Biscuit Joiners

BY ROLAND JOHNSON

A hands-on review of what's on the market





The year was 1956. Dwight Elsenhower was re-elected president; Don Larsen pitched a perfect game in the World Series; Elvis sang "Heartbreak Hotel." And in Switzerland, the first biscuit joiner was made by Lamello.

Lamello still makes biscuit joiners, also called plate joiners, but at least eight other manufacturers are cranking out biscuit joiners for sale in the United States. And woodworkers can now choose from more than a dozen models.

For anyone looking to buy a new biscuit joiner, that's a lot of options. In trying to sort them out, *Fine Woodworking* asked me to take a look at the most popular models. They included all of the commonly available corded versions: the Craftsman 277300 and 17501, DeWalt DW682, Freud JS100A and JS102, Jepson 7204, Lamello Classic C2 and Top 20, Makita 3901, Porter-Cable 557, Ryobi JM80 and Virutex AB11C.

How joiners work

A biscuit joiner is a relatively simple power tool. The motor spins a 4-in.-dia. cutter—a toothy disc that could easily be mistaken for a shrunken tablesaw blade.

Mounted to the front of the motor is a spring-loaded, sliding guide system made up of a base and a fence assembly. To cut a slot, simply butt the front face of the guide system against a workpiece, start the machine, then push the motor toward the workpiece. As the motor is pushed, the cutter slips through an opening in the front face of the base and into the workpiece, cutting an arc-shaped slot that accepts a biscuit. Once you stop pushing, the cutter moves back behind the face of the base.

As the spinning cutter slices into a workpiece, it wants to push the biscuit joiner in the opposite direction. So manufacturers have added a variety of devices to the front face of the guide system to keep the tool from sliding during the cut. They include metal points, rubber dots and abrasive- or rubber-covered faces. I don't see any one of these gripping systems being better than the others. Just different.

The depth of the slot is adjusted by a plunger that butts against a stepped, indexed turret. Repositioning the turret index quickly changes the travel of the cutter, providing effective control of the slot depth. To make the adjustments easier, each of the indexes corresponds to one of the standard biscuit sizes.

The Lamello Top 20 even has a means to micro-adjust the height of the slot. Simply turn a dial on the top of the tool, and the cutter can be raised or lowered in ¹/₁₀mm steps, up to 2mm. That's a nice feature to have when switching to veneered stock in the middle of a job. The dial lets you raise or lower the cutter to compensate for the thickness of the veneer.

Fences make good friends

The fence assembly positions the tool so that the cutter is square to the edges of the workpiece in both the vertical and horizontal planes. The main part on the assembly is the adjustable fence. To account for various joints and thicknesses of stock, the adjustable fence has two adjustments: vertical and angular. The vertical adjustment raises or lowers the fence, effectively changing the elevation of the slot on the workpiece. The angular adjustment changes the angle of the fence, which is useful when making mitered joints.

But the adjustable fence isn't the only option you have for cutting a slot. On all of these tools, the cutter is centered approximately 3% in. above the base of the guide system. That way, if you put both the workpiece and base on a flat surface, you can register the cut off the base and end up with a slot pretty much centered in the edge of 34-in.-thick stock. Don't worry if the slot isn't centered. The mating slot is going to align perfectly as long as you don't flip the parts at assembly time.

The skinny on adjustable fences—The

adjustable fences on biscuit joiners are not all the same. Several of them have a fence with a removable, perpendicular angle guide. On the Freud JS100A and Jepson, this guide can be reversed for cutting slots at a 45° angle. Removing the guide on the Freud JS102 and the two Lamello joiners exposes an adjustable-angle fence that has a protractor and locking device to help cut accurate, angled slots. Among this subgroup, the fence on the Freud JS100A and the Jepson are difficult to keep parallel to the cutter during adjustment.

On the Lamello fence assemblies, the removable guide can be attached to the base of the machine. Once mounted, the guide adds support when cutting a slot close to the edge of a workpiece.

The Makita combines a perpendicular angle guide with a rack-and-pinion height adjustment that attaches to an adjustableangle fence. The adjustable-angle fence includes a protractor—with detents at 0°, 45° and 90°—that simply locks in place with a lever. Its controls are easy to operate, and they hold the fence securely.

The DeWalt fence features a dual rackand-pinion mechanism that's designed to keep the adjustable fence parallel to the blade. As a result, it's easier to adjust the height and angle of the cut. The Craftsman 277300, made by DeWalt for Sears, has the same fence.

Porter-Cable has a fence that's similar to that on the DeWalt. The primary difference is the amount the adjustable fence can pivot. A second protractor allows the fence to pivot to a full 135° and makes it easier to cut a slot in a mitered workpiece. The thumbscrew-type height-adjuster is slow and a bit tedious.

