



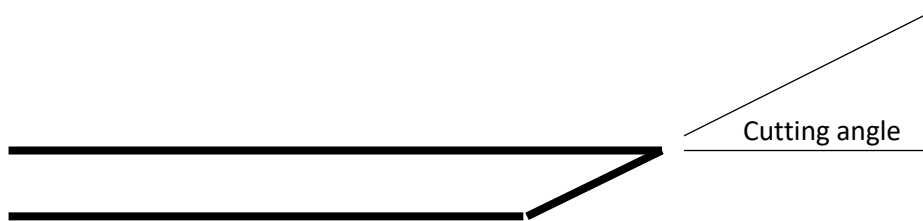
CORNWALL WOODCARVERS

Tool Care

An introduction into the care and maintenance of chisel by John Samworth.

To keep your tools in tip top condition is the crucial to your success as a wood carver. Anybody who tries to carve with blunt or damaged tools will always struggle and risk being put-off for life. In this article we shall consider various techniques of keeping your tools in good condition.

Each chisel has a bevel (sometimes two) which governs the angle the chisel need to be held in order to cut. The bigger this angle the higher you will need to hold the chisel handle off the wood and the more force is necessary to make a cut. For soft woods such as pine, jelutong and lime the ideal angle is 22.5° . This sound surprisingly precise but it is half of 45° . The cutting edge of this blade is extremely thin and delicate, thinner than tin foil, but it is strong enough to cut these timbers. For harder timbers such as oak, beech and maple a cutting angle this acute will be damaged and dulled very quickly. Use a larger cutting angle about 26° .



To check the cutting angle, hold the chisel flat against a piece of wood, gently lift the handle increasing the cutting angle while gently pushing the chisel forward. The point at which it bites (starts to cut the wood) will denote the cutting angle. Become familiar with this angle, being able to reproduce this angle will make sharpening the chisels much quicker and easier.

There are many words used to describe sharpening tools, I categorise them into one of three groups: removing lots of metal; removing a little metal and stropping. I shall refer to these as grinding, honing and stropping respectively.

Grinding

Step 1

Remove lots of metal
Uses course grits

To apply a cutting edge shape,
repair the cutting edge or alter the
cutting angle

Electronic or manual
Repeat: Infrequent, to be avoided

Honing

Step 2

Remove a small amount of metal
Uses fine grits

Apply a sharp finish to the cutting
edge

Manual to avoid heat damage
Repeat: after grinding or when
stropping is not enough

Stropping

Step 3

Does not remove metal
Uses leather, buffers and polishing
compound

Straighten the fine edge, make
very sharp, polish the edge,
remover scratch marks, clean the
edge

Electronic or manual
Repeat: Regular every 15 minutes
or so. More frequent when very
sharp edges must be maintained



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Grinding, removing lots of metal is physically demanding work, even with electric grinders and I recommend avoiding this if at all possible. Purchase tools which are correctly shaped and already sharp; it is worth the extra cost. There will still be occasions when you will need to grind your chisel e.g. repairing a damaged cutting edge or resetting the cutting angle when swapping between a soft wood project and a hard wood project.



Bench grinders are a popular choice for removing lots of metal quickly. **BUT** use with caution. There are not only safety procedures to follow but practical considerations to consider.

For safety: always follow the manufactures instructions.

In the photograph the dust guard over the buffer on the left has been removed to make the picture clearer. Replace dust guard before use. This grinder has been set with a belt sander on the right. The aluminium oxide belts are tough enough to cut through the tool steel. There is a hand rest in front of the belt for safe operation. The belt direction is in the original factory set with the belt and buffer rotating forwards and down. Any debris will fly down towards your feet not into your face. On the buffer it is important that the chisels point downwards and do not become caught in the buffing pad. **Warning:** using mechanical grinders generates lots of heat, sufficient to turn the cutting edge blue and ruin the tempering of the steel.



I prefer the belt grinder to the traditional disc or stone grinders because the point of contact with the tool is flat and leaves a flat grind, where stones leave a convex grind. Belts are available in course (80 grit), medium (120 grit) and fine (180 grit).



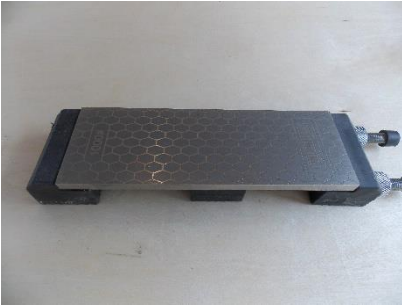
Grind stones, preferred by others, also come in a selection of grits. Here are course and medium grit stones. The finer the stone the quicker it will over heat the cutting edge. Do not use coolants around electric machines unless they have been specifically designed for the purpose. Water cooled grind stones are available but more expensive.



