

2024

FineWoodworking FineHomebuilding FineGardening

TOOL GUIDE



**Expert advice for
choosing the right
tools for the job**





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2024

TOOL
GUIDE

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The Taunton Press
Inspiration for hands-on living®

on the web

free extras at FineWoodworking.com/TG2024



Shopmade clamping station

This clamping station by Alan McIvor helps make panel glue-ups foolproof.



VIDEO

Drywall tools for the first coat

Learn about mechanical and automatic drywall tools such as the taper, the compound tube, and the banjo to make your drywall job better.



VIDEO

How to make a track saw crosscut table

Build a table that will make the track saw your go-to tool for crosscutting panels that are too big for your table saw.



VIDEO

Pruning tips for hydrangeas

If you decide you need to prune your bigleaf hydrangea, this video will give you the information you need to do it right.

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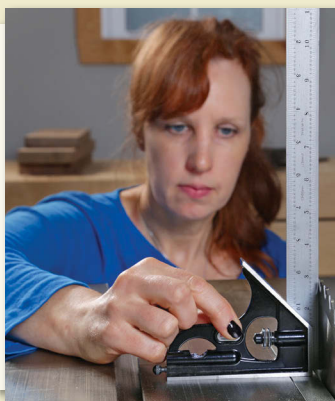
VIDEO WORKSHOP

Machine maintenance with Matt Wajda and Ellen Kaspern

A well-tuned machine makes woodworking more accurate and shop time more enjoyable. Not only have Wajda and Kaspern spent countless hours making furniture, but they've also both taught classes on setting up and maintaining machinery.

In this series, you'll learn how to tune up:

Tablesaws • Jointers • Planers • Hollow-chisel mortisers



2024 TAUNTON'S TOOL GUIDE

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GOOD TOOLS MAKE EVERYTHING BETTER

It doesn't matter whether you are a new homeowner attempting to tile your bathroom, a master woodworker crafting a piece of fine furniture, or a gardener looking to make a hard job less taxing: When you start with good tools, the work is easier and the results are better.

If you're on a quest for the latest tool information, this publication is a good place to start. *Taunton's 2024 Tool Guide* gathers tool reviews, roundups, how-tos, and advice from the past year, offered by the experts at *Fine Woodworking*, *Fine Homebuilding*, and *Fine Gardening* magazines.

From master gardeners across the country, there's a roundup of ergonomic gardening tools that are easier on the hands and body. Also from gardening experts is a look at some of the newer tools on the market.

On the homebuilding front, professional carpenters and contractors review new cordless table saws that are ideal for remote job sites, and compact cordless routers that make setup faster and eliminate pesky power cords that can trip you up. We also take a look at tools for leveling concrete, and variety of new accessories to make work easier and more efficient.

On the woodworking front, you can choose from reviews of table saws, miter saws, planers, routers, and a multitude of other tools that have hit the market in the past year. Or choose the unplugged route and check out our updated collection of hand tools.

So sit back and browse through the collections of tools curated here, and rest assured that each of our recommendations is backed by a professional who uses them in their shop, on the job site, or in their garden. Then head out and choose the right tool for the task you have in mind.



A NOTE ABOUT PRICES

Prices listed in this guide were checked at the time of publication and represent an average cost for the tool available online. Prices change, sometimes quite often. So please do your own price checks and survey several retailers if considering a tool.

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quick tips

Miter gauge guides a tablesaw sled

The most difficult part of making any tablesaw sled is attaching the miter runner(s) accurately so that the fence is square to the blade. My approach makes this critical step much more straightforward.

If you have a spare miter gauge lying around the shop, you can attach it directly to the sled, creating a robust, adjustable guide system. You'll only have one runner guiding the sled instead of the usual two, but these bars are made of durable steel or aluminum and can be adjusted for a snug fit in the miter slot, either with built-in adjusters or by dimpling the sides of the bar with a center punch.

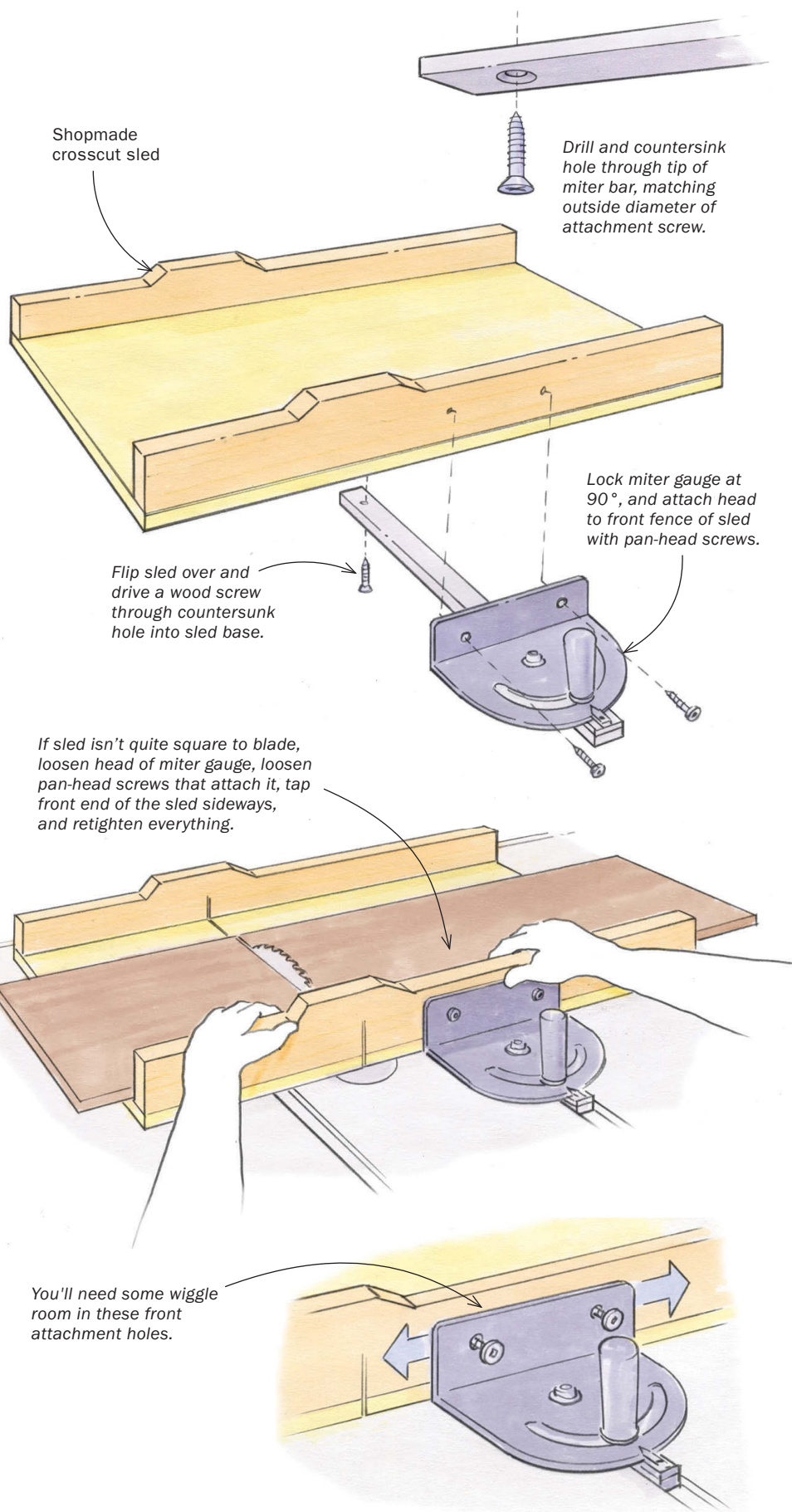
It's easier if you dedicate the miter gauge to the sled in question, adjusting it for squareness and leaving it that way, but you can also use the same miter gauge to guide multiple sleds.

To get the miter gauge ready for its new job, drill and countersink a hole in the leading end of the bar. Lock the miter gauge at 90°, and use the two attachment holes in its head/fence (drill them if they aren't already there) to screw it to the front fence of the sled, using pan-head wood screws. It's helpful to have a little bit of slop in these holes for later adjustment. Then make a test cut to see if the sled is square to the blade. Adjust its angle a little if necessary.

Next, flip over the sled and drive a standard wood screw through the tip of the bar into the base of the sled. The goal is to do this without the bar moving from its current position. Make a practice cut to check once more for squareness, and the sled is ready to use.

If the sled has moved slightly off square, you can make a small adjustment by loosening the head of the miter gauge as well as the front screws that attach it to the sled, and tapping the front end of the sled sideways. Retighten the screws and make another test cut.

—BRUCE LARSSON, Dudley, Mass.



Add a height dial to your tablesaw

Blade height is critical for a variety of joinery cuts on the tablesaw. In the past I would set the height as accurately as possible and sneak up on the precise depth with a series of test cuts. When I realized that one revolution of the handwheel moved the blade up $\frac{1}{4}$ in. on my saw, I decided to create a pointer system to make it faster and easier to set the height accurately, as well as to return to an earlier setting.

First, I made a wooden pointer that attaches to the saw cabinet with magnets. Using magnets lets me reposition the pointer when I make a bevel cut. That's necessary, since tilting the blade repositions the entire handwheel. I also attached small blocks to the cabinet, one on each side of the pointer, with double-stick tape; they let me return the pointer to its original location.

While you could mark the handwheel directly for various heights, I attached a ring made from thin white masonite to make the marks more visible. I divided the ring into quadrants to mark $\frac{1}{16}$ -in. height intervals.

I also make a mark on it whenever I need to return the blade to a specific setting. I use a grease pencil for all of these marks, so they're easy to redo if I change the blade to one with a slightly different diameter.

—JIM COX, East Aurora, N.Y.

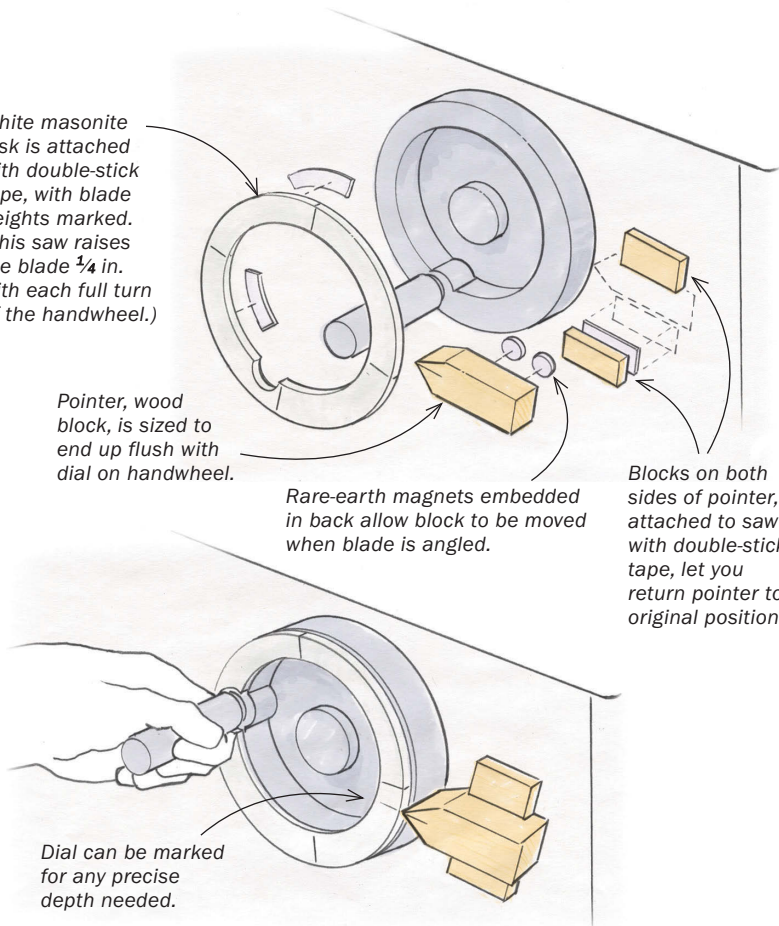
White masonite disk is attached with double-stick tape, with blade heights marked. (This saw raises the blade $\frac{1}{4}$ in. with each full turn of the handwheel.)

Pointer, wood block, is sized to end up flush with dial on handwheel.

Rare-earth magnets embedded in back allow block to be moved when blade is angled.

Blocks on both sides of pointer, attached to saw with double-stick tape, let you return pointer to original position.

Dial can be marked for any precise depth needed.



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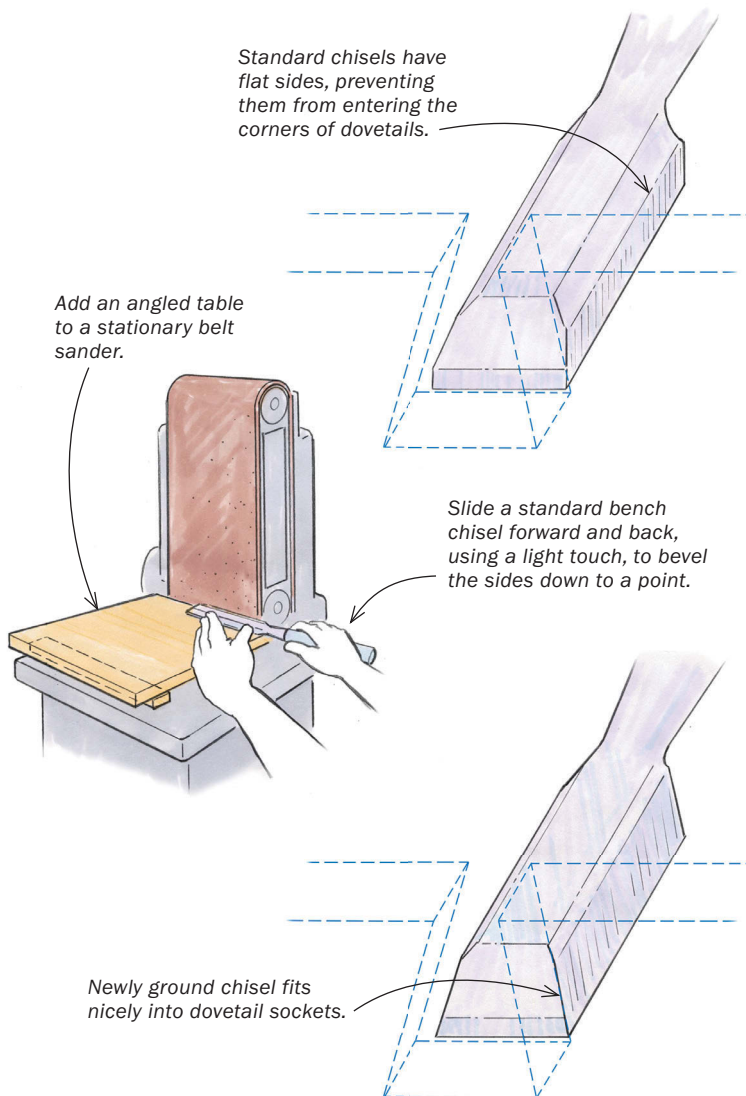


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Turn any chisel into a dovetail chisel

A dovetail chisel has angled sides, letting it nestle nicely into the corner of a dovetail socket. Standard bench chisels have flat areas at the sides, called “lands,” which prevent them from working all the way into the corners, and can make obvious dents there. To turn a bench chisel into a dovetail chisel, many folks use a bench grinder, which requires a steady hand to produce a smooth, even result. A stationary belt sander makes the job a lot easier. Start by creating an angled bed as shown, using a piece of plywood. The angle of the bed should match or exceed your favored dovetail angle. Slide the chisel forward and back against the belt, with a light touch, and stop just as the angled side reaches the bottom of the chisel. You’ll love the results. For Japanese chisels, you can use a black-oxide coating or other patina solution to turn the freshly ground metal black.

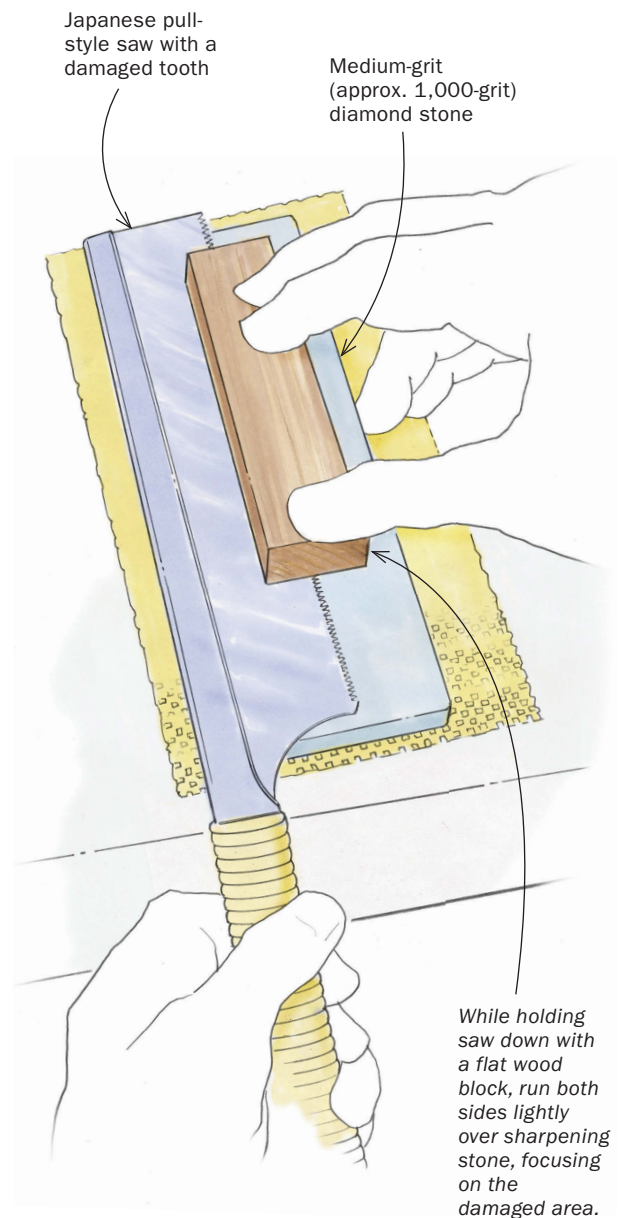
—DEREK COHEN, Rossmoyne, Western Australia



Quick fix for a bent or damaged saw tooth

A bent or broken tooth on a Japanese pull-style saw can extend out beyond the kerf and drag or catch with each stroke, making the saw difficult or impossible to use. To bring the damaged tooth back into alignment, gently run the side of the blade over a medium-grit diamond stone (1,000-grit works well), applying even pressure with a block of wood. A few easy strokes on each side of the saw is all it takes to flatten the trouble spot. A saw can be repaired this way many times before it has to be retired.

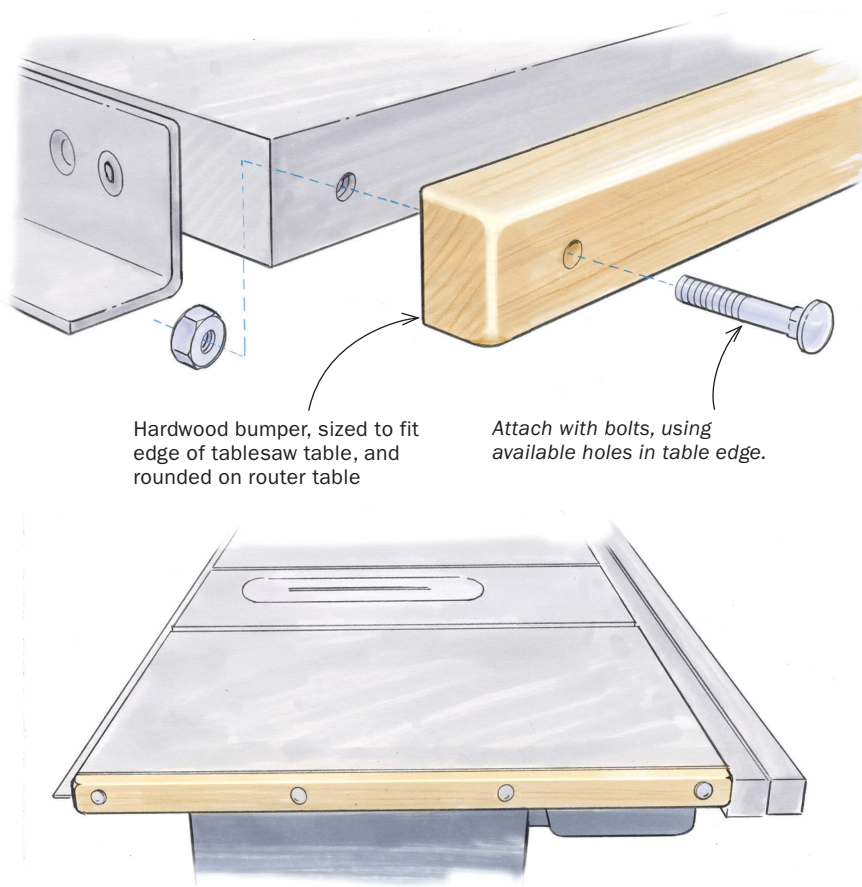
—DENNY SPECTOR, Redding, Calif.



Soften machine corners with custom bumpers

I find that sharp corners in my shop tend to catch my clothing and body as I walk by. I also worry about stumbling and hitting my head on them. The edges of my new tablesaw have a number of bolt holes along them. So I cut a piece of hardwood to match the dimensions of each edge, rounded the edges with a 1/4-in. router bit, and mounted them on the edges of the table with round-headed bolts. Hex-head bolts set in counterbores could also work. The wood bumpers not only soften the sharp corners, but also add a handcrafted look to my new saw. The same could be done on other types of shop equipment.

—CARL SPENCER, Nolensville, Tenn.



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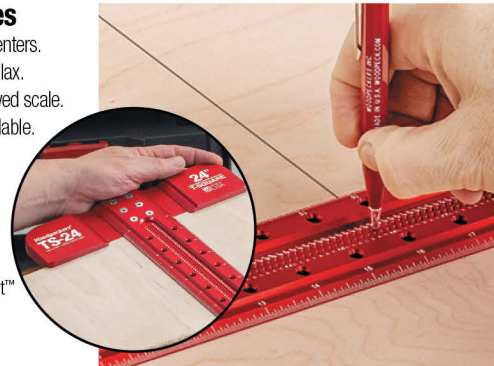
12" 1281....\$129.99

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Precision T-Squares

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Includes a wall-mountable Rack-It™

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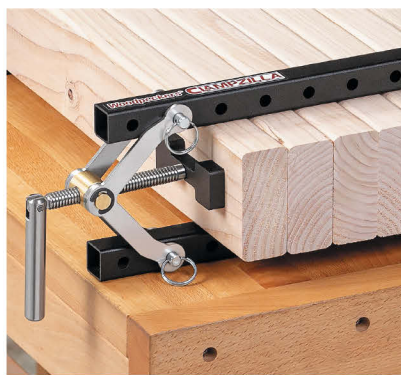


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4-Way Panel Clamp

- Applies pressure both directions.
- Works with material from 5/8" to 4".
- Improved vertical pressure.
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Includes a Woodpeckers case

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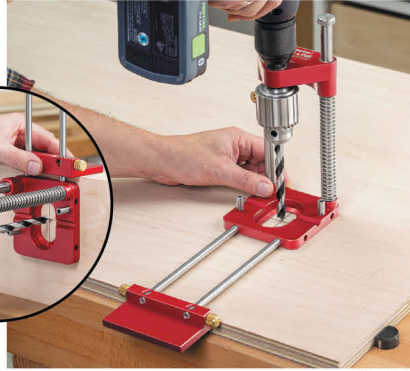


AUTO-LINE™ DRILL GUIDE

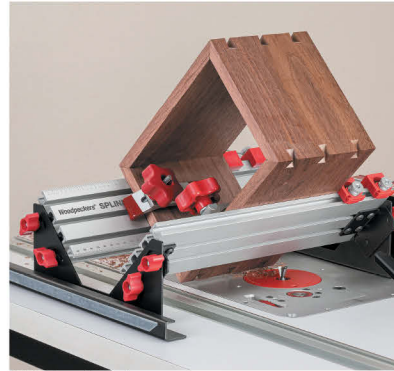
- Perpendicular holes anywhere.
- Fence fits on all 4 sides.
- Works with most drills.
- 1" inside frame.
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- Deluxe Kit includes extensions.



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Drill Guide....\$299.99
Deluxe Kit....\$399.99



Drill not included.



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Deluxe Kit....\$339.99



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- Flip stop with micro-adjust.
- Stop extends to 50".
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Left-or-Right Miter Sled....\$529.99
Drop Zone....\$129.99

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- Positive stops for standard angles.
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w/Fence & Stealth Stop
Miter Gauge....\$119.99

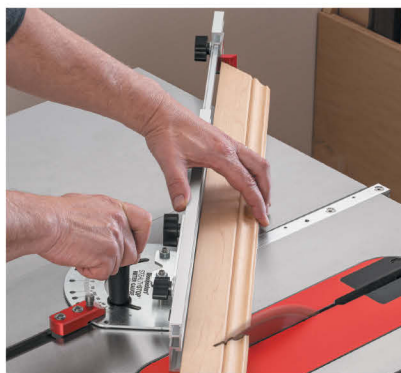


Table Saw not included.

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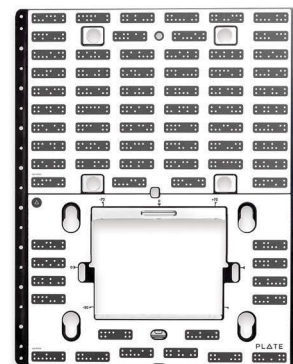
On the Horizon

A selection of some of the best new tools on the market.



Shaper's Complete Origin System

Shaper Origin is the world's first, and only, handheld CNC router. You steer Origin while it makes small automatic adjustments to ensure clean and accurate results. The Complete Origin System blends digital precision with the craft of woodworking for a range of applications, from joinery and custom template routing to hardware installation. Combine Origin with Workstation for all of your joinery needs or use it with Plate: the universal template for Origin that helps install a wide array of hardware, inlays, and bowties and includes hundreds of free digital templates from leading manufacturers in Shaper's Hardware Catalog.



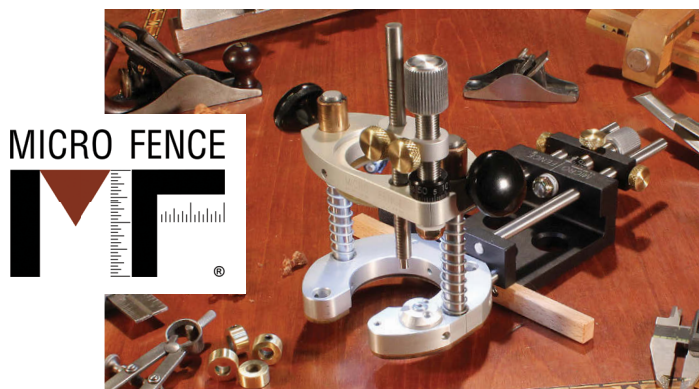
Compact 3-axis machining center

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See www.kellerdovetail.com for full information on the Pro and Journeyman Dovetail models.

Maintenance

Setting up your tablesaw

BY ASA CHRISTIANA



Some power tools will do their best work right out of the box. Don't expect that from your new tablesaw. It needs a tune-up on day one.

A tablesaw is designed so that the teeth at the front of the blade do all the cutting, and the teeth at the back spin freely, without rubbing or cutting into the board. For that to happen, the board needs to travel in a perfectly straight path through the blade. So the first step is aligning the table so that the miter slots are parallel with the blade. The rip fence also needs to be set perfectly parallel to the blade.

From there, the tune-up switches from parallel to perpendicular, as you set the blade and fences square to the table. Those 90° angles are essential if you want to end up with tight joints and square projects.

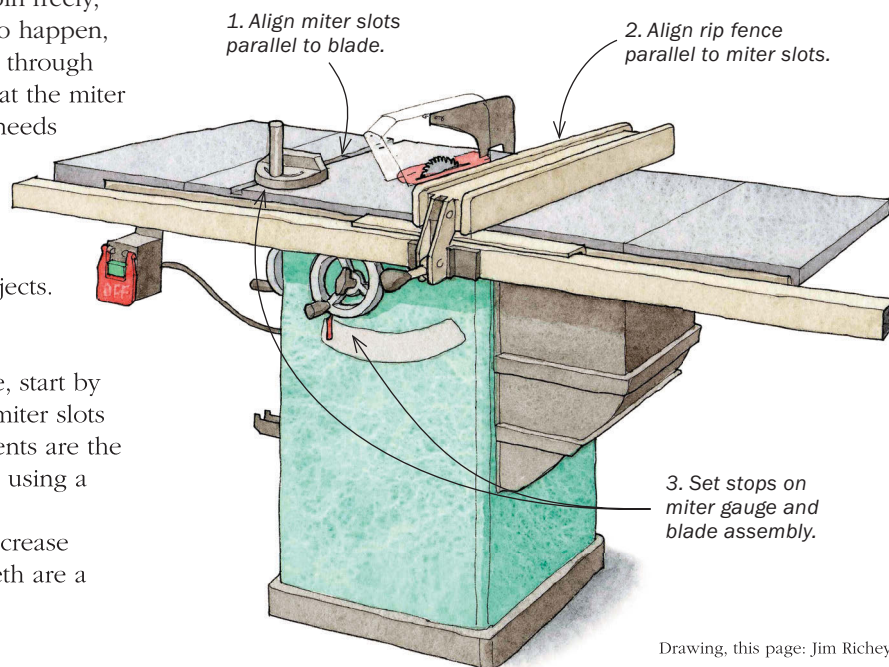
Align the blade parallel with the miter slots

To align the table (and its miter slots) with the blade, start by taking a measurement from the edge of one of the miter slots to the front and back of the blade. If the measurements are the same, the blade and table are aligned. I recommend using a 0-to-1-in. plunge-style dial indicator for this step.

Start by raising the blade as high as it will go to increase the distance between back and front. In case the teeth are a

THREE STEPS TO SAFE, SMOOTH, SQUARE CUTS

For perfect crosscuts, align the table's miter slots parallel to the blade. For ripcuts, align the fence with a miter slot, and it will be parallel to the blade, too. The last step is setting two built-in stops for square cuts.





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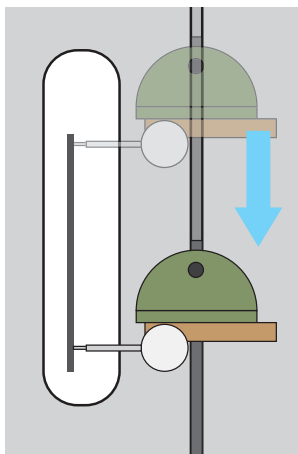
Align the blade and table

The miter slots must be parallel to the blade, and a plunge-style dial indicator is the best tool for checking.

1. CHECK TABLE ALIGNMENT

First check reading at front edge of blade.

Then check and compare reading at trailing edge of blade.

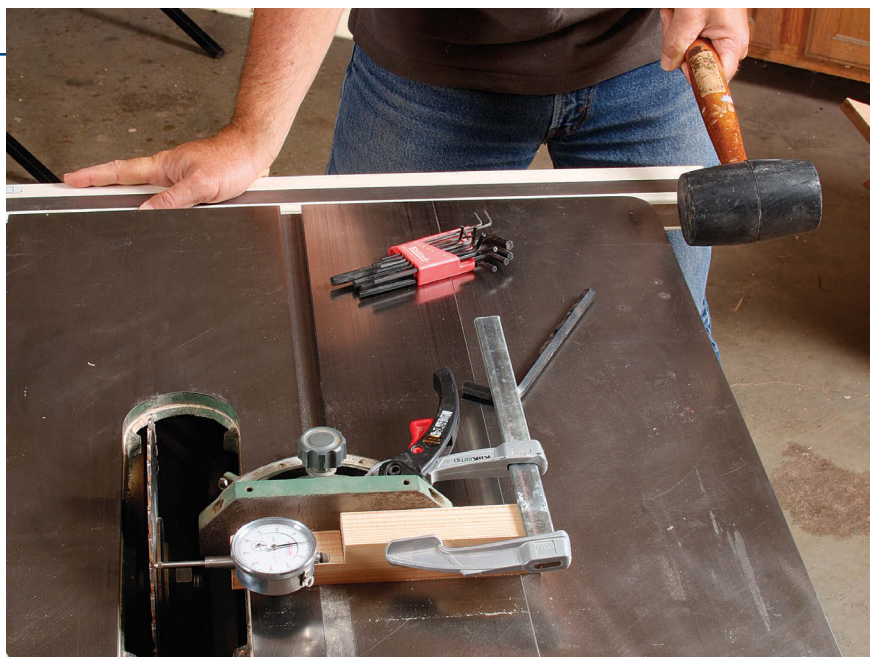


Check at the front and back of the blade. Clamp the wood block onto the miter-gauge fence so the indicator is pushing against a tooth. Move the blade and miter gauge to find the high point on the tooth, and then zero the dial on the indicator. Mark the tooth you measured earlier, and rotate it to the back of the table for another check. The dial shows a different reading at the back, meaning that this table is misaligned.

2. ADJUST AS NECESSARY



Loosen three of the four bolts that attach the table to the saw cabinet (above). Give the table a tap at one of the loose corners (right), and recheck the blade alignment. Lock down the bolts when the readings at the front and back of the blade are within 0.001 in. of each other.



little uneven or have some pitch built up on them, rotate the blade and use the same tooth for each measurement. The two numbers should be within 0.001 in. of each other, 0.002 at the most. They probably won't be, so you'll need to adjust them.

On cabinet saws, the trunnions (the assembly that holds the blade) are attached to the cabinet, and the table is attached independently, meaning you can move it and the blade stays put.

