Boil in the bag

This sycamore platter was defect free when it was put into a plain paper bag to dry. During drying it developed a catastrophic crack across the bottom. It is 355mm dia by 95mm deep (14 x 3 ¾in).

Steven Russell shows how boiling wood can help prevent or eliminate many common drying defects

Drying defects in wood can be reduced by boiling. I've done a series of timber drying tests and will look here at two of them – 'plain paper bag drying' and pieces that were 'boiled, then bagged.'

I started to experiment with boiling about three years ago, using the madrone burr I had a supply of. This burr is fairly unstable when green. Drying defects often include cellular collapse, gross deformities, checks and ridges.

Boiling was a tremendous success in reducing defects, and from then on I boiled other timbers susceptible to these problems during drying.

I later experimented with drying rough-turned bowls and platters in paper bags. Then, last March, I took 450 bowls and platters out of the normal drying cycle and dried them in paper bags. Some of the 'rough outs' were boiled for an hour and put in the bags without end-grain sealer, the rest were given a coat and went into the bag straight off the lathe.

The woods were maple, walnut, mulberry, sycamore, pecan, winged elm, white ash, flowering plum, bodark, sweet gum, black ash and cottonwood, plus a few others.

Some of the pieces had the rims or knots very near the pith. I usually remove the pith with my chainsaw, along with any checks and small growth rings, but I don't waste this central part. A single cut through it produces a bowl blank. The small growth rings next to the pith are prone to splitting during traditional air drying, but those in the boiled pieces stayed intact.

I've experimented with immature or overgrown branches (I call them 'branchlets') over the years, most of the sycamore pieces coming from trunks of about 30-32in diameter. Sometimes these young branches will dry intact, but most of the time they won't. They tend to shrink and loosen during drying and, at times, even fall out. Liberal doses of thin CA (cyanoacrylate) help, but even this won't save them all. However, the pieces with branchlets that I boiled, dried successfully and stayed tight in the timber.

The procedure

I use an open pot for boiling, but a pressure cooker will seriously cut overall boil time. The problem is in getting one big enough to hold bowls. Whatever you decide to boil in, use a pot you can use just for this, as the extractives in the wood will soon make a mess of it.

In the past, I vigorously boiled the roughed out bowls for the entire cycle, but later found this was not needed and wasted propane. Cajun cookers can really burn fuel.

I bring the pot to the boil and put bowls and platters into the 'soup', boiling them for an hour at 'low' to 'medium' boil – not a simmer, but not a full, rolling boil either. I extend the time to two hours if a piece needs it.

Make sure the pot doesn't run dry. You can cover it with a lid to help retain heat, water and save fuel, but make sure you are suitably protected, as some water may slosh out. Smaller items may need a weight on them to stop them floating. A brick or large rock is ➤

This 235 x 63mm sycamore platter (9 ¼ x 2 ½in) shows the typical failure of a 'branchlet' (bottom right) when dried in plain paper bags. This separation, or fissure, in the branchlet can sometimes extend well beyond its boundaries. Boiling pieces which show this unstable defect reduces branchlet fissures to almost nothing.

The 305 x 38mm elm platter on the left (12 x 1 ½in) was dried using the plain paper bag method. During drying, it developed a crack through the crotch figure (lower centre).

➤ good for this. After removing pieces from the pot, I let them dry overnight to reduce excess water, and bag them the next day. In extreme cases (as with green madrone burr), I put the items into cool water and bring it to the boil *slowly*, over the course of two hours. When the water starts to boil at the end of this period, I boil for two to three hours.

When this cycle is up, I turn off the burner and let the piece sit in the pot until the following day. Then I remove the items from the water and air-dry them for a day, before bagging. But most woods don't need this extra time.

Sometimes, the design of a piece will limit the number you can put into the boiling pot – semi-enclosed bowls, hollow forms or tall, roughed-out vases, for example. But load as many as you can. A pot can take lots of platters, because they stack so well.

Ask yourself the following questions before you decide whether or not to boil wood:

- Does the wood contain 'branchlets' in the sides or on the bottom?
- Is there wild grain on one side and straight on the other?
- Is the bowl's rim or bottom near the smaller growth rings (those nearest the pith)?
- Is the species known for gross distortion or cellular collapse during drying.
- Does the species show 'honeycomb' degrade or severe ridging when dry?

If the answer to any of these questions is Yes, then I suggest you augment your 'plain paper bag' method (the roughed out blank placed in a bag without any kind of alteration) with a boiling cycle.

