



Shoulder Planes Reviewed

Furniture makers can choose from a wide variety of high-performance tools

BY CHRIS GOCHNOUR

Three tools that always find their way to my workbench are the smoothing, block, and shoulder planes. Of the three, the shoulder plane commonly is viewed as a specialized tool with limited application, but this is not true. In a college furniture-making class I teach, students generally bring their own smoothing and block planes but end up borrowing my shoulder plane daily. Their actions confirm what I concluded some time ago: There is a never-ending list of tasks for a well-tuned shoulder plane.

A shoulder plane is a member of the rabbet-plane family. Its body has open sides, and the blade projects slightly from each side of the plane. Unlike the rabbet plane, which is designed to create

SUITED FOR A VARIETY OF TASKS

Shoulder planes excel at fitting tenon cheeks (top left), tuning shoulders (bottom left), and cleaning up trim (below). These tools cut cross-grain, long-grain, and end-grain wood.



CLIFTON

www.highlandhardware.com 800-241-6748
www.thebestthings.com 800-884-1373



420

Body: $\frac{3}{4}$ in. wide by 8 in. long
Weight: 2 lb. 10 oz.
Price: \$220

3110 3-IN-1 PLANE

Body: $1\frac{1}{8}$ in. wide by 6 in. long
Weight: 2 lb. 1 oz.
Price: \$230

Clifton is a maker of hand tools in Sheffield, England, a historic mecca for steel- and tool-making.

Each of the Clifton planes has a cast-iron body, which is ground and polished. The lever caps are made from unbreakable, malleable iron. The machining of the Clifton 420, 3110, and 410 was of high quality; except for the sole of the 3110, which required slight lapping, the soles and sides of these planes were straight and true.

The $\frac{1}{8}$ -in.-thick blades, made from oil-hardened tool steel, contributed to a solid, chatter-free cut. Blade adjustments are made by knurled captive nuts that engage the blade via a slot in its back. Although smooth and precise, with minimal backlash (slop), the nuts inadvertently slightly altered the blade's lateral position.

The wide blades on the Clifton planes require them to be set either to the left or to the right for use. To avoid this adjustment, the blades can be ground narrower.

The Clifton 420 is an excellent general-



Versatile plane. Removing the nosepiece from the Clifton 3110 converts the tool to a chisel plane for cleaning up tight areas.

purpose shoulder plane, well suited for a wide variety of trimming and tuning tasks. Its moderate weight and narrow body made it easy to grasp. The tool's tall profile provided good clearance from obstructions for the palm and fingers, while its lever cap served as a comfortable palm rest and, in certain situations, could be grasped as a handle. However, it was not as easy to hold while the plane was used on its side to shoot tenon shoulders. The tool's narrow mouth helped minimize torn grain and made nice end-grain and cross-grain shavings possible.

The Clifton 410 is a smaller version of the 420. Its light weight and slender body made it easy to hold in one hand, so the plane could be used to access awkward or

confined places, such as when cleaning the bottom of dadoes and grooves.

The Clifton 3110 is a fine general-purpose shoulder plane in its own right, but it has the added benefit of being able to convert to a bullnose plane or a chisel plane.

In shoulder-plane mode, the 3110 covered ground quickly, working tenon cheeks cross-grain. Its width also made it the easiest of the Clifton planes to hold while shooting tenon shoulders. The tool had a tight mouth and came with two additional shims, enabling me to regulate its opening.

The 3110 can be converted to a bullnose plane by unscrewing the long nosepiece and replacing it with a shorter one. By removing the nosepiece altogether, the 3110 becomes a chisel plane.

a joint rapidly, the shoulder plane's purpose is to refine and perfect existing joinery. I use it to trim the cheeks of a tenon so that the joint has a pistonlike fit; to pare a tenon's end-grain shoulders to make an invisible glue joint; to eliminate machine marks from rabbit joints; to refine molding details and perfect their alignment; and to perform tasks that require a plane capable of working into a corner. The heft of the tool, its tight mouth, and comfortable fit in hand make controlled and precise cuts easy.

Shoulder planes can be made from ei-

ther metal or wood. And even though they look quite different, both versions are capable of producing quality results. Metal shoulder planes generally have blades bedded at a low angle (20°) with a 25° bevel facing upward. The effective cutting angle is about 45°, low enough for end- and cross-grain work yet still capable of producing good results working with the grain.

