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TOOL TEST:

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# PLATE JOINERS

**E**arly in my carpentry career, I pried off an old door casing and found thin, football-shaped splines inside the miters. The house was built in the 1920s, but the

by David Frane

miters were still tight and flush. Years went by before I saw anything like it again. I was on a kitchen remodel job where the cabinetmaker used similar splines, which he called biscuits, to site-assemble an oversize pantry unit. He put glue and biscuits into a series of slots in the cabinet parts, and had the whole thing clamped together in no time. I asked the cabinetmaker what he used to make the slots, and he showed me a tool that looked like an angle grinder attached to a hollow aluminum base. Hidden inside was a 4-inch carbide-tipped blade that poked out the front when the tool was pushed against the stock.

Plate joinery was invented in the mid-1950s when a Swiss cabinetmaker named Herman Steiner developed the Lamello wood joining system. He used a stationary machine to cut slots to house elliptical wooden splines. Steiner's innovation was the manufacture of strong, tight-fitting splines. He made these by running the grain diag-

onally across the biscuits so they wouldn't break along the joint line. He also compressed the biscuits, so that the moisture in wood glue would make them swell and fit even tighter in the slot. In the late '60s, Steiner Lamello introduced hand-held plate joiners. By the late '80s you could get a plate joiner for less than \$200, which is around the time I started seeing

were designed by architects who put stringent quality standards in the specifications. On most jobs we were required to spline the miter joints on window and door casings. I've cut slots with a router and three-wing cutter, but can do it faster with a plate joiner. Biscuits also make it easier to get miters flush, especially with wide casings.

*Jamb extensions.* Every now and

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For trim joints that  
stay tight and flush,  
consider using biscuits

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them show up on job sites. These days, tool companies are concentrating more on adding features and less on cutting price.

## Job-Site Applications

I bought my first plate joiner while working for a company that did high-end finish work. Many of our projects

then, finish carpenters have to make their own jamb extensions. Maybe a straight door is going into a curved wall or you need extra-deep extensions to house structural posts between ganged windows. If you attach the extensions with biscuits, you can create consistent reveals while avoiding a lot of shimming.



## DeWalt DW682

An easy-to-read height scale and rack-and-pinion mechanism make it easy to adjust the fence on this tool. I particularly like the squeeze-action switch, good visibility through the fence, and overall compactness. It comes with a pair of detachable exhaust fittings: one fits a bag or vacuum hose, the other pivots to direct dust away from the user. The motor housing has spring-loaded metal dogs to keep it from slipping sideways when you cut. They can be retracted into the housing to avoid scratching delicate surfaces. The only negative thing I can say about this tool is that its rack-and-pinion mechanism is not as sensitive as the jackscrew mechanism used by another manufacturer.

## DeWalt DW932

This is the world's first cordless plate joiner. The one I tested was a preproduction model of an 18-volt tool, which along with a 14.4-volt model will be introduced in the summer of 2000. Everything forward of the motor is identical to DeWalt's corded model. With its 18-volt battery, it's longer and heavier than other plate joiners, and is noticeably tail-heavy. That said, it worked just as well as a corded model. Although I had nothing to compare it to, it seemed to have good run-time. It made over 160 slots in mahogany plywood on a single charge. Call me old-fashioned, but I'm not convinced the world really needs cordless plate joiners. What's next, cordless tablesaws?

