How do you get that perfect mirror finish?

Posted by Scott Sherman - 21 Oct 2012 20:46

This may be on of those depends type discussions, but I think I will ask it anyway. I can make the apex of my knife blade as sharp as I could ever desire it to be, I mean my knives are really sharp. That part is actually easy and WEPS excels at making amateur knife sharpener get expert results. But it seems to me that there are two camps when it comes to knife sharpening. The first is the utility blade, toothy cutting edge for a given purpose, food prep, box, rope, binder cutting etc. This is not the issue I want to address. The second group is concerned with the cosmetic aspect to knife sharpening. Obtaining a mirror finish. These are the big spenders, the micro and nano obsessed crowd that can not seem to get enough technical information on knife sharpening.

These are the ones that will eventually make Clay a multi millionaire because they buy every grit and gadget in pursuit of that perfect mirror finish. I include myself in that group

So, here is what I would like to discuss here if anyone else is inclined to. I have had trouble getting a "perfect mirror finish" and I am not sure exactly what I am doing wrong. By perfect, I mean glassy clear no scratches visible when observed with out magnification or maybe a 10x loupe. I am not talking 200x or 2000x here.

I have seen the result I am after in photos here and at other forums and on Youtube, but the process by which folks get there is a bit vague. I don't think it is (in my case at least) not having the right tools. I have every stone and grit from 50 to .5uM. That should do it. I suspect my problem is that I am either not using the right technique such as direction I drag the stones over the steel of the blade or I am not doing enough strokes from stone to stone and trying to get more out of the finer stones than they were designed for or perhaps it is because I am using them in the wrong order.

The first possible problem, direction of travel for the stones over the metal...

Do I do a circular scrubbing motion or an up and down sawing motion or push up, disengage the stone, reposition the stone below the knife and push up again and repeat until the stone has made it as fine a scratch pattern as is possible? I have tried different methods and the circular seems to get the best results at the medium grit level but not when it gets to polishing and shining. There it seems that the up and down sawing motion works better with the micro fine ceramic, and then the strops which are obviously one directional to prevent scarring the leather. I don't know, if you have a suggestion, I would love to hear it.

Next is the question of how many strokes and when do you advance to the next level of finer grit or abrasion?

This is probably the depends part. I know that different steel hardness, and thickness of the metal and other characteristics of the blade come into play, but I am wondering if there is some kind of rule of thumb. How do you know when you are done with a certain stone. To much and you are needlessly wearing away metal on the blade and may wind up making one side more beveled than the other. Not enough and the next finer grit stone or whatever is being asked to do too much or at least more than it was designed to do. I'll exaggerate to make a point here. You would not try to re-profile a blade with a 1000 grit stone. It could be done but it would take forever and is better done with a progression of stones. I think you all get the point.

And my last proposed issue, is grit order and where do you need to stop?

I suppose there are a couple of aspects to this. First if you start at 50 grits to say re-profile an edge, you are starting with some pretty deep and severe scratches. If you keep grinding away with the 50 then the 80 then the 100 etc. it seems like you are just eating away metal and perhaps even moving the apex from side to side making the bevel uneven. Not sure about that part, but logically it makes sense. So it seems like you should stop just when you get a burr on both sides and immediately go on to the next grit. That makes sense a the lower grits, but as you progress, it becomes less about the edge and more about the polish on the shoulder of the edge. So, how long do you continue this grinding away metal with a given stone?

Should the answer be, you just have to experiment and learn by failure or success? Or is there some sort of clue as to what to look for in the scratch pattern or shiny-ness of the bevel. I don't know. I just kind of scratch away until I feel like I have gotten the whole side about even and there is a burr. Problem is when I get to the final grits for burnishing, there are always still some obvious scratches visible without magnification on an otherwise shiny mirror finish.

Also, with regard to grits and abrasives. The grit on two of the diamond pastes for leather strops (5 uM and 3.5um) is between the coarse and the fine sides of the super fine ceramic. But because they are on leather, do they actually polish more than the ceramic stone which is more fine on the fine side (1600) than the paste. Also, at what level do you have to go to actually get a flawless shiny blade edge without magnification? Is .5uM enough, do you need to use the sprays at .012 or can you go from the fine paste at .05 to the bare kangaroo strop to get that result? Kind of like the amazing shrinking man movie in the fifties for those of you old enough to remember that. He kept shrinking until he became microscopic and then he realized that he was entering a whole new universe where the process started over again to sub atomic particle size. It's the everything is relative theory.

I know at some point you are polishing to high magnification levels of shine not visible to the naked eye, but how far is it practical to go on these stropping sprays and abrasives to get a real world mirror finish?

If you have stuck it out to read down this far, I apparently have tapped into a dilemma that you may

have. I suspect that this issue is central to a number of people from reading the various threads here. There is a constant theme of getting a mirror finish and so many threads and posts are asking questions related to this in one way or another. I hope that in some way, this will help one or more of you, as i hope to learn here from others experience and knowledge.

So thanks.

==========

Re: How do you get that perfect mirror finish?

Posted by FredHermann - 21 Oct 2012 21:05

_____

What he said.

Back to grinding a crap knife to nothing looking for inspiration.

==========

Re: How do you get that perfect mirror finish?

Posted by wickededge - 21 Oct 2012 21:09

_____

I can give a few answers in no particular order:

Pressure is a big factor in the depth of the scratches you're creating.

At 0.5 microns, if each and every stones/strop had effectively replaced the scratches from the prior strop, you would definitely need to use fairly high magnification to see any scratches.

Using a little soapy water and a lot of time with your Superfine stones goes a long way. Initially you can repeatedly switch stroke direction with them so that you're constantly cross-cutting the ridges of the scratches. The goal is to get to the 'valley floor.'

