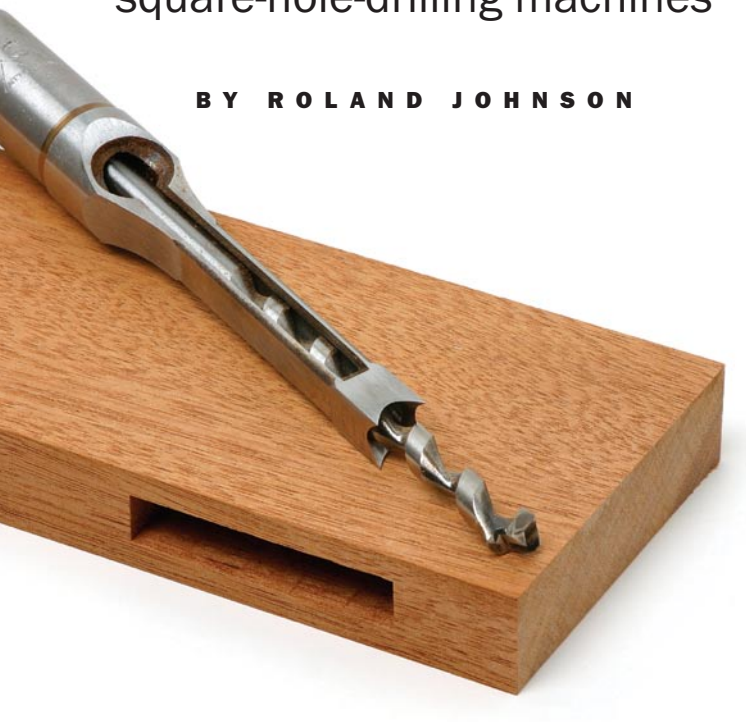
TOOL TEST

Benchtop Mortisers

Make mortises quickly and easily with these compact, square-hole-drilling machines

BY ROLAND JOHNSON



When it comes to cutting mortises, there is no shortage of ways to get the job done. One of the most efficient is to use a mortising machine, also called a hollow-chisel mortiser. Properly set up and operated, it cuts straight, square-sided mortises in relatively short order.

To compare the current benchtop models, I had them shipped to my shop for a close examination. Once all the unpacking was done, eight machines were sitting on my workbench: Bridgewood HM-11, Delta MM300, Delta 14-651, Fisch BTM99-44252, General International 75-050T, Jet JBM-5, Shop Fox W1671, and Woodtek 138-224.

A good fence and hold-down are important

The fence helps support the workpiece during a cut. It adjusts front to back so that you can align the chisel with the mortise location. It also keeps the workpiece square to the machine, so successive cuts will line up with each other. On several of the mortisers, the fence also provides a mounting point for the hold-down.

The fences on the General and Woodtek mortisers were my favorites. I liked the miter-gauge-like bar and slot assembly and the sturdy fence-locking system. If I had to pick between the two fences, I'd go with the General, simply because it's bigger.

Each machine includes a hold-down. As the name suggests, the hold-down prevents the workpiece from lifting off the table as the chisel and bit withdraw from the hole. The Bridgewood, Fisch, Jet, Shop Fox, and both Delta mortisers have a horseshoe-shaped, cast hold-down that slides on a rod mounted to the fence (see top photo, facing page). Once secured, each hold-down did an admirable job holding the workpiece against the table.

The standout hold-downs are the General and the Woodtek. Both machines have a sliding hold-down that was especially easy to adjust. Two cutouts in the middle of the fence allowed the

Photos, except where noted: Thomas G. Begnal; this page (left): Michael Pekovich

hold-down to be lowered below the top of the fence, a feature shared by the Delta 14-651. The cutouts made it easier to secure stock narrower than the fence. Of course, the other machines were able to secure narrow stock, too, but they needed a spacer block made from scrap. In addition, the General and Woodtek are the only benchtop mortisers in this review with a front vise (see bottom photo, below). A vise is a big plus because it keeps the workpiece anchored securely against the fence during a cut.

Only the Delta 14-651, General, Jet, and Woodtek have toolless methods for securing the hold-down to the shaft. The rest of the machines make you hunt down an Allen wrench. I much prefer the toolless approach. The General and Woodtek mortisers are almost entirely toolless, except for a chuck-key needed to install the drill bit. Nearly as user-friendly is the Delta 14-651; it needs only an Allen wrench that's integrated into the chuck-key to secure the chisel. The other machines require at least two tools to make machine adjustments.

