Fine Furniture with Biscuit Joints

For surprising precision, anchor the tool, not the workpiece

BY MICHAEL C. FORTUNE

Photos, except where noted: Matt Kenney

If you ask a furniture maker about joinery for fine furniture, you're sure to hear about dovetails, mortises, tenons, dadoes, and even rabbets. But I'd be surprised if biscuits were mentioned, unless only to explain how they have no place in high-end work. That's a shame, because there are some joints where a biscuit is the best solution. They're great for joining the rails and stiles of a face frame, attaching a solid-wood frame around a veneered panel, tabletop, or door, or joining a leg to a veneered panel. Biscuits also let me build more adventurous furniture that would be difficult with traditional joinery.

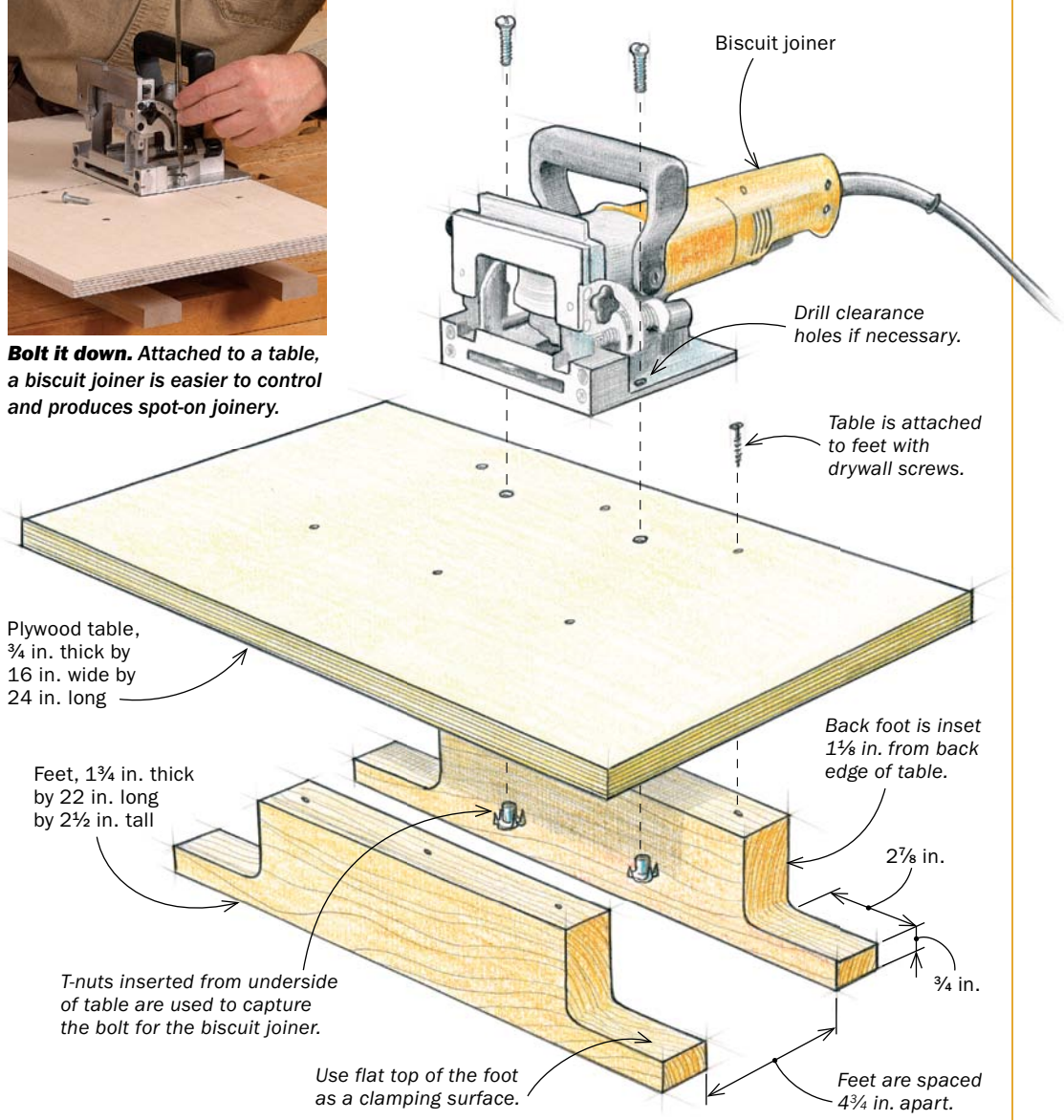
Perhaps the biggest reason why biscuits have been dismissed by many furniture makers is that biscuit joiners seem incapable of accuracy. The cutter's rotation has a tendency to jerk the machine sideways when you start the cut. Also, biscuit joiners can be difficult to hold and they have small fences, so they jump around and lift off the work. However, I've found a great solution to all of these problems: Turn your biscuit joiner into a stationary tool by attaching it to a shopmade table.

