Finishing Hardwood Floors

A professional takes the fear out of sanding and shows how to get great results with waterborne finishes

BY CHARLES PETERSON

People say that beauty is only skin deep, but they're usually talking about their neighbors, not about hardwood floors. The steps that bring beauty to the surface of wood are the hardest parts of floor installation; it's also when my customers start to ooh and aah. The job shown here, a basic strip floor finished with a waterborne polyurethane, is a good example of the techniques my crew and I use. Remember that every species of wood has different sanding and finishing nuances, so check manufacturers' recommendations for each species. For more information on finishing floors, contact NOFMA: the Wood Flooring Manufacturers' Association (www.nofma.org; 901-526-5016).

Getting started

The first step to finishing a strip floor is a thorough cleaning and inspection. The entire area should be swept clean; all of the nails should be countersunk deeply enough so that they can't tear holes in the sanding drum or produce sparks that can cause fires. At this time, I check my sanders, too (for more information on rental equipment, see the sidebar on p. 62). To minimize the effects of the dust that I generate, I seal the doorways with 6-mil poly and wear a dust mask while I'm working.

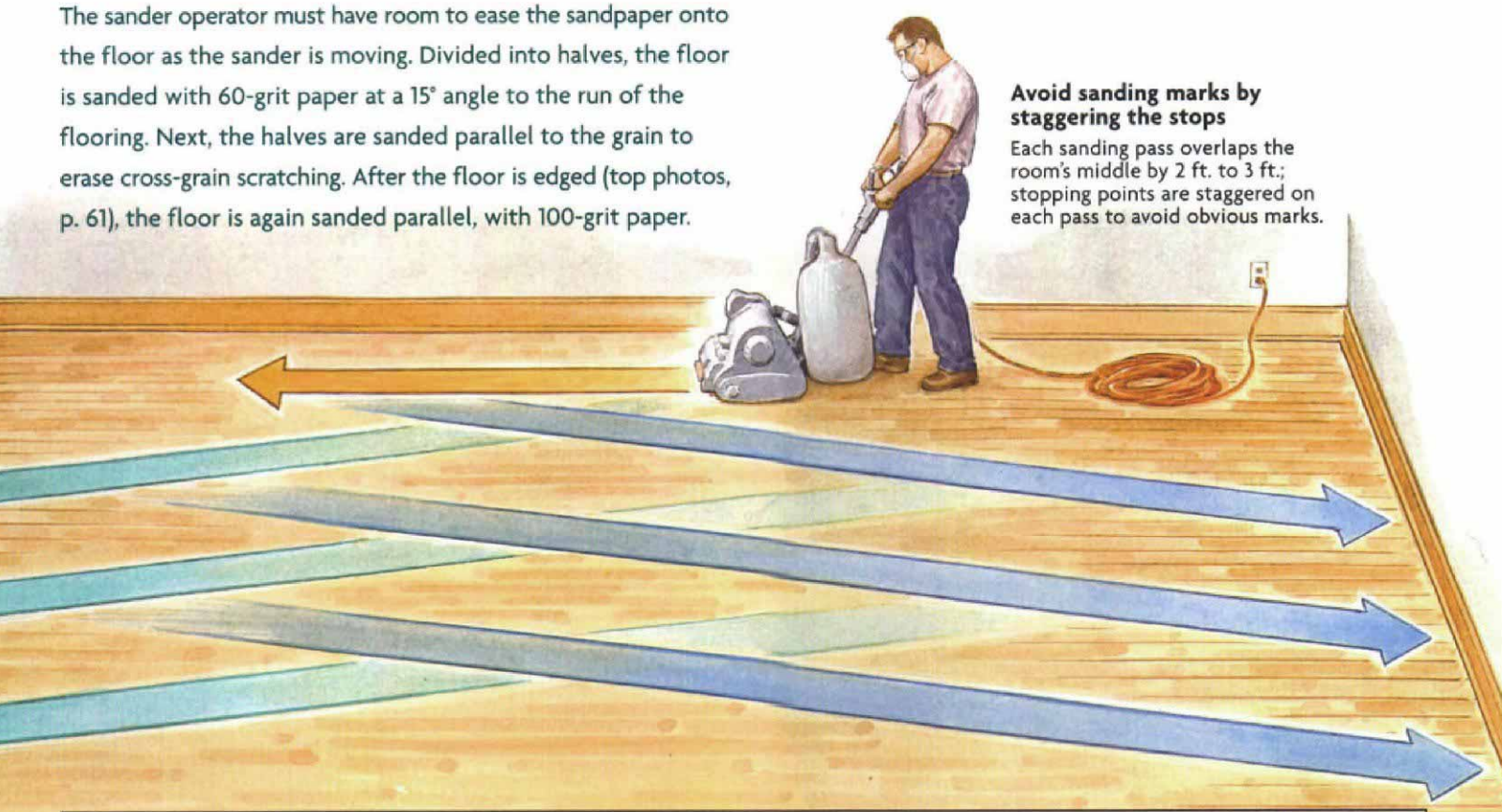
There are three types of sanding equipment: big floor machines, edgers and buffers. The newer three- and four-head random-orbit sanders *(FHB* #140, p. 116) aren't as readily available. The larger machines, either belt sanders or drum sanders, often feature a clutchlike device (photos facing page) that allows the operator to raise or lower the sandpaper to the floor. I prefer the belt types to the drums, mostly because the drum sanders' paper-clamping mechanism sometimes cuts imperfections into the floor.

