Clear Wood Finishes

How one painter applies lacquer and varnish to interior woodwork and camouflages the nail holes

by Byron Papa

People like the natural beauty of wood grain and figure. So just about every house, whether new or old, has some type of clear finish (see sidebar) applied to a wood surface. Even houses with painted walls and moldings typically have a fireplace mantel or a set of cabinets that shows off the natural color and figure of the wood. Side by side, the painted and natural surfaces add a stylish note of contrast to a room. They also add to the painter's work load.

If you read my earlier article on spray painting trim *(FHB* #42, pp. 54-59), you'll recognize some of the techniques to follow. Preparing wood for the application of clear finishes is very similar to preparing it for painting, though only up to a point. For example, filling the nail holes calls for a different approach when you can see through the finish.

If I'm doing enamel trim, I prefer that the carpenters install all the trim before I paint. But for varnishing, I like only the door and window casings to be installed. Other moldings can be prefinished and installed after the walls have been painted. I can get away with this because the joint where varnished moldings meet the wall doesn't have to be caulked—slight cracks just don't show up very much. Also, I have more control over the finish on the moldings when I'm working on them at a convenient height. A disadvantage to prefinishing moldings is that the nail hole putties won't have a top coat of varnish, but since baseboards and crown moldings are not at eye level, the difference in sheen is barely detectible.

Health hazards—Varnishing woodwork is not the healthiest of endeavors. Airborne dust particles and noxious odors abound throughout jobs. To put a hold on strong vapors, I use a Binks twin cartridge respirator (Binks Manufacturing Co., 9201 W. Belmont Ave., Franklin Park, Il. 60131). It works well and is quite durable. Paper prefilters stop large particles such as dust and spray mist, while charcoal cartridges stop most vapor. I change the paper filters when breathing becomes difficult. When I can smell fumes through the charcoal filters, it's time to change them.

For sanding, you can use the same respirator with the charcoal cartridges removed to ease breathing, but small disposable paper dust masks are more comfortable. I use 3M's #8710 mask (call 800-328-1667 for local distributors). It's more expensive than the typical disposable mask, but it works better. It has a paper carcase, a strip of foam that helps to stop leaks around the nose and two head straps instead of one. If a strap comes off, I reattach it with white glue.

Using an airless sprayer with a .011-in. tip, the author sprays alkyd sealer on birch doors. With each pass of the sprayer, he overlaps the prior pass by about one third. Nails driven into the ends of the doors allow them to be turned while the finish is still wet. ***Photo by Gail Bergeron.***

Clear Finishes

For houses, I use four different types of clear finish:
***Sanding sealer*—I always use alkyd (synthetic oil-base) sanding sealer under alkyd varnish. It's fairly inexpensive, easy to use and dries quickly. It's also very easy to sand and doesn't clog the paper. It can be used as a top coat, although I don't find the luster appealing, and it's not as durable as varnish. As long as I use top-of-the-line sealers, all brands seem about the same.**
***Alkyd or solvent varnish*—I use alkyd varnish on most interior trim, like doors, casings, windows and moldings. It's compatible with sanding sealer, easy to use and fairly durable. It's also affordable and the odor is bearable. Of the brands I've tried, my favorite is Devoe WonderWood Satin (Devoe & Raynolds Co., 4000 DuPont Circle, Louisville, Ky. 40207). It has an unbeatable luster and overall appearance.**
***Lacquers*—Ordinary lacquers can be difficult to use, especially in humid areas. I stick with Deft Clear Wood Finish (Deft Inc., 17451 Von Karman Ave., Irvine, Calif. 92714) (satin), a modified lacquer that's much easier to apply than ordinary lacquer. It dries a little more slowly, which allows more time for leveling out. Although you can brush it on, spraying is more effective. I don't find much of a problem with blushing, because moisture has more time to escape. I use Deft primarily for speed. It may dry more slowly than other lacquers, but it still dries faster than varnish. It also traps very little dust, a plus for the shop area. A minus is its strong odor. For the most part, I'll only use it outdoors, ruling it out for most house trim. I've found that in an enclosed area, even a respirator equipped with new filters can't completely check the fumes. Deft is also very expensive and not especially durable.**
***Polyurethane varnish*—This is the most durable stuff I use, but for the most part, the application of polyurethane is far too time consuming for big jobs. A good job will require three coats applied about a day apart. It dries and hardens slowly and can pick up a lot of dust. You usually have to wait at least two days to sand it, and even then it may clog the paper. It's also very expensive. I will use a good polyurethane such as Flecto Varathane (Flecto Company Inc., 1000 45th St., Oakland, Calif. 94608) when extra durability is required, as on stair treads, handrails and floors.**
***Buying it*—Deft and other finishes are available in gallons, quarts and in aerosol spray cans. The aerosols are very handy for touch-ups and small pieces that come in late. When buying aerosols, always look for the ones with the fan-spray heads—they spray an actual fan pattern like a professional paint sprayer and are much easier to use than the older aerosols. Most of them also have a rotating spray valve.**

