WOODWORKER'S JOURNAL Weekly

# 100 Woodworking Questions and Answers

## Experts answer your most puzzling questions




WOODWORKER'S JOURNAL
America's leading woodworking authority™

Welcome to ***100 Woodworking Questions and Answers***, a collection of expert answers featured in the pages of the *Woodworker's Journal* and on woodworkersjournal.com. In these pages you'll find questions about nearly every aspect of woodworking, and answers from the top experts in the industry.

**About *Woodworker's Journal***

Woodworker's Journal is a national magazine that covers all things woodworking. Featuring the nation's most knowledgeable and skilled woodworking experts, the Journal offers projects, tips, tools and techniques in an easy-to-read and entertaining format. With large clear pictures and detailed technical drawings, the magazine is perfect for hobbyist woodworkers.

# Table of Contents





## POWER TOOL & MAINTENANCE


**Q** ***Should I Install a Larger Saw Motor?***

I have a Delta hybrid table saw with 1-3/4 hp motor. My motor is going south. Can I replace it with a 3 hp motor? I could get my current motor rewound to a 2 hp, but I would rather have a 3 hp. I am just wondering if the shaft and bearings will stand the 3 hp motor.

**A** **Rob Johnstone:** The answer to whether the drive components will hold up to a larger motor is "maybe." If you are asking for my advice, I'd say go for it. You would, of course, need to step up to 220V circuit, as 120V will not power a 3hp saw. If you ask the manufacturer I am sure they would say don't do it, but over the years a lot of folks have switched motors on saw and machines. You just need to accept the possibility that the larger motor may cause problems. For example, a saw designed for a

larger motor will have more than one drive belt to transfer the motor's power to the arbor. A single belt (which is what you have on your hybrid saw) will not be as robust and is not going to perform as well. (It may break, get worn out in a hurry, etc.) Then consider the pulleys that the belt runs in — they, too, might not be up to the task and may fail at some point.I guess what I want you to know is that you won't be getting the performance of a $2,000 Cabinet Saw by upgrading the motor on your hybrid.

**Chris Marshall:** Ned, for the reasons Rob points out, I'm not sure I'd get a significantly larger motor. If you were retrofitting an old cabinet saw from 60 years ago those saws could handle it. Today's lighter-framed models might not fare as well. If the saw has underperformed for you, maybe installing an appropriate-sized replacement motor and selling your hybrid, then stepping up to a heavy-duty cabinet saw, might be the better investment in the long run. Or, use a smaller, lighter dado set (a 6-in. rather than an 8-in.) and a thin-kerf blade to get the best performance from your moderately powered hybrid.

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**Q** ***Why is the output table on a jointer adjustable?***

**A** **Michael Dresdner:** "Originally, it was to accommodate the changing size of jointer blades, as they were ground down during successive sharpenings. But it also is convenient for those days when you manage to get all three blades at the same height, but not necessarily at the same height as the outfeed table."



**Rob Johnstone:** "As Michael said, its first priority was practical but, woodworkers being who they are, they soon took advantage of the tool's adjustability. You can make tapered cuts (that work well for tapering table legs, for example) by clamping a ramp onto the outfeed table. You can adjust the taper with either table."

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**Q** ***My new Porter Cable router comes with two collets, 1/4" and 1/2". What is the advantage of the 1/4" size over the 1/2", or vice versa? It seems that the larger would be stronger, but I think there must be another reason for manufacturing the two sizes. I would like to have an idea of what to get as I start to build a library of bits. Right now, I will be doing light work, but in the months ahead, my tools will be used almost daily, so I will need some durable stuff.***

**A** **Michael Dresdner:** "Some bits don't come in 1/2" shank format, and some buyers already have many 1/4" shank bits from other router purchases. Simply put, the 1/4" collet allows you versatility. Think about a flush

cutting bit or "pattern" bit with the bearing on the shank above the cutter. It has a bearing pressed over the shank, and its outside race is the size of the cutter."

**Ellis Walentine:** "Many routers come with two collets so they can accommodate the two most popular bit shank diameters, 1/4" and 1/2". The shank diameter is based loosely on the size and weight of the bit. Heavier and larger-diameter bits have 1/2" shanks, to protect them against bending or breaking during heavy routing. Some small to medium bit sizes and profiles are available with either size shank. Generally, you will get less vibration with the 1/2" shanks, but 1/4" is available so you can run these bits in smaller routers that may have only 1/4" collet capacity."

**Lee Grindinger:** "You're right, the larger diameter is stronger and generally results in less chatter due to it's increased rigidity. However, there are times a 1/4" shank is more practical. Most dovetail jigs use template guides and these guides are sized so only the 1/4" shank will fit through the hole. Smaller bits, like 1/8" straight bits are sometimes offered only in 1/4" shanks. So, keep the small collet but do buy the 1/2" bits when possible or practical."

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**Q** ***Do I need to change speeds on my lathe for harder or softer woods?***

**A** **John Swanson:** The speed should be a function of the diameter of the wood, not the density. The speed of the lathe times the diameter of the pieces should never exceed 8,000. If the wood is less than round, this rpm should be lowered.




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**Q** ***I have toyed with the idea of buying a band saw, but I don't know what I could do with it that I don't already do with my table saw and sliding compound miter saw. Should I buy one?***

**A** **Mark Hensley:** Try cutting an arc or circle on the table saw.

**Carol Reed:** Check out a book on band saws from your local library and feast your eyes on the possibilities.

**Richard Jones:** If you need to cut irregular shapes, curves and circles, they're a boon. Resawing or deep ripping of wide planks is a relatively safer operation with a band saw than on a table saw.

**Q** ***Where can I get information on fine-tuning planers and jointers?***


**A** **Michael Dresdner:** As with anything, you can get information online by asking specific questions at one of the popular woodworking message boards. However, I'd go with a good book on the subject. Choose one that offers a combination of clear photos and accurate information, such as Mastering Woodworking Machines by Mark Duginske.

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**Q** ***How do you determine what speed your router is running at? You mention, for example, to run at 16,000 RPM instead of 18,000. My one router has a dial labeled 1 to 10 and another has 1 to 8. There is no way that I know how to tell how fast it is running unless I attach a tachometer to it.***

**A** **Chris Marshall:** I have six different mid-sized routers in my shop, and four of them either have RPM ratings right on the speed dial or provide a handy cross-reference chart on the motor that explains the numbers on the dial. Unfortunately, like your machines, two of my routers don't make the speed settings clear. Instead of trying the tachometer route, I suggest you call these two manufacturers and ask for clarification about your specific models. Their technical service departments should be able to provide that information for you.

**Rob Johnstone:** Chris's advice is right on the money to get you dialed in to the exact RPM that you desire. And whenever you get that sort of direction from the bit company, you should work to follow the directions closely. I've found that often you won't have that information to work with. The general rule to follow in that case is the larger the diameter of the bit, the slower the RPM setting. For me, any diameter 3/4 of an inch or less, and I let it run at full speed. Over 1-inch, and I start to dial it down. As you gain experience, you can "feel and hear" as you make a cut if you are in the proper speed range. (And really, Chris, six mid-size routers! Now you are just showing off!)

**Q** ***I have VERY limited space in my basement. I bought a Sears Table Saw that's along the lines of a contractor's saw. Can these saws be fitted with zero-clearance inserts? Also, is there a method for creating a cut-off table for this saw?***


**A** **Chris Marshall:** If the throatplate for your saw fits down into a fairly deep recess in the table, you should be able to make zero-clearance throatplates for it pretty easily. Make sure the thickness of your throatplate material matches the thickness of the throatplate that came with your saw. On the other hand, if your saw's throatplate is made out of a thin piece of steel, it will be more difficult or even impractical to make a zero-clearance throatplate for it. One option you can try is to cover the blade opening on your throatplate with a piece of wide packing or painter's tape, then raise the blade up through it to cut a thin slot. This can serve as a quick, makeshift solution for zero clearance. Concerning cut-off tables, since your saw has a motor that extends out in back of the machine, I would suggest making a work table that you can roll or slide up behind the saw instead of attaching a cut-off table to it. Make the table's overall height about 1/4 in. lower than your saw table. The extra work table will help with other shop tasks as well as provide a way to catch those offcuts coming off the saw. You'll kill two birds with one stone!

**Q** ***Somewhere along my pathway of woodworking, I was told that a table saw blade should be limited to 1/8th inch above the wood being cut. In pictures in different magazines, I have seen saw blades raised as much as 2 inches above the wood. Is there a rule for this? And if so, why?***

**A** **Chris Marshall:** Our own master woodworker Ian Kirby sums up the issue of how high to set your blade quite well in his book The Accurate Table Saw (Cambium Press, 1998) p. 70:

"Everybody wants to know the correct blade height, but there isn't any. Test it for yourself. Start with the gullets a

little above the surface of the workpiece and make a cut. Then raise the blade to full height and cut again. Compare the two cuts and decide which is better … The cleanest and most efficient cutting occurs with the blade raised to its maximum height. However, having that much blade exposed above the workpiece might make you nervous. The correct blade height is somewhere in between. For the cleanest cut, raise the blade; if it rattles you, lower it."

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***Q Can you add a riving knife to an existing table saw?***

**A Rob Johnstone:** In most cases, I believe the answer is no. Many of us in the woodworking world have been asking the major tool makers to put riving knives on their saws for years. Not only did they avoid producing new saws with riving knives, but no aftermarket riving knives were produced as accessories. Now, as you may know, in order to get U.L. approval, all newly designed and made table saws must have a riving knife.

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***Q In all the years I've worked with power tools, I have not seen anything on changing brushes. Is there any period that, with average use, they should be checked?***



**A Tim Inman:** Brushes in electric motors may be the weak link that gets no respect. Since they do their work delivering electricity to the motor armature faithfully and with almost no trouble, they're usually overlooked. In most motors, they seem to last forever because they get so little wear. In motors that are used often or under heavy loads, like routers, for example, they do wear down. As long as the motor is running properly and seems full of pep, there is probably no good reason to replace the brushes. However, inspection is important. The brushes are just pieces of carbon. If the brushes wear down to the end, the metal holders that carry them can cut into the motor armature and cause damage. Any motor that shows big blue sparks, or seems not to have the full power it should is likely past due for brush care. New brushes are commonly available as replacement parts. Otherwise, keep them blown out clean and keep using the tools.

**Chris Marshall:** Many handheld power tools these days have caps on the motor to make brush changing easier. But, as you say, not all manuals give clear instructions for when to do this or what to look for. (For tools that don't have brush caps, changing the brushes yourself isn't rec-

ommended and will probably void the tool's warranty.) I pulled three different manuals from my files, and one says every 100 hours of use. Another recommends taking a look after 50 hours or 10,000 On/Off cycles. The third says every two to six months. Not a lot of help, really, because how many of us record the number of hours logged on a tool-especially if it's only used occasionally? A more practical rule of thumb is to let the tool tell you when it's time to pull the caps. If you can see more sparks than usual through the motor's cooling vents, or if it occasionally cuts out during use, it's likely that the brushes are worn or possibly deteriorated. Some brushes have wear indicator lines to show how much material is left, but not all do. If you don't find any wear markings, replace brushes that are worn down to about 1/4 in. long or, of course, if they show signs of burning, cracks or crumbling.

**Rob Johnstone:** When it is time to change your brushes you will know. They start sparking and the machine drops RPM and it smells funny. (No kidding.)

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***Q A friend is making a violin and came to saw some maple scroll blanks on my bandsaw. Cutting straight cuts, everything was fine. Turning corners, the wood burned badly. The 1/4" saw blade was new with fine teeth, and the radii we were cutting were no less than an inch. What causes this burning?***

**A Tim Inman:** A one-inch radius for a 1/4" blade is a tight turn. I'm guessing that's your problem right there. But, I've worked a lot of maple, and there is another problem to consider. Maple has a lot of sugar in it, which is why we sometimes refer to the trees as sugar maples. So does cherry. That sugar content is easily burned. The combination of an easily charred wood and tight turns makes for a problem. One solution would be to use a narrower blade. Try coarser teeth rather than fine ones; you need more cutting action, not more friction. Make relief cuts into the waste before you do the final cut. This will ease the tension on the blade as you make the turns. And I'll offer this, too: Being very careful, and following all the safety rules, hold a piece of wax such as a candle against the back of the blade on both sides for a second or two to lube the blade just before you make your cuts. You'll be amazed at how this helps in a tight curve. Not too much—apply the wax "little and often" as the old guys say.

**Rob Johnstone:** As Scotty was fond of telling Captain Kirk, "You can't change the laws of physics!" A 1" radius is as small as you want to cut with a 1/4" band saw blade (according to Mark Duginske's The New Complete Guide to the Band Saw), so I'm guessing that you were trying

to push the envelope a bit. Just step down to a 1/8" band saw blade and I bet all will be well. With that said, maple is notorious for burning easily, so keep the cut moving steadily and as fast the saw blade can reasonably handle

**Chris Marshall:** Another option is to make a series of relief cuts and remove the waste in smaller segments rather than one big, charred piece. It takes a little longer but might give you better results — and less sanding! — in the end.

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***Q I have cherry planks that are warped. A planer's feed rollers push down hard enough to flatten a bow, so I shimmed the bow on a sled to plane the hump off, but that doesn't work well enough, and I don't have a wide jointer. I've read advice to use a planer as a substitute for a jointer. Are there models that won't put so much pressure on the wood? Or is there a technique I haven't discovered?***

**A Tim Inman:** Technically, one should use a jointer to flatten one side, then a planer to "thickness" and surface both sides. As a practical matter, this is seldom done in a working shop. If you're going to surface down to something like a standard 3/4 inch, then I think you should be able to get along just fine by being careful and smart when you use your planer. If you're going for 1/8-inch stock, then we might need to talk about making a router sled, for example. Some planers have segmented infeed rollers that could be helpful to you for taking out



cupping, but these are usually found on higher-end floor models.

Here's what I'd do: First, be sure the blades in your planer are sharp and set correctly! Dull knives in a cutterhead are never helpful. If you're trying to take the bow out of a board, you need to be able to take light cuts, and turn the

wood several times. Begin by running the board through the planer with the cup or "hump" down. Make a light cut. This first step may seem counterintuitive, but it will yield two nice flat little edges on the board for the next cuts. Now flip the board, and take another light cut. This will start truing up the top of the "hump." Once you've made these two passes, just continue making light cuts, flipping the wood as your judgment tells you. You'll need to flip the board several times to get the best surfaces on your wood. Be gentle and take light cuts! The heavier your cut, the harder the pressure rollers will push down on the wood, flattening the cup but not removing it. The duller the knives, the more they, too, will have to press down on

that board to make their cuts. Lighter cuts mean more planer time, but light cuts will almost always give you a nice flat board for your efforts. Once the cup is cut out and the board is flat on both sides, you can take a heavier cut if you want.

**Rob Johnstone:** While most of us have gotten away with simply running some rough stock through the planer, the proper technique requires flattening one face of the lumber before we do that. A jointer is a common way to do it, but it can be done with a hand plane as well. You mention that you don't have a wide jointer at hand, and I know how frustrating that can be. One alternative is to rip your rough stock into narrower pieces that will fit on your jointer. Number and mark the end grain so that you can then glue the pieces back together after you have surfaced them. If you are careful, the glue lines can be nearly invisible. Not an ideal solution perhaps, but workable.

**Chris Marshall:** This might be a good opportunity to pick up a long jack and jointer plane and learn how to use them—especially if you don't want to rip, joint and re-glue your wide stock back together again.




***Q** I have a small workshop with many benchtop and power hand tools. The problem is being able to connect them to my shop vac to reduce dust. Does anyone make an adapter kit which allows you to connect various different tools to a standard shop vac? Currently the only tools that I can attach to my shop vac are my table saw and my benchtop band saw.*

***A*** **Tim Inman:** The "usual suspects" (Rockler, etc.) almost all carry shop vacuum attachment supplies. Most of them, in my experience, "nearly" fit. So, my answer? Improvise! PVC pipe fittings make a great place to find cheap materials to adapt to specific tools when the real thing isn't available. The one adapter I have that really helps me is one that converts common vacuum hose sizes to standard pipe and PVC pipe sizes. This opened up a whole new world for me in my shop. I think I bought it at a local home/builder's supply center. I also use flexible plastic hose sold for sump pumps that I buy at hardware/builder's centers. Don't forget the duct tape!

**Chris Marshall:** Along with Tim's suggestions, I would add one additional thought: try to limit the number of tools your vacuum will service to one or two at a time. A vac hose branched off to too many different machines will reduce the vacuum's overall effectiveness. Or, plan out your system so you can close off individual branches with blast gates in order to keep the volume of air sufficient to clear your tools of debris.

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**Q** ***I just bought two 2.0 microns dust collector bags for my dust collector. Do I have to use both of them for the best results or can I just use the 2.0 on the top of the collector and the regular one for the wood particles on the bottom?***


**A** **Chris Marshall:** Since you've already bought two bags rated for 2.0 microns, I would use them both. Until the bottom bag is completely full, it will still offer a greater level of dust filtration than a bag rated for larger particles—especially right after you empty the bag. Anything you can do to trap fine wood particles inside your collector and not in your lungs is the best approach to take, in my opinion. However, do check the manual that came with your collector for further details regarding bag recommendations. Or, try contacting the manufacturer directly; there may be a FAQ section right on the company's website that addresses dust collection specifications.

