

Veneered Boxes Made

Create seamless beauty outside and in

BY CRAIG THIBODEAU



I built my first boxes from solid wood. Then I started playing with veneer, discovering a new world of wood species, colors, and amazing grain patterns. I used veneer for box-making, then for furniture, and I never looked back.

Using veneer makes it easy to decorate a box with inlays, marquetry, corner beading, and more. And the outside of the box is just the beginning of the fun. With veneer, you can feature a different material on the inside. The box in this article is a good example. Outside you get beautiful brown walnut. Open the lid and you discover a bright, golden interior of curly anigré, which lightens the look and adds an element of surprise.

Over many years working with veneer, I've developed techniques that make high-end results easier to achieve. On boxes, I veneer the inside before assembly and

Easy



the outside afterward. That not only delivers a flawless interior but also lets you use whatever joinery method you like to build the box—miters, half-laps, dovetails, or whatever—and then simply veneer over it, creating invisible joinery, a perfect grain match, and a seamless exterior.

My joinery method for veneered boxes is a combination of miters and rabbets that are easy to cut and even easier to assemble, as you'll see.

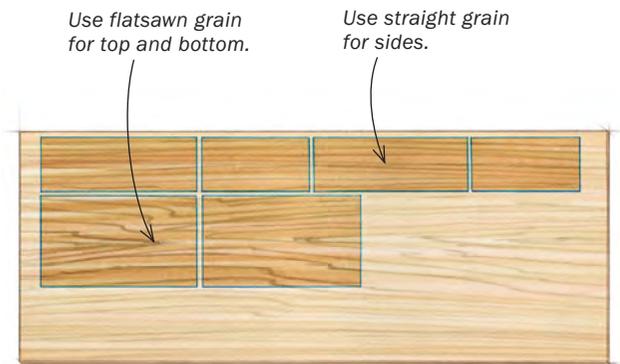
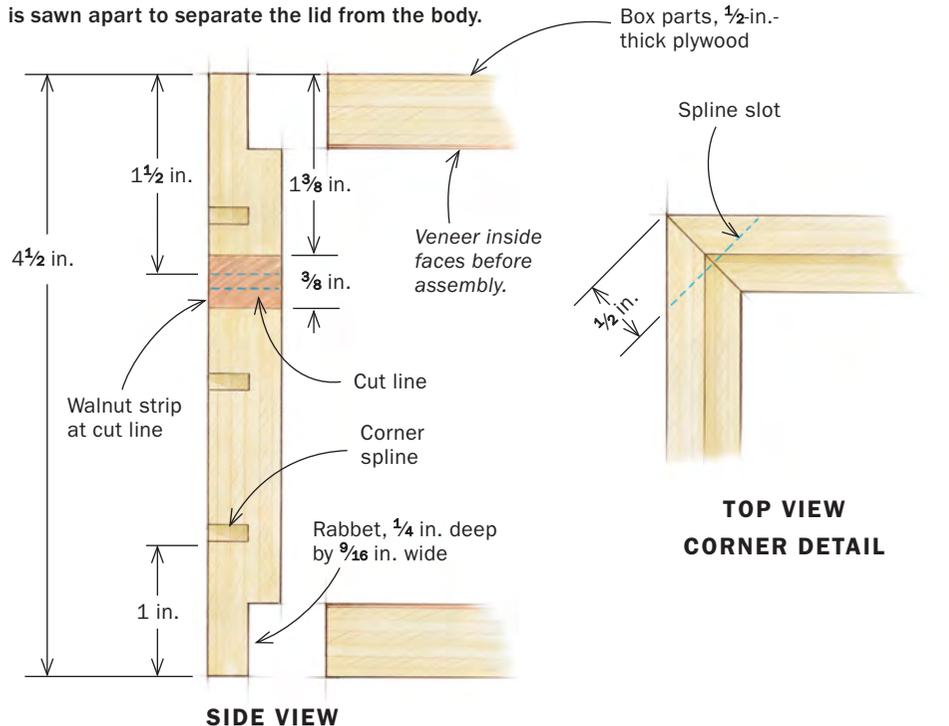
Another critical move is assembling the parts into a closed six-sided box, and then ripping off the lid on the tablesaw. You might think this would leave the edges of the plywood substrate exposed at the seams, but I have a trick for that. Before I veneer the sides and assemble the box, I figure out where the seam will be, rip apart the plywood pieces at that line, and glue a strip of solid wood between them—one that matches the exterior veneer. That way, when I cut off the lid later on, I end up with a solid edge on both lid and box, which blends in beautifully.

