Java With Style

By Malcolm Tibbetts

I'm reminded of a cute story about a little boy being asked by his teacher to name what he thought was the world's greatest invention. The little boy answered, "The Thermos." In surprise the teacher asked, "Why would you pick the Thermos?" The boy replied, "Well it keeps cold things cold and hot things hot and it magically knows which is which."

A wood-turned, insulated travel mug makes an excellent gift or crafts show item. It is also a nice way to enjoy your morning brew. There are unlimited designs to the turned wood wrap, so let your imagination go wild.

As shown in the photo on *page xx*, there are many other construction techniques. Of course the simplest and faster method is to use a solid piece of wood. Stacking segmented rings is a little more time-consuming, but it offers many design options. There are endless variations of laminated staves, too. For small hands, a handle is a nice touch.

The step-by-step instructions are based on the staved-constructed cylinder with laminted wood layers shown *above*. By mounting the cylinder off-center you can create the assortment of surfaces curves. This is what I call lamination trickery.

Have fun with the possibilities.

Get started

For turning tools, you will need a ½" bowl gouge, a ¼" skew, and a small diamond-pointed scraper.

The initial turning on the inside presents some challenge. Until the inside is round, your hollowing tool will bounce and jump as you attempt to remove wood from

only one side. It can be done with a handheld tool, but I used an armrest style Steward-style tool, followed by an Eliminator (a relatively new hollowing tool available through Packard Woodworks). At the lathe, you will need a 4-jaw scroll chuck.

This construction requires 10-¼×2½ ×15" strips of contrasting hardwoods (I chose bird's eye maple and cocobolo) and four 1/16×1½×15" strips of a third hardwood (I chose cherry). Veneer would also work for thin strips.

Before you begin, have your stainless-steel insert in hand to verify all dimensions. The 16-ounce stainless-steel insert shown retails for about $9 from Smooth Turnings (smoothturnings.com).

Prepare the staves

With a drum sander or surface planer, mill the hardwood strips to ¼" thick. It's not critical that each layer be the same thickness. However, each laminated assembly needs to be the same thickness. Use either a drum sander or planner for the final dimensioning. Be sure to avoid snipe, which will affect the gluing surfaces.

Using a water-resistance glue (I brushed on Titebond II), glue and clamp five layers of hardwood in alternating colors. I advocate of putting a clamp wherever there's space.

After a couple of hours, remove the clamps and let the glue cure for 24 hours. If you choose an oily exotic hardwood, be sure to apply the glue soon after milling the hardwood so that wood extractives don't have a chance to seep onto the gluing surfaces.

By using 15"-long strips, you can produce four staves from each lamination. Using a glue scraper and then a jointer, clean up and square each lamination.

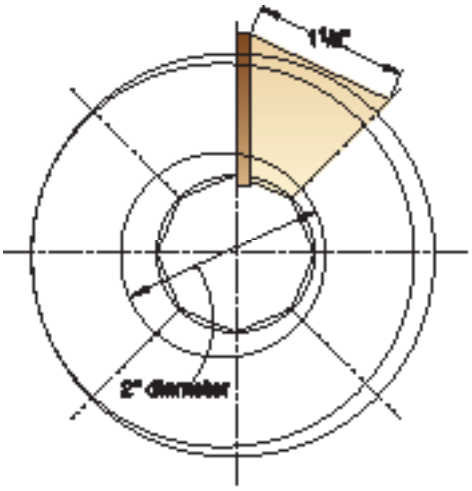
Set your tablesaw blade angle to 22.5 degrees and make a test cut to confirm the setting. When the angle is on the money, make a rip cut through the center of each lamination. Before making the second cut on the narrow staves, build the ripping jig described on *page xx.*

Before adjusting the saw fence for the final cuts, make a couple of wider test cuts. With a compound miter saw, cut eight short pieces from the strips. This provides one more confirmation of the saw-blade angle. Wrap the eight cutoffs with a rubber band to check the fit (**Photo 1**).