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**Q** ***I have often heard advice to use "paste wax" on my table saw and other equipment as a lubricant. What exactly is "paste wax" in this context? Is this some type of furniture product? Would you please supply details about "paste wax" as a lubricant? I would appreciate a specific brand name.***

**A** **Chris Marshall:** Any hard furniture wax in a can will work as a lubricant and general protective covering for bare metal on tool surfaces. I happen to have a can of Minwax® Paste Finishing Wax in the shop right now, but it wouldn't have to be that brand. The purpose of the wax is to reduce friction so workpieces slide more easily. I use it on my band saw, table saw, jointer and planer tables. It also prevents rusting on cast iron and steel from those inevitable sweat drips or damp air. Just wipe the wax on, wait for it to dry to a haze and wipe it off—like waxing a car. I've also had good luck with other spray-on products like Bostik® TopCote and Boeshield T-9®.


**Rob Johnstone:** As Chris said, brand is not really important for this application. I've used Briwax®, Johnson's® Paste Wax, Liberon and others. What I would add to this is that there are some paste waxes with colored pigment suspended in the mixture. I wouldn't use those on your equipment, simply to avoid getting a color transferred unintentionally on to your wood.

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***Q Please explain the difference between the mechanisms in an impact driver vs. a hammer drill (such as a Hilti) used for drilling into concrete, etc.***

**A Chris Marshall:** Although impact drivers and hammer drills seem to defy the laws of physics, they actually function in two different ways. The action produced by an impact driver is created by three internal components: a strong compression spring, a weight—called an impact mass—and a T-shaped anvil. When you're initially driving a fastener and the resistance is low, the spring holds the impact mass against the anvil so they rotate together. At this point, the tool motor is doing all the work. Then, as the resistance of the fastener increases, the impact mass slows down and momentarily slips away from the wings of the hammer. This "lag" allows the motor, which is still operating at a constant speed, to wind the compression spring behind the weight and drive it forward again with great force against the anvil. This all happens in a fraction of a second. Each time the motor winds the spring, the impact mass repeatedly strikes the anvil. The impact action is directed perpendicular to the bit and fastener, but not forward. It's an incredible mechanical advantage over a drill that simply uses the motor to turn the fastener or bit.

In comparison, a hammer drill doesn't have the impact mass component and anvil. Its gearing rotates a drill bit or driver just like a normal drill. But, when you set it to hammer mode, the drill's transmission shifts into a percussive "forward" motion while the chuck spins. A return spring pushes the chuck back to the start position between those forward pulses. That's what "hammers" a masonry bit into tough materials like concrete.


***Q** I suspect many home woodworkers have had the same debate I'm going through: Which 10" table saw carbide "combination" blade will perform best for me? What number of teeth, type of teeth, and hook will give the most usefulness from a combination blade? ATBR? Newer ATB with sides of teeth ground as smoothers? Thin kerf? Like most, I commonly saw hard and softwoods , rip the same, saw thin ply (like drawer bottoms), want glue-line edges from cuts, and occasionally overwork my saw by "resawing" up to 3+" drawer sides. Considering my uses and misuses, how do I select the combination blade that will work best on my saw?*

**A** Cliff Paddock: The cutting challenges you describe are common among home woodworking enthusiasts, as well as pros. For the range of applications you



mention, I would recommend a 10" x 50T combination blade, preferably with ATB/flat geometry (sometimes called ATB / Raker, or ATBR). The typical "combination" blade features a very deep gullet at intervals of every fifth tooth, which helps clean out the heavy buildup of fiber and dust you encounter during rip cuts. The flat-top raker tooth helps clean out and guide during the cut, while the ATB teeth provide a cleaner cut in crosscuts by "scoring" the sides of the kerf. Most home woodworkers will prefer the thin kerf combination blade, like Freud's LU83R010, if their saws have less than 3hp motors.

Of course, there are a number of blades on the market designed to cut certain materials — HiATB blades for cuts in thin plywood, for example, or blades with flat-top teeth for ripping – but many woodworkers prefer to have one "do it all" blade to reduce their tool investment and save time changing blades. Just remember that, in order to give you the best all-around performance, combination blades represent a compromise among the key features of these application-specific tools. My advice would be to take note of the applications in which you do the most cutting, then consider adding a specific blade for these key tasks, as your budget permits, to give you premium performance in the jobs you tackle most often.

***Q** My compound miter saw has been a workhorse for many years. Recently, the start of the cut face is rough and can be 1/32" deep plus slightly off vertical; partway through the cut it reverts to a smooth full cut. Everything appears tight. After many years of hard use, could it be play in the shaft or perhaps bearings going bad? What is the best method to reverse this condition - if any?*

**A Tim Inman:** Something is loose or wearing out! My best guess would be the motor bearings have seen their better days. End play in the motor shaft will also cause this type of complaint - which is also a bearing problem. Sometimes there is an adjustment in the motor/


bearings to compensate for end play in higher end tools which use tapered roller bearings instead of simple ball bearings. Might be time for a burial and a trip to the tool store....

**Al Pierga:** TV crime dramas use evidence to solve mysteries. Just the same, authorized service professionals seeing a miter saw issue first-hand is often the best way



to resolve issues. But here are a few things to try or think about prior to your visit. Rule out the blade: thin kerf blades, depending how thin they are, can be unstable, especially in bevel conditions. Try a thicker kerf blade and see what happens. There's also the reality of tool wear and tear: with time and heavy-duty cycles, blade shafts or bearings can fall out of tolerance causing blade "wobble" effect during load transitions – as the blade penetrates the work piece and the cut path increases or decreases. Blades usually stabilize when a steady load is achieved. Poor quality blades (bad tooth grind, clogged blade tips, missing tips, bent tips, etc) can accelerate this degeneration, too. Or, consider shock to power train / gearbox. Usually an abrupt stall, jam of the tool in the material, or a kickback where the blade binds and ejects form the work piece violently. This creates excessive loads in the gearbox causing damage to gears, bearings, or their mounting/supporting features. The visible effect can be "wobble," again, plus "noise," typically similar to tumbling marbles in the gearbox, or vibration in the handle.

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***Q How can I make a band saw blade cut in a straight line? Regardless of what size blade I use or the thickness of the material I'm cutting, the blade wanders off course. I've given up trying to resaw with it because, even with a jig and 3/4 inch blade (the widest my saw will take), I can't cut pieces with a consistent thickness. I replaced the guide blocks and adjusted everything that has a screw in it, but I couldn't solve the problem.***

**A** **Tim Inman:** Because band saw blades ride on crowned wheels, they always have a little "camber" angle relative to the vertical axis of the wheel. This causes the blade to tip a little and makes the cut "pull" to the side. Even if you get it "just right," the rubber tires on the wheels will likely change over time, and the camber angle will change with it, throwing your careful adjustments off.

Using a rip fence on a band saw, like a rip fence you might find on a table saw, will nearly always cause grief - especially when you try cutting long boards. The fence alignment (which is pretty constant) fights the blade alignment (which is pretty variable), and you end up with trouble.

Instead, use a simple shop-made guide (a scrap of wood) that provides a single pressure point right at the edge of the cutting teeth on your blade. You can set this for the thickness of the cut. Then, what I do is very low-tech, but very effective. Draw a pencil line down the edge of the board where you want the cut. Set the guide, and follow the line with your eye. The guide allows you to pivot the board as needed to keep the cut going right down the line - and no fence binding or trouble to worry over. I use this system all the time, and it makes resawing or long cuts a joy, instead of a pain. The blades are less likely to break, too.

**Chris Marshall:** A point fence works wonders! My band saw's rip fence can also be adjusted for front-to-back blade drift, and I've actually had good luck using it for resawing once I adjust for the saw's drift that day (as Tim says, it changes with blade sharpness, tire wear and so forth).

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**Q** ***I purchased a new band saw about four months ago. How can I minimize blade wobble? It seems that, no matter how tight I crank it, or how much I let out, I still get periods of wobble during cuts which leads to ridged lines.***

**A** **Tim Inman:** I'm not sure exactly what your problem is, so I'm guessing. My first instinct is to replace that blade and try a different one. If the blade welds are not

done correctly, the edge of the blade may be distorted so that it does not travel in one plane. Try laying the blade flat on its back on a concrete floor or other flat surface. It should be in contact with the floor all the way around. If you can see anyplace where the back edge is lifted up (probably right around the weld!) then Bingo! We know the trouble. Actually, it might be a good idea to test your new blade for "flatness" before you put it in, too.

Another place to look is at the tires that go over the wheels. They may not be "round." If your saw sat in a warehouse with the blade on, and tensioned, there may well be a flat or compressed side of the rubber tire. This would cause "wobble," too. Check the wheels themselves. Are they "round?" The wheels must be concentric, and true, or the blade will get a jumpy ride every time the wheel goes around. Finally, if your saw is only four months old, I would go back to the vendor and have a serious talk with them. Either this problem has a simple fix, or you have a defective machine. I know all the tool vendors I deal with, and have dealt with in the past, do not want unhappy customers when they can cure the problem. If you bought a $50 saw, don't expect them to offer you a $500 cure, though. Let us know when you find the problem - and what your solution was.

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***Q I upgraded to a new Ryobi biscuit joiner because the slots cut by my old one were too large. That made for loose biscuits and bad joints. The new one is better, but not by much. Are there consistency standards in the biscuit manufacturing industry, or are the machines that cut the slots using different size cutters?***

**A Rob Johnstone:** While there is certainly such a thing as too loose in the slot, biscuits should slide easily into the opening. The biscuits themselves are compressed and expand when they come in contact with white or yellow glue, thus fitting more tightly after glue-up than before. I don't think you are doing anything wrong as long as you are not trying to "free-hand" the cuts without supporting the biscuit joiner on a surface of some sort. It is true that the high quality biscuit jointers (for example, a Lamello) cut more accurately and have more exacting tolerances. It is possible your cutter is loose or bent, thus making a slot that is too wide for a typical biscuit, but I sure couldn't know that without looking at it. I hope this helps.

**Tim Inman:** Have you tried a different batch of biscuits? This sounds too simple, but it may not be the tool, but

rather the insert biscuits that are undersized If you get a sloppy fit from more than one source of biscuits, then the tool - or the tool user - need to be questioned. My biscuit joiner leaves me with a nice, snug fit -- with multiple sources of biscuits. If I need a looser fit, I can manipulate the tool and make the groove sloppy. So from that, I can say the operator does have control over the fit. Maybe you're making multiple cuts on the same groove? Be sure the guide surfaces on the cutter are flat and seated before you plunge the cut.


**Chris Marshall:** The upside to biscuit jointers is that you can cut slots lickety-split. But speed can lead to sloppy cuts. As with the other answers here, I can't be sure if it's your machine or a bad batch of biscuits that could be to blame. However, make sure your technique is solid, and you can eliminate one variable from the equation. The tool's contact surfaces need to be planted firmly against the edge of your workpiece, and they can't move at all when plunging the cutter in. Jiggling the tool even the slightest bit will widen the slot more than what you want. Work slowly and carefully and see if that helps you achieve better results.



***Q** I have an older contractor-style table saw that sprays sawdust off the back of the blade at me with every cut. By the time I get a board ripped, I'm covered in sawdust. I have reset the blade aliment on the frame and the fence and checked it with a dial indicator. There is no runout on the arbor, and the blade only has .005". It has new bearings, motor and saw arbor. I also run a link type belt on it. Anything you can think of that I have not done?*

**A** **Tim Inman:** My first reaction is to ask you to replace the blade. The difference between an average blade and a superior one is, well, superior! Since you seem to have addressed all the obvious mechanical issues, you may have already tried blade replacement, too. So, there is one other aspect you might check. This would help answer the question as to why that sawdust is being shot at you. What is directing that sawdust stream? Sometimes there are shields, guards or other elements below the saw surrounding the blade that might be involved. Can the sawdust escape from the blade tooth before it is hurled back up above the table? There should be a sawdust collection area below the table. Is it full or clogged? Does this saw require a vacuum dust collection system? I'm guessing "clearance" might end up being the missing link here, since you've double double-checked the obvious things like bearings, runout and angles. Give that sawdust someplace to go other than back up into your face.

**Chris Marshall:** You don't mention what sort of throatplate you use on your saw. The big gap around the blade on a standard throatplate could be part of your dilemma. Switch to a zero-clearance throatplate instead. If the sawdust is deflecting off of some surface under the throatplate, as Tim suggests, or if your saw just suffers from poor dust ejection by design, closing up the gap around the blade will only help to cut down on the blizzard of debris coming up and out. It will also minimize tearout on splintery woods and keep thin slivers from falling down inside and getting trapped here and there. It's a simple saw improvement that really has no downside.

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***Q I have two questions: Which would be better and more useful in a shop a good shop vac or dust collector? And secondly, what is the maximum time/hour a vac or dust collector can continuously run without overheating and burning out the motor?***



**A Tim Inman:** A good shop vac would be my first choice by far. Most shop vac motors are rated for "continuous use." That does not mean you can turn them on and let them whine away endlessly without getting hot and burning out, though. I'm reading between the lines that you are thinking about using a shop vac as the vacuum source for a dust collection system. I'd say go for it. Wireless "clickers" to control the vacuum would be a good investment. You might also use wired switch gates in your system. Either way, if you build a dust collection system, and the vac doesn't work out, you haven't lost anything except the vac; the system is still there. You can always add a better collector later. First, I'd get a good vac and go from there.

As long as there is good airflow through the vac motor fan, it should run for a long time without danger of failure. I have an old video made by a couple of guys who experimented with vacuum bag veneering very early on, in the 1970s. They actually used a shop vac for their vacuum source. It ran continuously for 24 to 48 hours in their process. I don't think this is a recommended use, but it worked. Use common sense, know the limitations, and be safe.

**Chris Marshall:** I think the answer to your question really depends on what you're expecting a shop vac or dust collector to do for you. I use a shop vacuum for around-the-shop machine cleanups and as a collector for fine dust coming off of my random-orbit, disc and spindle sanders. But, I wouldn't want to use that same shop vac for collecting all of the heavy shavings that come out of my 15-in.


planer, 8-in. jointer or off the lathe. It would fill up really fast and, on green lathe shavings, probably clog up. On the flip side, a dedicated dust collector is engineered to handle a huge volume of material through a 4-in. or larger hose, with a bag(s) or canister(s) that gives you some run-time before it needs to be emptied. A dust collector will have an induction motor, which is designed to run all day long — and without the same shrill noise of a vacuum. Honestly, if budget will allow for it, my vote would be to get both a vacuum and a dust collector. If you don't have a big shop (yet) or need a full dust collection system with ductwork, a 650cfm dust collector with a length of 4-in. hose can be had for less than $300 and makes a great collector for your larger stationary tools. You can probably find a good used one on eBay or a reconditioned model from a manufacturer for considerably less. I don't think you'll regret the investment one bit. Use the shop vac for your smaller shop machines, car cleanups and other around-the-house vacuuming chores.



***Q What is the current consensus of opinion about spiral router bits vs. straight bits for mortising? Are they in fact superior enough to the straight bits, for mortising application, to justify their high price? Also, if you were to buy one or two bits, what sizes would you buy?"***

**Rob Johnstone:** "While I don't have a great deal of experience with spiral bits (up-cut or down-cut), that has never prevented me from having an opinion. But instead of waxing elequent and dazzling you with rhetoric, I decided to ask somebody who would know. I called Dan Sherman of CMT USA, an importer of quality router bits, and asked him. Dan suggested that mortising is not a strong point for spiral bits. Instead, it makes more sense to use them for jobs where you need the bit to stay sharp longer and where it will be exposed to more heat build-up than their straight bit counterparts. Spiral bits are at their best in edge-routing situations where tear-out is an important consideration: e.g., materials like melamine, plastic laminate, etc."

**Ian Kirby:** "It depends on what you mean by big advantage. Spiral bits cut more smoothly and they leave a smoother wall surface. That helps if you need to glue something to the surface, which is important to me. I have two suggestions:

1. Set up a drill press and remove the bulk of the waste before you route. By doing that, you get rid of about 85 percent of the material you want taken off quickly and easily.
2. Consider using a loose tenon and not a mortise and tenon. Both parts come from the same bit and you can easily adjust the fence system for each piece. The router, in effect, then becomes a slot mortiser.
Finally, just buy one size bit. Make a left and right fence; then you can make any width of mortise using one bit."

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***Q I know a clean table saw blade will cut better, but I've never read anywhere how often I should clean my blades. Once a month, once a week, every other day?***

**A Rob Johnstone:** It is so seldom that my knee-jerk wise Aleck habit and my tendency to want to answer any and all woodworking questions align as one, but here we go: When they gets dirty. (OK, that was somehow less satisfying than I had envisioned.) If you see buildup and gunk on your blade -- look closely at both faces of the blade and at the place where the carbide teeth are brazed onto the steel blade body -- then you should clean it. Pick up the blade, look it over carefully, holding the blade under good light and close to your face. (This is called "gross inspection," but I am going to avoid the obvious smart-aleck retort, because the last one let me down so badly.) Pitch-rich woods like Ponderosa pine and spruce can build up gunk quickly -- especially if they are not well dried. Other material, like wood that has a resin finish or paint, can create a buildup that needs to be cleaned off.



If you are only using kiln-dried hardwood or man-made sheet stock, you may never need to clean your blades.

