INTERVIEW

Staining & Finishing Interior Millwork

Applying stains and clear finishes to interior woodwork is more complicated today than in the past. The quality of millwork isn't what it used to be. And fast-track production schedules create conflict with other trades. But good craftsmanship can overcome many scheduling and finishing problems.

To find out how painting pros approach a finishing job, JLC interviewed Joseph Calci and John Canning. Together, they have 68 years experience in the trade. Calci is the apprentice training coordinator for the painter's union in Boston, Mass., and Canning is a painting contractor who served his apprenticeship in Scotland.

Joseph Calci (top) is the apprentice training coordinator for the painter's union in Boston, Mass. John Canning (bottom) is a painting contractor in Southington, Conn.

To make millwork look its best, use stains and finishes that compensate for flaws in the wood

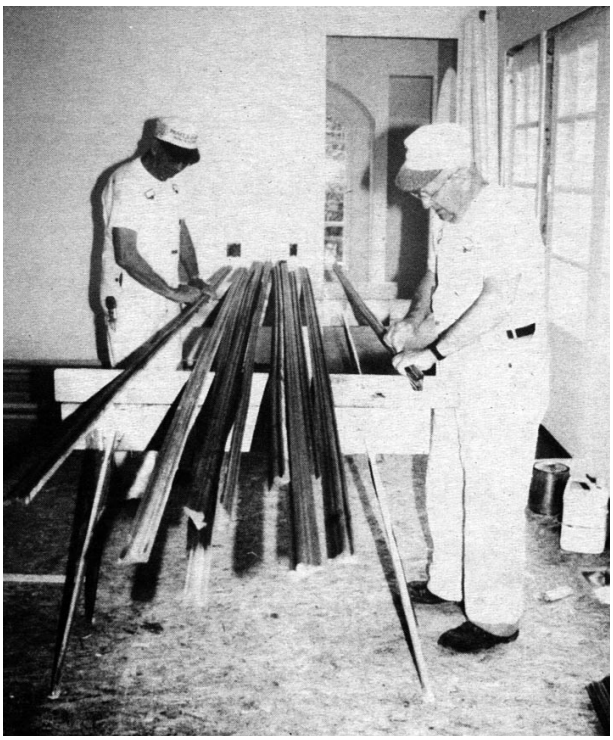
Scheduling the Work

JLC: *Which should come first—staining and finishing the trim or painting the walls?*
Canning: I prefer to finish the woodwork first. After the finish is dry, I protect the baseboard and moldings with "EZ Mask," a 6-inch-wide self-sticking paper masking tape. When I paint the walls, I can cut a nice sharp line around the trim.
JLC: *What about finishing the baseboard and door and window molding before the carpenter installs the trim?*
Canning: That's a good productive way of doing it if you can get the cooperation of the trim carpenter and general contractor. If possible, I prefer to apply the stain and sanding sealer or the first varnish coat in the shop or in a protected room at the job site, but it's best to apply the final varnish coat once the woodwork is in place.
JLC: *How do you work around other trades while applying clear finishes?*
Canning: Working with other trades is the bane of a painter's life, especially when we're doing clear finishes. Invariably if other trades are working in the building, they'll walk through a room and stir up dust. If the contractor agrees, I like to cut off power on the day we're varnishing or arrange to have the building to ourselves.

Prepping and Staining

JLC: *Does the wood used on today's doors and trim make a painter's job harder?*
Canning: Yes, millwork today is more difficult to finish. For instance, wood in new panel doors is not nearly as well selected as in old doors. The main feature of a panel door is the panel, but when the panels are selected randomly and the stiles and rails have wild grain patterns, no finish will improve the appearance of the door.
Calci: Builders can help by ordering stain-grade wood. A paint-grade product, such as finger-jointed wood, shouldn't be used with clear finishes. It's made from scrap pieces and has no natural beauty.
JLC: *How much do you have to clean up the wood before you can begin finishing it?*
Canning: Depends on how dirty it is. Where moldings come bound with metal straps, you'll find rust marks, finger marks, and dirt. Doors are better protected during transport, but if the carpenters have handled them, they'll have fingerprints. We use a mixed solvent wood cleaner to clean off the rust, fingerprints, and dirt. We like "Imperial Clean Wood" (Wilson-Imperial Co., Newark, N.J.; 201/589-6050) which is a mixture of toluol, methanol, methylacetate, acetone, and isopropanol. After going over the wood with the cleaner, we remove any residue with denatured alcohol. You could also use oxalic acid for deeper stains.
Calci: You might also have to sand with a 150-grit garnet sandpaper to get rid of dings. Then sand with 220 grit paper before applying stain or sealer.
JLC: *If you're going to go with stain, do you have any additional prep work?*
Canning: That depends on the kind of wood. You may need to seal or fill the wood before staining. You use sealer on softwoods, like pine. And you can use filler on open-grained woods, such as oak. Filler isn't absolutely neces-