The first thing to do when making any box is to decide on its size. Maybe it needs to hold specific items, or maybe you're just making a well-proportioned box with no plans for its cargo. This box is 9 in. deep by 13 in. wide by 4 in. tall, a pleasing shape that's just large enough to store something special.

To keep the focus on the fundamentals, from joinery to veneering, I've kept this box simple. But the same veneer approach makes it easy to take a box to another level with decorative inlays and borders. There are any number of ways to do this, everything from small, matching inlays inside and out, to adding a lock and an inlaid escutcheon plate. Another great touch is a solid-wood bead around the perimeter of the box to protect the corners and frame the exterior veneer.

SIMPLE RABBETS AND MITERS

Mitered corners reinforced with splines are hidden by veneer for a clean look. Built as a closed unit, the box is sawn apart to separate the lid from the body.



Perfect piece. For this box, Thibodeau chose a single, wide piece of walnut veneer, which included straight grain for the sides and flatsawn grain for the top and bottom.

VENEER THE INSIDE FACE OF THE PARTS

The box parts are veneered on their inside face before assembly. The exterior veneers go on afterward, covering the joinery. The process starts with the box sides, which are veneered as one long strip. Before veneering, rip the plywood strip in two and glue a piece of solid wood in between, at what will be the seam between the lid and body of the box.

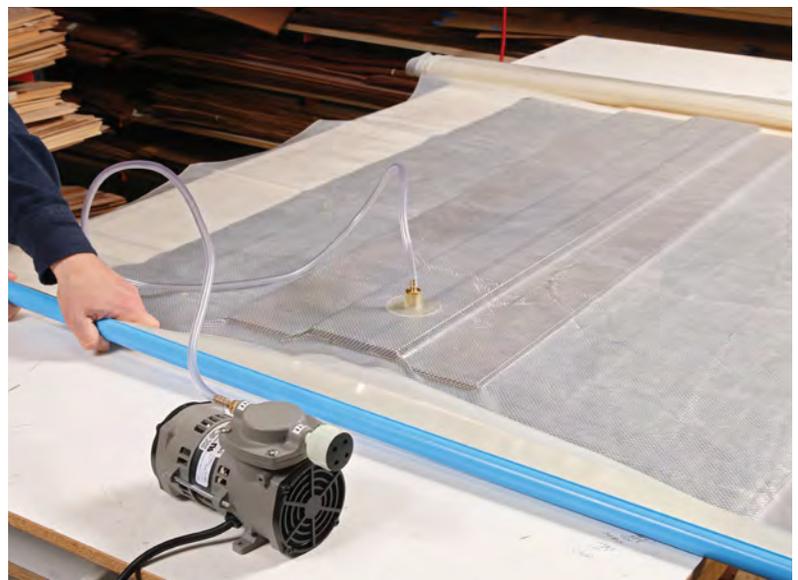
Rip veneer strips. Run your veneer saw against a straightedge—in this case, the edge of the substrate—and cut the interior veneers $\frac{1}{8}$ in. oversize in width.



Lay up the veneer. Use a roller to spread polyurethane glue on the substrate, then lightly mist the glue face of the veneer with water and press down the veneer by hand.



Quickly into the bag. The long strip is flipped immediately onto a $\frac{3}{4}$ -in. MDF caul. The caul is cut $\frac{1}{4}$ in. oversize in all directions, and covered in 3- to 5-mil plastic sheeting to resist glue. Breather mesh goes on top to distribute the vacuum pressure, then the bag is sealed quickly and the pump turned on. Leave it overnight to cure.



Interior veneers go on before assembly

I used less than a quarter sheet of $\frac{1}{2}$ -in.-thick Baltic-birch plywood to build this box and about the same amount of $\frac{3}{4}$ -in.-thick MDF (particleboard also works) to make clamping cauls for gluing on the veneers.