The two Freud biscuit joiners could benefit from a better fence-locking system. On both models, the fence slips with only moderate downward pressure.

Parallel is a plus—Viewed from the front of the tool, the adjustable fence should be parallel to the cutter. If it isn't, the slot won't be parallel to the workpiece surface, creating problems when the parts are assembled. When you cut the matching slot in the mating workpiece, the slot is going to be out of parallel in the opposite direc-



CRAFTSMAN 277300 (800) 697-3277 It has the same easy-to-control rack-andpinion fence that's on the DeWalt DW682. And it has a paddle-style switch. DeWalt makes this biscuit joiner for Sears.



CRAFTSMAN 17501 (800) 697-3277 The handle is comfortable. It has a switch that's easy to use, but it can't be locked on. The fence is flimsy and challenging to lock parallel to the cutter. Wide teeth cut a wide slot, so biscuits fit a bit loosely.



DEWALT DW682

(800) 433 9-258

This joiner has an easy-to-control rack-andpinion fence. The trigger switch is a plus. Two cordless models (14.4 volts and 18 volts) are also available.



FREUD JS100A (800) 472-7307 It has good scores in the parallel test. But the small adjustable fence is hard to keep steady during a cut. And the fence slips under moderate downward pressure.



FREUD JS102

(800) 472-7307

It has decent numbers in the parallel test. The indent stop at 90° isn't quite square. The small adjustable fence is a challenge to keep steady during a cut, and it slips under moderate downward pressure.



JEPSON 7204

(800) 456-8665

When registering off the base, it has an excellent result in the parallel test. But when using the fence, results are poor. The small adjustable fence is difficult to keep steady during a cut. The fence slips when moderate downward pressure is applied.



LAMELLO CLASSIC C2 (800)252-6355

Has a near-perfect score in the parallel test. The motor slides smoothly. Its large fence is easy to position. Also, the base easily disassembles for cleaning and blade changes. But the tool is expensive.



LAMELLO TOP 20 (800) 252-6355 This is the author's favorite machine. It cuts slots that are perfectly parallel. The motor slides smoothly. A micro-adjust dial allows the cutter to be raised or lowered in ½0mm steps, up to 2mm. However, the price is above the clouds. tion, effectively doubling the problem. And the same headache arises if the base of the carriage isn't parallel to the cutter.

To find out how parallel the slots ended up, we checked each model with a dial indicator and a flat, steel disc (for more on the test, see p. 62). The two Lamellos were as close to dead-on as can be expected. Check the chart for the other results.

Biscuits should fit snugly—To get maximum glue strength from a biscuit joint, you want the biscuit to fit snugly in the slot. If it's too loose, the glue bond might suffer. But too tight a fit, and it becomes a fight to put the parts together.

The Craftsman 17501 and Ryobi JM80 joiners cut slots that are a bit wide, so the biscuits fit somewhat loose. The remaining joiners cut slots in which the biscuit fit without problems.

Switches should be easy to use

The switches on these tools fall into three general categories: trigger, slide or paddle.

There's no one switch style that's best. It's a matter of what feels good in your hands.

The Porter-Cable has a trigger switch at the bottom of the slightly angled barrel grip, placing the switch in a comfortable position. To lock on the switch, simply depress a button under your thumb.

The Lamello Top 20 has a similar trigger switch. It's located on the bottom of the barrel grip with a lock-on device built into the switch itself. The safety lock is easy to use and lessens the chance of accidentally starting the tool when it's lifted by the barrel grip.

The Dewalt has a nicely weighted trigger switch on the bottom of the barrel grip. The switch is a pleasure to use, but the lock-on button is at the end of the barrel, directly above the power cord. This location makes it awkward to lock the switch with one hand.

The Craftsman 17501 and Ryobi also have trigger switches, but neither has a lock-on device. A modified D-handle grip places the switch in an easy-to-use position.

BEYOND THE BASIC BISCUIT



The biscuit joiner can be used for more than just cutting slots for biscuits. By cutting the slot into the face of a workpiece, you get an instant mortise for a Duplex hinge. And you can get the hinges in solid brass, nickel-plated steel or burnished black.

Simplex connectors are marketed as knockdown hardware that can be installed quickly and easily. Just cut the slots, then use a two-part epoxy to glue the interlocking pieces of aluminum in place.

For applications where clamps can't be used, a serrated plastic biscuit can be used to keep two parts together. The serrations allow the workpieces to be pushed together but prevent the parts from pulling apart.

For more information about biscuit-joiner hardware, contact Colonial Saw (800-

252-6355).

SIMPLEX CONNECTORS

DUPLEX

HINGE

PLASTIC BISCUITS The Freud, Jepson, Lamello Classic C2, Makita and Virutex all have slide switches. The Lamello has a switch mounted on the left side of the barrel (as viewed when in the operating position) that locks on when it's pushed forward. Depressing the back of the switch unlocks it, allowing the switch to slide back and shut off the motor. Freud and Makita have similar switches in similar locations.