Sand at an angle to level the floor

Sanding a floor should be thought of as a complete sequence of grits; each successive grit should erase scratches left by the previous grit. The final grit is determined by the finish manufacturer's recommendations. I always start with the least aggressive grit that will level height discrepancies between floorboards. On a new floor, I usually start with 60-grit paper on the big sanding machine. If a test pass with 60 grit doesn't even out the

SANDING WITH THE BIG MACHINE

The sander operator must have room to ease the sandpaper onto the floor as the sander is moving. Divided into halves, the floor is sanded with 60-grit paper at a 15° angle to the run of the flooring. Next, the halves are sanded parallel to the grain to erase cross-grain scratching. After the floor is edged (top photos, p. 61), the floor is again sanded parallel, with 100-grit paper.



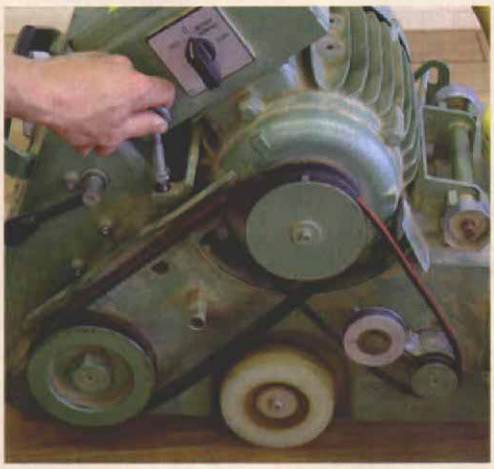
Avoid sanding marks by staggering the stops

Each sanding pass overlaps the room's middle by 2 ft. to 3 ft.; stopping points are staggered on each pass to avoid obvious marks.

BEFORE YOU START

Lever eases drum to floor. The operator needs to drop the sanding drum gradually as the sander moves forward so that the sandpaper doesn't dig a hole in the floor. Before using the machine, practice raising and lowering the drum on a piece of plywood.

WHEN YOU'RE DONE



Because belts can take a set and cause bumps in the floor, the sander's drive belts should be loosened with the belt tensioner when the machine is at rest for more than ten minutes.

surface, I try 40 grit. (Whatever grit you use, it's not a good idea to skip more than one grit in a sanding sequence, or you'll end up with visible scratches on the floor.) The first series of passes should be run at a 15° angle to the flooring's length (drawing above). This slight angle reduces the sander's tendency to bounce when it hits butt ends of the flooring that are proud of the surface. Bounces can dig troughs in the wood that can be impossible to remove.

