

## **Sharpening Chisels & Plane Irons**

Good morning, now a word of warning, don't answer the phone when Gary calls. Gary called Wednesday night and now I stand before you doing this presentation and demo.

### **Topics to be presented**

We are going to start with the abrasives that are commonly available to woodworkers. The abrasive you select determines how fast the process is and how sharp and durable the sharpened edge is.

The abrasives can be fabricated into oilstones, water stones, and sheets such as sand paper and as a grinding wheel. All methods work well, but you should select the system that works best for you and your budget.

We will end with a demonstration of all methods.

### **Abrasives used**

Five different abrasives are commonly used in general woodworking for sharpening tools. These are silicon dioxide, aluminum oxide, silicon carbide, garnet and diamond.

#### **Silicon Dioxide**

Silicon dioxide also known as quartz, novaculite, flint and sandstone and have been used for thousands of years. Some of the very best natural oilstone sharpening stones are still quarried in Arkansas. As far as I know natural sandstone grinding wheels are no longer manufactured. 100 years ago, one would go to Berea, Ohio to get the best sandstone grinding wheel made.

In general silicon dioxide is slow cutting. Using a Hard Arkansas oilstone will produce a sharp durable edge.

#### **Aluminum Oxide**

Aluminum oxide is both mined and manufactured and has completely replaced silicon dioxide for industrial use. Depending on manufacturing process color may be gray, white and pink. At the jewelry store it is known as sapphire. It is the abrasive in manmade water stones. In very fine grits it will produce a sharp durable edge.

#### **Silicon Carbide**

Silicon Carbide is a manmade abrasive with several trademark names. It is fast cutting because instead of grain edges dulling they fracture creating new sharp edges with a new smaller grit size. Good for fast metal removal but not the best edge. Best used to remove nicks, pits, and flatten back of plane irons and chisels.

## **Garnet**

Garnet is only available as free grit and as inexpensive sandpaper. Can be used when using sheet material on a flat surface.

DO NOT RECOMMEND FOR SHAPENING TOOLS.

## **Diamond**

Diamonds are very hard and very rapid cutting and expensive. Best used for flattening oil and water stones. Also good for flattening back of plane irons and chisels.

Does not produce a good sharp edge. Nice to have but not required.

## **Oil Stones**

The most traditional oilstones are natural stones made from Novaculite. These natural stones are quarried in Arkansas and processed to make what we call Arkansas Stones. These natural oilstones can produce a polished edge, but tend to cut more slowly than man-made stones.

Either oil or water must be used to carry away the swarf produced while sharpening. When a stone gets plugged with swarf it quits cutting. Using a light oil like kerosene works much better than lubricating oil.

These stones hold shape better than water stones but must be flattened when they become dished.

Natural stones, aluminum oxide, silicon carbide and diamond stones are the most common types available.

## **Water Stones**

All man made water stones are made using aluminum oxide. Instead of a vitrified bond used in oilstones, water stones use a silicate bond, which is softer and weaker. This promotes faster cutting because the old abrasive material breaks away and is replaced with fresh sharp material.

The other obvious advantage is the use of water rather than oil to remove the swarf from the stone.

The softness that promotes fast cutting also wears the stone down more quickly. This tends to wear the stone unevenly, which requires flattening to bring the stone back into shape. Can be flattened using a diamond stone or smooth concrete block.

## **Sheet Material on flat surface**

This method allows the greatest choice of abrasive materials to be used.

Offers the lowest entry cost.

Flat surface can be flat surface on a machine, glass plate, surface plate, etc.

Stick sheet of abrasive to flat surface with lubricate or tape.

Grits below 80 not useful.

Grits up to 12,000 available at auto finishing suppliers.

If you use Wet/Dry media you can use either oil or water lubricant. Otherwise use dry or with oil.

I generally use wet/dry silicon carbide paper when using this method.

### **Powered water stone**

If you are going to use a powered device for sharpening, a powered water stone eliminated most dangers associated with bench grinders.

A slow speed wet grinder of any type is better than a bench grinder.

A bench grinder removes metal too fast and can easily over heat the tool being ground.

The grinder being demonstrated today has a 1000 grit wheel.

The biggest limitation is only one wheel can be mounted at a time.

### **Demonstrations**

The first step in sharpening a plane iron or chisel is to flatten the back. This may take a lot of effort and time but fortunately only needs to be done once. One can cheat a bit with a plane iron but not a chisel. Personally I will use a diamond stone or powered water stone to do the initial flattening. The hollowed backs on Japanese irons and chisels make the step almost a pleasure. The back should be brought to a polished surface before stopping.

I always use a roller guide, it makes the process almost fool proof, and I need that help.

Always maintain the angle of the original bevel.

Always remove nicks with a course stone, and then using finer stones bring to a polished state before stopping. When it reflects light like a mirror and you can no longer see the edge you are done.