**Chris Marshall:** Max, I probably clean my blades twice a year, but it all depends on how quickly the pitch and other resins start to build up and leave scorched-on debris. Some manufacturers say that this gunk will actually shorten the life of the carbide by overheating it during cutting. I have no evidence to support this claim, but it's good reason to keep the teeth clean anyway. I use a chemical-based blade cleaner that smells like oven cleaner. There are citrus-based options as well, if you want to take a less caustic approach. One reader once suggested that laundry detergent also works if you soak the blade in it for a spell (I tried this out, with good results). It probably takes me a half hour, if that, to go from a grimy blade to a clean one back on the saw and ready for use. I spray the blade, let the cleaner soak in and then scrub it with a plastic-bristle brush. If your blade doesn't have a factory (usually colored) coating on it, rub a little light oil or wax on the blade body once it's clean to help prevent rust.

**Tim Inman:** The best answer I can possibly give is this: Clean it when it is dirty. Without being impertinent, it is a matter of judgment and objectivity. If you're doing the finest of fine work, you're going to notice your blade needs cleaning frequently -- probably daily. If you're making chicken coops from scrap lumber, you may not notice much difference whether the blade is clean or not. Clean, sharp blades are not only a pleasure to use, they yield better work -- and they are a lot safer!

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***Q** I am a 5' 2" female of average build; none of the routers I've held in stores is made so that I can easily hit the stop switch without letting go of one of the router's handles. I was very eager to start some of the router projects that I have been collecting, but cannot find a router that I can use safely. Thus, my eagerness is waning. Any direction / advice you can give me is appreciated.*

**A** **Chris Marshall:** Mary, don't lose hope in making a router part of your woodworking future! I have three suggestions for you, and I can relate to the anxiety you are experiencing. A big router can feel daunting, especially when letting go of one of the handles to power it up or down. So, first suggestion: look at Bosch's new MRP23E-VS 2.3HP Plunge Router, which offers a plunge base that has the On/Off trigger in the grip, right where it's easy to squeeze. Second, you could try a "D-handle" base. Porter-Cable and Bosch have been making them for fixed-base routing for many years. Again, the trigger is right in the grip. Third, for light-duty routing tasks, don't forget trim routers (a.k.a. laminate trimmers). They're lightweight, highly controllable and easy to grip with just one hand. I think any of these three options will help build your confidence in handheld routing.

**Tim Inman:** Instead of seeking a router with a switch you like, I'd try going the other way. Find a switch you like, then control your favorite router with it. There are two types that immediately come to mind; both are foot-controlled. One is called a 'dead man' switch. With this one, you must press down on it with your foot, and hold it down all the while you want the router to run. The other is simply a 'click-on, click-off' switch. You press down with your foot when you want it to turn on, and press down again when you're done. There are also radio-controlled 'pocket' switches you can buy to control various things. All these are simple to use. Just plug one end into the wall, and plug the other into your router. Actually, I think we'd all be safer using a foot-controlled override switch.

***Q*** ***Could someone tell me how to clean rust and rings left by someone leaving a glass on my table saw?***

***A*** **Rob Johnstone:** As Neil Young says, rust never sleeps … but it can be prevented. Sadly, once a cast-iron top has been rusted, it will never look as it did before. You can get rid of the rust and smooth the surface, but some discoloration will remain. I attack it with WD40® and ultra-fine steel wool, and follow that with paste wax. That is the old school method, but there are some really great products — TopSaver is one — that are more effective in dealing with the problem.

A good coat of cast-iron conditioning product and a layer of paste wax will do a lot to prevent rust from starting, but the number of cast-iron machine tops that I've seen without discoloration from rust is very small. Cast iron is durable, but someday, somehow, it will get wet and rust.

**Tim Inman:** There is a pleasure in having and using a perfect, bright, shiny table top on our tools. It is often, sadly, a short-lived one. Those stains can be very very difficult to remove. A simple sanding with very fine wet-or-dry sandpaper (400- or 600-grit) will remove the roughness. A good paste waxing rubbed in with #0000 steel wool will make it slick again. But the chances are that you'll always be able to see that visual blemish. That said, I have many antique tools in my shop that aren't so much "lookers" as they are great to use. My late 1800s Crescent brand jointer is one example. It was salvaged from the



Beloit Wagon Works factory, in Beloit, Wisconsin in the early 1980s. It had been relegated to a leaky storeroom and was just one huge rust bucket when I found it. It is now polished, painted, and fully functional - but the top shows the rust stains to this day. It also shows the hand scraper marks where the original top had been HAND worked flat and true; something no new tool in a wood worker's shop would show today. I'd never trade it for a shiny brand-new one.

**Chris Marshall:** We've got a big pond behind our home. When we first moved in, my shop was just a a dirt-floor pole barn, so it took some time to get that up and run-

ning. In the meantime, my cast-iron tools sat in the garage, and damp air from that pond turned those pristine tool tables a light brown in no time. After the anguish passed, I bought a pump spray bottle of a product called Rust Free made by Boeshield. A few spritzes of the spray, and the rust wiped right off with a rag. The initial shine of my cast iron was diminished, and it's never been fully restored since, but the surfaces are easy to clean whenever I get a spot of sweat or some dampness on a cast table top. I chalk the gray discoloration up to "character." Sort of along the same lines as those dings and nicks on a well-loved piece of family furniture. You just need a good way to erase rust and then take it in stride.

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**Q** ***Do drum sanders have the same issues with snipe as a planer does? And is there anything other than getting longer boards that I can do about snipe in a planer?***

**A** **Chris Marshall:** I don't own a drum-type panel sander, but I can certainly respond to your second question about planer snipe with my own solutions to the problem. There are several easy options: if you're feeding more than one board through the planer, butt them end to end. The adjoining ends will be snipe-free, because you're maintaining even feed-roller pressure from board to board and not giving the cutter head opportunity to dig in. If you make the first and last boards sacrificial when planing many pieces of lumber in a session (and butt each piece end-to-end in the series), all of your "keepers" will be snipe-free on both ends. Only the sacrificial boards will show snipe on the infeed and outfeed ends of the run. If I only have a single board to surface in my planer, I'll stop short of planing it when I'm within about a 1/32-in. of my final thickness. Then I head back to the jointer, set it for a very shallow pass and skim off both faces to produce a snipe-free workpiece. It works well for me.


**Tim Inman:** Yes, drum sanders will snipe just like a planer. Same cause, same effect, just different cutters. As with a conventional surface planer, correctly adjusting the tables and cutterhead positions will eliminate the sniping effect. Using longer boards with some sacrificial end material also can be done - and often is. Learning how to adjust your equipment will be more rewarding, and cheaper, and less wasteful in the long run, though. Do a search on this site, and you'll find lots of information about sniping and its cure.

***Q** I want to make insert door panels and have purchased the router bit (big and ugly) to cut the beveled edges. My question is: do I bring that up through the table and cut that big of a hole in my table, or is there some kind of extender so I can have the blade above the table?*

**A** **Rob Johnstone:** If your table is a solid top one (without an insert) then you will need to make the hole bigger. If you have an insert, you can fabricate a new one just for these large bits. Another, more complicated, solution is to buy a router table insert (Rockler sells some nice aluminum options) that has rings that snap in place and can be removed to accommodate the various sizes of router bits.



**Chris Marshall:** Whether you enlarge the hole in your tabletop just big enough to pass the bit through it, or add an insert plate to hang your router, a raised-panel bit is always partially "buried" in the table. It never gets elevated completely above the tabletop, so a collet extender wouldn't be necessary. I'll second Rob's suggestion to take the extra step and put an insert plate in your tabletop. Then you'll be set for any bit diameter you need to use. If you buy a plate that isn't made out of metal, get the thickest plate you can find to minimize deflection — especially if you own a heavy router.

***Q** I can't figure out what's happening whenever I rout rabbets in picture frames. I don't go more than 1/8-inch when cutting rabbets, sometimes less, and no matter what I do, I get nasty splinter tearouts. I rabbet both sides, with bad results going with and against the grain.*

**A** **Chris Marshall:** If the tearout is happening on the face of the stock receiving the rabbet cut, my first hunch is that your rabbeting bit could be dull or dirty. Clean the cutting edges and see if that improves your results. Next, try slowing down your feed rate — pushing too hard can lead to tearout. If, on the other hand, the tearout is happening when the bit exits the cut (edge grain), that's pretty normal for many router cuts. You could make a short climb cut first on the "exit" end of the workpiece, which will remove those fibers prior to making the usual pass to remove the rest of the waste.

Or, hold a scrap piece in front of the exit edge to support those fragile fibers and rout right into that scrap when you complete the cut. It'll act like a backup board.

**Tim Inman:** Your problem is almost certainly related to the basics. Let's review them. First, as my grandkids would tell me at the dinner table, "No Horking your food, Grandpa!" Take small bites. You say you only go an eighth of an inch before trouble steps in. Is this 1/8 deep? 1/8 along the cut? 1/8 across the entire width of the rabbet? 'No Horking!' I usually cut the full depth, but take multiple passes to cut to the full width. Try different cutting techniques, but remember, 'No Horking!' I do it my way simply because it is easier for me to set up.

The next basic would be cutting speed. This means both the router travel speed along the length of the wood, but also the rpm of the bit. Too slow, and you have troubles; too fast, and you have troubles, too. Try different feed and rpm speeds if you have a variable speed router. Are the router bearings in good shape? A bad bearing on the collet end will allow vibration and 'chatter' that can cause

cutting troubles like you describe. You shouldn't be able to 'wiggle' the collet. (Unplug and turn off before you test this!) Borrow a friend's router and try the cut with it if you think you might have a bearing issue.

Finally, I think we need to consider sharpness of the cutter itself. Is it sharp? Do you get the same problem with other bits, or just one? If you haven't tried other bits, then I'd do that right away. Borrow your friend's router and a bit, too. Unfortunately, not all router bits are the same. Even though they may look and feel sharp -- or be 'brand-new,' the angles and edges are variable, and you might have a 'dull' bit. Test and compare. Sometimes the carbide on one side is way out of place relative to the carbide on another plane. With a little testing and observation - trial and error work - you can solve this problem. If I had to bet, it is the bit itself.

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***Q Is there a time when is no longer cost-effective to have carbide blades (80 tooth, 10" dia.) resharpened? I have a blade that has been resharpened at least 10 times in the last 15 years, and it seems to me that the sharpness does not last as long as before.***

**A John McInerney:** Carbide-tipped blades have a "plate" (steel plate body) thickness measurement and a "kerf" (carbide tooth) measurement. The kerf is al-

ways proud of the plate, and this measurable difference is called "side clearance." A good saw sharpener will service a blade by grinding the individual teeth on the "top," the "face" and the "sides," always removing some measurable amount of carbide with each pass of the diamond wheel. After multiple resharpenings, the side clearance gets diminished as it approaches the thickness of the plate. Many people decide to continue to have their blades resharpened. However, all the saw shop can do at this point is "face grind" the tooth, as there must be some side clearance in order for the blade to cut properly. Everything has a lifespan, even saw blades. It might be time for you to invest in a new blade.

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***Q Why do companies make 8-in. dado blades? If a saw is made for a 10- or 12-in. blade, that is the optimum surface cutting speed for that saw and that is where it operates the safest. Now you change to an 8-in. blade and you are running at a reduced cutting speed (20 percent on a 10-in. and 33 percent on a 12-in. saw). Why don't companies make 10- and 12-in. dado sets to maintain more safety on the saw?***

**A Tim Inman:** This is going to sound obvious, but smaller diameter blades have a shorter radius. An 8-inch blade will leave less to clean out by hand if you're cutting a blind dado. A 12-inch dado would leave quite a bit to clean by hand, in comparison. More importantly, an 8-inch dado set would not require as much power as a 12-inch set, either. Other than these obvious differences, smaller sets can be a little cheaper to buy, too.

Cutting speed, material removal rates, feed rate, etc. are all variables that the operator must understand and take into consideration when setting up and making cuts. This is part of becoming a skilled woodworker. The rpm of the saw's arbor is not variable, but everything else is. There is not one "right" speed. The hardness of the wood, the dryness of the wood, the composition of the wood, the grain

direction of the wood being cut (dado sets will cut dado joints across the grain, and plow joints with the grain) - all these factor into the operator's decision as to how deep the cut might be in order to have a clean, perfect, safe job. Setting a dado head to take out all the waste wood in one pass, and then ramming the boards across the saw at fast feed speeds, hell or high water, will not only result in a poor job, but extra wear and tear on the saw - and possibly the operator.

Make light cuts, make multiple passes, and learn the traits of your saw and the cutting heads you put in it. Make practice cuts on scrap before each new job. For hands-on woodworkers, there is as much art in the craft as engineering science. A big part of the "art" is to learn and understand our tools and how they work best for the task at hand and the materials in use. I often like to compare our craft to medicine. Even though there is a great deal of science that goes into medical training and the practice of medicine, the beautiful new clinic they built in my town has a nice big sign out front that reads: "Medical Arts Building." Even the docs have to learn how to get the best out of their equipment and materials. That's the art of it for both of us.

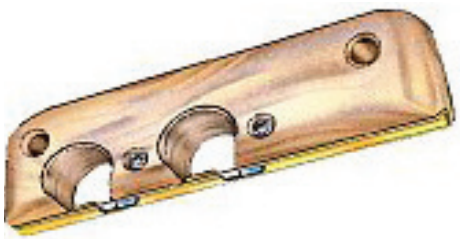
**Cliff Paddock:** Machine manufacturers actually determine the appropriate sized dado that can be used on their machine. They determine this given the design of the arbor, power transmission system and motor, along with safety considerations and other factors that influence the best size for their machine. Some 10" saws actually will only allow 6" dadoes. Dadoes remove a lot more of material than a blade does and are harder on the saw than a standard blade. You should only use the size the saw manufacturer recommends.

**Chris Marshall:** I'm certainly a far cry from a table saw engineer, but given the considerable weight of a stacked dado set with potentially all of its chippers in place, I can see why a smaller overall diameter might prevent some unnecessary wear and tear on the arbor and trunnion assembly, as opposed to a 10-in.-diameter dado blade. Aside from this, a dado set is just plain a different animal from a standard blade. While the smaller diameter might not provide optimal cutting speed, neither does its extra weight or big bite. The whole cutting dynamic changes with a dado blade, one way or the other. I've never had a bad experience when using a dado set, but as Tim says, finesse and extra safety precautions need to serve their role. I feed workpieces slowly but steadily, I use hold-downs and featherboards whenever they are feasible and I take multiple passes for hogging out deep cuts. Dado blades serve me well, but I use them with reserve and respect.

## HAND TOOL

***Q** I do a lot of woodworking with small projects, and I am looking for a special wood plane designed to take the edge off lumber. It is small and only 2 or 3" long. When you run it down the edge of a board it eases the corner (like a roundover bit in a router). I had one of these years ago, but it's hard to even look for one because I don't even know what to call it.*

**A** **Michael Dresdner:** "What you seek comes in both plane format and in a hand-held edge tool. Sometimes called a round molding plane or easing plane, the more common iteration is a smaller-handled gizmo called a cornering tool. For a good quality cornering tool in hand-held or plane format, check out leevalley.com. Do a search for "planes" under the woodworking button, and then click on "molding planes." Two versions of cornering tools and one plane format tool will pop up."



**Rob Johnstone:** "They are called radii planes. You can find them at rockler.com or any number of catalogs. Most have replaceable blades and work best on long straight edges. For curved edges I prefer a router bit (sometimes called a roundover bit) with a bearing to guide it."

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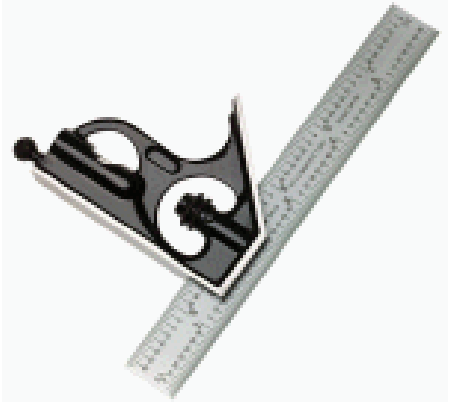
**Q** ***Can anyone tell me the best way to make sure that my 45 degree angles are accurate on my miter saw. My cuts for picture frames aren't too bad, but in cutting a 2 x 6, the last piece has a terrible gap.***



**A** **Ellis Walentine:** "Without belaboring the obvious, an accurate combination square is an excellent way to check a 45-degree miter for accuracy. If your saw doesn't produce perfect miters right out of the box, the solution is to adjust the fence. The owner's manual should explain how to do that -- usually by loosening the bolts that hold it to the table. Try to be aware of your sawing technique, too. On angled cuts, a miter saw can shift the workpiece slightly (or disastrously!) if you aren't holding it securely or using the hold-down clamp supplied with the machine. Those clamps aren't always useful, either, depending on the cut you're trying to make. Another good work habit is to make the cut by chopping (rather than sliding the saw motor assembly) if the workpiece is narrow enough. Chop slowly and evenly, and once the blade has bottomed out in the table groove, switch the saw off and wait until the blade stops before you move your workpiece. This way, the spinning blade won't ruin your perfect miter on the rebound."