I start near the center of the floor and sand to the opposite wall; then, still sanding, I pull back the sander to the starting point for the next pass. I repeat this back-and-forth pattern of sanding the floor until I've completed that section of the room. Then I turn 180° and finish the remainder of the room that I'm working on.

To remove the cross-grain scratches produced by the 15° sanding, I go over the floor again with 60-grit paper, this time exactly parallel to the flooring, and follow with a good sweep.

An edger gets the tight spots

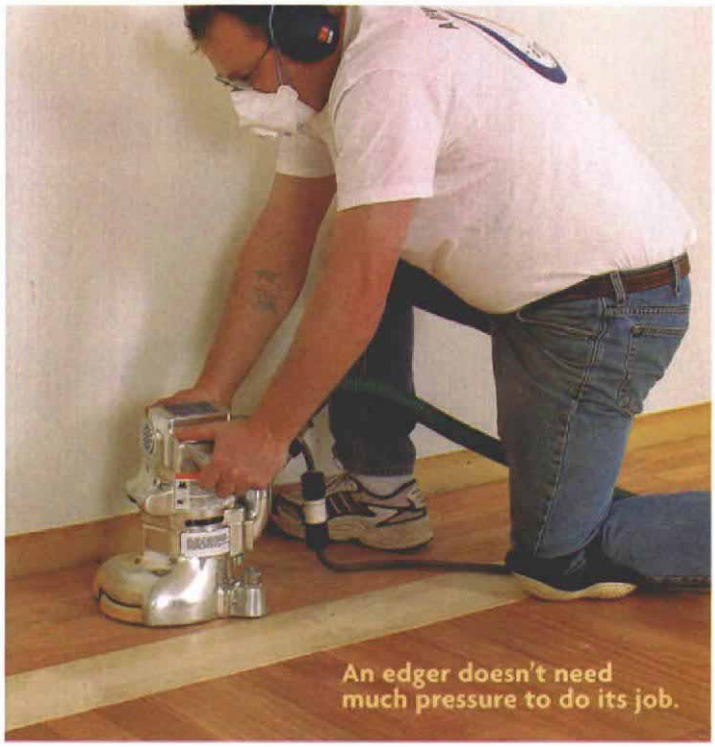
The room's perimeter is sanded with an edger, which goes where the big machines can't reach.

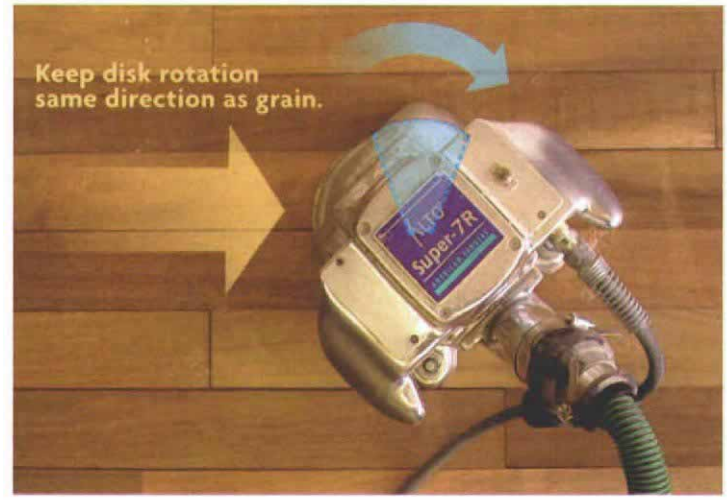
More aggressive than the big sanders, the edger can be loaded with the next finer grade of sandpaper, in this instance 100 grit. With the edger as close to the wall as possible, I