## Plate Joiners Spec Table

Manufacturer	DeWalt	DeWalt	Freud	Freud	Lamello	Lamello	Makita	Porter-Cable	Ryobi	Virutex
Model	DW682	DW932	JS102	JS100A	Classic/C2	Top 20	3901	557	JM80	AB-11C
Street price	\$160	\$269	\$125	\$99	\$369	\$639	\$160	\$199	\$95	\$265
Weight	6.6 lbs	8.4 lbs	6.8 lbs	6.8 lbs	6.8 lbs	7.3 lbs	6.2 lbs	7.5 lbs	6.5 lbs	7 lbs
Cord length	8'	cordless	approx. 8'	approx. 8'	approx. 8'	approx. 8'	approx. 8'	approx. 8'	approx. 8'	approx. 8'
Motor amp rating	6.5	n/a	5	5	6.4	6.2	5.6	7.5	6	6
Fence type	single piece	single piece	removable	removable	removable	removable	removable	single piece	single piece	single piece
Fence height mechanism	rack and pinion	rack and pinion	manual slide	manual slide	manual slide	manual slide	rack and pinion	jackscrew	manual slide	manual slide
Readability of height scale	better than average	better than average	better than average	better than average	much better than average	much better than average	average	average	below average	below average
Bevel angles	0-90	0-90	0-90+	0, 45, 90	0-90+	0-90+	0-90+	0-90+	0-90	0-90
Bevel scale stops and detents	stops at 0 and 90	stops at 0 and 90	detents at 0, 45, and 90	n/a	stops at 0 and 90; detents at 22.5, 45, 67.5	stops at 0 and 90; detents at 22.5, 45, 67.5	detents at 0, 45, and 90	stops at 0 and 90	detents at 0, 45, and 90	stops at 0 and 90
Antislip pads	retractable metal pins	retractable metal pins	rubber	rubber	rubber	rubber	rubber	abrasive grit	foam	rubber
Depth	0, 10, 20, M	0, 10, 20, M	0, 10, 20, A, B, Max	0, 10, 20, A, B, Max	0, 10, 20, S, D, Max	0, 10, 20, S, D, Max	0, 10, 20, Max, S	0, 10, 20, Max, FF, D, S	0, 10, 20	0, 10, 20,
Exhaust port	adjustable	adjustable	fixed	fixed	fixed	fixed	adjustable	adjustable	fixed	fixed
Dustbag	yes	yes	yes	yes	no	no	yes	yes	yes	no
Vac connection	yes	yes	yes	yes	need adapter	need adapter	yes	yes	yes	need adapter
Tool case	sturdy; extremely compact	not available at time of test	cheap plastic, hard to close	cheap plastic, hard to close	sturdy; easy to load	solid wood	sturdy; extremely compact	sturdy, moderately compact	two-piece; awkward to load and unload	moderately sturdy



## Freud JS100A

The JS100A is a no-frills machine that can do almost everything that other plate joiners do. The one thing it can't do is slot bevels at angles other than 0, 45, or 90 degrees. Even so, it's a fine tool for the vast majority of job-site tasks. The height scale is difficult to read because it references off the bottom of the fence and, unlike other tools, it indicates the distance to the edge rather than the center of the kerf. The fit and finish are not up to the standards of some of the more expensive machines, but this is a cosmetic, not a functional problem. It's not the best plate joiner on the market, but it's the best \$99 plate joiner money can buy.



## Freud JS102

This is an upgraded version of the earlier JS100A. It has the same gears, motor, switch, and depth stop. What's different is the fence mechanism, which adjusts to any bevel between 0 and 90 degrees. The height scale, which references off the top of the fence, is finely graduated and easy to read. Bevel detents are set at 0, 45, and 90 degrees. Although the switch is on the left side of the housing, it's easy to activate with either hand. This tool may lack some of the bells and whistles of more expensive machines, but it can do what you need it to out on site. My biggest complaint is that this tool comes in a cheap plastic case that's hard to close without jamming it on the cord.



Using a spacer on half the cuts is a handy way to offset joints without resetting the fence.

**Stools and sill extensions.** A window stool can lie on top of the jamb of a double-hung window, but it has to butt to the jamb of a casement or awning window, so that it doesn't interfere with the crank. You could space it off the sill with shims, but it's a lot easier to keep the pieces aligned if you join them with glue and biscuits.

I've also used biscuits to extend windowsills and door thresholds and to build boxed newels and balcony posts. They're good for the same applications as dados and rabbets.

**Site-built cabinets.** Most contractors don't build cabinets, because it's nearly always cheaper to buy them from a manufacturer or local shop. That said, there are plenty of carpenters who occasionally build cabinets. Some guys do it when they need a few simple built-in bookcases or utility units. Other guys do it when their usual supplier can't deliver in time to meet the schedule.

A plate joiner makes it easier to build cabinets, by allowing you to use butt joints, normally the weakest joint around. Biscuit joints aren't just stronger than butts; they're as strong as any joint you can make in plywood, melamine, or MDF. I know from experience that if you put a cabinet together with biscuits, you can't get it apart without destroying the pieces. Biscuits are ideal for making joints with no visible fasteners.

