Three bowls—slightly rearranged

Twisted Possibilities

By Malcolm Tibbetts

"Lacewood Ribbon," 13×7½"

Perhaps the best thing about segmented turning is the total lack of restrictions; there is no end to the possibilities.

A few years ago, I discovered one of those possibilities; I call it "segmented ribbons." With this technique, the boundaries are pushed once more, and at first sight many people (even experienced turners) are befuddled by how it is done.

The truth be known, it's not nearly as complicated as one might think. Look closely at "Lacewood Ribbon," *above*, and you will discover that this ribbon is simply a series of six bottomless half-bowls. But instead of stacked segmented rings, this ribbon is created from staves. To create your own ribbon, follow along through the step on the next pages.

Cut the staves

From a 48"-long board (about 2 board feet), crosscut your stock (lacewood shown here) to 3½" long and 6" wide. The 3½" dimension equals the width of the ribbon, which is also the length of the required staves.

"Chapter 16" is made from laminated stave material.

Using stave-constructed bowls is important because it provides side-grain to side-grain joints throughout the entire project.

Simple staves produce a straight-sided cylinder, but compound-mitered staves are required for a cone-shaped bowl.

To calculate the compound miter angles and the stave widths, use the simple Excel program available online at compoundmiter.com. There are also many charts available in woodworking books.

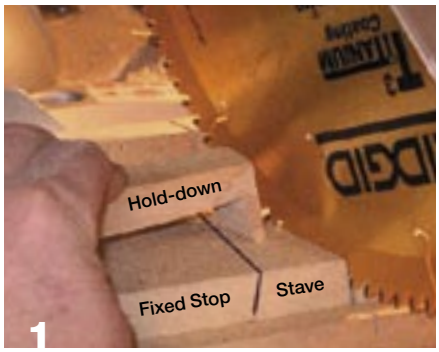
Compound miters require two angles—the blade angle and the miter angle. For this construction project, I built three bowls with a diameters of about 8" and 16 staves each. In order for the ribbon to come together, it is also important that the sides of the bowls be angled at 45 degrees. To achieve the required 45-degree angle, I determined that the mitersaw blade angle should be set at 7.93 degrees and the miter angle should be set at 8.01 degrees. You can also cut the staves on a tablesaw.

Before cutting expensive hardwood, it is a good idea to make test cuts from MDF or inexpensive stock to confirm the accuracy of your saw settings. A handheld hold-down device and a zero-kerf bed (**Photo 1**) will help produce identical pieces.

Place the test staves flat (outside facing up) and apply masking tape. This will allow you to roll the staves into a half-bowl shape and position them against a 90-degree surface. A jointer bed and fence is one way to determine the accuracy of your angles (**Photo 2**).

More than likely, you'll need to make a small adjustment to your saw settings and then try again. In addition to the staves forming a near-perfect half-bowl, remember that they must also form a 45-degree angle from the horizontal surface. Refer to **Photo 2** for a simple check of this angle.

With your mitersaw settings confirmed, cut 48 staves (**Photo 3**). This provides 16 staves for each of the three bowls.



Make test cuts to confirm angles.

At a jointer, check 90- and 45-degree angles.

Cut enough staves for three bowls.

To help guide your light sanding, pencil two lines on the edge grain of your staves.

Lightly sanding the stave sides will improve the appearance of the glue joints.

Assemble the bowl with the aid of glue blocks and rubber bands.

Sand to precision

Depending on the quality of your cut surfaces, your staves could be glued at this time. However, usually there are a few saw blade scoring marks; lightly sanding the surfaces will eliminate them.

Place pencil marks on a few staves, and barely touch them to a sanding disc (**Photos 4a** and **4b**). This will guide you as you adjust your sanding disc table to match the angle of your stave sides.

Make tiny adjustments to your table angle until the pencil marks disappear evenly with just the lightest sanding pressure. At this point, lightly sand each stave side; this will improve the quality of your glue joints. Be careful not to alter the original angles.

Begin gluing pairs of staves.

A tailstock cone is an ideal centering device.

Use duct tape as a clamp.

Install a temporary bowl base with a tenon.

Begin assembly

Begin by gluing pairs of staves together (**Photo 5**). Joining the pairs into assemblies of four (a quarter-bowl) is a challenge. Because of the sharp angles, conventional clamps will not work. My solution is to use a combination of duct tape and rubber bands (**Photo 6**). Duct tape has just enough elasticity to provide clamping pressure on the outside of the joints, and the rubber bands force the inside of the joints tightly together. The key to success with this technique is the application of the tape.

Position two sections of two (left side of **Photo 6**) with the outside edges slightly elevated (use a shim), and then apply tape as shown. This way, the tape will be stretched as you force the joint closed. Practice this a few times dry (no glue) before applying glue to the staves. In the background of **Photo 6**, you can see a completed glue job. This is a clever solution to a difficult clamping problem.

Assemble half-bowls

At this stage, the bowls are in quarter-sections. Before joining the quarters into halves, it's a good idea to dry-fit four sections into a complete bowl to check the overall fit. The goal is to create round, bottomless bowls. It is far

"Tolerance" is an extensively pierced combination of half-bowls, quarter-bowls, half-cylinders, and half-platters.

better (and easier) to make a few small adjustments at this stage than to wait until you only have assembled half-sections.

If necessary, use a disc sander to finesse the angles. After confirming that your angles are accurate, join the quarter-sections into half-bowl sections using the same duct tape procedure detailed earlier.

