

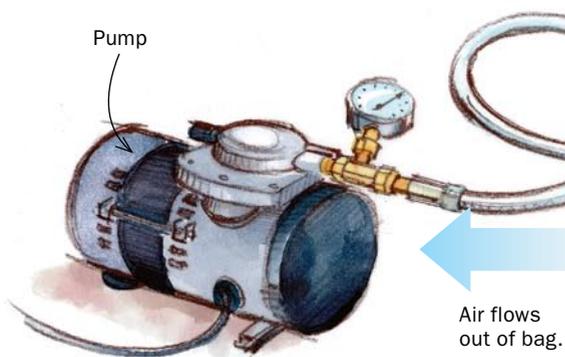
# A Vacuum Press Makes Veneering Easy

How to get started  
creating beautiful panels

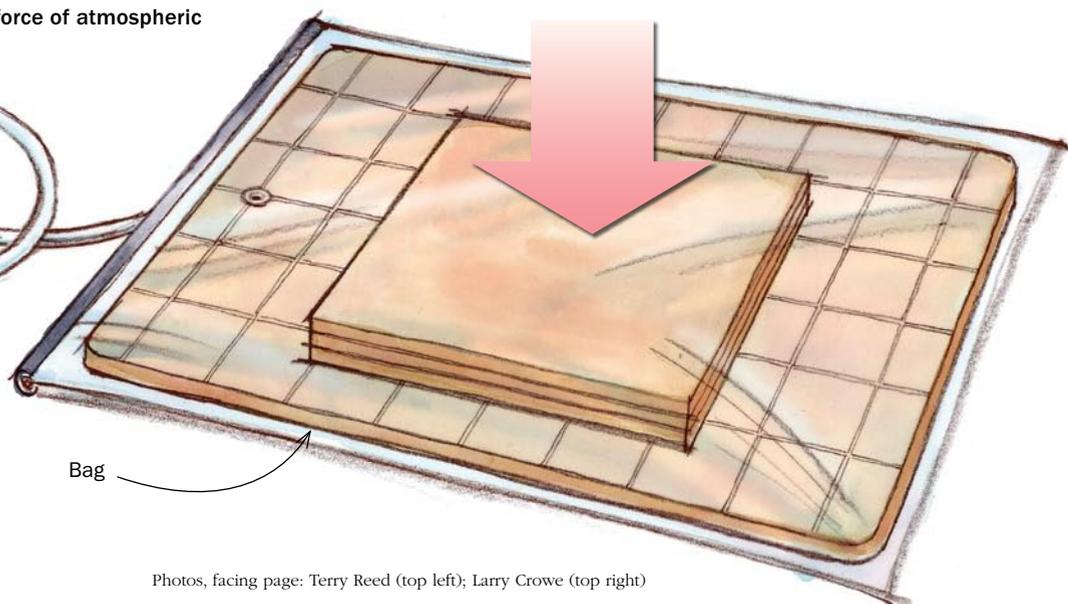
BY J. SPEETJENS

## THE MAGIC OF ATMOSPHERIC PRESSURE

A vacuum-bag system is a heavy-duty plastic envelope connected via air hose to a vacuum pump. With the bag sealed, the pump draws out the air. This creates a partial vacuum, letting the force of atmospheric pressure squeeze together the assembly inside.



The atmosphere applies strong, even pressure.



Veneering is a great way to grow creatively as a woodworker. The process lets you work with beautiful woods that are too rare, too highly figured, or too temperamental to be used as solid stock. It also allows much greater control over wood grain and figure as elements of design and decoration.

This creative freedom is more accessible than ever thanks to the wide availability of the vacuum-bag pressing system. The vacuum system eliminates the need for bulky mechanical presses or armies of clamps. It can be used to veneer flat panels small and large—from cabinet doors and drawer fronts to case sides and tabletops. The system also can handle more advanced applications like curved work, marquetry, and more.

If you plan to work only on small panels (under 4 ft.) with occasional curved pieces, it's possible to fully enjoy vacuum veneering with a small system that costs around \$400. If you have larger projects in mind, though, you can bring home a system that will



**Use veneer as an accent.**  
It mixes beautifully with solid wood, as shown in this maple cabinet with curly veneer door panels by Washington state woodworker Hugh Montgomery.

serve any veneering need for \$1,000 or a little more. This article will help you sort out the options and get started.

