Popular Woodworking

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EDITORS PICK THE 97 BEST!

October 2001 #124

TOOL BUYING GUIDE 2002

Straight Talk on Tools

The **only** guide that recommends **tools worth buying**

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Popular Woodworking
TOOL BUYING GUIDE 2002

FROM THE EDITOR

Buy With Confidence

Save money and find your comfort zone.

Admit it. Spending money on tools and machinery for your shop can produce lots of anxiety. Your budget is limited, and so is your knowledge of all the product lines. Go to the store, buy on-line or over the phone and the salespeople aren't giving you any confidence that you're making the right decision, either. If you're lucky, you may have a friend who owns a tool you're interested in, but it's several years old and there are lots of new models to consider now.

We publish this comprehensive Tool Buying Guide for only one reason. That is to give you the best chance you have to make the right decision the first time when selecting a new piece of equipment for your shop. Our goal is to arm you with more than enough knowledge to put you in the comfort zone when you open your wallet.

On the following pages you'll find 17 categories of woodworking tools as well an important article about what's going on in manufacturing these days. In specific tool categories, ranging from table saws to combination squares, we give you three important pieces of information:

- We tell you what are the important features to evaluate and compare among all the tools in this category (as well as those features that don't count for much at all).
- We list all the brands and models available in the U.S. market with their specs and street prices.
- And we go the extra mile and make specific recommendations about the models we have actually used in the *Popular Woodworking* shop and have confidence in.

We also know that all woodworkers are not alike. Some of you are just getting started, others have years of experience but keep a casual attitude about your hobby. Others are passionate about spending time in their shops almost every day, or are pros depending on their skills and tools to make a living and support a family. Clearly, different woodworkers make different demands on their tools and have different expectations about reliability and how much to spend.

For these reasons, we make our buying recommendations in three user categories so you can match yourself to the right tools.

In this year's Guide we added the most essential non-powered woodworking hand tools as a category: low-angle block planes, combination squares and chisels. For space considerations, we dropped scroll saws and lathes for this year. In the cordless drill category, we focused on 12-volt models only. In our opinion, this is the right sized cordless drill for most, but certainly not all, woodworking shop applications. These 12-volt drills deliver the power and runtime to get the job done without the weight that makes you feel like you just did 100 arm curls.

And if you fret over the question of advertiser influence on editorial recommendations, don't. Our job is to serve you, our readers. Not only is it our job, but truthfully, your subscription or newsstand purchase goes a lot further in paying our bills than does advertising income.We just couldn't afford putting anyone other than you first.

One final note, many thanks to the Edward B. Mueller Company in Cincinnati, Ohio, for allowing us to shoot photos in their store.

PW

Steve Shanesy

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Woodworking tool manufacturing is

CHINA BOUND

Now that Taiwanese woodworking tools are accepted by U.S. woodworkers, manufacturing is moving again. This time, to mainland China. What will this mean for American consumers?

If you're not in the habit of checking labels on your new tools and machinery purchases, you might be surprised to learn that "Made in China" is showing up a lot more frequently these days. Don't make the mistake and think this means the product was made in the Republic of Taiwan, the island country off the coast of mainland China.

With increasing frequency, products once made in Taiwan are now being manufactured in China. What can we expect from such a shift? Will quality suffer? What about prices? Just who is having woodworking equipment made in China now? And why would manufacturers make such a huge change just when their products have finally won broad acceptance with U.S. woodworkers?

Importers and manufacturers of Taiwan-made woodworking equipment have worked hard during the past 15 years for respect in the marketplace. Whether the bad rap "Made in Taiwan" was deserved in the early days is not only debatable but, like most issues, a lot more complicated than consumers imagine.

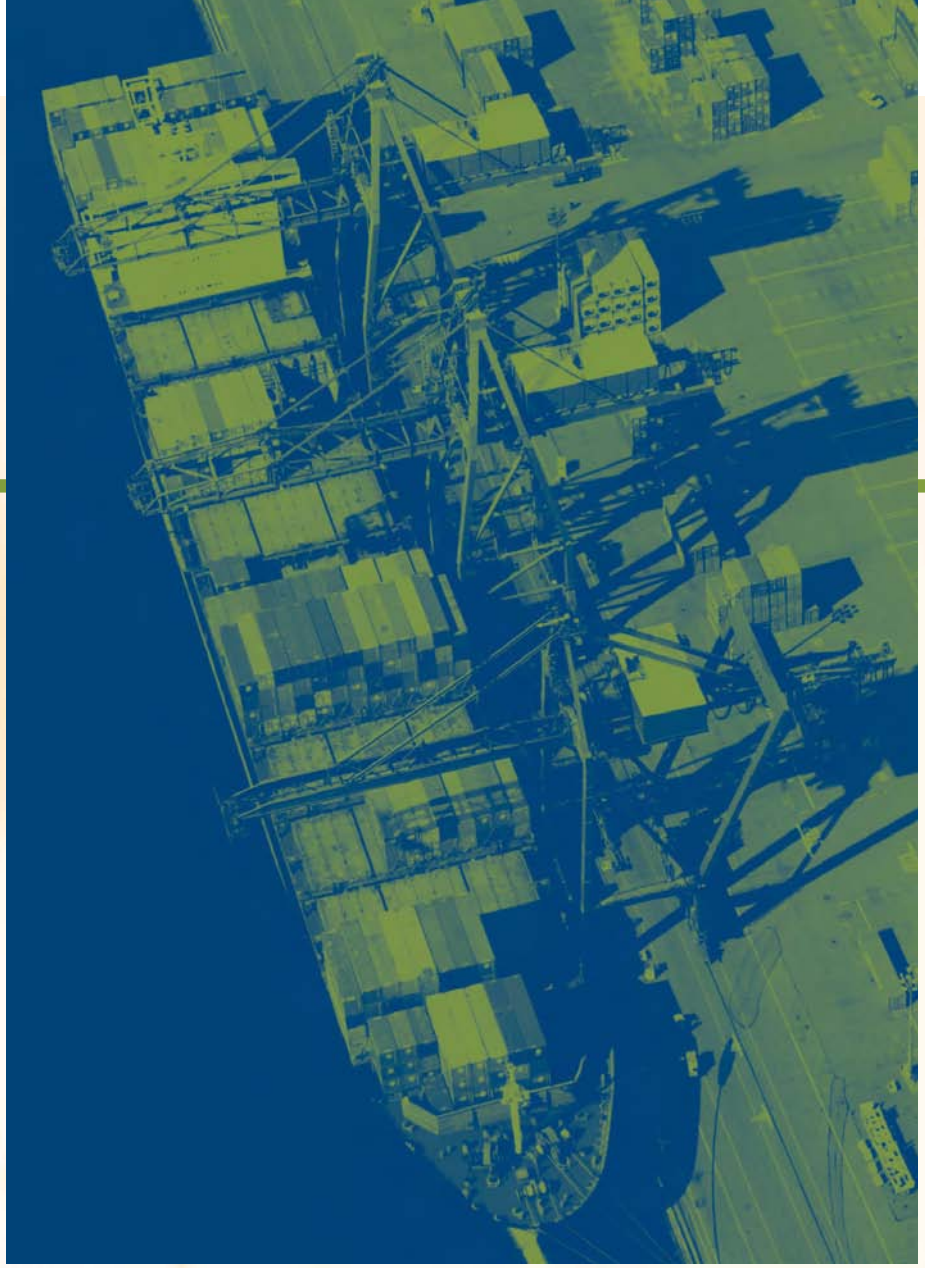
From the first days that Taiwanese equipment began arriving in our ports, there were real quality differences among the various importers. Quality differences still exist and can vary on what may seem to be the same product coming from the same manufacturing plant. But it's fair to say now that overseas manufacturers are producing millions and millions of dollars in good-quality woodworking equipment. Some of it's made by companies that import their entire line from Taiwan; some of it's made for venerable names who once built exclusively in the United States and now import some products. Either way, the American woodworker is reaping a huge benefit from these imported tools.

As woodworkers, we groan regularly at constant price increases for lumber. But when it comes to tools and equipment, particularly machines from Taiwan, we don't stop to think what a bargain they are. A case in point: I bought my first table saw, a Delta/Rockwell model 10 contractor saw, in 1981. I added long guide bars for the fence and casters and paid just over $850. What's that saw cost today? Equipped with a Biesemeyer fence, just over $850. Essentially, it's the same saw with a far superior fence.

Just for fun, I went to a web site that allows you to calculate the cost my table saw in 1981 and then adjust it for 20 years of inflation. Today, my $850 saw should cost $1,833.

by Steve Shanesy

Contact Steve at 513-531-2690 ext. 238 or SteveS@FWPubs.com.



Remembering back to that day in 1981 when I bought the saw, I recall that although the price didn't seem too expensive then, today's prices by comparison are quite reasonable. In fact, some prices are almost unbelievable. You can buy a Taiwanese contractor table saw from Grizzly Industrial with many of the same features as my original Delta/Rockwell for only $325 plus $48 shipping.

When you think about the cost of a reasonably equipped home shop, the prices are even more amazing. If you had bought a contractor saw, 6" jointer, small planer, drill press and 14" band saw in 1980, you would have paid about $3,200 — that's about $6,100 in inflation-adjusted 2001 dollars. Open up any woodworking catalog today and you can buy the same equipment and spend as little as $1,400 and as much as $2,600, depending on brand. At $6,100 for stationary equipment alone, I'm certain the number of home woodworkers would be a fraction of what today is one of top-rated hobbies in the United States among mature adult males.

Are Lower Prices Ahead?

According to some major manufacturers and importers, the great news for woodworkers is that prices might drop even more during the next several years. Some, such as Jet Tools' John Otto, woodworking product manager, project prices to drop some

In 1997, the author visited the Rexon factory in Taichung, Taiwan, and saw various products from different manufacturers rolling off assembly lines. **Miter saws** are just one example of high volume products that are making the switch from Taiwan to mainland China, as Delta Manufacturing has done for some of its miter saw products.

and then bounce back to today's level and then hold steady for another 15 years. The contrary view, and one held by Scott Box, manager of product development for Delta Machinery, is that prices will hold steady. All this good price news is being made possible by yet another shift in tool manufacturing. Many Taiwanese manufacturers are moving to mainland China, where labor costs are about one-tenth of those in Taiwan, land is plentiful and cheap, environmental standards are lower and safety standards are relaxed.

In manufacturing, it's not a new trend. In the 1950s, some tool manufacturing left the United States for Japan. By 1980, manufacturers were on the move again to Taiwan. Several years ago, the move across the Straits of Taiwan began, and now everything from shoes to tennis rackets to some woodworking machinery is now being produced in China. Not that you would notice, but about 90 percent of all drill presses are made in mainland China today. Principal importers in the U.S. market are Delta, Ridgid and Craftsman.

The question woodworking consumers must ask is: Will there be a price to pay for the low prices? Will some of the quality issues that arose with some importers after the move to Taiwan repeat as manufacturing shifts to China? The complaints about Taiwanese-made equipment largely stemmed from importers who were inexperienced in working with Taiwanese manufacturing, according to industry insiders. In the United States, the typical manufacturing facility makes many of the parts for its products, buys some basic or specialty parts and then assembles the product. In Taiwan "manufacturers" are primarily assembly plants with virtually every part and component sourced from outside vendors. For example, to make a benchtop table saw, completely separate companies cast the aluminum top, mill the top, form the plastic base, supply the motor, supply the motor mount and blade tilt mechanism, supply the

Taiwanese workers assemble Delta **benchtop planers** at one of its partner factories, Shin Hou, in Taichung. At the same plant, parts for automobile anti-lock brake systems by ITT were also being made.

Raw casting for **contractor saw tabletops** await machining in this dirt-floor machine shop in Taichung where sandals are worn by most of the workers. Although located in the city, a rice field was next door and an apartment building adjacent to that.

Taichung, Republic of Taiwan, is the tooling center of the world, but land scarcity, rising labor costs and demands for lower prices at **U.S. retailers** are forcing some manufacturing to relocate to mainland China.

fence, supply the fence rails. The more parts a machine has, the more vendors are involved. The simplest parts could be supplied by a vendor with crude fabrication equipment and manufacturing techniques that, from a quality and part consistency point of view, would be unacceptable in the United States.

Early complaints about machines of Taiwanese origin concerned motors and inconsistencies with replacement parts. And, of course, the complaint by U.S. manufacturers that their American-made machines were being copied and sold for substantially lower prices. As one manufacturer put it, "R & D in Taiwan means 'Research and Duplicate.'" Some importers went so far as to copy the color and even the instruction manual from a U.S.-made machine. To top it off, one story goes that an importer suggested its customers go to the U.S. manufacturer of the copied machine for replacement parts.

In the mid-1980s, Delta Manufacturing filed a complaint with the Federal Trade Commission to block importers from selling equipment in Delta's "trade dress." Basically, that means equipment that so closely resembles a Delta model that a consumer might be fooled into thinking it was a Delta.

Attacking importers on the issue of trade dress was about the only recourse American manufacturers had because most of the patents on their equipment had run out. Of course, the other alternative, which manufacturers like Delta said they wouldn't do, then eventually did, was begin a Taiwan-importing operation.

Once quality-minded importers, including those with U.S. manufacturing origins, began Taiwan operations with their own representatives and engineers on the scene, most quality issues were settled. Today, Jet, Delta, Grizzly, Bridgewood and Emerson Electric (the manufacturer of Ridgid woodworking tools and formerly Craftsman woodworking machines), all maintain offices and representatives in Taichung, Taiwan. Some, like Jet and Emerson, keep offices in Hong Kong as well to oversee operations in mainland China. As yet, Jet has little, if any woodworking product made in China as finished goods, but does source some parts, particularly rough iron castings, from the mainland. The company has had other equipment manufactured in China for years, but it is not woodworking related, according to Cliff Rickmer with Jet.

Taiwanese manufacturers have prospered by supplying woodworking equipment to the United States. Understanding the value of the business, they have invested in modernizing their plants, hiring engineers and training their employees.

It seems like a mind-boggling number, but U.S. manufacturers/importers estimate the number of woodworking tools and machines coming into this country at between 2.5 million and 2.8 million finished units annually with a retail value between $765 million and $1 billion.

U.S. importers praise these suppliers for improving existing products or even presenting new product altogether instead of just copy-

ing. "They've learned the money is in new products," so now they are bringing ideas to us, says Otto of Jet.

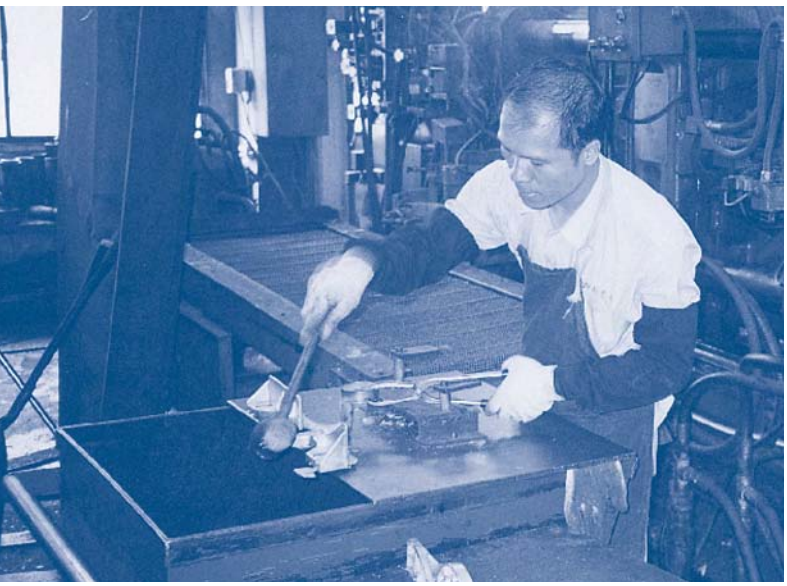
Success a Double-Edged Sword for Taiwan

So if prices are already low when adjusted for inflation, why is there a push for even lower prices? An aging baby boom population taking up the woodworking hobby, reasonably priced tools, and the concentration of retail power by home center megastores such as Home Depot and Lowe's all ensured the success of manufacturing in Taiwan. Now these forces have driven, if unwittingly, some manufacturing off the island and on to mainland China.

Some U.S manufacturers/importers say the promise of greater unit sales by the big retailers comes with the demand for lower prices. And since most of the efficiencies in the manufacturing process have eliminated as much cost as possible, reducing the cost of labor is the sole recourse. With labor shortages and rising wages in Taiwan, the vast low-wage labor pool in China is the obvious solution.

Added to this are huge incentives to relocate, such as:

- An aggressive campaign by the



At Hsum Tsao, a Taichung aluminum die cast molding plant, a worker knocks off excess aluminum from a **miter saw fence casting** (left). Castings for benchtop saws are stacked for machining and assembly later (right).

Chinese government to attract business investment.

- Millions of dollars worth of infrastructure being built by the mainland government.
- An opportunity for more attractive profit margins by manufacturers and importers alike.
- Even a chance for Taiwanese manufacturers to hedge their bets and protect their investments should relations between the mainland and Taiwan lead to a possible invasion.

By far, Taiwanese investment in mainland China surpasses that flowing in from any other country.

Will Quality Suffer?

One key question for American consumers is whether the move to the mainland will hurt the quality of woodworking tools. Will the same problems, or even different ones, show up as was the case in the early days following the move to Taiwan?

Virtually all manufacturers/importers agree that things will be different this time. And they have some compelling arguments. The explanation goes something like this: The importers are continuing to work with many of the same Taiwanese manufacturers with whom they have long, established relationships. These manufacturers are building new facilities in China, not relying on old, state-run factories.

The Taiwanese manufacturers are working with Chinese suppliers who are also investing in the new facilities. The result is a large facility with the separate principal manufacturers under one roof. For example, Box of Delta Machinery described one new plant as composed of an aluminum injection molding operation, a plastic molding operation, a machining facility and paint line — all feeding parts to an assembly area. This type of integrated manufacturing arrangement follows a successful Volkswagen car building model in Mexico. All these various operations are using modern, high-tech equipment. Lastly, only certain types of products lend themselves to this manufacturing method. These are machines produced in large volume and require only a few, highly skilled workers but many more lower skilled laborers to produce. This fits the available labor pool for much of China's developing industrial areas.

High-volume products that have moved to China are often "benchtop" machines, including power miter box saws, small band saws, jointers, grinders and table saws. High volume hand power tools such as cordless drills and jigsaws also fit the formula. Says Otto of Jet Tools, it's the high-volume consumer-grade tools that will be moving to mainland China. On the other end of the spectrum, says Box of Delta, the big industrial-grade machines such as big jointers and shapers, machines with big castings, have been made in China for some time.

Cautious Optimism

Woodworkers and future woodworkers should be optimistic about prices and the quality of their future woodworking tools and machines. The latest developments in Asian manufacturing point to a possible recipe for success. But all new ventures hit often unforeseen bumps in the road and it's likely the cruise across the Straits of Taiwan will not exclusively be of the "honeymoon" variety. For your own future tool purchases, practice a concept made popular by former President Ronald Reagan — trust, but verify. **PW**

12voltdrills

Bigger is not always better in the world of cordless drills. Figure out how much power you need without breaking your wrist.

Every year as we travel the country to woodworking shows, we're shocked and amazed at how big and powerful cordless drills have become. It's fair to say there's a small part of us that's impressed with the performance of these heavyweights. But the small bones in our wrists know better. For most woodworking, a 12-volt drill is more than enough.

If you're a contractor or professional deck builder, then your objections have been noted, so go ahead and purchase that 24-volt workout machine. For the rest of us, here's what to look for in a 12-volt drill.

Handle Design

Most cordless drills these days are T-shaped, with the handle coming down near the middle of the drill. A few are pistol-grips, where the handle comes down from the back end of the drill, like on most corded drills.

T-handle drills are more balanced and will stand upright (usually) on your bench. Pistol-grip drills allow you to put more of your weight behind them — usually not a big issue with woodworking.

Torque

Cordless drills with 12-volt batteries are available with 1 amp-hour batteries all the way up to 3 amp-hour batteries. The amp hours are analogous to the gas tank on your truck. The bigger the tank, the farther you can go. More amp hours give you more run time. Also critical is the amount of torque produced at the chuck. Torque is measured in inch-pounds for cordless drills; higher numbers are better. The more torque you have, the less likely you're going to bog down in a hole.

Battery Type

As you shop for a drill, you'll notice that some come with Nickel Cadmium (NiCad) and some with Nickel Metal Hydride (NiMH) batteries. Which is better?

According to battery experts, Nickel Metal Hydride technology gives you more run time in the same size battery cell.

NiMH batteries are also more environmentally friendly. The cadmium in NiCad batteries must be disposed of in a controlled manner. NiMH batteries are more expensive, and some manufacturers haven't jumped on the bandwagon yet saying the technology isn't perfect.

Speeds

All but the least expensive (and lightest duty) drill/drivers offer some nice features you won't find on many corded drills, including variable speeds.

Many drills are available with both variable speed and two-speed capability. They're different features that work together. Variable speed is the ability to control infinitely the rotations per minute (rpm) of the chuck by increasing or decreasing the pressure on the trigger. This allows better control over your work, to keep a drill bit from wandering off the mark, or to start a screw in the right spot. The two-speed capability allows the drill to be switched from one speed range to another, like switching from first to second gear in your car. Torque in low speed is higher, but the top rpms are lower. This is best for large-diameter drill

SHOPPING GUIDELINES

12-volt drills

- Get the most torque and highest amp-hours you can afford.
- Make sure your drill is variable speed. This will be listed on the side of the gearbox as, for example, 1-1,000 rpm. Drills without variable speed are more difficult to control.
- A "high-" and "low-" speed selector is handy for setting your tool to drill holes or drive screws.
- Don't get worked up about the number of clutch settings. Six or more will be enough.

On pistol-grip drills, the handle comes down at the rear of the motor. You can put more of your weight behind the drill with this arrangement, but this should rarely be necessary with these drills.

Photo by Al Parrish

bits. In high speed, the rpms are increased, but with less torque. This is best for small diameter drill bits.

Clutches

Another finesse feature is the clutch, something available on only a few corded drills. The clutch allows you to disengage the motor when a certain amount of resistance is met. Why is this important? You can set the clutch to sink screws perfectly flush and then disengage the motor (it makes a clicking sound when it does this). The clutch also keeps you from ripping the head off that solid brass screw. Clutch settings range from none to 24, but we tend to think six or more settings is plenty for most work.

Chucks

Chucks on drills appear very similar, but closer inspection will show some important differences. To start, a maximum $\frac{3}{8}$" jaw opening is standard on many drills under 14.4 volt size. If you use bits with large shafts, buy a drill with a $\frac{1}{2}$" chuck. Next, check the construction of the chuck. They can be mostly plastic with metal jaws, half metal and half plastic, or all metal. In most cases the half-and-half chuck is sufficient, but for more durability, an all-metal chuck is best. Finally, take a look at the jaws themselves. Do they close to allow no opening whatsoever, or do they close with a small gap? The jaws should close to hold at least a $\frac{1}{16}$" drill bit.

One feature we recommend is a keyless chuck. Nearly universal on cordless drills, the keyless chuck makes changing from bit to driver a toolless job. Keyless chucks are now available in two-sleeve or single-sleeve designs. The two-sleeve variant requires both hands to loosen or tighten the chuck. Single-sleeve mechanisms allow one-handed operation. A built-in shaft lock provides the opposing force. One application where we usually recommend a keyed chuck over the keyless variety is when using hole saws, auger bits and other larger tooling. A keyed chuck allows you to close the jaws more tightly on a bit, reducing the chance of slippage. However, keyless chucks are beginning to close this gap, too.

One other feature worthy of comment is an electronic brake. While hardly a deal-breaker if not provided, a brake can speed up your work because you don't have to wait for the bit to spin down after each hole.

Chargers

Finally, a quick word about chargers. The industry standard is a one-hour charger, which for most applications is quick enough. Fifteen-minute chargers are available as an

PW Recommends

occasional user

- **Hitachi FDS12DVA** , Hitachi has the market cornered when it comes to bargain drills that perform. Though it doesn't produce the same amount of torque as more expensive models, you'll hardly notice.
- **Ryobi HP1802MK2**, If you want to save a few dollars, then check out this drill/driver, which has the heft, feel and features of a more expensive drill — without the price tag.

serious home woodworker, advanced woodworker & professional user

- **Metabo BST12 Impuls**, This drill is definitely worth seeking out. It is decidedly a heavy-duty drill with an added feature no other drill has: a pulsing feature. This feature, which you can switch off, makes it easier to sink screws in difficult woods and remove stuck screws.
- **Porter-Cable 9866**, Porter-Cable's drill/drivers get better each year, and this one is priced to compete with anything out there. This is a shop favorite.
- **Milwaukee 0501-23**, Pros know that Milwaukee makes drills that are designed to take a beating. Pick one up, and you may never go back.
- **Makita 6216DWBE**, Makita excels at designing cordless tools, and its top-of-the-line 12-volt cordless drill is designed to run all day, everyday.
- **Panasonic EY6407NQKW**, Panasonic drills enjoy almost a cult-like following. These are tough and reliable drills.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

option on some models, and as a standard item on a couple. On the opposite end of the scale, some lower cost drill/drivers are sold with a three- or five-hour charger. While this seems a deficit compared to a one-hour charger, if your use of the tool requires less frequent use, a three-hour charger can save you money. Also check on the type of charge being provided. Some chargers require the battery be removed after charging, while others can remain in the charger with a continuous "trickle" charge to maintain full charge. Better charger technology improves the life of your batteries, and keeps your drill ready. **PW**

[stats]

BRAND & MODEL	STREET PRICE	TORQUE IN./LBS	MAX. SPEED(L/H)	BATT. CHARGER	AMP HOUR	# CLUTCH SETTINGS	WEIGHT (LBS.)	#/TYPE BATTERIES	HANDLE TYPE	BRAKE	COMMENTS
12 VOLT											
Black & Decker FS12	$99	115	800	3hr	1.3	24	3.5	2/NiCad	T	Y	Best New Tool 1998
B & D FSD122K-2	79	125	0-800	3hr	1.3	36	3.5	2/NiCad	T	Y	Quick connect chuck
Bosch 3305K	139	200	400/1200	1hr	1.4	6	3.4	2 /NiCad	T	Y	Performance 4.5 stars
Bosch 3315K	165	225	400/1200	1hr	1.7	16	4.3	2/NiCad	T	Y	15 min. charger optional
Bosch 3360K	159	400	500/1500	1hr	2.0	16	4.8	2/NiCad	T	Y	½" chuck, soft grip
Craftsman 27121	160	350	350/1100	1hr	1.7	24	4.4	2/NiCad	T	Y	
Craftsman 27123	190	400	400/1400	1hr	1.7	24	4.6	2/NiCad	T	Y	
Craftsman 27124	230	525	400/1400	1hr	2.0	24	6.8	2/NiCad	T	Y	Aux handle ½" chuck
Craftsman 27125	270	625	400/1400	1hr	2.0	24	7.1	2/NiCad	T	Y	Aux handle ½" chuck
Craftsman 27127	250	500	400/1400	1hr	2.0	24	7.0	2/NiCad	T	Y	Aux handle ½" chuck
Craftsman 27398	99	230	330/1000	1hr	1.3	24	3.5	2/NiCad	T	Y	
DeWalt DW953K-2	170	210	400/1200	1hr	1.3	17	3.8	2/NiCad	T	Y	
DeWalt DW980K-2XRP	180	350	450, 1400, 1800	1hr	1.7	22	4.9	2/NiCad	T	Y	3 speeds, ½" chuck
Fein ABS12-2 EUQ	250	230	340/1200	50min	2.0	13	4.5	2/NiCad	T	Y	Best New Tool 1998
Festool CDD12 ES	340	221	380/1100	15min	1.7	18	4	1/NiCad	P	Y	Also uses 9.6 batt.
Hitachi FDS12DVA	125	191	350/1050	1hr	1.4	22	3.4	2/NiCad	T	Y	
Hitachi DS13DV2	195	200	350/1200	1hr	2.0	22	4.2	2/NiCad	T	Y	½" chuck
Makita 6227DWE	159	200	350/1100	1hr	1.3	16	3.3	2/NiCad	T	Y	
Makita 6213DWAE	209	287	450/1400	1hr	2.0	18	4.2	2/NiCad	T	Y	
Makita 6313DWAE	209	225	450/1400	1hr	2.0	18	4.4	2/NiCad	T	Y	½" chuck
Makita 6213DWBE	219	287	450/1400	1hr	2.2	18	4.2	2/NiMH	T	Y	
Makita 6213DWBLE	229	287	450/1400	1hr	2.2	18	4.2	2/NiMH	T	Y	w/flashlight
Makita 6011DWE-2	199	239	450/1350	1hr	1.3	12	4.2	2/NiCad	P	Y	Also uses 9.6 batt.
Makita 6216DWBE	249	320	400/1300	1hr	2.2	17	4.6	2/NiMH	T	Y	Met. gear housing
Metabo BST12 Impuls	188	282	450/1450	1hr	1.4	20	3.5	2/NiCad	T	Y	Pulse feature
Metabo BST12 Plus	203	466	450/1600	1hr	2.0	20	3.8	2/NiCad	T	Y	Performance 4.5 stars
Milwaukee 0502-20	129	220	360/1100	1hr	2.0	19	3.8	1/NiCad	T	Y	Reversible battery
Milwaukee 0502-23	149	220	360/1100	1hr	1.3	19	3.8	2/NiCad	T	Y	Reversible battery
Milwaukee 0501-20	129	220	360/1100	1hr	2.0	19	4.2	1/NiCad	P	Y	½" chuck, revers. batt
Milwaukee 0501-23	149	220	360/1100	1hr	1.3	19	4.2	2/NiCad	P	Y	½" chuck, revers. batt
Panasonic EY6406FQKW	165	293	350/1000	30min	2.0	18	3.8	2/NiCad	T	Y	Elec. feedback
Panasonic EY6407NQKW	180	293	350/1000	45min	3.0	18	4.0	2/NiMH	T	Y	½" chuck
Porter-Cable 9866	137	330	400/1200	1hr	2.0	20	5	2/NiCad	T	Y	Performance 4.5 stars
Porter-Cable 9866F	175	330	400/1200	1hr	2.0	20	5	2/NiCad	T	Y	w/flashlight
Ryobi HP1202MK2	60	N/A	0 - 550	5hr	1.5	24	3.5	2/NiCad	T	N	Mag tray
Ryobi HP1442MK2	80	N/A	330/1100	1hr	1.7	24	3.9	2/NiCad	T	Y	Mag tray
Ryobi HP1802MK2	100	N/A	350/1300	1hr	1.7	24	4.8	2/NiCad	T	Y	Mag tray
Skil 2480-02	53	90	700	3hr	1.3	6	3.5	1/NiCad	T	N	
Skil 2480-04	75	90	700	3hr	1.3	6	3.5	2/NiCad	T	N	
Skil 2492-04	85	175	400/1200	1hr	1.3	16	3.5	2/NiCad	T	Y	Performance 3 stars
Skil 120VXT	79	100	850	3hr	1.0	6	3.9	1/NiCad	T	N	w/corded back-up
Wagner WB120K-2	90	NA	550	3hr	NA	6	3.3	2/NiCad	T	Y	

key

Handle type:
T= T-handle;
P=Pistol grip;
NA=Not available,
■ = PW Recommends

bandsaws

Usually an 'also ran' to the table saw, the band saw is a surprisingly versatile machine that belongs in every shop.

