Biscuit-joint basics

BY TOM BEGNAL

It will never match the beauty of a dovetail or the strength of a mortise-and-tenon, but for speed, accuracy, and ease of use, it's hard to beat the biscuit joint.

Biscuit joints can be used on all wood products: solid wood, plywood, medium-density fiberboard (MDF), and particleboard. For this reason, they are great for cabinetry, which typically involves a mix of solid wood and sheet goods. Biscuits are a great way to join a plywood carcase and attach an assembled face frame. They also help keep things aligned when gluing solid-wood edging to plywood or assembling solid boards into a wide panel.

Biscuit joiner cuts the slots

A dedicated tool and an oddly shaped tenon combine to create a biscuit joint. At the heart of the process is a power tool called a biscuit joiner or a plate joiner. To make a joint, use the tool to cut a shallow slot in each of the mating parts. Then, after adding glue to each slot, insert a thin, football-shaped biscuit into one slot. A little more than half the biscuit's width goes into the slot; the other half sticks out. To complete the joint, just slip the mating slot onto the "tenon" and clamp the parts together.

The biscuit joiner has just four main parts: a motor, a blade that cuts the slot, an adjustable fence that aligns some types of cut, and a base that houses the blade and also can align cuts.

The 4-in.-dia. blade looks like a miniature tablesaw blade. Unlike a tablesaw blade, however, the biscuit-joiner blade cuts horizontally. The kerf it creates, commonly called the slot,

All about biscuits

Simple and efficient. *An adjustable stop on the joiner (left) controls the depth of cut to match each of the common biscuit sizes—0, 10, and 20. A biscuit swells in thickness (right) when wet glue hits it, helping to anchor the joint. So store biscuits in a sealed jar to keep out moisture.*

Photos: Steve Scott; drawings (facing page): Stephen Hutchings

measures about ⅛ in., just wide enough to accept standard-thickness biscuits.

Thanks to a spring-loaded sliding "way" that connects the base and motor, you can butt the front of the base against a workpiece, start the motor, and push it forward. The spinning blade emerges from the front of the tool to cut a shallow arc-shaped slot in the workpiece. Release the forward pressure, and the springs push the motor back to retract the spinning blade safely into the base.

Expanding biscuits fill the slots

The second element in this joint is the biscuit. Made from beechwood or white birch that has been thoroughly dried, biscuits are compressed by machine to a standard thickness. For maximum all-around strength, the biscuits are cut so the grain runs diagonally.

When a biscuit comes into contact with moisture, it swells. So when you insert a biscuit into a glue-lined slot, the biscuit expands, creating a snug fit and a tight joint. It is important to use only water-based glues such as common yellow PVA glue. Biscuits won't work with epoxy, cyanoacrylate ("super") glue, or polyurethane glues.

Biscuits come in three standard sizes, No. 0, No. 10, and No. 20. The biscuit joiner has preset depth stops that match these sizes.

