Fuming: Darken wood without touching it

BY CHRIS GOCHNOUR

The impact of ammonia. *Gochnour built both the carcase and the base of his sideboard out of white oak, but he fumed only the base, giving it a deep, rich color without obscuring the grain. (The door panels are spalted live oak, unfumed.)*

Online Extra

To read about master finisher George Frank's adventures in fuming, go to **FineWoodworking.com/282.**

Photos, except where noted: Jonathan Binzen; top: Chris Gochnour

Using ammonia fumes to alter and enrich wood's natural color, a process called fuming, has been a staple of woodworkers for centuries. Its effect is quite distinct from other coloring techniques. When you see wood that has been stained or dyed, you know right away it's been stained or dyed. But fumed wood looks natural, as if it came straight from the tree, but with a darker, richer color. I have been fuming furniture for more than 30 years and love the natural, honest, and woody tones it imparts.

Ammonia fumes react with the natural tannins in certain wood species to deepen the wood's color and enliven the figure. Woods high in tannin—such as white oak, beech, and butternut—respond best to this treatment. The ammonia fumes penetrate the wood uniformly and deeply (to a depth of about ⅛ in.), so fumed pieces can be sanded without fear of sanding through the coloring.

The color goes deep

Rather than affecting only the surface, fuming changes the wood's color to a depth of about ⅛ in., so you can do final sanding and scraping after fuming without fear of going through the color layer.

What you need to get started

Fuming requires ammonia, plastic containers, and a fuming chamber. Since household ammonia is fairly weak at only 5% to 10% ammonia, I use a commercial aqueous ammonia (also known as aqua ammonia or ammonium hydroxide) that is a potent 25% ammonia mixed with water. You can purchase commercial-grade aqueous ammonia online, or at some janitorial supply stores.

I use plastic containers to hold the ammonia and build a vaporproof tent, or chamber, to house the fuming process. I typically build the frame out of wood and wrap it in clear polyethylene sheeting. I've used a 5-gal. bucket to fume small pieces. For really large pieces, I've portioned off a section of my finish room with wood framing and polyethylene tarps. I once did this to fume a dining table and eight chairs all at once. My finish room's fan made it ideal for venting the fumes when the process was complete.

Safety

Because ammonia is very potent, it's imperative to use extreme caution throughout the fuming process. Wear goggles and a respirator and use chemical-resistant gloves. Not just any respirator or goggles will do. I wear a 3M respirator and insert ammonia-rated cartridges. I use goggles that are vapor- and splashproof and gloves made of nitrile.

I prefer to fume outside where the fumes can dissipate easily, but I will occasionally fume indoors if I

Fuming supplies

Gochnour uses commercial-grade aqueous ammonia, or ammonium hydroxide, a mixture of ammonia and water available online and at some janitorial supply houses. Essential safety equipment includes splashproof goggles, nitrile gloves, and a tight-fitting respirator with ammonia-rated cartridges.

Photos, this page: John Tetreault

BUILD A FUMING CHAMBER

The frame should be flush. *The light and sturdy lap-joined frame, built with fir and nailed together, is flush at the joints on the outside so the 4-mil polyethylene tarp seals tight.*

Cut carefully. *To avoid folding the polyethylene over itself, which could compromise the seal, cut out a notch at each corner. Tape the side to the post, and then tape the end flap to the post.*

Weatherstrip seal. *The chamber will sit on a sheet of ¾-in. melamine. To make a vaporproof seal with the melamine, apply self-adhesive foam weatherstripping to the bottom edge of the frame.*

can open doors and windows and ventilate with a fan.

After fuming a piece, I place it outdoors under protective covering to let it off-gas. Off-gassing can take up to 24 hours. Until the fumes in the wood have dissipated, don't place the piece on a wooden floor or work surface, as the wood is still high in ammonia fumes and can cause stains.

The fuming chamber

To fume the base of my sideboard ("Strong, Stunning Sideboard," *FWW* #277) I made a chamber large enough to surround it. I built a lap-joined frame from sticks cut from a 2x4 and assembled it with glue and nails.

The frame was carefully wrapped with 4-mil polyethylene. I cut a notch at each corner of the sheet and then laid the tarp over the frame. I used packing tape to secure the plastic to the rails, taking pains to seal all the seams well. I completed the chamber by running self-adhesive weather stripping around the frame's

START FUMING

Pour the potion. *To reduce the chance of splashing and spilling, use deep containers and fill them to about 1 in. deep with aqueous ammonia. Work in a well-ventilated area and wear gloves, goggles, and a respirator.*

bottom edge. A panel of ¾-in. melamine serves as the base for the chamber, and the weatherstripping forms a tight seal with the smooth surface of the melamine.

Fume samples, then furniture

Before I fume a piece of furniture, I fume several samples to assess the time required to achieve the desired depth of color. The samples should be the same material as the piece of furniture and tested in the same chamber.

I usually prepare six samples, roughly 1 in. by 2 in. by 5 in. I place the samples on the melamine base and fill five or six plastic containers about 1 in. high with ammonia. I then put the chamber in place and note the time. I take out one sample every six hours, replacing the ammonia after 24 hours to keep it potent and fresh. The clear tarp provides a view of the process and a bit of intrigue as you watch the magic happen. When the last sample comes out, I compare all six to find the depth of color I like best.

Fuming the piece of furniture is exactly the same as fuming the samples. Place the furniture on the melamine base, fill the containers with fresh ammonia, and cover it all with the chamber. When I do this I also place new sample blocks in the chamber so I can easily remove a sample during the fuming to assess the progress. Place the samples near the edge of the chamber so you only need to lift it a couple of inches to retrieve a sample.

After your furniture has achieved the depth of color you desire, lift the chamber off. If the fuming was done indoors, have fans ready and open your doors and windows to vent the fumes. Place the piece of furniture outdoors or in another well-ventilated location to off-gas. Then your furniture will be ready for final sanding and any finish you choose. □

Chris Gochnour makes furniture in Salt Lake City, Utah.

Lower the tent. *After the chamber is in place on the melamine base, Gochnour puts a piece of MDF or other heavy sheet material on top of the chamber to weight it down and ensure a good seal at the bottom.*

Is it done yet? *Having placed samples in the chamber with the furniture, Gochnour pulls one out to check the progress and compare it with an unfumed sample.*