When readers call with questions about what tools are necessary in their shops, band saws are never very high on their lists, or they seem to be an afterthought. "Oh yeah, and a band saw." If there's one thing to be said about band saws, it's that they're frequently underrated. They rip, they crosscut, they bevel, they miter, they cut simple and compound curves, they resaw and they make a pretty cool cold cut slicer. But seriously, don't underestimate the band saw — every shop should have one.

They come in a variety of sizes and prices to fit just about every wallet and shop. It's a tool that's best set up and left in place, so take a look at your space requirements, then decide how much machine your wallet can afford.

Benchtop Models

On the inexpensive end of the scale (mostly) are the benchtop band saws. Ranging in price from $100 to $800, with the majority ending up around $175. They come in both two- and three-wheel configurations in 8" to 12" sizes (determined by the diameter of the wheel). The throat depth (the distance between the blade and the neck of the saw) is usually an inch or so less than the wheel diameter. And the resaw capacity ranges from 3" to 6½", though actually resawing on some of these machines would be challenging.

In deciding between a two- or three-wheel design, the largest difference is the increased throat depth with the addition of the third wheel. The downside to that deceptively simple decision is that in the three-wheel design the sharper turns in the blade reduce blade life, and it can be harder to get the blade to track properly.

In general, unless you're strapped for cash or space, you'll get better performance from a floor-model band saw. If benchtop is your only option, look for the best motor output and largest throat and resaw capacities.

Floor-Model Band Saws

Floor-model band saws cost more (averaging in the $500 to $800 range, with a number of commercial models running into the thousands), and they are the best choice for home shops. Ranging from 10" up to 24", the most common floor model saws are the 14" designs.

Offered in either open- or enclosed-stand designs (open stands are frequently less expensive, but the enclosed-stand design decreases vibration and makes a more stable tool), most 14" saws offer 6" of resaw capacity as standard, but also offer the option of a riser kit to increase that capacity to 12". These kits cost from $60 to $100 and include a cast chunk of metal to extend the neck of the saw, extended blade guards and usually a longer blade (required). If you want to occasionally resaw a board wider than 6", make sure the riser block option is available on your saw.

As with the benchtop models, motor performance will affect the quality of the machine's cut. A larger motor (check the amps or watts, not horsepower) will make the cut easier to make.

Other features to consider in any band saw include: blade guides, fences, wheel brushes, rack-and-pinion blade guards and brakes on larger models.

Guides

Blade guides can make or break a band saw. They keep the blade in alignment and stop it from wandering during a cut. Good guides provide straighter, smoother cuts. The standard guide parts on most band saws include a rear thrust bearing (to support the blade from the back) and a set of metal blocks to keep the blade from moving side-to-side during a cut. This guide arrangement appears above the table and below.

Though the stock guides are ad-

SHOPPING GUIDELINES for band saws

- Buy the largest motor you can afford in any size band saw.
- Check for the best capacity, both height and width.
- Look for the option to increase height capacity with a riser block.
- If possible, buy a model with a worthwhile rip fence.
- Check the guide system for easy adjustability and smooth movement.
- If you can afford an enclosed stand, good, but don't sweat it if the other features are available.
- A 14" saw is practical for most home (and many commercial) workshops. Larger saws are generally prized for their resawing capacity.

Photo by Al Parrish

equate for most operations, aftermarket upgrades to these guides improve tracking and decrease heat. These systems include synthetic-guide block systems (such as Cool Blocks) and, most recently, ceramic guide blocks to replace the metal blocks. These reasonably inexpensive upgrades ($15 or so) allow the blade to be held tighter without increasing heat on the blade.

Other guide upgrade options include a couple designs from Carter (616-451-2928) including one to replace the blocks and thrust bearing altogether ($150), or the Stabilizer that can be used on 1/4" or smaller blades. It replaces the thrust and side bearings with a single grooved bearing ($65). Iturra Design (888-722-7078) offers a variation that replaces the metal side guide blocks with blocks utilizing small bearings for about $60.

When it comes down to deciding whether to replace your guide blocks, let your work dictate your decision. If you're disappointed with your saw's performance it may be worth a try. But you may also look to one other area that affects performance, the blade.

Blades

Just like your car, if you spend lots of money on a quality machine and then put cheap or ill-matched tires on it, you're not going to get the ride you expect. There are a few things to remember about band saw blades. For tight curves, use a narrower blade; with dense woods, use a blade with more teeth per inch; and for resawing, a wider blade with fewer teeth per inch provides the best performance. A good general purpose blade is a 3/8" blade with six teeth per inch. **PW**

PW Recommends

occasional user

- **Delta 28-150**, This two-wheel benchtop model is a great starter band saw that provides easy-to-use features without taking up a lot of space.
- **Grizzly G1052**, For a little extra cash, this two-wheel benchtop adds a lot of metal to the mix, making it a solid performer with a larger motor.
- **Grizzly G1019**, Though benchtop models save space, we recommend a floor model whenever possible. The bargain priced G1019 offers power, capacity and accepts a 6" riser block.

serious home woodworker

- **Inca 205**, If your working space forces you into a benchtop band saw, this model offers some pretty large features in a small space.
- **JET JWBS-C14CS & 14CS**, A 14" band saw that has the nice features every band saw should have, the Jet is a great floor model choice for the serious home woodworker.

advanced woodworker or professional user

- **Delta 28-280**, While comparably close to the Jet above, this Delta floor model has more cast iron and continues to be a staple in many professional woodworking shops.
- **Laguna LT18**, Pros are frequently looking for greater capacity and resawing performance. The Laguna LT18 provides both in a well-crafted European design.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

MODEL	PRICE	SIZE IN.	RESAW CAP. IN.	TABLE TILT LEFT, RIGHT	BLADE GUIDES	MAX. BLADE (IN.)	HP	VOLTS	WEIGHT (LBS.)	COMMENTS
BENCHTOP										
Inca 205	$400	8	5 1/2	45, 0	M	3/8	1/3	115	44	with rip fence
Craftsman 21459	180	9	3 1/2	0, 45	M	3/8	1/3	120	35	work light
Delta 28-150	170	9	3 3/4	3, 45	CB	3/8	1/3	120	33	work light
Grizzly G1052	180	9	4 1/8	15, 45	BB	3/8	1/2	110	100	with rip fence
Ryobi BS901	100	9	3 1/2	0, 45	BB	3/8	1/3	120	30	
Tradesman 8168	350	10	4	0, 45	BB	3/8	1/3	115	36	
Inca 340	800	10 1/2	6 1/2	45,0	M	1/2	3/4	115	80	with rip fence
Craftsman 21451	210	11	3	0, 45	M	3/8	1/3	120	32	three wheels
Grizzly G8976	140	12	4 5/8	0, 45	BB	3/8	3/4	110	38	three wheels
FLOOR										
Delta 28-195	$310	10	7	3, 48	CB	1/2	1/2	120	75	
Craftsman 22432N	350	12	6	10,45	M	1/2	5/8	115	103	open stand
Jet JWBS-120S	340	12	6	10, 45	M	1/2	1/2	115	138	open stand
Craftsman 22414N	550	14	6	15, 45	NM	3/4	1 1/2	115	202	open stand
Delta 28-275	600	14	6 1/4	3, 45	M	3/4	3/4	115	201	open stand
Delta 28-280	740	14	6 1/4	3, 45	M	3/4	1	115/230	224	
General 90-100M1	605	14	7	0, 45	M	3/4	1	115/230	210	
Grizzly 1019	315	14	6 1/4	10, 45	M	3/4	3/4	110/220	203	with rip fence
Grizzly G1019Z	335	14	6 3/8	15, 45	M	3/4	1	110/220	165	open stand
Jet JWBS-14CS	580	14	6	10, 45	P	3/4	1	115/230	197	
Jet JWBS-14MW	630	14	6	10, 45	P	3/4	1	115/230	206	3-speed, open stand
Jet JWBS-140S	500	14	6	10, 45	P	3/4	3/4	115/230	183	open stand
Jet JWBS-C14CS	695	14	6	10, 45	BB	3/4	1	115/230	200	Carter guides
Jet JWBS-C14MW	630	14	6	10, 45	BB	3/4	1	115/230	209	Carter guides
Jet JWBS-C140S	630	14	6	10, 45	BB	3/4	3/4	115/230	186	Carter guides
Laguna LT14	795	14	8	15,45	CB	1	1 1/2	220	240	
Lobo BS-0143	330	14	6	10, 45	NM	1/2	3/4	115	167	
North State WA-14M	425	14	6 1/4	10, 45	M, BB	3/4	1	115/230	250	
Powermatic 44	650	14	9	15, 45	BB	3/4	1	115/230	212	
Ridgid BS1400	500	14	6	10, 45	M	3/4	3/4	120	178	Lifetime warranty
Shop Fox G9970	550	14	7	0, 45	M	1	1	110/220	215	with fence
Star WBS14	325	14	6 3/4	10, 45	-	5/8	3/4	115/230	195	
Star WBS143	375	14	6 3/4	10, 45	-	5/8	3/4	115/230	195	3 speeds
Tradesman 8157	580	14	6 1/4	10, 45	BB	1/2	1	115/230	162	
Transpower SB500	265	14	6	10, 45	NM	3/4	1	110	180	
Bridgewood BW-15BS	330	15	6	10, 45	M	1	3/4	115	151	
Craftsman 24393N	700	15	8 1/2	0, 45	M	3/4	3/4	115	234	3 speeds
General 490	1,250	15	6 3/4	10, 45	M	3/4	3/4	115/230	310	
Grizzly G1148	445	15	7 1/2	10, 45	M	3/4	1	110/220	175	2 speeds
Euroshop B-16	1,595	16	10	5, 45	ES	1	2	230	288	
Grizzly G1073	625	16	7 3/4	10, 45	M	1	2	110/220	456	with rip fence
Grizzly G1073Z	695	16	7 3/4	10, 45	M	1	2	110/220	480	
Hitachi CB75F	2,950	16	11 13/16	0, 45	P, BB	3	2.8	115	309	
Laguna LT 16	1,100	16	12	0, 45	ES	1	1-1/2	220	320	
Laguna LT 16 HD	1,895	16	12	5, 45	ES	1 3/8	3	220	385	
Laguna LT16 SEC	1,595	16	12	5, 45	BB/ES	1	2-1/2	220	320	
Lobo BS-0163	620	16	10	10, 45	ES	1	1-1/2	115	270	
Shop Fox G9971	825	16	8 1/2	10, 45	BB	1 1/4	1-1/2	110/220	335	
Transpower SB600	560	16	6	10, 45	CB	1	1-1/2	110	270	
Bridgewood PBS-440	1,795	17	12	0, 45	ES	1 3/16	3	230	480	fence; foot brake
Craftsman 24396N	1,200	18	11	0, 45	M	1	1	115	330	2 speeds
Euroshop B-18	1,895	18	12	5, 45	ES	1	2 1/2	230	390	
General 90-260M	1,725	18	9 3/8	10, 45	CB	1 1/4	1 1/2	115/220	495	
Grizzly G1012	695	18	10	5, 45	M	1 1/4	2	220	350	3 speeds

stats

MODEL	PRICE	SIZE IN.	RESAW CAP. IN.	TABLE TILT LEFT, RIGHT	BLADE GUIDES	MAX. BLADE (IN.)	HP	VOLTS	WEIGHT (LBS.)	COMMENTS
Grizzly G4186Z	895	18	9 3/8	10, 45	M	1 1/4	2	110/220	345	with rip fence
Jet JWBS-18	1,130	18	10	10, 45	ES	1 1/2	1 1/2	115/230	320	
Laguna LT18	2,095	18	12	5, 45	ES	1 3/8	3	220	451	
Laguna LT18RM	3,295	18	15 1/4	5, 45	ES	2	5	230	561	
Lobo BS-0183	800	18	11 1/2	10, 45	ES	1 1/2	2	230	360	
Mini Max S45	1,895	18	10	0, 45	ES	3/4	2 1/2	230	330	
North State WBS1803	795	18	10 1/2	10, 45	M	1 1/2	2	115/230	425	
North State WBS18L	975	18	10	0,45	M	1	2	115/230	330	
Transpower SB800	635	18	9	10, 45	CB	1	2	220	390	
Delta 28-640	2,000	20	11	4, 45	BB	1	2	230	585	
Euroshop B-20	3,095	20	13	5, 45	ES	1 1/4	3	230	458	
General 390	3,200	20	12 1/2	12, 45	M	1	2	230	865	
General 90-360	2,200	20	11 3/8	0, 45	M	1 3/8	2	220	640	
Grizzly G1258	1,395	20	13 7/8	10, 45	BB	1 1/4	3	220	613	foot brake
Inca 710	1,895	20	8	45, 0	BB	1	1 1/2	115/230	175	3 speeds
Powermatic 2013	2,695	20	12 3/8	15, 45	BB	1 1/2	2	230	740	fence, worklight
Laguna LT20	2,495	20	12	10, 45	ES	1 3/8	5	220	545	
Lobo BS-0202	1,600	20	11 3/4	10, 45	ES	1 3/4	3	230	620	
North State WBS-20	1,495	20	11	10, 45	BB	1 1/2	3	230	700	
Seco SK-20BS	1,545	20	10	10, 45	BB	1	3	220	816	
Star WBS20L	1,900	20	12	10, 45	BB	1 1/2	3	230	575	
Transpower SB1000	1,220	20	11 1/2	10, 45	NA	1 3/4	3	220	650	
Woodtek 959571	1,500	20	12 1/2	0, 45	BB	1	2	230	551	
Bridgewood PBS-540	2,195	21	14	0, 45	ES	1 3/8	4.8	220	595	fence;foot brake
General 90-600	3,800	24	13 3/4	0, 45	M	3	3/5	230	990	
General 90-460	2,795	24	13 3/8	10, 45	M	1 3/8	3	220	705	
Grizzly G7211	1,895	24	15 3/4	10, 45	BB	1 1/4	5	220	725	7 1/2 hp avail.
Grizzly G7212	1,895	24	15 3/4	10, 45	BB	1 1/4	7 1/2	220	750	
Laguna LT24	2,995	24	15 1/4	10, 45	ES	1 1/2	5	220	725	
North State WBS24	1,900	24	11	10, 45	BB	1 1/2	5	230	800	

key

■ PW recommends M= metal, BB=ball bearing, CB=Cool Blocks, NM=non-metal, P=plastic, ES=European-style ball bearing

The LT16 band saw is a perfect example of the European-style band saw. Instead of a cast frame, the machine's body is made from welded panels. These machines are remarkably rigid and vibrate very little.

Benchtop band saws stow easily and are economical, but you're going to wish you had a bigger machine when you want to resaw a 6"-wide board.

biscuitjoiners

Love 'em or leave 'em, biscuit joiners are here to stay. It's hard not to sell the heck out of something that's so fast.

Whether you consider them cheating, or just taking advantage of technology, it's hard to argue that the biscuit joiner hasn't made a dramatic impact on woodworking joinery.

Offering quick, simple and generally reliable joints for a wide range of applications, this descendant of an angle grinder has made it possible for a woodworker of almost any skill level to build strong furniture with one simple joinery machine.

The Fence

The basic machine is a modified angle grinder with a blade and a fence. The fence is the key feature to evaluate. Its complexity can vary from the simple plastic job on the Craftsman17501, to the sophisticated highly refined fence on the Porter Cable 557. Fences on the basic models will let you cut a joint at 0° and 45°. Move up the feature scale and you get continuous adjustment from 0° to 45° to 135°. Look for a fence that's easy to adjust and accurate. It should stay put when locked down. The fence should lock parallel to the blade, otherwise the parts being joined will not align across the joint.

The ease of adjusting the fence and the depth stop is also a major consideration. Check the knobs to see if they're easy to turn. Make sure they stay set when tightened. If you can't get the fence and depth stop to adjust correctly, the tool might as well be a paperweight. Also check out the size of the fence. Large fences make it easy to make an accurate cut.

The last thing to consider on the fence is the way the blade opening is held firm against your work as you plunge. Here are your options: two tiny pins that make small holes in your work, which are covered up when the joint is glued together. Or there are rubber nibs or a material like sandpaper to accomplish the same goal. We're partial to the rubber and abrasive faces.

SHOPPING GUIDELINES for biscuit joiners

- Make sure you buy a machine with an accurate and versatile fence. Otherwise, save your money until you can afford to buy a better machine.
- Don't sweat the motor. We've used all these machines, and the motors work well.
- We prefer anti-kickback technology on the blades. Kickbacks are rare; let's keep them that way.
- Buy some decent biscuits. We tested all the major brands and prefer Porter-Cable, Lamello and Kaiser.

The Freud JS100 (left) is a few-frills tool that has remained popular for decades. The Craftsman biscuit joiner (right) is an in-line machine, with the motor directly over the blade.

Photo by Al Parrish

Blades

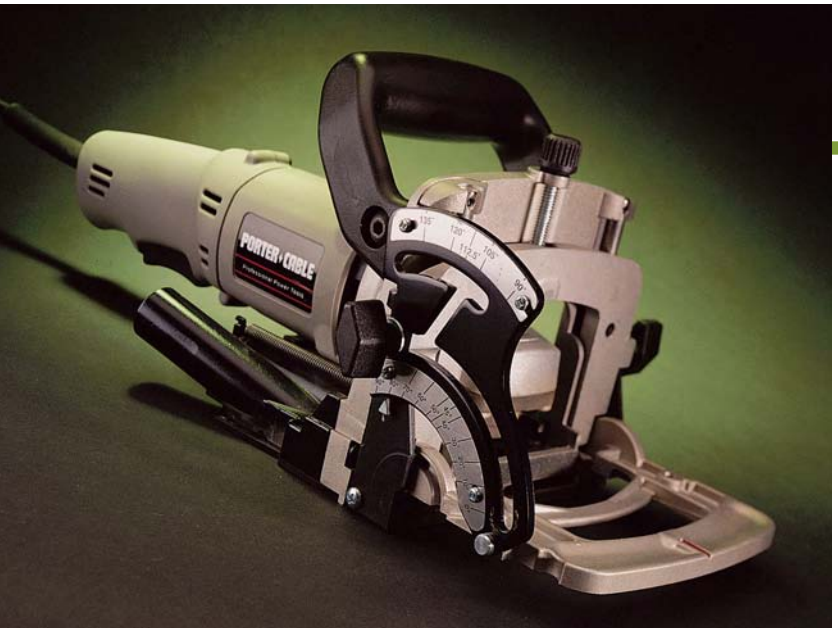
Most biscuit joiners are equipped with an anti-kickback blade. These are desirable, though biscuit joiners rarely kick.

Also critical is the blade's runout on the arbor. The less runout, the better the fit of the biscuit and the stronger the joint. Check out our chart on the next page for the measured runout of all the major brands.

Finally, check to see how easy it is to change the blade. This can vary from simple to major surgery. We found the blade on the Makita 3901 the easiest to change.

Biscuit Sizes

The work you do determines the kind of biscuit you will use. If you build a lot of face-frame cabinets, there is a special biscuit for you. If you do picture frames, you need a tool that cuts slots for "mini biscuits." For joining flat surfaces like table



tops, almost any tool will do (except the mini-biscuit joiners).

There are only three original sized biscuits: #0, #10, and #20. These range in size from 1¾" for the #0 to 2¼" for the #20, and they are all the same thickness. The face-frame biscuits currently sold by Porter-Cable are smaller than the #0 at 1¼". Craftsman sells mini-biscuits for its small joiner. They are numbered #1, #2, and #3. Their sizes are ⅝", ¾" and 1", and are thinner.

Lamello also makes a wide variety of specialty biscuits, everything from biscuit hinges, biscuits for knock-down joints and translucent biscuits for use in solid-surface material, such as Corian.

In general, big biscuits are great for large, edge-to-edge applications, such as tabletops. Porter-Cable's mid-sized biscuit is made for face frames. Craftsman's small-sized joiner is great for craft projects or special applications.

The quality of your biscuits is also important. We tested every major brand of biscuit to see how consistent their sizes were, how much they swelled and how many broken ones we encountered in a box.

The three best brands, according to our test, are Porter-Cable (whose biscuits are made of birch), Lamello and Kaiser (both of which are made from beech). Better biscuits make for better joints, so don't skimp on the biscuits.

Other Features

Make sure you try the switch before you buy. Some switches are holdovers from the angle grinder. Located on the side of the barrel, they take a little bit of getting used to.

The other type of switch is a trigger on the back of the barrel. These are easier to use, though they're more likely to be pressed accidentally if you drop the tool.

Most of the tools feature a switch that allows you to lock the motor on — a handy feature for large jobs. Some of the lock-on buttons are a pain to use, so check those out, too.

The next feature to look at is dust collection. Most joiners have a bag to collect the chips flying out the side of the machine. Take a fitting from your shop vacuum and see if it fits the model you're looking at. It's best to use a vacuum when cutting more than a few biscuit slots because the bags fill quickly and the ports clog easily.

Don't get too worked up about the motor's amperage. There's less than a 3-amp difference among all the major brands.

Lastly, noise is a consideration. The motors can be loud, and all of them operate in a decibel level where hearing protection is required. **PW**

PW Recommends

occasional user

- **Freud JS100**, This tool made biscuit joinery affordable for the masses, and it's still a workshop favorite. For the money, you can't buy a better entry-level tool.

serious home woodworker

- **Freud JS102**, This updated model includes a more versatile fence, a blade that's easier to change and a price that still beats many of its competitors.
- **Makita 3901**, We've been using this tool for years in our shop and have found it to be accurate and totally reliable, as you would expect with a Makita tool. It's also lighter in weight than some newer tools, which makes a difference if you've got a lot of slots to cut.

advanced woodworker or professional user

- **Porter-Cable 557**, Without a doubt, this is the most versatile tool available on the market today. The fence is capable of almost any sort of gymnastics you can dream up. It also comes with a smaller cutter for face-frame biscuits. The only downside is that you need to shim the face around the cutter slightly. Porter-Cable had to change this because of patent concerns.
- **Lamello Classic C2**, Lamello invented biscuit joinery, and the company's European-made tools are precision machines. The price of the tool is high, but many professionals are glad to pay it.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

	CRAFTSMAN 17501	CRAFTSMAN 27730	DEWALT DW682K	FREUD JS100	FREUD JS102	LAMELLO CLASSIC C2	LAMELLO TOP 20S	MAKITA 3901	PORTER-CABLE 557	RYOBI JM81K
Street price	$100	180	150	100	125	329	629	160	200	115
FENCE										
# of Detents	6	2	2	3	3	5	5	3	3	4
Material	Plastic	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Steel
Angle Capacity	0°-135°	0°-90°	0°-90°	0°-135°	0°-135°	0°-90°	0°-90°	0°-90°	0°-135°	0°-135°
Size in inches	3 3/4 x 5 1/4	2 1/2 x 4 3/4	2 1/2 x 4 5/8	2 x 4 3/4	2 x 4 3/4	2 1/2 x 5	2 1/2 x 5	2 3/8 x 5	3 3/4 x 5 1/4	3 3/4 x 5 1/4
MOTOR										
Amps/No Load	3.5	2.8	2.7	2.8	2.7	2.64	4.0	2.47	3.08	3.55
Amps/Load	6.7	6.75	5.89	3.89	4.49	4.07	5.89	4.93	5.29	6.08
Amps Variance	3.2	3.95	3.19	1.09	1.79	1.43	1.89	2.46	2.21	2.53
dB/No Load	102	104	103	103	104	105	101	102	98	101
BLADE										
# of Teeth	8	6	6	6	6	6	6	6	6	8
Anti-Kickback	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Blade Kerf	0.159	0.155	0.150	0.155	0.154	0.154	0.133	0.153	0.159	0.191
Hole Kerf	0.165	0.166	0.154	0.164	0.157	0.159	0.159	0.156	0.159	0.191
Variance	0.006	0.011	0.004	0.009	0.003	0.005	0.026**	0.003	0.000	0.003
OTHER STATS										
Cord Length	10'	8'	8'	7'8"	7'8"	10'	10'	9'	7'	10'
Weight in lbs.	6.5	6.7	6.9	6.14	7	7.3	7.11	6.15	7.7	6.8
Body Style	In-line	Right Angle	Right Angle	Right Angle	Right Angle	Right Angle	Right Angle	Right Angle	Right Angle	In-line
Size Biscuits	0,10,20	0,10,20, max	0,10,20, max	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, S,D, max	0,10,20, S,D, max,FF	0,10,20
Non-Skid Material	R/face	Pins	Pins	R/pads	R/pads	R/pads	R/pads	R/face	Grit face	R/face
Dust Collection	Box	Bag/VP	Bag/VP	Bag/VP	Bag/VP	VP	VP	Bag/VP	Bag/VP	Bag/VP
PW RATINGS										
Blade Change	2	3	3	3	4	4	4	5	4	2
Ergonomics	2	3	4	3	3.5	4	4	4	4	2
Overall Performance	2	4	4	3	4	5	5	4	5	2

key

* Angles past 90° (including 135°) can easily be achieved by attaching the 90° fence and adjusting the angle of the adjustable fence.
** Blade geometry for the Top 20 is different than all the other blades. The teeth are offset. As a result, the variance is not a measure of runout.
Pl. = plastic, Al. = aluminum, R=rubber, FF=face frame, Ratings on a scale of 1 to 5 with 5 being outstanding and 1 being unacceptable, ■ = PW Recommends

Where do Biscuits Come From?

