TOOL TEST

1-hp Mortisers

These machines are bigger, beefier and mightier than benchtop models, but are they worth the extra cost?

BY ROLAND JOHNSON

MOVING TABLES

Some mortisers use a single wheel (left) to move the table side to side and forward and backward. Other machines use two wheels to do the job (above). The Fisch (bottom left, facing page) has one wheel in front to move the table sideways and a second wheel in back to move the fence in and out.

When faced with cutting a bunch of mortises, I like to use a mortiser. Properly set up and used, the mortiser, also called a mortising machine or hollow-chisel mortiser, cuts straight, square-sided mortises in relatively short order.

Stand-alone mortisers have been around for nearly a century, but they've always been big, expensive, industrial-quality machines. Relatively recently, though, several manufacturers have introduced more-affordable stand-alone mortisers, with features that make them practical for serious hobbyists and small commercial shops. Compared with the drill-press add-ons and benchtop mortisers currently on the market, these mortisers feature lots of cast-iron tables that move, sturdy hold-downs, 1-hp motors and extralong lever handles.

Curious to find out just how well these newcomers work, I tested seven of them: Bridgewood MS-10 (sold by Wilke Machinery), Fisch FM-99-66252, Geetech CT-920 (sold by Sunhill as the CT-1913), General International 75-075 M-1, Grizzly G8620, Powermatic 719-A and Woodtek 924-020 (sold by Woodworker's Supply).

Tables move in two directions

Each of the seven machines has a sturdy table and an attached fence that allows a workpiece to be clamped securely. But what's special about the table is its ability to move both side to side and forward and backward. That means you don't have to unclamp, reposition and reclamp a workpiece for every cut. You just move the entire table and the attached workpiece.

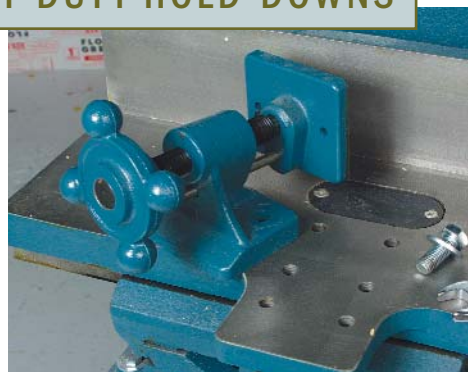
The Bridgewood, Geetech, Grizzly and Woodtek each uses a large handwheel on the front to move the table side to side and forward and backward.

Both the General and Powermatic mortisers have two relatively small handwheels. One wheel provides side-to-side movement, and the other moves the table forward and backward.

Fisch takes a different approach, with the table and fence moving independently of one another. A small handwheel at the front moves the table sideways while one at the back moves the fence forward or backward. But before the table can be moved, the clamp holding the workpiece against the fence must be released. That's a drawback if you're using stops to establish the mortise locations. Should the workpiece move while it's unclamped, the length of the mortise is going to change.

Table stops—With the exception of the Fisch, all of the machines have a system of stops that can limit the side-to-side movement of the table. When making several mortises, these stops ensure that the mor-

HEAVY-DUTY HOLD-DOWNS



The four look-alikes—Bridgewood, Geetech, Grizzly and Woodtek—and the General have sturdy clamps with leadscrews that tilt downward to hold a workpiece against the fence and help keep the workpiece from lifting when removing the chisel from a mortise. Depending on the thickness of the stock, the clamp on each look-alike bolts to the table in any one of three front-to-back positions (above). The Fisch and Powermatic have clamps whose leadscrews are parallel to the table, a system less effective at holding down the workpiece (above left).

FISCH FM-99-66252

Has the largest table area and longest side-to-side table travel, but front-to-back travel is shortest. Slowest motor speed of the bunch—a plus. Angle of lever handle is adjustable. No table stops for setting mortise length. Made in China.

GENERAL 75-075 M-1

The only machine with a tilting head and fence. Effective downward-tilting hold-down. Angle of lever handle is adjustable. Features a smooth-operating gas-strut counterbalance, table lock and workpiece stops. Made in Taiwan.

POWERMATIC 719-A

Has the longest vertical travel and front-to-back table travel. Angle of lever handle is adjustable. Features a smooth-operating gas-strut counterbalance, table lock and workpiece stops. Made in Taiwan.