Use the fence or the base to locate the slot

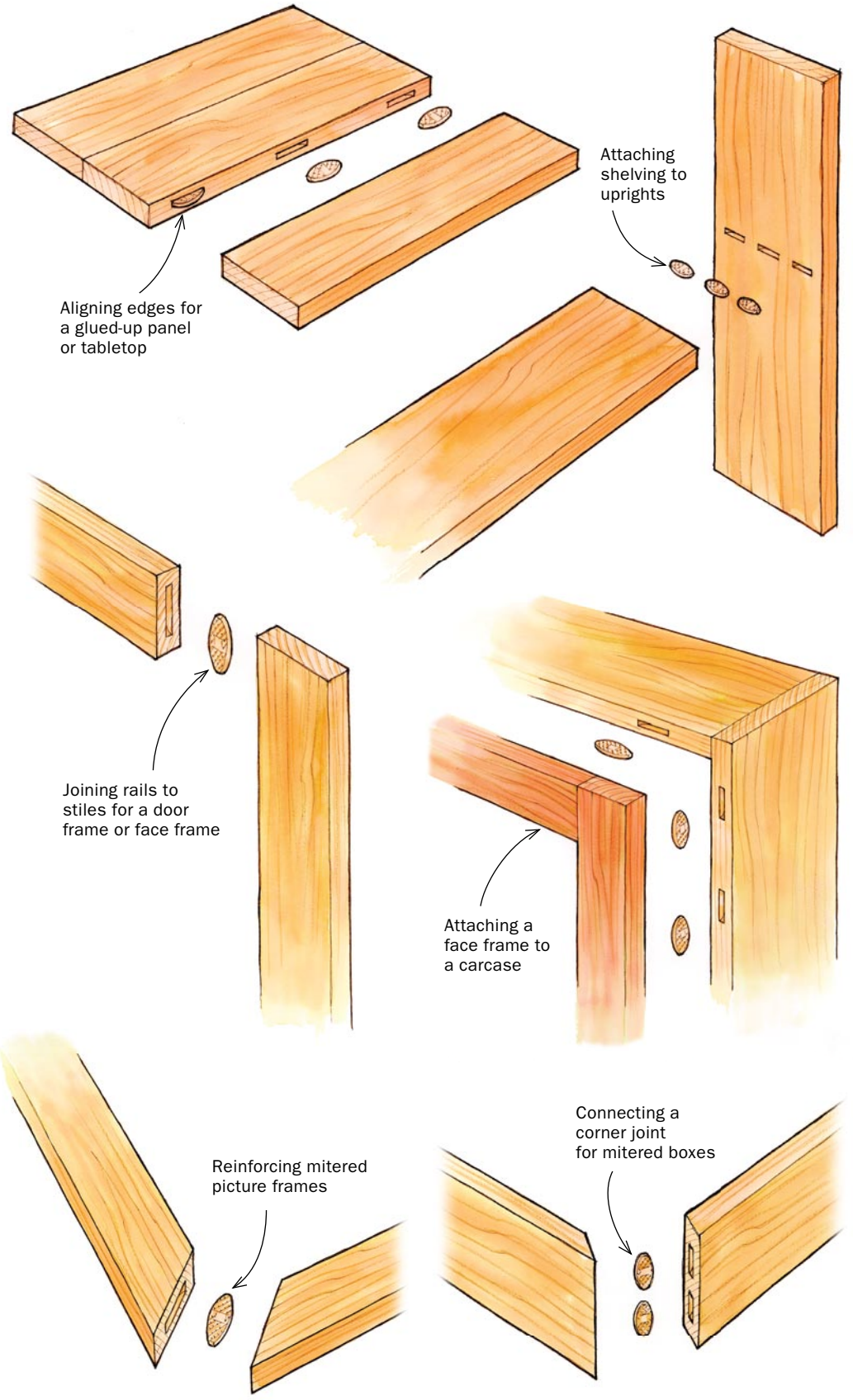
When using a biscuit joiner, you have two ways—the fence or the base—to register the slot in the workpiece. Each has advantages.

For extra flexibility, the adjustable fence lets you position the slot anywhere between 3/16 in. and 1 in. from the fence (if the biscuit is any closer than 3/16 in. to the surface of the workpiece, its swelling could create a bulge on the surface). Also, you can set the fence to cut slots in angled joints.

However, if all you want to do is center a slot on ¾-in.-thick stock, it's easier to register off the base. This is because the center of the kerf is located ⅜ in. from the bottom of the base. To create a slot in ¾-in.-thick stock, place the base and the stock on the same flat surface and make the cut. It's OK if the slot isn't exactly centered; just

A variety of uses

Biscuit joinery is useful in a wide range of applications, from aligning edge-glued boards to securing shelves to assembling and attaching frames, miters, and more.

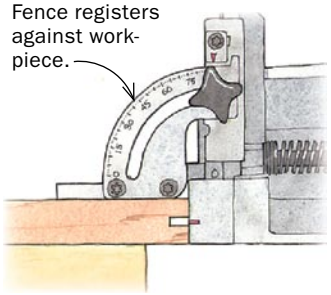


Reference off the fence

Using the fence to locate the cut lets you adjust the position of the biscuit slot to any point between 3/16 in. and 1 in. from the reference surface.