As important as the tool itself is the lowly biscuit. But just where do these little suckers come from? Kathleen Oberleiter, the dealer sales manager for Lamello, says her company has one plant in Switzerland that produces biscuits for Europe and the United States. In addition to producing biscuits under its own name, Lamello also makes the same quality biscuits for Makita and Black & Decker (and Black & Decker's sister company, DeWalt).

Lamello (800-252-6355) brags that its beech biscuits are compressed and within one-tenth of a millimeter in thickness with a moisture content between 8 and 10 percent.

Here in the United States, Porter-Cable (800-487-8665) started making its own biscuits in Jackson, Tenn., in the mid-1980s. Then the company concluded it would be better to have another company make the biscuits. Now Hill Wood Products of Cook, Minnesota, makes all of Porter-Cable's biscuits. In fact, Hill Wood's plant is the only major producer of biscuits in this country and makes between 60 percent and 70 percent of the biscuits sold in the United States, says Hill Wood President Steve Hill. Instead of beech, Hill Wood makes biscuits using Northern white birch.

Interestingly, Hill says Hill Wood does not compress the wood for its biscuits and relies on the moisture in the glue to swell the biscuit and lock the joint tight. The company's equipment is capable of compressing the biscuits, but Hill says he's found that wood can compress unevenly, resulting in biscuits of different thicknesses. Hill Wood cuts its biscuits to the same thickness within 5-thousandths of an inch.

So how does birch compare to the European beech? Hill says beech is actually a little harder and the grain is a bit tighter than in birch, but that it's real close. "The glue or the wood is more likely to fail than the biscuit," he says.

Freud (800-334-4107), a major player in the biscuit market, has its biscuits made by a Spanish firm that makes biscuits for many other firms, according to Jim Brewer, vice president of operations. Freud's biscuits are made of beech and are compressed, he says.

Kaiser biscuits, which are made in Austria from beech, are distributed in the United States by Practical Products Co. (800-847-8839) of Cincinnati, Ohio, according to Donald Baltzer, company president. Kaisers are well thought of in Europe and are compressed during manufacturing.

bradnailers

A brad nailer may be considered a luxury by some woodworkers, but they probably haven't tried one yet. It's a handy tool that will speed up your work.

Most woodworkers can avoid owning a brad nailer for an awfully long time. Sure, there are times when it would cut your assembly time in half, keep from having to wait 30 minutes for the glue to dry and make any moulding job (either on furniture or in your house) a lot faster and simpler. But you can get by without. But with air guns costing about $120, why should you?

Of course it's not just the brad nailer you need to buy. The compressor and hose will impact your bottom line. Already have a compressor? Great. Nailers will operate on almost any size compressor. Don't have one yet? You can get a smaller compressor for around $200 and you'll find lots of uses for it (ever blow up an air mattress?). You can also buy a combination kit and get a brad nailer with a compressor for about $250.

Why Brad Nailers

Air fasteners can be roofing nailers, small staplers and dozens of sizes and applications in between. For the average woodworker, the 18-gauge (about 1/32" square) nail offers plenty of holding power and leaves a less obvious hole in your wood. Brad nailers come in lengths from 3/4" to 2 1/8", which should provide for every job short of framing a house. Brad nailers tend to be grouped into two capacity categories: those that start with shorter lengths (3/8") and top out at 1 1/4" or so; and those that start at 5/8" and will fire up to 2" lengths. There are certainly variations available, but in general, those are the standards. While you may have specific needs for shorter brads, in general woodworkers use the longer lengths.

Depth of Drive

One feature to consider on a brad nailer is the method for adjusting how deep the nail is set. When a brad sinks into wood, it can be set flush, above or below the wood's surface. This depth can be controlled by modulating the amount of air being fed to the gun at the compressor, or on some nailers, by adjusting a mechanical setting at the nose of the gun to adjust how close the nose is to the wood. Both work (with some adjustment) but the mechanical option will keep you from running back and forth to your compressor.

Oilless Operation

Most brad nailers require a drop of oil before each day's use to keep the cylinder moving easily. Some tools on the market offer oilless operation, which can be handy and one less thing to remember, but it will cost a little extra. Oilless operation also removes the risk of oil spraying out the tool's exhaust port and onto your work. Most brad nailers now offer an adjustable, or rear-mounted exhaust to combat that problem.

SHOPPING GUIDELINES

for brad nailers

- Buy a nailer with the largest capacity range that best suits your needs.
- In general buying too "affordable" a nailer can mean less quality.
- Look for a mechanical depth-of-drive adjustment on the tool.
- If possible (and necessary) look for a combination kit to get started in air tools.
- Don't disregard a nailer requiring oil. It's not a big problem, and you'll save money.

The Porter-Cable BN200V12 brad nailer is a switch hitter. Without a compressor, it is powered by an on-board compressor fueled by a 12-volt battery. When a compressor is handy, you can hook it up to the fitting at the rear.
This tool is too new for us to test. Stay tuned.

Photo by Al Parrish

Safety Features

In general, brad nailers are required to fire only at a moderate pace. While some nailers offer what is referred to as bump firing (pull the trigger and fire repeatedly by depressing the nose safety against the wood), this isn't really a necessary or recommended feature for woodworkers. Rather a sequential firing tool with a restrictive nose safety (requiring the nose be lifted off the wood before the trigger will fire again) is the better woodworking choice.

Another common safety lock-out is the use of double-triggers. A double trigger requires first one, then a second trigger be pulled to fire the gun. These guns do not have a nose safety.

Jamming

One last feature is a way to easily remove jammed brads from the chamber. Many brad nailers offer a removable nose to quickly clear away the jammed brad. This nose-piece may require an allen wrench to remove, or use a simple flip-latch requiring no tools. While this is a feature to consider, today's nailers are less prone to jamming and we wouldn't base a purchase on this feature.

Pneumatics for Newbies

As mentioned earlier, one of the great ways to enter the pneumatic world is to purchase one of the nailer/compressor combination kits. Available in a number of different configurations, most include a 2hp compressor, gun, hose and fittings for between $250 and $300. If you piece out the components, this is an economical way to get started.

One word of caution, though. While we recommend a 2" capacity brad nailer for most woodworkers, it's not that easy to find a starter kit with a 2" capacity brad nailer. Accuset offers one for around $300, but most brad nailer kits will include a 1½" or 1⅝" capacity nailer. If you plan on purchasing two brad nailers, or anticipate using a larger finish nailer, then this is still an economical route. If not, you may want to still consider piecing together your set, starting with the larger capacity brad nailer.

Finally, some companies offer a tool that will fire both brads and staples. These are good in a pinch, just be prepared to fiddle with the gun a bit when you switch from firing brads to staples. **PW**

PW Recommends

occasional user

- If you're an occasional woodworker, there are lots of other tools you should buy before you get a brad nailer and compressor. When you start building lots of cabinets with trimwork, you'll be ready for one.

serious home woodworker

- **Accuset A200BN**, This 2" brad nailer has earned a permanent place in our shop at the magazine. It feels good in the hand and is amazingly reliable.
- **Porter-Cable BN200A**, Porter-Cable's 2" brad nailer is surprisingly lightweight and balanced. We also like the fact that the safety is behind the nose of the gun so it's easier to put that brad right where you want it.
- **Craftsman 18424**, If money's a little tight, this lightweight 2" gun will save you a few dollars over the other brands.

advanced woodworker or professional user

- **Senco SLP20**, For years, this has been the industry standard in professional shops. Its reliability and versatility are well-documented. With proper care, this tool will last you a lifetime.
- **Senco FinishPro 25**, This newer tool fires longer brads than any other brad nailer on the market, 2⅛".
- **Makita AF502**, Though expensive, this tool has one of the most unique and convenient safety devices, built into the entire nose-piece. A separate lock-off makes the option of bump or sequential fire safe. This is a quality tool for the pro woodworker.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

18-GAUGE BRAD NAILERS

BRAND & MODEL	STREET PRICE	NAIL LENGTH (IN)	SAFETY SYSTEM	BUMP FIRING	RUBBER TIP	QUICK CLEAR NOSE?	DRIVE DEPTH ADJ.	AIR PRESSURE (PSI)	WEIGHT (LB)	COMMENTS
Accuset A125BN	$90	5/8-1 1/4	RN	N	Y	Y	N	70 - 100	2.3	
Accuset AN125	129	5/8-1	RN	N	Y	Y	N	70 - 100	2.4	Nailer/stapler
Accuset A200BN	129	5/8-2	RN	Y	Y	Y	Y	70 - 100	3.4	
Airy ADA 0251CFE	119	5/8-2	RN	Y	Y	Y	Y	70 - 100	2.9	Performance/value:4.5
Bostitch BT-35-KIT	130	5/8-1 3/8	RN	N	N	Y	N	70 - 100	2.4	
Bostitch BT-50-KIT	160	13/16-2	RN	N	N	Y	N	70 - 100	2.6	
Bostitch SB-1850BN	100	5/8-2	RN	N	N	Y	N	70 - 100	NA	
Bostitch SB-1842BN	90	5/8-1 5/8	RN	N	N	Y	N	70 - 100	NA	
Campbell Hausfeld NB003099	70	3/8-1 1/4	RN	N	N	N	N	50 - 100	2.6	
Campbell Hausfeld NB004099	100	5/8-2	RN	Y	N	Y	N	70-110	2.8	
Craftsman 18409	80	3/8-1 1/4	RN	Y	N	N	N	60 - 100	2.2	Oilless
Craftsman 18424	120	5/8-2	RN	Y	N	N	N	60 - 100	2.6	
Craftsman 18454	120	5/8-1 1/2	RN	Y	Y	N	N	60 - 100	2.6	Nailer/stapler
DeVilbiss NB1252X4	89	3/8-1 1/4	2T	Y	N	Y	N	70 - 125	NA	
DeVilbiss NB2002X4	129	3/8-2	2T	Y	N	Y	N	70 - 125	NA	
DeVilbiss NBSNC2X4	129	3/8-1 3/8	2T	Y	N	Y	N	70 - 125	NA	Nailer/stapler
DeWalt D51238	150	5/8-2	RN	Y	Y	Y	Y	70 - 120	2.8	Trigger lock
Duo-Fast DBN-4450	299	5/8-1 5/8	2T	N	N	N	N	70 - 120	2	
Duo-Fast DBN-4440	260	1/2-1 1/4	2T	N	N	N	N	70 - 120	2	
Grizzly G6045	70	3/8-1 1/4	RN	Y	N	Y	N	60 - 100	2.6	
Grizzly G6046	80	3/8-1 9/16	RN	Y	N	N	N	60 - 100	2.9	
Grizzly G6047	100	5/8-2	RN	Y	N	Y	N	70 - 110	3	
Grizzly G8126	100	3/8-1 1/4	RN	Y	Y	N	N	60 - 100	2.6	
Hitachi NT32AE	85	5/8-1 1/4	RN	Y	N	N	N	70 - 120	2.6	
Hitachi NT50AE	120	3/4-2	RN	Y	N	N	N	70 - 120	3.2	
Jamerco JTBN1832	70	5/8-1 1/4	RN	Y	N	N	N	52 - 100	2.5	
Jamerco JTBN1832A	90	5/8-1 1/4	RN	Y	N	N	N	70 - 100	2	
Jamerco JTBN1850A	130	5/8-2	RN	Y	N	N	N	70 - 100	2.7	
Jamerco JT1838SB42	130	5/8-1 5/8	RN	Y	N	N	N	60 - 100	2.5	Nailer/stapler
Makita AF502	309	5/8-2	RN	Y	Y	N	Y	65 - 120	2.5	
Makita AF503	169	5/8-2	RN	Y	Y	N	N	65 - 120	2.4	
Paslode IM200-F18	429	5/8-2	RN	N	Y	Y	Y		4.9	Cordless Finish Nailer
Paslode T200-F18	119	5/8-2	2T	Y	Y	Y	Y	70 - 100	2.1	Finish nailer
Paslode T125-F18	99	5/8-1 1/4	2T	Y	Y	Y	Y	70 - 100	1.75	Finish nailer
Porter-Cable BN200V12	259	3/4-2	RN	N	Y	Y	Y	70-120	NA	12v batt or compressor
Porter-Cable BN125A	95	5/8-1 1/4	RN	N	Y	Y	Y	70 - 120	2.3	Performance/value:4.5
Porter-Cable BN200A	138	3/4-2	RN	N	Y	Y	Y	70 - 120	2.5	Performance/value:4.5
Senco SLP20	169	5/8-1 5/8	RN	N	N	Y	N	70 - 120	2.3	Oilless
Senco FinishPro 25	200	5/8-2 1/8	RN	N	Y	Y	Y	70 - 120	2.7	Turbo option
Spotnails CB1820	90	3/16 -1 1/4	RN	Y	N	N	N	85 - 100	2.6	
Spotnails DB1825	175	1/2-1 9/16	RN	Y	N	N	N	85 - 100	3.1	
Spotnails GB1832	199	7/8-2	RN	Y	N	N	N	85 - 100	3.3	
Woodtek 832-371	120	5/8-1 1/2	2T	Y	N	N	Y	80 - 100	2.3	
Woodtek 832-378	147	3/4-2	2T	Y	N	N	Y	80 - 100	3.5	
Woodtek 882-371	80	5/8	2T	Y	N	N	Y	80 - 100	2.3	Nailer/stapler
Woodtek 914-547	140	5/8-1 3/16	2T	Y	N	N	Y	55 - 95	3	Nailer/stapler

key

Safety - RN= restrictive nose, 2T=two triggers, Y=yes, N=no,
■= PW Recommends

Accuset Micropinner: In a Class By Itself

For those very fine pieces of woodworking or smaller intricate projects we've had excellent success with the 23-gauge A100MP micro-pinner from Accuset. This small tool allows you to apply mouldings and assemble small pieces with barely a hole showing from the nail. While the length capacity is limited to 1", this should be sufficient for the type of applications this tool was designed for. At around $130 it's not a tool to buy just for the heck of it, but we've found more uses for this finesse tool than expected.

drillpresses

Making holes that are all the same depth and all straight into your work might not sound like a big deal until you try to do that without a drill press. Trust us, you need one.

For most woodworkers, the drill press isn't the most important tool in your shop. But it's a tool you'll miss if you try to go without it. Drill presses excel at drilling consistent holes into your work with very little effort. For many people, drill presses may sit idle for long stretches before being put to use. But with additional attachments, the drill press becomes a mortiser or a spindle sander, increasing its usefulness.

Capacities on drill presses are determined by measuring the distance from the center of the chuck to the post. An 8" benchtop drill press has a 4" throat capacity from the post to the chuck.

Sold as benchtop and floor models, expect a 4" to 8½" capacity on standard benchtop models (which are priced from $80 to almost $1,000, with most around the $180 mark). Standard floor models will range from 6½" to 11" capacity and cost between $195 and $3,700 and average around $400. Both benchtop and floor model radial drill presses have a much larger capacity.

Choosing between a benchtop or floor model drill press is likely to come down to price and throat capacity. Many of the other features are similar among the models. Though benchtop units limit the possible height of the piece being drilled, the height limitation can be worked around by mounting it to a work surface and swinging the head so it extends over the edge of the work surface.

One feature that is standard on most drill presses is the ability to operate at variable speeds by changing the orientation of the drive belts on stepped pulleys. Some models allow speeds to be changed without stopping the machine or moving the belts. This feature is more important than most users realize, as specific speeds will provide better performance from bits. Larger bits perform better at slower speeds, while smaller bits work well at higher speeds. See the chart below to make sure you're getting the most from your drill press tooling.

Closely related to speed is the motor size. It's not important to have a large motor on a drill press. In essence, a drill press does the same type of work an electric drill does, but it is more accurate. A ⅙ hp to ¾ hp is the normal range for benchtops, while floor models will run from ½ hp to 2 hp.

One of the features that allows drill presses to be more accurate than an electric drill is an adjustable depth stop. Employing either a threaded shaft with stop-nuts attached to the quill, or an internal limiter that keeps the handle from turning past a certain spot, the depth stop allows you to drill hole after hole to exactly the same depth. Some drill press models offer both types of depth adjustment. Either will work, though you may find that you have a personal preference.

Now that we've got the bit spinning at the proper speed and to the proper depth, let's take a look at what's holding the wood. The tables that most drill presses are outfitted with are holdovers from when drill presses were crossover tools from the metalworking shops. The tables may be square or round, and if you're lucky they'll offer slots you can use to mount a plywood sub-table. The critical feature on the table is the way it adjusts. Tables move up and down using a simple friction sleeve (mostly found on benchtop units) or a rack-and-pinion system operated by a crank. In either case, if you get the chance to try the machine, make sure the

BIT SPEEDS

BIT TYPE	SOFTWOOD	HARDWOOD
twist		
1/16" - 3/16"	3,000	3,000
1/4" - 3/8"	3,000	1,500
7/16" - 5/8"	1,500	750
11/16" - 1"	750	500
bradpoint		
1/8"	1,800	1,200
1/4"	1,800	1,000
3/8"	1,800	750
1/2"	1,800	750
5/8"	1,800	500
3/4"	1,400	250
7/8"	1,200	250
1"	1,000	250

BIT TYPE	SOFTWOOD	HARDWOOD
pilot-point		
1/8" - 3/16"	3,000	3,000
1/4" - 3/8"	3,000	3,000
1/2"	3,000	1,500
spade		
1/4" - 1/2"	2,000	1,500
5/8" - 1"	1,750	1,500
1 1/8" - 1 1/2"	1,500	1,000
forstner		
1/4" - 3/8"	2,400	700
1/2" - 5/8"	2,400	500
3/4" - 1"	1,500	500
1 1/8" - 1 1/4"	1,000	250
1 3/8" - 2"	500	250

Photo by Al Parrish

table is easy to use and moves smoothly. We recommend a rack-and-pinion system whenever available.

A few words about radial drill presses. By having the drill press head mounted on a sliding post, the throat capacity can reach a maximum of 18", almost twice that of many standard floor models. The adjustable head also allows the press to be used at a number of different angles, adding a variety of applications. Though we've heard deflection concerns with the radial design, our testing hasn't shown any significant problem. We would suggest, though, you make sure the bit is square to the table after rotating the head. Though a little fussier to deal with, a radial drill press can significantly increase your tool's capacity without a lot more expense.

Some available attachments to increase your drill press' abilities include: a drum sander (to use the machine as a spindle sander); or a mortising attachment, which won't be as efficient as a dedicated mortiser, but it'll cost only about $75. **PW**

SHOPPING GUIDELINES

for drill presses

- Post to quill capacity is the most important feature.
- Decide between a floor or benchtop model based on your available space and the capacity you need.
- The easier it is to change the quill speed, the better.
- How easy is it to move and adjust the table? How easy is it to mount a sub-table?
- It might sound like a throwaway feature, but a good light mounted on the machine helps a lot.

PW Recommends

occasional user

- **Grizzly G7945**, Grizzly Industrial got its start selling drill presses, and it's hard to beat them on value. This benchtop radial press has impressive stats and a great price.
- **Grizzly G7946**, The floor model radial machine costs just a few dollars more and, like its little brother, will occasionally save your bacon when you have a tricky hole to make.
- **Grizzly G7943**, If space is a concern and you don't need the capacity of a radial press, check out this small but heavy unit.

serious home woodworker

- **Grizzly G7944**, It's almost impossible to find a new 14" drill press for this price anywhere but at Grizzly. A good machine at an incredible price.
- **Delta 17-965**, This 16½" unit is well made and is found in many pro shops. The price is competitive, too.

advanced woodworker or professional user

- **Grizzly G7948**, This monster 20" drill press has a table-saw-sized motor on back and an enormous table. For this price, you just cannot beat it anywhere.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

MODEL	STREET PRICE	THROAT CAP. (IN.)	CHUCK CAP. (IN.)	QUILL TRAVEL (IN.)	SPINDLE SPEED RPMS	RACK & PINION TABLE	HP	WEIGHT LBS.	COMMENTS
BENCHTOP									
Craftsman 21908	$115	4	1/2	2	620 - 3,100	N	1/3	48	5 speeds
Delta 11-950	100	4	1/2	2	620 - 3,100	N	1/4	49	5 speeds
Grizzly G7942	80	4	1/2	2	620 - 3,100	Y	1/3	50	
Jet JDP-8	180	4	1/2	2	620 - 3,100	N	1/6	42	5 speeds
Tradesman 8050S	100	4	1/2	2	620 - 3,100	N	1/4	50	5 speeds
Woodtek 829785	100	4	1/2	2	620 - 3,100	N	1/4	40	
Shop Fox H2271	110	4 1/4	1/2	1 5/8	620 - 3,100	N	1/3	49	oscillating
Delta 11-980	155	5	1/2	2 1/4	620 - 3,100	Y	1/4	70	5 speeds
Jet JDP-10	210	5	1/2	2 1/2	540 - 3,600	N	1/3	70	5 speeds
Ryobi DP101	100	5	1/2	2 1/4	570 - 3,050	Y	1/4	68	5 speeds
Tradesman 8062S	120	5	1/2	2	620 - 3,100	N	1/4	59	
Craftsman 21912	180	6	1/2	2 3/8	540 - 3,600	Y	2/3	83	fence;5 speeds
Delta 11-990	170	6	1/2	2 3/8	620 - 3,100	Y	1/3	78	5 speeds
Fisch DP2000	230	6	1/2	2 1/2	500 - 3,100	Y	1/2	80	6 speeds
Star S4016	195	6 1/2	5/8	3	195 - 3,500	Y	1/2	95	
Shop Fox H0626	220	6 5/8	5/8	3 1/4	250 - 3,050	Y	3/4	115	oscillating
Grizzly G7943	180	7	5/8	3 1/4	140 - 3,050	Y	3/4	160	12 speeds
Jet JDP-14J	305	7	1/2	3 1/4	195 - 3,630	Y	1/2	132	5 speeds
Jet JDP-14M	360	7	5/8	3 3/8	460 - 2,500	Y	1/2	132	16 speeds
General 34-02	760	7 1/2	1/2	4 1/2	460 - 4,910	N	NA	174	
General 34-02-M1	990	7 1/2	1/2	4 1/2	460 - 4,910	N	3/4	174	
General Int'l 75-100	470	8 1/2	5/8	3 1/4	340 - 2,800	Y	3/4	180	
FLOOR									
Star S4017	$255	6 1/2	5/8	3	195 - 3,500	Y	1/2	125	
Tradesman 8080S	320	6 1/2	5/8	3 3/8	250 - 3,100	Y	1/2	156	12 speeds
Delta 14-070	370	7	5/8	3 3/8	250 - 3,000	Y	1/2	157	12 speeds
Grizzly G7944	200	7	5/8	3 1/4	140-3,050	Y	3/4	172	work light
Jet JDP-14JF	370	7	1/2	3 3/8	200 - 3,630	Y	1/2	156	5 speeds
Jet JDP-14MF	380	7	5/8	3 1/4	460 - 2,500	Y	3/4	167	16 speeds
Yorkcraft YC-19FDP	259	7	5/8	3 5/16	140 - 3,050	Y	3/4	176	work light
Transpower DP16	195	7 1/4	5/8	3 1/2	250 - 3,000	Y	3/4	130	
Craftsman 22915	300	7 1/2	5/8	3 1/8	250 - 3,100	Y	1/2	166	12 speeds
Craftsman 22935	1,250	7 1/2	5/8	4 13/16	300 - 3,300	Y	1	440	
General 34-01	880	7 1/2	1/2	4 1/2	460 - 4,910	N	3/4	196	
General 34-01-M1	760	7 1/2	1/2	4 1/2	460 - 4,910	N	3/4	196	
Powermatic 1150-A	1,650	7 1/2	1/2	6	400 - 5,300	Y	3/4 or 1	323	
Ridgid DP1550	300	7 1/2	5/8	3 3/4	250 - 3,100	Y	1/2	162	2-location handle
Lobo DP-016F	280	8	5/8	3 1/2	240 - 3,800	Y	1/2	135	
Delta 17-900	340	8 1/4	5/8	3 3/8	250 - 3,000	Y	3/4	194	12 speeds
Delta 17-925	870	8 1/4	1/2	6	150 - 3,200	Y	3/4	230	variable speeds
Delta 17-965	390	8 1/4	5/8	4 7/8	215 - 2,720	Y	3/4	195	16 speeds
Jet JDP-17MF	420	8 1/4	5/8	4 3/8	200 - 3,630	Y	3/4	178	16 speeds
Jet JDP-17FSE	310	8 1/4	5/8	3 3/8	200 - 3,000	Y	3/4	168	16 speeds
Woodtek 816-805	379	8 1/4	5/8	3 1/4	250 - 3,000	Y	3/4	165	
Grizzly G7947	375	8 1/2	5/8	4 3/4	210 - 3,300	Y	1	275	work light
Bridgewood BW1758F	300	8 1/2	5/8	3 5/16	250 - 3,900	Y	3/4	150	work light
Craftsman 22917	400	8 1/2	5/8	3 1/4	200 - 3,630	Y	3/4	195	16 speeds
General 75-200	505	8 1/2	5/8	3 1/4	340 - 2,800	Y	3/4	200	
Lobo DP-186F	350	8 1/2	5/8	3 5/16	190 - 2,640	Y	3/4	170	
Powermatic 1170	480	8 1/2	5/8	3 1/4	190 - 3,500	Y	1	180	
Shop Fox G9974	325	8 1/2	5/8	3 1/4	150 - 3,050	Y	1	200	
Tradesman 8106S	430	8 1/2	5/8	3 3/8	250 - 3,600	Y	1	183	16 speeds
Transpower DP17	225	8 1/2	5/8	3 1/2	250 - 3,000	Y	1	178	
Grizzly G9749	1,550	9 5/8	5/8	6 7/16	300 - 3,000	Y	1 1/2	750	
Craftsman 22920	600	10	3/4	4 11/16	150 - 4,200	Y	1	282	work light

key

■ PW recommends

MODEL	STREET PRICE	THROAT CAP. (IN.)	CHUCK CAP. (IN.)	QUILL TRAVEL (IN.)	SPINDLE SPEED RPMS	RACK & PINION TABLE	HP	WEIGHT LBS.	COMMENTS
Grizzly G7948	425	10	5/8	4 3/4	210 - 3,300	Y	1 1/2	312	12 speeds/ light
Grizzly G7108	1,495	10	5/8	6 1/4	300 - 2,000	Y	2	717	variable speed
Powermatic 2000	815	10	5/8	4 1/2	130 - 2,770	Y	1 1/2	328	
Bridgewood BW2501F	500	10 1/4	5/8	4 5/8	150 - 4,200	Y	3/4	258	work light
Grizzly 9746	2,495	10 1/4	5/8	5 1/8	60 - 1,500	Y	1	682	
Jet 20MF	845	10 1/4	3/4	4 3/8	150 - 4,200	Y	1 1/2	288	
Woodtek 816-812	690	10 1/2	5/8	4 13/16	180 - 4,200	Y	1	346	
Grizzly G9747	3,695	10 3/4	5/8	5	60 - 3,000	Y	1 1/2	682	
General Int'l 75-500	880	11	3/4	4 1/2	130 - 2,770	Y	1	340	
Lobo 222F	680	11	1 1/4	4 3/4	190 - 4,300	Y	1	360	
RADIAL									
Tradesman 8090S	180	13	1/2	4	620 - 3,100	N	1/4	62	
Grizzly G7945	150	17	5/8	3 1/4	550 - 3,470	Y	1/2	100	benchtop
Grizzly G7946	180	17	5/8	3 1/4	550 - 3,470	Y	1/2	150	5 speeds
Yorkcraft YC-16RDP	190	17 1/4	5/8	4 5/8	550 - 3,470	Y	1/2	81	5 speeds

Radial drill presses, such as the G7945, give you immense throat capacity and the ability to easily make holes at compound angles. What's the downside? Some people report problems with the head flexing — something we haven't encountered in our shop. Radial drill presses are a little fussier to set up because you need to check the head when you square it to the table to make sure it's actually square.

dustcollectors

Nothing keeps a shop tidy and healthy like an effective dust collection system. Dust collection can be simple or complicated; here's how to get started in your shop.

