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PAINTING

PROJECTS AROUND THE HOUSE

Make old
walls smooth

PAGE 32

The right way
to paint trim

PAGE 54

Product guide
for wood repair

PAGE 20

Easy wallpaper
removal

PAGE 26

Paint problems
and how to fix them

PAGE 90

Techniques for rolling
walls and ceilings

PAGE 48

10 TIPS

to Paint Like a Pro

PAGE 96



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2020 Fine Homebuilding House

GREENWICH, CONNECTICUT



After
Remodel

Installing
Siding

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Time for siding and trim

It's time to install siding and trim at the **2020 Fine Homebuilding House**. The roofline trim, window casing, and vertical channel siding shown here are all Boral TruExterior poly-ash products. Above the vertical siding, the team is transitioning to Boral's Nickel Gap siding. The siding and trim are installed on $\frac{3}{4}$ -in. furring strips to create a ventilated rainscreen. The rainscreen gap allows drainage behind the siding and promotes drying of the siding, trim, and wall assembly. The furring strips also hold the continuous Rockwool ComfortBoard insulation securely in place. Elsewhere on the house, the team will be installing Eldorado Stone, using the stone veneer as an accent to the other siding materials.

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PAINTING

PROJECTS AROUND THE HOUSE



84
FLAWLESS
DOORS AND
WINDOWS

PREP WORK

16 Prep Before You Paint

When the paint dries, these 10 steps will go unnoticed, but skipping one can blow a perfect finish

BY JIM LACEY

20 A Product Guide to Wood Repair

Fill holes, fix rot, and prep for paint both inside and outside the house

BY BRIAN PONTOLILO

26 Stripping Wallpaper

Take your wall from paper to paint with minimal damage

BY MIKE DiBLASI

32 Make Old Walls Smooth and Sound

Cracks, peeling paint, and bad patches disappear with a wide roll of adhesive mesh and two thin coats of joint compound

BY TIM LEAHY

36 A Primer on Primers

With options aplenty, there's a lot more to know about this base coat than you think

BY PATRICK McCOMBE

40 Picking Paint

Manufacturers continue to tinker with chemical makeup to improve durability, ease of application, and hide, but shopping for paint still isn't simple

BY SCOTT GIBSON



66 SPRAY-FINISHING SECRETS



INTERIORS

48 Painting Walls and Ceilings

Tips for cutting straight lines and rolling on paint without making a mess

BY BRIAN J. DOHERTY

54 8 Steps to Perfect Trim

One pro's method of getting from prep to final coat

BY TIM LEAHY

60 Wallpaper the Right Way

Installed correctly, this wall covering should last a lifetime and come off easily once it has worn out its welcome

BY JOHN CLIFT

66 You Can Spray

A modest spray setup for quick, high-quality finishes is surprisingly easy to use

BY TYLER GRACE

72 Staining Secrets for Furniture-Quality Trim

Whether you're finishing a door, built-in cabinetry, or the moldings in between

BY TIM LEAHY



36 PICK THE PERFECT PRIMER

EXTERIORS

80 Spray or Brush?

Consider prep time, conditions, and cleanup to determine the fastest way to tackle an exterior paint job

BY SCOTT GIBSON

84 Skillful Brushwork for Doors and Windows

Proper preparation, materials, and technique for a durable finish in hardworking locations

BY PHILIP HANSELL

90 Paint Problems and How to Prevent Them

Knowing why paint fails is the best way to get a long-lasting, problem-free paint job

BY PATRICK McCOMBE

96 10 Tips to Paint Like a Pro

Products and advice for tackling the toughest parts of an exterior job

BY PHILIP HANSELL

102 Fabulous Finish for an Entry Door

Beautify a wood door with dye, stain, varnish, and a commitment to doing the process right

BY PETER GEDRYS

DEPARTMENTS

On the Web 6

Editor's Note 7

Tips & Techniques 8

What's the Difference? 12
Paintbrushes & drop cloths

Building Skills 108
Cutting in trim and corners

Keep Craft Alive 110



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Cover photo: Charles Bickford



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Video Series: Finishing an Entry Door

Step into the workshop of finishing expert Peter Gedrys and watch him sand, stain, and apply a beautiful coat of varnish on a wood entry door. You can find this and many more comprehensive video lessons at FineHomebuilding.com/videoseries



Get a shop-quality finish when spraying cabinets

Remodeler Tyler Grace explains how to spray paint doors, trim, and built-ins in his article on pp. 66-71. To see exactly how it's done, watch the companion video at FineHomebuilding.com/spraypaint

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Episode 154: Lead-Paint Removal and Cracking Drywall

The *FHB* editors suggest the best course of action for some common remodeling problems. Visit FineHomebuilding.com/podcast.

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Do it yourself—with help

After a three-year-long search, this summer I finally purchased my first home. With the entire *Fine Homebuilding* staff working remotely, it could not be a better time to find a more comfortable space for a home office. And with the entire *Fine Homebuilding* archives at my disposal, it could not be a better time to dive into some DIY home-improvement projects.

The home's previous owners had painted their son's bedroom a deep, dark blue. My first task was repairing the peeling sand-painted ceiling, and turning the walls a bright, sunny yellow. With access to every article about painting ever published by *Fine Homebuilding* magazine, I promptly ignored them all. Painting couldn't be too hard, I figured. I grabbed some spackle, some ceiling paint, and a 4-ft. ladder, and went to work.

As it turns out, painting can indeed be hard. A full day of spackling and a second of priming went to waste when the paint I applied to the ceiling began peeling off in large chunks, taking off layers of paint below with it. New paint and old paint hit the ground. It was only my first DIY project as a new homeowner, and my home was literally coming down around me.

I now have a newly painted room, a payment due to a professional, and a few ideas of what might have gone wrong. "Paint Problems and How to Prevent Them" (pp. 90-95) presents different types of paint failures. The bubbling, peeling ceiling paint I encountered was a sign of moisture damage and improper prep. "A Primer on Primers" (pp. 36-39) describes 16 types of primers and what they're used for. According to the article, the shellac-based primer I used to prepare the surface is good for hiding stains, but prone to cracking—a terrible choice for a moisture-damaged surface.

This painting guide has everything you need to start your own finishing project, be it one shelf or an entire house; indoors or out; painting, spray-finishing, staining, or wallpapering. Now that I've read Tim Leahy's technique of skim coating with joint compound (pp. 32-35), I see exactly how I can flatten the sand-painted ceilings in the other two bedrooms. My exterior door is cracked and peeling—wood finisher Peter Gedrys's "Fabulous Finish for an Entry Door" (pp. 102-107) has all the info to help me fix it.

There are many DIY projects in my future. But first, the rest of my house needs paint. And I won't need the professional this time—with this guide at my fingertips, I have all the help I need.

—SAMANTHA MAVER
 managing editor

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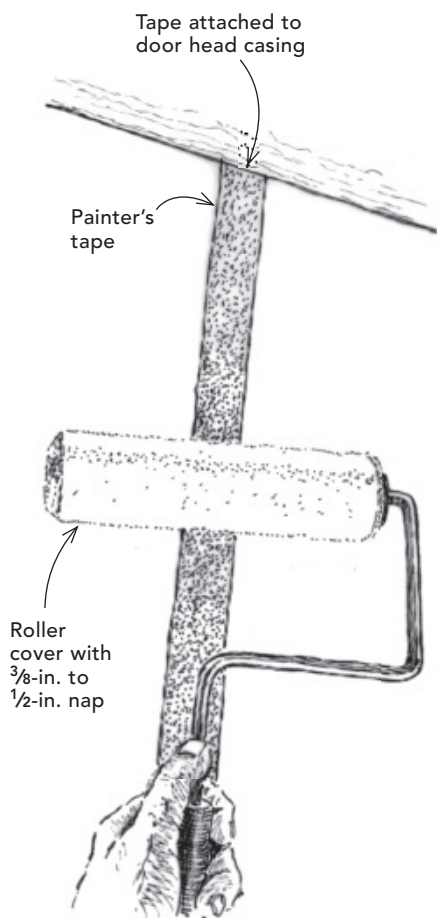
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Get the perfect paint job

It's frustrating when lint from your roller cover messes up a new coat of paint, but the solution is simple and inexpensive. Hang a piece of blue painter's tape that's 3 ft. to 4 ft. long from the head casing of any door opening. While holding the bottom of the tape with one hand, roll the fresh roller cover over the sticky side of the tape with the other hand. Make enough passes up and down the tape to cover the entire width of the roller cover a few times. You'll see the lint all over the tape.

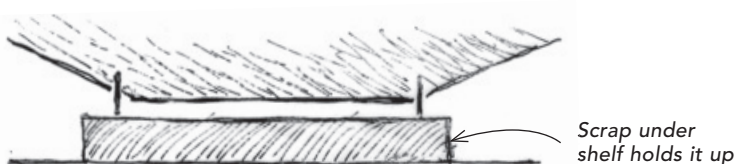
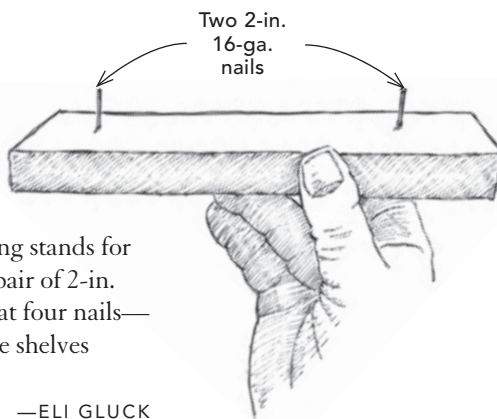
—MIKE ALEXANDER
Monrovia, Md.



Painting rack

I had a bunch of shelves that I needed to paint and I wanted to make disposable drying stands for them. I had some MDF cutoffs, and shot a pair of 2-in. 16-ga. finish nails through them. I found that four nails—two at each end—were plenty to support the shelves while they dried.

—ELI GLUCK
Brooklyn, N.Y.



WE SUPPORT YOU

While the full impacts of the global pandemic are not yet known, all of us at Fine Homebuilding are aware of the disruption it has created for the working lives of tradesmen and women throughout North America. We have been through tough times before. We will get through tough times again, together.

In times like these, those in the Fine Homebuilding and #KeepCraftAlive communities lean on each other. In the bond between builders and designers and suppliers, you'll find insight, inspiration, and, when it's needed most, support.

We're here to provide you the information and community you need to build to your best, and we remain committed to supporting students with scholarships and training resources during these times when they may need them more than ever.

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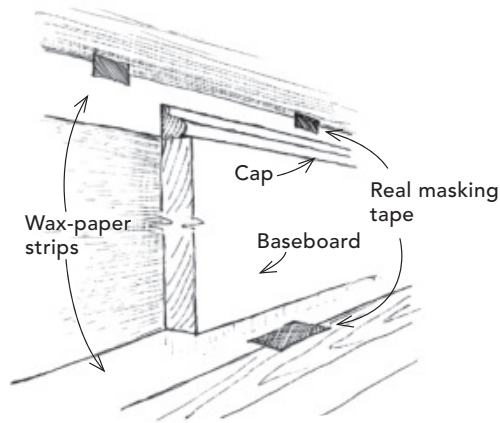
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Cheap masking help

If your ability to cut in a sharp edge with a paintbrush is on the shaky side and you don't mind saving a dime or two, you'll appreciate the masking tip that I came up with on a recent baseboard job. As shown in the drawing below, I used narrow strips of wax paper held in place by bits of masking tape to protect the floor and the wall.

I bought a 25-yd. roll of wax paper for \$1.50 at the market and cut it into four equal-width rolls. For this two-piece base, I put down the floor strip first and nailed the base to the wall. Then, with the wall painted, I put the wall strip on and installed the base cap. For one-piece base, I applied both strips before installing the baseboard.

Now my shaky cut-ins are sharp edges. Once the paint dried, I used a utility knife to cut away the tape. I caulked the joint after removing the paper so that the caulk could bond to the wall.

This method works equally well for window casings, especially the side pieces, where gravity is in your favor. Just tape the wax paper at the top, and let it unfurl.

—SCOTT GIBSON
East Waterboro, Maine

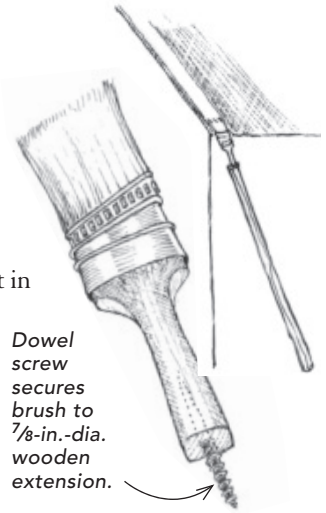
Prevent roller dry-out

When a painting project takes more than a day and you want to keep the roller cover and tray from drying, you could slip them into a large plastic bag. But there's likely enough air in the bag that the paint will skin over. So, before slipping the tray and roller into a kitchen-trash-size plastic bag, I drape a damp, folded cotton rag over the top. An old pillowcase folded in half works well—just soak the cloth, then ring it out. The dampness seems to keep the humidity inside the plastic bag high enough to suppress drying. I've used this tip to keep latex paint on the roller cover and in the tray fresh for several days.

—MIKE GUERTIN
East Greenwich, R.I.

Paintbrush handle extension

If I had lower ceilings, I wouldn't need a long-handled paintbrush to cut in a line along the top of the wall or where the ceiling meets the crown molding. But I've got nice high ceilings that require me to stand on a ladder or a low scaffold

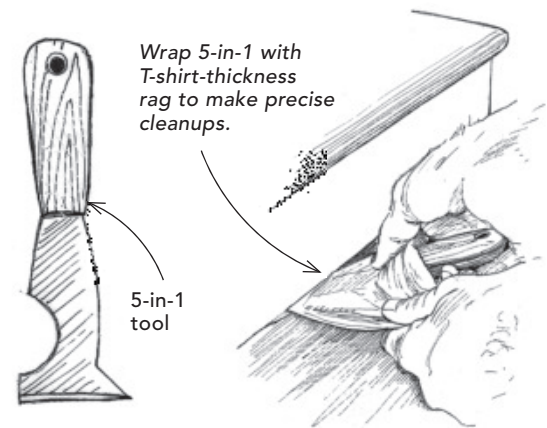


to reach these targets with a standard paintbrush. On the other hand, I can skip the ladder and scaffold altogether and use my customized paintbrush. I lopped off the wooden handle at the thickest part and inserted a dowel screw into a $\frac{3}{16}$ -in.-dia. pilot hole. Dowel screws have threads at both ends, which leaves a threaded shank to insert into a pilot hole drilled in a $\frac{7}{8}$ -in.-dia. dowel. I've found that a 3-ft. to 6-ft. dowel is most convenient, depending on the ceiling height.

—JAMES BROOKS
Boston

A neat way to wipe up paint

Good painters don't use a lot of masking tape. In the interest of efficiency, and as a point of pride, they cut in with a carefully loaded brush and a steady hand. Occasionally, though, some paint strays onto the adja-



cent surface. The best way to clean it without messing up the paint job is to wrap a cotton rag tightly over the blade of a 5-in-1 tool. This lets you wipe up the paint with surgical precision and maintain a straight line. I can't remember what painter I stole this tip from, but I've used it since, whether painting stair risers and window muntins, or cutting in trim.

—KEVIN IRETON
New Milford, Conn.



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difference?

■ PAINTBRUSHES

Bristle shape, ferrule, and handle

So you've got a painting project to tackle. If you'll be using latex paint, you'll want a brush with synthetic bristles. If you'll be using oil-based paint, you can use a brush with either synthetic or natural bristles. Sounds simple enough—until you go to the paint store and see just how many variations there are for a simple design. To make your decision a little easier, look at these three things when purchasing a paintbrush.

Fine Homebuilding staff

Bristle shape Paintbrush tips can be angled or flat. A flat-tipped brush is good for flat surfaces with no obstructions, such as horizontal siding. Although many pros use angled brushes for painting flat surfaces, they are more often used for cutting in and for covering areas, such as window muntins, that require precision. The best brushes have tapered filaments of various lengths that hold paint throughout the brush and release it smoothly. Look at the brush from the side. If it comes to a point at the end, it is tapered. If the thickness is the same from base to tip, it is not tapered and will not apply paint evenly and cleanly. Quality brushes also have flagged, or split, ends, which create more surface area for holding paint and leave fewer brush marks.

Ferrule The ferrule is the metal band that protects the base of a paintbrush. Ferrules on most professional-grade brushes are made from stainless steel, nickel-plated steel, or copper-plated steel. Cheap brushes often have ferrules made of tin-plated and brass-plated steel, which are not as corrosion resistant. The rust that develops after repeated cleanings could end up staining the paint. If you need to cover a large area by brush, you may want to consider a brush with a semioval ferrule. Its larger bristle capacity makes it able to hold more paint. Regardless of the metal it's made of, a ferrule should hold the shape of the bristles.

Handle The handles on most professional-grade brushes are made from unfinished wood, although handles made of finished wood, plastic, and other materials are available. Unfinished wood absorbs perspiration, which means the brush won't slip out of your hand. You also should consider shape: rattail, beaver tail, fluted, flowing, Shasta, block, round. The choice comes down to three related factors: comfort, balance, and size. Comfort is in the hand of the painter. Someone with a small hand might prefer a thin, light brush, while someone with a large hand might choose a wide, heavy brush. Manufacturers match handles to brushes in part to provide balance between the handles and the bristles. Better balance means more control. At times, however, size may outweigh balance. A brush with an extrashort handle, for example, may not feel balanced, but it might be just the right tool to reach a narrow corner.



■ DROP CLOTHS

Plastic, canvas, or alternative products

When painting, the most important and effective measure of protection from splatters and spills is a drop cloth. The two most common types of drop cloths are plastic and canvas. However, other products like rosin paper, cardboard, and natural and synthetic recycled fibers are available. While each type serves the same essential purpose, each functions differently.

Jim Lacey, a professional painter in Bethel, Conn.

PLASTIC IS CHEAP

Plastic drop cloths are useful, but serve a more limited purpose. They are lightweight, disposable, and inexpensive.

Pros: Lightweight, so they can be hung and draped easily. Impermeable.

Cons: Dangerously slippery on hardwood and carpeted floors. Easily ripped or torn. Must be taped to be kept in place.

Best use: Plastic can be hung with painter's tape, making it the best drop cloth for covering upper cabinets, light fixtures, and tall furniture.

Cost: \$3 each (9 ft. by 12 ft.)

CANVAS IS THE STANDARD

Next to a paintbrush, the most universal item in any painter's possession is the canvas drop cloth. A heavy-duty 12-oz. drop cloth is best because paint is less likely to seep through it.

Pros: Durable, long lasting, and reusable. Rubber-backed versions are impermeable.

Cons: Can be slippery on hardwood floors. Won't lie dead flat, which can create a tripping hazard.

Best use: General flooring coverage, tool and material staging, countertop and furniture coverage, exterior applications (like deck or walkway protection).

Cost: \$40 each (12 ft. by 15 ft.)

ALTERNATIVE PRODUCTS VARY IN EFFECTIVENESS

While some people use rosin paper and cardboard as drop-cloth material, I don't. They just don't offer the performance and ease of "installation" of other products. However, a fibrous drop cloth, like Clean&Safe (dropcloth.com), is a good option in some situations.

Pros: Lies flat, skid resistant, impermeable, reusable, easier to detail around transitions and stairs than other drop cloths.

Cons: Difficult to drape or hang. Distribution is limited, and online orders offer only larger quantities.

Best use: As floor protection over hardwood and carpet. Performs particularly well on stairs because it's less likely to bunch up.

Cost: \$40 each (80 in. by 12 ft., sold as \$200 box of five)



16

Prep Before
You Paint

20

A Product Guide
to Wood Repair

26

Stripping
Wallpaper

32

Make Old Walls
Smooth and Sound

36

A Primer
on Primers

40

Picking
Paint



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PROJECTS AROUND THE HOUSE

Prep Work



For a lot of people, painting is dreadful. They complain that it's messy and fussy, and that they don't always get the results they hoped for. The truth is that most people end up with less-than-desirable results because they ignore the importance of proper preparation.

In the 20 years that I've been painting houses, I've learned how to size up quickly the results of poor prep work. The signs include paint peeling in sheets off doors and trim, mildew seeping through layers of paint, and bleeding spots on walls and ceilings—paint failures that easily could have been avoided.

At each job, I follow a basic routine that ensures a long-lasting, attractive paint job. I start by removing items from the room. Large items, such as couches, can be moved to the center of the space and covered with drop cloths. With a fresh canvas, I can begin the real prep work. □

Jim Lacey is a professional painter in Bethel, Conn.
Photos by Rob Yagid.

PREP Before You PAINT

When the paint dries, these **10 steps** will go unnoticed, but skipping one can blow a perfect finish

BY JIM LACEY

STEP 1



Drop the entire room.

First, cover the floor with heavy-duty canvas drop cloths. Use 9-ft. by 12-ft. drop cloths near walls, 4-ft. by 5-ft. cloths under tools and paint, and a 12-ft. by 15-ft. cloth to cover a large area of flooring or furniture. Don't skip on the drop cloths. Cheap products can allow paint to seep through, and plastic drop cloths can be slippery, especially on hardwood floors.

STEP 2



Organize and stage essential tools.

Keep all commonly used tools close at hand. This helps the work go smoothly. Place these tools on their own drop cloth in an easily accessible but out-of-the-way area. Large items, such as step ladders and vacuums, also should be kept close by.

STEP 3

Light the space.

Set up work lights—LEDs, halogens, or domed incandescent lamps—wherever possible. Set the lights in a position that eliminates shadows and works best with the natural light coming into the room. Adjust the lights as conditions change.



STEP 4

STEP 5

Must-have materials

- Step ladder
- Canvas drop cloths
- 5-in-1 tool
- Multibit screwdriver
- 2½-in. angled brush
- Acrylic caulk
- Cut bucket
- Extension cords
- Taping knives
- Paint trays
- Roller handle
- ¾-in. roller sleeves
- Roller extension pole
- Bleach or TSP
- Rubber gloves
- Sponges
- Tinted primer
- Joint compound
- Tack cloths
- Sandpaper and sponges
- Rags
- Shop vacuum
- Auxiliary lighting



Remove wall and ceiling obstructions. Don't try to paint around easily removable elements such as window treatments, sconces, outlet covers, switch covers, thermostats, and recessed-light trim rings. Large fixtures, such as chandeliers, can be covered with plastic instead of being removed. The escutcheons can be unscrewed and lowered.



Wash down everything. One-quarter cup of trisodium phosphate (TSP) per 2 gallons of water will remove dirt, smudges, smoke residue, and most surface grime. Pay particular attention to high-touch areas such as door jambs and areas around light switches. Bleach and TSP work best on mildew stains. Use a light hand when washing; you don't want to soak the wall. Also, wear heavy-duty rubber gloves. Allow the walls and ceiling to dry completely before moving on.

TACKLE THE BULK OF THE SURFACE PREP IN THE FINAL FIVE STEPS

STEP 6



Assess the existing paint.

Glossy finishes need to be sanded with 120-grit sandpaper, while moderate-gloss paint can be sanded with 120- to 150-grit sandpaper. Very hard surfaces may need to be prepped with a palm sander, but most often, you can get away with using a sanding sponge or sandpaper. Remove dust from the wall with a brush and a tack cloth.

STEP 7



Repair any damage, and fill any gaps.

Joint compound is ideal for repairing cracks, holes, or dents in both drywall and plaster walls. (See pp. 32-35 for more on wall repair.) Use a high-quality wood filler for repairs on wood trim and doors. Sand the repairs, and remove dust from the wall with a tack cloth, a brush, and a vacuum. Any gaps that have developed between the trim and the wall or ceiling should be caulked. Acrylic caulk performs well in most applications. However, in damp areas such as bathrooms or kitchens, consider a vinyl adhesive-based caulk, such as Phenoseal, for greater longevity.

STEP 8



Mask conservatively.

Mask only those horizontal areas that are most vulnerable to paint splatter, like the tops of chair rails and the tops of baseboards if they're not going to be repainted. If baseboards are going to be repainted, mask the area where the wood flooring meets the baseboard.



STEP 9



Always prime walls, but not ceilings. Roll primer on walls to give paint a flat, uniform base to adhere to. Ceilings don't always have to be primed because they're often in good shape and are typically painted with flat paint. Recoating flat paint is less demanding than recoating glossy paint. You should, however, spot-prime areas with repairs, such as places that had water leaks or drywall cracks. Tinting the primer to the finish color helps to improve coverage and gives a better sense of how the room will look when it's done—much better than small paint swatches, which can bleed through subsequent coats of paint and ruin the final finish. Universal acrylic primers perform better than ever and have little odor.

STEP 10



Give the wall a final sanding and cleaning. Sand all wall and ceiling surfaces with a medium-grit sanding sponge, and inspect the surface for any irregularities, such as hardened paint or primer drips. This is an ideal time to make any final touch-ups or repairs prior to painting. If you make a repair, remove the dust, and be sure to spot-prime the area before starting to paint.

A Product Guide to Wood Repair

Painting, wallpapering, and other similar projects start with a desire to make our homes more beautiful. We cover surfaces with tile, trim, and paint, showing off these attractive layers and hiding the rough materials beneath. But in order to get to these flawless finishes, we often need to make some initial repairs.

I recently spoke to a number of painters, carpenters, and manufacturers to learn as much as I could about the products available for filling holes and making repairs in wood. What I found is that there are way too many products to fit into one article, and that preferences vary almost as much as the products do. While I tend to value the experience of pros who work with them every day, some education on the products' chemistry is also helpful in understanding how to use them.

Filler, putty, and beyond

You can divide a lot of these products into two categories—fillers and putties. Many articles and experts I spoke to referred to these categories in broad strokes. It turns out that the only distinction that holds up the majority of the time is this: Most wood fillers dry hard, while most wood putties are nonhardening.

Bruce Johnson is a woodworker and consultant for Minwax. He says that non-hardening putties are the best choice for filling small holes in stain-grade work. Johnson recommends staining the wood first, using a color-matched putty, and then applying the top coat. "I choose between putty and filler based on the

Fill holes, fix rot, and prep for paint both inside and outside the house

BY BRIAN PONTOLILLO



ELMER'S CARPENTER'S WOOD FILLER A go-to product for many professional painters, this filler is hard-drying, sandable, and paintable for interior use. Elmer's Color Change stainable interior fillers are purple when applied and dry white (or one of many other available colors) to signal that they are ready to be sanded and finished. Elmer's exterior fillers include their stainable exterior Carpenter's Wood Filler and their ProBond line. Both products are acrylic, so they retain some flexibility and expand and contract with wood movement. Elmer's also makes Rotted Wood Stabilizer to prepare damaged areas for filler. A 4-oz. container of the Carpenter's Wood Filler costs about \$7, a 4-oz. Color Change is about \$8, and ProBond Wood Filler is about \$10 for a pint.

DAP PLASTIC WOOD Available in two formulations, Plastic Wood Latex Wood Filler is water-based, and Plastic Wood Professional Wood Filler (shown here) is a solvent-based, cellulose polymer. Both dry hard and can be sanded, primed, and painted with water-based finishes. They are both rated for interior and exterior use, though DAP suggests the solvent-based product for more significant exterior repairs. The Professional product is also stainable and available in six premixed colors. Expect to pay about \$8 for a 16-oz. tub of the water-based filler, and about \$9 for a 16-oz. container of the Professional filler.

FILLER AND PUTTY

There are two differences between filler and putty that hold true for most of the products on the market. First, wood filler dries hard and can be sanded, while putty remains flexible. Second, fillers are applied before paint or finish (sometimes over primed wood), and putties are applied after finish, usually stain and/or clear coat. Beyond these distinctions, it is not a good idea to generalize the differences between wood fillers and wood putties. There are water-based, oil-based, and solvent-based products in each category. Some are interior only, while others are okay for exterior use. Some products are ready for paint in under 20 minutes, and others need 48 to 72 hours to set up.



Finish, then fill. Color-match putty doesn't harden, so unlike other fillers, it must be used after staining and topcoating rather than before.



FAMOWOOD WOOD FILLER

This filler is available in water-based and solvent-based versions. Both are acceptable for interior and exterior use, are made of mostly wood flour, are stainable and paintable, and can be sanded and shaped. They both also have very short dry times: about 30 minutes for the water-based product and 15 minutes for the solvent-based product. The only difference, according to the company, is that the solvent-based filler is available in a few more colors than the water-based version. Otherwise, it's a matter of personal preference. Both cost about \$9 for a 1-pint container.

CRAWFORD'S PAINTER'S PUTTY

This filler seems to be a true hybrid product. It's linseed-oil-based, so it dries slow but hard, and can be painted in 60 to 80 hours. Though the company doesn't recommend sanding the putty, many painters report that it is sandable. It can be tinted with oil-based stain and can be topcoated with stain once it is dry, and cleans up with soap and water. Crawford's, a family-owned company, prides themselves on making environmentally safe products, and their website lists the harmful ingredients found in competitive brands that they won't use in theirs. A 4-lb. can costs about \$12.

MINWAX WOOD PUTTY

If there's a product that fits the common definition of "wood putty," this is it. Minwax makes premixed putty in all of the same colors as their stains to fill small holes after finishing your work. The putty does not harden and can't be sanded, so it is not recommended for painted work. You can clean it up with soap and water, and linseed oil can be used to rehydrate the putty when it begins to dry out in the container. A 3¾-oz. container is about \$5.

DAP PAINTER'S PUTTY '53'

This non-hardening oil-based putty is paintable (after a few days) because the exposed surface develops a skin. It cannot be sanded, so a practiced application technique is required to fill holes just right. If there is a good reason to use this product, it's because it remains flexible, making it a worthy choice for exterior woodwork and window glazing. It dries white and is not suitable for staining. A 16-oz. container is about \$7.

size of the hole and if it is sandable work,” he says. “Putty isn’t sandable. Using a filler generally implies that you will need to sand.” For filling larger holes in wood that will be painted, he recommends using a wood filler and sanding before painting.