The plywood sides of the box start as one long piece, its length accommodating all four sides and their miters. Rip this long piece into two strips, with the cut located at the seam between the lid and body of your box, in this case $1\frac{1}{2}$ in. down from the top edge. Then glue and clamp a strip of solid wood between these parts, and plane and sand it flush.

Cut out the top and bottom parts now too, and cut an extra piece of substrate—roughly 6 in. by 12 in.—for testing the miter and hinge setups later.

I tend to use lighter-colored, straight-grained veneer for the interior of my boxes and furniture, in a color that both complements and contrasts with the exterior. Here the long piece of substrate for the box sides will be veneered on one side with a single piece of anigré.

For the tops and bottoms, you can use one wide piece of veneer, or cut and tape together two pieces to make a book-matched sheet. Bookmatching is covered in other veneering articles, including one of mine (“Choosing and Preparing Veneers,” *FWW* #234).

I cut veneer with a sharp veneer saw and a straightedge. A piece of MDF with sandpaper stuck to the bottom so it doesn't

CUT THE BOX JOINERY

The sides are joined with miters, and rabbeted to accept the top and bottom.



Start with butt joints. After trimming the excess veneer from the long edges, Thibodeau cleans them up with light ripcuts. Then he crosscuts them to final length as shown, with a backer strip preventing blowout.



Neat trick for clean miters. After tilting the blade to exactly 45°, clamp an auxiliary fence to the rip fence, and bury the blade in it. Then adjust the fence so the miter cut extends exactly to the tip of the butt joint. Dial in the setup using a sample of the veneered box sides, and support the workpieces with the miter gauge.

shift makes a good straightedge. But you could also use the substrate itself.

You have two great options for pressing the veneer onto the plywood. A vacuum bag (or vacuum press) is quickest and easiest, but clamps and cauls are a fine choice for those who only use veneer occasionally, especially on small workpieces like these. I'll use both approaches here to show each one in action, starting with the bag, which allows me to press all of the sides at once, as one long piece; with clamps I would probably precut the pieces and veneer them separately.

Either way, I recommend polyurethane glue, which introduces very little moisture and creates a rigid glueline.

Make clamping cauls—You'll need one clamping caul for the top/bottom, and one for the long side piece. For the bag my clamping caul is just a piece of $\frac{3}{4}$ -in. MDF, cut about $\frac{1}{4}$ in. larger than the substrate. For the clamp method, I again use MDF but I apply a layer of $\frac{1}{4}$ -in.-thick cork to the cauls to even out the pressure. I use spray adhesive to apply the cork, and then clamp each caul to my workbench—cork side down—to ensure a good bond.

I wrap my cauls with clear packing tape to resist glue, or place a sheet of plastic between the caul and workpiece. (I use rolls of 3- to 5-mil plastic from the home center.)

Cut joinery and assemble the box

The joinery I use for boxes like this is simple but effective. The sides of the box are



Rabbet the top and bottom edges. Use a dado blade to cut rabbets roughly half the thickness of the sides, and just a hair wider than the thickness of the top and bottom.



Dry-fit the sides. This confirms that miters are tight and lets you measure for the top and bottom. After cutting those to size, check their fit.

ASSEMBLE THE BOX

The box assembles with packing tape. The edges of the sides end up just proud of the top and bottom, and are easily sanded flush.

Tape and glue the joints. Lay the sides tip to tip, and stretch clear packing tape over the joints. Then flip the assembly and brush yellow glue onto the miters, keeping the glue away from the inside faces to minimize squeeze-out.



Wrap up the assembly. Fold up the box to close the joints, and stretch tape over the last joint. After removing squeeze-out from the corners of the rabbets, drop in either the top or bottom, unglued, to be sure the box stays square as the miters dry.



Glue in the top and bottom. After a couple of hours, glue in the top and bottom panels, using cork-lined cauls and focusing clamping pressure near the edges of the box.



joined with miters, and the top and bottom sit in rabbets cut into the sides. This lets you divide and conquer the glue-up, assembling the miters first and then dropping in the top and bottom.

