

Get Sharp the Diamond Way

For speed and versatility,
it's hard to beat diamond abrasives

BY BRIAN BOGGS

I've been listening to the debate over the virtues of different sharpening systems since my first days in the shop 31 years ago. The array of opinions broadens with each new stone technology, and I've tried most of them. I still like to explore which system is best for a given job and to retest them over time to see if my conclusions hold true as my techniques and skills evolve. I'm sure I won't end the sharpening debate here. But having multiple options at my disposal, I've watched most of them gather dust as I gravitate to diamond sharpening time after time. There are three main reasons for this.

Speed. Diamond cuts fast and requires virtually no maintenance. My current diamond plate has kept its flatness for five years and still cuts quickly.

Versatility. Diamond seems to sharpen every type of steel well, whereas softer abrasives like ceramic or waterstones don't perform as well on some of the alloys I sharpen, like A-2 steel, or on carbide.

Finally, diamond abrasive is available in paste form in a wide array of grits, allowing me to turn any

DOUBLE-SIDED
DIAMOND STONE
(1,000/300 GRIT)

A SIMPLE SYSTEM

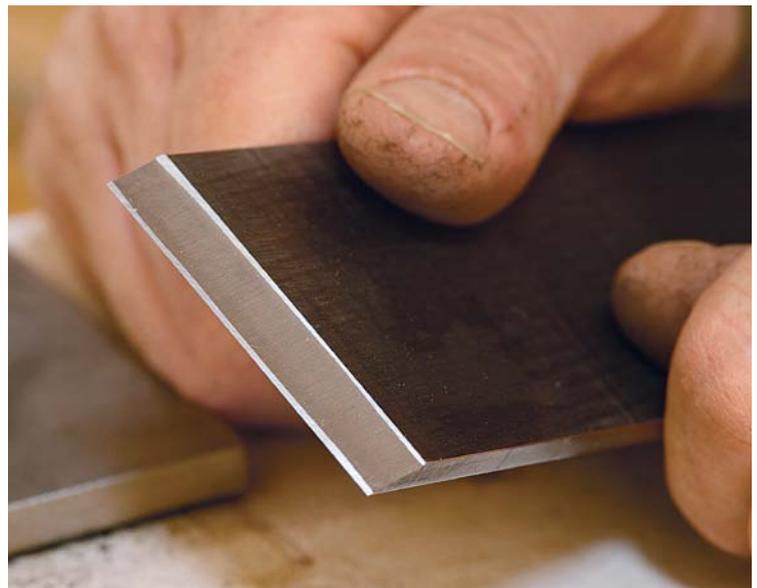
Boggs does the initial honing for his plane blades and bench chisels on a single reversible diamond stone. He then laps the back of the blade and polishes the bevel on a dead-flat steel plate charged with diamond paste.

STEEL LAPPING PLATE

DIAMOND PASTE

START ON THE STONE

A few strokes to create the bevel. After hollow-grinding the tip of the blade, establish the bevel on the 300-grit diamond stone. If you're doing just a touch-up, you can start on the 1,000-grit side of the stone.



Let there be light—and magnification. A bright, even line at the tip the hollow grind indicates accurate sharpening. When sharpening freehand, a parallel line will form at the heel of the grind (above). To monitor progress, a magnifying lamp is very helpful.

piece of steel, aluminum, brass, or wood into a sharpening or honing tool (see “Diamond paste can sharpen any shape,” p. 40).

While diamond stones may cost more to buy than water- or oil stones, the process is quicker and the maintenance is nil. So I save time—and money—each time I sharpen.

Diamond stones and paste both use industrial diamond particles to do the cutting. In diamond stones, the particles are bonded to a metal substrate. In paste, they are suspended in oil. I've used a variety of diamond stones, but have settled on Trend and Eze-Lap stones, which are both excel-

lent. I use paste from Betadiamond.com.

I sharpen in four stages: grinding, truing and sharpening, polishing, and stropping. After grinding the tool on an electric wheel, I create a bevel on a diamond stone. I polish the bevel and the back with diamond paste on a steel lapping plate, and I finish by stropping away the burr on a wooden block charged with paste.

Get sharp on a diamond stone

With a new diamond stone and a good grind on the blade, it should take only a few strokes to create an even bevel at the

tip of the blade. The fewer strokes you take, the less likely you are to round the bevel and waste metal. I sharpen freehand, and I skew the blade as I push forward and back. If you use a honing guide, use your normal approach. Check your progress after the first few strokes. That might be enough to create the bevel.

I typically start on a 300-grit stone and finish with 1,000-grit. But there are exceptions. If I am touching up a tool that doesn't need a lot of work, I go directly to a 1,000-grit stone. Also, newer stones will cut more aggressively, so if the 1,000-grit stone

is new, I often skip the 300. I use a stone from Trend (\$114) that has 300-grit on one side and 1,000-grit on the other.