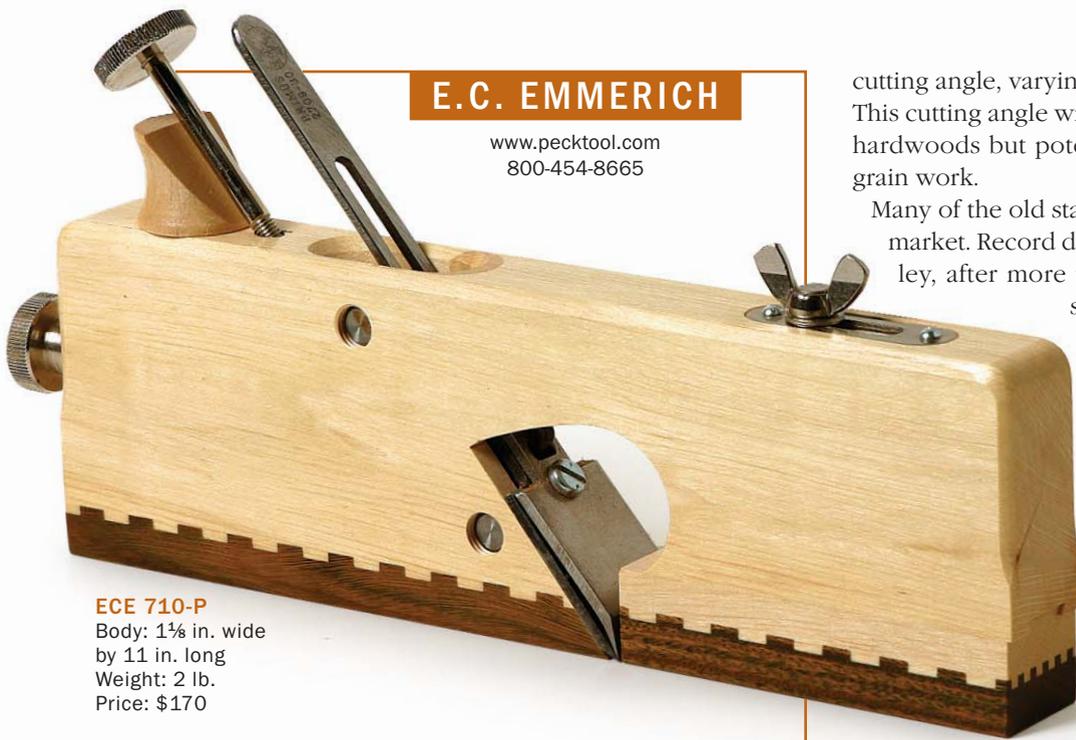
The blades of wooden-body planes, on the other hand, are bedded at a much steeper angle, and their bevels face downward. This makes for a steeper

**Watch it
on the Web**

For more on using
shoulder planes, go to
www.finewoodworking.com.

E.C. EMMERICH

www.pecktool.com
800-454-8665



ECE 710-P

Body: 1½ in. wide
by 11 in. long
Weight: 2 lb.
Price: \$170

This German-made tool is the only all-wood-body plane I tested. The horn-beam body is toothed to a rock-hard *lignum vitae* sole that glides over wood. The plane I received was slightly out of true, but flattening its sole required little effort. The mouth is adjustable not only for use but also because the double iron that's installed from the plane's sole requires the mouth to open wide and allow the iron's passage.

Unlike most wooden planes, the E.C. Emmerich doesn't use a wedge to hold its blade. Rather, it uses the Primus adjustment mechanism (see the photo below). The depth adjuster works in harmony with a spring bar to reduce backlash and blade chatter, but this system made blade changes cumbersome. Two adjusting screws on the plane's side did an excellent job of setting the blade laterally.

The plane was best suited for two-handed use—a one-handed grasp was awkward—and the plane's tall profile gave my fingers ample clearance from obstructions. Although the plane was capable of end-grain work, it excelled at long-grain rabbet work, and its 50° pitch reduced torn grain in figured wood.



Unique adjustment. The E.C. Emmerich plane employs a Primus blade-adjustment mechanism, which has a spring-loaded bar that hooks the center of the chipbreaker/blade and pulls it against the bed.

cutting angle, varying from 50° to 65°, depending on the model. This cutting angle will excel in long-grain work with challenging hardwoods but potentially can limit the plane's utility in end-grain work.

