Beyond Round
Therming

Flask, 2008, Quilted big leaf maple, 7¾" × 4¼" × 2⅛" (197mm × 108mm × 54mm)

This flask was thermed on two sides, cut apart on the bandsaw, hollowed using a drillpress, and then reassembled. The surface was further altered by carving and the figure in the wood grain was enhanced with acrylics.

Photo: Kenji Nagai

Art Liestman

The lathe is an excellent tool for making round things, but it can also be used to make partial cuts (arcs of a circle) that will yield interesting shapes. *Therming*, a woodturning technique dating back to the 1700s, allows the turner to produce multiple-sided spindles with each side turned. Historically, the technique was used primarily to produce table legs and balusters, typically with four sides. A cross-section through a thermed leg shows four arcs of a circle meeting at sharp angles. When the legs are attached to a table, these angles appear as vertical lines, emphasizing the form and creating attractive shadow lines.

My interest in therming comes, in part, from a curiosity about making objects on the lathe that are not obviously turned. I enjoy exploring realms beyond round. Other techniques (such as multi-axis turning) can be used to produce pieces with multiple-turned sides, but there are two differences that distinguish therming: in therming, 1) multiple workpieces are shaped at one time 2) while they revolve around the axis of rotation (which does not pass directly through the workpieces).

There seems to be some uncertainty about the origin of the word *therming*. The term dates back to at least the 1700s and seems to refer to a pillar design used for statue bases. The word itself is likely derived from the name of a Greek god, either Hermes or Terminus. Therming has also been called "barrel turning," "drum turning," and "angular turning." Sigi Angerer's article on therming, "Angular Turning on the Lathe," appeared in a 1998 issue of *AW* (vol 13, no 2) and was reprinted in the compilation, *American Woodturner's Techniques & Projects III* (1999, AAW). Mike Darlow's Woodturning Methods (1999, Fox Chapel) also includes some information on therming.

Methods of mounting

There are at least two methods for mounting workpieces for therming. In the first method, the workpieces are secured at each end to the outer faces of

Two 1" × 3" × 9" (25mm × 75mm × 230mm) workpieces are screwed to a 1" × 3" (25mm × 75mm) carrier (the middle layer). The assembly is mounted between centers.

The assembly looks like this after turning the outer faces.

After turning the outer faces, dismantle the assembly and reassemble with the workpieces flipped over.

Turn the new outer faces to achieve something as shown. Each of the 1" × 3" (25mm × 75mm) workpieces has now been reshaped by turning the two broad faces of the boards. These faces have been thermed.

a wooden carrier, which is mounted between centers of a lathe *(Photo 1)*. In the second method, the workpieces are secured at both ends to discs, forming a barrel *(Photo 12)*. In either case, the turner can shape the exposed face of each workpiece using standard spindle-turning techniques. The workpieces can then be rotated and the process repeated to shape another face, and so on *(Photos 2–4)*.

When using the first method, it is important to use screws that are long and strong and to drill pilot holes if the wood is prone to splitting. When turning, a portion of each end of the blank must be left unturned to avoid hitting the heads of the screws.

The turning process

I begin turning by creating a groove with a parting tool well to the inside of the mounting screws. This reminds me to turn inside the groove. I find that a spindle-roughing gouge is the easiest tool for doing most of the shaping of the pieces, although other gouges can also be used. Some of the assembly will be left unturned, so do not move the toolrest while the assembly is turning. If the toolrest has been repositioned, be sure to hand-rotate the assembly one complete rotation before turning the lathe on again to make sure the new position of the toolrest is safe.

Depending on the type of wood and the sharpness of your tools, the finish can be quite good straight off the tool. There may be some tearout as the gouge exits the wood, leaving a bit of fuzz. If you are therming all four sides, you can minimize the number of fuzzy edges by rotating the pieces so that the exit edge becomes the next entry edge. That way, only the last exit edge is likely to be fuzzy. For safety, all sanding should be done with the lathe turned off. I prefer to sand each face before rotating the workpieces. I do this with the assembly still mounted on the lathe.

Options for further turning

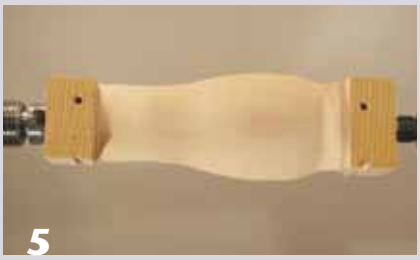
Another option for turning is to dismantle the assembly again and place one of the workpieces between centers for further shaping *(Photo 5)*. The ends of each workpiece have not been turned, so it is easy to find the center of the workpiece at each end. These centers can be marked and some of the unturned material can be removed using a bandsaw. The workpiece can then be remounted using these centers.

