Choosing a Belt Sander

Look for variable speed, a powerful motor and, above all, comfort

by Sven Hanson

I used to work with a craftsman who had been trained by the cabinetmaker James Krenov. He scoffed at my belt sander, good-naturedly dismissing the machine as a rank amateur's cheating version of a handplane. Then he bought some beautiful walnut planks encrusted with mud and who knows what else from the barnyard where they had dried. He realized that any blade he used on the planks would be ruined by the gritty mud or an unseen nail. I told him it was time to try a belt sander, and I loaned him one of mine. The next day, he bought his own.

Bosch 7350

Avg. discount price: $170
Motor axis: In-line
Weight: 7.1 lbs.
Amps: 5.0
Belt speed: 550-1,100 surface feet per minute (sfpm)
Platen size & construction: 3 in. by 6 in., steel/cork
Ease of belt installation: Very good, easy-to-grasp lever
Tracking adjustment: Very good
Noise level: 100 dB
Accessories: Frame, stand, fence

Comments: This sander's low profile, removable front handle and narrow body make it ideal for fitting into tight spaces and sanding right up to obstructions. Easy-to-grasp belt-tension release lever. Variable-speed control in trigger. Longest platen. Solid and quiet.

Photos except where noted: Scott Phillips

If a belt sander isn't part of your tool inventory, it should be. They come in all sizes, from detail sanders with belts measuring 1 in. wide by 21 in. in circumference to big worm-drive machines with 4-in. by 24-in. belts. Most pros choose simple, heavy machines that use 4-in. by 24-in. belts. These big belt sanders are ideal for surface preparation and other work on the bench, but they are hard to handle in other situations. For that reason, many woodworkers also have 3-in. by 21-in. belt sanders.

These machines are small and lightweight, so they are easier to use overhead or in narrow workspaces. A 3-in. by 21-in. sander combined with a random-orbit palm sander is a professional tag team for surface preparation. And good-quality belt sanders in this size are available for less than $200.

I looked at seven professional-grade belt sanders and used them in my shop and on the job. The characteristics of each are listed in the summary boxes that appear with this article. I soon discovered that even though the belts had the same measurements, the sanders varied widely in weight, power, shape, ease of operation and balance. Over several months, I learned what mattered and what didn't in belt sander design.

Belt speed and amp rating

There are two things to take into account when considering belt sander power: belt speed and amp rating. The more amps a motor draws, the more work it can do. For most tools, having a powerful motor is essential. Some tools, like drills, need power to turn under a heavy load. That's not the case with belt sanders, because good sanding technique calls for a light touch. With belt sanders, the speed the belt turns (measured in surface feet per minute, or sfpm) is a more accurate indicator of the machine's efficiency than the amp rating of the motor alone. The faster the belt turns,

DeWalt 431

Avg. discount price: $185
Motor axis: Transverse
Weight: 7.5 lbs.
Amps: 5.2
Belt speed: 475-1,100 sfpm
Platen size & construction: 3 in. by 5 in., steel/cork
Ease of belt installation: Very good, nice lever
Tracking adjustment: Fair
Noise level: 93 dB
Accessories: Frame, stand, fence

Comments: Innovative European design, with top handle. Wide range of speeds, with control on left side of handle at the back. One of the flattest steel/cork platens and best out-of-the-box sanding. Dust bag removes to expose front roller.

Hitachi SB75

Avg. discount price: $180
Motor axis: Transverse
Weight: 10.8 lbs.
Amps: 8.7
Belt speed: 1,180 sfpm and 1,475 sfpm
Platen size & construction: 4⅜ in. by 4½ in., steel/rubber
Ease of belt installation: Fair, skinny, stiff lever
Tracking adjustment: Fair
Noise level: 94 dB
Accessories: Stand

Comments: Widest, heaviest, fastest and most powerful sander reviewed. Two speeds controlled by slide switch at back. Nice balance. Round dust-collection port is well-located for hose connection. Upgrade to a graphite platen.