“In my world, a putty is a nonhardening product,” says Megan Youngs, a senior product manager at DAP, agreeing with Johnson. But that doesn’t mean that putties can’t be used for painted work, she explains. Some nonhardening putties can be used to fill nail holes in painted wood because they develop a skin. Conversely, some fillers are designed for color-matching stain.

All of this is to say that choosing a hole filler or a putty is less about finding the best product, and more about understanding the subtle differences in each product and how to use them properly. Moreover, putties and fillers aren’t the only choices for patching holes in wood. On the far ends of the spectrum are lightweight spackle, which can be used successfully for filling holes and making cosmetic repairs, and two-part epoxy systems, preferred by the pros for serious restoration work. These products not only fill voids, but have a tenacious grip that can add structural integrity back to the woodwork.

I’ve seen large sections of porch columns successfully rebuilt with epoxy. Yet I’ve been warned to proceed with caution. South Dakota woodworker and remodeler Ben Brunick has done extensive repair to damaged window sashes and other exterior trim with epoxy. He is quick to remind me that unless you first fix the problem that is causing the rot, you are wasting your time. The wood around the repair will just continue to degrade and the repair will fail.

Grace Ombry, marketing director at West System, an epoxy manufacturer, told me that when a repair is big enough and when it’s possible, they recommend starting with a solid-wood dutchman to create a patch. And Marsha Caporaso, president of Abatron, another epoxy manufacturer, warned that people can get carried away when making repairs with epoxy. “It’s not intended to be used as a coating,” she says. “If you encapsulate wood with epoxy, you could be trapping moisture inside and causing more trouble.”

Painters fill a lot of holes

When it comes time to fill the holes, professional painter Jason Eidsness relies primarily on two products that he says are readily avail-

EPOXY

To understand the value of epoxy, remember that it is the only filler that is also a reliable adhesive. In the most basic terms, epoxy is plastic. These two-part products combine a resin and a hardener and cure through a thermal chemical reaction. If you are looking for a tenacious bond and structural characteristics to repair damaged wood, particularly outside, use a product that is 100% epoxy solids. Because there is no water or solvent to evaporate, epoxy does not shrink.

Epoxy can be sanded and shaped to match profiles in millwork, and it can be painted or colored with pigments. Check the pot life of the product you choose before mixing to make sure that you’ll have time to use it all, and keep in mind that epoxy dry times vary and can be affected by weather conditions. Unlike other two-part products, you should never add extra hardener to speed curing with epoxy. Instead, to slow the setup time, you can spread your mixed epoxy out on a flat surface like a paint-roller pan; to speed things up, add heat with a blow dryer.



ABATRON WOOD RESTORATION KIT

Epoxy doesn’t just stick to wood. It will bond tenaciously to metal, concrete, and many other materials. But when the team at Abatron realized that epoxies were being adopted for home-restoration projects, they decided to give it some attention and developed their Wood Restoration Kit specifically for this application. The kit is available in three volumes to match the size of your project or the frequency with which you do this work, and includes LiquidWood, a flexible, penetrating epoxy that seals and primes the damaged area; WoodEpoxy, their epoxy wood filler; and Abosolv, which is used to thin and clean up LiquidWood. Like all of these epoxy products, the material can be sanded and shaped, colored with pigments, and painted. The kit starts around \$85.



Two-step repair. Epoxy putty is typically applied after a soaking coat of wood consolidant, which reinforces damaged wood.



Jack of all repairs. With a wide variety of available hardeners, fillers, and additives, West System epoxy can be tailored to everything from filling to adhesive to structural repairs.

WEST SYSTEM EPOXY Though West System is preferred by many professionals, their products aren't marketed to home builders, so you'll have to order components individually to put together a kit for the repairs you need to make. You can start with the 105 Epoxy Resin. From there, pick a hardener based on how fast you want it to set up. Keep in mind that the cure time of epoxy increases in colder temperatures and decreases in heat. So don't just consider the desired working time when choosing a hardener, but also the weather you'll be working in. Finally, you can choose from a number of fillers for the type of work you will be doing—and definitely order the calibrated pumps, which make mixing resin and hardener a one-pump to one-pump ratio. Expect to spend about \$85 to get started with West System products.

SYSTEM THREE ENDROT WOOD

RESTORATION KIT The folks at System Three want you to remember that before you make repairs to rot-damaged wood, it's important to stop the rot from continuing. This may mean fixing leaks that are allowing the wood to get wet, excavating damaged wood from the area, and then treating the wood to kill the fungus that is creating the rot. In this kit, you'll find their Board Defense borate powder, which is a water-soluble insecticide, termiticide, and fungicide used for treating rotting wood. Once the damaged wood is treated, their low-viscosity RotFix is used to seal and harden the wood. RotFix also acts as a primer for their SculpWood Putty, which is used to fill the void. And finally, the SculpWood Paste is a top coat used to refine the repair. The repair will be sandable, machinable, and structural. The kit costs \$46.



TWO-PART FILLER

Numerous articles and videos online refer to these products as “epoxy-based.” But that’s not correct. They are polyester resins. Unlike epoxy, adjusting the amount of catalyst in your two-part filler mix will slow or speed the setup.

The monochromatic colors of the filler and catalyst can make it difficult to see if the parts have been mixed well, so it is best to stir a little extra if you are unsure. These fillers are acceptable for repairs of all sizes inside and outside. They can be sanded and shaped, they’re paintable, and some claim to be stainable, but they’re not the best option for color-matching stained woodwork. While you can use a wood hardener to strengthen the substrate before making repairs with these products, if you’re making a large repair partially intended to hold the woodwork together, epoxy is a better choice.



Quick-dry option. By tweaking the mixing ratio of two-part fillers, holes can be filled and ready to finish at whatever pace is necessary, and multiple thin coats can be built up quickly.



3M BONDWOOD FILLER This product is similar to both automotive Bondo and the Minwax filler. As soon as you open the can, you’ll notice that they all share a distinct smell. And like Minwax, 3M recommends first treating your repairs, in this case with Bondo Rotted Wood Restorer. There are some differences between the two products: Most notably, Bondo is marketed for a speedy repair and can be sanded in 15 minutes and painted in 25. Bondo Wood Filler can also be stained, though it’s unlikely that it will absorb stain the same as the surrounding wood. A 1-quart can of Bondo Wood Filler with hardener costs about \$14.

MINWAX HIGH PERFORMANCE WOOD FILLER Minwax recommends removing paint, dirt and debris, grease, and any loose or flaking wood—and suggests using their wood hardener to treat damaged areas—before filling, which is excellent advice for all fillers. Also, instead of packing the void to be filled, they suggest applying the filler in 1/8-in. layers. Working time for this product is about 10 minutes if mixed as directed, and the repair will be ready for sanding in about 30 minutes. The manufacturer does not recommend this product for stain-grade work. A 12-oz. container with hardener costs about \$13.

able and never let him down: Elmer’s Carpenter’s Wood Filler and Crawford’s Vinyl Spackling Paste. What’s interesting is that he often mixes the two together until he reaches a consistency that he likes. “The less of the Elmer’s I use, the less it shrinks and the easier it is to sand,” he says, “but I want a denser fill than the spackle alone gives me.”

Eidsness, who can be found online as XC Painter, also insists on cleaning and vacuuming all holes prior to filling, and, expecting some shrinkage, prefers to overfill the nail holes, using a putty knife to feather the filler into the surface of the trim. Next, he’ll sand the filled holes with an orbital sander, vacuum again, and, if necessary, apply a second round of filler. Whether he’s used just Elmer’s or a mix for the first round, the second application of filler is always the lighter-weight spackle.

On the most demanding projects, Eidsness will shine raking light on the primed trim to inspect the filled holes and may sand more and apply a final round of filler to fix subtle imperfections. For this work, he uses an auto-body product called “glazing and spot putty,” available from Bondo and Dynatron. These one-part nitrocellulose fillers are designed to hide minor surface imperfections in automotive bodywork. These products shrink very little, can be sanded in 30 minutes, and retain some flexibility—a perfect combination to topcoat nail holes.

For stain-grade work, Eidsness uses colored wood putties. He blends pre-mixed colors until he’s created a few shades that match the color variations in the wood he’s working with, using different shades depending on the particular spot in the wood. “You also have to account for the color change of the wood over time,” he says. “Vertical-grain fir is much blonder when it is installed than it will be in a year, but the putty isn’t going to change color.” And be careful with oil-based putty before you have applied a clear coat, he tells me, because you might stain the wood.

Carpenters’ go-to for repairs

Connecticut remodeler Chris Green takes a tiered approach to filling holes and making repairs, and has a few go-to

products. For repairs that are more structural in nature, Green prefers West System epoxy. "It's a superadhesive and gap filler all in one. The ability to adapt the viscosity from a maple-syrup consistency to mashed potatoes and everything in between is a huge advantage." The one downside, he tells me, is that it is slow-drying.

For a speedier process on holes and repairs that need to disappear but don't require such a strong grip, Green likes Minwax High Performance Wood Filler. This is another two-part product. It has a peanut-butter-like consistency and is easy to spread according to Green, who appreciates its fast drying time. Just try not to mix more than you can use pretty quickly, he cautions. For common nail holes and cosmetic repairs, Green's go-to is Zinsser's Ready Patch, a water-soluble spackle that dries hard, doesn't shrink, and sands easily.

Brunick has similar opinions. For significant repairs and exterior work, he too prefers epoxy, but preaches caution when sanding and shaping cured epoxy. It may be harder than the surrounding material, and if you're not careful you can do more damage. He recommends isolating the repair with painter's tape and using sanding blocks to make sure that you're shaping the repair evenly.

For a durable, color-matched repair in stain-grade surfaces, like a stair tread, Brunick says that he sometimes mixes fine sanding dust into the epoxy until the color is close to what he is looking for and the epoxy has the right consistency for the type of repair he needs to make.

For common nail-hole filling, Brunick prefers Famowood Original Wood Filler. It's a solvent-based filler and Brunick likes that he can change the consistency, and reactivate an old can that is drying out, by adding acetone. He's also a believer in using Bondo for interior repairs. "People get bent out of shape about using Bondo for woodwork," says Brunick, "But I've never had a problem with it. Just don't use it where you shouldn't!"

Brunick wasn't the only professional I spoke to who likes Bondo for wood repairs. Yet many of them seem to need to defend this opinion. Perhaps their detractors don't realize that Bondo doesn't just make auto-body products. They also have a filler meant for specifically for wood. □

Brian Pontolilo is editorial director of *FHB* and Green Building Advisor.

SPACKLE

"Spackle" is now a generic term used to describe a number of different products from a number of manufacturers that, like fillers and putties, are difficult to categorize. Sometimes "spackle" is used synonymously with "drywall compound," an association that reflects the intended use of Spackle Paste, a trademarked product from Muralo. Spackles are typically vinyl, water-based products that dry hard and sand easily—and many are indeed intended for drywall repair. However, some of today's spackles are acceptable fillers for small holes in wood, and their creamy texture makes it easy to achieve a smooth surface.



Not just for drywall. Although originally intended for drywall repairs, many modern-day spackles are acceptable for wood applications as well.



CRAWFORD'S VINYL SPACKLING PASTE True to its name, this lightweight, easy-sanding spackling paste is formulated for drywall and plaster repair. But it's also an acceptable wood filler for nail holes, surface scratches, small cracks, and other surface imperfections. The water-based product is meant to be applied with a trowel and dries hard and sandable in 24 hours, but like all products, actual dry time depends on weather conditions. Crawford's specifically calls for a primed surface for their Spackling Paste. A 4-lb. can cost about \$13.

ZINSSER READY PATCH This "Spackling and Patching Compound" is a modified alkyd resin formulated to compete with vinyl spackles. It is recommended for repairs in everything from masonry to metal, and the list includes new or previously painted wood. It can be used for interior and exterior work and can be primed and painted. It can also be tinted with a universal colorant. For deep repairs, Zinsser recommends multiple applications. Ready Patch can be primed in about an hour, and is fully set up and can be sanded in about two. One quart sells for about \$10.

Stripping

Take your wall from paper to paint with minimal damage

BY MIKE DiBLASI

In the 30 years I've been a professional painter, I've stripped a lot of wallpaper. The fundamental idea is to make it as easy as possible to remove so you don't damage the wall underneath. To do that, it helps to understand how wallpaper is made.

Wallpaper has two layers: facing and backing. The facing has the pattern, and can be made of vinyl, paper grasses, fabric—almost anything. No matter what the facing is, you need to get past it so you can get to the backing, which is held to the wall with water-soluble adhesive. Unless the paper was hung using the wrong glue or applied to an unprepared wall, the wallpaper paste should give up its grip after a good soak with water. Many folks are under the impression that you need to use a steamer to release the glue, but the reality is that only 1% of our work pulling off wallpaper requires a steamer—almost always because the walls were improperly prepared. I'll talk more about how we wet the glue later. First comes the prep.

Protect the house

Before any wallpaper removal starts, it's important to protect your house and the



Wallpaper

things you keep in it from the dust that often comes from the removal process. We remove all of the furnishings from the space and cover the entire floor with Ram Board surface protection, using blue painter's tape at seams and around the perimeter. Once the floor is covered, we close off the workspace by taping plastic over doors or building temporary walls with plastic sheeting and support poles. If the floor is especially valuable or easily damaged, we coat the floor protection with water-based polyurethane, which adds to the board's water repellency and dries quickly with little odor. It can take a long time to cover the floor and build enclosures, but doing this work means you're doing all you can to protect your home and belongings.

Just scratch the surface

The facing on vinyl wallpaper, owing to its tear resistance, usually pulls off as a single piece. Start at the top or bottom of a panel and try to lift a corner and begin the separation. If you can get the facing to split from the backing, continue to pull slowly and steadily. Unfortunately, the facing on paper wallpaper rarely comes off its backing as a single piece. Instead you have to sufficiently abrade or score it to create openings to access the backing. Zinsser has sold a tool in hardware and paint stores for decades exactly for this purpose—PaperTiger—which has several spiky wheels that move in a random pattern as you roll it across the wallpaper. It works, but I don't like it because its spikes leave thousands of tiny holes in the drywall or plaster behind the paper. If the wall is being painted (instead of repapered), all those tiny holes will have to be repaired, which wastes a lot of time.

A faster and less-damaging way to get through the facing is to use a random-orbit sander. Good dust collection while

PULL OFF THE FACING



TRY PEELING FIRST

Wallpaper is made up of two layers—a facing and a backing—and you need access to the backing because it's the layer that's glued to the wall. If you're lucky, the facing will separate easily with the help of a putty knife, so always start there before trying more involved methods.



SAND THE FACING

If the facing tears off in small pieces, you'll need to settle for leaving it in place and abrading it so that you can access the backing in order to wet and remove it. Sand the surface using 36-grit paper in a sander connected to a vacuum (always wear a respirator for this type of work).



PLASTIC PREVENTS A MESS

Next, tape 3-mil plastic to the baseboard with high-humidity masking tape to catch and contain the wet, gluey wallpaper as it's removed. Fold over the untaped edge so the plastic holds any water that runs onto the floor. Leave the very top of the baseboard exposed so you can reach all the way to the bottom of the wallpaper.

GET AT THE GLUE

MAKE IT WET

The key to removing wallpaper is to wet the backing and not rush the process. Let nature's universal solvent do its work. If we can make a mess, we'll use a garden sprayer because it puts out a lot of water quickly. In other situations, we use an airless sprayer, which keeps the floor relatively dry.



WAIT FOR BUBBLES

You can tell when the water has done its job because the backing will start to bubble, usually about 5 to 15 minutes after you wet the surface. You can start scraping a few minutes after the first bubbles appear.



sanding is a must, so we hook the sander to a dust-collecting vacuum and use filter bags and HEPA filters, and we also wear respirators because even with a good vacuum there's still a lot of dust in the air. On this project, we used a Festool ETS 125 with their Saphir 36-grit sandpaper. The sander is connected to a Festool CT 36 Dust Extractor. I also have a Bosch 3725DEVSN and a Fein Turbo II vac that work just as well—but a less expensive random-orbit sander connected to a good shop vac would also get the job done.

Before sanding, it's important to know whether you're dealing with plaster or drywall underneath. If the wall is plaster, you can sand a little more aggressively, because the plaster surface is tougher than drywall's paper surface. If you're working over drywall, you need to go slow so you don't burn through the drywall's white-paper face. If you reach the drywall's brown-paper layer, you will have to repair and prime the surface before painting or repapering. Sometimes we'll dial back the power on the sander to avoid burning through.

Sanding the two walls in the stairway shown in the photos took about an hour. You can tell when you've sanded enough because you start to see the backing in spots. There's no need to remove the entire paper facing, you just want to get through the facing's protective coatings so the water can reach the backing and reactivate the paste.

SCRAPE TO GET STARTED

Use a 4-in. tapping knife to start removing the paper. Plaster walls are somewhat wavy and the small knife is less likely to catch on the uneven surface. Once a few inches of paper are separated from the wall, pull gently on the lifted section. If the wall was properly prepared and the paste is completely wetted, the paper will pull off easily with only occasional scraping necessary.



RINSE AND REPEAT

After pulling the wallpaper panels from a section, wash the wall with warm water and a grout-scrubbing sponge. The sponge and water remove any remaining paste from the wall. Change the water about every 300 sq. ft., and finish rinsing each stripped section before wetting the next.



WORK IN SECTIONS

Once you've removed the paper and rinsed the wall, start over by wetting another three or four panels. Don't leave the wet paper to sit for too long, or the glue can set up again and you'll have to wet it and wait again.

Improper prep

Occasionally we run into wallpaper that's been applied to the wall without sizing. Applied like paint or primer, sizing creates a slick surface that allows you to easily position the paper while you're hanging. It also makes it easy to remove the paper when it's time for a change. If the wall wasn't prepped correctly, wallpaper removal becomes much harder. When this happens with a plaster

wall, we can usually just sand all the way through the wallpaper to remove it, but if it's improperly prepared drywall, you will almost certainly damage the drywall's paper surface. You can fix damaged drywall by sealing the surface with a specialty primer (see "Toolbox," p. 31). Fortunately, the plaster walls in this early-20th-century farmhouse were in good repair, and properly prepared with primer and sizing.

The fact that the walls were in good repair brings up another point. Sometimes plaster walls are in such rough shape that the only thing that's holding them together is the wallpaper. You can often tell from bulges in the paper, but sometimes the plaster's poor condition isn't obvious. In an old house, you'll usually see some localized damage from leaks or broken pipes. Whether the damage is localized or widespread, you'll

PREP FOR A NEW FINISH

CLEAN UP RIGHT AWAY

Once you're finished pulling off the paper in the entire room, carefully roll up the plastic and wet paper. If you leave it there, someone will inevitably walk through the wet mess and get wallpaper paste on something in a neighboring room.



GIVE IT A GOOD LOOK

Using a bright raking light, look over the entire wall for damage and feel the surface to be sure there's no remaining wallpaper paste. Areas that feel rough or have a nonuniform sheen need to be rinsed again with clean water.



TEST THE WALL

When burnished with a rag dipped in denatured alcohol, water-based paint will rub off on the rag, meaning it's suitable for an acrylic-latex topcoat. Oil paint is unaffected by the burnishing test. If the paint is oil, topcoat a small section as a test. If the test patch dries without sags or wrinkles, paint without priming. If the patch wrinkles or sags, prime with a bonding primer.



need to make plaster repairs before priming and painting. If the damage is widespread, it may make more sense to put on another layer of wallpaper over the existing wallpaper instead of making extensive repairs.

Use hot water

When it comes time to wet the backing, always use the hottest tap water you can get. If the paste is especially tough, we'll boil water with an induction tea kettle. It's impos-

sible to handle boiling water, so we pour it in roller pans and apply it with 9-in. rollers. There are chemicals sold to make wallpaper easier to remove—DIF from Zinsser is a common example. It works well, but I try to avoid it because it smells really bad and is not typically necessary with properly prepared walls.

Removing the wallpaper happens in sections. I wet the wall, wait 5 to 15 minutes, and then scrape off three or four panels (6 ft.

to 8 ft.) at a time. Once I've scraped off the paper, I rinse the wall with water.

Prep for a new wall covering

If you're going to repaper and the wall is in good shape, re-size with whatever sizing the paper manufacturer requires. If you're going to paint, you need to determine if the underlying paint or primer will create adhesion problems with the new layer of paint. To do this, paint a small area using the



PATCH IT UP

Before painting, fix any damage to the wall with joint compound and spot-prime the repaired areas with a general-purpose primer, like Fresh Start from Benjamin Moore or Multi-Purpose Primer from Sherwin-Williams.



MAKE REPAIRS CONSPICUOUS

It's easy to miss a spot when you're applying compound to walls coated with white primer. Adding some blue chalk to all-purpose joint compound highlights patched areas so they can be sanded smooth before painting or repapering.



GARDZ from Zinsser (about \$30 per gal.) is a special primer made for sealing damaged drywall before skim-coating or repairs. It works well for repairing the damage that comes from pulling wallpaper from improperly prepared drywall.

BONDING PRIMER can often solve adhesion problems from oil-based primers sometimes found under wallpaper. They are meant to stick to slick surfaces and are compatible with almost any water or oil-based topcoat.



At \$280, a SureFire **RECHARGEABLE HEADLAMP** may seem like an extravagance, but its perfectly even light, free of hot spots, makes it easy to search the wall for damage and to ensure all of the glue residue has been washed off. The Fenix rechargeable headlamp (above) has a hot spot in its beam, but at \$75, it's a more reasonably priced second favorite.

Skip the sponges in the home center's paint and decorating aisle. Instead, go to the tile section and buy a **SCRUBBING SPONGE** for grout. Its textured side is good for removing any remaining bits of paper, and it costs half as much as a wallpaper sponge.



planned topcoat as a test. If the test area ends up showing sags or wrinkles, re-prime with a bonding primer and then paint with the chosen topcoat.

Removing wallpaper may not be fun—and the process may be more involved than you would expect—but it is satisfying. □

Mike DiBlasi is a painting contractor in Pleasant Valley, N.Y. Photos by Patrick McCombe, except where noted.

BY TIM LEAHY

Make Old Walls Smooth and Sound

The historic mansions that my crew and I work on in Newport, R.I., are sometimes bankrolled by folks who can afford to restore them to their original glory. This means that we strip paint off hundreds of feet of woodwork and repair a lot of plaster walls. A while back, we were hired to paint the interior of the Eisenhower House at Fort Adams State Park. Because the house is state-owned, the budget was tight. Lucky for us, the woodwork was in great condition, but the walls needed serious attention. Hairline cracks, poorly made patches, and large sections of peeling paint were evident in several rooms that needed to be painted. We made them new again with a technique I've used on many preservation projects.

After scraping loose paint and securing crumbling plaster, my crew and I covered the walls with wide fiberglass mesh, then applied two thin coats of joint compound. The results can't be beat—the walls are clean and smooth, and they won't crack again. Also, any potential lead hazards are now safely contained. While we typically use this approach on plaster walls, it works on drywall as well. Before we touched the fiberglass mesh or opened a bucket of mud, though, we inspected the walls to make sure they were sound.

Get it clean, dry, and dull

As time goes by, plaster succumbs to substrate movement, moisture, alterations, and repairs. On the surface, mildew, chalking,



Cracks, peeling paint, and bad patches disappear with a wide roll of adhesive mesh and two thin coats of joint compound

paint failure, and cracks were all easily visible. Before applying the mesh, we scraped and/or sanded any loose or flaking paint and leveled old patches and imperfections.

Deep cracks indicated structural movement, so I brought in one of our carpenters to assess the problem. He determined the cause and that it had been addressed long before we'd gotten there. At that point, my crew and I inspected the plaster more carefully, then stabilized loose areas.

We looked for paint that flaked off easily and for bulges in the surface, which indicate that the plaster keys had broken, releasing plaster from lath. When necessary, we used plaster washers (photo p. 35) and screws to tighten the wall back to the lath.

Some of the plaster flaked off in chunks. In these instances, we chipped away at the loose plaster until we reached an area where the keys were clearly intact. We then patched holes smaller than 8 in. dia. with setting-type compound, such as Durabond 45. Although we didn't need to patch anything larger than 8 in., I typically patch large areas with dry-wall. Setting compound can slump when applied over big areas, requiring multiple coats and sanding. It's best to attach the dry-wall directly to lath; cutting away lath undermines its strength around sound plaster keys.

We scraped away all flaking paint until we reached a place where it still adhered soundly to the wall. Because we were working in a home that predates the 1970s, we did all this with lead safety in mind. I suggest reading "Lead-Paint Safety, at Home and on the Job" (FHB #150 and online at FineHomebuilding.com) and visiting the EPA's website (epa.gov/lead) for guidance.

Once the walls were patched and sound, we vacuumed them to remove dust that would interfere with the adhesive on the mesh. We used trisodium phosphate (TSP) and a damp rag to clean areas that were chalky or had greasy residue.

Self-adhesive mesh adds strength

The fiberglass mesh we use comes in 3-ft.-wide by 75-ft.- or 150-ft.-long rolls. We apply it in vertical strips, overlapping each seam 1 in. to 2 in. Unrolling the fiberglass is easier if you approach it as a two-person job.

We started in one corner of the room and worked from the ceiling down to the base-

COVER THE WALLS WITH MESH

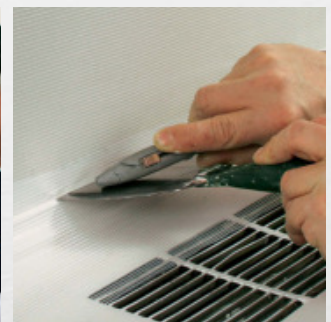
Peel, stick, and roll. Start each section by peeling several inches away from the roll, then pressing it against the wall. Let an inch or so run onto the ceiling. Keep the roll horizontal as it's unrolled to ensure that it stays in a straight line down the wall.



Unroll a few feet at a time. After a large section is adhered, unroll the mesh with two hands. Pull it tight as you go. Unroll, then smooth a few feet at a time. Make sure every inch is adhered.



Keep it smooth and straight. Use your hand to press and smooth the mesh onto the wall. Peel back the fabric, and reposition it as needed to remove wrinkles. Overlap each section by 1 in. to 2 in.



Trim to fit. Use a taping knife and a utility knife to trim the mesh around the casing, the baseboard, and the ceiling. Press the mesh into the joint, then trim it with the knife.

Overlap inside and outside corners



Lap, don't butt. Butting two pieces into an inside corner will result in cracks over time. Instead, run the mesh about 2 in. past the corner. Smooth it out to remove wrinkles, then go back and tuck it tight into the joint using a 5-in-1 tool or a taping knife.



Overlap, but give it room. Overlap the next piece, holding it back from the corner about 1/2 in. Keeping the overlapping edge away from the corner will ensure that it won't be snagged when joint compound is applied. Wrap outside corners the same way.

APPLY TWO THIN COATS OF COMPOUND



Use a side stroke. Using a 5-in. tapping knife, apply the compound to the wall with a side-to-side stroke. Be sure not to lift the mesh where it overlaps and where it has been trimmed.



Scrape it off. Pull the compound off the wall. Keep the knife tight; the first coat should fill only the mesh. Cover the entire wall, keeping this first layer tight to the mesh. Let the first coat dry, then lightly sand and recoat in the same manner.

Work the room



Pull to cut in. Work inside corners horizontally from the inside out. Move in this fashion from the top down. Don't run the knife from top to bottom with one edge tight to the corner.

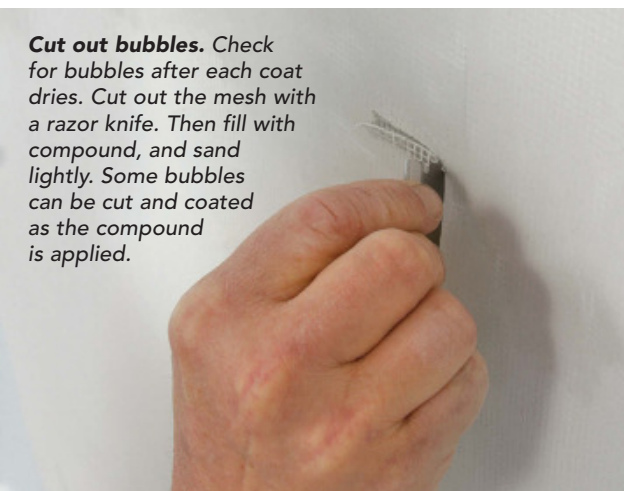
Move down from the ceiling. After the baseboard is cut in and the wall is coated, work along the ceiling.

BEFORE YOU PRIME, SAND THE HIGHS, AND FILL THE LOWS

Sand lightly. Allow the first coat to dry, then sand the entire surface with a fine-grit sanding sponge. Scrape down high edges first with a tapping knife. Repeat this process after the second coat has been applied and dries. Spot-coat areas where the mesh sits proud of the second coat.



Cut out bubbles. Check for bubbles after each coat dries. Cut out the mesh with a razor knife. Then fill with compound, and sand lightly. Some bubbles can be cut and coated as the compound is applied.



Use wide mesh and a narrow knife

Although covering walls with adhesive mesh and applying two thin coats of drywall compound take a little time, the process requires minimal sanding and is very inexpensive.



Plaster washers and screws

Reinforce plaster that has pulled away from lath with 1½-in. drywall screws and plaster washers (a 100-count container costs \$15).

All-purpose joint compound

Coat the mesh with two thin layers of all-purpose joint compound. Allow each layer to dry 24 hours before recoating and/or priming. A 4½-gal. bucket of mud costs about \$16 at most home centers.



5-in. taping knife

Use a knife this size to apply the compound to a wall or ceiling. The work goes quickly. Wider knives curve in the center, so it's difficult to get a smooth, even layer.