Painters apply the finish varnish coat to stained oak. For best results, they need a dust-free work place.



Many painters prefer to sand, stain, and prevarnish the trim before installation. The final varnish coat goes on with the trim in place.

sary, but some sort of sealer on softwoods usually is.

JLC: *Can you give us an example of how you'd handle pine?*

Calci: Pine absorbs stain quickly. If there is color variation in the wood, the stain will look uneven. To seal the wood, you can brush on a thin wash of 3 lb.-cut shellac, and sand with fine sandpaper (see "Don't Forget Shellac"). The can's label tells the dilution. Then use a pigmented stain. A pigmented stain does not penetrate the surface of the wood as a penetrating stain does, and over a shellac sealer, it will give you an attractive finish.

Canning: If the wood's natural grain isn't very attractive, pigmented stain over a shellac sealer is a good choice because pigmented stain is not quite as transparent as "penetrating" or "architectural" stain. (These terms are used interchangeably by manufacturers.) Penetrating stain soaks in 1/16 to 1/8 inch, and it accentuates the wood grain.

JLC: *Would you use pigmented or penetrating stain on birch doors?*

Canning: I'd prefer a penetrating stain with something called a "prestain" sealer. Birch doors usually have an attractive grain pattern which you want to show through. But birch veneer has some areas with open pores and others with tight grain. If you stain the door without sealing it, the open-grained areas will make the door look blotchy. But you can't use a penetrating stain over shellac sealer. Instead, use a specially made sealer which different companies call "prestain" or "stain control." This product is a real boon to painters because you can put a penetrating stain on top of it and still get a good result. You could try Bix's "Pre-Stain," McCloskey's "Stain Controller," or Benjamin Moore's "Neutral Blender." Then use a penetrating stain, such as Minwax or Pratt & Lambert's "Tonetic Wood Stain."

JLC: *What about a hardwood like oak?*

Calci: For the highest quality job on oak, use a wood filler. This is a thick, paste-like varnish. Wipe it on in the direction of the grain, then rag it across the grain. Wait five to ten minutes or until it loses its gloss. Then rub it with a burlap rag across the grain. Finish off in the grain direction to make it uniform. Let the filler dry overnight, then sand completely.

JLC: *Do you fill before or after staining?*

Canning: You can do either, but I wouldn't advise mixing the stain and filler together. Filler is tough to sand, and you'll have a hard time getting a uniform color. Some manufacturers claim they have combined a wood filler and stain, but I've never seen a successful one. Filler gives a beautiful, even finish, but it is one of the steps that is falling by the wayside. You can varnish four doors in the time it takes to sand the wood filler in one, and it typically adds 50% to the cost of a job.

Most builders find it more economical to put on an extra coat of varnish. This is called the "open pore" effect because you can see all the pores in the wood.