On smaller saws—job-site, portable, contractor, or hybrid saws—the blade assembly is usually attached directly to the

tabletop. That means you'll have to go a little farther under the hood. Check your manual, and take a look under the table for the attachment points. Newer saws make them easier to access.

Align the rip fence and check the splitter

Now that the miter slots are parallel with the blade, you can align the rip fence with one of the slots and know that it is square to the blade, too. Just line up the fence with a miter slot, feel for misalignment using your fingers, and adjust the fence.

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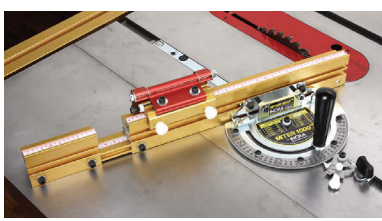





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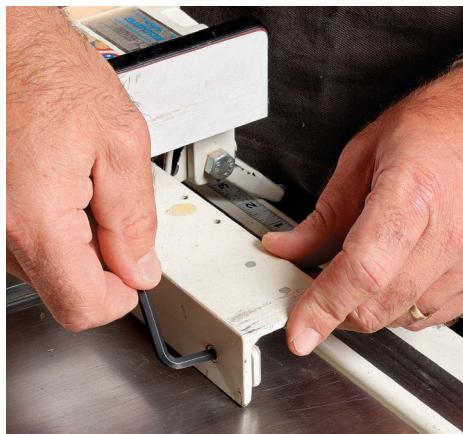
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Maintenance continued

Align the rip fence

Once you have the miter slots aligned with the blade, you can simply line up the rip fence with a miter slot to see whether it is parallel to the blade, too.

Go by feel. Clamp down the rip fence along the edge of one of the miter slots. Use your fingertips to check if the fence is flush with the slot from the front all the way to the back (above). Adjustments vary, but all are easy. On T-square fences like this (right), there are simple set screws on the bracket that rides the guide bar.



All saws should have some form of splitter behind the blade, designed to sit in the slot that it cuts, preventing the board from turning sideways and kicking back. On some saws you can simply flex the splitter sideways to align it; on others there will be a way to adjust it at its base.

Two stops make accuracy more convenient

For ripcuts and crosscuts alike, you also need the blade to be square to the table. There is a stop on the saw to help you return the blade to a perfect 90° every time. You can use a square to realign the blade after each bevel cut, and test cuts to be really sure, but it's nice to have a stop you can rely on.

The miter gauge that came with your saw also should have a stop on it for the 90° setting. If that stop is wiggly or sloppy in any way, replace the miter gauge with an aftermarket model. Before squaring the fence, add a long sacrificial piece of plywood or MDF to it.

Asa Christiana is a woodworker, writer, and editor in Portland, Ore.

Set the stops

Both the blade and miter gauge have built-in stops for returning them quickly to 90° after making an angled cut. Set these now and you'll save time later.

BLADE

Square the blade. Use a square to get the blade as close to 90° as possible. Then make a test cut on a thick, flat piece and check that with your square. That's the only way to know if your saw is accurate.



Now set the stop. The stop's location differs on various saws. Loosen it, push it against the blade assembly, and lock it in place.

MITER GAUGE



Square the fence to the blade. It's always good to attach an auxiliary fence to a miter gauge, so do this first. Get the fence as close to square as you can with a triangle or square, and try a test cut as before. Then adjust the set screw that acts as the stop.

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TOOLWORKS

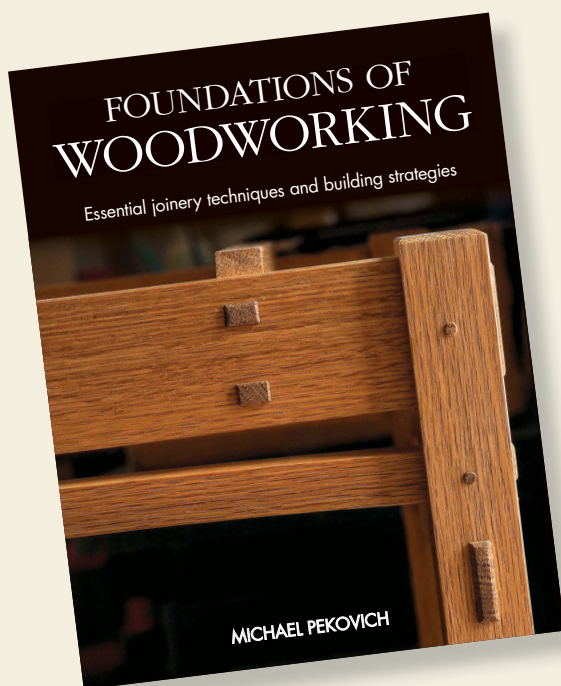
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New to market

Each year, the experts at *Fine Woodworking*, *Fine Homebuilding*, and *Fine Gardening* test dozens of new products and tools. Here is a rundown of some of the power tools we reviewed last year.

Quality sliding compound miter saw

Sliding compound miter saws have become a woodshop staple. Their ability to squarely crosscut wide boards and to cut difficult miter and bevel angles is huge. Festool's Kapex KS 120 REB fulfills these duties with aplomb.

The design keeps the saw close to the wall, allowing for a small footprint. The cut is rigid and precise provided you use good technique. It accepts 20mm blades, about 10¾ in. Its maximum width of cut is 12 in., close to several 12-in. saws I reviewed on pp. 28–35.

Setting the bevel is a literal snap. Flipping a clamp on the back unlocks the head. A counterbalance spring holds the head wherever it's placed, allowing single-handed adjustment. A rotating micro-adjust knob paired with a large scale allows for precise movements. One drawback is that the upper fence has to be removed for 45° bevel cuts—not a deal breaker, just a bit of a fuss.

I'm not normally a fan of laser lines, but the Kapex's are nice. It projects two lasers to define both sides of the kerf, making it easy to identify the waste.

The Kapex's miter capacity is 50° left and 60° right. The mechanism is easy to use. Integral table extensions lock securely and offer additional support for longer stock.

The blade change wrench is handily stored on the saw frame. The spindle lock is on the blade housing. This lock is much superior to a spring-loaded button, and also locks the trigger. Single-handed blade changes are possible. A speed control dial sets specific blade speeds for specialty blades. The saw arbor is 30mm, so typical ⅝-in. arbor hole blades won't work.

The handle, although ambidextrous, is my biggest complaint. I find its switches counterintuitive. It's not comfortable either.

—Roland Johnson is a woodworker and tool expert in Sauk Rapids, Minn.

Sliding compound miter saw by Festool
Model KS 120 REB
\$1,599



Bevels are a breeze. A rotating knob limits the range of overall travel left and right. A micro-adjust knob on the front allows precise bevel adjustments.



On-board angle transfer. The included Miterfast Angle Transfer Device makes finding the center of any angle easy and stores handily on the frame of the saw.

Cordless biscuit joiner

My corded Makita plate joiner has been a valuable part of my toolkit for years, and the cordless model is similar, with a few exceptions. The cordless version does not cut as quickly as the corded tool, and if you plunge too fast it will stall, requiring a reset. This is a minor problem that is fixed by changing your plunge speed. The handle is also shorter than that on the corded model, and I found my hand hitting the motor housing.

Makita says you can get 300 plunges from a 3-Ah, 18v battery; I've never had to make more biscuit slots than a fully charged battery delivers in a day. Dust collection is good, but the supplied bag fills quickly. It empties by sliding off a clip—an improvement over finicky zippers.

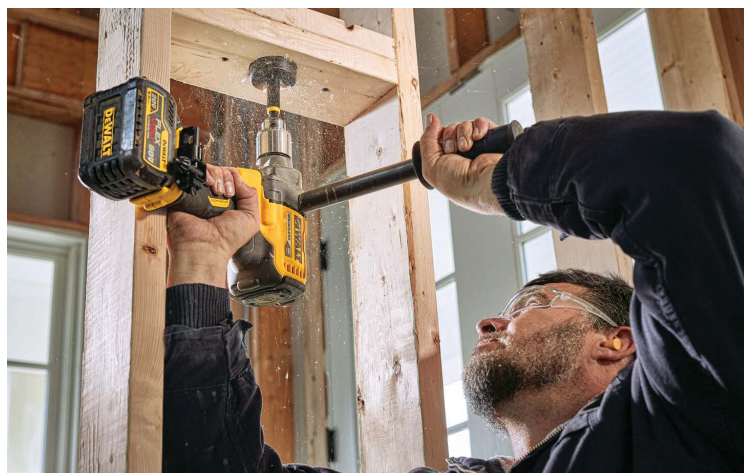
I used the joiner to cut slots to repair the casing of a round-top window. I also used the tool on an exterior window. Not having to drag a cord up a ladder was a plus.

I've found this joiner to be as useful as, and more convenient than, the corded version.

—Brian Campbell is a carpenter in Minneapolis.



Makita plate joiner
Model XJP03Z
\$290



More than a mixer.
In addition to mixing compound, mortar, or concrete, the DCD130 is sturdy enough for large-diameter self-feeding bits and hole saws.



DeWalt DCD130
Speed: 0 to 600 rpm
Weight: 6.9 lb.
\$270 (bare tool)

Multi-use mud mixer

A few months ago, I made the switch from a corded mud mixer to DeWalt's DCD130 60v Max FlexVolt cordless mixer/drill. It's a versatile tool. Though we primarily use the drill as a mixer, there have been occasions when we've used different drill bits and hole saws to make holes in tile. I've also seen landscapers chuck up an earth auger for drilling shallow holes in the ground, which is a good indication of just how much power this tool has.

Having been bound up in high-torque drills in the past, I appreciate the DCD130's E-Clutch system. This feature stops the tool if it detects binding of an attachment. The drill also has a handle that can be attached to three different sides for more control when mixing heavier products, such as concrete or dry-pack. According to DeWalt, you can mix as many as 17 5-gal. buckets of thinset mortar on a single 6-Ah battery. For my small crew, that's a couple days of mixing.

I've found a few drawbacks with the tool. First, I lost the key for the chuck. It fell out somewhere between the workspace and my truck. I would prefer a keyless chuck. Another issue is that the weight of the tool can cause smaller buckets of mixed products to tip over if not supported. This forces us to remove the mixing attachment from the drill frequently. Having a keyed chuck slows that process. Overall, the benefits outweigh the drawbacks. It's definitely a tool I would purchase again.

—Randy Williams is a builder and energy auditor in Grand Rapids, Minn.

Cordless rotary tool is ready for serious work

Dremel's new cordless rotary tool has all the power, stamina, and smoothness you'll need for all sorts of shaping tasks in the toughest woods. Without a cord dragging behind it, it's also very easy to control.

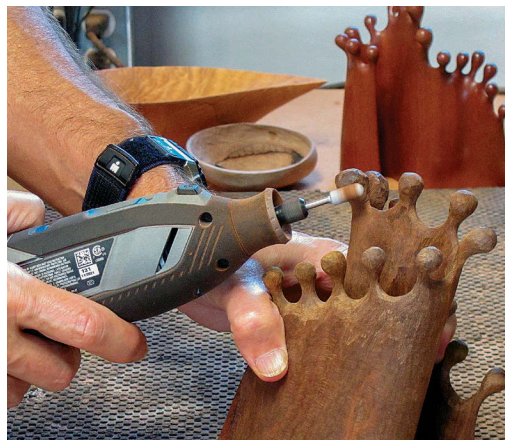
As a professional carver, I've owned several corded Dremel tools over the last 25 years, which I've used for light carving in tight spaces and various other odd jobs, like trimming screws and nails. Their small motors were prone to heat build-up, however, which often forced me to stop working after a relatively short session of continuous use.

Dremel has solved that issue with its new cordless model, which boasts a brushless motor powered by a 12-volt, 3 amp-hour, lithium-ion battery. Larger, heavier, and quieter than the corded Dremels I've used, the 8250 is very strong and smooth in use. It managed an impressive 52 minutes of heavy, continuous carving in tough Texas ebony, on a single charge, without bogging down or even getting warm.

—Danny Kamerath is a pro woodworker in Llano, Texas.



Dremel 8250
\$150



Power and control with no cord. Kamerath used the Dremel to carve a sculpture in tough Texas ebony, and it performed beautifully, with surprising stamina and smoothness. It will do the same for furniture volutes, drawer pulls, fluted turnings, and more.

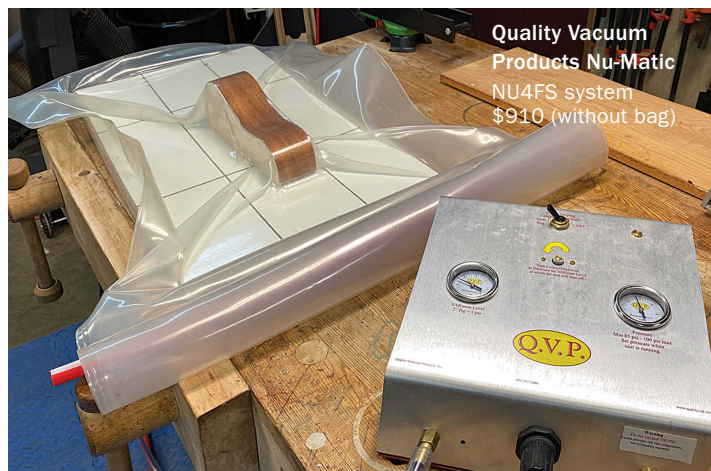
Versatile vacuum system

Quality Vacuum Products' NU-Matic system delivers vacuum pressure for veneering, laminating, and clamping—all the things you might want a vacuum pump for. Unlike an electric pump, this one is powered by compressed air; rather than plugging the unit in, you use it in tandem with your compressor.

I tested the "Pro" level system, which requires an air compressor capable of 4 cfm, but smaller and larger units are available. I went with the All-In-One (FS) system, which includes a foot pedal, letting you work hands-free on clamping jobs. The system includes all of the connections you need to attach it to any vacuum bag (QVP offers a wide range of those), and all gauges and controls are built into the box.

What's great about a unit like this is that it can be switched from pressing mode (with a vacuum bag) to clamping mode. In pressing mode, the unit automatically shuts off when the desired vacuum is reached and resumes when the level drops. But when the unit is switched into pneumatic clamping mode, commercial or shopmade vacuum blocks can hold workpieces firmly and instantly for routing and other tasks. In clamping mode, the unit maintains continuous high pressure, turned on and off with a handy foot switch. Various packages are listed at QualityVak.com, and you can call 800-547-5484 for more info.

—Roland Johnson



Quality Vacuum Products Nu-Matic NU4FS system
\$910 (without bag)

Ready for anything. The Nu-Matic system has everything you need to connect it to a compressor and vacuum bag and get to work. In the bag above is the steam-bent side of a ukulele, held on a form.



Handy foot switch. The All-In-One system includes a foot switch that lets you work hands-free with the pump in clamping mode, which holds workpieces for routing and other tasks.

Compact compound slider

Ridgid's 15-amp, 10-in. sliding compound miter saw solves an enormous number of problems for me. Let's start with the slide mechanism. Two heavy-duty aluminum arms roll on bearings, and the action is very smooth. And because the slide mechanism provides zero rear clearance, you can set up against a wall.

The size and weight of this saw is much easier to maneuver in my tool truck. My old 12-in. sliding miter saw is impossible to tuck between boxes, wheel wells, lumber, and the other things that pile up, not to mention the difficulty of lugging it to the job site through doorways and around obstacles. But I thought I needed to have a big 12-in. saw for cutting 5¼-in. base upright against the fence (beveling a saw is a frustrating endeavor for most models). I made do with the overall unwieldiness of a 12-in. slider for efficiency's sake.

I was floored to see the Ridgid's blade housing is knocked out enough that it can cut 5¼-in. base vertically with its 10-in. blade. I ran base, casing, and shoe



**Ridgid Coded
10-in. Sliding Miter Saw**
Model R4241
Crosscut capacity: 15.8 in. at 90°
Max. miter: 52° left, 60° right
Max. bevel: 48° left and right
Weight: 53 lb.
\$430

for several days during the test period and there were only a few occasions in an outside-right situation cutting in the middle of the board when I had to bevel the saw. That's OK, because the saw has the best bevel control I've seen. It was simple to adjust square out of the box, and the saw remained dead square. To tilt, lift a release lever by the miter lock knob, then flip the tab on the neck of the saw, and everything releases. Bevel the saw and lock into the detent.

The upright belt-drive motor is smooth and shows almost zero reaction torque or head bounce. When I cope ogee base, I make my inside-right cut, then flip the board over and drop the head through the square portion of the cut to minimize time with the coping saw. The Ridgid has no problem doing this delicate work.

The dust collection is adequate, but the beveled guard and blade light took some getting used to. The light seems overly bright. It casts a clean line down the blade, but I think it's ⅛ in.

or ¼ in. thinner than the actual (very nice) included blade. The guard housing reflects a lot of that light around and off the blade plate and carbide, making it sometimes difficult to focus on a pencil line. I did not notice this outside—where I do most of my cutting—but when I set up in a dim basement for trim, I did.

The saw feels powerful. It fights way above its weight without taking up any more space than necessary. It flew through hem-fir 2x10 just as easily as my 12-in. saw. It cut PT 4x4 without a hiccup. And it's corded, which I consider a plus—no battery to change or forget to charge during lunch. The saw is made by Delta Power Equipment Corporation; it carries a five-year warranty and doesn't include the same lifetime service agreement as most other Ridgid tools. That said, it's easily one of the most well-designed miter saws I've used.

—Mark Clement (@myfixituplife) is a remodeling contractor and author of *The Carpenter's Notebook*.

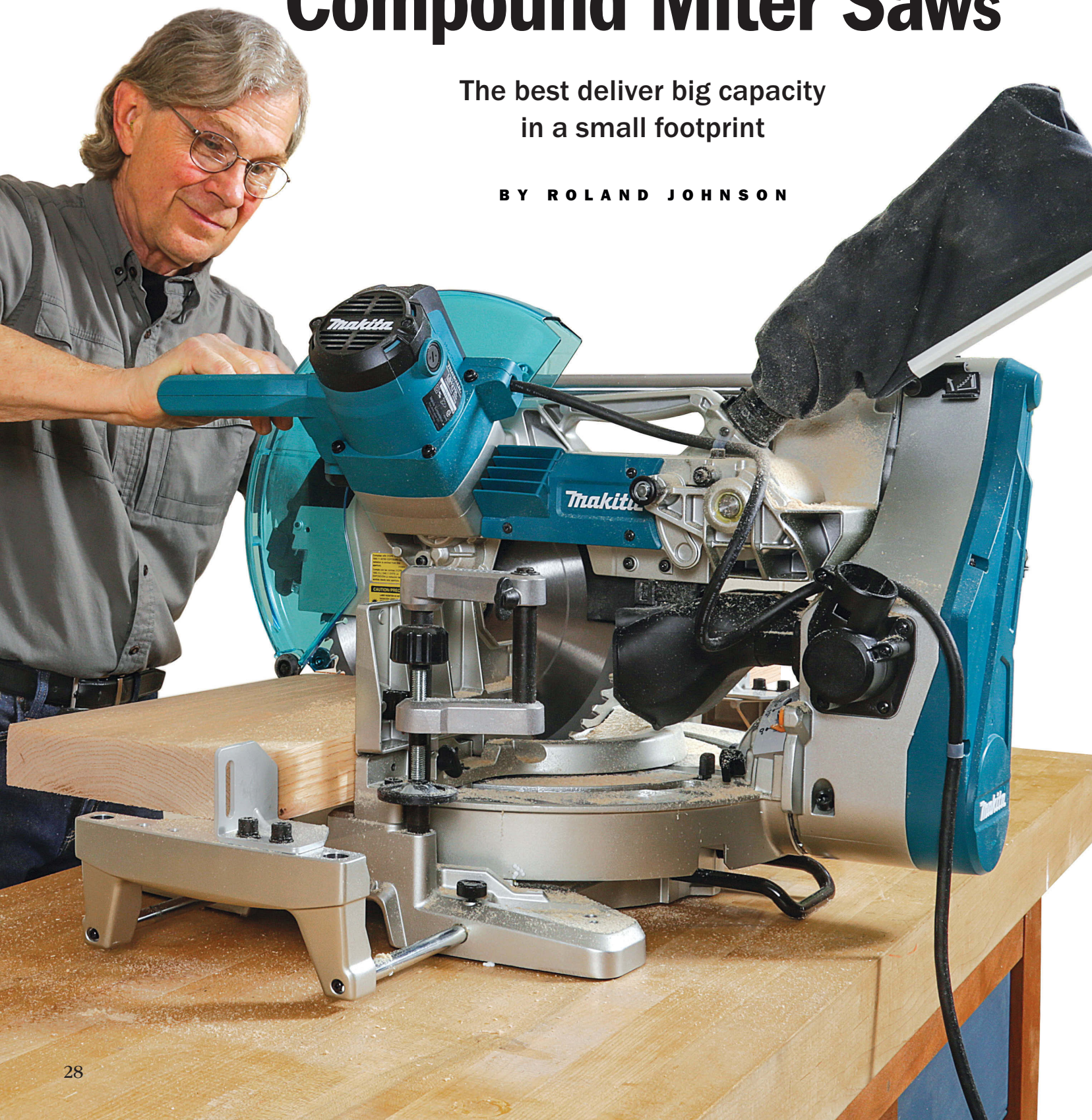


Arms for heavy lifting. The smooth-acting slide mechanism gives the Ridgid R4241 a nearly 16-in. crosscut capacity, and the articulating arm makes it possible to cut 5¼-in.-tall baseboard against the fence.

12-in. Sliding Compound Miter Saws

The best deliver big capacity
in a small footprint

BY ROLAND JOHNSON





Wonderful wallflowers. The saws that performed the best could also tuck right against a wall thanks to articulating arms, like those on this Bosch, or a carriage that slides on stout twin rails. Conversely, saws with sliding rails that require a lot of room behind the saw didn't yield better cuts.

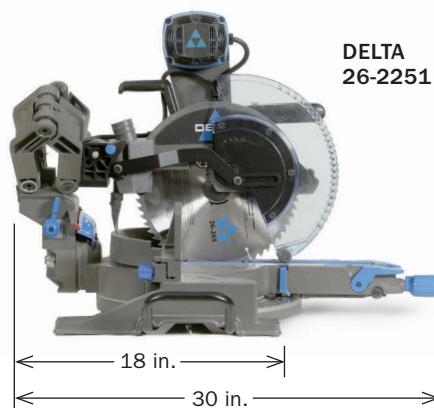
If you want to work easily with wide stock, invest in a 12-in. sliding compound miter saw. Compared with the winner from the last review we did of miter saws, the non-sliding Bosch CM12, the sliders in this field have an extra 5 in. or more of cross-cut capacity. Each of these sliders can crosscut stock over a foot wide. That's excellent, and the extra width doesn't come at the expense of performance, either.

Each saw I tested for this review was reliable enough to yield furniture-quality cuts every time. Every model can handle both rough cutting big boards and sizing panels to final length. What's more, their bevel and tilt mechanisms let them cut simple or compound angles with a flip of a handle or twist of a knob. These are capable, versatile machines, and there are plenty of options to pick from. So, if you're in the market for one, I'll give you some guidance on which saw might be right or wrong for you.

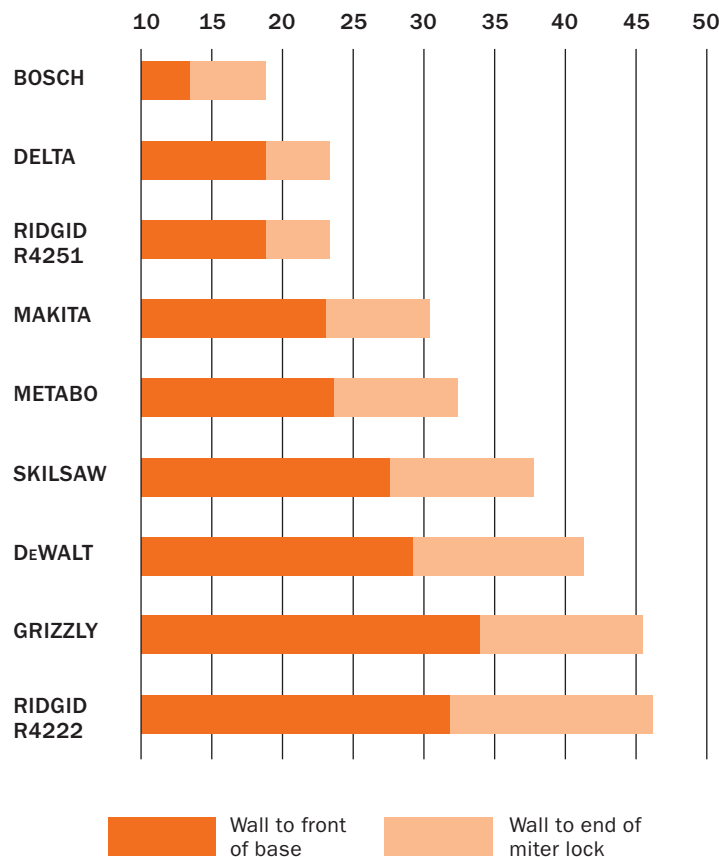
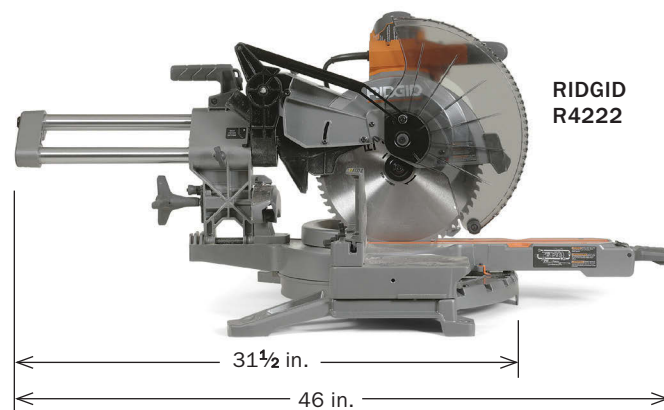
Among this group of saws, there is no poor choice. While evaluating them, I found all had high accuracy and good power. Tables were flat, fences were coplanar from side to side and square to the tables, and sliding action was accurate and smooth. Even with a full thickness 80-tooth blade, they all easily sliced through 8-in.-wide 8/4 red oak with a single cut without bogging or creating a rough cut. Cuts in 8/4 Eastern white pine were equally nice. No one saw had make-or-break cut capacity relative to the others.

Even though performance was essentially identical, the saws are not the same. The biggest immediate difference among them is their slide mechanisms, especially how much room each takes up. I much preferred the slides that don't need clearance behind the saw, a space-saving innovation that allows the tool to sit very close or even flush to a wall. A couple of models accomplish this via rods mounted alongside the blade. The Bosch, the Delta, and one of the Ridgids employ articulating arms.

TOP SAWS STICK CLOSE TO THE WALL



The saws with articulating arms need no clearance behind the saw, meaning they can hug tight to a wall to save space. In contrast, those with telescoping arms need up to 47 in. from front to back. In a small shop, this can make a big difference.



FEATURES TO CONSIDER

HANDLES

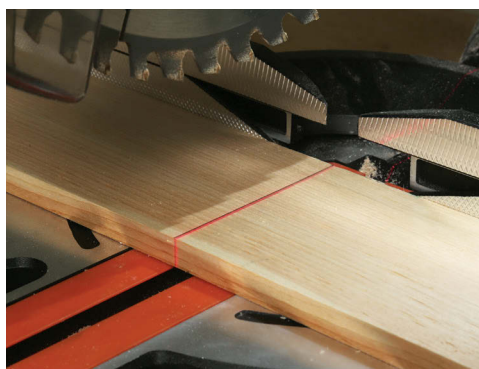
There's a range of handle sizes and trigger-lock options, including buttons outside the handle, buttons next to the trigger, and slides. Johnson found some intuitive, some a bit clunky, but almost none were so awkward that he wouldn't get used to them.



Vertical handles are the author's least favorite. Handles oriented vertically are one style that Johnson does have a hard time adjusting to. They put his arm and wrist in a cramped position, and the cut ergonomics are awkward for him.

LIGHTING

Several saws have LED lights that wash over the blade, casting a sharp shadowline for accurate cuts while also providing enough overall light to see what's going on. Lasers, on the other hand, are seldom accurate enough for furniture work. The Metabo's laser is an exception, since it can be adjusted easily.



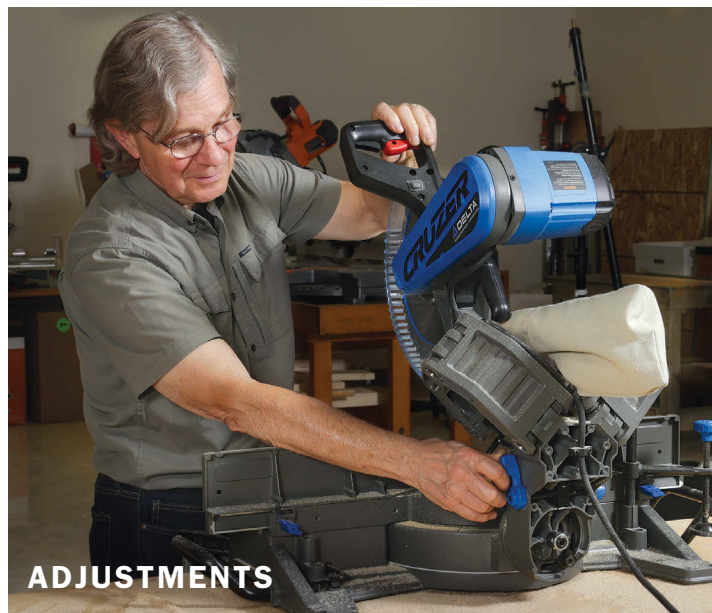
The rest of the saws have rods that extend behind the machine, requiring a foot or so of clearance to the wall. That's a lot of lost space without any benefit.

No sliding mechanism proved more inherently accurate than another. They all traveled true and were sufficiently rigid, making them all up to the task of furniture-quality cuts. A quality blade with a negative hook angle is critical; I like the Ridge Carbide RS1000 Super Miter.

Additionally, I believe poor cuts with miter saws happen more because of the operator than the machine. It's key to employ good cutting practices, such as pushing directly in line with the blade rather than to one side or another, much like with a handsaw. Any of these saws will deflect or cut off line if you don't move the blade in a controlled manner. Also, take small bites in thick

hardwood rather than trying to plow through the board in a single pass. A bit of finesse and use of best practices will make one of these saws a valued performer in even the fussiest shop.

In the end, it's the small details that make some of these saws sing. Take, for instance, ergonomics. Handles that are comfortable to grip lead to better control, as do triggers and trigger locks that are easy to engage simultaneously. Well-placed adjusters are not only more convenient, but they also improve accuracy since you're not contorting your body to set them while hoping the setting is spot-on. On some saws, I actually had to move around behind the saw to have enough muscle to release the adjustment and secure it again. That was frustrating. Although you can get used to any of these setups, with such solid choices in the field, you shouldn't have to.



ADJUSTMENTS

Opt for convenient controls. These saws bevel and tilt by design, but some locate the adjustment levers and knobs in easier-to-reach places. The best are designed like this Delta, whose controls are either at the front of the saw or a short, unobstructed reach away.

MAKITA LS1219L



Price: \$760

Max cut at 90°: 13½ in.

Clearance to front of base: 22¾ in.

Clearance to front of miter lock: 35¼ in.

Miter range: 60° left and right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right

Bevel range: 48° left and right

Bevel detents: 0°, 22.5°, 33.9°, and 45° left and right

Light: Laser

This is the saw I want in my shop. For one, it's easy to use. All of the controls are easy to reach and manipulate, and the glide mechanism is both robust and smooth. The handle works well for righties and lefties. Then there are added bonuses that no other saw has. For instance, its hold-down is superb, as it can move to different locations, hinges for a greater range of coverage, and actually holds down the work. In addition, the saw has two points of dust collection, letting it firmly beat the rest of the field. The one downside was the saw's laser, which was so faint we had to turn off the shop lights to see it. Still, all these pluses in a package that fits tight to the wall? That's a winner for me.

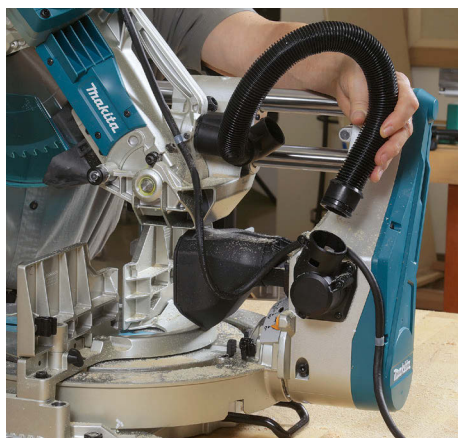
Lighting is important for accurate cutting. Several of these saws have LED lights that cast the blade's shadow onto the board, for a very accurate cut line and enough overall light to see what's going on. Other saws shine a laser directly onto the board. I'm typically not a fan of these because they are seldom accurate enough for the work I do. Metabo's laser is the standout because it can be so easily adjusted. The Bosch has neither an LED nor a laser.

My remaining criteria were mostly a wash. All the saws have depth stops, which are handy for dadoes and rabbets. However, the Metabo is the only model without a flip stop, making repetitive cuts, the purpose of the stop, a much taller order.

Blade changes were tedious but typically without drama. I wouldn't walk away from any of these machines because of a tricky blade change. We simply don't change blades that often for it to be a deciding factor.

Hold-downs are a nice idea, but they're mostly not worth bothering with. Similarly, except for a few saws, dust collection, for which I hooked up a shop vacuum, was mostly underwhelming.

These saws all have support arms that extend from the side to increase the width of the bed. Some of these worked better than others. But for the best performance it's worthwhile to ignore the extensions and create a miter-saw station where the saw is between two raised tables for maximum stock support.