I began my woodworking career standing in a pile of wood chips at the back end of a 20" planer. So I understand the benefit of dust collection. To keep the mess down, sure, but sucking dust into your lungs is a nuisance and a health risk.

Dust comes in many sizes in a wood shop, and there are collectors and air cleaners to keep your work place safe from plain and toxic dust.

Dust collectors come in a dizzying array of sizes, from the portable single bag, ½ hp models to the commercial models that are larger than some shops. While the smaller ones may have an application in your shop, there are a number of modestly sized units that will fit comfortably into your shop and your budget.

Collection units are of four varieties: the single-stage collector that sucks in big and little chips and drops them in a bag for emptying later; two-stage collectors that suck the chips into a barrel and divert the fine dust into a bag; cyclone collectors that generally do a better job of separating the fine dust from the bigger chips than the other units; and air cleaners that extract fine particles from the air in your shop by cycling the air through a series of filters.

For the majority of woodworkers, a single-stage unit will provide adequate chip collection for a number of machines and still not break the bank.

It takes about 350 cfm (cubic feet per minute) to adequately pull chips away from a table saw. On the higher end, a planer should be matched with between 400 and 500 cfm to keep things clean. If used for only one of these machines, literally every dust collector made could handle the job. So why are some collectors better than others?

Air movement measured in cfm is important, but there are other factors as well. The collector is attached to the machine by a hose. The length and diameter of the hose can reduce efficiency of the collector. If you choose to hook your dust collector to more than one machine and the sections of hose are not kept independent from each other (using blast gates to stop the air flow) the static pressure drops. If you decide to have your dust collector positioned outside of the main shop area, it's quieter, but you've decreased the effectiveness with the extra pipe.

While a great deal of math can be applied to determine the best machine for you, as a rule of thumb, a collector rated for 600 or 700 cfm will be adequate for use on multiple machines — when the machines are used independently and with blast gates. If you need to run two machines at the same time or will be using a central collection system, look for at least 1,200 cfm.

The other key statistic in choosing the right collector for you has nothing to do with the machine itself, it's the bags. Bag efficiency is rated by the size of dust particle trapped in the bag. The least efficient bags trap dust up to 30 microns in size. The best will trap as small as 1 micron. Buy the best you can afford, or plan to buy better bags later.

While we're on the topic of bags, one of the most frustrating experiences in a wood shop is changing the bags on a dust collector. First, it's messy (wear a mask!) and can be

SHOPPING GUIDELINES

for dust collectors

- CFM and static pressure are the two most important statistics.
- If you want one collector to roll around from machine to machine, 600 to 700 cfm is more than adequate.
- For two machines, 1,200 cfm is the best choice.
- The smaller the micron rating on the bags, the less fine dust will escape collection.
- Check the port sizes on your machines before you shop. Reducers and enlargers for ductwork can easily add $50 to your system.

Air cleaners are designed to remove fine dust made by hand-held power tools or dust that's missed by the chip collectors. Some models are designed to hang from the ceiling, such as this JDS unit; others sit on the floor or on a bench.

Photo by Al Parrish

quite awkward. Two-stage units are easier to empty as the barrels effectively function as a self-contained garbage can. But if a single-stage bag is your lot, check out the clamp or restraining system that holds the bag to the collector. Whether a lever, straps or a long screw, take it into consideration or you might curse your decision. Our money's on the quick-release clamp.

I recently added a dust collector to my garage shop. While I've used the units for years, it wasn't until I turned one on in my smaller garage that the importance of ear protection hit home. Check the decibel ratings on the machines. Some dust collectors are less noisy than others, but they're all within the painful decibel range, so plan on wearing ear protection.

Air Cleaners

If you're interested in keeping your lungs as clean as possible, look into an air cleaner. These machines are not connected to tools, but work independently, filtering the smaller dust particles that escape from a dust collector, or from power hand tools that might not be connected to your dust collection system. Air cleaners are also rated by cfm, but some math is required to find the correct unit.

Start with the square footage of your shop. Multiply the square footage by the ceiling height to get the total volume of the room. Then divide that volume by six (an air cleaner should re-circulate the air in your shop every six minutes) and you'll have the proper cfm rating for your shop. **PW**

Bookshelf

For further education on dust collection, read "Controlling Dust in the Workshop" (Sterling Publishing) by Rick Peters. At just $15, it's a must-read for woodworkers who want to stay healthy.

PW Recommends

occasional user

- **Grizzly G8027**, This is about the least expensive single-stage dust collector you'll ever find. We've been using it in our shop for a couple years with it connected to a table saw and have been quite impressed. The G8027 won a Best New Tool of 1999 award from *Popular Woodworking*.

serious home woodworker

- **Penn State DCIB-XL**, Penn State produces an excellent line of dust collectors with nice bags and easy-to-release clamps. When you do the numbers, the DCIB-XL is a great value for the money and a champ in the shop.
- **Grizzly G1029**, This unit costs a little more than the Penn State, but it takes up a lot more space and can handle a lot more chips. Check it out if you run more than one machine at a time.
- **Delta 50-860**, This air cleaner is more rugged than its competitors, in our opinion, and is perfect for the serious home shop.

advanced woodworker or professional user

- **Powermatic 75**, This unit is a common sight in cabinet shops.
- **RBI 869-0014**, Similar to the Powermatic, but it costs a bit less.
- **JDS Air-Tech 750**, We have three of these units in our shop and have been pleased with their reliability and performance.
- **Cyclones**, You also should be looking at cyclone systems from Oneida and Penn State. We haven't tried them in our shop, but plan to this year.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

BRAND & MODEL	STREET PRICE	HP	MAX. CFM	MAX. STATIC PRESSURE (IN. OF WATER)	SAWDUST CAPACITY (CU. FT.)	NO. OF PORTS, PORT DIA. (IN.)	VOLTS	WEIGHT (LB.)	DECIBEL LEVEL	BAG EFFICIENCY (MICRONS)
SINGLE STAGE										
RBI 869-0010	295	1/2	680	4.4	7.4	1, 4	115	75	NA	NA
Shopsmith DC3300	500	1/2	330	NA	4	3, 2 1/2	115	64	NA	NA
Woodmaster 820	295	1/2	680	4.4	NA	1, 4	115/230	50	NA	NA
Jet DC-610	175	3/4	610	6.9	1.8	1, 4	115	64	55-60	30
Tradesman 9992	200	3/4	453	6.5	1.5	1, 4	120	62	NA	NA
Woodtek 911-047	160	3/4	250	NA	20 gal.	1, 4	115	18	70-80	10
Belsaw MC-CT-50S	150	1	700	5.5	2	1, 4	115	46	62-82	30
Belsaw MC-CT-80A	150	1	700	5	2.2	1, 4	115/230	70	52-74	30
Belsaw MC-CT-90C	180	1	700	5.5	2.2	1, 4	115/230	73	62-80	30
Bridgewood BW-015A	160	1	700	5.5	2.4	1, 4	110/220	75	NA	1
Craftsman 29978	300	1	650	8.5	1.5	1, 4	120	72	55-65	30
Delta 50-840	240	1	650	8.5	2.1	1, 4	115/230	57	63-73	30
Grizzly G1028	240	1	1,150	10.3	5.4	1, 4	110/220	115	60-80	30
Grizzly G1163	150	1	450	2.8	2	1, 4	110/220	70	NA	30
Grizzly G8027	130	1	500	2.8	2	1, 4	110	79	NA	30
General 10-010	435	1	750	5.5	20 gal.	1, 4	120	76	52-62	NA
Jet DC-650	210	1	650	7.8	2.7	1, 4	115	84	60-70	30
Jet DC-650 SB	190	1	650	7.8	3.1	1, 4	115	58	55-65	30
Jet DC-TS650 2 Stage	295	1	650	7.8	44 gal.	1, 4	115	38	NA	NA
Lobo DC-1190	200	1	730	8.5	2.5	1, 4	115/230	78	60-70	NA
North State CT-50S	200	1	700	5.5	3.5	2, 4	115/230	80	55-66	15
Penn State DC1B-XL	220	1	850	6.5	3.5	2, 4;1,5	110/220	66	62-82	5
Ridgid DC2000	200	1	650	8.5	2.9	1, 4	120	97	NA	30
Seco UFO-40	200	1	500	5.5	1.5	1, 4	115/230	44	55-65	20
Seco UFO-70	265	1	655	5.5	2.5	1, 4	115/230	66	60-70	20
Seco UFO-70F	280	1	655	5.5	2.5	1, 4	115/230	66	60-70	20
Seco UFO-80	285	1	655	5.5	2.5	1, 4	115/230	66	60-70	20
Seco UFO-90	220	1	655	5.5	2.5	1, 4	110	61	60-70	20
Star S3810	185	1	700	4.5	2.2	1, 4	115/230	70	70-80	35
Star S3811	185	1	700	4.5	1.5	1, 4	115/230	70	70-80	35
Sunhill UFO-90	195	1	610	5.5	2.5	1, 4	110/220	70	55	20
Transpower DC747	175	1	700	6.5	2	1, 4	115	65	NA	NA
Woodtek 802-124	230	1	400	5.5	2.5	2, 4	115	85	74	5
Woodtek 864-367	210	1	380	5.5	3.5	2, 4	115	47	64	5
Delta 50-850	300	1 1/2	1,200	11.4	6	2, 4	115/230	100	69-79	30
Jet DC-1100	300	1 1/2	1,100	11.5	7.4	1, 6; 2, 4	115/230	103	70-80	30
Jet DC-1200FS	425	1 1/2	1,200	10.5	3.5	2,4	115/230	125	70-80	30
Penn State DC2-5	300	1 1/2	1,100	8.5	5.8	2, 4; 1,6	110/220	130	67-87	5
Penn State DC3-5XL	210	1 1/2	850	8.5	1.5	1, 4	110/220	46	62-82	5
Belsaw MC-1DC	280	2	1,059	8.3	5.2	1,5; 2, 4	230	123	67-87	30
Bridgewood BW-002A	270	2	1,059	9.1	5.8	1, 5; 2, 4	110/220	117	NA	1
Delta 50-851	475	2	1,500	13.7	6.5	3, 4	230	175	62-82	30
General 10-110	695	2	1,600	8.3	42 gal.	1,5; 2, 4	240	132	66-77	NA
Grizzly G1029	250	2	1,550	12.3	5.4	2, 4	220	130	65-85	30
Jet DC-1200-1	400	2	1,200	10.5	3.5	1,6; 2, 4	230	143	65-80	30
Jet DC-1200-3	400	2	1,200	11	7.4	1, 6; 2, 4	230	153	65-80	30
Lobo DC-101	360	2	1,290	9.5	5.2	2, 4	115/230	155	65-80	NA
North State UFO-101	295	2	1,182	9.5	5.4	3, 4 & 5	115/230	140	NA	15
Seco UFO-101	290	2	1,182	7.5	5.2	2, 4; 1,5	115/230/460	134	65-80	20
Shop Fox G9975	275	2	1,550	12.3	5.4	2,4	110/220	130		30
Star S3820	275	2	1,182	8.3	5.2	1, 5; 2, 4	230	135	67-87	35
Sunhill UFO-101	325	2	1,182	7.5	5.2	2, 4	110/220	143	69	20
Transpower DC2000	285	2	1,200	6.5	4	2, 4	115/230	143	NA	NA
Woodtek 805-930	400	2	790	8.3	4.4	2, 5	230	123	76	5
Penn State DC250	335	2 1/2	1,350	9.5	5.8	2, 4;1,6	220	145	65-90	5
Belsaw MC-2DC	450	3	1,836	8.7	10	1,6; 3,4	230	150	75-95	30

[stats]

BRAND & MODEL	PRICE	HP	MAX. CFM	MAX. STATIC PRESSURE (IN. OF WATER)	SAWDUST CAPACITY (CU. FT.)	NO. OF PORTS, PORT DIA. (IN.)	VOLTS	WEIGHT (LB.)	DECIBEL LEVEL	BAG EFFICIENCY (MICRONS)
Belsaw MC-CT-201H	450	3	1,836	8.7	10	1,6; 3,4	230	156	75-95	30
Bridgewood BW-003A	495	3	1,836	5.8	13.5	1, 7; 4, 4	220	184	NA	1
Delta 50-852	650	3	2,100	18.1	12.5	4, 4	200/220	200	77-91	30
General 10-210	1,200	3	2,300	8.7	83 gal.	1,6; 3, 4	240	165	75-85	NA
Grizzly G1030	450	3	2,300	16.7	10.8	3, 4	220	170	75-90	30
Jet DC 1900-1	640	3	1,900	10.2	10.7	1,6; 2,4	230	198	NA	NA
Jet DC 1900-3	660	3	1,900	10.2	10.7	1,6; 2,4	230/460	208	NA	NA
Lobo DC-102	540	3	2,600	11.5	10.5	1,6; 3,4	115/230	178	75-90	NA
Lobo DC-103	400	3	1,700	10.5	8.2	1,5; 2, 4	115/230	145	70-85	NA
North State UFO-102B	485	3	1,883	9.5	5.4	4, 5 & 6	230	181	75	15
Penn State DC4-5	500	3	2,300	10.2	11.6	3, 4;1,7	220	200	75-95	5
Powermatic 75	650	3	1,900	8	10.68	1, 8 or 6; 3, 4	230	215	75-90	5
RBI 869-0014	500	3	1,900	9.2	7.4	1, 6	230	110	NA	20
Seco UFO-102B	600	3	1,883	9.1	10.4	1,6; 3, 4	115/230/460	170	70-80	20
Star S3830	475	3	1,850	5.8	10.4	1, 6; 3, 4	230	165	75-95	35
Sunhill UFO-102B	460	3	1,883	9.1	10.5	3, 4	230	181	78	20
Sunhill UFO-103	795	3	2,683	10.4	17.7	4, 4	230	363	NA	20
Transpower DC3000	335	3	1,850	5.6	5.3	3, 4	115/230	178	NA	NA
Transpower DC4000	445	3	1,968	5.8	6.7	4, 4	115/230	250	NA	NA
Woodmaster 1033	500	3	2,688	9.2	*	1, 7	220	140	NA	NA
Woodtek 864-381	490	3	1,180	8.6	8.8	2, 6	230	194	78	5
Grizzly 9958	900	4	3,560	16.8	26	4,4	220	320		30
Bridgewood BW-005A	995	5	3,500	9.7	NA	1, 9; 4,4	220/440	227	NA	NA
General 10-510	1,630	5	5,100	16	144 gal.	4, 4	240	370	78-85	NA
Grizzly G5954	1,000	5	4,820	17	26	4, 4	230	403	NA	1
Lobo DC805	1,490	5	3,800	13	18.7	4, 4	220/440	310	NA	NA
North State	995	5	4,850	17		1,8; 4,4	220/440	380	75	NA

AIR CLEANERS

BRAND & MODEL	PRICE	CFM EFFICIENCY	# FILTERS (LB.)	DUST REMOVAL	WEIGHT	DECIBELS
Craftsman 16995	100	200	2	93% @ 5 micron	14	NA
Craftsman 29972	260	300	2	95% @ 5 mic.	45	NA
Delta 50-860	250	850	2	98% @ 5 mic.	50	45
Delta 50-868	300	1,000	2	98% @ 5 mic.	55	45
Delta 50-870	450	1,900	2	98% @ 5 mic.	85	50
General 10-600 M1	275	1,400	3	98% @ 0.5 mic.	50	64
Grizzly G9954	100	220	1	99.7% @ 5 mic.	15.5	NA
Grizzly G9955	130	400	2	99.7% @ 5 mic.	18.75	NA
Grizzly G5955	180	510	2	98% @ 3 mic.	40	NA
Grizzly G9956	325	1,400	3	99.7% @ 5 mic.	79	NA
JDS Air-Tech 10-16	695	1,000 or 1,600	3	99% @ 5 mic.	92	NA
JDS Air-Tech 750	260	200 to 750	3	99% @ 5 mic.	62	NA
JDS Air-Tech 8-12	495	800 or 1,250	3	99% @ 5 mic.	86	NA
JDS Air-Tech 2400	1,095	2,410	3	99% @ 5 mic.	203	NA
Jet AFS-1000	230	500; 700; 1,044	2	99% @ 5 mic.	54	NA
Jet AFS-1500	330	750; 900; 1,300	3	99% @ 5 mic.	75	NA
Jet AFS-2000	500	800; 1,200; 1,700	3	99% @ 5 mic.	110	NA
Penn State AC465	200	465	2	98% @ 3 mic.	40	65
Penn State AC930	280	930	2	98% @ 3 mic.	51	67
Penn State AC2500-S	1,000	2,500	2	98% @ 3 mic.	130	67
Ridgid AF2000	100	200	2	93% @ 5 mic.	14.5	61
Ridgid AF3000	200	300	2	97% @ 5 mic.	45	63
Woodtek 923-838	200	340	2	98% @ 0.5 mic.	35	55
Woodtek 923-859	250	510	2	98% @ 0.5 mic.	30	55

key

■ PW recommends
NA=not available

handtools

Even if your shop is a burden on the local power grid, you still need chisels, a combination square and a block plane.

Hand tools can be difficult to shop for. For some types of tools, particularly chisels, it's easy to spend way too much money and get mediocre performance. But for other tools (combination squares come to mind) buying cheap can come back to haunt you in the form of ill-fitting joints or cockeyed assemblies. So read on.

We've tested every major brand of chisel, low-angle block plane and decent combination square on the market. We tested the durability of the chisels' edges, the amount of setup needed with a block plane and the accuracy of all the major squares. If you want to buy a set of tools that will last a lifetime — no matter what your budget — you've come to the right place.

Beware the Chisel Snob

Your garden-variety bevel-edge chisel generally bats cleanup in the modern shop. They square the corners of hinge mortises cut with a router, clear out the waste in dovetail pins and pare a tenon for a perfect fit. They can be lightly struck with a mallet, but save the heavy stuff for a mortising or firmer chisel.

What's surprising about bevel-edge chisels is you don't have to spend a lot of money to get a tool with a durable edge. Some of the least expensive chisels, when properly set up, are the most hardy.

The first thing to check is the handle. Find one that feels good and know this: round-handled chisels will roll off your bench.

Next, you want to choose a chisel with a decent blade. The face (the side opposite the cutting bevel) of all chisels must be lapped reasonably flat, especially at the cutting edge. The face can bow one of two ways. If the face bows out in the middle, it is said to be "bellied." Personally, I'd return a chisel that had more than a little belly to it. These take a lot of work to fix, sometimes with a belt sander. If the face bows at the ends, the chisel is said to be "hollow." A hollow face certainly makes it easier to lap the face at the cutting edge. However, too much hollow and you're in trouble; your chisel will want to dig into your work.

Another thing to consider is how hard the blade is. Western chisels are typically hardened to a Rockwell hardness between 58 and 62. This is harder than a scraper or a hand saw, but softer than carbide on a saw blade or router bit.

You would think that harder is always better, but consider this: the harder the blade the more brittle it is. Or, put another way, the blade on a chisel is a trade-off between toughness and sharpness. Softer blades are tougher and withstand abuse without breaking. Harder blades are sharper and more likely to retain an edge during normal use, but they are brittle and more likely to fail under stress.

Our testing examined the chisels for how well they felt in our hands, how easy they were to lap flat and how well the edge endured after chopping dovetail pins in white oak, an admittedly brutal test. The results of the test can be found on the following pages.

Combination Squares: Slightly Expensive is Better

Combination squares were invented in 1877 by Laroy Starrett. The company that bears his name still produces this important tool, and its modern version is the best that money can buy. The combination square can assist you in almost every workshop operation and help you set up every machine. It is a ruler, a try square, a miter square, a scribe (with the scribe tip), a depth gauge and even a level — in a pinch. Purchase a combination square with a protractor and center-finding head and there's little you cannot lay out.

The two most important things to look for in a combination square are the markings on the blade and the accuracy of the head. On cheapo plastic or aluminum models (which we don't recommend) the graduation marks can be as thick as 1/16" and stenciled on or stamped. This makes accurate measurements nigh impossible. Better squares have machine-milled fine graduation marks

Photo by Al Parrish

SHOPPING GUIDELINES for hand tools

- It's easy to spend too much on a chisel. How it feels and how it cuts is what's important. Don't be taken in by a pretty birch handle with a shiny blade.
- For combination squares, accuracy is paramount. Buy a nice square.
- Even inexpensive block planes can be set up well. But they can take a lot of effort to get that way. If you buy an inexpensive plane, buy a nice aftermarket blade some day.

and often include etched gradations for better readability.

We tested each tool to determine if it was square with the standard head, and again with the protractor head set to 90°. To determine the smoothness of operation and reliability, we moved the blade 100 times through the head. We then checked the tool again for squareness.

Low-Angle Block Planes

The type of block plane we prefer in the *Popular Woodworking* shop is a low-angle block plane. With the blade set at 12° to the sole rather than 20°, these planes slice cleanly through figured and dense woods. Though low-angle block planes were designed originally for cutting end grain, they're capable of much more.

Here's what you need to know:

• **Sole flatness:** When you buy any plane, you should flatten the sole so your cuts are more smooth and precise. In general, the more expensive the plane, the less flattening you will have to do.

• **Adjustable throat:** All the planes in our test have an adjustable throat — the throat is the space between the blade and the shoe in front of the blade. This feature is critical to low-angle block planes because a small throat opening can prevent tear-out in tricky woods, and a large throat opening can help you hog off material in a hurry.

• **Lateral adjustment:** This lever allows you to twist the blade left or right a bit to square it up to the throat. Is this a good thing? That depends on you. If you are a meticulous sharpener, and you can grind the edge of the blade square to the sides, then lateral adjustment isn't for you. If you're a little sloppy, lateral adjustment will help you compensate for your less-than-perfect edge.

• **Blade adjustment:** Note how much you have to turn the blade-adjustment knob before the blade moves. Less idle spinning is better. Also, see how much the blade moves with each turn of the knob. We prefer finer adjustment because the difference between a perfect shaving and a torn up piece of wood is a tiny movement of the blade.

• **Blade thickness:** The thicker the blade, the less chatter you'll get. Inexpensive planes have irons that are just over 5/64" thick (.08"). More expensive planes have blades that are about 1/8" (.125") thick. Aftermarket blades, such as those from Hock and Lee Valley, weigh in at a beefy 3/32" (.094") thick. **PW**

PW Recommends

occasional user

- **Starrett combination square**, When you're just starting out, buy just the standard head and the blade.
- **Record 60½ low-angle block plane**, This reasonably priced English-made tool is a good first plane.
- **Stanley 16-180 chisels**, An inexpensive set that's good for small hands.
- **Craftsman 36857 chisels**, These tough chisels feel good in larger hands.
- **Marples Blue Chip chisels**, Inexpensive, tough and versatile chisels that are great for everyone. These are a shop favorite here.

serious home woodworker

- **Starrett C434-12-R**, The center-finding head and protractor head in this set are useful and dead-on accurate.
- **Veritas 05P22.01 block plane**, This is a well-made plane and an excellent design. Perfect for end-grain jobs.
- **Marples Blue Chip chisels**, See our comments above.
- **Ashley Isles chisels**, One of the most comfortable and durable chisels out there today.

advanced woodworker or professional user

- **Starrett C434-12-R**
- **Lie-Nielsen 60½ plane**, Quite simply the best that money can buy, and well worth it.
- **Two Cherries/Hirsch chisels**
- **ECE chisels**
- **Marples Blue Chip chisels**

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

key

* All hardness numbers are on the Rockwell "C" scale. The first number is the hardness of the metal measured 3/4" up from the cutting edge. The second number is the hardness 1 1/2" up from the cutting edge.
** Chisels not sold as set. Price is for 6mm, 12mm, 20mm and 24mm chisels.
† Ratings are on a basis of 1 to 5 with "one" being "unacceptable" and "five" being "outstanding"; W=wood; P=plastic

NOTE: "Turns to move 1/16"" indicates how many full turns of the height adjustment knob were necessary to move the blade forward 1/16". "Height knob slop" indicates how much we needed to turn the height knob before the blade would move either in or out. And "throat/blade variance" indicates how much wider the plane's throat is compared to the blade.

BEVEL-EDGE CHISEL SETS	SET PRICE	NO. OF CHISELS	FIT AND FINISH†	INITIAL FLATNESS†	EASE OF SETUP†	TYPE OF HANDLE	ERGONOMICS	HARDNESS OF BLADE*	NEED TO BE REHONED?
Ashley Isles	$80	6	4.25	4	3	W	4.75	59/58	No
Buck Brothers	15	3	3.5	3	2	P	2.5	59/58	Yes
Craftsman 36857	20	3	2.5	2	2	P	3	56/55	No
Crown/Woodworker's Supply	55	4	4	5	3	W	4	51/48	Yes
E.C.E.**	80	4	3.75	3	3	W	3.25	59/60	No
Footprint	30	4	2.5	4	2	P	3.25	58/59	Soon
Freud WC-104	55	4	3.25	5	3	W	3	59/57	Yes
Garrett Wade 10T15.01	70	6	3.25	2	3	W	3	60/60	Soon
Grizzly G5836	30	4	2.75	4	3	W	3.25	61/60	Yes
Lee Valley Butyrate	40	5	3.75	3	2	P	2.5	59/60	Yes
Lee Valley Wood Handle	40	5	2.75	4	1	W	3.25	61/59	Yes
Marples Butyrate Handle	100	6	3.75	3	4	P	4.25	60/59	Yes
Marples Blue Chip	35	5	3.25	3	4	P	4	60/61	No
Pfeil Swiss Made	150	8	2.5	4	3	W	3.25	60/60	Yes
Sandvik	95	6	4	3	3	W	4	59/60	Yes
Sorby Boxwood	115	4	4.5	2	2	W	3.5	58/59	Soon
Sorby Gilt Edge	160	5	4	4	4	W	4	57/58	Yes
Stanley 16-180	15	3	2.75	4	2	P	2.5	59/59	No
Two Cherries/Hirsch	80	4	3.75	2	2	W	4.25	56/56	No
Woodworker's Supply Hornbeam	35	4	3	4	3	W	2.75	61/59	No

BLOCK PLANES	STREET PRICE	SETUP REQUIRED†	FIT & FINISH†	PERFOR-MANCE†	LATERAL ADJ.	HEIGHT KNOB SLOP	WEIGHT (OZ.)	TURNS TO MOVE 1/16"	BLADE WIDTH/THICK
Bridge City CT-7	$600	4.75	5	4	no	1/2 turn	25.1	2 1/2	1 3/16"/.115"
Lie-Nielsen 60 1/2	$150	4.5	4.75	5	no	1/4 turn	25.4	2 1/4	1 3/8"/.120"
Record 60 1/2	$45	3	3	3	no	1 turn	22.2	2	1 5/8"/.080"
Stanley 60 1/2	$40	2	3	2	yes	2/3 turn	23.2	2 1/4	1 3/8"/.081"
Veritas	$85	3.5	4	4	yes	1/16 turn	28.4	1	1 19/32"/.120"

COMBINATION SQUARES	STREET PRICE	BLADE READABILITY†	FIT & FINISH†	SMOOTH-NESS†	ACCURACY†	SCALE	HEAD MATERIAL	BLADE
Bridge City CS-12	$150	3.5	5	4	5	1/32, .5mm	brass, steel friction pads	NA
General MG-S281-4R	$120	4.25	4.25	4.75	5	1/8, 1/16, 1/32, 1/64	cast iron	hardened & tempered
Grizzly G5726	$30	4.5	3.5	4	4	1/8, 1/16, 1/32, 1/64	cast iron	tempered
Starrett C434-12-R	$140	4.75	5	5	5	1/8, 1/16, 1/32, 1/64	hardened steel or cast iron	hardened & tempered
Woodcraft 14L90	$120	4.5	4.25	4	5	1/8, 1/16, 1/32, 1/64	cast iron	hardened & tempered
Woodworker's Supply	$50	3	2.5	3	4	.5mm, 1mm, 1/32, 1/64	cast iron	tempered

A TOOL IN THE HAND

The Lie-Nielsen 60 1/2 block plane (right) has all the hallmarks of a quality tool that will last a lifetime. The Starrett combination square is one of our favorite tools in our shop here at *Popular Woodworking*.

jigsaws

If you don't have a scroll saw, band saw, circular saw or coping saw, the jigsaw is a great understudy in a pinch.

