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Convex Profiling and Sharpening by Hand HOW-TO

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- Skills and guides - DIY, Making things. -



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Description :

How to sharpen well and profile a blade using hand tools..

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A follow-up to [Sharpening and Reprofileing Traditional Convex Blades](#) and [Sharpening experiences](#).

Purpose

The purpose is to give a proper convex profile to a high quality chopping blade, therefore making it more efficient, or to correct little forging defects found on forged blades. Not to forget having a razor edge.

Tools involved

1. 250/1000 [1] Japanese waterstone.
2. 1 page of 600 [2] water sand paper
3. 1 page of 800 water sand paper
4. 1 page of 1000 water sand paper
5. A leather strop and green paste
6. A cloth to wipe the blade from time to time.
7. White (fine) polish compound (optional)
8. A few drops of phosphoric acid (or rust remover), to remove the rusty color due to prolonged water contact, before the polish.

Proximity of water is necessary.

Steps

Drop the stone in water for 10mn.

Meanwhile, the first thing to do is obviously to protect the handle: wrap it in cloth, and use some tape, at the base of the handle to hold it. This will avoid scratches.

250

Here the blade has started being ground with the 250. Notice the deep scratches. In the sink is a small Norton waterstone, of a grit slightly finer. I have once reprofiled a blade with only this tool and some sand paper!



We start with the 250 grit from the Japanese stone

What we want to do at this stage is to correct the profile defects in the 3 dimensions:

1. warped laterally (going to one side)
2. warped vertically (doing local "recurves & bumps")
3. thinner or thicker at certain places.
4. wrong angles.

At this point, we do not care about sharpening, but about the angle of the edge from 1 mm behind the edge to 2 cm behind.

So the only way to get things back is to cross the strokes: almost perpendicular (for the lateral waves) and parallel to the edge length (for the "recurves & bumps", I also stoke the stone along it's length to do this), until bumps have gone, then 45 deg. to the tip and 45 to the handle (thus crossing at a 90 angle to homogeinize). I generally go edge biting the stone, and not going away.

I try to use the largest (and consistant in speed and presure) movement as possible, meaning that unless I have decided a specific spot does not need any removal at all, because it is a low, or that there is a high spot that needs more, I move all the blade length on the stone. Checking and understanding the exact place spots for removal is the key. it needs frequent checkings, under different angles. Low light, rather than roof light helps seeing the surface, so, look at the blade using "razor" glazes, in the prolongation of the surface. And also you want to keep some tempered

Convex Profiling and Sharpening by Hand HOW-TO

steel on this blade. So a lateral wave can be adjusted by removing steel on the wave, but also just before and after the wave, on the other side.

Whether you pull or push is to your convenience (and own coordination of movement). I stroke against the edge, but the right side, I pull, and the left I push (right hand on the handle, left on the tip). But I sometimes change hands and it reverses the movement. I do not like circular movement, because it is too localized on the stone and blade, and it does not leave a clear trace on the whole length. A clear trace (because the grind is at an angle with the previous ones) allows you to see the profile better, and if you change angles often, you can see if the trace is straight (or rather harmoniously curved) along the edge, which provided you kept the angle, is a sign that the profile is constant at a specific distance from the edge. If not straight (or a nice curve), you know where you need to insist.

Do not hesitate to wet the stone often, but leave the slurry on it, it makes it more efficient. Turn the stone from time to time, use it in its length, laterally, in its width, to avoid hollowing it in one place only.

The blade awfully scratched, but coming more symmetrical. Of course you have to think where to remove metal, and take care about angles. It goes fast



Imagine you are bringing a square profile to a convex blade profile, you can do this by taking successive bevels out of the square, and bevels on top of the bevels, etc, until the size of the bevel is so little that the form is convex, and that a bevel is just a tangent. When you reprofile a convex blade on a flat stone, you need to imagine these angles, that will help you. So when you reprofile, you start as if everything was wrong, and check the big first angles, just behind the edge. if they are wrong somewhere, you make them right, and then draw small bevels on top, etc...

Convex Profiling and Sharpening by Hand HOW-TO

Take care that the 250 stone removes a lot very quickly, so only use it at the edge angle if you want to remove a chip, and never go over the edge angle, because this will bring lots of work to correct, if it can be corrected! (the edge angle is obviously fixed by you 22-25 deg. for the golok)

Once the profile seem correct (or better) you can try to hold the blade in one hand, the stone in the other one, and grind on the whole length without applying pressure, to even the scratches, it will be less work for the next stage:

1000

Once we have successfully reprofiled, it is time to sharpen and start polishing.

Use water to remove all traces from the previous grit, clean the blade, and the stone, and underlying surfaces. You do not want the big grit to contaminate the finer one!

With this stone, we go down to the very edge, and also try to remove all scratches from the bigger grit.

Check often, as it is finer, you may notice spots you missed with the big grit, if it is the case, swap to big grit and back until you are satisfied.

The heavy profiling is finished, I switched to the 1000 side of the stone. It is slow to remove the scratches of the previous grit, the best would be an intermediary grit.



Be patient, this takes time, verify you have removed the scratches from the bigger grit.

Work the edge carefully to flow with the rest of the profile.

Convex Profiling and Sharpening by Hand HOW-TO

Mmmm, I though the image would be better! The work with 1000 grit continues.



More 1000 removal, see the slurry on the blade, in the stone recipient and in the sink?



sand paper

Clean the blade, and let's use the water sand-paper. the sand paper is for the polish only, so we pass it with the thumb (or better a rubber pad) from handle to tip. Pass close to the edge, take care not to cut yourself.

Try to get a uniform aspect. It is good when you almost only see the scratches from the sand paper.

Time to switch to sand paper... 600



Then switch to 800, processe the same way. Then 1000.

Instead of 1000, you can buy one on these gum rust erasers, gum loaded with abrasive particles, and use it to leave a "hand rubbed finish"

Sand paper : 1000 It is looking fine now, no? I could leave it like this.



Strop

Before doing this, apply a bit of rust remover at the base of the handle, and rinse and dry it well.

If you are really into performances: load the strop with green paste and use it on the blade from back to edge (else you cut the strop). Insist on the edge, but polish the whole blade. This takes some time too. Cross the strokes and apply pressure to go faster.

Ok let's have it shine: the strop and green paste. I use the strop on the whole blade. The traces are green paste.



Optionally, finish with a finer polishing paste, and a cloth.

Here it is, very shiny no?



Yes it is fine, it reflects the trees



This is a 2 hours work in total. It is not perfect, because some defects you only notice after the polishing. Nevertheless, it is a much better profile than what I started with. The edge is razor sharp, and scaring, specially for a blade of this size!. This is the first step. The second session, next time a good sharpening is needed will bring it closer to perfection. There are still some scatches left, which could have disapeared with another 1/2 to 1 hour work.

Warning Sharpening 14" of steel to razor sharpness is dangerous. Accept the risks, protect yourself, or just renounce.

[1] Japanese grit

[2] US grit