not fit into the cup holder of my car. I check and discover it fits comfortably.

After achieving the desired shape, it is time for any final sanding before applying a finish. A strip of painter's tape around the stainless rim protects it from abrasives. While parting the mug from the lathe, I undercut the base with a spindle gouge to create a slightly concave bottom. I took advantage of the taper cone on the tailstock and taped my mug to it with painter's tape. This allowed me to completely part the mug from the blank without damage. Held by hand, I removed the small nubbin on the bottom with a skew chisel, Raffan style. The bottom is sanded by hand to remove all vestiges of chucking.

I chose walnut oil as a finish—a couple of coats make the grain pop. This type of project lends itself to any type of finish, but the stainless insert should be masked prior to applying a surface-forming finish such as varnish or lacquer.

Final thoughts

The travel mug kit is a fun project that can be completed by any turner willing to take on an endgrain hollowing challenge. Wood choice and vessel shape let the turner customize the mug. The mug body could be further personalized with the choice of a segmented blank, a polymer clay cladding, staved construction, multiple species glue-up, or the use of inlay. Another idea I want to try is a ring-segmented blank. I think building it and turning the inside layer-by-layer is the way to go. There are also opportunities to add post-turning artistic enhancements in the form of painting, pyrography, carving, inlay, or simply a decal.

The mug will need to be hand washed and dried to protect it from damage. Properly cared for, it should last for many years. ■

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