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**Q** ***How are cabinet scrapers used; are they pushed or pulled?***

**A** **John Brock:** I both push and pull cabinet scrapers. It depends on the grain runout and where I can best reach the workpiece. I think I have more control pulling, but I routinely do both.

**Mark Hensley:** I use them both ways. However, I get more power when I push.

**Richard Jones:** I use them both ways. It depends on which is most convenient, but I generally find it easier to push. I find it easier to flex the wide face of the scraper nearest me concave using my thumbs near the center and pulling the short edges towards me with my fingers.

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***Q I have two diamond stones that I am having difficulty cleaning. The swarf is imbedded and is plugging up the diamond grit. I have tried scrubbing with a toothbrush and Comet, which has improved the stone dramatically, but I'm wondering if there is a way to clean the stone to like-new condition?***

**A Chris Marshall:** According to the website of DMT (a leading manufacturer of diamond sharpening stones), you're doing exactly what they recommend to clean your stone. They don't suggest the need for anything further to clean a diamond stone that's still in good shape.

But, they also add that a diamond stone won't last forever before the diamond wears out. Is there a chance that maybe your stones are clogged with swarf and probably underperforming for you because the diamond has reached the end of the road?

**Tim Inman:** You don't say whether this is a "wet" or "dry" stone. That would make a difference. If it is a wet stone, then I'd put it in a pan of water, and some soap, and let it perk for a while. Follow up with the brushing again. If it is a dry stone, then using an abrading tool, like a diamond, to expose a fresh new surface would be the classic treatment. Most "diamond" wheels are not actually "stones" but rather metal plates with diamond particles fixed to their surfaces. The true "diamond" wheels will not tolerate any surfacing. What does the manufacturer recommend? Truly, this is where I'd start looking for advice on an expensive stone or wheel.

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***Q I am new at woodworking but eager to learn. I'm considering buying my first hand plane. Which one should I buy and what brand do you recommend?***

**A Chris Marshall:** Before you can determine which plane to buy first, the bigger question really needs to be what tasks you want to do with it. And that opens up the larger matter of what method of work you want to pursue in your woodworking: hand tools, power tools or a mix of both. You can carry out all of your surfacing and truing tasks with sharp planes, or you can do much of this work with power tools instead. For instance, a bench plane will flatten stock faces and reduce thickness, a jointer plane will flatten the edges and a block plane will

square up the ends. So will a power jointer, surface planer and an accurately tuned table saw or miter saw.

A smoothing plane can produce a finish-ready surface, but so can a sander and abrasives. I'm grossly oversimplifying things here, but you get the point. I think a well-rounded woodworker should eventually become adept at both methods of work, but honestly, I'm not there yet myself. I favor power tools but reach for my low-angle block plane and rabbeting plane for chamfering, cleaning up tenons and so forth. Someday, I hope to be equally skilled with a larger variety of planes ... but for now I guess I'm a hybrid woodworker. There's always something new to learn. In terms of brands, I'll choose not to name-drop. There are a number of good hand plane manufacturers these days — not just one or two. Read some magazine reviews, check out hand tool forums and most importantly, try out some planes at a woodworking show or store. The ones that suit you best may not be the same brand and model as another woodworker suggests.

**Tim Inman:** If I could only have one plane, and I wanted to do "all-around" woodworking, I'd buy a good block plane. They're just handy for everything, and you should keep it in a really handy-to-reach place near your bench. Don't hide it away. I'd buy the lowest angle plane I could (there are a couple of approaches to blade angles in block planes out there), and I'd pay as much as I could possibly afford. Lie-Nielsen is a very fine maker. We gave my father one of these to celebrate the loss of his "favorite old one" some years ago. He is thrilled with it - which is about as good a testimonial as you'll ever find. He never endorses products. Then, the really important part: You must learn how to sharpen the blade, and KEEP IT RAZOR-SHARP whenever you use that plane. A good plane, well sharpened, will have a sound when you use it that is the key to knowing when you're sharp enough. If your plane is sharp, it will "sing" as it cuts a curl. It will make you smile, and your work will be better for it. You'll want to use it again! Then, you'll start buying more planes whenever you see them. They're fun to have. You'll actually use the block plane, though.

## JIGS & FIXTURES

**Q** ***Is there some special function for the "L"-shaped vises sometimes seen on European style benches?***

**A** **Andy Rae:** Known as a tail vise, this type of vise has two primary holding purposes. Work is grasped between the main jaws, one of which is the dog-legged end of the bench itself and, as such, offers a particularly sturdy clamping surface. Or, work can be clamped to the top of the bench between bench dogs. The dogs, which are wooden or metal posts, fit in a series of holes in the top

of the vise and along the front of the bench. Many woodworkers mistake the short "L" of the vise as a convenient spot for clamping. Please resist the urge, or you'll risk damaging the vise. The reason for the 90-degree turn is to provide support for a wooden or metal rail that guides the vise underneath the benchtop.

**Richard Jones:** I'm guessing you're referring to the end vise. The long leg of the L has a series of dog holes in it. These are in the same plane as the fixed dog holes in the main part of the bench. The primary purpose of the vise is therefore to clamp boards on the bench between a pair of dogs.

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**Q** ***Can I use UHMW polyethylene stock in the appropriate thickness for miter guides to screw to the bottom of homemade crosscut sleds and the like? Is it dimensionally stable enough and will it wear well?***



**A** **Tim Inman:** I've done it many times, but I find that a good hardwood stick does just as well. In fact, I prefer well-waxed maple slides for most of my jigs and fixtures.

**John Brock:** Yes. I found I needed to run a fresh file down the sides of the miter slots in my table saw to remove a couple of rough spots. Then the UHMW polyethylene works well for miter guides. The only complaint is it will wear over time, depending on use and the roughness of your miter slots.

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**Q** ***I am building dollhouses and gas stations in the 1:12 scale size. I will be working with 1/8" x 1/8" and up to 1/8" x 3/8" strips. What is the best table saw jig to use for this project? I have an old Sears contractor's table saw that is modified a little.***

**A** **Tim Inman:** Little pieces in big machines equal trouble! Be very, very careful, wear eye protection and follow all the safety rules. You'll hear the "Ping!" right after you feel the numb sting on your skin if you get a kickback, says the voice of experience. Use a zero-clearance insert and a fine tooth sharp blade, for sure.

That said, I'd make a sled. This is a great way to handle little pieces and cut them as precisely as you want them, with the least risk.

**Rob Johnstone:** Such small stock on the table saw raises a red flag for me. If you must use a table saw, build or buy a sled that surrounds (the deck runs on both sides of the saw blade) the saw blade. Do not raise the saw blade any higher than you absolutely need to. I would recommend a band saw or even a scroll saw for this job over the table saw. They would be much safer options, in my opinion.

**Chris Marshall:** I agree with Tim and Rob on this one. Use a sled and a fine-toothed blade if you end up using your table saw for these tiny cuts. You might also appreciate knowing that Proxxon sells a tiny table saw designed for just the sort of miniature work you're doing. It comes with a blade that's only 2 9/32" diameter with 80 teeth — so extremely fine! It might be worth the investment and the added degree of safety if you plan to build lots of wooden miniatures.



***Q** I've seen lots of articles on how to build a shooting board. These instructions are clear and well presented, but none seem to explain how to use the board. When planing the workpiece, what prevents the shooting board itself from being planed? Also, is it necessary for the projection of the blade to be exactly the same each time you use the board?*

**Tim Inman:** I think your questions will all be answered if you'll just make up a "quickie" shooting board and give it a try. In fact, I'd require it if you were one of my students. Before you spend time and materials making the "perfect" shooting board, try some things to see what you like and want in your final effort. You'll be surprised how easy they are to use, how simple they really are - and you'll wonder how you ever got along without one. I have a couple of them hanging on my shop wall. I often use the one that is ugly just because it works better than the one that is pretty.

To answer your specific questions, you will plane a little bit of the shooting board clamp, but only a few thou-

sandths - the thickness of the curl. If you'll look at the sole of the plane, the cutting iron sticks out from a little "window" which surrounds it. The metal on the edge of the window makes a "stop" so the plane can't keep digging into the shooting board. The depth of the cutter setting on the plane need not be exactly the same each time. It will be pretty close, though, because you'll usually plane off about the same amount each time. Veneer is pretty easy to "overpower" by hand, so super precision isn't too important with the shooting board.

A veneer shooting board is actually such a simple tool most authors probably don't recognize what a mystery it might be to someone who has never used or seen one. Thus, they fail to fill in the details that are so obvious to them. Again, my best advice: don't overthink this. Just make up a rude-crude shooter, and give it a try. Then you'll know what you want. The clamping part is the most important detail to me - and it never gets mentioned. Now go out and make one!

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**Q** ***What is a shooting board for flattening board edges, and how is it used? I never heard of it.***

**A** **Stephen Shepherd:** A shooting board is a handy tool for planing straight and square edges on a board. But what about a board that is 6 or 8 feet long, that won't fit on most shooting boards, so how to get a straight square edge?

Simple, you make your workbench a full length shooting board. All you have to do is have a piece of wood 1/2" or 3/4" thick as long as the board you need to plane and wide enough to support the board. The piece of wood is



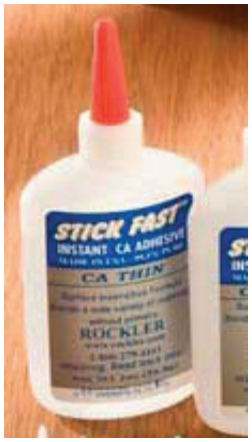
placed on the bench, the stuff to be planed placed on top and projecting out a 1/4" or so and clamped in place with clamps at the ends or with holdfasts or other clamping devices as appropriate.

A long jack or joiner plane is then run on it side along the bench as the base of the shooting board, (bench), the piece of wood elevates the stuff being shot and the clamps act as the stop on a regular shooting board. And the edge of your board will be square and with such a long board, either a long straight edge or string line will be necessary to determine if it is straight. The longer the plane, the truer the board will be. But on such a long board it is necessary to 'squint the joint' (get down and sight the board) to determine if it is straight.

So your only attention needs to be getting it straight as the shooting bench will always plane a square edge. Your body of the plane needs to be square and the iron set square as well to insure that the final cut will be square. This also helps in reducing the ends that tend to be rounded off and the boards planed with a belly. A shooting board or shooting bench will eliminate that problem.

# GLUING & ASSEMBLY

***Q** Is there ever an advantage to adding glue to a wood screw hole for either added strength or preventing the screw from working loose?*




***A*** **Tim Inman:** In new work, I think a well-fitted pilot hole and screw are all you need. However, in restoration work, I often harden the interior of a worn screw hole by soaking in a little water-thin CA (cyanoacrylate) before I reset the screws.

**Andy Rae:** For outdoor work, or any furniture that's exposed to a lot of wet/dry cycles, I routinely dip my screws in a non-shrinking adhesive, such as epoxy, to prevent moisture from working its way into the screw holes and loosening the joints. There is probably a slight advantage in screw-holding ability using this technique. Having said that, I wouldn't rely on just screws and glue to hold up a stressed joint, such as a seat-to-arm connection. Sound joints, such as mortise-and-tenon and dovetails, should do all the really hard work.

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***Q** When gluing boards together, woodworkers sometimes use biscuits, and sometimes they just put glue on the edges and clamp. Is there a rule on this subject?*



***A*** **Carol Reed:** No rule here. Glues today are stronger than the wood so biscuits are not needed for strength. Because biscuits help align the edges, there is some value in using them with long edge joined boards. I rarely use them, and never use them on short boards. Your choice.

**Lee Grindinger:** No, there is no rule. Biscuits are used to help align the boards but they do not add significant strength to a joint. In some cases, the material used in the biscuit will react to moisture differently than the rest of the wood. When this happens the biscuits can telegraph through. For works intended to outlast the glue used, pieces built for generations, use a proper joint like a tongue and groove or a profile called "glue joint" that adds a mechanical strength to the joint. Wood moves, and most glues can't keep up for centuries on end, so a mechanical joint will keep the piece serviceable when half the glue in the joint has failed.


**Mark Hensley:** I use biscuits if I'm gluing a bunch of boards together to help keep them aligned. If I have one or two boards, I just glue them.

***Q When I'm ready to clamp my gluedup panel, how tight is too tight? The directions on the Titebond® bottle says to allow the glue to set for 15 minutes. Does that mean at least 15 minutes or should you unclamp after that time so the wood can regain it's natural shape?***

**A Michael Dresdner:** If you are crushing or deforming the wood, it is too tight. All you really need is for the surfaces to be firmly in contact with one another. The 15 minutes is a minimum, and it certainly does not hurt to leave the wood in clamps until you are ready to machine it, or until the clamps get in your way or are needed elsewhere.

**Ian Kirby:** If you're clamping a mortise and tenon, a dovetail or a butt joint, you can see when the shoulder lines are closed—that's all the pressure you need. When you can't so easily see the joint line-say, two blocks face to face-enough pressure is when you squeeze out beads of the glue. But this goes to the question of how much glue do you use. A good rule of thumb is "as little as possible." You have to wet every surface and you should roll it where you can roll and brush or paddle elsewhere. Brush it on and then try to brush it off, but wet every surface. The aim is to get the smallest line or bead of squeeze-out. Gobs of the stuff squeezing out don't help the joint, but it does make Titebond richer.


The length of time glue can be stored before it deteriorates is called its shelf life. The amount of time you have to leave the clamping pressure on is call the closed clamping time. The time you have between starting to put glue on the parts and getting them into clamps is called the open clamp time. Some glue makers strive to provide a product with a long open time and a short closed clamping time. For my money, a job that relies on glue to hold it together is worth more time, so I leave stuff in clamps a couple of hours.

And about that last sentence: clamping shouldn't distort the work! If it does, you're clamping too tightly or using clamping blocks incorrectly. But yes, Titebond says you can take the clamps off, but you don't have to."

***Q What is the correct way to glue up dovetails? There are so many surfaces coated with glue, it's always a mess with lots of squeeze-out cleanup afterward. There must be a better way. I've read Ian Kirby's articles on dovetailing, but I don't recall that he ever said just where to put the glue.***

**A** **Michael Dresdner:** "The only areas that require glue on dovetails are the diagonal faces. All the diagonal faces are long grain, all the square faces are end grain, and all the flat faces abut end grain. Therefore, you need only apply glue to the diagonal faces on the tails or pins, or both. (In most cases, adding glue only to the tails or only to the pins is adequate.)"

**Rob Johnstone:** "It is a bit of a messy process applying glue to dovetails. I agree with Michael as to where to put the glue, and would only add how to apply it. I like to fashion a small and very thin 'glue spatula' to sort of trowel the glue in place. I feel that it gives me significantly more control of where the glue actually ends up over a brush."

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**Q** ***How can I keep my glue from drying out and getting hard? I buy a bottle of glue and use half, then before I can use what is left, it is hard and gets thrown away. This is a waste of money and glue.***


**A** **Chris Marshall:** You don't mention what kind of glue you are using (my CA glue seems to dry out in a New York minute!), or how long it's taking to dry out, but I'll presume you are using ordinary yellow or white PVA woodworking glue that's reasonably fresh. Glue gradually loses its moisture as it ages and thickens, which hastens the dry-out problem. One option would be to buy smaller bottles and squeeze the air out before replacing the cap. Then, you'll not only have fresher glue when you need it, but also less glue lost to the trash if it should happen to turn to stone in the bottle again.

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**Q** ***I have several almost empty bottles of Titebond I and Titebond II lying around. Would it destroy the glue, or make it all Titebond I, if I combined both in one bottle?***

**A** **Tim Inman:** I don't think this is a good place to be thrifty. The old saying is, "Penny wise, Pound foolish." I think there is good advice in that phrase. Just think, if you try to save a buck's worth of glue - and then the magic combination mixture fails during or after your project is underway, what have you really saved? Those glues are easily disposed of, so I'd say pitch 'em and get yourself some new glue. That's what I'd do -- and I'm about as thrifty as they come. (Some call it Iowa Cheap!)

**Mark Roberts:** Mixing Titebond Original Wood Glue and Titebond II Premium Wood Glue should be OK as long as the user understands that the projects he uses the mixture on are for interior use only. By mixing the two adhesives, the level of water resistance will be degraded.

## Q *I have a kitchen chair with loose legs. How do I fix them?*

**Tim Inman:** The very best way to repair those loose legs A is to completely disassemble the chair, clean the joints, and reglue it. There are alternatives, but they have shortcomings. I'll review two alternatives. First, if the joints are not too loose, or filled with layers and layers of paint, one possible alternative is to flood the joint (very carefully!) with cyanoacrylate glue. (Super Glue is one common brand name.) I prefer a CA that is "alcohol" thinned for this, because it will find its way deep into the joint through capillary action. It will take care, patience and skill -- and more than one application. It works well. (WARNING: Somewhere on the label will be the words, "Bonds Skin Instantly." They ain't kiddin'.... Be very careful.)

Another alternative is to drill a tiny hole into the bottom of the joint, and inject an adhesive using a syringe. This, too, can be effective, depending upon the joint condition, the cleanliness of the joint and the kind of glue used. It can be difficult to force the glue throughout the joint. With both these methods, the joint is never cleaned. This ultimately spells trouble.