There are other types of clear finish on the market. Shellac, though once used heavily in house finishing, has become fairly outdated. Penetrating oil finishes are nice for some furniture, but are not as well-suited for houses. *—B. P.*

General preparation—On a job where doors will be varnished, I separate all the doors from their respective casings by knocking out the hinge pins. Using an ink marker, I number each door in an inconspicuous place (the lockset hole is a good place for this on the door, as is the strike inlay on the casing). If the job includes bifold doors, I make it a point to mark how they go together. And if the doors will receive a dark stain, I cover all my labeling marks with masking tape to protect them.

If the edges of the doors are rough, I lay the door on one edge and sand the other out with a small belt sander and 100-grit sandpaper. After the edges are done, I round the corners with a 100-grit sanding block. By the time milled doors get to the painter, they're usually full of scratches and scuffs that have to be removed, so their faces should be sanded. I tape cloth pads to the tops of a pair of sawhorses and lay a door flat on them, doing this work next to a window so the face of the door is well lit.

A flush door with a veneer skin is easy to sand. I use an orbital sander, and one pass with 220-grit paper usually does it. If it takes more than three brief passes to sand out the scuffs and scratches, stop so that you don't run through the veneer.

I use a ¼-sheet orbital sander with 220-grit paper to prepare raised-panel doors. Where the machine won't go, I sand by hand. I generally don't sand louvers, door and window casings or moldings. The mill finish on these is usually decent and the extra time it takes to sand them is hard to justify. If time permits, though, it's not a bad idea.

Cabinets are usually ready to receive their finish, but if you're at all in doubt, give them a quick pass with 220-grit in the sander. A small sander works best—my Ryobi ⅛-in. sheet size gets to all the tight spots. Sometimes milled work comes with bum marks from routers or shapers. I use a single-edge razor blade to scrape them down.

Inevitably there are interior surfaces like windows, counter tops or shower stalls that must be shielded from overspray. For masking paper, I use end rolls of blank newsprint purchased from a local newspaper publisher. I don't recommend using printed newspaper because eventually the ink will get on something and mess up the job. Inexpensive plastic drop cloths (the kind that are almost impossible to unfold) are great for protecting large areas.

I use the best masking tape I can find to anchor the paper or plastic. Auto-body shop suppliers usually have the best stuff, but most professional paint stores carry a decent line. I've been using Sherwin-Williams "Professional Quality" tape and use 1½-in. tape for most masking chores. Although an Xacto knife works well for trimming the tape, I prefer single-edge razor blades. They're cheap so I can afford a new cutting-edge every few minutes.

Clear finish on trim and doors—Before any finish is applied, the surface should be cleaned. I use an old paint brush as a duster. Even though I don't sand door casings and moldings, there's usually some milling dust still on the surface. Cabinets should be cleaned with a tack rag, vacuumed or blown out with an air-compressor blower attachment. I also vacuum the floor around areas to be finished.

Sealers and varnishes should be stirred well before using (shaking causes bubbles in the finish if you're using a brush). Satin finishes contain ingredients that make the finish look dull, and they tend to settle to the bottom of the can. Partial mixing gives an uneven finish.

