WOODTURNING FUNDAMENTALS

American Association of Woodturners
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- *Turn an elegant box from a branch*
- *Make a biscuit cutter for the kitchen*
- *Choose the right carbide tool*
- *Make a food and beverage smoker*
- *Power–sand efficiently*

AAW AMERICAN ASSOCIATION OF WOODTURNERS
WE ARE TEACHING THE WORLD TO TURN

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February 2021 Vol. 10 No. 1

Andrew Potocnik

John Lucas

Larry Sefton

A Note About Safety

An accident at the lathe can happen with blinding speed, while respiratory and other problems can build over years.

Take appropriate precautions when you turn. Safety guidelines are published online at tiny.cc/turnsafe. Following them will help you continue to enjoy woodturning.

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The AAW strives to cultivate an organization built on mentorship, encouragement, tolerance, and mutual respect, thereby engendering a welcoming environment for all. For more, tiny.cc/AAWDiversity.

Cover: Larry Sefton shapes the interior of his food smoker to match the curve of a screen insert. *See page* **31** *for this project.*

Welcome

It's always a satisfying moment to look up from my keyboard to discover that the current issue of *Woodturning FUNdamentals* is brimming over with new projects and inspiring thoughts!

The offerings in this issue range from the pairing of turned wood with modern technology—Michael Hamilton-Clark shares a project to make a cell phone amplifier (p. 9)—to Mark Palma's thoughts on which carbide tools to choose first. This latter article reflects extensive time that Mark spent interviewing industry tool reps, and their answers are interesting for their range of feedback on his questions.

We always strive to teach turners the best possible tool technique. Good tool technique reduces the amount of required sanding, and might be the source of the over-simplified notion that somehow *turning is good, sanding is bad*. While offering us many helpful tips on power–sanding, Doug Reesor also gives us some interesting food for thought about a situation in which sanding can be the only tool to save the day (p. 14).

And taking on the Pro Tips column this issue, Betty Scarpino shares thoughts on an aspect of bowl turning that is as important as tool presentation—design (p. 39).

—Don McIvor, Editor

AAW Youth Committee Needs Your Help...

...identifying public or private middle and high school woodturning teachers, or groups who have woodturning programs for youth ages 10-25. The committee wishes to reach out to these teachers and groups to provide information about the AAW resources available for teachers and students. Please share this request with anyone who you believe would be interested. Teachers' and group names, along with contact information, should be sent to youth@woodturner.org.

—Linda Britt, AAW Youth Committee

Natural-Edged Box From a Branch

By Andrew Potocnik

How often have you found yourself with a tree that has passed its expiration date and didn't have the heart to burn it or simply put it in the garden recycle bin? Or perhaps you've received a diminutive branch from a well-meaning friend with a request to make something special from their lovingly nurtured landscape tree? As long as this sort of wood has dried without major cracks, you can make use of it for this project, using smaller branches that would otherwise not be large enough for typical turning projects. Branches that have distinct color differences between sapwood and heartwood, contain interesting radiating rays, or perhaps show curly compression grain can be used to advantage.

The material I used for this project is a little over 2" (50mm) in diameter and made its way to me as a part of a deceased woodworker's stash, much like I will leave when my time has come. The branch was well seasoned, and was free of checks or cracks from drying.

How long does wood need to dry? Wood dries according to the properties of the species and the environment in which it grows and dries, so you'll need to investigate how to dry wood according to where you live. This sort of information can often be gained from woodturning clubs in your area, so don't hesitate to contact them or post questions to social media groups (also see the sidebar for links to AAW resources).

Chuck the blank

This project began with a branch of Osage orange about 3" (8cm) long, and with an irregular outer surface. I took several measurements to find the central point before mounting it between centers. You may need to reposition your blank a few times and split the difference for an irregularly shaped piece until a central point is found, changing where your drive center and tailstock center contact the wood (**Photo 1**).

About drying wood

The AAW archives contain many articles and linked videos on drying wood. You might check out Sara Robinson's article or Carl Jacobson's video, in particular. Use the AAW's Explore! feature. Click the blue boxes or scan the QR codes to find out more.

tiny.cc/DryWood

tiny.cc/dryingtips

1. *Mount the blank between centers. Adjust the contact points at either end to get the blank to run true, especially where the box rim needs to retain its bark.*

2. *Create tenons to fit your four-jaw chuck on both ends of the blank. Make a parting cut (but don't cut completely through) where your lid and base will meet.*

Cut tenons

The initial goal is to separate the blank into what will become the top and bottom of the box, with a tenon on the bottom and top for mounting in a four-jaw chuck. Cut the tenons at each end to fit your chuck jaws with a standard parting tool (**Photo 2**). Begin parting the blank with a narrower version of the same tool, if you have one available. I place this defining cut about a quarter of the way down from the right of the blank, though you could increase this to a third. My choice of proportions allowed for extra material in the base, which led to a tall foot. Don't cut too deep into the blank where remaining wood can break and send your workpiece flying, possibly shattering the piece and your confidence. Instead, switch off the lathe and finish parting by sawing the two sections apart.

Turn the base

Mount the base section in a scroll chuck to begin shaping the box (**Photo 3**). If your chuck cannot contract enough to grip the turned tenon, you can save the project by turning a jam chuck to receive your blank. More on jam chucks below.

Two particular details in Photo 3 are worth noting. A tenon has been cut on the tailstock

3. *Mount the base and begin turning by adding a tenon for the box collar.*

end to form the collar of the box. This is done with a peeling cut from a parting tool. The intersection of the collar and the adjacent wing is cut into a vee shape using a skew presented on its side. This ensures the wing can be sanded up to the tenon without touching it and still leave a crisp intersection at the meeting of the two features.

Reduce the profile of the box, which will in turn guide the depth and dimensions of the interior hollowing (**Photo 4**).

4. *Begin shaping the base's exterior with a spindle gouge.*

5. *A design change—a tall base presents itself.*

6. *Hollow the interior using a small bowl gouge or round-nosed scraper. Use the outside of the form as a guide.*

7. *Hollowing the base enhances the delicate feel of the box.*

8. *Transfer the diameter of the base's collar to the bottom of the lid.*

9. *Frequently check the lid fit; it should open with one hand.*

As I turned down the exterior of the form, I realized that a tall base could work well, something I hadn't tried previously (**Photo 5**). This served as a reminder that it pays to evaluate your design as a project evolves, making changes according to the material you're working with.

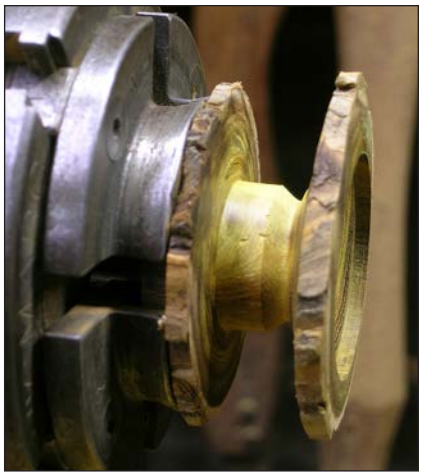
To hollow the interior, I use a selection of my smaller gouges and scrapers to form a wall thickness of little more than 1/16" (2mm), followed by sanding from 120 through 320-grit abrasives (**Photo 6**).

I reverse-mount the form to detail the base (**Photo 7**). Hollowing the foot with a gouge and scraper lightens the box.

Mount the lid

I mount the wood for the lid in a second chuck—this is the luxury of having several—and cut a recess into the lid's underside. If you have only one chuck, be sure to mark jaw numbers on your blank so it will run true once remounted. A Vernier caliper set to the base collar's outer diameter establishes the size of the recess and ensures both parts match (**Photo 8**). You can use a variety of tools to cut recesses accurately, but I prefer a square profiled tungsten carbide cutter. Go gently and nibble up to the correct size, measuring frequently.

Frequently check the fit of the top and base to avoid



10, 11. *Shape the top of the lid (headstock side) with a small gouge. When the space becomes too cramped, reverse the blank in expanding jaws and continue shaping.*

over-shooting the best fit (**Photo 9**). I aim for a fit that is just tight enough for the lid to not fall off and still be opened with one hand. When the top and bottom meet neatly, you can begin shaping the top of the lid (**Photo 10**). Once I reach the limits imposed by cramped turning quarters, I reverse-mount the lid in another chuck to complete its shaping and sanding (**Photo 11**). I use a set of long jaws in expansion mode, but you could turn a tenon on a scrap mounted in chuck jaws to hold the lid in a similar manner.

I generally begin sanding with 120 grit and move through each grade to 320 grit. When sanding into intersecting faces, I use a cut edge on sandpaper, rather than a torn or folded edge. This ensures I can sand right up to adjoining faces without creating a rounded surface. This is also why I like to cut a clean vee intersection between the two surfaces. Avoid focusing sanding on one area too long as you'll risk overheating the surface, increasing the likelihood of creating fine heat checks.

Avoid sanding tenons or recesses where lids are fitted to bases because you may round the mating surfaces, or worse still, sand more from one side of the tenon than the other, spoiling the overall fit.

I now realize there are even fewer reasons to toss aside small pieces of wood for lack of a creative use for them. I'll need to keep turning until I'm 150 years old to use up all the wood that comes my way.