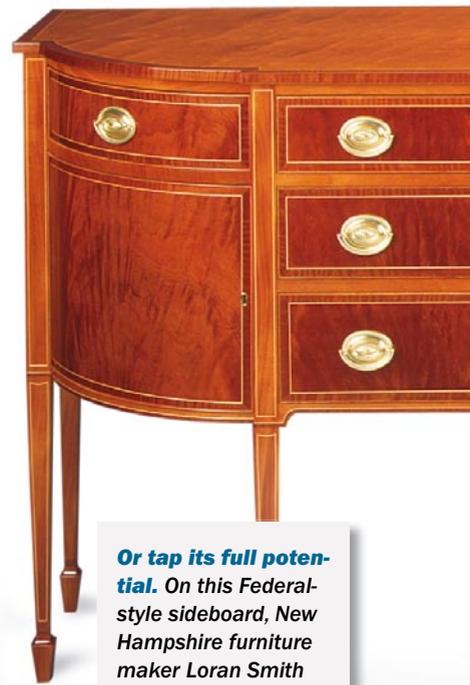
### Choose a bag to fit your work

You'll find it most logical to start by choosing a bag that's big enough for the work you plan to do. Simply put, you can't veneer what you can't fit in the bag.

Bags come in a huge range of sizes. Don't let that confuse you. Instead, think about the scale and nature of your work. Choose a bag that's at least 6 in. longer and wider than the largest flat panel you anticipate veneering. Curved work requires even more room—a foot at each end and at least a foot beyond the assembly on the sides. This added space helps ensure that the collapsing bag will conform to the workpiece without excessive stretching. Think, too, about where your work may be headed in the future. If you seriously expect to tackle larger veneering jobs down the road, you might want to buy a larger bag.

The next big question on bags has to do with material. At the grocery store, the bagger asks "paper or plastic?" When you're shopping for a vacuum system, the question is "vinyl or poly?"

If you plan to do a lot of veneering, the simplest answer is to buy a polyurethane bag if you can afford it. Poly is generally more puncture-resistant and more flexible, better at returning to its original shape after being stretched. You'll spend less time patching pinholes and it will be a long time before you need to replace it (I've had mine for 18 years). There's no need to be afraid of vinyl, however, and it's much less expensive. For example, a 49-in. by 49-in. poly bag from Vacuum Pressing Systems costs \$243,



**Or tap its full potential.** On this Federal-style sideboard, New Hampshire furniture maker Loran Smith used a pattern of veneers and stringing on the matched doors and the drawer fronts, both curved and flat.

## Two good systems

Most vacuum-veneering dealers offer packaged systems or will let you build your own by mixing and matching from an array of components.

The first step is to decide what type of pump will drive your system. An electric vacuum pump is compact and easy to plug in anywhere. But if you have a compressor, you can save money on a vacuum system by buying a compressor-driven unit. Many

systems can be powered by midsize portable compressors, but larger pumps, like Speetjens's (bottom right), may require a large stationary compressor.

The next decision is how big a bag you will need. A 4X4 bag will handle most flat-panel work, and you can always upgrade later.



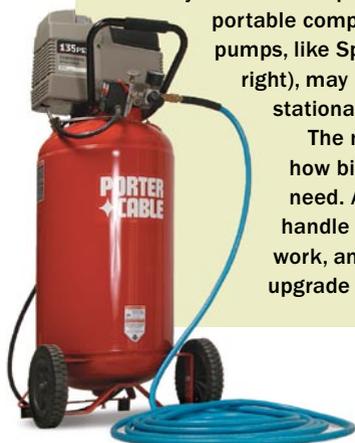
### A POPULAR STARTING PLACE

Small systems like this one from Vacuum Pressing Systems combine an electric 1-cfm pump with a bag about 48 in. by 48 in. At around \$400, they are ideal for small panels, flat or curved.



### READY FOR ANYTHING

Speetjens's system is a 5-cfm, compressor-driven pump and a 4x8 bag. Priced at \$1,000 to \$1,200, systems like this one from Quality Vakuu Products are capable of handling larger panels and curved work. Such systems also typically feature automatic shutoff and an adjustable vacuum level.