## Fence Mechanisms

A plate joiner is similar to a table saw in that the distance between the fence and blade determines where the cut will be. If you use a plate joiner for standing and running trim, virtually every cut will be indexed off the fence. Usually, you set the fence so the biscuit is more or less centered in the edge of the stock. But it doesn't really matter where you make the slots, as long as the ones on



## Lamello Top 20

If plate joiners were cars, this would be a Rolls Royce. It has easy-to-read scales, a trigger-action switch, and detents on the bevel gauge. The step memory system, which is controlled by a dial on the gear housing, allows you to move the blade up or down in relation to the fence in preset increments of 0.1 mm. My Construction Master freaked out when I tried to convert this to inches, but I've since determined that it's about 1/240 of an inch. The system allows you to make incredibly fine adjustments to blade height and to accurately recapture previous height settings. My only complaint is that visibility is poor because the fence openings are small. It's a fantastic machine, but at \$640, it's more plate joiner than most carpenters can afford.



## Lamello Classic C2

The moment I pulled this tool out of the box I could tell it was a superior piece of equipment. There is absolutely no play in the slide mechanism, and the depth setting and bevel mechanisms click cleanly between preset detents. This tool has many of the features of the Top 20, but lacks the step memory system, center-mounted trigger switch, and calibrated bevel scale. It's a great tool for a cabinetmaker, but like the other Lamello machine, is more tool than most finish carpenters can afford.



Scales are easier to read when the pointer is right up against the graduations.

adjoining pieces are the same distance in from the face of the material. If the distance varies even the slightest bit from one piece to another, the joint won't be flush when you pull it together.

On the job site, almost all of your cuts will be square to the face or edge of the stock. But if you want to join mitered edges, you'll need to set the fence to 45 degrees, or whatever angle it is you're joining. Plate joiners with fences that pivot between 0 and 90 degrees index off the inside face of the beveled piece. But if you own one of the models that tilts beyond 90 degrees, you can index off the outer face of the stock. This allows you to join extra-thick material or pieces of unequal thickness, but is of no advantage to most carpenters.

One type of fence looks like a reinforced angle bracket that slides up and down the face of the machine. It's held in position by a lock lever, but is removed from the tool for the 0-degree





## Makita 3901

This tool has nearly every feature you could ask for on a plate joiner: directional exhaust, rack-and-pinion height adjustment, and detents on the bevel gauge. Makita made it particularly easy to change blades, so you can install an auxiliary blade and use the tool to scribe cut jambs and wall trim. But the switch is small and mounted on the left side of the motor housing. I'd prefer one that had smoother action and was mounted on top. Small openings in the fence make for poor visibility, and the rack-and-pinion mechanism is not nearly as sensitive as similar mechanisms on other machines.



## Porter-Cable 557

This tool has a better fence than most other plate joiners. The most visible feature is a bevel mechanism that allows you to slot any angle between 0 and 135 degrees. But what I like is the height-adjusting feature, which uses a jackscrew mechanism to raise and lower the fence. There's some slop in the threads, but with a little bit of finesse, you can use it to make very fine adjustments to the fence. It has good visibility, a multi-directional exhaust port, and a trigger-style switch. My only complaints are that the height scale is hard to read with any accuracy, and the tool is not as compact as other machines.

cuts used to join fixed shelves to the sides of cabinets. The fence has only so much throw, so it has to come off if you want to cut slots in the middle of a big piece of material. Instead of indexing off the edge of the material, you butt the bottom of the blade housing to a straightedge clamped across the workpiece.

A second kind of fence folds up into the face of the machine for 0-degree cuts and swings perpendicular for 90-degree cuts. A lock knob will hold the fence up, down, or at any angle in between.

**Scales.** The surest way to make biscuited joints come out flush is to cut all the slots without changing the position of the fence. But if you forget a couple of slots or have to remake a damaged piece, you'll need to bring the fence back to the original setting.

**Height settings.** Height scales indicate the distance between the fence and centerline of the kerf. In theory, they

should make it easy to set the fence, but most of them look better than they work. Usually, it's because the pointer isn't close enough to the scale, so the reading varies with your angle of view. Or the tick marks are so wide that using them is like cutting to an overly fat pencil line. In most cases, a scale can help you get close, but you'll still need to do test cuts.