Longer lever arms are less tiring to use

When cutting mortises, some machines needed a lot more downward force on the lever-arm handle, even though I used the same chisel and bit to make the cuts. All things being equal, I'd much prefer using a mortiser that cuts with less effort. That distinction was shared by three machines: the General, Shop Fox, and Woodtek. As you might expect, they also have the longest lever arms.

I especially liked how easy it was to adjust the lever arm on the Shop Fox. A spring-loaded cogged collar allowed me to simply push the lever to the side, move the handle to a new position, and let the lever return to its original position, locking the cogs. The two Deltas, the Fisch, and the Jet have spring-loaded cogged levers, which were okay, but it took two hands to operate them.

Cutting depth is affected by machine design and bit choice

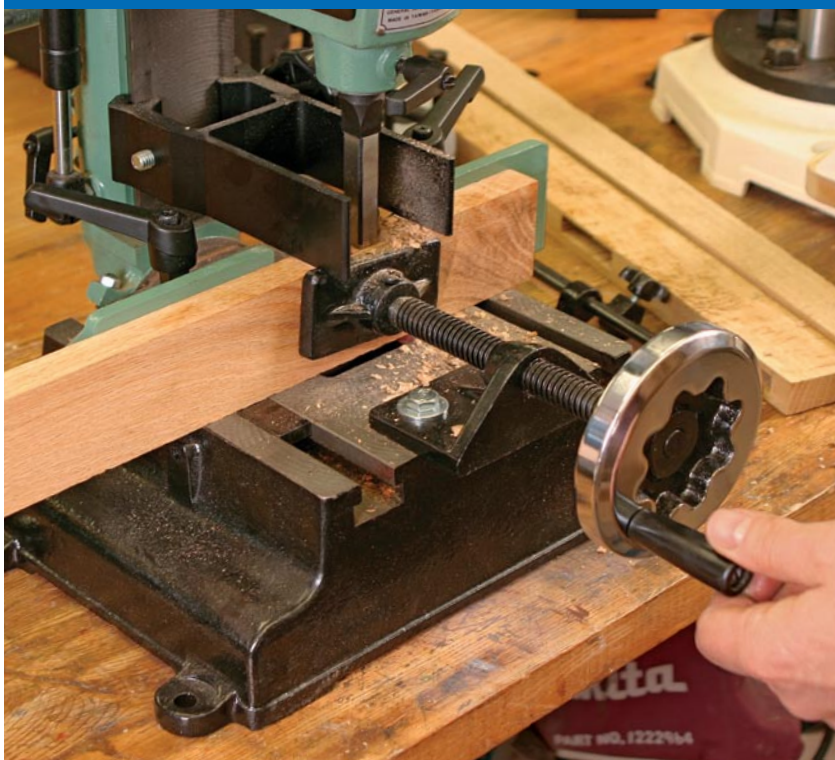
More is better when it comes to the maximum depth of cut a mortiser can produce. However, before you can nail down that number, you must consider a couple of measurements: the plunge depth of the machine and the cutting depth of the chisel. The smaller of the two determines the cutting depth.

The plunge depth is the distance between the tip of the installed chisel (when the motor is raised to its highest point) and the surface of the table. (See the chart on p. 70 for a listing of the plunge depths.) The chisel's cutting depth is the maximum depth you can lower the chisel into the workpiece. If a mortiser has a plunge depth of, say, 4½ in., but the chisel has only a 2-in. cutting depth, the deepest mortise you can cut is 2 in. On the other hand, if the plunge depth is 3½ in., and the chisel can make a 4-in. cut, the maximum mortise depth is 3½ in.

While on the subject of workpiece capacity, one of the mortisers,

Fence options

On most mortising machines, a sliding rod permits in-and-out adjustment of the fence (top). Thanks to a rack-and-pinion gear, the fence on the Delta 14-651 lets you make relatively fine adjustments simply by turning a knob (left). General and Woodtek mortisers have a fence that slides in grooves in the base and a front vise to hold the stock against the fence (bottom).



BENCHTOP MORTISERS

The standouts here are the General and the Woodtek. Both machines have a hold-down that is especially easy to adjust.