# A bit of DIY

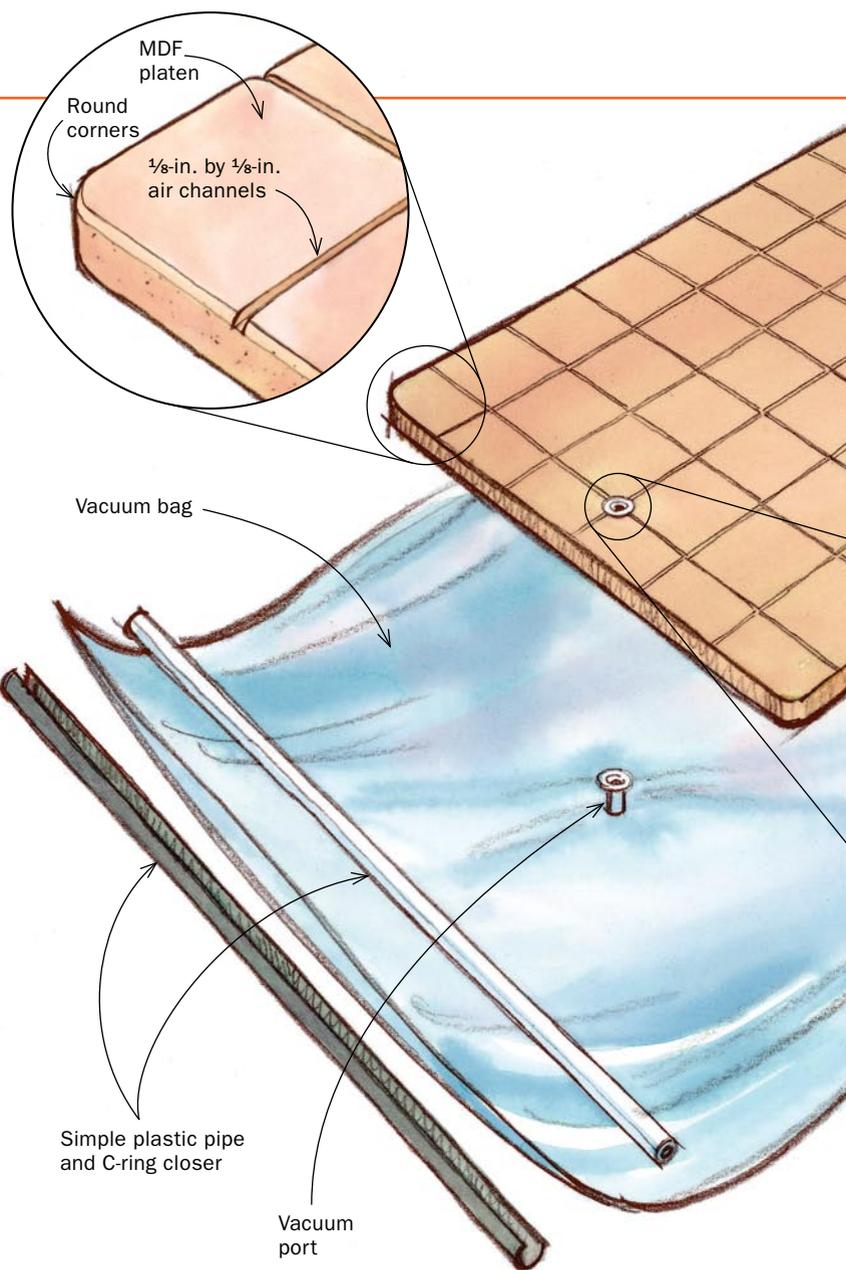
When you buy a veneer-pressing system, you get everything you need for flat work except the platen, which is a piece of grooved MDF or melamine that ensures a flat work surface and good airflow.

## MAKE A PLATEN

**The air needs an exit hole.** This system by Vacuum Pressing Systems calls for installing a plastic sleeve that will hold the brass coupler at the end of the vacuum hose. The sleeve is positioned directly over the built-in port on the underside of the bag.



**Grooves carry the airflow everywhere.** Use the tablesaw or a router to cut a grid of channels, approximately  $\frac{1}{8}$  in. wide by  $\frac{1}{8}$  in. deep and 6 in. to 10 in. apart. The evacuation port (above) should sit at the intersection of two channels. Get rid of sharp corners (right) to avoid damaging the bag.