Drawing: Rick Daskam

EDGER SHOULD SAND WITH THE GRAIN

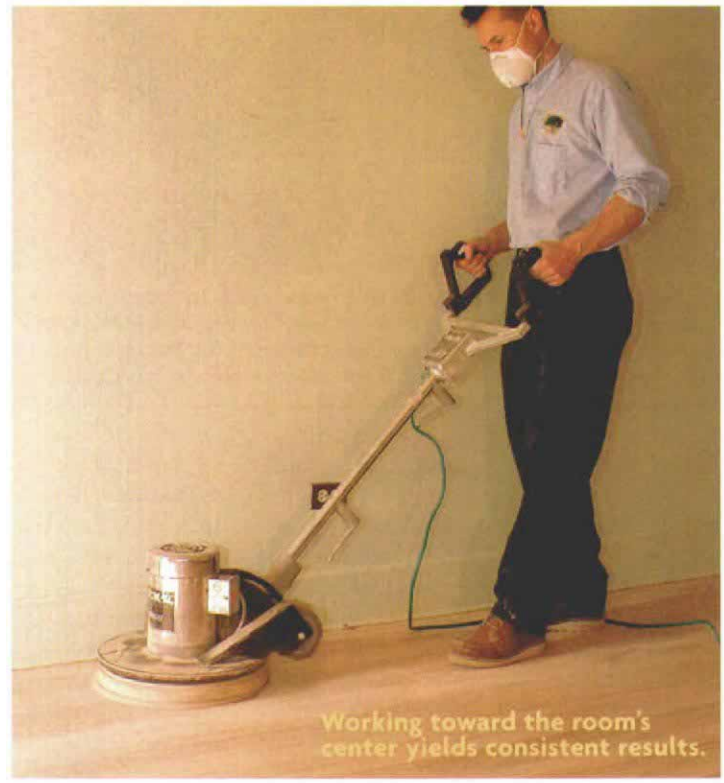
Offset by the rear wheels, only a narrow portion of the edger's sandpaper (photo above right) hits the floor, so it's important that the edger is positioned to sand with the grain (photo below right) at all times.





BUFFERS ARE MULTIPURPOSE SANDERS

A buffer's slow oscillating head can be fitted with various abrasives. A buffer with an abrasive nylon pad and screen (photo below left) blends disparate areas of a sanded floor. Hook-and-loop strips of sandpaper (photo below right) are loaded on the buffers pad to smooth finishes between coats.



start from the left and work toward the right (photo top left, facing page). I position the edger so that the disk is cutting in the same direction as the wood grain (top photos, facing page). Taking a couple of passes over a distance of about 20 in. or so, I move the edger back and forth in a sweeping motion, then repeat the motion a little farther out until I'm about 1 ft. from the wall. A couple of side steps to the right put me in place to start a new area. As anyone who has used one knows, an edger can be hard on your back. Although it may be comfortable to kneel while edging, I've found that I can rest my back and go faster if I stand up and rest my elbows on my knees while holding the machine.

After a thorough sweep, I load the big machine with 100-grit paper and sand the entire floor again, parallel to the grain. Once this last sanding is complete, I go back with a wooden-handled scraper and a small random-orbit sander with 100-grit sandpaper to hit the hard-to-reach perimeter areas. Any cross-grain sanding marks should be taken out at this time.

Buffing readies the floor for finish

I use a buffing machine (bottom photos, facing page) to unify the surface areas that have been sanded and edged. Most buffers turn counterclockwise and abrade the floor from the five o'clock to the one o'clock position. As with the edger, it's important to orient the buffer so that the screen is going with the grain of the floor.

