

May 8 MCW demo: Demonstrator Dion Fralick

Title: Stabilizing, Dying and Turning Spalted Wood

Bio: Dion Fralick began woodturning with his grandfather more than 35 years ago. Instantly hooked, he learned additional skills by reading books authored by Peter Child, Dale Nish and Richard Raffan and making shavings in his own shop. He joined a woodturning club, Tidewater Turners of VA, in 1992 and the AAW shortly after. Through the mentorship of very skilled and professional woodturners, he increased his proficiency and still enjoys learning from the interaction with fellow woodturners today. He enjoys turning bowls, boxes, candle sticks, tea lights, jewelry and various other items, as well as teaching and mentoring.

Demonstration Description:

I'll start with a short PowerPoint presentation walking through the equipment and the stabilization process, then turn and finish a few small projects using dyed and stabilized wood and follow that up with a Q & A session. When turning, I'll talk about the mounting, turning, fixing defects, sanding and finishing. I'll bring some finished items to display and pass around as well.

Stabilizing and Dying Spalted and Punky Wood

I suspect many woodturners have come across pieces, of highly figured, spalted, or otherwise, really great pieces, of wood to turn only to discover it's too punky or too far spalted as a candidate for turning on the lathe. Into the trash or fire pit it goes.

Some time ago, I came across several YouTube videos (you can find almost anything there) where the topic was stabilizing and dying pen blanks. I thought what a great way to save prized and highly figured wood that is too punky and too far gone from the heat of the fire pit. I was intrigued and thought I could potentially use this process for more than just pen blanks. I took a chance, bought the necessary equipment, and began experimenting. I have extended this process for producing blanks for bracelets, necklace pendants, bottle stoppers, bottle openers, birdhouse ornaments, shawl pins, buttons, etc. The results have been extremely positive and produced some striking results. In this article, I will share my experiences with equipment, setup, the stabilization process, preparation, turning and finishing of stabilized wood.

The Equipment

To begin exploring this process, I needed to purchase some equipment. I already owned a vacuum pump that has been in use for a vacuum chuck, so I did not need to purchase one. It is a small 2.5 cfs rotary vane HVAC vacuum pump (Figure1). You can find these at garage sales, on-line and even stores like Harbor Freight. Woodcraft and other woodturner supply stores sell a venturi vacuum pump that works with compressed air that will produce a good partial vacuum. However, rotary vane pumps will produce a higher level of vacuum (better). I did some research and purchased a small 3-gallon vacuum vessel. It came with a glass top (important), a seal for the lid, a pressure gauge and all the plumbing pieces required (Figure 2). If you choose to begin experimenting with stabilizing resins, make sure you get a vessel with a glass top. Polycarbonate and other plastics are designed for vacuum degassing of epoxies and silicone molding compounds and will degrade with exposure to stabilizing resins. I looked at various places for a used toaster oven and finally found one at Goodwill for \$10. This is required for curing of the stabilizing compound once the vacuum process is complete. It is a bit dented and beat-up but I am still using this one. If you are interested in exploring this process, I recommend a used one that you can dedicate to this process and keep in your shop or garage. A note of caution here! **DO NOT** use the toaster oven you have in your kitchen...that will not go over very well with others in your household!



Figure 1 Vacuum pump used for stabilizing projects.



Figure 2 Three- gallon vacuum chamber, gauge, valves and filter

Process Overview

For a recent demonstration, I prepared two bottle stopper blanks. (Figure 3). First, I dried them by cycling them in the toaster oven several times for an hour at a time, at 175 deg F. The stabilization process works better if the moisture content of the wood is as close to 0% moisture content as possible. The pre-stabilization weight was roughly 1.5 oz for each blank. The stabilization process was initiated by submerging the wood blanks in the stabilizing resin solution. I used a separate container that could be lifted into the vacuum vessel (Figure 4). Note that wood, especially soft and punky wood, floats. Additional weight was added on top of the blanks to ensure they remained completely submerged. I used some garage-sale ½” drive sockets as inexpensive weights. The container with the blanks and stabilizing solution was placed into the vacuum vessel. The glass top was then centered on the top of the vessel. I started the vacuum pump and the vessel remained under vacuum for several hours. I let the pump run until the air bubbles stopped emerging from the solution. Once the bubbles stop, the air is essentially evacuated from the wood. It is easy to watch for this through the glass lid (Figure 4). This can take as long as six-to-eight hours or more depending on the porosity and species of the wood.