Better, though, is suggestion Number One. Take the chair apart, and do it right the first time. Clean the old glue away, fix any broken wood, and enjoy a long-lasting repair job. One little trick I can offer is to put two small pieces of removable masking tape at each joint. Number them "1" "1", "2" "2" and so on. This helps get the exact



part back in the exact location when you are ready to apply new glue and reassemble. Just match up the numbered pieces and joints - and it all comes back together like magic.

Another secret weapon I use for regluing chairs is "shrink wrap." I think you'll find a four-inch roll available at building stores, etc. It is common. Use it to replace clamps. It works like giant rubber bands or tourniquets. Shrink wrap banding makes bar clamps pretty much obsolete for chair gluing. It is better, faster, and easier. Make multiple "turns" until you have the pressure needed. Every "lap" adds more compression force. Be sure to set the chair on a flat surface to dry. Put a weight on the seat to hold all four legs down evenly.

**Chris Marshall:** With all of the forces a chair must resist (tension, compression, racking) as we drag them around, plus the weight of holding people, I'm skeptical about the strength of glue joints. Sooner or later, that glue will probably fail if the chairs get hard use. You might consider pinning the tenons in their sockets with a dowel driven into the chair legs perpendicular to the tenons. At least the dowel would provide a mechanical connection to reinforce the glue joint. If the glue does give way eventually, the cross dowels will still hold the joint together. But, you'll see the dowel ends with this approach...that's the price you pay for added insurance.

# SANDING & FINISHING


**Q** ***I have a bay window that has been finished with 3 coats of spar varnish over a stain to match the room's woodwork. The window has a seat, ceiling and the usual window trim. Despite filtering the air during the drying cycle, the last coat of varnish picked up dust particles. I would like to smooth out the finish -- at least on the seat -- but retain a relatively high gloss finish. What would you recommend?***

**A** **Michael Dresdner:** "Rub out the finish. The truth is, it is almost impossible to get a slow drying finish, such as varnish, to cure without some dust nibs settling into it, even in what seems to be a clean room. "Let the finish cure completely -- six weeks or more if possible. The longer it cures, the easier it will be to rub. Sand the surface smooth very lightly with 600 or 800 grit sandpaper -- sanding just enough to get the dust nibs out. Then resand with 1000 and 1200 grit paper.

"Once the surface is completely smooth, rub it up to gloss using automotive rubbing compound, which is somewhat coarse, followed by polishing compound, which is much finer. You will find many brands and types at any auto supply store. (I like the cheap No. 7 brand that comes in a flat, round plastic tin.) Follow the directions on the container -- you rub a finish on wood the same way you do one on a car, only a bit more gently."

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**Q** ***Is there a quicker way to sand the many spindles on chair backs and legs other than the old-fashioned way?***

**A** **Greg Williams:** There are several manufacturers producing what are essentially abrasive-coated strings for hand sanding, as well as disc-mounted strings and abrasive-loaded plastic fingers on a spindle or mandrel that can be used to sand the profiles much faster than by hand. There are also slitted or sliced abrasive discs that become flexible, multi-layered wheels that will sand profiles like this. Try looking for names like flap wheel, flap disc, sanding mop, and sanding star.

**Tim Inman:** Another old timer is the Sand-O-Flex, a wheel you put into an electric drill. It is a set of brushes which carry sandpaper strips onto the work surface.

**Q** ***If a S4S board is already planed down and smooth, why is it necessary to sand the S4S board again?***

**John Brock:** If it's for an outdoor project, I probably wouldn't bother sanding. If the board will be used as part of a more formal, indoor project, then sanding will remove the planer marks.

**Tim Inman:** If the wood was planed conventionally with spinning cutter knives, there will be little corduroy ripples left behind. You may not see them now, but you will once you stain and finish. Sanding removes those machine marks. If the wood was "planed" using a drum sander, then you'll want to do a fine finish sanding to remove the coarser drum sander scratches.

**Michael Dresdner:** There are two reasons to sand smoothed wood. The first, as Tim and John said, is to remove planer or sander marks that may not even be visible in the raw wood. The second has to do with adhesion. The longer a wood surface is exposed to air, the more it oxidizes, which diminishes adhesion of both glues and finishes. Thus, you should always surface or sand wood just before glue-up or finishing, even if it is smooth.



**Q** ***What finish will work if we wanted to use the bowls I turn for hot soup?***


**A** **Greg Williams:** I would go for a reputable salad bowl finish, and even then I would be careful about the heat of the soup.

**Q** ***How should I finish the inside of a cedar chest so as not to lose the aroma?***

**A** **Michael Dresdner:** You shouldn't. If you want the aroma, leave the inside of the chest unfinished. In fact, if it starts to lose its distinctive smell, lightly sand it to rejuvenate the aroma.

**Richard Jones:** Leave it bare and occasionally sand it if you wish to reactivate the aroma.

**Q** ***As a relative novice, I have heard about "wet sanding". Can you describe what this is, when to use it, on what wood, how to use it without water damage, etc?***

**A Chris Marshall:** A lot of terminology gets tossed around among different hobbies and specialties. I believe "wet sanding" is a crossover term from automotive finishing. It involves using a lubricant such as soapy water or mineral spirits, in conjunction with very fine silicon-carbide paper, to smooth and flatten each coat of finish before applying the next. The lubricant helps to wash away grit particles and the little bits of finish that are abraded as well as keep the dust down. You can do the same thing on your woodworking projects between coats of thoroughly cured film finishes such as shellac, lacquer or varnish. The wood type makes no difference. Some wood finishers call this process "rubbing out" rather than wet sanding. It will help smooth away little dust nibs, brush strokes or other tiny imperfections so the finish feels smoother. A good book on wood finishing will explain the process in better detail to help get you started



— it's not difficult to do and makes a big difference in the quality of your finishes.

**Rob Johnstone:** It occurs to me that you may be asking about a completely different concept, that of raising the grain with water during the sanding process. Our late contributing editor Mike McGlynn was a big proponent of sanding an entire project to 220-grit, then taking a wet cloth and wiping the whole piece of furniture — removing sawdust and applying a layer of water at the same time. When they are moistened in this manner, the wood fibers swell and then dry. (This lifts very small dings and closes ultra-small cracks and creases in the wood surface.) Sanding one more time with 220-grit, and then finer paper if desired, will provide a super smooth surface upon which to apply your finish.

Mike would always take this step if he was going to apply a water-based dye to the wood. In addition to the super smooth surface, this process helped him achieve an even dye application.

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***Q I'm just starting to get into lathe turning. With the multiple speeds on the lathe, at which speed is it best to finish-sand the project? It seems to me that at the lower speeds, the sand paper doesn't clog up as fast.***

**A** **Tim Inman:** Turning has had a special place in my heart since I was a 10-year-old boy; I'm still fascinated with it. Turning is truly one of the "ancient" crafts. Thus there are lots of "rules" and many experts with advice on the topic. One of the best rules I was ever taught came to me from a man in England who is the best turner I ever met, and probably the dean of turners in the world today, Bill Jones. When asked which tool he used to do a certain job, he replied, "The one that cuts." Take that lesson from the master, and use it to answer your own question. In other words, use the speed that works best for your sanding job. I generally prefer to err on the slower side when I work at my lathes. Many others prefer higher rpm's. In the end, it is the quality of the work that tells the tale, and discussions about rpm should follow, not lead. Different woods, different sizes, different abrasives - different operators! - all make a difference. Use the speed you like that works best. More speed means more heat, and heat is often the enemy, especially sanding.

**Chris Marshall:** Take your time with sanding, too, and follow the same routine you'd use with other projects. Start with coarser grits and move up to finer ones, regardless of what speed you use on your lathe. Don't make the spinning action a substitute for methodical sanding. When the paper loads up and loses its effectiveness, grab a fresh piece—I tend to go through a lot of it! Whether you're sanding on the lathe or at the bench, it's always a process of replacing larger scratches with smaller ones until you reach a point that you can't see or feel them anymore.



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***Q*** ***I made a benchtop that includes my radial arm saw out of MDF. What is the best product to use to seal or finish the MDF?***

**A** **Tim Inman:** Short answer: Formica. Longer answer: Plastic laminate. Really. This is a great place for a melamine, mylar, or phenolic type laminate surface. That said, virtually any sealer will work. MDF is like a sponge, so it will soak up quite a bit of finish at first. Let it drink, and be prepared to apply more than one coat. Scuff sand, then recoat to get a smooth "gliding" work surface. Here's another tip you might consider if you're wanting a surface that will let the work slip and slide. Floor sealers made especially for bowling alley maintenance usually include some "slipping" agents to keep things moving along. They are very tough, and quite durable. I once used such a product that had powdered Teflon® included in it. It made a great working surface. Check with flooring contractors or your local bowling alley to find a source.

**Chris Marshall:** I'll take a different approach from Tim on this one - but I don't disagree with his reasoning. If this bench isn't one you plan to hand down to the next generation, and it's just a workaday

shop fixture, a finish isn't absolutely mandatory. Adding a protective topcoat will make glue drips and other shop liquids easy to clean up, no question about it. But, MDF actually has a pretty durable surface all on its own. I've had a worktable in my shop with an MDF top on it for at least a decade, and it has no finish on it. It's still going strong. I recommend that you edge your bench with hardwood. MDF's edges aren't nearly as tough as the faces.

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**Q** ***I made a breadbox for my wife and finished the interior with polyurethane, and it smells. I've tried to put baking soda in it, let it stand open for days, alas it still has a strong odor that permeates the bread within. Is there anything I can do to save my project ? Help!***


**A** **Tim Inman:** Time is your friend. Open the box so it can get as much fresh air circulation as possible, and let nature take its course. If you can, I'd put it outside in the shade and let the wind blow through it. If outdoors isn't an option, put a fan blowing on it. I would think that in a couple of weeks with lots of fresh air circulation, you'd be back in the happy place. Next time, you might consider leaving the interior unfinished. Many old cabinets I restore have bread drawers or boxes. They are almost never finished on the interior surfaces.

**Chris Marshall:** I agree with Tim - once the poly completely cures, the smell should diminish and then eventually disappear. But, maybe time isn't your friend for this project or you'd rather not wait for the stink to go. There is another solution, which has been suggested before by finishing expert Michael Dresdner: shellac. Shellac seals in odors, and you can apply it right over the poly inside your breadbox. There will be no adhesion problems, and it dries super fast. I'd use Zinsser® SealCoat™ for this job, because it imparts no color to the finish you've already got in place. You can find it at many home centers.

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**Q** ***I'm about to start finishing my new maple kitchen cabinets. Maple has proved difficult to stain using everyday stains like Minwax® so, after a little research, I realized I was going to have to use a dye stain. I chose General Finishes water-based dye stain as it is easiest for a novice to use and penetrates the maple well. On my sample pieces, I applied a wood conditioner and lightly sanded.***

***I then applied the stain to the color I wanted. I do not know what my best next step should be. Should I apply a sanding sealer, then sand again, or is that necessary? I have also read that you cannot use sanding sealer under a sprayed precatalyzed spray lacquer, which is what I was thinking of finishing them with. I'm concerned with brushing on a final finish because I don't know if it will cause the water-based dye stain to bleed into the liquid brush-on finish. Will it? Also, can I just use a water-based finish like Deft water-based wood finish instead of the spray lacquer? I just want to be sure and get it right.***

**Tim Inman:** It is just great that you're asking questions and doing some testing first. Sample boards are your friends! You will not only get a better result using them, but you will also set yourself up to have some fun doing the real job. Jumping in headfirst without testing or learning usually results in headaches and disappointment.

Maple, one of the really dense woods, does indeed offer interesting staining characteristics. Actually, some refer to it as "blotchy" and others refer to it with more favor. Whatever, it is natural for maple to NOT stain evenly.

I like to "sneak up" on my finishes. I think dye staining is a great first step. However, I'd recommend you try using your stain at about half-strength. With dyes, you can go back later and add more to get a stronger richer color. Dyes are not very forgiving, so test and sample before you launch. After your dye has dried, a light sealer coat would be the next step. I prefer what is called a "wash" of sealer. This simply means you dilute your sealer material a lot. I often use shellac cut to about 10 percent shellac and 90 percent solvent (alcohol) as my sealing wash. Why? It goes on wet, and "restores" the dry dye color. It soaks in, and it scuff sands easily. If I want to add more color, I haven't clogged up the wood with sealer. You could also use sanding sealer as a wash — just dilute it with the appropriate solvent, which is labeled on the can. Since you will be putting on such a small amount of finish product, once it is completely dry, you should have no compatibility issues with your chosen topcoat.

Now here's a place you might want to experiment a little more. This additional step is more work, but the results can be fantastic. Oil stains do things to wood that water stains can't. You can have the best of both. After scuff-sanding your dyed and wash-coat sealed wood, apply a coat of an oil-based wiping stain. This is a stain that contains both dyes and pigments carried in a drying oil base. Your wood will take on a rich, deep look as a result. Try this on a sample board first, but I'll bet you like the results enough to do it on your whole project. Again, seal with a dilute wash coat. Allow it to dry completely, and scuff sand for smoothness. (Nylon Scotch-Brite™ or steel wool substitute may be all you need for this step.) Complete your finish. Send us pictures!

**Chris Marshall:** I'll add only one more side note: You'll only be in danger of smearing water-based dye if you topcoat it with a finish that contains water as its solvent—such as water-based varnish. Water will redissolve the dye in the wood and could lead to a mess. Once the dye is encapsulated under a seal coat as Tim discusses, any finish (even water-based) should work fine. Or, if you don't use

a sealer over the dye, pick a topcoat with a different solvent base (shellac or oil-based varnishes are safe choices).

**Q** ***I have an order for a wooden bathtub carved out from a huge tree trunk. While I am busy with the excavation, I will very much appreciate some help and/or ideas for waterproofing this huge tub. Many thanks in anticipation.***

**A** **Rob Johnstone:** What an awesome and, if I might add, totally crazy idea. Are you burning out the interior of the log like the South Sea islanders do for dugout canoes?

To your question: as I see it you have a couple of options. You could spray it with a catalyzed lacquer, which dries very hard and is quite resistant to water. A similar concept is to use clear epoxy as your finish … for the same reasons. The problem, even with these two ultra-sturdy finishes, is that they will wear over time, and the wood fibers will expand and contract over time, which means



that the finish will fail at some point. Another option is just to leave the wood finish-free. As long as it gets dry between uses, it will last a long time and might be more "user-friendly" than a finish would be.

**Tim Inman:** If transparency is not an issue, I'd suggest one of the "below grade" two-part epoxy paints designed for tank lining and water containment areas. "Swimming pool" paint, for lack of a better description. If transparency is desired, then I'd still go with a two-part epoxy. Polyester clear or gel coat would be another option. Probably the biggest concern for failure would be simply good old wood movement. As your bathtub dries, it will move. Keeping a finish from cracking or peeling away would be my concern. Two-part polyurethane coatings are available in both opaque and clears. Although not as durable as either epoxy or polyester, polyurethane is typically more flexible. Whatever you do, coat the interior before you even think about sealing in any plumbing connections with silicone caulk. Don't even think about it!

**Q** ***I am restoring an old oak rocking chair that has been outside in the weather. I have sanded down the chair, removing the old dirty surface. The oak wood seems to be unusually soft on the surface. I plan to use spar varnish on the new surface. Is there anything special that I should do to prepare the chair for finishing?***

**Tim Inman:** That soft surface is evidence, more than likely, that the wood fibers have been broken down by the sun. Ultraviolet light and weather destroy everything.

UV light attacks the lignin that holds those wood fibers together. Then, the actual cellulose of the fibers begins to decay. Water just hurries things along. Sometimes one can sand off the ruined surface and expose a nice new one to finish and enjoy. Other times, the damage is too deep. Varnish alone will not "consolidate" the surface and make it hard enough for use. There are things like epoxies and polyesters which can be used. Caution: Test first to be sure this will be right for you. The damage you're seeing is part of the history of that chair. Maybe you could keep some of the damage, and tolerate the imperfection, without doing further damage to the wood.


**Chris Marshall:** Bill, if you try to use an epoxy-based repair system to reinforce the spongy wood (such as the one shown here from System Three), then follow that with spar varnish, I would definitely try it on some scrap wood first. Or, maybe some inconspicuous place on the actual chair. I would want to be sure the spar varnish and cured epoxy are compatible with one another. You should also investigate if the repaired areas will look different than the unrepaired areas under your new varnish. If the epoxy makes the repair areas look "patchy" in the end, it might not be worth the time and effort. As Tim says, you may want to just live with it "soft" and consider that to be part of the old chair's character.

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## Q *What's a good finish for a butcher block countertop?*

**A** **Chris Marshall:** When I was in high school, I worked behind the meat counter at a local grocery store. The butcher block received nothing in the way of "finish" besides regular contact with meat fat. The end grain soaked up enough of that fatty oil over time to bead up when water was applied to it. Even daily cleaning with an ammonia solution didn't stop the wood from beading water. That said, I would be inclined to finish your countertop with a butcher block or salad bowl finish or possibly just mineral oil -- some nontoxic oil-based finish that would be easy to replenish when the surface begins to look dry. Maintenance would sure be simple: flood on a new coat, let it soak into the wood and wipe off all the excess. This would be a better solution than applying a film-forming topcoat like varnish that wouldn't stand up to repeated exposure to water, heat, kitchen cleaners, knife edges, etc. Actually, no finish is going to last long on a countertop next to a busy kitchen sink, so I'd want to make refinishing as easy as possible.

