

Surface Prep: Why Sanding Isn't Enough

Three-step process
leaves a flawless surface
for finishing

BY PHILIP C. LOWE

As the knives on your jointer and planer go dull after the first few board feet, the surfaces of your boards take a turn for the worse. Instead of cutting the wood cleanly, the dull knives heat the surface and pound it into a compressed layer of fibers. Unfortunately, many woodworkers go straight to sandpaper at this point, removing just the tool marks and no more. Without slicing well below that crushed layer, they never see the full beauty of the wood. Minute characteristics, such as the pores and medullary rays, are obscured. To expose these hidden elements, the surface must be cut cleanly. One reason why antiques have such a glow is that all of the surfaces were planed and scraped.

I haven't been able to improve much on the classic methods for

fine surface preparation. I still find that a sharp smoothing plane and scrapers are the most efficient tools to get the best surface. Aside from cutting quickly below that "compression layer," these tools leave a dead-flat surface and produce less dust.

The following process may seem like a lot of bother, but each stage involves only a few strokes with a well-tuned tool to remove the marks made by the previous tool. Don't get me wrong—I love the thickness planer as much as the next guy. It takes away hours of drudgery, leaving more time for joinery and ornamentation. But it's just a starting point for fine surface preparation. □

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STEP 1 HANDPLANE ALL SURFACES

The process starts after the parts have been thickness-planed and the panels have been joined. Begin by planing all surfaces with a No. 4 smoother. Sharpen the blade with a slight curve over its entire width, leaving the corners about $\frac{1}{64}$ in. back from the center. This crown prevents the corners from digging in. An iron that is correctly ground and properly adjusted laterally leaves a series of subtle undulations or hollows in the surface.

A handplane quickly flattens a surface, leaving it level but textured. A random-orbit sander, on the other hand, just follows the ups and downs that are already there. If you put a glossy finish on a tabletop that has gone straight from glue-up to sandpaper, be sure not to look at it in a raking light. You'll see hollows where there was planer snipe, where boards were misaligned and where the sander lingered.

TIPS FOR SUCCESS

Adjust the frog so that its leading edge lines up evenly with the throat. If it is skewed, the blade will not project through the throat squarely. Make sure the bottom edge of the chipbreaker meets the blade cleanly. If there are any gaps, the chipbreaker will clog with shavings and prevent cutting. File and hone the chipbreaker flat along its bottom edge.

Like most surfacing tools, the handplane should be pushed in the direction of the grain but skewed slightly to create a shearing action. The cap iron should be tightened enough to keep the iron from shifting in use.



Handplaning is the most important step. A well-tuned smoothing plane will flatten the surface quickly and slice below the "compression layer" left by planer blades. To make the job easier, rub some paraffin on the sole and skew the plane slightly to create a shearing action.



A slightly crowned plane blade won't dig in at the corners. Grind and hone a gentle curve across the entire width of the blade, with the corners about $\frac{1}{64}$ in. back from the center.



Secure the blade tightly. Planing with the tool held at an angle puts lateral pressure on the blade and can shift it out of alignment.

STEP 2 REMOVE TEAROUT WITH A CABINET SCRAPER

Even the best-tuned smoothing plane leaves undulations and tearout. These imperfections become quite apparent once a finish has been applied. The Stanley No. 80 cabinet scraper, with its $2\frac{3}{4}$ -in.-wide blade, removes these textures, leaving even shallower undulations in their place while maintaining the level surface.

The blade of the cabinet scraper is tipped forward in the body of the tool at about 30°. The edge is burnished like a card scraper, but it starts out at a different angle. File a 45° bevel along its edge

using a second-cut mill file, then hone it on medium and fine stones to create a sharp edge for burnishing. To create the burr, hold the blade in a vise and draw a burnisher along the edge.

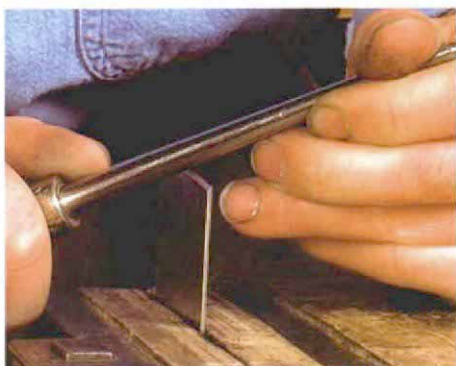
TIPS FOR SUCCESS

To prevent the sharp edge from getting nicked, place the blade in the tool by sliding it up through the throat. When setting up the tool, loosen the thumbscrew on the back of the body until there is no tension applied to the blade. Now place the body

on a flat surface, let the blade drop down level with the sole and tighten the screws to hold the iron securely. Turning the thumbscrew on the back of the body bows the blade, which makes the cutting edge protrude and regulates the amount of cut.