How I apply each finish depends on what I'm using and where I'm using it. I like to spray as much as possible, both for speed and finish quality. I spray most of the mass work (doors and trim) with an airless sprayer outfit. This consists of an electric pump that atomizes paint or varnish by forcing it through the nozzle of a spray gun at high pressure. Airless sprayers are well suited for laying on most house coatings fast and efficiently, although sealer and varnish are a bit on the thin side for this type of equipment. I use a tip with a .011-in. orifice—this is about the smallest available. Each orifice size is available in several different fan-spray patterns (the actual width of the fan-shaped stream of fluid coming out of the gun, measured at 12 in. from the tip). I use an 8-in. spray for most work—it's a good average size.

The tips on airless spray guns can easily be clogged by small particles, and the problem intensifies with small orifices. To prevent this, I use a fine-mesh filter that fits just behind the tip. These filters are readily available from spray gun suppliers.

A word of caution: airless sprayers can be dangerous. They operate at very high pressure and if a finger gets too close to the tip of an operating gun, fluid can actually penetrate the skin, causing serious injury. The tip housing is usually equipped with a safety guard, but some people remove it—you shouldn't.

To help keep overspray off of me, I wear a cheap knit cap and a long-sleeved shirt. If I know I won't have to touch any of the work, I'll rub petroleum jelly on my hands so they won't get sticky.

I spray two liberal coats of sanding sealer on all my doors and trim, thinned by about 20%. I prefer to use naptha over ordinary paint thinner. It evaporates much faster, which speeds setting and lessens the chance for sags. Spraying door casings and windows is tricky. An airless sprayer sprays at a fast rate, and you have to really move the gun to keep from building up too much finish. I hold the gun at about a foot from the work and try not to overlap excessively at corners. For finishing trim, I typically adjust the fan to spray a vertical pattern. But if I'm finishing large areas—wainscotting, for instance—I'll set it on horizontal so that I don't have to hold the gun sideways for maximum coverage. It's a good idea to go around with a paint brush and a drop light looking for sags,

while the first coat is setting. Points of overlap are the most troublesome. After spraying the first coat, I open some windows to help the sealer set up more quickly. When it's dry to the touch, I'll go with a second coat.

I always try to spray doors, loose moldings and anything else that isn't nailed down, outside. A short sit in the sun and fresh air helps to speed drying, and ventilation is vastly improved (though I still wear the respirator). I lay two doors on a pair of horses, spacing them about 6 in. apart so I can reach the edges (photo, p. 74). I spray the doors the long way, with each pass overlapping the previous one by about one-third. Raised panels and louvers have to be sprayed from each side to catch the details. Usually by the time I've finished spraying one coat on a batch of doors, I can start from the beginning again with the second coat. As I spray the second coat, helpers will be flipping the doors I've finished. This way I never have to stop spraying. When all the doors are done, we'll do baseboards and other moldings the same way.

Because everything that isn't nailed down is sprayed and sets up in the flat position, sags and runs are never a problem. The doors can't be left in the sun very long though, or they could warp.

Outdoors, overspray isn't as much of a problem with clear coatings as it is with paint. You don't have to worry much about concrete and brick, but with automobiles, it's a different story. Sealer and varnish might not show up, but it can still cause trouble. Watch the wind direction and be sure to get other workers and neighbors to move their trucks and cars before you start.

The indoor work doesn't set up as fast as the outside work. By the time I've got two coats on the outside stuff, it's time to hit the interior with its final coat of the day. This way, it only takes a few hours to get the first two coats of sealer on all the doors and trim.

Cleaning an airless pump system can be quite a task and can take a lot of solvent, so the job has to be big enough to justify the trouble and expense of using as much as two or three gallons of solvent. For smaller jobs I use portable airless cup guns, but they can be cranky. They don't always atomize the material well enough, and it takes practice to do a good job. Still, they can be very handy for a quick job and they're very easy to clean. They're completely self-contained, so the only accessory they require is a light-duty electrical cord. I have a couple of old Wagner 350s (Wagner Spray Tech Corp., P. O. Box 9362, Minneapolis, Minn. 55440) and use them with tungsten fan-spray tips (similar to the tips used for the other system). The guns usually come with cheaper tips that don't last and spray in a harder-to-control cone pattern (like old-fashioned aerosol cans).