Standout features. The Makita is the only saw with two areas of dust collection. Its dust management was exceptional compared with most of the other saws. Johnson was also a fan of its handle thanks to its ambidextrous design and responsive button.



Roland Johnson is a contributing editor and trusted tool authority who works wood in Sauk Rapids, Minn.

BOSCH GCM12SD



Price: \$650

Max cut at 90°: 13³/₈ in.

Clearance to front of base: 13¹/₂ in.

Clearance to front of miter lock: 26¹/₂ in.

Miter range: 52° left; 60° right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right

Bevel range: 47° left and right

Bevel detents: 0°, 33.9°, and 45° left and right

Light: None

Bosch has produced another quality miter saw. It not only fits tight to the wall; it also has the shortest distance to the miter lock. The saw's generous miter range is complemented by its large selection of miter detents. However, it falls short in a few areas. The handle is nicely ambidextrous, but its large size may make it cumbersome for all but large hands. I also found the miter and bevel controls, including their locks, stiff. The saw is the only model in the field with no light, either an LED or laser.

DELTA 26-2251



Price: \$573

Max cut at 90°: 13¹/₄ in.

Clearance to front of base: 18 in.

Clearance to front of miter lock: 30 in.

Miter range: 50° left, 60° right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right; and 60° right

Bevel range: 47° left and right

Bevel detents: 0°, 15°, 22.5°, and 45° left and right

Light: LED

The Delta is another model that you can locate close to a wall. It employs dual articulating arms that save space while yielding good, wide cuts provided you use good technique. The saw is tied for the second-shortest overall footprint. The Delta's ergonomics were a treat too. Thanks to convenient placement and ease of use, the locks for the miter and bevel stops were superb. Its LED results in a nice, accurate shadow. The dust collection was just slightly lower than the Makita's, but still quality for a miter saw.

DEWALT DWS780



Price: \$560

Max cut at 90°: 13¾ in.

Clearance to front of base: 28¾ in.

Clearance to front of miter lock: 41¾ in.

Miter range: 50° left; 60° right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right

Bevel range: 49° left and right

Bevel detents: 0° and one movable stop on each side

Light: LED

This saw produced good results and has some positive features, like the miter range, quality locking hold-down, and stout side-support extensions. Its dust collection is also on par with the Delta's. However, it has no bevel stops, just two adjustable stops left and right. Some of its controls are awkward to reach.

Note: DeWalt recalled this model sold in North America between April 2019 and May 2022 because the plastic rear guard assembly can break, exposing the blade. Consumers are advised to get a free repair kit from DeWalt or take it to a DeWalt service center for a free repair. DeWalt has taken defective units off store shelves. Currently available units incorporate a fix.

GRIZZLY PRO T31635



Price: \$450

Max cut at 90°: 13¾ in.

Clearance to front of base: 34 in.

Clearance to front of miter lock: 45½ in.

Miter range: 52° left; 60° right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right

Bevel range: 45° left and right

Bevel detents: 0°

Light: Laser and LED

This saw performs well and the ergonomics are good. I appreciated the easily accessed controls and nice, ambidextrous handle. The Grizzly employs two lights, a laser to guide the cut and an LED to illuminate the cutting surface. The visibility is good, although the LED does not cast a shadow, it just lights up the cutting area. The miter range and number of detents are nice. However, the bevel range extends to only 45° on each side and has no positive stops. The saw requires a good deal of clearance from the wall, which, like similar models, may make it tricky for smaller shops.

METABO HPT C12RSH2



Price: \$450

Max cut at 90°: 12 $\frac{1}{8}$ in.

Clearance to front of base: 23 $\frac{5}{8}$ in.

Clearance to front of miter lock: 36 $\frac{5}{8}$ in.

Miter range: 45° left; 57° right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right

Bevel range: 45° left and right

Bevel detents: None

Light: Laser

This saw has a similar design to the best overall Makita, but it falls short because of small details that add up. First and foremost are the poor ergonomics. I find vertical handles cumbersome. The bevel lock was frustrating too. The tilt lever was at the back of the saw, meaning the tool can't sit tight to the wall. There are no bevel detents. It's the only saw without a flip stop, meaning you have to reset it between cuts. Still, the saw has a compact design, and it's the most affordable of the bunch. The side extension arms have slick levelers, too.

RIDGID R4222



Price: \$440

Max cut at 90°: 15 $\frac{1}{4}$ in.

Clearance to front of base: 31 $\frac{1}{2}$ in.

Clearance to front of miter lock: 46 in.

Miter range: 70° left and right

Miter detents: 0°, 15°, 22.5°, 31.6°, 45°, 60°, and 67.5° left and right

Bevel range: 48° left and right

Bevel detents: 0°, 15°, 22.5°, 33.9°, and 45° left and right

Light: Laser

Especially considering the price, among the lowest of the bunch, the Ridgid R4222 has impressive adjustability. It has the largest crosscut capacity of all the saws. And the miter and bevel settings have the largest range of travel, and a bevy of detents.

However, the power switch is clumsy, a bad design especially for lefties. The adjusters are either hard to use or hard to reach. Plus, its slider needs the most room out of any of the saws.

RIDGID R4251



Price: \$550

Max cut at 90°: 13¼ in.

Clearance to front of base: 18 in.

Clearance to front of miter lock: 30 in.

Miter range: 50° left; 60° right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right

Bevel range: 47° left and right

Bevel detents: 0°, 15°, 22.5°, and 45° left and right

Light: LED

The Ridgid R4251 was a pleasant surprise. It uses two articulating arms to let it sit against a wall. The mechanism had me skeptical, but it performed excellently. The controls are conveniently placed and easy to use. The bevel and tilt locks for working off of the stops were my favorite of the field. Its LED results in a nice, accurate shadow.

SKILSAW SPT8801



Price: \$630

Max cut at 90°: 14 in.

Clearance to front of base: 27 in.

Clearance to front of miter lock: 41 in.

Miter range: 50° left; 60° right

Miter detents: 0°, 15°, 22.5°, 31.6°, and 45° left and right

Bevel range: 48° left and right

Bevel detents: 0°, 22.5°, 33.9°, and 45° left and right

Light: LED

This saw performs as well as the others, but its price and inconveniences make it hard to recommend. As far as the positives go, the handle is comfortable to grip. In use, its power switch works for both righties and lefties. However, other ergonomics are OK at best. It's also another saw with the bevel lock at the back, meaning it's a reach to get to. The tool has good bevel and miter range. It's the only worm-drive saw, but I did not notice any difference in cut. The saw cannot sit flush to a wall.



Compact Cordless Routers

**All have great power, but
balance and bit visibility
make a winning tool**

**BY ARTHUR W.
HENDERSON III**

When I was 15, I bought my first router to help build a custom-size linen cabinet for a bathroom remodel. Shortly afterward, I built a raised-panel door and marveled at the pile of sawdust beneath my feet. Because of their versatility, routers are still among my favorite tools. I can profile edges, plow dados, cut mortises, make identical pieces, flush-trim veneer and laminate, reproduce architectural elements, and build custom doors.

Lithium-ion batteries and brushless motors have revolutionized cordless tools, including compact routers. In addition to the normal benefits of faster setup and less tripping on extension cords, getting rid of the cord on a router allows you to



PRICE
\$200 (tool only)

POWER
18v

WEIGHT
4.6 lb.

BASE DIAMETER
2 $\frac{7}{8}$ in.

ILLUMINATION
Two LEDs

BRAKE
Yes

BIT VISIBILITY
● ● ● ● ● ●

ERGONOMICS
● ● ● ● ● ● ●



MILWAUKEE 2723-20

The Milwaukee has the best bit visibility, thanks to a large-diameter opening in the base and unmatched brightness from two LED lights. It's solidly constructed, with the main body and base manufactured from metal parts. It takes two hands to turn the tool on or off with a dust-protected rocker switch. This router is well-balanced and feels good in the hand. Thanks to an engraved scale with $\frac{1}{16}$ -in. graduations and a screw-type depth adjustment with $\frac{1}{64}$ -in. markings, depth adjustments are fast and precise.

One downside is that the depth-adjustment screw projects from the housing and detracts slightly from the tool's ergonomics. I unknowingly changed the bit depth on a few occasions when my thumb was resting on the screw. I learned not to grip the tool this way, so this was by no means a deal-breaker. This router comes with a dust-extraction port and an edge guide, and is the only tool that comes with two baseplates—4 in. dia. and 5 $\frac{3}{4}$ in. dia.—made from polycarbonate. The larger baseplate improves the stability of the tool, the primary weakness of this category.



PRICE
\$100 (tool only)

POWER
18v

WEIGHT
4.2 lb.

BASE DIAMETER
2 $\frac{5}{8}$ in.

ILLUMINATION
Single LED

BRAKE
No

BIT VISIBILITY
● ● ● ● ● ●

ERGONOMICS
● ● ● ● ● ● ●



RYOBI PCL424

For a low price, this router boasts impressive features, but some tradeoffs were made with its construction to keep the price down. Its base is cast metal, but the remainder of the tool is plastic, and the depth scale is a sticker. Turning the tool on and off is accomplished by a sliding switch that requires two hands to operate. Depth is adjusted with a graduated screw that has a release lever for fast macro-adjustments and base removal. Bit visibility is good, thanks to a clear polycarbonate baseplate and a single LED light.

The base has a slightly larger footprint than that of most of the competing routers and comes with a dust-collection chute. The battery has some wiggle when connected to the tool, and the collet wrench is thin stamped steel. Although this router is comfortable to hold, its balance is just a little awkward. This is not a polished tool, but I was pleasantly surprised at its performance. It can easily keep up with an ambitious carpenter. The biggest selling point of the Ryobi is its low price, which helped it become the best-value winner.

PRICE
\$140 (tool only)

POWER
12v

WEIGHT
2.8 lb.

BASE DIAMETER
2¼ in.

ILLUMINATION
None

BRAKE
Yes

BIT VISIBILITY
● ● ● ● ● ●

ERGONOMICS
● ● ● ● ● ● ● ●



BOSCH GKF12V-25

This 12v router has a unique shape that fits right into my palm and feels like a natural extension of my hand. It has a sliding power switch that can be operated with one hand. Despite the lack of a removable base, bit changes are fast and easy thanks to a spindle lock and easy access to the collet nut. Height adjustment is simple, and micro-adjustment is done via a screw-type mechanism with 0.04 in. of movement per revolution.

This router lacks built-in lighting and has poor visibility of the bit, so it is not ideal for freehand mortising. It is clear that the Bosch was built for edge-profiling, however, and it excels at this task. After routing thousands of feet of edge profiles for this review, I found the ergonomic design of this router to be a welcome change. I liked it so much that I purchased one. I keep a 5/32-in. roundover bit in the collet, so it's always ready to ease edges.

PRICE
\$220 (tool only)

POWER
18v

WEIGHT
4.6 lb.

BASE DIAMETER
3⅜ in.

ILLUMINATION
Two LEDs

BRAKE
Yes

BIT VISIBILITY
● ● ● ● ● ●

ERGONOMICS
● ● ● ● ● ● ● ●



DEWALT DCW600

The DeWalt has a responsive electric brake and a dust-protected rocker switch. It provides an excellent view of the bit without any obstruction from the base and has two bright LED lights. There's a depth-adjustment ring on the body of the tool with a scale that can be zeroed. It works well and offers precise height adjustment, reminiscent of Porter-Cable's venerable 690 routers.

The housing diameter of the DeWalt is 2¼ in., about ¼ in. larger than those of its peers, and its base diameter is about ½ in. larger than the others. That small difference made this tool hard to grip, and my thumb hurt with extended use. The only way I could comfortably use this tool was by mounting it in a Woodhaven bushing plate, which enabled me to grasp the two knobs on the plate instead of the housing. The DeWalt does not disappoint in terms of power, and it does the most work per battery charge of the group, but I struggle to consider this a compact router, and its additional size makes it uncomfortable to use compared to the others. No accessories are included.

focus on what you're doing without the risk of a snagged cord messing up your work.

I've been using a Makita cordless router for more than four years. I was so pleased with it that I purchased a second within a few months of buying the first. Given my fondness for routers, I was happy to conduct a test of compact cordless routers when I was asked. My test included mod-

els from Bosch, DeWalt, Makita, Metabo HPT, Milwaukee, Ridgid, and Ryobi. All have amazing power and capability.

Most of the cordless compact routers in the test share some general features. All have a spindle lock for one-wrench bit changes, and all but the Bosch have removable bases. Their baseplates have relatively small diameters, typically less than

3¼ in. They are also tall, about 9½ in. high, because the battery is on top of the tool. This raises its center of gravity, making it all too easy to tip the tool as you are guiding it along the workpiece. This can cause a less-than-perfect profiled edge—and a frustrated finish carpenter.

I also ran test cuts with some of the tools using smaller, lighter 2-Ah batteries.

PRICE
\$110 (tool only)

POWER
18v

WEIGHT
3.8 lb.

BASE DIAMETER
2 $\frac{1}{8}$ in.

ILLUMINATION
Two LEDs

BRAKE
Yes

BIT VISIBILITY
● ● ● ● ● ●

ERGONOMICS
● ● ● ● ● ● ●



METABO HPT M1808DA

This router's motor starts with a push of a lock button and then a tap on a second switch. Located opposite each other, these mechanisms are easy to operate with a single hand. LED lighting is bright, the electric brake is fast, and the tool features a rack-and-pinion depth adjustment with a scale deeply engraved in the aluminum body. The square base allows excellent visibility of the bit. Unfortunately, this tool's motor became noticeably warm during testing, despite a fan providing airflow through ventilation ports. After rounding over 97 ft. of white oak with a $\frac{3}{16}$ -in. roundover bit, the motor stopped for nearly 10 minutes, presumably for self-protection.

Metabo HPT sent another router, which also becomes noticeably warm with use, but it has never stopped. This tool is very reminiscent of the Makita, with a housing of the same diameter and similar shape. I like that it is easily powered on and off with one hand, and I appreciate its responsive electric brake. The Metabo's plastic base seems less durable compared to those on the other routers. It comes with a dust-collection port and an edge guide.

PRICE
\$100 (tool only)

POWER
18v

WEIGHT
4 lb.

BASE DIAMETER
2 $\frac{1}{2}$ in.

ILLUMINATION
Single LED

BRAKE
No

BIT VISIBILITY
● ● ● ● ● ●

ERGONOMICS
● ● ● ● ● ● ●



RIDGID R860443

This router has similarities to the Ryobi, possibly because both brands are owned by the same parent company. It has a plastic body and a die-cast base. I found that adjusting the base was sometimes complicated by friction between the base and the tool body. The square baseplate is illuminated by a single LED light, and it has a sticker indicating the depth adjustment. Its screw-type depth adjustment works well, but I found the release lever for macro-adjustment poorly placed and always in the way of my thumb, which made it hard for me to enjoy using the Ridgid router.

The power switch is a push-pull type capable of single-hand operation, but the switch was finicky, and I frequently felt like I had to cycle it twice before the tool would power up. The battery feels a little loose when engaged on the tool, although poor fit didn't seem to affect operation or complicate battery changes. The Ridgid comes with an edge guide and a dust-collection port. Bit visibility is good, and the router performs well despite an overall lackluster design.

I appreciated the lighter weight, but the balance wasn't significantly better. While Milwaukee is the only manufacturer that improves the balance issue by providing a second, larger baseplate with their tool, shop-built baseplates are a viable option and aftermarket baseplates are available.

No matter which router you choose, it

is important to remember that the best router is the router that is used safely. Ear protection, eye protection, and respiratory protection are a must. Wood chips and shrapnel from a damaged router bit (or nails embedded in lumber) could easily cause a blinding eye injury. Hearing loss is preventable with earplugs or earmuffs.

Many of these routers come with a dust-collection shroud, and all performed well when coupled with a vacuum. I think the hose throws off the balance, so I prefer to use a respirator. ☐

Arthur W. Henderson III, M.D., is an ER physician, cabinetmaker, and serial remodeler.

ROUTER TIPS AND TRICKS

INCREASED STABILITY

An enlarged baseplate is my most important router accessory; Milwaukee includes one with their router. Woodhaven (woodhaven.com) makes quality baseplates for reasonable prices. I use the offset plate for edge-profiling. The bushing plate for mortising has a handhold on each side and can span across jigs, and it accommodates guide bushings.

ACCURATE DADOES

A cordless router outfitted with a 1/4-in. spiral bit works perfectly for cutting dados. I start by stapling a 1/4-in. plywood base to a straight piece of 3/4-in. stock to make a pair of fences. After an initial pass through the router, these guides are zero-clearance fences that I align to a line showing one side of the dado. To position the fence for the other side, I use a scrap of stock that matches the width of the dado.

BETTER EDGE-BANDING

I use a lot of plywood for my projects, with solid-wood edge-banding to hide the laminations. But sometimes the edges swell after exposure to glue, which pushes the edging away. This requires extra work, including filling the gaps with wood putty. The Collins Ply Prep router bit (\$34, collinstool.com) makes a plywood edge slightly concave and allows a tight joint between the plywood and the edge-banding. I use this bit so often it has a dedicated router.

I incorporate LED tape lighting into a lot of cabinet and built-in projects, and I put the tape into a dado. Not only does it look more polished, but it also reduces the glare when looking head-on toward the lighted project. I often rout these channels with my dado guides and a cordless router.

Today's Track Saws

Corded and cordless models
for all users and budgets

BY ASA CHRISTIANA



Take a handheld circular saw, mold the base to fit an aluminum track, line the bottom of the track with rubber strips, add a sacrificial strip of plastic along one edge, and you've created woodworking magic.

The first cut trims the plastic strip flush with the blade, which then eliminates chipping on future cuts, and makes it simple to line up the track with your pencil marks. Plop the track down on any surface, line it up in any direction, drop the saw into place, and make a flawless cut—all in seconds, from setup to sawdust.

A track saw also plunges smoothly in and out of stopped cuts, and tilts sideways to cut smooth, accurate bevels.

As any user will tell you, you have to own a track saw to understand all the ways it will make your life easier. For woodworkers, carpenters, and cabinet makers, it's the best tool for breaking down large sheets of plywood and MDF. It's also perfect for cross-

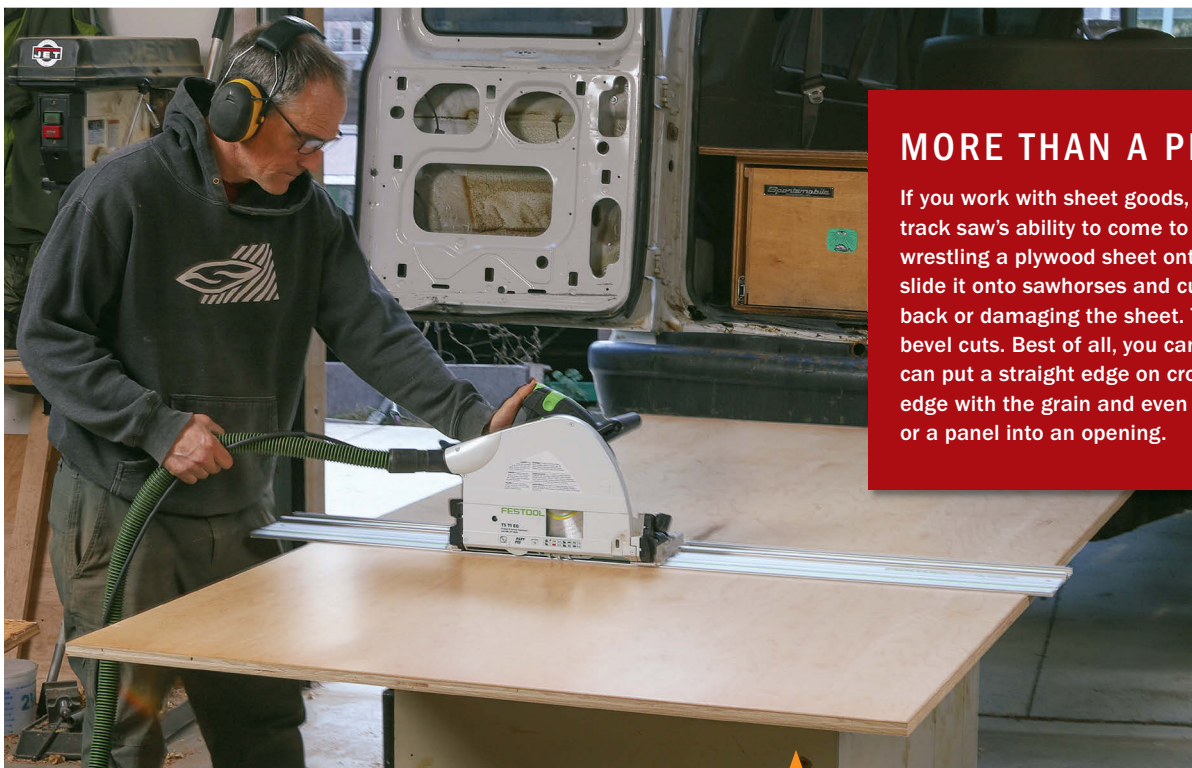
cutting big slabs, ripping a reference edge on rough lumber, and fitting inset doors and drawer fronts. Sink cutouts? Back-bevels before scribing? Long, clean miter joints? All that and much more.

For beginners and DIYers, a track saw offers a safer, less expensive alternative to the table saw. It won't guarantee parallel cuts or square corners, but with careful layout, you can cut out accurate parts of all sizes.

What matters most in a great track saw

The first modern track saw, the Festool TS 55, was an immediate hit. Many other brands and models followed. While Festool still stands alone at the top of the category, there are great alternatives.

The key to identifying the top performers and best buys is understanding what matters most in this tool. Power and smoothness of cut are at the top of the list.



MORE THAN A PLYWOOD SAW

If you work with sheet goods, you'll appreciate the track saw's ability to come to the work. Instead of wrestling a plywood sheet onto a table saw, you can slide it onto sawhorses and cut without breaking your back or damaging the sheet. The saw also tilts for easy bevel cuts. Best of all, you can cut at any angle, so you can put a straight edge on crooked boards, or align an edge with the grain and even use the saw to fit a door or a panel into an opening.

Break down sheet goods

Another key factor is the stability of the track on a variety of surfaces, without clamping. All of our favorites grip surfaces well, and have nice track clamps available for the odd time when they don't. The length of the standard track matters a lot too, as well as the cost of longer tracks or add-ons.

Cutting depth is more important to woodworkers than cabinet-makers, due to the types of material they work with. Here, track saws fall into two overall categories. The majority have blades around 6 in. dia. with just over 2 in. of cut capacity, while a couple of others have larger blades—and larger motors to power them. Cordless models are in the smaller category for now.

Adjustments should be smooth and precise, from bevel angle and depth of cut to how snug the saw fits on its ribbed track. Plunge action should also be smooth, and efficient dust collection is always a plus.

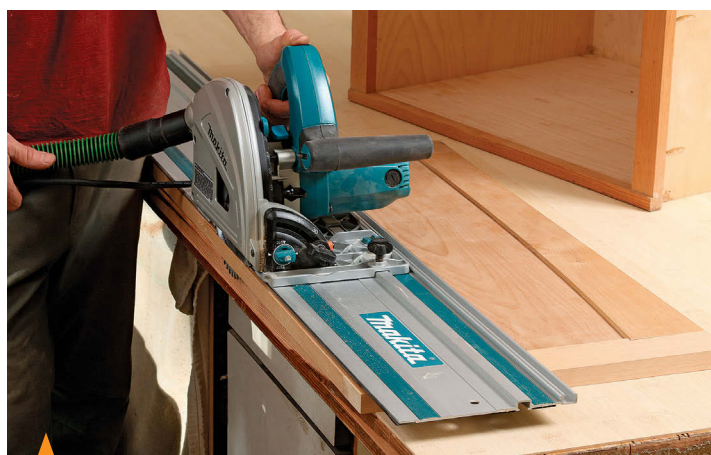
Kickback devices vary—All but one of our picks have a device intended to prevent kickback. Most have a small riving knife that sits in the blade kerf during cuts, helping to prevent material from pinching the back of the blade. But these pivot upward during plunge cuts, which is when you need them most. The latest Festool cordless saw has a better solution to kickback (see the TSC 55 KEB, on p. 45), and the Wen saw addresses the issue in an altogether different way.

The bottom line: If you are careful and controlled when plunging and sliding the saw, you shouldn't get kickback. If you do, it's likely to be mild, and tracks are relatively affordable to replace if they are damaged by blade contact.

Asa Christiana is a woodworker, editor, and writer in Portland, Ore.



Put a straight edge on lumber



Trim doors and drawer fronts

Our favorite corded saws

Although battery power and run time continue to trend upward, corded models still offer the best combination of price, power, and cutting depth.



FESTOOL TS 75 EQ-F-PLUS-FS USA

Price: \$975 with 75-in. track
Power: 1600 watts (2.15 hp)
Depth of cut: 2¾ in.



Festool's largest track saw stands alone at the top of the category. A newly engineered blade makes it even more powerful and efficient. It was last tested by *Fine Woodworking* in 2016, when Mark Edmundson said, "The Festool TS 75 EQ was the powerhouse of the lot, blowing through the thickest, toughest materials, with an unmatched depth of cut. There was no blade deflection, cuts were very smooth, and the track side of the blade kerf was super-clean. Bevel cuts were very clean and accurate." He also noted that the plunge action and depth setting were the easiest of any saw in the test, adding that the track did not slide on any material. Festool also sells excellent track clamps, which can be operated with one hand.



MAKITA SP6000J1

Price: \$480 with 55-in. guide rail
Power: 12 amps (1½ hp)
Depth of cut: 2¾ in.

In the *FWW* and *FHB* tests cited above and right, the Makita was the most comfortable and easy to use among the mid-priced models, and recent users agree with its best-value status. It has a comfortable handle position, very smooth plunge action, and its track is very stable, with no clamps needed. It hesitates just a little in the thickest hardwoods, but powers easily through everything else, with a scoring setting that delivers chip-free cuts in melamine. Like the Festool saws, it has a little tab that keeps it level on the track when tipped over to 45°.



FESTOOL TS 55 FEQ-F-PLUS-FS

Price: \$700 with 55-in. track
Power: 1200 watts (1.6 hp)
Depth of cut: 2½ in.

The TS 55 was Festool's first-ever track saw, and they continue to refine it. Functionally identical to the TS 75, aside from a smaller blade and motor—and lower price tag—it's the perfect choice for woodworkers and cabinetmakers who don't need the additional depth of cut. While lighter than the TS 75 and a little easier to handle, its 1,200-watt motor is surprisingly powerful. In a 2015 test in *Fine Homebuilding*, the TS 55 sliced through thick oak with ease, and made clean cuts in melamine particleboard. Like all Festool track saws, it offers smooth plunge and sliding action, and a host of other thoughtful touches.

Best cordless track saws

As power and run time continue to rise, and the relative cost of cordless tools keeps dropping, more and more power-tool users are cutting the cord. While cordless track saws have smaller blades and shallower depth of cut, the best have amazing power and run time.

FESTOOL TSC 55 KEB

Price: \$880 with 55-in. track, batteries, and rapid charger; bare tool is \$550
Power: 36 volts, 5.2 amp-hours
Depth of cut: 2 $\frac{3}{8}$ in.

Cutting the cord on a Festool track saw makes a great tool even better. The TSC 55 KEB has two 18-volt batteries on board, which team up to deliver amazing power and run time. You can also remove one of the batteries on this tool, to keep one in the charger and make the saw easier to handle. As with all Festool track saws, you get furniture-quality cuts, smooth adjustments, perfect plunge action, and great dust collection. The TSC 55 KEB has a very effective new sensor that replaces the riving knife, making any kickback extremely brief and harmless—to you and the track. This will be most helpful to pros who tend to make more cuts and make them faster.



MAKITA XPS01PTJ

Price: \$620, with batteries, charger, and 55-in. track
Power: 36 volts, 4 amp-hours
Depth of cut: 2 $\frac{3}{16}$ in.

By all reports, the Makita's power, run time, and cutting speed are an even match with the amazing Festool TSC 55. While cuts aren't quite as glassy, users won't notice the difference in the vast majority of applications. Like the Festool saws, Makita's cordless model has a brushless motor with variable speed for different materials, smooth plunge action, a stable track, excellent adjusters for sliding action, and a tab that keeps the saw flat on the track during bevel cuts. Unlike the Festool, it lacks a riving knife, and its two 18-volt batteries must be used in tandem, but those factors won't be a big deal for most users.



New to market

Each year, the experts at *Fine Woodworking*, *Fine Homebuilding*, and *Fine Gardening* test dozens of new products and tools. Here is a rundown of some of the machines we reviewed last year.

Improved Dust Deputy

For more than a decade, I have used Oneida's first-generation Dust Deputy mounted to the top of a 5-gal. plastic bucket. The system worked great, but the unit was top heavy and therefore prone to tipping over.

In contrast, Oneida's new Dust Deputy 2.5 Deluxe 10 Gal. Cyclone Separator Kit is a pleasure to use and works well. The cyclone still separates dust nicely, but the tippiness is gone thanks to the added weight from the metal barrel and the unit's wide stance. The 10-gal. bucket holds ample dust but isn't so large it's unwieldy to empty. The kit's six 1½-in. casters let the unit roll easily over mats and cords.

The kit comes with a high-quality, 5½-ft.-long, crush-resistant hose to run from the separator to your dust extractor, as well as a strip of foil tape to mount to the separator if you're worried about static buildup in the separator.

One downside to the metal barrel is that there is no visual indicator that the barrel is full.

Oneida also sells the Dust Deputy 2.5 in packages with just the cyclone itself or with a 5-gal. plastic bucket. But, if you can swing it, the Dust Deputy 2.5 Deluxe 10 Gal. kit, with its heavy metal drum, is fantastic.

—Ben Strano is the editor of *FineWoodworking.com*.



Oneida Dust Deputy 2.5
\$199.95



Cordless compressor by Metabo HPT
Model EC36DAQ4, 36V MultiVolt
\$300 (bare tool)

Compact cordless compressor

Upon receiving the Metabo HPT cordless compressor, my first thought was that it was a solution without a problem. Corded compressors were just fine. I was wrong.

The first time the compressor saved me 10 minutes was when filling the tire on my tractor, which was parked outside the radius of where I could easily run a cord. On my walk to the tractor—without 100 ft. of cord in tow—I was delighted to discover just how light the 2-gal., single-tank Metabo HPT compressor is. Though it doesn't hold as much air as a twin stack, comparatively it's a dream: light, well-balanced, and easily stored. Shortly after the tractor situation, my customer's car tire went flat, and the cordless compressor easily took care of the problem.

In terms of carpentry, the compressor spent a few days setting interior doors and base molding. One battery runs for a half-day shooting 1¾-in. brads. With smaller nails, it doesn't cycle much and it runs quietly. The compressor can run a framer or a siding nailer, but the pump kicks on every five nails; it's not made for these larger nailers, but it works in a pinch. I also used it with a narrow crown stapler to tack up shiplap siding for a screened porch using the MultiVolt adapter instead of the battery and the tool didn't miss a beat. The tool works well and has become my go-to compressor for small jobs.

—Mark Clement (@MyFixItUpLife) is a carpenter in Ambler, Pa.

Compact SawStop is a win for smaller shops and budgets

The new Compact Table Saw (CTS) brings SawStop's proven safety technology to a wider range of customers, while carrying on the company's tradition of well-designed and well-constructed tools. With a winning combination of price, size, portability, accuracy, surprising power, and a full 10-in. blade, the CTS is unlike anything on the market for small shops or newer woodworkers.

While the 120-volt CTS can rip through 8/4 maple with relative ease, it doesn't accept dado sets, which means woodworkers will have to get more creative with some joinery cuts. The well-engineered fence stands out. Riding on front and rear gear racks, it stays perfectly parallel to the blade, and adjusts precisely with a clever knob that pulls out to engage the gears and pushes in to lock. The blade's bevel angle micro-adjusts in a similar way.

The innovative fence includes an auxiliary bar that flips into place to act as a low fence for narrow rips. And, when the bar is lowered slightly, it doubles as a shelf to support wide pieces, helping this compact saw overcome a drawback of its relatively small tabletop. Stops at the front of the table that keep the fence from being inadvertently pushed into the spinning blade (and triggering the brake), can be pushed in for narrower rip cuts.

With the blade encased in a tight lower shroud, dust collection is nearly 100% effective below the saw when a vacuum source is attached. Last but not least, the fence, riving knives (shark fin and standard), multi-leaf blade guard, blade-change and adjustment wrenches, miter gauge, and extra blade cartridge (available separately) all store neatly in a removable plastic box on the back of the saw. One caveat: I would replace the stock miter gauge with a better, aftermarket model.

—Roland Johnson is a woodworker and tool authority in Sauk Rapids, Minn.



Table saw by SawStop
Model CTS
\$900



Plenty of power. With a 10-in. blade and standard 120-volt power, the SawStop CTS easily rips through 2-in.-thick maple. Full blade height is 3¼ in., comparable to a full-size cabinet saw.



Smart fence. The rip fence rides on gear racks at the front and back, keeping it square to the blade, and it adjusts and locks precisely with a front-mounted knob. It includes a low fence for narrow rip cuts, which drops to support wide stock for ripping, as shown.

Miter gauge and fence team up

Rockler's Precision Miter Gauge and Miter Gauge Fence is easy to set up and works well. I used them both in the shop for several weeks, and they performed dependably, whether making square cuts, 45° cuts, or miters for an octagonal frame. All in all, the Rockler miter gauge makes a beneficial addition to a tablesaw. The fence is nice too, but with some caveats.

The guide bar was easy to tune for a precise fit in the miter slots via four nylon set screws. Once set, the bar tracked smoothly and precisely. The front face of the gauge was accurately plumb.

The protractor head has detents for accuracy. In addition to one at 90°, there are detents at five common angles on each side of the head. There's also a detent that positions the guide bar parallel to the fence for ease of storing. The bar even has a large hole for hanging. The detents are not microadjustable to the bar, but my gauge came square out of the box anyway.

