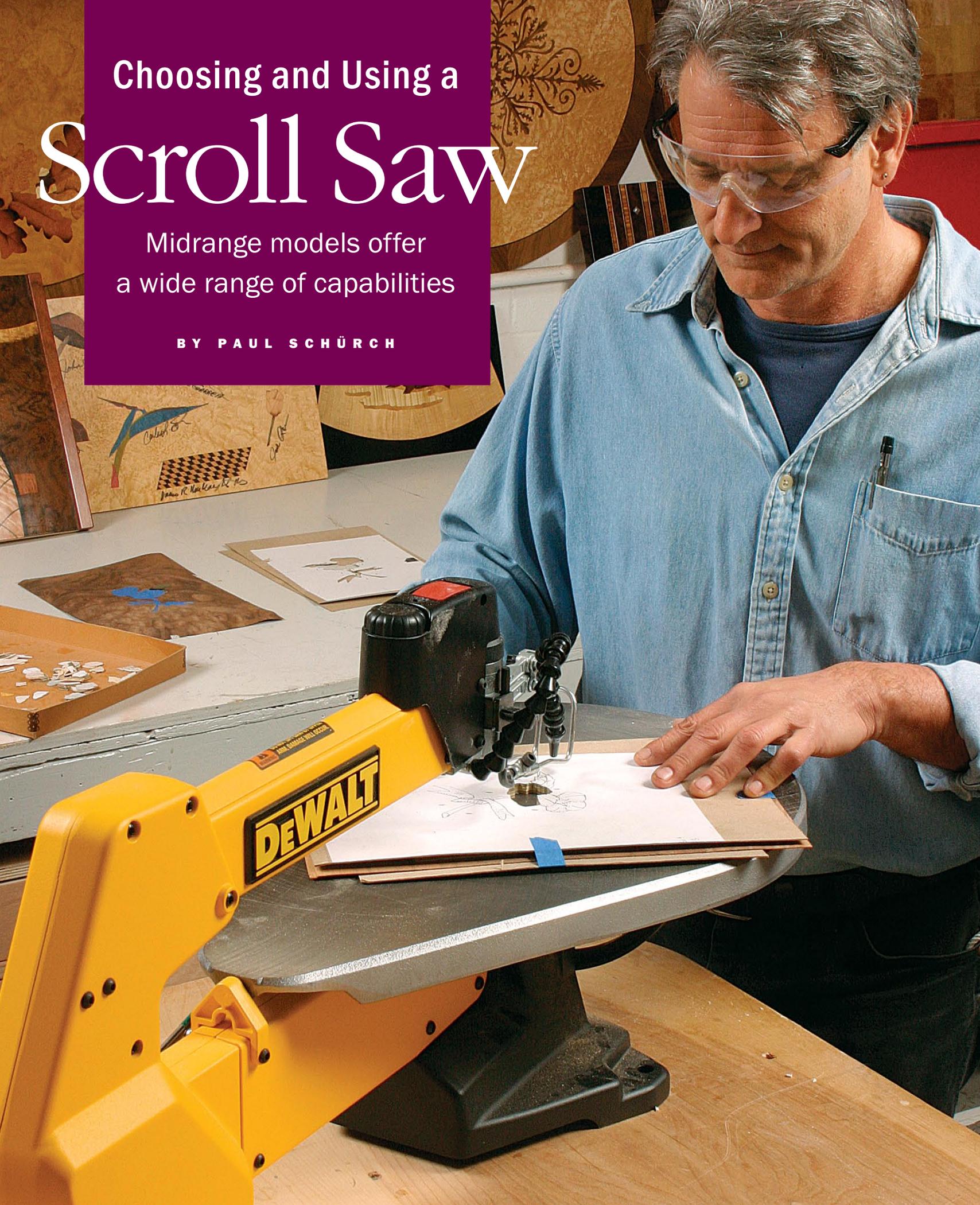


Choosing and Using a Scroll Saw

Midrange models offer
a wide range of capabilities

BY PAUL SCHÜRCH



The scroll saw holds extremely fine blades under tension, allowing it to do jobs that no other motorized saw can do. Unfortunately, many woodworkers think that a scroll saw is only for hobbyists who make fretwork, bookends, whirligigs, and knickknacks. As a professional furniture maker, I've found the machine much more useful than that, and I believe it makes a valuable addition to any woodworking shop.