Makita 9900B

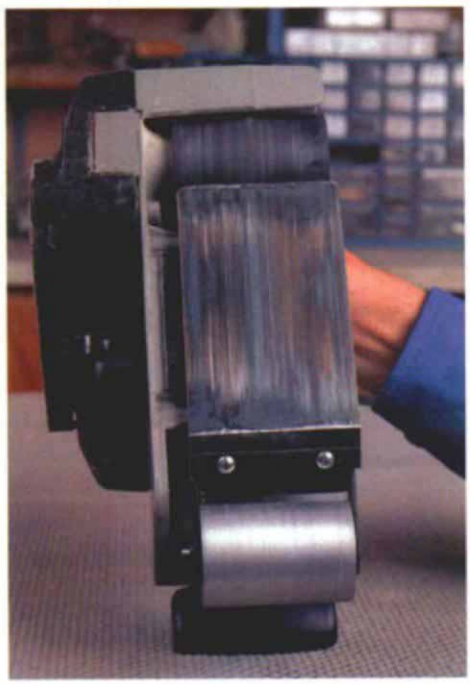
Avg. discount price: $180
Motor axis: Transverse
Weight: 10.1 lbs.
Amps: 7.8
Belt speed: 1,180 sfpm
Platen size & construction: 4 in. by 4¾ in., steel/cork
Ease of belt installation: Thin lever
Tracking adjustment: Good
Noise level: 99 dB
Accessories: Graphite platen

Comments: Classic muscle machine for continuous service. Big bearings where they count and extra-long, 16.5-ft, power cord. The belt-tension release lever flops around while sanding. Needs upgrade to a graphite platen.

Metabo 775

Avg. discount price: $329
Motor axis: Transverse
Weight: 10.7 lbs.
Amps: 5.5
Belt speed: 1,300 sfpm
Platen size & construction: 3 in. by 4¾ in., graphite/aluminum
Ease of belt installation: Excellent twist knob
Tracking adjustment: Good, small knob near back
Noise level: 95 dB
Accessories: Frame

Comments: Single speed limits its versatility, but this sander is a pleasure to use. Large twist knob makes releasing belt tension easy. Vacuum hose adapter inside dust bag. Best off-the-shelf platen. Solid German engineering.



Tuning a wavy platen improves sanding quality. *This platen was hammered and filed flat to improve sanding performance. The leading edge was sharpened, and the platen was honed on sandpaper.*

the more aggressively the machine sands.

For many of the jobs a 3-in. by 21-in. belt sander is called upon to do, comfort, lightness and versatility are more important than raw power. In choosing a sander, I'd narrow down the field to the machines that felt good in my hands and had the features I wanted. Then I would choose the machine with the largest motor. Generally speaking, a more powerful motor will run faster and last longer. But there's a price to pay—more powerful motors are bigger and heavier. For instance, the Hitachi sander draws the highest number of amps of the sanders I surveyed (8.7). It also has the fastest belt speed (1,475 sfpm). And it weighs in at 10.8 lbs., a disadvantage when working on vertical surfaces or overhead.

A flat platen equals a flat surface

The real work of belt sanding takes place on the bottom of the sander, on the pad between the rollers called the platen. It's the most important factor in the quality of the surface the sander produces. A flat platen produces a smooth, flat surface; a warped or uneven platen will sand unevenly.

Bigger platens mean flatter sanding. Most of the platens are about 3 in. wide by 4½ in. long. Bosch has an innovative way of increasing the platen length. An auxiliary shoe extends right up to the front roller.

Most of the sanders I reviewed didn't sand a flat surface when used right out of the box. Their platens were made of thin steel plate over a cork pad, and such platens are rarely flat. These platens have a large sur-

Bottom photo: Aimé Fraser

Porter-Cable 352VS

Avg. discount price: $162
Motor axis: Transverse
Weight: 10.5 lbs.
Amps: 7.0
Belt speed: 850-1,300 sfpm
Platen size & construction: 3 in. by 4¾ in., steel/cork
Ease of belt installation: Tiny stiff lever
Tracking adjustment: Good
Noise level: 102 dB
Accessories: Graphite platen

Comments: Large, heavy sander with good balance. Wide range of speeds, controlled by a dial near the rear handle. Orientation of dust port requires taping the bag or hose in place. All-metal drive train.

Ryobi B321

Avg. discount price: $150
Motor axis: In-line
Weight: 7.9 lbs.
Amps: 6.0
Belt speed: 755-1,148 sfpm
Platen size & construction: 3 in. by 5 in., steel/aluminum
Ease of belt installation: Very good
Tracking adjustment: Very good
Noise level: 95 dB
Accessories: Frame, stand, fence

Comments: A selector dial in the front handle of this machine allows right-handers to change the electronic speed control while sanding. Easily attaches to the accessory sanding frame or stand. Good instruction sheet.

face area in proportion to their thickness and tend to undulate in use.