If you wanted to start woodworking but you had money for only one power hand tool, I'd make it a jigsaw. With a little care, jigsaws can crosscut, rip and cut curves in any size material. No other portable saw can make this claim.

To be fair, the quality of the cut from a jigsaw isn't going to be as flawless as what you'd get from a table saw. But new blade technology has improved cut quality greatly in the last few years.

In the woodshop, jigsaws excel at making cuts that would be impossible on other tools — such as cutting a curve in a large sheet of plywood, or shaping the bracket feet on an assembled cabinet base. If you've ever had to notch out a 1 x 4 to make a window sill, then you know the value of a good jigsaw.

So what makes a good jigsaw? You can spend as little as $50 for a tool that you'll get out once or twice during a project. But if you're a kitchen installer, you should spend at least $150 to get a tool designed for daily use.

Stroke and Amps

Most 4- or 5-amp tools will handle the everyday jobs you throw at it, but if your work includes a steady diet of dense hardwoods, look for a beefier motor. Keep in mind that amperage in itself is an imperfect measure of the tool's output. Some lower-amp tools manage to squeeze more power out of fewer amps through excellent motor design. So factor in the manufacturer's reputation for quality. Also critical to the equation is the tool's "stroke," which is how far the blade moves up and down. The longer the stroke, the more aggressive the cut (and the cut will be cleaner and chips will be removed faster). Bargain jigsaws have a stroke length of 5/8" to 3/4". More expensive models have a stroke of 1" or more.

It's also key to determine if the jigsaw has "orbital action." Orbital action moves the blade slightly forward on the upstroke and slightly back on the down stroke. This makes the saw cut more aggressively, but produces a rougher cut. On better jigsaws, the orbital action is adjustable and can be turned off.

The maximum cuts per minute isn't terribly important. Just make sure the jigsaw has variable speed so you can slow down in thin material or in tight turns.

The Business End

The ease of changing the blade can vary wildly. In the past, jigsaws needed a long screwdriver to release the blade. While that system is still used on some tools, many manufacturers have come up with some sort of quick-change system. Before you buy a tool, try changing the blade. Some machines are quicker than others.

Also pay attention to what sort of blade the jigsaw will accept. A few will take only special blades made by the manufacturer — a frustrating proposition when you're out of blades on a Sunday afternoon.

Others take T-style blades, which are also called Bosch-style or bayonet-style blades. These blades have

SHOPPING GUIDELINES for jigsaws

- The amperage on a jigsaw is not the only measure of its power. Check out the stroke length and how many orbital settings the tool has.
- We prefer barrel grip jigsaws in our shop. We find them more comfortable to hold and easier to steer.
- Many quality jigsaws have a chip blower, which is a big help during cuts.
- Once you've bought your saw, buy an assortment of high-quality blades to go with it. Blades that come with some tools are perfect for crosscutting 2 x 4s and not much else.

Barrel-grip jigsaws are more popular in Europe than in the United States, but they seem to be gaining ground here every year. We find these jigsaws easier to steer because your hand is lower on the tool.

Photo by Al Parrish

tangs on the edges that the blade vise grips.

Universal-style blades are held in place with friction or screws. More and more saws accept both types of blades. But most of these saws hold the blade in with just a friction clamp. It won't be as good a grip as you'll get when the jigsaw clamps down on a T-style blade.

Also key is whether or not the tool has a blade guide. The blade guide can be anything from a grooved bearing to a notched bar of metal that is positioned behind the blade. Its job is to prevent the blade from deflecting to one side in a tough cut. Blade guides are common on all but the less expensive jigsaws, and a few expensive ones.

Body Features

Jigsaws come in three body styles: top handle, barrel grip and in-line. Top handle jigsaws are the norm in this country, though the European-style barrel-grip tools are getting more popular every day, especially among professionals. The in-line jigsaw is like a miniature reciprocating saw, which is great for getting into tight spaces. However, we do not cover these tools in this buying guide.

Also check out the base of the saw to see if it bevels. This allows you to make angle cuts. Make sure the beveling mechanism has detents (or stops) at 0° and 45°. And check out how easy it is to change the angle. Some need a screwdriver, others an allen wrench and the easiest need only the flick of a lever.

Also, some saws come with a piece of plastic you can sleeve over the metal base. These are useful for delicate situations when you don't want to risk scratching the surface you're cutting.

Finally, see if the saw has dust collection, or at least a blower that will clear dust away from your cutting line. Some tools require you to buy an aftermarket accessory to connect the jigsaw to your shop vacuum. Dust collection is a real plus because even though these tools don't throw up a lot of sawdust, there's enough to obscure your cutting line.

Should You Buy Cordless?

In the last few years, manufacturers have started building cordless jigsaws. The models we've tried have more than enough power and features to handle the needs of a kitchen installer or deck builder. But if you use your saw only in your shop, we recommend a corded saw with more features or power. But if you need to work where the power supply is questionable, these are great tools. **PW**

PW Recommends

occasional user

- **Freud FJ85**, Freud's top-of-the line jigsaw has a price that makes it a great entry-level saw. The FJ85 has lots of features found on expensive saws, such as dust collection, a good-sized stroke and orbital action.

serious home woodworker

- **Bosch 1584AVS, 1587AVS**, These two tools are virtually identical except the 1584AVS is a barrel-grip and the 1587AVS is a top-handle tool. These are the tools you're going to find in the toolbox of almost every kitchen installer. Bosch is considered the category leader, and its tools are what others are measured against. Buy one and you'll find out why.
- **Milwaukee 6266-21, 6276-6**, Again, these are basically the same two saws with different body styles. Milwaukee's jigsaws have what we consider to be the easiest blade-changing mechanism on the market today.

advanced woodworker or professional user

The two tools above are also excellent choices for the professional and are common sights in cabinet shops.

- **Metabo STE105 Plus, STEB105 Plus**, Metabo's newer line of jigsaws are rock-solid performers that give Bosch a real run for its money. This tool is a shop favorite.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

BRAND & MODEL	STREET PRICE	BODY TYPE	BLADE MOUNT TYPE	BLADE GUIDE	STROKE LENGTH (IN.)	CUTS PER MINUTE	AMPS	DUST CONTROL	WEIGHT (LB.)
Black & Decker JS200	$35	TH	U	Y	1 1/16	800 - 3,200	3.2	CB	4
Black & Decker JS300K	45	TH	U	Y	1 1/16	800 - 3,200	3.5	CB	4
Black & Decker JS350	50	TH	U*	Y	1 1/16	800 - 3,200	3.7	CB, VP	4
Bosch 1581AVSK	150	TH	T	Y	1	500 - 3,100**	5	CB	5.5
Bosch 1584AVS	155	BG	T*	Y	1	500 - 3,100**	5	CB, Opt.VP	5.5
Bosch 1584AVSK	160	BG	T*	Y	1	500 - 3,100**	5	CB, Opt.VP	5.5
Bosch 1587AVS	155	TH	T*	Y	1	500 - 3,100**	5	CB, Opt.VP	5.5
Bosch 1587AVSK	160	TH	T*	Y	1	500 - 3,100**	5	CB, Opt.VP	5.5
Bosch 1587 AVSP	160	TH	T*	Y	1	500 - 3,100**	5	CB	5.5
Craftsman 17228	80	TH	U	Y	3/4	0 - 3,000**	4	CB, VP	5
Craftsman 17230	30	TH	U	N	5/8	2,600 - 3,000**	3	CB	4
Craftsman 17231	50	TH	U	Y	5/8	0 - 3,000**	3.5	CB, VP	4
Craftsman 17232	70	TH	U	N	5/8	0 - 3,000**	3.5	CB, VP	4.5
DeWalt DW313	100	TH	U	Y	1	3,100**	4.5	-	6.2
DeWalt DW318K	100	TH	U	Y	1	0 - 3,100**	4.5	-	6.2
DeWalt DW321K	150	TH	T, U*	Y	1	500 - 3,100**	5.8	CB	6.4
DeWalt DW323K	165	BG	T,U*	Y	1	500 - 3,100**	5.8	CB	6.4
DeWalt DW933K	210	TH	T,U*	Y	1	2,000**	18v cordless	-	8.1
Fein Aste 638	450	BG	U	N	13/16	1,050 - 2,600	3.9	VP	4.8
Festool PS2E	292	BG	T	Y	1	1,200 - 3,100**	4	CB, VP	4.9
Freud FJ65	65	TH	T, U	Y	3/4	0 - 3,000**	3.2	VP	3.4
Freud FJ85	110	TH	T, U	Y	1	0 - 3,000**	4.8	VP	5.4
Grizzly G8994	60	TH	U	Y	1	0 - 3100**	5	CB	5.5
Hitachi CJ65V2K	180	TH	T,U	Y	1	700 - 3,200**	5.2	CB	5.5
Makita 4304	189	TH	U	Y	1	500 - 3,000**	5.5	-	5.1
Makita 4304T	150	TH	T, U*	Y	1	500 - 3,000**	5.5	CB	5.1
Makita 4305T	180	BG	T, U*	Y	1	500 - 3,000**	5.5	CB	5.1
Makita 4323	60	TH	U	Y	1 1/16	500 - 3,100**	3.7	VP	4
Makita 4324	109	TH	U	Y	1 1/16	500 - 3,100**	3.7	VP	4
Makita 4300DW	70	TH	Special	Y	9/16	2,700	9.6v cordless	NA	3.3
Makita 4331DWD	280	TH	T, U	Y	1	0-2,800	12v cordless	NA	5.7
Makita 4333DWD	290	TH	T, U	Y	1	0 - 2,800	14v cordless	NA	5.7
Makita 4334DWD	290	TH	T, U	Y	1	500 - 2,800	18v cordless	NA	7.3
Metabo STE70	135	TH	T, U	Y	3/4	1,000 - 3,000**	4.8	CB	4.9
Metabo STE105Plus	190	BG	T, U*	Y	1	1,000 - 3,000**	6	CB, VP	5.7
Metabo STEB105Plus	190	TH	T,U*	Y	1	1,000 - 3,000**	6	CB, VP	6.2
Milwaukee 6256-6	150	TH	U	Y	1	0 - 3,100	3.8	CB	5.8
Milwaukee 6266-21	150	TH	T*	Y	1	450 - 3,100**	5.7	CB, VP	5.3
Milwaukee 6267-21	300	BG	T*	Y	1	1,700**	12v cordless	VP	5.8
Milwaukee 6276-6	200	BG	T*	Y	1	450 - 3,100**	5.7	CB, VP	5.3
Porter-Cable 548	295	TH	U	N	7/16	0 - 4,500**	3.5	-	6.5
Porter-Cable 9543	160	TH	T*	Y	1	500 - 3,100**	6	CB, VP	6.5
Porter-Cable 97549	145	TH	U	Y	1	500 - 3,200**	4.8	CB	6.5
Porter-Cable 643	250	TH	U	Y	1	0 - 2,200	19.2v cordless	CB, VP	NA
Skil 4240	25	TH	T, U	Y	5/8	3,250	3.3	CB	3.6
Skil 4280	30	TH	T, U	Y	5/8	800 - 3,250	3.5	CB	3.7
Skil 4380	40	TH	T, U	Y	5/8	800 - 3,250	3.7	CB	3.7
Skil 4340	45	TH	U	Y	5/8	800 - 3,200	4	CB, VP	4
Skil 4445	45	TH	U*	Y	5/8	800 - 3,200**	4	CB, VP	4
Skil 4470	60	TH	U*	N	5/8	800 - 3,200**	4	CB, VP	4.1
Skil 4470-44	60	TH	U*	N	5/8	800 - 3,200**	4	CB, VP	4.1

key

c=chip blower, VP=vacuum port
* Toolless blade changing.
** Has orbital action
NA, not available
■ = PW Recommends

jointers

Some people say you don't need a jointer. Don't believe them. A jointer will ensure all your stock is square and true, the first step to tight joints and square projects.

If your woodworking involves solid lumber, you need a jointer. Don't let anyone tell you different. As lumber becomes harder to find in widths greater than 6", your woodworking will continue to require more glued-up panels. To make these correctly you need a jointer.

Need more proof? A jointer will pay for itself because you'll be able to buy rough-sawn lumber at a discount and surface it yourself. Even if you do buy expensive surfaced lumber you still need a jointer. Surfaced lumber can be as cupped, twisted or bowed as rough stuff. Add to all this the fact that the jointer can cut rabbets, tapers, bevels and chamfers and a jointer becomes a necessity.

Jointers can be divided into three categories: benchtop models, 6" and 8" floor models and floor models that are 12" and wider. The size is the width of the cutterhead. We consider benchtop models to be too limited in performance, and 12" models are a luxury. Anything wider than 8" is for commercial shops.

Benchtop Jointers

Benchtop jointers frequently use universal motors, making them somewhat underpowered for the task. The fences and tables are shorter than on floor models, making accuracy more difficult. In short, we find them limited in application. If space is driving you to a benchtop, buy a 6" model and build outfeed and infeed tables. If it's a money thing, save your pennies to buy a floor model.

There are situations where a smaller benchtop jointer is appropriate. If your woodworking involves smaller pieces such as jewelry boxes, humidors or intarsia, a benchtop jointer can adequately do the job for under $300.

Floor Model Jointers

For the great majority of woodworkers we recommend a floor model jointer. Six-inch-width jointers are the most popular machine, providing reasonable capacity and price. If you have the means to purchase an 8" machine, we highly recommend it. The greater width can be a real advantage, allowing you to use wider lumber. Plus the bigger machines have longer tables.

Six-inch jointers are available with either an open-frame base or an enclosed cabinet. The open frame will usually save you a few bucks, but the enclosed base offers superior dust collection and a more stable machine. Costing between $325 and $750, the 6" models offer ¾ or 1 hp motors and bed lengths ranging from 42" to 66".

Eight-inch jointers all include enclosed bases and cost between $675 and $2,400. Bed lengths range from 64" to 86", while motor sizes fall between 1½ and 2 hp.

The Case for Handwheels

One critical feature on jointers is how you adjust the infeed table, which determines the depth of cut. Most every jointer uses either levers or hand wheels. Hand wheels are a more precise method, allowing the user to expect that a half-turn on the wheel will increase the depth of cut by 1/64". Levers are more subjective but are faster and can provide smoother adjustment on heavier infeed tables. Some personal preference is involved in choosing an adjustment mechanism. Many woodworkers don't consider the accuracy of depth of cut on a jointer very important. The idea is to put a straight edge or flat face on the board. Sizing the board is the responsibility of a planer or table saw.

Knives: More is Better

Jointer cutterheads have two, three or four knives, depending primarily on the width of the machine. Generally, the more knives, the smoother the cut. Having more knives increases the life span between sharpenings and pretty much makes it easier to put a nice surface on the board. The rpms involved will also affect the smoothness of cut (the higher the rpms, the smoother the cut).

Benchtop models are the only

Photo by Al Parrish

SHOPPING GUIDELINES for jointers

- Buy at least a 6" machine; an 8" is the better choice.
- Longer beds handle longer boards. Get the longest you can afford.
- Make sure the fence is true. If it's not, return it.
- Look for jackscrew adjustments for the knives. This will save time and effort.
- The more knives, the better the cut.

machines with two knives in the cutterhead. All 6" jointers have three knives, while 8" and 12" jointers may have three or four knives. Except in rare situations, all jointers are shipped with high speed steel knives. Many woodworkers think these knives provide the best edge, but many commercial shops replace the knives with more expensive carbide knives, increasing the time between sharpenings and the ability to joint plywood edges.

Knife Setting a Pain

Setting jointer knives is one of the least loved woodworking tasks — second only to setting longer planer knives. The way those knives are set can make the job easier or harder. Setting can be done with either a magnetic knife-setting jig (using a magnet to lift the knife out of the cutterhead to the proper height), or jackscrew adjustment (lifting the knives to proper height by adjusting a set of jackscrews under the blade).We find both methods to be accurate.

Fence: Check for Twist

In addition to the tables on a jointer, the fence is another place where accuracy comes into play. The longer the fence, the better. More importantly, the flatter the better. We've seen a variety of jointer fences that either bow, dip or twist. This can throw off every joint you make. Whenever possible, check the fence for flatness before buying, but if that's not possible, make it the first thing you check when it arrives. If it's not flat, send it back.

Make sure it's easy to move the fence, either to adjust the amount of blade that's exposed, or to change the angle of the fence. Fences can be adjusted by loosening the locking handle and sliding the fence back and forth, or by adjusting a rack-and-pinion mechanism. The rack-and-pinion system is fairly new, but it's worth looking for. It makes it easier to adjust the fence accurately and with less effort. **PW**

PW Recommends

occasional user

- **Grizzly G1182 or 1182HW**, Do yourself a favor and forget about buying a benchtop jointer. For a couple dollars more you can have a real cast-iron machine from Grizzly. We prefer the 1182HW, which uses handwheels instead of a lever to adjust the infeed bed, but both are outstanding machines.

serious home woodworker

- **Jet JJ-6CSX**, This 6" jointer has proven itself a worker with its beefy 1 hp motor.
- **Delta 37-195**, The rack-and-pinion fence and easily accessible switch make this 6" jointer a pleasure to use.
- **Delta 37-380**, This 8" jointer also has a rack-and-pinion fence. The switch is also conveniently located above the infeed bed.
- **Jet JJ-8CS**, Jet's 8" jointer has a magnetic switch, handwheel adjustment and nice long cast iron tables.
- **Grizzly G1018**, You can save several hundred dollars by taking a look at the Grizzly G1018 8" jointer. It has a lot of features you'll find on the big boy's machines.

advanced woodworker or professional user

- **Powermatic 60**, This 8" jointer is the machine to beat and is a common sight in professional cabinet shops. Sure, it's expensive, but the reliability and accuracy of this machine prevents anyone from complaining.
- **Bridgewood BW-12JD**, This cast-iron 12" monster has been in use in our shop for a couple years now and has proven itself an accurate and durable machine. Once you use a 12" machine, you'll never want to go back.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

MODEL	PRICE	WIDTH X LENGTH (IN.)	# OF KNIVES X RPM	HP	VOLTS	TYPE OF HEIGHT ADJ.	DUST PORT	WEIGHT (LB)	COMMENTS & FEATURES
BENCHTOP									
Star S3100	$250	5 x 31 1/4	3 x 5,000	1/2	115/220	K	Y	110	
Craftsman 21768	250	6 1/8 x 28 1/2	2 x 8,000	1 1/2	115	K	Y	52	
Delta 37-070	260	6 3/16 x 30	2 x 6k-11k	10 amp	120	K	Y	35	

MODEL	PRICE	WIDTH X LENGTH (IN.)	#/KNIVES X RPM	HP	VOLTS	TYPE OF HEIGHT ADJ.	DUST PORT	JACK SCREWS	WEIGHT (LB)	COMMENTS & FEATURES
FLOOR										
Bridgewood BW-6R	$400	6 x 45 1/2	3 x 4,500	1	110/220	W	Y	Y	210	enclosed stand
Delta 37-190	450	6 x 46	3 x 4,800	3/4	115/230	L	Y	Y	210	open stand
General 80-100 LM 1	620	6 x 56	3 x 4,800	1	115/230	W	Y	Y	275	
Grizzly G1182	325	6 x 47	3 x 5,000	1	110/220	L	OPT	Y	215	
Grizzly G1182HW	325	6 x 47	3 x 5,000	1	110/220	W	OPT	Y	215	
Grizzly G1182Z	395	6 x 47	3 x 5,000	1	110/220	L	Y	Y	225	
Grizzly G1182ZX	475	6 x 47	3 x 5,000	1	110/220	L	Y	Y	235	R&P fence, top switch
Jet JJ-6CSX	500	6 x 46	3 x 4,800	1	115/230	W	Y	Y	258	
Jet JJ-60S	410	6 x 46	3 x 4,850	3/4	115/230	W	Y	Y	192	
Lobo JT-2206	370	6 x 42 1/2	3 x 5,000	1	115/230	W	Y	NA	194	
North State	395	6 x 42	3 x 5,000	1	110/220	W	Y	N	250	
Powermatic 54A	750	6 x 66	3 x 4,500	1	115/230	L/W	Y	Y	287	quick & fine adjust
Star WJ6	395	6 x 43	3 x 4,600	3/4	115	NA	NA	NA	218	open stand
Tradesman 8202A	350	6 x 42	3 x 4,000	1	115/230	W	OPT	Y	169	
Woodtek 924-028	400	6 x 46	3 x 3,450	3/4	115/230	L	Y	Y	210	
Craftsman 21706	380	6 1/8 x 46	3 x 5,000	1	115/230	W/L	Y	Y	230	
Delta 37-195	550	6 1/8 x 46	3 x 4,800	1	115/230	L	Y	Y	225	R & P fence
Ridgid JP0610	450	6 1/8 x 45	3 x 5,000	1	115/230	W	Y	Y	208	dual bevel fence
Sunhill CT-60L	425	7 x 52	3 x 4,500	1	110/220	W	Y	NA	220	
Transpower JT700	325	7 x 46	3 x 4,500	1	115	W	Y	NA	170	
Seco SK-0006JT	495	7 1/4 x 45	3 x 5,000	1	220	W	Y	NA	185	
Bridgewood BW-8J	895	8 x 66	4 x 4,500	1 1/2	110/220	W	Y	Y	412	USA motor
Craftsman 20651N	1,350	8 x 86	3 x 3,450	1 1/2	230	W	Y	NA	476	
Delta 37-380	1,100	8 x 72	3 x 5,600	1 1/2	115/230	L	Y	Y	414	R & P fence
Delta DJ-20 37-350A	1,500	8 x 76 1/2	3 x 5,500	1 1/2	115/230	L	Y	Y	480	
General 80-200 M1	1,305	8 x 66 1/2	3 x 5,000	1 1/2	230	W	Y	Y	515	
General 480-1-MI	2,420	8 x 64	3 x 4,500	1 1/2	230	W	Y	Y	440	
General 80-200 HC M1	2,035	8 x 66 1/2	hel. x 4,500	1 1/2	230	W	Y	Y	515	Helical cutterhead
Grizzly G1018	695	8 x 65	3 x 5,000	1 1/2	230	L	Y	Y	450	
Jet JJ-8CS	1,250	8 x 66 1/2	3 x 5,500	2	230	W	Y	Y	398	
North State CT 200	795	8 x 68	3 x 4,500	2	115/230	NA	Y	NA	500	magnetic controls
Powermatic 60	1,900	8 x 72	3 x 7,000	1 1/2	115/230	L/W	Y	Y	584	quick & fine adjust
Seco SK-0008JT	1,000	8 x 66	4 x 4,500	2	220	W	Y	NA	400	
Star WJ8	650	8 x 66	3 x 4,500	1 1/2	220	NA	Y	Y	430	
Sunhill CT-204L	885	8 x 72	4 x 4,500	2	220	NA	NA	NA	510	
Transpower JT980	735	8 x 67	4 x 4,500	2	220	W	Y	NA	430	
Woodtek 907-064	760	8 x 67	3 x 4,500	1 1/2	115/230	W	Y	NA	445	
Grizzly G9859	1,895	8 1/2 x 73 3/8	3 x 5,900	3	220	W	Y	Y	900	single phase
Lobo JT-1008	770	8 1/2 x 66	3 x 5,200	2	230	W	OPT	NA	400	
Bridgewood BW-12JD	2,995	12 x 79	4 x 5,000	3 or 5	220	W	Y	Y	980	jackscrews, USA motor
Delta DJ-30 37-360	3,800	12 x 84	3 x 5,000	3	230/460	L	Y	Y	706	
General 80-300	3,700	12 x 80	3 x 5,000	3	230	W	Y	Y	1,080	
Grizzly G4178	1,995	12 x 76	3 x 5,200	2	220	W	OPT	Y	840	Rack & pinion fence.
Lobo JT-0012	2,490	12 x 72	3 x 5,250	3	230	W	Y	NA	836	
North State CCA512	2,475	12 x 87	3 x 5,200	3	230	W	Y	NA	1,450	
Powermatic 1285	4,900	12 x 84	3 x 5,000	3	230	W	Y	Y	880	
Seco SK-512JT	2,494	12 x 74	3 x 5,200	3	220	W	Y	NA	1,060	
Sunhill J-127L	2,950	12 x 84	3 x 4,500	3	230	L	Y	NA	900	
Grizzly G9860	2,495	12 1/2 x 80	3 x 5,900	3	220	W	Y	Y	1,080	single phase

key

Type of height adjustment: K=knob, W=wheel, L=lever, L/W=both lever and wheel; NA=not available

■=PW Recommends

mitersaws

Contractors call them 'chop saws' — an unfair name for this accurate and versatile tool.

Unlike many kinds of tools, you can find the same miter saw in a carpenter's truck, a trim carpenter's van and the assembly area of a high-end cabinetshop. Miter saws are capable of everything from rough crosscutting to shaving airtight miters. It's all in how you set up and use the tool.

For woodworking, you can tune up the saw's fence and equip your saw with extra wings and adjustable stops and you'll have a tool that's capable of great accuracy and repeatability.

If you're in the market for a miter saw, there's a lot to consider. These tools are priced anywhere from about $100 to $700 — about the price of a decent table saw. It's easy to buy too little or too much tool in this category. To make sure you don't buy the wrong saw, you've got match the tool to the task. The first step is to choose from the three major types of saws.

• **Standard miter saws.** These saws make crosscuts and miters anywhere between 45° (or more) and 0° to the left and right. These saws are available with a blade between 8¼" and 15" in diameter. Most woodworkers need to bevel the blade for compound miters occasionally, so these saws are usually not versatile enough for woodworking.

• **Compound miter saws.** For a few bucks more, buy a saw that makes crosscuts and miters — plus the head bevels to 45° or more to the left, right or in both directions. The bevel feature is great for cutting compound miters, like those needed for crown moulding or undercutting miters for a super-tight fit. These saws are available with a blade between 8¼" and 12" in diameter. The 10" saws will cut 6 x material (a little less than 6"). The 12" saws cut 8 x stock (or usually about 8").

• **Sliding compound miter saws.** At the top of the heap is this saw, which has the saw head mounted on a sliding carriage. This allows you to crosscut and miter boards up to 12" wide on many models. These saws are available with a blade between 7½" and 12" in diameter. All of the sliding models cut both miters and bevels.

The key here is to buy as much cutting capacity as you possibly can. If you purchase a 10" compound saw, you are probably going to be a little miffed the first time you want to crosscut a 7"-wide board. And if you buy a 10" saw first, then upgrade later to a 12", you will have spent enough money to buy a sliding compound miter saw.

SHOPPING GUIDELINES

for miter saws

- Buy the saw in your price range that can cut the widest board.
- Are you a woodworker? Then don't buy a saw without a carbide blade.
- Saws that can miter past 45° are preferable to those that don't. Also, saws that bevel past 45° are better, too.
- Don't sweat the motor; all the saws we've tested are powerful enough.
- Compound saws are preferable to straight miter saws.

Sliding compound miter saws (far left) offer amazing cut capacities in a small package but at a big price. Straight miter saws are a bare-bones bargain, but their heads cannot bevel.

Miter and Bevel Range

All miter saws swing 45° to the left and right, but some go a couple degrees further. We like these machines because they help you fine-tune your miters — especially when you're working in a corner or on a case that isn't square.

You also want your saw to lock in at common miter settings, such as 0°, 22½° and 45°. These stops, called

Photo by Al Parrish

detents, make life a lot easier. When you buy a compound miter saw, it will tilt right at least 45°. Some better saws also tilt to the left. Make sure it's easy to lock and unlock the bevel and that there's a stop at 0°.

Motor is Mostly a Non-issue

We have yet to run into a universal motor on a miter saw that was significantly underpowered. Some are particularly noisy, and some make it easy to change the brushes. But other than that, don't be too concerned about the amperage or horsepower. The longevity of the motor is important, of course, but also is impossible to judge in the store. When in doubt, stick with a name you trust.