I use a scroll saw to rough out dovetails, to cut mortise-and-tenon templates, to make small mock-ups of furniture I am designing, and to make cuts particular to marquetry, such as cutting "packets" of multiple layers of veneer. I've also cut material such as shell, bone, sheet brass, pewter, and copper for decorative hardware and inlay. It is even possible to cut 1/8-in.-thick glass for a curvy door panel using a barbed diamond-wire blade, or to perform detail sanding and polishing using small belts attached to the scroll saw like a blade.

It is true that most scroll-saw users don't focus on furniture making. But decorative fretwork and intarsia (a picture made of various woods, of various thicknesses) certainly qualify as woodworking. Some professionals also make a living gluing pictures onto seven-ply, 1/4-in. aircraft-grade plywood and scrolling beautiful puzzle patterns. If these areas interest you, there are clubs devoted to scroll-sawing, and scores of books and magazines that contain useful information, project ideas, and patterns.

Inlay, marquetry, and beyond

For inlay and marquetry, a scroll saw is indispensable. These machines give you an easy and accurate means of cutting highly detailed inlay pieces to add to your furniture. Whether it's a bellflower on a period table leg, or a mother-of-pearl square to be used as a decorative element, the process is straightforward. Draw

TOOL TEST

Turn to p. 60 for a review of five midpriced scroll saws, all suited to a wide range of tasks.



the design onto the inlay material—usually between 1/16 in. and 1/4 in. thick—and cut it out on a scroll saw with the table set at a slight 2° to 4° angle, beveling each edge of the material inward a bit. This is called a conical cut. Then place the inlay onto the background, scribe around the outline with a knife, and hollow out the recess with a small router and a small chisel. Clamp and glue the inlay firmly into place, and then level it with the background after the glue has set. The bevel-cut edges will ensure a tight fit with the surrounding wood.

With a decent scroll saw, you can step past inlay into the world of marquetry, which involves making detailed pictures by joining multiple pieces of veneer. Panels of marquetry can elevate the look of your furniture and case work. Except for one machine, which takes only pin-style blades, all of the midrange saws tested on pp. 60-61 will perform the basic marquetry cuts well, including the packet, contour, conical, window, piece-by-piece, and boule methods.

For packet cutting, my preferred marquetry method, a good scroll saw and a very thin blade make the job as easy as stacking and pinning together all of the veneers to be featured in the final picture, spray-gluing a drawing onto the stack, cutting out all of the pieces in one shot, and then pulling the pieces apart

Scroll-saw uses in the shop

MARQUETRY



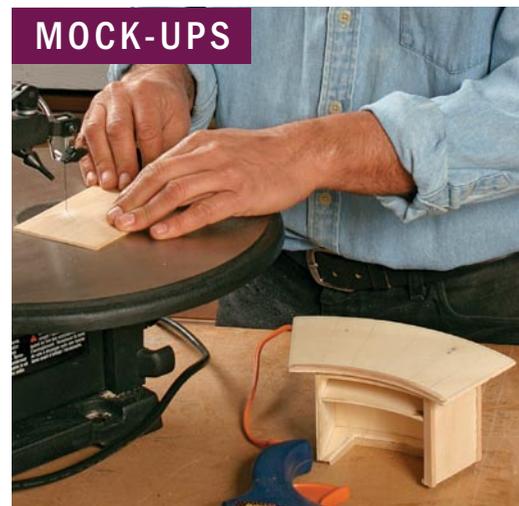
Indispensable for marquetry. A scroll saw can cut through a thick packet of veneers (facing page) with a very thin blade, cutting out all of the pieces for a picture in one shot.

JOINERY



Perfect for dovetails. After the initial cheek cuts are made, the tiny scroll-saw blade makes it easy to cut across the bottom of a dovetail socket and quickly remove the waste.

MOCK-UPS



An easy way to test designs. With a scroll saw, small, intricate pieces are easy to cut quickly and assemble using hot-melt glue. This 1/10-scale model is a reading podium.