Photos, except where noted: Tom Begnal; facing page (left): Michael Pekovich

COUNTERBALANCE SYSTEMS

A counterbalance system makes it easier to raise and lower the heavy mortise head. To help counterbalance the weight of the mortise head, the General and Powermatic use a gas strut; the Bridgewood, Geetech, Grizzly and Woodtek use a hanging weight (above left and inset); and the Fisch uses a spring (above right).

tises start and stop at the same place on each workpiece.

Both the General and the Powermatic have stops that slide along a rod at the bottom front of the table. When cutting short mortises, setting these stops can be a chore because the control wheel gets in the way. The General has adequately sized locking knobs, so tightening them took little effort. Powermatic, however, uses knife-blade-style handles that required more effort to tighten securely.

The Bridgewood, Geetech, Grizzly and Woodtek mortisers incorporate a stop rod behind the table. Stop clamps slide along the rod and, once positioned, are secured with a small Allen wrench.

Workpiece stops—Two machines, the General and Powermatic, have a stop system on the table that positions the workpiece. The stops, which can be used on either end of the table, are especially handy for doing multiple parts. They were easy to use and locked securely.

Hold-downs—Each of these machines has a single, viselike clamp mounted to the table that holds the workpiece securely against the fence, preventing it from shifting sideways during a cut. The clamp also helps hold the workpiece against the table. That's important, because if the work lifts up even slightly during a cut, the chisel is likely to bind in the mortise. Then you're faced with the chore of extracting the chisel. Also, when a chisel binds, I've noticed

FOUR LOOK-ALIKES

Except for the color of the paint and some differences between the motors and the on/off switches, four of these mortisers—the Bridgewood, the Geetech, the Grizzly and the Woodtek—look very much alike. Even the owner's manuals are identical.

The biggest difference among the machines is the motor in the Grizzly. As shipped, the Grizzly has a 110-volt motor, a plus if your shop is not wired for 220 volts. The Bridgewood, the Geetech and the Woodtek ship with motors wired for 220 volts.

BRIDGEWOOD
MS-10

GEETECH
CT-920

GRIZZLY
G8620

that the bit gets pushed against the chisel, creating unwanted friction and heat.

The clamp on each of the Bridgewood, Geetech, Grizzly, Woodtek and General has a leadscrew that tilts downward. The Fisch and Powermatic each has a clamp whose leadscrew is parallel to the table.

I prefer the downward-tilting clamps because they more securely hold the workpiece, preventing it from lifting when the chisel rises out of the hole. The parallel clamps don't enjoy that mechanical advantage, so it takes a lot more clamping pressure to keep the workpiece down on the table.

The General has a long, Acme-threaded rod that provides the clamping power. On the machine I tested, the rod tended to bind in the threaded nut in the clamp base as the distance increased between the handwheel and the threaded nut. Releasing a pair of bolts allowed the clamp to tilt to the side when I made cuts with the fence in the tilted position.

The Fisch includes an assortment of clamps. Among them, a tabletop clamp holds the work securely to the fence. But because the fence doesn't travel with the table, you have to release the clamp before the table can be moved.

Long handles provide good leverage

The mortising head of a mortiser is made up of a large casting, an electric motor, a drill chuck and a bit and chisel. The head is raised and lowered with a lever. All of the machines' handles were long enough to provide sufficient leverage.

At first glance, such a long handle might seem like overkill, but that's really not the case. Granted, it doesn't take a lot of force on the handle to feed the drill bit into a workpiece. But to chisel away the waste around a hole, especially when using a big chisel, can take quite a bit of force.

The handles on the Bridgewood, Geetech, Grizzly and Woodtek are pinned in place, so they can't be adjusted. I prefer an adjustable handle, such as that found on the Fisch, General and Powermatic mortisers, because it can be positioned at a comfortable working angle. Unlike the handles on the other mortisers, the Fisch handle attaches to either side of the machine, a plus for southpaws.

The heavy mortising heads on these machines need some sort of counterbalance system. The General and Powermatic use gas-strut counterbalances. The Bridgewood, Geetech, Grizzly and Woodtek incorporate a cable, weight and pulley. And the Fisch uses a simple spring to hold the head at the top of its travel.

The gas-strut system provided a smooth and effective counterbalance. The mortise head stayed put, even when I removed my hand from the handle. The cable, weight and pulley system, while not quite as smooth as the gas strut, was reasonably effective. The spring system on the Fisch worked okay.