Many of the old standard shoulder planes are no longer on the market. Record doesn't make handplanes anymore, and Stanley, after more than 100 years of manufacturing excellent shoulder planes, has stopped production. The good news is that many smaller manufacturers around the world have stepped up to fill the void, producing some of the finest and most diverse handplanes ever made.

I looked at 14 shoulder planes in a wide range of styles and sizes from seven manufacturers. To be as objective as possible, I sharpened all of the plane blades at 25° and then honed them with a 2° microbevel, polishing to 8,000 grit using waterstones. I then put each plane through a series of tests on a variety of woods.

H.N.T. GORDON

www.craftsmanstudio.com 888-500-9093

Whatever type of work you do, there's a Gordon shoulder plane to fit your needs. Made in Australia, the plane is available in four sizes, ranging in width from ½ in. to 1½ in. Choices for the beautiful hardwood bodies include rosewood, ebony, ironwood, and gidgee. The wood is housed in a brass channel to ensure that the sole and sides stay true through extended use. Held firm by a wedge that abuts a pivoting brass block, the blade is bedded with its bevel down at a steep 60° pitch. Flip over the blade so that the bevel faces up, and the tool becomes a scraping plane. This is a nice bonus if you're working challenging grain. Blade adjustments are done with a



½-IN. PLANE

Body: ½ in. wide by 5½ in. long
Weight: 10 oz.
Price: \$120

¾-IN. PLANE

Body: ¾ in. wide by 7 in. long
Weight: 1 lb.
Price: \$130

I began by machining 1½-in.-long tenons on 5-in.-wide hard maple. Then I cut the shoulders 1° out of square and kept the tenon cheeks oversize. I used each plane to correct the out-of-square shoulders and trimmed the cheeks to fit.

I also used each of the planes to fine-tune the fit of an oversize tongue on a matched joint in quarter-sawn white oak. Finally, I cleaned up sawmarks from a rabbet joint in figured bubinga.

I assessed each tool's performance regarding ease of setup and adjustment, and the blade's ability to hold a keen edge. I evaluated how well they could make a solid and unwavering cut that was chatter-free with minimal torn grain. Finally, I considered the ergonomics, comfort, and balance of the tool in my hands. Test evaluations for each tool are discussed on pp. 43-47.

Chris Gochnour is a frequent contributor to Fine Woodworking on hand tools.

LIE-NIELSEN

www.lie-nielsen.com
800-327-2520



073
Body: 1¼ in. wide
by 8¾ in. long
Weight: 3 lb. 12 oz.
Price: \$225

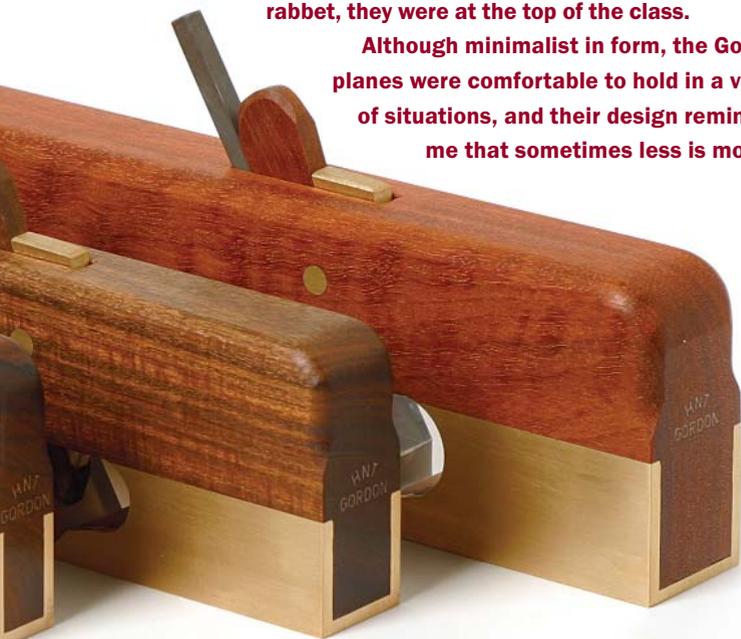
½-IN. BRONZE
Body: ½ in. wide
by 5½ in. long
Weight: ½ lb.
Price: \$160

small wood hammer; this takes a bit of getting used to, but the instructions offer some helpful guidance.