You Need a Carbide Blade

Some entry-level saws come equipped with high-speed steel blades. These are OK for framing a house, but not for framing a picture. If the saw doesn't come with a carbide blade, factor in how much you're going to have to spend to buy one. We recommend a crosscut blade with either a 0° or -5° hook to the teeth. This will make a cleaner cut.

Dust Collection or Dispersion

With a few exceptions, these tools seem designed to spray dust everywhere except in the dust bag. Hook yours to a portable vacuum.

Extras Add Up

Sometimes the details make one brand more favorable than another. Extension wings are useful, as is a movable accessory fence for crown moulding cuts. (Always move this out of the way when bevel cutting.) Also check out the handle you pull to make the cut. A horizontal handle is more comfortable than a vertical one. And does the tool have motor brushes that are easily accessible from the outside of the tool? That's a sign the tool is designed for long life. **PW**

PW Recommends

occasional user

- **Delta 36-225**, A great beginner saw with enough power and features for most woodworking.
- **Hitachi C10FC2 and CB**, Another solid choice for beginners. Hitachi has an excellent reputation for making accurate miter saws.
- **Craftsman 24315**, Uses a laser to help guide your cut that works quite well.

serious home woodworker

- **Bosch 3912**, This 12" tool is accurate, durable and is great for cutting crown moulding.
- **DeWalt 705s**, This is a favorite saw among trim carpenters, but it's also a great choice for woodworkers.

advanced woodworker or professional user

- **Makita LS1013**, We can't recommend this tool enough. It's won every award this magazine gives out and has earned a permanent place in our shop because it's tough and accurate.
- **Hitachi C8FB2**, Among trim carpenters, this is considered the saw to beat. We really like it, but the smaller blade is an occasional annoyance when you want to cut thicker stuff.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

MODEL	PRICE	BLADE DIA. (IN.)	MAX CROSSCUT T X W (IN.)	MITER RANGE (L, R)	BEVEL RANGE (R, L)	DEPTH STOP	AMPS	DUST COLLECTION	WEIGHT (LBS)	COMMENTS
STRAIGHT MITER										
Tradesman 8325	170	8 1/4	2 1/8 x 5 1/4	45, 60	N/A	Y	9	DB/VP	28	
Black & Decker BT1000	150	10	2 x 6	47, 47	N/A	N	15	VP	28	
Craftsman 21240	140	10	2 5/8 x 5 3/4	45, 45	N/A	Y	13	DB/VP	31	
Delta 36-070	115	10	2 1/4 x 5 3/4	48, 50	N/A	N	13	DB/VP	28	5 miter stops
Hitachi C10FM	170	10	3 1/8 x 4 1/4	47, 47	N/A	Y	13	DB/VP	27	9 miter stops
Makita LS1030N	180	10	2 3/4 x 5 1/8	45, 52	N/A	N	15	DB/VP	24	9 miter stops
Milwaukee 6490-6	285	10	2 1/2 x 5 9/16	51, 59	N/A	Y	15	DB/VP	32	steel blade
Ryobi TS1301DX	100	10	3 9/16 x 5 9/16	46, 46	N/A	Y	14	DB/VP	34	electric brake
Makita LS1440	750	14	4 3/4 x 6	45, 45	N/A	N	12	DB/VP	66	
Hitachi C15FB	645	15	4 3/4 x 7 9/32	52, 52	N/A	Y	15	DB/VP	55	table extensions
COMPOUND										
Craftsman 21218	$300	8 1/4	2 x 6	45, 45	0,45	N	-	DB/VP	21	18v cordless
Delta 36-040	140	8 1/4	2 1/8 x 5 1/8	47, 47	N/A	N	9	DB/VP	16	9 miter stops
Black & Decker BT1500	200	10	2 x 6	47,47	-2, 47	N	15	DB/VP	30	
Craftsman 21211	200	10	2 5/8 x 5 1/2	45, 45	0,45	Y	15	VP	37	mlti-pos. handle
Craftsman 21213	220	10	2 5/8 x 5 3/4	45, 45	45, 0	Y	15	VP	34	sliding fence
Craftsman 24315	200	10	2 5/8 x 5 3/4	45, 45	45, 0	Y	15	VP	34	laser guided
Delta 36-075	180	10	2 3/8 x 5 3/4	47, 47	48, -3	N	13	DB/VP	28	5 miter stops
Delta 36-225	185	10	2 3/4 x 5 5/8	47, 47	48, 3	N	15	DB/VP	33	table extensions
DeWalt DW703	230	10	2 1/2 x 6	50,50	0,48	N	15	DB/VP	33	11 miter stops
Hitachi C10FC2	240	10	2 5/8 x 5 3/4	60, 45	45, 0	Y	15	DB/VP	32	10 miter stops
Hitachi C10FCB	240	10	2 5/8 x 5 3/4	60, 45	45, 0	Y	15	DB/VP	32	pivoting fence
Hitachi C10FCD	285	10	2 27/32 x 5 5/8	45, 45	45, 45	Y	13	DB	33	10 miter stops
Makita LS1040	250	10	2 3/4 x 5 1/8	45, 52	45, 0	N	15	DB/VP	24	pivoting fence
Makita LS1045	320	10	2 3/4 x 5 1/8	45,52	45,0	N	15	DB/VP	42	
Milwaukee 6494-6	330	10	2 1/2 x 5 9/16	51, 59	50, 3	Y	15	DB/VP	38	tall flip fence
Ridgid MS1050	190	10	2 5/8 x 5 5/8	48, 48	-3,48	Y	15	DB/VP	34	"D" handle
Tradesman 8328	215	10	2 5/8 x 5 3/4	45, 45	45, 0	Y	12	DB	34	
Bosch 3912	300	12	3 7/8 x 7 5/8	52, 50	47, -3	Y	15	DB/VP	43	sliding fence
Craftsman 21222	360	12	5 7/8 x 7 7/8	45, 45	45, 0	Y	15	DB/VP	51	table extensions
Delta 36-225	300	12	3 7/8 x 6	48, 48	48, 3	N	15	DB/VP	50	sliding fence
DeWalt DW705S	300	12	2 1/2 x 7 7/8	48, 48	0, 48	N	15	DB/VP	40	tall sliding fence
DeWalt DW706	450	12	2 1/2 x 7 7/8	50, 50	48, 48	N	15	DB/VP	44	double bevel
Makita LS1220	330	12	3 7/8 x 6	48, 48	45, 0	N	15	DB/VP	38	soft start
Porter-Cable 3802	300	12	2 1/2 x 8	48, 48	47, 2	N	15	DB/VP	63	
Ridgid MS1250	300	12	2 x 8	48, 48	0, 48	Y	15	DB/VP	57	
Tradesman 8338	340	12	3 7/8 x 5 7/8	45, 45	34, 45	Y	15	DB/VP	58	
SLIDING COMPOUND										
Makita LS0711Z	420	7 1/2	2 x 7 1/8	47, 57	45, 0	Y	10	DB/VP	23	
Makita LS711DWBEK	370	7 1/2	2 x 7 1/8	47, 57	45, 0	Y	18V	DB/VP	23	cordless
Craftsman 21294	450	8 1/2	2 5/8 x 12	45, 60	45, 0	Y	10	DB/VP	44	2 dust ports
Freud TR215	270	8 1/2	2 3/4 x 11 3/4	45, 45	45, 0	N	9.7	DB/VP	37	dual pole
Hitachi C8FB2	530	8 1/2	2 9/16 x 12	45, 57	47, 0	Y	9.5	DB/VP	39	3 bevel stops
Tradesman 8336	380	8 1/2	2 9/16 x 12	45, 60	45, 0	Y	10	DB/VP	50	
Bosch 3915	505	10	3 1/2 x 12	52, 62	47, -2	Y	13	DB/VP	47	table extension
Delta 36-240	430	10	3 5/8 x 11 1/2	57, 47	45, 0	Y	15	DB/VP	51	work clamp
Delta 36-250	480	10	3 5/8 x 11 1/2	57, 47	45, 0	Y	15	DB/VP	56	folding stand
Hitachi C10FS	620	10	3 17/32 x 12 9/32	45, 57	45, 45	Y	12	DB/VP	44	soft start
Makita LS1011	450	10	2 5/16 x 12	45, 57	45, 0	Y	12	DB/VP	35	single pole
Makita LS1013	530	10	3 5/8 x 12	47, 52	45, 45	Y	13	DB/VP	47	dual pole
Milwaukee 6496-6K	590	10	3 7/16 x 12 3/8	51, 59	48, 3	Y	15	DB/VP	52	dual pole
Milwaukee 6497-6	605	10	3 7/16 x 12 3/8	51, 59	48, 3	Y	15	DB/VP	56	table extensions;
Porter-Cable 3807	480	10	3 5/8 x 11 1/2	57, 47	45, 0	Y	15	DB/VP	57	dual pole
DeWalt DW708	600	12	2 1/2 x 12	50, 60	48, 48	Y	13	VP	57	tall sliding fences
Craftsman 21292	590	12	4 x 12 5/8			Y	15	DB/VP	92	2 dust ports
Makita LS1212	800	12	3 7/8 x 12 1/4	47, 60	45, 45	Y	15	DB/VP	48	dual pole

key

N/A= not applicable.
DB = dust bag,
VP = vacuum port,
DB/VP = both.
■=PW Recommends

mortisers

Take great care when buying this machine; it's easy to get stuck with a tool that can't hack it.

It just makes sense that as Arts & Crafts furniture has become a popular style again, mortisers have become a hot tool. In the last 12 months, five manufacturers have introduced new benchtop mortisers designed for the home woodworker.

And while that sounds like good news if you're thinking of buying a machine, it's not entirely. Some of these new machines have more features but aren't as gutsy as the ones that have been on the market for years. The bottom line is you've got to do your homework when you buy a mortiser, or you might end up with a machine that's frustrating to use in tough woods, such as oak and maple.

Motor Speed: The Big Difference

In the last few years, manufacturers have been introducing mortisers that spin at 1,720 rpm, which is half the speed of the older machines, which turn at 3,450 rpm. Slow-speed machines are supposed to keep the chisel and bit cooler, reduce smoking and run quieter. We've tested every benchtop machine on the market and what we found is surprising.

- **Smoking:** Slower-speed machines are supposed to smoke less as the chisel and bit plunge into the wood. In tough woods especially the tremendous friction caused by the combination of the cutting and the chips passing up the flutes of the auger bit inside the hollow chisel causes the chips to scorch. We found that slow-speed machines reduce, but do not eliminate, smoking.
- **Stalling:** Here's the big difference: slow-speed machines were likely to stall in tough cuts. With the slow-speed machines, some performed better than others. We stalled the Jet only once during our test. But the Craftsman machine stalled more than a dozen times in each 1¼"-deep by 10"-long mortise we cut during testing. We couldn't stall a fast machine, even when we tried our darndest.

Slow-speed machines are more likely to stall for a variety of reasons. For one, slow machines cut bigger chips because they aren't turning as fast. Bigger chips are more likely to get caught between the chisel and bit. There also are other explanations that engineers could give you.

One important note: not all slow-speed motors are weak. The burly 1 hp motor on the Powermatic floor model mortiser 719A turns at a slow speed. But because the motor is so much bigger, it does not stall. It was some of the ½ hp motors on the benchtop machines that gave us trouble.

- **Temperature:** Slow-speed machines are supposed to reduce the amount of heat in the chisels compared to fast-speed machines, so your tooling will stay sharp longer. Fast-speed mortisers heated up the chisel to an average of 237° after one 10"-long mortise. The slow-speed machines' chisels averaged 209° after the same amount of work. Heat is the enemy of a sharp edge, so you probably will be caring more for your chisels or replacing them if you own a fast-speed machine.
- **Working time:** Fast-speed machines will speed your work. It took us about a minute and 15 seconds to cut a 10"-long mortise using a fast-speed machine. When using the slow-speed Jet, the beefiest slow-speed machine, that same mortise took 2 minutes and 9 seconds. Other slow speed-machines that would occasionally stall in a cut took more than 3 minutes to complete the cut.

It should be obvious that we prefer the fast machines. The slow machines run cooler and generally have more features than the fast-speed mortisers. But the fast-speed machines are simply less frustrating to use.

Check the Holddown

One of the big gripes with benchtop mortisers is the holddown. After you plunge the bit into your board, the holddown is supposed to keep the work in place as you pull the chisel and bit out of the work. It doesn't always work this way. The holddown on the Multico PM 12 is the best, hands down. It rides on the same

SHOPPING GUIDELINES for mortisers

- We know we're in the minority, but we recommend fast-speed machines. Just be careful and use a ⅛" clearance between the chisel and bit.
- If you work with big parts, check the maximum depth under the holddown.
- You can spend a lot of money on chisels. Learn on the cheap ones and move up if you must. Many pros use inexpensive chisels that are properly sharpened.
- Make sure the chisel is at 90° to your table. Shim the underside of the table with tape to square everything up.

Photo by Al Parrish

dovetailed ways that the motor moves up and down on. You tighten a lever or screw to set the holddown and the thing stays put. End of story.

Other manufacturers use a holddown that has a steel post that comes up off the back of the fence. The two-pronged holddown rides on that post and is held in place by a small screw tightened against the post. Sometimes these screws work loose after use, which will force you to stop what you are doing and tighten everything down again.

Tools to Adjust Your Tool

Some mortisers require you to use different tools to adjust different settings. Some need a hex key to tighten the holddown, set the depth stop or tighten the chisel bit in its bushing. The Multico even requires a hex key to access the chuck.

The fewer tools you need, the better. The Jet JBM-5 has only one place you need a hex key, and that's for attaching the steel holddown post to the fence.

Other Details

All of these machines are noisy, and they get noisier as they heat up. We recorded decibel levels between 70 dB and 93 dB during use. Always use hearing protection when operating a mortiser.

Check out the arm of the machine that makes the head plunge. You need to be able to adjust this arm easily for different mortising situations. On some machines, you can quickly adjust the arm without tools. Others require you to loosen a bolt or screw first.

Machines also vary in how much gap there is between the fence and the table. On the Fisch and General, the fence is flush to the table. Other machines have a gap between 1/8" and 5/16". This gap is supposed to help clear out chips that build up around your work during mortising. The gap helps, but there are so many chips that even a big 5/16" gap is not enough. **PW**

PW Recommends

occasional user

We don't recommend the occasional user buy a mortising machine. You can get by with an inexpensive mortising attachment to your drill press, chain drilling or using your router to cut mortises.

serious home woodworker

- **Bridgewood HM-11**, This tough machine is low on frills, but its motor grinds through anything you can throw at it.
- **Grizzly G3183**, Virtually the same machine as the Bridgewood, the G3183 is inexpensive and powerful.
- **Shop Fox W1671**, Shop Fox has just upgraded this machine with a 3/4 hp fast-speed motor. Plus this machine has the capacity of many floor-model mortisers. This machine is hard to beat.

advanced woodworker or professional user

- **Multico PM-12**, If you need a benchtop machine, this is the top of the line. The hold-down is the best of all the benchtops and the motor is gutsy.
- **Powermatic 719A**, This floor-model mortiser has sliding tables and a front-mounted clamp to hold your work securely. We use this machine in our shop, and it's now popping up in other professional shops. Also worth mentioning is Fisch's new floor-model mortiser. It has many of the same features as the Powermatic, but it is too new for us to test.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

MODEL	STREET PRICE	MOTOR HORSE POWER	AMPS/ NO-LOAD	AMPS/ LOAD	SPEED/ RPM	FENCE LENGTH	HEIGHT	MAX." FENCE TO CHISEL*	HOLDDOWN MAX DEPTH UNDER HOLDDOWN	MIN. DEPTH UNDER HOLDDOWN
Bridgewood HM-11	$220	1/2	3.8	6.62	3,400	13 3/4"	1 9/16"	2 5/8"	3 1/4"	1 5/8"
Craftsman 21906	200	1/2	3.06	5.7	1,725	13 5/8	1 5/8	2 3/8	4 3/4	1 3/4
Delta 14-650	240	1/2	4.68	6.43	1,725	13 3/4	1 9/16	2 1/8	3 3/4***	1 15/16
Fisch BTM99-44252	250	1/2	3.96	5.25	1,725	13 9/16	1 5/8	2 9/16	3 1/4	1 5/8
General 75-050 M1	300	1/2	2.2	4.25	1,720	11 1/16	2	3 1/8	5 1/4	1
Grizzly G3183	225	1/2	3.75	6.6	3,400	13 3/4	1 9/16	2 5/8	3 1/4	1 5/8
Jet JBM-5	240	1/2	3.05	5.6	1,720	14	1 5/8	2 5/8	3 5/8	1 3/4
Multico PM12	450	1/2	4.44	6.88	3,470	13 3/4	1 9/16	3 1/2	3 3/8	1 1/2
Record RPM75	290	1/2	NA	NA	3,400	NA	NA	3 3/4	6	NA
Shop Fox W1671	235	3/4	3.9	4.75	3,400	16	2 1/8	2 1/8	7 3/4	2 1/4
Woodtek 876-775	240	1/2	3.75	5.89	3,450**	13 3/4	1 9/16	2 5/8	3 1/4	1 5/8
Powermatic 719A	770	1	NA	NA	1,720	20	4 1/4	3 7/8	NA	NA
Fisch FM99-66252	830	1	NA	NA	1,140	26	3 5/8	2 7/8	6	3 5/8

MAX SPINDLE TRAVEL*	CHISEL MAX CHISEL ACCEPTED	CHISEL BUSHINGS INCLUDED	CHISELS INCLUDED	TOOLS NEEDED TO ... ...ACCESS CHUCK	...ADJUST HOLDDOWN	...CHANGE DEPTH STOP	...REMOVE CHISEL
4 5/16"	1/2"	5/8", 3/4"	none	none	hex key	hex key	screw
3 7/8	3/4†	5/8	3/8	none	hex key	hex key	screw
3 5/8	1/2	5/8	1/4", 5/16", 3/8", 1/2"	none	hex key	hex key	hex key
3 3/4	1/2	5/8	none	none	hex key	none	hex
5 1/4	5/8	5/8, 3/4	1/4", 5/16", 3/8", 1/2"	none	none	none	none
4 5/16	5/8	5/8, 3/4	none	none	hex key	hex key	screw
4 5/16	1/2	5/8, 3/4	1/4, 3/8, 1/2	none	none	none	screw
4	1/2	5/8	3/8	hex key	none	hex key	hex key
NA	9/16	NA	NA	none	none	NA	NA
4 1/2	3/4	5/8, 3/4	none	none	hex key	none	hex key
4 5/16	1/2	5/8, 3/4	none	none	hex key	hex key	screw
7 1/4	1	5/8, 3/4, 1 1/8	none	none	none	none	screw
7 1/2	1	1/4, 5/8, 3/4, 1	1/4, 5/16, 3/8, 1/2	none	hex key	none	allen

key

* All measurements were taken with a 3/8" chisel and bit installed, which is why these measurements will sometimes disagree with those supplied by the manufacturer.
** Woodtek will switch to a slow-speed motor in the coming months.
*** Add Delta's 14-611 height adjuster ($14) to this machine and it will increase the capacity to 5 3/4".
† in softwood. NA = not applicable or not available
■ = PW recommends

routers

Talk about a multi-tool. There's very little a router cannot do.

Every woodworker needs a router. It's just too versatile a machine not to have one. Able to accomplish basic joinery tasks such as dadoes, rabbets, dovetails and mortises, the router also lets you make complicated edge details, do inlay work and make raised-panel doors a cinch. The real question is which one to buy, or for that matter, how many do you need?

Routers are positioned in three broad categories: trimmers, fixed-base and plunge. Within the fixed-base and plunge categories there are routers with both big and small motors. Starting this year we have the opportunity to offer a new and growing category — the multi-base category — where you buy a kit that has one motor with interchangeable plunge and fixed bases.

Trim Routers

Designed originally for working with laminates (such as Formica) these small routers excel when working with intricate details and for just having a router that fits comfortably in one hand. Equipped with ¼" collets, trim routers can be purchased with a standard height-adjustable flat base, or in kits with multiple bases such as tilting (for angled cuts), offset (for reaching into corners), and underscribe bases for veneer and laminate work.

Fixed-Base Routers

A fixed-base router is what most people think of when talking about routers. Sporting a larger motor than a trim router (usually they're either about 6.5 or 15 amps, forming the two size divisions within this category), these tools offer a simple, adjustable-height flat base that the motor slips into. Some offer variable-speed control and most will use interchangeable ¼" and ½" collets. Able to be used hand-held or in a router table, these routers are capable of the great majority of routing applications.

The bases themselves can be either a two-knob design or a D-handle base. The D-handle also has two handles, but one of them is a full-grip handle, usually with a built-in trigger. The D-handle design lets you operate the router more safely because you don't have to remove your hands from the handle to turn the machine on. Choosing a D-handle or standard base is also a "feel" thing. Put both in your hands to decide which you prefer.

Plunge Routers

Using essentially the same motor options as fixed-base routers (including the two size divisions) plunge routers mount the motor on a spring-loaded base that lets you easily raise and lower the bit with the motor running — kind of like a pogo stick. Great for stopped grooves, mortising or template work, plunge routers offer more precise methods of setting depth control than most fixed-base models.

Multi-Base Kits

Porter-Cable has offered its 690 motor in a kit with interchangeable fixed and plunge bases for a couple of years. With a price tag around $200, it's still a great bargain, especially for a first router. Now Makita and Bosch are offering similar kits with the added benefit of variable speed and easy base changes. The prices are a little higher, but we're pleased to see the idea grow and improve.

Features to Consider

Collets (the part that holds the bit) have an inner sleeve with divided fingers on one end, and an outer nut

SHOPPING GUIDELINES for routers

- If it's your first router, buy one of the multi-base kits to get the best of both worlds.
- Don't buy cheap. A router can last for 20 years, and the newest features make these machines very user friendly and a pleasure to use.
- More horsepower doesn't mean a better tool. Unless you will be doing lots of "large bit" routing, a mid-sized router will handle the great majority of your routing requirements.
- Make sure you get the chance to hold the router and adjust it before buying. How it feels in your hand is almost as important as how it performs.
- Look for soft start, a spindle lock and an easily removable and adjustable base.

Fixed-base routers (left) excel in a router table or on cutting edge details. Router kits (right) such as this one from Bosch, allow you to get a plunge- and fixed-base router for one reasonable price.

Photo by Al Parrish

that threads over the inner sleeve. As the nut is tightened, it compresses the inner sleeve against the bit, holding it tight. The collet can be tightened using either two wrenches or one wrench and a spindle lock to hold the spindle in place. There's been some debate that a spindle lock places too much stress on the spindle; we're also divided on this issue, so stay tuned. Also, the versatility of interchangeable ¼" and ½" collets on one router is preferable

Variable Speed, Soft-Start and Electronic Feedback

These three items offer improved performance and safety in a router. In any mid- to large-sized router (over 8 amps), variable speed offers better performance with larger bits because you can slow the motor down.

As a safety benefit, some of these routers also offer "soft-start." The motor starts at a slower speed and then ramps up to full speed after a second or two. Often a router can jerk when started at full speed. If it's touching the workpiece, the wood can be damaged, or the router can "walk" and be pulled from your grasp.

Another newer feature that's worth looking for is electronic feedback. This computer-chip technology continuously checks the torque resistance on the spindle and will increase the amperage draw to maintain constant torque.

Depth Controls

With both fixed-base and plunge routers, there are a variety of ways to control the depth of the bit. Some models use a tension buckle that's fast and secure, others use a knob that you turn. While we all have our favorites, we recommend you take the time to visit a store and adjust a few of the bases to learn which method you prefer.

Template Guides

One of the versatile features of routers is their ability to use template guides to accurately repeat patterns. There are a few types of guides, and you should check the ease of fitting and removing them in the router base. Even though this function of the router might not be on your to-do list today, don't limit yourself down the road.

Dust Collection

While only a few routers are designed with built-in dust collection (with varying degrees of success) dust collection on a router is a great idea. Just make sure the benefit of dust collection doesn't complicate and distract from the way you use your router. **PW**

continued on page 74

PW Recommends

occasional user

- **Porter-Cable 693PK**, Many beginning woodworkers can't decide if they should first buy a plunge router or a fixed-base unit. That's why we recommend the 693PK, which features the venerable 690 motor, a fixed base and a plunge base.
- Bosch **1617EVSPK**, Bosch plans to enter the market with a similar router package, this one with variable speed. It costs a bit more, but if you ever plan on using a panel-raising bit, it's worth it.

serious home woodworker

- **Makita RD1101**, This 11-amp, variable speed D-handled router is a sweetie. It's quiet, powerful and easy to adjust.
- **DeWalt 621**, As far as plunge routers go, this one remains our favorite. The depth controls are intuitive, the dust collection is superb and it's just the right size for most operations.

advanced woodworker or professional user

- **Bosch 1608**, You can buy this trim router in a variety of configurations. It's the trimmer of choice in our shop.
- **Hitachi M12V**, This large-scale plunge router is a favorite among many commercial shops.
- **Porter-Cable 7529,** Long considered the industry leader, this large router has earned its stripes in cabinetshops all over the country.
- **Fein RT1800,** Like many Fein tools, this one costs a bit more, but it is a powerful tool and is built like a tank.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

continued from page 71

key

Trigger Location: B = body, H = handle; BNT=Best New Tool rating; ■ = PW Recommends

TRIM ROUTERS

BRAND & MODEL	STREET PRICE	AMPS	SPEEDS (RPM)	SPINDLE LOCK	DEPTH ADJ. (IN)	DECIBEL RATING	WEIGHT (LB)	COMMENTS
Bosch1608	$105	5.6	30,000	N	1/2	70	3.6	Four bases available
Bosch1608LX	115	5.6	30,000	N	1/2	70	3.6	Std. base, dlxe. guide
Bosch1609 AKX	250	5.6	30,000	N	1/2	70	3.6	Installers kit, w/4 bases
Craftsman 27512	100	3.8	23,000	N	1 1/8	68	2.7	
DeWalt DW670	110	5.6	30,000	Y	7/8	70	3.7	
Hitachi TR6	120	4	30,000	N	1 1/16	68	3.4	Beveling base
Makita 3700B	135	3.3	28,000	N	1 5/8	68	3.4	
Porter-Cable 309	117	3.8	28,000	N	1	70	3.3	
Porter-Cable 310	154	4	27,500	N	7/8	70	3.4	
Porter-Cable 7310	112	5.6	30,000	Y	1	72	3.4	Three bases available
Ryobi TR31	80	3.8	23,000	N	1 1/8	68	3.0	

FIXED ROUTERS

BRAND & MODEL	STREET PRICE	AMPS	SPEEDS (RPM/K)	COLLET SIZES (IN)	TRIGGER LOCATION	DEPTH ADJ. (IN)	DECIBEL RATING	WEIGHT (LB)	COMMENTS
Bosch 1617	$165	11	25	1/4, 3/8, 1/2	B	1 7/8	95	7.5	BNT '98
Bosch 1617EVS	185	12	8-25	1/4, 3/8, 1/2	B	1 7/8	95	7.7	Soft start, BNT '98
Bosch 1618	175	11	25	1/4, 3/8, 1/2	H	1 7/8	95	8	D-handle, BNT '98
Bosch 1618EVS	210	12	8-25	1/4, 3/8, 1/2	H	1 7/8	95	8.2	D-handle, soft start, BNT '98
Craftsman 17506	100	9	15-25	1/4	H	1 1/2	98	9.1	Light, spindle lock
Craftsman 27500	130	9	25	1/4, 1/2	H	1 1/2	NA	11	Light, spindle lock
Craftsman 17505	80	7.5	15-25	1/4	H	1 1/2	NA	8.3	Light, spindle lock
Craftsman 17504	70	8	25	1/4	H	1 1/2	98	8	Light, spindle lock.
DeWalt DW610	160	9	25	1/4, 1/2	B	2 3/8	109	7.3	Rack & pinion depth adj.
Makita 3606	129	7	30	1/4	B	3	81	5.5	
Makita RD1100	259	11	24	1/4, 1/2	H	2 3/8	81	7.9	D-handle; performance: 5 stars
Makita RF1000	239	11	24	1/4, 1/2	B	2 3/8	81	7.1	Performance: 5 stars
Makita RD1101	289	11	8-24	1/4, 1/2	H	2 3/8	81	7.9	D-handle, soft start
Makita RF1001	259	11	8-24	1/4, 1/2	B	2 3/8	81	7.1	Performance: 5 stars
Milwaukee 5660	220	10	24.5	1/4, 3/8, 1/2	B	2 1/4	100	8.5	Depth-adj. ring
Milwaukee 5680	367	12	26	1/4, 3/8, 1/2	B	2 1/4	104	8.8	
Milwaukee 5682	240	12	26	1/4, 3/8, 1/2	B	2 1/4	NA	8.8	
Porter-Cable 100	140	6.5	22	1/4	B	1 1/2	NA	6.8	
Porter-Cable 690	173	10	23	1/4, 3/8, 1/2	B	1 1/2	103	8	Optional bases avail.
Porter-Cable 691	190	10	23	1/4, 3/8, 1/2	H	1 1/2	103	9.3	D-handle
Porter-Cable 7518	315	15	10-21	1/4, 3/8, 1/2	B	2 1/2	NA	14.5	Soft start
Porter-Cable 7519	351	15	21	1/4, 3/8, 1/2	B	2 1/2	NA	15	Soft start
Ryobi R161K	60	8	25	1/4	H	1 1/2	NA	7.5	Designed for BT3000 table saw

