Are You

Random-orbit sanders are not as foolproof as they seem

BY TERI MASASCHI

Just about every woodworker has a random-orbit sander. They're cheap to buy, they can handle any job, and you don't need to serve an apprenticeship to use one effectively. But you do need to understand how the tool works. Most people don't. Perhaps they saw one being used on TV, a friend gave them a one-minute lesson, or more likely they simply slapped a disk on their new sander and hit the wood.

The result is too many pieces that show the telltale evidence of poor sanding. These include failure to remove planer and jointer marks or scratches from coarse sandpaper, and surfaces that are smooth but not flat, with depressions and rounded-over edges.

I'll tell you how to handle the sander correctly, what grits to start

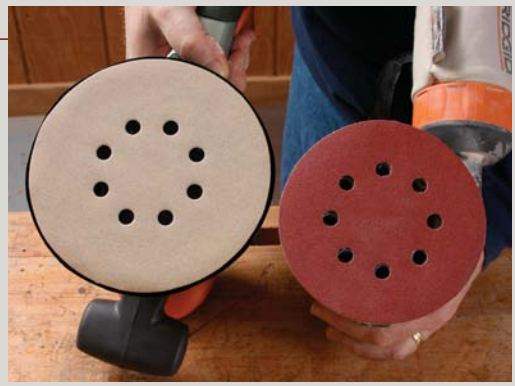
Choose your weapon

5-IN. SANDER IS NIMBLE

Almost everyone owns a 5-in.-dia. random-orbit sander. They aren't expensive, and they can handle almost any task from sanding chair legs and frame-and-panel assemblies to smoothing big tabletops.

6-IN. SANDER COVERS MORE GROUND

The extra inch gives you nearly 45% more sanding surface, which not only covers large, flat surfaces faster but also does a better job of flattening them (for a test of 6-in. random-orbit sanders, see *FWW* #202).



Photos: Mark Schofield

Sanding Right?

and end with, and how to check your progress. It's worth learning how to sand correctly, as sanding is the most critical part of the finishing process. A well-sanded piece is already half finished!

A light touch and a slow hand

One of the biggest sanding debates is about whether to land the sander on the surface running at full speed, to place it on the wood and then turn it on, or to try a compromise, touching down while the motor is still picking up speed. In truth, do whatever feels best (this can vary by model); it really doesn't matter. What is more important is how you sand once you begin.

A key factor is how fast you move the sander over the workpiece. Some people work in a frenzy, moving the sander rapidly back and forth as if they were using a sanding block. Others spend too long sanding the same spot. The correct speed is eight to 10 seconds per foot. The frenzied among you will find slowing down like coming off the highway and going 25 miles an hour, but skittering the tool around doesn't help: You can't possibly move faster than the sander's vibration. On the other hand, slowing down allows you to keep better track of your sanding pattern and to be sure you are covering the surface evenly.

Random-orbit sanders need to float on the surface with light pressure to produce an optimum orbital pattern. Don't push down on the sander in the belief that it will cut faster. You'll just cause the tool to bog down, load up the paper with dust, and leave swirl marks on the wood. Bearing down also will create excessive heat, which can warp the sander's pad. If the sandpaper is constantly wearing out only around the perimeter, the pad has been distorted by heat buildup around the edge and you need to replace it.

Other secrets of success

When sanding a wider surface, overlap each pass by between a third and a half to ensure even coverage. As for the edge of the workpiece, it's fine to overhang it slightly, but keep at least two-thirds of the pad on the surface to avoid the risk of tipping the sander and rounding over the edge. If you are working on narrow surfaces such as legs or the edges of boards that individually can't meet the two-thirds rule, consider clamping identical pieces together and sanding them collectively. The wider surface provides a more stable platform for the sander.

One thing you should never try to do with a sander is to break or bevel an edge. The action is not designed to work on a narrow

The 5-in. sander is the one most woodworkers should buy first. It's versatile and a must for narrow surfaces such as chair legs, but there are some good reasons a 6-in. machine should be second on your list. If you do a lot of sanding, take a look at the Mirka Ceros sander (see *FWW* #218, p. 20). It has the light weight and low center of gravity of an air sander, yet it is electric, so there's no need for a large compressor. That said, the Ceros costs about $500, considerably more than most electric sanders.

