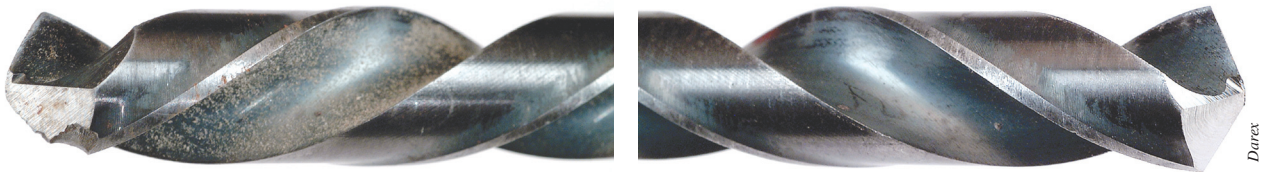


► BY SUSAN WOODS, FEATURES EDITOR

Bring it on Home

-A variety of machines are available for resharpener cutting tools in-house.



A split-point drill before and after being sharpened on the XT3000 Xpandable drill sharpener.

Resharpener cutting tools is something most machine shops can perform in-house, whether they are aware of it or not. Larger manufacturers might prefer to discard tools rather than resharpen them, especially commodity-type tools. Or, they might send them out to a tool resharpener service. But many shops may find value in buying a quality machine and resharpener tools themselves to save time and money.

Depending on what type of sharpening is needed, a variety of precision machines and attachments are available to do the job. The more-sophisticated equipment ranges in price from around \$1,000 to almost \$22,000.

Gundrilling and More

The Accu-Finish Series II is a benchtop, manual machine from Glendo Corp., Emporia, Kan. The Series II is designed around a diamond-plated grinding wheel. A variety of fixtures are available for sharpening gundrills, endmills and inserts.

To hold endmills precisely, collet blocks are available that use any 5C collet, along with an alignment fixture.

The machine is not intended for standard drills, though. "The problem

with sharpening regular drills is there are so many products on the market dedicated just to that," said J.B. Taylor, technical services for Glendo. "You can get a drill sharpener for \$150. We tend to stay in the specialty markets that are not served by other products using low-speed diamond-wheel technologies."



Fixtures are available so the Accu-Finish Series II can sharpen gundrills, endmills and inserts.

The Series II sharpens HSS, PCD and carbide tools. As for endmill sizes, the shank diameter has to fit into a 5C collet. "In most applications, a 3/4"- or 1"-dia. shank is about the biggest you can go," said Taylor. Gundrills can be up to 1" in diameter.

The diamond-plated wheel rotates at about 300 to 400 rpm. "It is a low-speed grinding system because dia-

mond does not need to turn very fast to be effective. Tool heating is never a problem," said Taylor.

A fixture is also available for the Series II to sharpen inserts. While most shops don't want to pay a machinist to stand and sharpen inserts, if it is a type that is not common, sharpening might be worth it.

"Cutoff inserts are quick and easy to touch up," said Taylor. "That fixture is big with the screw machine folks."

Customers for the Series II are bigger shops. "We have a lot of tool and die makers, folks that use special tooling for deep-pocket machining," said Taylor. "We also have established ourselves in industries that use a lot of gundrills."

The 'Master'

Another option is the manual, benchtop CutterMaster from Conquest Industries Inc., Santa Fe Springs, Calif. The machine is mostly used to sharpen endmills. It can also be outfitted for other processes and types of tools, such as reamers, countersinks, router bits and taps when outfitted with the proper accessories.

Accessories include the universal grinding fixture, which allows for "gashing" of endmills, which means rebuilding the end, and the Z-axis attachment for "refluting," which means

bring it on home

sharpening the inside of the flutes once chip clearance has been lost. The pneumatic finger provides the ability to sharpen router bits. It also allows an operator to switch from sharpening the primary angle to the secondary angle on an endmill with the flip of a switch, thus eliminating an additional setup. This ensures repeatability and keeps the total sharpening time short—approximately 1½ minutes per tool.

Tools with shank diameters up to 2" and flute lengths up to 10½" can be sharpened. Depending on the wheel, tools can be HSS or carbide.

Users of the CutterMaster are "mostly companies that don't want to take the time to send tools out and are looking to control quality, delivery and pricing, along with companies that sharpen tooling as a business," said Bret Benson, product manager at Conquest Industries. "We also have had pretty big companies buy them [for] specific tooling or [to] supplement what they farm out."

What is important to look for when purchasing this type of machine? "It should be well built and precise and be able to do the processes that are needed so you are not getting a one-dimensional machine," said Benson. "Many buyers start with a basic machine to do endmills, but then get the accessories that open them up to do other processes and tooling."