**Tim Inman:** I'm sure this question will get a wide range of responses! My wife (who teaches culinary arts) would

say, "Nothing!" She wants just a plain, clean, cleanable wood surface. I made "cutting board" countertop insets for her many years ago, and she has cut, chopped, shredded, grated, kneaded and peeled on them ever since. Indeed, they do show knife scars and badges of wear and tear, but they look "right" in a real working kitchen. Finisher that I am, I do like to at least give the wood a coat of wax or oil from time to time. (She won't read this, so it will just be our little secret, right?)


However, plain old wood may not be everyone's cup of tea. Any "film-building" finish you might apply will be subject to chipping, peeling and scratching. This may be fine -- especially if the chef is wanting something that looks better, and is willing to treat the surface with more respect for the aesthetic, and less demand for the utilitarian. A happy bridge might be a finishing oil like tung oil or an oil/wax/varnish blend (Sam Maloof's favorite) that will soak into the wood surface and provide some aesthetic enhancement, but will not be so vulnerable to surface failure. Oils can be reapplied without much stress. Film building surfaces can only be repaired or refreshed with much work and preparation.

The wood will be fine, whatever your choice. The use and enjoyment of the tops will be reflected in your pick. Select the finish, if any, that will perform the function you most want.

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***Q** I repair and restore antique pieces. If necessary, I sand off the old finish rather than stripping. I like using my orbital sander, but have trouble with chatter marks. Any suggestions?*

**A** **Tim Inman:** By "chatter marks" I'm going to assume you mean what I usually call "swirlies": little machine made marks left by sandpaper/abrasive scratches. Every tool leaves its own mark. A random orbital sander is less prone to leaving the very easily seen "swirlie" marks on wood; an ordinary orbital is more likely to leave them. Straight-line or "in-line" sanders also leave marks, but they are linear rather than circular. So what to do? My best advice, which I recommend in my book, is this: Do the sanding with your favorite machine. Work your way down through the necessary grits from coarser to finer. When you have finished the job with your power tool, then use this trick: Whatever grit you stopped with on your sander, for example 220, go backwards one grit. In this case, that would be 180 in my shop. Now, re-sand by

hand. Go with the grain, and do a nice job, but don't work yourself into a frenzy. Pay more attention to flat surfaces that are the most likely to show swirlie flaws. Now you have "hand sanding'" marks on your furniture. I find that this technique virtually eliminates the machine-made scratches. Your manmade ones are not very visible in the finished job.

Now, about sanding the finish off antique pieces: don't. Sanding not only removes the finish, it also removes the wood surface that has the patina so cherished in an antique. It also cuts off sharp molding edges and surface elements that are so strongly deserving of preservation. Usually, an appropriate chemical cleaning is much less destructive of the surface -- when finish removal is absolutely needed.



**Chris Marshall:** After final sanding by hand, I will also flood on some mineral spirits or denatured alcohol — it makes those remaining sanding scratches much easier to see, and neither solvent will raise the grain like water. Sometimes it really helps! One other word of advice: easy does it on the hand pressure on your sander. Bearing down on the machine may seem like a logical way to speed up the process, but it doesn't. It slows the tool down and leads to even more swirl marks. Use a light hand and let the sander's weight do the work.

## LUMBER & SHEET GOODS

***Q What grit is 'A' grade plywood sanded to from the factory?***

**A T. C. Knight:** The APA Engineered Wood Association specifies a Grade A face to be "fully sanded with 80-grit or better," so it is really up to the manufacturer how much "better" than 80-grit they will sand an A-grade veneer. For instance, Formwood Industries in Indiana claims to sand their panels with 100-grit followed by 150-grit. If you really need to know what grit is used, you will have to contact the specific manufacturer.

**Q** ***I assumed that since there is a special sized bit for a dado for plywood, all nominal plywood must be the same thickness. The plywood I purchased for one job came in three different sizes. Is this unusual, and what's the solution?***

**A** **Chris Marshall:** Hardwood plywood can be as much as three sixty-fourths of an inch thinner than its nominal thickness and still meet industry tolerances. Its thickness is also influenced to some extent by changes in humidity. The way I deal with these variables is to cut my dadoes with a stacked dado set on the table saw whenever possible. I shim the blade to match the thickness of the actual divider or shelf I'm installing, and I make test cuts in scrap to check my setup — a pretty standard approach. When you're using a router and undersized plywood bit, you may have no choice but to reset the guide fence and make another pass in order to widen the dado a hair.

**Richard Jones:** Generally I find the most satisfactory solution is to avoid the full housing (dado) and go for the tongue and housing. If you're using, let's say, three- quarter-inch plywood, rout a convenient router cutter diameter, say a half-inch groove or housing in the female part, then rout a matching shy half-inch tongue in the male part to suit the groove. If your boards vary in thickness a bit, rout the tongue a hair tight and get it to the final size with a pass or two of a shoulder plane.



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**Q** ***I left some milled four quarter maple in a basement shop in New England during the winter with the heat off. Upon my return, the boards were no longer flat. Could repeated warming and cooling of the shop air have played havoc with my lumber?***

**A** **T. C. Knight:** More than likely, the cause of the warping was incorrect handling of the boards. A cold, humid basement should have reduced the chance of warping because it slows the drying rate. Wood warps as it dries due to the stresses applied as the outer area dries while the interior of the wood is still moist. To reduce warping, wood should be stacked and dried correctly. Stack the boards on a level floor with space between them and the concrete to allow air circulation. Three-quarter-inch strips of wood, called stickers, should be placed about every two feet along the stack, separating one layer of boards from the other and the bottom layer from the floor. Once the stack is complete, heavy objects such as cinder blocks should be placed on top to evenly weigh the top layer, holding it flat. Some boards, however, are prone to warp no matter what you do, especially if they came

from a leaning tree containing compression wood.

**Andy Rae:** Any milled wood in any woodshop, left standing or lying horizontal, will warp. How much depends on the moisture variances in your particular shop. Regardless of location, if you've milled your wood flat and must go do something else other than join it in the form of furniture, stack it on a flat surface with weight on top.

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***Q*** ***I have a large eucalyptus log with a burl on one side that projects three inches and measures 16 by 28 inches. The log section is 18 inches in diameter. What is the best way to harvest the burl for future turning?***

***A*** **Richard Jones:** Saw it through and through, aka plainsawn, so that the burl is the first or last plank cut.

**Tim Inman:** Harvest it with a saw in one hand, and a bucket of waxy sealer in the other hand. Immediately after cutting the burl, seal that cut side. Seal it again. Seal it again in a week. Store it where it is cool and out of the sun. Be patient. I have one about that size I cut from my Grandmother's giant maple tree in 1979. It is doing fine. I'll find something worthy of it one of these days and see how it turns.



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***Q*** ***I have a fair amount of aged oak timbers that are about 2x12 rough and full cut. They would make great tabletops, good stuff. What would you recommend to rip them? Your advice will be appreciaed.***

***A*** **Chris Marshall:** Ripping the timbers should be easy to do with any 10-in. table saw or on a band saw, provided you've got plenty of outfeed support to help manage the weight as it comes off the machine (I'd crosscut them to rough length first to make them easier to manage). Hopefully you have a jointer to straighten one edge before ripping them to width. Then, if you want to resaw these thick boards into thinner 1x stock, that will involve using a big band saw with enough capacity to handle a 12-in.-wide workpiece standing on-edge. Again, set up plenty of outfeed support to work safely. If you rip these boards down narrow enough, you might be able to resaw them on your table saw instead.

***Q** My daughter and son-in-law bought an older home in the Pittsburgh area. In one bedroom, the walls were paneled in semi-circular boards, like a log cabin. After removing the logs, we realized that they were wormy chestnut. I've milled them into 1 inch thick boards 4 3/4 inches wide. I got about 150 board feet. The logs milled up beautifully. It was as if, borrowing a term from metalworking, the boards were annealed. Was this due to the fact that the boards were cut from trees that were standing dead, or was it the fact that the logs were inside of a warm dry house for 78 years, or was all American chestnut that way?*

**A Rob Johnstone:** The stability and workability of the wood was likely the result of a few factors. First, as you suggest, the wood was probably harvested from standing dead timber. Second, the stock was sorted through before it was machined into the log paneling. There was such a large supply of wormy chestnut at the prime of its popularity that the questionable stock was set aside for less demanding tasks. And third, as you said, the stock had decades out of the weather to cure down or reach a state of equilibrium. Although there is much debate about how the characteristics of wood change over long spans of time (Is one reason Stradivarius violins sound so good because their wood has aged for 300 years?), anyone who has worked red oak recycled from a barn and red oak from a lumberyard can notice the difference.

***Q** I have some really old (more than 20 years) redwood. I am planning to build an outside bench for my grilling station and would like to restore the natural beauty of the wood (it is currently a dark reddish/brown color). The wood is already dimensioned and I would prefer not to run the boards through the planer. Do you have any suggestions that I could try?*

**A Tim Inman:** You might get the look you want by applying an oxalic acid wash to the wood surface. Follow the label instructions. Usually, this will bring back the "fresh sawn" wood color. But why fight Mother Nature? Eventually, light and oxygen will bring the wood color back to what you are seeing right now. Outside service means just that more diligence will be needed to keep the "indoor furniture" look on your wood.

**Chris Marshall:** Given how old your redwood is, it's hard to know for sure exactly what's darkened it. Oxidation,

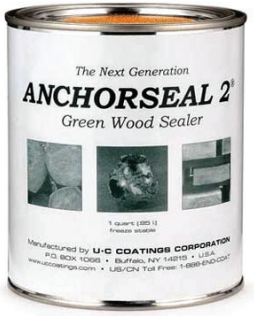

possibly sun exposure or maybe just dirt. Could be all three factors, to some extent. Even if the lumber is already dimensioned, I'm sure you're still planning on doing some sanding when the project is completed. Try sanding a test piece to see how easy it is to cut through that surface discoloration. It probably doesn't go very deep. Or, scrub it with soapy water and a Scotchbrite pad to see if that lifts off any grime. You could even try one of the liquid wood brightening and cleaning products, fortified with oxalic acid and sold for deck maintenance. Home centers stock it. That should help bring back the original color, too.



**Q** ***Kindly please let me know some types of wood recommended to build cutting boards for chopping food.***

**A** **Chris Marshall:** For cutting boards, I would choose woods that won't impart tastes to the food, hold up well to rough cutting and chopping tasks and with a closed grain to prevent trapping food particles in the pores or fibers. So, my picks would be hard maple, beech or birch. When you're arranging the pieces for your cutting board, think about it like a workbench top. End grain will give you the greatest durability, followed by edge grain. Face grain will work, too, but it's the softest of your stock surfaces.

**Q** ***I want to dry my own logs. What can use for end sealer to reduce end splitting?***




**A** **Chris Marshall:** Woodworkers that dry their own lumber and woodturners that want to preserve

green turning blanks typically use a product called Anchorseal®, produced by U•C Coatings Corporation. It's a wax emulsion with a viscosity similar to latex paint. You can brush or spray it on, and it comes in quart, gallon and two- or five-gallon containers. You can purchase it directly from the manufacturer.

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***Q I've been building some shop cabinets using MDF. I like drywall and deck screws, but I've noticed a tendency for the MDF to split apart even though I drill pilot holes for the threads and clearance for the screw body. What am I doing wrong?***

***A*** **Tim Inman:** MDF is not very tough; stable, yes, but tough, no. Give your screw a meatier perimeter around the pilot hole, if it is splitting near the edge of the board. If the screw is "exploding" the MDF and swelling it as it goes into the hole, then your pilot hole isn't large enough; use a bigger drill. Some drywall screws use a "double"-pitch (which is actually two unique threads wrapped around the screw shank) which makes them go in twice as fast - but with one-half the holding pressure. Others use a conventional single-pitch thread (one thread wrapped around the shank). See if you have both, and try them in a test. Does one type do better than the other? Sometimes the double twist pushes out less, so will hold better in MDF or strand board.



**Chris Marshall:** Along with Tim's good suggestions, I would try to avoid getting to within a couple inches of the corner of MDF when driving screws into an edge. The material may still split some when the screw penetrates it, but the crack usually won't migrate all the way to the corner. Tim refers to a double-pitch screw intended for melamine, particleboard and MDF: some manufacturers call this style Hi-Lo, and an image of it is shown here. When building with MDF, Ian Kirby actually won't drive screws into the edge of MDF. He glues solid-wood corner blocks at these intersections and drives screws into wood instead. I've had mixed degrees of success when fastening MDF edges with screws. I tend to use glue and long brad nails rather than screws to help avoid these problems.

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***Q I'm sure I am not the only one with the problem of wood warpage, but I've never seen a letter or article dealing with this. It seems like no matter what precautions I take, things still warp. I share my garage as a woodshop and an everything else area. In the summer, when everything is closed up, it gets quite hot in there. Could this be my problem? I really take pains to glue and clamp everything correctly, using premium materials, but to no avail. Any suggestions?***

**A** **Tim Inman:** Burn these letters into your woodworking mind: E.M.C. (Equilibrium Moisture Content) Wood is not "alive" nor does it "breathe," but it does react with its environment in ways metal and glass do not. It does take on and give off moisture from the air -- which some refer to as breathing. Wood will ALWAYS come to equilibrium with the moisture content in its environment, sooner or later. As the conditions around the wood change, so do the conditions within the wood. Equilibrium Moisture Content is the result.

When you roast the wood in your garage/shop -- or try making icebergs out of it -- the E.M.C. in the shop-stored wood is very different than the E.M.C. in the wood after it becomes a project -- or lands in its new resting place in your home or your office. Once the wood is at equilibrium, it will be stable -- whatever shape it has taken. Do yourself, and the wood, a favor. Allow it some time to come to equilibrium before you begin to work it. Once you do begin to use your wood for a project, keep it stored in the same basic environment it will eventually "live" in. Finish will slow the changes, but finish will never stop the changes. Just as ice can crack a rock, moisture changes in wood can have tremendous force. You cannot clamp or glue wood into submission. If it wants to move -- it will. Work with the force and be happier.

**Chris Marshall:** Sounds like you have a very damp shop environment if your sheet materials are warping this much. Maybe you live in a humid state or the garage floor slab is wicking up an excessive amount of moisture for some reason. In a garage shop where the space is still being used to park cars, it's pretty tough to de-humidify it with a big garage door opening and closing.



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***Q*** ***I bought some 5/4 bird's-eye maple at an auction. The problem is most is twisted. It's dry but appears to have not been stickered. Typically, the projects I build don't need lengths over 18 ". How do I plane or joint flat and turn this potential heat source into usable material.***

**A** **Chris Marshall:** The upside to your purchase is that you have some extra stock thickness to work with. If you usually use 3/4 in. stock, you've probably got 3/8 to 1/2 in. of extra wood thickness with your 5/4 maple. Surface only what you need to use for the project you're working on (I follow that plan even with the best material), and cut your workpieces to rough length before sur-

facing. Then follow the usual surfacing regime: flatten one face, run the material through your planer to flatten the other face and bring it parallel to the first, then continue to reduce the thickness as needed. Even if you've got some pretty distorted stock, you'll probably end up OK, provided the pieces you need aren't extremely long. But, really badly twisted wood may have no other fate than the wood stove. One other thing: if you just bought that maple recently, or if it came from another part of the country than you live in, give it time to acclimate to your shop climate. Several weeks or longer never hurts. If you're not sure of how it was seasoned — and it sounds like you aren't — I'd find a moisture meter and check it before using the wood. Moisture content should be below about 10 percent before it's suitable for furniture-building.

**Rob Johnstone:** Once a piece of lumber has dried out and distorted, you can flatten it and it will likely stay flat and true. The problem is that material on all faces of the stock will need to be removed to get it into a usable form, and that can mean that your stock might end up pretty thin. Cutting your stock to the shortest usable length that you can safely run across a jointer before you start surfacing the stock will mean that you need to remove less material to get it flat (18-inches is about as short a length as I would choose to face-joint). Of course, if you are using a hand plane to flatten your stock you can go shorter. After you have cut it to length, start by face jointing the stock on a jointer until one surface is flat and out of twist. (Winding sticks will tell you if there is a twist or not.)



When you get a flat face, use the jointer to make a perfect 90-degree edge. Now you can step to the planer and surface the face opposite the one you made on the jointer.

**Tim Inman:** This is basic Woodworking 101. Face, edge, end. End, edge face. That is the "correct" sequence for working a board flat and true. Begin by getting one face flat. Traditionally, this is done with a hand plane and a straight edge. If you're not into hand tools, then a jointer is your next best friend. Be sure the jointer is sharp, and the tables are set correctly for the cutterheads. You'll need to learn about "winding sticks" in order to get the board flat and not twisted if you must have long boards. A good book like Feirer's Cabinetmaking and Millwork will show you how it is done. Heavy use of a surface planer will usually just copy the twist onto your subsequently thinner boards. In other words, the pressure of the roller system in a planer just presses the wood flat while it is under the cutters, then the board springs back into its twist once it is free again. All this is to say just how important it is to sticker and dry wood correctly.

So, have you bought firewood? No, I don't think so. Cut those boards shorter to make useable pieces. If you can make judicious cuts to minimize the twisting and distortion, you should be OK. You will have shorter pieces, of course, but you should be able to flatten them without much twisting. Maple is very hard. If you use a really sharp surface planer, and reasonably shorter pieces (not too short!) and gentle, light cuts, you can probably plane those boards flat and pretty -- without too much waste.