MORTISER	BRIDGEWOOD HM-11	DELTA MM300	DELTA 14-651	FISCH BTM99-44252
CONTACT	800-235-2100 www.wilkemachinery.com	800-438-2486 www.deltawoodworking.com	800-438-2486 www.deltawoodworking.com	724-663-9072 www.fisch-woodworking.com
PRICE	$189	$199	$240	$240
MOTOR	7.4 amps, ½ hp 1,750 rpm	5 amps, ½ hp 1,725 rpm	6 amps, ½ hp 1,750 rpm	7 amps, ¾ hp 1,720 rpm
BITS INCLUDED	None	¼ in., 5⁄16 in., ⅜ in., ½ in.	¼ in., 5⁄16 in., ⅜ in., ½ in.	¼ in., ½ in., ⅜ in.
PLUNGE DEPTH	4 in.	4½ in.	4¼ in. (6 in. with riser block)	3½ in.
WEIGHT	53 lb.	52 lb.	68 lb.	64 lb.
BIT CHANGES	Fair	Fair	Very good	Fair
COMMENTS	Capable of cutting long or wide workpieces; second-lowest runout; lowest price; chisels and bits not included.	Capable of cutting long or wide workpieces; second-lowest price.	Tallest fence; toolless hold-down; riser block included; gap at fence bottom allows chips and sawdust to escape; greatest runout.	Microadjustable fence; upper-limit stop on support column.

the Delta 14-651, includes a riser-block kit. When installed, it adds about 1¾ in. to the plunge depth of the mortiser.

The Bridgewood, Delta MM300, Jet, and Shop Fox can mortise a workpiece that's wider or taller than the norm simply by unbolting the vertical-support assembly, turning the top of the machine 180°, and then reattaching it to the base. After that, the base must be unbolted from its stand or platform, then rotated and reattached so the fence extends over the workbench. This takes the table out of play, leaving an unobstructed space under the chisel. Granted, the setup process is a chore, but it's a feature some woodworkers occasionally might put to good use.

All of these machines have depth stops. When properly adjusted, they will stop the chisel when it reaches the desired mortise depth. Considering that the downward pressure applied by the mortiser's lever arm can be substantial, a sturdy stop system is ideal. If the stop slips, you'll end up with a mortise that's deeper than you anticipated. The stops on each mortiser I tested provided adequate holding force.

The ability to secure the bit and chisel easily is important. The drill chuck secures the bit, with a chuck-key providing the tightening force; a setscrew secures the chisel. Any machine that simplifies the procedure of changing the bit and chisel gets bonus points in my book.

When it comes to mounting only the bit, the Delta 14-651 offers the best access to the drill chuck. A clever wraparound door swings to the side, out of the way of the chisel. I much preferred it to the more common drop-down doors that always seemed to be in the way. On the Delta 14-651, the Allen wrench for securing

GENERAL INTERNATIONAL 75-050T	JET JBM-5	SHOP FOX W1671	WOODTEK 138-224
514-326-1161 www.general/ca	800-274-6848 www.jettools.com	800-840-8420 www.ballewtools.com	800-645-9292 www.woodworker.com
$440	$250	$230	$320
3.8 amps, ½ hp 1,720 rpm	6 amps, ½ hp 1,720 rpm	8 amps, ¾ hp 3,450 rpm	12 amps, 1 hp 1,720 rpm
¼ in., 5⁄16 in., ⅜ in., ½ in.	¼ in., ⅜ in., ½ in.	½ in.	None
6 in.	4 in.	9 in.	6 in.
95 lb.	50 lb.	92 lb.	84 lb.
Good	Good	Fair	Good
Includes vise; post tilts to make angled cuts; when moved, fence remains square to chisel; includes end stops; best hold-down (tie with Woodtek); minimal chip jamming during cuts.	Toolless hold-down; capable of cutting long or wide workpieces; lowest runout; lightest mortiser.	Easy-to-adjust lever arm; long lever arm makes for easier cuts; capable of cutting long or wide workpieces; microadjustable fence; greatest plunge depth.	Includes vise; when moved, fence remains square to chisel; includes end stops; best hold-down (tie with General); long lever arm makes for easier cuts; minimal chip jamming during cuts.

the chisel is stored on the chuck-key; that's helpful, but a lever handle would be a lot more convenient. The Jet mortiser, by the way, has a great chuck-key, thanks to a long shank that makes it easy to reach the chuck.