Before assembly, sand and finish the inside face of all the parts. I typically start at 150 grit, then work up through 180 and 220 grit, but you can go higher if you desire. Shellac is a great option for an interior finish as it dries quickly and, unlike oil finishes, it doesn't impart a strong scent in a closed space.

One of the reasons I use miters to join veneered boxes is because they are so easy to assemble, using nothing more than a roll of tape. I like clear packing tape here vs. blue tape, as the former is stronger and doesn't tear when you pull it over sharp corners. I use Titebond I because it dries quicker than polyurethane and is easier to clean up.

When the miters are cured, I glue in the top and bottom. Then, on a box this big, I add splines to strengthen the miters.

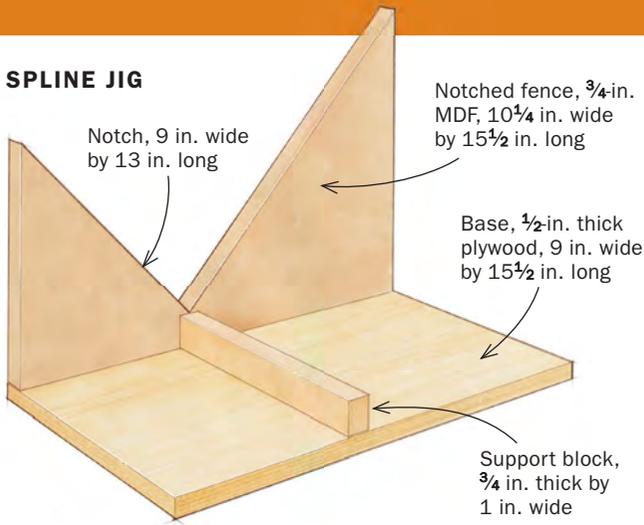
Rip off the lid and apply backer veneers

Once the splines are dry, trim them flush. Then it's time to cut the lid off the box on the tablesaw. When you've done that, sand the cut edges smooth, and test the fit of the lid and box. If there are any gaps between them, flat-sand them with a hard block until they disappear. On the top and bottom of the box, the uneven edge grain

ADD SPLINES, RIP OFF THE LID

Thibodeau reinforces the miters with small splines before sawing off the box lid.

SPLINE JIG



Smart sled. This simple jig cradles the box at 45° for cutting the spline slots. Be sure you don't cut too deep and penetrate the box interior.



Glue in the splines and trim them flush. Solid wood splines are planed for a snug fit in the slots. After the glue dries, use a handsaw and block plane to trim them flush.



Rip off the lid. Set the tablesaw blade $\frac{1}{8}$ in. higher than the thickness of the sides. Then make cuts on three sides, starting on a short side. For the fourth cut, stabilize the box by adding shims equal to the thickness of the blade's kerf and taping the box together as shown.

of the plywood will telegraph through over time if you use a single piece of veneer, so use a backer veneer under the walnut. I use plain, straight-grained veneer as a backer because it's cheap and flat. Align the backer's grain perpendicular to the grain of the substrate.

Later, when you apply the walnut top veneer with its grain running 90° to the backer, you end up with two cross-grain

veneer layers that are very stable, acting just like two more plies in the plywood.

I always go with traditional clamps for applying the exterior veneers, as the vacuum bag could crush the hollow lid and body of the box. Use a set of thick cauls to ensure the clamp pressure is distributed evenly. I recommend two layers of $\frac{3}{4}$ -in. MDF for each caul, covered with cork and packing tape.