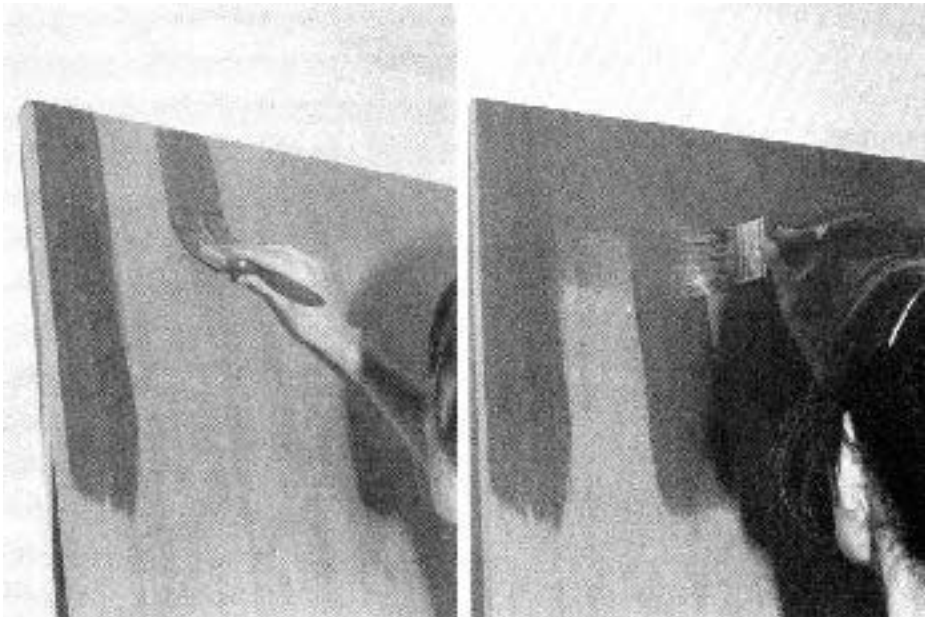
JLC: *Given a choice, do you prefer penetrating stains or pigmented stains?*

Canning: Most painters now use penetrating stains because they're easier to apply, but pigmented stains are an option, especially when the millwork doesn't have a uniform color.

JLC: *Aren't pigmented stains hard to control?*

Canning: Not if you use good technique. You apply a pigmented stain with a brush. Then you "lay it off" immediately with a soft, dry brush. "Laying off" means you barely touch the bristles to the stain and brush in the direction of the wood grain.

If you stick with penetrating stains, on the other hand, such fancy brushmanship isn't needed. With these, dwell



For doors, apply varnish in vertical strips across the top third of the door (left). Then brush horizontally to blend the strips together (right). When the door is fully covered, gently brush the finish from the bottom of the door to the top with a soft, dry brush.

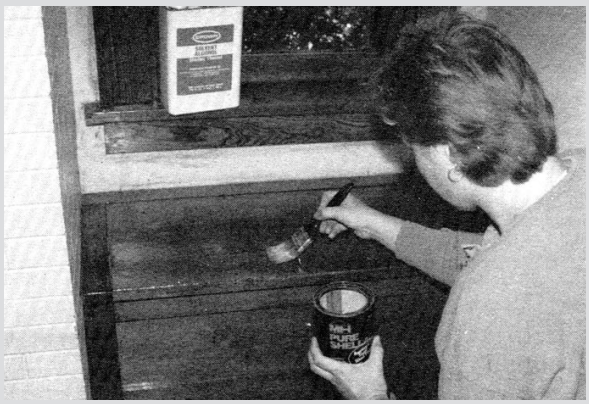
Don't Forget Shellac

By James Boorstein

Shellac can be used as a sealer under pigmented stains, but shellac is also an attractive clear finish that can be used instead of varnish. Shellac has been around hundreds of years, so we know exactly how it behaves. It dries quickly, and it's very hard. If you're finishing millwork on site, shellac gives you the benefits of a quick-drying lacquer with less toxicity and less fire hazard.

Shellac is a resinous finish which can be brushed or sprayed on. You can apply it in a manner similar to other clear finishes. However, shellac has one big advantage—you can repair drips or mistakes by rubbing them out carefully with a solvent-dampened rag or steel wool. Then you can feather in a repair.

Shellac, as applied, is a relatively thin film, so you need several layers. You can figure that one coat of shellac is equivalent to two-thirds of a coat of varnish. If you use two to three coats of oil varnish, use three to six of shellac. In the old days six coats were common.



Shellac works well as a sealer under pigmented stain or as a primary finish. It's main advantage as a finish is the ease with which you can repair drips or scratches.

All Shellacs Are Not Equal

You have a choice of color when working with shellac—white or shades of orange. All shellacs are really orange shellac; white is just orange shellac that has had wax and impurities taken out; and in some cases, it has been bleached.