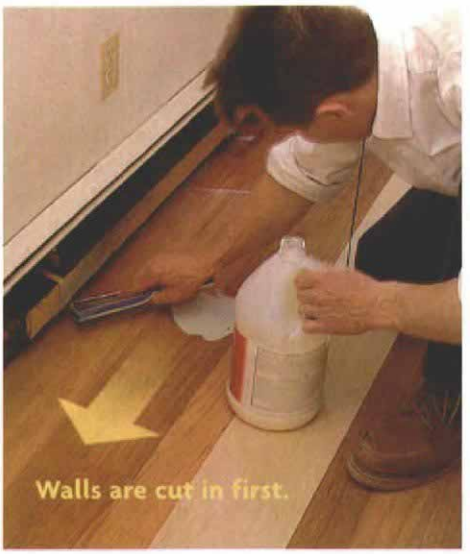
After loading the buffer with a driving pad and 120-grit screen (photo bottom left, facing page), I go over the entire floor. Because screens wear down fairly quickly, I want to address the perimeter first because it is the area that needs the most blending. I start along one wall at a slow, steady walk and buff the entire perimeter, then go up and down the floor. At the end of a pass, I turn and overlap half of the last swath, working my way toward the middle of the room. When I've reached the middle, I start with a fresh screen from the opposite wall, again buffing toward the middle. Any areas where the buffer can't reach have to be hand-worked with a piece of screen.

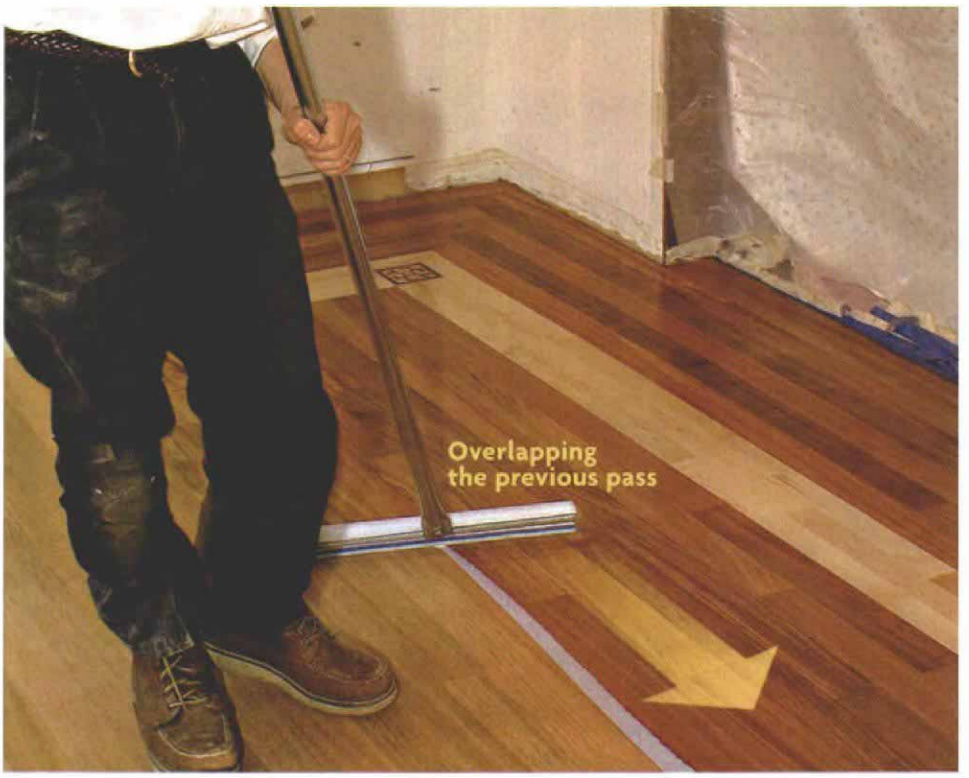
A thorough cleanup yields a great-looking job

After the dust has settled, I vacuum every inch of the room. I use a Pro-Team backpack vacuum (www.pro-team.com; 800-541-1456) that's easy to carry, but any vacuum that you use should be outfitted with a HEPA (high-efficiency particulate air) filter to clean out the dust and not dump it back

APPLY WATER-BASED FINISHES IN A CONTINUOUS POUR

The secret to a successful floor finish is keeping the leading edge wet. The finish is poured out in a long puddle (photo below left) and then pulled the length of the room with a T-bar applicator (photo below right). At the wall, the applicator sweeps the finish through a 180° turn (bottom photo) and back across the room with a slight overlap of the last pass.





into the air. I also make sure that dust that has collected on windowsills, the floor and other horizontal surfaces is picked up with a clean, lint-free tack rag. To make a tack rag, I lightly dampen a clean rag with the solvent used in the finish (mineral spirits for oil-based finishes, water for water-based finishes) and wrap it around a push broom. Moving the broom in only one direction helps to keep the dust on the rag.

