# Safe and Simple Arts and Crafts Finish

## Pigment stains and dyes reproduce a fumed finish without the ammonia

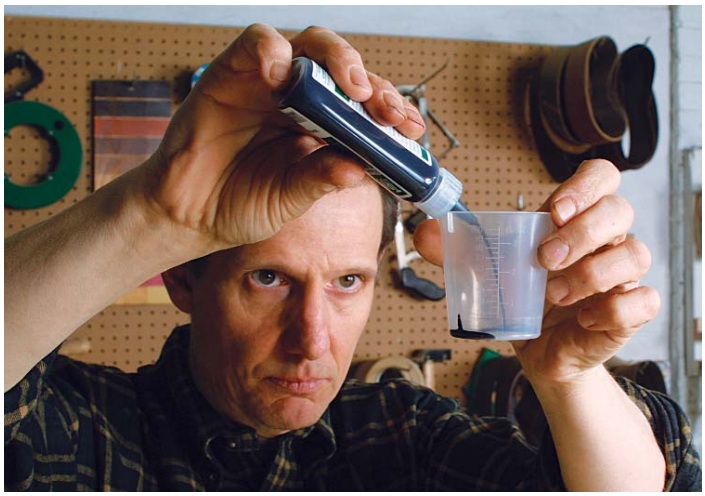
BY JEFF JEWITT

The Arts and Crafts furniture that became the rage in this country in the early 20th century was a reaction against the ornate and excessive style of Victorian designs. Several companies, such as Roycroft, Limbert and Stickley, all produced this style of furniture. Gustav Stickley is considered by many as the leader and originator of this style of furniture in America, and he had a particular fondness for quartersawn white oak. He worked tirelessly to perfect the finishing process, even after his company folded, and he clearly favored results that emphasize the subtle character of the oak with a low-luster, "in-the-wood" type of finish.

Stickley and others used a method of coloring oak in which the wood was exposed to ammonia fumes in an airtight chamber. The method effectively colored the hard, glassy surface of the ray-fleck patterns as well as the rest of the wood, establishing an even tone throughout the furniture. Fuming isn't that hard to do, but there are drawbacks, not the least of which is that ammonia is a dangerous chemical. Ammo-

## STEP ONE A DYE STAIN MIMICS FUMING

***Prep work before the color goes on.*** *When using a water-based dye stain, it's best to raise the grain with a coat of clean, distilled water. After that dries, lightly sand the raised grain on all of the wood that will be stained.*



***A light dye stains it all—even the ray flecks.*** *This washcoat of a light brown dye brings the color of different woods closer together, imparting an even tone to all. Work fast when applying dye stain. Flood it on and wipe it off quickly. The small pieces get dunked into the dye and wiped immediately.*

nia produces color by reacting with tannic acid in the wood. The color can vary widely in boards from different trees, and the lighter sapwood (often difficult to spot on white oak) will not react to the ammonia. Also, the strength of the ammonia, the length of exposure and the amount of tannic acid in the wood are all variables that make the process difficult to control.

Ammonia produces a cool brown tone—color that is devoid of orange or red. Stickley and other manufacturers sometimes corrected this initial fumed color by using warmer tones of dyes or pigment stains. Reading about those finishing practices, it occurred to me to try another approach—to eliminate the fuming process altogether. And I have found that I can finish white oak to look as though it were fumed. I get great results using only water-based dye stain, store-bought oil-based pigment stain and a clear topcoat such as lacquer or shellac. I prefer this method to fuming because it's less toxic and dangerous, and it gives me more control over the final color.

When finishing quartersawn oak, proper selection of wood for grain, texture and color is of the utmost importance. After lightly planing the rough stock, choose boards to make up panels very carefully. To get a better read on the grain patterns, you can wet the wood with distilled water. (Regular tap water can contain dissolved

Photos: William Duckworth

## STEP TWO A PIGMENT STAIN POPS THE RAYS

*A darker pigment stain adds color by filling the pores. Oil-based pigment stains contain particles that lodge in the open grain and stay behind as color after the excess stain has been wiped clean. Jewitt uses oil-soaked rags and brushes to apply this stain and wipes it clean in two stages.*

Quartersawn white oak doesn't blotch, and the open grain and glassy ray fleck provide either subtle or rich contrasts, depending on the type of colorant used. Dye stains add color to the ray flecks; pigment stains don't. Water-soluble dyes are a terrific way to imitate the effect of fuming. You can usually nail the exact color you want by starting with some basic brown colors on scraps and tweaking them with primary dye colors. This initial dye can range anywhere from a light tan to a dark reddish brown. The only way to tell if the color is right is to experiment on scraps and carry the finish all the way to the end.