Jam chuck tip

A well-sized jam chuck both holds the workpiece securely and *makes it difficult to remove after turning. I often drill a hole through the chuck so a dowel can be pushed through from the back to remove the finished piece, should it become stuck.*

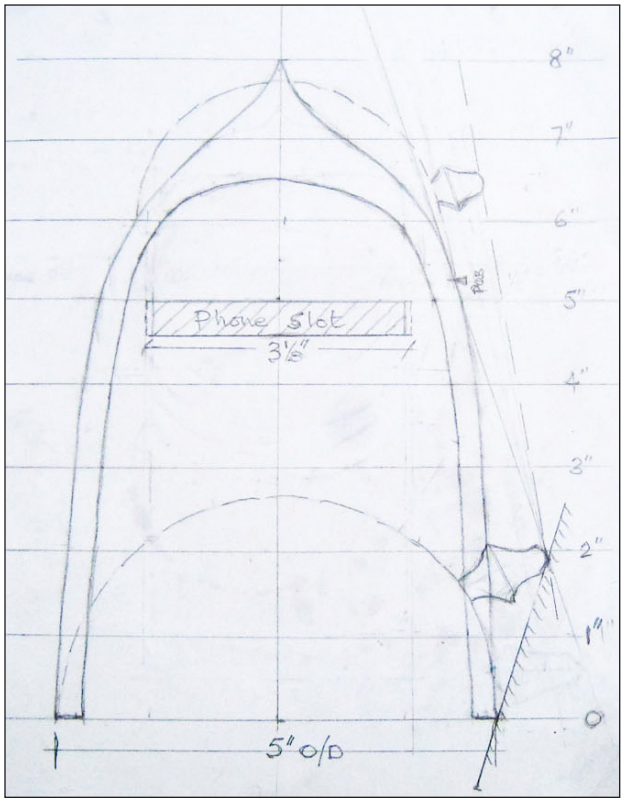
Andrew Potocnik has been involved in woodturning since high school. He has demonstrated internationally and writes for other woodworking publications. For more, visit andrewpotocnik.com.

Cell Phone Amplifier

By Michael Hamilton-Clark

A woodturning friend recently shared a YouTube video by Dutch turner Ronald Kanne in which he turns an amplifier for use with a cell phone. With its crusader's helmet shape, it looked intriguing, so I decided I would have a go at making one. It is amazing how much extra sound is produced when cell phone audio is played through this turned chamber.

Though there are no accompanying drawings, Kanne mentions the dimensions of the block of wood he used as being 13cm (5") square and 19cm (7.5") in length. This information, along with the various views in the video, was enough for me to draw a full-scale 5" × 8" (20cm) working profile drawing (**Photo 1**). I decided on a 1/4" (6mm) wall thickness and made a cardboard template for checking the inside profile.



Rough-turn a blank

I started with a 5-1/2" square and 10" long (14cm × 25cm) maple blank. I mounted the blank in long-grain orientation on a 4" (10cm) faceplate using four 1-1/2" (4cm), #10 pan head sheet metal screws. Kanne roughed his form between centers and turned a tenon on the end to secure in the contracting jaws of a chuck, which is an alternative method to faceplate chucking. With the torque stresses induced by the hollowing, I felt the possibility of the work pulling out of the chuck was higher than it

1. *Based on details gleaned from Kanne's video, the author sketched a design for the amplifier. This helps plan blank size, grain orientation, chucking, and turning steps. This design led to a successful project.*

being pulled off the faceplate. With the tailstock for support and the lathe at 500 rpm, I turned a 5" cylinder using a 3/4" (19mm) spindle roughing gouge (**Photo 2**).

Hollow the center

My design calls for a 6-1/2" (17cm) internal depth. This requires endgrain hollowing, so I decided to remove the bulk of the material with a series of Forstner bits held in a drill chuck in the tailstock. I started with a 1/2" (13mm) bit, moving up in 1/2" increments to a 2" (5cm) bit, which I advance to a 6" (15cm) depth. I then switched to my 2-1/2" (6cm) bit, which I advanced to 5", leaving enough material for the 1/4" wall thickness. Forstner bits remove a lot of material, and it is important to set a slow lathe speed (about 250 rpm) and frequently retract the bit to clear chips.

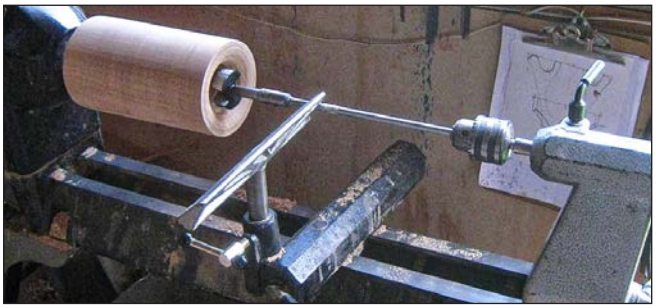
When the depth of the cut began to exceed the reach of the bit and quill, I added an extension shaft to hold the Forstner bit. An extension shaft is prone to vibration and drifting off center; I brought the toolrest up against the side of the shaft to provide lateral stability (**Photo 3**).

After hollowing as much as I could with the Forstner bits, I switched to a curved scraper on a hollowing tool to complete the interior at 750 rpm (**Photo 4**). A bent shaft deep hollowing tool is needed as the 6-1/2" depth lies beyond the safe reach of a standard scraper. I frequently stopped the lathe to check the interior profile against the cardboard template made from my profile drawing. Once the profile matched the cardboard template, I sanded the surface through 220-grit abrasive at 250 rpm.

Turn the outside

I shaped the outside of the amplifier using the 3/4" spindle roughing gouge at 750 rpm, working from the large diameter at the opening towards the smaller diameter at the headstock. To provide additional support for the form, I made a disk to fit in the opening and brought up the tailstock with a live center (**Photo 5**).

2. *Mount the blank and round it using a spindle roughing gouge.*

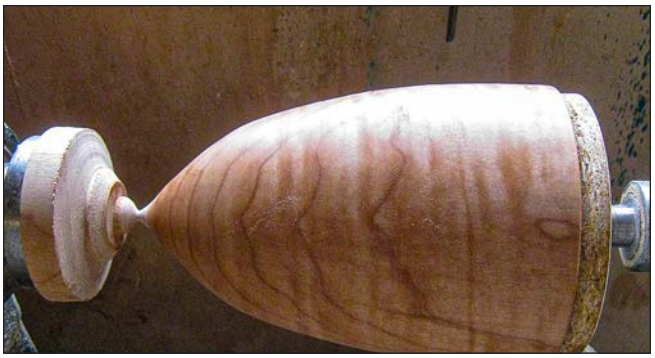


3. *Bring the toolrest up to just touch the side of the bit extender—this adds stability for drilling.*

4. *Use a deep hollowing tool to clean up the interior, much of which lies beyond the safe reach of a standard scraper.*

I continued to verify measurements every inch or so, taking caliper measurements across the working profile drawing and comparing those against the form. This cautious routine ensured a flowing curve and a uniform 1/4" wall thickness down to the smaller end, where I left a 3/8" (10mm) spindle for support (**Photo 6**). The spindle will be shaped to a point later. At this stage, the surface was carefully sanded through 220-grit abrasive.

5. *An insert turned from scrap lumber allows you to bring the tailstock up for extra support.*



6. *Shape the exterior, but leave the form attached with a small spigot for support.*

7, 8. *Mark the slot for the phone on masking tape. This will guide the saw cut and reduce splintering. Clean up the bottom of the slot with a narrow bench chisel.*

Cut the phone slot

Before completing the smaller end, I cut the slot for the phone. I decided that to get reasonable amplification, the back side of the slot should be 1/2" in from the interior bottom of the cone. I measured my cell phone and determined that the slot should be 1/2" wide and 3" (8cm) across. I marked these measurements on masking tape applied over the location of the slot; the tape reduced splintering when cutting across the grain (**Photo 7**). I used a flush-cut detail saw to make the two parallel cuts and a 1/2" chisel worked in at the ends to ease out the waste material. On the finished slot the cut surfaces are smoothed with a thin sanding block (**Photo 8**).

Complete the tip and apply finish

Before parting by cutting through the waste material attaching the form to the faceplate, I placed a blanket over the lathe bed beneath the form. The thin holding wood could break during turning, causing the form to fall before I am prepared to catch it. The blanket would provide a soft landing in such an event.

I carefully paired the wood to about 1/8" (3mm) with a 1/4" spindle gouge and the lathe at 750 rpm. I stopped the lathe and held the cone with my right hand and used the flush-cut detail saw in my left hand. A couple of pulls with the saw cut through what was left. The point on the tip was cleaned up with some careful whittling with a craft knife and then smoothed by twisting the tip into a piece of 220-grit abrasive.

I like a natural look and used walnut oil as a finish. I applied the oil inside and out, and to the edges of the phone slot. Application can be by brush or cloth, with the oil left to soak into the wood before being rubbed out.

Turn feet

Kanne's video shows two feet supporting the front of the amplifier. With the cone laid on the work bench, I determined these needed to be 1-1/2" (38mm) long, and I decided to use a couple of 2-1/2"-long offcuts from 3/4"- (19mm) square black walnut pen blanks. As such, the shape would include a 1/4"-diameter tenon for gluing into the cone, then a flair to 3/4" diameter followed by a taper to a 1/4"-diameter rounded end; I cut a cardboard profile template accordingly.

For turning, the offcuts were mounted in pin jaws, brought into round at 750 rpm with the spindle roughing gouge, then profiled with a 1/4" spindle gouge to match the template. The turning was done with the 1/4" diameter tenon (for connecting to the cone) oriented nearest the chuck, working outwards to the 1/4" rounded end. With the help of the profile template, I turned two identical legs. I parted them off so that I had 3/16"- (5mm) long tenons to glue into the cone.

Marking foot locations

The phone slot must be horizontal, so care is needed to set the locations for drilling 1/4" holes to embed the legs in the cone. From the circumferential middle of the phone slot's front edge, I defined a centerline to the rim and noted its location with a mark. Another mark was placed half-way down around the rim. This point was located by running a flexible tape measure around the rim to determine the circumference and making the mark at half this distance. The leg positions were then marked 1-1/4" to either side and 1/2" inch back from the rim. I marked indentations with a center punch and drilled 3/16"-deep holes perpendicular to the cone's surface. The travel limiter on the drill press was set to avoid

9. *The speaker at broadcasting position.*

drilling through the wall. I rounded the ends of the tenons with sandpaper and glued the legs in place and when dry, applied walnut oil finish.