Orange shellac is the kind of shellac used historically on woodwork and floors, and it imparts a rich orange hue to the wood. Two companies sell liquid shellac for retail customers—Mantrose-Hauser and Zinsser. Liquid shellac from either company can be ordered from Janovic Plaza Inc., a mail-order paint store (718/786-4444). I prefer Zinsser's because it is pure orange shellac; Mantrose-Hauser's is tinted white shellac.

Shellac out of a can is cut with alcohol solvent, and the dilution changes from product to product. The standard used to be a 5-lb. cut, meaning 5 gallons of resin are dissolved in 1 gallon of alcohol. In recent years, 3- or 4-lb. cut shellac is more common in stores. The can's label tells the dilution.

If you purchase a 3- or 4-lb. cut shellac, use about 1 part shellac to 2 parts solvent for finishing. If you're going to use shellac as a sealer, thin it 1 part shellac to 5 parts solvent.

An important part of any finish is the solvent, but this is especially true for shellac. Alcohol is the solvent, but off-the-shelf varieties of solvent alcohol may have traces of water or other impurities. Using a pure solvent, without impurities, makes the shellac easier to brush. The tricky part of using shellac is that it dries so quickly, but with a better (and more expensive) solvent, the workability improves. "Behkol" is one such solvent, and it is available from the Garrett Wade tool catalogue (800/221-2942) or from The Olde Mill Cabinet Shoppe (717/755-8884). "Den Alko" is another high-grade solvent alcohol that you can order from the manufacturer, Mohawk Finishing Products (800/545-0047). You can use less expensive solvent to clean your brushes or spray equipment.

How to Apply Shellac

To build up base coats, you can apply shellac with an airless sprayer and small-tip spray head. You should experiment with distance, but holding the spray head 6 to 8 inches from the wood works well for me. With an airless sprayer, overspray isn't a huge problem because the shellac droplets partially dry in the air. They can be rubbed off fairly easily. You might get some orange peel if you spray too much in one place, and you can get some drips and runs. However, if your spray technique is good, you'll find that you can spray shellac with much success.

When I'm trying to duplicate historic finishes quickly or at a lower cost, I brush on the final coats over a sprayed base with a thin badger bristle brush. Using a thin brush means you don't hold too much material in the brush.

Shellac is very adhesive. Even though dry shellac is glossy, you don't absolutely need to rough it up with sandpaper before recoating, though I do. The new coat slightly dissolves the surface and bonds with it. The finished shellac becomes one film.

Shellac has a limited shelf life. Before buying a can of shellac, check the date on the lid. The shellac is good until that date; after that, it dries more slowly. Orange shellac has a longer shelf life than white shellac and should last about a year.

Where You Can Use It

Shellac has a reputation for getting damaged by water and solvents, but the homeowner could wipe it down with a damp cloth, and it wouldn't discolor. If you put it on window rail that collects condensation, you'll have problems. And in strong ultraviolet light, shellac will craze and alligator over time. I solve these problems by finishing areas exposed to water or sun with tinted varnish. If I'm using orange shellac, I tint the oil varnish to match. But other than using varnish in damp or sunny locations, I prefer shellac because it is a quick-drying hard finish that wears well and imparts a beautiful color to the wood.

James Boorstein's company is Traditional Line Ltd., Manhattan, N.Y.

For a panel door, start with the ribbon mold, using a 1 1/2-inch diagonal "sash tool." Then do the panels, the center stiles, the cross rails, and the two end stiles.

time is the critical factor. Brush on a good amount of stain, then let it dwell as long as the label says. Wipe it off evenly with rags. If your timing is consistent, the color will be uniform.

JLC: *How long should you let a stain dry before applying the clear finish?*

Calci: A penetrating stain should dry overnight. Pigmented stains should also dry at least overnight, and in winter or humid weather, two days.

JLC: *Do you sand again before varnishing?*

Calci: You don't have to sand after staining if the wood has been previously sanded thoroughly and is smooth. But if you have overlooked some rough spots, you should sand. Use caution since you don't want to remove the stain. Feathering in new stain can be difficult.

Sanding Sealer

JLC: *What's the next step in the process?*

Canning: After you've stained the wood, you apply a sanding sealer. Sanding sealer takes the place of the first varnish coat. The sealer has silicone in it, and that makes it easy to sand. Because it's easier to sand, you save labor. Also, the sealer won't scratch, so the varnish looks smoother.