Each machine has an adjustment system that allows you to stop the bit and chisel at a preset depth. Setting the stop on each of the machines I tested was a breeze. Simply position a sliding stop rod and lock it in place with a knob.

For improved leverage, the four lookalikes let you mount the head at any one of three vertical positions.

Bit and chisel changes are straightforward

When it's time to change the bit and chisel, you want the process to be as easy as possible. But it can be a challenge. After all, one hand is always occupied supporting

DEPTH STOPS

Stop systems set the depth of cut simply by stopping the travel of the mortise head. The Bridgewood, Geetech, Grizzly, Woodtek and Powermatic use a sliding stop that's secured with a lock knob (left). The General incorporates a threaded rod with lock collars (right).

WOODTEK
924-020

***Adjustable mortise head.** To improve leverage when cutting stock of various thicknesses, the Bridgewood, Geetech, Grizzly and Woodtek each has a mortising head that can be adjusted vertically along the column.*

The General is the only machine that has a tilting fence (above) and mortise head (left), handy features for cutting angled mortises.

the sharp chisel and an equally thorny auger bit. Your other hand has to work to get the bit and chisel mounted. So a clumsy holding system is not appreciated.

All of the mortisers here use a setscrew to secure the bit into a collet located beneath the drill chuck on the mortise head. Most of the machines use a bushing for small-shank bits. The screw passes through a hole in the bushing, allowing direct pressure on the bit shank.

The General is the hands-down favorite here. By adding an adequately sized lock handle to the screw, the bushing and bit can be easily and securely clamped in the collet. All of the other machines use an Allen-head setscrew, so you need to keep an Allen wrench handy.

Runout is reasonable

A mortising bit with a lot of runout (wobble) is going to be a problem. A wobbling bit rubs against the inside of the chisel, creating excess friction and heat between the two parts. And in a procedure that inherently creates plenty of heat, any extra is not going to be welcome. As a matter of fact, too much heat can eventually cook the tips of the bit and chisel.

I used a dial micrometer to measure the runout on all of the machines. And although far from machinist tolerances, all measured in the 0.005-in. to 0.010-in. range, which I believe is reasonable for their intended purpose.

Slow motor speed is better

The drill bit on each of these machines spins at the same speed as the motor. The Bridgewood and Grizzly motors operate at 3,600 rpm, the Fisch at 1,200 rpm and all of the others at 1,720 rpm.

With that in mind, I ended up preferring the models with lower-speed motors for a couple of reasons.

First off, when making a cut, particularly a deep one, the bit and chisel are inevitably

Multico 1-hp mortiser is a benchtop unit

Unlike the stand-alone mortisers reviewed in this article, a typical benchtop mortiser is likely to have an anemic ½-hp motor, a small, fixed table and a hold-down system that leaves a lot to be desired. But one benchtop mortiser on the market isn't typical. The Multico PM 22, made in England and sold in the United States by Garrett Wade, has features closely related to the floor-standing mortisers reviewed here. It includes a 1-hp motor, a good-size table and substantial hold-downs.

It also has some other unique goings-on. The table tilts 45° to the left or right. It even can be positioned vertically for mortising the end of a board. And while the table on the Multico is fixed, the mortise head itself moves. The price is unique, too, about double what you'll pay for other 1-hp mortisers.

The hold-down clamps did an adequate job. But the dog-bone handle on the clamps always seemed to be at odds with the table. I prefer handwheels. The Multico incorporates table stops that screw to the table—a plus. And I like the gas-strut counterbalance system, which made for smooth travel of the lever handle.

The easily adjusted stop rod with a multistep turret stop similar to those found on routers could be a real help when cutting haunched mortises.

The Multico is a good machine; however, for the upscale price, I expected it to be significantly superior to the others in the test.