Epilogue

Developing this project from a video was an exercise in reverse engineering—I essentially started with a virtual example of a finished product and had to determine how to build it from scratch. This kind of problem-solving is fun, but not without setbacks.

After completing my first amplifier, I selected a song, started the music, and placed the phone in the slot.

Disaster! Despite effective amplification, the cone was unstable and rolled easily to either side. The height of the phone's mass and its location behind the cone's contact point with the table provided enough leverage to lift the front of the cone and the legs off the surface.

To correct the design flaw, I tried 2"-long legs, but there was still a tendency to roll. I then carved a piece of 1.5"- (4cm) square, 6"- (15cm) long oak to match the curve of the cone and attached it as a counterweight in place of the front feet. The result was total stability, but not the aesthetic I was looking for.

My grandson was much taken with the whole idea, so I made one for him, but with some needed design changes. I made a new drawing with a broader profile and inside template, and with the phone slot a bit forward of the contact point. These changes are reflected in the drawing in Photo 1 and the process I've described. For good measure, I added two feet at the rear (see opening photo). These feet are the same profile as the ones in the front, but they are only 1" long and spaced 1" to each side of the center line. Here the center line is defined by the cone's point of rear contact with the tabletop while the cone is resting on the two front feet.

The form is as striking as the amplification (**Photo 9**). When not in use, the cone can stand on end to show off its resemblance to a crusader's helmet (**Photo 10**).

Michael Hamilton-Clark lives in the Fraser Valley, BC and has been turning for 15 years after retiring. He is a member of the Fraser Valley Woodturners Guild and the AAW. His work is sold through craft shops and at shows and can be seen at www.alberystudiowoodturnings.com.

Michael thanks Ronald Kanne for his kind permission to quote the use of his video.

10. *When not in use, the amplifier rests out of the way on its base, looking rather like a crusader's helmet.*

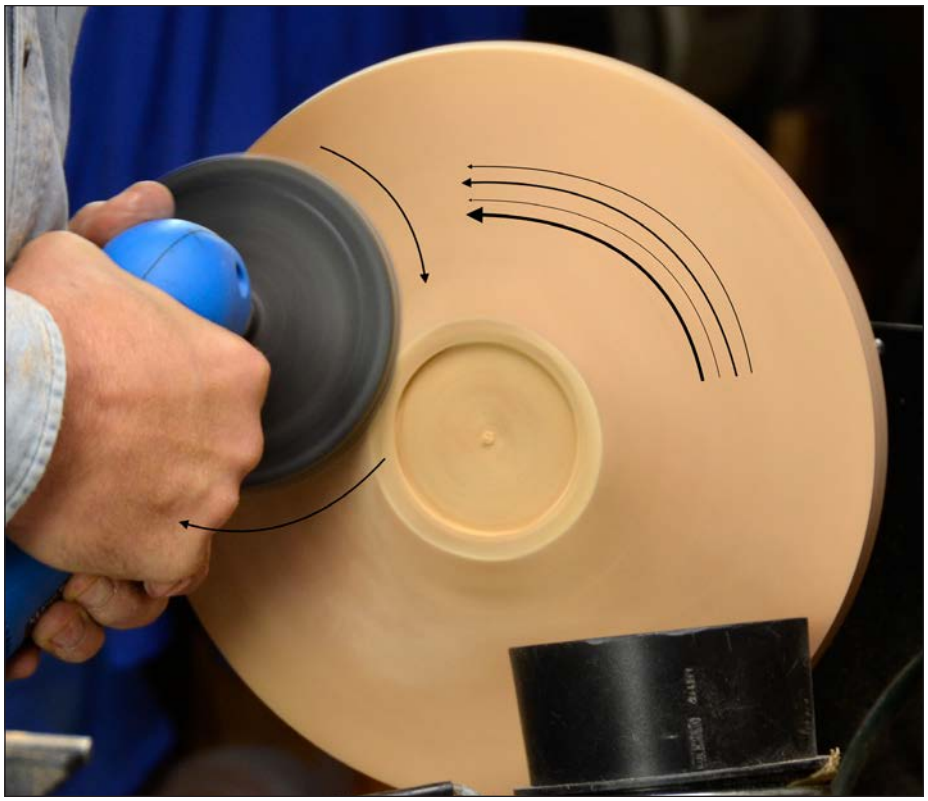
Power–Sanding to Enhance Your Turning

by Doug Reesor *Photos by John Kelsey*

One of the biggest challenges I regularly face in woodturning is executing an uninterrupted cut across a wide shallow plate or platter. I love to caress the delicate curve of a well-finished platter, but even after thirteen years of turning, I still come away dissatisfied with the tool results. Without the ability to rotate the lathe head or turn off the end of the lathe, the "woodturner's dance" is difficult to do without repositioning my feet. The result may be a surface that looks smooth, but where I still feel undulations that detract from the tactile experience I am trying to achieve. Because hand-sanding applies the grit along the same axis as the finishing cut, the sanding action tends to accentuate surface bumps. Using a coarser grit creates deeper surface scratches instead of modifying the undesirable feature. Applying more pressure to flatten the hills and valleys just generates heat and surface checking.

Abrasives at work

Magnify a piece of sandpaper and you'll see that it is comprised of an uncountable number of sharp, angular pieces of grit (stone or synthetic) adhered to a piece of paper. Inconsistencies in the size of the grit particles leads to variation in the way they cut the surface of the material they contact. To improve the wood surface, you must be able to remove the peaks left behind from the previous grit or tool cut without deepening the existing valleys. While this can be achieved using support blocks on pads behind the abrasive, it is cumbersome to have a block on hand to match every curve you make. This is where power-sanding becomes a valuable tool.



1. *The rotation direction of the sanding wheel is approximately perpendicular to the direction of rotation of the piece and any tool and hand-sanding grit marks. This presentation of the sanding surface minimizes the effort needed to remove the effects of the previous step and provides good visual clues for knowing when the sanding step is complete.*

Power-sanding

The key advantage of power-sanding is that any two opposing sides of the sanding disk are moving in opposite directions across the surface of the turning (this is true if the pad is presented flat, so that both sides of the disk are contacting the wood) (**Photo 1**). A powered sanding disk works best when it is presented perpendicular to tool marks. This makes for efficient removal of material and the creation of a more disordered pattern of surface scratches, which become harder to detect by eye as the grit progresses to finer grades. The ridges created in the previous cutting or sanding step are smoothed with less effort because the abrasive is moving across imperfections left by the cutting action of the last tool.

2. *Because the disk is tilted, the pad hits any high points first and naturally produces a smooth concave shape. For a sharper curve use a smaller diameter disk.*

In addition, the powered disk moves through that mysterious center point of your platter or bowl, where the surface speed approaches zero regardless of your lathe speed. Note that a motor-driven sanding disk is different than floating-disk sanders. With those sanders, the disk rotation stops when pressure is applied to the part of the disk that is perpendicular to the lathe rotation—precisely the point of contact where power-sanding is most effective.

Blending and smoothing

Like tool work of any sort on the lathe, sanding can be broken into two stages: roughing (or blending), and finishing (or smoothing). When applied incorrectly in the roughing phase, abrasive can quickly soften any design features or create unwanted undulations as the wood changes density. In the case of bowls, even with a uniformly straight-grain piece of wood, transitioning from sidegrain to endgrain twice with each rotation of the piece can introduce unwanted wall thickness changes, especially when hand-sanding.

Wherever possible, I use power-sanding for the first sanding to take advantage of the cross-cutting action. I set the lathe speed as low as possible to make control of the sanding disk easier. By slightly tilting the sanding disk and using only the portion of the disk that is perpendicular to the lathe axis, the wood surface sands to a smooth curve (**Photo 2**). This practice also helps me see any cutting irregularities or tearout that I may have missed, and any significant deviations in the flowing curve I'm trying to achieve (**Photo 3**). I can also change the sanding direction by tilting my drill up and down to contact opposite sides of the sanding disk.

Inspect the surface

The greatest benefit of changing from hand– to power-sanding and back with each change in grit is that the pattern of sanding scratches changes. With single-point backlighting, it is easy to inspect the surface produced in each case, whether by hand or by disk (**Photo 4**).

3. *Using the disk sander as your first step highlights opportunities to improve tool work. The concentric rings suggest I wasn't consistently riding the bevel, and I staggered my stance as the cutting edge approached the center of the platter. The white streaks also suggest grain tearout.*

Care must be taken with a handheld backlight to inspect the surface from multiple vantage points. Like the angle of the sun in the desert where the dunes appear different depending on the time of day, scratches will appear to change depending on the angle of the light. Because the grit lines created by hand and power-sanding are essentially perpendicular, it is easy to see any residual lines from the coarser grit and continue to sand until they have disappeared. It amazes me how little sanding effort is required to remove the scratch marks left by the previous grit.

Hybrid approach

Once blending is complete, I alternate between hand sanding and power-sanding for each step. The important part is to make sure the sanding lines travel in a different direction for each subsequent grit change. In this way, each new grit of abrasive moves across the peaks left by the previous grit to eliminate valleys or deep scratches. This practice makes it easier to see when the previous swirl or line pattern has been eliminated.

Because of air entrapment at higher speeds, firmer pressure is required to get the same effective grit contact with the surface. This, leads to greater heat from friction. I turn my lathe down to its slowest speed when power-sanding. Because the sanding disk is rotating under power, the abrasive still cuts effectively. This also reduces the bucking effect of the disk when initially blending surfaces.

I always rely on hand sanding for the final grit. The residual lines left by the abrasive will flow around the center axis of my piece. I usually stop sanding with 400-grit abrasive, particularly with dense timbers that will receive a satin finish.

