# Switch to Spraying Water-Based Finishes

A former 'lacquer head' gives tips on going green

### BY TERI MASASCHI

he first time I used a water-based finish, I promised it would be my last. In the late 1980s and 1990s, companies launched a mass of water-based finishes and used the consumer as the testing lab. I wasn't alone in finding the new finishes too difficult, too finicky, and too unpredictable.

Twenty years later, the air-quality laws are more stringent than ever and the end is approaching fast for many solvent-based finishes. The good news is that during this period, the formulators of water-based finishes have been busy. As a hardened "lacquer head," I never thought you'd hear me say this, but when it comes to water-based finishes, I like what I have used recently.

Switching to water-based finishes has been a relief: No more headache or solvent hangover at the end of a long day, and far less use of flammable solvents. However, the transition has not been easy, in part because solvent lacquer and water-based lacquer are as alike chemically as chalk and cheese (see "Lacquer: What's in a name?" on the next page). Therefore, fellow lacquer heads have to forget much of what they know and in some ways become novice sprayers again. However steep the learning curve, it is well worth the climb. And for newcomers to spray-

## GEARING UP \_\_\_\_

## CHOOSE YOUR GUN CAREFULLY

Water-based finishes will corrode an aluminum cup. Instead, make sure the cup and the gun's fluid passages are either stainless steel or plastic. 3M's PPS system of plastic cups with disposable liners works well (far right).



ALUMINUM

STAINLESS STEEL

PLASTIC

ing, here is your chance to finally achieve professional-looking finishes without the need for an explosion-proof spray booth.

## The right tools and conditions are critical

One thing that hasn't changed is that water-based finishes remain generally fussier than solvent-based ones. Your spray gun needs to have either stainless-steel or plastic fluid passages because water-based finishes corrode aluminum quickly.

Everything must be clean, clean, clean! Keep the surface contaminant-free, the gun dedicated to water-based finishes, the air source (if compressor driven) filtered to remove moisture and oil, and the spray gun's cup clean (a disposable lining is best).

I have sprayed solvent-based finish as low as  $45^{\circ}$ F and gotten away with it, but water-based finishes are more temperature sensitive. The safe range is about  $60^{\circ}$  to  $80^{\circ}$ F.

One thing you don't have to worry about is compatibility with no-load sandpaper, which has stearates to prevent the paper from gumming up. Stearates used to leave a waxy coating that fouled up water-based finishes, but modern stearates don't have this problem.

Anyone who has refinished old furniture is familiar with "fish eye," the shallow craters in the finish caused by contaminants, in particular silicone. You can add a fish-eye destroyer to solventbased finishes but not to water-based ones, so if you are working on antique furniture, be prepared to use shellac as a sealer coat

RGET COATING

WATER-BASED ACRYLIC

SPRAY LACQUER



## CLEAR THE AIR

Water-based finishes are very sensitive to contamination. Use a filter to remove moisture and oil coming from the compressor. This combined regulator/filter costs \$145 at homesteadfinishingproducts .com.

## NO TACK CLOTH, Please

Use a damp cotton or microfiber cloth to wipe away sanding dust. A sticky tack cloth can leave residue that will repel water-based finishes.

over the contaminants first. On most woods it isn't necessary to pre-raise the grain before spraying a water-based

finish, but you should on gnarly or figured wood.

## How to warm up the color

One of the main differences between solvent- and water-based finishes is the latter's cold appearance and inability to warm the wood. If you are finishing maple, birch, ash, or any white wood,

## Not your dad's lacquer

For 80 years, nitrocellulose lacquer has been the benchmark against which all other finishes are found wanting. Each coat melts into the previous one, creating a single film of finish no matter how many coats are applied. This creates the dimensional and reflective sheen that allows you to look down into the beauty of the wood.

Trying to associate their new finishes with the industry standard, manufacturers started calling many water-based formulations lacquer. However, the ingredients of the two have nothing in common. Water-based lacquers usually consist of a glycol solvent, an acrylic resin, a glycol ether, and various leveling agents, defoamers, and other performance enhancers. This is not your father's lacquer but it will, most likely, be yours.

— T. M .



**H.BEHLEN** 

## **SECRETS OF SUCCESS**

#### **FILTER FIRST**

Before spraying, pour the finish through a finemesh paint filter to remove any contaminants that could block the gun.