PLUNGE ROUTERS

BRAND & MODEL	STREET PRICE	AMPS	SPEEDS (RPM/K)	COLLET SIZES (IN)	TRIGGER LOCATION	DEPTH ADJ. (IN)	DECIBEL RATING	WEIGHT (LB)	COMMENTS
Black & Decker RP200	$69	9.5	25	1/4	H	2	NA	NA	Soft start
Black & Decker RP400K	99	10	0-25	1/4	H	2	NA	NA	Soft start, dust collection
Bosch 1613AEVS	209	12	11 -22	1/4, 3/8, 1/2	H	2 1/4	97	9.7	Soft start, precis. centering
Craftsman 17507	120	9	15-25	1/4	H	2	NA	8.4	Spindle lock
Craftsman 27510	200	12	22	1/4, 1/2	H	2 1/2	105	11.5	Spindle lock
Craftsman 27511	250	15	10-22	1/4, 1/2	H	2 1/2	NA	13	Soft start
DeWalt DW621	220	10	8-24	1/4, 1/2	H	2 1/8	99	10	Dust collection, Endurance Tested
DeWalt DW625	300	15	8-22	1/4, 1/2	H	2 7/16	NA	11.3	Soft start, electronic feedback
Fein RT1800	349	15	8-22	1/2	H	3	100	12	Soft start, 1/4" collet opt.
Festool OF1000E	330	7.5	10-20	1/4	H	2 3/16	78	6	Soft start
Freud FT2000E	210	15	8-22	1/4, 1/2	B	2 3/4	NA	12.9	Soft start
Hitachi M8V	206	7.3	10-25	1/4	B	1 7/8	NA	6.4	Soft start
Hitachi TR12	235	12.2	22	1/4, 3/8, 1/2	B	2 7/16	104	11	Template guide includ.
Hitachi M12V	245	15	8-20	1/4, 3/8, 1/2	B	2 7/16	NA	11.7	Soft start, template guide includ.
Makita 3621	160	7.8	24	1/4	B	1 3/8	81	5.3	

[stats]

BRAND & MODEL	STREET PRICE	AMPS	SPEEDS (RPM/K)	COLLET SIZES (IN)	TRIGGER LOCATION	DEPTH ADJ. (IN)	DECIBEL RATING	WEIGHT (LB)	COMMENTS
Makita 3612	$259	15	22	1/4, 1/2	B	2 3/8	102	13.2	Spindle lock
Makita 3612 C	349	15	9-23	1/4, 1/2	B	2 3/8	102	13.2	Spindle lock, electric brake
Makita RP1101	240	11	8-24	1/4, 1/2	B	2 19/32	81	9.3	Soft start, speed control
Makita RP1100	220	11	24	1/4, 1/2	B	2 19/32	81	9.3	Soft start, speed control
Porter-Cable 7529	245	12	10-23	1/4, 3/8, 1/2	H & B	2 1/2	NA	11	BNT '98, Performance: 4.5
Porter-Cable 7538	315	15	21	1/4, 3/8, 1/2	H	3	NA	17.3	Soft start
Porter-Cable 7539	351	15	10-21	1/4, 3/8, 1/2	H	3	NA	17.3	Soft start
Ryobi RE175	100	9	15-25	1/4	H	2	106	9.4	Spindle lock
Ryobi RE601	250	13.6	10-22	1/4, 1/2	H	2 3/8	NA	13.6	Soft start
Skil 1823	59	8.5	25	1/4	H	2	100	7	
Skil 1840	79	9	25	1/4	H	2	97	7	
Skil 1845-02	99	10	8-25	1/4	H	2	97	7.3	Soft start, fine adjustment

BRAND & MODEL	STREET PRICE	AMPS	SPEEDS (RPM/K)	COLLET SIZES (IN)	TRIGGER LOCATION	DEPTH ADJ. (IN)	DECIBEL RATING	WEIGHT PLUNGE(LB)	COMMENTS
PLUNGE/FIXED BASE ROUTER KITS									
Bosch 1617PK	$220	11	25	1/4, 1/2	B	2	NA	9	
Bosch 1617EVSPK	240	12	8 - 25	1/4, 1/2	B	2	NA	9	Soft start, variable speed
Makita RF1101KIT	299	11	8 - 24	1/4, 1/2	B	2 19/32	81	9.3	W/dust collection, edge guide
Porter-Cable 693 PK	200	10	23	1/4, 3/8, 1/2	B	2 1/2	103	11.5	

sanders

High-tech random-orbit sanders are the only way to go. They make a bad job almost bearable.

If you think sanding is a dreadful job now, just be glad you weren't my grandfather. After he died, I was assigned the job of going through his workshop to separate the useful stuff from the rubbish. In one cabinet I found three sleek-looking electric sanders that looked like they were of a 1950s vintage. Intrigued, I tried them out.

All three had the sanding power of an electric razor. The pad didn't move; instead the electric motor merely vibrated the pad. Essentially, these tools were big sanding blocks that made your fingers tingle. Thank goodness for random-orbit sanders.

These high-tech marvels excel at smoothing flat surfaces for finishing because the sanding pad both vibrates and rotates in an orbital fashion. The result is that you remove material quickly, and the scratches (or swirls) left behind are often smaller than those left by other types of sanders and less noticeable because of the random scratch pattern.

There are four types of random-orbit sanders:

- **Palm Grip**: These sanders are small, lightweight and inexpensive. The motor is mounted over the pad and you grip the top of the motor.
- **Inline:** These sanders look like the palm-grip models with extra handles on the front, back or both to make them easier to grip.
- **Right Angle:** These resemble an angle grinder and are the most powerful random orbits on the market. They excel at flattening tabletops and leveling joints. You'll wear yourself out if you use these on a lot of vertical surfaces, however, because they are heavy.
- **Pneumatic:** These small sanders are powerful. The only downside is that you need a big compressor to run them and they aren't made with pad brakes, which slow down the pad as it comes into contact with the wood. Without a pad brake, you have to be careful not to gouge or severely scratch the wood. These sanders are rarely found in home shops and aren't covered in our charts.

SHOPPING GUIDELINES

for random-orbit sanders

- Variable-speed tools cost a bit more, but they are also more versatile when you need a light touch.
- Pad brakes help prevent you from gouging the wood when you put a spinning sander on your work. You can do without, but it takes a light touch.
- If you're a home woodworker, buy a machine that takes hook-and-loop paper.
- Whichever tool you choose, be sure to pick up the attachment that allows you to attach your shop vacuum to your sander. Sanding dust is quite unhealthy.

Inline sanders are basically palm-grip sanders that have a larger motor and an additional handle or two added that make it more comfortable to use during long sanding sessions.

Right-angle sanders look more like angle grinders than the other random-orbit models. These are the brutes of the bunch, packing more sanding power (and weight). These excel at sanding flat, horizontal surfaces.

Photo by Al Parrish

Power is Paramount

The most desirable random-orbit sanders will have lots of power and allow you to vary the speed of the pad, so you can slow things down when you're sanding veneer, for example. To determine how aggressive a tool is check three things: the amperage, the offset (also called the "orbit" or the "pad movement") and the number of orbits per minute.

Amperage is a rough measure of

how much juice the motor uses. It's a misleading statistic, however, because efficient high-power motors draw less amperage then less powerful, less efficient motors. So take that number with a grain of salt.

Check out the pad's "offset" or "orbit size." This is the measure of the size of the swirls made by the sander. Big offsets remove lots of material but leave a more visible scratch, sometimes called a "pigtail." Smaller offsets are less aggressive and leave less visible scratches.

The number of orbits per minute is also a measure of the aggressiveness of the sander.

Pads: Go Velcro

Another critical choice is the way the sanding pad attaches to the sandpaper. You have two choices: pressure-sensitive adhesive (PSA) or hook and loop. PSA is less expensive, but once you remove a sanding disk from the pad, it won't ever stick to the pad again. Hook-and-loop disks can be removed and replaced repeatedly. We recommend hook and loop for all home woodworkers because you'll waste far less sandpaper.

Many sanders today have what is called a "pad brake." This feature slows down the spinning pad as it comes in contact with the wood. It further prevents you from easily gouging the surface you're sanding.

If the sander doesn't have a pad break, it's a good idea to place the sander on your project before you turn it on.

Finally, check to see if there are replacement pads available that are softer and harder than your stock pad. These can be useful. Soft pads let you easily sand contours. Harder pads excel at things like tabletops, where flatness reigns.

Dust Collection

Also critical is dust collection. Some sanders have great dust collection; on other sanders the bag or canister is only for show. Find out how difficult it is to hook up the sander to your shop vacuum because that's the best way to suck up the dust.

Because your tool generates a lot of dust, it will last longer if you blow some compressed air through the sander's vents occasionally to blow dust off the motor's commutator.

Beyond the health benefits of dust collection, dust removal also greatly increases the efficiency of your sanding. A layer of dust can clog your sandpaper and you end up sanding a pile of dust more than your project.

And that, ladies and gentlemen, is one thing actually worse than sanding itself. **PW**

PW Recommends

occasional user

- **Ryobi RS241**, If money is tight, don't buy a sanding block. Check out the Ryobi RS241. For about $40 you get a machine that is powerful and versatile.

serious home woodworker

- **Makita BO5010**, Among all the palm-grip sanders we use, this one feels the most aggressive. As an added bonus, the dust collection is superb.
- **Makita BO5020, BO5021K**, The inline versions of the BO5010 make sanding a little more pleasant with added features, such as additional handles and variable speed on the BO5021K.
- **Porter-Cable 333**, This line of sanders is hard-working and available in a variety of configurations.

advanced woodworker or professional user

- **Fein MSF 636-1**, As far as we're concerned, the Fein MSF 636-1 is about as good as a sander gets. This thing is as aggressive as anything out there today, and it is capable of great finesse. Add a Fein vacuum to your tool and you will keep your shop free of sanding dust. All in all, it's an excellent system.

If you're a pro, you also should take a look at pneumatic sanders. You'll need a big compressor, but they are capable of many hours of continual use.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

key

Safety - HL= hool and loop, PSA= pressure sensitive adhesive, Y=yes, N=no,
■= PW Recommends

BRAND & MODEL	STREET PRICE	PAD DIA. (IN.)	PAD TYPE	PAD BRAKE	ORBITS PER MINUTE	DUST COLLECTION	ORBIT/ OFFSET	AMPS	WEIGHT (LB.)
PALM GRIP									
Black & Decker RO100	$39	5	HL	Y	12,000	DB	3/32	2	3.5
Bosch 1295DK	69	5	HL	Y	12,000	DC	1/16	2.2	3.5
Bosch 1295DVSK	89	5	HL	Y	7,000 - 12,000	DV	1/16	2.2	3.5
Craftsman 11621	40	5	PSA	Y	12,500	DB	5/32	2.4	3
Craftsman 27708	80	5	HL	Y	7,000 - 12,000	DB, VP	NA	2	4.1
DeWalt DW420	65	5	PSA	Y	12,000	-	3/32	2	3
DeWalt DW421	70	5	HL	Y	12,000	DB, VP	3/32	2	3
DeWalt DW422	70	5	PSA	Y	12,000	DB, VP	3/32	2	3
DeWalt DW423	85	5	HL	Y	7,000 - 12,000	DB, VP	3/32	2	3.2
Makita BO5010	70	5	HL	Y	12,000	DB	1/8	2	2.6
Makita BO5001	65	5	HL	N	10,000	VP	5/32	1.7	2.9
Makita BO5011	70	5	PSA	Y	12,000	DB	1/8	2	2.6
Milwaukee 6018-6	70	5	PSA	N	12,000	DB, VP	3/32	1.8	2.9
Milwaukee 6019-6	70	5	HL	N	12,000	DB, VP	3/32	1.8	2.9
Porter-Cable 332	60	5	PSA	Y	12,000	-	3/32	1.7	3.2
Porter-Cable 333	65	5	HL	Y	12,000	DC, VP	3/32	2.4	3.5
Porter-Cable 333VS	85	5	HL	Y	5,000 -12,000	DC, VP	3/32	2.4	3.5
Porter-Cable 334	65	5	PSA	Y	12,000	DC, VP	3/32	2.4	3.5
Porter-Cable 335	90	6	PSA/HL	Y	9,000	DC,VP	3/32	1.7	3.5
Ryobi RS241	40	5	HL/PSA	Y	12,500	DB	5/32	2.4	3.6

BRAND & MODEL	STREET PRICE	PAD DIA. (IN.)	PAD TYPE	PAD BRAKE	ORBITS PER MINUTE	DUST COLLECTION	ORBIT/ OFFSET	AMPS	WEIGHT (LB.)
INLINE SANDERS									
Black & Decker RO600	60	5	HL	Y	10,500	DB	3/32	1.4	5
Bosch 3107DVS	95	5	HL	Y	4,500 - 13,000	DB, VP	3/32	3.3	5
Bosch 3107DVSK	120	5	HL	Y	4,500 - 13,000	DB, VP	3/32	3.3	5
Bosch 3725DVS	150	5	HL	Y	4,500 - 12,000	DB, VP	3/32	3.3	5.1
Bosch 3727DVS	160	6	HL	Y	4,500 - 12,000	DB, VP	5/64	3.3	5.2
Craftsman 27717	60	5	PSA	Y	13,000	DC	5/32	3	3.5
Craftsman 27877	40	4	PSA	N	14,000	DB	1/16	2	2.8
Festool ES125 E	214	5	HL	Y	6,000 - 13,000	DB, VP	3/32	2	2.4
Grizzly G9910	25	5	HL	N	10,000	DB, VP	1/8	3	4.7
Makita BO5020	80	5	HL	Y	12,000	DB	1/8	2	3.1
Makita BO5021K	110	5	HL	Y	4,000 - 12,000	DB	1/8	2	3.1
Metabo SXE425	145	5	PSA	Y	5,000 - 12,000	DB	3/16	3.6	5.2
Metabo SXE450	190	6	PSA	Y	4,000 - 10,000	DB	1/8 or 1/4	3.8	8
Ryobi RS280	60	5	HL/PSA	Y	0 - 12,000	DB	5/32	2.8	3.3

BRAND & MODEL	STREET PRICE	PAD DIA. (IN.)	PAD TYPE	PAD BRAKE	ORBITS PER MINUTE	DUST COLLECTION	ORBIT/ OFFSET	AMPS	WEIGHT (LB.)
RIGHT ANGLE									
Dynabrade Dynorbital	330	5	PSA	N	10,000	OPT	3/32	5.5	4.8
Porter-Cable 7335	110	5	PSA	N	2,500 - 6,000	OPT	11/32	3.7	5.5
Bosch 1370DEVS	275	6	HL	Y	4,800 - 12,000	DB, VP	11/64	5	5
DeWalt DW443	150	6	HL	Y	4,300 - 6,800	DB, VP	3/16	4.3	5.7
Fein MSF 636-1	450	6	HL	Y	7,500	VP	5/16	4.7	3.7
Festool RO150E	512	6	HL, PSA	Y	4,000 - 11,200	VP	3/16	4.2	5
Makita BO6040	355	6	HL	NA	1,600 - 5,800	VP	7/32	6.6	5.9
Milwaukee 6125	230	6	PSA	N	10,000	OPT	5/32	5.5	5
Porter-Cable 7336	130	6	PSA	N	2,500 - 6,000	OPT	11/32	3.7	5.75

tablesaws

Almost every woodworker needs a table saw; here's how to choose the right one for your shop.

Delta Manufacturing makes a $170 table saw, a $1,600 model and dozens more in between. Which one is best for woodworking? That's one of the most common questions we field here at the magazine.

Table saws come in basically three styles. Benchtop models cost between $100 and $530. Contractor saws cost between $300 and $900. And cabinet saws cost $800 to $2,000 or more. All cut wood. The bigger price tag buys you more power, better accuracy and more weight (a good thing for many table saw users). We've talked to hundreds of woodworkers over the years, and it's fair to say the No. 1 mistake they make when buying this machine is they skimp and quickly outgrow that saw. So tell your spouse that we said, "Plan for the future."

Benchtop Saws

It's tempting when you start woodworking to buy a $200 benchtop saw and then plan to upgrade later. For the most people, this is a $200 mistake.

Basic benchtop saws just don't have the accuracy you need for most woodworking. Benchtops are designed for job-site carpenters who value portability. The saws' rip fences are less adjustable and accurate than those on even bare-bones contractor saws, and there's almost no way to later upgrade your fence. Plus, these saws have little resale value.

All benchtop saws are powered by universal motors, which are noisy and less reliable than the induction motors on contractor and cabinet saws. Because the motors are bolted to the underside of the table saw's top, the motor and blade are more likely to flex than in a contractor or cabinet saw, which has massive cast iron trunnions instead.

The only reason to buy a benchtop saw today is if you absolutely don't have the space for a contractor or cabinet saw. And while the top-of-the-line benchtop saws get better every year, they are as expensive as entry-level contractor saws.

Contractor Saws

We recommend entry-level woodworkers buy a low-price contractor saw when they begin their hobby. The fence is more accurate, the motor is quiet, reliable and powerful, and you can upgrade your saw with dozens of accessories.

Most contractor saws (priced between $300 and $900) are powered by a 1½ hp induction motor that hangs outside the rear of the machine on a belt and pulleys (a few are direct drive). You'll find this motor is sufficient for most woodworking and should last longer than you do. Almost all of these motors can easily be rewired to run on 220-volt power, which can improve the performance and longevity of your motor. Check the information plate or spec sheet on the saw and make sure it's "TEFC," which means it's a totally enclosed fan-cooled motor — a good thing in a dusty shop.

The first upgrade you should make to your saw is to replace the standard belt. You'll greatly reduce vibration by switching to a link belt, sometimes called a Powertwist belt. Then replace the standard throat insert with a zero-clearance insert. You can buy one or make it yourself. This will reduce tear-out, improve dust collection and increase safety.

Another worthwhile improvement is to buy cast iron extension

SHOPPING GUIDELINES for table saws

- The most common mistake is to buy a smaller or less powerful saw than you need. You'll save money in the long run if you choose correctly the first time.
- Front-locking fences are easier to adjust and generally more accurate than fences that lock at both the front and back.
- Make sure your saw can lock in the height of the blade — especially in benchtops.
- Check how smoothly the controls work on several saws to see what works for you.
- Solid cast wings are preferable over stamped steel or open-style cast wings.
- More weight is a good thing in a contractor saw and cabinet saw. Weight reduces vibration.

The contractor-style saw is the workhorse of many home workshops.

wings instead of the stamped steel ones. The extra weight will make your saw vibrate less, and your top will be flatter, which will allow your jigs to ride more smoothly and increase the reliability of their cuts.

Here are other things to look for while in the store:

• Which way does the blade tilt, left or right? This is a personal preference, but people with left-tilt saws swear they are safer because the blade tilts away from the fence.

• How long are the bars for the fence? Most brands let you choose between a 30" rip capacity or 50". Take the 50" if you have the space so you can crosscut to the center of a full sheet of plywood.

• Is the switch easy to reach or a pain? This is as much for safety as for convenience.

• Is the miter gauge worthless, or does it feel heavy-duty and have preset stops at 0° and 45°?

• Can you remove the guard easily? If it's a pain to take off, you'll likely leave it off all the time and compromise your safety in the name of convenience. Finally, check the fence. It is the most important (and sometimes most expensive) part on the saw. Buy the best fence you can, but rest assured you can always upgrade for about $300.

That aside, for the home woodworker on a budget, the contractor saw is the best combination of value and performance.

Cabinet Saws

Cabinet saws are a lot like contractor saws, except everything is beefier and generally better. Most of the features that are important on contractor's saws are important on cabinet saws as well.

They are built to industrial standards, which means they can be used all day, everyday and provide years of service. Instead of an open stand, cabinet saws are mounted on a steel cabinet. This improves dust collection. The motor is bigger (usually 3 hp or 5 hp) and is enclosed inside the cabinet and turns the blade using three v-belts, so cabinet saws actually can take up less space than a contractor saw. The trunnions are beefier and mounted to the cabinet instead of the underside of the top, as with contractor saws. Also, the blade adjustment wheels are bigger and easier to turn.

All this comes at a price. An entry-level cabinet saw starts at $800, and you could spend $2,000 in a heartbeat. However, this is a saw that will last through a lifetime of woodworking, and you'll probably be able to pass it down to the next generation. **PW**

PW Recommends

occasional user

- **Grizzly 1022SM**, Instead of a benchtop saw, consider this unit. Upgrade it with cast wings and a beefier fence later on.
- **Delta 36-444**, This saw has stamped wings, a decent fence and the capacity to upgrade later.
- **Jet JWTS-10JF**, Jet's entry-level saw is comparable to its competitors' and is easily upgraded and expanded.
- **Bridgewood TCS-10CL**, Bridgewood's entry-level saw costs a bit more, but it comes with an excellent front-locking fence.

serious home woodworker

- **Delta Series 2000**, The saw to beat for woodworking, and the reputation is well-deserved.
- **Jet JWTS-10-PF**, Clearly a challenge to Delta's saws, this Jet features a world-class rip fence.
- **Powermatic 64A**, Another serious contender, Powermatic's left-tilt contractor saw also sports an excellent front-locking fence.
- **Grizzly 1023S**, An excellent cabinet saw at a contractor saw price. We flat-out love this saw.

advanced woodworker or professional user

- **Powermatic 66**, The Cadillac of 10" saws that's famous for its three-point yoke and mirror finish. At this level, you might also want to eye the 12" saws, where everything is bigger.
- **General S350-T50 cabinet saw**
- **Jet JWCS-10A-PFX cabinet saw**
- **Delta 36-821 & 821L Unisaw**

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

BRAND	PRICE	BLADE DIAMETER (IN.)	MAX CUT DEPTH (IN.)	MAX RIP (IN.)	TABLE SIZE (IN.)	TABLE MATERIAL	DRIVE TYPE	VOLTS	AMPS	DUST PORT	WEIGHT
BENCHTOP											
Makita 2702	300	8 1/4	2 11/16	12	27 x 22	AL	D	115	15	Y	40
Bosch 4000	$530	10	3 1/8	24 1/2	29 x 21 1/2	AL	D	115	15	Y	60
Craftsman 21878	180	10	3	10 7/8	26 1/2 x 17 1/2	AL	D	115	13	N	49
Craftsman 21825	250	10	3	24 1/2	26 x 171/8	AL	D	115	15	N	77
Craftsman 22801	370	10	3	24 1/2	25 x 21	AL	D	115	15	Y	77
Craftsman 22811	450	10	3 9/16	30	41 x 27	AL	B	115	15	Y	125
Delta 36-540	135	10	3	9 7/8	17 1/4 x 26	AL	D	115	13	N	40
Delta 36-560	170	10	3	20	17 1/2 x 34	AL	D	115	15	N	60
DeWalt DW744	500	10	3 1/8	24 1/2	26 1/2 x 19 1/4	AL	D	115	13	Y	64
Hitachi C10RA2	360	10	3	15 3/4	34 x 19 5/8	AL	D	115	15	Y	56
Makita 2703	320	10	3 9/16	12	27 x 22	AL	D	115	15	Y	40
Porter-Cable 3812	395	10	3 1/8	24 1/2	26 x 20	AL	D	115	15		60
Ridgid TS2400	500	10	3 1/8	25	30 1/4 x 21	AL	D	120	15	Y	75
Ryobi BTS10	100	10	3	9 1/2	16 x 25 3/4	AL	D	115	13	N	40
Ryobi BT3000SX	400	10	3 9/16	30	41 x 27	AL	B	115	15	Y	107
Skil 3400	190	10	3	12	26 5/8 x 17 5/8	AL	D	115	15	Y	38
Skil 3400-08	195	10	3	12	26 5/8 x 17 5/8	AL	D	115	15	Y	38
Tradesman 8030B	140	10	3 1/8	9 7/8	26 x 17	AL	D	115	13	Y	38
Tradesman 8035B	190	10	3 1/8	9 7/8	26 x 17	AL	D	115	13	Y	59

BRAND	PRICE	BLADE DIAMETER (IN.)	MAX CUT DEPTH (IN.)	MAX RIP (IN.)	TABLE SIZE (IN.)	TABLE MATERIAL	FENCE TYPE	DRIVE TYPE	VOLTS	HP-AMPS	DUST PORT	WEIGHT
CONTRACTOR												
Bridgewood TSC-10CL	530	10	3 1/4	30	40 x 27	CI	Front lock	B	115/230	16-8	N	297
Bridgewood TSC-10C	620	10	3 1/4	26	40 x 27	CI	Front lock	B	115/230	16-8	N	287
Craftsman 22839	500	10	3 7/16	24	44 x 27	CI/S	F & R	B	120	1.5-13	OPT	218
Craftsman 22849	600	10	3 3/8	24	44 x 27	CI	F & R	B	120/240	1.5-13	OPT	236
Craftsman 22859	800	10	3 3/8	30	44 x 27	CI	F & R	B	120/240	1.5-13	Y	265
Delta 36-444	600	10	3 1/8	30	40 x 27	CI	F & R	B	115/230	1.5-12.8/6.4	N	220
Delta 36-445	775	10	3 1/8	30	62 x 27	CI	Front lock	B	115/230	1.5-12.8/6.4	N	248
Delta 36-460	830	10	3 1/8	28	52 x 27	CI	Front lock	B	115/230	1.5-12.8/6.4	N	267
Delta 36-480	880	10	3 1/8	52	76 x 27	CI	Front lock	B	115/230	1.5-12.8/6.4	N	282
Delta 36-426	850	10	3 1/8	30	54 x 27	CI	Front lock	B	115/230	1.5-12.8/6.4	N	295
Delta 36-431	850	10	3 1/8	30	62 x 27	CI	Front lock	B	115/230	1.5-12.8/6.4	N	327
Delta 36-600	300	10	3 1/8	27	22 1/4 x 38 3/8	CI	F & R	B	115	15	N	145
Delta 36-650	500	10	3 1/8	30	47 1/2 x 27	CI	F & R	B	115/230	1.5-12.8/6.4	N	234
DeWalt DW746	900	10	3 1/8	30	27 x 40 3/4	CI	F & R	B	120/240	1.75-15/7.5	Y	254
General 50-175	730	10	3	28	40 x 27	CI	Front lock	B	230	2-9	N	300
General 50-185	730	10	3	28	40 x 27	CI	Front lock	B	230	2-9	N	300
Grizzly G1022SM	325	10	3 1/8	24	40 5/8 x 27 1/8	CI	F & R	B	115/230	1.5-16/8	OPT	220
Grizzly G1022Z	425	10	3 1/8	24	40 5/8 x 27 1/8	CI	F & R	B	115/230	1.5-16/8	OPT	250
Grizzly G1022ZF	575	10	3 1/8	25	40 5/8 x 27 1/8	CI	F & R	B	115/230	1.5-18/9	Y	290
Grizzly G1022ZFX	625	10	3 1/8	25	40 5/8 x 27 1/8	CI	F & R	B	115	2-20/10	Y	290
Jet JTS-10DD	405	10	3 1/8	27	22 1/4 x 38 1/2	CI or S	F & R	D	115	15	N	154
Jet JWTS-10-PF*	810	10	3 1/8	30	40 x 27	CI or S	Front lock	B	115/230	1.5-18/9	Y	321
Jet JWTS-10-PFX*	850	10	3 1/8	52	40 x 27	CI or S	Front lock	B	115/230	1.5-18/9	Y	337
Jet JWTS-10JF*	525	10	3 1/8	30	40 x 27	CI or S	F & R	B	115/230	1.5-18/9	Y	279
Lobo TS-0010	490	10	3 1/8	30	40 1/4 x 27	CI	F & R	B	115/230	1.5-20/10	OPT	245
North State TSL-10L	485	10	3 1/4	30	27 x 40 1/2	CI	Front lock	B	115/230	2/NA	N	310
Powermatic 64-A	750	10	3 1/8	50	40 x 27	CI	Front lock	B	115/230	1.5-18/9	Y	310
Ridgid TS2412	470	10	3 3/8	24	44 x 27	CI	F & R	B	120	1.5-13	OPT	204
Ridgid TS2424	600	10	3 3/8	24	44 x 27	CI	F & R	B	120/240	1.5-13/6.5	OPT	244

