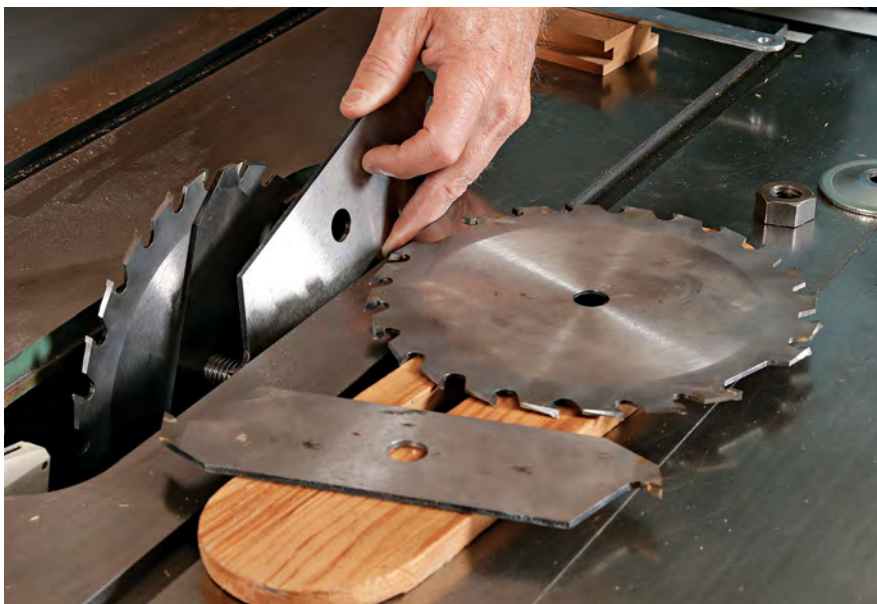


Cut accurate tenons on the tablesaw

BY CHARLES DURFEE



Dado set is the secret. Assemble the outer blades and inside chipper blades to make a wide cut. With this setup, you can cut a tenon in one or two passes.

Set up the saw's miter gauge and fence

I've tried many techniques for cutting tenons over the years, but the method I've settled on uses a dado set at the tablesaw. With the stock flat on the table, I can cut a tenon in one or two passes. It's fast because I cut the shoulders (the base of the tenon) at the same time as the cheeks. I can dial in the fit and I get a tenon that's perfectly centered and parallel with the faces of the workpiece. Tenons that are offset or haunched can also be cut this way, but will require a few more setups.

Before you begin

It's important to start with flat, square stock because



Screw a hardwood fence to the miter gauge. The piece should be milled flat and square. The fence will help prevent chipout and will offer plenty of support as you make the cut.



Square up the miter gauge. Durfee uses a piece of MDF with a square corner for the job. Hold the MDF against the tablesaw fence and the miter gauge, and adjust the miter gauge until it is flush with the back edge of the MDF. Make a test cut to check the setup.

all of the faces will be used for reference on the tablesaw top when cutting the tenons. If the stock is not flat, you'll end up with a wonky tenon. It's also critical that the end of the stock be square. This will result in shoulders that are square so that the joint comes together without any gaps.

I cut all of the mortises before the tenons, because I find it easier to fit a tenon to a mortise than the other way around. The mortising method isn't important, but if you use a router, you'll need to deal with the rounded mortise ends—either squaring the mortise with a chisel, or rounding the tenon when it's done.



Set the tenon length. When cutting tenons, Durfee uses the tablesaw's rip fence as a stop. Use a combination square as shown, and measure from the outside of the dado set. Slide the fence until it touches the end of the rule.

