



Keeping your files clean is the key to keeping them working. A good file card (left) will have stiff brush bristles on one face to clean rasps. On the other side will be wire bristles, which are good for cleaning files.



Get a rasp with a half-round profile like the ones shown here. The round profile allows you to sneak into inside curves that the flat face would butcher.

FINISHING TOOLS

After all your parts have been cut, you need to prepare the surfaces for finishing. And that's when you should turn to your files, rasps, sander and block plane.

Rasp and File

Rasps and files are free form shaping tools. They can be used on their own to create shapes or they can clean up the work left by other tools, such as the jigsaw. The rasp is the coarser tool and you use it before you turn to the file.

There was a time in history when a discussion on rasps would be quite lengthy. There used to be hundreds of patterns and sizes available to the woodworker. Now you're going to be lucky if you find more than one kind to choose from at the store.

Files are a little different matter. They are actually a metalworking tool and there are a lot of files available. For woodworking (and the metalworking involved in woodworking) I think you simply need one file; a bastard-cut file will do – either the 8" or 10" length. This file will smooth wood nicely.

Rasps are merely the coarser cousins of files. Finding a good rasp can be a challenge in some stores, but most home centers carry at least one. You'll typically find them labeled as bastard cut, second cut and smooth cut, which is an indicator of their coarseness. Bastard cut is the coarser one; smooth cut is the finer one. Because we're going to do most of the work with a jigsaw before turning to a rasp, I recommend you try to get a smooth cut rasp. Look for one that has one flat face and one face that curves out. Sometimes this is labeled as a half-round profile. This will allow you to shape inside curves.

Avoid the four-in-one rasps, sometimes labeled shoe rasps. These tools have two working ends, one coarse and one fine. They seem like a good idea, but the tools are actually too short for many woodworking applications. Longer rasps are better. You get more control from taking two long strokes rather than 10 short strokes.

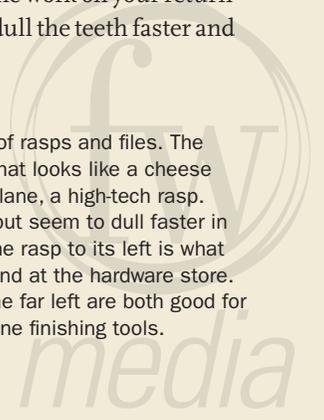
In addition to your rasp and file, you'll

need what's called a file card to clean them. As you use a rasp or file, the teeth will get clogged with wood fibers. The file card is a brush that cleans the tools so they continue to cut well. Most file cards are like a small hairbrush with two faces. One side has synthetic black bristles; the other has metal bristles. Use the black bristles to clean your rasp; use the metal bristles to clean your file.

One more accessory: a handle. Files and rasps have a pointed tang at one end. The tools are much more comfortable to use if you have a handle on one end. The handles, sold in the same section as the tools, simply screw off and on the tang.

The rules for using files and rasps are the same. Use the tools with two hands: One hand on the handle the other on the end. Like a saw, the tools cut only in one direction – on the push cut. If you drag the tool across the work on your return stroke you will dull the teeth faster and clog the tool.

A good selection of rasps and files. The tool on the right that looks like a cheese grater is a Microplane, a high-tech rasp. They work great, but seem to dull faster in my experience. The rasp to its left is what you'll commonly find at the hardware store. The two files at the far left are both good for woodworking as fine finishing tools.





A typical file handle. Some people swear by them; others never use them. I'm somewhere in between.



The rasp and file are generally two-handed tools. You'll get better control and a more square cut if you adopt the two-handed approach.

After every few strokes, tap the tool against your sawhorse or workbench. This shakes loose the big particles. When the tool starts to cut slowly, clean it with your card file.

When working with a surface fresh from your jigsaw, begin by using the rasp. Always begin your work with light strokes, which will show you where you are cutting. After a couple of light strokes you'll know if you have the tool at the right angle and you can then add some downward pressure.

Once all the marks left by the jigsaw are replaced by marks made by your rasp, you can switch tools. Use the same tech-

niques with your file as you did with your rasp and work the area until all the tool-marks left by the rasp are gone. The file can leave a good surface, but I still usually finish things up with some sandpaper.