[stats]

BRAND	PRICE	BLADE DIAMETER (IN.)	MAX CUT DEPTH (IN.)	MAX RIP (IN.)	TABLE SIZE (IN.)	TABLE MATERIAL	FENCE TYPE	DRIVE TYPE	VOLTS	HP-AMPS	DUST PORT	WEIGHT
Star WTS10	385	10	3	30	40 x 27	CI	F & R	B	115/230	1.5-16/8	Y	285
Tradesman 8000T	450	10	3 1/4	24	40 1/2 x 27	CI	F & R	B	115/230	1.5-18/9	N	262
Transpower MS10	395	10	3	30	40 x 27	CI	F & R	B	115/230	2-24/12	N	260
Belsaw MC-12CS-T	900	12	4 1/8	25	39 1/2 x 27	CI		B	115/230	2-20/10	N	260
Lobo TS-0012	520	12	4 1/8	30	40 1/4 x 27	CI	Front lock	B	115/230	2-24/12	OPT	250

BRAND	PRICE	BLADE DIAMETER	MAX CUT DEPTH	MAX RIP	TABLE SIZE	TABLE MATERIAL	DRIVE TYPE	VOLTS	HP-AMPS	DUST PORT	WEIGHT	FENCE TYPE	COMM.
CABINET													
Bridgewood BW-10TS	995	10	3 1/4	50	27 x 40	CI	B	230	3-18	Y	409	Front lock	
Craftsman 22694	1,300	10	3	50	36 x 37	CI	B	230	3-17	Y	537	Front lock	
Delta 36-820	1,600	10	3 1/8	52	36 x 27	CI	B	230	3-17	Y	435	Front lock	L or R tilt
Delta 36-821 & 821L	1,600	10	3 1/8	50	36 x 27	CI	B	230	3-12.4	Y	457	Front lock	L or R tilt
Delta 36-830	1,500	10	3 1/8	30	36 x 27	CI	B	230	3-17	Y	419	Front lock	
General 350-1-MI	2,245	10	3 1/8	25	36 x 28	CI	B	230	3-12	OPT	415	Front lock	
General S350-T50	1,995	10	3 1/8	50	28 x 72	CI, AL	B	230	3-12	Y	495	Front lock	
General 50-200 MI	1,220	10	3 1/8	30	27 x 40	CI	B	230	2-24	Y	360		
General 50-200L MI	1,260	10	3 1/8	52	27 x 40	CI	B	230	2-24	Y	375		
General 50-275	1,640	10	3	52	36 x 27	CI	B	230	3-12	Y	450		
Grizzly G1023S	795	10	3 1/8	25	36 1/4 x 27	CI	B	230	3-18	OPT	360	Front lock	
Grizzly G1023S110	795	10	3 1/8	25	36 1/4 x 27 1/8	CI	B	110	2-24	Y			
Grizzly G1023Z	995	10	3 1/8	25	36 1/4 x 27	CI	B	230	3-18	Y	460	F & R	
Grizzly G1023ZX	1,095	10	3 1/8	25	36 1/4 x 27	CI	B	230	5-25	Y	475	F & R	
Jet JWCS-10A-PF	1,000	10	3 1/8	30	30 x 27	CI	B	115/230	1 3/4-22/11	Y	383	Front lock	
Jet JWCS-10A-PFX	1,245	10	3 1/8	52	30 x 27	CI	B	115/230	1 3/4-22/11	Y	399	Front lock	
Jet JTAS-10X50-1**	1,400	10	3 1/8	50	40 x 27	CI	B	230	3-17	Y	489	Front lock	L or R tilt
Jet JTAS-10X50-3**	1,500	10	3 1/8	50	40 x 27	CI	B	230/460	5-15/7.5	Y	562	Front lock	L or R tilt
Jet JTAS-10X50-5/1**	1,800	10	3 1/8	50	40 x 27	CI	B	230/460	5-15/7.5	Y	572	Front lock	L or R tilt
Lobo TS-1010	1,290	10	3	49	36 x 27	CI	B	230	3-36/18	Y	410	F & R	
Mini Max SC-2	2,995	10	3	51	22 x 33	CI	B	230	3-3/5-14	Y	616		
North State TSC-10HK	995	10	3 1/4	50	40 1/2 x 27	CI	B	230	3-16	Y	450	Front lock	
Powermatic 66	2,100	10	3 1/8	50	38 x 28	CI	B	230	3-17	Y	605	Front lock	left tilt
Powermatic 66-5	2,200	10	3 1/8	50	38 x 28	CI	B	230	5-17	Y	605	Front lock	left tilt
Robland XZ	2,695	10	3 1/4	50	36 x 48	CI	B	230	3-25	Y	600	Front lock	
Seco SK-1010TS	1,460	10	3	49	36 x 27	CI	B	230	3-NA	Y	410	F & R	
Star S3202	1,095	10	3	36	36 x 27	CI	B	230	3-15	Y	425		
Star S3204	1,295	10	3	36	36 x 27	CI	B	230	5-35	Y	425		
Transpower TSC-10HK	845	10	3	48	27 x 40	CI	B	220	3	Y	360	F & R	
Transpower MBS-250	1,175	10	3	30	36 x 27	CI	B	230	3-18	Y	495		
Bridgewood BW-12CS	1,895	10 & 12	4	50	29 x 44	CI	B	230	3-18	Y	485	Front lock	
Craftsman 22692	1,600	12	4	50	48 x 30	CI	B	230	3-17	Y	717	Front lock	
General 50-375	2,070	12	4	50	48 x 30	CI	B	230	3-12	Y	690		
Grizzly G5959	1,495	12	4	50	48 x 30	CI	B	230	5-27	Y	615	Front lock	
Inca 2200	2,995	12	4	25	27 x 31	CI	B	230	3-18	Y	385	Front lock	
Lobo HTS-0012	930	12	4 1/8	30	27 x 37	CI	B	230	3-36/18	Y	385	F & R	
Lobo TS-1212	1,890	12	4	49	48 x 30	CI	B	230	5-19.6	Y	572	F & R	
Mini Max S300W	7,995	12	4	54	34 x 23	CI	B	230	7.25-24	Y	1,280	F & R	
North State MBS-300	1,975	12	4	50	30 x 48	CI	B	230	5-NA	Y	750	Front lock	
Seco SK-1212TS	1,840	12	4	78	48 x 30	CI	B	230	5-25	Y	570	F & R	
Star WTST10	1,650	12	4	36	40 x 29	CI	B	230	5-35	Y	600		
Sunhill TAS-12	1,895	12	3 3/4		40 x 30	CI	B	230	3/5-17/14	Y	570	F & R	
Sunhill TAS-16	3,450	12 - 16	4 to 6		48 x 38	CI	B	230	7.5-23	Y	1,150	F & R	
Transpower TSC-12HK	970	12	4	30	40 x 27	CI	B	230	3-18	Y	410	Front lock	

key

* Also available with two cast wings; **Also available in left tilt; CI = cast iron; S=steel; B=belt; D=direct drive; F & R=front and rear locking

■=PW Recommends

thicknessplaners

You can't buy too much raw power when choosing a planer.

The biggest mistake people make when buying a thickness planer is that they don't buy the other machine you need to make the planer work properly, and that's the jointer. These two machines work together to turn rough stock (or even dressed stock) into usable parts.

You can get by with just a planer, but be advised that you'll need to shim the high spots under each board during planing. Why's that? The feed rollers on a planer will press warped wood flat during planing. Once the board leaves the planer, it will spring back to its original bow. The other way to get by without a jointer is to use a hand plane to flatten one side of each board before planing.

You basically have two choices when buying a planer. Benchtop models are getting better and cheaper all the time, but they aren't for heavy-duty all-day use. Induction-motor stationary planers with cast-iron beds and serrated infeed rollers are built for that job, but you're going to pay $800 or more for one of these. So check your wallet, think about your woodworking and figure out which machine is for you.

Benchtop Planers

We've tested every benchtop planer on the market, and after using them for several months we concluded they are less reliable and less gutsy than floor-model planers. When it comes to the quality of the cut, however, benchtop models hold their own when compared to the big boys. And they are generally easier to set up and maintain. Most woodworkers will do fine with one of these benchtop machines — as long as they don't ask too much of them.

For us, the most important factor when buying a benchtop model is the motor. We tested the efficiency of the motors to see how much they would bog down in a cut and how much more amperage they would need to maintain their speed. The results are available on the chart on the following pages.

All planers have a tendency to "snipe" a board. Snipe is when the first and last two or three inches of a board gets cut deeper than the rest of the board. You can adjust your machine to remove most of the snipe in normal planing operations, but you'll never be free of it entirely. Benchtop machines tend to snipe more than stationary ones.

However, these portables do have some real advantages. The blades are generally easier to change than those in stationary machines. The machines can be stored under a bench when not in use, and the price is reasonable for the home woodworker.

When shopping, check out how easy it is to adjust the infeed and outfeed tables. These reduce snipe. Check how easy it is to change the blades. This varies from unbelievably simple to a task requiring three hands. Look for portable models that come with two-sided disposable blades that will give you twice the life of single-edge blades. Also see if you can adjust the blades side-to-side slightly so you can cancel out any nicks in your blades.

Cutterhead locks are another feature that're appearing on portable

SHOPPING GUIDELINES for planers

- If you're buying a benchtop model, get the beefiest motor you can afford.
- One critical difference with all planers is the ease of changing the knives. At the least, buy a machine with springs or jackscrews.
- On stationary planers, insist on a machine with serrated metal infeed rollers, which are more durable than rubber infeed rollers.
- Don't worry about the accuracy of the depth-of-cut indicator — they are all designed to just get you in the ball park.
- Two-speed stationary machines are valuable when surfacing figured woods.

The Jet JPM-13 is a 13" planer that is capable of cutting all sorts of mouldings. If you want to make your own trim that would be impossible to make (or nearly so) using a router, look into buying a planer/moulder.

Photo by Al Parrish

planers. These hold the cutterhead in place on your final pass. They reduce, but do not eliminate, sniping.

Stationary Planers

These heavy-duty workhorses are powered by an induction motor and built using cast iron. As a result, they are heavier, more reliable and need less coaxing than their smaller cousins. Stationary planers start at 12" wide and go up. Most home woodworkers buying a stationary planer will shop for a 15" model, which starts under $1,000.

When shopping for a 15" machine, check out the horsepower (usually 2 or 3 hp) and cuts per minute (between 13,500 and 15,000). One measure of the guts of the machine is the maximum cut the manufacturer recommends you take in one pass — most 15" planers can take between ⅛" and ¼".

Check out the feed rate, which is how quickly boards move under the cutterhead. Some floor models have variable feed rates that can be changed with a lever or by adjusting a chain inside the machine.

Another important feature is the knife-changing method. Most use springs or jackscrews to hold the knife in position as you lock it to the cutterhead. If your planer doesn't have these, buy a jig for setting your knives.

Rollers are critical in stationary planers. Most quality models use serrated steel feed rollers to grab and drive your wood under the cutterhead. Most have an adjustable chip breaker that will improve the final finish of your board. And be sure your stationary planer has adjustable bed rollers. These rollers are opposite the cutterhead and move rough stock more smoothly.

Finally, don't forget to add up the niceties that come with some planers. You'll probably want to buy infeed and outfeed rollers for your planer. These come packaged with some planers and are expensive accessories on others. Some planers come with knife-setting jigs, some don't. Some planers come with a dust hood, others don't. When factored in with the purchase price, these accessories can quickly turn an expensive machine into a reasonably priced one. **PW**

PW Recommends

occasional user

- **Delta 22-560**, This 12½" portable planer gives you a lot of high-end features at a good price — and you get the Delta name to boot. Knife-changing is a breeze. Keep your eyes peeled this year for the new 22-580 13" planer from Delta that will offer two speeds and some other nifty features.
- **DeWalt DW733**, Rugged and powerful, this 12" planer is an excellent machine. Our only complaint is we wish the knives were two-sided.
- **Ridgid TP1300**, This well-made machine offers a lot of refinements not found on some others, such as on-board tool storage. Plus it has a lifetime warranty.

serious home woodworker

- **Bridgewood BW-15P**, This machine comes complete with a dust hood and infeed/outfeed rollers. The motor is mounted below the cutterhead, a configuration that we prefer. This makes the knives easier to adjust and reduces vibration.
- **JET JPM-13 & 13CS**, This 13" induction-motor planer gives you many of the features of floor-model planers and the additional ability to cut hundreds of moulding profiles with extra knives you install on the cutterhead.

advanced woodworker or professional user

- **Grizzly 1033**, You are going to be hard pressed to find another 20" planer for this price. It has many of the features found on its competitors — except for the price.

These tools have been tested or used by the editors of *Popular Woodworking* and have earned their recommendation.

[stats]

BENCHTOP

	CRAFTSMAN 21713	DELTA 22-540	DELTA 22-560	DELTA 22-580	DEWALT DW733	GRIZZLY G1017	GRIZZLY G8794	JET JWP12-DX	MAKITA 2012NB	RIDGID TP1300
Street price	$389	254	299	500	379	369	279	329	489	399
MOTOR										
Amp load/no load	15/8.3	15/8.8	14.3/8.6	15/NA	15/7.3	15.6/9.3	15/8.6	NA	11.8/5.7	15/9.0
RPM load/no load	8K/9.5K	7.3K/8.4K	7.5K/8.4K	NA	9K/20K	8.1K/9.4K	8K/9.2K	NA	7K/8.4K	8K/9.4K
dB level@3 ft.	97	92	94	NA	95	93	91	NA	88	94
Peak dB @3 ft.**	102	99	102	NA	100	94	101	NA	98	102
Overload switch	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes
CUTTERHEAD										
Knife change (1-5)*	2	2	5	NA	4	3	3	NA	5	4
Knives/type	13"/2x D	12"/2x D	12½"/2x D	13"/2x D	12½"/1x S	12"/1x S	12½"/2x D	12½"/2x D	12"/2x D	13"/2x D
Lateral knife adj.	No	¼"	1/16"	Yes	No	¼"	⅛"	¼"	3/32"	.040
Blade thick/width	.059" x ⅞"	.07" x ¾"	.058" x 7/16"	.058" x 7/16"	.125" x 11/16"	.12" x ¾"	.063" x ¾"	NA	.077" x 5/16"	.071" x ¾"
Snipe @ 1/16" outfeed:/infeed:	.001"/.009"	.005"/.007"	.000"/.000"	NA	.005"/.006"	.005"/.007"	.001"/.008"	NA	.001"/.002"	.005"/.008"
Corrected Snipe outfeed:/infeed:	.001"/.009"	.000"/.005"	.000"/.000"	NA	.000"/.003"	.000"/.003"	.004"/.005"	NA	.001"/.002"	.001"/.002"
Cutter shaft lock	Yes	No	Yes	Yes	Yes	No	No	No	Yes	Yes
FEATURES										
Ease of adjusting height of head (1-5)*	4.2	3	3.4	NA	3.4	4.4	3	NA	4	3.4
Table Adj.(1-5)*	2.8	3.4	3.4	NA	2.6	3.2	3.2	NA	4.2	3.8
Table W" x L"	15½ x 37½	12½ x 23½	12½ x 23¾	13 x 35	13½ x 33⅛	15 x 21½	12⅞ x 25	15 x 23¼	13 x 30⅜	14 x 34
Fit and finish (1-5)*	4.4	2.8	4	NA	4.2	3.4	3.2	NA	4.4	4.4
Ergonomics (1-5)*	3.8	2.2	3.4	NA	3.4	3	2.6	NA	3.8	3.8
Scale readability (1-5)*	3	2.8	3	NA	2.6	4.6	2.8	NA	3.4	2.8
Feed rollers?	Yes	No	No	No	No	Yes	Yes	Yes	No	No
Cord length/type	8'6"/P	6'/P	6'/P	10'/R	10'/R	5'/P	6'/P	NA	8'/R	10'/P
Weight in lbs.	85	62	65	86	80	78	75	69	60	82
Warranty	1 yr	2 yrs	2 yrs	2 yrs	1 yr	1 yr	1 yr	2 yrs	1 yr	Lifetime

FLOOR

BRAND/MODEL	PRICE	MAX STOCK (T X W IN.)	MAX CUT DEPTH (IN.)	KNIVES # X RPM	BED MATERIAL	BED ROLLERS	FEED ROLLERS	HP	VOLTS	WEIGHT (LBS.)	COMMENTS
Williams & Hussey	$1,970	8 x 7	¼	2 x 3,450	CI	N	U	2	115/230	220	moulder
Shopsmith Pro Planer	1,200	4 x 12	⅛	3 x 5,750	CI	N	S, R	1¾	115	151	variable speed
Belsaw 1120002	1,700	6 x 12½	3/16	3 x 4,500	CI	N	R	5	230	350	moulder
Woodmaster 712	1,365	7 x 12½	3/16	3 x 4,200	CI	N	R;S OPT	5	230	300	
General 30-100	1,115	6 x 13	⅛	3 x 4,500	CI	N	R	1½	115/230	275	
Grizzly G1037	695	6 x 13	⅛	3 x 5,000	CI	N	R	1½	110/220	240	moulder
Jet JPM-13	800	6 x 13	1/16	3 x 4,500	CI	N	R	1½	115/230	209	moulder
Jet JPM-13CS	830	6 x 13	1/16	3 x 4,500	CI	N	R	1½	115/230	269	moulder
General 130-1	3,900	6 x 14	1/16	3 x 4,500	CI	Y	S	3	230	520	jackscrews
General 130-1-M1	3,200	8 x 14	⅛	3 x 4,500	CI	Y	S	3	230	650	
Grizzly G1021	765	6⅛ x 14⅞	⅛	3 x 5,000	CI	Y	S	2	220	440	roller extnsns
Grizzly G1021Z	995	6⅛ x 14⅞	⅛	3 x 5,000	CI	Y	S	3	220	540	
Bridgewood BW-15P	895	6 x 15	⅛	3 x 4,500	CI	Y	S, R	3	230	446	jackscrews
Craftsman 22615	1,250	6 x 15	⅛	3 x 5,000	CI	Y	R	3	230	548	2 speeds
Jet JWP-15CS	1,200	6 x 15	⅛	3 x 4,500	CI	Y	S	3	230	502	closed stand
Lobo WP-0015	1,000	6 x 15	3/16	3 x 4,500	CI	Y	S, R	3	230	480	2 speeds
Powermatic 15	1,325	6 x 15	⅛	3 x 4,500	CI	Y	S	3	230	484	
Seco SK-0015WP	1,135	6 x 15	¼	3 x 5,000	CI	Y	R	3	230	440	
Star WPL15	925	6 x 15	⅛	3 x 5,000	CI	Y	S	3	220	510	
Sunhill CT-38B	925	6 x 15	¼	3 x 4,500	CI	Y	S	3	230	500	
Sunhill CT-400D	2,500	6 x 16	¼	3 x 5,000	CI	N	S, R	3	230	700	
Transpower AP900	850	6 x 15	¼	3 x 5,600	CI	Y	S	3	230	485	
Woodtek 875-001	1,000	6 x 15	⅛	3 x 3,450	CI	Y	S	2	230	470	knife tool inc.

key

P=plastic; R=rubber; 2x D= two-sided, disposable; 1x S=single-edged, sharpenable
* On a scale of 1 to 5 with "1" being "unacceptable" and "5" being "outstanding."
** Peak dB is measured at 3' while making a 1/16"-deep cut on a 6"-wide poplar board. Always wear hearing protection when planing.

[stats]

BRAND/MODEL	PRICE	MAX STOCK (T X W IN.)	MAX CUT DEPTH (IN.)	KNIVES # X RPM	BED MATERIAL	BED ROLLERS	FEED ROLLERS	HP	VOLTS	WEIGHT (LBS.)	COMMENTS
Delta 22-680	1,545	6 1/2 x 15	1/8	3 x 5,000	CI	Y	S	3	230	340	jackscrews
North State 315	890	6 1/2 x 15	3/16	3 x 5,000	CI	Y	S	3	230	500	2 speeds
General 30-125 MI	1,600	7 x 15	1/8	3 x 5,000	CI	Y	S	3	230	539	
Lobo WP-1015	870	8 x 15	1/8	3 x 4,500	CI	Y	S, R	3	230	480	
Bridgewood BW-16PV*	2,795	7 x 16	1/4	3 x 5,600	CI	Y	S	3	230	748	var spd,
Transpower AP800	750	8 x 16	1/4	3 x 5,600	CI	Y	S, R	3	220	485	
RBI 816	2,000	8 x 16-1/4	5/16	4 x 4,600	S	N	U	5	230	440	
Powermatic 180	6,300	6 x 18	1/4	3 x 4,800	CI	Y	S	5	230/460	1,523	jackscrews
Woodmaster 718	1,780	7 x 18-1/2	3/16	3 x 4,200	CI	N	R; S OPT	5	220	480	
Bridgewood BW-200P	2,495	6-1/2 x 20	1/4	3 x 5,000	CI	Y	S	5	230	780	jackscrews
Grizzly G5850	2,495	7 3/4 x 20	1/8	3 x 5,200	CI	Y	S	5	220	900	24 ft. per min.
Bridgewood BW-20PV	3,195	7 x 20	1/4	3 x 5,600	CI	Y	S	5, 7 1/2	220	857	jackscrews
Craftsman 22622	2,050	8 x 20	1/8	4 x 5,000	CI	Y	S	3	230	792	2 speeds
Grizzly G1033	1,295	8 5/8 x 20	1/8	4 x 4,833	CI	Y	S	3	220	785	2 speeds
Seco SK-0020WP	1,740	7 x 20	1/4	4 x 5,000	CI	Y	R	3	230	770	
Woodtek 816-427	2,480	7 x 20	3/16	3 x 5,000	CI	Y	S	3	230	981	
Woodtek 816-434	2,480	7 x 20	3/16	3 x 6,000	CI	Y	S	5	230	981	3 phase
Woodtek 924-083	1,295	8 x 20	1/8	4 x 5,000	CI	Y	S	3	220	771	5" dust port
Powermatic 208	2,860	8 x 20	3/32	4 x 5,000	CI	Y	S	3	230	640	opt. 5 hp
Lobo WP-0020	1,590	8 x 20	1/4	4 x 5,000	CI	Y	S, R	3	230	770	
Lobo WP-1120	2,490	8 x 20	1/4	3 x 5,000	CI	Y	S, R	3	230	770	
Lobo WP-2000	3,490	7 x 20	1/4	3 x 5,500	CI	Y	S, R	3	230	850	
North State CT-508	1,395	8 x 20	1/4	4 x 5,000	CI	Y	S	5	230	950	
General 30-300 MI	2,200	8 x 20	3/32	3 x 5,000	CI	Y	S	3	230	880	
Seco SK-824WP	4,495	6 x 20	1/4	3 x 5,400	CI	N	S	7 1/2	230	1,390	
Seco SK-720-WP	2,680	6 1/2 x 20	1/4	3 x 5,200	CI	N	S	5	230	770	
Star WPL20	1,295	8 x 20	1/8	4 x 5,000	CI	Y	S	3	220	885	
Sunhill CT-508	1,395	8 x 20	1/4	4 x 5,000	CI	Y	S	3	230	925	
Transpower AP200A	1,275	8 x 20	1/4	4 x 5,600	CI	Y	S, R	5	220	860	
Transpower AP720	2,100	8 x 20	1/4	3 x 5,200	CI	Y	S	7.5	230	970	
Delta 22-450	3,760	8 5/8 x 20	3/16	3 x 5,000	CI	Y	S	5	230/460	840	controls in front
Bridgewood BW-508	4,195	9 x 20	1/4	3 x 5,000	CI	Y	S	7 1/2	220	1,370	jackscrews
Grizzly G9740	4,750	9 x 20	5/16	4 x 5,000	CI	Y	S	7 1/2	220	1,678	
Grizzly G9967	4,850	9 x 20	5/16	4 x 5,000	CI	Y	S	5	220	1,678	1 phase
Delta 22-470	4,300	9 x 24	1/4	3 x 5,000	CI	Y	S	7 1/2	230/460	980	2 speeds
Bridgewood BW-240P	3,395	6 1/2 x 24	1/4	3 x 5,000	CI	Y	S	7 1/2	220	880	jackscrews
General 330	8,500	9 x 20	1/8	4 x 4,000	CI	Y	S	5	230	2,100	
Lobo WP-508	5,790	11 3/4 x 20	5/16	4 x 4,800	CI	Y	S	7 1/2	230	1,580	
Laguna P20	10,995	12 x 20	5/16	4 x 4,500	CI	Y	S	9	230	2,100	
Seco SK-20WP5	2,014	7 x 20	1/4	4 x 5,000	CI	Y	R	5	230	882	
Powermatic 201	4,135	9 1/2 x 22	1/8	4 x 4,800	CI	Y	S	5	230	1,279	3ph available
Laguna P24	14,995	12 x 24	5/16	4 x 4,500	CI	Y	S	12	230	2,000	
RBI 820	2,400	8 x 20 1/4	5/16	4 x 4,600	S	N	U	5	230	500	
Mini Max SP-1	7,255	9 3/4 x 20 1/2	5/16	4 x 4,500	CI	Y	S	9	230/460	1,496	
Delta 22-610	9,700	9 3/8 x 24	10 mm	4 x 5,000	CI	Y	S	10	220	1,675	3ph available
Seco SK-820-WP	3,520	6 x 24	1/4	3 x 5,400	CI	N	S	5	230	1,300	
Seco SK-724WP	3,280	6 1/2 x 24	1/4	3 x 5,200	CI	N	S	7 1/2	230	990	
Seco SK-724WP5	2,950	6 1/2 x 24	1/4	3 x 5,200	CI	N	S	5	230	990	
Grizzly G5851	3,395	8 1/4 x 24	1/8	3 x 5,200	CI	Y	S	5	220	1,030	
Grizzly G7213	3,295	8 1/4 x 24	1/8	3 x 5,200	CI	Y	S	7 1/2	230	1,030	3 phase
Grizzly G9741	5,550	9 x 24	5/16	4 x 5,000	CI	Y	S	10	220	2,030	
Grizzly G9961	6,995	9 x 24	5/16	4 x 5,000	CI	Y	S	10	220	2,030	spiral cttrhed
Star WPL 24	NA	7 x 24	3/8	3 x 5,400	CI	NA	NA	7 1/2	230	NA	
North State WJ-24	2,900	7 x 24	1/4	3 x 5,300	CI	Y	S	7 1/2	230	1,450	variable speed
Woodmaster 725	2,900	6 3/4 x 25	3/16	3 x 4,200	CI	N	S	7 1/2	220	808	

key

KEY: A = aluminum. CI = cast iron. S = steel. Feed Rollers: R = rubber coated. S = serrated steel, U=urethane. Y = yes. N = no. OPT = optional. NA = information not available. *=also has jackscrews ■ = PW Recommends,