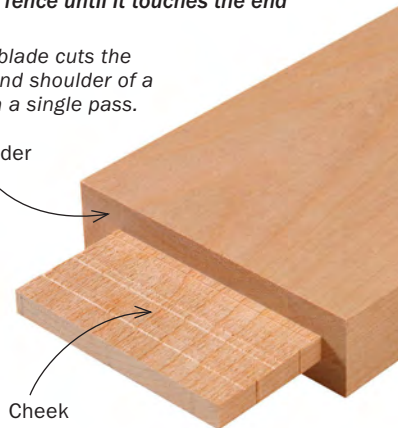
Install the dado set

I use a standard 8-in. dado set. It consists of two outer blades and a number of chipper blades between them. The blades all have teeth that make a flat-bottomed cut, a must for tenons. Most tenons are longer than the width of my dado set, so I choose a width that allows for a nice

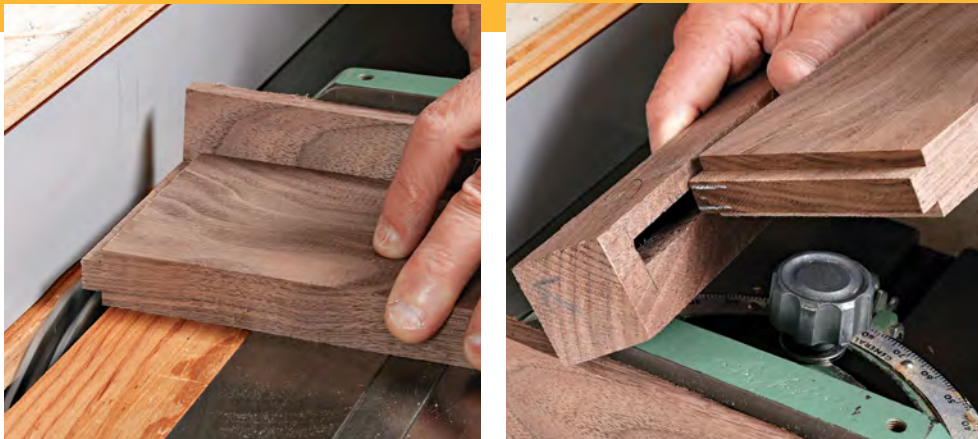
A dado blade cuts the cheek and shoulder of a tenon in a single pass.

Shoulder

Cheek



Cut both cheeks of the tenons



Sneak up on a snug fit. Start with the blade height set for a tenon that will be too thick to fit the mortise. Take cuts on each cheek, checking the fit after each pair of passes, and raise the blade gradually. Aim for a fit where the tenon will go in with hand pressure, but snug enough so the joint won't fall apart when suspended (far right).



Cut the tenons.

Once you have the tenon fitting in the mortise, the rest goes quickly. Start with a pass on the end of the tenon, then butt the stock against the rip fence to finish the cut. Be sure to keep the stock flat on the saw's table as you cut.



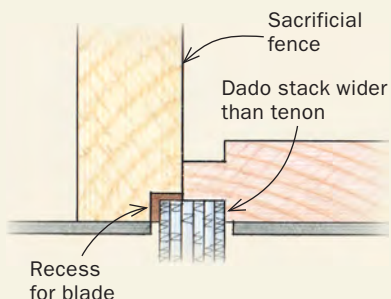
overlap from cut to cut, say $\frac{5}{8}$ in. for a 1-in. tenon. For short tenons, anything under $\frac{3}{4}$ in., I set the dado blade for a wider cut and bury a portion of the blade in a sacrificial fence clamped to my rip fence. This allows me to cut a full-length tenon in a single pass. Once the dado set is installed, square up the miter gauge and adjust the tablesaw's rip fence to set the length of the tenon.

Cut the cheeks

To dial in the fit for centered tenons (which I use whenever possible), make

BURY THE BLADE FOR SHORT TENONS

For tenons under $\frac{3}{4}$ in. long, use a dado set that's wider than the tenon's length. Add a sacrificial fence to your rip fence and raise the blade into it to create a recess. Adjust the fence to set the tenon length. The fence will overlap the blade.