Attached to the table, the biscuit joiner really does have a place in fine furniture. I'll show

JIG CURES THE JITTERS

The biggest problem with a biscuit joiner is how much it wants to move around when you use it handheld. To stop it cold, bolt it to this table.

Bolt it down. *Attached to a table, a biscuit joiner is easier to control and produces spot-on joinery.*



Break through to new designs

When designing, Fortune doesn't worry about construction. He figures it out later. Keeping his mind open, he's found the biscuit joint to be reliable and, more importantly, versatile, allowing him to build furniture that would be impossible with traditional joints like the mortise-and-tenon.

Make a pyramid. *Biscuits join four triangles to make this plywood door and the drawer fronts.*

Join a side to legs. *Biscuits make a solid connection between wide veneered panels and solid wood.*

Wrap a veneered top in solid wood. *Biscuits join the wood to the panel and reinforce the miter joints.*

Drawings: John Tetreault; photos (right column): Michael Fortune

A smarter way to make face frames

Mortise-and-tenon joinery is overkill for a face frame, because after it's attached, the cabinet gives the frame more than enough strength to stay together over the long haul. Replace the mortises and tenons with biscuits, a far easier joint to make. But don't try this with doors and table aprons: They need the strength of a full mortise and tenon.

you where it's smart to use one and how to get the best results.

When and where to use biscuits

Biscuits can be used to join two solid-wood parts, two veneered panels, and solid wood to a veneered panel. But they can't be used everywhere. Don't use them for heavily stressed joints, like those in a chair, or for joints that hold a lot of weight, like those attaching shelves to a bookcase.

OK, that covers where to use them, but not how. A strong biscuit joint is a balancing act. You need enough biscuits to create adequate glue surface, but not so many that their slots significantly weaken the two parts you're joining. I follow these guidelines to determine how many biscuits a joint can handle and where to put them: First, biscuits should be at least 3⁄16 in. from the top surface and 1⁄8 in. above the bottom one. Second, slots should be at least 1⁄4 in. away from any edge—any closer and the remaining material is too weak. Likewise, the minimum spacing between slots is 1⁄4 in., but I typically space them 2 in. to 3 in. apart.

Finally, go easy on the glue and apply it only to the slots (spreading it around) and, of course, the mating edges of the parts. Then wait at least 24 hours after glue-up before you sand or plane the parts. Biscuits are compressed during manufacture, and water in the glue causes them to expand and push out on the material surrounding the slot. That creates a slight bump on the surface. If you sand or plane too soon, that bump becomes

Stop block does double duty. *It aligns the rail and stile with the cutter. And because the cutter's rotation forces them into the stop, it prevents them from shifting during the cut.*

Slot the stile. *Because of the table and the stop block, you need worry about only two things: holding the stile firmly against the joiner and pushing the cutter into the stile.*

Repeat for the rail. *The stop block hasn't moved, so just put down the rail and cut the slot. You'll need to flip the parts to do the joint at the opposite end of the rail, so you won't be referencing off the same face. But don't worry: The biscuits will still line up.*

Wrap a veneered tabletop with solid wood

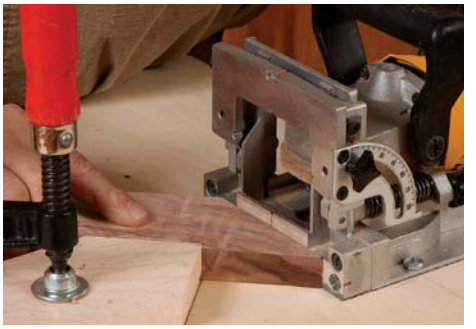
Tabletops made from veneered panels can be quite attractive. They also are more stable than a solid-wood panel and so, less likely to cup. But their edges are unattractive and prone to chipping. The best approach is to glue a broad, solid-wood frame around the panel, reinforcing the joints with biscuits.

START WITH THE MITER JOINT

Use a pointed stop block for this joint. Be sure the point forms a perfect 90° angle.

Locate the stop block. *Align the joint's centerline with the joiner and trace the part's edge on the table. Repeat for the second part.*

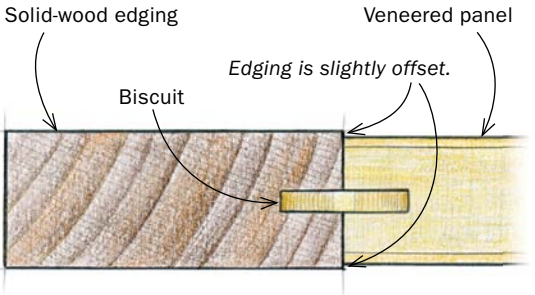
Clamp the stop in place. *Its point is at the intersection of the two lines, located so that the parts fit snugly between it and the joiner.*



Two jobs again. *The stop both aligns the parts and provides some resistance against the cutter. Still, hold the part firmly against it.*

SLOT THE EDGE-JOINTS NEXT

Continuous splines remove too much wood and weaken the joint. Biscuits are a better choice.