Doug Reesor

4. *Single-point backlighting with an incandescent bulb makes it possible to see the disk pattern of 320-grit abrasive and see that there are no residual grit lines from the 220-grit step. I achieved this result with one pass across the platter in less than 10 seconds. There* are *still some tool marks.*

5. *A carving stand adapted to hold a four-jaw chuck gives you an extra set of hands to hold work steady. This particular stand replaces the toolrest in my banjo, expanding the options for positioning the blank for sanding or enhancement.*

Warped surfaces

Power sanding is also useful for sanding a platter that has distorted beyond re-turning after being turned green. Even though such a piece may not make a practical platter, sometimes the figure is just too beautiful to resign the blank to the firewood pile. Because it's impossible to hold a power-sanding disk against a warped spinning surface, I use the carving mount I purchased from Trent Bosch Studios to hold the distorted blank during power-sanding (**Photo 5**). It is also possible to chuck the form on the lathe and lock the headstock to prevent movement. I still alternate between power-sanding and hand-sanding with each change in grit and use visual inspection to detect residual scratches.

My woodturning motto is "cut for show, sand for dough." The shape of a well-executed vessel will attract attention in any setting. Once a viewer has approached for close inspection, the scratch-free finish will encourage the person to gingerly reach out to touch and handle the vessel. The delicate caress of a satin-smooth vessel will help ensure the admirer will want to take it home with them (**Photo 6**).

Doug Reesor is a retired Metallurgical Engineer. He left his duties working on the surface quality of aluminum sheet products to spend the last thirteen years focusing on the surface quality of turned wood. He is a member of the Lancaster Area Woodturners and the AAW.

Doug Reesor

6. *A 12" Cherry plate with a 1/4"-deep, smooth curved surface. Finished with carnauba wax.*

Biscuit Cutter

by John Lucas

One thing I really like about woodturning compared to flat work is the ability to make objects for friends and family quickly and inexpensively. I'm always looking for fun projects. A friend who worked with his dad as a professional turner in Gatlinburg, Tennessee, taught me how he makes biscuit cutters. It is a fun project that teaches useful skills and produces a practical tool for the kitchen.

While cutting firewood, I keep an eye open for pieces that are 2-1/2" (6cm) or more in diameter, have straight grain, and do not include the pith. I cut these to about 16" (40cm) in length and dip the ends in melted wax. I use an old electric skillet to reduce the danger of fire. I set the controls just above the melting point and then hot glue the control knob to that setting. I put these waxed blanks on the shelf to dry.

If I feel the need to make shavings, I will turn the wood into a cylinder before dipping; it dries faster if you do this. It can take a year or longer to dry a cylinder of this thickness, but you can quickly accumulate a sizeable stash of dry wood to make boxes, handles, and of course biscuit cutters. You can also glue up dry wood to make a blank of the needed dimensions.

For biscuit cutters, I use close-grain wood that doesn't have a lot of pores so that they're easy to clean. I have had success with cherry, maple, dogwood, apple, redbud, and many other are local hardwoods.

Tooling

I decided I would use only carbide tools to make this biscuit cutter—mine happen to be Hunter Tools (**Photo 1**), plus a parting tool. If you prefer, you could use standard HSS tools.

EXPLORE!

Use the AAW's Explore! feature, click on the box, or scan the QR code to read Joe Larese's article (*AW* 34(3): 16-17) on turning a biscuit cutter with traditional turning tools.

tiny.cc/BiscuitCutter

1. *The carbide tools for this project differ in two respects: round shank and flat cutter, and square shank and angled cutter.*

Start with a cylinder about 5" (13cm) in length. Mount it between centers, and rough it down to about 2-1/2" using the angled cutter as a scraper. Simply guide it along the toolrest. I use my fingers against the toolrest to control the depth of cut. Then use the parting tool to cut a tenon for your chuck. Cut the tenon with a shoulder to rest on top of the jaws of the chuck. This helps prevent the workpiece from rocking and working its way out of the jaws.

Mark dimensions

With the workpiece mounted in the chuck, drill a hole in the end about 1" (25mm) deep (**Photo 2**). Mark off the project dimensions on the blank (**Photo 3**). I used about 1-1/2" (38mm) for the bottom, 1" for the cove, and 1" for the handle. These can be flexible depending on the shape you want for your cutter, so don't get hung up on exact dimensions. I rough–shape the outside before I hollow so I have a reference for the internal form (**Photo 4**).

Hollow

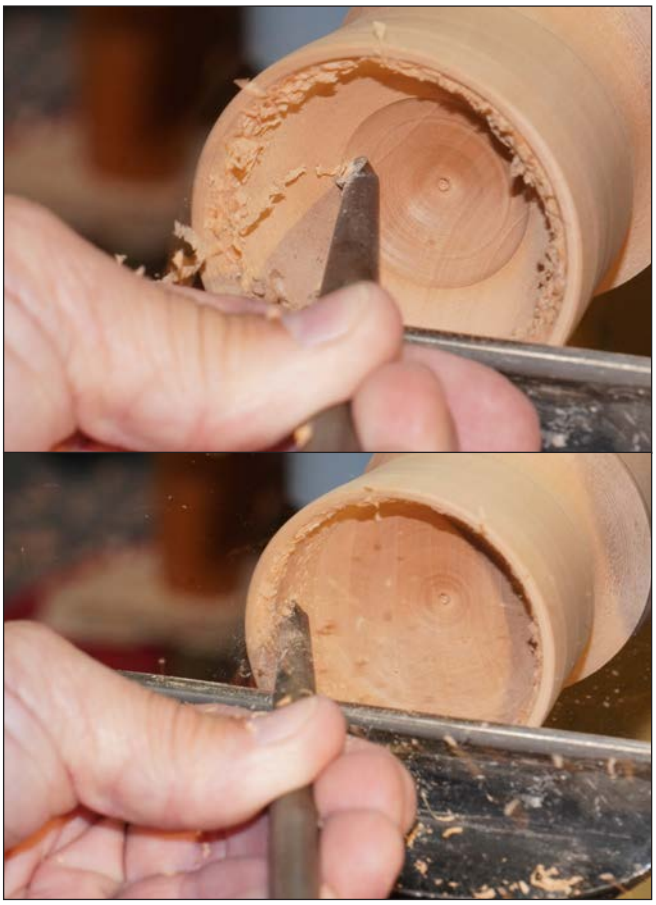
I use the angled cutter held flat like a scraper to hollow the inside (**Photo 5**). You can push it straight in a little bit at a time starting at the center. Cut in about 1/2" (13mm), then move over and do the same thing again, working your way toward the outer edge. Do this until you have the interior shape close to size. I like to make the edge of the rim fairly thin and let

2. *Using a drill chuck in the tailstock, drill a 1"-deep hole in the end of your trued blank. This is a depth guide, so dimension is not critical.*

3. *Mark off measurements for the bell-shaped bottom, the cove, and the handle.*

4. *Begin shaping the outside. Establishing the profile of the bottom will help guide your hollowing cuts.*

5. *Hollow the interior using a series of straight-in push cuts, working your way from the center outward.*



6, 7. *I use the flat cutter presented at about 45° to the wood, rotating to near-vertical as I approach the sidewall. This shear-scraping cut leaves a refined surface that will need little sanding.*

it get thicker as the curve progresses inward. Leaving the bottom concave makes the next step easier to execute.

I switch to the flat cutter to clean up the inside. Never use this tool flat like a scraper or it will bite you. Tilt the cutter so the cupped face is angled about 45 degrees to the left and use the outside as a bevel. I start by touching the heel of the bevel to the wood with the handle to the right of center, then gently bring the handle back toward myself until the tool edge engages and starts to cut. I simply pull the tool through an arc toward the rim while moving the handle to create the concave area (**Photo 6**).

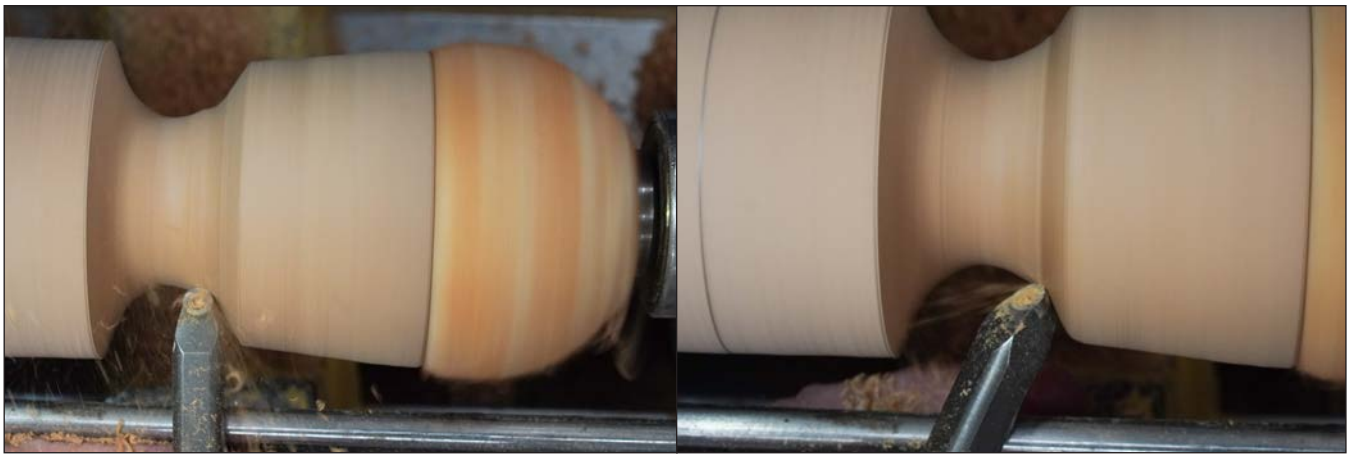
When approaching the sidewall, rotate the cutter so that it's closer to vertical and the cup faces the wall. The bottom of the cutter now becomes a shear-scraper, and you pull it out toward the rim, cleaning up all the tool marks (**Photo 7**). This shear-scraping action is very safe and lets you thin the rim as much as you like. Done properly, this tool presentation leaves a surface that almost doesn't need sanding. Remember, you will need to refine the shape of the outside, so don't cut the wall too thin.

