

# Waterstone Upkeep

*For the sharpest tools, keep stones wet and flatten them often*

by William Tandy Young



*A dedicated sharpening station makes sharpening less of a chore. The convenience of having an area specifically for sharpening will take much of the hassle out of the process. And it doesn't have to be pretty: Scrap materials work just fine.*

*Flat steel starts with flat stones. To get the backs of chisels and plane blades flat, you have to be able to depend on the flatness of your sharpening stones.*

I wouldn't want to work wood without sharp tools, and I sure wouldn't sharpen them with anything but waterstones. Waterstones cut more quickly and efficiently than oilstones, and the finish they leave on a tool's edge is more consistent. The feedback they provide is tactile and immediate. I can feel the waterstones abrading the steel as I hone, and I know what kind of edge I can expect from each stone that I have.

I use the commonly available synthetic waterstones, as opposed to the natural wa-

terstones. The synthetic stones, which make up more than 99% of the waterstones sold in this country, are sold under such names as King, Dragon, Deluxe, Bester, Aquastone and Debado. These stones differ in composition and in the processes by which they're made, but generically speaking, they're all combinations of abrasive minerals (such as aluminum oxide or chromium oxide) in a matrix, or binder, of ceramic material.

Natural stones, besides being generally more expensive (sometimes extravagant-

ly so), also need to be treated differently. Most importantly, perhaps, natural stones should not be stored in water, or they could crack and eventually decompose. So for the purposes of this discussion, I will talk about the synthetic stones that I use and am familiar with.

Waterstones belong in that select group of tools whose actual performance is as good as the claims and fanfare that precede them. If you don't believe that, try talking to a woodworker who's switched from oilstones to waterstones. But waterstones don't work magically; using them effectively requires care and practice.

My first attempts at honing with waterstones were erratic and messy, and I found myself spending more time maintaining the stones than using them. Ultimately, though, I developed a sound technique. Working with waterstones is now a delight; I can sharpen my tools quickly and consistently, which in turn helps make hand-tool use a more fluent and vital practice in my shop. Here's a basic overview of how I have come to integrate the storage and maintenance requirements of synthetic Japanese waterstones into my shop space and routine.

## Getting the stones ready

You don't need a huge collection of waterstones; I more than got by for years with just an 800-grit stone, a 1,200-grit stone and a polishing (6,000 or finer) stone. A nice addition would be a supercoarse stone, about 220- to 400-grit, to speed the preparation of new tools. Many woodworkers also use an intermediate stone, something around 3,000-grit.

Before soaking your stones, label their ends with a permanent marker. This tells you which grit is which at a glance and which face of the stone is which (top and bottom). This is important because you'll want to use each face of a stone for a different purpose. The top faces of coarse and intermediate stones are used for sharpening and the bottom faces for truing the next finer stone. The top face of your polishing stone is for sharpening flat blades; the bottom face is for honing tools that tend to wear a stone unevenly, such as carving tools.

Because I use both faces of each stone, I remove any bases that they are mounted on. The easiest way to do this is to band-saw the bases off with the stone on its long edge and the top face of the stone bearing against a fence. Aim to split the glue line between the stone and the base, but don't actually cut into the stone itself. Once the base is off, you can sand any

traces of glue off the bottom of the stone using coarse sandpaper and a block.

## Storage

I prefer keeping stones together standing on end in a 5-gal. plastic bucket rather than in individual food-storage containers or after-market stone ponds (see the bottom photo below). It would be too much fuss opening and closing the food containers every time I needed a stone, and the ponds just don't contain a sufficient volume of water. If you'll be moving the bucket around your shop, you can put a short length of wide PVC or other plastic pipe in the middle of the bucket to keep the stones from banging against each other

I keep synthetic stones soaking continu-



*Keeping slip stones in a separate smaller bin keeps them safe. Otherwise, the big stones in a bucket would stand a good chance of breaking the slip stones.*



*Salvaged 5-gal. bucket makes a good storage bin for waterstones because it contains plenty of water to keep the stones clean. Place a section of perforated rubber mat at the bottom of the bucket to cushion the stones and to keep them from sitting in a slurry of mud.*

ously in a bucket of water, which I change fairly often. The water you use should be potable tap water at the very least. The tap water in my shop is rather nasty, so I use a canister filter on the faucet to remove any large impurities.

Like wood, the porous surfaces of waterstones will distort with wide variations in their moisture content, so it's best to keep them immersed in water. A stone that's flat when wet may cup or twist slightly as it dries. Likewise, a stone that's flat when dry is unlikely to stay flat when soaked.

Polishing stones (stones in the 6,000- to 8,000-grit range) are an exception to the "keep 'em soaking" rule. You can store a polishing stone either wet or dry. (If kept dry, spritz your polishing stone with water before use.) Either method is fine; just pick one and stick with it. If you keep your polishing stone dry, the small amount of water you use to hone will not measurably affect its flatness.