After confirming the blade angle, adjust the rip fence to cut staves with an outside width of about 1½". The tip box *at right* explains how this width was determined.

From each of the four 15"-long staves, cut two 7"-long staves for a total of eight. (The final length is 6¾"; you'll have an extra ¼" for fitting). Before applying glue, dry-fit the cylinder (**Photo 2**).

With rubber bands holding pieces together, wrap a few layers of masking tape around the cylinder. Then cut the tape along a stave seam/glue joint, unroll the



Determining Stave Widths

How did I determine the required width of these staves? The simplest method is to draw a layout of the assembly. The drawing *above* shows my diagram. Before drawing my sketch, I knew the insert's smallest diameter was about 2" and I knew that I wanted to off-set the cylinder about ¼". Therefore, I decided that the cylinder's inside diameter should not be larger than about 1⅝". The insert's largest diameter was about 3½", which meant that my cylinder needed to be at least 4" in diameter (3½" insert + ¼" offset + ¼" wall thickness). In my sketch, the stave size is shown along with the width of my spacers. The bold circles represent the inside and outside of my offset cylinder, while the light circles represent possible dimensions of a centered cylinder.

—Malcolm

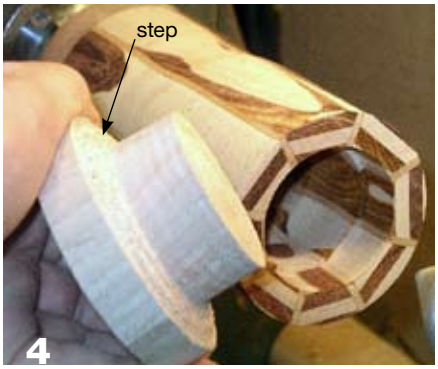

1

Cut5 eight short pieces to test that your saw blade is set precisely at 22.5-degrees.

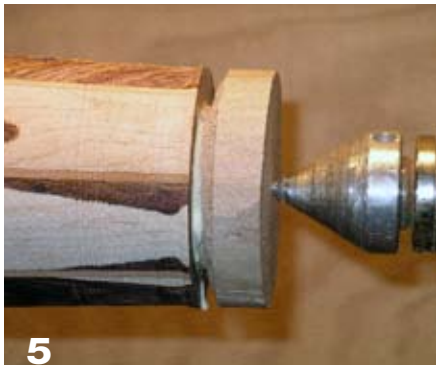

2

Before applying glue, gather your clamping supplies and dry-fit the staves.

Pipe clamps provide the ideal pressure for gluing up the stave mug wrap.



Turn a plug with a step; this will limit the depth of the plug insert.



After applying glue to the bottom plug, bring up the tailstock to apply clamping pressure.

cylinder, apply glue, roll it back together, apply a few rubber bands, and tighten four hose clamps.

Prior to gluing, mount a faceplate onto a wasteblock and turn it to about a 3¾" diameter. After gluing together the cylinder, glue the wasteblock onto one end, slightly offsetting it about ¼" (**Photo 3**). Let the glue cure overnight.

Depending upon quality of your saw blade cut, you might need to invest a few mintues of sanding the stave surfaces before gluing. To do this, adhere a piece of 80-grit paper onto a flat board and carefully rub each glue surface back and forth a few times. Be careful not to alter the miter angles.

Shape the cylinder inside

With the top of the cylinder securely attached to the wasteblock, use a ½" bowl gouge to rough-turn the outside and true up the inside. As noted earlier, I used a Steward-style tool followed by termite-style tool.

To close the bottom, turn an opening with a step (**Photo 4**). Note the little step inside the opening; this limits the depth of plug insertion and determines the final depth of the cylinder. A small diamond-pointed scraper is a handy tool for this type of turning. The steel insert requires a minimum of 5¾" of cylinder depth.

Need some help with this photo caption. This keeps everything "centered"

Chuck the fit frequently to get a tight fit between your wrap and the mug insert.