When I first start with the next finer stone, I feel all the ridges from the previous stone like drag or resistance. As I work with the new stone, the resistance lessens with each stroke getting ever smoother. When I reach the point that all the strokes feel the same and I can't detect any more improvement, then it's time to switch stones again.

I put a little bit of rubbing alcohol on my strops and that helps a ton in creating more 'stiction' which is invaluable for removing scratches. Overall, I do a LOT of stropping when I'm trying to get a perfect mirror. The kangaroo strops are the most effective with the finer grits. If you go with a set of kangaroo strops, you might want to do a 1.0/0.5 spray combination or a 0.5/0.25 spray combination.

I often go forward and the backward through the finer grits when trying for a mirror. I might get to the 3.5 strops and realize that there are bigger scratches that I hadn't successfully removed with earlier stones, so I might go back to my Superfine stones and work there again for a while.

There is lots more, but that is a start...

==========

Re: How do you get that perfect mirror finish?

Posted by KyleMazur - 21 Oct 2012 21:24

_____

well i'm still working on that perfect mirror polish, but here's what i've learned so far. it is possible to take a picture of a knife with a "mirror polish" but u can still see the scratches. it depends on angle.

i read a good portion of what ur wrote so i'm going to hit on a few things. the most important thing to realize in your case. your stones are still new and not broken in. your results will get much finer as the break in happens. there's a post that i created a while back where clay shows high magnification pics of new 600 grit stones and broken in 600 grit stones. the results are incredibly different.

my technique is what clay preaches. scrub at 100 to find the burr then alternating strokes all the way up. as for how many times. that depends on so much. how many u used previously the state of the blade, how hard u pushed with the previous stone, the kind of steel. i go by sound feel and sight. i use a loup to see how many scratches are left and how big they are. at that point it's just continuing until you get them out before going to the next grit

hope that helps

==========

Re: How do you get that perfect mirror finish?

Posted by wickededge - 21 Oct 2012 21:37

_____

Kyle makes some great points. What he said about photography is spot on; you can get a bevel to look

great in a photo and not show any scratches by tweaking the lighting and camera angle. The same is true under the microscope.

How well broken in your stones are is another very big factor, it's hard to overstate it.

When you're working with the ceramics, you can get some benefit from taking advantage of the play in the original arms or by tweaking the angle slightly with the new arms. If you're using the original ones, vary where on the handles you're putting pressure so that your creating some small facets; this will help you get to the 'valley floor' more quickly. If you're using the new arms in the Pro-Pack II or the upgrade it, you can vary the angle minutely up and down to create the little facets. Once you're close to the valley floor with either set up, go back to your original angle and flatten out the bevel with the fine stone and you'll be pretty far along. Then strop the heck out of it.

==========

Re: How do you get that perfect mirror finish?

Posted by Scott Sherman - 21 Oct 2012 21:52

_____

wickededge wrote:

I can give a few answers in no particular order:

There is lots more, but that is a start...

Thanks Kyle and Clay. Clay, I really appreciate your sharing your expertise here and I know that a lot of the threads and questions that are posted here are redundant and ask the same thing in different ways or approach a problem from an individuals perspective (usually in hope of allowing others to learn also). Which is why I posted this question(s) and as you have seen, I try to do that frequently. There were a lot of new customers or upgrade customers all getting delivery of their new WEPS within a short time, (including me) who are trying to obtain the perfect results that you and others with more experience are obtaining. One of the problems I see is the the WEPS in many ways raises the expectations of users because it takes a lot of variables out of the equation by guiding the strokes and using very well designed tools. As I know and most are probably aware of there is still that one variable that really can not be taken out of the equation and that is the individual user or as some call it the Peter Principal.

Anyway, I just wanted to take a moment to express my appreciation for your almost a thousand posts to date trying to help people get the most out of their "new toys" as I like to think of mine. I know you are building a business, but it is obvious that you go way above and beyond what you need to do and really care that we are getting the most out or WEPS.

So THANKS. I and (I am sure) every one else here really appreciates you and what you have done and continue to do both in creating this thing and supporting us in our voyage into this somewhat technical and challenging pursuit of that perfect edge.

==========

Re: How do you get that perfect mirror finish?
Posted by wickededge - 21 Oct 2012 22:03

Thank you for your kind thoughts Scott. I love the community we have all created here on the forum and the many, many great people and all their contributions and participation make being here a joy. I am also very passionate about the sharpener and am still discovering many things for myself as I continue to use it and it's very satisfying to share and discuss results with everyone. That said, you're right in that I want people to get the most possible from their machines and I'm deeply committed to giving back to our customers as much and as often as I can. After all, it's I that should be thanking you.

==========

Re: How do you get that perfect mirror finish?
Posted by KyleMazur - 21 Oct 2012 22:08

---

i just finished working on my zt 0560. i will put up some pictures of different angles so you can see what i'm talking about. the scratches are still visible, but with a different angle they appear hidden

==========

Re: How do you get that perfect mirror finish?
Posted by Billabong - 22 Oct 2012 01:50

Hi Scott, I found this old thread which may interest you.

"What grit/micron should I have mirror polish?"

wickededgeusa.com/index.php?option=com_k...id=892&Itemid=63

Keep asking the questions, as I'm sure there are many lurkers who are enjoying your posts also.

==========

Re: How do you get that perfect mirror finish?
Posted by JamesBell - 22 Oct 2012 07:30

Being new to this, great topic by the way, all of you keep referring to "How well broken in your stones are is another very big factor" At about how many knives does it take to get them broken? Is the feeling of how they are working the metal something I would notice? I guess my next question, what is the life of the kits diamond stones. Have you see a difference after many hundreds of usages.

==========