MORTISER	MOTOR	CHISEL CAPACITY	CHISEL AND BIT SET INCLUDED	TABLE SIZE	TABLE TRAVEL (Front to back, side to side)	VERTICAL SPINDLE TRAVEL	NET WEIGHT
BRIDGEWOOD MS-10 (800) 235-2100 Price: $895	7 amps 220 volts 3,600 rpm	1 in. (softwood) ¾ in. (hardwood)	None	6½ in. by 20 in.	3½ in., 16 in.	5 in.	381 lbs.
FISCH FM-99-66252 (724) 663-9072 Price: $800	8 amps 110 volts 1,200 rpm	1 in. (softwood) ¾ in. (hardwood)	¼ in., 5⁄16 in., ⅜ in., ½ in.	9¾ in. by 25¾ in.	2⅞ in., 21½ in.	7 in.	178 lbs.
GEETECH CT-920 (800) 929-4321 Price: $700	7 amps 220 volts 1,720 rpm	1 in. (softwood) ¾ in. (hardwood)	None	6½ in. by 20 in.	3½ in., 16 in.	5 in.	370 lbs.
GENERAL 75-075 M-1 (514) 326-1161 Price: $958 ($848 with open stand)	10 amps 110 volts 1,720 rpm	1 in. (softwood and hardwood)	¼ in., ⅜ in., ½ in., ¾ in.	7 5⁄16 in. by 18 in.	3 in., 14½ in.	6 in.	244 lbs. (with closed stand)
GRIZZLY G8620 (800) 523-4777 Price: $895	14 amps 110 volts 3,600 rpm	1 in. (softwood) ¾ in. (hardwood)	¼ in., 5⁄16 in., ⅜ in., ½ in.	6½ in. by 20 in.	3½ in., 16 in.	5 in.	364 lbs.
POWERMATIC 719-A (800) 248-0144 Price: $800	11 amps 115 volts 1,720 rpm	1 in. (softwood and hardwood)	None	10 in. by 20 in.	4 in., 16 in.	8 in.	261 lbs.
WOODTEK 924-020 (800) 645-9292 Price: $995	7 amps 220 volts 1,720 rpm	1 in. (softwood) ¾ in. (hardwood)	None	6½ in. by 20 in.	3½ in., 16 in.	5 in.	352 lbs.
MULTICO PM 22 (800) 221-2942 Price: $1,895 (without stand)	5 amps 220 volts 3,300 rpm	⅞ in. (softwood) 11⁄16 in. (hardwood)	None	6½ in. by 23⅜ in.	Mortise head travel: 3⅛ in., 7¾ in.	7¼ in.	175 lbs.

going to deflect some. When that happens, the two parts often start rubbing against each other. Usually the result is a high-pitch squeal, a telltale sign that friction is hard at work. Where there's friction, there's sure to be heat. And the faster motors create more of both.

Also, as you might expect, the slower motors produced chips at a slower rate, which allowed the chips to eject from the hollow chisel slot with little difficulty. But the higher-speed motors made chips a lot faster, and sometimes those chips couldn't eject fast enough from the chisel. When that happened, the chips quickly got jammed in the chisel, causing the bit and chisel to heat up even faster.

Picking a favorite wasn't easy

All things considered, I was pleased to find that all seven of these machines were well made and did a decent job cutting accurate mortises, even when running a ¾-in. bit. That puts them head and shoulders above any of the drill-press add-ons or benchtop mortisers I've used. So it wasn't easy for me to choose a favorite.

Watch it on the web
Take a tour of a 1-hp mortiser at www.finewoodworking.com.

In terms of power, the Fisch had plenty, cutting ¾-in. square holes with little effort. But compared with the other machines I tested, the fence, the table and the hold-down systems were rather awkward to use and less-than-perfectly effective. Also, with no dampening system, the spring return was less than ideal. The farther down the head was moved, the faster it wanted to snap back to the uppermost position.

The Bridgewood, Geetech, Grizzly and Woodtek all did an adequate job boring any size mortise up to ¾ in. Their hold-down systems worked great, the tables moved smoothly, and the stops for the table and mortise head worked satisfactorily. Bit changes were relatively easy, even more so when I switched to a T-handled Allen wrench over the standard-issue L-shaped version. Keep in mind, though, you need a 240-volt circuit to run the Bridgewood, Geetech and Woodtek.

The General and Powermatic were a bit more pleasurable to work with than the others. Bit changing was especially easy on the General, which also has thick, brass wear strips on all of the dovetailed ways found on the table and mortise head. The brass ways provided a smooth sliding action and should help ensure long life for the castings.

Overall, when it comes to cost, quality of construction and ease of use, it's almost a toss-up between the General and the Powermatic for top honors. But I give the nod to the General, mainly because of the added versatility provided by the tilting head and fence. □

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