Outside shaping

Now we go to the outside and use the angled cutter to rough out the shape. Use it as a scraper until you approach your desired shape (**Photo 8**). The big advantage of the angled cutter is that it functions as a scraper without catching. This tilt means the outside bevel of the nose is almost at the exact same angle as a standard bowl gouge nose (**Photo 9**). This lets you use the tool in a bevel–rubbing push cut to get a controlled, clean cut. I use the tool as a scraper to rough-shape and then use the push cut to clean up the outside.

Shape the knob

To cut the cove below the handle knob, start at the high point and push toward the low point. I use the angled cutter as a scraper to get the approximate shape, and then starting at the



8, 9. *The author shapes the exterior using the angled cutter as a scraper and refines the cut by rubbing the bevel of the same cutter. Note the cut proceeds downhill, from larger-to-smaller diameters.*

10. *Shape the knob, continuing to work with the angled cutter as a scraper, then as a shear-scraper to refine the surface. Leave enough waste wood to support the blank through the sanding step.*

11. *With the shape refined, sand the form and part it off.*

high point, use a bevel-rubbing push cut down to the bottom of the cove to clean up tearout from the scraping cut. Then I start shaping the top of the knob (**Photo 10**). I leave enough waste wood to sand without fear of breaking the piece off the lathe. After sanding, I reduce the waste and part-off, leaving only a small area to be turned away when the biscuit cutter is reverse-chucked for completion (**Photo 11**).

Jam chuck

Use a scrap or two of wood to make a jam chuck. I find a piece of scrap that will fit in my four-jaw chuck, glue it onto the center of a 2×4 scrap, and put this assembly in my chuck after the glue has dried (**Photo 12**). I want the jam chuck to be larger than the biscuit cutter. I measure carefully with my calipers and transfer the diameter of the biscuit cutter to the face of the jam chuck (**Photo 13**). I carefully turn a rebate for the biscuit cutter. You want a tight fit, so take your time and sneak up on the right dimension. I use the parting tool for this task.

Complete the exterior

With the jam chuck complete, you can now turn and finish the top of the knob (**Photo 14**). I normally tell people to "glide" the bevel. For most cuts, you want as little pressure as

12, 13. *Make a jam chuck by gluing together two pieces of scrap material—the smaller square fits in the four-jaw chuck. Once the glue has dried, mount the chuck and transfer the outer diameter of the biscuit cutter to the face of the chuck. Make sure only the left side of the caliper touches the rotating blank or you will get a nasty catch.*

14. *With the biscuit cutter reversed in the jam chuck, take light cuts to finish turning the top of the knob.*

15. *Drill an air hole to allow the cut dough to slide out of the biscuit cutter.*

possible on the bevel. However, when cutting the waste off the top using a jam chuck, you want more pressure on the bevel and almost no pressure going forward with the cut. This will help keep you from pulling the biscuit cutter out of the jam chuck. Take your time and take small cuts with each pass. When you get it shaped, sand this area.

Air hole

You need to drill a hole for air to escape so the biscuit you cut will fall out after it's stamped. I do this with a hand drill. About 3/16" (5mm) is sufficient (**Photo 15**).

Apply finish

I like to use wipe-on poly as a finish because it's durable and food safe once it's cured. Another good choice is walnut oil for wood finishing. I buff these to "finish the finish" and leave a soft feel that customers seem to appreciate (**Photo 16**).

Retired photographer John Lucas has been working in wood for more than 35 years and also dabbles in metalworking. He enjoys modifying machines, making tools, and sharing his knowledge through written articles and videos. He has taught classes at John C. Campbell Folk School, Arrowmont, and The Appalachian Center for Craft.

16. *The completed biscuit cutter, brought to a high luster through careful sanding, a well applied finish, and buffing after the finish has cured.*

EXPLORE!

Want to learn more about buffing? Use the AAW's Explore! tool, or click on the boxes, or scan the QR codes.

tiny.cc/BuffPerfect

tiny.cc/BuffingVideo

Though small, this project lends itself to customizing. Note the texturing on the collection below made by Mike Zinzer.

Mike Zinzer

Navigating Carbide Tool Choices

By Mark F. Palma

Each of us has likely purchased what we thought was the perfect tool, only to later put it through its paces to find it didn't live up to our expectations. At the beginning of our turning journey, with so many gleaming tools to choose from, we are particularly susceptible to buying tools whose best attributes turn out to be that they are bright and shiny. I turn a lot with carbide tools and have also spent a lot of time at tradeshows talking to their manufacturers. I hope that in sharing what I've learned, I may help you make informed decisions to meet your carbide tool needs.

I reached out to four manufacturers for this article: Carter Products (the Carter Axe and Hybrid lines), Easy Wood Tools, Hunter Tools, and Woodpeckers (maker of the Ultra-Shear line). I asked each manufacturer the same five questions, and here is what I learned.

Why purchase a carbide tool at all?

The responses from each manufacturer resonated with some common themes—ease of use (for both new turners and turners who want to reduce the wear on their bodies), lack of sharpening (with the associated expense of sharpening equipment), long cutter life (which results in more time at the lathe), and safety.

"For beginners, the answer is simple: they learn to turn without spending time and money getting equipped for and learning to sharpen. For the more advanced turner, the right carbide insert tool can deliver a superior surface finish in many species of wood and tricky synthetic materials. The experienced turner is always chasing the surface finish that needs the least amount of finish work and [carbide tools] are another 'club in the bag' that can get you there." —Woodpeckers

"It's important for all turners to use both standard and carbide tools, but carbide tools just make turning more approachable for the beginner. We want to encourage novice turners to turn, as that's how we grow our woodturning community. Carbide insert tools give the turner one more tool in their arsenal to create the vision the artist has in their mind." —Carter Products

Ultra-Shear *tools come in three sizes, each offering square, round, and diamond cutters. The tools have a unique shaft design with a flat bottom and 45-degree sides designed to permit tipping the tool's orientation to the wood to control shear-scraping (hence the name).*

Which tool should be a turner's first purchase?

The range of responses from the manufacturers varied widely on this question. Below are three divergent views.

"Long-time turners will generally agree that you can turn small stuff with big tools easier than you can turn big stuff with little tools. Larger tools are in general more forgiving and easier to control. Unless you are never going to turn anything bigger than an ink pen, start with full-sized tools." —Woodpeckers

"As with all turning tools, there is not one carbide tool that is best for everything. If we had to recommend a first carbide tool, it would be our Axe [or Hybrid] Round tool, followed by the Axe [or Hybrid] Square. I'd recommend a size based on anticipated work and lathe size." —Carter Products

"My first questions for a potential customer are to gauge experience, lathe size, what they like to turn, and what tools they currently use. For example, if they are talking about turning Christmas ornaments, small vases, or sugar bowls, then there is no need to talk about larger tools. Likewise, if they are a new or occasional turner who has not learned to use a gouge, I would suggest an easier to use tool." —Hunter Tools

Each manufacturer offers guides on their websites to help you choose tools sized to fit the type of work you envision completing. While many of us dream of turning 20" (50cm) platters, our reality may be more like blanks in the 7" (18cm) range. Using a full-sized tool on a midi lathe can work, but it is hard to maneuver a long handle around a tailstock and lathe bed. On the other hand, hanging a small tool more than an inch or two off the toolrest can generate tremendous torque and a dangerous situation.

What about carbide insert sharpness?

I have heard many traditional-tool turners dismiss carbide insert tools based on concerns embodied in this question. I asked the manufacturers to explain the longevity and sharpness of carbide insert tools.

"There are many variables that affect sharpness, including whether your materials are synthetic or natural, the species of wood and how green it is, how much time you're turning, and how aggressively you cut. As a rule, a carbide edge lasts ten times longer than a high-speed steel (HSS) edge. With carbide, you simply rotate the cutter to a new edge and get back to turning. With HSS, you spend time sharpening on a grinder." —Easy Wood Tools

Hunter Tools. *The Hunter tool line is broad with many specialty tools. Only Hunter secures its cutters with a Torx screw and flagged wrench, which offers less chance of stripping off the screw head in the tool. As the cup style cutters cut so aggressively, beware that bigger may not be better. Many of the tools have built-in geometry so that when the tool is placed level on the toolrest with the cutting tip at center height, the cutter is presented at the sweet spot to the work.*

"Depending on the user and the type of wood, a carbide insert can last twenty-five to thirty times longer than a traditional tool, if properly maintained and rotated. Some users claim they go an entire year on one carbide insert." —Hunter Tools

"Edge life is dependent on material being cut and its condition. Generally, carbide inserts outlast HSS edges by at least ten to one. By rotating the insert to a fresh edge, that means you would sharpen a steel tool at least forty times before you've worn out your first insert." —Woodpeckers

I've done some subjective tests of cutter life in my shop. With a carbide insert tool used to remove bark, rough out blanks, and turn wood with high silica content, the cutter will wear noticeably and even round-off after a few large vessels. In fairness, that is an extreme torture test. I would have sharpened a traditional cutter more than thirty times to make the same progress.

In another test I used one manufacturer's tool to turn forty, four-inch diameter red oak bowls. I started with a new cutter and exclusively used that one tool to take the bowl from rough cut off the bandsaw through final shaping. No other tool was used on the bowls and I did not rotate the cutter. At the conclusion of making forty bowls, I was starting to see tearout. Had I followed the manufacturer's advice and rotated the cutter, I could easily have turned more than 100 small bowls with that one insert.

To evaluate the edge of the cutters, I compared a new cutter from each manufacturer against some generic cutters purchased from the internet. Although they looked superficially similar, close study showed that the quality of the original manufacturers' cutters far exceeded the generic cutters. Ultra-Shear and Hunter cutters have a remarkable mirror finish. Axe, Easy Wood Tools, and Ultra-Shear are also marked on the face so that you have a reference for rotation purposes.