I was impressed with how consistent and well-made the Gordon planes were. All four had tight mouths, the sole and sides were square and true, and the blades fit the planes perfectly.

I was skeptical of how planes with such a steep pitch would handle end- and cross-grain work. But these tools had no problem working maple end-grain shoulders, repeatedly taking full-length shavings. With blades sharp, the Gordon planes also had no problems with cross-grain work, and when planing the figured bubinga rabbet, they were at the top of the class.

Although minimalist in form, the Gordon planes were comfortable to hold in a variety of situations, and their design reminded me that sometimes less is more.



1-IN. PLANE
Body: 1 in. wide by 7¾ in. long
Weight: 1½ lb.
Price: \$135

1¼-IN. PLANE
Body: 1¼ in. wide by 8¼ in. long
Weight: 2¼ lb.
Price: \$145

Lie-Nielsen's 073 is an all-metal shoulder plane based on the classic English design of Edward Preston. The body is cast from ductile iron, a strong and resilient material that is less brittle than gray iron. The tool has a highly polished bronze lever cap, and the mouth opening can be adjusted easily by a movable toe shoe. A screw in front regulates the movement in and out, and a screw on top locks the shoe in place.

The cryogenically tempered A2 steel blade adjusted smoothly with very little backlash, but changing the depth did have the problem of slightly altering the blade's lateral position.

The body was ground absolutely flat and square, although some of the edges were a bit sharp. The blade fit the body well, allowing me to use the plane on either side without having to adjust the blade. Honing the blade prior to use was all it took to put the Lie-Nielsen 073 into action.

The plane's tall body gave fingers and palms good clearance from longer tenons, and the wide blade covered ground quickly when sizing tenon cheeks. I found the 073 to be excellent on large work that required a two-handed grasp, but the tool's length, width, and weight made it less ideal for one-handed use.

This plane is a rock-solid performer. If you're looking for a larger shoulder plane, the Lie-Nielsen 073 is sure to please.

In the tradition of fine English infill planes, the Lie-Nielsen ½-in. plane is cast manganese bronze filled with rosewood. The A2 blade is secured in place with a wooden wedge that also serves as a pad for the palm of your hand. Blade adjustments are made in the traditional way with a setting hammer.

The machining of the tool was exact: It had a flat sole and square sides, the mouth was tight, and the blade fit the body closely. Despite the tool's diminutive size, its bronze and rosewood body provided surprisingly good heft. Too small to be a general-purpose shoulder plane for cabinetmakers, it excels as a small plane for fine detail work, miniatures, or models.

ST. JAMES BAY

www.stjamesbaytoolco.com
800-574-2589

1-IN. INFILL

Body: 1 in. wide
by 8 in. long
Weight: 3 lb. 10 oz.
Price: \$300



Prominent depth adjuster.
The St. James Bay plane's blade adjuster works well, but its great length sometimes makes holding the plane awkward.

Custom-made by a small company in Mesa, Ariz., this infill plane is cast from bronze and has a cocobolo in-fill and wedge. The Norris-type blade adjuster fit loosely in the body but still worked well. However, in some situations, the long blade and adjustment knob were right where I wanted my palm to rest. The blade is made from oil-hardened tool steel and really held an edge well when repeatedly punished on some white-oak end grain.

This is one of the heaviest planes I looked at, with consequent advantages and disadvantages. It was tiring to hold for long periods of time, especially with one hand. Conversely, its great heft made it absolutely solid in trimming end-grain shoulders and figured hardwood. Akin to a train, the tool was slow to get moving, but once set in motion, there wasn't much to slow it down. This plane is finely crafted, aesthetically pleasing, and gave a solid performance.

Tuning a shoulder plane

A shoulder plane is a precision tool and must be fine-tuned to get the most out of it. First, check that the plane's sides are parallel with each other. If they are not, it is probably best to return the plane to the manufacturer. You also should check that the plane's sole is square to its sides and flat.

If it is necessary to true the sole, clamp a square block of wood to a dead-flat abrasive surface. With the plane assembled, tensioned, and ready for use, but with the blade retracted into the plane's body and flush with the plane's side, hold the tool square against the wooden guide block and lap the sole true.