Some woodworkers keep stones of different grits in separate buckets. These woodworkers are concerned that particles from the coarser stones could scratch the finer stones or become embedded in them and then damage the steel they're sharpening. But I don't separate these stones, and I haven't had a problem. By keeping the bucket full of fresh water, changing the water frequently and swabbing the stones off as I pull them out for use, I've been able to keep the stones clean and uncontaminated by coarser grits.

Excess sharpening slurry, or mud, does settle and collect at the bottom of the bucket. To keep the ends of the stones from standing in this mud, I cut out a section of rubber floor mat and lined the bottom of the bucket with it.

If you use a variety of waterstones from different manufacturers, you may choose to keep different brands soaking in different containers. Until recently, I'd worked mainly with King stones, but lately, I've begun using some of the newer ceramic stones (such as Bester and Aquastone). If kept in the same bucket with King or similar clay stones, the mud from the newer stones will completely envelop the King stones, requiring a good rinse before you can use them. It's also a good idea to keep small stones like slip stones soaking in a separate small tub, so they won't get chipped by the benchstones (see the top photo on this page).

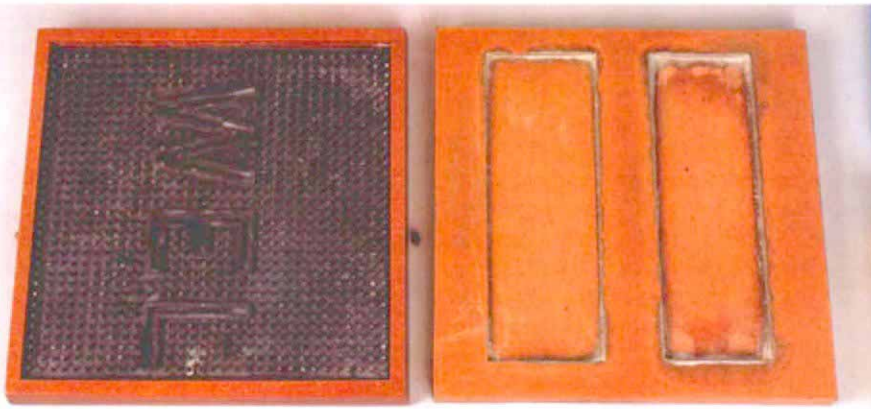
## Making a dedicated space for a sharpening station

You should carefully consider where you plan to do the actual sharpening. A dedicated sharpening station is not an absolute necessity, but it sure helps. I put a simple table together from flakeboard offcuts and dressed up the top with a partial sheet of discount plastic laminate from the local building-materials supplier (see the photo at right on the facing page). The table is stoutly bracketed and screwed to a stud wall for rigidity.

Items I keep at the sharpening station include a squirt bottle, a sponge, a cotton rag, a covered leather strop block and a little container of camellia oil (available from



## STONE-HOLDING SOLUTIONS



*Trays keep stones from sliding around when you're sharpening. The old tray, on the right, is still in service and working fine after a dozen years. Water damage is just beginning to occur. The new tray uses a rubber mat to keep the stones from sliding around. The tray is kept in place with indexing pins set into the table.*



*Tray with a cleat makes a good short-term or job-site sharpening station. The author uses a scrapwood tray with a cleat that can be clamped in a vise.*



The Japan Woodworker, 1731 Clement Ave., Alameda, Calif. 94501; 800-537-7820) to wipe blades with after sharpening and drying them. All but the camellia oil were free or cheap, and they all contribute to making sharpening quicker, cleaner or more effective. The camellia oil is a bit pricey, but a little goes a long way.

To hold the stones in place, I made trays out of water-resistant exterior grade, medium-density fiberboard (MDF). The trays hold the stones firmly, and they contain excess water and sharpening mud for easy

cleanup, I used four or five coats of Waterlox to seal the MDF thoroughly; polyurethane would work as well or better. The trays have slotted backs that register on dowel pins set into the tabletop. The two top pins fit into the back slots, and the two side pins restrict the tray's lateral movement. Another scrap of rubber door mat keeps the stones from sliding around in use (see the top and center photos on this page).

If you don't want to take the time to build a dedicated sharpening station, you could

make a tray with a cleat below to clamp in a vise, which is what I use when working on-site (see the bottom photo at left).

### Flattening stones and keeping them that way

Initial preparation and maintenance involve essentially the same process: abrading any high spots until the stone is perfectly flat. If integrated into your normal sharpening routine, maintenance can become second nature, an automatic reflex that doesn't slow you down.

Because waterstones wear more quickly than oilstones, they need to be checked and trued frequently. I check my stones each time I use them and will typically retrue them several times during the course of preparing a new plane iron.