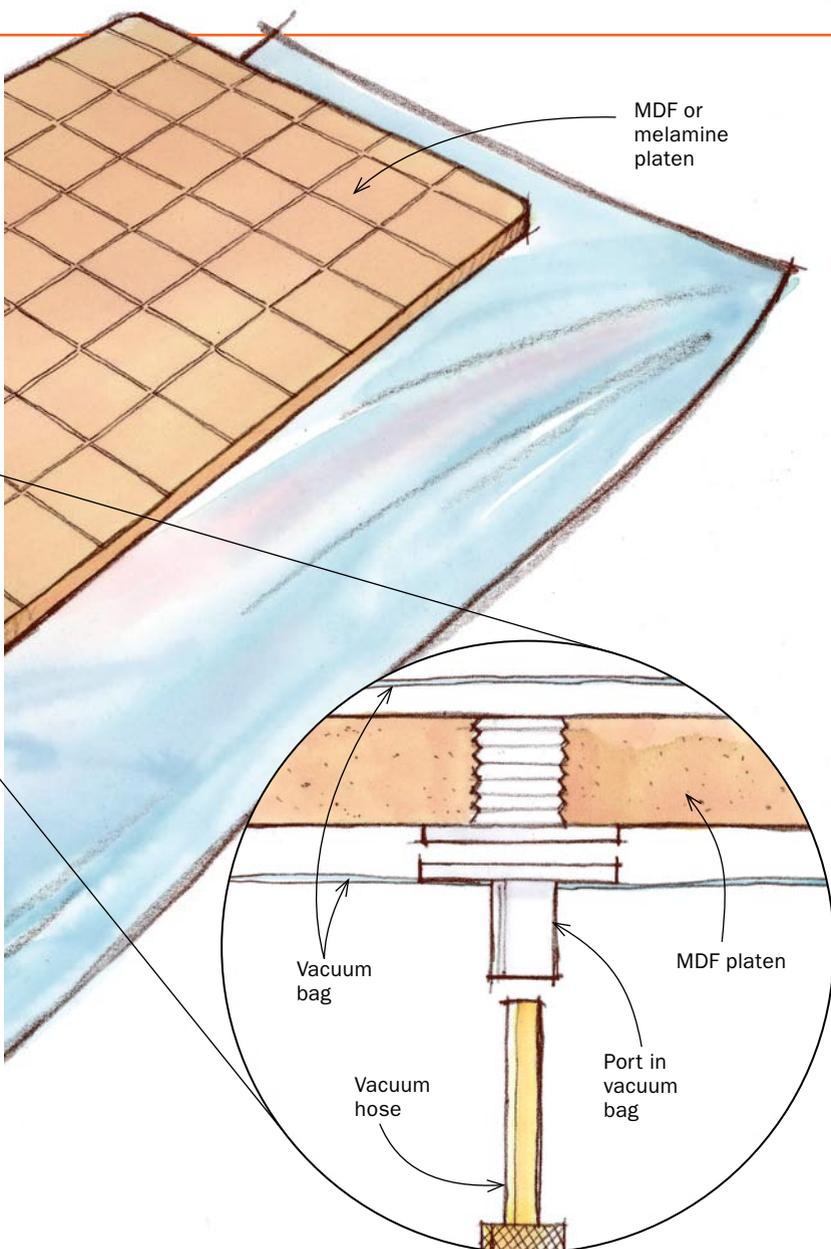


compared with \$110 for the same bag in vinyl. I know of pros who've babied a vinyl bag and gotten many years of service.

Regardless of material, bags typically can be found in either 20-mil or 30-mil thicknesses. Either will work, but buy the thickest you can afford for greater durability.

## Match the pump to the bag

Having carefully chosen a bag to fit your work, you now need a pump sized to match the bag. A good match depends on how quickly the pump can remove all of the air from the enclosure. The task is fairly easy when the workpiece and bag are flat, but more pumping is required when a bulky or curved workpiece turns the bag into a tent holding large pockets of excess air. There are no hard-and-fast rules for how quickly the pump should evacuate the bag, but one minute or so is a good general guideline. The pump should be fast enough to bring the assembly under pressure comfortably within your glue's open time, even with complex assemblies that take longer to get into the bag. But the process



**Attach the vacuum hose.** In this system, the fitting on the end of the hose fits snugly into the nozzle on the bag and the hole in the platen.

shouldn't be so rapid that it prevents last-minute adjustments to the assembly, or the bag itself, as the bag is drawing down.