For flat finish work, I like to use a 220 garnet paper after the sanding sealer. But for curved moldings, we use the 4 3/8x11-inch sheets of green "steel wool" ("Stripping Pad," 3M Company, St. Paul, Minn.; 612/733-1110). This is a non-metal abrasive similar to a pot scrubber, and it leaves none of the residue of metal steel wool.

JLC: *What if you're using a wood filler, but not stain?*

Canning: If you aren't using stain, you would skip sanding sealer and apply varnish directly over the wood filler. And if you're not using wood filler, you'd put the sanding sealer straight onto the sanded, bare wood, and then apply varnish.

JLC: *How would you schedule these steps for maximum productivity?*

Canning: On one day I'd sand the wood and stain it; then next day apply sanding sealer. The following day I'd finish sanding, then give the woodwork a coat of varnish. In production work, you don't need a third coat.

JLC: *What's the best time to fill nail holes and cracks, and how do you get a good match with the stain color?*

Canning: Most painters use a colored putty or putty stick. You can also mix stain into a powder to fill wider gaps. "Durham's Water Putty" and Bix "Stain Putty" are examples of powders that you can mix a stain into, and if you've already stained the wood, that's probably the way to go. If you haven't stained it, you could use "Minwax Wood Filler." You can stain right over it, and it accepts the stain fairly well.

It's best to fill holes as early as possible, but never put putty on bare wood. You should have your stain and sanding sealer on the wood first. If you putty on bare wood, you leave a thumb print, and the putty may shrink because the wood absorbs the oils.

If you color your putty slightly lighter than the finish, you'll have a better match than if the putty is darker. When the final finish coat is applied, the nail holes will blend in.

Clear Finishing

JLC: *When you're ready to varnish, how do you set up a dust-free environment on the job site?*

Canning: Make sure the room is swept up and clean. Clean all horizontal surfaces with a dusting brush. Use a tack rag on all surfaces. Splatter water on the floor to hold the dust down.

JLC: *What exactly is a tack rag?*

Calci: A tack rag is a slightly sticky cloth used to wipe sanding particles off the surface.

Canning: We make our own from scrap linen, which we dampen with turpentine, then work in two tablespoons of whatever varnish we're using.

JLC: *Do you have any tips on organizing the work?*

Canning: With varnishing, it's extremely important to have a clean brush. First do the parts of the room where a clean brush and flawless finish are most critical. Begin with the doors and other panels. Then do the windows and finally the baseboard. You'll do the baseboard last because you're more likely to pick up dust and dirt on your brush.

I always stop in the middle of the day and strain the entire can of varnish through an old nylon to filter out specks.

JLC: *Let's talk about varnish. What type do you use?*

Calci: All varnishes are glossy, but flatteners dull the sheen, so you can have flat, dull, satin, semi-gloss, and gloss. Flatteners also soften the varnish slightly. I've found some varnishes tend to sag or else set too fast, and it's hard to control their application. You have to experiment with different products until you find the one you like.

Canning: I'm not keen on satin varnish. I like a semi-gloss oil varnish because it's harder and more durable. The more glossy the varnish, the more depth the finish appears to have.

I've also done some experimenting with acrylic varnishes, and I found that they dry too quickly. I tried all sorts of things to retard the drying, but none of them gave the varnish the workability of an oil varnish. On a job I did in Connecticut, where low-VOC varnish was required, I ended up using a polyvinyl acetate medium, a ready-mix retarder, and a drop of acrylic for color. I worked on a small area at a time, and the job was a headache.

JLC: *Most people over-brush varnish and end up with air bubbles. How should you apply varnish, especially to doors where bubbles really show?*

Canning: You do a slab door in three steps, whether the door is vertical or horizontal. Do the top third first, the middle third, then the bottom. Apply a brushload vertically with a 3-inch brush. Leave a 3-inch gap, then apply another 3-inch strip. When you've gone across the top third of the door this way, brush horizontally to blend the strips together. Brush continuously from one edge to the other. When you've repeated these steps for the other sections of the door, very softly place the tip of the brush against the varnish and brush up. This "laying off" should be done from the bottom of the door to the top.