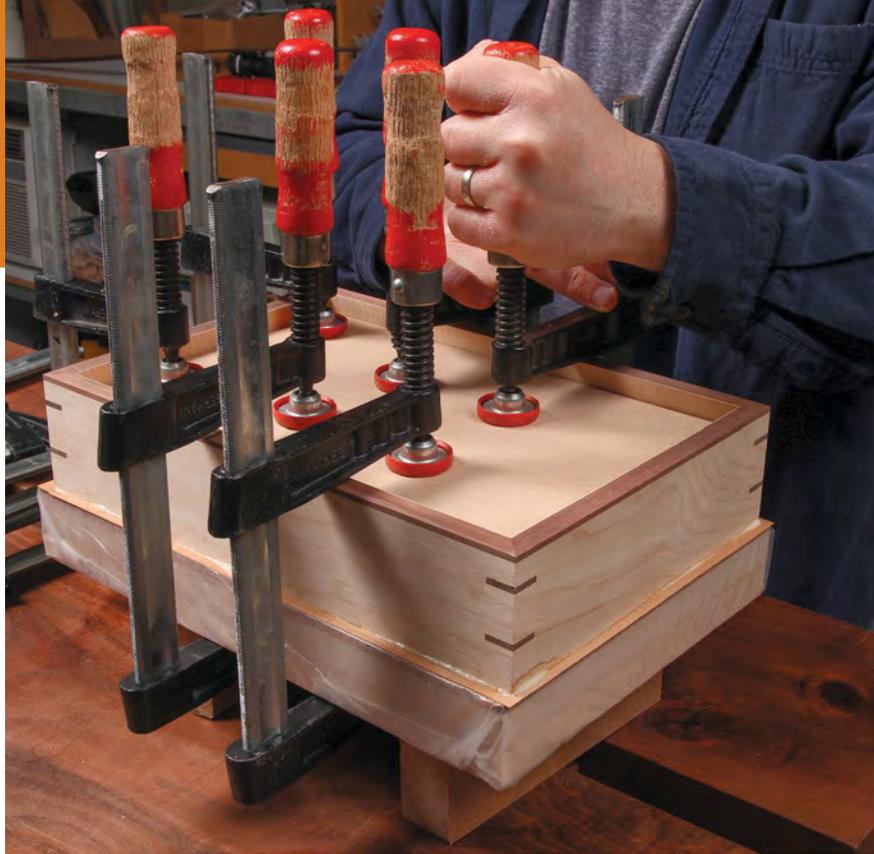
Be sure the top and bottom of the box are dead-flat before veneering, sanding the edges of the sides flush to the top and bottom if necessary. Leave the backer veneer to dry overnight, trim off the excess at the edges, and then give the entire exterior of the box a light scuff-sanding with a hard block and 150-grit paper—not enough to change its size or shape, just enough to clean up any glue.

BACKER SHEETS TOP AND BOTTOM

The plywood edges of the sides will be detectable under the veneer unless you add a backer veneer first. The grain of the backer sheet should be perpendicular to the grain of the plywood below.



Glue and clamp. Backer veneer can be any common species, cut slightly oversize, with the grain running perpendicular to the plywood's face grain. A thick caul placed inside the box distributes clamp pressure evenly (right).