In my shop, a correctly and freshly sharpened traditional turning tool is the standard for sharpness and nothing surpasses it—for about five minutes of turning. All four of the manufacturers' carbide cutters, when new, replicated the cutting action and produced comparable shavings to a traditional tool after those first five minutes. You can get an exceptionally sharp edge for a short period of time on a conventional turning tool. But few of us stop and sharpen every five minutes. After five minutes at the lathe, because of the wear resistance of a carbide edge, any of the four carbide insert tools retained a superior edge to my traditional turning tool.

You can purchase generic inserts for your carbide tools, but the ones I tried got so hot that I couldn't touch them, and the torn grain they produced was a terrible sight. Testing the edge with an unscientific flick of my

thumb, it seemed that the generic cutters were comparable in sharpness to the old carbide inserts in the bottom of my drawer that I removed from use years ago. Adding the cost of a fancy latte to what I paid for them, I could have purchased a replacement cutter from any of these four manufacturers and been back to a new tool!

How do you tell a dull carbide insert?

A challenge with carbide inserts is that the edge wears down so slowly that you forget how sharp the insert used to be and how well the tool cut when it was new. Also, more than one turner will go "around the world" with their inserts many more times than the manufacturer recommends. You end up looking for the least dull spot with this practice, not a factory sharp edge. These are replaceable carbide inserts, not permanent ones.

"My recommendation is at the end of the turning session, always randomly rotate the cutter. When the tool starts to pull up grain, it is time to replace the cutter. Another indication that the cutter needs replacement is the cutting action produces small chips rather than curls." —Hunter Tools

"The two most common characteristics of a dull cutter are chatter and over-heating. Chatter is fairly easy to detect and heat is generated by excess pressure. If you're needing to apply more and more pressure to achieve the same cutting action as before, regardless of chatter, your bit is probably heating up a lot more, hence it's dull or starting to dull." —Carter Products

Easy Wood Tools *offers six lines of tools with three different shapes in each. All feature a square shaft and a proprietary two-step handle (many color coded) that offers two holding points.*

Can you resharpen carbide inserts?

A sharp edge is the intersection of two sides meeting at a point. Most turners who claim to sharpen carbide inserts are only honing one edge, rather than sharpening both faces. Worse yet, some of the approaches suggested by turners to hone a carbide insert are dangerous. Trying to hold a small carbide insert up to a grinding wheel is not worth the risk. Buy a new insert and be frugal in some other area of the hobby. Do not put your personal safety at risk to try to save buying something that has given you a year's service life.

"There is no consumer–available honing equipment that can duplicate the surface finish on Ultra–Shear inserts. It's a false economy to try to sharpen carbide by hand. Even those who advocate honing carbide inserts will admit that a hand–honed insert is never as sharp as a new one. If it's Sunday afternoon and the store is closed, it might get you by, but having a new sharp insert in the shop drawer is a better plan." —Woodpeckers

"I do not recommend any honing, sharpening, or any edge enhancement. Many turners try to touch up the carbide but no one restores the original factory edge. In addition, the cutter is held in a carefully machined pocket of the shaft. This helps provide secure lock–up of the cutter and it is counterproductive to reduce the diameter of the cutter." —Hunter Tools

"Contrary to popular belief, carbide bits can actually be sharpened for a limited number of times. I'm purely speaking about flat bits, not cupped or alternate rake bits, although with enough

Carter Products *offers six tools, plus one specialty tool. The handles are three-sided so that you know how the tip of the tool is oriented relative to the handle position. Like Ultra-Shear, the tool can be rolled to a shear-scraping position. The stainless steel shaft is also designed for shear-scraping but uses rounded areas to allow you to vary your shear-scraping angle to find the sweet spot for the cut. The ferules are color coded according to the insert shape, allowing tool identification at a glance.*

persistence I'm sure even those could be sharpened. With flat bits, all you need is a diamond stone of 600 to 1000 grit and oil or lapping fluid. As carbide is structurally strong, only a diamond stone will allow you to sharpen your bits. There are a few videos and articles on how to do this so I won't go into the process, but just say it is possible. The simplest way to look at this though is not if you can, but merely if you want to. The cost of most replacement bits is so economical that simply replacing them as needed is the easiest and best option." —Carter Products

"We prefer you replace your cutters instead of sharpening them." —Easy Wood Tools

Parting thoughts

"Have fun with carbide turning tools. They are like any other woodturning tool and require practice to get the best results. The woodturning hobby is a vortex that you get sucked into and there is no escape. Enjoy your hobby, keep your tools sharp, and turn, turn, turn." —Hunter Tools

"The beauty of carbide tools is their ease of use, thus there are different tips and techniques based on skill level. For the novice turner, the most basic tip for success is always make sure you keep the tool level with the midpoint of your work or slightly below and always keep the tool flat. Try not to hang too much of the tool bar off the toolrest. As for intermediate to advanced turners, we suggest giving the skew feature a try when you're finishing a piece as it really does create a perfectly smooth finish. To do this, just rotate the tool off the flat onto the bevel and bring it onto the surface to be smoothed, making light consistent passes across the surface." —Carter Products

"My advice to anyone...beginner or expert...is to not get bogged down in the often-quoted advice to always keep the tool flat and level. A slight down angle to the tool can improve surface finish. We suggest that rather than buying an entirely new set of negative rake inserts, you can create your own negative rake by slightly tilting the tool down. There's no right or wrong way to use Ultra-Shear tools. Flat and level works, but so does riding the bevel, shear-scraping, and slight down-angle." —Woodpeckers

Each manufacturer was kind enough to let me sample their tools and put them through the paces in my own shop. I will say all are high-quality tools. I also compared them against a generic carbide insert tool made by a hobbyist and noted marked differences in quality. Some turners think if you tap a bar of steel with a screw thread and mount a carbide cutter, and add a handle on the correct end, then you have matched the tool offerings from these companies. I have yet to see a shopmade version that rivals any of the offerings from these manufacturers.

Mark Palma is a cook, woodturner, educator, prolific writer, and reformed attorney in Cameron, WI.

❐

Bradford Pear

By Dave Schell

I'll admit it. I have a thing for fruitwoods. I really enjoy turning them, although I'm sometimes frustrated by the cracks that develop as they dry. Apple is one of my favorites, and I love cherry because of the great finish it takes and the possibility of high figure, interesting grain patterns, and color variation. Fruitwoods sometimes smell fragrant, even evoking their fruit as you turn the timber. Not having turned Bradford pear (*Pyrus calleryana*) before researching this article, I was expecting to enjoy it as much as apple or cherry.

Bradford pear is often planted as an ornamental street tree because of the attractive white spring flowers. It is also a common landscaping tree. The flowers have a unique odor which many people find unpleasant. Their diminutive fruit feeds birds throughout the year, but the fruit also stains sidewalks, discouraging some from planting the tree at all.

The tree is fast growing and short–lived, usually living no more than a few decades. The rapid growth produces wide growth rings, though the grain remains fine and uniform, taking detail well. The trees are weak as branches tend to grow from one central crown at the top of the trunk, making them susceptible to storm damage. And that is how a few pieces of Bradford pear made their way to my workshop! My town removed a tree that had several broken branches and I was able to grab a few pieces of the trunk before they went to the compost facility.

Bradford pear can grow to 30–50 feet (9m–15m), but if planted in a town, they are usually trimmed to a lower height. Trunks of pruned Bradford pear in a municipal setting may have smaller diameters. In some areas, the tree is considered an invasive species (birds readily spread the seeds). Because of the frequent limb breakage, municipalities are starting to remove them and replace them with lower maintenance options.

The bark is grey and undistinctive, being similar in appearance to maple and many other common city trees (**Photo 1**). The wood varies from a cream color to a light orange or pink tint, and a small amount of dark heartwood may be present (**Photo 2**). The grain is generally straight. Like many fruitwoods, Bradford pear checks quickly. In contrast to many fruitwoods, there is no distinct odor during cutting or turning.

The wood turned easily and I didn't experience any catches or tearout. The wood was similar in appearance to maple and with the straight grain, not overly

1. *The bark of Bradford pear looks like many other species of common hardwoods.*

2. *Grain is fine but plain with little figure. This makes the wood well suited to detail and decoration.*

exciting when finished. It sanded and took an oil finish well. For the next piece I turn, I will burn the edge or carve it to add some interest. It's not a wood I would choose over other fruitwoods to turn.

Instead of using this wood for bowls, I would use it for smaller spindle projects, like wands, vases, or ornamental Christmas trees. The straight grain would work well for those products. While the wood does make a nice bowl, I am much more likely to select other more figured or highly colored species to turn.

While I was not impressed by my experience, other turners seek out Bradford pear for a variety of reasons. With its ability to take fine details, it is a good species for embellishing with textures or carving. It is acceptable for thread-chasing, though other species such as boxwood or African blackwood are better (these other species are expensive, so Bradford pear would make an inexpensive practice material for threading). It is good for natural-edged bowls as it tends to retain its bark, and its plain appearance offers a clean palette for pyrography. Interestingly, the wood oxidizes as it ages to a much more pleasing warm orange-brown, somewhat reminiscent of freshly finished cherry.

Bradford pear is also used for other woodworking projects and was once used frequently for hand planes. It is used as smoking wood for barbeques (great with pork and fish). The straight grain makes it sought after for woodwind instruments and furniture veneer.

This wood is a good choice for beginning woodturners because it is forgiving to turn. I haven't seen Bradford pear turning blanks in specialty woodstores, but it can be found online. Your best chance to find some free wood would be to contact your local municipality, arborist, or landscaping company if your community features some of these trees along its streets.

Dave Schell lives in Mount Joy, PA. View his work online at: imakebowls.com, facebook.com/imakebowls or instagram.com/imakebowls.