Adhesive mesh

Apply 36-in.-wide adhesive fiberglass mesh over the entire wall to create a strong, unified substrate for the skim coats. The FibaTape Super Crackstop used here costs about \$45 for a 75-ft. roll.



board. I like to run the mesh past inside and around outside corners by about an inch, then overlap the next section. Doing so makes for a stronger joint that is unlikely to crack. As with wallpaper, we let the mesh run long by about an inch at the ceiling and at the baseboard, then trimmed it later.

The key to rolling the mesh is to have about a foot well-adhered before trying to unroll large sections. This takes advantage of the adhesive's strength. Using an open palm, we smooth the fiberglass over the wall, working from the middle out to the edges. Every once in a while, it is necessary to peel a bit back and reposition it to keep it smooth and wrinkle-free. I find it easy to trim the mesh with a utility knife and a taping knife or wallpaper edging tool.

All-purpose compound does the trick

For the skim coat, we used USG's all-purpose joint compound because it is premixed and sands easily. To make the compound easier to apply, I mix it with a paddle mixer.

Although a wide taping knife might seem like the most logical tool for this job, it isn't. Wide taping knives have a bend in the center to help float taped joints. For this application, a perfectly flat knife is key. I've found that a 5-in. knife is a good choice. We applied the mud in a two-stroke fashion using a 5-in. knife. The first coat should be only as thick

as the mesh itself, so with the first stroke, we applied the mud to the wall. Then we scraped it off with the second. We also made sure to work the knife in the proper direction of any overlapped seams so that we didn't lift the mesh.

After allowing the first coat to dry overnight, we inspected the surface. We knocked off small nibs or ridges with a taping knife or with 120-grit sandpaper. We trimmed bubbles or wrinkles flush with a razor knife and filled them with compound.

We then applied another coat in the same fashion, again removing the excess compound to leave a tight, neat surface. Once the second coat was dry, we used a fine sanding sponge to smooth out minor imperfections. I didn't worry about areas where the mesh was slightly visible because the primer and paint would cover them. You also can use joint compound to spot-coat areas where the mesh sits proud of both coats.

Once the walls were well vacuumed, we applied an acrylic primer, then two coats of Benjamin Moore Regal wall paint. The wall profile and slight irregularities were not changed in this project, but the surface is as it used to be: even and smooth. □

Tim Leahy is director of architectural finishes for Kirby Perkins Construction in Newport, R.I. Photos by Chris Ermides, except where noted.

A Primer on

PRIMERS

With options aplenty, there's a lot more to know about this base coat than you think

BY PATRICK McCOMBE

Primers are one of those everyday building materials I've never given a lot of thought to. I've always used latex primer because it dries fast and is easy to clean up, but a quest for a durable exterior paint job on some basement bulkhead doors convinced me that I needed to know a lot more about the primer I use. So in the interest of science and a longer-lasting paint job, I interviewed primer experts from Benjamin Moore, Dow Coating Materials, and Sherwin-Williams. I also talked to *Fine Homebuilding's* most-trusted painters about what they use and why. I'm grateful for everybody's help, and I was surprised by the consistency of their advice. Here's what I learned.

Primers have a specific job

Primer and paint have different jobs, and they're made differently for that reason. Primer prepares a surface for a topcoat and improves the topcoat's adhesion. Paint sticks to the primer and provides color, dirt resistance, and weather

resistance. As part of its job, a primer may have to cover or seal in stains, level an uneven surface, or effectively stick to smooth or glossy surfaces. This wide range of needs is what gave birth to all of the specialty primers you can now find on store shelves.

Unlike a topcoat, primer isn't made for long-term exposure. It doesn't have the same resistance as paint to UV rays, mold, weather, pollution, and job-site wear and tear, so you shouldn't leave it exposed for any longer than necessary, especially outdoors. Generally speaking, more expensive primers cover better and hold up better than less expensive primers because they have higher-quality resins as well as additives such as mildewcide, according to Benjamin Moore field integration manager Mike Mundwiller.

Because primers aren't supposed to be exposed to the weather for a long time, any primer that's been outside for more than a few weeks should be lightly sanded, thoroughly cleaned, and reprimed. Some

FOUR FORMULATIONS

According to Jocelyn Gruver and Paul Doll of Dow Coating Materials, oil is the traditional choice when it comes to primers. **OIL-BASED PRIMERS** sand easily, have excellent film leveling, and are better at blocking wood tannins. Unfortunately, as with oil-based paints, oil-based primers are higher in VOCs, have a strong odor, require cleanup with mineral spirits, and can take 24 to 48 hours to dry. Plus, they can be food for mold, even under latex topcoats, so either be sure that your oil primer has a mildewcide, or add your own.

Many states, especially those on the East and West Coasts, have limited the VOC levels allowed in primer and paint. A local paint-store manager told me that unless manufacturers make significant advances in the formulation of oil-based coatings to reduce VOCs, gallon-size oil-based coatings, including primer, will soon be gone from stores in states with VOC-reduction strategies. You'll likely still be able to buy quarts of oil-based paints and primers, but that's not a given.



Mildewcide additives prevent mold in damp locations on exterior and interior topcoats.

WATER-BASED PRIMERS are lower in VOCs, have less odor, and clean up more easily, but they have difficulty blocking stains from nicotine and food, as well as oil-based stains, including wood tannins. Instead, water-

based primers use stain locking, which means that they lock stains in the dry film; however, those stains may still be visible until a topcoat is applied. Water-based primers are better at covering up solvent-based stains such as markers and tar.

SHELLAC-BASED PRIMERS are noted for their ability to seal and hide stains, especially knots, but their film cracks easily as the material underneath expands and contracts. Shellac-based primers also have poor metal adhesion, are high in VOCs, and clean up with alcohol, a flammable solvent.



A shortage of natural shellac has prompted manufacturers to develop synthetic substitutes in recent years. Sherwin-Williams's Rick Watson says that **SYNTHETIC SHELLAC PRIMERS** are very close in performance to the real thing, but they clean up with mineral spirits.



primers have a sweet spot for when they're best topcoated. This is spelled out—along with the expected coverage, the recommended application thickness, and the final film thickness—in the individual primer's product data sheet or technical data sheet. You can find this information at a paint store and on paint manufacturers' websites. Product data sheets are also the best sources for minimum and maximum application temperatures and other application instructions.

Primer can be applied with a brush, a roller, or a sprayer. What tool to use depends on the size of the job. For small jobs, a brush is best

because it's fast to deploy and easy to clean. Rollers are for medium-size jobs, and sprayers are for large jobs. When spraying, my experts suggest going over the sprayed primer right away with a brush or roller to ensure that there are no tiny bare spots.

Clean, dry, dull, and sound

As with any painting process, prep is the most important part of priming. Rick Watson of Sherwin-Williams started off our conversation by telling me, "Preparation is key. The surface to be primed has

What about "paint and primer in one"?

Recently, paint manufacturers started selling "paint and primer in one" or "self-priming" paints. For many—myself included—the idea of a self-priming paint sounded too good to be true, so I asked my experts if there are any downsides to this new generation of self-priming topcoats. Mike Mundwiller of Benjamin Moore said that you shouldn't expect self-priming products to prime and topcoat in a single coat, but rather to seal the underlying surface and ensure the long-term adhesion of the paint. All of the experts said that these products should not be used as substitutes for specialty primers that solve specific coverage or adhesion problems. Paint-and-primer-in-one products may not deliver the specific primer property that is needed, or they may not work as well as a primer followed by a topcoat. According to Jocelyn Gruver and Paul Doll of Dow Coating Materials, "Using a separate paint and primer will often offer better performance attributes than a combined paint-and-primer product."

Rick Watson of Sherwin-Williams said that he wants the longest-lasting paint job possible, so he prefers primers for problem surfaces. But he said that high-quality paint-and-primer-in-one products can sometimes cover stains such as markers and tannins. When I asked him about going directly over drywall patches, he replied, "You're more likely to have success with lower sheens, like flat and matte. Higher-gloss topcoats often show a difference in color or gloss over the dry-wall patch compared to the surrounding previously painted wall."





DO-IT-ALL VS. SPECIALTY PRIMERS

In recent years, paint companies have been touting their **DO-IT-ALL PRIMERS**. According to Gruver and Doll of Dow, painters and DIYers don't want the hassle of buying 10 different primers for 10 different jobs, so manufacturers have responded with what are described as "multipurpose primers." These primers, which are available in both oil and latex versions, have additives that improve their bond, hiding ability, and mold resistance.

They can't solve all the problems a painter encounters, but they are making it easier to address multiple problems with a single product.

Multipurpose primers aren't good at everything, though. Rick Watson of Sherwin-Williams told me, "One size does not fit all when it comes to primers." Rather, he says, you should consult the product data sheets or talk to a paint-store salesperson about specific conditions such as covering stains, bonding to glossy surfaces, and priming unfamiliar materials. If you're looking for guidance on whether to embrace or steer clear of multipurpose primers, I would say this: For most priming tasks, multipurpose primers are fine, but if you're dealing with stains, difficult substrates, "hot-solvent" topcoats such as industrial epoxy, or other special problems, get a specialty primer.

to be clean, dry, dull, and sound." *Clean* means that the surface is free of contaminants that would affect the primer's bond to the underlying surface. *Dry* means that the surface is not only dry to the touch but also that the moisture content of the material is within the tolerance of the primer. *Dull* means that the surface has been sanded or otherwise prepared to increase the primer's bond. *Sound* means that any underlying coating is sufficiently bonded to the substrate; how well the primer sticks to the previous coat of paint doesn't matter if that paint is poorly adhered to the material below.

SPECIALTY PRIMERS

can boost adhesion, smooth damaged drywall, prepare surfaces for wallpaper, and even help dark topcoats cover better. Prices range from about \$15 to about \$50 per gal., but primer is not one of the products you want to buy on price. The cost of primer is so little compared to the cost of a home improvement or painting project, and having to fix a problem paint job because you skimped on the primer is going to be far more costly than spending a few dollars on the right high-quality primer.



Rusty-metal primer

Designed for steel and iron, oil-based rusty-metal primers are designed to slow rust formation. This manufacturer claims that the product has superior adhesion for better resistance to cracking, peeling, and chipping and that it minimizes the need for additional topcoats.



Vapor-barrier primer

Vapor-barrier primers can replace kraft-paper-faced vapor retarders on batt insulation or polyethylene sheeting behind the drywall. When applied at the recommended coverage rate (3.8 mils wet), this product has a perm rating of 0.58, making it a Class II vapor retarder, which allows some drying.



Problem-drywall primer

Ever destroy the paper face of drywall when removing wallpaper from improperly prepared walls? The fix is a product like this, which prevents the paper from falling apart or blistering when it's wetted by paint, more-conventional primer, or a skim coat of joint compound.

If you're worried that an existing coating doesn't have a good bond, complete paint removal is the safest bet. Obviously, that's not always practical, so thorough scraping or sanding is the best alternative. If you do need to scrape or sand, be sure to clean the surface thoroughly before priming. Best practice is to power wash after moderate or heavy scraping, but many painters power wash first because the stream of high-pressure water removes much of the old paint. That's OK, but they may have to wash again if there's additional scraping. Allow enough time after washing for the surface to dry thoroughly.



Gray-tinted primer

For dark topcoats to better cover light-colored previously painted surfaces, most primers can be tinted with black pigment. Gray primer is also an option, and because it comes tinted, you don't have to wait for someone at the paint counter to add black colorant and shake the can.



PVA primer

Among the least expensive primer options, PVA primer is only designed for a single task: priming bare drywall under flat or matte paints. The polyvinyl acetate formula evens the porosity of joint compound and the drywall's paper face so that subsequent coats of primer or topcoat cover evenly.



High-bond primer

Any paint can have difficulty bonding to slick, previously painted surfaces. These especially sticky primers can eliminate the need to sand those problematic surfaces and are the best choice if you're dealing with painting over glossy paint, tile, melamine, or laminate.



Mold-killing primer

This primer has a mildewcide that kills mold, fungi, and odor-causing bacteria, but you still have to clean the surface. The technical data sheet says this: "Physically or mechanically remove gross filth, heavy soil, overgrowth or loose material including dirt, grease, and oily films before application."



Concrete-and-masonry primer

It's tough for primer to get a good bond on masonry and concrete, but products such as Tuffcrete are sticky and specifically made for bonding to those challenging substrates. Concrete-and-masonry primers should also tolerate efflorescence and high-pH levels.



Low-VOC primer

Low- and no-VOC paints and primers are increasingly popular, as homeowners try to reduce the smell and irritation that come with interior painting projects. Primers such as Greenguard Gold-certified Harmony Wall Primer from Sherwin-Williams has a VOC-free formula.



Peel-bonding primer

You used to have to either live with the rough surface caused by badly peeling paint, or resort to complete paint removal. Fortunately, the thick consistency of a peel-bonding primer can often smooth an alligatored surface without the expense and time commitment of complete paint removal.



Drywall primer

Although they are more expensive than PVA primers, drywall primers are better for patches because, in addition to working on bare drywall, they also can be used over previously painted areas. These products contain more pigment than PVA, so they cover better and can be tinted for dark topcoats.

Keep it cool

My experts say that in the summer you should apply primer in cooler temperatures and move your work around so that you stay in the shade. Keeping out of the sun slows the drying process, which helps the primer to penetrate the surface for better adhesion and improved long-term durability.

Slow drying is especially important when priming bare wood because the primer needs time to penetrate into the wood fibers for a good bond. My experts recommend slow-dry oil primers because

they stick better. It may be tempting to move a project along with a fast-dry primer, but those products are not as thorough at penetrating the surface for a good bond. Interior primers are less susceptible to UV damage and dirt and can be left exposed longer; however, it's still good practice to apply a coat of paint over these products as soon as possible to minimize the chances of dust compromising the topcoat's bond. □

Patrick McCombe is a senior editor. Photos by the author.

Responding to wartime shortages of basic raw materials, Sherwin-Williams managed to produce the nation's first water-based house paint in 1941. Consumers snapped up 10 million gallons of Kem-Tone in the first three years of production, according to an account by the American Chemical Society. Industry chemists ever since have been incrementally improving their water-based paints to make them easier to apply, last a long time, and cover in one or two coats.

A ban on lead in residential paint in 1978 and government limits on volatile organic compounds (VOCs) in paint have been instrumental in pushing oil-based paints toward extinction, and also have forced manufacturers to develop paint that's less toxic while retaining the best characteristics of solvent-based coatings. The result is a wide range of choices for consumers who will now pay more for top-quality paint than they used to, but also get more in return.

The basic building blocks of paint haven't changed in decades. House paint (what the industry calls architectural coatings) has four main ingredients—the carrier (now mostly water), resins, pigments, and additives. Manufacturers continue to tinker with these constituent parts and how they are combined to improve overall performance and meet consumer needs, such as stain or scuff resistance. The industry continues to invest in waterborne technology while oil and alkyd paints get less and less attention. (Most commercially available “oil-based” paints are made with alkyd resin and not oil, but the same drawbacks apply).

This is not news—the industry was saying essentially the same thing 10 years ago. So the question is, have residential paints gotten any better since then?

“Let's say they're *different*,” says Bob Welch, the technical director of the Master Painters Institute, which develops testing standards for the industry. “They are better in some respects. There have been great advances in lowering VOC content, which is a good thing for the environment. The durability of the early low-VOC products wasn't as good as it is now. The application properties weren't as good. They are much improved since then.”

A hybrid approach

Lower VOC limits make it so paint smells better, is safer to be around, and contributes less to smog. But the transition to water-

borne coatings has been a major challenge to manufacturers. When Kem-Tone was introduced nearly 80 years ago, professional painters preferred the oil-based paints they were used to, and waterborne paints were not as forgiving to apply.

“It was a big change,” says Steve Revnew, senior vice president for marketing and product innovation at Sherwin-Williams. “There wasn't a whole heck of a lot of durability. The technology just wasn't as advanced as it is today. It just continues to progress.”

Picking Paint

Manufacturers continue to tinker with chemistry to improve durability, ease of application, and hide, but shopping for paint still isn't simple

BY SCOTT GIBSON

The U.S. Department of Environmental Protection now limits VOC content to 250 g per liter for flat paint and 380 g per liter for other sheens. Some regional agencies have much more stringent requirements. In Southern California, the South Coast Air Quality Management District sets a cap of 50 g per liter and manages a list of “super compliant” paints with less than 10 g of VOCs per liter for extravigilant shoppers. A number of manufacturers offer zero-VOC paints.

The rules are gradually pushing alkyd paints to the sidelines. Although some juris-



Rules of thumb you won't find on a label

Consumers who like to do their homework before buying paint will face some challenges. There is more information on a 99-cent can of pinto beans than there is on a \$75 can of exterior paint, and even if you're a knowledgeable chemist, the information that is printed there won't be of much help. Still, when shopping for paint, these general rules of thumb seem to apply:

1 Once you pick the brand of paint you like, price is a good overall indication of relative quality from that manufacturer.

2 Water-based paints are getting better at replicating some of the most desirable qualities of alkyd paints—faster curing times and better surface hardness—while offering the environmental advantages of acrylic resins.

3 Manufacturers have introduced more products that fit niche needs, such as fast-drying paint that allows windows and doors to be closed shortly after they are painted, or exterior paint that sheds dirt when rinsed with water.

4 How paint is applied—meaning the brush that's used, the technique, and the prep work—is just as important as the quality of paint in getting good results.

The best of both worlds

WATER-BASED ALKYDS

Where water-based paints have had the most difficult time measuring up to old oil-based products is on trim, where the best finishes level out the brush strokes and cure hard with rich color. Waterborne paints that contain small amounts of alkyds are a step in the right direction while maintaining soap-and-water cleanup and low-VOC levels, though tinting can increase stated VOCs. These hybrid paints have their own characteristics, and may take some time to get comfortable with. And while they are known to yellow less than traditional alkyds, if you are concerned about yellowing, it's best to choose a latex paint.

BENJAMIN MOORE ADVANCE

This product line includes a primer and matte, satin, semi-gloss, and high-gloss topcoats for most interior surfaces.

With proprietary colorants, Advance maintains low VOC levels even after tinting (approx. 48 g per liter).

The company recommends nylon/polyester brushes for application, water for thinning, and soapy water for cleanup.

FINE PAINTS OF EUROPE ECO

A waterborne acrylic with a urethane-alkyd emulsion, ECO is a line of scrubbable paint with a primer and satin and brilliant topcoats for interior and exterior work. ECO has a VOC rating of 35 g per liter.

The can recommends that ECO be applied with a synthetic brush, but the company's website says it can also be used with Omega Orel brushes, which have short and stiff natural bristles.



SHERWIN-WILLIAMS PROCLASSIC

Available in semi-gloss and satin, this hybrid paint is formulated for trim, cabinetry, and high-traffic areas where a durable finish is needed. Sherwin-Williams recommends using nylon/polyester blended brushes. The paint has VOC content less than 50 g per liter and cleans up with soap and water.

PPG SPEEDHIDE

Note that not all PPG Speedhide paints are hybrids like this interior/exterior water-based alkyd. Also requiring a polyester/nylon brush and containing under 50 g per liter of VOCs, this paint is available in satin and semi-gloss sheens and cleans up with warm, soapy water. Its product literature says it should not be thinned.

dictions allow high-VOC paints to be sold if they come in small containers, alkyd paints are getting harder to find. Oil-based primers, Welch says, are not even available in some parts of the country.

"Oil-based paint is the buggy whip of paint," says John Lahey III, president of Fine Paints of Europe, a Vermont-based company that imports a line of Dutch paints. Many painters and consumers, however, fondly remember some of the performance characteristics of oil-based paints, and manufacturers have tried to duplicate these characteristics in waterborne paints while simultaneously taking advantage of benefits that acrylics offer.

"What do oil-based paints do better than acrylics?" Lahey asks. "They look better; they level better. And you can get purer, deeper, richer colors. But latex coatings do a lot of things better than oils. They're more bendable and flexible. They're more forgiving. They're easier to use. They also hold their color better, longer than alkyd. That's why all these contractors and homeowners are wanting to use acrylics but they want the look of the oil."

This best-of-both-worlds approach has led a number of companies to the hybrid paint model. These are waterborne paints that contain small amounts of alkyds. They are sold as "waterborne alkyds" or "water-based alkyds." Manufacturers say they level better than all-acrylics, are harder, and have deeper colors. They also have low VOCs and can be thinned with water (meaning they clean up with soap and water rather than solvents). These include such brands as Emerald from Sherwin-Williams, Advance from Benjamin Moore, Speedhide from PPG, and Eco from Lahey's company.

Lahey says these hybrids are typically used on trim, where hardness and some sheen are often desired, although there are versions for painting exterior walls. Hybrid paints, Lahey says, take some getting used to. If they are being brushed on, most of them should be applied with a synthetic brush, but follow manufacturer recommendations on the can. The hybrid paints also have a shorter open time than conventional alkyds, which means they can only be brushed for so long before they start to set. "It doesn't have the same forgiveness on the application side," Lahey says.

While waterborne alkyds have been a fairly recent breakthrough, even these low-VOC hybrids might be threatened in the future.

Darin Laird, PPG's senior group technical leader in architectural coatings, says that if the VOC limit drops to 25 g per liter, as he's heard it might, hybrids could very well be history.

Why cost often equals quality

Pigments and resins are the keys to some of the most important characteristics of paint—how well the paint hides what's underneath, for example, and the durability of the paint film. Manufacturers don't say much about the proprietary resins they use, but titanium dioxide is an industry standard and an important hiding pigment. It's also relatively expensive, so it's less likely to show up on the label of a cheap paint.

In general, higher-cost resins and pigments mean higher retail costs. Conversely, when you want to make a less expensive paint, you start by taking stuff out of the mix that costs too much. The first thing to go, Welch explains, is the hiding pigment, which in white paint is titanium dioxide. That means the paint costs less but it also loses hiding power. So, for example, it might take more coats of paint to hide a color that had been applied previously. Then you trim back the resin content—the binder that holds everything together. Now, Welch adds, the paint is less expensive still, but the paint film isn't going to have the same integrity that a more expensive paint would provide.

"Basically, you reduce the solids of the paint; the amount of paint that's left when it dries," Welch says. "You reduce the expensive components, which are the resin and the hiding pigment, and you also reduce the total solids in the can. They all have a cumulative effect."

With that in mind, one approach to choosing paint is selecting the manufacturer you like (Sherwin-Williams, say, or Benjamin Moore) and then specifying the most expensive option the company offers in a particular category—the priciest exterior wall paint, for example, or the most expensive trim paint. Price comparison may not be the most useful approach when trying to choose between different manufacturers, but within one company's offerings, price is probably the most reliable measure of quality a consumer is going to get.

These days, top-quality U.S. paints are running \$80 and up per gallon, but niche products can cost much more than that. Fine Paints of Europe sells some paint for \$155 for a 2.5-liter container (what Lahey

Painters' picks

We have been covering the evolution of paint at *Fine Homebuilding* for as long as we've been making the magazine. Unfortunately, we are not set up to test paint, so we contacted a few professional painters to ask for their recommendations.

Jason Eidsness, who can be found online as XC Painter, works in the Pacific Northwest and prefers products from Benjamin Moore, Sherwin-Williams, and a few less common brands. "It's not my main wall choice," Eidsness writes, "but let's get Scuff-X checked off as a great product." He uses the specialty Benjamin Moore paint for high-traffic areas.

But Eidsness's go-to for walls is Benjamin Moore's Regal Select in eggshell. "You can't go wrong with this paint with how easy it is to use," he writes. "It has great flow with a brush or roller, and good coverage." He recommends Benjamin Moore's Aura in eggshell for "slick feel, cleanability, color retention, and coverage." Though Aura is marketed as a one-coat paint, Eidsness still recommends two coats. For production jobs, he recommends Ultra Spec 500.

"However, currently I am using Sherwin-Williams ProMar 200 HP in eggshell for walls and bathroom ceilings," writes Eidsness. "It's their middle-range product, available in three sheens only. It's working pretty well. Brushability and coverage is good. The eggshell sheen is a little shiny compared to others, but it does look nice and feel nice."

Eidsness says that Benjamin Moore's Advance in satin is one of the best trim paints. "It flows so well off the brush, with a long open time, and it self-levels," he writes. "So, it's almost impossible to over-brush a piece of trim where the paint starts dragging. You have time to apply and lay it off with much less worry about it drying up or brush marks showing." He also likes

(Continued on p.44)

(Continued from p. 43)

Benjamin Moore's Insl-X Cabinet Coat for trim and cabinets and Kelly-Moore DuraPoxy for trim, and he uses Miller Paint's Evolution and Premium products on drywall.

Joe Cook, former painter and current partner at Catalyst Construction in Prairie Village, Kans., starts with a list of preferred sheens: Ceilings get flat paint; walls get eggshell; trims, doors, cabinets, and exteriors get satin. Before making recommendations, Cook notes, "I don't know if I would consider these cutting edge, but they are tried-and-true products that we stand behind."

For ceiling paint, he likes Sherwin-Williams ProMar 400, Behr Premium Plus Interior Ceiling Paint, and Kilz water-based ceiling paint for its hiding and stain-blocking qualities and low odor. For walls, Cook chooses Benjamin Moore Regal Select interior paint, Sherwin-Williams ProMar 400, or Behr Premium Plus, depending on the project and budget.

For trim, doors, and cabinets, he specs Benjamin Moore's Satin Impervo or their Advance water-borne alkyd paint. The first, he writes, is a "great paint that brushes well and is durable. It does have an odor and will yellow over time." The latter he likes for its lower VOCs and non-yellowing characteristics, though, "It is not as durable as an oil-based enamel," he adds.

Outside, Sherwin-Williams's Duration and Benjamin Moore's MoorGard Low Luster are his go-to products for their durability and long-lasting color.

Finally, we spoke to Brooke Cambridge, owner of BLC Painting in Boston, Mass., who is a loyal Benjamin Moore customer and uses their Ultra Spec ceiling paint, Regal Select and Aura for walls, Advance on trim, and Regal Select and Aura products for exterior work. One alternative she recommends is Fine Paints of Europe for interior trimwork.

—Brian Pontolilo, editorial director

calls a "Eurogallon"). It should cover as well as a U.S. gallon, he says, but the price is still going to shock some would-be buyers right out the door. Maybe so, Lahey says, but that's because the binders and the product-specific pigments are expensive. Unlike most paint companies, he doesn't use Universal Tinting Colorants, or UTCs, but rather tints that are specific to a certain paint.

"When you approach it that way, you get an entirely different level of coating," he says. "You get better tinting accuracy; better coverage when tinting dark or tricky colors. It's the quality of the paint, but also the quality of the pigment used in the paint that elevates the game."

He adds that one thing to keep in mind is that the cost of paint is probably going to be a small part of the total cost of a professional painting contractor's price. If the painter bids the job at \$2000 and it's going to take two gallons of paint, does it really matter if the paint costs \$100 and not \$25?

Reading the label won't help

In any supermarket on any given day, you'll find someone in an aisle carefully reading a label for the nutritional information it offers. Calories, sodium, saturated fat, sugar—it's all there. Do you get the same level of detail when shopping for paint? Not so much.

Take, for example, the label on a 1-gal. can of Sherwin-Williams Resilience, an exterior acrylic latex paint that lists online for almost \$75. After water, the most abundant ingredient is "Acrylic Polymer 25852-37-3," whose CAS registry number identifies it as a butyl acrylate-methyl methacrylate polymer. The paint also contains titanium dioxide (called TiO₂ in the trade), nepheline syenite (a mineral pigment and filler), and zinc oxide, an additive for stain blocking and mildew resistance. Unless you're a chemist, there's not much here that will ring a bell. And even if you were a chemist, without more specific information it would be difficult to compare this paint to a competitor's paint.

One useful bit of information is that the paint contains less than 50 g of VOCs per liter. That's low enough to meet current air-quality standards in Southern California and well below the federal limit.

"For the most part, the general categories of component types that are in there are very similar," Laird says. "If you look at the polymeric binders, whether it's acrylic or a cheaper form of acrylic, we have similar

components as others. I wouldn't say there's a huge difference." However, paint manufacturers also strive to set some of their products apart by meeting specific consumer needs, such as scuff or stain resistance. In these instances, big manufacturers with a lot of resources will be able to draw on their own chemists to develop unique resins, or borrow resin chemistry from another business unit, as PPG did in developing its UltraLast paint brand.

The paucity of useful information on a paint-can label may prompt consumers to look elsewhere for information: Consumer Reports reviews, online reviews, or a recom-

BRUSH BASICS

Paintbrushes have three parts: a handle, a ferrule, and bristles.

Handle sizes and shapes are about balance and comfort.

Ferrules are about durability—corrosion-resistant ferrules will not rust, which keeps rust from bleeding into the paint. Bristle sizes and shapes are chosen for the task—

a large, flat-bristled brush will make quick work of painting siding; a smaller, angled brush is suited for

jobs like painting stair parts. Importantly, bristles should be matched to the type of paint being used.

Latex paints generally require synthetic bristles. Oil-based paints can be applied with synthetic or natural bristles. Some paints are very specific about the bristle requirements, so always check to see what the manufacturer calls for.



Wooster
2½-in. nylon/
polyester angled
sash with steel
ferrule and
maple handle



Purdy 2½-in.
natural White
Bristle angled sash
with stainless-
steel ferrule and
fluted handle

Problem-solvers

Manufacturers want their paint to meet basic consumer expectations—such as good durability and hide—but they're also looking for ways to make their products stand out in a crowded marketplace. Increasingly, that means developing paints that have attributes their competitors' paints do not.

"Our R&D resources and long-term road maps for our products are strongly rooted in consumer insights," says Alison Bruce, senior marketing manager for the PPG brand. "We decide where to go based on where our consumers say they want to go."