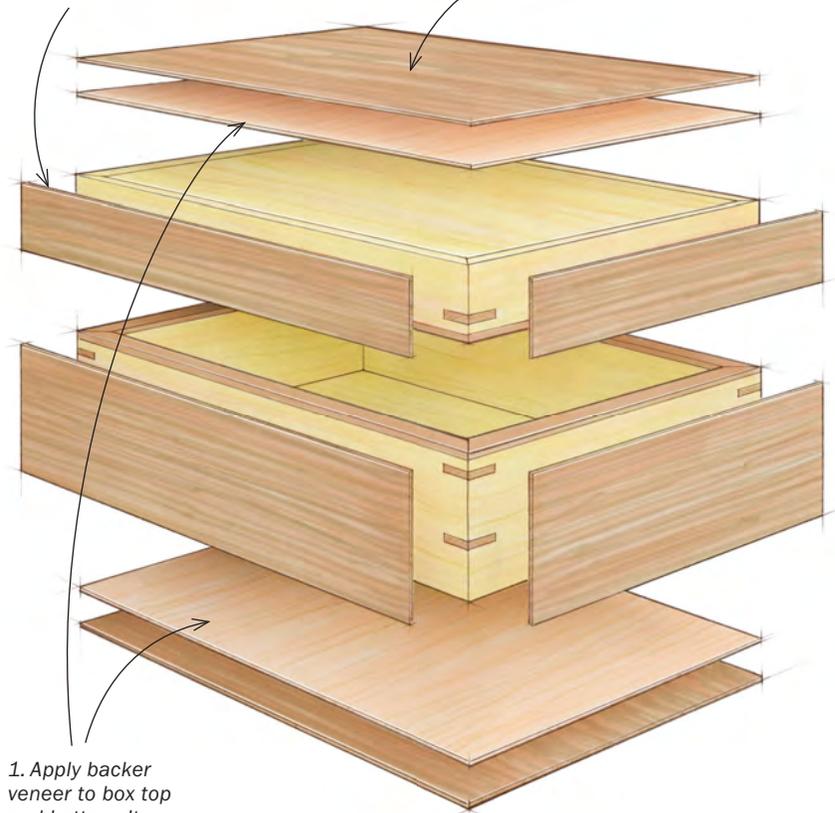


2. Apply veneer to sides, working around the box one face at a time.

3. Add the face veneer to the top and bottom of the box.



Trim the excess. Trim overhanging veneer using a handheld router and a flush-trimming bit, starting with the end-grain areas and using a climb-cut to avoid chipout. Then sand the edge square and flush with a hand block.



1. Apply backer veneer to box top and bottom. Its grain should run perpendicular to the face veneer.

VENEERING SEQUENCE

VENEER THE EXTERIOR

Thibodeau cut the exterior veneers from one large piece to create continuous grain and a harmonious look.

Prep the side veneers. For continuous grain, cut a long, straight-grained strip for all four sides of the box and lid, slightly oversize. Label the parts and their orientation on the box before cutting them apart.



One side at a time. The veneer goes on as before, with polyurethane glue, and one caul sized to fit inside the box and the other slightly oversize for the outside.



Align one part with the next. After trimming the excess veneer as before, align the grain of the adjacent piece as you apply it, holding it in position with blue tape.



Attach the outer veneers and finish the box

Now you're ready to apply the exterior veneers. The side veneers go on first. Cut the side pieces from one long piece of veneer, so there will be a continuous grain match at three out of the four corners and a perfect match at the seam between the lid and body.

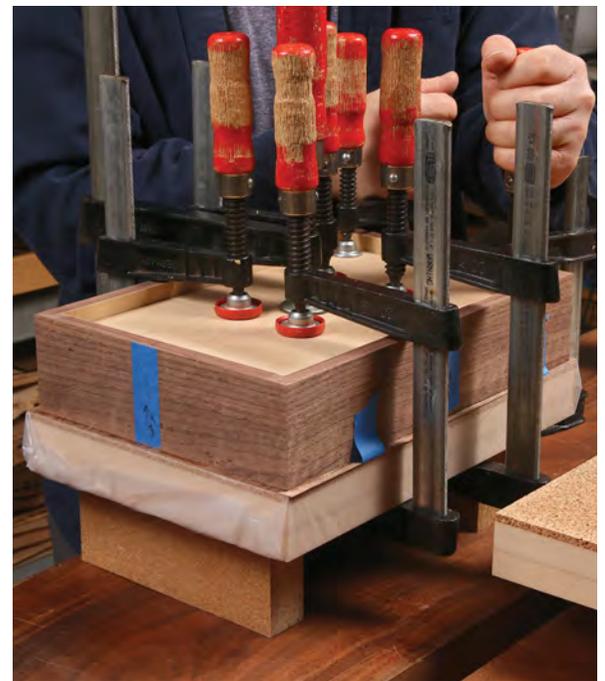
Once the side pieces are attached and trimmed flush on both the lid and the body, glue on the final top and bottom veneers. After trimming them flush, give the whole exterior a quick sanding with a hard block and some 150-grit paper to smooth everything out and remove any glue. But don't sand it any smoother until the hinges are installed; you want the veneers to stay as thick as possible so you can sand away any little misalignment of the top and bottom.

After the hinges are installed (see pp. 60–61), do the final sanding of the sides (except the back) with the box assembled, to ensure all the corners line up perfectly. Sand with a hard block, lined with cork, using 180-, 220-, and 320-grit paper. Then remove the hinges to finish-sand the back, top, and bottom.

The exterior finish is your choice: oil, polyurethane, more shellac, whatever you like.

Once you have these box-making techniques down, I encourage you to explore new veneer species, and common veneering techniques for adding decorative flair. The possibilities are exciting.

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Veneer the top and bottom. These veneers are applied and trimmed exactly like the backer veneers, but with the grain running lengthwise this time.

