

# Cut Precise Joints on the Tablesaw

And stay safe in the process

BY MARC ADAMS



## VIDEO WORKSHOP

See all of these techniques in motion and more, including how Adams builds a crosscut sled, in a members-only video series at [FineWoodworking.com/extras](http://FineWoodworking.com/extras).



**I**n my previous article (*FWW* #233), I demonstrated how to get better ripcuts and crosscuts—and stay safe in the process. But the tablesaw can do more than make rectangles. If you add a dado set and a few shopmade jigs and fixtures, it can become your favorite machine for cutting flawless joinery, too. The tablesaw offers an unmatched combination of accuracy, repeatability, speed, control, and endless jig potential.

To produce joint-quality cuts, both across the grain and with it, you'll need two types of blades. You can stick with your normal combination blade, but make sure you keep the teeth clean of pitch buildup. A clean blade will always cut better. For wider notches in wood, whether rabbets, dadoes, grooves, tenons, or lap joints, I use an 8-in. stack dado set. Quality is very important here. You need a set that cuts clean edges and flat bottoms.

A dado set's inside and outside blades have angled teeth designed to eliminate tearout at the edges of the cut. A variety of chipper blades go between, allowing 1/4-in.- to 7/8-in.-wide dadoes. Thin shims go in to fine-tune the width, if necessary. Be aware

that dado sets take big cuts and can cause underpowered saws to bog down, and that the shorter arbors on some portable saws won't allow the full stack to be used.

### Add a few key jigs and fixtures

You can cut most of the common joints on the table saw with just four simple jigs and fixtures: a zero-clearance throat plate, a miter-gauge extension fence, a crosscut sled, and a sacrificial fence for rabbeting. I showed how to make the first three in my earlier article, and I'll cover the last one here.

The cool thing about learning the fundamental joints, like dadoes and rabbets, is that the same techniques work for many others, such as laps, tongues, and bridle joints. In fact, the design of a table saw invites a host of joints and jigs. This article is just the beginning. Soon you'll be calling this versatile machine "the variety saw," like I do.

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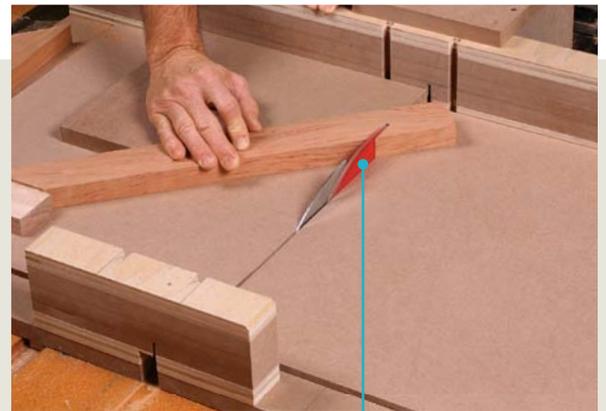
*Marc Adams's woodworking school in Franklin, Ind., is one of the largest in the world. Go to [MarcAdams.com](http://MarcAdams.com) for a course listing.*

## Two kinds of blades do it all



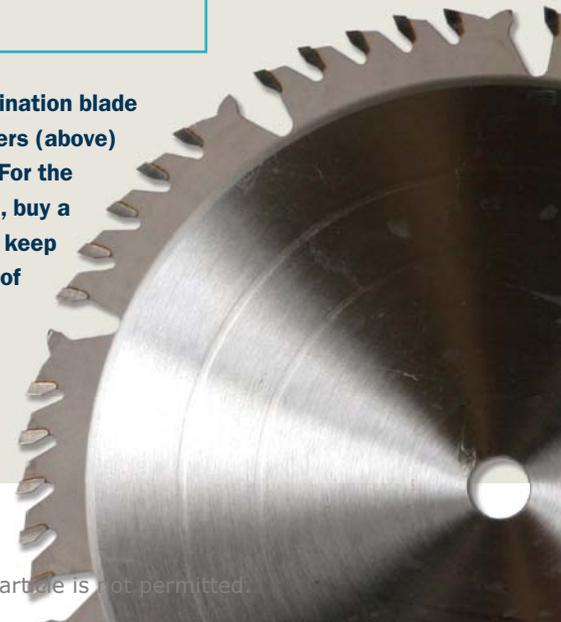
### Dado

**For many joinery cuts, you'll need a good dado set. Get the best stack-type dado set you can afford. It should cut slots with clean edges and flat bottoms.**



### Combo

**A basic combination blade is fine for miters (above) and grooves. For the cleanest cuts, buy a good one and keep its teeth free of pitch.**



## The simple groove



**Ride the fence.** Adams makes grooves with a single blade, making multiple cuts for wider grooves. A long push stick gives better downward pressure and control.