The gauge has a high-contrast protractor scale that is easy to read and align with the gauge's hairline indicator. A tall handle locks the head in various positions. Additionally, there are knobs for securing a sacrificial fence, meaning all adjustments on the gauge can be made without additional tools. An added plus is that all the knobs and adjusters are easy to grip.

The fence is made of lightweight anodized aluminum. At the end of the main fence is a short section that telescopes out. A flip stop for setting repeat cuts slides along the top of the fence, though there is no measurement scale. Included with the fence is a removeable melamine face for zero-clearance cuts.

The fence is a nice, simple idea, but I should note that the telescoping arm, when tightened, extends forward of the main fence by 0.010 in. This pushes the main workpiece slightly out of square.

—Chris Gochnour is a furniture maker in Salt Lake City.

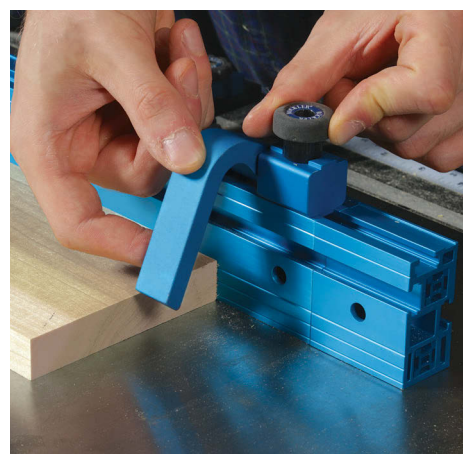


Easily adjustable. A spring-loaded pin engages detents to lock the head at common angles. For in-between angles, the pin can be withdrawn so the knob can lock the head anywhere within 70° left and right. The handles and knobs are easy to grip.



Miter gauge
by Rockler
\$120

Miter gauge fence
by Rockler
\$70



Flip stop is a convenient timesaver. With a flip stop, you can alternate between squaring the ends of boards and cutting them to equal length without the stop getting in the way or the setting being lost.



Telescoping arm is a stretch. The fence worked well, but not with the arm. When the arm was extended, it was slightly forward of the main fence, interfering with square cuts.

New dado set cuts extremely cleanly

Infinity's latest 8-in. dado stack ticks all of the boxes and more. What makes the XL different from Infinity's standard Dadonator is thicker interior (chipper) blades that produce even flatter-bottomed dadoes and make setup quicker as well.

For example, it takes just two of the $\frac{1}{4}$ -in.-thick chippers plus the two outer blades to produce a $\frac{3}{4}$ -in.-wide dado. And a full stack of all chippers and blades can produce dadoes up to $1\frac{1}{16}$ in. wide, if your saw arbor is long enough. As with all stack dado sets, shims are included for fine-tuning the overall width.

The XL's chippers, thick and thin, have large cutouts that reduce their weight, making for safe operation in SawStop table saws (the weight of some dado sets is too great for the brake cartridge to stop them effectively). The cutouts also make this top-quality dado set more suitable for smaller table saws, such as portable and contractor's models.

I threw all sorts of challenges at the Dadonator XL, including various sheet goods and solid woods, and all of the cuts came out clean and splinter-free. Also, the scoring cuts from the outside blades were close to invisible. If you're in the market for a top-quality dado set, I give my highest recommendation to the Dadonator XL.

—Jeff Miller is a furniture maker and teacher in Chicago.



Clean joinery. The bottoms and ends of dadoes are square and clean, which prevents gaps at the front edges of joints.

Thicker, lighter chippers. The set includes two $\frac{1}{4}$ -in.-thick chippers (among other sizes), which make setup quicker and help to prevent steps in the bottoms of dadoes.



Infinity Dadonator XL
\$300



Bandsaw Companion
by iGaging
\$27

Easier bandsaw setup

It's often overlooked, but a critical step in setting up a bandsaw is adjusting the table parallel with the blade. If you don't, you're left with frustrating "drift," which is nothing more than the fence, which is typically adjusted parallel to the miter slot, being skewed relative to the blade because the table isn't set up correctly. Rips will be skewed and crosscutting with a miter gauge or sled will be choppy and inaccurate.

While squaring the table often takes careful, patient trial-and-error, iGaging's Bandsaw Companion makes the process super easy. The Companion is essentially a $\frac{1}{4}$ -in.-thick by 12-in.-long aluminum rule with four rare-earth magnets fastened to one side and a space rule next to the magnets for the bandsaw's blade. Simply snap the rule to the blade ($\frac{1}{2}$ in. or wider works best), loosen the table bolts (keep one snug as a pivot point), and align the blade and miter slot using a finely graduated ruler. The length of the Companion greatly exaggerates the path of the blade, making it much easier to measure its relationship with the miter slot.

The Companion is also an accurate rule, has a sliding stop for setting distances, and can be used as a beam for scribing circles.

—Roland Johnson

Cordless Table Saws



Portability and onboard power make them appealing, but utility and real-world performance vary by brand

BY MATTHEW MILLHAM

Before lithium-ion batteries became the go-to for powering cordless tools, I couldn't have imagined there'd ever be such a thing as a cordless table saw. Now we live in a time with battery-powered pickup trucks, and running a little table saw on that same technology seems like no big deal. Nevertheless,

cordless table saws aren't yet that common on job sites. But if you don't like wasting money and you value your time, a cordless table saw might deserve a place in your tool lineup.

Consider the lack of power on a typical new-home build; the expense of buying, maintaining, and fueling a portable

generator; and the time it takes to make fuel runs, perform oil changes, and get the generator running on a cold day. Add those up, and the relatively high sticker price of a cordless table saw suddenly seems less shocking. When power isn't available, it's far less costly to run a small generator to charge batteries than one large enough to power a table saw. Get enough batteries to run the tool all day, and you can forgo a generator altogether. Some cordless table saws are also light and superportable, making them convenient for common table saw tasks that don't require huge capacity, like ripping stock for furring, face frames, and extension jambs.

I've been using Milwaukee's cordless saw for four years, and I spent a few months testing saws from DeWalt, Metabo HPT, and Ryobi. They all come with thin-kerf blades to reduce the strain on battery-powered motors and increase run time. The thinner blades require slightly slower feed rates—and slower cuts—to minimize blade deflection. None of these tools are gimmicks. Some are capable of handling all (or at least nearly all) tasks a similarly sized job-site corded saw can, without the tripping and electrical hazards of plugging in.

That said, these cord-free saws do have limitations. If you plan to run them all day, you will need more than one battery, especially for "tentative cutters" who turn on a saw and then spend a minute or two contemplating how to make the cut as the blade spins. That's free entertainment with a corded saw but frustrating to watch with a cordless, especially if you don't have a fresh battery on deck. Obviously, batteries are a cost you don't have with corded tools.

And while fine for everyday tasks, no cordless model will replace a corded saw for, say, resawing 4x4s, which is something I had to do in the middle of the pandemic when lumber was hard to get. For testing, I brought these saws to job sites every day, where they were used by carpenters, apprentices, and helpers with various levels of table saw experience.

Matthew Millham is a carpenter for North River Design Build in Stone Ridge, N.Y.

STABLE STANDOUT

MILWAUKEE 2736

Table size 22½ in. by 17½ in.

Weight 41.6 lb.

Blade diameter 8¼ in.

Rip capacity 12¾ in. left, 22 in. right

Maximum depth of cut
2½ in. at 90°, 1¾ in. at 45°

Price \$600 (tool only)

I got my Milwaukee cordless table saw in late 2018. I liked it immediately, and it's become my go-to job-site table saw. It only gets subbed out for a corded saw if I have to resaw or cut fly-ash trim, or if I know that the table saw is going to be running nonstop all day (as it did when I had to re-dimension 1600 lin. ft. of siding). The one thing that bugged me about the Milwaukee early on turned out to be user error. The riving knife wasn't perfectly aligned with the blade, and I apparently hadn't read the part of the manual where it describes how to fix this. The screws for adjusting the riving knife alignment are somewhat hard to access—but it is doable, and the saw has been pretty flawless since.

Milwaukee's fence is controlled with a rotating knob, and it locks onto geared rails in the front and back. The fence moves smoothly, locks securely, and was true right out of the box. The saw provides good cut quality with the stock blade, but you'll want a finer blade for finish work. (The same is true for all of the models discussed here.)



FINE FENCE The rack-and-pinion fence fastens to geared rails at the front and back of the saw. It has a flip-up auxiliary fence for cutting small stock and an easy-to-use lever that locks it in place.



THIRST FOR POWER Standard Red Lithium XC batteries quickly go into panic mode when the saw is under load and shut the saw down, presumably as a means of self-protection. Thus, high output batteries are a necessity.



It's compact, portable, and about as lightweight as it can be despite its sturdy metal frame. Dust collection is fine as long as you attach a vacuum or other dust collector.

The Milwaukee's controls are the best of the four. A standout feature is the riving knife lock/release, which is mounted under the table's edge and allows the riving knife to be inserted and removed without removing the throat plate or fully raising the blade. The Milwaukee is also capable of (albeit limited) resawing—and it can accommodate a 6-in. dado stack up to ¾ in. thick.



STABLE STAND Milwaukee's stand locks to the saw with a draw catch, so you can easily move the entire thing in one piece. The stand is sturdy and gives the saw more stability when ripping long stock.

SOLID CONTENDER



DEWALT DCS7485T1

Table size 19 in. by 19 in.
Weight 45 lb.
Blade diameter 8 $\frac{1}{4}$ in.
Rip capacity 12 $\frac{1}{2}$ in. left, 34 $\frac{3}{8}$ in. right
Maximum depth of cut 2 $\frac{9}{16}$ in. at 90°, 1 $\frac{3}{4}$ in. at 45°
Price \$550 (tool only)

DeWalt's cordless table saw was the first on the market when it debuted in 2016, and while it's similar to the Milwaukee saw in a lot of ways, it has some frustrating quirks that I'd guess Milwaukee learned from before introducing its version. First is the blade-height adjustment. It takes 35 turns to raise DeWalt's 8 $\frac{1}{4}$ -in. blade all the way, compared to 14 turns for Milwaukee's. Then there's the stand latch, which Milwaukee has and DeWalt doesn't. If you want to move the DeWalt setup, you have to take the saw off the stand, reposition the stand, and then put the saw back on it—that is, unless you bolt the saw to its scissor stand, which either wastes time if you do it every day or kills its portability if you don't.

To add or remove the riving knife, you must remove the throat plate, raise the blade all the way up, stick your fingers down to unscrew a wheel, and then press the wheel to release the knife. It's easy enough for smallish hands, but it takes considerably more time and effort to do this than with the Milwaukee. Also, the DeWalt saw shut down during routine cuts a number of times in the three months I had it on the job, presumably from overloading. The DeWalt also doesn't allow for dadoes—the arbor is too short to even try.

Milwaukee doesn't win on every point, though. The DeWalt has more room behind the blade, which provides better outfeed support when you don't have a competent helper and makes the saw more stable when used without a stand. Even without a latch, the DeWalt is plenty stable on its stand. (With all but the smallest or lightest materials, the Milwaukee is prone to tipping unless it's on its stand and latched.)



SMART RIP FENCE The rip fence works well and functions the same as Milwaukee's. The fence attaches to geared rails on both ends, which makes it durable and accurate.



NOT-SO-SMART SWITCH If you don't lower the lever carefully, it will smack the off switch hard enough to turn off the saw. I did this at least a dozen times before I figured out what was going on.



WRONG-SIDE BATTERY Unlike the Milwaukee's, the DeWalt's battery is opposite the carrying handle. This is no big deal until you stand the tool on end and can't remove the battery.



RYOBI PBLTS01B

Table size 17 in. by 12 $\frac{1}{2}$ in.
Weight 31 lb.
Blade diameter 8 $\frac{1}{4}$ in.
Rip capacity 7 in. left, 12 $\frac{1}{2}$ in. right
Maximum depth of cut 2 $\frac{9}{16}$ in. at 90°, 1 $\frac{1}{2}$ in. at 45°
Price \$300 (tool only)

LIGHT BUT LIMITED

The Ryobi's construction is what you'd expect from the least expensive and lightest saw here. It's mostly plastic, and its metal table includes just one miter-gauge slot. (All the others have two.) It doesn't have a carrying handle and can't be stood on end. Unlike the other saws, whose fences mount on rails that can extend beyond the table, Ryobi's fence engages the table directly, so capacity is limited.



A SAFER SWITCH A plastic paddle covers the on/off switch to prevent accidental startup. The paddle's large surface area also makes it easy to shut off the saw when you're done cutting.

NOT SO PORTABLE



METABO HPT C3610DRJQ4

Table size 28¾ in. by 22 in.

Weight 58 lb.

Blade diameter 10 in.

Rip capacity 22 in. left, 35 in. right

Maximum depth of cut 3¼ in. at 90° 2¼ in. at 45°

Price \$600 (tool only)

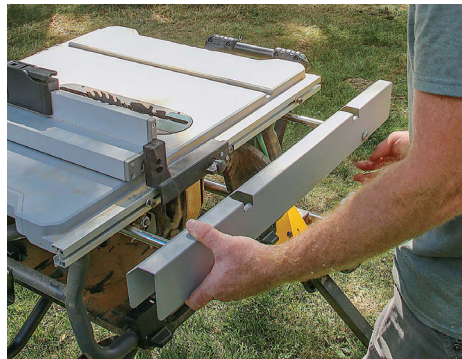
My hopes for this saw were high considering its 10-in. blade, 35-in. rip capacity, and extendable outfeed support, but my giddiness at its arrival wore off as I set it up. When I checked the fence for perpendicular to the tabletop (verticality), all was not well. Even with all the fence's knobs and levers locked, the fence rotated out of plumb a few degrees under slight pressure. This might not be a huge issue for rip cuts, but it's a major problem for resawing, which is one area where I expected this saw to outshine the others due to its larger blade. Because of its fence's instability, I didn't even try to resaw with it. On the other hand, it handled rips just fine and is one of only two saws here that can run a dado stack.

I'd be negligent if I didn't mention that the Metabo HPT saw isn't available as a kit with a stand. I couldn't even buy a stand separately, as they were out of stock everywhere. With no other good options, I went with a DeWalt rolling stand that I modified slightly, but it was an imperfect workaround.

"Compact" and "lightweight" are two words that don't belong anywhere near this saw. With a battery, the saw weighs in at over 60 lb. Add the stand (if you can find it), which has to be bolted on, and it's even heavier. This bulk is not so fun if, like me, you have to heave it into a full-size pickup.



PLUG-IN POWER It takes a few seconds for the blade to get up to speed whether you're using a battery or an adapter. The adapter turns 120v AC line voltage to 36v DC, so the saw can run all day without batteries.



ADDED SUPPORT This is the only saw with an outfeed support. The support is difficult to slide in and out, but it's worth the hassle.



EASY ANGLES Metabo HPT has a wheel for bevel adjustments, similar to a cabinet saw, which is a nice feature.

LIMITED RIP CAPACITY Ryobi's rip fence has high and low positions, but you can only use the low position on the left side of the blade and the high one on the right. This saw also has the smallest rip capacity.



The kit included two 4-Ah, 18v batteries and a charger. (I received the others as bare tools.) The saw needed significant adjusting out of the box. The blade wasn't parallel to the miter slot, and the riving knife was out in every possible

direction. Adjusting these was easy, thanks to a surprisingly good instruction manual.

Once it was all set up, the Ryobi cut just fine, and the fence somehow stayed parallel to the blade—though I did check it every time to make sure, since



it basically relies on the act of engaging the lock to push it into parallel. I used it to rip some PT framing lumber, some 5/4 oak boards, and some smaller pieces of plywood. Cut quality was plenty good enough for rough work, and it could

BASIC CONTROLS

The blade-height adjustment crank turns easily and maintains the blade height without drift. The bevel lock lever is above the wheel and also works as it should.

probably handle finish cuts with a blade finer than the 24-tooth one it came with. The lack of a compatible stand isn't a deal-breaker, but you'll need a table or a piece of plywood and sawhorses to set it up on.

Benchtop Planers

Get smooth surfaces on the toughest woods

BY ASA CHRISTIANA

Roughly the same size as a large toolbox, the benchtop planer is a wonderful innovation. Before these came on the scene, woodworkers had to invest in an industrial, floor-standing model to smooth rough boards and plane them to custom thicknesses.

Despite their compact size, benchtop planers can plane boards as wide as 12 in. or 13 in. and up to 6 in. thick. And while they can't take as a deep a bite as an industrial planer, they tend to leave an even smoother surface, thanks in part to their rubber rollers (large planers have serrated steel rollers that sometimes leave tracks on the wood).

Benchtop planers are also simple to use. The best have a depth gauge that helps you set the initial cutterhead height for any board, ensuring that the feed rollers will grab it firmly and pull it through the machine. All you have to do is insert the board in one side, and walk around to receive it on the other.

DEWALT 735X

Price: \$640

Power: 15 amps

Width: 13 in.

Knives: 3, two-sided HSS



The DeWalt was the Best Overall benchtop planer in a 2016 test in *Fine Woodworking*, and no other planer has knocked it off its perch since. Still tops in editorial reviews and user ratings, the 735X excels in every performance category. Its double-edged disposable knives are a snap to switch over or replace. More importantly, they produce amazing cut quality on a wide range of woods, thanks in part to the machine's two-speed feed rate, which lets you slow the rollers for maximum cut quality on the final pass. The 735X produced perfectly uniform thickness in our test, and had the best dust collection, thanks to an internal blower system.

WEN PL1326

Price: \$428

Power: 15 amps

Width: 13 in.

Cutters: 26, two-edged HSS



The new PL1326 includes a spiral, segmented cutterhead as standard equipment, armed with 26 two-edged, high-speed-steel (HSS) cutters. These produce smooth surfaces on the toughest woods, and are easy to rotate when the first edge chips or dulls. While HSS cutters are not as durable as the carbide inserts in the aftermarket Byrd Shelix cutterhead (opposite page), they will hold an edge significantly longer than standard steel knives. Also, whether HSS or carbide, segmented cutters tend to produce smoother surfaces with less noise. Although Wen is a relative newcomer to the woodworking world, users report that the PL1326 is very solidly built, with a cast-iron base and smooth adjustments. All this, together with the segmented cutterhead, make it a no-brainer for our Best Value choice in benchtop planers.

But don't mistake the planer for a jointer. If you feed a bowed board into your planer, a bowed board will come out the other side, though it will have uniform thickness. That's why woodworkers usually team up their planer with a jointer, which will create the straight, flat reference surfaces needed for successful milling.

What matters most

With any woodworking machine, adequate power, smooth cuts, and efficient dust collection tend to top the performance list. Both of our picks tick these boxes, making very smooth cuts in a wide variety of woods, with little to no snipe (over-cutting near the beginning and end of a board).

With planers, you can add cutter changes to the list of potential pain points. Planers cut more wood than any other machine, which puts a lot of wear and tear on their cutters. If those cutters happen to be straight knives, they should be easy to access and change, as they are on the DeWalt 735X, our Best Overall pick.

Segmented cutterheads are next-level—The big recent innovation in planers (and jointers) is smaller, tougher cutters, which dull more slowly and can be simply rotated and retightened to expose a new edge. These cutters are called “segmented,” and they tend to make smoother cuts. They are also quieter. The small cutters are arranged on a spiral, meaning at least one is always engaged in the wood.

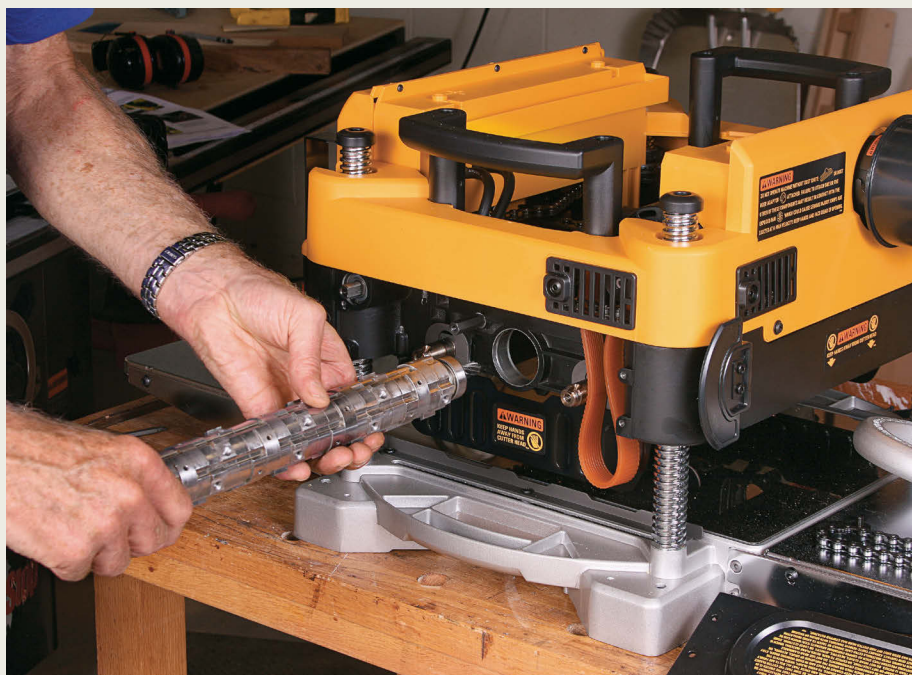
If you are interested in this new planer technology, which not only makes cutter changes easier but far less frequent and delivers much smoother results at the same time, you can buy a new planer that offers these new cutterheads as standard equipment. That's the case with the Wen planer. Your other option is to retrofit an existing planer with an aftermarket cutterhead.

Two planers stand out

Our two picks are a combination of time-tested and new-to-market. The DeWalt 735X has been available for a long while now, but it still takes top honors in every editorial test and user poll. Wen is a newer entrant to the power-tool market, but their products have been turning heads with an impressive combination of price, features, and performance. □

Asa Christiana is a woodworker, editor, and writer in Portland, Ore.

Even better: Add a Byrd cutterhead to your DeWalt 735X



While the high-speed-steel (HSS) knives and cutters on our two favorite benchtop planers will create a glassy surface on all but the gnarliest woods, and their edges are tougher than standard steel, they will still begin to dull before too long. Enter the aftermarket Byrd Shelix cutterhead, which can be retrofitted into most planers and jointers.

The Shelix is the industry's best, made in Kentucky to a very high standard, with a dense array of four-edged carbide cutters. These are arranged on a spiral, and their slightly curved edges are shaped to match that helical curve, creating a shearing cut for incredibly smooth results on the toughest woods.

Each edge of these curved cutters will stay sharp at least 10 times longer than HSS, and be much more resistant to nicks and dings. And when one or all of the first edges finally dull or get damaged, you simply rotate the cutter(s) to use the next edge (right). Due to the constant cutting action and helical edges, your planer will run much quieter as well.

There are two ways to add a Shelix cutterhead to your DeWalt 735X. If you are mechanically inclined, you can buy the head for \$695 and install it yourself. Or if you'd like to skip the work and don't already own the planer, you can purchase a DeWalt 735X outfitted with a Byrd Shelix cutterhead for \$1,595 from ByrdToolExperts.com.



Wall-Mounted Dust Collectors





When woodworkers are considering dust-collection options, wall-mounted models often get overlooked. Designed to save valuable floor space in tight workshops, these come in a range of sizes, with smaller units best dedicated to one machine or two, and larger ones capable of pulling chips at a distance from four or more.

I recently took a close look at six of these units to see how they stacked up. While there are more than six on the market, I limited the field to those with filtration of 3 microns or better. That left in dust collectors with pleated cartridge filters and heavy felted bags, and left out the thin, frankly outdated bags that only grab larger chips and particles, while emitting clouds of fine dust at head height.

I also eliminated cyclone collectors, some of which can be mounted on the wall but are much larger and generally cost much more than these small, single-stage units.

These space-saving units have the power to get the job done

BY ASA CHRISTIANA

Of the six I tested, five are similar in size and power—at $\frac{3}{4}$ to 1 hp—and allow a measure of portability if additional wall brackets are placed around the shop. The sixth is much larger: a heavy $1\frac{1}{2}$ -hp model designed to stay put and connect to multiple machines.

To assess the portability and power of the units, and to see how each model might be used most effectively, I put them through a series of basic tests. Along the way, I looked at their overall chip capacity and what it's like to dump and reattach the bag, a frequent task that should be straightforward.

Real-world power test

The primary test for any dust collector is power, its ability to pull chips through a typical hose of a given length. While manufacturers provide airflow ratings for their units—in CFM, or cubic feet per minute—these are sometimes based on the blower motor only, without the filter attached, which significantly affects bottom-line efficiency.

Two ways to use them

Five of the wall-hung dust collectors we tested are 1 hp or less, and each will do a fine job collecting chips and dust from a machine placed a few feet away. The sixth—a much larger, heavier unit from Rockler—is capable of acting as a central dust collector in small shops.

Single-machine specialists. Use one of the smaller dust collectors as a companion to a larger collector placed elsewhere in the shop. By dedicating a wall-mounted model to one or two machines, you can avoid stretching a long hose from your main collector.



So I devised my own power test, designing it to be fair to the five smaller units but relevant to the big guy too. Using a standard 4-in.-dia. hose, roughly 6 ft. long, I connected each wall-hung collector to my jointer-planer combo machine, and made 100 passes over the jointer with large fir timbers, 2½ in. thick by 30 in. long. The jointer directs chips into the semi-closed chamber between the cutterhead and planer bed where the dust port is located. After each set of passes I could compare how many chips remained uncollected by each unit.

In general, while I could discern power differences between the five smaller units, they were minor. Each one collected more than 95% of the chips and dust produced—the same result I get with my large 1½-hp rolling dust collector, albeit with a longer hose. So I can say with certainty that each of these smaller wall-mounted collectors will do a fine job in your shop, provided that you keep hose runs shorter than 6 ft. or so.

The big unit from Rockler was a different animal, sweeping the jointer chamber almost clean throughout the test, meaning it could handle a much longer hose than the 6-footer in my test—no doubt up to 10 ft. or more—and therefore act as a central unit connected to three or four machines with a system of blast gates.

Bag capacity and attachment are important too

Five of these units have canister-type filters, dropping chips into clear plastic bags that hang below. One Shop Fox model gathers

Larger model can do it all. The 1½-hp Rockler is strong enough to pull chips from 10 ft. away, letting it serve a range of machines in a compact shop on its own. Keep in mind, though, that while wall-hung collectors save space compared to floor models of similar power, they have smaller bags, which means more frequent emptying.





Real-world testing

To compare the power of the units in use, Christiana hooked up each collector to his jointer-planer with 6 ft. of hose, and made 100 passes over the jointer with a 2½-in.-thick, 30-in.-long fir timber. In the process he noted bag capacity, and assessed the ease of emptying each unit.



Joint and check. The combination machine directed chips into a semi-closed space under the jointer table, which has a 4-in. dust port. He lifted one jointer table after 40, 80, and 100 passes to document the chips left uncollected.

chips and dust in the same felted bag that serves as its filter. The five smaller collectors, including the Shop Fox with the felted bag, have nearly identical capacity, with each comfortably accommodating the 100 jointer passes before they had to be emptied.

Strangely, the big Rockler 1250 had the smallest bag, which overflowed with chips before the jointer test was over. However, the taller bag from the Rockler 650 unit happens to fit the 1250 even better, and packs of five are available from Rockler for \$10.

As for emptying and reattaching the bags, the best plastic ones stayed stretched over the bottom of the canister when empty, freeing up both of my hands for re-attaching their long band clamps. The felted bag was more troublesome to deal with.

Reality check on portability and best uses

While some manufacturers suggest that users buy additional hanging brackets and move the smaller models around the shop as needed, I'm not buying it as a solution to whole-shop dust collection. Even the lightest unit is 40 lb., and the models with cartridge filters are all 50 lb. or more. Moving any of those regularly would be a pain in the back for all but the burliest lumberjack. This reality became very clear as I shouldered the units on and off their brackets during testing.

That's why I would consider all of the wall-mounted units I tested as stationary fixtures, with the key differences being the hose runs each can support while delivering effective suction to the end of the hose.

In small shops like mine, one of the five smaller models would make a great companion to a larger dust collector. I probably would put the wall-hung unit near my tablesaw, saving me from dragging a long flexible hose across the floor from my rolling 1½-hp dust collector, which sits near the other major machines. And I wouldn't lose a foot of floor space. So think of the smaller units as companion collectors for out-of-the-way machines.

For even smaller shops, with too little floor space for a rolling unit, the Rockler 1250 could serve as a main dust collector, hung in a convenient spot and connected to multiple machines with blast gates.



Capacity and bag changes. Five of the six bags are equal in size, and easily handled the 100 jointer passes. Ease of bag changes varied between units.



Asa Christiana is a woodworker, editor, and writer in Portland, Ore.

Wall-mounted dust collectors, head to head

The “good” suction ratings on the five smaller collectors are relative to hose length. If each is kept close to a tool or machine, the efficiency rises to excellent. Chip capacity was virtually equal on the smaller units.



GRIZZLY G0785

Price: \$400 with canister
Motor: 1 hp
Weight: 54 lb.
Filtration: 1 micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Very good



RIKON 60-101

Price: \$750 with canister
Motor: 1 hp
Weight: 54 lb.
Filtration: 1 micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Fair



ROCKLER DUST RIGHT 650 CFM

Price: \$720 with canister
Motor: ¾ hp
Weight: 57 lb.
Filtration: 1 micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Very good

Seemingly identical to the Shop Fox W1844, the Grizzly G0785 collected a few less chips in our test—but was still roughly average among the five small models. Emptying was easy, thanks to a bag that stays in place on the canister while you operate the band clamp, which also works well. Both units hang well on their brackets.

The Rikon's power and capacity are comparable to the other smaller models, but a few issues held it back. Because the chip bag hangs a bit loosely on the canister, it tends to slip off during changes. On the plus side, it's the only small collector with a 5-in.-dia. intake, so if you discard the Y-junction with the 4-in. ports, and run a 5-in. hose closer to your machines, you'll add efficiency.

While all five of the smaller units will collect chips efficiently when deployed properly, the ¾-hp Rockler was just a bit more powerful in our suction test. Bag changes were very easy too, thanks to a lip on the lower edge of the canister, which holds the bag in place while you operate the clamp. The Rockler 650 also hangs very solidly on its bracket, which helps when you turn the filter-cleaning crank.



Easy bag changes. The Grizzly's plastic bag wraps tightly over the canister, freeing up your hands for the band clamp.



Tricky bag. The Rikon bag tends to slip off its canister while you are positioning the band clamp. Practice helps.



Easy bag changes too. A handy lip on the bottom of the canister keeps the bag tightly in place while you operate the clamp.



ROCKLER DUST RIGHT 1250 CFM

Price: \$1170 with canister
Motor: 1½ hp
Weight: 78 lb.
Filtration: 1-micron canister
Suction: Excellent
Chip capacity: Fair with
standard bag
Emptying bag:
Fair with standard bag



SHOP FOX W1844

Price \$680 with canister
Motor: 1 hp
Weight: 54 lb.
Filtration: 1-micron canister
Suction: Good
Chip capacity: Good
Emptying bag: Very good



SHOP FOX W1826

Price: \$340
Motor: 1 hp
Weight: 40 lb.
Filtration: 2.5 micron felted
bag
Suction: Good
Chip capacity: Good
Emptying bag: Fair

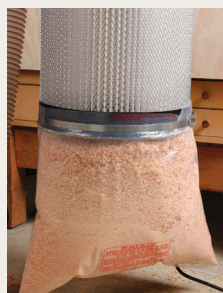
The big motor on this collector left the chamber under my jointer very clean. You'll need help to get this heavy unit onto its bracket, but if you're looking for a central dust collector that won't gobble floor space, this may be the unit for you. Strangely, this huge unit comes with the smallest plastic chip bag, but you can replace that with a taller one from Rockler.

Although seemingly identical to the Grizzly G0785, the Shop Fox W1844 delivered slightly better suction than the Grizzly. Bag changes are easy on both machines, thanks to a nice-fitting bag that stays in place while you operate the band clamp. And both units hang solidly on their brackets.

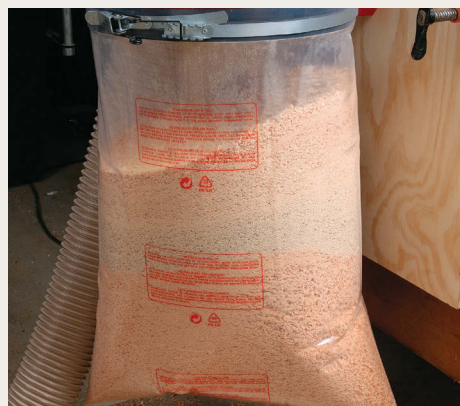
The thick, felted bag on this Shop Fox is a plus and a minus. On one hand, it makes the unit much less expensive than collectors with canister filters, and also lighter and easier to hang on the wall. Without a separate plastic bag to catch chips, however, they stay in the felt bag, and the shortish zipper on the bottom makes it tough to shake them out. Otherwise, the W1826 is an excellent value.



Handy remote.
The big Rockler is powerful enough to serve as a small shop's main dust collector, and comes with a remote.



Replace the bag.
The small bag on the Rockler 1250 is easily replaced with the taller type from the Rockler 650.



Good power. Barely edged out by the Rockler 650, the Shop Fox W1844 demonstrated admirable efficiency after 100 passes.



Head outside to dump it. Packed chips come out slowly at first so it's a good idea to empty this thick bag outdoors.

New to market

Each year, the experts at *Fine Woodworking*, *Fine Homebuilding*, and *Fine Gardening* test dozens of new products and tools. Here is a rundown of some of the hand tools we reviewed last year.

