Any truth to this theory? Thoughts?

Posted by razoredgeknives - 05 Dec 2012 14:55

Saw this posted on another forum about what happens on a microscopic level at the edge of the edge...

" The edge after use when blunted is heavily stressed, deformed, cracked, etc. though on a micro-level. If the knife is sharpened without removing this damaged steel it will collapse again very quickly just like when you fold a piece of paper it folds again along that same line very easily.

To destress the edge make a very light cut into the brown rods before you start to sharpen as if you were trying to saw the rod in half. But use very light force, not even the weight of the knife, just 10 grams or so. You are just trying to grind off the weakened metal, if you press hard you will take off too much, this doesn't harm the knife but does make sharpening more work than necessary.

...the most likely reason for [an] edge blunting very quickly is that the stropping is stressing it by mechanically deforming the edge back and forth. The edge should be clean and sharp right off the stones.

There are a few concerns [when sharpening a knife if you are having edge retention issues]:

-why is the edge burring significantly, it should not (major issue)

-bending the edge back and forth stresses the steel under the break

-it is very time inefficient and adds unnecessary complexity

-it creates more work having to apex again

The first two are fairly major, the last two are fairly minor.

This edge easily cuts cardboard for an extreme length of time :

This edge is slightly finer, easily shaves and cuts cardboard for an extreme length of time :

so what do you guys think? Clay, maybe you have seen something of this occurring when you look at edges through your microscope? I remember seeing some images you did a while back that did appear as if the edge did this to some extent - you could see "stress" lines. This was done (if my memory serves correctly) when you have a damaged/rolled edge and then steel it to realign it.

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Re: Any truth to this theory? Thoughts?

Posted by wickededge - 05 Dec 2012 15:36

Interesting stuff. I haven't seen the fatigue and micro-fractures with my scopes; I think I'd need something with much higher resolution. I believe in the theory of bending a wire edge back and forth and that it will harden with each bend and become more brittle. How that extends into the stock of the blade I don't know. Most often what I see with the wire edge and alternating strokes is eventual erosion as the grits get finer though I sometimes still observe a wire edge with the 10k Choseras and the Micro-Fine ceramics. It's possible that the strops can bend the wire edge back and forth a few times before ripping it off, but i don't see a lot of evidence of that (yet).

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Re: Any truth to this theory? Thoughts?

Posted by razoredgeknives - 05 Dec 2012 17:22

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well, I think what he is saying is that you need to remove the burr with the last stone used and not remove the burr with a strop. This will making a your edge stronger and sharper.... Not sure about filing off your edge with a few light passes before sharpening though... Thiswas oposted by Cliff Stamp btw in case you were wondering

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Re: Any truth to this theory? Thoughts?

Posted by cbwx34 - 06 Dec 2012 08:36

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razoredgeknives wrote:

well, I think what he is saying is that you need to remove the burr with the last stone used and not remove the burr with a strop. This will making a your edge stronger and sharper.... Not sure about filing off your edge with a few light passes before sharpening though... Thiswas oposted by Cliff Stamp btw in case you were wondering

Not sure I agree (or disagree) with the reasoning, simply because I don't really know, but I do agree with the two statements. Cutting into a stone on a knife that needs sharpening (not just a touchup) results in a cleaner edge to start with. Harrelson Stanley (the US Shapton distributor), also does it after grinding in a new edge on a coarse stone, before moving to the finer stones, and I've found that to be effective as well. I don't always do it... but I've found on knives that I have issues with, like a burr that I can't get rid of, or a knife I just can't seem to get a stable edge on, it's a good tactic to use On the WE, you can take a ceramic, and very lightly run it down the edge. I also agree that a burr should be removed on the stone, not with the strop. The strop's purpose should be to further refine an already great edge.

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Re: Any truth to this theory? Thoughts?

Posted by razoredgeknives - 11 Jan 2013 10:20

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I sent cliff an email asking him more about it... Posted below for those interested

" I don't recall a formal study which ha investigated this but I can't imagine how it could be disputed as it is based on fairly basic properties of metallurgy and the known behavior of steel once it has been micro-fractured and stressed beyond the elastic limit.

The basic idea is that when a knife blunts it will have :

-worn

-micro fractured

-been deformed past the point of elasticity and stayed bend (rolling/impaction)

If you strop/steel you basically push this weakened metal back into the edge, that edge then has to have very low edge holding compared to an edge which is formed on cleaned metal. This in fact is such a dominant effect that it often saturates perception of steels, it is why people believe cardboard can chip edges, why steels like ZDP are ultra-fragile, while people accept a knife going dull in a few cuts on cardboard, etc. "

I have started doing this to each of my edc's, just a couple of light passes with the 1k diamond stone. Doesn't really extend sharpening time at all, but makes the edge a lot stronger I believe.

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Re: Any truth to this theory? Thoughts?
Posted by Mikedoh - 11 Jan 2013 11:47

RE,

Are you saying that you make the light passes:

1) at a slightly steeper angle

2) blunt the edge by cutting perpendicularly to the stone.

Do you strop after stones?

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Re: Any truth to this theory? Thoughts?
Posted by razoredgeknives - 11 Jan 2013 12:16

#2 I believe is what I do. I will try to explain it in better words: basically I will take the knife blade and cut straight into the stone, with the blade perpendicular to the stone, almost as if trying to cut the stone in half. However, I try to use very light pressure to do it, and only do 2 passes normally.

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Re: Any truth to this theory? Thoughts?
Posted by razoredgeknives - 11 Jan 2013 12:20

Sometimes I strop after the stones, but in reality I normally finish on the last stone I use, which typically is the 1k grit diamond... I love this edge. Stropping takes away some of the bite that I love so much. I do strop to maintain however.

You should never strop to remove the burr... As CBW said, stropping is for refinement only.

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