Years ago, pressure-sensitive adhesive (PSA) disks were cheaper than hook-and-loop (H&L) ones, but if you were sanding a small piece you often had to discard a PSA disk before it was used up, whereas H&L disks can be reused. Now the cost has nearly evened out and most sanders come with a H&L pad. Yours should, too.

Don't spend extra on a sander with speed control: I have never understood why anyone would sand at lower speeds and not keep the sander at its maximum setting. The only exception is wet sanding or polishing, which you shouldn't do with an electric sander anyway because of the risk of a shock. ***—T.M.***

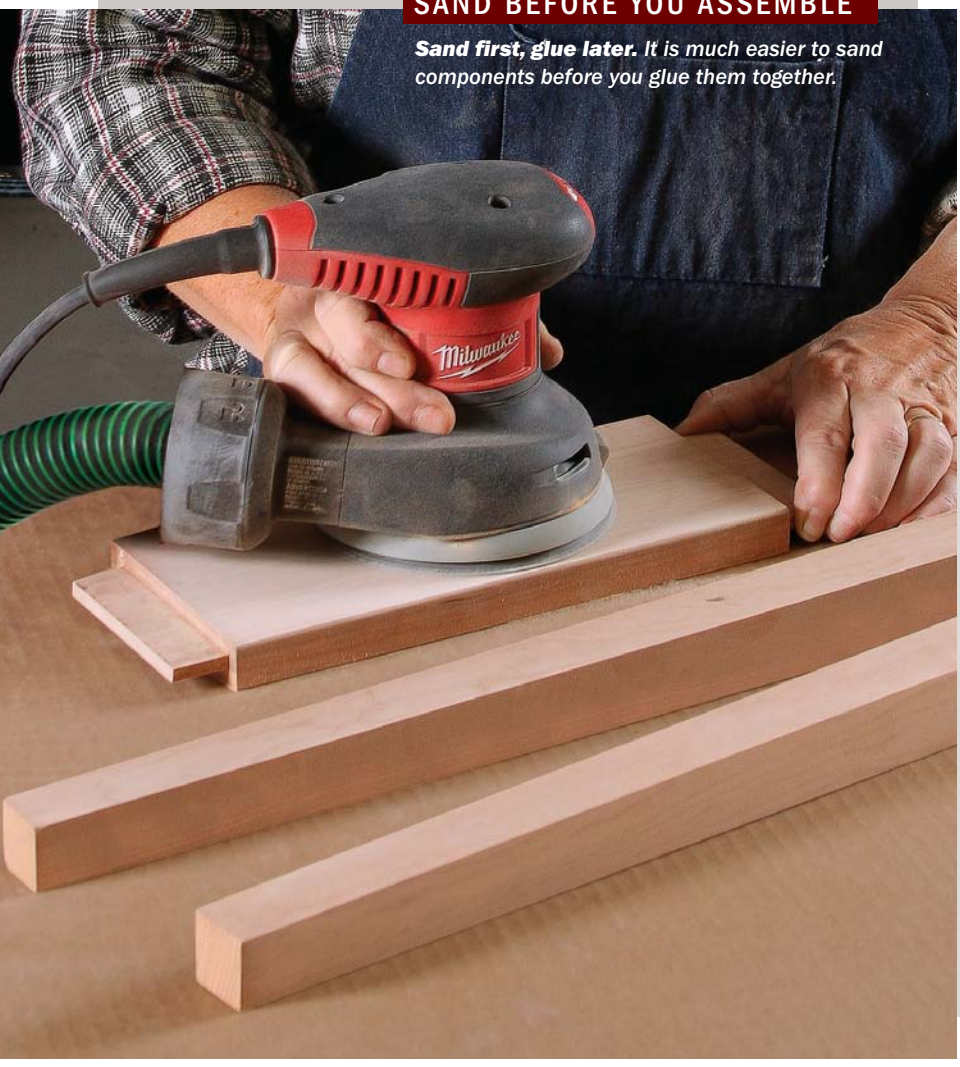
AIR POWER FOR HARD-CORE SANDERS

The majority of professional finishers and large cabinet shops use air-powered sanders for several reasons: They are more compact, lighter, and less top-heavy than their electric counterparts. They have fewer moving parts, last longer, and can be repaired rather than being generally disposable. However, these sanders are air hogs and at 90 psi, they need 20 plus cubic feet of air per minute, which translates into a 50- or 60-gal. compressor, compressed air lines, and in-line air filters and driers. That is the real expense of these machines, which makes them hard to justify for a hobbyist.

