The edge of the edge... What is really going on?

Posted by razoredgeknives - 25 Jun 2012 23:00

So there is a thought out there among those of us who love the science behind the edge of a blade that says that the more refined you make an edge the thinner it becomes (i. E. If you were to use a metallograph and take a microscopic picture of the edge looking directly down on it). I don't have the article here, but this has been done on a commercial razor and it measures around 4um if my memory serves me correctly. But I know that several people can attest to the fact that they can get hair whittling edges at relatively low grit.... So what are your thoughts on this? Does the edge get thinner the more you refine it? Does that make it weaker for edc use?

I'll try to find that article and post it soon... It's an interesting read

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Re: The edge of the edge... What is really going on?

Posted by BassLakeDan - 25 Jun 2012 23:16

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razoredgeknives wrote:

..But I know that several people can attest to the fact that they can get hair whittling edges at relatively low grit....Does the edge get thinner the more you refine it?.. ..)

These are very interesting questions... If i had not had such a bear of a day, and now am falling asleep at the keyboard I would do a paragraph or two here.. But just want to say, in short that razor blades (the commercial ones you buy at the drug store) are a classic example that proves beyond a doubt that you can get very sharp using heavy grits.. even surgical blades can be the result of heavy grit honing. here is an interesting pdf file form one of the leading surgical blade manufaturers. Note the first picture in the upper left hand corner (the article is about something different than what we are discussing here, but that is no matter,.. it is the micrograph that is of interest..) note the crappy grit job on the "pristine blade"

www.swann-morton.com/pdfs/blade_care.pdf For some reason I have lost the 'imbed' tool bar here on the forum or I would put a link to one of my own micrographs of a commercial double edge razor blade that also proves the point (no pun intended..) I will try to return here tomorrow when wider awake and edit this post with better links... well humm, just tried again, can't get the link bar back, do here is the direct address for the other micrograph (the black line at the top of this razor blade is vapor deposited Boron Nitride, a common "commercial razor blade trick"
www.dans-photos.com/knives/Mystery_Edge.jpg

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Re: The edge of the edge... What is really going on?

Posted by MODiFiEDZ - 26 Jun 2012 04:51

What kind of low grits are we talking about? I think I got a hair whittling edge at 2000 or 2500 grit sandpaper taped to my Wicked Edge stones at 15 degrees.

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Re: The edge of the edge... What is really going on?

Posted by razoredgeknives - 26 Jun 2012 07:39

Here you go..... Download this pdf, read it, and look at the pictures. Quite interesting don't you think?

www.bushcraftuk.com/downloads/pdf/knifeshexps.pdf

Langrangian also touched on it in the spyderco forums but the author of the thread could not get his microscope to cooperate

www.spyderco.com/forums/showthread.php?5...Under-the-microscope

So I guess what I'm saying, is that is sharpening (after a point) 2D or 1D? Do you both polish out the micro serrations and thin the edge or just remove the micro serrations?

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Re: The edge of the edge... What is really going on?

Posted by razoredgeknives - 26 Jun 2012 08:52

MODiFiEDZ wrote:

What kind of low grits are we talking about? I think I got a hair whittling edge at 2000 or 2500 grit sandpaper taped to my Wicked Edge stones at 15 degrees.

Well, for instance.... A few people on the below thread say they can get hair whittling edges at most grits.....

www.bladeforums.com/forums/showthread.ph...litting-edges-for-me

Also, if I'm reading this right, it seems as if the author is saying you can get a hht-3 edge off of a 325 grit DMT stone.....

www.coticule.be/hanging-hair-test.html

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Re: The edge of the edge... What is really going on?
Posted by wickededge - 26 Jun 2012 09:55

I'm hoping to be able to add in to this conversation later this week once my 2000x scope comes in. I've got a bunch of sample blades I'm preparing today and hope to be able to photograph them edge on and from the side. I'm very curious about the interplay of grit and angle as it relates to the question of edge thinning as well as durability.

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Re: The edge of the edge... What is really going on?
Posted by BassLakeDan - 26 Jun 2012 10:44

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razoredgeknives wrote:

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I'll try to find that article and post it soon... It's an interesting read

Ah Ha, the Professors papers resurfaces again ! Very Good ! I have quoted many times in other thread topics his classic definition of "sharpness"..

The problem is that "sharpness" is a very very hard word to get your mind and hands around. Definition of "apex sharpness" get confused in these discussions with "cutting ability" which are two different things.

As long as the edge is "straight" (whatever that means) and is vanishingly small, you have "sharpness:.

Josh, I know you are a member of the team that is working with me on the sharp-tester-jig. I am soon going to send out a condensation of many emails from that group, where these definitions are discussed

in some detail: Here is an example quote that might be of interest:

As to the geometry of the bevel effecting how sharp the edge is,.. In theory, any angle from 1 degree to 179 degree could be made to be very sharp if the that point is vanishingly fine and straight. Of course, as a practical reality the real limits of angle are much less. (this is) point sharpness.., (this is not) "cutting ability" which is a whole 'nother world. If we were using the jig to test any form of "cutting ability" then we have to do something very different than thin tape that is pressed, without lateral movement, across the blade edge. ..... The mind exercise to visualize (testing sharpness or to answer the question 'how sharps is it?') .. can be stated as this: If the blade edge was infinitely sharp and the (material to be cut) was infinitely thin we would have a metric result of 100 on the scale, Anything that makes the blade edge less than that, or anything that makes the tape less than that lowers the number. The two factors interact. What we want to test and quantify is the deterioration of the blade as it goes less than infinitly sharp, we could do that if we had the right infinitely thin test tape, but we don't.

So, Josh, before you start discussing grit in relation to sharpness, you best get a firm definition of sharpness that you can center the discussion around. Most people do not understand, but 'whittling hair' is not a test of sharpness, it is a test the cutting ability of a blade to whittle hair. This is a subtle but very important distinction.

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Re: The edge of the edge... What is really going on?
Posted by BenBurke - 26 Jun 2012 13:18

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About what level of refinement is good for EDC use I've read 600 grit stones will get you a sharp edge that lasts. See here: bit.ly/MYhQsY

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Re: The edge of the edge... What is really going on?
Posted by razoredgeknives - 26 Jun 2012 14:13

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Clay, can't wait for the microscope pictures and the coming experiments!

Dan, thanks for the post. Those are excellent points... But in this thread I am not really trying to define "sharp" per say, just see if anyone can offer any experience or data to show that the edge of the edge does indeed get thinner with higher levels of polish or grit. And if so, will this degrade the edge quicker due to it being weaker?

Ben, thanks for that thread! That is very relavent to what we are discussing... It would appear that a

course edge (i. E. Maybe 1k diamond) is more durable in the long run. Hopefully after Dan gets this "tester" done we can have some standards with which to test different kinds of edges!

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Re: The edge of the edge... What is really going on?

Posted by BassLakeDan - 26 Jun 2012 21:30

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BenBurke wrote:

About what level of refinement is good for EDC use I've read 600 grit stones will get you a sharp edge that lasts. See here: bit.ly/MYhQsY

Ben,

Thanks for the link. These discussion from 2005 that Cliff participated in are a very valuable reference, and should be required reading. It was around that time that Cliff coined the phrase "cutting ability" and spelled out in an understandable way several important concepts.

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