Layout is simple. *Just align the workpieces, then draw a line across the mating faces to mark the centerline of the biscuit.*

Center the cutter on the stock's thickness. *With the fence flat on the workpiece, adjust its height to locate the cut. To make the cut, simply align the joiner with the single layout mark, start the tool, and push the joiner's body forward.*



remember not to flip the parts when it comes time to glue them.

Cut and assemble a simple biscuit joint

With a biscuit joiner in hand, it takes just four steps to join a pair of ¾-in.-thick boards end to edge (see photos, left). This joint is useful for making light-duty door frames, especially when the panel is plywood or MDF. That's because plywood and MDF don't expand and contract with changes in humidity, so they can be glued in place to add strength to the frame.

Step 1: Align and mark—Align the boards as you want to see them joined, and use a single line to mark the biscuit centerline on the top face of both parts.

Step 2: Determine the biscuit size—Based on the width of the board, choose

ANGLE THE FENCE FOR MITERS

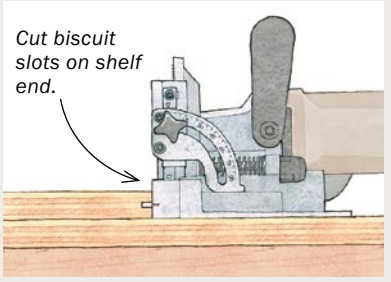
Setting the fence to 45° allows the joiner to cut a slot in the end of a mitered workpiece. Align the joiner for a cut toward the inside of the miter, so there is plenty of material in which to sink the slot.

Drawings, except where noted: Jim Richey

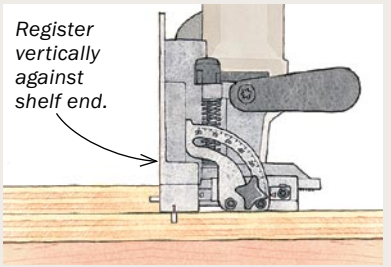
Reference off the base

Registering a cut from the joiner's base always puts the biscuit slot ⅜ in. from the reference surface, or centered on ¾-in. stock. This can make for quick biscuiting, as when attaching a fixed shelf to an upright.

Layout trick. *To start, mark out the shelf location on the case side and clamp the actual shelf along one of those lines. You are now set up to cut both sides of the biscuit joint.*



Just butt and cut. *With the joiner base on the side piece, cut the biscuit slots in the end of the shelf (above). Reposition the joiner so the base butts against the end of the shelf, and cut the mating slots in the side piece (below).*



the largest biscuit that it can accept. For the 3-in.-wide stock shown, No. 20 biscuits are a good choice.

Step 3: Cut the slots—Clamp one of the workpieces in place (never hold the workpiece by hand). Set the depth-adjustment knob for the No. 20 biscuit. Align the center-registration mark on the biscuit joiner with the biscuit-centerline mark made in step one. Start the motor and, with one hand on the top handle and one hand on the motor housing, push the motor toward the stock. Continue cutting until you reach the stop, and then allow the spring action to return the motor to the starting point. Repeat the process to cut a slot in the second piece.

Step 4: Apply glue—Use a small brush (I use a throwaway soldering brush) to apply a generous coat of glue to each slot. Be sure to coat the sides of the slots—that's where a lot of the glue strength comes from. Add glue to the biscuit and insert it into one of the slots, then attach the other piece and clamp them together. Don't answer the phone after the biscuit has been inserted into the first slot. By the time you come back, it will already have swelled enough that you won't be able to insert it in the second part of the joint. The only thing you can do then is let the glue dry, saw away the protruding part of the biscuit, and recut the slot. □

Join the parts. *Apply glue to the slots and biscuits, then fit the shelf to the side pieces and add clamps.*