The switch on each of the two Freud models seems counterintuitive. It is pulled toward the operator to start the motor and pushed to shut it off. All of the other joiners use the reverse procedure.

If you're left-handed, you probably won't like the feel of the switches on the Freud, Lamello C2 and Makita tools. With your thumb on the right side of the motor, and the switch on the left side, it's a nuisance to turn the tool on and off.

Virutex has a switch mounted on the top of the barrel. A lockout button in the switch must be depressed before the switch can be pushed forward to start the machine. Jepson also has the switch mounted on top of the barrel. It locks in the on position when pushed forward and down. Pressing on the back of the switch releases the lock, and the spring-loaded switch returns to the off position.

Craftsman's 277300 is the only model with a paddle switch. It's located toward the bottom of the barrel grip, near the back end. The lock-on device is located at the end of the barrel just beneath the power cord. It's supposed to be a one-handed operation, but it's a chore to operate.

Slides should glide

Except for the Makita, all of the biscuit joiners have ways cast into the base of the guide wings. Matching tabs cast into (or attached to) the motor housing allow the housing to slide back and forth in the ways. The Lamello joiners have a similar arrangement, except the ways are machined into the base. The Makita has parallel rods mounted on the base that slide in machined housings mounted on the motor.



MAKITA 3901 (800) 462-5482 This machine has an excellent score in the parallel test. The rack-and-pinion fence is easy to adjust. But the fence on the model we tested slipped under moderate pressure until the fence-lock lever was repositioned.



PORTER-CABLE 557 (800) 368-1487 The tool scores well in the parallel test. It has a switch location that makes good sense. The fence pivots to 135°. A 2-in.dia. blade is included for cutting smaller (#FF) biscuits.



RYOBI JM80 (800) 525-2579 It has an excellent result in the parallel test when registering off the base but not when using the fence. The handle is comfortable. It has a switch that's easy to use, but it can't be locked on.



VIRUTEX AB11C (800) 868-9663 It has excellent results in the parallel test. The fence tends to flex under moderate downward pressure.

MINI-BISCUITS

Even the smallest of standard-sized biscuits can be too big. As an example, when joining narrow face frames or picture frames, #0 biscuits can break through the edges of the frames, exposing the ends of the biscuits.

> One answer can be found in the form of a diminutive biscuit joiner that cuts baby biscuits (left). A deadringer for the recently discontinued Ryobi DBJ50, the Craftsman 175500 cuts three sizes of minibiscuits: R1 (½ in. by % in.), R2 (½ in. by ¾ in.) and R3 (½ in. by 1 in.).

With a 3.5-amp motor, this joiner runs a 1¹/₂-in.-dia.

cutter at 19,000 rpm. A fence allows vertical adjustment and flips to provide a 45° surface for cutting miters. The 175500 is priced at \$79.99. For more information, contact Craftsman at (800) 697-3277.

In addition, Porter-Cable makes a #FF biscuit that's smaller than standard, measuring ½ in. by 1%s in. But before you can cut slots for a #FF biscuit, you first need to switch from the 4-in.-dia. cutter to a 2-in.-dia. cutter (right) that's a standard accessory for the Porter-Cable 557.

BISCUIT JOINERS BY THE NUMBERS



Testing for parallel. For the first test, the adjustable fence supports the joiner (left). The base of the joiner serves as the fence for the second test (right).

To check that the joiners cut slots parallel to the cutter, I ran a couple of tests. First I cut slots for a #20 biscuit with the adjustable fence supporting the joiner. After that, a flat steel testing disc was slipped into the slot. Then, with a dial indicator resting on the top of the workpiece, the elevation of each end of the slot was checked. The difference between the measurement represented the amount that the disc was out of parallel. As a second test, I cut a slot while using the base of the biscuit joiner as a fence. The results for both tests appear in the chart. -John White

Watch it on the web

Visit www.finewoodworking.com to see how the biscuit joiners were tested.



Checking the results, A dial indicator is used to see whether the slot is parallel to the face of the workpiece. A reading of 0.007 in. or less is considered good.

\$180 AVERAGE STREET PRICE AMPERAGE 6.5 ADJUSTABLE-ANGLE Yes FENCE **NO-LOAD NOISE LEVEL** 100 dB USING FENCE 0.007 in. AMOUNT SLOT IS OUT OF PARALLEL USING BASE 0.006 in. **CUTTING-DEPTH** 0. 10.

INDEXES ON TURRET

CRAFTSMAN 277300

20. M

Thanks to machined ways, the Lamello carriages enjoy silky smooth travel. The Makita carriage also slides smoothly. Plus it has lower spring pressure, making it easier on the muscles when making lots of cuts.