I choose to orient the plug grain the same as the staves; this just helps to minimize wood movement problems and provides a more desirable side-grain-to-side-grain glue joint.

To achieve a nice fit between plug and hole, it is easier to finalize the plug first and then enlarge the opening slowly while frequently checking the fit. When you're satisfied with the fit, glue the plug in place (**Photo 5**).

To remount the cylinder, turn down the protruding plug and shape a tenon to fit 4-jaw scroll chuck (**Photo 6**).

Turn the cylinder inside

Check the fit frequently as you turn and remove wood from the inside of the cylinder. As you approach the final fit, apply black crayon to the insert and rub the insert on the inside the cylinder. This provides evidence of where the fit was still too tight.

With the mug held between a jam chuck and a live center, use a scraper to turn the bottom.

Other than at top, the fit doesn't need to be precise. In fact, a little space provides room for the insert to expand when hot and not stress the wooden cylinder. Take a little extra time fitting the top

steel lip. For both esthetics and for a waterproof seal, a snug fit is necessary (**Photo 7**).

Refine the shape

With the internal turning complete, finalize the outside shape. Instead of turning a straight-sided cone, use a skew to turn a slight curve. The curve also provides a better grip.

For finish, apply several coats of lacquer-based sanding sealer (sanded between coats), followed by four coat of gloss lacquer, and then topped off by one coat of satin lacquer.

To provide a moisture barrier and minimize wood movement, it's a good idea to apply an equal number of finish coats to the insidse of the cylinder.

Finish your mug

Use a jam chuck to reverse-mount the mug. To clean up the bottom, part off the tenon, and then used a jam chuck along with a tailstock (**Photo 8**). The jam chuck shown is a MDF disc with a precicely turned groove to snugly hold the top rip of the cylinder.

If your jam-chuck is snug enough, your left hand can act as a keeper as you sand the entire bottom while the mug is still mounted on the lathe. After a little turning and sanding, sign the bottom with a woodburning tool or permanent marker. Then apply finish.

The last step is to permanently install the stainless-steel insert. To increase insulation properties, I applied a thin coating of polyurethane glue (Gorilla Glue is one trade name) to the inside of the cylinder. This type of glue foams as it cures, which fills voids and provides insulation. Before clamping, apply clear silicone adhesive into the steel insert's top groove. Wrap the finished wood with blue painter's tape to protect your surfaces during this final glue job. Because polyuretehane expands as it cures, maintain clamping pressure for four hours.

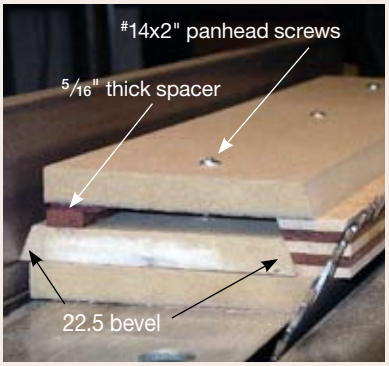
AAW board member Malcolm Tibbetts (malcolm@tahoeturner.com) lives in South Lake Tahoe, CA.

Build a Ripping Jig

Had the staves been wider, I could have made another cut on the opposing sides, but pushing these skinny staves through the blade would be risky.

Building this jig may seem like a lot of hassle just to make four cuts, but it is worth the trouble. By having a large jig such as this, it's easy to attain a smooth pass through a sharp rip blade.

The photo *below* shows a lamination clamped in place as it is passed through the saw blade.



Build this ripping jig from ¾" MDF, plywood, or particle board. First, rip both edges of the middle layer at the same 22.5-degree angle as the staves. Then glue the middle layer to the lower layer so that one beveled side rides along the saw fence and the other side acts as a support for the previously cut beveled edges of the laminations. Three #14x2" panhead screws provide the clamping pressure and 5/16"-wide strip of hardwood provides a means of leverage. —*Malcolm*