A pump's performance is a function of its airflow, measured in cubic feet per minute (cfm). The smallest commonly available pumps typically generate 1 cfm. These are fine for a bag of about 4 ft. by 4 ft. This combination, in fact, is the basis for a highly popular class of starter systems that cost around \$400. For those who are certain they will veneer only pieces like door panels, small tabletops, or curved lids for jewelry boxes, they can be ideal.

It's important to note that buying a small pump doesn't mean you'll sacrifice pressing power. Most commercially available pumps generate a vacuum pressure of around 25 in. of mercury, which translates to something like 12 psi. That's plenty of pressure for veneering applications. But if the scope of your work—now or in the future—demands a larger bag, you'll need a stronger pump. For a 4x6 or 4x8 bag, a 5-cfm pump can handle almost any task, allowing work on large flat panels as well as generously sized curved work. A system like mine costs \$1,000 to \$1,200.

In addition to greater airflow, the larger pumps offer important choices and features not available on smaller units. First, larger pumps come in two basic types, those driven by an internal electric motor and those that connect to an air compressor to generate airflow. In general, the motor-driven type is slightly more efficient. Practically speaking, though, choosing between the two is largely a matter of convenience and expense. If you already have a compressor, you could save a couple hundred dollars.

When gauging whether your compressor will drive the pump you want, don't cut it too close. To yield 5 cfm at the bag, for example, a pump may need more than 6 cfm from the compressor. Some smaller systems work well with a midsize compressor, or even a small, pancake model. Larger systems like mine may require a large, stationary compressor. If you don't want a compressor, consider an all-in-one vacuum system. You can operate one just about anywhere that has an electrical outlet.

On most larger systems (both electric and compressor-driven), the pump shuts down when it reaches proper vacuum pressure

# Veneering a flat panel is a cinch

A handsomely veneered panel can add lively detail to a quiet design. The vacuum bag simplifies the process, taking only seconds to create perfect pressure for flawless results.

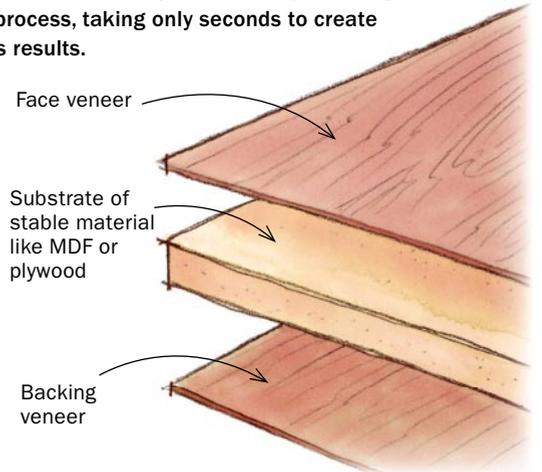
## ALWAYS VENEER BOTH FACES

Even with a stable MDF or plywood base, a veneered panel can warp if the construction isn't balanced. Apply the same veneer species and thickness to each face.

Face veneer

Substrate of stable material like MDF or plywood

Backing veneer



**Make a sandwich.** After applying a generous bead of yellow glue all around the substrate, spread it evenly with a roller. The veneer should be cut to overhang the edges by 1/8 in. or so. Align a corner of the veneer first, then lower the rest of the sheet. Now do the same on the other side.



and restarts when the pressure drops. These pumps also let the user reduce the maximum pressure, which helps when you're worried about crushing a form or oversaturating veneers with glue.

## Vacuum-veneering a flat panel

The most basic task in veneering is laminating a flat panel that consists of two veneers and a stable core like medium-density fiberboard (MDF) or plywood. This two-sided construction prevents warping and is a cardinal rule of veneering.