Something for Everyone

When it comes to manual, benchtop equipment, Darex Corp., Ashland, Ore., offers two drill sharpeners and one endmill sharpener. Its newest product is a CNC drill sharpener.

The low-end manual model, the V390, is for common drill sizes: diameters from ⅛" to ¾" and point angles from 118° to 140°. The next model is the XT3000 Xpandable, which sharpens drills from ⅛" to 1½" in diameter with point angles from 118° to 150°. It accepts drills 2" long and longer. There are two wheels—one for standard drills and another for split-point drills. Optional attachments include ones for sharpening drill sizes ⅜" to 1", counter-

sinks, step drills and 90° point angles.

The E90 sharpener is for endmills from ⅜" to 1" in diameter that have up to a 6" flute length.

The machines come with CBN wheels for HSS tools, but diamond wheels are available for carbide.

Customers for these machines are job shops, technical schools and re-sharpening businesses.

The Darex XPS-16 CNC drill sharpener allows users to sharpen preprogrammed points or to program custom points. The machine automatically detects drill length, diameter and web thickness, and then sharpens and splits the drill in one continuous process without operator involvement. For carbide, there's an automatic cycle to hone the cutting edge. The machine can do ⅛"- to ⅝"-dia., 2-flute drills with point angles from 118° to 150°. Customers for this machine are larger shops and resharpener businesses—companies that sharpen lots of drills.

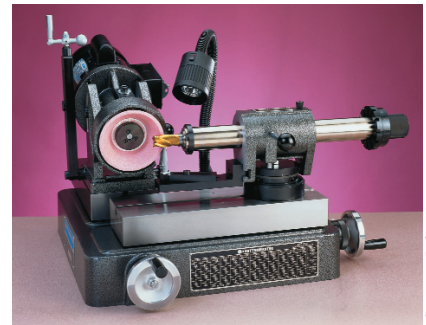
"With a broad range of choices, making sure the sharpener fits the customer's application is the key," said Jim Wiltrout, engineer. "Also, all drills sharpened on a Darex machine meet or exceed ANSI standards for accuracy."

Fix It Up

Rush Machinery Inc., Rushville, N.Y., makes sharpening machines, both benchtop and floor-mounted styles, and grinding fixtures for sharpening tools. The fixtures mount on Rush Machinery's grinding machines and most other tool and cutter grinders.

The company's air-bearing fixture allows for sharpening of endmills, reamers, shell mills and other cutters. Tools, with up to 2"-dia. shanks, are held by a 5C or 5ST collet or extension bushing. The radius-grinding attachment is for grinding the ballnose, corner radius and concave radius shapes on shank-type cutters. The attachment is a tilting compound slide for setting tools to the correct position. The spiral-flute grinding fixture allows for sharpening or modifying the flute, OD and end of a tool. All three can be ground in one setup.

The sharpening machines are for step drills, taps, reamers, countersinks and endmills. They accept tool-shank



Conquest Industries

While the CutterMaster is mostly used to sharpen endmills, it can be outfitted for other processes and types of tools.

diameters ranging from 0.080" to 3⅛". Wheels are available for HSS and carbide tools. Manual and semi-automatic versions are offered.

"With the automatic, you can set the amount you want to grind off, but there is no guarantee you're going to take it all off in one setting," said Bill Freese, sales manager for Rush Machinery. "Generally when you are regrinding an end tool, you are just grinding it back and making the tool shorter. So if the

The following companies contributed to this report:

Accu-Finish/Glendo Corp.

(800) 835-3519
www.accu-finish.com
Information Services #320

Conquest Industries Inc.

(562) 906-1111
www.cuttermaster.com
Information Services #321

Darex Corp.

(541) 488-2224
www.darex.com
Information Services #322

Famco Machine Div.

(262) 654-3516
www.famcomachine.com
Information Services #323

Rush Machinery Inc.

(800) 929-3070
www.rushmachinery.com
Information Services #324

Spangler's Superior Tool & Manufacturing Inc.

(419) 737-2377
www.spanglersuperiortool.com
Information Services #325

The V390 is for drill diameters from ⅝" to ¾" and point angles from 118° to 140°.

tool is dull or chipped, you have to grind it back until you clean up the damage. So it is not always the same amount."

The grinding fixtures fit Rush Machinery machines or a universal-type grinder. "Most of our grinding fixtures are sold to go on somebody else's machine," said Freese.

Customers tend to be shops with 50 or more people. Rush Machinery also sells a lot to companies that specialize in tool regrinding.