Scroll-saw uses (continued)

FRETWORK



Endless options for pierced work. Schürch made this jewelry-box tray by cutting out small openings in solid wood and laying that fretwork onto a felt-covered plywood bottom. He detailed the carved leaf after the main vertical cuts were done.



and taping them into place. A #2/0 blade leaves only a 0.010-in.-wide kerf, which tends to close up in the final pattern. For more information on marquetry techniques, go to my Web site (www.schurchwoodwork.com).

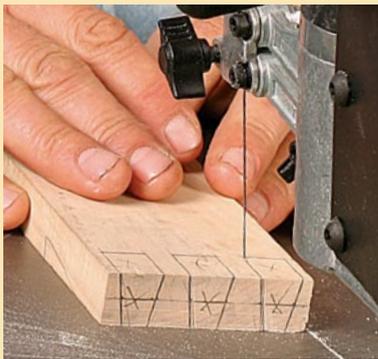
Scaled mock-ups of furniture are very helpful in the design process, allowing a 3-D preview prior to drawing and building the actual piece. Models also are great for selling a design idea to a client. A scroll saw is ideal for the detail work involved in building a model out of thin materials. The pieces can be put together very quickly using hot-melt glue.

I sometimes use a scroll saw for cutting dovetails, roughing out the pins and tails before trimming them to the line with a sharp chisel, if need be. Other times I make the initial sawcuts with

a dovetail saw and then use a scroll saw to cut squarely across the bottom of each socket, removing the waste. If the blade is tensioned properly, the cuts will be accurate and need very little cleanup. I've seen other woodworkers (*FWW* #152, pp. 56-61) make the initial cuts on a tablesaw, then use a scroll saw to remove the waste.

Once you have a scroll saw, you'll find that lots of odd cuts become easier to make. I've used one to create matching templates in 1/2-in. plywood for routing odd-shaped mortises and tenons where large furniture components join (see *FWW* #94, p. 54). The matching inside and outside templates are attached temporarily to the mating workpieces, where they can guide a flush-cutting router bit. I use this technique often when joining solid wood legs

Scroll-sawing tips



blade. To cancel out blade drift when following a straight line, adjust the angle of the workpiece when pushing it into the blade. For best results, work in a series of short pushes, making small

finewoodworking.com

Visit our Web site to see the author demonstrate straight-line cutting and turning sharp corners.

ADJUST FOR DRIFT TO CUT A STRAIGHT LINE

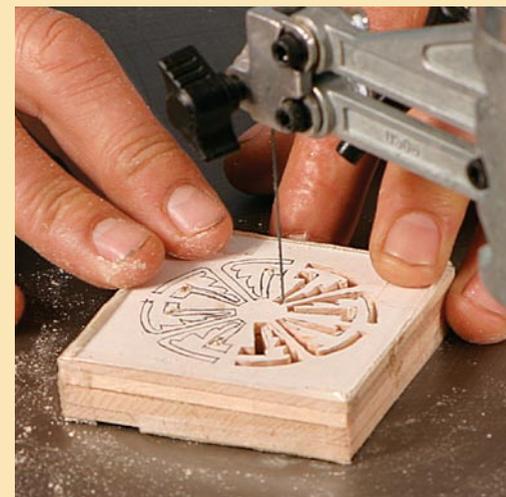
I have found that the toughest techniques to master are cutting straight lines and going around sharp corners. Many blades are milled in a way that can leave the blade slightly sharper on one side, so it tracks like a dull bandsaw

corrections as you go. As the blade dulls, the drift gets worse; keep blades well tensioned and change them often.

HOW TO TURN A SHARP CORNER

When cutting marquetry or finely detailed fretwork, negotiating sharp points and corners can pose a challenge. Essentially, you need to pivot the workpiece around the blade while the saw is running, reorienting it toward the new direction.

This is accomplished by cutting up to the corner, then slightly pressing the workpiece against the side of the blade. This method stabilizes the workpiece without any unwanted cutting. Now maintain that pressure as you pivot the workpiece into the desired position, shifting the pressure onto the back of the blade as you go.



INLAY

Inlay becomes straightforward. Tape the design to thin material and cut out the inlay. Then scribe around the inlay piece to lay out the recess. When cutting fragile materials like this abalone, make a zero-clearance plate from a piece of veneer.



directly to a top piece. On period furniture, I've used a scroll saw to cut out carving blanks for applied decorative elements.