After a little practice, you'll find that these tools (even the cheap ones) are extraordinary shaping tools. You can round over an edge easily and quickly clean up tool marks that would take an impossible amount of sanding. They also allow you to easily incorporate sculptural elements in your work that make you look a lot more advanced than you are (and that's what this is all about, right?)

Random-orbit Sander

Good sanding is the modern foundation of a good finish. And a good finish can make an average project look fantastic. Though sanding is a chore, it's something you need to get good at to produce good work as you begin your craft.

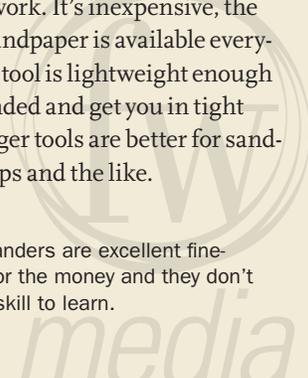
We do a lot more sanding these days than our forebears, who used bench planes, scrapers and some hand-sanding to prepare their surfaces for finishing. And truth be told, I do very little sanding in my shop, but that's because I've spent years using hand planes, learning to sharpen and so on. But that takes time, and the real beauty of our modern sanders is that they can produce an extraordinary surface with a far smaller investment in skill.

Oh, there are still some skills involved in using a sander properly and most effectively, but they can be taught in an hour or so and the basic moves are easy to pick up without a lot of instruction. The downsides to sanding with a machine are that it's mind-numbing work and it generates a lot of unhealthy dust.

So if you want to start building today, you are going to need a sander. Don't buy a belt sander – that's for hogging material off. Don't buy a pad sander. These vibrating tools use sheets of sandpaper and aren't very aggressive. Buy a random-orbit sander. These high-tech tools are a marvel. Though they have a disk that spins rapidly, it's also wiggling eccentrically. The result is that the tools strike a nice balance between aggressively removing stock and leaving a fine finished surface.

There are three body styles available: the small palm-grip tools, the big right-angle tools (that look like an angle grinder) and an intermediate tool that's between the two. I have used them all and recommend you get a palm-grip tool for furniture work. It's inexpensive, the 5"-diameter sandpaper is available everywhere and the tool is lightweight enough to use one-handed and get you in tight spots. The bigger tools are better for sanding big tabletops and the like.

Random-orbit sanders are excellent finishing tools for the money and they don't require a lot of skill to learn.



Generally, the variable-speed feature is unnecessary on a random-orbit sander. The only time I've slowed down the tool is when I was dealing with some really thin veneer. That's it.



So what should you look for when buying a random-orbit sander? Here's the funny thing, I have yet to find one I really dislike. They all work pretty well. Some vibrate a little more, some are a little slower, but they all pretty much do the job. These tools don't have a lot of bells and whistles available, so I think you can buy a basic tool and be just fine. Some of them are variable speed – I have yet to find a moment where I thought to myself: "Boy, I sure wish I could slow down the sanding process so I could really enjoy it." I'm sure there are some delicate jobs that benefit from this feature, but I think you'll be hard-pressed to say it's essential.

These tools don't have lasers, work-lights or wrist-straps (yet), so that's not a consideration. But one thing you should pay close attention to is the dust collection. Dust collection on almost all of these machines is a spotty business, and sanding kicks up a lot of the dangerous dust – the sub-micron stuff that gets lodged in your lungs. If you own a shop vacuum, get the upgraded filters for the vacuum and buy the hoses that attach to the sander. If you can't afford a shop vacuum, then you need a face mask that filters out this nasty dust. And not just a paper mask – I'm talking about a mask that's NIOSH approved. These are available at home centers and are the essential sanding equipment.

The other consideration is the sandpaper. Sandpaper can be expensive, but there's nothing more expensive than cheap sandpaper. The quality stuff (Norton 3X and Klingspor are both good brands) lasts a long time. I think you really need three grits to handle

most project building. Get #100- or #120-grit paper for your coarse grit. Buy the most discs of this grit because you will go through a lot of it. Do as much sanding with this grit as you can because it does the job fast. Then get a smaller quantity of #150-grit paper for your medium grit. This intermediate grit goes pretty quickly if you did a good job with the coarse grit. And then get a small quantity of #220-grit paper. Again, if you did a good job in the earlier grits, the #220 work will go quite fast.

