PREP WORK FOR
Clear Finishes

The success of a clear finish depends on proper sanding and filling

A clear finish is used to protect wood and to enhance the wood's figure and coloration, but does neither well unless the surface is properly prepared. In this article, we'll explain how to prepare a wood surface to accept the many available kinds of clear finishes. In a future article, we'll survey clear finishes and explain how to apply them.

by James Benney, Dan Greenough, and Doug Kelly

New Wood

A close examination of the wood surface is the first step in preparing for any finish, because the finish will magnify even the smallest flaw. The most common blemish is likely to be mill marks that show up as horizontal waves running across the length of the molding or board. You'll also want to check for saw burns, glue residue, grease smudges, dents, splinters, nail gun "volcanoes," pencil marks, and other flaws that will come back to haunt you if you don't spot them early.

Sealer Coats

If the clear finish work will include staining or dyeing of the wood, uneven absorption of stain or dye could be a problem, particularly with softwoods. A sealer like Minwax Pre-Stain Conditioner (Minwax, 10 Mountainview Rd., Upper Saddle River, NJ 07458; 800/462-0194) will ensure that the wood takes the color evenly. With open-grained woods such as oak, the application of a wood-grain filler can close the openings in the wood that otherwise would suck up coat after coat of finish, leaving a "pitted" coating. We like Pratt and Lambert's Paste Filler (Pratt and Lambert, 101 Prospect Ave., Cleveland, OH 44113; 800/289-7728).

Screw and Nail Holes

Screw or nail holes should be filled only after at least two finish coats have been applied. The object is to seal the wood well enough to restrict the fillers to the hole itself and thus avoid spreading the filler to the surrounding areas.

Putty sticks and wax crayons come in stain and natural

Fill holes only after at least two coats of finish; this prevents the solvents in the filler from spreading to the work. A dulled screwdriver makes a good tool for applying the putty.

Painter's putty can be mixed to match stain colors. Shown here are three mixed colors and a neutral putty being tinted with linseed oil coloring.

Wood corners get hardened by the milling process and won't take a stain well unless they are "eased."

wood colors and are applied directly to the hole. The filler can also be applied with a putty knife or packed in the hole with a dulled screwdriver. When applying the filler, the trick is to apply a little more than is needed, then smooth it by pressing down and pulling toward you with a putty knife. Finally, carefully remove all extra fill material around the hole with a clean thinner rag, being careful not to dig out the top of the fill.

Paste fillers and nitrocellulose wood doughs are fast-curing fillers that clean up with lacquer thinner or acetone. Acrylic-based putties can be cleaned up with water before they cure, or with xylene or acetone after they have cured. We've had good luck using Zar's Latex Putty (Zar's, P.O. Box 70, Scranton, PA 18501; 800/845-5227). It comes pretinted or can be tinted either in paste form or after curing. Often you'll be dealing with several colors of filler, because the wood background color is usually lighter than the grain color, with variations in between.

When using paste or dough fillers, allow for shrinkage. The binder in these materials bonds with anything it comes in contact with, which in turn can prevent stain penetration and leave unsightly blemishes. It's often impossible to get the residue off after it has cured without disturbing the surrounding area. So be as precise as possible filling the holes, taking care to keep the filler off adjacent work.

Sanding

Sanding is a multistep process with several objectives. Initially you sand to remove mill marks, glue splotches, dents, and other minor flaws in the wood. Sanding also removes fingerprints and levels wood dough or paste fillers. Subsequent passes with progressively finer grits reduce the "scratch pattern" until it is invisible to the naked eye. Sanding after the first coat of sealer smooths any residue and allows for adhesion to the next coat of finish material. After the application of stain or dye and the first coat of finish, sanding knocks down irregularities in the finish material, such as lint or dust specks, and provides adhesion for the next coat.

The cardinal rules of sanding are to sand with the grain and to remember to "ease your edges." Typically, the sharp corners of trim material have been hardened or "burnished" by machining and won't take color or a finish until you lightly sand them. Easing the edge opens the fibers to accept stain and finish, and makes the piece friendlier to the touch.

Choosing Sandpaper

Sandpaper selection can be complicated. The most commonly used grits for wood are 120, 150, 180, and 220. These are available in a variety of coatings, including flint, garnet, aluminum oxide, or silicon carbide.