You can increase sanding performance by tuning the platen—as one of the manufacturers did before sending its sander for review (see the bottom photo on the facing page). If you want to do what they did, check the flatness of the platen with a straightedge. Pay particular attention to the diagonals, and flatten the high spots with a file. The manufacturer also had sharpened the bend at the front of the platen, hammered the platen flat and honed it on 220-grit sandpaper.

The Metabo sander produced the best finish right out of the box because its platen is made of graphite-impregnated cotton over a base of aluminum. This platen is stiff and flat, and it reduces friction to let the belt run faster and cooler.

The powerful and heavy Makita sander had the poorest sanding quality out of the box. As an experiment, I installed the $4 graphite platen Makita sells as an accessory. With that simple change, the sander produced a finish equal to that of the Metabo. It's a must-do upgrade for the Makita, and I recommend it for any sander with a steel/cork platen. The Makita graphite platen readily adapts to fit most sanders, or you can buy a graphite-platen upgrade kit from one of the big mail-order houses.

Choose a sander that feels good in your hands

You'll be forming a partnership with your belt sander. Expect to spend long hours together. The key to good results is finding one that fits comfortably in your hands.

Motor orientation affects balance— The majority of these sanders have transverse motors mounted at 90° to the centerline of the machine, with the center of gravity directly over the platen. Bosch and Ryobi made a radical departure by mounting the motor on the centerline of the sander, with the center of gravity over the rear roller. The two designs have slightly different balance points.

The sanders with in-line motors are longer, narrower and lower than the transverse models. This lets you reach into a cranny where a transverse sander won't fit—a potential lifesaver for forgotten details or solving tricky job-site problems. The handles on these sanders are widely spaced front to back, but you need to use both hands. I often run my big transverse-motor sander with one hand. I couldn't do this with the in-line motor sanders; they need a hand on the front to keep both rollers on the work.

I tried the belt sanders on a narrow strip of wood to check their side-to-side balance. All were a little heavy to the left,

The way the motor is mounted has a big effect on handling. The Hitachi sander (above left) is typical of a transverse mounted motor. The center of gravity is over the platen. The Bosch sander (above right) has its motor mounted on the centerline, with the center of gravity toward the rear roller.

which is the side where the drive pulleys are mounted. The transverse sanders balance at a point about ¾ in. to the left of the centerline, and the in-line sanders balanced only ¼ in. to the left. This may seem like a small difference, but in some situations, it's significant. On narrow stock, a transverse motor requires the operator to tilt the sander to the right to compensate for the off-center balance point. The in-line sanders require little or no compensation.

Variable speed increases control— Most of the sanders I surveyed had a variable-speed control. This is valuable when sanding a surface that has both rough and smooth sections. By varying the speed, I can aggressively cut the rough spots and then slow the belt to remove less material in the places that are relatively smooth. This eliminates having to change from a coarse-grit belt for the high spots to a finer grit to surface the whole board.

The Ryobi has the most convenient method for changing speed. Its speed is variable from 755 sfpm to 1,148 sfpm by turning a dial on the right side of the front handle. It's easy to operate while sanding, but the location favors right-handers. The DeWalt speed control is on the back handle, but it's situated so that you have to take your finger off the trigger to turn it. The Hitachi has two speeds (1,180 sfpm and 1,475 sfpm); the high/low switch is near the heel of the machine. The Makita and Metabo sanders have only one speed, but you can get around this. For less aggressive sanding, change to a finer belt, or slow down the belt by pulsing the switch.

Metal, paint, adhesives and plastics usually sand better at speeds lower than the speeds suitable for sanding wood. If you work in these materials, a variable-speed belt sander will be more useful than a fast-turning sander with only one speed.

Changing the belts—My favorite belt-changing mechanism is Metabo's easy-acting knob. A quarter turn retracts the front pulley for fast belt changes. Makita's thin lever is hard to grasp, especially on a cold morning. It waves around after the belt is installed and tensioned. I thought it was loose or broken, but others tell me it's common on that machine. Ryobi and Bosch machines have large plastic lever grips, which are easy on the hands.

Beyond the basic belt sander

Some sanders offer accessories like vacuum cleaner hook-ups and special stands and frames that can increase the sander's effectiveness and versatility.