For PPG, that meant developing a paint called UltraLast, an interior acrylic latex designed for high stain resistance (the resin technology behind the paint won a 2020 R&D 100 Award last October). A video posted at the company's website shows oil- and water-based stains on a white background easily wiped away with a sponge while stains on two adjacent test surfaces can't be removed completely. The company drew on technology developed in non-paint parts of its global operations to develop the resins that give UltraLast its stain-resistant qualities. (UltraLast is only available at a PPG store, and is referred to by the brand as a pro-oriented product.)

Mike Mundwiller, field development manager at Benjamin Moore, recommends deciding on paint by researching the most desirable attributes for the area being painted. "Select the paint that meets most of the needs that way," he says, "as some paints are designed to solve specific challenges and may be a better fit than others for any given job."



PPG ULTRALAST



BENJAMIN MOORE SCUFF-X

As its name implies, Scuff-X is a scuff-resistant paint that is highly cleanable and also contains antimicrobial additives to inhibit the growth of mold and mildew. This paint is best for high-traffic areas, such as hallways, stairwells, service entrances, and restrooms. A gallon sells for about \$50.



SHERWIN-WILLIAMS SNAPDRY

This interior/exterior paint dries in as little as one hour so doors and windows can be closed on the same day they are painted without marring or sticking. It sells for about \$80 per gal.



SHERWIN-WILLIAMS EMERALD RAIN REFRESH

This product has what the company says are "self-cleaning" properties, similar to its Loxon masonry paint introduced several years ago. Any dirt on the paint surface washes away with water contact, whether from a rainstorm or a garden hose. This acrylic latex paint sells for about \$105 per gal.

mendation from a professional painter or even a neighbor.

"There's virtually no way to get that from the can," Welch says. "It's difficult. If you don't have access to some testing, which every consumer does if they want to look in our approved product list online, it would be difficult for them to understand. The easy answer is that price is a pretty good indicator of quality. Basically, if you want to make paint cheaper, you've got to take something out, and the most expensive, top-line brand from any manufacturer is generally their best-performing product."

The "approved product list" that Welch refers to is an online database at the Master Painters Institute where anyone can look up a paint to see if it qualifies. The tests, which MPI devised itself, are not designed to show which paint is best. The standards are more like model building codes. They set minimum performance criteria for what Welch describes as "dependable performance over the long term." The standards, he says, are used by both the U.S. and Canadian governments.

Prep and application are important

Just about any painter will tell you that surface prep is key. Welch adds one other pointer: Don't forget that paintbrushes and technical skill count for a great deal.

"Cheap brushes, which is what most consumers buy, are a waste of time," he says. "The better the brush, the better the application."

Modern acrylic paints are good and getting better, but they are not dramatically more durable than they were 10 years ago, says Tim Leahy, director of architectural finishes for historic restoration and custom projects at Kirby Perkins Construction, a Newport, R.I., firm that tackles high-profile jobs on historic homes. In harsh climates, even the best paints available will need recoating or touching up before too long.

"Take a gallon of oil with heavy-duty resins and throw in some lead and apply that," he says. "You might not live forever, but that paint job is going to last forever. With modern paints, we tell people in shoreline areas that the paint will last 1000 days before it needs attention." □

Scott Gibson is a contributing writer at *Fine Homebuilding* and *Green Building Advisor*. Photos by Melinda Sonido, except where noted.



48

Painting Walls
and Ceilings

54

8 Steps to
Perfect Trim

60

Wallpaper
the Right Way

66

You Can Spray

72

Staining Secrets
for Furniture-
Quality Trim

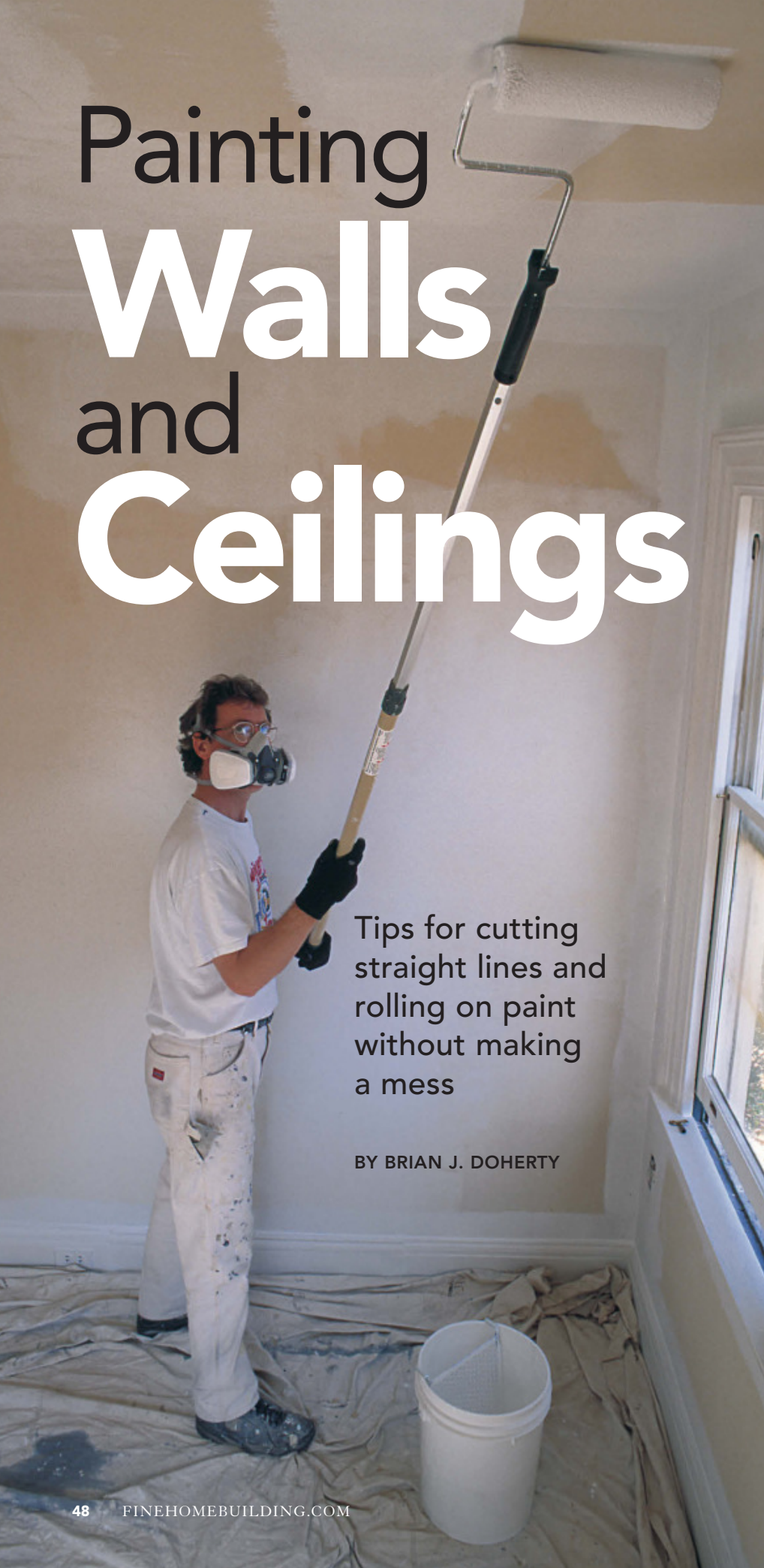
The Best of **FineHomebuilding**

PAINTING

PROJECTS AROUND THE HOUSE

Interiors



A man wearing a white t-shirt, white pants, a respirator mask, and safety glasses is painting a wall with a roller. He is standing on a drop cloth, and a white bucket is on the floor. The wall is partially painted, and a window is visible on the right.

Painting Walls and Ceilings

Tips for cutting straight lines and rolling on paint without making a mess

BY BRIAN J. DOHERTY

Most of my friends think I've got the easiest job on the planet. After all, anybody can paint walls and ceilings, right? The truth is that anybody can paint if they go about it in the right way, with the right paint and the right tools. Proper technique for cutting in and rolling is not the stuff of national secrets, but there is a lot more to it than you'll get in the pamphlets handed out at paint stores.

Before I open the paint can

The room I worked on for this article is one of several that needed complete refinishing in an existing home. The first thing I do when painting a room is spread professional-quality canvas drop cloths to cover and protect the floor. Spilled paint doesn't soak through canvas as it does a bed sheet or other lightweight cloth, and canvas is safer to walk on. Working on a plastic drop cloth can be like painting on roller skates.

The plaster walls in this room needed some fairly extensive patching work. In this type of situation, I start by fixing all the questionable areas, taking care not to create a lot of dust that might get into fresh paint. Next, I caulk all gaps between the trim (baseboard, window and door casing) and the walls with a high-quality paintable caulk. I smooth the caulk with a damp rag. Caulking always makes the finished paint job look better.

I also make sure that the room I'm painting has adequate lighting. Even if there is a lot of natural light, I always have halogen work lights and clip-on parabolic lights handy.

The next step is prepping and priming the trim. Painting trim is a different kettle of fish, but I make sure that the trim paint overlaps the wall about $\frac{1}{8}$ in. When the trim is primed, I begin work on the walls and ceiling, letting the finish coat on the trim cover any stray paint from the walls.

Painting: prime time

The walls and ceilings in this room had water stains from an old roof leak that had been fixed; also, the former owners of the house were heavy smokers, which left the walls and ceilings stained. So I decided to cover everything with an alkyd-based primer/stain blocker. By the way, a respirator should always be worn when applying oil-based paint.

The two steps to painting a large area are cutting in and rolling. Cutting in is brush-

ing paint onto areas the roller won't reach. Painters naturally start at the top and work down; I stand on a ladder and paint everything I won't be able reach comfortably from the floor. For cutting in, I never work out of the paint can but instead use a cut bucket. You can buy one or make one (see a video on how to make your own at FineHomebuilding.com). I cut in with a 3-in. brush to give me a 3-in. band to roll into. Because the walls and ceiling are being painted with the same primer, I cut in the corners without being too careful, using the flat part of the brush on both sides of the corner. (For more on cutting in trim and corners, see *Building Skills*, pp. 108-109.)

Where the primer meets the prepped trim, I paint up to the edge of the trim using the narrow side of the brush, overlapping the wall primer onto the trim slightly but not being overly accurate with my line at this point. Overlapping coats at the edges of the trim creates a less stark line between the trim paint and the wall paint. When I've finished cutting in the upper parts of the room from the ladder, I work from the floor cutting in the rest.

Staying out of the paint rain

Once the entire room is cut in, it's on to the rolling. The first thing I need is a roller frame, which is the handle and holder for the roller cover. Roller frames come in an amazing array of widths and shapes, but I usually stick with the standard 9-in. model. I avoid cheap roller frames because they don't hold up well.

The next-most-important tool for painting walls and ceilings is a telescoping extension pole. I use Sherlock poles (woosterbrush.com). These poles come in various sizes, but for most rooms with flat ceilings, a 4-ft. pole that telescopes to 8 ft. or so works great. I avoid screw-together extension poles; they're a lot of trouble.

The extension pole has a broom-handle thread on one end that screws into the roller frame. This tool keeps me from running up and down a stepladder to paint ceilings. If I paint a ceiling without an extension pole, I end up working directly under the roller, getting spattered as I paint.

Working out of a 5-gal. pail

Next, I need the correct roller cover for the job and paint I'm applying (see sidebar, right). For the oil-based primer that I'm



CAULK BEFORE YOU PAINT

Before the walls or trim is painted, apply a bead of paintable caulk to fill the gap between the trim and the walls.



OVERLAP EACH LAYER OF PAINT

Beginning with the primer on the trim, each coat of paint should slightly overlap the adjacent surface, producing a cleaner line.

Choosing a roller cover

There are several factors I consider when choosing a roller cover. The first is the surface I'm going to paint. For smooth surfaces, a roller cover with a short nap ($\frac{1}{4}$ in. to $\frac{1}{2}$ in.) is fine. But if you're covering a heavy stucco, you may need as much as a $1\frac{1}{2}$ -in. nap. Light ceiling textures usually require a nap that's somewhere in between.

Next, I look at the type of paint I'm applying. Most roller covers are made with synthetic fibers that work fine with all paints, latex or oil. But for applying a finish coat of oil paint, I recommend using a natural-fiber roller cover.

Another factor is how smooth I need the finish coat to appear. Gloss paints tend to show off the stippled finish from the roller really well, so I usually opt for a fine-nap cover that leaves a smoother finish. Flat paints are much more forgiving, so having a fine nap isn't as critical.

Roller covers come in a lot of different lengths and diameters, but the standard 9-in. roller cover and frame works well for 95% of my painting. However, when I need to roll paint in a really narrow spot, I reach for my "hot-dog" roller. The cover for a hot-dog roller is 6 in. long with a diameter of less than an inch. Mounted on a long-handle frame, it's perfect for rolling places such as the wall behind a radiator.

A brief word about quality. I won't use cheap paintbrushes, and I never, ever use cheap paint. I do, however, occasionally use cheap roller covers for applying flat latexes. If I need the cover to last only for one room and plan to toss it out after I'm done, an inexpensive cover is just the ticket.

I never use a cheap roller cover for applying an oil paint. Oil paint pulls the fibers out of the cover and leaves walls with an incredible koalalike finish.

—B. J. D.



using for the job in the photos, I chose an inexpensive $\frac{3}{8}$ -in. nap roller cover good for any kind of paint.

The two most common ways to get paint onto the roller are a standard paint pan (bottom photo, this page), which I use for the finish coats, or a 5-gal. bucket with a roller ramp hung on the rim (top photo). I needed about $2\frac{1}{2}$ gal. of primer on this project, so I poured that amount into the pail, inserted the roller ramp, and got to work.

The 5-gal. bucket should be no more than half full, leaving most of the ramp exposed. I dip the roller cover slightly into the paint—about one-quarter of the way—and draw it up onto the ramp. Dipping the roller into the paint any deeper can make it drip all over the place.

I dip the roller several times while rolling it up and down the ramp until the cover is completely saturated. Most ramps are made of expanded metal that distributes the paint evenly on the roller cover while allowing excess paint to drain back into the pail. When the roller cover is fully loaded, I place it near the top of the ramp and give it a quick downward push off the roller ramp to spin off any excess paint.

Ready to roll

I start rolling in one corner of the ceiling, working down the short side of the room first. I roll the paint in 3-ft. squares with each square overlapping the next slightly. (A 3-ft. by 3-ft. area is about what a properly loaded roller ought to cover.) For each square, I roll the paint on from side to side in compacted “W”

or “M” formations: down straight, back up on a slight diagonal, then straight down again, overlapping each down stroke with the one before. Remember, you’re painting, not spelling. Overlapping gives you even coverage and keeps you from missing any spots. Where the squares overlap my cut-in band, I try to keep the roller about 1 in. from the corner.

Once the ceiling is finished, I start on the walls. I first work my way along the top of

each wall in similar 3-ft. squares. The small sections above windows and doors are done in shorter, smaller strokes.

Ropes, drips and runs

The biggest concern when rolling paint is that excess paint tends to build up on the outside edges of the roller cover and frame. Paint buildup leaves behind ropes, or heavy lines of paint, in the wake of the roller. Going back over a section with the roller smooths out any ropes or areas with too much paint,

the paint should be a consistent thickness over the entire area.

Mix all your cans of finish paint for consistent color

You never want to be short on paint. You also want a little paint left over in case you need to touch up or repair a wall in the future. But custom-mixed colors usually vary from can to can, which can be obvious if you have to buy an extra quart to finish a job.

The trick is to overbuy and then mix all the cans of paint together thoroughly before starting. Most paints cover around 400 sq. ft. of flat surface per gallon, and I knew that the walls in this room would need two coats. So after a little mental math, I bought six quarts—or a gallon plus two quarts. I figured this amount would leave me with about a half-quart after I was done.

I’ve seen painters pour half of a gallon can into a container and then pour half of a second can into the first. They continue this process around until all the cans have been blended completely. Mixing paint in this manner is known as boxing, but I find it easier just to pour all the paint into a 5-gal. bucket.

Ready for the finish

Because I use a fast-drying primer, I can apply the finish coats almost immediately. For this room, I gave the ceiling one coat of white finish paint, and the walls two coats of teal.

I start with the ceiling so that any drips or spatter that I get on the walls will be covered with their finish coat. When cutting in the ceiling, I again overlap the

finish paint slightly onto the walls. It’s still not necessary to be extremely tidy; I just try not to leave any globs of paint on the walls.

I then move on to the walls, and this is the time to take the extra effort to cut in neatly. I start at the ceiling line of one wall and cut it in as neatly as possible. It’s still okay if it’s not absolutely perfect; I’ll fine-tune the line on the final coat. Again, I create the first horizontal line with a high-quality 3-in. brush turned on edge. I then complete the

Loading the roller



RAMP IN A BUCKET

When a large amount of paint is being applied, it’s easiest to work out of a 5-gal. pail with an expanded metal ramp to load the roller cover.

A PAINT PAN FOR BETTER CONTROL OVER THE PAINT

It’s easier to manage the amount of paint that gets on the roller cover when working out of a paint pan. Give the roller a quick swirl to remove excess paint before you start painting.



which is often the result of working with an overloaded cover. Even better, it helps to get rid of the excess paint on the roller before it leaves ropes.

When ropes begin to appear, I tilt the frame and cover slightly at an angle to the wall with just the end touching and roll it for a couple of inches. I repeat the process with the other side of the roller and then work the drips that have squeezed out into the area I’m painting. When I’m finished with a section,

PRIMER COAT

Even if a room has no damage, I recommend using a primer under the finish coat. It not only helps to seal the surface, but it also makes the finish coat go on more evenly—critical if I'm applying a gloss finish paint.

CUTTING IN FROM THE FLOOR

I first cut in the upper part of the room from a ladder, then work my way around the room, standing on the floor and cutting in.



PAINTING Ms AND Ws

To apply an even coat of paint, I draw the roller straight down, back up at a slight angle, and then straight down again, overlapping the previous downstroke in the shape of an M or a W.



THE END OF THE ROPES

Ropes, or heavy lines of paint, show up when there is too much paint on the outer edges of the roller. Running the edge of the roller on the wall squeezes out the excess.

FINISH COAT



BLEND ALL THE PAINT TOGETHER

Custom-mixed paint can vary in color from can to can. Mix all paint together in a 5-gal. pail before it goes on the walls.



YOU'RE GETTING PAINT ON THE TRIM

Overlapping paint between adjacent surfaces continues as the wall paint is extended onto the trim slightly. The finish paint on the trim will create the final line.



“I roll the walls the same way I did on the primer coat, working in 3-ft. squares and making sure the paint is applied evenly.”

ROLLING ON THE FINISH COAT

Applied with the same rolling pattern, the finish coat is rolled onto the walls.



SMOOTH THE WALLS BETWEEN COATS

A work light helps to find any lumps or debris in the first coat. A light sanding smooths everything out.



FINAL FINICKY CUT IN

The final cut in is the most crucial to make sure the line between ceiling paint and wall paint is perfectly straight.

band using the full 3-in. width. I also overlap onto the trim slightly, but I don't go crazy. For the project featured here, the trim was to be white, which wouldn't cover the teal wall paint well.

A paint pan minimizes ropes

Instead of working out of a 5-gal. bucket, I use a roller pan for the finish coats on both the ceiling and walls. Loading the roller out of a pan gives me better control over ropes and drips. When filling a roller pan, I pour in just enough paint to fill the deep end of the pan. And again, I don't let the entire roller submerge in the paint. When the roller is saturated, I give it a light twirl to spin off excess paint from the ends.

I roll the walls the same way I did on the primer coat, working in 3-ft. squares and making sure the paint is applied evenly. When the first coat is dry, I go over the walls with light sandpaper using a work light to illuminate lumps or debris that might need to be smoothed out.

Cutting in the second coat gives me the chance to fine-tune the line between the ceiling and walls. Working in an older home, I often find myself having to invent a straight line because the corners are uneven. I take my time and fill in any small gaps left from the first coat.

Don't use masking tape to create a straight corner line, which can make an even bigger mess than you're trying to prevent. Instead, take your time and trust yourself with the brush. You can't do any damage that can't be

easily fixed with either wall or ceiling paint.

The roller cover I used for the first coat still had plenty of life in it after one coat, so I didn't want to throw it out. But I couldn't let it sit out overnight either, so I stuck it in the fridge. I just double-wrapped the roller cover (still on the frame) in old plastic grocery bags and set it next to the eggs and milk. Paint dries slowly at refrigerator temperatures. The next day, I let the roller come to room temperature and was ready to roll the next coat.

When I'm finished with the final coat, I use the curved part of a painter's 5-in-1 tool to scrape most of the residual paint out of the roller, and then I throw the roller cover away. There are gadgets on the market that are supposed to help with cleaning rollers. But cleaning a roller cover can shorten its limited life span and can even destroy a cheaper cover that has a cardboard core.

Throwing covers away may not be frugal, but besides being a pain, cleaning roller covers is inefficient. Every time I try cleaning a cover, there always seems to be a bit of residual paint that spoils whatever I try to paint next.

To store leftover paint, I secure the lid and store the can upside down. The next time I need it, the tint that settles to the bottom naturally mixes back into the paint. □

Brian J. Doherty is a full-time painter and part-time musician who lives, works and plays in Richmond, Virginia. Photos by Roe A. Osborn.

8 Steps to Perfect Trim

One pro's method of getting from prep to final coat

BY TIM LEAHY

Most people who are new to painting see the job in terms of applying the finish coat, but that's just the icing on the cake. The real work that makes or breaks a paint job is how you prep the surface. If you're painting interior trim and don't do a good job of sanding, cleaning, and priming, the final coats of paint won't look pristine. At the very worst, a poor prep job can make the finish coats fail. I work in high-end restoration, where the end result is paramount. Over the years, I've developed the following procedures for a great paint job. □

Tim Leahy is director of architectural finishes for Kirby Perkins Construction in Newport, R.I. Process photos by Charles Bickford; product photos by Rodney Diaz.

STEP 1 Clear the air

Whether it's your spouse or a construction manager, everyone needs to know when the painting stage of a job is set to begin. Other people need to be out of the area, and the air needs to be right, especially for the last finish coats. The inside temperature should be between 55°F and 80°F, and the humidity level should be less than 50%. Humidity between 50% and 80% is less than ideal. When the humidity shoots over 85%, the paint won't dry properly, which may cause blushing, sags, wrinkling, or film failure.

Air quality is very important, especially during the finish-coat stage, so we try to eliminate all airborne dust by using fans fitted with filters to draw in clean air and exhaust dusty air from the work area.



STEP 2 Clean and protect the room

A dirty floor and fresh paint don't mix. The dirt gets airborne when kicked or when cords, hoses, or ladders are moved. Once everyone has left the area, the first thing we do is vacuum. Sawdust, dirt, and other debris on the floors and walls need to be cleaned off with a powerful vacuum that has nonmarring attachments. Vacuums equipped with high-efficiency particulate absorption (HEPA) filters are the best, although they can be expensive.

Any hardware should be removed or protected. We remove hardware, tag it with tape, label it with a marker, and place it into plastic bags or clean cups. If there is a lot of hardware, I use a camera or a sketch pad to document the layout before taking everything apart.

If the area has finished floors, we use one of three levels of protection. If we happen to be priming in a room where the flooring hasn't been finished, we tape down rosin paper, which helps keep the dust and dirt to a minimum. If the finish is in place, then we switch to a thicker, more protective paper product such as Ram Board, and sometimes even add a plastic layer to block moisture. The ultimate protection is paper first, followed by a layer of plastic and a layer of luan plywood.



First things first. Before starting the prep, thoroughly vacuum the floor and all horizontal edges to eliminate dirt and dust. An aftermarket HEPA filter (inset) improves the performance of a typical job-site vac.



Cover the floor. It's a good idea to cover the floor with builder's paper to contain any embedded dirt. The author uses this quick method of footwork to apply tape to the paper.

STEP 3 Fill the holes

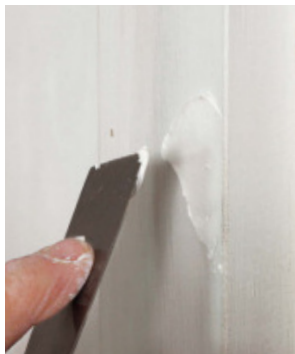
On many of our jobs, paint-grade trim comes to the site already primed. Once it has been installed (and if not primed, see step 5), the next step is to fill the fastener holes. For typical finish-nail holes, I use lightweight spackle. I like UGL brand, which dries quickly and expands out of the hole when dry, which makes it easy to sand flush with the surface. For large screw holes, I use a two-part wood filler. Lots of folks use auto-body filler, but I use a two-part filler from Minwax that is made for wood.

For dents and shallow imperfections, I use Elmer's interior Wood Filler. This product has better adhesion than spackle, so it works on fine dents and scratches. It tends to shrink, though, so I have to compensate with a slight overfill or a second application.



Fill nail holes. Use a light-weight filler such as UGL spackling

to fill small holes. Press the filler into the holes, and allow it to expand to prevent shrinkage.



Level dents. Use a medium-body product

such as Elmer's Wood Filler to fill any shallow depressions in the trim. Overfill slightly so that sanding will create a flush surface.



Think body shop. For wide holes deeper

than 1/4 in., use a two-part acrylic product that is similar to auto-body fillers, such as Minwax's Wood Filler.



STEP 4 Sand surfaces and soften edges

When the fillers have dried, it's time to sand everything smooth. This prep stage creates a uniform profile over the trim surface. Hand-sanding and checking your work by feel is critical; your fingertips can detect imperfections that your eyes would miss. I always use a disposable mask with a N100 rating when sanding.

I begin with 180-grit sandpaper to smooth the entire surface and to level all fills. Since fillers are often softer than the wood around them, I make sure to keep the paper flat so as not to dig out any filler. Working from the bottom up means not sanding over dust from above. I feel every inch as I go to ensure the surface is buttery smooth. At this point, it's OK to burn through the primer on some edges and profiles and to remove heavier raised grain. The primer used in the factory is typically applied heavily, which results in a poor texture that has to be sanded down quite a bit to create a truly flat surface.

Sharp edges are easily worn and chipped, so it's best to soften them with 150-grit paper. Remember, it's all about the feel. After everything has been sanded, I use a vacuum to thoroughly clean the surfaces, and then a raking light to inspect for defects. It's better to fill a spot now than it is to interrupt your workflow in the middle of painting to spackle a divot.

TOOL OF THE TRADE

Sandpaper

Quality sandpaper makes a difference. It should have a rugged backing, aluminum-oxide or silicon-carbide grits, and a stea-rate coating that prevents clogging. For hand-sanding, Norton 3X paper is good, as are Mirka, Abralon, and Festool papers. All good papers are also made for random-orbit sanders, which work well for large, flat surfaces. (For sanding molding profiles, 3M sanding sponges are great.) Poor-quality paper may be cheaper to buy, but it wears out faster, so you use more paper and really don't save any money.





Proper technique. It's easier to control the work if you sand by hand. Fold the sheet into thirds, and hold it between your pinky and ring finger to keep it from sliding around.



Don't forget the edges. Make all surfaces consistent by sanding the edges of trim pieces and the adjoining wall areas.



Shine a light. When a section is complete, use a strong light to make sure that all the imperfections are filled.



Clean up. After sanding, be sure to vacuum the dust from the trim and the surrounding surfaces. Use soft attachments that won't ding the trim surfaces.

STEP 5 Apply the primer

We always make sure the trim has a total of two coats of primer. If you begin with unprimed trim, apply an oil-based primer to the entire surface. I like to use Zinsser's Cover-Stain Primer because it seals off the grain and tannins better than water-based products, it sands smooth, and it can be topcoated with oil or latex. I have used water-based primers, but they tend to raise the grain, which means I have to prime and sand two or three times until the grain texture is tamed.

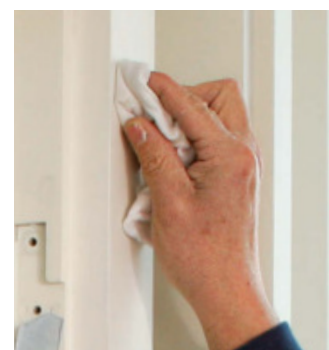
The second coat builds the surface, giving it an even color and texture that's a good substrate for any type of finish paint. Be sure to brush the primer onto the adjacent walls to create a better seal for the caulk. This foundation coat has to have straight brush strokes, minimal build, and no fat edges or overlaps. Brushing needs to be done in proper sequence: first the edges, then the flats.



Thin is better. Many modern oil primers must be diluted with turpentine or paint thinner (about 1 part thinner to 10 parts paint) so that they soak into the wood.



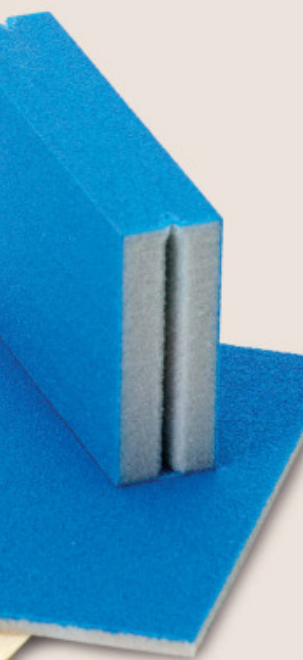
Start from the edge. To avoid buildup, brush first from the edges of the trim, making sure to hit the seam between the trim and the wall.



Get rid of the excess. It's difficult to brush away more paint than the brush can hold, so use a rag to wipe off the flats before proceeding.



Create a good foundation. Working in one direction, brush out the face of the trim in even, straight strokes, being sure to avoid lumps and drips.



STEP 6 Sand both primer coats

I lightly sand the trim after both the first and the second coat of primer to remove dust nibs or unwanted texture. I also wipe down the adjacent walls and vacuum to remove dust before caulking.

It makes a difference. After each coat of primer has dried, I use 320- or 400-grit sandpaper or an extra-fine nylon abrasive pad to prepare the surface.