People sometimes laugh when they hear there is a proper way to sand. After all, you simply put the tool on the work and move it around until everything is consistently sanded right? There actually is a little more to it than that, and proper use of the tool will ensure you get the job done in short order.

First thing to know: hand pressure. Try not to bear down too hard on the tool while you are working. It's tempting to do

After some experience with these sanders, you'll want to hook it up to a shop vacuum. The dust this tool makes is the worst. It's unhealthy and annoying. Adding a vacuum and hose to your sander will make your sanding faster (because the dust won't interfere) and (almost) pleasant.

this when you're sanding a rough patch, but it's not so good for the tool and there's a risk of you going too far when you get rowdy. Similarly, try to keep the tool flat on the work. It's tempting to sometimes tip the tool so one edge of the pad is contacting the work so you can work a small area of tear-out. This will work with a little skill and if the tear-out is shallow. If it's deep tear-out or you linger too long, you will create a valley in the work that may not be evident until you put a shiny finish on the work.



You'll need the biggest supply of #120-grit sandpaper (left) because it does the most work and needs to be replaced more regularly. You'll need less of the #150 (middle) and even less of the #220.



Move your sander in a regular pattern to ensure a consistent job. I'll start with overlapping strokes along the length of the board. Then I'll do overlapping strokes across the width. Then I repeat.



Always break the edges of your work before finishing. This makes your project nicer to the touch and makes your edges less susceptible to damage.



A raking light, such as the one shown here from a desk lamp, will point out the dings and scratches that your overhead lights will conceal. It helps to turn out your overhead lights as you sand critical areas (such as tabletops).

Second thing: Don't move too fast. Zipping around a board with a sander doesn't do the job. Manufacturers recommend moving the tool about a foot every ten seconds (at least, that's what a couple of engineers told me). I think that's too slow to be practical – try it and I think you'll agree. I go faster – maybe a foot every seven seconds.

Third: Work each surface in a consistent pattern. I like to work a panel left to right, slightly overlapping my passes. Then I come back and work the panel front to back in this way. This ensures I don't miss any spots.

Again, you'll do most of the work with the coarse grits. But how do you know when to switch to a higher grit? Once the workpiece looks consistently scratched to the naked eye, I'll take a desk lamp with a movable head or one of the yellow job-site lights and position it so there's a low, raking light across the work and give it a quick look. The raking light will point out any dings or divots or tear-out you missed as areas in shadow. If the board looks good under raking light, then switch grits.

The higher grits go faster. Much faster. Usually, I spend half the time (or less) with the #150-grit paper. And the #220 is used even less than that. After everything is sanded with the random-orbit sander, you might need to do a little hand-sanding with #220 paper in a few areas, sand the boards' edges and then break (slightly round over) the corners and sharp edges of all the touchable pieces. Sharp edges are fragile and don't feel good to the hand.

Breaking the edges is quick and greatly improves the tactile quality of your work. Use #150-grit paper in your hand and take down the corners slightly. A couple of strokes is usually enough.

You should be aware that you will have better results if you cut with the grain. Think of each board like a furry animal – the grain lines are the fur. If your tool is pressing down the fur as you cut, it's like petting an animal correctly. If you rub (or cut) the wrong way then the animal will get mad and the work will tear out.

Block Plane

Buying and sharpening a block plane is probably the most involved task we're going to ask of you as you get started in the craft. The barrier here is sharpening the blade – lots of woodworkers get tied up in knots about this simple and very important skill. Here's the promise: Once you learn to sharpen a single woodworking tool, the same principles will allow you to sharpen a lot of other things: chisels, carving gouges, all manner of plane blades, turning tools, marking knives and so on.

Sharpening is one of those "minute to learn; lifetime to master" things. The principle is so simple: A sharp edge is the intersection of (sorry for the geometry) two planes. The smaller the point of the intersection, the sharper the edge is. The act of sharpening is simply the abrading of those two planes until they meet at the smallest point possible. That's it.