Freese believes accuracy and versatility are important in these machines. The machine has to be versatile enough to accommodate a variety of applications—different geometries, point angles and relief angles.

It is also important that the customer actually wants to do the sharpening in-



Darex

house. "Sometimes, management forces it on people who were used to sending them out or throwing them away," Freese said. "They have to become accustomed to doing it in-house."

Standing Alone

Spangler's Superior Tool & Manufacturing Inc., Pioneer, Ohio, offers two manual, stand-alone drill sharpeners for 2-, 3- and 4-flute, spiral or straight drills. A semi-automatic version is also available.

The 302 drill sharpener is for drills ⅝" to 1¼" in diameter with a point angle from 90° to 140° and a maximum drill length of 13½".

The 308 subland/step-angle sharpener and drill pointer is a dual-purpose machine for sharpening points and step angles. It can change from pointing to step sharpening without adding attachments. Diameters can be from ⅝" to 1½", point angles from 90° to 140°,

step angles from 30° to 90° per side and lengths up to 15".

The machines are used mostly for HSS drills. "We can convert the wheel for carbide, but we don't recommend it," said Jim Spangler, president. "It gets too expensive."

Customers for the machines are "everyone from drill manufacturers to manufacturers that need to sharpen their own drills to mom-and-pop re-sharpening houses," Spangler said.

The 302 model comes complete and ready to operate. "It is an economy machine," said Spangler. "It is not as economical as a benchtop machine, but it is more rigid. For what it costs (\$6,995), it is a real workhorse."

Create and Cut

Famco Machine Div., Kenosha, Wis., offers three machines that grind tools from blanks and sharpen them. These are manual machines: Models 265 and 500 are benchtop types and the Model 375 is a pedestal type.

Depending on the model, they can grind and sharpen single- and multiple-

Specifications and costs of tool resharpeners

Company	Model	Power	Measurements	Weight	Cost
Accu-Finish/Glendo	Accu-Finish Series II	115v, 220/240v, 100v	18"x11"x17"	60 lbs.	\$1,699
Conquest Industries	CutterMaster	110v, 220v	30"x28"x29"	180 lbs.	\$3,200 to \$7,900
Darex	V390	115v	12"x11"x9"	24 lbs.	\$998
	XT3000	115v	19"x19"x16"	60 lbs.	\$2,998
	E90	115v	19"x19"x16"	72 lbs.	\$2,998
	XPS-16	115v	22"x26"x12"	115 lbs.	\$16,600
Rush Machinery	Model 132C	115v/230v	27"x28"x18"	240 lbs.	\$6,000
	Model 380	208-230v/460v	50"x48"x54"	720 lbs.	\$22,000 (Grinding fixtures are less than \$2,000)
Spangler's Superior	Model 302	220v/440v (110v special order)	15½"x24"x44"	500 lbs.	\$6,995
Famco Machine	Model 265	115v	18½"x23¼"x16"	150 lbs.	\$8,815
	Model 500	115v	18½"x23¼"x16"	150 lbs.	\$10,670
	Model 375	115v	25"x31"x44"	550 lbs.	\$17,740
			(including pedestal)		

flute tools (straight-flute style) and multiflute helical tools, and grind square, ballnose, conical and corner radius shapes.

The shanks can be from $\frac{1}{10}$ " to $\frac{5}{8}$ " in diameter. Conventional wheels are available for HSS tools and diamond wheels are available for carbide tools.

They are not for sharpening drills, however. "They are not designed for the clearances you need for drills," said Lance Pauley, Famco sales. "You can't create the lands. We tried to develop it years ago, but it just didn't work. Then drill sharpeners came out for \$150, and they can do it twice as fast."

Famco machines are suitable for any size shop, said Pauley.

Pauley noted repeatability and concentricity are critical when sharpening a tool. "It needs to stay true and round, so when you are cutting with a 4-flute endmill, you are cutting with all four flutes and not just two," he said.

Short setup times are also important. "It shouldn't take 6 hours to sharpen an endmill that you could buy for the same price."

Many optional accessories are available for all of the machines mentioned. Cabinets are available to turn the benchtop models into stand-alone units. These cabinets can be used for storage as well. Other accessories include extensions for larger size tools, taper attachments for tools with tapers,

work lamps and diamond dressers for diamond wheels.

Anyone looking to buy one of these machines should know that the best thing about them is they are all easy to use. The required training is minimal. All the machines come with a manual, and some with a video. There is typically no on-site training because none is required. "Anybody with a mechanical or machining background that understands the principles of tools can figure them out with use of the manual," said Pauley.

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