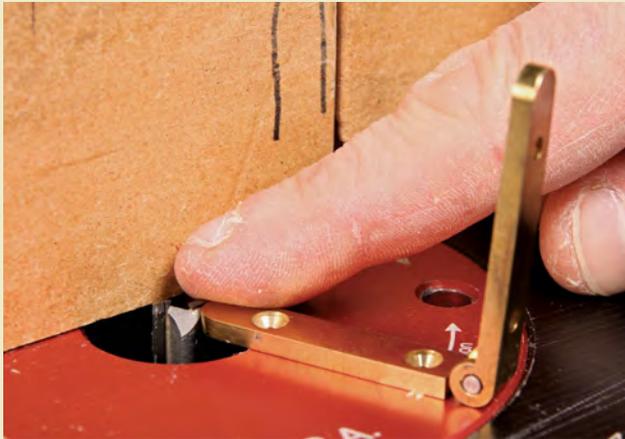
Side-rail box hinges: Looks, performance, and easy installation

1. SET UP YOUR ROUTER TABLE

Each mortise is cut in a single pass on the router table, approaching the bit from one side or the other, depending on the part of the box being mortised.

Set the height.

Use your fingertip to set the bit flush with the thickness of a hinge leaf.



Add a stop block and make a test cut.

Thibodeau positions a stop block with the help of a 34mm spacer. Make sure the cutting edge of the router bit is at its outermost point. Set the fence to center the bit on the thickness of the sides. Use a sample piece, veneered like the real box sides, to check the setup (far right).



Test the fit. The hinge leaf should be flush on top, with the barrel centered on the back edge.



I install high-quality side-rail hinges in every box I make these days. I'm using them here on a veneered box, but they work just as wonderfully on solid-wood boxes. I prefer this type of hinge because of its clean, minimal look and built-in lid stop.

There are a number of high-quality side-rail hinges on the market. My favorite ones are the SmartHinges from Andrew Crawford (smartboxmaker.com). The lid stop is machined into the hinge barrel, making it invisible, and the hinge barrel is rounded on its back end, the only side-rail hinge with that elegant touch. The ends of the hinge leaves are also rounded, which makes mortising super easy on the router table.

By the way, if your box design incorporates a lock, Crawford's SmartLock hardware is easy to install and matches the design of the hinges.



SmartHinges only require two router-table setups, using either an 8mm or $\frac{5}{16}$ -in.-dia. router bit (both work) and a small shopmade spacer, which dials in the distance between the bit and a stop panel clamped to the table. For SmartHinges the spacer should be 34mm wide.

Set your bit height to exactly the thickness of one hinge leaf, and set the fence to locate the bit in the center of your box sides. Use the spacer to position your stop block on the left side of the cutter.

To test the setup, you'll need a sample box side, veneered the same way as the real thing. Make a test cut, sliding the sample along the fence until it hits the stop block and then pulling it back until it clears the bit. Keep the piece pressed against the fence.

2. ROUT THE HINGE MORTISES

Now the real thing. Be sure to hold the box snug against the fence all the way up to the stop block and all the way back out of the cut. Note how Thibodeau marked the hinge locations in chalk to keep track of these critical cuts. You'll be able to cut two of the four mortises with this first setup.



Test-fit a hinge leaf to check your setup. If you need to make an adjustment, just make a test cut on another edge of your sample part. Use this setup to cut the top-right and the bottom-left hinge mortises, as shown. Then move the stop block to the right side of the bit, using the 34mm spacer as before. Just to be sure, test the setup on the sample piece again. Now you can cut the top-left and bottom-right hinge mortises.

To install the hinges cleanly and accurately, push each leaf into place and use a centering bit to line the pilot holes up with the holes in the hinges. It helps to angle the holes very slightly toward the front of the box in order to pull the hinge leaves tightly into their mortises.

—C.T.



Switch sides. To cut the two remaining mortises, move the stop block to the other side of the bit, using the same spacer to position it. Once again, keep the box or lid snug against the fence throughout the cut.



Check the alignment. Insert the hinge leaves fully in their mortises, and then check the alignment of the lid at the front edge (above). If the alignment is off, you can add a shim to align the parts. Use the hinge leaf to press a small piece of veneer into the back of each mortise, taping the hinge there until the glue dries.