Photo 6 shows the workpiece reshaped between centers. In this instance, the turning that was done with the workpiece held between centers has resulted in the shaping of two new faces so that the spindle now has four turned faces, two turned by the therming process and two turned between centers *(Photo 7)*. Part off the workpiece and the result is a totally turned object. ▸

Inga, 2009, Big leaf maple burl, ebony, 5½" × 7" × 3½" (140mm × 178mm × 89mm)

A teapot can be created from a four-sided thermed object that was then hollowed on the lathe. The figure in the wood grain was enhanced with acrylics.

Photo: Kenji Nagai



One of the workpieces has been remounted and is ready for turning between centers. Notice that the unturned ends have been trimmed.

The workpiece is reshaped between centers.

The workpiece is completely turned and parted off at both ends. Each of the four faces of this object has been turned.

Use of thicker wood

Using a 3" × 3" (75mm × 75mm) carrier, you can mount and turn four workpieces at a time *(Photos 8–11)*. The curvature of the faces of the resulting thermed workpieces will be flatter, as the wood being shaped is further away from the axis of the lathe. By varying the dimensions of the carrier and the workpieces, many different effects can be achieved.

Barrel-mounted assembly

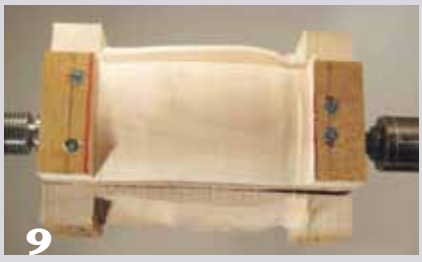
Another way to mount the workpieces for therming is to connect them in a barrel-shaped assembly with discs screwed into the workpieces at either end. The cylindrical barrel consists of several spindle blanks—staves of the barrel—and two round pieces of plywood at the ends. The plywood discs form the top and bottom of the barrel. With the barrel positioned horizontally, it is mounted on the lathe with a faceplate attached at the middle of one end of the barrel and the live center at the middle of the other end.

The outer face of the barrel staves are shaped, the barrel dismantled, each stave rotated, then reassembled to form the barrel assembly again, this time with a new, unturned face of each stave facing outwards. The barrel assembly is remounted, and the new face of each workpiece is shaped. The process is repeated to shape all the sides of the barrel staves.

To try this method, begin with discs made of high-quality ¾" (20mm)-thick plywood. Cut two 9" (23cm)-diameter plywood circles. For each disc, drill pilot holes approximately 1" (25mm) apart on a circle laid out ¾" (20mm) in from the edge of the disc. Center a faceplate on one of the discs and attach it securely to the disc. Drill a small hole (⅛" [3mm] diameter, or so) in the center of the other disc to allow easy location of a live center.

When using this method, it is important to cut your workpieces carefully, making them all exactly the same length and being careful to ensure that the ends are parallel to each other. Careful preparation of these blanks will minimize complications in assembling and aligning the barrel. The eight workpieces I use in this project are 2" × 4" × 9" (50mm × 100mm × 23cm) attached to two 11" (28cm)-diameter plywood discs.

Stand the workpieces on end in a circle and space them evenly. Place the disc, with the faceplate attached, over the workpieces and securely attach the disc to the workpieces using at least two strong screws for each workpiece *(Photo 12)*. The screws



Photos 8 – 11 show a similar process, only with a 3" × 3" (75mm × 75mm) carrier in the middle. The pieces are thermed on the two broad faces.

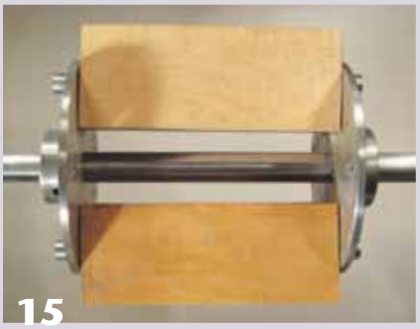
should extend a minimum of ¾" (20mm) into the workpieces.

Invert the partially constructed barrel assembly and loosely attach the other disc to the tailstock end. Do not fully seat the screws yet. Mount the assembly on the lathe by threading the faceplate onto the spindle and then bringing the tailstock into place to center the disc. Use enough pressure to keep the assembly centered. Once the tailstock is in place, tighten the screws on the tailstock disc, advancing the tailstock as needed to maintain the alignment as the disc is drawn toward the ends of the staves. This ensures that the assembly is properly aligned with the tailstock. The barrel-shaped assembly is now ready for the first turning *(Photo 13)*.