For a panel door, do the ribbon mold, then the panels. Then do the center stiles, the cross rails, and the two end stiles.

Don't forget to seal the top and bottom of the door. This is especially important on exterior doors. If the carpet installer cuts off the bottom, make sure the door is sealed again before it is rehung.

JLC: *How long should oil varnish cure?*

Canning: Overnight or until dry. I'd wait a couple days before putting on hardware or hanging doors.

JLC: *Have you run into compatibility problems between a stain from one manufacturer and a finish from another?*

Canning: Yes. The term we use in Scotland is "cissing." The finish breaks up into little globules because the stain rejects the finish. Also, some finishes will reliquify the stain.

It's good to stay with one manufacturer because as soon as you mix product lines, you don't have recourse to either company if the products fail.

JLC: *Do you ever use polyurethane?*

Canning: I'm wary of polyurethane. You have to be careful about the stains and sealers you use under it. The only place I'd use it is on floors. After applying one coat, you must recoat within 12 hours. The coats cure and fuse together; one film bonds to the other. If the previous coat should happen to cure completely (this might happen if you start the job on a Friday), you have to sand to provide a mechanical bond for the next coat. I also don't like polyurethane because it's not very reversible. To refinish it, you have to strip down to bare wood.

Polyurethane can also cause problems if it's exposed to direct sunlight. I used it on the floors in my house, and the floor around a rug turned light while the area under the rug turned dark. We'll never be able to move that rug.

Tools and Clean-up

JLC: *What brushes do you favor for varnishing?*

Canning: I buy my brushes in England, and I've bought from companies such as "Wright of Lym," "Hamiltons," and "Whistler." In this country, I'd recommend china bristle brushes for varnish work.

JLC: *How many do you need?*

Canning: Just two. When I'm varnishing, I have the bucket of varnish and two brushes in my left hand, and I switch the brushes as needed. The brushes aren't idle long enough to harden up. I use a 1 1/2-inch sash tool and a 3-inch-wide brush for flat work. The sash tool has a diagonal cut at the end, but the flat brush is straight across.

JLC: *Bristle brushes are a big investment. What's the secret to making them last?*

Canning: If you're using a china bristle brush, rinse in clear turpentine three times. Use your fingers to clean out the heel of the brush. Then spin it. Never use soap or water.

Once you've cleaned the brush, use your fingers to work sapphire oil into the brush, especially the heel. The sapphire oil keeps the residue in the brush from drying out. You can get this oil in sign-writing or artists' stores. Wrap the brush in waxed paper for storage. Before using the brush again, rinse it in paint thinner.

JLC: *When it comes to final job-site clean-up, who should remove the masking tape, and when should you take it off?*

Canning: Painters are responsible for removing the tape. That way, if there is some problem with the finish, we can correct it. On a job I did recently, another painter had done the walls before we finished the woodwork. He hadn't used a primer over new plaster, and when we took off the masking tape, the new wall paint came right along with it. Because we removed the tape, we were able to figure out what caused the problem.

We typically do our woodwork first, mask it, then paint the walls. We remove the tape as soon as the paint is set—two to three hours with alkyd paint and less with latex. If you remove the tape promptly, you won't peel off the new varnish.

JLC: *How do you handle disposing of solvents and rags?*

Canning: Many of the materials painters use are extremely flammable. When we're on the job, we don't allow smoking and we're also very aware of spontaneous combustion. Linseed-oil-soaked rags can ignite without a live flame. When we're doing our daily or end-of-job clean-up, we douse rags in buckets of water and take the bucket outside. Or we spread the rags out to dry. We never put rags in a cardboard box and walk off the job.

Some general contractors now have contracts with waste disposal companies. This is a big help to me because the company can take four or five gallons of waste at a time. Painting contractors who don't have this option have increasingly been recycling their solvents and decanting them for reuse. ■

Joseph Calci joined the International Brotherhood of Painters and Allied Trades in 1958, and is now the Training Coordinator for Painters District Council #35 in Boston, Mass. John Canning began his apprenticeship as a decorative painter in Glasgow, Scotland at the age of 15, and he's been a tradesman for 32 years. His company, John Canning & Co. Ltd., in Southington, Conn. works in new construction and restoration, and specializes in decorative finishes.