Although more expensive than flint paper, garnet sandpaper is the most commonly used in the painting trades because the cutting grit is hard, sharp, and long lasting. Even harder and sharper are the aluminum oxide sandpapers, which are used for hardwoods and metals. Silicon carbide paper is very hard and brittle, making it useful for soft metals, plastics, and stone. These are usually waterproof also, which allows for "wet" sanding with water, oil, or stain. Wet sanding is done on fine finish work or to hold down dust when sanding old lead paint. Inexpensive flint sandpaper has a short working life, but is well suited to sanding old paint or gummy woods that quickly ruin the more expensive papers.

To add to your choices, there are also stearated silicon carbide papers (also called no-load or self-lubricating), which contain metallic soap. The soap lubricates the paper surface, keeping it from filling or clogging up as fast as nonstearated papers.

Pads and sponges. Finally, there are the new professional-duty "painter's" abrasive pads, such as 3M's 230U/235U (3M Center Bldg. 515-3N-02, St. Paul, MN 55144; 800/480-1704). Specifically designed for sanding old latex paint and other water-based finishes, these are fast cutting, nonloading, flexible, and humidity resistant.

Abrasives with sponge backing work well on contoured surfaces. They can be used wet or dry, and can be rinsed out to unload the grit. They are best used for detail trimwork such as scrolled, routed, or multiplaned surfaces. They perform better on coatings than on raw wood.

Sanding Blocks

On very fine work, using a sanding block ensures that pressure will be evenly applied. The blocks keep a flat surface flat, whereas holding the paper in your hand can result in noticeable ridges or dimples, because finger pressure will dig out the softer wood grain. You can buy a hard rubber sanding block, or you can make your own wood block. If you make one, back it with a felt or cork cushion to reduce clogging.

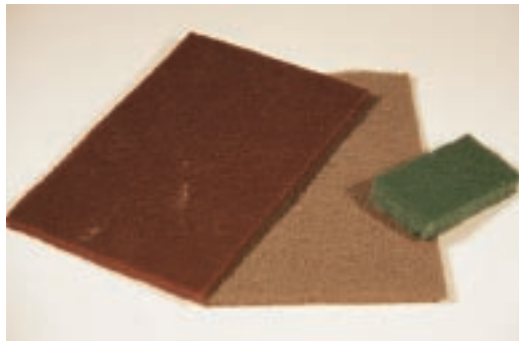
For sanding large amounts of coved or curved work, it can be worthwhile to carve out of wood or Styrofoam a "negative" shape to act as backing for the sandpaper.

Power Sanding

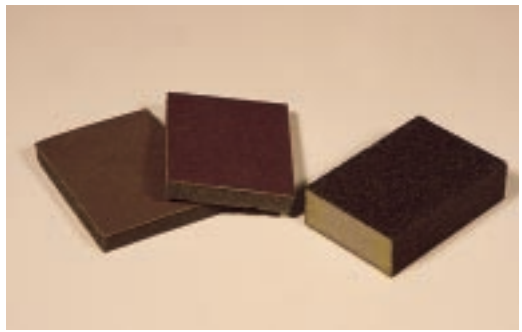
Sanding machines are useful before applying color or the first coat of a clear finish, and then only on larger-scale areas like countertops, tables, simple doors, paneling, siding, floors, and occasionally flat casements or simple moldings.

Belt sanders are the tools of choice when you need to remove a lot of wood fast or to remove an existing finish. But if you are trying for smoothness or flatness, a belt sander can be downright dangerous unless you work the tool absolutely flat with no rocking whatsoever.

To keep from doing serious, often irreparable damage, keep the sander in constant motion: Usually a combined back-and-forth, side-to-side "floating" motion works best. Make sure the operator has a lot of skill and experience before risking valuable woodwork under a belt sander. Veneered surfaces are off-limits for this tool.



Synthetic abrasive pads work well for sanding existing latex paints.



Sponged-back sanding pads are well suited for sanding complicated shapes. The pads work best on finished wood.

For sanding contours, carve a piece of Styrofoam and use it as a sanding block.