When securing only the chisel, the General and Woodtek mortisers were my hands-down favorites, thanks to nothing more than a generously sized lock handle. But when considering the overall ease of changing both the bit and chisel, I favored the Delta 14-651 because of its chuck-cover design.

Stated horsepower vs. perceived power

A mortiser that constantly bogs down during a cut is frustrating to use. Generally, the problem occurs when chips jam the chisel. The simple solution is to slow down the feed rate. But if you have a mile of mortises to cut, a slow feed rate can make you feel like you're doing 40 mph on a highway when the speed limit is 70.

To compare the power of these mortisers, I made test cuts in red oak and maple using the same ½-in. bit and chisel. All of the machines cut shallow mortises well. But as the cuts got deeper, I began to notice differences. Deeper cuts meant the motor had to push the chips up through more of the chisel and out a relief slot that gradually got smaller. All of the machines accomplished the task, but some needed a slow feed rate to do so.

The performance of the General (½ hp) and Woodtek (1 hp) stood out during this test. Compared to the other machines, aggressive cuts jammed these two mortisers less often.

Most of the mortisers ran at approximately 1,720 rpm, with the

Installing a bit and chisel

The bit must extend past the end of the chisel to allow wood chips to pass between the auger and the mortising chisel. Typically, I offset the parts by 1⁄16 in. to 1⁄8 in.

1. INSERT THE BIT AND CHISEL, AND TIGHTEN THE CHISEL

Place a piece of scrapwood on the table of the mortiser, then slip the bit into the chisel. With the tip of the bit supported by the scrap, slip the shank of the chisel into the mounting bushing, then tighten the shank to allow about 1⁄8-in. space between the shank and the bushing (top photo). To help wood chips eject as easily as possible when you're cutting a mortise, position the slot of the chisel so that it faces either left or right.

2. TIGHTEN THE BIT AND REPOSITION THE CHISEL

Use the lever arm to lower the chisel until it just touches the scrap. Tighten the bit in place (center photo). Loosen the chisel and push it up until the shank butts against the bushing. This positions the end of the bit 1⁄8 in. below the chisel's end. Place the scrap against the fence and slide the fence until the scrap butts against the chisel (right photo). Hold the chisel, loosen the setscrew and rotate the chisel until one face is parallel to the scrap.

exception of the Shop Fox, which ran at 3,450 rpm. I couldn't discern any advantage or disadvantage to the higher speed.

Runout: Less is more

A mortiser with too much runout creates a lot of friction between the outside of the bit and the inside of the chisel. Add that to the heat produced as the bit and chisel work their way through a chunk of hardwood, and you can end up with the steel in both parts turning blue. Blue steel has lost its hardness, which means it won't cut as well.

Typically, runout on a mortiser can be traced to the bit, the chuck, or both. A bit that's not especially straight will create extra heat. So will a perfectly straight bit in a chuck that's less so.

To measure chuck runout on each machine, I first installed a dead-flat drill rod to the chuck. Then, using a dial indicator, I measured the drill rod at a point 5 in. from the chuck. Showing the least amount of runout, by far, was the Jet mortiser, with a measurement of only 0.0008 in. (0.0004 in. each side of the centerline). On the other end of the scale were the Fisch, with 0.0140 in. of runout (0.0070 in. each side), and the Delta 14-651, with 0.0190 in. (0.0095 in. each side). That said, I couldn't conclude that the runout on any of these machines affected their cutting capability in any way.

Choosing a favorite

After spending several weeks with these machines, I generally was impressed with all of them. All of the hold-downs worked pretty effectively. And while none of these mortisers could be considered industrial-strength machines, they performed quite well, as long as the chisels and bits were kept sharp and I watched the feed rate.

I consider the General the best all-around benchtop mortiser. It features a great fence and hold-down; it has a vise and end stops; and it's the only mortiser with a tilting head. On the downside, though, these features come at a price: The General sells for about $440, making it the most expensive pickle in the barrel by nearly 35%.

If you want something a bit more affordable but with a list of solid features, consider the Woodtek mortiser. It has a fence much like the General's, a vise, end stops, toolless adjustment, plus good mechanical advantage and motor power. Although the Woodtek's $320 price tag makes it the second-highest priced in the group, the boatload of features it provides for that price qualified it as the best value.

If your wallet is really squeezed, consider the Delta 14-651. It had a better than average fence and the best bit-changing system of the mortisers tested. □

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