How close is close enough depends on the work. If you're building simple cabinets or joining pieces at a reveal,  $\frac{1}{32}$  inch is probably close enough. But you'll need to do better than that if you're trying to make flush joints, especially with prefinished trim or veneer plywood. In cases like these, use the scale to get close, and be ready to make some test cuts.

**Bevel settings.** Bevel scales are not as critical as height scales, because as a carpenter, most of your cuts will be at 90 degrees. That's good, because bevel scales



The Lamello Top 20 step memory system adjusts the blade to the fence in increments of  $\frac{1}{240}$  inch.



### Ryobi JM80

This is an example of what happens when a manufacturer tries to put the maximum number of features on a tool that sells for the minimum number of dollars. Though not ideal, the vertical motor configuration and the stamped-steel fence didn't seem to affect performance. But the blade housing is made from plastic, which makes me uneasy about its durability. There's also a lot of play in the slide mechanism, so you may not get perfectly flush joints.



### Virutex AB-11C

If you set the fence on this tool to 90 degrees and slide it to the lowest setting, it bottoms out  $\frac{3}{8}$  inch from the center of the blade. This is extremely handy when you're building case-work, because it automatically centers the cut in  $\frac{3}{4}$ -inch stock. The switch is mounted on top of the motor housing, and is easy to activate in spite of the safety button. Large openings in the fence give it the best visibility of any tool I tested. It's a simple, well-made machine. My only complaint about this plate joiner is that it's relatively expensive for a tool with so few added features.



Porter-Cable uses a jackscrew mechanism to fine-adjust fence height.

are rarely any easier to use than height scales. The only exceptions are the tools with detents at common angles like 90, 45, 22.5, and 0 degrees. I like this feature, because when the fence clicks into the stop, I know it's in the exact position as the last time I had it there. It's too bad no one has figured out how to put detents on the height scale, because that's a feature a lot of carpenters could use.

**Fine adjustment.** On most plate joiners, height is adjusted by releasing the lock mechanism and sliding the fence up and down the face of the tool by hand. With this setup, fine adjustments take some finesse. However, a few plate joiners have rack-and-pinion or jackscrew mechanisms that make it easier to move the fence tiny fractions of an inch.

**Visibility.** Before you slot for biscuits, you have to put layout lines on the stock. Each layout line spans the joint and indicates the centerline of the slot you plan to cut. At the beginning of

each cut, you align the center mark on the fence or housing of the plate joiner with the layout mark below. There's side-to-side slop in the joint, so it's okay if your cut is slightly off the mark. One difference between various machines is how easy it is to see your layout marks. I prefer models with large openings through the fence, because they allow me to see layout lines in low-light conditions and from a variety of angles.