Orbital pad sanders are the natural choice for preliminary sanding before staining and finishing. Always follow up by hand sanding with a finer grit, because an orbital sander leaves circular scratches on the work surface that aren't obvious until you apply stain. To keep the orbital scratch marks to a minimum, don't set the tool to the work surface until it is running at top speed, and then don't press down on it. Let its own weight and the sandpaper do their job. Also, watch for splinters or debris that could become trapped between the paper and the work. These will create even deeper orbital marks that can only be sanded out by hand.

Random orbital sanders combine the tight, circular motion of the orbital pad with a larger random motion, which in combination cuts material faster and almost eliminates the circular scratches. Unlike an orbital pad, a random orbital sander should be started on the surface, because placing it on the wood at full speed can gouge the surface. Again, let the tool's own weight apply the pressure. In a regular back-and-forth motion, move it at an even speed and keep the pad as flat to the work as possible. As effective as these tools can be, and contrary to the hype about them, they do in fact leave some scratches in the surface. For best results, finish by hand sanding before staining, dyeing, or applying a clear finish.

Sanding Tips

The goal of sanding, whether by machine or by hand, is to eliminate blemishes and glue imperfections by using the coarsest grit sandpaper necessary. You then use increasingly finer grits to remove the scratches

left by the previous sandpaper. Always sand with the grain, and continue sanding until you can see improvement before stepping up to the next finer grit. Skipping grits prematurely can end up making more work. If you are sanding with dull or loaded paper, you are wasting time and energy. Changing the paper often lets the sandpaper do the work.

It's important to clean your work surface thoroughly before moving up to the next grit sandpaper. If you leave coarser dust from earlier sanding, it will continue to put coarse scratches in the work. We use a "foxtail" brush, dusting down from the highest to the lowest point. You can also use compressed air, but it creates dust clouds and there's always the possibility of blowing compressor oil onto your work, which will cloud the finish coat.

Checking progress. Check your prep work before committing to the next step. One way is to position a low-angle light source to highlight the surface in relief. This "raking" light can be a hand-held work light or even a good flashlight.

You can also wipe down questionable surface areas with thinner. The glossy surface mimics a clear finish and highlights imperfections, while also pulling sanding dust out of lingering scratches. Thinner doesn't raise the grain and evaporates quickly.

Prepping for water-based finishes. The water in water-based stains and finishes will cause wood fibers to swell on first contact, leaving the surfaces rough to the touch. This "raising of the grain" will persist through all subsequent applications of finish or color. No matter how smoothly you sand the surface before applying each coat, you won't be able to avoid raising the grain. The solution is to raise the grain before applying finishes.

Start by sanding with 180- to 220-grit paper. Then, after dusting, use a cloth or sponge and wet the work with water as if you were staining it. Let it dry overnight, then sand off the raised grain. The grain won't be raised further when you apply your water-based stain or finish.

The authors clean between sanding grits with a fine-haired brush. Be cautious about using compressed air; you may contaminate the finish with compressor oil.

Small dents in wood can be steamed out. Apply a soldering iron to a drop of water in the dent. As the water turns to steam, the wood fibers expand and raise the dent.

Tack cloths are a fine way to pick up sanding dust if you're using an oil finish. Avoid tack cloths with water-based coatings: The sticky residue left behind will contaminate the finish.

Steaming small dents. To avoid using fillers and putties, which can be hard to color-match, you can sometimes "steam" out small dents if the wood fibers haven't been broken. Apply water to the dent with an eye dropper or syringe, let it soak in, then add an additional drop to form a bead over the dent. With the hot point of a soldering iron, heat the water bead (not touching the wood) until it steams. This steaming action swells the fibers and raises the grain flush to the surface. Let this dry thoroughly, then carefully sand flush and smooth.

Cleanup

A thorough cleanup will help the final coats of clear finish stay free of dust and other airborne particles. After the final sanding, dust off sanding residue thoroughly from the highest point to the lowest. Then wipe down the work with a tack cloth.

If you are applying water-based finishes, skip the tack cloth: The varnishlike substance on the tack cloth will leave a residue that affects the ability of water-based material to flow out well. To eliminate airborne particles, try to eliminate air movement and wait until any dust settles.

Now you're ready to apply your favorite clear finish. Whether to brush, spray, or wipe is a story we'll save for another time. To encapsulate (currently a popular word among painting contractors), know what you are trying to achieve, then take the time to do it right.

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