

Basic Sharpening Principles For Chisels & Plane Irons Meeting Presentation on August 18, 2007

There is no absolute “right way” to sharpen.

- Different methods are preferred by different people.

New tools are almost never sharp when you buy them.

- The back is not flat.
- The metal is not smooth.

The Importance of a Sharp Tool

- Sharp tools are more enjoyable to use because they produce better work and make it more likely to have a successful experience.
- Sharp tools allow you to work safer by requiring less effort, which creates less opportunity for a mishap.
- Sharp tools save time and money by performing right the first time, which reduces wasted materials, extra effort, and frustration.

Keep it simple

- The people who make and sell honing gadgets tend to turn sharpening into a kind of voodoo.
- Find a system that works for you and keep it simple.

What is “sharp”?

- The sharp edge on a chisel or plane iron is the result of two **smooth** metal surfaces meeting at an angle of usually 25 to 35 degrees.

How smooth is “smooth”?

- The smoother the surface, the sharper the edge, and the longer it will stay sharp.
- When you rub a blade on a sharpening stone, the abrasive grit scores the metal, wearing it away and leaving tiny grooves in the metal.
- Magnified, the grooves would be like a steak knife, though irregular and random, so the meeting surfaces would look like the teeth on a saw.
- This is good for cutting tomatoes, but when pushed through wood, the fine teeth quickly break off, leaving the edge flat and thick, or blunt.
- The fine sharpening stone wears the grooves down to mirror smoothness, so there are no teeth – the edge is continuous.
- The result is two polished faces meet in a very sharp edge which won't break down in the wood.

The Three Surfaces

- On woodworking chisels and plane irons, the sharp edge arises at the intersection of two surfaces: the **back face** of the blade and the **sharpening bevel**.
 - These two surfaces usually meet at the angle of 25 to 35 degrees.
- Because of the way tools are sharpened, you are also concerned with a third surface, the **grinding bevel**.
 - The grinding bevel speeds up the act of sharpening, but is not part of the sharp edge itself.

The Flat Back Face

- When you buy a new woodworking tool, the first thing to do is prepare the back face of the blade.
- It has to be dead flat, right up to the cutting edge, and it has to be smooth as a mirror.
- **Get the back flat once and you will never have to do it again.**

The Grinding Bevel

- The grinding bevel has only one purpose: it makes sharpening faster.
- Without a grinding bevel you would have to remove ten times as much metal at each sharpening, which would take too long and wear out your sharpening stones.
- The grinding bevel is usually at 25 degrees to the back face on both chisels and plane irons.
- Depending on sharpening system used, this may or may not be a “**hollow grind**”.

The Sharpening Bevel

- The sharpening bevel should be flat and polished mirror bright.
- It has the same qualities as the back face of the blade, because the sharp edge arises at the intersection of the two faces.
- The sharpening bevel and the back face meet at an angle of about 30 degrees on chisels and 35 degrees on plane irons.
- The sharpening bevel is steeper than the grinding angle, though the precise number of degrees is a matter of **personal preference**.

Microbevel – a misleading term

- The term “microbevel” has crept into magazine articles and books about sharpening.
- The term has been used in a variety of confusing ways.
- There is only the sharpening bevel and the grinding bevel, and the one that cuts is the sharpening bevel, no matter how “micro” you make it.

Sharpening Process

Check for Damage and Square

- If needed, grind the end of the blade to remove any damage, making sure end is 90 degrees square with sides.
- Be careful not to overheat and discolor metal.

Flatten the Back

- For newly acquired tools, flatten the back (this step is not necessary if you have flattened the back previously).
- It's only necessary to flatten an inch or less nearest the end of the blade.

Grinding Bevel

- For newly acquired tools, or for tools where much of the grinding bevel has been removed from repeated sharpening, create a grinding bevel.
- Grinding bevel usually between 18 and 25 degrees.
- Not necessary to grind to a "feather" edge.
- Be careful not to overheat and discolor metal.

Sharpening Bevel

- Produce a sharpening bevel on preferred sharpening system.
- Sharpening bevel should be 5 to 10 degrees higher than grinding bevel.

Ian Kirby's Recommended Angles

- **Chisels**
 - Grinding bevel can be as low as 18 degrees for bench chisels
 - Ian prefers 18 to 20 degrees
 - Mortise chisel should be ground at 25 degrees
 - Sharpening bevel should be 5 to 10 degrees higher than grinding bevel
- **Plane Irons**
 - Grinding bevel of 25 degrees
 - Sharpening angle of 35 degrees
 - For hard exotic woods increase sharpening bevel to 40 degrees

References:

"Sharpening with Waterstones – A Perfect Edge in 60 Seconds"

By Ian Kirby,
Cambium Press.

"How to Sharpen Every Blade in Your Woodshop"

By Don Geary,
Betterway Books