Cut the tenons to width

a small cut on the end of a piece of scrap stock, turn it over, and do the same on the other face. Check for fit, and raise the blade until you can just start the tenon into the mortise with hand pressure. Go slow with this process; each adjustment of the tablesaw blade is doubled since you're making a cut on each face, and it's easy to go from too thick to too thin if you're not careful. I like to err on the heavier side rather than end up with a tenon that's too thin. You can always shave a bit off with a shoulder plane. Once you have the fit dialed in, cut the full length of the tenon using the rip fence as a stop.



Use the mortise to mark the tenon width. Make tick marks at the top and bottom of the tenon (left). Before cutting, tap the fence over slightly to avoid accidentally cutting into the shoulders (above).



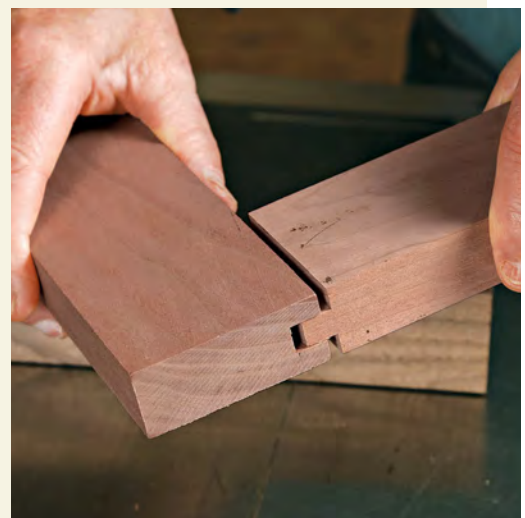
Work toward the lines. With the stock flat against the miter gauge fence, slowly raise the blade up to your marks. Test the fit as you go. Once you have the width dialed in, finish up with the stock against the rip fence. You'll be left with a little material that must be pared away with a chisel.

HAUNCHED TENONS ARE EASY

In frame-and-panel construction, haunched tenons have a small stub left at the outer end of the tenon. This fills the gap at the end of a stile where the panel groove exits. You simply cut the tenons with one shoulder offset to the depth of the groove. Creating the haunch is simple. When cutting the outside end of the tenon, move the fence in to create an offset. Check the fit to make sure the haunch bottoms out in the panel groove just as the joint seats. A haunch that's too long will prevent the joint from fully seating, so it's better to leave a slight gap at the bottom of the groove.



Cutting the haunch. Move the fence toward the blade to cut the outside shoulder. Make small adjustments until the haunch seats fully in the groove when the joint is assembled.



Fine-tune the fit at the bench

Pare away the stub. Remember the extra material left when you cut the tenon to width? Now's the time to remove it. Start by knifing along the shoulder, and then pare with a chisel until the surface is flush.



Fine-tune the cheeks. Score the base of the tenon with a knife. Use a shoulder plane to take light passes as needed. Take equal passes on each cheek.



Check for a gap-free fit. The finished joint should come together with just hand pressure.



Cut the tenon to width

With the cheeks cut, the next step is to cut the tenon to its final width. I use the fence as a stop again, but as a precaution, I give it a slight tap toward the blade. This avoids having the blade nick into the shoulders that are already cut. It does result in a very slight stub above and below the tenon, but that's quickly pared off later with a chisel.

Finish up at the bench

You are now done with tablesaw work, but there is still a little handwork to do. The first task is to cut a slight chamfer at the end of the tenon, on all four faces. This helps it slide into place. Next, trim off the little stub left when the fence was tapped over to cut the end shoulders. I knife a line along the baseline of the end shoulder, and then slice away the stub with a chisel.

Finally, fine-tune the fit with a shoulder plane, as needed. There should not be a whole lot to do here, just very light work. You don't want to make the tenon too thin. Use a utility knife to make a score mark where the shoulder and cheek intersect, then plane across the face of the tenon, taking equal amounts off each face. Recheck the fit often as you go. □

Charles Durfee makes furniture in Woolwich, Maine.