The finish begins with a sealer

Although I don't use them exclusively, I like water-based finishes because they dry faster, they don't add color to a floor and they are often more durable. No matter what finish I'm using, though, I always read the manufacturers directions carefully before I start.

Water-based top coats require compatible water-based sealers. Like paint primers, sealers reduce the absorption of subsequent coats so that a layered finish can build up on the wood's surface. Sealers also help to protect against stains and help some finishes to adhere to the floor.

The sealer I used on this floor, Color-lok (Basic Coatings; www.basiccoatings.com; 800-441-1934), is applied in the same manner as the top coat (photos p. 61) with straight, snowplowing strokes that spread out the finish. When working with most water-based finishes, I'm careful not to overwork the finish so that it doesn't foam up; the faster drying time could trap air bubbles. After the sealer is dry, I buff the floor per the manufacturer's recommendations to increase the adhesion between coats and to remove small imperfections.

Although some installers use buffing screens, I like to use 1-in. wide sanding strips (3M Corp.; 888-364-3577; www.3m.com) that hook and loop onto a buffer-driving pad (photo bottom center, p. 60). They seem to produce a higher quality finish. I generally use 180-grit strips for oil-based finishes and 240-grit strips for water-based finishes.

Wet edge for water-based finishes

Water-based finishes have a reputation for being difficult to apply. Applied too thinly, the finish may have variations in sheen; too heavy an application, and bubbles might appear in the finish. For these reasons, manufacturers specify a particular applicator (usually their own brand) that meters the thickness of the finish. The sealers and top coats must be compatible, so for this project, we used a top coat from Basic Coatings as well.

I cut along the baseboard with a hand pad (top photo, p. 61); rather than cut the entire room, I cut as I go to maintain a wet edge. The majority of the finish is applied with a damp T-bar applicator (photo center right, p. 61). I pour a line of finish down the length of the room (photo top left, p. 61), pouring a bit less as I approach the wall. A clean plastic watering can is a great tool to help meter the puddle line. Once I reach the wall, I go back and steadily pull the applicator through the long puddle of finish, directing excess finish toward the room's center. At the end of the room, I sweep the applicator through a 180° turn and start back (bottom photo, p. 61), slightly overlapping my last pass.

The trick here is always to keep a wet edge and not stop in the middle of a coat. I keep steady, even pressure on the applicator. Water-based finishes leave lap marks if allowed to dry, so the entire coat must be applied in one session. When the puddle starts to thin, I stop and pour more to stay ahead of myself. Spots that are missed can be touched up if the surrounding finish is still wet; otherwise, wait until the floor is dry. If it's possible, shade the floor from direct sunlight; if one area dries too quickly, it may stand out. After the first coat is dry, I buff the floor, wipe it with a tack rag and start the next coat. □

Charles Peterson is a flooring contractor in Gales Ferry, CT. Photos by Charles Bickford.

What to look for when renting a sander

If you don't finish floors for a living, it makes sense to rent sanding equipment, especially if you don't have the $5,000 for a new sander. Essential sanding equipment includes a large floor (belt or drum) machine, an edger and a buffer. It's a good idea to know what to look for when you go to the rental center: You won't be the first person to use these machines, and many of them aren't in the best shape.

Most places rent drum sanders (photo below) rather than belt sanders. It's a good idea to inspect the drum for damage that could create imperfections in the floor. Also, check the drum's paper-clamp mechanism; you shouldn't have any problems loading the paper tightly.

The edger's rubber backing disk should be flat, and the wheels should be round and clean. Give the power cords a close inspection, too, because they are often abused.

Before leaving the rental shop, ask how to set up and adjust the machines. Wheel and drive-belt adjustments are especially important to a smooth-running sander.

—C. P.