12 Eight workpieces are securely attached to two plywood discs to form a barrel shape for mounting on the lathe.

13 The barrel-shaped assembly is mounted to the lathe and is ready for turning the first face of each workpiece.

14 The custom-made mounting jig is shown from the Morse taper end. There are two locating pins mounted opposite each other for accurately holding two workpieces for turning.



15 Two 3" × 3" × 9" (75mm × 75mm × 230mm) workpieces are mounted to the jig and are ready for initial turning.

Safety considerations

Before turning this barrel-shaped assembly, there are several safety issues to be considered. First, the mounting of the faceplate and the connecting of the discs to the workpieces must be done carefully using appropriately long and strong screws. As there are gaps between the workpieces, care must also be taken during the turning process.

Because the turner will be turning air during some portion of each rotation, catches are possible. To minimize the chance of a catch, start each cut carefully keeping the tool handle low as you initiate each cut, and then raising the tool handle as you advance the cut. Doing so controls the depth of cut. Also, using more workpieces allows the gaps to be smaller, increasing the safety of the process.

Turning speed is always a safety consideration. It is best to begin turning your assembly at no more than 500rpm. As you become comfortable with the cutting action, the rpm can be increased, assuming your assembly is properly put together. Turning at a higher rpm will help avoid catches that could result from the voids between elements of the assembly. Establish a safe balance between too slow and too fast.

Before you start the lathe, be sure to always check the lathe speed, hand-rotate the assembly to check the position of the toolrest, and make sure the tailstock is tight and locked into position.

My practice is to clearly mark on the workpieces (using colored pens) the location of the ends of the mounting screws. I then use a parting tool to create a trough on the workpiece side of those marks (clear of the mounting screws).

Alignment of workpieces

Using plywood for the discs allows the turner to attach various "stops" making for easy alignment of the workpieces when they are rotated. L-shaped stops, made from plywood and attached to the plywood disc, would permit easy repositioning of square corners of the workpieces. A second layer of plywood (on one or both ends) with notches cut to fit the workpieces also adds to the rigidity and safety of the assembly.

Another method to align workpieces for easy and accurate repositioning is to use a center pin located in a hole at the center of each end of the workpiece. ▸

Photo: Kenji Nagai

Ancient Tower, 2009, Big leaf maple, 14" × 4⅞" × 4½" (35cm × 124mm × 114mm)

Although it does not appears to have been turned, this sculpture was thermed on four sides, cut in half horizontally, hollowed on the lathe, then glued back together. The surface texture was applied after reassembly. The final color was achieved with wood bleach.

Custom-made mounting rig

If you intend to do a lot of therming, it may be worth making a more sophisticated jig *(Photos 14–18)*. My current jig (designed by Dennis Cloutier and made by a local machinist) uses steel discs with alignment pins to locate the center of the workpieces and a steel central shaft to aid in setup and jig-to–lathe alignment. I have different sets of discs for different diameters.

The central shaft is 1" (25mm) in diameter with a #2 Morse taper on one end and a dimple at the other end for locating a live center. The shaft has a ¼" (6mm)-wide keyway that runs full length. The discs have keyed hubs that slide onto the shaft.

The discs have threaded holes for locating pins that allow even spacing of two, three, or four workpieces. The locating pins are modified bolts with the threads removed on one end leaving a ⅜" (10mm)-diameter pin approximately ¾" (20mm) long. Around each locating pinhole are several smaller holes to be used for screwing the disc to the workpieces.

Beyond the basics

An added bonus of therming is that it allows for the use of nicely figured wood that has been slabbed into planks that are anywhere from 1"–3" (25mm–75mm) thick. Such planks can be used for platters, peppermills, and shallow bowls using regular turning techniques, but therming provides a way to use this dimensional lumber to make flattened vessel forms.

Once you have the basic idea of therming, you can apply this method to other realms. Thermed pieces can be remounted between centers of the lathe and shaped further. Larger workpieces can also be hollowed on the lathe after therming. Another way to hollow thermed pieces is to cut them apart, hollow the halves using carving tools, and then glue them back together. The basic technique also allows you to make a piece with any number of thermed sides.

This age-old technique offers exciting, unexplored possibilities for woodturners. By using therming alone or combining it with other turning techniques, we can move beyond round to create innovative shapes using our lathes. ■

Art Liestman coaxes wood into peculiar shapes in Coquitlam, British Columbia. Please visit his website at artliestman.com. Art will demonstrate his woodturning techniques at the AAW symposium in Hartford.

The first face of the workpieces has been turned and the pieces are ready for remounting.

The two workpieces mounted to the jig after the fourth faces have been turned.

The two workpieces look like this after being dismounted from the jig. The two (identical) workpieces are rotated to show the different profiles.