After a little touch-up on the disc sander, join the half-bowls to form complete bowls (**Photo 7**). Glue blocks attached with hotmelt adhesive provide a means to apply rubber bands for clamping pressure.

Turn a bottomless bowl

To turn a bottomless bowl, center the bowl on a flat disc (MDF works well). A large cone center on your tailstock will do a nice job of centering the bowl (**Photo 8**). With the tailstock holding the bowl, apply six to eight dabs of hotmelt adhesive. Using a bowl gouge, clean up the outside of the bowl and the small end opening.

Now, glue a prepared plug into the opening (**Photo 9**). The plug shown is made from two laminated pieces of ¾" MDF. Try to match the tapers of the opening and your insert. Apply glue and use your tailstock or a little weight for clamping pressure.

After 60 minutes of clamping time, use a pointed scraper to true up the tenon on your plug so that when you place it in a 4-jaw chuck, everything will be nicely centered. With a utility knife, cut through the hotmelt adhesive to remove the bowl from the MDF disc.

After the base-plug glue job cures overnight, you can rough-shape the outside of the bowl. Initially, just turn it smooth, without removing too much wood. Remember, the bowl angle must be 45 degrees. By using a straightedge and a combination square (**Photo 10**), you can check this angle.

After achieving a 45-degree angle on the outside of each bowl, measure each diameter. Select the smallest one and proceed with the final turning. When you turn the other two, try to match all of their dimensions. This ribbon has a ¼" wall thickness. Check the inside angle using the square and straightedge described earlier.

In theory, if the inside angle matches the outside angle, then the wall thickness should be consistent. Before proceeding, it's a good idea to check the wall thickness with calipers.

The goal is to produce three bowls with the same wall thickness, the same diameter, and the same 45-degree sides. Take your time and constantly check the dimensions and angles. When you are satisfied, sand the surfaces to 400-grit smoothness.

Next, reverse-mount the bowls to remove the MDF plug and to clean up the small end of the bowls.

Check that the bowl angle is 45 degrees.

Reverse-mount and clean up the small end.

One reverse-mounting technique (**Photo 11**) is to use a disc of MDF with a groove that matches the bowl's rim along with a "keeper" ring of MDF held in place with a few screws. A few rubber pads will protect the surfaces.

Begin deconstruction

Use a bandsaw to cut the bowls in half (**Photo 12**). Make sure your bandsaw blade is set at a 90-degree angle to your table. Cut slowly and stay on the glue joints.

Just as you touched up the pre-turned half-bowls on the disc sander, do the same with the finished half-bowls (**Photo 13**). Examine the surfaces closely; they should be perfect.

Putting together these half-bowls into the final shape can get confusing, so in order to avoid a mistake, tape together the shape

Splitting the bowls requires a steady hand. Because the glue line can be difficult to see the blue tape provides a visual aid.

Lightly sand the bandsaw cuts.

and label each side of each joint (**Photo 14**).

A few custom-made devices (**Photo 15**) help provide clamping pressure. These are half-pieces of 1" dowel with a thin layer of rubber pad, drilled and bolted together. Their only purpose is to provide a method of installing rubber bands.

To get a feel for the technique, try it dry first. Another pair of hands can be a big help.

The exact order in which you join the components makes no difference. I usually sand the seams of one joint before gluing the next component; it is just easier to do the sanding this way because you will have better access to the glue joints.

If the wall thicknesses are equal, there should be little sanding required—mostly just cleaning up the glue squeeze-out. Carefully use

"Bird's-eye Mobius" is a combination of half-bowls and quarter-bowls.

a power-sanding disc, progressing through the grits to create smooth transitions between segments.

This same technique works to create many different shapes. If you create staves from laminated material, the possibilities of surface designs are endless.

A twisted ribbon can also become a canvas for carving, piercing, painting, and pyrography. As you experiment, remember to keep all your wood grain oriented in the same direction.

Have fun as you explore this twisted woodturning adventure.

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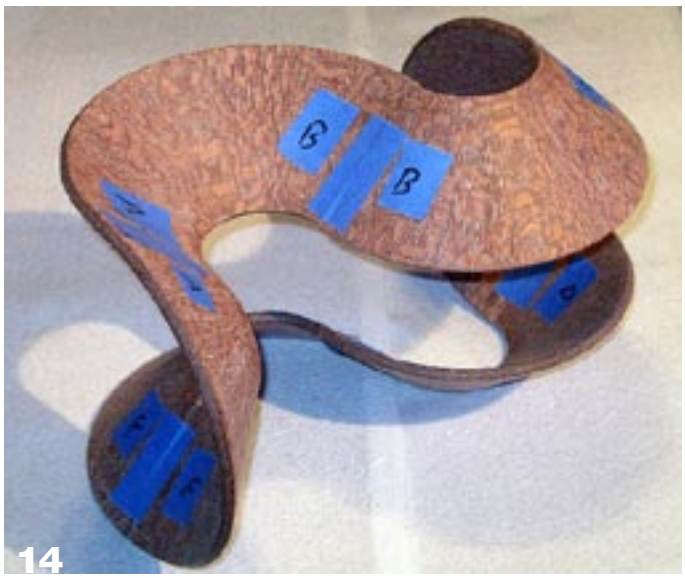

Labeling the joints helps avoid assembly mistakes.

Carefully align the joints.