Setting up your saw

It's important for first-time users to realize that scroll-saw blades break regularly, especially thin ones. A #2/0 blade, for example, will break in five or 10 minutes when cutting 1/2-in.-thick material. A broken blade can make a startlingly loud noise, but it doesn't necessarily mean you are doing anything wrong.

For best results, the blade should be tensioned to roughly an octave above middle C on the piano, or until a clear musical plucking sound is reached. If the blade is too loose, it will make a "thunk" sound when plucked and will tend to deflect in use, distorting the

cut, fatiguing the blade, and causing it to break early. With too much tension, the blade will snap more often or slip out of the blade clamps.

A few modifications—I recommend making changes and adding accessories to any scroll saw. A wider auxiliary table placed over the top of the standard table will support wider work. To turn the saw on and off, a foot-pedal switch (the electrical type that stays on only when the pedal is depressed) takes the panic out of scrolling detail work and stops the noise when the blade breaks. Also, I tape zero-clearance plates of thin cardboard, plastic, or veneer on the saw table to support fragile material and keep small pieces from dropping through the throat.

I don't like the blade guards on a scroll saw—they only get in the way—so I remove them. In the classes I teach, with students ranging in age from 8 to 85, I've never seen more than a minor cut on any scroll saw with the blade guards removed.

Paul Schürch, a furniture maker and teacher in Santa Barbara, Calif., specializes in marquetry.

Blade Sources

SCROLL-SAW BLADES

Wildwood Designs
www.wildwooddesigns.com
800-470-9090

Woodcraft Supply
www.woodcraft.com
800-225-1153

BARBED DIAMOND WIRE
for cutting glass and other very hard materials

Alpha Supply,
No. J0510B
www.alpha-supply.com
800-257-4211

MATCH THE BLADE TO THE TASK

Scroll-saw blade sizes range from the smallest #8/0 (pronounced eight-aught) to the largest #12 (sometimes called #0/12), with the most common for woodworking between #3/0 and #8. Thinner blades have more teeth per inch. The orientation of the teeth also is important (see chart at right). For more blade information, check out the excellent chart at www.olsonaw.com/scroll_chart_1.html.

AN ESSENTIAL BLADE KIT

These are the six blades Schürch uses most often, with Olson item numbers in parentheses.

#12 skip tooth (453): Heavy-duty blade for cutting straight lines in thicker material such as plywood.

#5 precision ground, reverse tooth (495RG): Used for straighter-line fretwork.

#5 skip tooth (446): Thinner depth than the precision-ground #5; turns tighter corners. Good for more detailed fretwork, as well as dovetails.

#2/0 skip tooth (440): The one I use for marquetry and other very finely detailed work. Kerf is only 0.010 in.

#1 metal-cutting (479): For metal, shell, and bone.

Tooth patterns



STANDARD TOOTH The basic, cut-anything blade.



SKIP TOOTH Runs cooler in harder material.



REVERSE TOOTH Bottom few teeth are reversed to reduce tearout.



PRECISION GROUND More aggressive and straighter cutting. Available in #5, #7, and #9, in skip tooth or double/reverse tooth.



DOUBLE TOOTH Slow cutting, but smoother results.



CROWN TOOTH Cuts on both upward and downward strokes; slow, but minimizes tearout. Good for plastic.



SPIRAL Cuts in any direction but leaves rougher, wider kerfs.

Tool test Midrange scroll saws

With the average woodworker in mind, I tested five midrange scroll saws with throat depths between 18 in. and 22 in. Each saw has enough throat capacity, power, and accuracy to handle all of the tasks described in this article, and each costs less than \$600. (Unfortunately, Craftsman was not able to supply its latest 18-in. model in time for testing.)

I put the machines through a variety of tasks, and all made acceptable cuts. For each of these saws, it is important to find an ideal midrange speed for any given task, a “sweet spot” that is the balance between speed and smoothness. If you don’t push a saw past that point, you will minimize vibration and produce the best cuts.