Results

Of the 450 bowls and platters I tested, the largest number of drying defects were in the plain paper bag group. Fewest defects were in the boiled then bagged group, which had little or no drying problems such as splits and fissures. This group also exhibited least gross distortion, warp, twist or other undulations.

The species with the most defects present when turned were sycamore and pecan, followed by sweet gum. Several of the sycamore and pecan test pieces had branchlets in the sides or bottoms.

'Boiling was a tremendous success in reducing defects'

Of the 20 bowls with branchlets in the plain paper bag group, 16 showed splits in the branchlets. In 12 bowls, most of these splits were limited to the diameter of the branchlet. The four remaining bowls had splits that extended well past the branchlet boundaries. I'd given all the branchlets a coating of CA glue before bagging the bowls.

Twenty-one bowls and five platters in the boiled then bagged, group showed no splits in the branches. There was also much less gross distortion on the rims of bowls and platters among this group. They still warped slightly, but far less than in the plain paper bag group.

Other comparisions gave similiar results. Twelve black ash bowls contained both heartwood (wild grain) and sapwood, and were boiled, then bagged. They showed a lot less gross distortion than the plain paper bag pieces. All of the black ash test pieces that were

The 293 x 85mm pecan platter (11 ½ x 3 ¼in) on the right was boiled, then bagged, and dried successfully without degrade.

Woodturning Magazine
Issue 99 Dec, 2000

'Nothing works in every situation, on all woods, but I urge you to try boiling some of your problem bowls and platters before bagging them'

boiled, then bagged, had no splits. Only two of the 10 black ash pieces in the plain paper bag group, revealed minor splits.

Bowls turned with their rims or tops very close to the pith showed similar results, with just one of the 45 bowls and 12 platters in the boiled then bagged group having a split.

Of the 40 bowls and 15 platters in the plain paper bag group, 31 bowls and 12 platters showed numerous splits at the rim.

Conclusion

The tests clearly show that adding a boiling cycle helps prevent or eliminate many common drying defects. I plan to boil then bag much more often, reserving the plain paper bag method for pieces whose grain character and overall defects meet the success criteria I mentioned earlier.

Other pieces, which have various defects or possible grain/growth ring problems will get a 'hot water bath.' The main advantages are these:

- Boiled timber dries up to 25% faster than non-boiled.
- Woods which clog sandpaper when traditionally air dried, offer little or no clogging when they are boiled.
- Most bugs are killed.

It is clear that boiling has benefits for unsound as well as sound pieces. It's my guess that boiling relieves or relaxes many of the internal stresses. The area around the branchlets on dry pieces which had been boiled was very tight and showed no separation from the surrounding timber.

I believe the combination of heat and water loosens the lignin bond between the cell walls. That the internal stresses relax during boiling and that when the piece cools, the lignin bond 'cures' (for lack of a better word) in the new relaxed state. Wild grain and other defect-prone areas are therefore brought under control.

Most of the platters I tested were crotch wood, and the feather pattern on the boiled pieces were tight and free of checks. By contrast, the plain paper bagged pieces had some minor checks in the crotch-feather areas.

Even very thin platters (10mm, ⅜in) thick showed very little rim movement in the boiled samples. By contrast, the non-boiled group had some pieces that looked like crisps.

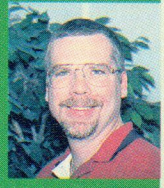
Some turners say "don't boil wood" because of the colour loss. It's true that the outer 1.5mm (1/16in) or so will lose colour, but below that the colour is unaffected.
I have often compared the colour in air dried pieces with that of boiled, and have found no detectable difference. Nor in shading or tone values. But if your roughed bowl is 3mm (⅛in) or less in thickness, you have a valid point about colour loss.

However, on a 305mm (12in) bowl with a wall thickness of 25mm (1in), the point is mute, in my opinion.

Obviously, nothing works in every situation, on all woods, but I urge you to try boiling some of your problem bowls and platters before bagging them. Its an easy, fairly quick process, and offers amazing results. ■

The 240 x 70mm pecan platter (9 ½ x 2 ¾in) on the left was boiled, then bagged. Although there were numerous defects in the rough out (including the pith), it dried successfully without further degrade. The larger, 255 x 63mm sycamore platter (10 x 2 ½in) on the right, was defect free when it was put into a plain paper bag to dry. But it developed a bad crack across the bottom during drying.

The Author



Steven D. Russell is a professional woodturner, demonstrator and turning teacher. He specialises in bowls, platters and hollow forms with unique surface treatments. **You can write to him at: Eurowerks**
The Woodlands, Texas, USA.
E-mail: benzer@flash.net