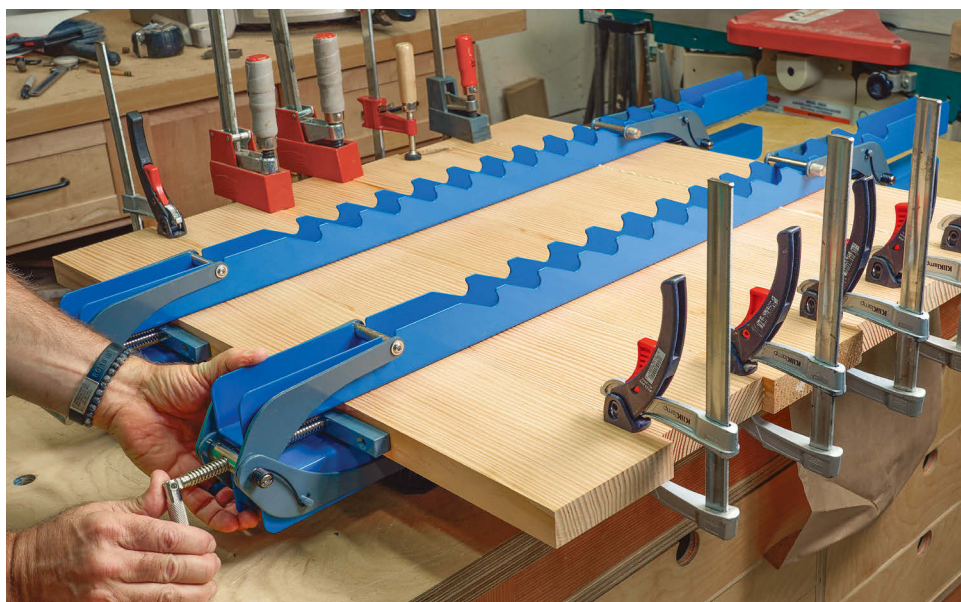
Panel clamps change the glue-up game

Panel clamps are designed to pull pieces flat and flush while applying pressure to edge-glued joints. I've tried a few in the past—from individual clamps to wall-mounted systems—and found that they were either too weak or unwieldy or that they consumed too much cash and wall space. So I was excited to try out Rockler's new Deluxe Panel Clamps, heavy-duty models that can be set up quickly and stored easily.

Made of thick steel plate, with U-channel construction, movable jaws, and sliding feet, they promised to sit solidly on my benchtop, adjust quickly, apply plenty of pressure, and stay flat and rigid in any situation. And that's exactly what they did.

I put the new Rockler panel clamps through a variety of tough tests, on glue-ups both narrow and wide, with boards both bowed and straight. They worked beautifully in each case, pulling straight boards perfectly flush and bowed boards very close to it.

These clamps can handle glue-ups between 10 in. and 36 in. wide, and boards up to 3 in. thick. Sliding feet attach to the lower bars with magnets, letting you position them quickly for stability on any surface. The spring-loaded jaws adjust easily, dropping into notches along the bars. And the powerful clamp handles clear the benchtop.



Start with a pair. Just two of these clamps will keep assemblies flat, drawing joints tight and flush so you can add bar clamps for additional pressure and F-style clamps to pinch ends flush. They work just as well on small glue-ups.

You set the bottom bars on your bench, adjust the feet for stability, and apply glue to and assemble the workpieces on top. Then you slide the top bars into place and tighten the handles. That pulls the joints flush and tight, at least near the clamp bars, and draws the panel dead-flat.

On small glue-ups and frame-and-panel assemblies, a pair of panel clamps will do the trick. On everything else, you can add as many of your normal bar clamps

as you like to apply pressure along the full length of the joints. I usually also pinch the ends with F-style clamps to ensure they end up flush, too.

With the panel clamps as a flat foundation, glue-ups come together very quickly. There's no chance of the panel curving under clamp pressure, so all additional clamps can go on the top side. And if bowed boards are still misaligned a little, there is plenty of room to add curved cauls to bring them flush.

If you are tired of wrestling to keep bar clamps stable and piles of boards flat and flush as the clock ticks and the glue stiffens, you'll love Rockler's Deluxe Panel Clamps. I'll be using mine on almost every flat glue-up I do, from doors and door panels to cutting boards, cabinet sides, and tabletops. They aren't cheap, but they will pay for themselves many times over in time saved and frustration avoided.

—Asa Christiana is a woodworker in Portland, Ore.

Deluxe Panel Clamps by
Rockler
\$120 each

Burnish scrapers more easily

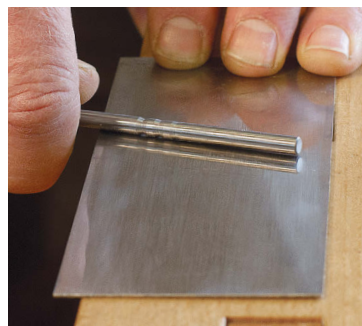
The Accu-Burr burnisher makes it easier to turn consistent cutting burrs (or “hooks”) on scrapers. What makes it unique are its V-grooves, which form two burrs at once, one on each corner of an edge. There are three grooves, which produce three different burr angles, for varying levels of aggressiveness. The V-grooves let you simply keep the burnisher level as you push it along the edge, instead of guessing at the correct angle and maintaining it as you push, as you must with a standard burnisher.

After smoothing and squaring a scraper’s edge with a file and stones, I used the 5° groove to produce sharp, even burrs on each side of the edge. The process was quick and easy, and the scraper produced beautiful, feathery shavings on quartersawn white oak.

The Accu-Burr is available as a bare rod, as well as with two brass handles pre-attached. I recommend buying the rod only and attaching a single handle of your own, or one of the pre-made handles available from Heartwood. That’s

because burnishing actually involves two steps: After forming the initial burrs on the edge and using them for a bit, you refresh them by drawing them upward and then bending them downward again as you did at the beginning. The drawing step requires that the burnisher lie flat against the face of the scraper, which you can’t do with two handles attached.

—Chris Gochnour is a furniture maker in Utah.



Choose your angle. The V-shaped grooves turn two burrs at once, along both corners of an edge, at 5°, 10°, or 15°.

Accu-Burr Burnisher
\$40 (rod only)
HeartwoodTools.com

With or without handles. If you don’t yet own a burnisher, buy just the Accu-Burr bar and attach only one handle (also available from Heartwood Tools), so you can roll burrs flat before refreshing them.

Two steps. Hold the Accu-Burr level to form perfect burrs along both corners of an edge (far left). Leaving one handle off lets you lay it flat to pull burrs upward (left), a key part of the burnishing process.

Versatile premium mallet

The mallet by Harold & Saxon Toolworks is a high-quality tool with a good feel and great finish. This 16-oz. to 18-oz. mallet is approximately 9 in. long with a 2¾-in.-dia. head at its widest and is made of dense Australian hardwoods. I have different requirements for a mallet depending on whether I’m carving wood or making furniture. I put the Harold & Saxon mallet to work in both scenarios. What I look for in a wood-carving mallet is a weighted head with a smaller overall profile. This mallet hit the mark. It performed well while setting in and roughing out a carving, and while making fine detailing cuts. For furniture making, a mallet should have good weight and medium size, and it must perform a multitude of tasks: assembling and disassembling project components, chopping joinery, and performing delicate work such as setting in inlay. The Harold & Saxon performed well in all of these aspects, and it was comfortable and allowed for good control whether I gripped it around the handle or the head. I recommend it as a great hybrid mallet for both wood carving and furniture making.

—Dan Faia is a carver, furniture maker, and instructor in Rollinsford, N.H.



Mallet by Harold & Saxon Toolworks
\$135

Trio of stones and strops

M. Power's Side By Side (SBS) diamond stones and leather strops are a reliable sharpening setup. The SBS's aluminum base solidly holds six sharpening surfaces, three diamond stones and three strops, and allows for efficient movement from coarse to fine. Everything, including the strop compounds and stone lubricant, fits into a heavy-duty storage case.

The stones and strops measure 3 in. wide by 8 in. long. The diamond stones' grits are 300, 600, and 1200. The polishing compounds' are 1800, 2500, and 5000. The strops are leather attached to plastic covers that slip over the diamond stones and use magnets to stay in place.

I was able to quickly reshape a bevel on the coarsest stone, then proceed through the finer stages to get very good

results with plane irons and chisels. The system also worked well for carving gouges with the addition of a slipstone for the inner flute. The strops and compounds worked surprisingly well. The first two strops are particularly firm to minimize rounding of the cutting edge. As the finest diamond stone breaks in and becomes finer, even less follow up on the strops should be required. The

final strop left a mirror polished surface.

For sharpening sloyd knives, the SBS does not allow good access to the middle stone. Also, since the stones are attached to the base, it was not possible for me to take the stones to the tool as I do when I sharpen adzes, axes, and drawknives.

—Dave Fisher works with hand tools in Greenville, Pa.



Sharpening kit
by M Power
\$225

Measurably better rule

Last Christmas I received a Tajima Sigma Stop tape measure as a thoughtful gift, and it has become one of my favorite tools. The case has a rounded rectangular shape that perfectly fits in the palm of my hand. It has an automatic lock, similar to Stanley's Lever Lock design, but the thumb operation is more ergonomic and its design allows both automatic retraction and the ability to firmly lock the tape.

The blade's durable coating has held up well to constant use, and it has a standout of about 7 ft. 8 in. The hook is made from thick stainless steel that has held up despite repeated drops, unlike most of my other measuring tapes. The hook itself is sized perfectly: not too big and not too small. Versions are available with a conventional belt clip, which I prefer, or with a Tajima proprietary locking safety belt hook.

Both sides of the Sigma Stop tape are graduated; the first 12 in. has $\frac{1}{32}$ -in. markings on one side and $\frac{1}{16}$ -in. markings on the other. The 16-footer retails around \$28, slightly more than its competitors, but its high-quality features make it well worth the price.

—Art Henderson, MD, is an emergency room doctor and remodeler.



Double-faced tape.
The high-contrast black-on-white scale, printed on both sides of the blade, is easy to read in all lighting conditions.

Tajima Sigma Stop
tape measure
\$28 for 16-ft. model

Comfy sanding pad

A sanding pad is a critical aid when hand-sanding. It not only helps ensure a flat surface because it itself is flat, but the right ones also make gripping sandpaper less taxing. My problem is I rarely have one on hand. If I make one, I invariably lose it, so I end up grabbing a piece of scrap of about the right size and then making do.

Thanks to Infinity's sanding pads, I'm done settling. I tried the 5-in. circular and mouse pads when sanding a pair of interior doors, and both worked a treat. Each fit my 5-in. mesh disks perfectly, making changing them both a breeze and satisfying.



**Sanding pads
by Infinity**
\$11–\$30



The circular pad was easy to grip and allowed for good pressure both one- and two-handed. It also worked well when sanding edges, since it has enough room to wrap my fingers underneath it to register them along a board's face. The mouse pad also sat nicely in my hand. I used it more for controlled finish sanding. Another perk: The pads are yellow, so they were easy to spot amid all the other clutter on my bench. It's a nice benefit when I'm already frustrated because I'm sanding.

Infinity also sells a 6-in. circular pad.

—Barry NM Dima is a former associate editor for Fine Woodworking.

Clip-on tool pouch

Framing work is hard enough—if I can dodge wearing my framing rig for a day, my shoulders appreciate it. For most of my tasks, I only need a handful of tools. I've tried using my back pocket, but it takes too long to fumble for the right tool for production work, so I decided to try a small tool pouch hung from my regular belt. I bought the Occidental Leather 5523 four-in-one clip-on tool holder. It holds a tape, a pencil, a small tool such as a screwdriver, and

snips or pliers. The belt clip is great because I don't have to drop my pants to take it on and off. The tape holder can accommodate a pro-scale 25-ft. tape, albeit with a little initial stretching. The main compartment comes with a plastic protector for sharp tools, but I removed it to get my snips to sit a little lower; it would take a lifetime of use to wear through the thick leather pouch anyway. I stow my utility knife in what I think is a belt loop. I use the side sleeves for a pencil

Occidental Tool Pouch
Model 5523
\$44

and my 4-in. combo square, and that's everything I like to carry. At the end of the day, I unclip the whole thing and throw it in the truck for the next morning.

The \$44 Occidental 5523 keeps everything at hand without the raw shoulders. I should have bought it a decade ago. And with its stout construction, I'm wondering who I'm going to leave it to in my will.

—Andrew Grace is a remodeler in Ligonier, Pa.



Must-Have Concrete Tools

A longtime builder's
labor-saving tools mean
better concrete, too

BY ANDY ENGEL



Knowing the tools needed to place and finish a concrete slab is a road map to doing good concrete work. Most of the hand tools are relatively inexpensive, and most of the more expensive ones can be rented. Concrete is pretty safe stuff most of the time, though it can cause chemical burns, particularly with extended contact. Long pants, long-sleeved shirts, rubber overboots, and gloves are called for when working the wet slab. Safety glasses aren't a bad idea either. When saw-cutting, be sure an electrical saw is plugged into a GFCI outlet and wear safety glasses, hearing protection, and at least an N95 dust mask or respirator because of the silica dust.

It takes surprisingly little water for concrete to complete the chemical reactions that make it hard—so little it would be unworkable without some additional water. To be workable, concrete must be wet enough to flow tight to the forms and for air bubbles to escape. The wetter concrete is, the easier it is to settle into the forms—but the weaker it will ultimately be. That's because

concrete's strength is related to its density. From a chemical standpoint, any water that isn't necessary for the reaction just takes up space. When that water eventually evaporates (which can take weeks), it leaves tiny voids that reduce the density and strength of the concrete. Also, if it's too wet, the water on top of a slab won't evaporate fast enough to allow tooling before the underlying concrete is too hard to work. Adding plasticizer to the mix costs a little more money, but it temporarily lowers the slump of the concrete without affecting its ultimate strength.

Whether your tools are rented or bought, wash the concrete off before it sets. The higher the water pressure, the easier it is to clean concrete tools. The pressure in the hose on board every concrete truck is Niagara-like. Ask the driver if you can use that water to wash off your tools before the truck leaves.

Andy Engel was a former editor at Fine Homebuilding and a builder in Roxbury, Conn.

SET UP REINFORCEMENT



The first phase of concrete work involves no concrete. Assuming the ground is properly compacted and the gravel below the future slab is level, reinforcement is the first step. Most concrete footings and foundations have some rebar in them, and slabs frequently have rebar or reinforcing wire. Concrete is very strong in compression, but will crack when placed in tension. Steel rebar adds tensile strength to concrete. Wire mesh keeps the surface of the slab in plane should cracks develop.

BOLT CUTTERS

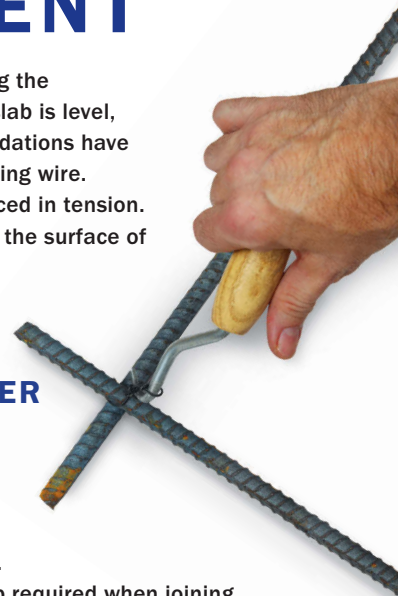
Simple tools, bolt cutters' main purpose in concrete work is to cut welded wire mesh to size. An 18-in. cutter is perfect for this task. You can also use a grinder with an abrasive wheel or a circular saw with a carbide or abrasive blade made for metal-cutting, but the bolt cutters are just as fast and don't require power or batteries. Be sure to wear a face shield when working with cutoff wheels, which sometimes shatter, throwing partial discs of carborundum and fiberglass at high velocity.

REBAR BENDER/CUTTER

Rebar is hard steel—cutting it isn't something you do with bolt cutters. It is also as hard to bend as it is to cut. For cutting on small jobs, you can get away with an angle grinder. For bending in a pinch, I've stuck the end of a piece of rebar in the trailer-ball hole of an F-250's bumper and used that as a fulcrum. The results were serviceable but not great, and mostly limited to #4 bar. A rebar bender/cutter makes for much neater, more easily controlled bends, and cuts rebar much faster than a grinder.

TIE TWISTER

On small jobs, rebar can be wired together with pliers and 14-ga. steel wire. (The standard lap required when joining bars lengthwise is 40 bar diameters—i.e., #4 bar, which measures $\frac{1}{2}$ in., must overlap at least 20 in.). If you only have a couple of pieces, this is no big deal. For bigger projects, use a tie twister with special rebar wires, which speeds up the tying process dramatically.



ROTARY HAMMER

It's common to abut new concrete to existing—for example, when building an addition to a house. The plans should specify a doweled connection, which simply means you drill into the existing concrete so lengths of rebar can be inserted into place. Some circumstances call for the dowel to be epoxied into place, while others require some movement and the engineer will call for the rebar to be greased so the concrete doesn't adhere. In any case, the tool to use for drilling the holes is a rotary hammer. Most contractors already own one, but you can rent them too.



PERFECT METHODS OF PLACEMENT

Concrete is heavy. A standard 10-cu.-yd. truckload weighs 40,000 lb. and is enough for 750 sq. ft. of 4-in.-thick slab, accounting for spillage and assorted variances. You'll want to move as little concrete by hand as possible while also moving fast. Concrete begins setting up the instant the first water is added, and ready-mix companies only give limited time to unload the truck once on-site.

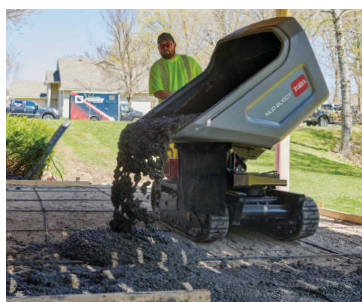
FRONT-DISCHARGE TRUCK

Obviously, the simplest method of placement is to get the ready-mix truck close enough to the hole so that the truck's own chute can place the concrete. I had an epiphany about this process when I moved from New Jersey to Connecticut 25 years ago. In Jersey, all the trucks had rear-wheel drive and rear discharge. They could get pretty close, but because the driver had no direct line of sight, he could only help you out so much. And because of the rear-wheel-drive configuration, firing up the backhoe to drag a concrete truck out of the mud was a regular event. Connecticut introduced me to front-discharge, all-wheel-drive concrete trucks. I have yet to see one stuck in the mud. And because the driver can see and control the chute from inside the cab, the concrete mostly ends up exactly where you want it. If you can't get close enough with the truck's standard chutes, ready-mix suppliers can often send additional chutes for a reasonable upcharge. Longer chutes are at a more shallow angle, so you may have to pull the concrete.



STEEL WHEELBARROW

Wheelbarrows are an obvious and cheap vessel for moving concrete (or mixing it by hand). Don't buy a plastic wheelbarrow. They are lighter but flex when loaded, making them very difficult to maneuver around a site. A high-quality steel wheelbarrow is rigid and far easier to push when full of wet concrete. Your concrete wheelbarrow should also have solid tires—few things make me lose my temper, but a flat tire on a wheelbarrow full of concrete is one of them.



POWERED WHEELBARROW

Concrete buggies (or "mud buggies") are big, motorized wheelbarrows. They're a great way to move concrete from the street to the backyard. If you have more than a couple of yards that need wheeling, consider renting a buggy.



CONCRETE PUMP

An even easier way to move concrete long distances is with a pump. Concrete pumps are specialized trucks or truck-pulled trailers. Concrete from the mixer flows into a hopper on the pump truck, and that truck pumps it to where the concrete is needed. There are two main types of pump truck. Line or grout pumps push the slurry through a 4-in. hose that gets manhandled around the site. Boom trucks have hydraulic-controlled booms so the truck driver can move the concrete hose and outlet to where you need it. Unless you're experienced, it's a good idea to hire a crew with a boom truck. Some have mechanical arms with a 100-ft. reach. Neither is cheap, but for large projects where you need to move a lot of concrete quickly or for sites with difficult access, they're the way to go.



PORTABLE MIXER

Hand-mixing in a wheelbarrow is often fine for small concrete jobs, but a portable mixer is faster and will save your back on bigger projects. Portable mixers are also ideal for larger jobs where there is no ready-mix plant or site access is impossible for a concrete truck. Sizes range from small models found at home centers for a few hundred dollars to large tow-behind machines that can mix nearly $\frac{1}{2}$ yd. of concrete at a time and sell for thousands. A good rental yard will have at least two sizes.

VIBRATORY SCREED

I will never do another big slab without renting one of these—ever. Screeding a big slab by sawing back and forth with a 2x4 or metal screed works, but it's exhausting. Vibratory screeds work by attaching a gasoline-motor-powered vibrator to either its own integral metal screed or to a 2x4. The tool's vibration settles the concrete while replacing the hard physical labor of screeding. Renting one of these for your next slab is the best tip in this article, hands down.

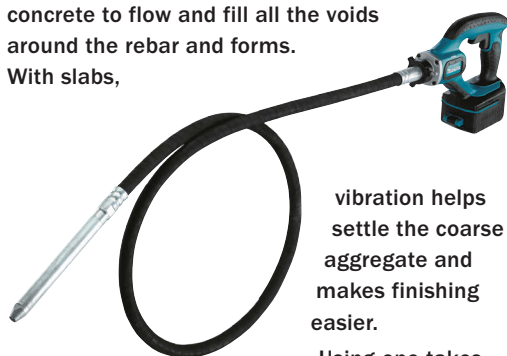


VIBRATOR

One tool that's useful with both walls and slabs is the concrete vibrator. A slender metal mechanism powered by a flexible shaft that ties to either an electric or gas motor, concrete vibrators help settle wet concrete into its forms. Every rental yard in existence will have a concrete vibrator. The key is to vibrate sparingly.

Concrete is a mix of Portland cement, water, and large (gravel) and small (sand) aggregate. The sand fills the spaces between the gravel, and a slurry of Portland and water fills the space between both. Vibration helps concrete to flow and fill all the voids around the rebar and forms.

With slabs,



vibration helps settle the coarse aggregate and makes finishing easier.

Using one takes a delicate touch—

excessive vibration can separate the large and small aggregate too much, weakening the concrete. For that reason, don't hit the rebar or the sides of the forms with the vibrator any more than you can help. If appearance is a concern, you can tap the forms with a hammer or take the blade out of your recip saw and run it up and down the form a little bit. Don't get carried away, though, because vibration liquefies concrete and the added hydraulic pressure can blow out the forms.



COME-ALONG

The simplest, most useful tool you aren't using is the come-along, also called a placer. Essentially a solid rake, the come-along is the perfect tool

for pulling and rough-leveling concrete for a slab. Do not use a steel landscape rake to move concrete—this will segregate the aggregate, seriously reducing the strength of the concrete. There is a hook on top of a come-along to pull up reinforcing wire when needed.

CONCRETE TAMPER

Composed of wire mesh in a frame with a pair of handles, a concrete tamper pushes the coarse aggregate down into the surface of a slab to make finishing easier. However, it can settle the aggregate too deeply, increasing the likelihood of

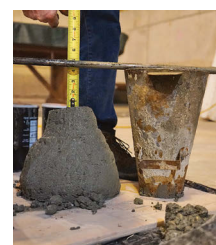


freeze-thaw cycles scaling the top of exterior slabs in cold climates. Therefore, tampers should be used judiciously and only on slabs not subject to freezing. Their use should be limited to very stiff (low-slump) concrete or concrete with unusually large aggregate.

What slump?

Slump is determined by filling a special cone with a sample of fully mixed concrete, removing the cone, and measuring how much the wet material sinks (or "slumps"). A 4-in. slump is the standard for structural purposes, but without special tools 4 in. is unworkable. Most residential concrete is placed at a 5-in. or 6-in. slump. It's a balancing act, and the tools you use to settle concrete into its place and to level slabs are crucial. For concrete work such as footings, a shovel and a piece of rebar are most of the tools you'll

need. All that you have to do is move the concrete through the forms, jab the shovel (or in tight places, the rebar) in a few times, and bang on the side of the forms with a hammer to burp out big air bubbles. A mag float does



a fine job of tooling the top of the concrete level with the forms.

Slabs and walls are a different story. There, the fit and finish of the concrete becomes much more important. Most builders, myself included, hire out foundation walls. The forms are heavy and expensive, the work takes experience, and mistakes are costly.

FINISHING BRINGS IT HOME

Finishing is when the magic happens and where concrete skills really shine. It's also the most nerve-wracking time because the window when concrete is workable shrinks rapidly. Concrete finishing is done in a specific sequence, and each of these tools is appropriate only at certain times during the process. Using them incorrectly can affect the finish and durability of a slab.

BULL FLOAT

Screeding leaves a coarse surface that needs smoothing to be useful. A bull float is used immediately after screeding to remove ridges and fill hollows while slightly depressing the coarse aggregate. The aluminum blade of the bull float doesn't seal the surface of the concrete the way steel does, which is one difference between a bull float and a steel trowel. At this stage, it's important not to seal the concrete to facilitate evaporation of the excess water.

Bull floats are typically about 8 in. by 48 in. They have sectional handles that assemble to as long as 18 ft., allowing the user to stand outside the concrete while floating. The handle joins the float with a universal joint, so you can twist the handle to change the float's angle of attack: Lowering the handle raises the front edge of the float slightly, making it easier to push the float away from you; raising the handle does the opposite.



KNEEBOARDS

Once the slab begins to set, you need to get on it to trowel it without leaving deep footprints. Concrete finishers use kneeboards that spread out their weight like snowshoes for this task. You can buy nice aluminum kneeboards with integral kneepads—but while these look plush, they aren't cheap, and I've never seen them used in residential construction. More typical are pieces of $\frac{1}{2}$ -in. plywood about 8 in. wide and 2 ft. long with strips of wood fastened to the front edge to make them easier to pick up.

To use kneeboards, you walk out to the center of the hardening slab and then kneel down on them to float or trowel. Working backward toward the edge of the slab, you smooth out the marks left by the boards—and, inevitably, the toes of your boots—as you go.

MAG FLOAT OR WOOD FLOAT

Mag is short for magnesium, the metal mag floats are made from. In decades past, wooden floats served the same purpose. Mag floats smooth the lines from the bull float, and on small jobs are often used in place of bull-floating. They're employed as the bleed water evaporates and the top of the concrete begins to lose its sheen. Mag floats don't polish the surface, but rather "bring up the cream," meaning they further help to embed the coarse aggregate below the surface and bring moisture up from below as that on top evaporates. The point is to create a surface that's open to allow bleed water to evaporate, for further finishing with a steel trowel or concrete broom.

EDGER AND GROOVER

Edgers are small steel trowels that impart a radius edge to slabs.

This edge is less prone to chipping and friendlier in use than

a square one would be. I use edgers at two points during the finishing process. The first is shortly after bull-floating. At this point, the goals are to separate the wet concrete from the forms to minimize chipping when the forms are removed, and to push the coarse aggregate down to allow a smooth finish to be imparted later. The second time I edge is after steel-troweling or brooming to give the slab a smooth, finished edge.

A groover is like a two-sided edger, used to mold control joints and decorative joints into the slab. It works fine for sidewalks and broom-finished patios, but I prefer to saw-cut control joints in garage and interior slabs.





STEEL TROWEL

The final tool used for a smooth slab, steel trowels are used after all the sheen from the bleed water is gone, but before the concrete is too stiff to work. A darby is a larger version of a steel trowel, with two handles. The trick is to keep the leading edge slightly elevated as you smooth the last remaining ridges and compact the surface. Pool trowels can be a useful finishing tool as well. Their rounded corners are less likely to leave ridges in the concrete.

Steel trowels should not be used on air-entrained concrete—these are finished with a mag trowel. Steel trowels close off the pores on the surface of the concrete, trapping in air that should be allowed to escape. Another common mistake is to sprinkle water on a slab that's setting up too fast. Both of these things can lead to scaling and other surface failures. If it's a hot day and it seems likely that the concrete will set faster than you can finish it, have the batch plant add retarder to the mix to buy extra time.



FRESNO TROWEL

Out West, concrete finishers routinely use Fresno trowels to finish concrete. Fresnos are larger than a handheld steel trowel and they attach to long handles like a bull float, making them ideal for large slabs. The downside is that because they're larger than a hand trowel, they don't compact the concrete surface as much, so the surface can end up less durable. Like smaller steel trowels, Fresnos should only be used after the concrete has been floated with a wood or mag float.



POWER TROWEL

I've never used one, but I regularly see professional finishers using a power trowel. It's a great option for large slabs because its gas engine doesn't get tired and it can cover more ground before the concrete is too hard to work. The secret to using this tool is to get it on the concrete at the right time. Start too early and it will sink into the fresh concrete, making a mess; wait too long and you won't be able to smooth surface imperfections.

Power trowels can be equipped with float, finish, and combination blades. Talk to the rental company about what you're trying to do and they can set up the machine for your project. The machine's handle is how you control the direction of the power trowel: Lift up on the handle to move left; push down to go right.

CONCRETE BROOM

Sometimes you don't want the polished surface steel trowels create on concrete. Usually this is because they can be slippery when wet. In these cases, a broom finish is called for. After mag-floating and while the concrete is still wet, a broom simply is dragged across the surface of the slab. Any broom can be used, but special concrete brooms are available with finer or coarser bristles depending on the finish desired. Brooms are also available that attach to a bull-float handle, extending the finisher's reach so you don't have to walk on the slab to broom it. Once the slab is broomed, use an edger to finish the corners.

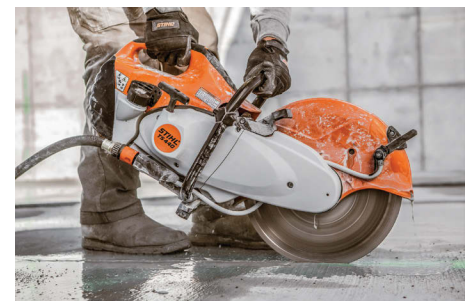


CONCRETE SAW

The old saying is that there are two kinds of concrete: Concrete that has cracked, and concrete that hasn't cracked yet. Assuming everything else was done correctly, thermal expansion is the main cause of cracking. It's essentially unavoidable.

The way to avoid cracks looking like defects is to saw-cut control joints a day or two after the pour. Saw cuts are straight and look deliberate, not like mistakes. Saw cuts should be one-quarter the depth of the slab, and the slab should be divided into rectangular sections that are as close to square as possible to even out the amount of movement between saw cuts. For residential purposes, 10-ft. squares are about right, although the size isn't a hard-and-fast rule.

You can use a circular saw with an abrasive or diamond blade for small cuts, but even better is a gasoline-powered concrete saw, which is rentable. Also described as a cutoff machine or power cutter, a concrete saw is the preferred tool for bigger jobs, but only outdoors unless you have a carbon monoxide death wish.



Hand-Tool Buyer's Guide

Fine Woodworking tool tests reveal the essential kit

BY ASA CHRISTIANA



Whether you're trimming machine-cut tenons for a perfect fit, leveling one surface to another, planing decorative chamfers, or squaring up a router-cut corner, you can count on hand tools to do the job quickly and efficiently. They'll also do it quietly.

Appreciation for the peacefulness and pleasure of handwork has grown markedly in recent years, fueling an explosion of products, from handmade collector's items to excellent factory-made options.

But with so many options available, it can be hard to know where to start. Luckily, *Fine Woodworking* has been conducting real-world tests on the best hand tools for decades now, with the help of a small group of trusted, independent experts.

In this article, I've compiled a list of the tools that came out on top in our tests in

each essential hand-tool category. Whether you're at the beginning of your hand-tool journey, or are looking to make a long-awaited purchase, you can rely on these recommendations to find excellent tools that will soon become trusted friends.

Asa Christiana is a woodworker in Portland, Ore.

**GOOD
VALUE**

In addition to presenting the best tools in each category, where possible we've also included a less expensive but still excellent option for woodworkers on tighter budgets.

Measuring and marking

For hand-tool work especially, success starts with accurate layout. There are lots of measuring and marking tools out there, but the following types are must-haves, which is why we tested them in the first place.

SQUARES

The two types of adjustable squares most woodworkers rely on are the 12-in. combination square, used for everything from measuring and marking to setting up machines accurately; and the handy 4-in. double square, which fits in your apron and is easier to handle for smaller tasks.

STARRETT 12 IN., \$115

Well machined; easy to read; head is easy to remove and lock down; excellent all-around performer.



GOOD VALUE

PEC 12 IN., \$86

Very good product; nearly identical to expensive models from McMaster-Carr and Brown & Sharpe.



STARRETT 4 IN., \$104

Head is easy to remove, replace, and lock down; narrow blade, at $\frac{5}{8}$ in., made it easier to fit into tight places.



PEC 4 IN., \$46

Good fit and feel; comfortable to use; locknut occasionally needs extra tightening.



GOOD VALUE

WOODPECKERS INDEXABLE 12-IN. COMBO SQUARE, \$180

Head is easy to adjust and remove; unique marking system indexes head at 1-in. marks with scribing notches every $\frac{1}{16}$ in.; variety of rules and heads available; pull-out tab keeps square level on an edge.



HOCK VIOLIN KNIFE, DOUBLE-BEVEL, \$33

Heavy blade that stays solidly on track in all situations.



BLUE SPRUCE CLASSIC MARKING KNIFE, \$75

Feels great in the hand; long, reinforced spearpoint blade and flat back make it especially good for laying out dovetails.

GOOD VALUE



X-ACTO, NO. 1 PRECISION KNIFE, \$6.50

Unorthodox choice works great; thin, nimble blade leaves a deep, narrow line, follows curves and delicate details, and carries lines nicely around corners.

MARKING KNIVES

Whether you're working against a ruler or transferring the location of one part to another, laying out joinery with a knife is more accurate than marking with a pencil. A good marking knife will cut wood fibers cleanly, leaving a narrow, crisply defined line, easily visible and deep enough to anchor a chisel. All three knives shown here cut in both directions.

MARKING GAUGES

Marking gauges do one thing very well: mark a crisp line parallel to an edge. This is most valuable for cutting traditional joinery, but it comes in handy for power-tool woodworking too, ensuring a clean cut at the incised line.



