

# Notes from the Shopsmith Woodworking Academy

## *Clean Cuts* — PART I

### **Benchstone Basics**

Sharp tools not only make cleaner cuts than dull tools, they're also safer and easier to use, as well. So, how do you keep your tools sharp – I mean *Really Sharp* ? Believe it or not, it really isn't that complicated. So, relax ! You'll find lots of useful information in this column...with loads more to come in the next four issues of Hands-On.

When I was a carpenter's apprentice, I always felt that sharpening my tools was a lot like eating healthy food – I knew it was supposed to be good for me, but I just didn't like the taste of it ! To this day, I still don't like everything that's labeled as "healthy food", but I have discovered that I actually *enjoy* sharpening my tools. Why? Because I finally learned the basics of how to go about getting the sharpest edges with the least amount of work.

### **Why have sharp tools ?**

Sharp tools will save you a lot of time and effort – besides being a source of pride as they peel off those long, paper-thin shavings. Plus, they're a heck of a lot safer to use, as well. That's because you're not having to apply excessive amounts of pressure to make your cuts – a practice that can easily lead to *slips* that will invariably result in serious damage to both your project...and your **self** !

My brother, the engineer, explained it best. "The anatomy of a cutting edge is simple," he said. "A sharp, thin edge of steel offers less bulk as it enters the wood and requires far less pressure to work it into the cut. The less pressure it takes, the more control you have. As a result, a sharp tool is safer because you're not tiring your muscles, so you're less likely to lose control, jamming it out of the wood and into your body somewhere. It's just more likely to *shave* the wood cleanly, rather than split it like a wedge and jump out at you."

### **Getting started**

To sharpen your tools, you'll need *sharpening tools*. Duh ! Pretty obvious, right ? But *which* sharpening tools should you buy ? A grinding wheel ? A Strip Sander ? A set of files ? One of several Benchstones ? They *all* sharpen – that is, they *all* "cut" steel – but which of these is basic to every shop tool kit ?

Most will agree that the common benchstone is probably your best buy. They can be used to sharpen many different kinds of tools, they're relatively inexpensive and they're very safe to use. When I set out to buy one, I found myself intimidated by what seemed like a vast array of benchstone types. But aside from a whole lot of shapes and sizes, there are really only a few basic benchstones.

**Silicon-Carbide:** Classified as man-made oil stones – “oil” because that’s what’s used to keep them clean. They’re also often called “carborundum”, are usually gray in color and are most often sold in double-grit (coarse/fine – 100/280-grit) configurations. The Norton Company sells this kind of stone under the trade name “Crystolon”.

**Aluminum Oxide:** Also called “India” or “Aloxite”, you can purchase these brown colored stones in various double-grit configurations (fine/medium – 280-240-grit) — (medium/coarse – 240-100-grit) — etc. Also man-made stones and classified as “oil” stones, since they’re cleaned with light oil.

**Arkansas:** Made from novaculite quartz found in the Ozark Mountains, “Arkansas” stones are more costly than the previous two previously mentioned categories. One way to save on these is to buy smaller sized stones. Arkansas Stones are cleaned with light oil or kerosene.

— “Hard” Arkansas stones are available in both white and black forms and would be best classified as “Ultra-Fine Grit” stones (900-grit for Black Arkansas and 700-grit for White Arkansas).

— “Soft” Arkansas stones are available in gray and green forms and would be best classified as “Super-Fine Grit” stones (typically 500-grit).

— “Washita” stones are available in a multitude of colors and would be best classified as “Fine Grit” stones (typically around 350-grit).

Arkansas stones don’t cut steel as quickly as some stones, but they produce edges that are amongst the keenest attainable.

**Waterstones:** Made from Aluminum Oxide or Silicon-Carbide abrasives, Waterstones are available in a broad range of grits from 180-grit through 1200-grit (on the American Grit Scale) – which translates to 250-grit to 8000-grit on the Japanese Grit Scale. As their name suggests, Waterstones are cleaned with water.

Many people prefer these stones because they’re among the fastest-cutting of all stones, minimizing the sharpening times for most tools. However, this comes at a price. They must be used carefully, since they’re very soft and easy to gouge.

**Diamond:** Diamond stones are made from finely granulated diamond dust that’s been embedded in a soft metal such as nickel, then fused to a steel plate. They’re available in grits from 250-grit through 1200-grit. Used dry, they require no lubricant and may be cleaned with a damp cloth or a fiber pad and scouring powder.

