

How I Turn Green Wood
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Design Implications

My designs usually begin at the log with way a flitch is cut from the log with a chain saw:

The pith (center of tree) near the top of a piece gives a hyperbolic pattern, while the pith located on the base side gives a concentric oval pattern. (See diagrams by Todd Hoyer, last pages)

Another pattern variations are achieved by tilting the "bowl" in the tree, such as a horse shoe - U shaped pattern in a delta shaped vessel.

A radial-cut flitch from a large tree will warp much less than a tangential cut flitch.

If you find a tree with a flat side, you can cut on the tangent, creating platter/plate blanks with little warp.

A branch or trunk with uniform roundness is best for a natural edge bowl.

Bark stays attached best if the tree is cut when the cambium layer is inactive - late fall and winter.

The outside portion of a large tree may have a curly or quilted pattern. Burls and trees with burl pattern all the way through make the most striking pieces. Black cherry heart wood can vary substantially from tree to tree, and can have some mild quilted pattern.

The sapwood of maples, holly, sycamore, and oak will spalt while moisture content is high and wood temperature is above 70°. For spalting a large quantity of flitches, I usually contaminate them with composted leaves, and wax all sides. I setup a pallet level on bricks providing air space above the ground, lay a large piece of clear plastic on it, place flitches of about the same length on end, place a sheet of cheap plywood on top, and build another layer that includes any odd sizes and shapes. Pull the plastic over the pile and tape it to keep moisture in. Cover this pile with a brown tarp and secure it with nails and straps so as to protect the clear plastic from the sun and from puncture. Leave covered for one summer, then check for results in winter. Don't leave it for more than two summers.

I generally leave the pith out of the piece, except for some end grain turning. Therefore, as the tree stands upright, the bowl in the tree is standing on edge. (An imaginary line across the top of a piece runs parallel with the pith orientation.) Exceptions: very small pieces from branches, or deep end grain pieces, or certain low shrinkage species like paulownia and red cedar. A tall "V" shaped vessel with the pith and heart cracks emerging from the side above the base sometimes works well in red cedar, turned with the end grain running from top to bottom.

A crotch pattern along one straight side of a delta design is a layout challenge, but can provide a unique flame pattern. A crotch pattern across the top of a flare piece or low hollow form can work well.

My open form pieces generally have a narrow base to enhance an impression of lightness or of being delicate. The base of salad bowls is 50 percent or less of the bowl diameter.

Roughing Out

Preparing a large round piece to mount on the lathe.

One side of the flitch is cut flat with the chain saw. This is usually the top of the vessel.

Locate center - consider obvious or suspected defects to be eliminated or incorporated into the piece.

Drill 3/8" hole in the center for a pivot post. This hole size also used for Stronghold screw center mount.

Place a circle jig on the band saw, set the flitch upside down on the pivot post, and slowly cut a circle. Set the round piece upside down on a 45° jig using the pivot post, and cut off a ring of excess wood from the bottom side.

Exception for natural edge top pieces: Cut a flat bottom (with chain saw, band saw, or mount between centers),

and nail cardboard circle on top as guide at band saw to cut an approximate circle.

Mounting a face plate or screw chuck:

If necessary to get a flat surface, use a hand plane or run piece across the jointer. Or swing the chain saw at 90° to the surface to flatten. Or some type of over head/over work router.

Using the $\frac{3}{8}$ " pivot hole, turn piece onto the screw center of a "One Way Stronghold" chuck (for large flitches, mount the chuck in a metal bench vice), or set a face plate on the center and secure with sheet metal screws. To later eliminate a defect along the rim, the chuck or face plate can be shimmed with washers on the opposite side from the defect. Use a straight edge to check on shimming and slope needed to cut defect away. This process reduces the lost height by half.

Screw the chuck or mounted face plate on to the head stock of the lathe. Position the tool rest. Hand turn the piece to check for clearance. Start the lathe at a slow speed.