To reach the color you want, use a systematic approach for mixing the dyes. Start with the manufacturer's suggested mix of dye to solvent (such as 1 oz. dye to 1 qt. water), what I call the master mix, and apply the dye to a piece of scrap. The color of the wood when it's wet is pretty much the color it will be after a clear finish has been applied. If the dye is the right shade but too dark, take one part of the master mix and add one more part of water. Then try that on a piece and see if you're closer. If it's still too dark, continue to dilute it. When the approximate shade and intensity are

iron salts that react with the tannin to produce gray stains that will discolor the final finish.) After gluing up panels, sand them all to 100 or 120 grit and then do the shaping and joinery. After dry-fitting, sand all of the parts up to 180 grit and raise the grain with distilled water. When the wood has dried, hand-sand the raised grain with 180-grit paper and remove all of the dust from the pores with a brush, a vacuum or a blast of compressed air.

With most Arts and Crafts or Mission furniture, you can do most of the coloring and initial sealing before the final assembly. It's a great technique if you have mostly flat components like those on the dictionary stand shown on these pages. The keyed through-tenons on this piece hold this project together, so it was a cinch to prefinish. On pieces that you must glue together, mask off all of the glue surfaces and plug open mortises with scraps of wood.

right, use master stock solutions of primary colors (made from the manufacturer's suggested ratios) to tweak the dye color to what you want. If the color is almost there but not red enough, put 1 oz. of the master mix in a new container and then add ¼ oz. of red at a time until the color is right. If the color is too red, do the same with green. Orange, yellow and black can be used in the same way, but I usually get what I'm after by tweaking brown with either red or green. When tweaking colors, keep a record of the amount of new color you use for each sample.

When you have the color you want, mix the amount of stain you'll need for the job. Figure a quantity of 1 qt. of dye for every 100 sq. ft. of material. This amount works for stain applied by hand, but figure more for the additional waste if you intend to spray it on. You can apply dye stain by just about any method—sponge, rag, brush or spray. Whichever you use, apply the dye liberally to the entire surface you're working on and blot up the excess quickly. When it's dry, lightly scuff the surface with a gray synthetic abrasive pad to bring down any raised grain. Don't use sandpaper because it will cut through the dyed surface and remove the color.

You can stop adding color at this dyed stage if all you want is a subtle surface color and less pronounced grain, and move straight to a clear topcoat finish. But I prefer to take it another step for the added effects you can get with a pigment stain.

An oil-based pigment stain applied over a dye stain is a good way to highlight the grain and "pop" the ray fleck because the pigments fill in the crevices of the open grain without adding color to the harder, smooth surface of the ray flecks. Dark pigment stains applied over lighter dye stains are particularly effective when using this technique. Choose a pigment stain that contains Gilsonite, the trademarked name for asphaltum, which is essentially tar. You can find Gilsonite in many wood-tone stains such as McCloskey's stock maple and walnut colors and Watco's dark and light walnut colors.

After the stain has dried, you can add a topcoat to it, which will darken the color slightly and add some depth to the piece. To check whether the stain is dry enough for a topcoat, wipe the stained surface with a clean white cloth. If any stain comes off, wait longer. When no more stain comes off, you can safely apply just about any topcoat—lacquer, shellac or varnish—with the exception of water-based finishes.

Most Arts and Crafts or Mission furniture looks better with a fairly thin topcoat, and a satin or matte sheen is preferable to gloss. Rub out any glossy sheen with 0000 steel wool. When the finish is dry, the piece can be waxed, but use a dark-colored wax for furniture that is stained a dark color. □

***How you apply it doesn't matter, but what it looks like does matter.*** *Whether sprayed, brushed or padded on with a rag, you can make an Arts and Crafts finish work by using almost any clear film finish, as long as you steer away from glossy sheens. A dead flat, or at most a satin sheen, will work best.*

---

*Jeff Jewitt writes frequently about finishing topics for* Fine Woodworking.

## Vary the look with different stains

**Different stain combinations will significantly alter the look of a piece of furniture. These samples were prepared with three colors of dye stain (TransTint). The first two were then colored with a coat of walnut pigment stain (McCloskey); the third was colored with a coat of jet-black mahogany pigment stain (Bartley).**