STEP 7 Caulk open seams

For the last step before the finish paint, I fill all cracks and seams with a high-quality acrylic adhesive caulk. The main trick with caulk is to make sure that a good bead of it gets forced behind the surface of the crack. Joinery with gaps of less than $\frac{1}{16}$ in. don't need to be filled as deeply, but anything larger should be filled behind the crack, not just on top of it. If the bead is too thin, the caulk will crack at the slightest movement of the underlying material. Once I've applied the bead, I use my finger to push the bead into the crack and smooth it out at the same time. I don't use rags, as they tend to wipe away too much caulk. Larger fills are prone to shrink and may need a second application.

Control the output. When you're about to use a new tube of caulk, cut off the tip at an angle so that the caulk can be easily directed into cracks without too much waste.



Pull, don't push. With the angled tube facing the crack, pull the tube along the seam as you squeeze out a consistent amount of caulk.



Digital workflow. Use a fingertip to smooth out the bead of caulk and to push it into the seam. Use a rag only to wipe off your finger, not the seam.

STEP 8 Apply the topcoat

Vacuum as needed, then ensure that the air is as free of dust as possible and within the manufacturer's recommended temperature and humidity levels. Add heat to the room if it's too cold; if it's too hot and there's no air conditioning, work at night. Allow for extra drying time if the humidity is high.

EPA regulations have adversely affected the performance of oil-based finish paints, especially in terms of their tendency to yellow over time. Fortunately, manufacturers have improved the performance of acrylic paints so that they level better and work easier than before. On this job, I used Benjamin Moore's Advance, which is a water-based paint with a small alkyd component to help it work and be tough like oil. Slight thinning according to the label directions is OK, but you shouldn't need any additives such as flowing agents.

Mind your strokes. When applying primer or finish coats, keep the brush strokes definitive along transitions such as miters and other joints.





Scuff and buff. After the first finish coat has dried overnight, rub all areas lightly with an extrafine nylon pad or 400-grit sandpaper to smooth any imperfections and to dull the surface for the final coat. After vacuuming, wipe everything down with a tack cloth.



Apply the second topcoat. The final coat of paint should provide a perfect sheen and an extra layer of protection. After it has dried, check for missed spots and then clean the area, remove any masking, and reinstall the hardware.



TOOL OF THE TRADE

Paintbrushes

For even brushwork, you need a decent brush. A high-quality China-bristle brush works best for oil-based paint, while a good nylon brush works well with water-based finishes. Look for evenly cut, feathered ends on the bristles, which help to smooth out the paint. Purdy and Wooster are reputable brands.



Online members can watch a video series of this trim-painting process at FineHomebuilding.com.



Wallpaper the Right Way

Installed correctly,
this wall covering
should last a lifetime
and come off easily
once it has worn out
its welcome

BY JOHN CLIFT

Wallpaper is trendy again, both with designers, who are spec'ing it more often, and with homeowners, who are drawn to the ever-growing range of designs, colors, and types popping up on home-improvement shows and social media. But hanging wallpaper isn't a quick and easy job, and because today's wallpapers are more expensive than the DIY products of decades past, making mistakes is costly. Too often, homeowners call me only after their project has gone south.

This isn't to say that hanging wallpaper is out of the average person's reach; it's just more involved than many people realize. Along with an eye for detail, it takes preparation and planning to ensure that the job looks good and that it lasts. And if the paper is ever going to be removed or replaced, this prep work will make that future removal easier as well.

With so many different products available, it's impossible to cover all of their various installation quirks in one fell swoop. But in 20 years of hanging wallpaper, I've found that some basics—things you need to do in order to do the job right—apply almost universally.

Ready the room

A key to good-looking wallpaper—and to ensure its future removability—is wall preparation. Wallpaper can't hide irregularities in walls, so repair any imperfections to provide a smooth plane for the paper to cling to. Walls must be clean, dry, structurally sound, and generally free of

ESTIMATING WALLPAPER

Online wallpaper calculators aren't accurate enough for determining how much wallpaper is needed for a given room. There are just too many factors—pattern size, pattern match, roll length, wall height, and more—that complicate estimating. Wallpaper is printed in batches, and for a good color match, all the paper for a given room should have the same dye lot. If you're going to supply your own paper, buy more than you think you need, and return unopened rolls.

Pattern matches

There are three main types of wallpaper matches: random, straight, and drop. Random matches are easiest to estimate and hang; straight and drop matches are more complex and result in more waste.



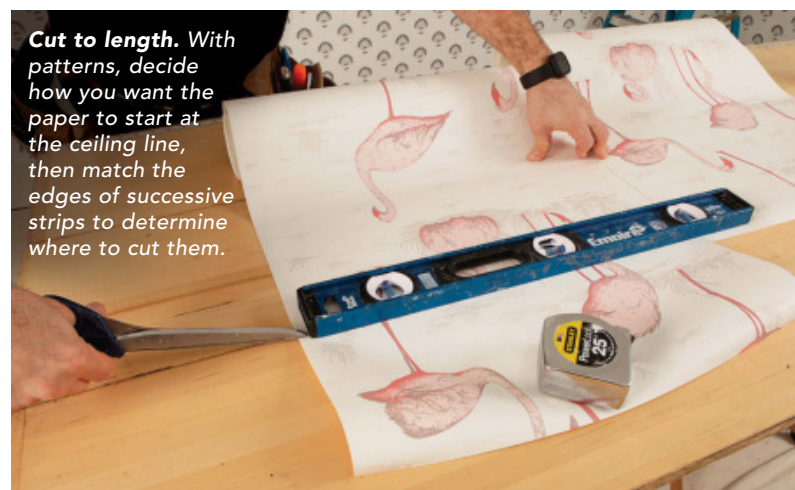
Random-match papers don't have patterns that require matching.

Straight-match papers repeat horizontally from one sheet to the next.

Drop-match papers have a repeat that is offset from one sheet to the next.



Find a starting point. Step off measurements from various inside corners and directions to determine a starting point that results in the fewest narrow strips of wallpaper.



Cut to length. With patterns, decide how you want the paper to start at the ceiling line, then match the edges of successive strips to determine where to cut them.

Paper prep

Cut all of the strips for a given wall or room to rough lengths, leaving a couple of extra inches at the top and bottom. If the paper has a drop match, you may get more usable material by alternating between two rolls for successive strips. It can help to back roll the paper slightly so it doesn't curl as you paste. Paste the paper on an easy-to-clean surface, such as a pasting table (photo above), and allow time for the paper to expand if necessary after it's pasted.



Label it. Mark each strip with its length and, if it's a drop match, where the strip falls in the sequence.

- | | |
|-------------------------|------------------|
| 1 Paint tray and roller | 6 Utility knife |
| 2 Primer/sizing | 7 Blade disposal |
| 3 Wallpaper paste | 8 Scissors |
| 4 Straightedge | 9 Smoother |
| 5 Microfiber towel | 10 Level |



TOOLBOX

PAPER THE WALLS



Prime for removability. Apply a quality sizing—or primer—to all surfaces before wallpapering to ensure good adhesion and to make future removal easier.



Paste it up. Use a roller to apply paste to the back of one-half of the strip at a time. Fold over the pasted half to the middle without creasing it, and repeat on the remaining half.



Hang it plumb. Use a level to help set the first strip perfectly plumb. This is critical, especially with patterns, to prevent the pattern from walking up or down the wall.



Free the bottom. After smoothing in the top of a strip, unstick the bottom of the sheet from its folded position and smooth it in.



stains. Remove all switch and outlet covers, as well as wall-mounted fixtures. Lightly sand painted or primed walls with 120-grit sandpaper to rough up the surface and remove any small bumps.

To help the paper stick and aid its removal down the road, the next step is critical. Sizing—or priming—the walls creates a better bond between the paper and the wall and makes wallpaper removable. For walls that are damaged—say, from the removal of old wallpaper—I like to use Gardz Problem Surface Sealer. When the walls are in good shape, as they were in this house, I prefer Roman Rx-35.

Roll and brush the sizing on just as you would do with paint to get an even, thin coat over the entire surface, and let it dry completely before hanging the wallpaper. Sizing feels slightly tacky when dry.

Determine the layout

It's rare that the last strip of wallpaper will fit perfectly between those on either side of it. With patterned wallpapers, one seam is likely to

be unmatched, and it's important to decide where this irregular seam will land before you start. Place it in the least conspicuous spot possible, which is often over a door, where it will be short, or in a corner behind you as you enter through the door.

Measure each wall to determine how many strips are needed to complete the room and to determine a starting point. You want to avoid having thin strips of paper (as may happen at inside corners, where the paper is cut and readjusted on the intersecting wall), and it may be possible to avoid a sliver in one corner by starting in another.

To find a starting point, I lock in the paper's width on my tape measure and step off measurements from various places until I find the layout that results in the fewest seams and narrow strips.

Cut, paste, rest, and repeat

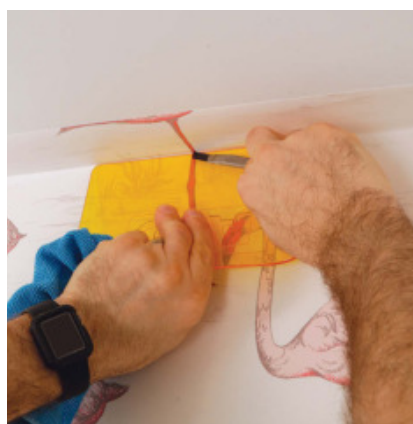
For efficiency and to ensure that each strip matches up correctly, cut all of the strips of paper for a given wall or room before you start



Butt, don't lap. Use hand pressure to coax seams together until they touch but don't overlap.



Smooth it out. Use a smoothing tool to push or pull air bubbles from behind the paper, ensuring good adhesion with the wall.



Cut it close. Use a sharp utility knife guided by a straightedge to cut the excess paper from the top and bottom tight to the ceiling and the base trim.



hanging. Cut the strips long—a couple of extra inches at the top and bottom—to allow for minor adjustments and so that you can cut the paper flush with the ceiling and the base trim. Except at openings and built-ins, all strips should be continuous from floor to ceiling.

Label the back of each strip at the top with its length and, if the paper has a drop match, a number that indicates its place in the sequence. The pattern on the half-drop-match paper used in this room, for example, repeats every other strip, so each was labeled with either a 1 or 2 to show its place in the sequence.

I prefer using unpasted paper because it gives me total control over the adhesive, which I can match or thin to work with the paper I'm using. For most jobs, I recommend Roman Pro-880 wallpaper adhesive, which is a pro-grade product that works well right out of the bucket with many traditional and newer nonwoven wallpapers. Use a paint roller with a 1/2-in. nap to apply an even coat of adhesive—about as thick as a heavy coat of paint—on the back of one-half of the

paper's length. Then lightly fold the pasted end toward the center, without creasing it, and repeat the process for the other end. Always wipe down the work surface you're pasting on between strips to avoid getting paste on the face of the sheet that you're applying glue to next.

Most traditional wallpapers expand a bit after they're pasted and so need to be "booked"—or given time to expand to avoid wrinkles and bad seams. The required booking time is typically printed on the wallpaper packaging. Nonwoven wallpaper, such as the one used in this room, is dimensionally stable and doesn't require booking, so it is hung immediately after it's pasted. With nonwoven papers, you also have the option of pasting the wall instead, and hanging the paper dry.

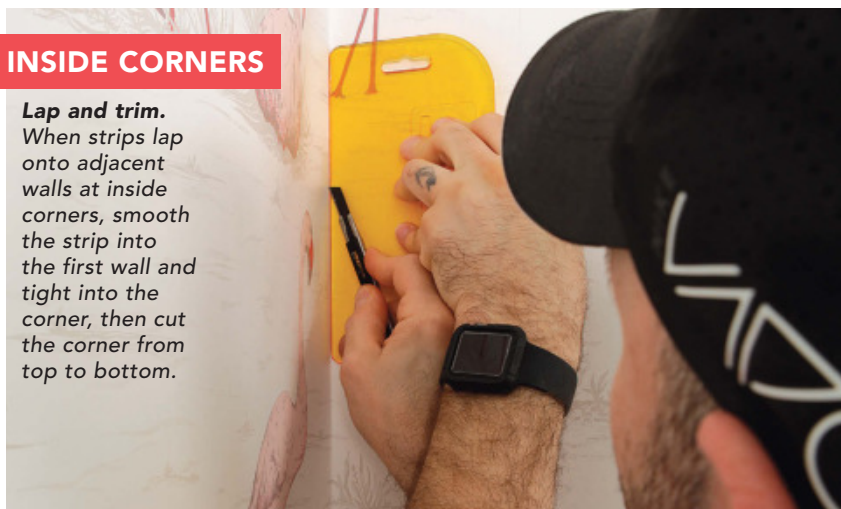
The tricks to plumb paper and match patterns

To clean and lubricate the paper during installation, have at the ready at least a couple of buckets of clean, warm water and some sponges or cloths. I wipe each strip down continuously as I install it, and I like to

CUTTING CORNERS

INSIDE CORNERS

Lap and trim. When strips lap onto adjacent walls at inside corners, smooth the strip into the first wall and tight into the corner, then cut the corner from top to bottom.



Reset. Realign the remainder of the strip plumb on the opposing wall, lapping if necessary on the preceding wall.



Lop the lap. Trim back any laps onto the preceding wall to keep the corners tight and crisp. Patterns will be slightly off in corners that are out of plumb—more so at either the top or bottom of the wall, depending on the wall's lean.



OUTSIDE CORNERS

Make relief cuts. Using scissors, make cuts at the top and bottom of the strip so it can easily wrap the corner and lie flat on both walls.



Plumb again. After wrapping an outside corner, check plumb again.



TRIM DETAILS

use microfiber cloths because I can feel air bubbles through them, and finding and removing air bubbles is part of the process.

Wallpaper should be hung plumb; otherwise, the pattern will creep up or down the wall from one end to the other. It can help to draw plumb lines in pencil on the walls beforehand, but these can show through light-colored paper. Often I just use a level to set the first strip on each wall and then check plumb every so often along the way.

Generally, start hanging at an inside corner. If the corner is plumb, set the paper tight into the corner and use a level to check that the other edge is plumb. If it's out of plumb, lap the paper slightly onto the opposing wall at the top or bottom so that the other edge of the strip is plumb. Trim away whatever laps onto the opposing wall, and do your best to match any pattern when going out of the corner in the opposite direction, again lapping and trimming as necessary.

Always hang strips starting from the top and work down. When starting with a booked strip, unstick the top of the strip from the back—leaving the bottom folded up—and position the strip on the wall. Once it's plumb, use a smoothing tool to push out air bubbles and create a good bond with the wall. Small paste bubbles behind the paper are fine; they'll suck the paper back to the wall as they dry.

Once the top of the strip is set, unstick the folded bottom of the strip from the back and set it the same as the top. Once the strip is smoothed in, trim the excess from the top and bottom using a utility knife and a straightedge to guide the cuts. Keep the knife on the waste side of the cut—toward the ceiling at the top, toward the trim at the bottom, and toward the opposing wall at corners.

I use snap-off utility blades, and I start with a new section of blade for nearly every cut to ensure that it's clean and to prevent accidental damage to the wallpaper. It may seem crazy to go through 10 or more blades on a job like this, but with wallpaper costing about \$100 per roll on average, it's worth the extra cost to avoid an expensive mistake.

With the first sheet hung, continuing along the wall is simply a matter of lining the next sheet up with the last. Don't overlap seams; just butt each sheet tight to the last, making sure to line up any patterns precisely. Take a step back from time to time to check that everything looks right. If a pattern is off, it's usually obvious.

At inside corners, smooth the paper onto the first wall and into the corner, but leave it largely free of the intersecting wall. Once it's set, cut the strip at the corner from top to bottom, and reset the cutoff on the intersecting wall, making sure it's plumb. When corners are out of plumb, lap the paper onto the preceding wall as described above, plumb the strip's remaining factory edge, and trim any overlap.

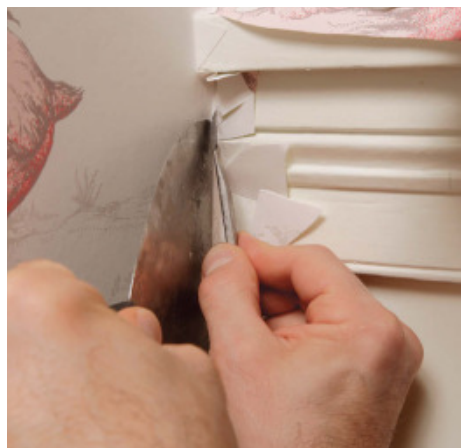
Outside corners are typically wrapped without cutting. As long as the edge of the paper remains plumb after wrapping the corner, smooth it in and continue down the wall. If it's out of plumb, bring everything back in line with a "double cut." Begin by hanging the next strip plumb and overlapping the previous strip close to the corner. Align any patterns to match the previous strip as closely as possible. After smoothing in the new, plumb strip, cut through both strips where they overlap, avoiding any graphical elements. Remove the excess paper from both sides, leaving a tight seam without any overlap.

After all the paper is hung, wipe it down again with a clean, damp cloth or sponge. Everything should be dry and set within a few hours to a day and should look good for many years to come. □

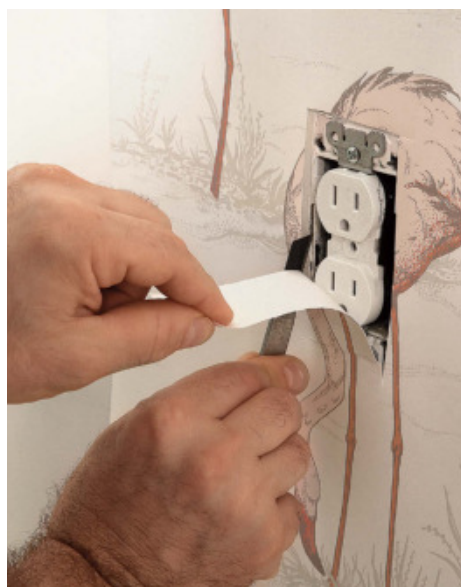
John Clift is the owner of Platinum Paperhanging in Springfield, Pa. Photos by Matthew Millham.



Cut for casing. Use a utility knife or scissors to cut away paper that laps over windows and doors, leaving enough to lap onto the casing. Make relief cuts in corners.



Follow the profile. Make relief cuts where the wallpaper abuts profiled trim, smooth the paper tight to the trim, and use a utility knife and a straightedge—a stainless-steel taping knife does the job without marking the paper—to cut away waste.



Cut for power. Use a utility knife to cut openings over junction boxes, being careful not to cut beyond the edges of where the cover plates will be.



For information on papering over cover plates, videos of the process, and more, check out FineHomebuilding.com

You Can Spray

A modest spray setup for quick, high-quality finishes is surprisingly easy to use

BY TYLER GRACE

People often ask why I spray finish a lot of my own cabinetry, built-ins, and trim at the job site. The answer depends on why you're asking the question. If you're wondering why I spray finish instead of using prefinished options, it's because a spray finish means more leeway for caulking transitions, filling nail holes, plugging screws, and sanding joints that need a bit of extra touchup work. If you're questioning my choice of a spray finish over a brushed finish, the answer is that a spray finish is faster to apply and smoother to the touch. If you're wondering why anybody would bear the hassle of doing a spray finish on-site instead of in a dedicated booth, I'd ask if you were offering me a bigger shop. And if you're asking why I spray finish on my own rather than pick up the phone and call

a painter to do the spraying for me, well, that just comes down to how much control I want over my work, and whether I'd rather pay a subcontractor or myself.

The truth is that spraying in a home isn't always the best option—it takes time to set up and break down an on-site spray job, and time is money. But spraying on-site has some definite perks for finish work. Besides, high-quality spray equipment is less expensive than ever, and modern waterborne finishes are safer and easier to work with, and dry much faster, than their solvent-based predecessors.

On a medium-size job like finishing the mantel, overmantel, bookcases, and console cabinet pictured here, I can easily spray two coats of shellac, two coats of primer, and two coats of waterborne lacquer in

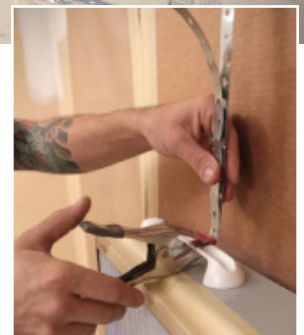
PREP

Before spraying inside the house, thoroughly clean the room to eliminate the chance of swirling dust, protect surfaces in the line of fire, set up steady airflow to draw away overspray, and protect yourself with the right equipment. Because I mostly use waterborne primer and lacquer, which are fairly safe compared to solvent-based finishes, ordinary box fans suffice for air movement, and a particulate respirator is all I need to protect my lungs.



Isolate face frames. If the cabinetry has a different finish or color on the inside, apply painter's tape just inside the edge of the face frame to ensure a crisp line, then slide slightly oversize cardboard into place over the tape.

Full-scope masking. I use a combination of cardboard, Ram Board, kraft paper, painter's plastic, and tape to protect all of the doors, windows, floors, walls, and—if they can't be removed—lights, hinges and hardware, and other finished surfaces. After masking off the area around the windows, I set a finish nail into the top edge of the casing to secure the metal strapping hanging in front of the window. I use the strapping to suspend the box fans, each of which also receives a furnace filter to catch overspray and protect the motor.





PRIME

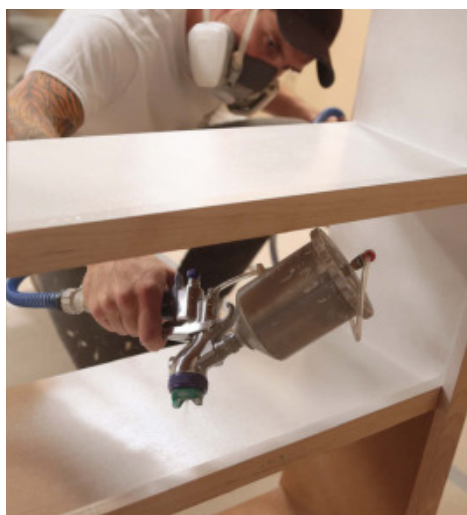
Although often treated as nothing more than an obligatory step in the painting sequence, primer deserves as much care as the top coats that come after it. Aim for a smooth, consistent finish, sanding between each coat to get the surface completely level for the finish that comes later.



Seal with shellac. Waterborne primer will raise the grain on raw wood, so I start by applying two coats of thinned, dewaxed shellac to any stock that isn't factory primed, and to any spots where the factory primer was sanded through.



Open for airflow. Rather than spraying into closed cabinetry, which can cause blowback, leave the backs off and set the cabinetry in front of the exhaust fans so that airflow helps draw away the overspray.



Start upside down. Even though all of the surfaces will be sanded, I spray cabinetry upside down so that overspray will land on what will be the underside of the shelves, where a dead-smooth surface is less crucial.



Simple spray rack. For small parts that need to be coated on both sides, I suspend the pieces from coat hangers using small hooks spun to face opposing directions, all hung from an old rolling garment rack.



Sponge-sanding. After priming, sand all surfaces to ensure a glass-smooth surface that's ready for top coats. I use a 150-grit sanding sponge, then I vacuum and use a tack cloth to pick up every bit of dust.

a single day, with results that are as good as you'd see in any cabinet shop.

Experience will guide your workflow

If I'm building the cabinetry, I generally set up a shop in the room where the work will be installed. Since I'm already isolating and protecting the entire room when setting up my tools, it's easy to get it ready for spraying too. In addition to vacuuming thoroughly, setup includes masking the room and ensuring proper airflow.

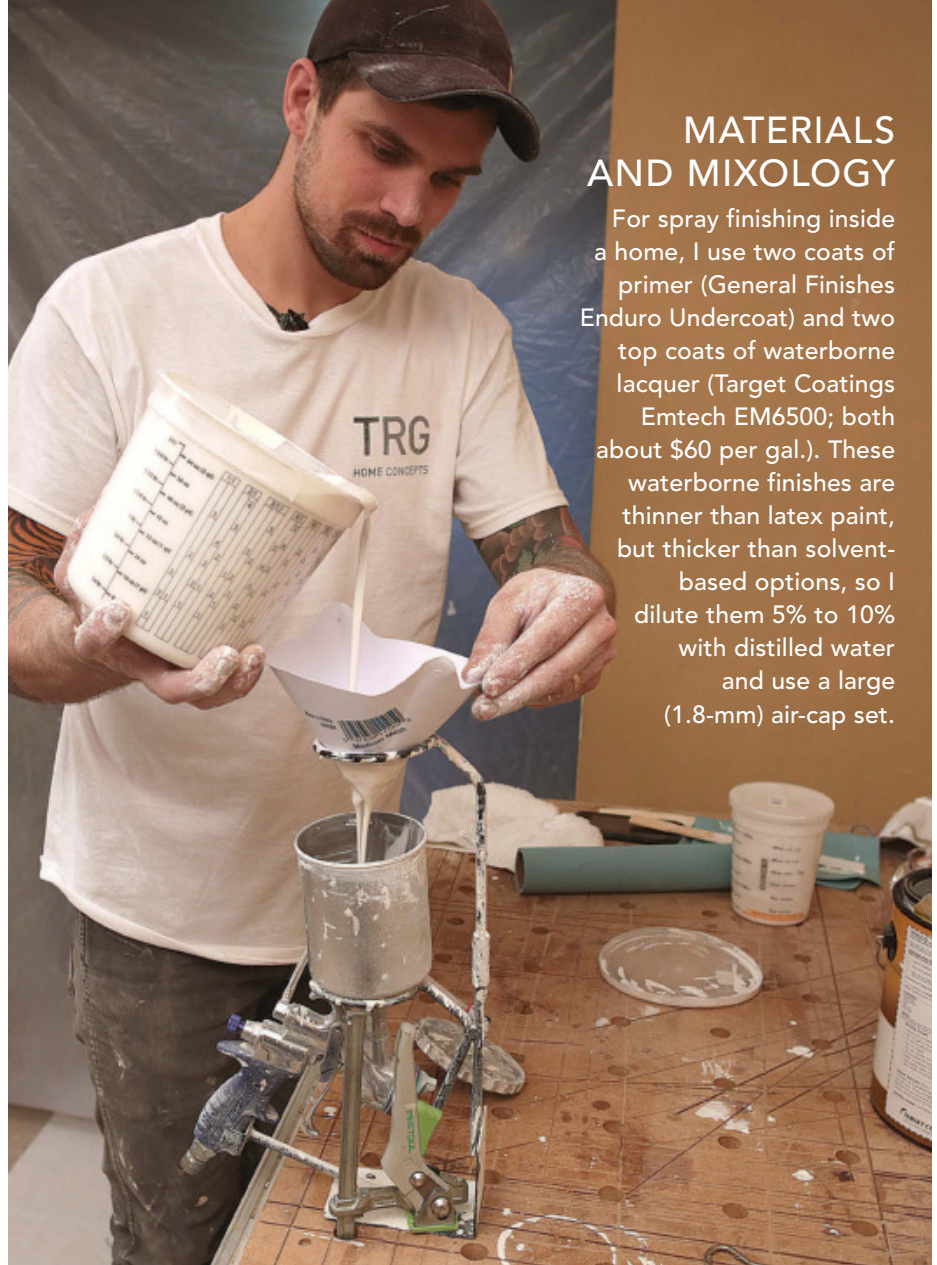
Spraying on-site also means deciding what should be installed before finishing and what should be left free to move around. Most of this decision comes down to the risk of overspray. When spraying quick-curing waterborne finishes into enclosed spaces, the overspray can blow back toward you and settle on surfaces that are already beginning to cure, leaving a gritty finish. Trimwork and relatively flat items aren't as problematic as boxes, which is why I chose to install this mantel and overmantel and then finish them in place. I also fit and fastened the console cabinet because I only needed to spray the outside of that piece (the interior was built using prefinished plywood).

The bookcases were scribed to fit, but then pulled out of position and placed in front of the windows and fans for better ventilation while spraying. Whenever possible in a situation like this one, I leave the backs off and spray them separately so there will be good airflow to pull away the overspray.

The right products used in the right sequence

After the cabinets are fabricated, I sand everything to 150 grit—first using a random orbital sander and then hand-sanding—being sure to ease any hard or sharp edges to aid with paint adhesion in these areas.

Waterborne coatings raise wood grain much more than solvent-based coatings. If you don't combat this reality early on, you'll fight it the entire finishing process. You could spray the primer on raw wood and then sand down the raised grain, but sanding off most of the primer you've just sprayed doesn't make much sense to me. Instead, I coat the unprimed wood and MDF with thinned dewaxed shellac. The shellac seals the wood without raising the grain, dries within minutes, and is compatible with just about anything you'd spray on top of it. The only hassle is that, because shellac is solvent-based, you

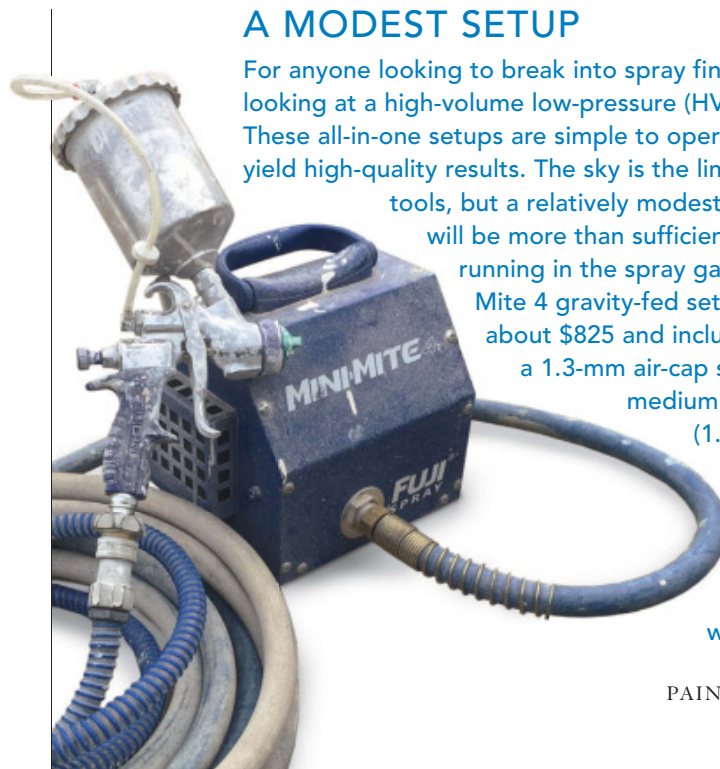


MATERIALS AND MIXOLOGY

For spray finishing inside a home, I use two coats of primer (General Finishes Enduro Undercoat) and two top coats of waterborne lacquer (Target Coatings Emtech EM6500; both about \$60 per gal.). These waterborne finishes are thinner than latex paint, but thicker than solvent-based options, so I dilute them 5% to 10% with distilled water and use a large (1.8-mm) air-cap set.

