Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by wickededge - 21 Aug 2012 15:14

This was a really fun study to do on the Wicked Edge knife sharpener - I started by sharpening a blade to a near perfect finish using kangaroo strops and .25 micron diamond spray. Here is the edge just after the strops:

There are a few small scratches but the bevel is very smooth overall.

Then I created a micro-bevel 5 degrees wider with a set of .6 micron Micro-Fine ceramic stones that I had not previously lapped. Here is the image:

It's easy to see the micro-bevel and the way the metal has been grooved.

Next I used a set of .6 micron ceramic stones that I had lapped to create another micro-bevel at 4 degrees lower, so just in between the stropped edge and the unlapped micro-bevel. Here is that picture:

You can see the smooth section where the blade had been stropped, then 1 degree wider there is a small band where the lapped .6 micron ceramic stones were used and then a wider band where the unlapped .6 micron ceramics stones were used. Clearly, lapping the stones will yield a more refined edge. I'll try another experiment soon where I use each stone on the very edge. I find the ridge of metal being pushed toward the stropped portion interesting. I was using edge leading strokes, pushing into the blade and clearly pushing metal back up the bevel toward the stropped area.

You can check out the zoomed images on my here on my **blog** .

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by wickededge - 21 Aug 2012 15:16

Next, I smoothed out the bevels again in one long gentle arc from 22 degrees out to 30 degrees using the kangaroo strops and .25 micron diamond spray. Here is the progression up the bevel as I increased the angle:

to be continued...

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by wickededge - 21 Aug 2012 15:19

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as promised:

After progressing up the angles again over the 8 degrees in 2 degree increments, I had a nice smooth bevel:

Since I had a nice smooth curve, I figured I could do a few light strokes with the .6 micron Micro-Fine ceramic stones right in the middle of the curvature and get a great contrast between the scratches and the smooth surface:

This is just 5 **very** gentle edge-leading strokes. Again, it's easy to see the metal being pushed toward the shoulder of the bevel down in the bottom of the image.

Again, please see my **blog** for zoomed images. Once there, click on any image to see it in its original resolution.

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by BobNash - 21 Aug 2012 15:37

Very cool Clay -

Did you lap the ceramic with the 1000 grit diamond?

Interesting to see the metal being pushed - now that I've seen it I guess I should have thought it would do that since we can push up a burr....

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by wickededge - 21 Aug 2012 15:44

I lapped them with all stones 100#-1000# and the with a 3um bench stone I have though I doubt is was necessary to go that far.

BobNash wrote:

Very cool Clay -

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Interesting to see the metal being pushed - now that I've seen it I guess I should have thought it would do that since we can push up a burr....

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by wickededge - 21 Aug 2012 15:49

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I also learned something about the kangaroo strops in this series (besides the fact that they ROCK!) which is that they work best when they're slightly damp. I had loaded them heavily a few blades back and they were long since dry. Powder was coming off so I decided to moisten them to make the most of the diamonds still on the leather. I used rubbing alcohol since that's what I had on my desk. The difference was dramatic; they worked much better after I sprayed them. Later, I sprayed them with some more .25um spray which worked just as well. In the past, I had thought that I needed to recharge them almost every time - I realize now that the benefit I was getting from the recharges was mostly from the moisture.

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by wickededge - 21 Aug 2012 17:02

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I added a scale to the last image as requested earlier by Lagrangian:

Zoom

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by mark76 - 21 Aug 2012 17:09

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Wow, these are incredible pictures! Your new microscope is definitely paying off 😀. And that convex edge looks terrific. It must be unearthly sharp. I will nominate the third-last picture for the best edge ever to be put on a photograph.

In the second-last picture, where you applied the .6 micron stones to the smooth edge, did you use the lapped ones or the unlapped ones? On the picture their coarseness seems to be a bit in the middle, compared to the lapped and the unlapped ones before. (The scratches left by the lapped stone in the third picture seem very tiny.)

And have you ever compared the kangaroo strops to the nanocloth strops? The kangaroo strops leave a very smooth edge, but the nanocloth strops should not be abrasive by themselves either. And they have the advantage that they do not (should not) round the edge.

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by wickededge - 21 Aug 2012 17:35

Thanks Mark!
I used the lapped stone in the 2nd to last and last images. I'm not sure why it looks a little coarser there, maybe because it's biting into the curvature instead of a flat bevel...

I will be doing a lot of studies with the nano-cloth thanks to a generous contribution by Ken Schwartz. He sent me a bunch of pieces for testing. Right now I'm preparing the samples to get them super smooth so each grit I test will start on a clean slate. It should be a very exciting study!

mark76 wrote:

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Re: Lapped and Un-lapped Micro-Fine Stones at 800x

Posted by mark76 - 21 Aug 2012 18:10

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wickededge wrote:

I will be doing a lot of studies with the nano-cloth thanks to a generous contribution by Ken Schwartz. He

sent me a bunch of pieces for testing. Right now I'm preparing the samples to get them super smooth so each grit I test will start on a clean slate. It should be a very exciting study!

It definitely should be. My experience thus far is that the nanocloth strops indeed do not have any abrasive powers by their own. (That probably also means they don't really help much in smoothing out existing scratches, but I wonder how important that is for edge sharpness - smoothing out these scratches looks great, though, of course.)

The main question I have is how to use the nanocloth optimally effect for material removal. Even if I spray them literally with diamond spray, they seem to remove relatively little material and not have a great impact on edge sharpness. Maybe I'm doing something wrong (like not making them wet - I too noticed some dust) or maybe I use too little pressure.

I'm very curious about your findings.

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