TOOL TEST

Metal othing Planes

There are several great choices between \$30 and \$300

BY CHRIS GOCHNOUR

hen I first set up shop building custom furniture, I relied completely on portable belt sanders and orbit sanders for all surface preparation. However, I soon grew weary of the sanding woes—too much dust and noise, time and tedium working through the progressive grits. It never failed that when the finish finally went on, I became painfully aware of some sanding flaw I'd overlooked or planer snipe I'd neglected to remove.

With so much time spent on surface preparation, I needed a more effective method of accomplishing the task. I knew

> little about smoothing planes, but I was aware of their value to artisans throughout the ages, so I decided to give them a fair shake.

> > At first, the results were mixed. I

Unmatched at surface preparation. A good-quality, well-tuned handplane will create a dead-flat, cleanly sliced surface in minutes. struggled with getting the planes sharpened and tuned just right (for more on tuning, see the story on p. 79). I also strived to comprehend the importance of reading and understanding wood grain. In spite of the learning curve, I thoroughly enjoyed the journey. In time, the tuning process became routine, and understanding wood grain became second nature. Now I use smoothing planes as my primary means of surface preparation, and I get cleaner, crisper results in less time than I ever did by sanding.

Ten planes, four different designs

For this article, I looked at eight metal Bailey- and Bedrock-style planes in the most common No. 4 size—as well as two low-angle models. Within this wide selection and price range (from \$30 to \$300), everybody from hobbyist woodworkers to professional furniture makers can find a tool that suits their needs.

The Bailey-style planes can trace their roots back 125 years to an original designed by Leonard Bailey and made by the Stanley Rule and Level Co. The Bailey plane worked so well that little has been done over the years to improve upon its basic design. The Anant, Footprint, Groz, Kunz, and Stanley planes (right) are based on the Bailey pattern.

Around the turn of the 20th century, Stanley refined the basic Bailey design and created the Bedrock plane, declaring it the best plane made. The Clifton and Lie-Nielsen planes (see pp. 76-77) are based on the Bedrock pattern.

The Veritas bench plane (see p. 77) is a uniquely 21st-century tool. It is not based on any one historic design; instead, it draws on successful elements from a variety of makers and incorporates some truly original concepts.

Low-angle smoothing planes are becoming more popular and are appealing in their simplicity. So I decided to try two low-angle smoothers made by Lie-Nielsen and Veritas (for more on the low-angle planes, see p. 78).

What to look for in a handplane

I find there are three critical criteria in selecting a handplane, as well as a handful of other characteristics that make a plane more effective. First is a good-quality blade that can be sharpened to a keen edge and then hold that edge for a substantial

Bailey-style planes

The original No. 4 Bailey design featured a cast-iron body, wooden tote and knob, an adjustable frog milled at 45°, and a blade held with the bevel down. Though variations exist among the Anant, Footprint, Groz, Kunz, and Stanley, they all are Bailey-style planes, with prices ranging from \$30 to \$80. Some of the planes required a good deal of tuning before being put to wood, but each performed reasonably well. For the price, they make good general-purpose planes, suitable for miter, end-grain, and long-grain work.



Price: \$30 Weight: 3 lb. 6 oz. Blade thickness: 0.068 in.

M^{ade} in India,

the Anant appears to

be a reproduction of an original Bailey, but it lacks refinement in its fit and finish. That said, I didn't have to spend much time tuning it. The handles are made from a tropical hardwood resembling mahogany. The finish on the handles was a bit rough but still comfortable. I honed the blade and tuned the chipbreaker, and the plane gave satisfactory results.

There was a lot of backlash in the blade-adjustment knob—nearly four rotations—and it was difficult to get it set for a light cut. Once set, it held well. The blade is only 0.068 in. thick and chattered slightly when planing challenging hardwoods.

If tuned meticulously and fitted with a thicker aftermarket blade, the Anant could be a dependable smoother.

Classic Bailey-style design. The adjustable frog on the Anant plane allows for easy vertical and lateral adjustments.

FOOTPRINT

Weight: 4 lb. 4 oz.

Blade thickness:

Price: \$35

0.078 in.



the Footprint, made in Sheffield, England, comes the closest to matching the original made by Stanley. The casting and machining were clean. Like the Baileys of old, the Footprint has a three-piece lateral adjuster, solidbrass blade-adjusting screw, and a frogadjustment screw. It even has wooden handles, although they're painted.

I had trouble aligning the frog with the body while adjusting the mouth opening. I discovered that the blade's factory grind was slightly out of square, which required me to adjust the frog laterally to get it aligned. The sole of the Footprint was out of true by nearly 0.003 in.—enough that it required lapping. Once sharpened and tuned, however, this plane had a feel similar to vintage Bailey planes.