For finishing cabinets (above), Papa prefers to use a conventional spray gun because it is easier to control than the airless variety. Papa has modified this rig by adding the 2-qt. pressure cup held fast by the portable wooden base on the floor. Note the trouble light; Papa shines it on surfaces to check for sags in the finish. Using a spray gun with a siphon cup (below), the author sprays Deft on a cabinet door. The back of the door has already been finished, and he is now spraying the rails and stiles from both sides to get thorough coverage.

Clear finish on cabinets—I prefer a conventional air-compressor sprayer when it comes to finishing cabinets. Cabinets demand a finer finish, and spraying them involves more stop and go to get around tight areas and turns. A conventional sprayer is more forgiving because it sprays a thinner coat than an airless sprayer.

I have a Binks model 7 gun which is both reliable and easy to use. For small jobs, I use it with a 1-qt. siphon cup attached to the gun itself, but for an entire set of cabinets, I prefer to use the same gun with a 2-qt. pressure cup. Pressure feed is faster than siphon feed, and I don't have to refill it as often. Since the larger cup is connected to the gun by way of a hose, the gun is more maneuverable. Also, the pressure-feed mode is capable of producing a finer finish than the siphon-feed mode. The 2-qt. cup I have (Binks model 80-228) is intended to be carried in one hand with the gun in the other. I went ahead and installed longer hoses so I can rest it on the floor next to the cabinet I'm doing (photo left, top). I also made a wooden base for it so it doesn't topple.

I have a 3-hp Craftsman air compressor with a 30-gallon tank that puts out 7.8 cfm at 100 psi. It's more than adequate for this conventional spray-painting system, but I couldn't imagine using a compressor much smaller than a 1½ hp.

Spraying Deft on cabinets with a conventional sprayer is one of the easiest of all my jobs. I thin it by about 15% with ordinary lacquer thinner and start with two full coats, allowing it to set up between coats. Cabinets are hard to spray without some overlapping, but with Deft it isn't much of a problem.

If they're manageable, I like to lay cabinets atop a pair of horses so that I can see them better as I apply the finish. I put base cabinets on top of paint cans to keep them far enough above the floor so as not to send aloft clouds of dust to settle in the finish. Adjusting the air pressure as low as possible will help cut down on spray rebound when doing the inside of cabinet carcases. For large flat areas, I generally overlap about half with a conventional sprayer.

I usually do about five cabinet doors at a time. I tape pieces of rag to the top of paint cans, place the cans on benches and lay one door flat on each can (photo left, bottom). Separating the doors like this leaves room for the hose as I travel between doors. I spray the backs first, then let them dry in the flat position. By the time I've sprayed them all with one coat, the first ones are usually dry enough to come back to with a second coat. When the backsides are dry, I flip them over and do the fronts the same way. For panel doors, I have to spray in logical patterns from all directions in order to wet all the details. Some areas will inevitably get more build-up

Photos this page: Gail Bergeron

than others, but this is to be expected. If you've stained the wood, be advised that Deft will dissolve most stains, so brushing out a sag can cause the stain to smear.

Sanding clear finishes—I use 320-grit waterproof silicon-carbide sandpaper to sand all my clear finishes. It is very durable and isn't affected much by humidity. It's one of the most expensive of all sandpapers, so I stock up by mail order and buy it for about half of what local suppliers usually charge (Industrial Abrasives Co., 642 North Eighth St., Reading, Pa. 19603). Aluminum oxide is not a bad alternative, but I don't like any of the cheaper papers (garnet and flint). They don't hold up, and I think you end up paying just as much in the long run.

For hand-sanding, typical 9 in. by 11 in. sheets can be cut lengthwise into four strips 2¾- in. wide. Folding each piece in thirds yields a 2¾-in. by 3-in. sanding pad, a handy size. Remember that in folding sandpaper, a grit side should never fold against another grit side.

I wait overnight before sanding alkyd sealer. Most labels say 3 hours is enough, but sanding it this soon usually clogs the sandpaper. Deft sands well in 2 hours or so.

I sand flat areas with an orbital sander, but most of the trim has to be done by hand. As a general rule, you should sand with the grain, but as long as you're cutting away the sealer and not the wood, the finish doesn't care in what direction you move the sandpaper. On flat panel veneer doors, I use my orbital sander again, this time overlapping the passes by 75% and using light pressure. Sanding the sealer forms a lot of powder, and you have to keep wiping the door down with a soft rag to see what areas need more sanding. Generally, one pass like this with a little additional sanding on the spots makes a good job.