EXPLORE!

Use the AAW's Explore! feature to learn more about Bradford pear. To see Mike Peace's video tour of the species click the blue box or scan the QR code to find out more.

tiny.cc/bradfordpear

Cocktail and Small Food Smoker

by Larry Sefton

My son texted me about a rush Christmas gift for an eclectic friend. He wanted to know if I could make a cocktail smoker because all the commercial suppliers were sold out.

I had never heard of such a contraption, but my son sent a link (https://foghatsmoker.com/) and helped me visualize the design and understand the smoker's purpose. In retrospect, I realize I was set up as my son knew I could not pass up this opportunity. He would end up with unique gifts for friends at no cost to himself (including some wood chips from my shop as smoking wood), and I would have fun with the designing and making.

I was already in my shop when I read his text so, in a hurry to prove my skill, I went straight to the wood storage shelves. Version 1.0 was a real flop, but it sent me to YouTube, where I found a video of someone making a cocktail using a cocktail smoker. Understanding how the device was to function made the task of backwards engineering its design much easier; in hindsight, this is where I should have started.

Version 2.0 was a success but there was still room for improvement. A few days later, Amazon delivered a sink strainer, which would solve the problem of the wood chips being pushed out by the torch's flame, and back to the shop I went. Version 3.0 was a complete success. Like any proud maker-father, I sent my son a photo and a video clip of the finished smoker. His reply came back "Awesome! Can you make two more as Christmas presents?"

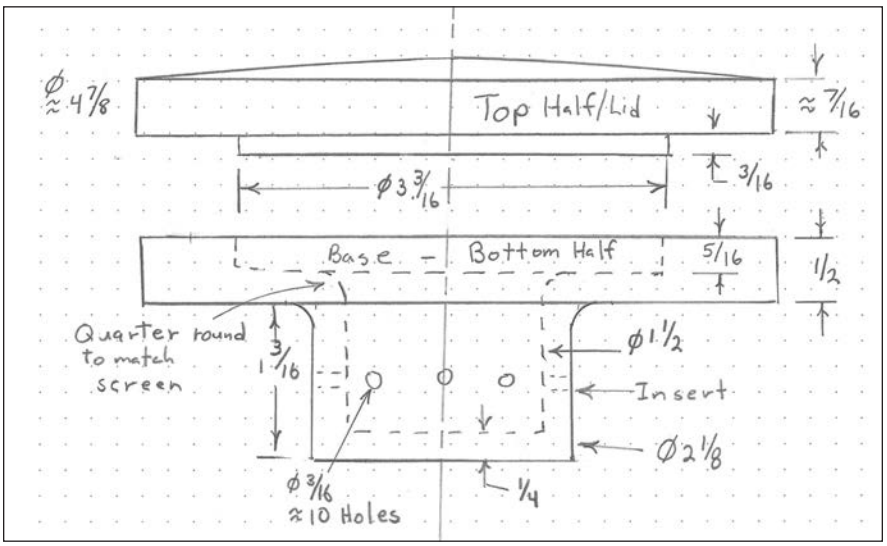
Good old dad—of course I could.

This smoker project is easy to make because it is forgiving in size, tolerances, types of wood, and final surface finish. Best of all, when the project is completed, you can impress others and enjoy beverages and food with new flavors. Be ready—your friends will want one.

Materials

You'll need the following three items for this project:

- **Two seasoned hardwood disks** 1-3/4" x 5" (45mm x 13cm) in diameter. Avoid soft or spalted wood.
- **One wire mesh stainless-steel sink strainer** to hold the wood chips in place while they're ignited with a kitchen torch. I used a Besseek brand "Heavy-Duty Stainless-Steel Slop Basket Filter Trap 2.75" top and 1" mesh metal sink strainer." I do not recommend the smaller size or the plated wire strainer that are lower cost. I will refer to this strainer as a "stainless-steel screen" in this article.
- **Double-sided tape.** I use Roll Grip Tape DFTG2 (www.golfworks.com/). Other double–sided tapes work but this is my favorite because it is not thick and gummy.



1. *A project of this type is not about designing on the fly, but thoughtfully adhering to a set of key measurements. A sketch will capture your design concepts and any critical tolerances.*

Sketch a design

I recommend you make your own sketch to best understand the project design (**Photo 1**). Measure the stainless-steel screen and develop your design around it. It is also a good idea to measure a standard beverage glass. The smoker comprises two turned pieces, a lid and base. The stainless-steel screen fits into the base and sits over the wood chips. The lid prevents the smoke from escaping. Plan for a minimum of 1/16" (2mm) clearance between the stainless-steel screen and the bottom of the lid.

Cut blanks

Using a compass, scribe a 5"-diameter circle on each disk and mark the centers. Use a bandsaw to cut the blanks slightly larger than the circles (**Photo 2**). The finished components will be about 4-3/4" to 4-7/8" (12cm) in diameter.

I use 1-3/4"-thick lumber for both the lid and the base. Both are cut from the same board for a

2. *Using a bandsaw, cut the two blanks slightly larger than 5" in diameter.*

Bandsaw safety tip

When I cut small blanks on a bandsaw, I use a quick one–hand bar clamp to hold the wood and keep my hands away from the blade (shown in Photo 2). It may look cumbersome, but after a short learning curve I found I am faster and safer than just holding the blank by hand.

Tailstock support

The tailstock support in Photo 3 uses a live center that allows a 3/8" diameter shaft to be inserted into it. The steel shaft is inserted into the wood support, allowing the non-marking support to be removed when not in use and a standard point to be inserted into the live center.

good color and grain match, although I am not overly concerned about matching grain because someone will literally be building a fire inside this box.

Make the lid

Using a faceplate with a wood block attached, mount the lid blank using double-sided tape, using the flat and smooth surfaces of the turning blank and the faceplate to bond with the tape. Position the tailstock for additional support and to apply pressure to ensure the tape adheres (**Photo 3**). The wood face plate will make it is easy to remove any old tape by cutting away the residue.

Using a 3/8" (10mm) deep fluted gouge, true the outside of the form, leaving the diameter a little larger than the finished size (**Photo 4**). There is no need for perfection on this surface because it will be sized and finished in a later step.

Turn a 3-3/16" (8cm) diameter, 3/16"-long spigot—this is the underside or bottom of the smoker top (**Photo 5**).

Remove the tailstock support and clean up the underside of the lid with a 3/8" spindle or detail gouge (**Photo 6**). Hand- or power-sand and complete the underside of the lid, if needed.

3. *Bring the tailstock up for support. The author uses a shopmade soft tip for non-marking contact.*

4. *True the side of the blank with a deep-fluted gouge.*

5. *Turn a short spigot on the bottom of the lid. This will confirm the lid is seated in place when the smoker is in use.*

Add any desired details to the underside, but don't get carried away as this is a utilitarian item that will be exposed to fire.

Remove the lid from the faceplate, removing all tape from the lid and the wood faceplate.

6. *Retract the tailstock and turn away the remaining material that had been pinned under the live center.*

7. *With the base mounted, make a paring cut with a parting tool to form a spigot on the tailstock side to fit in your chuck jaws.*

8. *Mount the base's spigot in a four-jaw chuck and true the side of the blank.*

Complete the bottom half

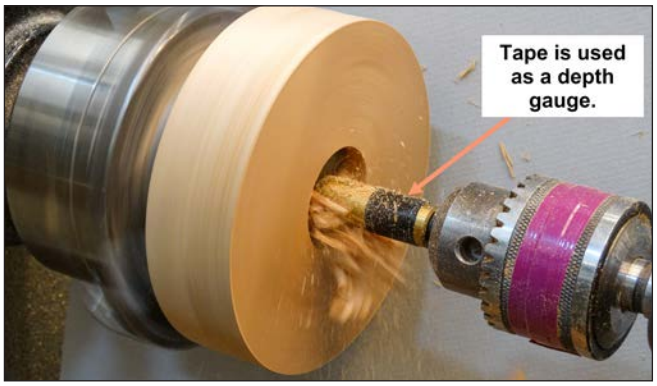
Mount the bottom-half blank to the wood faceplate with double-sided tape, using the flat smooth side of the blank. Don't try to re-use the tape from the earlier step; it's intended to be a single-use product. Use the tailstock for support.

Use a 1/4" (6mm) parting tool to create a 2-1/4" - 3" (6cm - 7cm) diameter spigot (**Photo 7**). Confirm that the spigot will fit in your contracting chuck jaws while also retaining enough material to accommodate the final dimensions of your spigot (2-1/8" (5cm), in my design).

Remove the turning from the faceplate, remove the tape, and remount the base in a four-jaw chuck by clamping the spigot you just created. With your gouge, true the blank to a generous 5" (final sizing will happen later) (**Photo 8**).

Using a 1-1/2" Forstner bit held in a Morse taper drill chuck, drill a flat-bottom hole about 1/8" (3mm) deeper than the height of the stainless-steel screen, plus the clearance needed for the lid's spigot (**Photo 9**).

Using a 1/2" (13mm) square profile scraper, cut a 5/16" (10mm) recess that matches the lid's spigot diameter (**Photo 10**). This recess's depth equals the lid's spigot height plus the clearance needed for the stainless-steel screen. If you use a sharp scraper with good tool control,



9. *Use a Forstner-style bit to drill a hole in the base equal to the depth of your screen, plus 1/8".*

10. *With a square scraper, cut a recess to accept the spigot on the bottom of the lid.*

11. *Use light shearing cuts to form a transition between the flat recess and the depth hole. This provides clearance for the curve of the stainless-steel screen.*

12. *Check the fit of the screen and the lid, removing any material that is interfering. You may also want to make the rim around the base's recess slightly concave.*

there will be no need for sanding. Carefully work up to the lid fit. The final fit should be slightly loose.

Turn a convex radius to transition between the flat recess and the 1-1/2" drilled hole (**Photo 11**). The curve should match the stainless-steel screen's curve. Sand as needed.