Trust your eye. To align the blade parallel with the sole on a Bailey-style plane, you simply sight down the sole and adjust the lever.



Thick blade is better. The spring tension in a blade and chipbreaker assembly can cause a thin blade to bow, which will cause chatter. Install a thicker aftermarket blade to boost performance.



Price: \$37 Weight: 3 lb. 12 oz. Blade thickness:

he Groz is a new

plane made in India by a company that also makes precision machine tools. The plane looked good with its black japanning, nickelplated lever cap, tropical hardwood tote and knob, and brass fittings. But my optimism dimmed after closer inspection.

The frog bed was concave from side to side by 0.003 in. and, coupled with a thin blade, caused the plane to jump and chatter on white oak and maple. The chipbreaker needed tuning to help shavings pass without jamming. Even fitting the plane with a ³/₃₂-in.-thick Hock blade and a Clifton Stay-Set cap didn't help. Also, although the sole was flat, it was so coarsely milled that it required lapping with an abrasive. To work satisfactorily, the Groz plane also would require lapping the frog bed flat, a difficult task because the lateral adjuster and the yoke are in the way.

KUNZ NO. 581-1204

Price: \$80 Weight: 2 lb. 15 oz. Blade thickness: 0.095 in.

he Kunz

plane is made in Germany. Though

lacking in aesthetic appeal, the plane was comfortable to use. Compromises of the original Bailey design, such as a pressed-steel lateral adjuster, a pressed-steel yoke, and no frog-adjusting screw, in no way restricted the plane's adjustment capabilities. Note that unlike all of the other planes, the blade-adjustment knob on the Kunz advances the blade with a counterclockwise rotation, which took me a minute to get used to.

The thick blade had been nicely lapped at the factory, which made sharpening a breeze. The chipbreaker had a little burr, but once removed, it fit the blade just right.

In spite of an adjustable frog, the narrowest I was able to close the mouth was about 1/8 in.-a bit wide for optimum smoothing. This plane required little time to set up and performed reasonably well.

ALUE STANLEY NO. 12-904

Price: \$62 Weight: 3 lb. 14 oz. Blade thickness: 0.083 in.

he Stanley is the only **Bailey-style plane that** rightfully can trace its lineage directly to its inventor, Leonard Bailey. But sadly, the once familiar rosewood handles have been replaced with molded plastic and the trademark three-piece lateral adjuster is now one piece of pressed steel. On the plane I looked at, the frogto-body contact was quite rough, and the sole was dished 0.002 in., toe to heel.

Once tuned up, this tool felt similar to the vintage Baileys I've used for years. After I replaced the stock blade with a ¹/₈-in.-thick Lie-Nielsen blade and chipbreaker, this plane produced a consistently thin shaving in dense hardwood.

Even though Stanley's current offering isn't quite at the level of quality it once was, as a general-purpose plane it's still a good product, and it's my choice for best value among the planes reviewed.

amount of working time. The blade thickness matters, too: Thin blades are more likely to chatter and vibrate.

Second, for those planes that incorporate a chipbreaker, a well-made one is essential. Chipbreakers serve two purposes: They hold the thin cutting edge of the blade steady during the cut, and they aggressively deflect the shaving upward, keeping tearout to a minimum. If the chipbreaker is not made or tuned properly, it becomes more of a liability than an asset, creating undue friction and requiring more force to propel the plane. Worse yet, it can snag the shaving, causing it to back up and quickly choke the mouth. The best smoothing planes have well-designed chipbreakers that need little tuning.

Third, you need a plane with a flat sole. A smooth, consistent cut is not possible if the sole is far out of true. To do its best in finishing a surface, a smoothing plane need only take a gossamer-thin shaving of 0.001 in. to 0.002 in. thick. If the sole of the plane is concave from toe to heel by, say, 0.003 in., then the blade needs to be advanced before it even contacts the surface. It's not possible to maintain a consistent, light cut if the sole of the plane is not flat. Again, the best models need little tuning. Other important factors:

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Ease of adjustment—Can the blade be set quickly and does it hold its setting? The blade must seat flat and be held securely to the frog. Are the adjusters where they should be for easy access?

Narrow mouth—For optimum smoothing of figured wood, a narrow mouth should be possible. A narrow mouth closely supports the fiber being cut by the blade, further reducing the potential for torn grain.

Heft, or weight—Within reason, a heavy tool can dampen vibration, making the plane less fettered by changing figure, grain, and knots.

Ergonomics and aesthetics—Is the plane comfortable to use for extended periods of time? Are you content with a functional tool lacking in aesthetic appeal, or do you prefer to outfit your shop with tools steeped in form as well as function?