With one exception—the Craftsman 17501—all of the remaining tools have a sliding action that I'd consider acceptable. But the spring tension on the 17501 gets excessively high when the carriage reaches the end of its travel. Combine that with a handle that's located high on the motor housing, and it becomes a chore to make a full-depth cut for a big biscuit like a #20.

Setting slot depth is easy

As mentioned earlier, the depth of the slot is controlled by an adjustable plunger and a stepped, indexed turret. All of the turrets have positive stops at the different depths of cut. And all of them work well.

The settings O, 10 and 20 correspond to the biscuit sizes most often used. The M (or Max) setting is used to cut a slot for an even bigger #6 biscuit. Some biscuit joiners include additional settings, such as S and D (or A and B), that stand for Simplex and Duplex, respectively. These settings are used for knockdown hardware and specialty hinges. The Porter-Cable has an additional FF setting for its unique face-frame biscuit (see p. 61).

Dust collection is a healthy option

The two Lamellos and the Virutex have adapters that hook up to an auxiliary dust

collector or shop vacuum. The Craftsman 17501 has a screened dust box, but the dust port tends to clog. The ports on the DeWalt and the Craftsman 277300 have a small prong in the middle, presumably to prevent a user from sticking a finger into the port and accidentally making contact with the spinning cutter. But the prong tends to catch the shavings, which effectively plugs the dust port. The Ryobi JM80 also clogs easily because of a constricted exhaust port.

The biscuit joiners made by Porter-Cable, Makita and Freud have dust bags that are very effective. The two Freuds work especially well. The dust bag on the Jepson also does a good job collecting dust, but it gets in the way when using the base of the tool

CRAFTSMAN 17501	DEWALT DW682	FREUD JS100A	FREUD JS102	JEPSON 7204	LAMELLO Classic C2	LAMELLO TOP 20	MAKITA 3901	PORTER-CABLE 557	RYOBI JM80	VIRUTEX AB11C
\$100	\$169	\$99	\$125	\$136	\$321	\$629	\$159	\$202	\$100	\$265
6	6.5	5	5	6	6.4	6.2	5.6	7.5	6	6
Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
96 dB	103 dB	95 dB	95 dB	98 dB	96 dB	96 dB	96 dB	96 dB	96 dB	95 dB
0.017 in.	0.017 in.	0.003 in.	0.007 in.	0.014 in.	0.000 in.	0.000 in.	0.001 in.	0.005 in.	0.015 in.	0.000 in.
 0.007 in.	0.007 in.	0.004 in.	0.004 in.	0.001 in.	0.001 in.	0.000 in.	0.002 in.	0.001 in.	0.001 in.	0.003 in.
0, 10, 20	0, 10, 20, M	0, 10, 20, A, B, MAX,	0, 10, 20, A, B, MAX,	0, 10, 20	0, 10, 20, S, D, MAX	0, 10, 20, S, D, MAX	0,10, 20, S, D, MAX	0,10, 20, D, D, MAX, FF	0, 10, 20	0, 10, 20

to make a cut. The only solution, but not a good one, is to remove the bag.

Top choices

All things considered, and after poking, probing and "playing" with each of the tools, I'd say the Lamello Top 20 is my favorite. Top-quality construction, smooth operation and plenty of accuracy make this tool a pleasure to use. Plus, the turret has a wonderful action. And it has a trigger switch that should be the industry standard. Although the Top 20 is by far the most expensive of the bunch, it's built for the long haul. And as a full-time woodworker, that's an important plus for me.

But if the Lamello Top 20 looks to be a budget buster, I'd take a look at the Porter-

Cable 557 For about a third the price of the Top 20, you get a 7.5-amp machine with comfortable handles, a convenient switch and a 2-in. accessory cutter. It also gets good marks in the parallel test. Plus it's the only machine I looked at that has the auxiliary handle mounted to the guide system rather than to the motor. The auxiliary handle stays fixed during a cut, making it a bit easier to hold the fence to the workpiece.

The Makita 3901 is nice machine that generally sells for about 20% less than the Porter-Cable, making it a good choice for those of us who count their pennies. Initially, the fence slipped under only moderate downward pressure, but a repositioning of the locking lever quickly corrected the problem. It's not quite as comfortable in the hands, but I like the rack-and-pinion fence. And it scores well in the parallel test.

I also like the DeWalt DW682. The fence adjusts easily, and the on/off switch is simple to use. And I like the price. But I was disappointed it tied for the worst score on the parallel test when using the fence. I expected it to do better, mostly because the Craftsman 27730, which has the exact same fence, did reasonably well in the test. Although I can live with 0.017 in. out of parallel, biscuit joints assemble with less fuss when the number is 0.007 in. or lower.

Roland Johnson builds furniture in Sauk Rapids, Minn. Contributing Editor John White tested the joiners for noise and parallel in the FWW shop.