THE RIGHT RATE

Slow and steady. *Advance the sander at a rate of about 8 to 10 seconds per foot, rather than rushing the sander all over the place. This lets the sander do the work and lets you keep track of your pattern, so you sand uniformly.*

SAND BEFORE YOU ASSEMBLE



Sand first, glue later. *It is much easier to sand components before you glue them together.*

edge and you'll end up with an irregular surface. Break edges using a sanding block or bevel them with a block plane or a router bit.

There is no doubt that random-orbit sanders create enormous amounts of dust. Effective dust pickup from the sander will not only keep the air clear but also keeps dust from packing the spaces between the abrasive particles and killing sanding efficiency. Hooking up a vacuum to the sander speeds stock removal and will extend the life of the disk.

Even with a vacuum attached, it is still necessary to sweep, vacuum, or blow off the surface before switching sandpaper to the next higher grit. Otherwise, leftover abrasive from the previous grit can create occasional deeper scratches even after you've switched to a finer disk.

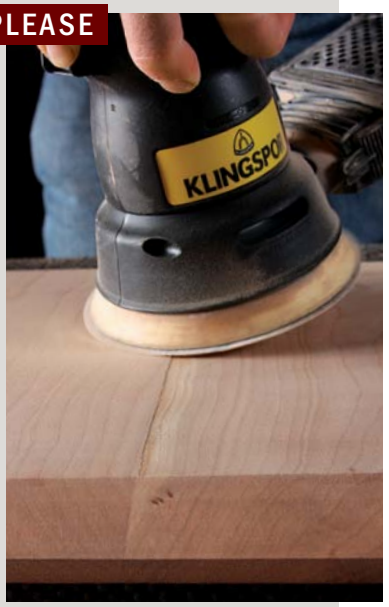
Guide to the grits, from start to finish

The first grit is unique: Its job is to remove surface defects. How coarse that grit should be depends on the severity of those defects: For large changes in height such as planer snipe or uneven edge-glued boards, you should start with 80 or 100 grit (it would be quicker, though, to remove the bulk of the high areas with either a handplane or a belt sander with a 100-grit belt). If the surface is essentially level but there is some tearout, you can start with 120 grit. If you have a smooth, flat surface left by either a well-tuned planer or handplane, you can start with 150 grit.

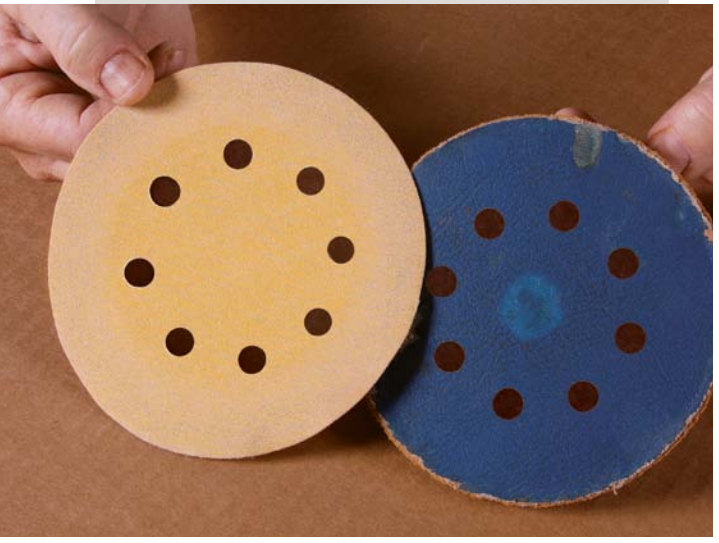
TIP IF YOU MUST SAND AFTER ASSEMBLY

If you glued parts together before sanding them, it can be difficult to sand corners without damaging adjacent parts. A large drywall-taping knife lets you work into the corner safely.