I'll get lots of critical feedback about this answer, but I've done it many times. It isn't textbook, but it can work. More skill, less force, as my Dad always taught me!

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***Q I have prepared boards for jointing edge-to-edge by careful sawing, jointing on a router table and most recently with a jointer. In all cases, I get boards that join with a noticeable gap in the center. I'm certainly doing something wrong, but what?***

**A Tim Inman:** Since the ends typically shrink away from the glue line, I have always taught (and was taught) to have a goal of a little clearance in the center of the boards. The idea is that this will compensate for the end shrink. The clearance should be no more than a few thousandths, though. An ordinary playing card is about 12 thousandths thick. If you can slip a playing card in your gap, it is too open. A sheet of copy paper, and you're good to go.

To be in control of the work, though, analyze your tools and your technique. Are you using infeed/outfeed tables or guides that are two-pieces? Are they in line? Are you exerting more pressure in the middle of the run? I'm guessing this is more technique than tools. Try some test pieces to see if you can produce the fault one way or the other.

**Chris Marshall:** Whether you're edge jointing on a router table or with a dedicated jointer, the fence facings and infeed/outfeed tables need to be co-planar in order to produce flat edges. And, the cutter(s) must be exactly flush with the outfeed fence or table. But, since you say you are having similar problems with both machines, one other possibility is that your boards are "sprung" (curved on the edges) to begin with.

Is your lumber sufficiently dry (6 percent to 8 percent moisture content) and acclimated to your shop humidity level? Is it really narrow, in which case you might be pushing the stock flat when you make the jointing pass, but it's simply returning to a sprung shape as soon as it leaves the cutters? Try taking gentler passes to start with, so the cutters knock off the ends but not the middle. Once the ends are in line with the center, you should be able to continue flattening without perpetuating a sprung edge. One other thing: it's tough to flatten the edges of long stock (say, 6 ft. or more). Practice on shorter lumber and see if your luck changes. It probably will.

***Q*** ***I have made some kitchen cabinets, and the doors are made of poplar frame with paneling in the middle. They are so bowed it is heartbreaking. How can I remedy this? Any suggestions will be gladly appreciated.***

***A*** **Chris Marshall:** I wish there were an easy answer to your cabinet door problem, but I don't think there is one. Here are a couple of suggestions to consider:
If the panels are warped but the frames are flat -- and you built the doors with tongue-and-groove joints holding the panels in place -- you might be able to rout off the back lip that captures the panels in the frames and replace them. Then, nail the new panels back in with wooden retainer strips.

But, I'm guessing that it's the door rails and stiles that are bowed, which is a more perplexing problem. It's possible that the wood wasn't properly seasoned when you bought it and not fully dry, so now the poplar is taking on a bow as it dries. Or, you could just have some particularly unruly stock on your hands. You might be able to take the doors to a cabinet shop and have them run through a large belt sander to flatten the faces again, then refinish them. In the future, it's very important to buy dry stock and let it acclimate to your shop environment for a few weeks before using it. Some woodworkers even do a preliminary round of surfacing, leaving it thicker than necessary and waiting a few more weeks before milling to final thickness. That way, the wood has plenty of opportunity to distort and reach equilibrium before it's flattened and squared for the final time.

**Rob Johnstone:** Like Chris, I am a bit at a loss as to exactly what has happened to your doors. One idea that comes to mind is that you may have only finished one face of the doors. If that is true (or if one face has a heavy finish applied and the other face just a flimsy film), it may be unequal moisture absorption that is behind the distortion. (Although with frame and panel doors I confess it seems unlikely.) If it is the case, applying a good finish to the lightly sealed face may help.

Another cause of warping in frame and panel doors is not allowing sufficient room for the panel to expand. If the panels completely fill up the groove in the door rails, when they expand, they have to go somewhere. I think that your best bet is to remake the doors with properly seasoned stock and sufficient space in the grooves for your panels to move. (And finish both faces equally!)


***Q** I have several board feet of knotty pine that was removed from a room renovation. This has what appears to be some sort of poly or gloss coating with some pigment. I'd like to take that finish off as it's not in my style. I could reuse these boards for other projects if I could accomplish this. So I have a Delta 12-in. portable planer. How badly will I mess this thing up if I try to reduce the stock from 3/4 in. to around 5/8 in.?*

**A** **Chris Marshall:** At worst, the old finish will dull your knives some, but if all you have are a few board feet to plane, I wouldn't worry about it. I would run them through my planer, double-checking for hidden nails first. If you're really concerned about those knives, put on a good quality dust respirator, take the boards outside, and remove the old finish with a belt sander. Blow off all the residual grit, and then plane down the bare wood as usual.

**Rob Johnstone:** If you get all the nails out of the wood, the knots in the pine are more likely to dull your knives than the finish. Knots can be exceedingly hard, especially



in old lumber. And they can take the edge off of a planer knife in no time. But truth be told, your options are sand off the finish … which will clog up some belts ... or use your planer or jointer, which will dull up some knives. You're going to have to change your planer knives sometime, so my recommendation is use the planer, because I hate to sand. I actually have two planers in my shop, and only do the sketchy work on one of them. (If I am afraid that the lumber will be hard on the machine, I use my benchtop planer whose blades are easiest to change.)"

***Q** I have a 6-in. jointer and a 12-1/2-in. thickness planer. I have roughsawn lumber of varying widths. I am (trying to) make panels (sides and top of a cabinet) measuring 22 x 21 inches. I am ripping to something less than six inches to plane the lumber flat on one side, jointing one edge, ripping the opposite edge on the table saw, jointing that edge, and gluing up a 1/2 panel that will fit in the thickness planer, planing the half panel to flat and to thickness, then gluing the half panels together. I cannot get a perfectly flat panel. I have attempted to check flat, straight and square at all steps, and I still end up with a bow from half panel to half panel. I glue the half panels on a flat surface and clamped to that surface as well as clamped panel to panel. The bow is in the direction of the panel to panel clamps. Could they be too tight?*

**A** **Chris Marshall:** I would double-check those final jointed edges of the half panels to make sure that they are indeed square (or at least complementary to one


another) before gluing them up. The wider a panel gets, the easier it is to accidentally tip it a tad off the jointer fence and create an unsquare edge. But, if those edges are on the money, my next guess would be that since you are clamping the half panels to the work surface as well as to one another, you are applying too much clamping force on one side of the panel with no way to tell how those panels are responding to the clamping pressure. I would suggest elevating your panel glue-ups on two short stands and alternating the clamps above and below the workpieces to distribute the pressure evenly. Then, check your freshly glued panel for flatness with a straightedge before the glue dries. You should know in a hurry whether the clamps are too tight (bowing starting to happen) or just right.

**Rob Johnstone:** If I am understanding your problem correctly, it is at the point that you are gluing up the two 12-inch wide panels that you are getting the bowed result. At first blush, I agree with Chris that the wide panels are getting away from you as you joint a fresh edge. The short fence on your planer makes it challenging (but not impossible) to hold a wide panel perfectly aligned. Another option might be to rout the edge square using a handheld router and a good straightedge. Remember, there is usually more than one way to skin a woodworking cat.



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**Q** ***I need to disassemble a coffee table I made. Is there a "trick" to undoing glued joints?***

**A** **Chris Marshall:** The first "trick" to disassembling a glued joint is remembering what kind of glue you used to put it together. If it was hide glue, hot water will dissolve it. If you used white or yellow glue, hot water, acetone, toluene or xylene will dissolve them. Nothing I know of works on epoxy or poly glue. The second trick is getting the dried glue wet with the right solvents — and that's tough to do on a closed, tight joint. If there's any gap, use a small syringe to squirt the solvent where you need it, and give it plenty of time to break down the glue. Good luck — it won't be much fun!

**Rob Johnstone:** With the exception of those made with hide glue, glue joints are simply not made to come apart after the glue has cured. With that said, you can break down white and yellow glues with a combination of heat and moisture. When luthiers reset guitar necks, they commonly inject

steam into the joint to release the glue. It is a messy and tedious process.

Epoxy will break down under heat. Most epoxies will release after they get to 250-degrees Fahrenheit. Hide glue will release with a combination of water and pressure. It is the most civilized of glues in this regard. Violin family instruments are assembled with hide glue because they need to be worked on - disassembled and then put back together on a regular basis. There are Stradivarius violins that are 300 years old that are still around and being played in orchestras. So hide glue is a viable product even today.

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**Q** ***As a newbie woodworker, one thing that I've not found in my references regards mitering for picture framing, though I'm quite sure it's been asked and answered many times. What's the math used to calculate the overall length of the individual pieces?***

**A** **Tim Inman:** Build the desired "total length" out from the "known" dimension - the mat or the artwork - which must lay in the rabbet of the frame. I most often build up a "mock construction" or a model to measure from and do my layouts. I find this test piece a much more reliable assistant than my calculator.

**Chris Marshall:** I agree with Tim; it never hurts to create a prototype of your frame first. To size a picture frame, you have to start with what you want the inside opening of the frame to be. Then, consider what you have on each end of the four frame pieces: an isosceles right triangle



where the hypotenuse is the 45° mitered edge. What does this mean? Well, the width of the frame piece equals one of the triangle's two matching sides. So, once you determine the length of the inside edge of the frame piece, just add twice the width of the frame stock to this measurement: you're adding on those two outside legs of the triangles, which of course match the width of the frame piece (the other matching legs of the triangle). Then, give yourself several more inches of extra stock when preparing the frame pieces so you won't come up a tad short when mitering the pieces to length.

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**Q** ***Occasionally, I've had to drill out a dowel in a chair or drill holes for the long dowels that you can buy in hardware stores. None of my standard drill bits or Forstner bits match the diameter of these dowels. Is there a special set of bits sized for dowels?***

**A Chris Marshall:** I've been in the same situation as you, fitting undersized or oversized dowels into standard-sized dowel holes. It's frustrating and, I suspect, due to some poor quality control standards where the dowels are made. So far as I'm aware, there are no specialized drill bits designed to cope with odd-sized dowels. But, you can get high quality brad-point bit sets sized in 1/64-in. increments as well as metric sizes. Rockler and other woodworking suppliers sell them. These bits should be close enough to handle any strangely sized dowel that comes your way.

Tim Inman: The problem probably isn't your set of bits. More than likely it is the dowel! They may be made to metric diameters, or they may have been cut "green" and have dried to irregular shape and diameter. This is most likely the case. If you really need precision diameters, consider making up a simple tool to "resize" the dowels. An ordinary piece of flat steel will do. We call this tool a "match plate." Drill precise holes in it for the dowel sizes you'll want. Leave the burr on the back side of the hole where the drill comes through. When you want to resize a dowel, drive it through the plate - from the burr side. Just start the dowel into the hole by hand, then smack it with a mallet. Crude, but it works - much better than you might think. I learned this little trick from Mervin Martin, a conservator I studied with, and greatly respected as a cabinetmaker. He was a master in the best sense of the word.



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**Q** ***I build Adirondack chairs from kits. I then stain and paint them: fish, lizards, things like that. I like to countersink the screw holes and plug them with dowels. My problem is, the dowels have to be very thin, 1/16 to 1/8 of an inch, and I can't figure out how to consistently do this without shredding them. For a loveseat, it takes about 50 to 60 plugs. Any ideas?***

**A Tim Inman:** I think there might be a better plug material than the dowel for this job. Two-part "Tootsie Roll®" epoxy sticks would be my first choice. You could also use a catalyzed polyester filler. Either one would "stick" better than that little piece of dowel. Since you're painting over it anyway, I'd go synthetic on the screw hole plug/filler. That said, if wood is your option, then I'd set up a little jig for your table saw, and zip off a few hundred at a time.

To make the job go fast, I'd use something like a vacuum mounted right at the point of cutoff to suck away the little plugs as you go. Not only would this save time - it might also save fingers! A separator mounted in front of your shop vac would be ideal. These little devices are readily available from better woodworking suppliers (Rockler), and easy to use. All your little plugs would end up in the separator can, where you could collect them for use. What adhesive do you use to set these plugs? If speed is important, a CA [cyanoacrylate] would be great. A final sanding to level the plug surface flush with the rest of the chair, and you're ready to go.

**Chris Marshall:** Steve, you don't mention when the plugs are shredding for you— when cutting them from the longer rods or when flush-cutting them after gluing them in place. If the former is the case, I'd head to the band saw for cutting them to length and use a fine-tooth blade. It will cut more cleanly than the table saw and might even keep the occasional plug from launching across the shop. If they're shredding after you glue them in place, try a different method than sawing or chiseling to bring them flush. On soft woods like cedar or treated (which you may be using for your chairs), I've used 80-grit sandpaper before and just sanded them down smooth. It's quick and provides good results. One other thought here: have you ever considered using pocket screws instead of counter-sinking through the slats? You might be able to get those smooth seat and backrest surfaces you're after without needing to plug the screw heads at all. I went this route



for a garden bench years ago, driving screws in from below. Those pocket screws are still holding the bench slats in place beautifully, and it sits outside year-round. I'll do the same thing again when I build another one.

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**Q** ***We have some kitchen cabinets that are 1970's vintage, and they are particle board-covered with some type of veneer. The cabinets are in very good shape, we just don't like the look. Is it a good idea to take reface the cabinets or just replace them? I keep looking at putting all of this in a landfill and it just seems such a waste!***

**A** **Tim Inman:** Refacing, or resurfacing, kitchen cabinets like this can definitely be done. In fact, it is a major part of some cabinet shops' business.

There are a couple of common-sense precautions you should take. First, be sure the surfaces are clean, dry and grease/oil-free before you attempt to bond anything to them. Second, remember Rule Number One in Veneering: The grains must not run parallel between two adjoin-

ing layers - ever! In other words, you don't want to lay a long grain veneer over a long grain cabinet part. If you do, I'll guarantee a "glue" failure sooner or later. The solution is easy: add a "crossbanding"'layer under your new face veneer to fix the problem. This is super easy to do, if you just buy veneer that is already '"two-ply" with the cross-banding factory installed for you. Presto! No worries.

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**Q** ***I just got a Box Joint sled from Rockler and started to make small drawers from Baltic birch plywood. Is there a trick to prevent the tearout from the spiral router blade on the plywood? I was thinking of either rolling glue onto the edge or sandwiching the plywood between two sacrificial pieces of wood. Any suggestions?***

**A** **Tim Inman:** Perfection is always more difficult. If the little tearout is too much, then some sort of "sacrificial" surface is probably your best answer. Sometimes a little tape can do the trick. Adhere masking tape along the edge before you make your cuts. That jig makes it easy to lay another piece over the "real" one. I'd suggest something like 1/8-inch Masonite or hardboard to protect the finish wood, and let the bit cut clean. You may need to



sandwich the workpiece between two sacrificial ones so both the front and the back cut clean.

**Chris Marshall:** Abbott, I second Tim's motion to use a thin "backer" board behind the plywood (shown in this photo)— and in front of it, if you are getting tearout there too. Make sure your spiral bit is razor sharp and clean. Here's another suggestion that once worked for me with Baltic birch. I was using a dado set for cutting box joints and was getting unacceptable blowout behind the workpiece. So, I brushed on a coat of Zinsser SealCoat (it's just dewaxed shellac) first to lock the face veneer fibers. It dries super fast and worked like a charm to help me achieve cleaner cuts. Then, I used more SealCoat as my final topcoat for the drawer boxes.

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**Q** ***I want to put glass in my kitchen cabinet cathedral doors. The doors have mitered corners held together with metal wedges, so they can't be routed. Is there an expert in your group who can lead me in the right direction to follow, step by step?***

**A** **Tim Inman:** My confidence in my answer would be much greater if I could see your doors! But, here goes.

First, knocking apart the doors would likely lead to disaster. Using the procedure I'm outlining here, I don't think it would be necessary, either. I think you should be able to use a router and jig to rout out the rabbet for the glass everywhere but the last half inch or so, before you hit that little metal devil in the miters. Then, I'd go to

hand tools. A simple little dovetail saw and a scrap block guiding jig should let you saw one edge of the rabbet close to the metal. A good sharp chisel and you should be able to pare away the remaining wood to reveal the metal part.

My secret weapon: For little trouble jobs like this, I often find that an ordinary Dremel tool with an abrasive cut-off wheel does the trick. These little wheels "don't get no respect," as Rodney Dangerfield used to say. My experience leaves me with a lot of respect for them. The wheel is made of a solid carbide abrasive type material. It will cut metal easily, both ferrous and nonferrous. I think you'll be surprised how readily it will cut off the offending part. Be sure to cushion the glass when you install it so it doesn't rub the metal edge and "Zing!" off an edge of your glass. If this answer misses the mark for you, please email us a picture!

**Chris Marshall:** I'm less optimistic than Tim about this one. If your cabinet doors are factory-made, the metal wedges must serve a structural purpose of some sort to keep the mitered rails and stiles connected. I can't imagine how or why they would hold the wooden panels in



place that are currently in your doors. The metal might even be the only mechanical connection holding the frames together, besides a glue bond. If you dive into installing that glass, pick a door you can afford to sacrifice before removing the metal wedges. If the wedges do come out, consider reinforcing the corner joints with some other mechanical connection (dowels or screws) just in case. The glass will add weight to the frames and consequently more stress when you open and close them.