Like sanding, you start sharpening with a coarse grit and move up in grits. You can use almost any medium to sharpen. Sandpaper works well as you're learning. You'll also find diamond stones and oilstones at the home center. Pick a system that fits your budget. If there's an oilstone that has coarse grit on one side and fine grit on the other, that's what I'd get. Sometimes it's called an India stone. Buy a little 3-in-1 oil and you're in business.

The Basic Strokes

There are lots of good books and web sites that can help you with sharpening. I'm going to tell you here how to get a good working edge that will get you started cutting pine and other work-a-day woods. My personal sharpening regimen is different, but everyone's is. The following requires the absolute fewest tools.

Disassemble the block plane and clean off the cutter. Notice that one end is wedge-shaped. This is called the bevel of the cutter. The flat part of the cutter that intersects the bevel is called the back of the blade. The back and the bevel are the two planes of your cutting edge and are what is to be abraded.

Begin with the back. There's a lot of metal here. Abrading all that metal flat would be a massive task. Remember that only the very end of the back is what does

Block planes are commonly available. Paying a little more will add some nice features – a blade adjuster, a mouth that you can close up for high-tolerance work and the blade pitched at a lower angle. That said, even the cheap ones work well on softwoods when sharpened.

the cutting. That's all you need to worry about. So we're going to cheat so that we work only that area (and get to work much faster). Take a thin, cheap 6" ruler and stick it along one edge of your sharpening stone. Now rub the back of the cutter on the stone with the cutting edge on the stone and the back part of the cutter propped up on the ruler. The ruler holds the back end of the cutter in the air so you work only the area up by the edge.

If you use the ruler in the same way every time you sharpen you'll find that the



angle stays the same. This is called the ruler trick and it was developed by British craftsman David Charlesworth. It's a big time-saver. Use the ruler trick on the coarse side of the stone and then on the fine. Look at the cutter, the scratches should be consistent and the metal should be shinier than when you started.

Now turn your attention to the bevel. This is the part that trips people up because they have trouble balancing the



By propping up the back of the blade as you work the back, you'll greatly speed the polishing action of this critical surface. The ruler ensures that every time you do this it will be consistent.



Learning to hone the bevel takes a little practice. Take it slow and check your work frequently. A honing guide is a good \$12 investment if you can find one at your home center.



A small block of wood can check the setting of your plane's iron. If the block of wood has the same amount of drag all across the mouth, then your blade is centered in the mouth and is projecting squarely – get to work!

Note the grain on the face of the board. See how it is heading up toward the edge being planed? Think of those grain lines as fur. If the tool is pushing them down as it works, the chances are your cut will be sweet.



tool on the stone on the narrow bevel. I like to use a little jig to hold the cutter for this part, but if you don't have a jig, it's still easy to pick up the skill. Start at the far end of the stone. Rest the tool's bevel flat on the stone (don't forget the oil). Now raise the tool just a tad so you're working only at the tip. Drag the tool toward you. Lift and repeat the stroke about four or five times.

Now feel the back of the blade with your thumb. There should be a little burr of metal curled over on the back. That's good; that means you really sharpened up at the tip of the tool. Work the bevel some more with your coarse stone and then your fine stone until your scratches look good. At the very end, you want to remove the burr. Put the ruler back on your fine stone and stroke the iron over the stone and ruler – this is called backing off. Wipe down the blade and reassemble the tool.

Setting a block plane is pretty easy. You want to project the iron equally all across the mouth. Turn the tool's adjuster to project the blade until it looks like it's just starting to emerge. You can feel this by passing your fingers lightly over the mouth or by sighting down the sole of the plane head-on. Then use a little scrap of wood to confirm your setting. Rub the block over the mouth. You should feel it drag as the iron removes a tiny shaving. And you should be able to hear it. Try it in several places along the mouth. If the drag feels the same and the sound is the same, then your iron is square in the mouth.

Using a block plane is a one- or two-handed operation – I prefer to use two hands as much as possible. Once you sharpen it up, you'll find endless uses for it. After you rip a board with your jigsaw, the block plane cleans up the sawblade marks, making the edge ready to finish (no sanding necessary). If two parts of a joint aren't in line with one another, the block plane can trim the proud surface flush.