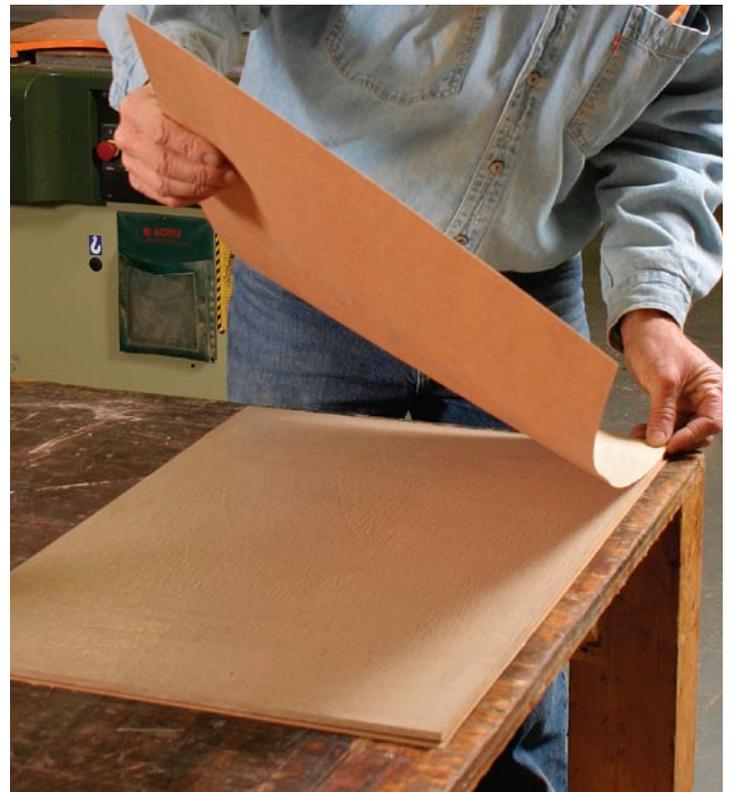
To limit the variables in your first efforts, use a glue that's familiar to you. Yellow glue's relatively short open time—5 minutes or so—means you must work efficiently. Cold-press glue, which is marketed for veneering, offers an open time of up to 15 minutes. It's also thicker, which helps to prevent glue from bleeding through porous veneers.

Standard yellow glue retains some flexibility after it sets, which in theory means it can “creep” and allow shifting between laminated layers. Some woodworkers avoid veneering with it for this reason, but I've never had a problem using it for flat panels.

For curved or complicated work, consider an epoxy or urea resin glue, both of which resist creep and have longer open times.

Glue-up is fairly straightforward, but be sure to walk through the process before spreading any glue. Start by spreading out the bag on a clean, flat surface and placing the platen inside, sawkerfs up (see photos, p. 62). Set the pump on a nearby surface and connect it to the bag. Now set your substrate on a suitably sized work surface near the bag's mouth. Your prepared veneer, glue, and spreaders should be ready nearby, along with a pair of cauls made from 1/4-in.-thick melamine or waxed hardboard to protect the veneer, distribute pressure, and contain glue squeeze-through.

Apply glue to the back face of the substrate with a glue spreader or a short-nap paint roller. Aim for a generous, even coat that isn't





**Bag it.** Depending on the size of your work (top), you might want a helper for this step. When the work is in place, close the bag by wrapping the end around the plastic tube (above). Clamp it in place with the C-ring for a reliable seal.



**Turn on the pump.** The vacuum pulls the bag tight to the work. The top caul is sized to match the lamination. The bottom caul can be up to 6 in. larger without harming vacuum performance.

### VACUUM VENEERING 102

Pick up the January/February issue (FWW #210) to learn how to veneer and edge a curved panel.

too heavy. Too much glue will cause some veneers to swell and buckle, and could bleed through the veneer, especially with a porous veneer like burl. A dry joint, on the other hand, will leave the veneer with air bubbles or cause the face to delaminate. When the glue is spread, lay the veneer in place, then flip the assembly onto one of the caul. Now spread glue on the opposite face of the substrate, position the veneer, and add the second caul. Place the assembly in the bag. Seal the bag and turn on the pump.

I find that about two hours in the bag is plenty of time when working with yellow glue. When you pull the panel from the bag, scrape away any excess glue and trim the panel on the tablesaw. I also like to set aside the panel overnight on a flat surface, where it won't be disturbed, to allow the glue to cure completely. □

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### HOW TO TRIM A PANEL



**Trim the waste, then cut to size.** Speetjens uses a handplane to trim the excess veneer at the edges. This panel will go into a frame and so does not need to be edged. Then he cuts it to final size on the tablesaw.