TITE-MARK, \$130

Excellent micro-adjuster. Can be easily and precisely adjusted with one hand.

GOOD VALUE



VERITAS, STANDARD WHEEL, \$38

O-ring inside fence provides right amount of friction to let head slide but keep it stable when tightened, making fine adjustments easy.

Hand planes

There's an overwhelming array of hand planes, for everything from smoothing boards to shaping your own moldings. This list sticks to the essentials and steers clear of the used market in order to guarantee performance and availability. The best arrive tuned up and ready to make fluffy shavings, save for a quick sharpening.

LOW-ANGLE BLOCK PLANES

A block plane's small size makes it easy to control for a wide array of common tasks, from chamfering edges and trimming joinery flush to removing machine marks from both straight and curved edges. Compared to standard-angle block planes, these low-angle models are more comfortable in the hand, less prone to chatter, and effective on both end grain and long grain, making them the right choice if you're buying just one.



LIE-NIELSEN
NO. 102, \$160

Joy to use;
compact size
fits any hand;
easy to set up and
adjust; will deftly handle
any job.



LIE-NIELSEN
NO. 60 1/2, \$187

Adjustable
mouth for coarse
or fine work; all
adjustments smooth
and precise; very well-
balanced and comfortable
to hold.



VERITAS
DX60, \$220

Very comfortable to
hold and use; smooth,
responsive adjustments;
adjustable mouth.



VERITAS
LOW-ANGLE,
\$162

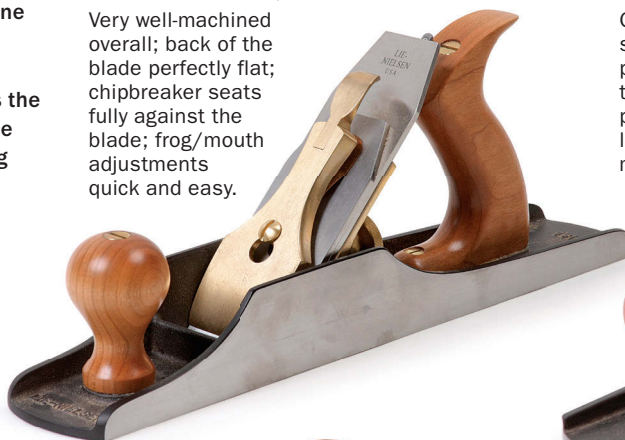
Largest
plane among
this group,
capable of heavier
work; comfortable to hold
and control; precise adjustments;
adjustable mouth.

JACK PLANES

If you can afford only one bench plane to start with, some woodworkers recommend this jack of all trades, which handles smoothing as well as the slightly smaller No. 4 but can also be used for flattening and straightening tasks often reserved for even longer planes. While standard versions (top row) are easier for beginners to adjust and handle, the bevel-up blade orientation in low-angle jacks lets you alter the cutting angle by resharping.

LIE-NIELSEN NO. 5, \$375

Very well-machined
overall; back of the
blade perfectly flat;
chipbreaker seats
fully against the
blade; frog/mouth
adjustments
quick and easy.



VERITAS 5 1/4 W, \$258

Great fit and finish; Norris-
style adjuster is tight and
precise; blade is flat, easy
to sharpen; screws in
plane body prevent
lateral blade
movement.



LIE-NIELSEN NO. 62
LOW-ANGLE JACK PLANE, \$295

Very well machined, flat blade back, flat sole, and
square sides; cuts very well; blade and mouth
adjustments precise and easy; accessory handle
available for use with a shooting board.



VERITAS LOW-ANGLE
JACK PLANE, \$266

Adjustable mouth; Norris-style adjuster
is tight and precise; blade flat and
easy to sharpen; screws in plane body
prevent lateral blade movement.



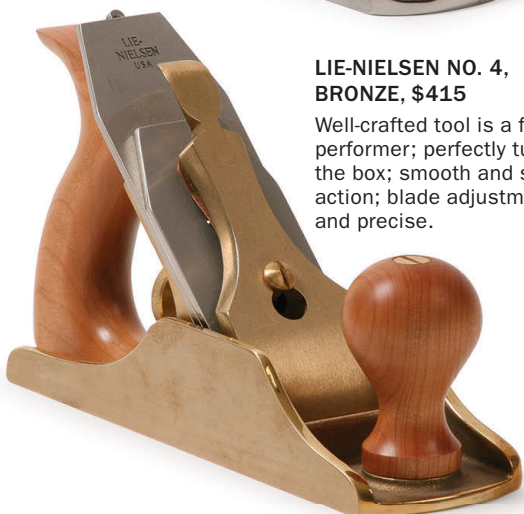
SMOOTHING PLANES

The first time you use a No. 4 smoothing plane to whisk away machine marks, you realize your days of endless sanding are over. The No. 4 size is large and heavy enough for broad surfaces yet nimble enough for general planing jobs like fitting and trimming parts. All three of our recommendations will deliver flawless results, and all three allow mouth adjustments without removing the blade, a big plus.



CLIFTON NO. 4, \$390

Handled every test with ease; a hefty tool, but perfectly balanced; thick blade holds an edge well and has a stout, two-part chipbreaker; back of blade needed some flattening, a minor inconvenience.



LIE-NIELSEN NO. 4, BRONZE, \$415

Well-crafted tool is a fabulous performer; perfectly tuned out of the box; smooth and steady in action; blade adjustments easy and precise.



WOODRIVER NO. 4, V3, \$215

First-rate performance; machining is clean and accurate; blade adjustments smooth and effective; mouth adjustments a little finicky.

GOOD
VALUE

PLANES FOR TUNING TENONS

Shoulder planes and rabbit block planes are the types used most often for fine-tuning tenons. That's because both cut all the way into corners. While some woodworkers use the shoulder plane on tenon cheeks as well as shoulders, many turn to the wider rabbit block plane to shave thin, precise layers off the cheeks. Both tools can do both jobs, however.



VERITAS LARGE SHOULDER PLANE, \$247

Flawless tool; very comfortable to grip with one hand or two; blade lapped dead flat; mouth easy to adjust.

LIE-NIELSEN RABBIT BLOCK PLANE, \$205

Cut quality is good; square, full-width blade cuts rabbets on both sides; depth adjuster tended to shift blade laterally, so you must be careful.



SPOKESHAVES

Essentially small handplanes, spokeshaves offer the same fast, smooth, controlled cuts. Their much shorter sole, however, lets the spokeshave work this magic on curves, leaving behind a smoother, fairer surface than sanding can produce. The most versatile type of spokeshave has a flat sole, as our three favorites do.

KUNZ 51A, \$30

Smooth-working blade-adjustment knobs; lever cap, bed, and sole needed 30 minutes of flattening and tuning, then the Kunz worked extremely well.



GOOD
VALUE



VERITAS LOW-ANGLE SPOKESHAVE, \$87

Reversible sole is flat on one side and round on the other; easy to adjust for light or coarse shavings; blade shape is easy to sharpen.



VERITAS FLAT SPOKESHAVE, \$140

Sharp, perfectly tuned, ready to go out of the box; blade adjustments smooth and precise; equally at home in soft or densely figured hardwood.

Saws

Every woodworker needs a good handsaw or two to make quick, precise cuts on parts that power tools can't easily handle. Dovetail saws specialize at their namesake joint but do a lot more. All-purpose backsaws, useful for a range of joinery, are even more versatile. Japanese saws, which cut on the pull stroke, handle the same tasks but tend to be easier to start. Then there's the coping saw, which is a curve-cutting specialist.

ALL-PURPOSE BACKSAWS

Also known as carcass saws, these larger joinery saws can do it all, making them a great first handsaw for beginners, and a big-joinery specialist for those who own a dovetail saw already. These are Western-style saws, which cut on the push stroke, with a thick spine down the back for stiffness. Our four favorites perform well on both rip and crosscuts.



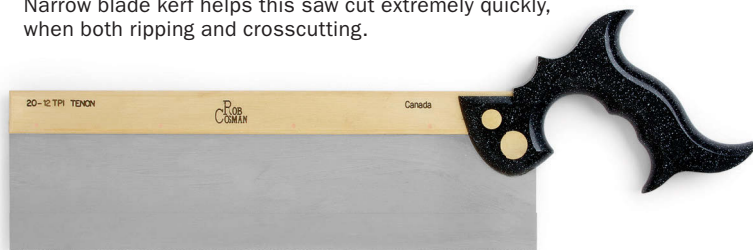
BAD AXE NO. 9 PRECISION TENON SAW, HYBRID GRIND, \$350

Cuts all types of joints beautifully, across the grain and with it; starts easily, cuts fast and straight; excellent balance; three handle sizes available.



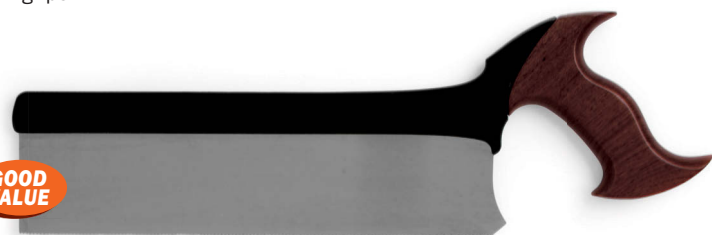
LIE-NIELSEN TAPERED CARCASS SAW, \$175

Narrow blade kerf helps this saw cut extremely quickly, when both ripping and crosscutting.



ROB COSMAN LARGE TENON SAW, \$300-\$320

Very easy to start; cuts smoothly without binding; molded resin handle comes in two sizes, with finger grips.



VERITAS CROSSCUT CARCASS SAW, \$95

Did very well in all tests; starts smoothly, cuts fast, and tracks well, for both rip cuts and crosscuts; fantastic value.

DOZUKI "Z" SAW, \$40

Best all-purpose dozuki; best crosscut performer, also rips adequately; a bargain.

GOOD VALUE

GYOKUCHO DOVETAIL SAW, 240MM, NO. 311, \$42

Makes dovetail cuts extremely well at an affordable price; blade is replaceable.

GOOD VALUE



DELUXE 240MM RIP DOZUKI SAW, \$52

Available at ToolsforWorking Wood.com; superb dovetail saw with a clear performance edge; replaceable blade.

JAPANESE-STYLE SAWS

A fair number of woodworkers prefer Japanese-style handsaws, which cut on the pull stroke. They start easier than push saws, cut faster, and very seldom bind. They are much less expensive. While most can't be resharpened, when their hardened, razor-sharp teeth finally become dull after years of use, it won't cost you much to replace them, as some blades are replaceable and the whole saw isn't very expensive. To cut dovetails specifically, buy a rip saw. For both ripping and crosscutting, the Dozuki "Z" saw is your best buy.

WESTERN-STYLE DOVETAIL SAWS

Great western-style dovetail saws are available at prices for every budget. While these specialize at precise dovetail cuts, all four are fantastic at other common tasks, from trimming parts to length to cutting quick, accurate miters.

BAD AXE STILETTO, \$275

Top choice; cuts with ease, accuracy, and speed; amazing overall; multiple handle sizes available.

LIE-NIELSEN DOVETAIL SAW, \$175

Performs beautifully starting a cut, traveling smoothly, and tracking a line; well balanced.

VERITAS DOVETAIL SAW, STANDARD, \$90

Most bang for the buck; cuts extremely smoothly; quite maneuverable; performed as well as pricier saws; composite spine saves weight.



COPING SAWS

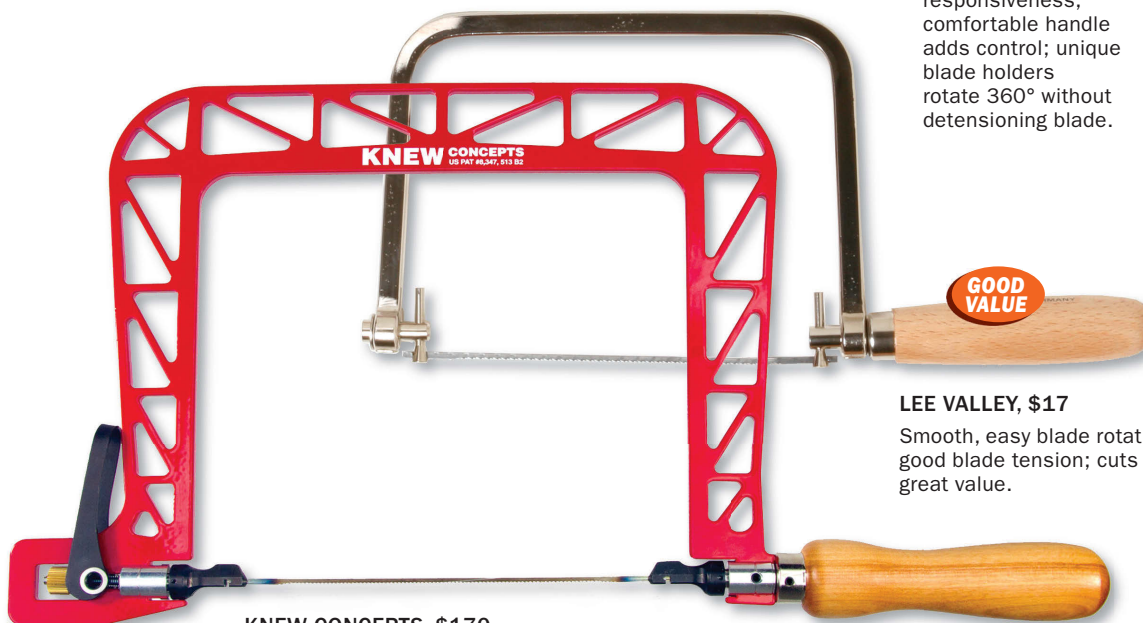
Coping saws can be used to remove waste in joinery, make cope cuts on molding, and saw tight curves of all kinds. Motorized bandsaws and scrollsaws perform similar tasks, but require the workpiece to be brought to the tool, a task that can be difficult, awkward, or even impossible. This makes the coping saw an indispensable tool in the woodshop.

BLUE SPRUCE ULTIMATE, \$340

Frame is exceptionally rigid for fantastic responsiveness; comfortable handle adds control; unique blade holders rotate 360° without detensioning blade.

LEE VALLEY, \$17

Smooth, easy blade rotation; very good blade tension; cuts very well; great value.



KNEW CONCEPTS, \$170

Outstanding blade tension and cutting control; light yet extremely rigid frame; easy blade changes; eight positive detents for blade rotation; convenient knurled knob for adjusting tension.



Bench chisels

This general-purpose tool is suitable for a variety of chopping and paring tasks, including dovetailing and mortise-and-tenoning, and installing hinges. They can be driven by hand or with a mallet. Popular sizes start at 1/4 in., so that's where our prices start too. While Japanese chisels offer some unique benefits, their availability is spotty these days, so we are focusing here on western-style chisels.



LIE-NIELSEN BEVEL-EDGE CHISELS, FROM \$95

Size and feel make this the ideal bench chisel; A2 steel; back was lapped flat and almost fully polished out of the box.



GOOD VALUE

NAREX CLASSIC BEVEL-EDGE CHISELS, FROM \$16

Easy to grasp whether chopping with one hand or paring with two; back of chrome-manganese blade was flat and edges beveled sufficiently for dovetailing; cutting edge holds up quite well; great value.



GOOD VALUE

NAREX RICHTER CHISELS, FROM \$38

Rivals premium chisels for much less; tough chrome-vanadium steel takes longer to sharpen but delivers very durable edge; side bevels taper to tip; slightly concave back needs polishing only near tip; ready to use out of box.



VERITAS BENCH CHISELS, FROM \$72

Two excellent types of steel available; flawless out of the box; blades stout with bevels that extend all the way to tip; backs lapped dead flat; handles comfortable to grasp and won't roll off bench.

CONSIDER A FLUSH-CUTTING CHISEL

With handles cranked slightly upward, these specialists can slide along a surface to flush-trim splines, plugs, dowels, or anything else that protrudes, including glue squeeze-out in tight corners. Unlike a block plane, they let you watch your progress as you work.

VERITAS FLUSHING CHISELS, FROM \$76

Long, flat blade provides great reference and control; backs are flat out of box; PM-V11 steel delivers super-durable edges; handle unscrews for fitting chisel into tighter spaces.



Sharpening

For a hand tool to perform well, it has to be sharp. A set of waterstones and a honing guide make it fast and simple to get razor-sharp and back to work.

WATERSTONES

Waterstones (water-lubricated stones) are the most straightforward choice for honing chisels and handplane blades. They produce a finer polish than oil- or diamond stones, and are more durable and less expensive than sandpaper in the long run. Prices are based on the 800- or 1,000-grit stone, and go up for finer grits.



OHISHI, FROM \$52

Cuts very fast; very hard so they remain flat for a long time; don't need to be soaked in water.



NANIWA PROFESSIONAL (WAS CHOSERA), FROM \$73

Very smooth cutting action; creates nice slurry with use; very easy to flatten.



SHAPTON GLASS STONES, FROM \$65

Great performers; very hard surface doesn't cut quite as quickly as standard waterstones but stays flatter longer.

HONING GUIDES

While some pros prefer to sharpen freehand, a honing guide holds a blade or chisel at the same angle on multiple stones, guaranteeing consistent results for woodworkers of all levels.



LIE-NIELSEN, \$150

Machined to tight tolerances; held blades tight and square; easy to use; accessory jaws available for narrow and skewed blades.



GENERIC SIDE-CLAMPING GUIDE, \$16

Requires angle guide or stop system to set up accurately, but performs basic honing very well, on a wide variety of plane blades and chisels.

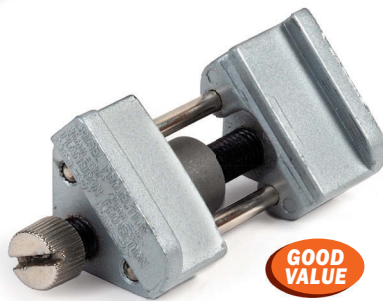
VERITAS MK. II DELUXE SET, \$140

Does an excellent job sharpening every type of blade; comfortable to use and easy to set up; take care to clamp blades squarely; includes head for narrow blades.



LEE VALLEY REPLICA, \$26

Inspired by vintage Stanley No. 50; works on slotted plane blades only, clamping them at two common angles; quick to set up and easy to use; sharpens cambered edges as easily as flat ones.



GOOD VALUE

GOOD VALUE

New to market

Each year, the experts at *Fine Woodworking*, *Fine Homebuilding*, and *Fine Gardening* test dozens of new products and tools. Here is a rundown of some of the gardening tools we reviewed last year.

Trip-saving tool hauler

Wheelbarrow or hand truck? Try both, and more. With a 300-lb. load capacity, the Worx Aerocart is a multipurpose labor-saver.

Aerocart by Worx
\$230

The Worx Aerocart may seem like the DIY-est of infomercial-type wheelbarrows, but it's not just a way to move mulch around the backyard—as a tool cart, it shines. I'm a deck and outdoor specialist, so I spend a lot of time lugging tools and supplies into backyards, and hauling trash out. Typical wheelbarrows are too big to live in my truck, but the Aerocart isn't much larger than a folding hand truck and stores vertically, so it takes up little space. Moving my everyday tools—portable tablesaw, impact drivers, chargers, and tool pouch—is a snap in the Aerocart. It's remarkably adept at holding my miter saw and a cord or two as I wheel (not dead lift) the stuff to its prescribed spot.

The Aerocart is not just a wheelbarrow—clip down a metal plate and voilà, it's a hand truck, which I used to move a 12-ft. raised garden bed. The cart's two wheels have never-flat tires, which

I wish had more give, but the cart is stable over less-than-perfect landscapes. There's even a snow-blade attachment that works better than a shovel for light powder. At \$230, the Aerocart is far from free. But measured in trips not taken to and from the truck, it has offered a pretty good return on my investment.

—Mark Clement (@MyFixItUpLife),
is a carpenter in Ambler, Pa.

A chainsaw for those who don't like chainsaws

I have been pruning for a long time and am always looking for ways to make it easier. That's why I was happy to discover the Stihl GTA 26 garden pruner kit. For years I had used a cordless reciprocating saw to prune big branches and small trees. I needed two hands to use it, and I found that it was not very precise. This small chainsaw from Stihl has replaced my reciprocating saw. It's battery operated; without a traditional pull start, and with no gas to run out of, it's amazingly easy to use. The saw cuts sharply and quickly. You only need one hand to use it, so you can hold the branch with one hand while cutting with the other.

—Susan Calboun is the owner of *Plantswoman Design* in Bainbridge Island, Wash.



Stihl garden pruner kit
Model GTA 26
\$130 (bare tool)
\$170 (with battery and charger)

Versatile weed weapon



Barnel cultivator/hoe
\$20

A tool that I'm constantly turning to is my Barnel 15-in. combination cultivator/hoe. On one side of the forged head is a straight-edge hoe, and on the other side is a cultivator with four tines. This tool is the first thing I reach for when I need to weed, dig, till, rake, or cultivate in a confined space, such as between two plants. The sharp, stainless-steel hoe blade is particularly useful for hacking at the heftiest and most resilient weeds. Perfectly balanced and easy to grip, this cultivator/hoe weighs a little over a pound—not heavy, but with enough weight to put some force behind each swing.

—Fionuala Campion is the owner and manager of Cottage Gardens of Petaluma in Petaluma, Calif.

Curved-blade digger is a multipurpose workhorse

The 7-in. EZ Digger from A.M. Leonard has a hand-forged, sharp iron blade with a comma shape that can pull out the crown of the most stubborn weeds. It's great at digging holes for planting as well, and the fine point of the blade is handy for making shallow soil impressions for sowing seeds. I also use it to roughen up the sides of plants in nursery pots and push off their containers; if a plant is rootbound, using this tool to whack a hole in the bottom of the pot will often free the plant. I spray-paint the handle of mine a bright color (see photo) to keep it from getting lost in the garden.

—Susan Calhoun



EZ Digger from A.M. Leonard
\$22



Garden Weasel
multiuse transplanter
\$12

Trowel with a twist

I use my Garden Weasel multiuse transplanter for everything: light cultivating, weeding, transplanting thick ground covers, and planting annuals. Weeds don't stand a chance when I have this little helper in my hand; it can cut through the toughest underground fibers. This 13-in.-long tool has four blades that are welded in the center at right angles. Two of the blades are slightly curved inward and meant for cutting through soil; the other two blades are notched and useful for sawing through more-compacted soil, roots, and other tough materials. Measurements in both inches and centimeters are clearly marked into the blades, making it a perfect tool for bulb planting or any other task where precision on a small scale is called for. This tool will make the perfect complement to your standard garden trowel.

—Marti Neely, FAPLD, owns and operates Marti Neely Design and Associates in Omaha, Neb.

Keep your equipment handy in this luxurious tool bag

Nick Pence is a horticulturist and leatherworker who has designed a beautiful and functional collection of leather sheaths, holsters, and bags through his company Seed & Sawdust. He field-tests his pieces in his own garden to adjust and enhance them before bringing them to market. I particularly love his tool bag, “The Muir.” This 7½-in.-tall, 9-in.-deep, and 16-in.-wide bag is made from vegetable-tanned leather with solid brass and copper rivets, but it’s still lightweight. Every detail is thoughtfully considered. The bag includes an inner waxed-canvas pocket, a strap on the side gusset for pruners and other tools, and looped side straps for carrying loppers and shears. The double-layered flat bottom even includes feet for lifting the bag off the ground. This is a tough, gorgeous piece of equipment that will last forever.

—Adam Woodruff is a landscape designer based in Marblehead, Mass.



Tool bag
\$500 to \$575

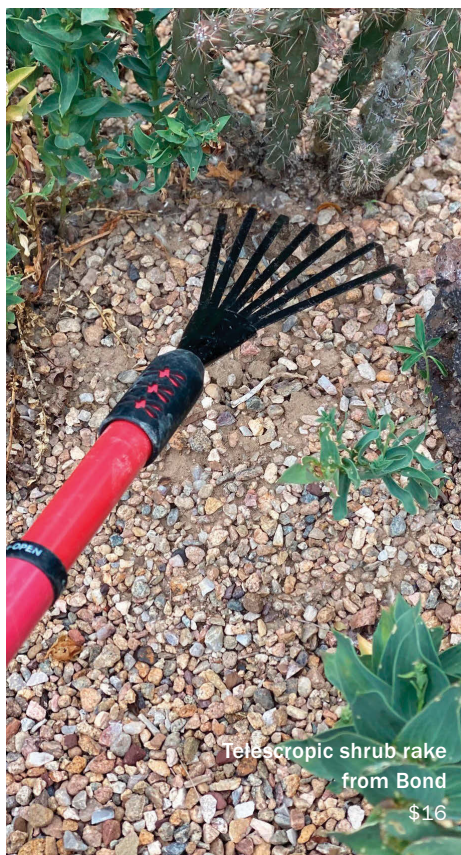


Heavy-duty hose reel

When I needed a new hose reel a few years ago, I decided to try one from Eley because of the great reviews I read online. I’ve owned Eley’s portable garden hose reel wagon with the extra capacity kit for five years now, and it looks to be the last hose reel I’ll ever purchase. Made from aluminum, stainless steel, and brass, it’s solid and well-balanced. Even when it’s loaded down with up to 200 ft. of hoses, the wide wheelbase ensures that it won’t tip over. The wagon is easy to move around the garden with its four wheels; dense, run-flat turf tires; and two grip handles. A feeder hose is included, but you can also purchase a 150-ft., 175-ft., or 200-ft. polyurethane hose. Best of all, it’s backed by a 10-year warranty.

—Adam Woodruff

Eley hose reel
\$444 without hose, \$723
to \$806 with hose



Telescopic shrub rake
from Bond
\$16

Telescopic rake built for precision

One of my favorite tools for garden cleanup is this telescopic shrub rake from Bond. The telescoping feature allows the tool to extend from 25 in. to 37 in. long, making it perfect for reaching under plants of all sizes to remove garden debris. I also use it around prickly plants such as roses and cacti, thereby saving my hands and arms from nicks and cuts. The 5-in. fan of tines allows you to get into small spaces, including between rocks and dense plantings, or near the edge of a structure. It also works great on peastone, leaving the rocks in place while gathering leaves. This rake is both lightweight and sturdy. I've owned mine for years.

—Michelle Provaznik is executive director of the Gardens on Spring Creek in Fort Collins, Colo.

Handheld rake for tight spaces

With over two decades of supervising garden volunteers, I've noticed that the small whisk rake from Harmony Farm Supply and Nursery

continually makes the list of their favorite tools. This well-balanced, stainless-steel, 9-tine rake is great for collecting debris without damaging surrounding plants or shallow roots. Roughly 16 in. long and 5½ in. wide, it excels in those hard-to-reach or confined spaces where special attention is warranted. The wide, flexible tines are also spaced well for debris collection or light cultivation efforts, and the handle has a rubber grip that won't slip out of your hand.

—Mark Dwyer is garden manager for the Edgerton Hospital Healing Garden and operates Landscape Prescriptions by MD in Wisconsin.



Whisk rake
\$10



TRG
Groundskeeper
II shrub rake
\$51

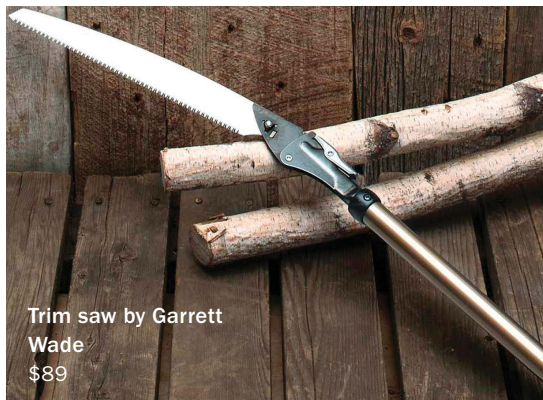
Sturdy tines for tough materials

A rake may be the most practical yet least exciting of garden tools. But as many gardeners know, some rakes don't work well for all the jobs we demand from them, and many times those jobs are much more complicated than merely raking leaves. My favorite rake is the Groundskeeper II shrub rake from TRG, with a 55-in.-long fiberglass handle and a 21-in.-wide rake head. It can handle leaves in addition to sticks, pine needles, and thatch grass, but it takes raking to a whole new level. Its stiff, spring-loaded tines can quickly rake gravel, peastone, and even topsoil, making it perfect for pulling out young weeds through light cultivation. Despite its size, it is lightweight and will surprise you by how much it can do.

—Matt Mattus is the author of two books: *Mastering the Art of Flower Gardening* and *Mastering the Art of Vegetable Gardening*. He gardens in Worcester, Mass.

Small trim saw has a big reach

I've always been frustrated by those higher branches that traditional loppers can't quite reach. Pole saws are often used in these situations, but they can be cumbersome to maneuver. The arborist folding and extending trim saw from Garrett Wade is my pick for those just-out-of-reach pruning needs. When folded, this tool is only 24½ in. long, but once the blade is extended you have a 53-in.



Trim saw by Garrett Wade
\$89

reach. That length is perfect when I'm cutting smaller branches directly overhead, and I use this saw often when dormant-pruning small ornamental trees. Sturdy and light, it can be used one-handed if necessary. The curved, 10½-in., super-sharp blade is narrow enough to fit in tight spots and is designed for efficient cuts. It can be locked into different positions with a convenient aluminum thumb lever.

—Mark Dwyer



Bypass pruners by Okatsune
\$30

These small pruners go easy on your hands

There are many great bypass pruners on the market, but I had carpal tunnel surgery years ago, and my hands tire easily when using many standard options. The model 101 bypass pruners from Okatsune are only 7 in. long and weigh about 6 oz.; they are specifically meant for smaller hands, and I find them less stressful on mine. (For larger hands, check out the model 103 and 104 pruners). These super-sharp pruners fit in cramped spaces, and I have used them to cleanly cut branches up to 1 in. dia. The robust latch, which is located at the base of the handle, is designed to be operated with one hand. My biggest complaint with other pruners is that the latch can slip and lock up the blades. These pruners do not have that problem.

—Marti Neely



Sneeboer Perennial spade
\$94

A compact spade that's built to last

I have purchased and replaced a lot of poor-quality garden tools that are not designed or made well. A few years ago I came across Sneeboer. This small, family-owned Dutch company has been around since 1913 and makes hand-forged, stainless-steel tools with ash handles. I now own several, but perhaps my favorite of all is the perennial spade. It's 22 in. long with a 17-in.-long handle and weighs just over a pound; this makes it the perfect size to use while digging from a kneeling position or working in tight spaces where a full-size spade would be too large. A version with an 11-in.-long handle is also available. I use my spade for planting small or medium-size perennials and grasses, and when I need to plant bulbs in an already established, crowded planting. The sharp, pointed head is also great for dividing plants.

—Adam Woodruff

This lightweight coiled hose can fit anywhere

The ability to water the garden with ease is valuable. I like a hose that isn't heavy, attaches to the faucet easily, and moves around without much effort. Over the years I have found that a coiled hose serves my needs best. After using various brands, I have come to prefer the 300 series polyurethane coil hose from Water Right. Manufactured in the USA, the hose is made of 100% toxin-free polyurethane with brass fittings and is drinking-water safe. This $\frac{3}{8}$ -in.-wide hose is extremely lightweight yet strong enough to withstand a car driving over it. It's available in eight colors, and its small size makes it easy to transport.

—Marti Neely



Water Right coiled hose
\$45 (25-ft.); \$60 (50-ft.);
\$80 (75-ft.)



Flexzilla hose
\$30 (25-ft.); \$40
(50-ft.); \$55 (75-ft.);
\$70 (100-ft.)

For a traditional hose, try this flexible workhorse

If you are a gardener, you have a hose. If you've been gardening for a while, you might have several hoses in various stages of use and disrepair. Last year, fed up with twisted, leaking hoses, I invested in a Flexzilla garden hose, and it's become a real asset in my garden. Made of a hybrid polymer with easy-to-use connections, this $\frac{5}{8}$ -in.-wide hose is soft, lightweight, and very flexible, even in cold weather. It also lies flat on the ground rather than kinking. No longer does my tugging on an old, hardened hose decapitate plants close to the edges of a path. It's rated as safe to drink from as well, so you and your pets can stay hydrated while you're outside.

—Susan Calboun

A durable, expandable hose that is easy to use

I've spent countless hours watering with traditional hoses, with too much of that time spent dealing with kinks, twists, and lack of flexibility. Using expandable hoses has minimized those frustrations for me, since they are lightweight, maneuverable, and flexible. My favorite such hose is the one from Joey's Garden. The extra-strength fabric and double latex core work to avoid abrasions, potential punctures, and ruptures. Solid brass connectors and a thumb valve make this hose a resilient tool that self-drains and shrinks to a third of its full length for easy storage. It even comes with an eight-function rubber-grip nozzle. Its money-back guarantee and lifetime warranty mean that I'll never go back to traditional hoses.

—Mark Dwyer



**Hose from
Joey's Garden**
\$40 (25-ft.);
\$50 (50-ft.);
\$60 (75-ft.);
\$70 (100-ft.)

WHAT IS AVAXHOME?

AVAXHOME-

the biggest Internet portal,
providing you various content:
brand new books, trending movies,
fresh magazines, hot games,
recent software, latest music releases.

Unlimited satisfaction one low price

Cheap constant access to piping hot media

Protect your downloadings from Big brother

Safer, than torrent-trackers

18 years of seamless operation and our users' satisfaction

All languages

Brand new content

One site



AVXLIVE . ICU

AvaxHome - Your End Place

We have everything for all of your needs. Just open <https://avxlive.icu>

Garden Tools That Are Easier to Use

What to look for when replacing timeworn tools

BY DIANA KOEHM

It's a yearly ritual for the gardener: Starting the season with an inventory of the tools in our sheds, looking for damage and making mental notes of what needs updating.