Clean up the mating surface of the base that fits against the lid's rim and sand as needed. To get a good-looking outer mating surface, you may need to make this surface slightly tapered or concave to accommodate imperfections on the lid's rim.

Test fit the lid with the stainless-steel screen in place and adjust as needed (**Photo 12**).

Complete the lid

Using small pieces of double-sided tape, secure the lid into the base using the tailstock with the non-marring support. Keep the tape well within the finished diameter because the tape does not play well with cutting tools and sandpaper.

Approach the assembled lid and base as a single blank and, using a deep-fluted gouge, turn both the bottom and top to the final outside diameter (**Photo 13**). Sharpen your gouge and take a finishing cut. Sand to remove sharp edges and tool marks. Let your hands inform your sanding process—your sense of touch will tell you more about the form than your eyesight.

13. *Tape the lid to the base and, using tailstock support, true the combined outer rims.*

Complete the top of the lid to whatever design you like (flat, convex, etc.), leaving the tailstock in place for support as long as you can. In this case, the lid is flat and I am using a three-point tool to create three embellishment grooves (**Photo 14**). I also burned the grooves using a Formica chip. Finish sanding, remove the lid and any tape, and set the lid aside.

14. *Decorate the top of the lid. The author uses a three-point tool to cut grooves.*

15. *With the base reversed in the chuck, transfer the thickness of the lid to the top of the base.*

16. *The author added more embellishments with the three-point tool.*

Turn the insert

The insert is the section of the base that sits inside your glass or jar. Remove the base from the chuck, turn the blank around and expand the chuck jaws into the recess of what is now the inside of the bottom half. Draw a reference line (on the chuck end) to indicate the location and thickness of the 1/2" rim (**Photo 15**).

Turn away the excess wood to create a 2-1/8" diameter x 1-3/16" (3cm) long spigot or insert below the 1/2" rim. I used my 1/4" parting tool to form the spigot. Then with a deep-fluted gouge and a detail gouge, I turned the insert's exterior bottom surface, maintaining a 1/4" wall thickness (**Photo 16**). Take care not to break into the drilled chamber.

You can embellish the insert at this stage or go straight to final sanding. Again I added lines with the three-point tool and burned the lines in with a piece of thinned Formica.

Formica chip

A Formica chip is an alternative to using a wire to burn or burnish accent lines. You can usually get a sample Formica chip from a building supply store for nothing more than the cost of asking.

I start by cutting a groove in my blank with a point tool. With the lathe running, I hold the edge of the Formica in the groove until the heat of friction burns in a line. For wide lines I use original thickness Formica. For fine lines I reduce the thickness along one edge using an abrasive grinder or drum sander.

Smoke holes

You will need to drill 10 to 12 holes evenly spaced around the spigot, penetrating through to the inside hollow area that will hold ignited wood chips. You could eyeball the locations and do this by hand and still have a functional item, but I am going for a more systematic look. I use a 3/16" bit and my drill lying on a platform clamped in my banjo that replaces my toolrest (**Photo 17**). I use the indexing feature on my lathe to distribute the holes evenly around the spigot insert.

17. *An adjustable-height shopmade platform aligns the drill bit with the axis of rotation.*

18. *A kitchen torch and a few wood chips will have you in the business of smoking drinks and small quantities of food.*

Finishing

Use a utilitarian hardening oil finish such as walnut oil. A wax or a surface film finish would be affected by heat or contact with alcohol and should be avoided. Do not over-do the finishing oil as heat will make any excess uncured oil bubble back out of the wood the first couple of times your smoker is used. This is to be expected, so just warn the recipient and let them know the remedy is to wipe away any excess oil. The smoker could also be left unfinished.

In use

Place your smoker base on a glass or a jar. Place a few fine wood chips of your choice in the bottom of the insert section. Place the stainless-steel screen on top of the chips. Using a kitchen torch, heat the chips to the point of ignition and then place the lid on top (**Photo 18**). You will see the smoke escaping through the drilled holes in the insert into the glass.

As for smoking cheese and other food, put small pieces in a jar (I use a quart canning jar) and use the smoker as above. I have also smoked popcorn in a bowl using an aluminum foil cover with a hole for the smoker.

There are hundreds of recipes and videos online for making a variety of smoked cocktails—just search for "smoked cocktail recipe."

Safety tips

This smoker will create pungent smoke, so use it outdoors or under an outside–vented cooking hood.

Before too many cocktails are made and consumed, choose a designated operator of the smoker. Use of this project poses a potential fire hazard. Take care to avoid accidental ignition of the smoker unit itself and of flammable alcohols used in cocktail recipes. Be ready to extinguish unexpected fires.

As a woodturner, you now have another reason to save fruitwood, hickory, or oak shavings. Small quantities of flavored wood chips can also be purchased online from a variety of sources. You may also have a local retailer that sells BBQ smokers along with flavored wood chips. When you go, be sure to take your smoker with you because the store owner has likely never seen a smoker of this design.

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The smoker with and without the essential screen. With the screen removed, note the convex transition into the bottom recess, with a profile that accommodates the curvature of the screen.

The smoker is useful for small quantities of food items, in this case, cheese cubes on skewers so the smoke can reach all sides.

Basic Bowl Design

by Betty Scarpino

Three basic elements define bowls: rim, body, and base

Rims

From almost nonexistent to expansive, bowl rims greet the eye and meet the fingers. They delineate the transition from the inside body of a bowl to its outside form. If a rim is wide, its surface provides an opportunity for embellishment or for showing off interesting grain patterns.

Charles E. "Ricc" Havens, 2020, Maple, acrylic paint, 10" dia. *This shallow bowl with its wide rim is close to being a platter, but its depth still defines it as a bowl. The wide rim and plain grain pair well with this colorful design.*

Far too often, woodturners fail to consciously consider the design of bowl rims. A rim can be more than just a necessary element. A well-designed rim enhances the overall look of a bowl. Wide rims make it easy to pick up a bowl. Thin-rimmed bowls are usually picked up by their bodies, but the rim design is still important.

Whether a rim is wide or narrow, consider its slope. For instance, a rim that slopes slightly inward will lure the viewer's eye into the bowl.

Body (Sides)

The inside cavity of a bowl is defined by the shape of its inside walls, most often in tandem with the outside form. However, the inside and outside shapes of a bowl's body can be designed independently from each other.

The form of a bowl's body will also help determine what its base (bottom) will look like. For instance, the base of a straight-sided bowl will most likely require a flat, wide bottom.

Base/Bottom

Bowls usually meet tables and shelves with their bases. Bases can range from completely round (indistinguishable) to widely obvious. For most beginners, bowl bottoms tend to be dictated by the method used to attach the wood to the lathe. With time and attention to design considerations, bowl bottoms can be splendid aspects of the overall design.

Design and function

When designing your next bowl, consciously consider each of the above elements—there

Paul Winer, 2020, Spalted maple, 3.5" × 13.5". *This form works well to showcase the complex designs in the spalted maple. The bowl's base is well-considered and sized ideally for the bowl form.*

are an almost unlimited variety of options and combinations from which to select. The key to designing a pleasing wooden bowl is to select options within each category that go well together. The selections you make will usually depend on the purpose you have in mind for your bowl. Be intentional with designing each element.

Salad bowls

Donna Stewart, 2020, Manitoba maple (boxelder), 4" × 7.5" dia. *This calabash form is ideal for holding food. Notice the lovely curve of the body, which flows smoothly into the base. Curves tend to be more pleasing than straight sides.*

If you want to turn a large bowl for serving salad, think about what constitutes *useful*. I would want a fairly wide bottom so that when I'm digging into a mess of greens with servers, the bowl will remain stable and not tip over. I prefer a rounded body for salad bowls—that shape helps move bits and pieces to the center for easy access.

Popcorn bowls

Depending on how you pop kernels, you might need a size that will accommodate an entire bag of popcorn. For individual snacking, something smaller might suffice. I like to have the bowl sit on my lap, so a rounded bottom feels comfortable. For ice cream (when not eating directly out of the carton), I like to hold a bowl in one hand, a spoon in the other. For that, a rounded bottom is ideal.

Chris Ramsey, 2020, Red oak, 10" × 16" dia. *This full-bodied bowl form can be a bit challenging to turn using bowl gouges—hollowing tools might be needed.*

Decorative bowls

Most natural–edge bowls are considered "decorative"—those bark edges tend to be fragile. Bowls with wide rims and plain grain are ideal for applying designs such as turned beads, pyrography, texturing, painting, and carving. Of course, bowls can be decorative as well as functional.

Before turning your next bowl, consider each element, then make the shavings fly.

Betty J. Scarpino lives in Indianapolis. Additional articles and her artwork can be seen on her website, bettyscarpino.com, or on her Instagram feed, @bettyscarpino.

Betty Scarpino, 2000, Maple, 12" diameter, milk-painted eggs. *Bowls can have small inside dimensions and exaggerated body sizes. A large form with a tiny basin increases the perceived value of whatever treasure occupies the small space.* ❐

Safety Quiz

Turn to the back cover and challenge your skills before checking the answers below.

1. Using only eye protection leaves the forehead unguarded.
2. Faceshield is safely out of harm's way, when it should be covering his face.
3. Blank has visible defects (including a large crack) that should have relegated it to the firewood pile.
4. Using the wrong tool. A spindle roughing gouge should never be used for bowl turning.
5. Relying on reaching the off switch to prevent disaster; you won't have the time.
6. A blank tends to leave the chuck in a plane perpendicular to the lathe bed—stand out of this line of fire.
7. No dust collection, although at this moment that's the least of this turner's worries.

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.*

John Kelsey

As imminent danger hurtles towards Our Hero, the only thing that can save him is you, dear reader. To save our model (*Woodturning FUNdamentals *editor emeritus John Kelsey), identify seven safety violations in this image, then scroll to page 41 to check your answers.

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