Removing wood that isn't bowl:

With the piece turning, use a long and strong gouge to remove wood on the outside and turn a tenon or dovetail to be gripped by the chuck, or flatten an area at the base wide enough to mount the face plate. Leave enough stock to later cut away the jaw marks or screw holes. A small base will be inside this damage, so that height is not lost from stock removal.

When finished with the outside, place the tenon in the chuck, or mount a face plate on the bottom. Remount on the lathe, and remove wood from the inside. Depending upon diameter, species and proportion of sapwood in the piece, leave 1" to 1.5" or more of thickness in the bowl sides to accommodate warping and shrinkage as the piece dries. Pieces from limbs with a pith off center should be thicker than a piece from a vertical trunk.

Write the date on the piece with a felt pen. Paint the piece with a liquid wax or Johnson's paste wax to slow drying and prevent cracking. To avoid the irritation of wax on the tendon when remounting a dry piece, cover the tendon with masking tape before waxing, then wax. Set piece outside to dry for 6 months to a year, depending on the density of the wood and moisture in it. A cool high-humidity room may also be satisfactory. Protect the drying piece from the sun (heat) and rain. (Wax will melt and soak into dry wood in a hot attic, for example.) If the species is prone to crack, a high humidity place is best. If the piece has high moisture, store it in a cool and humid place to help reduce potential for fast drying and cracking. Other turners have successfully controlled moisture loss by covering the piece with liquid dish detergent (50-50 mix with water), and encountered no problems with the final finish. I sometimes wrap unwaxed pieces in newspaper and place in a brown paper bag or large leaf bag. This is particularly useful for near dry pieces that won't warp much, that may have soft or punky areas, and that I don't want to turn wax off of and would like to treat with epoxy in a few months.

After it seems dry, the piece, including the base, becomes oval, and the piece rocks on the base which is no longer flat, which is unacceptable since I plan to mount the piece in a chuck more than once. Usually I flatten the base with a 40 grit belt on a 6" belt sander that is level in both directions. I have two straight sticks with brick layer levels on them. One stick lays across the low spots on the top of the bowl. The other lays across the high spots. Holding the sticks in place with my thumbs, I slowly lower the bowl bottom onto the moving belt and against the stop block at the end of the belt, watching to keep the bubbles in the center of the levels. While a bit crude and clumsy, this process is rather quick and works well enough for me.

By moving the piece as I tighten jaws in a four-jaw chuck, the oval base will center itself, and I mark the location of one jaw for later remounting in the same place. This centering will not happen in a chuck with 8 contact points. In that case, I still clamp the oval base in the chuck, turn the top flat, turn the piece over centered against a flat drive surface, and with the tail stock supporting the piece under compression, turn the base round to enable accurate remounting.

After a piece seems dry, I remount it on the lathe, turn the wax off and turn the piece round to $\frac{1}{2}$ " to $\frac{5}{8}$ " thick. I

mark the date on it. If in a hurry, I mark its weight (if desired, a baby scale works well), and set it aside on a low shelf. Later move it to a high shelf or other warmer place. My warm attic or ceiling storage above the furnace works well as the last drying area. In absence of an accurate moisture meter, time and patience are assets toward avoiding disappointments later from warp. If the dried piece warps or is out of round a few weeks or month after turning the wax off, that is proof it had not reached a stable moisture content previously. I can also accelerate drying in a warm oven. Avoid a micro wave oven and potential surprise of burning internal wood you can't see until you turn into it.

I go through an epoxy treatment stage before turning the bowl thin. The epoxy paint accomplishes several helpful things. 1. By filling pores it seems to reduce later warpage from oil finish penetration on the flare pieces. 2. The epoxy hardens soft, spalted, or punky wood, and loose bark., which reduces the chance for tearout from the final cut. (While less effective, polyurethane will accomplish the same thing and provide a very smooth surface with an oil finish.) 3. The epoxy brings out the final color, allowing me to choose the most appealing available pieces for finishing.