A MODEST SETUP

For anyone looking to break into spray finishing, I recommend looking at a high-volume low-pressure (HVLP) turbine unit. These all-in-one setups are simple to operate, and generally yield high-quality results. The sky is the limit on prices for these tools, but a relatively modest investment of \$1000 will be more than sufficient to get you up and running in the spray game. I use a Fuji Mini-Mite 4 gravity-fed setup, which sells for about \$825 and includes a 25-ft. hose and a 1.3-mm air-cap set. To that I added medium (1.5-mm) and large (1.8-mm) air-cap kits, a cleaning kit, extra parts, and a 6-ft. flexible whip hose, which allows for easier maneuvering when spraying.



PAINT

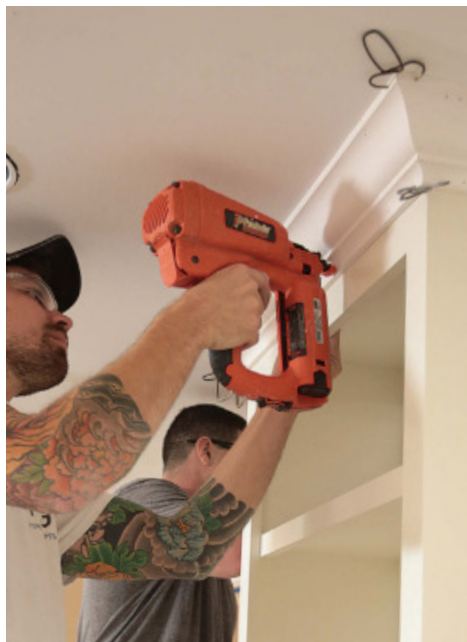
The top coats on any piece should only be for color. If you're looking to achieve build or correct any inconsistencies in the previous coats, you didn't do an adequate job with the prep or priming sequences. Most importantly, take the time to test-spray on scraps or masking and adjust your settings before spraying the actual work.

Finish flatwork in place.

Relatively flat or open surfaces are less prone to blowback, so they can be leaned against a wall, set on a table, or installed and painted in place.



To see a video of Tyler's spraying process, visit FineHomebuilding.com.



In with the trim. After repositioning and fastening the built-ins, apply the prefinished trim elements. Every fastener used at this stage must be spackled—I use Dap Crackshot—and spot finished, so be frugal with your fasteners.



Caulk the transitions. Seams between components look best when sealed with caulk. After taping both sides of each joint, I apply Sherwin Williams SherMax and smooth it with a wet finger, then peel off the tape for a perfect bead.



Spot finish. For blending and touch-up work, I set the air cap to the focused setting so I can limit my spray pattern to just the spot where I want it without creating a lot of overspray.

either need to break down and thoroughly clean your sprayer before moving on to the primer coats, or have a dedicated sprayer. After years of cleaning between finishes, I bought a second sprayer just for shellac—a basic AeroJet RS1 sprayer for about \$130.

After sealing all the raw wood, I apply two coats of a waterborne, high-build, sandable primer, knocking down the surface between coats to ensure I'm creating a glass-smooth base for the top coats. If site conditions are ideal—warm and dry—I'm usually ready to sand the primer within one hour of applying it. I use 150-grit sanding sponges, then vacuum the dust and wipe it with a tack cloth if needed; whatever it takes to remove any residual dust that could interfere with the adhesion of the finish. After the second round of primer, vacuuming, and tacking, the piece is ready for the top coats.

The top coats of waterborne lacquer are applied in the same sequence as the primer coats, but I switch from the 150-grit sanding sponges to either 220-grit or 320-grit between coats. At this point, the sandpaper is simply scuffing the surface so the finish has something to bite into.

When spraying all coats, I apply the finish in slow passes, holding the gun perpendicular to and 6 in. to 12 in. away from the surface being sprayed. To avoid buildup, it's important to start spraying before moving the gun over the surface, being sure to keep steady pressure on the trigger until each pass is finished. This method, when paired with passes that overlap by about 50%, ensures an even build and a perfect sheen.

Touch it up in place

After everything is coated, I re-install the cabinet backs, re-install the cabinets (which have already been scribed for a perfect fit), and trim out the remainder of the casework with stock that I've already primed and top-coated prior to cutting and fastening.

After installing the trim, I putty nail holes, caulk any transitions, and then touch up the trim right in place. This way, every part of the cabinetry and trim appears as if it is one cohesive piece with a consistent finish, reaffirming the wonderful results you can achieve by spraying on-site. □

Tyler Grace is an *FHB* Ambassador and owner of TRG Home Concepts in Haddon Heights, N.J. (trghomeconcepts.com). Photos by Brian McAward.

GET YOUR SPRAYER DIALED IN

Knowing the quirks of your sprayer is crucial to maintaining a proper balance between spray pattern and film thickness, and this comes down to understanding three settings on the sprayer: airflow, material, and air-cap orientation. The key is to make practice passes on masking paper to ensure you have the right results.

1 Airflow to the gun will affect the amount of atomization and overspray. Ideally, use the least amount of air possible while still maintaining full atomization. You want the material to be fully atomized so the finish is completely broken apart without large particles or splatters appearing anywhere.



2 Adjusting the amount of material that comes through the needle allows you to match the volume of finish with the pattern. Spraying too thinly will leave a gritty finish that does not level out correctly. Spraying too heavily will lead to sags and runs and lengthen the cure time. But don't worry if it doesn't look perfect while wet. The goal, unlike with solvent-based finishes, is to get a heavy enough coat of waterborne finish on the surface that it will level out as intended. Generally, I aim for a 2-mil to 3-mil wet-film thickness, which can be checked with a gauge (photos below).

3 Most air caps allow you to spray in three patterns: a horizontal fan, a vertical fan, or an isolated point. Adjust the width of your spray pattern and volume of finish to correspond with the item you are spraying. If you're spraying a large flat area, use a wide fan pattern. If you're touching up a caulk line or nail holes, dial the spray pattern to a small point.



Staining Secrets

for Furniture-Quality Trim

Whether you're finishing
a door, built-in cabinetry,
or the moldings in between

BY TIM LEAHY

As far as work in the trades is concerned, I'm a lucky guy. For the past 12 years, I've spent my days as a finish foreman with a company that remodels and restores historic mansions and builds new homes in Newport, R.I. Our carpenters install custom-milled trim, cabinetry, doors, and windows. Then my crew and I go in and finish them. Given all that—and the ocean views—it's a sweet deal.

There's no doubt that the craftsmanship that precedes us sets the stage for us to do our best work. But delivering flawless finishes is no easy task. Staining and clear-coating the mahogany mantelpiece featured here—and the paneled library that it's in—took three of us two weeks to complete. Yes, we were methodical and took great care when applying the stain and the final clear coats. But nothing got more of our attention than the prep we did before popping the lid off the first can of stain.

Sand every inch

On one of our recent jobs, someone accidentally dripped water on an oak floor that my crew and I had just prepared for stain. Unfortunately, that someone never told us what had happened. When we applied the stain, there—in deep, dark splotches—was the evidence. The water had raised the grain, creating an uneven surface. Unlike a layer

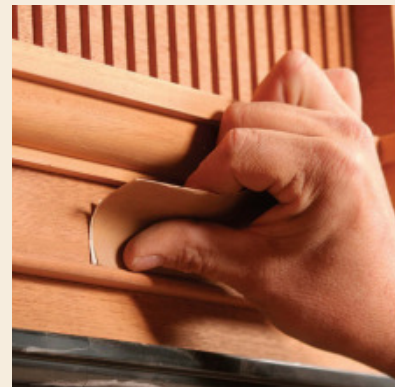
STEP 1 SAND After protecting the surrounding area with rosin paper and masking tape, spot-sand blemishes with 120-grit sandpaper. Then sand all the woodwork in two passes, first with 120-grit sandpaper, then 150 grit. This grit sequence is good for hardwoods, like the mahogany shown here. On softer woods, start with 150 grit or 180 grit, and proceed up to 220.



Hit the imperfections first. The area around an errant nail becomes a lump in the surface. To flatten it, use 120-grit sandpaper wrapped around a flat, square-edged block. Once all imperfections are sanded, begin sanding the entire surface.



Ease sharp edges, but don't alter the profile. Sharp joints and edges splinter easily and don't take finish well. Use gentle pressure, and sand in the direction of the grain. Sandpaper wrapped around a wooden dowel works well on crown, especially in the cove portion of the profile.

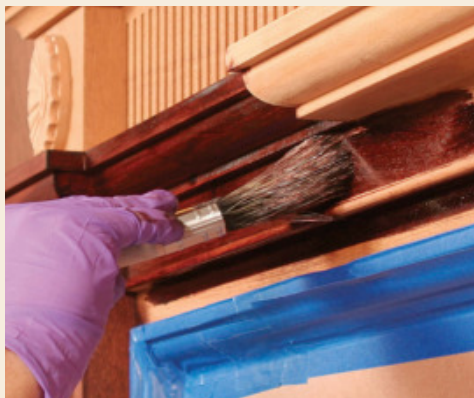


Sand every inch, no matter how smooth it looks. Planer and profile-cutting knives compress the top layer of wood fibers so much that stain can't penetrate the surface the way that it's designed to. That's why it's necessary to sand everything before applying stain.



One section at a time. Sand each shape or plane separately so that you don't sand one spot more than another or in the wrong direction relative to the grain. Be sure to get into grooves and crevices, and around corners. Keep the area well-lit and vacuumed so that you can see the surface. Make sure everything feels smooth before proceeding to Step 2.

STEP 2 STAIN Staining wood is a two-step process. First, brush on the stain; then wipe it down with a clean rag. Let the stain sit for several minutes to achieve its full color potential. Additional coats yield a darker color but can muddy the grain. Let the stain dry fully before proceeding to Step 3.



Cut in with a brush. Working in small sections, apply the stain liberally, and let it sit for several minutes before wiping it off. Apply stain in a neat, orderly process. Excess stain can drip, run, and puddle, which can leak or leach out from behind moldings afterward.



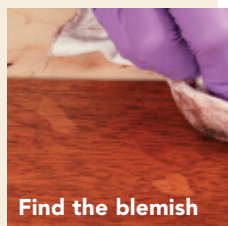
Wipe with a clean rag. As you're working across the surface, keep the soaking time consistent for all sections, and pay attention to the edges, profiles, and corners. Replace the cloth when it gets loaded with stain.



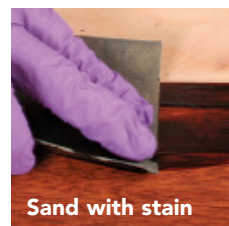
After wiping, use a clean brush to get into crevices. Inexpensive brushes are great for removing excess stain from tight spots. Have a dry cloth handy to keep bristles dry.

THE SECRET TO DEALING WITH BLEMISHES: WET SANDING WITH STAIN

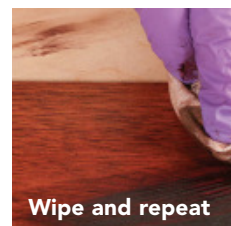
When water or glue stains appear after stain is applied, sand the spot with 180- or 220-grit wet/dry sandpaper and stain. Apply stain to the wood and also to the paper; then sand the area in the direction of the grain. Wipe and repeat to remove the spot. Use longer strokes to feather out the area if needed. After the wet sanding, the glue spots are erased. This process also works wonders on scratches.



Find the blemish



Sand with stain



Wipe and repeat

of paint, which hides the wood, stain highlights it. Unfortunately, stain also highlights watermarks, fingerprints, dried glue, and swirl marks left by power sanders. To get consistent results with stain, you can't just sand the blemishes; you need to sand the entire project evenly.

Sanding everything evens the porosity of the wood. Let me explain: When wood is run through a planer or shaper, its outer fibers are compressed, which leaves it with a glazed or glossy appearance. If stain is applied directly over those compressed fibers, it doesn't penetrate the wood the way it's meant to. Sanding opens the fibers evenly, allowing stain to soak into the wood.

The amount of sanding you should do depends on the quality of the wood. If you are staining molding or cabinetry made at a high-quality woodshop or in your own shop, chances are you'll need to sand the surface only lightly. Wood from big-box stores and moldings or cabinetry that has been exposed to temperature and humidity changes will likely need more work. In either case, using the proper grit sequence is important.

Because of the high quality of wood we work with, we typically use a two- or three-step sanding sequence. We thoroughly inspect all the wood first for the problem areas mentioned above, as well as for planer snipe. We do this by holding a light at a 45° angle close to the wood so that the light rakes across the surface. Don't use halogen work lights; they create too much glare. An aluminum clip-on work light with a 150w bulb works best.

We remove the illuminated trouble spots by sanding along the grain with 120-grit sandpaper. We also lightly sand sharp corners and edges at this point because they splinter easily and don't take finish well.

Once the imperfections are removed, we sand the entire surface with 120-grit paper. Then we sand with 150-grit paper, still working with the grain. We maintain even

pressure as we sand, making sure that we don't bear down with our fingertips. Doing so could leave sanding marks and stripes.

You can use a random-orbit sander on flat stock and cabinets, and sanding sponges are great for molding profiles. Just make sure to use high-quality sponges from 3M or Norton; their sanding surface is consistent, the granules don't flake off, and they have a stiff sponge material, which gives them crisp edges. Cheap sponges fall apart easily and often lack crisp edges.

Once everything has been sanded, we vacuum and clear sawdust from nooks and crannies. We check the surface one more time with our bare hands to make sure it's smooth. Then we lay tarps around the area and bring out the staining supplies.

Premixed stain isn't for every wood

I've seen plenty of beautiful woodwork virtually destroyed by stain because it was applied to wood that's difficult to finish. Pine, cherry, maple, and birch can absorb stain unevenly, often resulting in a blotchy look. To prevent blotching, use a wood conditioner prior to staining these woods. Woods like oak, mahogany, walnut, chestnut, ash, and hickory are easier to stain. Their porosity is more consistent, so they take stain more evenly.

Off-the-shelf oil-based wiping stains such as Minwax are easy to use. They are premixed, so they are ready to use straight from the can. They also dry slowly, so they can be pushed around the surface easily to avoid lap marks. Dye stains, on the other hand, require mixing and dry much more quickly, so they are more difficult to use. Dye stain can be the best option for blotch-prone woods, however.

Using premixed stain, as we did on this project, is a two-step process: applying the stain, then wiping it off. We apply stain from the bottom up so that an errant drip doesn't hit bare wood. It's possible to apply it with a rag, but a tapered top-quality paintbrush with natural bristles is the best choice. These brushes offer better control over the stain, which is crucial when working around molding profiles. To prevent lap marks, we cut in every surface as if we were painting trim. To remove any excess stain, a rag is the tool of choice, though brushes are helpful in tight spots.

To heighten the level of finish on open-grain woods like oak, hickory, and mahogany, we often apply a grain filler like

STEP 3 FILL THE GRAIN

Add a grain filler to accent the grain and to smooth the surface of open-grain woods such as mahogany. Filler also can be used on bare wood if no stain is to be applied. If you don't want to use grain filler, skip this step and proceed to Step 4.

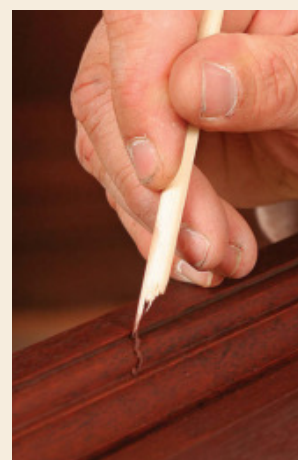


Mix the grain filler with the stain to add color to the grain. Follow the label directions for the proper filler-to-stain ratio and consistency. Here, I accented the grain by using a darker stain. It's also possible to use a lighter stain for a different effect.

Apply along the grain, then perpendicular to it. Use a brush, and work in both directions to force the material into the wood pores. Wait for the sheen to dull; then use a rubber squeegee or plastic spreader to remove the excess. Work across the wood at a 45° angle to the grain.



Finish the removal with a clean rag. First, work across the grain, then with the grain. I like to fold the rag flat and wipe off the residue as if waxing a car. Overrubbing with the grain can remove too much filler. Letting the residue dry for too long makes it difficult to remove.



Don't forget profile transitions. Filler left on edges or in grooves results in a sloppy finished piece. A dull putty knife or pointed stick works well to clean these areas.

STEP 4 TOPCOAT Apply three to four coats of clear finish to protect the wood and to enhance its tones. Fill the nail holes after the first coat. If you fill them before the wood is sealed, the filler will penetrate the pores around the holes, creating a smudged look. Sand between each coat with fine sandpaper, and rub down the surface with a tack cloth between coats.



A properly applied spray finish gives a furniture-like quality to this library. The first coat of precatalyzed lacquer makes the wood come to life. When spraying lacquer or any other finish, maintain a wet edge at all times. Safe working conditions require good ventilation, a respirator, and a Tyvek suit.

OR



Brushed-on polyurethane is a great choice, too. Always use a high-quality brush. Also, thin the first coat with mineral spirits or naphtha for a base layer void of brush marks. Then follow with two coats straight from the can. Make sure the area and the air are clean so that dust doesn't settle on the surface as the polyurethane dries.

Behlen's Pore-O-Pac once we're done staining. Grain filler produces a smooth surface and is often used on fine furniture and musical instruments. Whether we end the coloring process with stain or grain filler, we wait at least 18 to 24 hours before applying the finish coats.

Topcoats serve many purposes

Topcoats protect. They also affect the overall feel and final look of the wood. Products like teak oil, furniture oil, or Danish oil create a natural look. They highlight the grain, but because they soak into the wood, natural finishes don't leave a durable film that protects the surface. Use them for projects that won't be exposed to much sunlight or wear and tear. Oil finishes are typically brushed on, then wiped off with a rag, so they're easy to work with.

Film-forming finishes create a hard, durable surface and a lens that allows light to accent color and grain. The most commonly used film-forming finishes include varnish, shellac, polyurethane, and lacquer, which I'm applying here. Two-part conversion finishes are available, but they're difficult to apply and typically are used on production cabinetry and furniture.

Each of the film finishes I mentioned is available in waterborne and solvent-based formulations. To protect wood from alcohol, water, and ultraviolet (UV) light, we typically use varnish or a conversion finish with UV-blockers. For a durable finish that comes close to an antiqued look, choose lacquer or shellac. And, as you guessed, the most commonly used hand-applied finish is polyurethane. It doesn't spray well, so we don't use it often. We like to use lacquer because it is easy to spray and dries quickly.

We prefer to spray clear coats because spraying produces the smoothest finish. Spraying also allows us to apply thin layers so that it's easy to fix problems that present themselves after the first coat. We can sand down the initial thin layer to fix a stain blemish that we missed, and we can blend the clear finish around that area when we're done. Despite the great working conditions and projects, there always seems to be something that needs a little extra attention. □

Tim Leahy is director of architectural finishes for restoration contractor and builder Kirby Perkins Construction in Newport, R.I. Photos by Chris Ermides.

Scuff each coat for the smoothest result. Use 400- or 600-grit sandpaper, 0000 steel wool, or fine Scotch-Brite pads to remove dust nibs and to prepare the surface for subsequent topcoats. Be careful not to sand through the clear coat and remove stain around profile edges.



Last-minute touch-up. I like to fill imperfections and nail holes after the first topcoat so that the putty matches the wood tone exactly. Force the material into the hole; then wipe it clean. You might need to mix two or three colors to match various tones in the piece.

80

Spray or Brush?

84

Skillful Brushwork
for Doors and Windows

90

Paint Problems and
How to Prevent Them

96

10 Tips to Paint
Like a Pro

102

Fabulous Finish
for an Entry Door



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PAINTING

PROJECTS AROUND THE HOUSE

Exteriors





Spray or

A good painter knows that prep work is everything. Once that's done, though, there are two choices for applying paint or stain: with a brush or roller, or with a sprayer. You'll find professional painters on both sides of the fence. Some stick with painting by hand, either because that's how they learned the trade or because their customers prefer it. Many others use spray equipment, either by itself or, more frequently, in tandem with a brush and roller.

There's no question that spraying an exterior finish is much faster than brushing or rolling alone. But before pulling the trigger, spray painters have to make sure all surfaces are protected against overspray, the inevitable drift of atomized paint particles that bounce off the surface or are carried away by wind. This takes time, so the question becomes: Does the time saved by spraying the finish outweigh the effort of getting ready to spray?

The answer depends as much on the person who is holding the brush or sprayer as it does on the type of finish, the type of trim and siding, the time available, and the weather conditions.

The case for spraying

Although many painters combine spraying with brush and roller work, there are circumstances where a sprayer alone is the best approach.

Why I spray

People see the airless sprayer as a replacement for the brush and roller. It's not. I wouldn't use a sprayer without having a brush or a roller on hand to help spread the paint evenly without over-applying. That said, an airless sprayer is the fastest and most consistent way to get a lot of paint onto the building. It's like carrying 5 gal. of paint in your hand.

Hugh Schreiber
Berkeley, Calif.

SPRAY
or
BRUSH?
It all
depends
on ...

... what's in the can

Paint	Spray: All exterior finishes can be sprayed, given the right sprayer tip and paint viscosity. Thick finishes may need thinning to atomize properly.
	Brush: Many paints can be applied right out of the can, although thinning can help thick paints to level out in hot or very dry conditions. Choose a good-quality brush that matches the finish: synthetic bristles for acrylics, natural bristles for oil-based paints.
Stain	Spray: On bare wood, back-brush the surface after spraying to ensure even film and penetration.
	Brush: Because stains are usually thinner than paints, watch for drips along edges. Keep a wet edge to avoid lap marks in the finish surface. If you have to stop midjob, look for a natural break, and cut to that point so that lap marks won't show later.
Primer	Spray: Back-brush or back-roll for good penetration and even distribution on the surface. Thinning can help primer to penetrate the surface, but don't exceed the manufacturer's recommendations.
	Brush: Thinning may help penetration.
Oil	Spray: Overspray is more of a threat to distant objects because oil takes longer to dry. Oil paint's slower drying time allows it to flow out smoothly after spray application to a nearly flawless finish. Equipment must be cleaned with solvents that contain volatile organic compounds.
	Brush: Application is slower, but brushing fills minute gaps and seams effectively, and using a brush gives you more control than using spray equipment. Some brush marks will be evident.
Latex	Spray: Water-based finishes dry quickly. Atomized paint dries quickly and will fall as dust sooner, reducing chances of damage due to overspray. Paint sprayed in direct sunlight on a hot day may not have a chance to flow to a smooth surface before it dries. Additives such as Floetrol help.
	Brush: The finish may dry too quickly in direct sunlight. An additive such as Floetrol can help paint to level before it dries.

Brush?

Consider prep time, conditions, and cleanup to determine the fastest way to tackle an exterior paint job

BY SCOTT GIBSON

Rhode Island painter Tim Leahy found one such opportunity in the restoration of a period brick home in Newport, R.I., where carpenters had installed a wide band of complex trim at the top of the second story. The house had already been staged, allowing painters to move quickly. Although masking off the wall below the trim took an hour, it took one painter just 30 minutes to spray a 60-ft. section of soffit, a job that would have taken two painters with brushes half a day to complete.

Easy access and calm winds helped to guarantee a high-quality spray finish in a very short time. A smooth substrate also helped: The trim was sprayed with primer before it left the shop. After installation, nail holes were puttied, the surface was resanded, gaps were caulked, and the trim was primed again.

That's the key to a good spray-only finish. Aluminum siding, metal meter boxes, and smooth metal fencing—the smoother the surface, the better it responds to a sprayer alone. In the hands of a skilled painter, a sprayer leaves a blemish-free finish without roller or brush marks.

When it's best to break out the brushes

Nonetheless, it takes time to set up a sprayer, to mask off areas to be protected, and to clean the equipment at the end of the day. When that outweighs the speed advantage of spraying, out comes the brush or roller.

Stan Hallett found that to be the case as his crew repainted a sprawling condominium last summer in a Portland, Maine, suburb. Although a sprayer made sense on the sidewalls, it was easier to paint the simple trim by hand because nothing had to be masked. As one painter applied



... what's being painted

Wood shingle	Spray: A sprayer spreads finish effectively into cracks between shingles, but make sure to back-brush on at least the first coat to ensure even penetration into pores of wood.
	Brush: A brush provides more control when working near plants, trim, and other surfaces that could be damaged by overspray, but is much slower. Watch for drips along the bottoms of shingles.
Clapboard (wood or fiber cement)	Spray: Application is fast, but back-brush on the first coat. Sand the surface of wood clapboards first to eliminate slick surface called "mill glaze" that can hamper the penetration of finish. Fiber cement usually comes preprimed.
	Brush: Application is slower but offers more control in tight spots. Be wary of mill glaze.
Brick	Spray: Application is fast as long as masking windows and trim isn't overly complicated. Brick must breathe, so use an acrylic finish. Back-roll after spray application. Use an alkali-resistant primer.
	Brush: Provides more control, but application is slower. For small areas, brush application may be faster than spraying when masking is considered.
Concrete	Spray: Large areas with minimal masking can be finished quickly. Back-roll at least on the first coat.
	Brush: Rolling is much faster than brushing, although not as fast as spraying. For small areas where masking is required for spray equipment, rolling may be the best option.
Vinyl siding	Spray: Vinyl's smooth surface may mean no back-brushing is required. Make sure surface chalk and mildew are removed.
	Brush: Brushing is faster when the surface to be finished is relatively small or required masking is extensive. The finish surface probably won't be as smooth.
Intricate trim	Spray: Much faster than brushing detailed profiles, especially when trim can be painted before windows or siding is installed and masking is held to a minimum. Count on back-brushing at least the first coat unless the prepped surface is very smooth.
	Brush: Although slower than spraying, brushing offers more control. No masking is necessary, so it may even be faster when trim is not extensive or especially complicated.

Why I brush

My customers really don't want to know anything about sprayers because they think it's going to get all through their ventilation system.

I learned how to paint by hand, and my customers are willing to pay me to do that. But if I was starting out in painting, if I was trying to start up a business, I would be seriously looking into how to operate a sprayer.

Brian Doherty
Ashland, Va.



SPRAY or BRUSH?

It all
depends
on ...

solid stain to clapboard and shingle walls with a sprayer and brush, a second followed with just a brush for the trim.

Hallett and Leahy both weigh the circumstances carefully before they make their choice. “Why would we go through all the hassle of spraying when we can just fly right along with a brush?” Leahy asks. “We make our decision based on complexity and how much time we can save. If you have a big soffit with corbels and brackets and decorative trim, it’ll take two guys all day to paint with a brush, and you can spray it in an hour. If you have a simple trim detail that two guys can knock out in a half-hour by brush, then you lose the reason to spray.”

Sticking with a brush or roller also makes sense when there isn’t much paint to apply. “It always comes down to the volume of paint,” says Berkeley, Calif., contractor Hugh Schreiber. “If you’re doing less than a gallon of paint, I would say it’s not worth cleaning the sprayer.”

Working around lots of obstructions is another reason to stick with a brush, Schreiber adds. In an area with lots of windows, doors, and fixtures, it may not be worth the effort to mask everything.

Other painters apply finish exclusively by hand because that’s what their customers expect. Brian Doherty, a Richmond, Va.-area painter, never uses spray equipment even though he’s

... who’s doing the painting, and with what

Experience of crew

Spray: Advertisements featuring inexperienced homeowners applying flawless finishes are unrealistic. No one learns how to spray overnight, so expect some missteps in the beginning, such as overspray, finishes that go on too thick or too thin, and improperly thinned paints. Choosing the right tip and gun pressure and knowing when to thin and how to cope with weather variables take years of practice.

Brush: Much easier to learn, but experience is still valuable, especially when it comes to painting complex trim, window muntins, door panels, and similar elements. Knowing when and how to thin paint or use additives takes experience.

Size of crew

Spray: One person with a spray gun and two others to handle masking, small areas of trim, and other details are enough to paint a small house in three to five days, depending on the complexity of the job.

Brush: To paint the same house by hand would take the same crew five to six days, all things being otherwise equal.

Equipment

Spray: A homeowner-grade airless sprayer is fine for simple jobs under good conditions, but it won’t atomize the finish as effectively, is noisier, and doesn’t offer the same range of adjustments as professional-quality equipment. A pro-level kit can easily top \$2000.

Brush: Much less expensive to get started. Whether you brush or spray, you’ll still need ladders, drop cloths, and possibly staging.

... time factors

Preparation

Spray: Same as for brush painting; the additional task of masking windows, doors, and roofing on a 2500-sq.-ft., two-story house might add half a day for a professional crew.

Brush: Basic surface prep, but no masking.

Application

Spray: Huge time advantage for complex trim and large expanses of wall. Depending on site conditions and the surfaces being painted, application could be 10 times as fast.

Brush: Application much slower.

Dry time/recoating

Spray: No significant difference, although sprayed finishes may dry marginally faster because the paint film is thinner.