One of the most important factors for efficient and enjoyable scroll

sawing is the ease of tensioning and changing the blade, especially if you plan to try fretwork or other pierced cutting where the blade must be untensioned, removed, threaded through the workpiece, and reattached often. All of these saws come with quick-release blade clamps, which are important, but not all have access to their tensioning system at the front.

Also important is the ability to change speeds quickly. Some saws have easy-to-reach adjustment knobs at the front, offering an infinite range of speeds, but two have pulley systems that take more time and effort to adjust and offer a limited range of speeds. I also prefer saws with a larger stroke, which uses more of the blade’s teeth and prolongs blade life.

I evaluated the stability of each saw’s upper arm and table, looking at how wobbly they were and how easily they could be knocked out of adjustment. If either happens

while cutting through a packet of veneers, for example, the crooked cut will leave big gaps in the finished marquetry. I can’t recommend scroll saws that accept only pin blades. These perform well for rougher work but have limited abilities for finer detail.

My choice for the best overall scroll saw is the DeWalt, a quiet, smooth-running, well-designed machine at a reasonable price. It is very solidly built. The trunnions supporting the table are strong and allow full tilt in both directions. The upper arm lifts up, making it easier to thread work onto the blade from above, which is helpful for pierced cutting.

My choice for best value goes to the Dremel. It also is a smooth performer, with important adjustments at the front of the saw. While it tends to bog down just a bit more often than the DeWalt, the Dremel is a great value at its price and includes some helpful attachments, such as a small disk sander on the side, a work light, the ability to take either pin-end or plain-end blades, and the option of attaching a rotary, flex-shaft tool onto the motor.



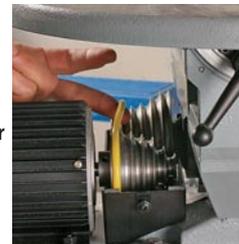
Schürch used each saw to make a variety of cuts in a variety of common materials. He graded the smoothness of cut by feel and by looking at the cuts under magnification.



DELTA 40-680

800-223-7278
www.deltawoodworking.com

The Delta is a solid performer, but the belt system forces you to turn off the saw and reach under it to change speeds. (The PS Wood also has a belt system.)



Model	Average price	Throat depth
Delta 40-680	\$480	20 in.
DeWalt DW788	\$390	20 in.
Dremel 1800 Scroll Station	\$240	18 in.
Grizzly G0537	\$130	22 in.
PS Wood Machines 21-in. Scroll Saw	\$600/direct	21 in.



**AUTHOR'S
BEST OVERALL
CHOICE**

DeWALT DW788

800-433-9258
www.dewalt.com

The DeWalt, like the Delta and Dremel, has its tensioning lever up front (jutting out at top), making it easy to release the blade.



**AUTHOR'S
BEST VALUE
CHOICE**

DREMEL 1800 SCROLL STATION

800-437-3635 www.dremel.com

Like the Grizzly and DeWalt machines, the Dremel's speed-control knob is up front, allowing you to improve the cutting action while under way.



GRIZZLY G0537

800-523-4777 www.grizzly.com

The Grizzly machine takes only pin-style blades, which require a bigger pilot hole than plain-end blades, making them unsuitable for the finest pierced work.



PS WOOD MACHINES 21-IN. SCROLL SAW

800-939-4414 www.pswood.com

The removable blade clamps add two minutes to the blade-changing process, requiring a special jig built into the side of the machine.



Blade types	Table angle	Stand	Strokes per minute	Stroke length	Ease of blade changes	Ease of changing speed	On/off access	Stability of table and arm	Smoothness of cut
Plain end	Left 45° right 15°	Included and necessary	400-2000, 6 speed	7/8 in.	Very good	Fair	Very good	Excellent	Excellent
Plain end	Left 45° right 45°	Optional	400-1750, Variable	13/16 in.	Very good	Very good	Excellent	Very good	Excellent
Plain end and pin end	Left 45° right 7°	Optional	500-1700, Variable	13/16 in.	Good (plain end) Excellent (pin end)	Excellent	Very good	Very good	Very good
Pin end	Left 30° right 2°	None	425-1300, Variable	5/8 in.	Fair	Good	Poor	Fair	Fair
Plain end	Left 40° right 30°	Included and necessary	170-1370, 5 speed	15/16 in.	Fair	Poor	Fair	Fair	Good