This is the perfect time to upgrade your standbys with replacements that perform better and are easier to use. The newer products explored here were selected

by *Fine Gardening* editors and contributors for their durability and strength, but best of all, each one was designed to reduce the strain and effort required with more traditional tools. One or more of these could be just what your gardening routine is missing.

Diana Koehm is the assistant editor of Fine Gardening.



A lopper that will spare your back and arms

From Corona's new ComfortGEL line of ergonomic tools, this bypass lopper has grips designed for more-comfortable cutting that will reduce pressure on your hands and arms and provide greater control while you work. This is a lightweight tool with 25-in.-long trapezoidal steel handles that are stronger than those of previous models. The handles are also extendable, reaching 35 in. long for those hard-to-access branches. Built-in shock-guard bumpers decrease the strain of difficult cuts, allowing you to work longer with less fatigue. The blades themselves have a nonstick coating to repel tree sap so that they stay sharper longer.

SOURCE: shop.coronatoolsusa.com

PRICE: \$35.50

A quiet leaf blower with an ergonomic design

It's lightweight, it's powerful, and—best of all—it's quiet. Now what will the neighbors complain about? The BGA 86 leaf blower from Stihl has 50% more blowing force than the previous model but only weighs 10 lb. with a battery. Its lightweight, ergonomic design will let you breeze through both wet and dry leaves with ease. It's also weather resistant, in case it starts to drizzle while you work. Powered by an AP 300 battery, the BGA 86 is so green that it's certified as Zero-Emission Equipment in California. Lefties, don't worry; the control handle is built to be used on either side. But best of all, a brushless motor makes this blower much quieter than traditional leaf blowers and improves its lifespan.

SOURCE: [minnesotaequipment.com](https://www.minnesotaequipment.com)

PRICE: \$280



An improved gardening glove for better performance

Bionic Gloves have been a staple in the gardening world for a long time. If you thought the classic Bionic gardening gloves couldn't get better, you'd be wrong. The ClassicGrip 2.0 gloves contain many improvements, including better padding to reduce friction and a new design to reduce hand fatigue and to allow for a greater range of motion. Added terry-cloth and lycra fabric make the padding more breathable and better at wicking away moisture. And even though the outside of the gloves is made from sheepskin leather, they are machine washable. The women's gloves range in size from small to XL, and the men's gloves go up to XXL, making the ClassicGrip 2.0 gloves a fit for everyone.

SOURCE: [bionicrogloves.com](https://www.bionicrogloves.com)

PRICE: \$50





Ditch your wheelbarrow for this self-propelled cart

If you have a big project coming up that involves moving lots of heavy material, this garden cart from Greenworks is for you. All you have to do is guide the cart while it moves forward or reverses by itself, hauling up to 220 lb. of cargo without any strain on your part. With two speeds (reaching up to 2.6 mph), this cart will move at your pace. A hydraulic dump lever easily empties the bed forward without requiring you to tilt the cart off the ground. The pneumatic tires are designed to roll over rough terrain without getting a flat. Best of all, the cart operates on a heavy-duty, long-lasting 60-volt battery and requires no gas or cords.

SOURCE: greenworkstools.com

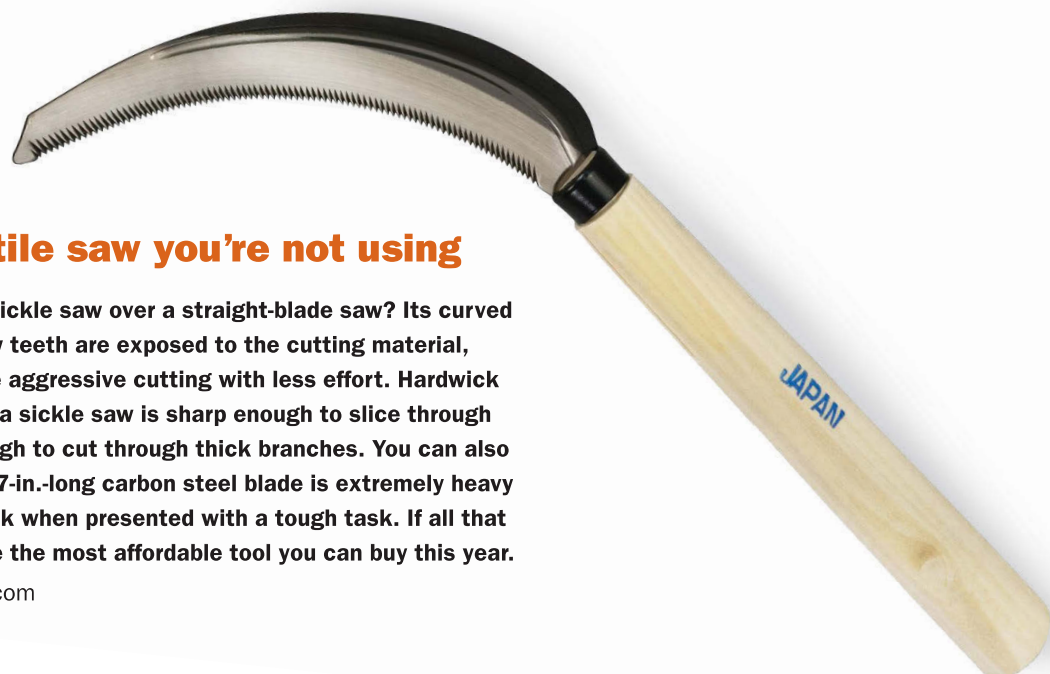
PRICE: \$700

The most versatile saw you're not using

What are the benefits of a sickle saw over a straight-blade saw? Its curved shape means that more saw teeth are exposed to the cutting material, allowing for faster and more aggressive cutting with less effort. Hardwick & Sons' Japanese Nokogama sickle saw is sharp enough to slice through fine grasses yet tough enough to cut through thick branches. You can also use it to break up sod. The 7-in.-long carbon steel blade is extremely heavy duty and won't bend or break when presented with a tough task. If all that weren't enough, this may be the most affordable tool you can buy this year.

SOURCE: hardwickandsons.com

PRICE: \$10





Get more from your harvest with this fruit picker

Are you tired of lugging around a ladder and hoping you won't fall when it comes time to harvest the fruit at the top of your trees? Garrett Wade's telescopic fruit picker extends up to 10 ft., allowing you to stand on the ground while comfortably reaching even the highest branches. A cutting tool at the end of the picker is operated by a handgrip at the bottom, allowing fruit to fall gently into a suspended collection bag that's large enough to hold about 10 apples. This tool is intuitive to operate, allowing you to harvest all that your fruit trees have to offer without worry or waste.

SOURCE: garrettwade.com

PRICE: \$80

Sturdy scissors for your smallest pruning tasks

The 7¼-in.-long Darlac vine scissors from Kinsman Company, originally designed for collecting and thinning grapes, can be used for any intricate or delicate work, such as cutting flower stems, removing vines, and pruning bonsai. These scissors are designed to be super easy to use. The blades are hollow and made out of tough high-carbon steel, reducing friction and allowing plant sap to clear as you cut instead of clogging up the works. The handles have a nonslip coating and a simple and intuitive closing loop. Use these the next time you venture into your cut-flower garden.

SOURCE: kinsmangarden.com

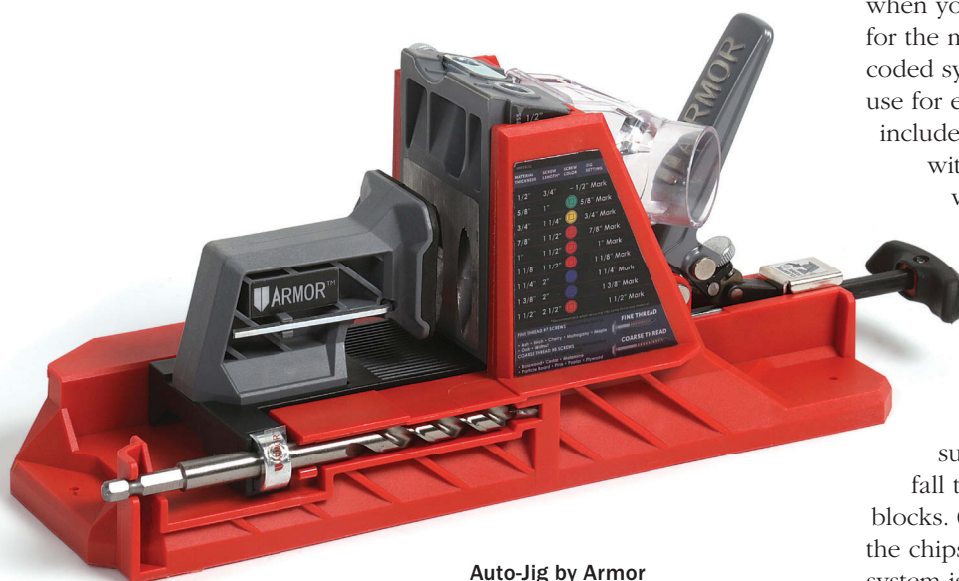
PRICE: \$20.50



New to market

Each year, the experts at *Fine Woodworking*, *Fine Homebuilding*, and *Fine Gardening* test dozens of new products and tools. Here is a rundown of some of the accessories we reviewed last year.

Pocket holes, posthaste



Auto-Jig by Armor
Model APJ1400-1
\$170

I was skeptical at first, but Armor's Auto-Jig for pocket holes proved to be a pleasant surprise. The jig's primary design feature is that the depth guide on the drill bit is set when you clamp material into the jig, so it is always right for the material thickness (from ½ in. to 1½ in.). A color-coded system of screws tells you which screw length to use for each material thickness. A starter set of screws is included. The jig and screw system work as designed, with the exit holes well centered in material of varying thicknesses.

The jig is almost entirely plastic, but the most important components—the clamp mechanism and the drill guide blocks—are steel. There's a small set screw to adjust the clamp pressure. I especially like the reversible steel guide block that can be rotated for narrow or wider spacing of two pocket holes. A dust-collection port is surprisingly functional because chips from drilling fall through port holes on the back side of the guide blocks. (Other systems require multiple plunges to pull the chips out the top side.) The color code for the screw system is mounted to both sides of the jig.

—Tony O'Malley is a cabinetmaker in Emmaus, Pa.

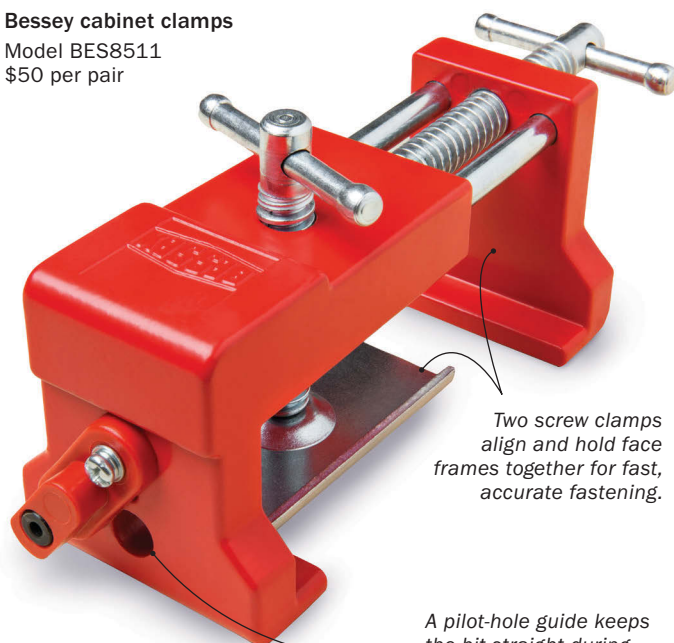
Face-frame clamp

Bessey cabinet clamps are a secret weapon for cabinet installations. They offer a 4-in.-wide clamping capacity with a 1¼-in. throat depth. They come with adhesive-backed felt pads that attach to the clamping surfaces to protect cabinet finishes. They also have a handy pilot-hole jig that flips out of the way when you want to drive a screw. This arrangement allows you to drill and screw face frames together while the clamp is in place. This pilot-hole feature also helps with lining up your drill bit so you don't drill through the face of the cabinet.

The beauty of these devices is that they not only clamp the face frames together side to side, but they also align them front to back. The best way to use the clamps is with one at the top and one at the bottom of the two cabinets you're fastening together. Open the clamp, slide it over the face frame, and snug it up so that it holds itself in place. Then tighten the face screw to align the face-frame stiles. Once the frames are aligned, tighten the side screw the rest of the way, drill your pilot hole, and screw the face frames together. At \$50 a pair, these tools pay for themselves on the first job and give great results.

—Andrew Grace is a remodeler in Ligonier, Pa.

Bessey cabinet clamps
Model BES8511
\$50 per pair



Two screw clamps align and hold face frames together for fast, accurate fastening.

A pilot-hole guide keeps the bit straight during drilling and then flips out of the way for driving the screw.

Speed up half-laps

I remember learning way back when I started woodworking that relative dimensioning (or measuring without actually measuring) is often the best way to go. The new FitFinder 1/2 Gauge from MicroJig is a pretty clever tool that does just that. Specifically, it quickly finds the center of your workpiece and half its thickness. It is designed to allow you to make layout marks or set up your tool at exactly that measurement without ever picking up a ruler or tape. Having spent endless hours making test cuts and micro adjustments on fences and blade heights, I see a lot of value in this tool. Simply put, the jig is more accurate and faster than any other method I've tried for setting up half-laps, resaws, and numerous other tasks. It makes setting up the router table fence for cuts down the center (a task I've found particularly tricky) a snap.

The tool works using triangle geometry (they did all the math already!). Simply loosen two small knobs in the back, place your stock under the top bracket, and then use the lower bracket as your halfway point. The jig also has two small rare-earth magnets that securely hold the jig to magnetic tables. One of these magnets dislodged from the tool while I ran the jig through its paces, but it was easily glued

FitFinder 1/2 Gauge
from MicroJig
\$35



back into place. Magnet mishap aside, the tool is sturdy and well-made, as we've come to expect from MicroJig. I plan to add this tool to my kit and can confidently recommend it.

—Adam Godet is a furniture maker in Washington, D.C.

Stronger finishing gloves

I use nitrile gloves almost daily in my shop, typically taking them on and off many times a day, particularly if I'm working with stains, dyes, or other finishing products. My current gloves are good quality quasi-medical gloves that are resistant to chemicals, but they're hard to put on and off and are frequently destroyed trying to get one on a damp hand. I keep a bottle of talcum powder around for that purpose, but that's a messy hassle.

I've had a much better experience with Venom Steel gloves. These nitrile gloves have two layers, a tough outer layer and a slick inner one, that make it easy to put them on or take them off without destroying the glove or my patience.



Nitrile gloves
by Venom Steel
\$18

They even stood up to student use. I took several pairs to a class and they held up amazingly well. We were building a large torsion box, and two of the students wore the gloves all afternoon with only one rip in one of the gloves.

The gloves also feel good—so good that I'm wearing them as I type this review! They seem to do well at keeping the chemicals at bay and are tough enough to survive rigorous use in the shop. Venom Steel sells them as "one size fits most," which means they'll be a bit big on small hands.

—Roland Johnson is a woodworker and tool expert in Sauk Rapids, Minn.

Compact thermal imager

Thermal-imaging cameras are useful for building diagnostics such as tracking down air and water leaks, seeing if electrical cables or equipment are overheating, and checking the temperature of ducts and HVAC equipment. But thermal-imaging tools used to be so expensive, the only people to own them were researchers and specialty tradespeople. Thankfully, that's not the case anymore. Anyone can get a decent thermal-imaging camera for under \$1000, and my latest is a good example.

I was introduced to Hikmicro at the International Builders' Show. A newer manufacturer to the industry, Hikmicro had several products on display where people could try them out. I gravitated toward the Pocket Series of cameras, which look closer to traditional digital or smartphone cameras than the pistol-grip thermal imagers we're accustomed to seeing. Compact but filled with features, the Pocket 2 has the resolution of a more expensive model (256x192). By comparison, my first thermal imaging

Hikmicro Pocket 2

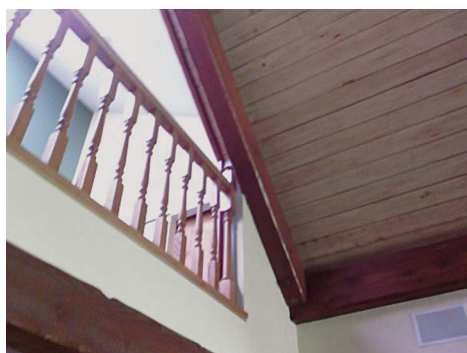
IMAGE RESOLUTION: 256 by 192 pixels

OBJECT TEMPERATURE RANGE: -4°F to 752°F, accuracy ±2%

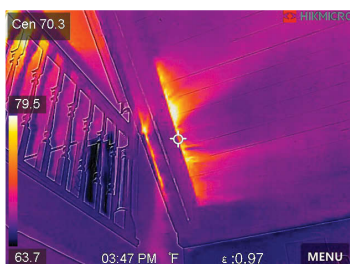
REAR DISPLAY: 3½-in. LCD touch screen

CONNECTIVITY: Wi-Fi or hot spot

\$600



See the full picture. The compact Hikmicro Pocket 2 highlights differences in temperature across surfaces, giving you clues as to where the performance of your building might be suffering.



camera had a resolution of 60x60, and the Pocket 2 is one-third the price.

Other features of the Pocket Series include four selectable image modes: thermal, optical (digital photo without thermal), picture-in-picture, and "fusion," which blends the optical and thermal pictures to show greater detail. The camera will also record video and live stream to a phone or tablet.

I have two small complaints with the camera, and the first is the short touchscreen lag that occurs between the time I touch an icon on the screen and the time it registers in the software. The second is the

manufacturer's listed battery life, which is up to four hours of continuous run time. On large building diagnostic projects or multiple projects during the same day, I have had my other cameras operating for longer. So far there hasn't been a problem, but it may be a good idea to carry a portable charging station.

There's a learning curve to using any thermal-imaging camera; understanding what the picture is telling you takes practice. Several companies offer training, both online and in a classroom, which can help. Many in the construction trades would benefit from owning a thermal imager, and at \$600, the Pocket 2 is valued so more people can afford one.

—Randy Williams is a home energy auditor and contractor in Grand Rapids, Minn.



Better jigsaw coping. A well-known secret among trim carpenters, the Collins Universal Coping Foot lets you use nearly any jigsaw to easily cope all kinds of trim and moldings.

Quicker coped moldings

There is no substitute for learning and understanding the basics of coping by hand. I teach each employee how to cope, file, and fit moldings with a hand coping saw and files. You must understand how to cope, the internal stresses of wood, how to safely remove material, and what you are doing before wielding a high-rpm reciprocating blade attached to a power tool. But once you grasp the basics, using a coping foot on a jigsaw can make the delicate task easier.

Roughly 10 years ago I purchased a Collins Coping Foot, which is a dome-shaped, somewhat conical metal base that replaces the flat base on a jigsaw. The unique shape of the base and blade support (which almost “hugs” the blade) allows you to twist, turn, and angle the saw in any

direction without binding or deflecting. It essentially turns your jigsaw into a handheld scroll saw (though less delicate and accurate) that can cut complex shapes and compound angles.

While I typically use the attachment for coping moldings, it can also be used to remove the bulk of material for a tricky scribe or relief cut that would be hard to access with a larger power tool. I prefer to have a dedicated saw set up with the coping foot, but it is relatively easy to install and remove. The Collins Coping Foot makes fast, efficient, effortless work out of coping moldings and is just \$35; for that amount of money and time savings, it is tough to beat.

—Tyler Grace is owner of TRG Home Concepts in Haddon Heights, N.J.

A universal fit. Shims provide clearance between the inside dome of the Coping Foot and the guide or roller on your saw. The kit includes a variety of shims plus hardware to fit most jigsaws.



Collins Coping Foot
\$35

Standout stapler

I remember seeing Milwaukee's 12-volt cordless stapler at the home center a few years back and wondering who would buy one. When I found myself with my head in between my basement floor joists, stapling about 800 sq. ft. of aluminum heat-transfer plates under the dense solid-board subfloor, the reason for such a tool became perfectly clear: power and portability. The stapler is slightly larger than a typical handheld stapler, and weighs about 3½ lb. with a battery, which means it's light enough to use above your head all day and fits just about anywhere you'd want it to, including comfortably on your tool belt.

The tool takes ¼-in. to ⅝-in. T50 staples; one pull of the trigger fires one staple, or, if you hold down the trigger, it'll fire a staple every time you depress the foot—not quite as responsive as a pneumatic stapler in bump-fire mode, but still very convenient. It has plenty of power to drive ½-in. staples through aluminum and into old dense wood, and the fact that you're not dragging around a hose is a bonus. The controls are intuitive, and include the ability to dial in how deep the staples are set (try doing that with a manual stapler). If you're doing any kind of repetitive stapling with T50 staples, it's a worthy investment.

—Andrew Zoellner is former editorial director at Fine Homebuilding.



Milwaukee M12
crown stapler
\$130

No cord required. The Milwaukee M12 ¾-in. crown stapler isn't much larger than a standard stapler and fires up to 1500 staples on a 1.5-Ah battery.

Essential Clamps for Woodworking

The gear you need to tackle any glue-up in the shop

BY ASA CHRISTIANA

There's a dizzying array of clamps in the marketplace, each promising to earn its place in your shop. But experienced woodworkers and cabinet-makers rely on just a handful of types. That's good news for buyers because good clamps aren't cheap.

The way to identify the most helpful clamps is to consider the most common clamping tasks. I'll do that here as I assemble an essential collection for most woodworkers.

I'll also highlight specific brands and models in each category—based on past tests and articles in *Fine Woodworking*, as well as user ratings and my own experience—and suggest how many of each type and size I think most hobbyists will need.

There's at least one type of clamp that pros love but hobbyists probably don't need—the heavy, powerful I-beam. While these are great for cranking out solid-wood panel glue-ups, day after day, the rest of us can team up pipe and bar clamps to get the job done, without a back-breaking pile of I-beam clamps to handle and store.

Here are the essential categories, with specific recommendations in each. It's a great collection to assemble over time. If you're toward the beginning of your woodworking journey, start with four to eight standard F-style bar clamps and four sets of pipe clamps. Those take care of almost every clamping task for now, and you can add specialists as you need them.

Asa Christiana is a woodworker in Portland, Ore.



F-style bar clamps are the workshop workhorse

Most clamping jobs are relatively small. These include clamping things to your workbench, clamping stop blocks onto fences or sleds, attaching fences and fixtures to machines, and a wide variety of small project and jig assemblies, held together with glue, screws, or both.

For the vast majority of those jobs, a 12-in. to 24-in. F-style bar clamp is the perfect tool. Among the more affordable clamps, these offer excellent power and control.

Even if you use clamping cauls to spread out the pressure, you'll need lots of F-type clamps on some jobs. Those include laminating parts together, face to face, and bending parts over forms. Then there are those small glue-ups that happen in bunches, meaning the more clamps you own, the more assemblies you can knock out without waiting.

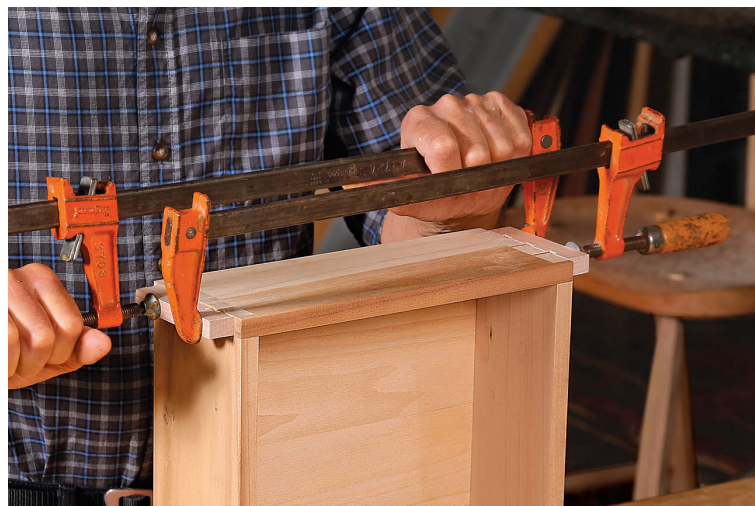
The standard type of F-clamp, with screw adjustment, offers the best value, but you'll also want a quick-action type.



STANDARD F-STYLE CLAMPS

These are the clamps woodworkers reach for most. Avoid light-duty models, as their bars will bend under pressure, tilting their fixed heads, but don't throw away the F-style clamps you already own. If you are buying new, look for models with large, rubberized handles, a great upgrade that lets you apply 600-plus lb. of force without hurting your hands. Both Bessey and Jorgensen make great medium-duty F-style clamps, both highly rated and reviewed online. I'm giving the edge to Jorgensen on price. These have stiff bars, ergonomic handles, smooth-turning screws, and clutch plates that won't slip on the bar. If you're a pro, go for the heavy-duty models of these clamps. Everyone else will be fine with medium-duty. Click around for deals on sets of four.

Start with: At least two at 8 or 12 in. and two at 24 in.
Est. price for set: \$70



FAST-ACTION F-CLAMPS

Supplement your standard F-style clamps with a few of these cam-action models. They're a bit pricier than their basic cousins, but they make up for it with fast action. The adjustable jaw slides quickly on the bar, and then tightens or loosens in less than a second with a satisfying ratcheting action, making this the clamp I reach for most often in my shop. I'm happy with my Bessey KliiKlamp models, but they are edged out on price and performance by the Jorgensen Gear Clamp. Users report that the "Gear Clamp" doesn't tend to shift workpieces as much as some of its competitors do, and its robust components are capable of a hefty 340 lb. of pressure, according to Tom Begnal, who reviewed these for *Fine Woodworking*. Grab four of these to supplement the standard F-clamps.

Start with: two at 4 in. and two at 12 in.
Est. price for set: \$75





Long-reach clamps for large assemblies

A lot of panel, furniture, and cabinet glue-ups are too big for F-style clamps. Panel glue-ups also need more pressure than small bar clamps can provide. This is where a variety of longer, stronger clamps are indispensable.

The best buy here is the humble, hard-working pipe clamp, but there are two strong bar clamps that are also extremely helpful. The first is the parallel-jaw clamp, which features large pads and square clamping action. The other is the light, strong aluminum bar clamp.

Just as you can with F-style clamps, you can team up these types on the same job, meaning you won't need as many of each.

PIPE CLAMPS

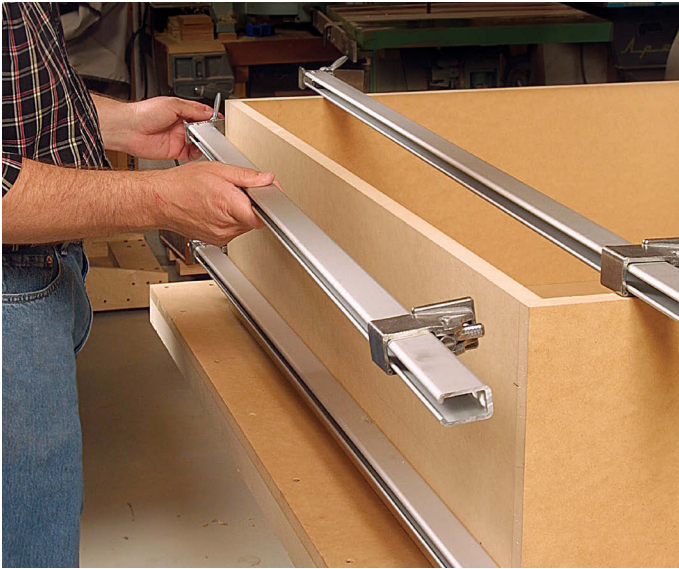
These simple yet effective fixtures fit onto standard steel plumbing pipe to create clamps of almost any length. The pipe has threaded ends, and the fixed part of the clamp fixture goes on one of them. The other end slides onto the pipe in any position, locking itself in place with small clutch plates, just like those on F-type clamps.

There are clamp fixtures made to fit both $\frac{1}{2}$ -in. and $\frac{3}{4}$ -in.-dia. pipe, but stick with the larger pipe, which will flex much less under pressure. I recommend buying the pipe in 4-ft. lengths, and using threaded couplers to double its length to 8 ft. when needed.

These fixtures, and the pipe they fit on, are relatively cheap considering how strong and long they can be, so buy at least four, with some extra lengths of pipe so you can expand your reach when necessary. The latest and greatest pipe clamps have taller, wider feet, so the clamps don't topple over on your workbench or work table, and the clamp handle spins freely. There are a number of models like this, but the most highly rated and best reviewed is Rockler's Sure-Foot Plus.

Start with: Four clamp sets
Est. price for set: \$80





ALUMINUM BAR CLAMPS

Often overlooked among the slew of new entries to the clamping market, aluminum bar clamps are a tried-and-true winner. Their box-shaped bars are surprisingly rigid, with notches that prevent the adjustable jaw from slipping. While pipe clamps and parallel jaws tend to weigh down assemblies, with the potential to pull them out of square, aluminum bar clamps pull just as hard while adding a fraction of the weight. Handling and storage are easier too. We recommend Dubuque Clamp Works Universal Bar Clamps. The only aluminum bar clamps still made in the United States, these strong, stiff, smooth-operating clamps are as close to perfect as it gets, beating out “new and improved” versions year after year. Robust construction, acme threads, and large wing knobs make them stand out from the crowd.

Start with: two at 48 in. long and two at 60 in. long
Est. price for set: \$175



PARALLEL-JAW CLAMPS

This relative newcomer to the clamping world made a big splash two decades ago, with large flat jaws and perfectly parallel clamping action that allow these unique models to do the job of two or more other clamps, keeping assemblies square in the process.

Early problems included smallish wood handles that made it difficult to apply enough pressure, herky-jerky sliding action on the toothed bars, and somewhat fragile plastic jaws. Those issues have all been addressed in the best new models, leaving you with nothing but the benefits of these unique clamps.

All that said, these are the priciest clamps on the market, so go with just four to start. Our pick is the Bessey K-Body REVOLUTION. Earning top marks in user ratings and editorial reviews, these newer Besseys have large, rubber handles that are not only ergonomic but also let you insert a 6mm hex wrench in the end, for additional torque. Sliding spacers on the bars keep workpieces parallel, and leave room for glue squeeze-out, so it doesn't inhibit future sliding action. A sliding end clip keeps the clamp level on the bench.

Start with: two at 24 in. long
and two at 40 to 50 in. long
Est. price for set: \$200



Essential oddballs

Standard bar and pipe clamps are workhorses for woodworking assemblies, but there are a few other indispensable types, for assembly, tool setups, and the wide range of other clamping tasks that crop up. You won't need more than two of most of these. Buy them as you need them and you won't be sorry.

CARPENTER'S HAND SCREWS

Made and used for centuries, modern versions of this classic woodworking clamp are indispensable. I reach for these most often for their deep throats and long reach, but I also love how the large maple jaws can be angled to apply pinpoint pressure, or uniform force over a big area, without marring what they are holding. With an endless variety of uses, they are a must in any woodshop. Their square jaws can be clamped to a bench or table and used as a low-profile vise, they can be used on their own as a work stop, and their wood jaws can be cut and grooved to hold round objects. We like the clamps from Dubuque Clamp Works. Their oiled maple jaws and smooth operation set them apart. There are larger and smaller sizes, but I think the 10-in. version (with a 5-in.-deep throat) offers the best combination of capacity, cost, and compactness.

Start with: two at 10 in. long
Price for pair: \$58



TRIGGER CLAMPS

Sold as the ultimate clamp, these lack the power and control needed for woodworking glue-ups, which is why I moved them to the oddball pile. But their unique one-handed operation is great when you need the other hand to hold something in place. I use these mostly for clamping things onto my bench, and setting the occasional stop block. We recommend Jorgensen EZ Hold, medium-duty clamps. Although these are a bit pricier than the competition, their deep reach, stiff jaws, large handles, and smooth adjustments set these clamps apart from the competition.

Start with: two, 6 in. long
Price for pair: \$30



DOVETAIL-SHAPED F-CLAMPS

This is another variation on the F-style bar clamp that I find indispensable for a few specific tasks. The fixed metal end fits into a dovetail-shaped slot that you rout into a fence or template, for example. Because the tip of the clamp is buried in the wood, it won't get in the way like other clamp jaws do. I use mine most for attaching an auxiliary fence to my table saw rip fence and attaching templates for table routing, but they work great on a variety of jigs and fixtures. I like the MicroJig MatchFit Dovetail Clamps. Once you have a pair of these specialized hold-downs, you'll find yourself routing dovetail slots in all sorts of jigs, templates, and fences. They are strong, smooth operators, compatible with any 1/2-in., 14° dovetail bit.

Start with: two, one size
Price for set: \$45



BAND CLAMPS

A "band" (or "strap") clamp is a miter specialist, able to draw together four sides of a box or frame while aligning their joints perfectly at the same time. There are lots of other products sold for clamping miters, but I still reach for a band clamp every time. The Bessey Variable-Angle 2K is a good choice.

Start with: 1
Price: \$28



C-CLAMPS

Although the old-timey C-clamp might be boring at this point, no other clamp offers as much power in such a compact size, at such a low price. These are especially good for clamping fences and stop blocks in place without getting in the way. I don't have a brand and model recommendation here because those don't really matter with C-clamps, as long as the body seems sturdy and the screw turns smoothly. Harbor Freight is a good source. Buy a few in a couple different sizes, clamp them onto the edge of a shelf, and grab 'em when you need 'em.

Start with: two 1-in. and two 2-in. clamps
Price for set: \$10

Anchor Your Work to the Wall

Choosing the right fasteners for drywall, plaster, and masonry

BY MARIO RODRIGUEZ



You've finished building your cabinet, mirror, picture frame, or shelf. Now you just need to hang it. If you can hit studs with every screw, you're in good shape. But if not, you'll need wall anchors, those little devices you set into the wall to receive screws or bolts. There's a plethora of anchors out there. Which type is best in your case? That will depend on the size and weight of the piece you're hanging and the composition of the wall you're hanging it on. I've gathered a wide range of anchors, and I'll describe how they work, what situations and wall types they're suited for, and how to install them.