Brush: A heavy coat will take longer to dry than a thin coat applied by a spray gun.

Cleanup

Spray: 15 minutes or so to clean lines and gun tips in solvent (water or paint thinner), plus time to clean any brushes and rollers that are used and to remove and dispose of masking materials.

Brush: Somewhat faster.

... conditions

Wind

Spray: A very light breeze in an area where overspray isn’t an issue is OK. As soon as the wind starts to affect the spray pattern, work should stop. Atomized paint carried off by the wind means more wasted materials and increases the risk of damage to plants, cars, and other parts of the building.

Brush: Wind has much less of an effect, although it can cause finishes to dry too quickly, especially in direct sunlight.

Heat

Spray: Surfaces that dry too quickly may not level properly. Avoid spraying in direct sunlight, especially as the mercury climbs.

Brush: Brushing in direct sunlight also can mean an uneven surface. An additive can help by increasing the drying time.

Cold

Spray: Follow manufacturer’s recommendations on minimum temperature, and make sure the surface will stay at the temperature while the paint dries, not just at the time of application.

Brush: Same considerations as for spraying.

Humidity

Spray: Very high humidity can trap moisture in the paint film, causing it to blister.

Brush: Same considerations as for spraying.

Choosing spray equipment

An airless sprayer is the most common choice for painting professionals. As the name suggests, an airless system does not use an air compressor as a means of atomizing the finish. Instead, a powerful pump forces the paint through a tip at very high pressure (3000 psi

or more), causing it to break into tiny droplets.

According to Jeff LaSorella, owner of Finishing Consultants in Seattle, airless sprayers get a higher percentage of paint on the surface than either conventional high-pressure sprayers or high-volume low-pressure

(HVLP) equipment. This “transfer rate” is 70% with an airless sprayer, versus as little as 35% with a high-pressure sprayer powered by an air compressor and 65% for an HVLP sprayer.

Less common but even more efficient are Airmix or air-assisted sprayers, according

to LaSorella. Airmix, a proprietary technology owned by a company called Sames Kremlin, uses a pump to develop hydraulic pressure at the tip while slight air pressure helps to disperse paint particles in a fan-shaped pattern. LaSorella says transfer rates of 90% are



Paint-spraying pointers

Manuel Fernandes, chief inspector for the Master Painters and Decorators Association and a professional painter for 44 years, offers these suggestions for anyone using spray equipment:

- Always work in the shade. Paint sprayed on a substrate in direct sunlight dries too quickly and doesn't adhere well.
- Be wary of wind. When wind is affecting the spray pattern or when spray drift is obvious, stop spraying.
- Always back-roll or back-brush after applying a first coat of paint or stain by sprayer.
- Most finishes can be reduced for better atomization and a smoother finish by following directions on the can for thinning.
- Never paint (by brush or spray) when the humidity is greater than 85%.
- Multiple thin coats are better than one thick coat.
- Let paint cure thoroughly between coats.

possible. Air-assisted airless spraying uses similar technology to achieve a transfer rate of 75%.

Although airless sprayers are highly efficient, they carry risks. Extremely high fluid pressure can cause injury if the tip comes into contact with

skin. Never remove the sprayer's guard.

Airless sprayers at home centers start at several hundred dollars, but expect to pay more for professional-quality equipment with higher pressure at the tip for better atomization, longer hoses, and greater durability.

Air-assisted equipment is even pricier. For example, while Graco's model 390 professional airless sprayer is available for about \$900, the price rises to \$1500 for the air-assisted airless model. The smallest Airmix starts at around \$2000 for the pump and sprayer.

Professional-quality equipment can also be rented by the day from a local big-box store or rental center.

If you rent, make sure you get the right tip size for the finish you're using, and check that filters and hoses are clean before you leave the store.

well aware of its speed advantages. Why? First, because that's how he learned the trade. And second, his traditionally minded customers don't want spray equipment in or around their homes for fear of damage from overspray.

Combining spray and stroke

Spraying gets a lot of finish on the surface quickly and evenly, and a brush or roller works the finish into the surface for good penetration, better coverage, and ultimately, better durability. Combining the two—called back-brushing or back-rolling—offers all the advantages of both.

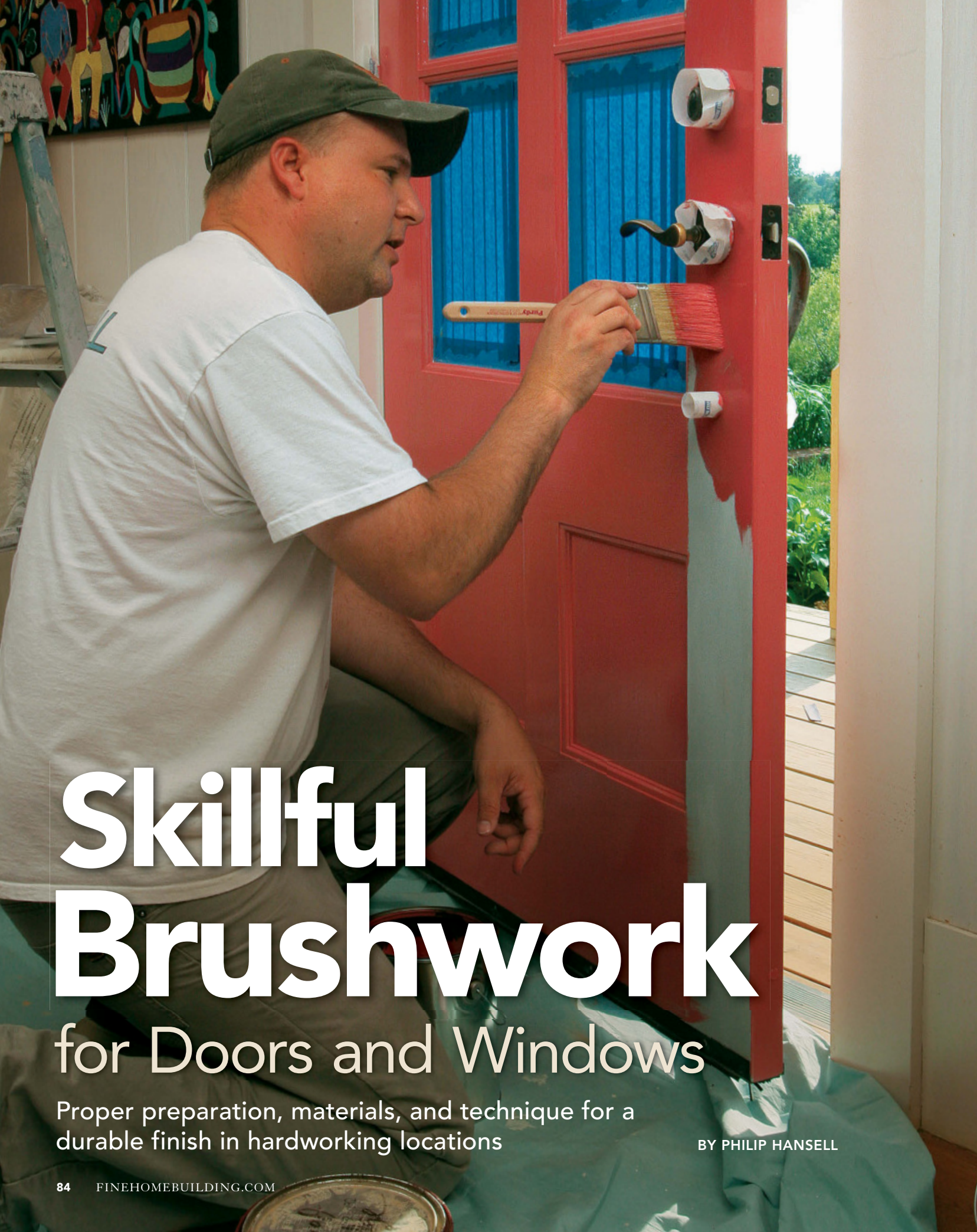
"Spraying by itself would be wonderful if it worked well because it's very quick," says Hallett. "But it doesn't do a good job. That paint is going to be gone in 10 years. We spray only as a means of getting the paint onto the surface."

Hallett's technique is common. After masking off nearby surfaces, a painter sprays a section of wall, then works the same area with a brush or roller to even the coat and push paint into the surface. The paint film is more uniform, and the pressure from the sprayer forces paint into all the depressions that a brush or roller by itself might not reach. Surfaces with uneven texture, such as rough-sawn clapboards, shingles, and split-face masonry block, are especially well suited to this approach.

Manuel Fernandes, chief inspector for the Master Painters and Decorators Association, says new work always should be back-rolled or back-brushed on the first coat. "If you spray it only, the paint just sits on top of the substrate," he says. "You're not forcing the paint into the pores of the wood."

But back-rolling or back-brushing on subsequent coats is a judgment call. Rough-textured surfaces may benefit from a second round of back-rolling or back-brushing, but a sprayed second or third coat on a smoother substrate may not need any further attention. That's where experience counts. □

Scott Gibson is a contributing writer. Photos by the author, except where noted.



Skillful Brushwork

for Doors and Windows

Proper preparation, materials, and technique for a durable finish in hardworking locations

BY PHILIP HANSELL

The paint protecting your doors and windows has a tough and important job to do. It must endure hostile weather, punishing wear, and up-close scrutiny every day. Paint made for doors and windows used to be judged by how much lead it contained—the more lead, the better. These coatings worked great. The heavy metal helped the paint to stick and to move seasonally. As is well-known now, however, lead is toxic and is especially dangerous to kids. For this reason, lead has been banned from household paint since 1978.

Old doors and windows generally have high concentrations of lead paint, so it's important to protect yourself and any children who live in the house by working lead safe. This means containing and collecting dust and chips and minimizing airborne particles. Wear a good particle mask when scraping and sanding, and use a HEPA vacuum. Thoroughly clean up the work area every day, and change your clothes before playing with the kids.

Key preparations

As with all painting projects, proper preparation is key for painting doors and windows. Before starting, my painters and I wash the glass with glass cleaner and paper towels. We then mask the hardware and the perimeter of the glass panes.

Once the door is cleaned and masked, we fill any damaged areas with two-part auto-body filler and sand the dry filler with 180-grit paper. For the initial sanding on the rest of the door, we use 220-grit paper on the interior and 180-grit on the exterior. For the second sanding (between the first and second coats), we use 320-grit paper for interior work and 220-grit for exterior work. A rougher grit

ALL PAINTING STARTS WITH PREP

The prep work is the same for both windows and doors. The surrounding area is protected with disposable drop cloths, and the glass is cleaned and masked to prevent scratches. Any scratches or damage are repaired and spot-primed with oil primer. New doors and windows get a full coat of oil primer before painting. Tinted primer helps dark-colored topcoats to cover the surface fully.



MASK GLASS AND HARDWARE

Clean the glass, then mask the glass perimeter and any nearby hardware with painter's tape. High-quality tapes may seem expensive, but they are less likely to leave a sticky residue.



SCRAPE LOOSE PAINT

Using a paint scraper or a painter's tool, scrape any loose paint. Sand out any scratches that don't reach the underlying surface.



FILL DEEP SCRATCHES

Two-part auto-body filler is great for repairing dog scratches and other deep imperfections. Apply it with a putty knife.



SAND REPAIRS

Once it's dry (in about 15 min.), sand the filler with 180-grit paper. Repairing significant damage may take more than one application.

PAINTING DOORS: START OUTSIDE

Painting an entry door requires leaving it open for several hours. You'll need to manage small children and pets accordingly. If the sun is directly on the door, open it fully so that it's shaded by the home's interior. Keeping the door cool prevents lap marks and deep brush marks. (In the photos on the facing page, the panes of glass are completely taped over. I would not do this ordinarily, but the photographer was unable to get good pictures with the western sun streaming through the glass.)



SPOT-PRIME AS NEEDED

Once any damage is repaired, lightly sand the rest of the door surface with 180-grit (exterior) or 220-grit (interior) paper. Cover repairs with stain-blocking oil-based primer.



REMOVE WEATHERSTRIPPING

Most exterior doors have kerf-in weatherstripping that's removed by gently pulling on it. Removing it eliminates a lot of tedious masking.



APPLY THE SECOND COAT

The second coat is applied in the same order as the first. For the second pass, though, remove the masking tape so that the paint laps onto the glass by about $\frac{1}{16}$ in.



CLEAN UP AS YOU GO

Wipe off excess paint and drips right away. Remove masking materials when the paint is dry to the touch. Reinstall weatherstripping when the paint is fully dry (one day for latex; four days for oil).



APPLY THE FIRST COAT

Starting at the top of the door, paint all of the rails and muntins, and then paint the stiles one at a time.

on the outside gives the surface a little more “tooth” for better paint adhesion.

The weatherstripping on modern doors is generally easy to remove for painting. The vinyl-covered foam, sometimes identified as “Q-Lon” after one brand, is removed by starting at one end and gently pulling it out of the kerf that holds it. Removing the strip eliminates a lot of tedious masking. I replace it when the door is fully dry—24 hours for latex and about four days for oil. It easily pushes back into the slot it came out of.

I recommend leaving hardware in place. Disassembly and keeping track of the many small parts is an unnecessary and sometimes expensive hassle. Forgoing doorknobs and locks for two or three days is an even bigger problem.

Choosing paint

My favorite paint for interior work is Sherwin-Williams ProClassic. I like both latex- and oil-based versions. Most clients choose satin or semigloss, which are easy to keep clean but don't produce an overly shiny finish.

For new exterior work, I prefer slow-dry oil primers because they penetrate and stick well and they prevent brown stains caused by wood tannins. Slow-dry primers must dry for four days or more before a topcoat is applied. Otherwise, the evaporating solvents in the primer can cause blistering and poor adhesion of the topcoat.

For a topcoat on both new and old work, I use acrylic latex paint, such as Sherwin-Williams Duration or Sherwin-Williams Emerald. Acrylic latex paints have greater elasticity and are more vapor permeable than oil paints, which makes them better



WORK FROM THE TOP DOWN

After an initial sanding with 220-grit paper and a wipe down with a tack cloth, paint the top rail and any muntin bars. Because this door was painted previously and was free of damage, priming was unnecessary. New doors and repaired areas should be primed before painting, however.



PANELS FIRST, STILES LAST

Paint stiles one at a time. Brush away any drips where panels meet stiles and rails as soon as possible. Look for and correct drips near locks and hardware.



SAND, TACK, AND RECOAT

Sand the door with 320-grit paper, and wipe the surface clean with a tack cloth. Turn the cloth often to pick up the maximum amount of dust. Apply the second coat in the same order as the first. The inside of the door isn't exposed to weather, so you can leave the tape on the glass for both coats.

PAINTING WINDOWS: ONE SASH AT A TIME

To paint a double-hung window correctly, you must be able to operate both sashes. You often can free a stuck sash by cutting the paint seal between it and the frame with a utility knife and then gently prying on the sash with a painter's tool or a small pry bar. Start painting with the upper sash on the inside and the lower sash on the outside.



LOWER THE UPPER SASH

Begin by painting the muntin bars on the top sash, then lower the sash to coat the bottom rail and the lowest part of the stiles.



RAISE THE UPPER SASH

Raise the upper sash and lower the bottom sash to expose the stiles and the top rail of the upper sash. Leave the sash partly open to paint the top rail.



FINISH THE UPPER SASH

Paint the top rail and then the stiles. A final pass with a dry (undipped) brush yields straight and uniform brush marks. Push up the painted sash with a painter's tool.



PAINT THE BOTTOM SASH

Working from the top down, paint the lower sash. Once you're done, brush out any drips where vertical and horizontal parts meet.



PAINT THE TRIM

Start with the head casing, and then paint the sides. Finish by coating the stool and the apron. As you finish each part, make a final pass with a dry brush.



at dealing with seasonal moisture and wood movement.

The right equipment

For exterior painting on doors and windows, I like a 2½-in. angled-sash brush. My favorite is a Corona with Chinex bristles. It works well with both latex- and oil-based paint and cleans up easily, even on hot, sunny days.

For painting the interior of doors and windows, I like an “all-paints” 2½-in. nylon-bristle brush from Corona or Purdy. Indoors, where brushes don’t get baked by the sun, I prefer nylon bristles because they shed less than other bristle types.

When I’m painting large areas such as stiles, rails, and panels, I dip one-third of the bristle length into the paint and then slap both sides of the brush on the inside of the paint pot. For smaller, more precise locations such as muntin bars, I dip the brush, slap the sides of the pot, and scrape both sides of the brush along the rim. This removes excess paint from the sides of the brush, helping to prevent drips at corners.

The right order

It’s best to work from the inside out to prevent messing up work you’ve already completed. When painting the interior side of double-hung windows, I start with the upper sash; when working on the exterior side, I start with the lower sash. On doors, I start with the muntin bars and panels. Rails come next, and then the stiles. The edge of the door with hinges gets painted the exterior color. The latch edge is painted to match the door’s interior side. □

Philip Hansell is a painter in Durham, N.C. Photos by Patrick McCombe, except where noted.

The right gear for the job

The tool kit below is all you need for painting doors and windows. You can find everything here at paint stores that cater to professionals.



TIP: STRAIN YOUR PAINT

Old paint should be strained before use. Squeezing the paint through the strainer with a gloved hand saves time. Afterward, pull the glove off inside-out to prevent a mess.

Paint Problems and How to Prevent Them

Knowing why paint fails is the best way to get a long-lasting, problem-free paint job

BY PATRICK McCOMBE

Although you've probably never thought about it, paint manufacturers don't actually make the ingredients that they use in their paints. Instead, they buy the components from chemical companies and combine them to their own specifications. To ensure that the paint companies are getting the best-performing ingredients, the chemical companies employ paint chemists to formulate and test paint in many ways, including real-world scenarios.

I recently had the chance to meet with employees from the Dow Chemical Company and a team of technical experts who test paint for the Paint Quality Institute (PQI) in a complex near Philadelphia. This "paint farm" has more than 40,000 samples and includes painted building materials ranging from vinyl and fiber-cement siding to steel bridge parts and weathered decking. The complex even includes special racking to hold some of the samples upside down to simulate how paints perform under porch ceilings and soffits, where they won't be washed by rain.

Because substrates and field conditions can be all over the map, the testers even apply paint samples to weathered primers and sunburned wood to simulate houses that have taken too long to get primed and topcoated.

Every few months, the samples are photographed with automated equipment and the photos are checked for changes in appearance. The samples themselves also receive regular visual checks for adhesion, fading, cracks, chalkiness, mildew, and dirt.

The insights gained from decades of testing (the oldest samples date to the early 1960s) have improved both performance and workability. The company's research also provides excellent guidance on how to solve most common paint problems, which are outlined on pp. 92-95. □

Patrick McCombe is an associate editor. Photos by the author.





WHAT'S IN YOUR PAINT?

4% Additives

Additives improve specific properties, such as mildew resistance and workability.

42% Binder

The binder helps keep the pigment in suspension and helps boost adhesion.

20% Pigments

Pigments are what give the paint its color and hiding ability.

14% Filler

The filler provides additional bulk and acts as a thickener.

20% Carrier

The carrier or liquid component allows the paint to spread onto the surface at the right consistency.



WHAT MATTERS MOST?

Inorganic trumps organic

Pigments can be broken down into two basic types: organic and inorganic. Organic pigments—which include bright blues, yellows, and reds—fade faster and don't cover as well as paints made with inorganic pigments. Inorganic pigments—which are usually mined minerals—make blacks, whites, barn reds, yellow ochers, and dark greens.

You get what you pay for

Additives are the most expensive components in a can of paint and have the biggest effect on its workability. *Rheology modifiers* help paint to go on properly and to resist spattering. *Dispersants* keep the pigments spread out so that they hide well. *Biocides* keep bacteria from forming in the can, and *mildewcides* prevent mold from growing on the paint film. *Defoamers* break down bubbles caused by shaking, stirring, and rolling. *Cosolvents* improve workability and allow painting at lower temperatures.

The more solids, the better

Solids are what's left behind when the liquid carrier evaporates. They give a paint its hiding ability and contribute to its overall durability. Quality exterior house paint has a solids content from 35% to about 45% by volume. Paints on the higher end of the scale cover better and last longer. You can find the exact percentage by checking the product data sheet on the manufacturer's website.

PAINT FAILURES AND

If a budget is tight, it's better to cut costs on interior paint than exterior paint. Rain, sun, and pollution all take their toll on outdoor paint jobs. Shady locations, especially those shielded from rain by porch roofs or overhangs, are also susceptible to mold and algae. All of these challenges play out at the Paint Quality Institute's outdoor test facility.



Alligatoring

Problem: Patterned cracking that resembles the skin of an alligator

Likely causes: Applying a hard rigid coating such as alkyd enamel over a more flexible coating such as latex primer; applying a topcoat before the undercoat is dry; loss of elasticity, which is part of the natural aging of oil-based paint

Solution: Completely remove alligatorated paint by scraping or sanding, and then prime the surface with a high-quality oil-based or latex primer. Topcoat with an acrylic-latex paint.



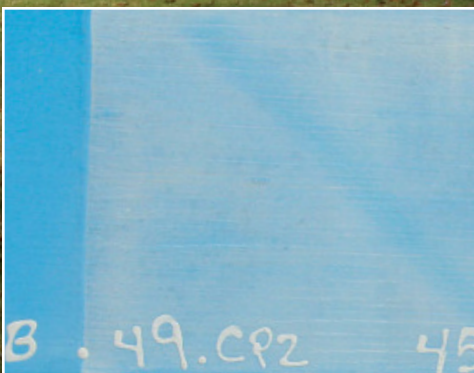
Blistering

Problem: Localized loss of adhesion resulting in bubbles in the paint film

Likely causes: Applying oil-based or alkyd paint over a damp or wet surface; moisture intrusion; exposing latex paint to moisture shortly after the paint has dried

Solution: If the blisters go all the way to the substrate, remove the source of moisture and scrape away the blisters. Prime and repaint with acrylic latex. If the blisters don't go all the way to the substrate, scrape or sand them away and repaint without priming.

THEIR FIXES

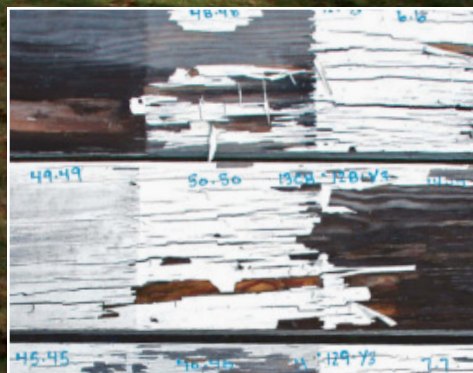


Chalking

Problem: A fine powder on the paint film that causes color fading and results from weathering

Likely causes: Using a low-quality, highly pigmented paint; using interior paint in an outdoor application

Solution: Using a stiff brush or a wire brush, remove as much of the chalk as possible, then rinse with a garden hose or a pressure washer on a light setting. Check for remaining chalk by running your hand over the surface. If chalk is still present, coat the surface with a high-quality oil-based or latex primer, and topcoat with a high-quality acrylic latex. If little or no chalk remains and the paint is sound, priming may be unnecessary.



Cracking/flaking

Problem: The splitting of a paint film from aging, which starts as hairline cracks and progresses to flaking

Likely causes: Poor-quality paint with inadequate adhesion and flexibility; overthinning or overspreading; poor surface prep or failing to prime; hardening and brittleness of aged alkyd paint

Solution: Remove loose paint by scraping, wire brushing, or sanding. Feather any hard edges, and prime bare areas before repainting. Use a high-quality paint and primer to prevent recurrence.

PAINT FAILURES AND THEIR FIXES

continued

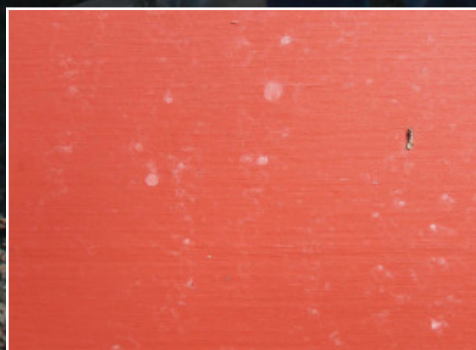


Efflorescence

Problem: A white saltlike substance that leaches from mortar or masonry as water moves through it

Likely causes: Failing to remove previous efflorescence before repainting; moisture intrusion from interior or exterior sources

Solution: Eliminate sources of moisture, then remove the efflorescence and any loose material with a wire brush. After rinsing the surface, let it dry completely. Cover any bare areas with a high-quality primer before topcoating with a high-quality house paint or specialty masonry coating.



Frosting

Problem: A white saltlike substance on the paint surface that can show up on any color paint but is less noticeable with white and light colors. It forms mostly under protected overhangs and porch ceilings that don't get washed by rain. On masonry, it is sometimes mistaken for efflorescence.

Likely causes: Using dark-colored paint with a calcium-carbonate filler (a common industrial mineral); using dark-colored paint over a primer with a calcium-carbonate filler

Solution: Often a stubborn problem, frosting is best removed by sanding (wood) or wire brushing (masonry). After a thorough rinse, let the surface dry, and then prime with an alkyd-based primer. Topcoat with a high-quality exterior paint.



Mildew

Problem: Black, gray, or brown areas of fungus growth on the paint surface or on nearby caulked areas that form most often in damp places with little or no direct sun, such as north-facing substrates

Likely causes: Using a low-quality paint with an inadequate mildewcide; failing to prime bare wood before painting; repainting a substrate where existing mildew wasn't removed; too thin of a paint film

Solution: You can test for mildew with a few drops of household bleach, followed by rinsing (shown above). If the discoloration bleaches away, it's most likely mildew. Remove the rest with a solution of one part bleach to three parts water. Pressure washing also works. Rinse thoroughly, prime bare areas, and then topcoat with a high-quality exterior paint. Such paints typically have more mildewcide than cheaper products.



Peeling

Problem: One or more layers of paint/primer falling off due to poor adhesion

Likely causes: Seeping moisture from leaks or failed caulk joints; moisture escaping through exterior walls, especially when the paint is oil-based; poor surface preparation; applying oil-based paint to a wet surface

Solution: Eliminate sources of moisture. Prepare the surface by removing all loose paint with a scraper or wire brush, and prime any bare spots. Repaint with acrylic-latex paint, which offers better adhesion and water resistance.



Poor hiding

Problem: The failure of exterior or interior paint to sufficiently cover the underlying paint or surface to which it's applied

Likely causes: Paints mixed with neutral or deep bases, which don't have as much titanium dioxide as paints mixed from light and medium bases and so don't cover as well; using a paint that's much lighter than the underlying surface, or using a paint with low-hiding organic pigments; application of a thinner coat than what's recommended

Solution: Start with a high-quality paint, which covers better than a lower-quality paint. If the surface is significantly darker than the new paint, it should be covered first with a tinted primer. Apply the paint at the manufacturer-specified spread rate, using the recommended spray tip or roller.



Tannin staining

Problem: Brown or tan discoloration caused by tannins within common wood species such as redwood, cedar, and mahogany

Likely causes: Skipping primer; using a primer with insufficient stain-blocking qualities

Solution: Correct any sources of excess moisture. After thoroughly cleaning the surface, apply a high-quality, oil-based, stain-blocking primer. In some cases, a second coat of stain-blocking primer may be necessary to hide the staining. Topcoat with a high-quality acrylic-latex paint.

10 Tips to Paint Like a Pro

BY PHILIP HANSELL

As a professional painter with over 20 years of experience, I've developed a thriving business. Getting there hasn't been easy, though, and I've made my share of mistakes. However, I've used these mistakes to improve my technique and to seek out high-quality, problem-solving products that I now rely on for almost every job. Here, I'll share some of my favorite products and some tips for getting the best possible exterior paint job.

The 2200-sq.-ft. house featured here was in rough shape when we started, and it demonstrated that it's best not to neglect exterior painting for too long. Regular maintenance could have prevented much of the prep work and saved thousands of dollars when it came time to repaint. Because of the home's condition, we had between four and eight painters on the job for nearly two months, which pushed the clients' bill to more than \$30,000. The price included removing the existing vinyl shutters; pressure-washing the entire house; scraping, priming, and painting all the trim and overhangs; stripping much of the siding down to bare wood; and painting the porches, siding, and window sashes. Finally, we painted and hung new, historically accurate wooden shutters.

As previous articles have mentioned, there are rules for painting and remodeling houses that have lead-based paint. If you're a contractor and you're caught ignoring the EPA's RRP (renovation, repair, and painting) rule, you're risking your livelihood. One Connecticut-based company I know of was fined more than \$30,000 for violations. Homeowners doing their own work are exempt, but that doesn't mean you should disregard the requirements. If you're a homeowner planning to repaint your own house, I suggest reading up or taking a class on handling lead-based paint. □

Philip Hansell is a professional painter in Durham, N.C. Photos by Patrick McCombe, except where noted.



Products and advice for tackling the toughest parts of an exterior job

1



SCRAPE AND SAND BEFORE WASHING When there is a lot of scraping and sanding to do, as there was on the house featured here, we like to do it before the house is washed. Many painters make the mistake of washing first and then doing a lot of heavy sanding afterward. The dust left behind makes it hard for the paint to bond. After the scraping and sanding are done and the house has been washed, check all scraped areas to make sure the washing didn't loosen any more paint.

2



STICK TO LOW PRESSURE WHEN WASHING We add about a tablespoon of dish soap to our mix of TSP (trisodium phosphate) and bleach. Dish soap creates suds that help the solution to cling to the siding and trim instead of running off the house. Then we rinse the house with a pressure washer on a low setting. Never use high pressure, which can force water into the wood and damage siding and windows.

3



COVER PLANTS, CARS, AND EXTERIOR LIGHT FIXTURES We use lightweight canvas drop cloths to cover plants. They don't break branches, and they let the plants breathe. Plastic covers can heat up like a greenhouse and kill plants. We cover lights, windows, and doors with Cling Cover plastic. Unlike with traditional poly sheeting, tape sticks well to the slightly textured surface. This material comes in 9-ft. by 400-ft. rolls and costs about \$30.