Figure 3 Pre-stabilization-process, dried, spalted-maple bottle stopper blanks. Size 1.5" square x 2.25" long.



Figure 4 Blanks submerged in dyed stabilizing solution and under vacuum. Note the high-tech weights to keep the blanks submerged. Bubbles emerging from the solution is the air being extracted from the wood.

I released the vacuum once the bubbles stopped. The resulting increase in air pressure enables the stabilizing resin to fully penetrate the wood blank. The blanks are left in the vessel and continue to soak overnight. This provides time for the atmospheric pressure to force the stabilizing resin into the wood. I have found I get better results with dye penetration if I leave the blanks to soak at atmospheric pressure for at least twice the time they were under vacuum.

After soaking the blanks for some time, I removed the blanks from the solution and wrapped them in aluminum foil. This is an optional step to minimize mess in the toaster oven.

I placed the resin-saturated and wrapped blanks in a toaster oven at 200 deg F for roughly an hour. This allowed time for the internal temperature of the wood blank to reach the point where the resin cures. The resin curing occurs when the temperature in the wood blank reaches between 177 deg F and 205 deg F, for 6-8 minutes. This usually takes about 45 minutes to an hour, or even longer for larger blanks. I keep bottle stopper blanks in the toaster oven for 65-70 minutes, since they are thicker than pen blanks, to ensure the internal temperature reaches the curing temperature for long enough. Smaller or thinner blanks used for buttons or pendants take less time to cure. The blanks are allowed to cool and then unwrapped. At this time, they are ready to turn. The blanks, once stabilized (Figure 5), are much heavier (and denser) and each weighed-in at roughly 3.5 oz, a three-fold increase in weight. Note: one of the blanks was sanded to provide a glimpse of the resulting color from the dye.



Figure 5 Stabilized and dyed bottle stopper blanks

Turning and finishing

Stabilized wood can be turned with high-speed steel or carbide turning tools. I have found it is a bit dustier to turn and highly recommend a dust mask if you are not already using one. Note that the stabilization process does not necessarily fill voids. Voids and latent defects can be addressed with cyanoacrylate glue as needed and works very well. Sanding and finishing stabilized woods can be done with readily available abrasives and finishing products. Most stabilized woods will take an extremely high polish. My process is below. I sand to P600 grit using standard products. I then switch to Norton foam-backed abrasives and sand to P1200 grit. Following the sanding process, I switch to polishing compounds. I use my own polishing compounds made of pharmaceutical grade mineral oil, beeswax and two different polishing compounds: pumice and rottenstone. I used these because I had them in my shop. There are commercially available polishing compounds and other methods that will work equally well. I then finish with a light coating of thin cyanoacrylate glue and then polish again with the finest polishing compound. Some examples of finished bottle stoppers are shown in figure 6.



Figure 6 Completed Dyed and stabilized bottle stoppers.

Dyed and stabilized wood is a great candidate for several turned projects. A sampling of some finished items are included below (Figures 6,7 and 8). Almost all of the finished items have turned out extremely well. Some are very striking! I have found there is a downside to this experiment. It now redefines my definition of scrap wood! Pieces of highly figured and spalted wood that otherwise would have been thrown away are accumulating now in my shop!

I have used Cactus Juice from TurnTex and used the StickFast stabilizing resin available from Woodcraft, both with good results. There are a lot of on-line resources and information available. A YouTube search using "stabilized pen blanks" or "stabilized wood" will get you started. Included at the bottom of the article are some links for some on-line resources if you are interested in this process.



Figure 7 Dyed and stabilized necklace pendant



Figure 8 Dyed and stabilized, turned-section combined with beads



Figure 9 A sampling of dyed and stabilized turned items

<https://www.turntex.com/>

<https://www.woodcraft.com/>

<https://www.frugalvacuumchuck.com/>