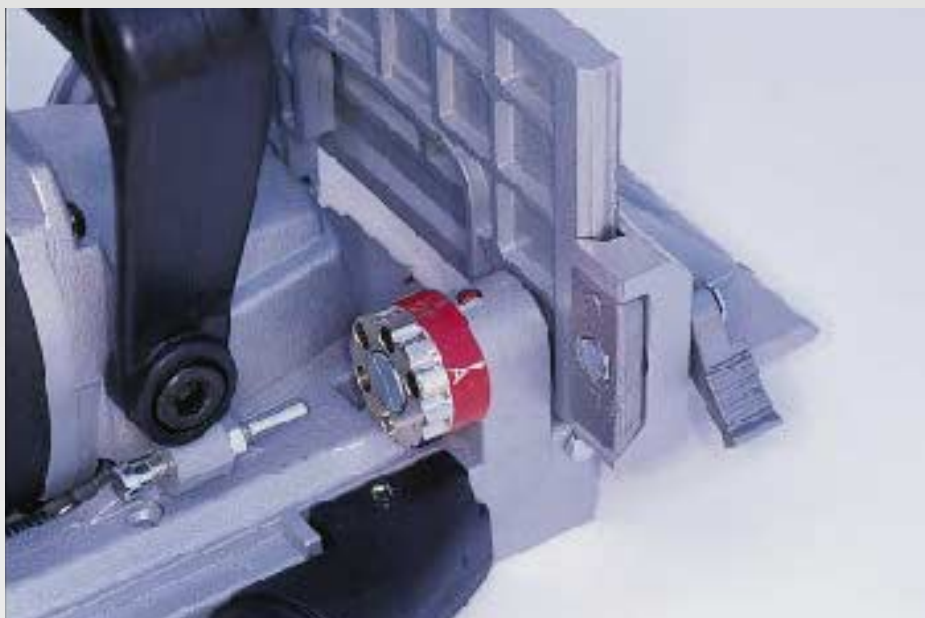
### Depth of Cut

When you push a plate joiner against a workpiece, the base assembly retracts and a 4-inch blade cuts a  $\frac{5}{32}$ -inch kerf in the material. The deeper the blade goes into the stock, the longer the kerf will be. Depth of cut is controlled by an adjustable stop that can be set to match the dimensions of the biscuit you plan to use. The slot will be slightly longer than the biscuit, which makes joints easier to assemble because there's room for side-to-side adjustment.

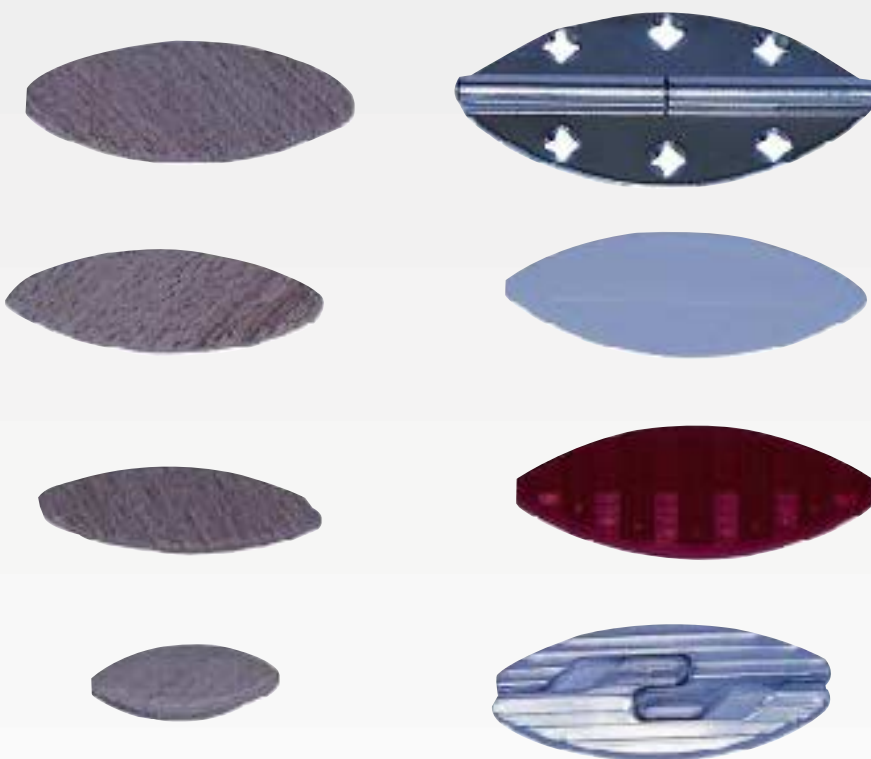
**Biscuits.** Standard biscuits are  $\frac{5}{32}$  inch thick and come in a variety of sizes. The most valuable size for job-site use is the number 20 biscuit, which is about  $2\frac{1}{4}$  inches long and  $\frac{7}{8}$  inch across at the widest point. Smaller sizes, like number 10 and 0 biscuits are used for thinner, narrower stock. Every plate joiner will cut slots for 0, 10, and 20 biscuits. Many have additional depth settings for specialty hardware like Duplex hinges, Simplex knockdown fittings, and exceptionally large or small biscuits. Some plate joiners have a setting called "Max," which is the maximum extension of a 4-inch blade. But if you're a carpenter, you'll mostly use 10s and 20s.

**Antislip pads.** To keep plate joiners from slipping sideways during cuts, manufacturers put antislip devices on the front of the blade housing. Usually, they're a pair of rubber pads, though some tools rely on metal pins or an abrasive facing material. They all seem to work, but I think the rubber pads do a better job on slippery material like melamine.

It's a plus if the pads are easy to remove or retract, because in a pinch, you can slide a plate joiner sideways to



Choosing between preset depth settings is a matter of rotating a knob, as on the Freud JS102.