4



CONSIDER SPECIAL PRIMERS INSTEAD OF WHOLE-HOUSE PAINT REMOVAL

If we are working on a house that has old oil-based paint that is peeling and cracking badly and complete removal is not an option, we like to use XIM Peel Bond primer. It's a high-build, clear acrylic primer that can be applied up to 30 mils thick. It's great at leveling cracked surfaces, and it costs two-thirds less than stripping down to bare wood. We used this product on the porch ceilings and on the second story of the house shown here as a way to make the project more affordable. We stripped the lower part of the house down to bare wood so that it would have a flawless finish at eye level.

5



THE RIGHT TOOL MAKES ALL THE DIFFERENCE

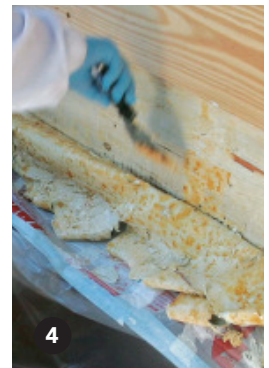
Considering the EPA's RRP rule for dealing with lead-based paint, we had to rethink how to prepare surfaces that test positive for lead. When we were introduced to a Festool sander/vacuum combo by a local cabinet builder, I was really impressed, but I was hesitant to buy one because of the price. The tool works so effectively, though, that after we bit the bullet on the first one, we ordered two more soon after. Now we use all three every day on lead jobs. The vac's EPA-approved HEPA filter captures 99.97% of particles down to 0.3 microns. We love that these vacuums protect our employees from lead exposure and reduce our cleanup time.



Sometimes you have to start from scratch



On old houses, paint can be in such rough shape that complete removal is the only way to go. We like a stripping product called Peel Away, which has the consistency of joint compound (1). We apply it with a mud knife in a ¼-in.- to ⅝-in.-thick coat (2), then cover it with the waxy paper included with the product (3). We leave it covered for 12 to 72 hours, checking it about three times a day until we see that it has worked its way through all the layers of paint. After scraping off the softened paint onto 6-mil plastic with a putty or taping knife (4), we apply with pump sprayers the neutralizer that comes with the product (5). We work it in with stiff nylon brushes, let the wood dry for a couple of days, then neutralize and scrub again. The final step is a scrub and rinse with clear water. After the wood is dry, we check the pH with a test strip. If the pH is too high, we go through the neutralization process again. Once neutralization is complete, it's important to check the wood's moisture content before priming. Anything below 15% is acceptable. Peel Away is labor intensive, but when done correctly, it gives great results. On this house, we used it on the siding up to the bottom of the second-story windows.



Windows get extra attention. With the glazing putty replaced and the window scraped and primed, we fill screw holes left by the old shutters with auto-body filler. The patches are then sanded with 150-grit paper and primed.

Paint in the right order

Sometimes it's hard to know where to start on an exterior paint job. Below are outlines that show how we paint homes in good condition and homes that have been neglected.

Home with minor peeling

1. Remove the shutters and screens.
2. Wash the exterior, shutters, and screens.
3. Scrape all loose paint and glazing putty.
4. Replace any rotten wood.
5. Sand all scraped areas.
6. Spot-prime all bare wood.
7. Apply caulk and glazing putty where needed.
8. Brush all overhangs and high trim.
9. Paint all siding.
10. Paint the windows, doors, and trim.
11. Paint the porch floors.
12. Hang the shutters and screens.

Home with major peeling

1. Remove the shutters and screens.
2. Scrape all loose paint and glazing putty.
3. Sand where needed.
4. Wash the exterior, shutters, and screens.
5. Check the scraped areas, and sand where needed.
6. Replace any rotten wood.
7. Prime all wood.
8. Apply caulk and glazing putty where needed.
9. Paint all shutters.
10. Brush all overhangs and high trim.
11. Paint all siding.
12. Paint the windows, doors, and trim.
13. Paint the porch floors.
14. Hang the shutters and screens.

6



PICK THE RIGHT PRIMER With so many primers out there, it's easy to get confused about which one to use. We almost always use a slow-drying oil-based primer for exterior wood, such as

Sherwin-Williams Exterior Oil-Based Wood Primer. Because it dries slowly, it has time to penetrate the wood and provides the best base for all types of paint. Many people think that if they are going to use latex paint, then they must use latex primer, which is incorrect. As long as the primer has time to dry, it's perfectly fine to topcoat with latex paint. For fiberglass and PVC trim that needs to be painted, we've had good success with Sherwin-Williams Extreme Bond Primer. One often-overlooked step is to wipe these materials with denatured alcohol to remove any manufacturing oils before priming. When priming new wood, watch out for mill glaze. I've heard carpenters and painters say they don't believe in mill glaze, but if the wood appears shiny or especially smooth or if it's been in the sun for a few weeks, sand it lightly before priming.

7



ALLOW EXTRA TIME FOR PAINTING WINDOWS When painting old windows, it's best to remove loose glazing putty and peeling paint and then reglaze where needed. It's OK to leave portions of old glazing putty if they're well adhered. Once the glazing putty is dry (we like to wait two to three weeks), we mask the perimeter of the window with 1½-in.-wide blue tape, which protects the glass from scratches and speeds up priming and painting. After masking, we sand all the wood and old glazing, then wash the window with a solution of TSP, bleach, and detergent. We let it sit for 10 to 15 minutes, then rinse the window with clear water. After the window is dry, we prime the sash and glazing putty with a slow-drying oil-based primer. Once the primer is dry, we sand the wood lightly, caulk where needed, and apply the first coat of paint. Then we pull off the tape and clean the glass with spray-on glass cleaner and paper towels. For the final coat, we lap the paint ⅙ in. onto the glass. This prevents water from getting behind the glazing putty, which is what causes the putty to fail. Before the paint dries, we open and close the window a few times to prevent it from becoming sealed shut with paint.

Sashes must look good inside and out. The last step in painting windows is to scrape excess paint from the glass and to give it a thorough cleaning. If the window sticks because of the recent paint job, the sides of the frame are given a coat of paste wax.



WRAP UP PAINTING BY EARLY AFTERNOON IN THE FALL AND SPRING Surfactant leaching is something that most people haven't heard about but have probably seen. It occurs when ingredients in the paint leach to the surface as a result of moisture. It's common in the fall and spring with their warm days and cool nights. At night, condensation forms on the paint film; then the water breaks down the water-soluble components in the paint and brings them to the surface. When the water evaporates, it leaves behind a waxy-looking area that usually wears off on its own, but it's hard to convince a customer of this. To prevent surfactant leaching, we stop painting around 1 p.m. in the spring and fall. We do surface prep in the early morning, paint from late morning to shortly after lunch, and then resume prep work until the end of the day. This process takes longer, but it avoids problems.

8



9

THERE'S A QUICK FIX FOR STICKY DOORS AND WINDOWS Have you ever tried to open a cabinet door that feels like it is glued shut? This condition is known as blocking, and it is common on places where cured latex paint tries to stick to itself, such as on wood windows, painted doors without weatherstripping, and garage doors. Most exterior paints are not resistant to blocking, so we apply a thin coat of clear Briwax to window sashes, garage-door panels, and places where doors meet door stops.

10



DON'T FORGET HOME MAINTENANCE Most people think that if they clean their gutters twice a year, they've maintained their home. We recommend that our customers hire us to wash their homes every other year and to have us check the caulking and touch up the paint where needed. We have customers who have 11-year-old paint jobs that look nearly new. The cost for this service is usually under \$1000 and can add years to a paint job. I've seen something simple like cracked caulking between trim and a windowsill ruin many window frames. These costly repairs could have been avoided with a \$10 tube of caulk and a few minutes of work.

DIY one side at a time

If you are a homeowner trying to tackle a large exterior paint job yourself, my first advice is to set plenty of short-term goals. If you set out to paint the exterior of your house without a plan, you're going to run out of steam or end up hating painting. I recommend working on one side of the house at a time, preferably starting on the least visible elevation. This will give you time to develop your technique and to perfect your painting skills. If you're like me, there are probably a few projects around the house that you haven't finished, so you don't want to add exterior painting to the list.

With such a long-term project, you're likely to get rained out on occasion. I suggest keeping some work in reserve, such as prepping and painting shutters and sashes, that you can do in the garage or basement on rainy days. Make sure to protect yourself and your family from lead paint by avoiding any dry-sanding or scraping and by keeping a neat work area free of paint chips.

How to tackle a DIY whole-house paint job

1. Remove all shutters and storm windows or screens.
2. Remove all loose window glazing.
3. Glaze the windows where needed.
4. Scrape and sand the overhangs.
5. Wash and prime the overhangs.
6. Scrape and sand the siding.
7. Wash and prime the siding.
8. Scrape and sand the windows, doors, and trim.
9. Wash and prime the windows, doors, and trim.
10. Scrape and sand the shutters.
11. Wash the shutters.
12. Wash, prime, and paint the shutters.
13. Caulk.
14. Paint the overhangs.
15. Paint the siding.
16. Paint the windows, doors, and trim.
17. Clean the windows.
18. Hang the storm windows or screens.
19. Hang the shutters.

NOTE If you are going to try Peel Away, do a test spot first, because sometimes it works in hours and sometimes it takes days. Don't apply more than you can remove in one day. Letting the wood sit bare for a couple of months isn't a problem unless you live in an area with a lot of rainfall. If the wood is going to be bare for weeks or months, tack up some 6-mil plastic to protect it. When we need to protect bare siding from rain, we wrap the plastic around a 2x4 and screw it to the house. We keep the plastic rolled up as much as possible so that the wood under it can dry, and we let it down only when there is a good chance of rain.



To see a video demonstrating the author's full process for finishing this door, visit FineHomebuilding.com.

Fabulous Finish for an Entry Door

Beautify a wood door with dye, stain, varnish,
and a commitment to doing the process right

BY PETER GEDRYS

In the world of home building, we too often let time outweigh quality. That's a concern I have day in and day out as a professional finisher. I try to help people understand that making their mahogany paneling, cherry vanity, or walnut stair rail truly shine means putting in the time, and we all know that time means money.

An entry door is a good example. For many people, a one-and-done premixed pigment stain applied to bare wood followed by a couple of coats of varnish is just too cheap and easy to pass up. That's fine as long as expectations match efforts, but a bit more care and the simple added step of dyeing the wood will make a major difference.

Looking at stained wood is similar to looking through a window covered with a thin sheet of plastic; you can still see the grain, but it's muddy and somewhat blurred. By layering the stain over a coat of dye, you can add depth and interest to the color. But achieving this look means more work. For example, the six-lite Douglas-fir door from Simpson shown here required about 22 hours of labor, which included testing colors and making sample boards to try out color combinations.

Is my process the only way to finish a door? Absolutely not. It is, however, one that I have tested with success. Followed carefully, this sequence should

ensure that your wood door looks beautiful for years before needing maintenance.

It starts with sanding

After sanding the entire door to 150 grit with a random-orbit sander, it's crucial to sand by hand every square inch with 180-grit and 220-grit paper to bring all surfaces of the wood to a consistent feel before adding any color. This is your chance to get to know the surface of the door, using a raking light and running your hand over the wood to find dents, chips, and spots of glue that could cause problems during the finish stage.

Be methodical with your sanding sequence. I usually do panels and muntins, then rails, then stiles. The specific order doesn't matter, but having a sequence does, because it ensures that you don't miss any spots. It can be hard to see blemishes on the surface of the unfinished door, but hands are incredibly sensitive to subtle differences in surface texture. Sand with one hand, and run your other hand lightly over the surface to determine which areas need more attention.

After sanding, remove all traces of dust from the surface of the wood. I don't use off-the-shelf "tack cloths"—typically cheese cloth treated with a tacky material—because to me they are an opportunity

STEP 1 SANDING PREPS THE SURFACE

Never assume that a factory-fresh wooden door is ready for finish. You have to go over every square inch with sandpaper, starting at 150 grit with a random-orbit sander, and then working through 180 grit and 220 grit by hand. Be on the lookout for dents, scratches, and splinters, all of which should be dealt with before you start the dye phase.



Address your sanding. Avoid arcing sanding patterns by standing in line with the wood grain and moving your hand straight back and forth. Use a backing block and 180-grit paper, then 220-grit paper, to sand every inch of the surface. Sharp edges can't hold finish, so round them over.



Wipe away dust. A rag dampened in denatured alcohol picks up dust, and the alcohol highlights any imperfections that need extra attention.

to introduce surface contaminants. Instead, I wipe the door with a clean, dry cotton cloth, then vacuum it and finish by wiping it again with denatured alcohol.

Unify the wood with a ground color

The wood stains that most people are used to buying and working with are known as pigment stains. The particles of pigment are suspended in a binder, much like the flakes in a snow globe, and must be mixed up so that they don't settle to the bottom. When applied to wood, the pigment lodges in the grain and pores of the wood surface. By contrast, the dyes I use are made by mixing powdered concentrates into a solvent (in this case water), sort of like stirring sugar into coffee. There is no pigment to settle if a mixture of dye is left on a shelf, and when applied to wood, the color penetrates more evenly than a pigment stain, unifying the color of dark and light areas of the wood.

The typical dye solution is made by mixing 1 oz. of concentrated dye powder to 1 qt. of hot distilled water. I prefer to make a stronger solution of 2 oz. dye to 1 qt. of hot distilled water, which becomes my master batch of dye. Now I can take a measured amount from the stock solution and mix in a measured amount of water to create the exact color strength I'm looking for.

For this project, I used a combination of dyes. I mixed each colored solution separately, then combined the solutions incrementally to create a customized color, which I read by wiping test streaks on a white paper plate. After dialing in the desired dye color, I mixed up a quart of this solution, knowing this was more than I would need, and made note of the color combination so that I could reproduce it later.

One of the biggest mistakes people make when applying dye is to put it on too lightly. It's important to apply a copious amount with a saturated pad, making sure to wet the surface of the wood thoroughly. Because the applied solution dries quickly, you may see streaks between overlapping passes during application. Don't panic—these streaks are easy to blend together by passing over the affected area again to reincorporate the color. Watch out for dye accumulating in corners; use compressed air to blow out puddles before they dry.

Shellac for an entry door? You bet

Although vibrant when first applied, dye stain fades faster than a politician's campaign promise. To lock in the dye and to allow me to add another layer of color on top—a process known as glazing—I apply a coat of dewaxed shellac, often labeled as a sanding sealer.

STEP 2 DYE CREATES THE GROUND COLOR

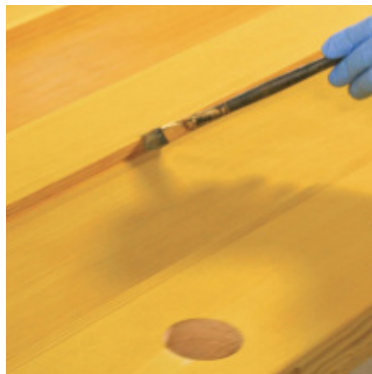
Working with dyes is about as easy as it gets. Add the powder concentrate to hot water, stir it well, strain the mixed solution, and apply with a pad. If you've never used dye, remember that it's part of a layered color scheme. It will dry to a dull, flat color that's very different from how it looks during application. Don't worry; just trust the process.



Don't just dump it in. To control the mixing rate of the dye to the hot water, hold the measuring cup in one hand, and then tap the top of that hand to shake the dye into the water.

Apply dye liberally. Use a brush for details and a pad for flat areas, wetting the surface of the wood liberally, then wiping up the excess.

Lock in the dye. To seal the dried dye, apply a thin coat of dewaxed shellac to all surfaces of the door, again using a brush for the details and a pad for the flats.



Shellac is not an exterior-grade finish, so you can't use it as a final coating for an exterior door. I've used it innumerable times for the very thin seal coat atop the dye, however. If shellac makes you nervous, you can use an oil-based sealer such as Interlux for this step, but plan on letting it dry overnight. By contrast, shellac dries much faster.

I apply the shellac with a pad made from unembossed paper towels—the blue Scott-brand shop towels are a widely available option. I dampen the pad with denatured alcohol before charging it full of shellac so that a reservoir of finish is soaked in. For detail work, I use an artist brush with bristles made for water-based paints.

STEP 3 GLAZING CREATES DEPTH AND INTEREST

Essentially a pigment stain applied over a coat of sealer, a glaze gives you control over your color. This translucent layer not only enhances the color of the underlying dye to add depth to the finished color, but it allows you to finesse problem areas. Contrasting wood tones can be blended, dark areas can be made light, and light areas can be made dark. If you don't like what you see, you can wipe it off with mineral spirits. When I'm happy, I let the glaze set up and then lock it in with oil-based sealer.



Mix up a glaze. After combining the gel stains to create your color, add mineral spirits and a bit of glaze base to create a creamy mixture that applies smoothly and dries a bit slower.



Work in sections. Start with the panels, then move to the rails and stiles, and then the muntins, stopping at changes in grain direction between pieces. Blend the surface with a dry soft-bristled brush, unloading excess glaze from the brush onto a paper towel.



Scuff sand. After the glaze coat has set up, apply sealer, let it set, and then lightly scuff the surface with 320-grit sandpaper to prepare it for varnish.



Once the shellac is dry, I hand sand it with 320-grit paper so that the glaze—the next step in the process—has something to cling to when applied. I use a light touch here; the coat of shellac is very thin, and I don't want to sand through and into the dyed wood below.

Give the glaze some slip

A gel stain alone can be used as a colorant over the sealed dye, but I prefer to combine it with an alkyd glaze base—essentially a thick base that can be combined with an oil stain in order to extend the working time of the stain. I start with one part glaze base, one part

mineral spirits, and two parts gel stain, then adjust from there. I like the mixture to be about the consistency of heavy cream, which gives me good control when blending and softening the glaze.

A glaze coat doesn't need to be thick, and a few ounces goes a long way. I prefer a pad for applying this coat, but a brush or cloth is fine, too. Again, I work sequentially, starting with the panels, then moving to the rails and stiles and finally to the muntins.

The glaze can be feathered with a dry softener brush to create a soft, even color; removed in the center of a panel and pulled into the corners; or pounced with a brush to create light and dark areas. You

can have fun with it. If you don't like what you see, just wipe the surface before it dries, and start again. If the surface has started to become tacky, wet a paper towel or a rag with mineral spirits to remove the glaze from the sealed surface. When you're happy with the look, let the glaze dry overnight.

Once the glaze is dry, lock it in with a coat of oil-based sealer. I don't recommend shellac here because you're closer to the exterior face of the finish. Let the sealer cure, sand the surface lightly with 220-grit or 320-grit paper, hit it with the vacuum, then wipe it down with a cloth dampened with a mixture of water and denatured alcohol. Before adding final clear coats, though, fill the nail holes.

Wax color sticks are fine for filling nail holes in most applications, but I don't like them for an exterior door because of the potential for sunlight to soften the wax. Instead, I use WoodEpoxy, a two-part epoxy filler that I mix with a bit of dry earth pigment. Choose a pigment that matches the dye color already applied to the door, which allows you to then apply glaze over the filler to create a nice match with the rest of the door. I apply the filler with a gooseneck knife, and since it is slow-setting, it can be wiped smooth easily with a moistened gloved finger. As I like to tell students, if your eye doesn't pick it up, it's not there.

At least five coats of varnish

You have a lot of choices for the topcoat of an exterior door. Here, I used McCloskey Man O'War Marine Spar Varnish, a commonly available product that provides solid quality at an average price.

Even if you don't want the look of a glossy topcoat, it's worth applying a gloss sheen. It has better clarity and can either be buffed to a satin sheen with Scotch-Brite pads or be finished with two coats of satin (the far easier option) to achieve a lower luster.

VOC regulations are changing the finishing game, and the lower VOC formulas (McCloskey 6505 series) are nowhere near as user-friendly as the standard (7505 series) formulas. My advice is to skip the low-VOC formulas because they are maddening to work with. No matter how carefully I apply them, and even when I use the best brushes in my arsenal, they still dry to a streaky appearance.

Even when using the 7505 series, I have noticed that while I used to have to thin the varnish prior to applying the first coat, the formula is now so thin that any further reduction would be counterproductive. That said, if the varnish you use is thicker, you can certainly thin it before application (a brushing thinner is a better choice than mineral spirits), and there are simple tricks for achieving the correct viscosity.

STEP 4 VARNISH ADDS PROTECTION

I consider five coats of varnish to be the minimum for a newly finished door. Factor in drying time of 24 hours for each coat, followed by sanding to prep for the next coat, and it's easy to see why some people cut corners on this step by only applying one or two thick coats. Do it right, though, and the extra coats ensure that the door can go for several years before needing to be recoated.



Epoxy for the holes. A two-part epoxy filler mixed with dry pigment creates a tinted filler that's easy to pack into nail holes or blemishes.



Sealer makes life easy. Because the glaze is sealed, excess filler can be wiped away easily, and glaze can be dabbed on to match the rest of the finish.



Gauge the viscosity. Let the stirred varnish run off the end of a mixing stick while counting (one-one thousand, two-one thousand, etc.). If the stream changes to drips at around the four count, you're good to go. If it takes much longer, thin the finish and test again.



Charge the foam. After wetting the foam brush with mineral spirits, dunk it several times into the varnish, letting the finish soak into the foam between each dunk. This loads the foam with finish for a better application.

For applying varnish, I use an artist's brush for the detail work and switch to a disposable foam brush for the panels, rails, and stiles. For some, the idea of using a cheap foam brush flies in the face of the well-established belief that if you want a good brush, you have to spend good money. That's not always true. If it's a good foam brush (one where the tang extends close to the tip of the foam for full support), you can lay an even, bubble-free coat of finish that rivals any produced by an expensive brush, and you can save yourself the cleaning and waste solvent involved in the latter. If you use satin or semigloss varnish, stir it every few minutes while working so that the flatteners



No brushmarks and no bubbles. A quality foam brush—one with plastic supporting the foam—lays down a smooth coat of finish that's free of bubbles and brushmarks. Apply the coats in the direction of the grain while holding the brush at a 45° angle to the surface of the wood (above). Come back over the finish with the brush held almost perpendicular to the surface to tip out the finish (below).



RECIPES FOR SUCCESS

Here are the products and mixture ratios used on the door shown here.

WATER-BASED DYE

- ✦ 1 qt. hot distilled water
- ✦ Concentrated powder dyes, \$7 to \$10 per oz. wdlockwood.com
 - 1 part Medium Yellow Maple (#142)
 - ½ part Golden Yellow (MCW #194)
- ✦ Dewaxed shellac (sanding sealer), about \$15 per qt.

GEL STAIN

- ✦ Alkyd glaze base 409 \$27 per qt. benjaminmoore.com
- ✦ General Finishes gel stains about \$25 per qt. generalfinishes.com
 - 1½ parts thinned glaze base
 - 3 parts Prairie Wheat
 - ¾ part Georgian Cherry
- ✦ Softener brush or similar soft-bristled brush

VARNISH

- ✦ WoodEpoxy, \$41.50 abatron.com
- ✦ Dry pigment (raw sienna) \$12 dickblick.com
- ✦ McCloskey Man O'War gloss spar varnish, 7505 series, \$25 per qt. mccloskey.com
- ✦ Plastic-reinforced foam brush, \$1

in the finish stay suspended and the resulting sheen is consistent. The directions on the back of a can of McCloskey varnish recommend a minimum of two coats. In my opinion, an exterior door should get at least five coats to start its life.

The finish dries to the touch within six hours, but it's crucial to allow 24 hours of dry time before sanding and recoating. The first coat of this varnish was thin, so I used 320-grit sandpaper to refine it. Anything rougher probably would have cut through and into my color coats. For subsequent coats, I used 220-grit paper for most of the work, only switching to 320-grit paper for the muntins. Besides sanding, I like

to refine the surface with a maroon Scotch-Brite pad between coats, being careful not to rub through the varnish at edges and corners.

Don't wait until the varnish is cracked and the wood is discolored to think about recoating. Keep an eye on the finish (gloss coatings that become dull are one indicator), and stay on top of the maintenance. Then when it does come time to renew the surface, it's as simple as washing, drying, scuff sanding, and recoating with more varnish. □

Peter Gedrys is a professional finisher in East Haddam, Conn.
Photos by Justin Fink.



Cutting in trim and corners

One of the benchmarks of a good paint job is crisp, straight transitions of color where trim meets a wall or a wall meets a ceiling. I've found that cutting in these areas is as much about having the right tools as it is about having the right technique. It all starts with the right brush.

My favorite is a Corona 2½-in. Excalibur angled sash brush (about \$20). First, it works well with both oil- and water-based finishes. It's also good for a wide variety of painting tasks besides cutting in, and its Chinex bristles are both long-lasting and easy to clean.

Most painters, pros and do-it-yourselfers alike, hate cleaning brushes; some pros even wrap their brushes in plastic wrap or aluminum foil for later use. Unless I'm in an extreme rush, though, I clean them. Clean bristles produce a much better finish, and it really doesn't take long to clean a high-quality paintbrush.

Having a clean brush is so important that I wash my brushes both at lunchtime and at the end of the day. In hot or dry conditions, I may wash my brush three or four times a day. The problem with storing brushes in plastic wrap, foil, or even zip-top bags is that the paint near the top of the bristles dries in a few hours and becomes difficult to remove completely. Before long, the bristles don't hold as much paint or flex as they should, which contributes to a rough finish and ragged lines where you're cutting in.

Besides the brush, you need a paint pail. I like metal pails because they don't flex unnervingly like plastic pails; however, the seams in metal pails make them more difficult to clean. If you find this a problem, look for a paint store that sells liners for metal pails. I use them whenever I'm changing colors several times a day.

I fill the pail about one-quarter full so that there's plenty of room to tap off excess paint on the side. Generally, I find high-quality, well-mixed paint (I like Benjamin Moore) to be fine right out of the can, but in extremely hot or dry conditions, a paint additive such as Floetrol or Penetrol (flood.com) can reduce brush marks and even the transitions between brushed and rolled areas. Follow the additive directions carefully to avoid problems.

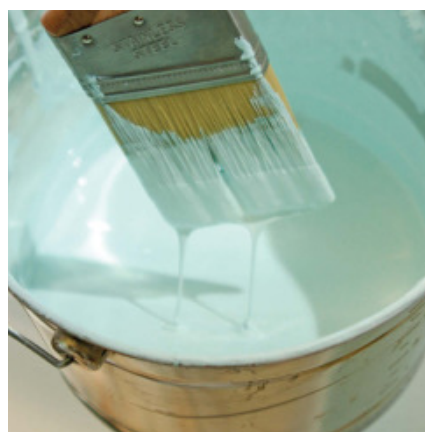
Jim Lacey is a professional painter in Bethel, Conn. Photos by Rob Yagid, except where noted.

STEP BY STEP



1 Wet the bristles. Before painting, wet the bristles in the appropriate solvent (check the paint can), and then squeeze out the excess. This makes cleanup easier and prevents paint from creeping up the bristles.

2 Get a grip. Hold the pail with four fingers on the bottom and your thumb wrapped around the handle. Keep only an inch or so of paint in the pail to keep your brush and workspace clean and minimize spills.



3 Take a dip. Dunk the brush into the pail so that paint covers about one-third of the bristles. You can adjust the paint depth by tipping the pail slightly to the side.



4 One tap. Tap one side of the brush against the side of the pail, and then gently drag the bristle tips over the rim. While painting, keep the pail in your nondominant hand for maximum productivity.



A kit for cutting in

Cutting in nice, straight lines starts with the right brush and a high-quality paint pail. A good choice is an angled sash brush with Chinex bristles. This bristle works well with both oil and latex paint. Pails come in several sizes. Choose one that's comfortable to hold and has enough room for tapping excess paint off the brush.



Leaktite 5-Quart Metal Paint Pail
\$6

Leaktite 5-Quart Paint Pail Liner
\$1

Corona Excalibur 2½-in. Angled Sash Brush
\$18

5 Apply the paint. Starting from ½ in. to ¼ in. away from the trim or ceiling, with the brush oriented vertically, use a single stroke to apply the paint. Looking slightly ahead of the bristles, pull the brush toward you; keep dragging until the paint stops covering.



6 Work it out. With the brush rotated 90°, take a second pass with the bristles just touching the trim or corner. The paint should level out, leaving a smooth line free of ridges. Take a third pass only when necessary.

Most woodworkers hate to apply finishes, just as most carpenters hate to paint. But Peter Gedrys is wired differently. He doesn't build anything—all he does is apply finishes. To appreciate what Gedrys does for a living, most of us can't rely on direct experience, because not many operate at his level.

"There are cooks, and there are chefs," Gedrys says. By any measure, Gedrys is the latter, bringing museum-quality furniture finishes to architectural woodwork. A typical stain-grade finish might include one coat of a pigment stain followed by two or three coats of polyurethane. Gedrys' process typically involves multiple layers of wood dye, shellac, and glazing before he even gets to the topcoat, which, on an exterior door, will include a minimum of five coats of varnish. The resulting finish has color, clarity, and depth that cannot be achieved any other way. "Do it right," he says, "and you'll have something that changes color in different light and just ... glows."

Thirty years ago, Gedrys started out stripping furniture for a man who would turn his back whenever he refinished a piece so Gedrys couldn't watch. As a result, Gedrys is largely self-taught, but he has a very different attitude about sharing what he knows. In addition to running his business, Architectural Finishes, in East Haddam, Connecticut, Gedrys also teaches all over the country—at schools, at conferences, and even in private lessons. Teaching, he says, helps him learn and improve. "That's what drives me. I want to be the best. But there's always somebody better. Always." And then he adds, without a hint of irony, "I feel like I'm just scratching the surface."

— Kevin Ireton, editor-at-large



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"I can finish a handrail without using stains and polygoopathane ...

... and have it just dazzle you."

PETER GEDRYS,
WOOD FINISHER



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