



Waterstones

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The use of natural stones for shaping and sharpening tools goes back to the beginning of mankind. Today craftsmen still rely on these traditional abrasive materials to hone their modern edge tools. Both waterstones and oilstones are mined and sold throughout the world as premium sharpening materials. But as the veins of this material slowly run out, the availability of natural stones decreases, and the cost per stone increases accordingly (some natural polishing stones in Japan cost over \$2,000.00!). To combat this inevitable supply-and-demand trend, man-made synthetic abrasives have been developed with the help of modern technology. Duplicating and advancing upon the benefits of natural stones, the new synthetic abrasives give craftsmen superb sharpening performance with consistent grain/ grit composition, sizing availability, and at a reasonable cost. Woodcraft's waterstones are made from the finest materials. A variety of grits are available (coarse to fine) to handle the shaping, sharpening, and final honing of woodworking tools. When comparing stone grits, it should be noted that the American grading system varies from the Japanese system. Both are based on measuring the abrasive particles in microns, a unit of length equal to one millionth of a meter. The final scale used to equate a measurement is different however. For example, a stone averaging particle sizes of 37 microns would be classified as about 320 grit on the American scale, 500 grit on the Japanese. The chart to the right gives an approximation of this relationship.



Figure 1

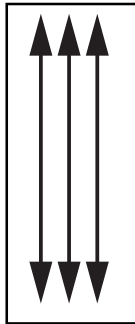


Figure 2

stone's porosity. A fine polishing stone will take 15 or 20 minutes to soak, while a coarse stone will become saturated more quickly. During the honing process, the stone's should also be kept moist.

As the tool edge is sharpened small metal particles combine with loosened grit particles and the water wash to form a "slurry". This fine compound actually hastens the sharpening process and helps produce a finer finished cutting edge. For fine polishing waterstones (6,000-8,000 grit), the formation of the slurry may be accelerated by the use of a Nagura stone. This special dressing stone is simply rubbed over the surface of the honing stone to wear off abrasive particles and suspend them in the water lubricant prior to actual honing. The Nagura can also be used to flatten small areas or rub out embedded metal particles that may appear in a stone. When honing is complete, the slurry is simply cleaned from the surface to assure a fresh, sharp start for your next honing. Tools being should also be wiped free of stone residue when changing stones. This ensures that the finer stones are not contaminated with coarser grit particles. A used waterstone should be flushed clean with water or left suspended in a water bath for a time to allow any leftover particulate matter to work free. Waterstones do not require storage in water, and care should be taken not to leave a waterstone in water when freezing conditions may occur.

Waterstones sharpen with great efficiency because of the nature of their construction. They are made by fusing together very sharp abrasive particles (aluminum oxide, silicon carbide) with a porous bonding agent designed to break down with use. As the "dull" grit particles are broken off, fresh sharp particle edges are exposed to the edge being honed. For this reason, waterstones will wear more quickly than other stones, but they are easily dressed to restore their original flatness or to shape them to a desired contour. This makes them ideal for sharpening all types of flat and curved cutting tools.

Using Waterstones

The techniques for sharpening and honing with a waterstone are essentially the same as those used with oilstones. To allow the surface to wear evenly, your honing motion should utilize as much of the surface as possible. While the pattern will differ according to the tool, a figure eight motion proves efficient (Figure 1). This is especially important for very narrow tool edges, which can quickly wear a groove in a stone's surface. The motion for chisel or plane blades, the width of which approaches the width of the stone's surface, should utilize the full length of the stone (Figure 2). As with oilstones, a liquid must used during honing to facilitate the process and to keep the stone from "loading" (having the pores clogged with metal particles). Waterstones should be soaked in a shallow container of water for a few minutes prior to use. The time required will vary based on the

Surface flattening

To flatten a worn waterstone, simply place a sheet of wet-dry sandpaper on a flat surface such as a bench top, piece of glass, tablesaw top, or flat cement floor. Use a paper with a grit appropriate to the stone being restored: a coarse water stone of 250 to 1,000 grit should be resurfaced with 180 to 220 grit paper; a polishing stone of 8,000 grit should be worked with at least a 400 grit paper. Rub the stone on the sanding surface in a circular motion to wear down tile high spots, taking care to keep the stone flat during resurfacing so the body of the stone wears evenly. A

water wash can be utilized) or the paper can be used dry. In order to maintain their grit integrity, waterstones of different grits should not be flattened on the same piece of paper. An increasingly popular method for resurfacing medium to coarse waterstones, especially larger stones such as those on the motorized grinders, is with the use of diamond honing stones. Diamond stones remain truly flat with use, providing a conveniently flat, abrasive surface to work waterstones in place. For owners of motorized waterstone grinders, a diamond stone may simply be held atop a rotating waterstone on the grinder to quickly renew a level honing surface. Again, use an appropriate diamond grit on your waterstone, as diamonds are extremely aggressive. A coarse diamond stone will chew up an 8,000 grit polishing stone in a hurry! When resurfacing is completed be certain to flush the slurry off both the waterstone and diamond stone.

Sharpening Stone Comparison

Stone Type	US Grit	Japan
Compares approximate abrasive grit relationships of American and Japanese Stones.		
Coarse Crystolon,		
Coarse India	100	150
Medium Crystolon	180	240
Medium India,		
Coarse Diamond	240	280
Fine Crystolon,		
Fine India	280	360
Medium Diamond	320	500
Washita	350	600
Soft Arkansas	500	1000
		1200
Hard WhiteArkansas,		
Fine Diamond,		
Medium Black Ceramic700	2000	