OFFSET THE FRAME, AND PLANE IT FLUSH

Tape under the panel centers it on the thicker edging. Plane the offset flush after assembly.

Cut slots for the frame's edge. *A fence clamped to the table keeps the workpiece firmly against the joiner, but lets you quickly slide it from one slot to the next.*

Raise the panel with a strip of tape. *This creates the offset between the frame and panel. Make sure to slot the panel with the face down. Lean into the panel to keep it against the joiner during the cut. A short support stand (bottom right) comes in handy.*

Join a side panel to a leg

Splines, dowels, and tenons are more hassle than they're worth here. A biscuit joint can be cut much more quickly and provides plenty of strength.

an indentation after the biscuit dries out and shrinks.

Lock it down

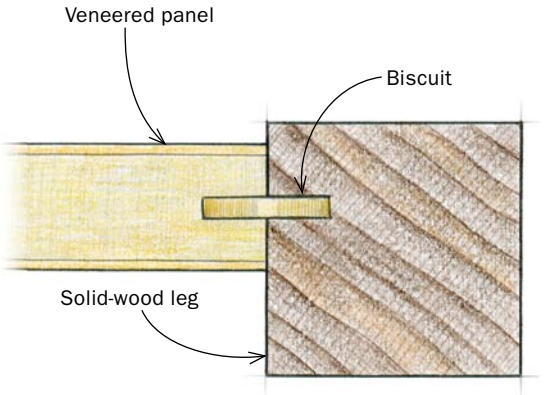
After a lot of frustration and sloppy joints, and just as I was ready to give up on the biscuit joiner for furniture, I decided to try something new. I designed a benchtop table and bolted my joiner to it (see p. 53). Attached to the table, it can't jump because of the cutter's rotation or lift off the workpiece. Now it lives on the table and I almost never need to take it off.

The table is nothing more than a plywood base attached to two sled feet. The feet have flats that allow me to clamp the table to my workbench, putting the biscuit joiner at a comfortable height. The joiner is bolted to one edge of the plywood, leaving a large open workspace where I can temporarily attach stop blocks and toggle clamps as needed.

The stop blocks (and an occasional fence) do two jobs. First, I set them up so that they align workpieces to the cutter. Second, when possible I locate them so that they help the workpiece resist the force of the cutter, and that makes for

SHIM THE JOINER

Panels are typically set back from the edge of a leg. To create that offset, put a shim under the joiner. The thickness of the shim determines the amount of offset.



Put a spacer under the joiner. *The spacer raises the cutter to offset the slots in the leg. Vary its thickness to vary the offset and remove it for slotting the panel.*

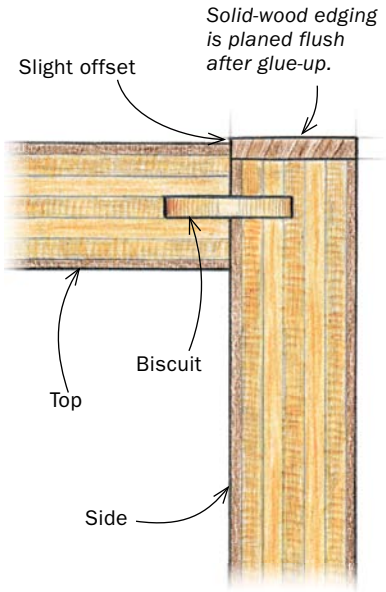
Hold the leg with a clamp. *Fortune's Da-Sta-Co-style plunge clamp lives on a square of plywood so that he can put it wherever it's needed on a variety of biscuiting setups.*