NO TIPPING PLEASE



Not an angle grinder. *Don't try to concentrate the sanding power in a small area by tipping the sander. You'll create hollows in the surface. You also risk overheating the rim of the pad and causing it to expand. A sign this has happened is if the disk wears only toward the outside (below).*



MANAGE THE DUST AND GRIT

Attach a vacuum. *As well as keeping your lungs cleaner, attaching a vacuum lets sanders cut faster and extends the disk's lifespan.*

Clean between grits. *Remove any dust left on the workpiece before switching to a higher grit. It reduces the risk of coarse abrasive contaminating the finer disk, and it keeps the shop cleaner.*

Stick with this first grit until *all* of the defects have been removed, and if it is taking too long, switch to a rougher grit. The purpose of subsequent higher grits is only to refine the scratch pattern of the previous grit, not to remove defects. If you switch to a higher grit when *most* of the defects are removed, you may never get rid of them. Most likely you will go through several disks of this initial grit, so don't be tempted to extend their life. Most disks lose their cutting action dramatically after 15 to 40 minutes for coarse 80- to 120-grit disks and half that time for finer 180- to 220-grit disks (see "Tool Test: Sanding Disks," *FWW* #222). After that, it is time to toss them. Continuing to use these disks can cause the dreaded swirl or "pigtail" marks from sandpaper that is clogged. Secondly, don't think that if you start with 100 grit and use it

Two common jobs

IT ALL COMES TOGETHER ON TABLETOPS

The tops of cabinets, chests, and tables are the most visible surfaces and therefore require the most careful sanding.

Level first. *The first stage is leveling the surface. The grit you choose depends on how much material you need to remove. Letting up to a third of the sander's pad overhang the edge of a work surface helps ensure uniform sanding. But go beyond a third and you risk tipping the sander and rounding the edge.*

Check the surface. *Looking across the surface into a raking light (above) helps reveal any imperfections. This pigtail squiggle (right) was probably caused by a piece of debris that the sander picked up when it was set down on the bench.*

long enough, it becomes 120 or 150 grit. It just creates 100-grit scratches, more and more slowly.

To see if you've removed all the defects, vacuum the dust, wipe on some denatured alcohol or mineral spirits, and check the surface with a raking light.

The two-line trick—The subsequent grits go much quicker. Draw a light pencil squiggle across the surface and sand the entire surface until it is gone. Draw a second line and sand it off. Now switch to the next-higher grit; it's as simple as that. As you move to higher grits—120, 150, 180, 220—the appearance of the surface will improve as coarse scratches are replaced by finer ones.

The industry standard for what should be the final grit is 220 for softwoods and 180 for hardwoods. This standard applies when using any film-building finish such as shellac, lacquer, and water- or oil-based poly-

Then smooth. *After you've removed surface imperfections with a coarse grit, the role of subsequent finer grits is to refine the scratch pattern. Here's a great way to know when to switch grits. Draw a light pencil line across the surface and sand the whole surface until the line is gone. Repate and then move on to the next-grit disk.*

Hand-sand last. *Once you've completed the final grit with the sander, use a sanding block with the same size grit, sanding with the grain. This removes any swirls left by the sander. Finally, use 180- or 220-grit paper and a sanding block to break the edges. Don't attempt this with a sander.*

HOW TO HANDLE A FRAME-AND-PANEL

Right and wrong sanding both before and after glue-up can make or break your frame-and-panel assemblies.

PANEL

Flat surfaces first. *It is fine to use a power sander on the raised portion of the panel and its back.*

Hand-sand the profile. *Don't use the sander, even on a flat, bevel-edged profile. Instead, hand-sand up to the same final grit as used on the sander. Go to 320 or 400 grit on the end-grain sections, so they don't absorb too much finish and end up darker than their surroundings.*

FRAME

Gang up parts. *To sand the narrow sides of the frame, clamp them in pairs to provide a wider surface for the sander to ride on.*

Sand the face after glue-up. *After the frame is glued up, you need to level the joints. You may want to reduce major high spots with a hand-plane, but a random-orbit sander is ideal as it won't leave any cross-grain marks on adjacent parts.*

urethane or varnish. But if the surface is going to get a French polish or a thin-finish such as a penetrating oil, then it is a good idea to continue up to 400 grit. If you can't find 320- or 400-grit disks locally, you can mail-order them or, if you have a small project, you can apply these grits by hand using sheets of sandpaper and a sanding block.

In any case, always do the final sanding by hand. Use the last grit that you used on the machine, wrap it around a cork-faced block or any firm sanding block, and sand with the grain in long, straight strokes. This will remove any sneaky swirl marks or other flaws and will soften the edges and refine delicate details. Check the surface again as before. You'll spot any flaws before you apply a clear coat or stain, and you can finish your project confident in its final appearance.

If you've never experienced a well-sanded project, you'll be surprised at how nicely the finish goes on.□

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