Next, check that the blade fits the plane body accurately. It should be parallel to the plane's sole and sides, projecting slightly (0.004 in. to 0.005 in.) from each side. This projection is a bit like the set in a handsaw; it provides necessary clear-



Narrow the blade. Use writing paper as shims to grind the blade so that it projects 0.004 in. to 0.005 in.

ance. If the blade does not project from the side, the tendency is for the plane to be pushed farther out of the cut with each successive pass, resulting in a cut that is not at an accurate 90°. If it projects too much, the blade can mar the edge adjacent to the surface being worked.

To correct a blade that is misaligned or too wide, carefully grind the blade into alignment. Extra care must be taken not to make the blade sides too narrow or out of parallel, which would render the blade useless.

I have a favorite method for aligning the blade with the plane's sides and providing accurate side projection. First, secure the blade in the plane's body. Make sure the blade's cutting edge is in alignment with the sole and its sides project equally from both sides of the plane's body. Lock the blade in place and set or position two pieces of 0.004-in. to 0.005-in. shim stock (medium-weight writing or printer paper will do) 1¼ in. apart on an abrasive lapping plate. With the side of the plane resting on the shim stock and the blade exposed to the abrasive, lap the blade into alignment on each side. Be careful to keep the shims free of abrasive particles so that you don't scratch the plane.



Check for squareness.
The sole of the plane should be 90° to the sides. If it's only slightly off and the sides are parallel, correct the problem by flattening the sole. Set up a guide block (right) 90° to the abrasive surface. Check for squareness after each couple of strokes.



SHEPHERD

www.shepherdtool.com 519-624-7350

The Shepherd Tool Co. is a small outfit that makes hand-planes and kits in Ontario, Canada, reproducing infill planes based on the patterns of legendary planemakers Stewart Spiers and Thomas Norris. The shoulder planes I tested were two different sizes of a Spiers style No. 8. The bodies, made

from plates of steel or brass joined with interlocking double dovetails, were appealing because they don't have the internal stresses that can distort a cast plane body. The sides of the planes, however, were slightly out of parallel from bottom to top; this is a situation that would make tuning the planes a challenge. The company assured me that the planes are warranted and that any manufacturing defects would be corrected or the planes replaced.

The dovetail body is filled with attractive cocobolo, which is secured in place with steel pins that are riveted from side to side. The blade is supported its full length by a bed of wood and steel that readily dampens vibration. A sculpted wedge, which doubles as a palm rest, holds the blade in place. Blade adjustments are made with a hammer, and the hook at the rear of



1½-IN. STEEL

Body: 1½ in. wide by 8 in. long
Weight: 2 lb. 13 oz.
Price: \$264

¾-IN. BRASS

Body: ¾ in. wide by 8 in. long
Weight: 1 lb. 13 oz.
Price: \$289

the iron makes it possible to retract the iron. On each plane, the blade is much wider than the body and required shifting from side to side in use. I'd make it narrower.

There's nothing quite like an infill plane. If you have shied away from them because of the scarcity of antique originals

or because of high-priced reproductions, a Shepherd plane in kit or finished form may be the answer.



Blade adjustment with a hammer. Both of the Shepherd planes require a hammer to adjust the depth of the blade and to free the blade for sharpening.



VERITAS

www.leevalley.com
800-871-8158

¾-IN. PLANE

Body: ¾ in. wide by 7 in. long
Weight: 2 lb.
Price: \$139

A pivoting hand rest. The Veritas plane has a knob on the top of the lever cap that acts as a hand rest and pivots 180°.



Veritas is the latest company to enter the shoulder-plane market. The company's design team is well known for taking a fresh look at traditional designs, and true to form, this plane has some unique and innovative ideas.

The plane's body is cast from ductile iron, and all of its edges are nicely eased. It has an adjustable mouth that is regulated by two screws, one that moves the toe piece in and out and another that locks it in place. The ⅛-in.-thick blade is made from A2 steel and is regulated with a very precise Norris-style adjuster that didn't affect the blade's lateral setting when I tested it.

The blade on the Veritas was a mere 0.003 in. wider than its body, but with setscrews in the plane's side, the blade could be set and held in perfect alignment. The blade projected only 0.0015 in. from each side, which made for accurate and consistent planing into corners.

One of the most unique features of the Veritas plane is its lever-cap design. It has a pivoting knob that let me adjust the plane to fit my hand and holding style. This feature, in conjunction with the finger hole cast in the plane's body, makes the plane suitable for many different situations. I really liked the way the Veritas plane felt in my hands and the excellent results it produced. The price of this plane, its novel features, and all-around good performance make the Veritas a worthy winner.