Traditional oil or wet stones can be used, without risk of overheating. They are available in many forms and qualities and of different level of abrasiveness, however for grinding this is slow.

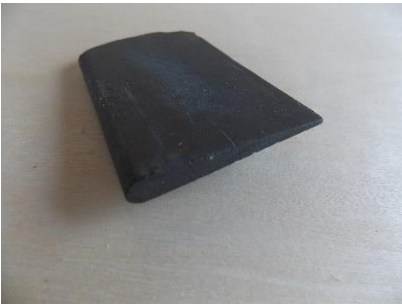


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A recent addition to the tool kit are these diamond stones. Better ones, as here, are made from solid slabs of stainless steel with diamond abrasives electrostatically attached to the surface. There are several grit options. Here it is 1000g (fine) with 400g (medium) on the reverse side. They are used like a traditional oil stone. I recommend using some thin oil or WD40 as lubricant. When working on small chisels, avoid the type of diamond stones with holes. The edge of the blade will catch in the holes and spoil.

These traditional and diamond stones are excellent for honing the cutting edge. I do not recommend the electronic grinders for this.



Whenever grinding or honing a chisel, or creating an inside bevel, the inside of the chisel's sweep will become rough or burred. These slip stones are designed for use inside the sweep. They are available in various widths, sweeps and grits.



An inexpensive and versatile option for honing is to use a homemade paddle with 'wet and dry' abrasive paper. Here 1200g the abrasive paper has been glue to a piece of plywood, some people prefer to use sellotape, making the paper easier to replace. This abrasive paper can be applied to a piece of dowel as a substitute to a slip stone.



The buffer pad, with a little honing compound, can be used to strop the edge. Here hold the chisel against the rotation buffer pad while pointing down. On another machine: check the direction of rotation before use.

Apply light pressure. Can be used on inside and outside faces.



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A leather stop can be use just as effectively.



The inside of the chisel requires stropping too. Here strips of wood have been shaped to fit the sweeps of the chisels, then a piece of leather glued to the surface.

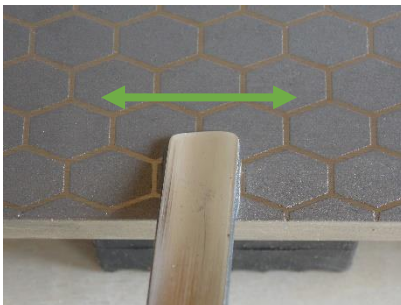
The nearest profile is for a 60° parting chisel.

Inexpensive alternative is to use MDF and honing compound.

The honing and stropping routine.



Start by examining your cutting edge. This one is fine and good to use, but I shall use it for demonstration. Note the shine of the stropped (polished) edge. By keeping the edge polished as here not only cuts cleanly but has the following invaluable use.



The green arrows indicate the direction of movement and is perpendicular to that of honing a standard carpenter's straight, flat chisel. Most guides advise the carver to place the chisel flat on the stone and increase the angle until they can find the angle of the bevel. This is much easier said than done! If the bevel in rounded or narrow this become extremely difficult. My technique is to hold the chisel and the comfortable cutting angle which you will use the chisel. If this is not the correct angle, then you ought to grind and hone the chisel to this angle. The honing movement is simple to rub from side to side

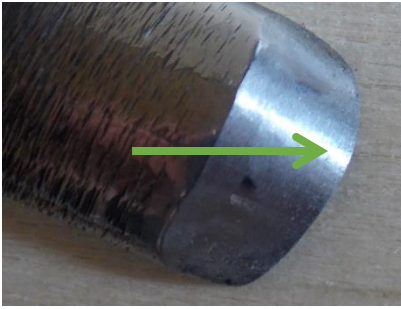
(as per the arrow direction) and add a slight rotation to fit the sweep. Shallow for No.3 or 4 increasing steadily up to No. 11. Only a couple to rubs is necessary to mark the back, then check.



Only a couple of quick rubs will scratch the polish off the surface and prove where the honing has been applied. Here (done deliberately for demonstration) the honing was away from the cutting edge and therefore quite ineffective. Correct this by lifting the handle slightly and repeat. Those with sharp eyes will also note that by rotating the chisel as I rubbed I covered the entire width of the chisel but I was a little light on the bottom edge. More practice needed!



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Raise the handle to place the honing on the cutting edge and repeat the above step. Just 4 or 5 rubs in each direction and the honing is complete. The polish is replaced by the dull honed finish right to and across the cutting edge.



Start the stropping by using the same technique mastered in the honing stage, but on a leather strop. You can check the progress by examining the polish. 8 to 10 rubs in both directions with a rotation should be sufficient to bring the polish finish back.



Finish by pulling the chisel over the profile strop to polish the inside edge.

Next article: The choice and use of mallets.

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