Finish turning:

For an open salad bowl form, I first turn the outside, then turn the inside to match. But on the horn-shaped and delta-shaped pieces, I have better design control by turning the inside or top first, then cut the underside to match. These decorative pieces are thinned to 3/16" or less if the wood is sound. If there has been hardened soft wood, the piece will warp with the last epoxy treatment unless it is thicker such as 3/8" to 1/2".

After turning one side, I rough sand to remove gouge marks or pitting and to confirm satisfaction with curvature or straightness desired.

I thin the other side immediately after turning and rough sanding first side, because soon the piece will likely go out of round.

A key step for the other side of a thin piece is to cut only a short distance of 1/2" to 3/4" at a time to a thinness of 3/16" or less. Check thickness with calipers. Once it is thin, don't again cut over the unsupported area. Cut only near the thick support that is ahead of the cut. If any tear-out was experienced when the bowl was roughed out, it is now important that final cuts be small with a sharp gouge, removing hair-like shaving in the most extreme cases. If tear-out is still a problem, treat the wood with something to harden it (epoxy paint, CA glue, polyurethane, and allow time to cure).

Ingrown bark may contain wind blown grit that dulls the cutting tool. I stop turning and use a sanding dist to remove bark ahead of the cut down to the approximate level of the finished cut.

Sanding:

A 3" disk sander, air driven, is used to even out the cut surface with a succession of grits - 180, 220, and 320 while the bowl is turning at a moderate to slow pace on the lathe. Selected end-grain areas or knots may be sanded with the bowl stationary to remove gouge marks. After checking that no deep sanding scratches remain, I use hand held paper, 320 and 400 or higher, and then sometimes new and worn 600 grit or higher. Check for circular scratches again. Bright light tends to visually wash out scratches. Try different lower light intensities and hold surface at an angle to the light so that one side of the scratch is in shadow, to aid in finding it. Black cherry is most pron to show scratches when oiled, so sand excessively with fine grits.

If center area is too small for a disk, then sand paper is held by hand with a foam pad or leather against the spinning bowl. Leather or a foam pad helps distribute the pressure and protects from heat.

If soft wood has been exposed in the final turning (usually true with spalted wood), I treat the piece with epoxy paint (sometimes twice) before sanding. CA glue can also be applied. (Time and patience are valuable assets for working with soft spalted wood.)

If desired, small holes and cracks, bark intrusions, and loose wood may be filled and secured with a mixture of clear epoxy glue, sanding dust and water color pigments (Burnt Sienna plus very small amount of Lamp Black as needed to darken, provides various shades of brown). After the glue cures, complete the sanding. If ants have filled worm holes, use a dental pick to remove the dirt before applying finish, or dark filled holes will seem out of place on the piece.

Finish the bottom:

For wall mounting of platters, use an extra long (electrician's) $\frac{1}{8}$ " bit to drill a hole through the base. If present, screw holes or jaw marks are cut away and the wood sanded to blend that cut area into the surface above the base. The bottom is hollowed slightly, and sanded. Home made or purchased jigs or holding devices are available to mount the piece for turning and sanding the base at the lathe.

I mount the largest bowls upside down on either a larger face plate jig with masking tape and a bolted ring, or with rubber buttons on a chuck-plate jig. Mount the jig on the lathe, bring up the tail stock with a leather covered live center to steady the piece, turn off the excess wood from the base, and sand it. (Bottom diameter is inside any circle of screw holes or jaw marks.)

Small pieces may be compression mounted between leather tipped cones for turning and sanding. (Stocksdale's method) If no holes through the wood, a vacuum chuck also works well for some turners.

Sign the bottom with a wood burner (preferred by one collector for permanence) or special art pen. Be sure that other people can read your name. I write the common name of the wood, location source of wood if known, my name, and a two or four digit number for year, a dash, and the sequential number for the piece.