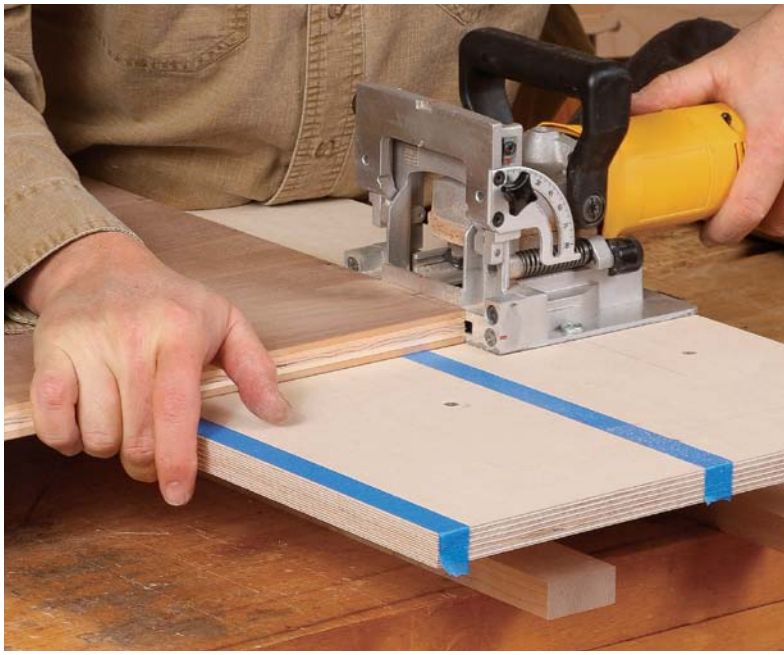
Perfect case joints every time

In theory it's no problem to join two case panels with biscuits, but in practice it can be difficult. Murphy's Law always seems to kick in and the top ends up proud of the side. Here's how to head off the problem.

CONTROL THE OFFSET

Adding tape to the table ensures that the panels align the way you want.

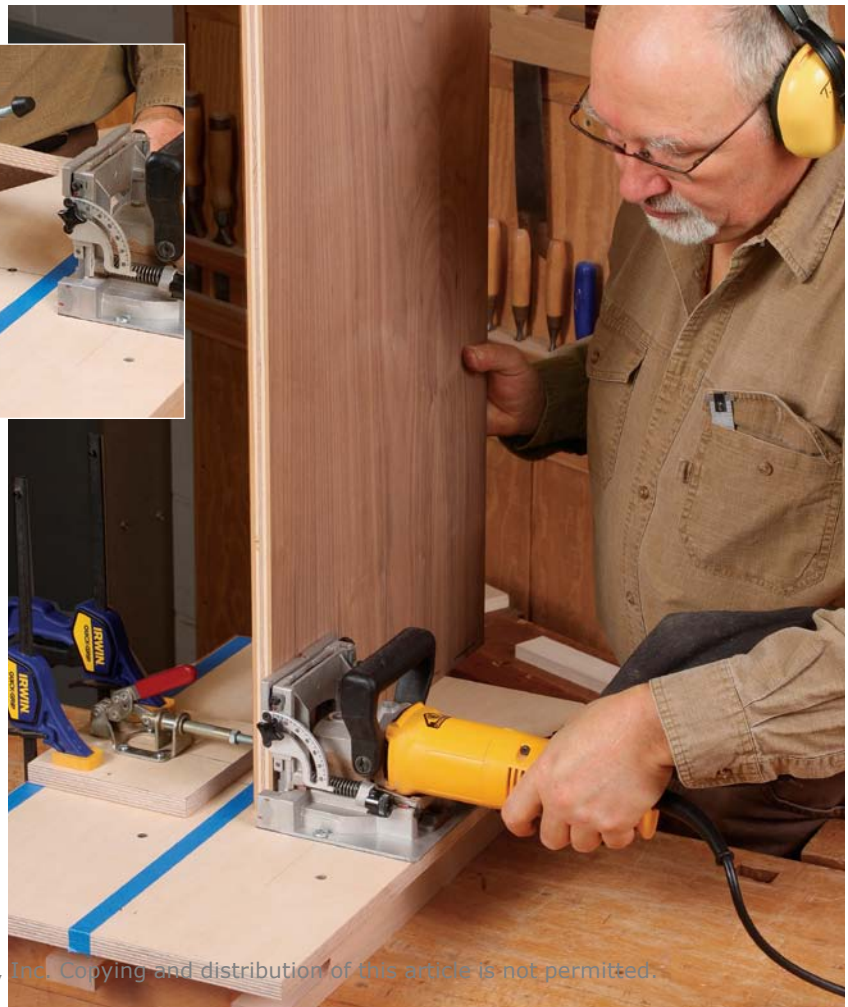




Tape creates an offset. *The top is raised slightly and, after assembly, it ends up just beneath the top end of the side.*

a cleaner and more accurate slot. As for the toggle clamps, I put them on their own bases, which are then clamped down, making my work much more efficient because it's quicker to clamp down a block and unclamp it when you're done using it than it is to screw down a clamp and unscrew it when you're done. Also, it keeps the table free of screw holes.

I glue 100-grit sandpaper to the faces of all of my stop blocks so they grip better. I also rabbet the bottom edge, because biscuit joiners eject dust from the front of the machine. Without the rabbet, dust builds up on the front of the stop block, pushing the workpiece out of alignment. □



Add a clamp for the side. *Attach it to a square of plywood that can be clamped to the table. That way, it's quicker to switch between using the clamp and not. Be sure the side isn't resting on the tape.*

Michael C. Fortune is a contributing editor.