

Fixing a Big Crack

June, 2020

A common problem, seeking input from members of Santa Cruz Woodturners

The Beatles memorably sang *Fixing a hole where the rain comes in*. We turners might have to do that occasionally, too, but more often we need to *fix a crack where the air comes in*.

Dwain Christensen picked up several handsome chunks of English Walnut late last year. One he cored, recently finished, and it looks great.



The other one, roughed out on the outside but not hollowed, developed a big nasty crack. He approached this with a bow tie graft.



We shared the communication below. Knowing there are lots of solutions, I'd love other SCW members to pitch in.

The "bow tie" repair is an ancient, effective way to do it, and Dwain's shows real craftsmanship. There are kits and jigs for putting in multiple, identical small ones to "stitch" the crack together. Larry has some and knows how to use them. Others accept the crack as a natural feature and actually stitch it with fiber or wire.

Two comments, Dwain.

First, in the theme of learning along the winding path toward enlightenment: You just gotta either core or hollow out those big blanks early, or else this is going to happen over and over again. A 5" thick chunk of hardwood takes 5 years to dry according to the conventional formula. If it's a wood that moves a lot...which English Walnut does more than black walnut...those radial splits are almost obligatory when the periphery shrinks while the center stays wet. For really dynamic shrinkers like madrone, live oak, or sycamore...do it within a week. In any wood, don't let it sit for a month. Otherwise you've just wasted all those hours harvesting, retrieving, and roughing out...to make gourmet firewood. Hollow it so the wall thickness is about 10% of the diameter, coat right away with Tree Saver or the sealer of your choice...and feel satisfied you've done everything you can.

Footnote to that: Some of our advanced turners have solved that by boiling the wood, which relieves internal tensions. I've never done it, but someday might try as an experiment with several different approaches...especially if I ever get more sycamore. Some advocate curing in a low oven (140 degrees) overnight, or even microwaving (my wife won't permit that). I bet our members could chime in on those workarounds.

There are chemical products (Pentacryl, about \$20 per gallon) which seep in and replace moisture in the microscopic tubules with the chemical. It then evaporates without shrinkage over several months...ergo no cracks. You have to submerge the whole thing, which means buying several gallons and finding a plastic container big enough to do that. It takes several months to dry, as opposed to years, according to the manufacturer. I've done that, but can't recommend it. It doesn't smell awful, but I intuitively wouldn't want to eat out of the vessel even if it eventually had a film type surface finish. Others may have more experienced opinions.

Second, this is more to the point.

1. After you turn down your bow tie to create a relatively smooth surface, rough hollow out the inside to about 1" thickness.
2. Then use 2" Gorilla Tape to tape off the crack on the convex, outer surface. (Masking tape or blue tape won't hold epoxy. Duct tape iffy.)
3. Then use a slow-setting, low viscosity epoxy, such as "medium" System Three.

4. Allow the epoxy to puddle over the inside of the crack, and block the vessel into position so it won't roll around.
5. The epoxy will seep down all the way to the tape, slowly penetrate the wood on both sides of the crack, and solidify over several hours and harden overnight. Unlike more viscous epoxy, it will lock in the splinters you made while rough turning so you can cleave those off cleanly later.
6. You may need to do that more than once if the puddle doesn't reach both ends of the crack, or if you have multiple cracks. It's worth the effort for a pretty piece of wood.
7. Give it a couple days, and then rough turn off the epoxy.
8. If the wood is 14% or less moisture content, go ahead and finish it.
9. If not, give it another couple months in a cool dry place, and then you're done.

For cracks under 1/8" (3 mm), the epoxy will hold forever. It turns and sands nicely, but it will leave a visible, dark line, which you may or may not like. For wider cracks, you can mix the epoxy with fine sawdust to make a better gap filling bond. If you're feeling creative or bold, try a deliberately contrasting color such as powdered stone (Craft Supply has Lapis, malachite, chrysocolla, turquoise, jet, and pipestone) or powdered brass or copper. I use these a lot to fill small knot holes, irregular bark intrusions, insect borer holes, as well as cracks. I like the look.



Mango hollow form, with epoxy and powdered brass filler of irregular bark intrusion. Dual function of stabilizing a vulnerable crack and dragon-like visual.

Wells Shoemaker, June, 2020