Connect the sander to a vacuum—I've never knocked myself out to keep a clean shop, but a belt sander throws so much dust that it requires some kind of dust-collection system. The little bags supplied with the sanders gather only a small portion of the dust the machines generate. When I work in a home or office, where I'm especially careful about dust, I use duct tape to secure the hose of my vacuum cleaner to the sander's dust-collection port. On sanders with round dust-collection ports, such as Bosch and Porter-Cable, this is easy. The DeWalt and Makita sanders have square ports, which require an adapter (sold as an accessory) or more duct tape. The Metabo port is also square, but unzipping the dust bag reveals a round hose adapter for easy hose connections.

Photos this page: Aimé Fraser

There's a greater payoff to using a vacuum system than merely keeping a cleaner workspace. Removing the dust lets the belt sand the wood instead of merely rolling dust around, producing a better surface faster. And flowing air keeps the motor and belt cooler.

A sanding frame makes a flatter surface—A sanding frame is a rectangular metal frame that fits around the outside of the sander (see the center photo). The underside of the frame is faced with smooth fabric or bristles. Like the long sole of a jointer plane, the frame gives the tool a larger reference area to prevent localized bumps and hollows.

Bosch, DeWalt, Metabo and Ryobi belt sanders have their own proprietary sanding frames. To attach the frame, special recesses and threaded inserts are built into the housing. It takes only a few minutes to install the frame and adjust the depth of cut to suit the job.

At first, dragging a frame over the surface of the wood felt awkward, but a straightedge proved that it was worth the trouble. I was surprised to find the sanding frame produced a measurably flatter surface than my old faithful 4-in. by 24-in. sander. If you're planning to do much surface preparation, choose a sander that can accept a sanding frame. They cost from about $60 to $80, depending on the manufacturer.

More versatility with a bench-mounted sanding stand—I rigged up a crude fixture in a rush some years ago to hold my running belt sander on the bench as a stationary sander. When I used the sanding stands sold as accessories for some of the sanders, I knew I'd found something better. These stands are lightweight and portable. They're ideal for using a belt sander on the job site for shaping and sharpening. The Bosch and Ryobi stands hold the sander upside down and come with a fence for setting angles for sharpening. The DeWalt stand holds the sander perpendicular to the benchtop and has a small adjustable table (see the top photo at right). All the stands have built-in clamps for snugging to a benchtop. These plastic stands are stronger, lighter and get a better grip on the sander than my shop-built version. They cost about the same as a sanding frame.

What to buy

When I began this survey, I thought amps, cord length and sanding quality would be the most important factors in picking a sander. But the sanders that fit and balanced in my hands were the ones I reached for most often.

A sanding stand adds another level of versatility to a belt sander. *Most stands hold the sander upside down, but this DeWalt stand holds the sander vertically. The adjustable table is good for sharpening.*

For a flat surface, use a sanding frame *(above). This Bosch frame increases the plane of reference and prevents bumps and hollows (below).*

The Bosch and Ryobi, both in-line machines, look like twins from a distance. They both have weights and amp ratings of less than average, and they can fit into places that the higher and wider transverse sanders can't go. They have good balance, and the distance between the handles makes steering easy.

Both sanders provide built-in attachment points for sanding stands, fences and sanding frames. Their round dust-bag attachments fit most vacuum systems. Both manufacturers work hard at making their accessories available at reasonable prices.

The sanders are closely matched in features and feel. The Ryobi ($150) has a wonderful speed control in the front handle and an extra amp of power. The Bosch ($170) has a slight edge in sanding quality and speed range. It also has a longer cord.

For transverse machines, the Makita ($180), Porter-Cable ($162) and Hitachi ($180) sanders scored at the top of the chart for fastest belt speed and greatest weight. If I were going to a desert island with a generator, a crate of power tools and a job to get done, I'd take one of these. They're big, powerful and built to last. The relatively heavy Metabo ($329) also fits in this class. It has some great features and high-quality parts, but I don't think that warrants its relatively high price.

I think all the sanders have their good points, but the DeWalt ($185) is my favorite. It felt good in my hands, and it produced one of the best finishes out of the box. The light weight and top-handle design make it possible to use the sander in odd positions or one-handed. I'll grant that the front dust bag/front roller cover looks odd, but it works well and pulls off to expose the front roller. This is a big plus for sanding into corners, scribing, shaping and sharpening. The top-quality sanding frame and vertical stand and fence extend this sander's capabilities.

Belt sanders can crank out a lot of work, but they require a lot of energy and attention from the user. I'm a big fan of mail-order buying, but this is one tool that requires hands-on shopping. It's worth driving a little farther and spending a little more money to find a tool that feels good. □

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Top photo: author; bottom photos: Aimé Fraser