Grooves are the easiest joint to cut. Since they are aligned with the grain, you can use the rip fence to guide the workpiece. I normally use my combo blade, adjusting the fence and taking multiple passes for a wider groove. If the bottom needs to be dead flat, you can also use your dado set.

The advantage of the single blade is that it lets you use a riving knife to prevent kickback. If your saw doesn't have one, you can use a shopmade stub splitter as I demonstrated in *FWW* #233.

In any case, always use a push stick or push pads to maintain good control while keeping your fingers safe (you can't see the blade until it exits the board). Pay special attention to keeping the workpiece flat at the point of contact.



**Use a push pad for short pieces.** On these shorter drawer sides, a push pad, lined with rubber and/or sandpaper, gives better control.

## Clean dados



A dado is a groove cut across the grain and is usually sized precisely for a second piece to fit into. Since dados are crosscuts, tearout can be a problem without a zero-clearance surface below the cut. If the back edge will show, you'll need zero clearance there, too. You can use a variety of fences to make a dado cut safely, but it depends on the size of the workpiece and location of

### NEAR AN EDGE, RIDE THE FENCE

**Tame tearout.** You'll need a fresh throat plate to prevent tearout. Adams showed how to make these in his earlier article (*FWW* #233). Insert a blank one, position the rip fence to hold it down without getting in the way of the blade, and then bring the dado set up through it.



**Push pad stars again.** A push pad works better than a push stick to keep a big panel down on the table and tight to the rip fence.

the dado. On wide workpieces with the dado close to the end of the piece, you can run the stock against the rip fence.

But the crosscut sled is my favorite tool for dadoing, because it carries pieces with excellent control and great accuracy. That control is especially important because you can't use a splitter or riving knife in conjunction with a dado set on most saws. A crosscut sled also accepts all types of stops.

### IN THE MIDDLE, USE A SLED



**Refresh your crosscut sled.** To prevent tearout on a sled, tape down a piece of  $\frac{1}{4}$ -in.-thick MDF (above). Do the same on the fence (right), and then cut a zero-clearance slot through both.



### TIP CARPET TAPE GRIPS BETTER

To add holding power to jigs, Adams uses double-sided carpet tape with mesh inside. It is thicker and far stronger than the thin plasticky type.



**Why the sled is best.** A crosscut sled controls workpieces of almost any size, and is a must for the middle dadoes on these long bookcase sides. A hook-style stop offers a long reach and is easy to attach.



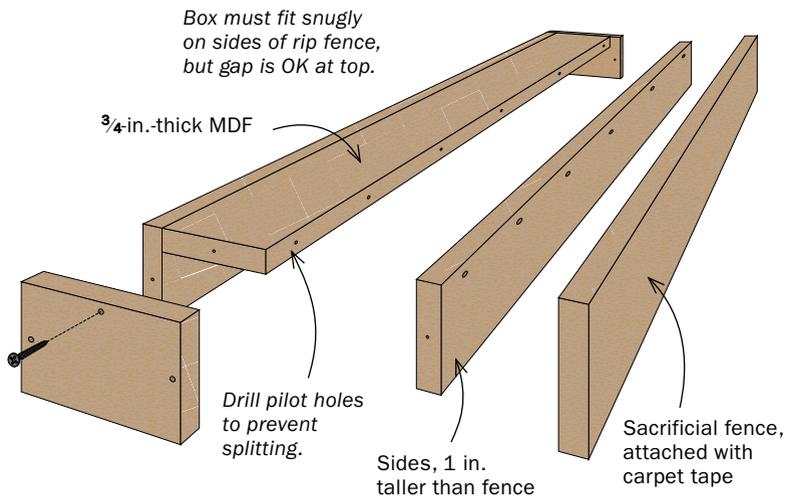
# Accurate rabbets



To cut rabbets, you should bury the dado set in a sacrificial rip fence. This makes it easy to adjust the width of the rabbet: You simply nudge the fence a bit instead of fine-tuning the width of the dado stack.

But a sacrificial fence can be hard to clamp to the short sides of a standard rip fence without the clamps getting in the way. My solution is to build a simple MDF box that fits snugly over the fence, and then tape the sacrificial piece to that. The box allows the sacrificial fence to be removed and replaced easily, on either side, so it works with the fence on either side of the blade. And a single piece of MDF can be positioned four different ways to extend its use.

## BUILD A BOX TO BURY THE BLADES



**How to get a snug fit.** Cut the sides 1 in. taller than the rip fence, and long enough to allow clearance for the lever at the end. Clamp the sides in place to measure for the top plate and attach it as shown. Drill pilot holes to prevent splitting. Keep the clamps on as you screw on the end caps.



**Add the fence and bury the blades.** Use thick carpet tape to attach a tall MDF fence (above), then move the fence over the top of the dado set and bring the spinning blades up into it (left), only as high as needed.