To flatten my coarsest stone, I use a  $\frac{3}{8}$ -in.-thick sheet of glass, about 4 in. by 10 in., faced on both sides with 80-grit, cloth-backed, industrial wide-belt sandpaper. I went through the scrap bin of a local glass supplier, checking various pieces for flatness with a Starrett straightedge. When I found a good flat piece, I had the glass supplier ease the edges. I applied the paper to the glass with a solvent-based contact cement. Other adhesives like photo mount or water-based contact cements don't hold up in wet use nearly as well as the contact cement.

I use the sandpaper plate to flatten both faces of the coarsest stone in a set (an 800-grit, for example), working slowly and deliberately at my sharpening station (see the top photo on the facing page). I reserve the top face of the coarsest stone for sharpening and use its bottom face for truing both faces of the next finer stone, such as a 1,200-grit. I do this stone-to-stone face-truing right over the bucket, resting the back of my left wrist on my bent left knee to keep one stone stationary while rubbing the other stone around with my right hand (see the center photo on the facing page). To complete the process, I use the bottom of the 1,200-grit to true both faces of my polishing stone.

When the paper on my glass reference plate is worn, usually after a couple of months or more of use, I soak the plate in a bucket of water overnight and peel the paper off in the morning. I clean the contact-cement residue off with lacquer thinner. As soon as the glass is dry, I repaper both sides.

When using the trued bottom face of a coarser stone to flatten the slightly worn top face of a finer stone, the worn stone is usually a bit hollow from tools being sharpened more toward the center of the

stone. You can usually feel the worn stone grab the truing stone a bit as you rub the two together. When both stones slide together smoothly, the finer stone has been re-trued. You can also visually check the surface of most stones as you true them because low spots generally look darker than areas that have just been leveled (see the bottom photo).

Truing a hollowed stone face is a lot easier than flattening a domed, or convex, one. If I have to true a convex face, I do so by rubbing a small coarse stone or bit of coarse, cloth-backed sandpaper on a block over the central area of the stone to take the convex portion down just below flat. Then I flatten the face as usual with the bottom face of a full-size coarser stone.

### Sharpening: putting steel to stone

To get the most out of your tools and to spend more time using them than sharpening them, take extra care in their initial preparation. True your stones often as you flatten the back of edge tools so that when you have achieved an even mirror-like shine on the back of a tool, you'll know that it's truly flat, not that you've worn the stone to conform to any inaccuracies on the tool surface.

A typical sequence in honing a previously well-prepared Western tool would be as follows: Check and re-true, if necessary, the top face of a 1,200-grit stone with the bottom face of an 800-grit stone. Then check the face of the polishing stone with the bottom of the 1,200-grit stone. Put the 1,200-grit and polishing stones (top side face up) in a stone holder on the sharpening bench. Raise some mud on the polishing stone by using a nagura stone, which is sold for that purpose. Or you may have already raised some mud as a result of truing the stone with the back of the 1,200-grit stone. Hone the bevel side of the tool on the 1,200-stone, and check that you've raised a burr. Sponge the tool off, and then hone the bevel side on the polishing stone. You should feel a smaller burr. Finally, polish the back of the tool, and then clean up.

The average time for a honing like this is a minute or two. I spend more time getting a blade in and out of a plane body than I do sharpening it. Once the blade is sharp, I wipe it dry, dry it for a couple of seconds with an electric hair dryer and then oil the business end with a bit of camellia oil. The slight film of lubricant prevents the tool from rusting and helps it cruise through whatever you're chopping or paring. Sharpening, after all, is essentially about reducing friction at the tool's edge.



I sharpen tools one at a time, even when I have a batch to do, finishing each tool completely before beginning the next one, rather than sharpening all the tools on one stone and then letting them stay wet before taking the whole batch to the next stone; on a good piece of high-carbon steel, it doesn't take long before rust begins asserting itself, even if you've wiped off the tool with a rag. □

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## FLATTENING STONES

*Glass plate with sandpaper flattens coarsest stone. A slow, steady motion ensures you don't round over the stone you're flattening. Industrial-weight, cloth-backed, 80-grit sandpaper makes quick work of removing any high spots.*

*Bottom of coarser stone trues both sides of finer stone. To flatten one stone with another, the author holds the finer stone steady in his left hand, resting his arm on his knee, while he moves the coarser stone around on the finer stone until it feels and looks flat.*

*Low spots show up as dark patches when flattening waterstones. Rubbing two stones together will cause the high areas of the finer stone to look shiny and new. This leaves any hollows or depressions looking dark and worn. When no dark spots remain, the stone is re-trued.*

### Waterstone video



William Tandy Young demonstrates his stone-maintenance routine and a typical honing sequence in a 20-minute video tape (VHS only). To order, send \$10 to The Taunton Press, Order #011045, P.O. Box 5506, Newtown, Conn. 06470, or call (203) 426-8171.