Diamond stones are available in a wide variety of shapes and sizes and are your best choice for sharpening carbide-edged tools such as router bits, shaper cutters, etc. Diamond stones are very expensive.

**Ceramic:** Ceramic stones are made from Aluminum Oxide abrasives that have been embedded in a ceramic material and fused at very high temperatures. Available in grits from 600-grit to 1200-grit, they’re also used dry and require no lubrication. To clean, just wipe with a damp cloth or scrub with a fiber pad and scouring powder.

Like Diamond stones, they’re also ideal for sharpening carbide tools and are available in a wide range of sizes and shapes.

So, which stone is really best? Which should you own? The answer to this question is simple...each type of stone does what it’s supposed to do best. Silicon-Carbide and Waterstones cut fast and are best for removing deep nicks and gouges from steel tool edges. Coarse India stones can

also accomplish this task and a Fine India stone can also hone an edge quite nicely. A Soft Arkansas stone cuts about the same as a Fine India stone. Hard Arkansas stones are a great choice for honing razor-sharp edges.

It's important to note that oil is used on "Oil Stones", NOT to reduce friction, but to suspend and carry away the "swarf" (a nice little Norwegian word that means "little flakes of metal"). Light machine oil, sewing machine oil, honing oil (which is mostly mineral oil) or kerosene (alone or mixed with any of the above) all work quite well. **Don't** use vegetable oil, as it will clog the stones very quickly.

### **The sharpening process**

For a chisel, plane iron or other bevel-edged cutting tool, start by flattening the back side of the tool on a fairly coarse stone. Be sure to push the tool over *all* of the stone to be sure the stone wears evenly. Turn the edge over, bevel side down and rock it forward till the oil (or water) squishes out from the front lip of the blade – this is typically the correct bevel angle. Using a stiff wrist, move the edge over the full stone's surface to ensure even wear.

The ideal bevel angle for chisels and plane irons is about 30-degrees. Hone an edge too thin and although it becomes very sharp, it also becomes brittle and breaks prematurely during use. Make the bevel angle too steep and you'll get a wedge that will be sharp, but difficult to work with. It's usually best to maintain the bevel that comes on the tool when you buy it...*providing* that angle works well for you. A rule of thumb – the length of the bevel should be about twice the thickness of the blade. Special Bevel Gauges are available for checking the accuracy of your sharpened bevel angles.

Check the squareness of the blade frequently as you sharpen it – it's easy to apply sharpening pressure unevenly and end up with a blade that's not square to the handle (in the case of a chisel). If you must, use a try square or combination square to check this squareness.

Once the edge is properly honed, turn the tool back over to the flat side and with a **few** light strokes, remove the small burr on the back side. Failure to do this means this film if thin steel will simply flop over and cover up the sharp edge. Stroking too many times on the flat side will also ruin the cutting edge.

Here are some simple tips:

- *All* stones (except diamond & ceramic stones) get dips and bumps in their surfaces. Using them evenly helps to delay this problem...but not forever. It's a good idea to periodically re-flatten your stones by rubbing them in a circular motion over a piece of 1/4" plate glass or Formica countertop covered with a slurry of loose grit such as carborundum powder.
- Adjustable Honing Guides can make easy work of maintaining bevel angles when sharpening chisels and plane irons.
- If you're looking for a nice strop to finish-up a razor-sharp edge on your tools, a leather shop or shoe repair service will sell you a good, thick piece of leather for this purpose. To perform this stropping operation, *pull* the bevel across the smooth side of the leather...unlike the *pushing* action used with a benchstone.
- If your silicon-carbide stone becomes clogged with swarf, it will no longer cut steel. Rescue it with an overnight *bath* in kerosene, followed by a brisk rubbing with a stiff brush.
- You can always tell a dedicated woodworker by how little hair they have on the backs of their forearms and hands. That's the favorite place for testing the edges of tools. If it shaves hair, it's sharp !

The methods used by woodworkers for sharpening their tools is a personal statement, as unique as the way they sign their names. Every one of them has strong feelings about the *best* way. Ask them about their opinions of these *best* ways and you'll learn a lot.

Coming up in the Sept/Oct issue — PART TWO — *Sharpening Lathe Chisels*