**Fast, accurate rabbets.** Whether the rabbets are along the edge (left) or end of a workpiece (above), you can run the workpiece against the fence. But you'll need a zero-clearance throat plate to prevent tearout when working across the grain. Push pads do a good job controlling the workpiece, but you'll need to support narrow workpieces with the miter gauge.

# Quick tenons

One way to cut tenons on the tablesaw is to first make shoulder cuts with the pieces lying flat, and then make the cheek cuts using a tenoning fixture. But my favorite method is to cut them with a dado set, which is faster and easier and works on larger workpieces. Long pieces are a problem on a tenoning jig, because they have to stand straight up in the air. With a dado set, the workpiece lies flat on the table, where it is easier to control.

You can control the work with a miter gauge and use the rip fence as the stop. You'll need a zero-clearance throat plate to prevent tearout at the shoulders. I stack my dado set to



about  $\frac{3}{4}$  in. wide, and I always start with the stock against the rip fence for the first cut and then nibble away the rest. Do not lift the stock when you finish a cut; just keep a tight grip as you pull it back.

Start with the two opposite cheeks, testing the fit in one of your mortises as you dial in the setup. Then change the blade height to trim the tenons to width. You'll notice that the outside blades leave fine lines on the surface, but these will not affect joint strength. Some woodworkers leave the tenon a bit fat and finish the job with a shoulder or rabbeting plane. Using a test mortise, I am able to get a good fit right off the tablesaw.

## TIP

### GET SQUARE FIRST



To get even tenon shoulders, you need a perfectly square miter gauge. You can place a square or drafting triangle against the blade to check, but inconsistencies in the fence or blade can throw it off. Instead, do this simple test. It works for squaring up fences and blades for all sorts of joinery tasks. Rip parallel edges on a long piece of scrap, and mark one side for reference. Make a crosscut (above) and then flip one of the pieces. Set both against a straight surface like the rip fence (below). A gap means you need to adjust the miter gauge and try again.



**Tenons in minutes.** Set the rip fence to position the first cut at the shoulder (above), and make a series of nibbling cuts (center left) to finish the job. To cut the top and bottom of the tenon, change the height of the blades if necessary and just flip the workpiece on edge (bottom left).



# Tight miters on a crosscut sled

The most common type of miter is the flat type used to join frame pieces. They often surround a plywood panel to make a door or a tabletop, and standard moldings are cut this way, too.

The challenge with flat miters is the wide cut, which makes it hard to end up with a 90° corner and no gaps. If you rely on your miter gauge, you will struggle with accuracy and repeatability. That's why I cut them on my crosscut sled using a

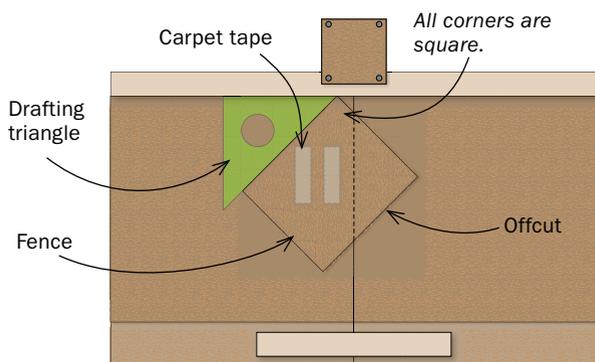
simple 45° fence. You use the sled to make the fence, too, and the whole process is easy.

In this case, with flat stock and zero-clearance below the blade, you could keep the fence in one position for all of the miter cuts, simply flipping the pieces to miter the second side. But if the front of the stock is molded or you are getting chipout on the bottom edge, you'll want to flip the fence to the other side of the blade when cutting the second end of each piece, in order to keep the same side up.

Aside from accuracy, what I love about this setup is how easy it is to attach a stop: You just tape it down.

## MAKE AN ACCURATE FENCE

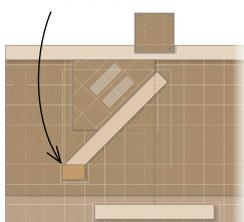
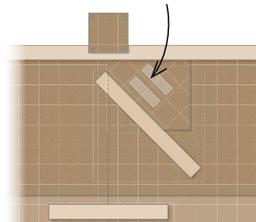
Start with a perfectly square piece of MDF and use your crosscut sled to turn it into an accurate 45° fence.



## HOW IT'S USED

Tape holds fence for cuts.

Add a stop block for second cut.



**Easy to make.** Use a 45° drafting triangle to position the MDF fence on the sled. Use carpet tape to hold it down, but keep the triangle in place as you cut, to be sure the workpiece doesn't shift.

**Miter one end of each workpiece.** Put the fence on the left or right, pressing it down very firmly on the carpet tape, and then use it to miter one end of each workpiece. Hold the workpiece firmly to be sure it doesn't drift.



**Switch sides.** Flip the fence over to set it up on the other side. This time you'll need a stop to set the final length of each piece, but that's as simple as taping a block to the sled. The miters should come out perfect.