Bedrock-style planes

The original No. 4 Bedrock-style planes were refined versions of the basic Bailey design (see p. 74). The frog moves forward and backward on a track, which eliminates slop and allows you to adjust the mouth opening without removing the blade assembly. Two pointed draw pins, accessible from the rear of the frog, engage slightly offset conical depressions, allowing the frog to be loosened and tightened from behind. The Clifton and Lie-Nielsen planes both are based on the Bedrock pattern. The Veritas bench plane (far right) is a different animal, drawing on successful elements from diverse makers, as well as some wholly original concepts, such as a frog and handle that are one unit.

Weight: 4 lb. 6 oz. Blade thickness: 0.120 in.

CLIFTON

Price: \$250





Two-piece chipbreaker. The Stay-Set design on the Clifton allows for quick honing of the blade and more support near the cutting edge.

terned this plane after the Bedrock design, so the frog is rock solid and easy to adjust. The blade is 0.12 in. thick and made from hand-forged high-carbon steel. The back of the blade was slightly distorted, and it took me about 20 minutes to lap it flat.



Frog provides plenty of support. The blade and chipbreaker are mounted on a solidly milled frog, which gives better support and adds stability in use.

The two-piece, Stay-Set chipbreaker required no tuning. This unique design has a couple of advantages. First of all, it makes touch-up honing of the blade quick because the front piece lifts right off, exposing the cutting edge and the back of the blade. Also, the chipbreaker adds excellent support and dampening qualities to the blade, especially near the cutting edge where it's most needed.

One disappointment with the Clifton was the sole, which was dished 0.003 in. from toe to heel. In use, the concave sole made for erratic performance, especially in harder woods. Fortunately, this was remedied easily in about 30 minutes by lapping the sole with abrasives on a flat surface. With its sole flattened, I was able to take full advantage of this good-quality tool.

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A new design

LIE-NIELSEN NO. 4

Price: \$300 Weight: 4 lb. 10 oz. Blade thickness: 0.125 in.

ie-Nielsen's bronze smoothing

plane, based on the Bedrock design, was impressive right out of the box. The sole was dead flat, and the blade had been ground accurately and lapped flat at the factory. The chipbreaker required no tuning. After less than five minutes of honing the edge, the plane was in service and cutting perfectly.

Bronze castings dampen vibration and give the plane an unwavering feel, but you also can buy a version made from ductile cast iron for about \$50 less. The cherry tote and knob fit the hand just right. The blade is a full 1/8 in. thick, made from A2 steel that has been cryogenically tempered. It held a keen edge well.

Lie-Nielsen has designed a new chipbreaker that makes things even better. Made from ¹/₈-in.-thick steel, it has a 25° bevel with a 0.015-in. lip on its underside. I was able to move the chipbreaker right up close to the cutting edge, maximizing its utility without increasing any drag on the plane caused by friction. You can buy this plane with a frog milled at 50°. The increased cutting angle can help control torn fibers in highly figured woods.

The bronze Lie-Nielsen smoothing plane is the best overall tool of the bench planes reviewed.

really like this plane for two reasons: Its design is unique and original, and it works well. The Veritas plane is cast from ductile iron and trimmed with hardwood handles and knurled brass knobs. Its blade is a full 1/8 in. thick and made from A2 steel.

Two setscrews center the blade in the mouth opening. Hence, all lateral movement occurs in back. The Norrisstyle adjuster serves double duty, controlling both depth and lateral adjustments. Though not quite at your fingertips, as in the Bedrock design, the adjuster is precise and had very little backlash.

The frog assembly is unique. The handle and frog are one unit, which adds

assembly. This new design adds strength and stability to the handle and frog.



blade. The frog on the Lie-Nielsen plane benefits from the added weight of bronze, which helps dampen vibration. The 1/8-in.-thick blade was lapped flat at the factory and held an edge well.

strength and rigidity to both. The blade bed on the frog is sizable and precisely milled, and it extends through a cutout in the body of the plane, allowing the frog to reach all the way to the sole. This provides maximum support of the blade all the way to its beveled cutting edge. Like the traditional Bedrock design, the frog on the Veritas can be moved forward and back to adjust the mouth opening without having to remove the blade.

All of these design features, fine workmanship and a reasonable price make this a first-rate plane, capable of planing even the most highly figured hardwoods. It ties for best overall with the Lie Nielsen.

The frog and handle become one

OVERALL VERITAS NO. 4

Price: \$175 Weight: 4 lb. 9 oz.

0.127 in.