One note before you get to the point of selecting anchors: Be sure to build in some means to easily install or hang your piece. For a cabinet that will carry a lot of weight or see heavy use, you might consider using a thicker back panel, or you could incorporate an inset top rail to keep the piece square and to better support your fasteners. Using a French cleat (as shown on this page) adds some time to your build but provides solid attachment, makes the cabinet easily removable, and keeps you from having to drive screws through the cabinet from inside. If you're hanging a stock cabinet (obtained from a box store or cabinet wholesaler), inspect its construction and, if need be, add any cleats, rails, or corner blocks that will strengthen the piece and ensure an easier installation.

Mario Rodriguez makes furniture and teaches woodworking in Philadelphia.



SOMETIMES JUST A SCREW WILL DO



For some light-duty applications, like smaller picture frames or a light display shelf, you can actually use coarse-threaded screws designed to be driven into drywall without an anchor or a pilot hole. They're rated to hold as much weight as plastic sleeve anchors, and they

have the advantage of leaving a relatively small hole when you extract them. Lee Valley sells Wall Dog Screws (1), which have very nice bite in drywall and are rated at 60 lb.; they can also be used in masonry (or wood) if you drill a pilot hole. Bear Claw Screws (2), also available from Lee Valley, have a flange below the head, making them well-suited for frames or light mirrors that you are hanging with picture wire. They're rated at 30 lb. in drywall.

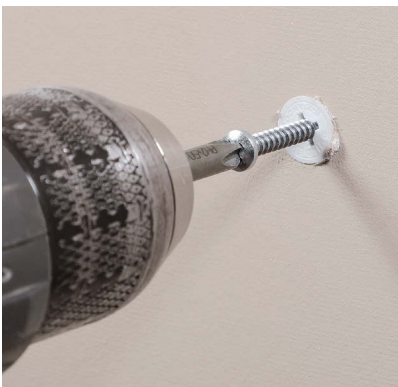


SELF-DRILLING ANCHORS

You drive these clever anchors into drywall with a screwdriver, no predrilling required. I like their speed and ease of use. Their coarse threads really bite into the wallboard, but they are easily removed and leave little damage. Some have a solid shank so that after a screw is driven into them they simply expand somewhat; others are scored along the shank so the tip splits open behind the drywall for greater holding power.



The EZ Ancor Drywall Anchor (1), rated for 50 lb., has a solid shank that expands as the screw is driven; Toggler Self-Drilling Drywall Anchors (2), rated for 65 lb., scissor open when the screw is driven; EZ Ancor zinc drywall anchors (3), rated for 50 lb., can self-drill even if you happen to hit wood behind the drywall; EZ Ancor Drywall and Stud Anchors (4), rated for 50 lb., have a coarsely threaded shank for drywall and a finely threaded tip that enables it to grip a stud behind the drywall.



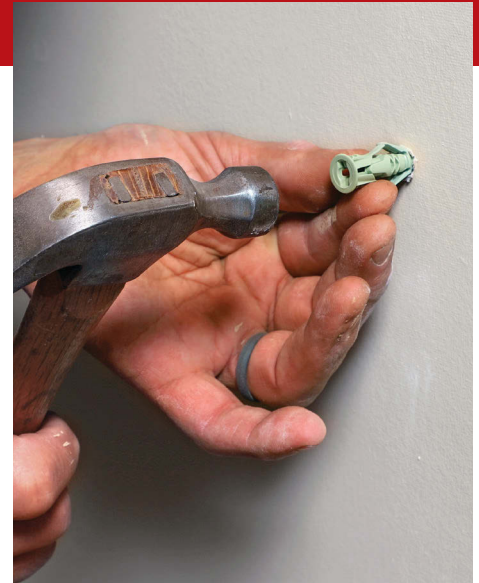
Expanding anchors

PLASTIC SLEEVE ANCHORS

These anchors are suitable for light-duty tasks like hanging pictures, curtain rods, small shelves, towel rods, and paper holders. You predrill for them, and they work in plaster-and-lath walls and masonry as well as in drywall. Some merely expand when the screw is driven in; others, like the Cobra Triple Grip, have wings that will flip out behind the drywall. Some of the smaller ones require only a small predrilled hole and therefore very little repair when they're removed. Removing the ones with wings can be a chore, and sometimes I just drive them farther into the wall and spackle over the hole.



The Cobra Triple Grip (1), intended for all wall types, is rated for 46–61 lb. in drywall, 200–225 lb. in masonry; Everbilt Ribbed Plastic Anchors (2 and 3), which come in kits of assorted sizes, are rated for 20–25 lb. in drywall, 155–435 lb. in concrete; Duo Power plastic anchors (4) elbow open and are rated for 45 lb.

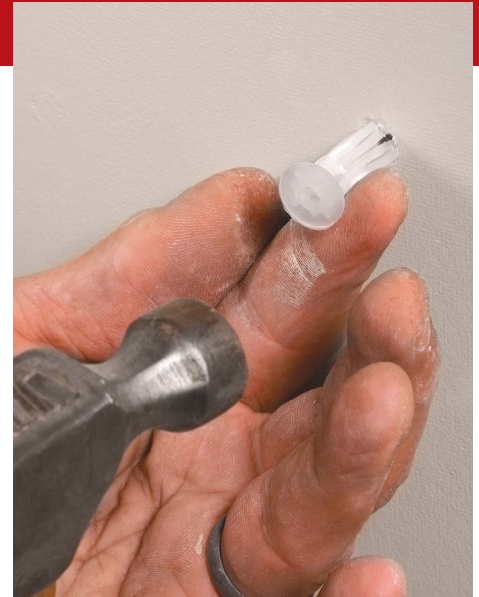
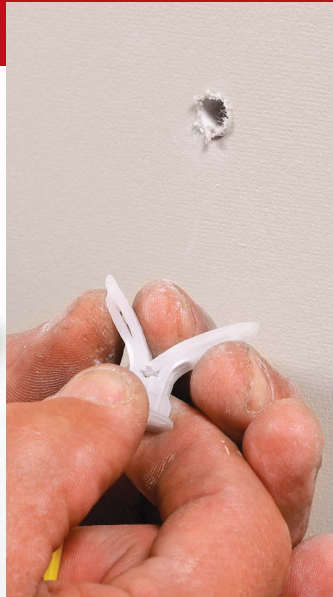


MOLLY BOLTS



Molly bolts have a slotted sleeve that will spread open behind a hollow wall when you tighten the machine-threaded screw, creating powerful purchase. They work best with drywall but can also be used in a plaster-and-lath wall. After you predrill and insert the anchor, tapping the sleeve's flange tight to the wall, you begin driving the screw. Small spurs beneath the flange prevent the anchor from spinning in the hole before the sleeve expands. These Midwest Hollow Wall Anchors are rated for 100 lb.

BUTTERFLY ANCHORS



Butterfly anchors have wings that spread open behind a sheetrock wall. They come in different sizes to suit drywall of various thicknesses. The standard type, like the Hillman Pop Toggle (1), is only suitable with drywall. It requires a large predrilled hole and won't hold well if the wings don't deploy behind the wall. But the Toggler Alligator Concrete and Drywall Anchor (2), while it has wings that will open behind drywall, has a slimmer shank that will expand or scissor open in a predrilled hole, making it suitable for use in masonry walls as well. They are rated for 70 lb. in drywall and 675 lb. in concrete.



Setting tool for molly bolts. The old-style molly has a newfangled partner. Slip the bolt into the gun's tip and the anchor into the clearance hole. Pull the trigger and the anchor's legs expand, locking it tight. Very handy for setting a lot of mollies.



Squeeze the wings and hammer the anchor home. After predrilling, fold the anchor's wings together and push it into the hole, then tap it home with a hammer until the flange is flush with the wall surface. With the anchor in place, use the supplied plastic pusher to pop open the wings. Then drive the screw.

Toggle anchors

TOGGLE BOLTS

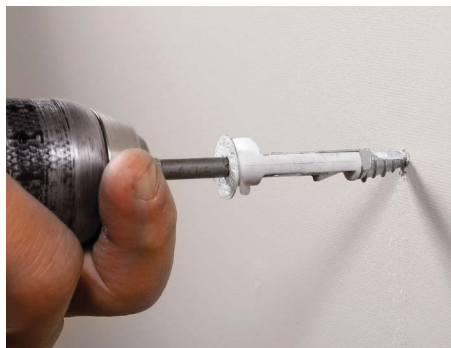


When I need to secure larger cabinets or other wooden pieces to a drywall or plaster wall and there is no stud accessible, **toggle bolts** are the anchors I most often turn to. Composed of a bolt and a threaded, spring-loaded toggle, they're simple and dependable. They need a hollow space behind the wall, so they won't work in brick, but they do fine with concrete block. Their long screws make them very adjustable, so they're great for plaster-and-lath walls where wall thickness can be inconsistent and hard to determine, often varying significantly on the same wall.

After you've drilled through the wall, the inserted toggle must clear the wall material far enough to spring open; they won't work otherwise, so make sure to use a long enough screw to get the toggle clear of the wall. Properly installed, these anchors have a very positive feel. Once the screws are tightened, there is little doubt that the cabinet they are holding is secure and strong. The Everbilt toggle bolt above is rated for 95 lb. in drywall, 90 lb. in hollow block.



SELF-DRILLING TOGGLE



The Cobra Driller Toggle is a very clever hybrid anchor, marrying self-drilling capability with toggle action. The metal toggle, which is hinged to a split plastic shaft, is threaded at the tip. Using a screwdriver, you drive this anchor in without predrilling; when the head nears the wall, two short wings on the plastic shaft pull it flush to the surface. Next you insert the machine screw. As you do, the screw pushes the toggle sideways until the threads on the screw engage the threads on the toggle. Then you tighten the screw until the toggle is firmly drawn to the back of the drywall. This anchor is rated for 100 lb. in drywall.

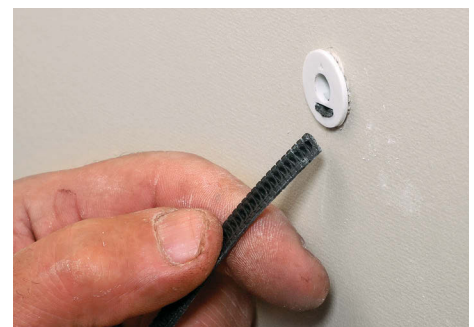
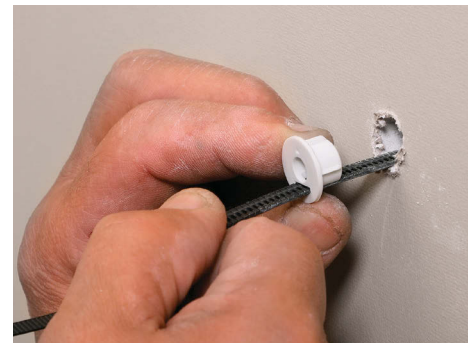


PULL TOGGLES

These are a new breed of toggle anchors that link a metal toggle with one or two ribbed plastic pull strips. After drilling a hole in a hollow wall, you insert the toggle and push it all the way through until it clears the hole. Next you pull on the strips until the toggle is crosswise and tight to the inside of the wall. Then, to keep the toggle in place, you slide a threaded plastic nut along the pull strip until it plugs into the hole you drilled. With the strips pulled tight, you bend them back and forth until they snap off flush with the nut. Now you can insert the machine screw; as the screw is tightened the toggle is pulled ever more firmly to the inside of the wall. These toggles will work with any hollow wall, from drywall and plaster to cinderblock.

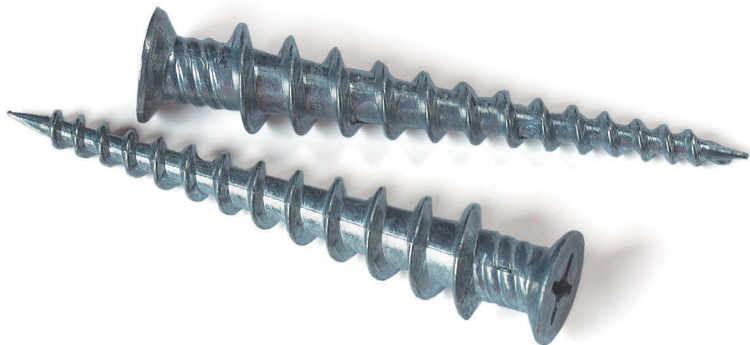


The Hillman Pull Toggle (1), with a spiked, solid metal toggle and a single pull strip, is rated for 120 lb. in drywall and 620 lb. in concrete block; the Cobra Flip Toggle (2), with a formed sheet metal toggle, is rated for 105 lb. in drywall and 435 lb. in block; the Toggler Snaptoggle (3) has two pull strips, both hinged to the toggle, and once you have inserted it you can use the strips to swivel the toggle so it is parallel to the back of the wall; it is rated 240 lb. in drywall and 800 lb. in concrete block.



Beyond drywall

SCREWS FOR METAL STUDS



Attaching woodwork to a sheetrock wall that has metal studs is not much different than doing so on a wall with wood studs. Any of the drywall anchors mentioned here will work between the studs. And if the stud is in the right place, you can drive a long, heavy screw directly into it. But if you want to create a particularly strong anchor point right on the steel studs themselves, you could try 1Shot steel stud anchors, which are rated for 300 lb. when driven into a steel stud. You can use them like a giant screw to attach a workpiece to the wall, or you can use them like an anchor, driving them flush to the drywall and hanging the workpiece using a #8 screw driven into the hollow shank of the 1Shot.



SCREWS FOR MASONRY



Tapcon screws, or blue screws, have become a dependable favorite of mine for installing woodwork on a concrete or masonry wall. They let you skip masonry anchors and the big holes they require. These screws need only a small pilot hole (made with a masonry bit and a hammer drill) before being driven into place. With their unique double-threading, they possess the ability to tap their own threads in concrete or brick, so they hold fast. I live in an old house that still has brick behind plaster-on-lath party walls. In the correct length, Tapcon screws allow me to go right past the plaster and lath and into solid brick. I've never had a blue screw strip or had its head snap off.

You can buy Buildex Tapcon Concrete Anchors in star drive or Phillips-head versions and they're available as a kit that comes with the correctly sized masonry bit.

EXPANDING MASONRY ANCHORS

Red Head Sleeve Anchors (1) have a threaded bolt in a metal sleeve. One end of the bolt is flared, so that when a nut is tightened on the other end the wedge expands the sleeve, locking it in the hole. Wedge anchors require a hole drilled slightly deeper than the length of the anchor. After you drill the hole with a masonry bit and hammer drill, be sure to vacuum out the brick or cinder dust. Then slide the anchor into the hole. Once it's seated, the threaded portion of the anchor, extending from the wall, receives a washer and nut to secure the woodwork to the wall. They're a little unsightly, but very strong. Once the anchor is fixed into the masonry, the woodwork can be easily attached, adjusted, or removed without compromising the seated anchor.



When you want to attach with screws or lag screws, use lead sleeve anchors. These old-style Everbilt soft lead lag sleeves (2) are studded with projections and built in two loosely connected halves, allowing them to expand and shift in shape to conform to a predrilled hole when the screw is driven home.



Drawer Slides

The best slides offer smooth action and easy installation

BY BEN SCOTT

With over 21 years making custom cabinets, I use only undermount soft-close slides. But not every budget has room for the most-expensive slides available, so in this look at drawer slides, I included lower-cost options. The two low-cost options are a bit more finicky to install because they lack built-in up/down and tilt adjustments, but they are very reliable when installed with care. The more expensive slides have built-in adjustments and ultrasmooth operation. And

they mount on the drawer bottom instead of the sides, so they're hidden from view when the drawer is open.

One of the keys to drawers that operate smoothly is getting the slides installed on the cabinet box at the same height and square to the front of the case on both sides. Drawer boxes must also be made the correct size.

We use an adjustable Blum jig to drill the holes for the slides at the needed height; it is costly, but it saves a lot of time. You can

also lay out the slide mounting holes on a plywood or MDF template and use it to drill the holes in the cabinet sides before attaching the slides. The slide dimensions here fit a 24-in.-deep cabinet, and the prices include a pair of slides and the locking devices for the drawer box. The Grass prices include the rear drawer-box mounting brackets as well.

Ben Scott is cabinetmaker in Maple Ridge, B.C., Canada.

HEAVY DUTY

ACCURIDE 4034 SIDE MOUNT

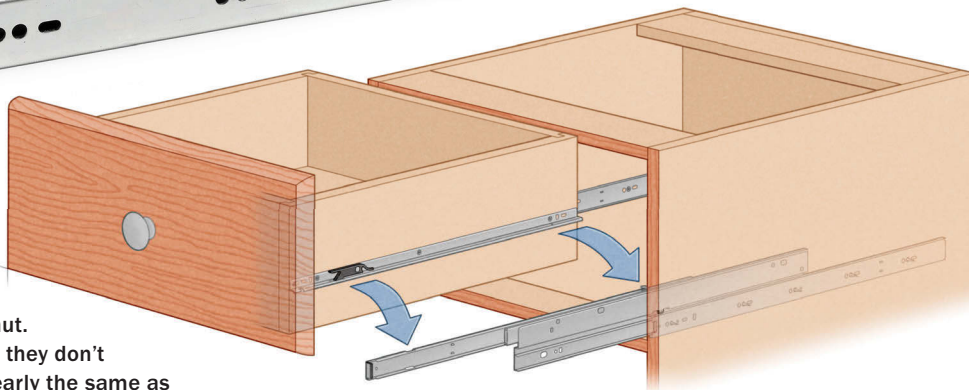
Model no. C403422D Length 22 in.
Load rating 150 lb. Price \$35 per pair



These are standard slides for commercial projects. They operate well, are fairly smooth-running, and have a good load capacity. This model is not self- or soft-close—you have to push the slides closed and a detent holds them shut.

There are soft-close models, but in my experience, they don't operate very well, and the added cost comes to nearly the same as heavy-duty undermount slides. Drawer boxes can be made with a plant-on bottom or a grooved-in bottom, but because the slides mount to the sides of the drawer box, a plant-on bottom can pull off if it isn't well-attached.

Side clearance is $1\frac{1}{16}$ in. smaller than the opening. We typically use veneer-core plywood for our drawer boxes, with a $\frac{3}{4}$ -in. front and back and $\frac{1}{2}$ -in. sides, doweled together. The $\frac{1}{2}$ -in. material is usually $\frac{1}{32}$ in.



undersize, so we cut the front and back of the drawer box 2 in. smaller than the inside of the cabinet. The undersize $\frac{1}{2}$ -in. material provides the additional $\frac{1}{16}$ -in. clearance needed. The slides must be straight on the cabinet and the drawer for proper operation. The downsides are a lack of adjustments and side-to-side racking on wide drawers.

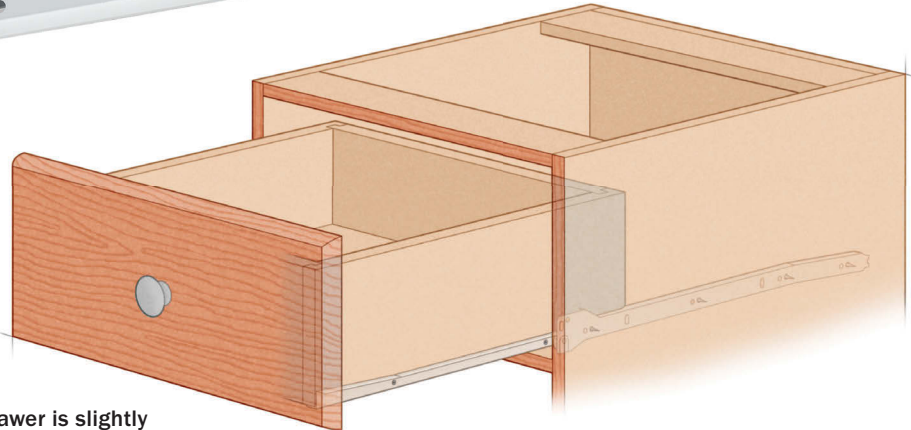
NO FRILLS

BLUM 230M SIDE MOUNT

Model no. 230M5500 Length 22 in.
Load rating 55 lb.
Price \$8.50



These are the lowest-price standard drawer slides. They work well and are self-closing—when the drawer is almost closed they ramp into the closed position. They are easy to install on the drawer box by either screwing to the underside or to the outside. The slides wrap under the drawer so you can use a plant-on bottom without risking the drawer bottom pulling off. Drawer boxes are 1 in. narrower than the drawer opening.



These are reliable low-cost slides. I like that if the drawer is slightly smaller, the slides will still work, because one side of the slide hooks the nylon wheel to keep it tracking correctly, and the other, straight side accommodates up to $\frac{1}{8}$ -in. undersizing. These slides aren't as smooth-running and are a little louder than more-expensive options. The weight capacity is the lowest of the bunch, and there is no soft-close option. And with only three-quarter extension, there's limited access to the back of the drawer.

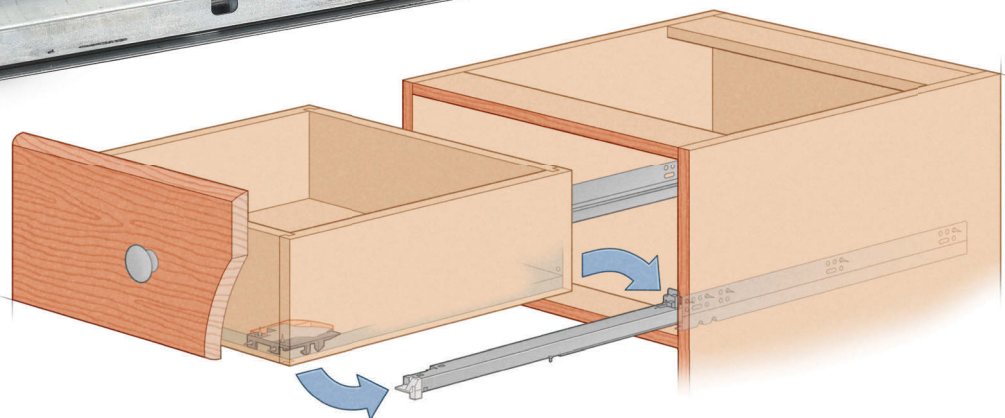
AFFORDABLE UNDERMOUNT

BLUM TANDEM

Model no. 563F5330B Length 21 in.
Load rating 100 lb.
Price \$30



Standard locking device



These were the first widely available undermount drawer slides I used. They're smooth-running, they mount under the drawer box, and they're hidden by the drawer sides when the drawer is open. The first version didn't have soft-close, and then the feature was an add-on; now, all Tandem slides have soft-close built in. These were the first slides that I used with up/down and tilt adjustments to the drawer faces. Clips hold the drawer box to the slide at the front, and a 6-mm hole drilled into the back of the drawer holds the back of the drawer box and provides the tilt adjustment. The drawer bottom must be above the bottoms of the drawer sides for attachment and to ensure the slides are hidden from view.

All undermount slides from Blum and Grass use the same sizing. The drawer-box front and back are 42 mm smaller than the inside measurement of the cabinet. The drawer-box sides can be any thickness up to $\frac{5}{8}$ in. (16 mm). The depth of the drawer is determined by the slide length, sold in 50-mm increments. The drawer is always 10 mm shorter than the slide length. For example, a 550-mm slide holds a 540-mm drawer.

The drawbacks are no side-to-side adjustment, and the hole in the back of the drawer is hard to locate. It typically lands where the drawer bottom and the back of the drawer box meet. We use the manufacturers' jigs to drill these holes, but the location isn't ideal.

EXCELLENT ADJUSTABILITY

GRASS DYNAPRO 16

Model no. F130100728204 Length 21 in.
Load rating 100 lb.
Price \$35



These slides (and the Tipmatic version below) are really the only slides we use now. They are smooth-running, come in a heavy-duty version for additional weight capacity, and seem to have less side-to-side racking than all the other slides I've used, which is great for wide drawers. Up/down, side-to-side, and tilt adjustments are built into the front mounting clips, and there's an add-on for in/out adjustment.

Sizing is the same as the Blum; the inside width of the drawer is 42 mm smaller than the inside width of the cabinet. The depth is the same as Blum too: 10 mm less than the length of the slide.

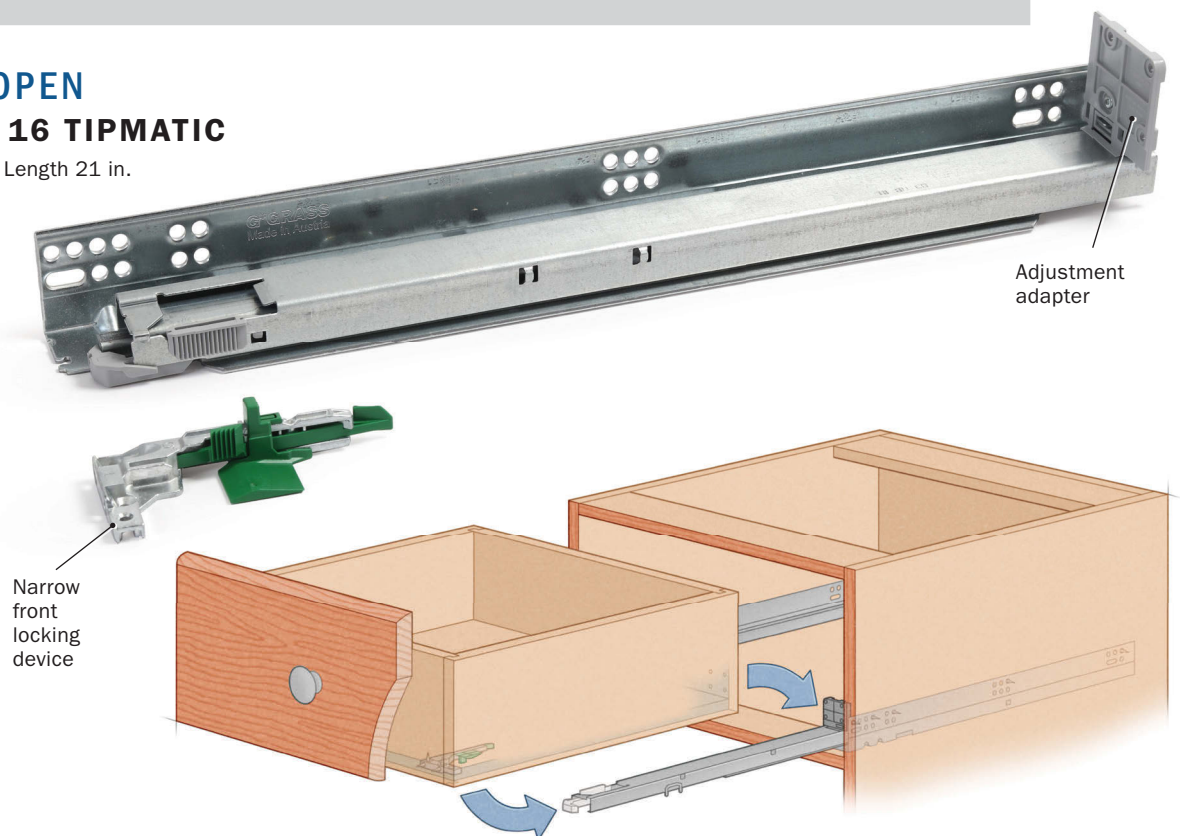
The big plus of these slides is the back-of-drawer mounting bracket, called an "adjustment adaptor," that's screwed to the drawer box and accepts the hook for the tilt adjustment. It is easy to locate the holes for the mounting screws with a shopmade or manufacturer's jig. The setup creates a positive connection at the back of the drawer and makes the tilt adjustment easy to access and operate.

BEST PUSH-TO-OPEN

GRASS DYNAPRO 16 TIPMATIC

Model no. F130116434204 Length 21 in.
Load rating 100 lb.
Price \$75

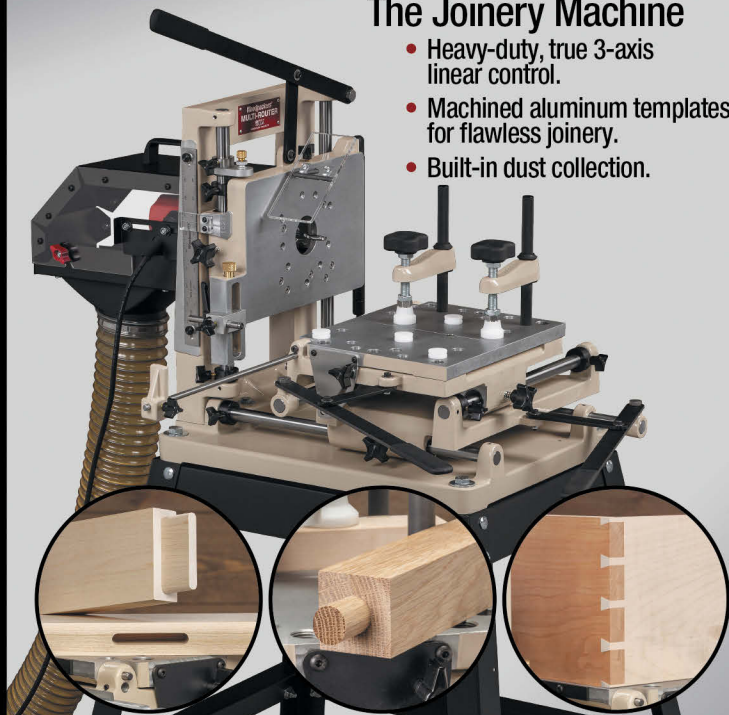
These are Grass's top-shelf slides. They have up/down, side to side, and tilt adjustments as do the standard Dynapro, but these slides also include a push-to-open feature that is built into the slides. The push-to-open has three settings so you can adjust them for each drawer weight.



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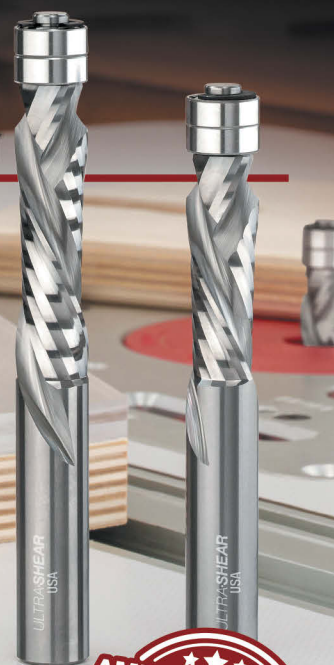


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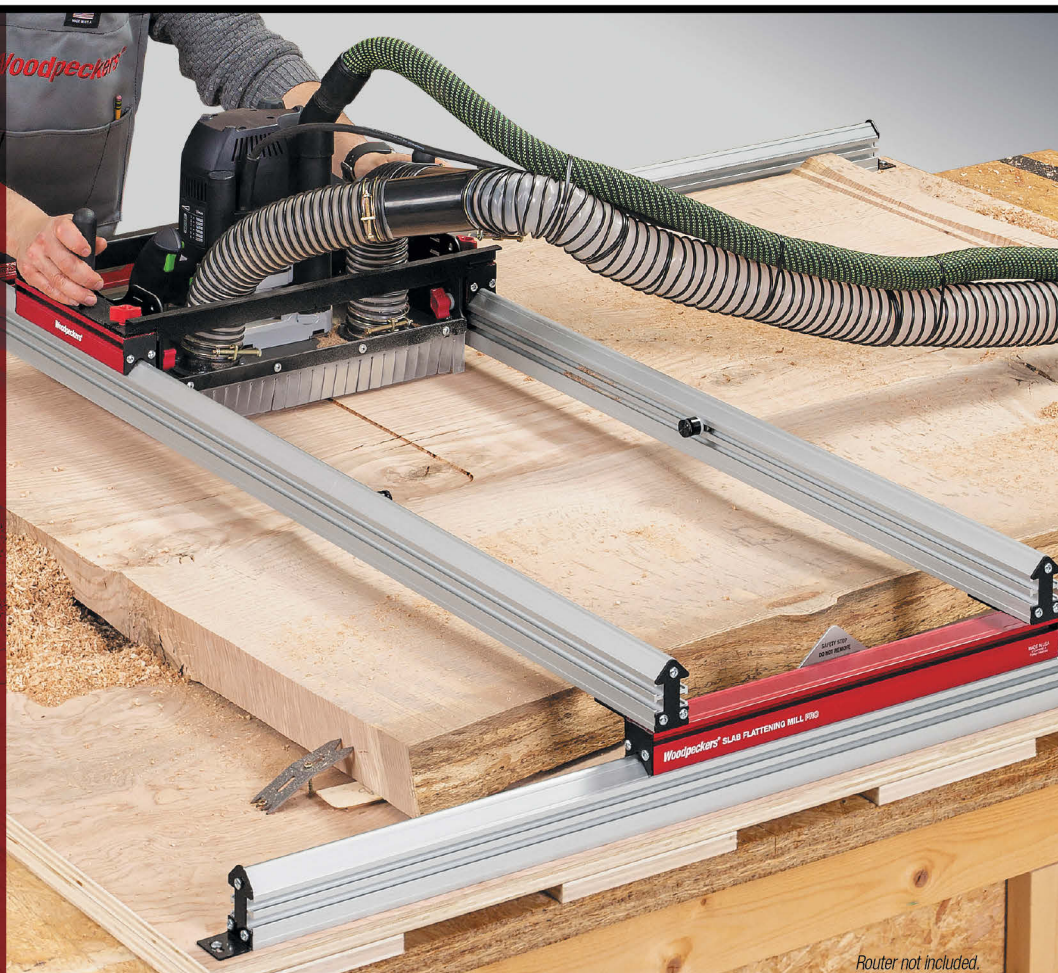


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Router not included.



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