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***Q** I have been making quite a few pull and ride-on toys for my grandchildren lately. They all need wheels, which I have had to purchase, since making multiples of the same size by hand with a band saw and sanders is extremely difficult. Also, finding the larger size wheels is difficult or very costly. Can the wheels be made on a lathe and, if so, how would I do it? I have just purchased a mid-size lathe and basic tools so I am a newbie to turning -- what other accessories would I need?*

**A** **Tim Inman:** My answer is a combination approach. I'd use the band saw and a "circle jig" to rough cut the wheels. There isn't a faster way to do a lot of wheels, and make them the same size, that I know of. If you know the axle size for your wheels, you can set up your circle jig with an axle sized pin for your rough cuts. Drill the wood blanks to the axle size, then slip them over the axle pin in your circle jig. Cut the wheel.

A side note about band saw circle jigs. The design is common and readily available in good woodworking books. One simple change I have made is to mount a guide rail

on the bottom to fit the miter gauge slot in my band saw fence. This lets me slide the jig and rough blank into the cut, much like a crosscut sled. When my jig hits the "stop" and is firmly in position, I can then finish cutting the circle.

Once you have your blanks roughed into true circles, then, I'd set up a wooden sacrificial faceplate system on your lathe with that axle pin size for a mandrel. You would then be able to place the rough wheel concentrically onto the face plate, and cut the final profile and do the finish sanding, etc. If your setup is well planned, I think you could turn out nice wheels right and left!



***Q** I plan on building a Craftsman style dresser using solid wood and traditional joinery. This project will take quite a while for me, and I want it to be as functional as it is beautiful. I don't want to see metal slides when I open a drawer. How do I make drawers slide smoothly back then and maintain a traditional look?*

**A** **Tim Inman:** Shane, the way they made those drawers slide easily was by quality construction, and fitting them properly! When I was learning how to build drawers, my instructor's standard was the "one-finger push" rule. It worked like this: When I was ready to be graded, he pulled the drawer out to one-third of its length. Then, using only one finger, he pushed the drawer back into place until it rested correctly against its stops -- all the way around the opening. The trick was that his

finger pushed at all four corners of the drawer, in turn, pushing the drawer back into place. First, he'd push on the top right corner. If that worked, he'd try again and push on the bottom right corner; then top left, bottom left, and I'd get a grade. Any resistance or binding, and I got a '"do-over" and a scowl!

If the drawer fits too tightly, it will bind. If the drawer has too much play, it will also cock off to one side, and bind. I discovered that a piece of cardboard from the back of a yellow legal pad gave me about the right clearance. So, that cardboard '"feeler gauge" became my best friend as I constructed drawers. When I had that much space between the drawer and the sides of the cabinet guides, and when the drawer was properly waxed with a candle or beeswax, it worked every time.

How can you do it? My recommendations: Plan A: Do it just like the old masters did. Build the cabinet well, and fit the drawer properly. Plan B: there are metal ball bearing guides that fit underneath the drawer invisibly. Plan C: There are a number of polymer glides and tracking materials available that will improve the drawer operation. See Option A.

**Chris Marshall:** I agree with Tim. There's a lot of original Stickley furniture with drawers still being put to good use. Think of how proud you'll be to build a set of drawers with traditional supports and have them work as well as Tim points out. I would give it a "go" to build your dresser as traditionally as you can. But, if practicality is the primary motivator—and that's sometimes the wisest choice—I'd try undermount drawer slide hardware.




## A

***Q Where is the next generation of woodworkers coming from? Is woodworking as a craft going into decline?***

**Rob Johnstone:** "Our newest group of truly active woodworkers seems to be coming from the Baby Boomers as they reach some level of maturity. And while the term "mature Baby Boomer" may seem an oxymoron, it is plain to many people interested in woodworking that Boomers are embracing the craft with a passion. And passion may be the answer to the second part of the question regarding woodworking's decline. As with any craft, the quality of work varies with the skill of the individual. And while some folks are gifted with skills that others will never attain, quality is, and has always been, the result of skills applied with effort and diligence.

Today's passionate woodworker can achieve a level of quality that few would have reached in years past, even with only moderate skills. Modern tools and equipment have seen to that. By the same token, a motivated modern woodworker with well-honed skills can achieve truly magnificent results. I look at the gallery pages in woodworking magazines and on the Web and see wonderful examples of woodworking. True, some of the designs are

fantastic in the strictest sense of the word, but craftsmanship still shines through. There is something so satisfying about the act of creation -- whether it's woodworking, cooking, quilting or something else altogether -- that it seems unlikely these things will fade away. It is my belief that woodworking will be an important part of the fabric of our culture for a long time. People all over the world, from widely diverse cultures, make beautiful and practical wooden objects to enrich their lives. Woodworking is not in decline; it is illuminating the human experience as it has always done."

**Rick White:** "What a good question. I am worried about the future of woodworking. The school systems, for the most part, do not teach the mechanical arts as they did when I was in school. The kids are able, and even interested, in doing woodworking, but they are not getting the traditional exposure to the craft that they used to. I don't really know how it will all play out, but I would hate to have woodworking go away as a hobby for the average person."

**Ian Kirby:** "The next generation of woodworkers will come from the next generation -- one way or another. They won't arrive by the same path as this generation, but then they never do. Decline? Hell no. There's more interest, more books, more magazines, more equipment and some awesome work being done. It will be different, but so will the society that needs woodworkers. But that's not the same as a decline. Have faith.



***Q** I am a novice woodworker. I've looked at lots of plans for simple projects, and I'd like to know why measurements are very seldom in whole numbers? It seems like fractions are the rule: 12-1/2, 13-7/8, 5-1/8 and so on.*

***A*** **Rob Johnstone:** Sadly, we use an archaic system of measurement developed from some dead monarch's appendage. That is where it all started to go wrong. There is no doubt that dealing with fractions is a troublesome and tedious fact that our system of measurement requires. When I went to school to become a luthier, I was informed on the first day of school that we would be using the metric system henceforth. I panicked — as I had never really used it before. After literally about two minutes using it, I wondered why anyone would use any other system … it was so incredibly easy and user-friendly. The shortest answer to your question is that the relative proportions of the components of woodworking projects simply vary to a nearly infinite degree — hence, they don't fall on even measurements.

**Tim Inman:** If a 2 X 4 were really two inches by four inches, we would probably see more "whole" dimensions. But, due to the nature of wood, sawmills, accountants and marketing, a board is seldom what it is claimed to be,

dimensionally. A one-inch board is usually more like 3/4 when it is dried, planed and ready to use. Architectural standards usually specify the overall dimensions for seating, cabinets and other interior appointments in whole numbers. We furniture makers work "backwards" from these standards - and end up with fractions.

**Chris Marshall:** And then, to top all of this reasoning off, there's the matter of cumulative error we introduce into our project part dimensions. We cut a little bit short here, plane or rout away too much there, and before you know it, even those initial fractions actually become different fractions as a project transforms from numbers on paper to reality. Fractional dimensions are an inevitable part of American woodworking, it seems. I've learned to just grin and bear them.

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***Q I'm building a butcher block counter top out of soft or hard maple. It needs to be 50" x 90". On a top that large, is it appropriate to build it in 12"- 13" sections that then are glued together for the final phase? Also, how thick does the butcher block top need to be? It has been suggested that the top should be 2" thick because of the large size. Should that contribute to the thickness of the project?***

**A Rob Johnstone:** Most modern kitchen cabinets are constructed so that a 1-1/2" countertop will put the work surface right at 36" from the floor. That standard work height is the compromise the industry came to for the "average" person. With that said, I put cabinets into an



NBA player's house one time and we lifted the work surface up to 40" — of course, he had a tall wife as a partner. Although it is entirely subjective, I would suggest 1-1/2" thick counter unless you have a big reason not to do so. We are used to seeing countertops of that thickness and any significant variation will draw attention to the counter. Which could be good -- if that is your goal.

From a purely functional point of view, it makes no difference if you use hard or soft maple; the countertop will perform equally well.

Now to the question of the 12" or 13" sections … I am guessing that what you mean by butcher block is not the

ultra traditional end grain presentation, but simply gluing long strips of solid maple together to form a solid wood countertop. If you are doing the latter, then by all means, glue up sections that you will be able to run through your planer — and in that way get flat level tops and bottoms to the panels. To make your final task of gluing the panels together, take care that all the pre-glued-up panels are the same thickness: it will make the final glue-up a bit easier.

**Tim Inman:** One man's butcher block is another man's (or woman's) idea of just another wooden workbench top. There are differences in definition. Traditionally, a "butcher block" was made so the end grain was the working surface. This involves gluing up thousands of little blocks to get the end product on a job like yours. Expansion and contraction is the enemy, and the "force majeure." The top made this way will be stable in the vertical dimension, but it will swell and shrink like crazy in the horizontal directions. A lot, and often. Most often, the "butcher block" countertop is actually wood pieces laid up with quarter cut wood, so the swelling and shrinking is directed more to the vertical dimension, like an old-fashioned wooden porch floor, making the counter more dimensionally stable along the horizontal dimensions.

Either way you make it, dimensional stability is your goal, and your worry. Making small workspace-sized pieces that can insert into a visually pleasing frame system that will tolerate some movement is a great idea.Whatever you do, allow for wood movement so you won't be disappointed a year or two after the installation.



**Chris Marshall:** I second Rob's advice to glue up the countertop in smaller sections, flatten them and then join the flattened blanks into a larger countertop. I actually do that with any large panel I need to glue up. The fewer wet glue joints and clamps you have to grapple with, the better!

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***Q I've become the recipient of my neighbor's mesquite tree. I've cut some boards from his tree and have found some great wood, but with several 1/8" to 3/16" checks in them. I've heard of "black epoxy" on one of the wood shows and have yet to find any in the stores. Could you tell me if folks sell it somewhere, or can I make some myself from regular clear epoxy?***

**A Chris Marshall:** I've created colored epoxy before by adding a small amount of aniline dye powder to ordinary two-part epoxy. It worked great, with one caveat:

be careful when you sand it to prevent spreading the dye powder/epoxy dust to other areas you don't want colored (it wipes up pretty easily with a dampened rag, but the dust is very fine and can go down deep into wood grain and open pores). West System® Epoxy's website offers several options for tinting epoxy:

"Powdered pigments (tempera paint, colored tile grout, aniline dyes) and universal tinting pigment can be added to the epoxy mixture. Acrylic paste pigments (available from marine chandleries) are also used to tint the mixture, as long as they are specified for use with polyester or epoxy resin...Generally, coloring agents can be added to the mixed epoxy up to 5 percent by volume with minimal effect on the cured epoxy's strength. Always make test samples to check for desired color and opaqueness and for proper cure. None of these coloring additives provide UV resistance to the cured epoxy, so limit their use to areas not exposed to sunlight unless additional UV protection is applied."

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***Q I noticed that you sometimes describe a piece of furniture as "arts and crafts." I was just wondering what constitutes a piece being called that?***

**A Joanna Werch Takes:** "Arts and Crafts" refers to a style of furniture characterized by exposed joinery, visually simple lines and natural materials: probably the most common wood choice for Arts and Crafts style furniture is quartersawn oak. The style had its original heyday in the late 19th and early 20th centuries in first the



United Kingdom, then the U.S., as somewhat of a backlash against the Industrial Revolution: instead of having the things in their homes (furniture, textiles, etc.) mass produced in factories, the early practitioners of the Arts and Crafts style wanted to emphasize the value of things made by hand, by individual craftsmen. (They were also kind of tired of all the extra decorative elements -- the frills and furbelows, if you will -- found on the Victorian style furniture of their day; hence the emphasis on simple, natural lines.) The style remains popular with today's woodworkers, which is why you'll see frequent references to it in woodworking publications.

# SHOP & SAFETY

***Q** I just finished my first real woodworking project. During finishing, I noticed the warnings of spontaneous combustion on my cans of stain and poly topcoat. The warnings got to me, and I checked my garage every few hours to make sure my house wasn't burning down. Is this a real threat? Should I be worried? How should I throw out used rags?*

***A** **Chris Marshall:** Finishes that contain solvents or oil are potential fire hazards. But, the warning about spontaneous combustion actually concerns how you treat your rags that get soaked with finish. What you DON'T want to do is leave varnish-soaked or oily rags wadded up when they're still wet. As the finishes cure, they absorb oxygen and generate heat. If the finish gets hot enough in a crumpled rag, it can catch fire—and yes, it really happens. The simplest way to stay safe is to spread your rags out flat where they won't be disturbed until they fully cure and get hard. Then you can toss them in the trash.*

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***Q** Could you please tell me if boiled linseed oil applied to finished wood then wiped dry with a cloth has a danger of being toxic?*



***A** **Michael Dresdner:** Boiled linseed oil is a drying oil, which means that it will go from liquid to a solid film in a day or two after it is applied to wood. Once it is dry, it is quite safe. As you probably know, raw linseed oil, sold as flaxseed oil in the grocery store, is edible and considered by some to be a health food supplement. To make boiled linseed oil, metal salts are added. They cause the oil to dry faster. While these render boiled linseed oil inedible, you'd have to consume a decent amount before it would be toxic. However, once the oil is dry, the metals are trapped in the film, making it perfectly safe for use on furniture.*


*Incidentally, the single most hazardous aspect of boiled linseed oil is fire risk. Oily rags or towels, if left in a pile, generate enough heat during cure that they can spontaneously combust, smoldering and eventually bursting into flame all by themselves. Make sure you lay your used oil wipes out one layer thick so they can dissipate that heat while drying. Once they are dry and crusty, they are landfill safe and can go out with the household trash.*

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***Q** Is there is a paste or lubricant I can use for long wood screws that will allow them to thread easily and protect them from rust?*


**Tim Inman:** A well-fitted pilot hole drill is your first best thing to do. Drill the pilot hole as deep as the screw so the threads don't have to push or swell the wood as they go in deeper. Hard woods need a larger pilot hole, softer woods get a smaller diameter fit. I find that ordinary bar soap makes a great lube for screws. Beeswax works great, too. There are arguments for and against, but all in all, I use both and find nearly identical results. I've been restoring furniture for pay for 47 years now, and I have had occasion to refinish a piece or two the second time, after decades of service. The screws were not rusted, and they were holding tight when I removed them — again.

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***Q I want to build coved, raised panel doors, but I don't have the equipment. I've heard of milling the cove on a table saw by sliding the workpiece across the blade. This seems like a safety hazard. Also, can damage occur to the blade?***

**A Tim Inman:** This is a procedure for very highly skilled, very highly accomplished and experienced woodworkers. It can be done safely, but it is also a dangerous operation if not done correctly. Passing wood at an angle more or less "perpendicular" to the saw blade can indeed cut coves. The cut is NOT done all at once. Rather, the cove is cut by making multiple, progressively deeper passes. The exact angle determines the parabolic arch of the cove. A circular cove would indeed be passed at 90 degrees. An elliptical cove (more common) would be passed at some other angle. This operation requires shop-made auxiliary fences.

I do not recommend you attempt to make your panel door edges with this technique. If you have a number of panels to make, consider purchasing the correct tooling, or finding a friend that can help you. If you have only one or two, why not carve the coves? This isn't as difficult as you might imagine. A very sharp carving chisel or two, and some time, and you'll have your coved panels - and all your fingers left!

**Chris Marshall:** Don, as Tim points out, cutting coves on a table saw is definitely doable. Dialing in the correct angle of approach on the blade is what establishes the precise curvature of the cove, and that takes some mathematics or trial-and-error to get right. It's actually a pretty cool technique, and one I used to create a large picture frame

in our December 2009 print issue. Take Tim's advice to heart: this is a technique that requires very shallow passes and a sturdy fence setup to execute safely, but it definitely can be done. Find a woodworking book that covers the setup process step by step, and follow it. Use a full-kerf blade for maximum stiffness. You won't bend the blade or turn your workpiece into a missile if you keep each pass limited to about 1/16 inch of material removal (or less) at a pass. Certainly, this is one of those techniques that doesn't lend itself to most typical guard styles. Use push pads and push sticks to keep your hands safely clear of the blade. Keep the wood pressed firmly down against the table at all times.

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**Q** ***I read that walnut trees secrete a chemical that prevents growth from around its base. With this fact in mind, I don't add walnut shavings to my compost pile, afraid that it would kill anything I used the compost on. Can you verify this?***

**A** **Tim Inman:** Juglone is the chemical you're thinking of, which is produced by Juglans nigra - American black walnut. Black walnuts produce this to protect themselves and their surroundings from competition. It will do serious damage to tomatoes, strawberries, and a host of other "desirable" plants, and some animals. I would definitely NOT put walnut anything into the compost pile. I innocently mulched my fruit trees with walnut hulls one year. The new fruit tree replacements are just now reaching bearing age...

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**Q** ***At what setting should I set my dehumidifier in my basement shop?***


**A** **Tim Inman:** About 40 percent relative humidity is ideal for most furniture and wood environments. Try to maintain this all year around. The humidity in your basement workshop should be the same as the humidity in the upstairs or in your office where your nice custom-made heirloom furniture will live its life.

**Chris Marshall:** For those of you with dehumidifiers that don't provide a readout showing relative humidity -- mine doesn't -- buy a hygrometer and put it up in the shop. They're one of the features that are often included on indoor/outdoor digital thermometers with a clock. Inexpensive and very handy.