## TIP

Seal first with tinted shellac. If you don't like the cool look of a water-based finish on some darker woods, warm up the wood by applying dewaxed shellac tinted with a dye concentrate (homesteadfinish ingproducts.com) as a sealer.

Or tint the finish. You can tint the finish with one or more dye concentrates (woodworker .com). If you use water-soluble dye powders, mix the dye in some warm water before adding it.



2 WAYS TO WARM UP





water-based can be perfect. On cherry, walnut, mahogany, or figured woods (including maple), it isn't. You can solve the problem by tinting the coating with an amber dye to mimic the tone of solvent lacquers and oil-based products. But water-based finishes have a milky appearance at first, making it hard to judge the tone.

A better approach is to coat the bare wood with dewaxed shellac. You can tint light-colored shellac such as beige or blond, or use darker grades such as orange or garnet. This eliminates any need to pre-raise the grain. Also, if you wipe on a coat of oil to enhance a wood's figure, apply a coat of dewaxed shellac before using a water-based finish.

## **Big pluses: Faster build, fewer fumes**

If the preparations for spraying water-based finishes are more elaborate than for their solvent siblings, the actual spraying is easier. Unlike solvent-based lacquers, which tend to be sticky and syrupy, water-based coatings spray thin and wet but have excellent "cling," which means fewer sags and runs. They dry in about the same amount of time as solvent-based ones—30 to 45 minutes. With any type of finish, the number of coats is subjective. However, because the solids content of water-based finishes is generally higher than for solvent-based ones, you will be pleasantly surprised after only the second coat. This faster build offsets the fact that water-based finishes cost 20% to 30% more.

Use a small setup for the gun, such as Accuspray's 0.043-in. needle and a No. 5 aircap. You could use a No. 7 aircap for a large surface. After prolonged spraying, crusted coating may build up on your

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## NO FANCY Booth Needed

If you don't have a purpose-built spray booth like this one, build a simple knockdown one. An exhaust fan draws air through the filters, pulling away overspray.



#### Online Extract To learn how to make a simple spray booth, go to FineWoodworking.com/extras.

spray gun. I apply a thin film of Vaseline on the horns of the air cap first, so I can flick off the buildup later with my fingernail.

**Water-based finishes are safer**—The moment when solvent finishes are the most dangerous is not when spraying them—you're wearing a respirator and the fan is drawing off the fumes—but when they have just dried. You've removed your respirator and are scuff-sanding the surface. The fan has been shut off, but all the solvents are lifting off the surface and hanging heavy in the air. This is incredibly lethal exposure. Water-based products give off gas, too, but are far less toxic. The gas has a smell similar to mild ammonia.

#### Rubbing out and cleaning up

Most water-based materials contain a blend of resins such as acrylics and urethanes that offers durability and clarity, and you can often get a perfect finish off the gun, particularly for a satin sheen.

However, if you want a polished-out surface, don't assume that these coatings are going to behave like solvent lacquer. Successive coats do not melt completely into the previous layer. In this way, water-based finishes are more like solvent-based varnishes or polyurethanes in that the finish builds in layers rather than melting into a single film. Consequently, there is a higher risk of "witness lines" when you polish through one coat into another.

The solution is to apply two or three coats and then completely flatten the surface. This will create numerous white witness lines, but they will disappear when the next couple of coats are applied. You can then polish the last coat with less risk of burning through the layers. Cure time for a successful rubout is the same as for



SAND

BETWEEN COATS

With a quick-drying,

water-based finish

in a clean environ-

ment, you shouldn't

need to sand away

dust nibs between

coats. However, if you let the finish dry for longer than the time specified on the can, you must sand the surface to give the next coat a mechanical bond.

**BROWN BAG: A PRO'S SECRET WEAPON** 

You can use brown shopping-bag paper to smooth and polish the last coat of a satin or semi-gloss water-based finish.

solvent-based finishes: A minimum of 200 hours is preferable.

When you are done spraying, flush and clean the gun with water and ammonia, and then flush it with alcohol or lacquer thinner (you can't escape flammable solvents entirely).

Go ahead and use the new generation of water-based finishes. Just don't try them at the last moment! It is much less stressful to use test samples, and get a feel for these products first.

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