You can use either oil or water as a lubricant. I use water with a little dish detergent in it. With oil, you need to clean your hands thoroughly after a sharpening session to avoid contaminating the wood.

When I am happy with the bevel's evenness and camber, I take it to a lapping plate charged with diamond paste.

Paste on the plate

For a long time I used an old Arkansas translucent stone for a honing/lapping plate, but I recently upgraded to a steel



POLISH WITH PASTE

A little dab will do. Using a clean applicator, prepare for lapping and honing by spreading a BB-sized amount of diamond paste on a dead-flat lapping plate.



Get the back flat. Boggs flattens the back of his blades on the lapping plate with 4-micron diamond paste and oil. After a new blade's initial flattening, it shouldn't require more maintenance to stay flat than the few strokes used to remove the burr during lapping.



Brighten the bevel. A half-dozen strokes in 3- or 4-micron diamond paste on the lapping plate will bring the bevel to a high polish.

TIP

FLATTEN THE PLATE



To get your lapping plate perfectly flat, rub it on 150-grit wet-or-dry sandpaper adhered to plate glass or a granite slab. Keep the glass or stone covered when not in use and reflaten the lapping plate periodically.

STROP ON A BLOCK



Make a flat strop. Plane the top of a hard-maple scrap to prepare the surface for use as a stropping block.



Final polish and deburring. To cap off his regimen, Boggs strops the blade with 4-micron diamond paste lubricated with oil. The diamond particles become slightly embedded in the wood, producing a finer abrasion.

plate available from Lee Valley for \$25. Regardless of the material your plate is made from, you will need a way to maintain its flatness. With a granite plate or a chunk of plate glass and some 150-grit wet-or-dry paper, you can sand any lapping plate to reasonable flatness. Use water as an adhesive and lubricant.

I tend to do all my lapping and stropping with 3- or 4-micron paste (roughly equivalent to a 4,000-grit stone). But if you use a variety of grits, you'll need a dedicated lapping plate for each grit. Diamond particles get stuck in the pores of the metal plate, so once you've used coarse paste, you have a

coarse lapping plate. If you use a honing guide, be sure to clean the wheels before honing and between grits.

Honing the bevel to a polish can be done quickly using diamond paste and WD-40 or 3-in-one oil on your lapping plate. The paste is also available in a water-soluble version, but I use oil because it seems to cut better that way. You need only a tiny bit of paste—maybe the size of a BB—and a few drops of lubricant. I keep my paste in a jar and scoop out a dab with a fresh-cut piece of wood—or my fingertip, if it's very clean—and smear it around the surface of the plate. It's important not to let the diamond paste

get contaminated, so I keep the jar closed. I also keep the plate covered between uses.

I find a lapping plate and 4-micron paste the best way to flatten the back of a blade. Stones always seem to produce a slight rounding. If the back of the blade has not been worked yet, I will spend a fair amount of time flattening it, but once it's flat I shouldn't ever need to re-flatten it. Simply lapping it to remove the burr keeps the back of the blade nice and flat.

Strop for a high polish

As with any sharpening system, a burr is created as you hone each side of the

Diamond paste can sharpen any shape

You can easily create custom lapping blocks and use them with diamond paste to sharpen blades of nearly any shape. Boggs uses steel pipe, sanded smooth, to sharpen a gouge with a mating curve (right). He turns dowels to match other gouges. To sharpen his concave spokeshave blade (far right), he made a lapping plate by doming the top of a wooden block.





On your back. Using your normal sharpening action, alternate between stropping the bevel and the back.



TIP

THE SECRET TO REMOVING THE BURR

After charging the stropping block with paste, swipe the blade firmly through the end grain of the block 10 times or so to remove any remnants of a burr, creating an edge that takes silky shavings.

blade, bending the fragile edge over to the unsupported side. Even though I go back and forth repeatedly on the lapping plate between the back and the bevel of the blade, I have never succeeded in completely removing the burr this way.

To finish the job—and to give the blade its final polish—I use a wood block charged with diamond paste. The diamond grit embeds itself more deeply into the wood block than in the steel lapping plate, making effectively a finer abrasive; the softer the wood, the deeper the diamond grains are embedded and the finer the abrasion. I typically use a block of hard maple.

Using this as a strop will polish the back and the bevel very well. I take a few strokes using my standard honing technique here. Then, to finally get the burr cleaned up, I push the tip of the blade through the end-grain corner of the block with a little added 4-micron diamond paste (see photo, above right).

If you already have a sharpening system that is working, then just add this wood strop and burr-removing trick and you'll enjoy better performance from your tools. If you aren't enjoying your sharpening tasks now, give diamonds a try. □

Brian Boggs makes chairs in Asheville, N.C.