If you have any sags from the first coat, don't remove them by sanding. You're bound to cut through the finish around them before you've flattened the sags. Instead, slice the excess off with a razor, then come back with a light sanding. Occasionally, I'll use steel wool (#0 or #1) on stained moldings to keep from cutting through the finish at the corners.

Filling nail holes—Filling nail holes must be a difficult job, because I've rarely seen it done well. If you're serious about getting the filler to match the color of the wood, you can forget about the hard drying paste-like putties made to be applied to bare wood. The only way to really get it right is to look carefully at the color around each hole after the wood has had at least one coat of the clear finish applied to it and match it accordingly (photos, bottom right). To do this, you'll need to custom-mix several shades.

I use a soft oil-base putty called Color Putty (photo, top right). It comes in a variety of shades, and I intermix them to match different woods. Depending on the wood, I'll mix a spectrum of about six to eight shades from the very lightest color in the wood to the very darkest, with the average color right in the middle. I also use universal paint colorant (especially raw sienna) (see chart, following page) and white glazing compound to modify the colors. They're both available through paint suppliers. It takes a while to make a batch, so mix more than enough for the whole job. You can save leftovers for future work.

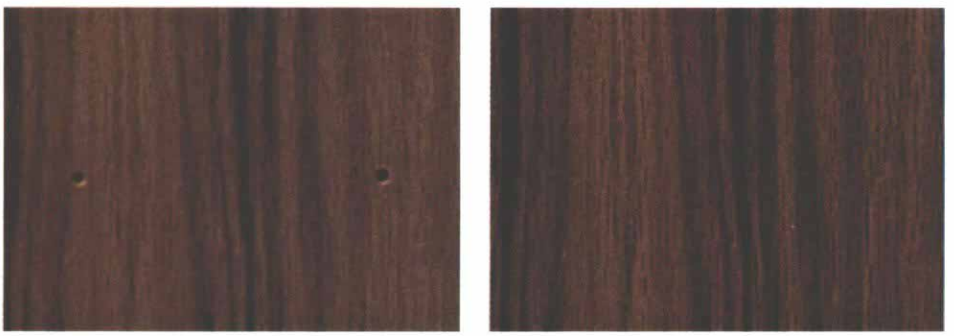
This putty is pretty oily, so when it starts sticking to my hands, I stop, wrap each gob in a double-folded Job Squad paper towel and squeeze it several times so the towel can pull out some of the oil. Otherwise, it gets to be a real mess. Flattening out the putty mixtures on a softwood board and letting them sit overnight also draws out a lot of oil.

I always putty nail holes after the first coats of sealer have been sanded. This limits smearing. Using my index finger, I fill the holes as full and flush as possible and clean around them with a couple of quick passes, using a rag dampened with mineral spirits. Even making a good effort, the holes won't be entirely as flush as they could be with paste fillers applied before finishing, but in my view, slight dimples are a lot better than poor color matches.

Recoating—Before recoating, all surfaces should be dusted again. When dusting off sanding sealer, a fine powder will usually remain on the surface. This is the nature of the product. As long as most of the powder has been removed, the new varnish will dissolve the sealer anyway. The same holds true with Deft over Deft. This is not a general rule for all clear finishes, though.

I thin alkyd varnish by about 15% with naptha. With the airless sprayer, I first apply

It takes a lot of colors to match a variegated material like wood. Papa begins with Color Putty in a variety of tones and modifies them with white glazing compound and universal paint pigment to match the wood in question. For recipes to match common woods, see the chart on p. 78.



By using custom-mixed putty, you can virtually make fastener holes and surface dings disappear. The example above shows before and after photos of nail holes in a cabinet carcase.