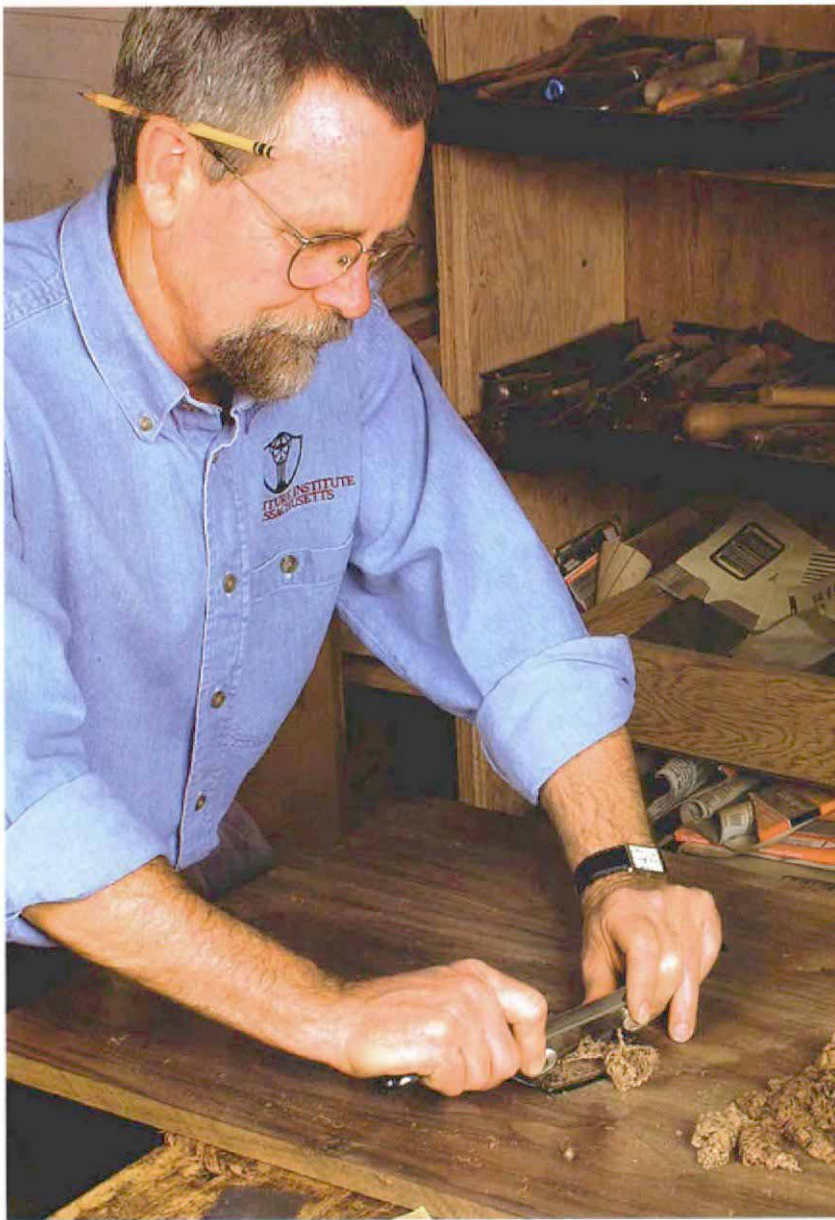
Push the cabinet scraper along the grain, removing the undulations and tearout left by the plane. The hollows left by the No. 80 are shallow, but if a finish were applied at this stage, the unevenness of the surface would still be apparent. The card scraper is the next step.

Burnish the hook onto the edge. Start with the burnisher at 45°. Then tilt it slightly toward level for subsequent strokes.



Place the tool on a flat surface. Loosen the thumbscrews and let the blade drop down level with the sole. Then tighten the screws while keeping the blade in contact with the surface.

Next, tighten the thumb-screw on the backside. This bows the blade, regulating the depth of cut by making the blade protrude from the sole.



The Stanley No. 80 cabinet scraper removes material faster and more uniformly than a card scraper. Continue until all of the handplane marks and most of the tearout are gone. Again, angle the tool for better cutting action.

STEP 3 HAND-SCRAPE AND SAND



Use a wide card scraper to remove the subtle hollows left by the cabinet scraper and any remaining tearout. The flat blade should be bowed in the hands as it is pushed or pulled across the work. Scrape in the direction of the grain, and skew the tool slightly.

The card, or hand, scraper cleans up nicely after the first two tools, leaving much subtler depressions. Like the cabinet scraper, this blade employs a burr as its cutting edge.

However, the edges are filed and honed to 90°, leaving four square corners to be turned over into cutting hooks using a burnisher (for more on sharpening and using a scraper, see *FWW* #147, pp. 94-96).

When this wide tool is sharpened correctly, it will surface a board quickly. It should be bowed slightly in the hands and pushed or dragged across the surface. A card scraper removes any leftover tearout or tool marks from a board, but it leaves a slightly detectable texture.

OKAY, BREAK OUT THE SANDPAPER

To bring the panel to final smoothness, go through a few grits of sandpaper. Start with 120 grit wrapped around a block of wood that has a thin piece of fine cork glued to the surface. Be careful to make all strokes in the direction of the grain.

Next, raise the grain by wetting the surface with a damp rag. Let it dry and jump to the next grit of sandpaper (150) and continue through 180 and 220 grits.

WORTH THE EFFORT

Each of these steps is essential to the process, and together they will produce the finest surface possible for staining and finishing. Tune up your tools, and give it a try. You will uncover a clarity in your wood surfaces that might surprise you.

No power sanding needed. Start with 120 grit. Sand evenly and use a cork-lined sanding block to maintain the flat surface.



Raise the grain. After the first sanding grit, wet the surface with a damp rag and let it dry before continuing through the grits to 220.