Blade thickness:

Low-angle planes

Low-angle smoothing planes orient the blade with the bevel up. They do not have a frog and chipbreaker; instead, the blade is supported by a large bed and held in place with a lever cap. Because the bevel faces up, the angle at which you sharpen the blade alters the cutting angle. The standard 25° sharpening angle, plus the 12° bed, produces a 37° cutting angle, ideal for end-grain and cross-grain work. A blade sharpened at 38° produces a 50° cutting angle, perfect for tackling highly figured woods prone to tearout.



Low-angle planes excel at slicing end grain. Dampening the stock with paint thinner will help reduce tearout.

he Veritas low-angle smoother is basically a largehandled block plane cast from durable ductile iron, outfitted with bubinga handles and nicely detailed. The A2-steel blade rests firmly, bevel up, on a precisely milled bed.

The adjustable mouth accommodates coarse or fine cuts. The blade is centered in the mouth by two setscrews, so all lateral movement occurs at the back. It's regulated by a Norris-style adjuster that handles both vertical and lateral adjustment. With its stock blade ground to 25°, the plane excels at end-grain tasks, such as making dovetails flush. By replacing the standard blade with an optional high-angle blade (35°), the plane becomes an outstanding smoother. Its clever design also makes it perfect for use with a shooting board. Overall, the Veritas low-angle smoother is a well-designed, versatile plane at a very reasonable price. LIE-NIELSEN NO. 164 LOW ANGLE

> Price: \$235 Weight: 3 lb. 9 oz. Blade thickness: 0.173 in.

great design and making it even better. The plane is the same size as a No. 4 bench plane. It's cast from ductile iron and fitted with familiar cherry handles. The stout ¾6-in.-thick A2-steel blade is mounted bevel up on a large, precisely milled bed. The mouth can be adjusted easily by loosening the front knob and shifting the cam lever left or right.

The plane's compact size doesn't allow for a depth adjuster behind the blade. As a result, a very unconventional design was adopted where the adjuster sits atop the lever cap. This works well enough, and it puts the knob right at your fingertips, though it does make blade removal slightly more cumbersome. Lateral adjustments

are made by manually shifting the blade back and forth.

ie-Nielsen's low-angle smoother

is patterned after Stanley's No.

164, which was produced for a

quently, originals are rare. Hats

off to Lie-Nielsen for taking a

relatively short period, and conse-

Out of the box, this plane was up to the stringent standards Lie-Nielsen has established. Everything was in perfect order and ready to go after a couple of minutes of honing the blade.

With its blade sharpened at 25°, the Lie-Nielsen excelled at end-grain and cross-grain tasks. With a blade sharpened at 38°, it became a high-angle smoother capable of handling the most challenging woods.



Simple to adjust. The knurled knob on the Lie-Nielsen No. 164 plane serves as the depth-of-cut adjuster.

VERITAS LOW ANGLE

Price: \$160; Weight: 3 lb. 5 oz. Blade thickness: 0.129 in.



Well-designed for use with a shooting board. Dimples in the square body make the Veritas easy to hold while on its side.

Tuning up a bench plane

ake the time to fine-tune your plane if it needs it. Flatten the sole by lapping it with sandpaper on a truly flat surface and tune the chipbreaker.

Sharpening the blade should be the only maintenance the plane requires on a regular basis. I like to put the slightest crown on the edge of the blade. This allows the shaving to feather to nothing at its edges, and prevents hard blade lines in its wake. I crown the blade while honing it by exerting a little extra pressure on the left and right corners while moving it forward and back on the sharpen-ing stones.

Lubricate the plane's sole with paste wax or paraffin, and occasionally add light machine oil to the moving parts. Set the blade for a light cut and take out any backlash from the adjusting knob. Set the mouth narrowly for a fine shaving. Make sure the shaving is even across the width of the blade. Once tuned, your plane rarely should require further attention.



HONE A SLIGHT CROWN ON THE BLADE

By exerting a little extra pressure on each corner, you can eliminate blade marks on the workpiece.

Sources of supply

These planes are available from a variety of sources, but here are some good places to start:

Anant, Groz www.highlandhardware.com

> Lie-Nielsen www.lie-nielsen.com

Veritas www.leevalley.com

Footprint www.sears.com

Clifton www.toolsforwoodworking.com

Kunz www.traditionalwoodworker.com

> Stanley www.woodcraft.com

FLATTEN THE SOLE



Sanding the metal sole is like sanding wood: Work from coarse to fine abrasives on a reliably flat surface to flatten the sole and get rid of burrs.



Smoothing the outside edge of the chipbreaker (above) will help eject shavings effortlessly. Flattening its inside edge (below) will maintain tight, even contact between the chipbreaker and the blade.