In addition to four sizes of biscuits, various fittings can be installed with a plate joiner. Left column, top to bottom: #20, #10, 0, and FF biscuits. Right column, top to bottom: Duplex hinges, clear biscuit for joining solid-surface material, K20 adhesive plate (used without glue), and Simplex knockdown fitting.



make long continuous cuts. I once saw a carpenter use this method to slit the lower edge of an exterior sill that was accidentally installed without a drip slot. If he hadn't figured out how to make the cut in place, we'd have spent hours removing and reinstalling siding that was installed over the piece. A couple of manufacturers actually suggest using their plate joiners to scribe cut panels to floors and ceilings.

## Ergonomics

Weight and balance are not big issues with plate joiners. That's because they're all pretty light, and not the sort of tool you use one-handed or when you're hanging off a ladder. Plate joiners have front handles that you're supposed to grip when you make a cut. But most carpenters grab the tool with one hand and use the other to press the fence directly onto the stock.

**Switches.** Most plate joiners are activated by switches you slide back and forth with your thumb. Some manufacturers put it on top of the motor housing, others put it on the left. I prefer the center location because it makes it easier to operate the tool with either hand. A few models have undermount switches that you squeeze to activate and release to deactivate. I prefer these trigger-style switches because they're as easy to use as the switch on a recip saw or drill. If need be, you can use an auxiliary button to lock them on.

**Dust collection.** Plate joiners produce a lot of dust, so most tools come with collection bags, and all can be hooked up to a shop vac. Personally, I'm not a big fan of bags or hoses because they always seem to get in the way. My other tools already make dust, so collecting what comes out of the plate joiner is not going to make my work area a lot cleaner. That said, I did try these tools with and without dust collection. The collection bags worked surprisingly well, though the exhaust ports did tend to clog when I slotted solid wood, which, unlike sheet goods, produces shavings rather than chips.

Most plate joiners eject chips from the right side of the blade housing. So if you

use the tool lefthanded, chips end up in your nail pouch or face. A few plate joiners come with pivoting exhaust ports that allow you to direct the chips wherever you want. It's worth going out of your way to get this feature if you don't plan to use a vacuum or bag.

**Cases.** I don't mind throwing some tools in a bucket or stacking them on top of each other in the back of my truck. But you can't do this with a precision machine like a plate joiner, which is why they all come in cases. To me, a case is an important accessory. It should be durable and easy to get the tool in and out of. I prefer a case that's compact, because it's easier to pack in my truck or job box.

## Favorites

All the plate joiners I tested did a fine job of cutting slots for biscuits. If you're going to buy one, you need to decide which features you've got to have and how much you're willing to pay for them.

If quality is your number one criterion, look no further than Lamello. You could examine their machines blindfolded and still be able to tell that they're superior pieces of equipment. Unfortunately, they're mighty pricey for job-site use. Most finish carpenters can't justify spending the same amount for a plate joiner as they'd spend to get a sliding compound miter saw.

If I was in the market for a plate joiner and could afford to spend \$200, I'd be looking at DeWalt and Porter-Cable. Both tools have the main features I want — center-mounted "trigger" switches, fences with fine-adjustment mechanisms, good visibility, and directional exhaust.

If you're on a tighter budget, take a look at either one of Freud's machines. They don't have the features of a DeWalt or Porter-Cable, and they're not as well made as Lamello. But for \$99 to \$125, you'll get a reasonably well-made machine that can do almost anything you'd need to do on a job site.



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## Plate Joiner Manufacturers

### DeWalt Industrial Tool

626 Hanover Pike  
Hampstead, MD 21074  
800/433-9258  
[www.dewalt.com](http://www.dewalt.com)

### Freud U.S.A.

P.O. Box 7187  
High Point, NC 27264  
800/472-7307

### Lamello/Colonial Saw

122 Pembroke St.  
P.O. Box A  
Kingston, MA 02364  
800/252-6355  
[www.lamello.com](http://www.lamello.com)

### Makita U.S.A.

14930 Northam St.  
La Mirada, CA 90638  
800/462-5482  
[www.makitatools.com](http://www.makitatools.com)

### Porter-Cable

4825 Hwy. 45 N.  
Jackson, TN 38302  
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[www.porter-cable.com](http://www.porter-cable.com)

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