Matching Putty to Wood

To match:	Darkest shade	Lightest shade	Secondary shades**
Ash	1 p. cherry 1 p. lt. oak	1 p. lt. oak 3 p. white	
Birch	redwood (straight)	8 p. lt. birch 1 p. redwood 8 p. white	1 p. redwood 1 p. special mix* (lighten with lt. birch)
Fir	1 p. lt. birch 1 p. redwood 1 p. white	2 p. birch 1 p. redwood 6 p. white	
Ponderosa pine	1 p. lt. birch 1 p. fruitwood	1 p. special mix* 16 p. white	4 p. lt. birch 1 p. pecan
Red oak	2 p. lt. birch 1 p. nutmeg	1 p. 'darkest shade' 1 p. white	1 p. lt. birch
Southern yellow pine	special mix* (straight)	1 p. lt. birch 3 p. white	
White oak	1 p. cherry 1 p. honey oak 1 p. lt. oak	3 p. 'darkest shade' 4 p. white	1 p. cherry 1 p. lt. oak
White pine	1 p. special mix* 1 p. white	1 p. lt. birch 2 p. white	pecan (straight)

*special mix: 4 oz. white glazing compound
1 tsp. raw sienna paint colorant

**Secondary shades are occasional streaks of color that occur in some species of wood. Unless otherwise noted, secondary shades are lightened with white.

For white, we use DAP glazing compound, instead of Color Putty's white. All of the woods we used were sprayed with two coats of Deft Clear Wood Finish and sanded lightly. Other clear finishes could affect outcome (for example, most polyurethanes would have a more amber tone). The natural colors in a given species of wood can vary considerably. We used at least four different pieces for each sample. With some species, such as Western red cedar, the grain color can vary so greatly that matching putty can be very difficult, and it may take several "spectrum" mixes to get it right. Knots also add to the confusion.

a thin coat (the varnish won't set up as fast as the sealer did). When it's dry to the touch (or at least tacky), I'll come back with a full wet coat. If the second coat isn't leveling out, I'll add a bit more thinner. Alkyd varnish is more prone to sags than sanding sealer is, so you have to be more careful about overlaps and excessive build-up. I check for sags as I go, and if I find one, I use an artist's brush to feather it out. I also check for skips because it's easy to miss an area with clear finishes. This is especially true outside where the wind tends to deform the spray pattern.

I reapply Deft in about the same way I do the first coats. Except for the backs of the cabinet doors and the inside of cabinet carcases (one more coat for these), I'll again apply two full coats of slightly thinned material. In both cases, this completes a very efficient four-coat system that's hard to beat in luster, smoothness and uniform appearance.

In the case of polyurethane, you can use an airless system, but a conventional sprayer is a better way to go. A good job typically takes three coats. Label directions vary and it's a good idea to follow them, but generally you have to wait about a day before recoating and longer if you're going to sand the varnish between coats (which I recommend). Unlike the other finishes, polyurethane won't dissolve into the previous coat after about 48 hours, so adhesion can be a problem. I always wipe down and degrease the sanded surface with naptha before recoating, in addition to giving it a good sanding. Most labels warn against using their product over certain other finishes, including sanding sealer and shellac.

Whatever clear finish you're using, a word of caution: Don't lean freshly finished doors against each other for at least a few days. The finishes can weld themselves together and ruin your job.

Brushing on the finish—You can get decent, if not spectacular, results brushing on most clear finishes, but it will take time, and brushes tend to attract dust and leave it in the finish. I use a 2-in. brush for most interior trim. I prefer white China hog bristles over black or brown. Prager's #W-104 line is very good (Prager Brush Co., P. O. Box 93263, Atlanta, Ga. 30377), and Purdy Inc., (Box 03097, Portland, Ore., 97203) also makes excellent brushes.

When brushing, it helps to strain the varnish at one-pint intervals. Not surprisingly, the rule of thumb when varnishing trim with a brush is to start at the top and work down. Dip just the first inch or so of the bristles in the varnish, and really work it back and forth onto the trim. This will minimize drips, sags and skips in the finish. On panel doors and windows, work from inside to outside. Large flat surfaces, such as flush doors, are the toughest to do with a brush because it can be difficult to maintain a long broad front. A little thinner can help, and also a smooth-nap roller can be used to spread the varnish more quickly before smoothing it out with a wide brush. Don't use cheap rollers for this—they tend to shed fibers in the varnish.

Porous woods such as oak help to disguise brush marks, so you can expect better results with them. When brushing vertical surfaces, horizontal pieces such as header trim are more likely to sag, due to the gravitational effect on the texture left by the brush. Use a light to catch blemishes as they form. □

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