Diamond &Ceramic Plates - Microscope progression

Posted by jendeindustries - 12 Feb 2012 06:15

People have been asking about jumps to the Shapton and Chosera stones from the WEPS 800/1K diamond plates and 1200/1600 ceramic plates. Most of what I've written up to this date evolves around the stock 600 as the leaping off point, as it is the highest grit in the package when you purchase your WEPS.

The micron chart used to compare the WEPS, Shaptons and Chosera stones is a very loose guide at best - it only compares abrasive sizes, and does not reveal the maximum results each medium can achieve due to the vast number of combinations of technique, types of scratches, abrasive breakdown, effects of the binder, etc..

So, I've compiled a microscope progression of the 100, 200, 400, 600, 800, 1K diamond plates and the stock 1200/1600 ceramic plates on a knife using my Veho 400.

I will be adding the full Chosera and Shapton Progressions in the next couple of weeks.

It is my hope that this will help visually explain the differences between the choices available for the WEPS.

You can see the Stock diamond and ceramic progression here .

Keep in mind that I am a perfectionist

Enjoy!

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by wickededge - 23 Feb 2012 12:25

This is an issue I've struggled with a lot. Tom is correct in that the more you polish the edge, the more individual scratches really stand out, especially under high magnification. Tom is also correct that by using a crosshatch method, not only is it easier to knock the ridges between scratches down, it's easier

to see if you're removing the scratches from the previous stone. When you stroke in the same direction with every grit, you're not working as efficiently as possible because many of the particles will be fitting inside the scratches from the previous stone and won't be doing any work at all. We did a fun study of different stones last year on Knife Forums: WEPS Shapton Progression Tom started the post and it evolved into a comparative study of Shaptons vs. Choseras with a lot of stropping along the way. From the photos, it's easy to see exactly what Tom is describing in the way of deep scratches hiding under the scattered light from all the myriad micro-geometry of the scratch pattern. As you peel back the metal to get closer to the scratch valleys, you're able to see them more clearly. During this study, I re-learned something I had really come to know in the knife sharpening competition: when stropping, USE VERY LIGHT PRESSURE! It was astonishing how deeply the abrasives dug in when using too much pressure with the strops.

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by jendeindustries - 23 Feb 2012 18:39

Josh - You've got a really tough problem.
Unfortunately, I'm not sure what the root of it is without seeing the actual edge.

The good news is that from the sound of things, it looks like the sharpening aspect is working since you were able to get it sharp.
Often times on razors you still see scratches without any magnification, but they won't necessarily hinder the overall performance.

The fact that you aren't getting rid of the scratches with 700+ strokes with the 14 micron paste leads me to believe that it is the razor and/or the steel quality. Sometimes during the factory hollow grinding, the scratches may run really deep - so deep that getting them out completely is not worth the amount of metal removal needed. Sometimes that stainless steel is pretty hard - Gold Dollar Razors are notoriously poorly made, but can be fruitless to abrade with only the lightest touch.

At this point I would try using a little more pressure on the strops.

A USB scope would definitely help in diagnosing the problem. I always recommend the Veho 400 since it is pretty inexpensive and if a bunch of guys have the same scope, we can all see what we're talking about.

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by mark76 - 23 Feb 2012 18:44

Thanks Tom and Clay! I finally understand the issue

I have read the entire thread at Knife Forums. I had read bit and pieces of it before, but never the entire thread! It should be mandatory for every WEPS user. If I had done so, I wouldn't have asked this question in the first place. And now I understand the issue, I see it appear everywhere, including on my own knives, even at much lower grit levels (my highest grit level stone is the ceramic 1600). The consequences are just not so bad at lower grit levels.

Any tips on how to conquer this other than spend enough time with higher level grit stones to remove the scratches from lower level stones and using the crosshatch method to make such scratches easier to spot?

Clay, if the stropping compound digs in too deeply, why not use a less abrasive compound of the same micron size, e.g., chromium oxide instead of diamonds? Or (but maybe this is a very stupid question) strop without any abrasive compound at all?

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by jendeindustries - 23 Feb 2012 19:27

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That was a great thread on knife forums - and when the whole "underhoning" issue was still a rather new concept. Thanks for posting that link, Clay!

Mark, the best way (IMO) is to really spend time at the medium grit levels - more than you would think. I generally do enough strokes to make it look good under the scope, then I do a bunch more. You can't do too many strokes here, but you need to lighten up on the pressure to make sure you don't cut too deeply.

There is also what I call a "critical leap" in any progression, which is the transition from medium grits to fine grits. The medium grits will always abrade, but the surface of the bevel will always have those higher peaks and valleys. On the finer grits, the stone is no longer aggressive enough to create such high peaks and valleys, and the surface becomes much flatter as a result. That is when all the previous work will either pay off, or show the flaws.

On the stock WEPS, it the critical leap is between the 1K diamond and 1200 Ceramic. On the Choseras, it's between the 5K and 10K (it's also arguably between the 3K and 5K - but that's another story!) On the Shaptons it is between the 2K and 5K.

I'll let Clay answer the other question

Josh - I'll try to get a progression with the pastes. I may need a few weeks - though.

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by wickededge - 23 Feb 2012 21:44

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mark76 wrote:

Thanks Tom and Clay! I finally understand the issue

I have read the entire thread at Knife Forums. I had read bit and pieces of it before, but never the entire thread! It should be mandatory for every WEPS user. If I had done so, I wouldn't have asked this question in the first place. And now I understand the issue, I see it appear everywhere, including on my own knives, even at much lower grit levels (my highest grit level stone is the ceramic 1600). The consequences are just not so bad at lower grit levels.

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Clay, if the stropping compound digs in too deeply, why not use a less abrasive compound of the same micron size, e.g., chromium oxide instead of diamonds? Or (but maybe this is a very stupid question) strop without any abrasive compound at all?

Great questions Mark. I've fiddled about with lots of different compounds on the strops and finally settled on diamonds for efficiency. As long as you keep the pressure light, they don't dig in too much. I've had some nice results with Chromium Oxide and Boron Nitride, but they are very messy to use and don't work as quickly as the diamonds. Stropping with plain leather works well. Leather has the unique ability to burnish the metal surface while honing the edge. Adding a micro-abrasive accelerates the process of of bevel and edge finishing, giving you a 3-in-1 punch.

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by wickededge - 23 Feb 2012 21:47

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razoredgeknives wrote:

Hey Tom, quick question... I can't seem to find any info to this effect... when going through the process of sharpening a straight razor I have found that the jump between the 1k stock diamond to the 14m pasted strops is too large... after 500 strokes per side w/ the 14m strop it has not removed any of the scratches. Which leads me to my question, what is the logical progression if I am sticking with all stock stones/strops (i.e. no chosera/shapton stones)? I just ordered the 1200/1600 ceramic stones as an "in-between" before I go to the 14m strops. Any suggestions or should I be good? Thanks for your help!

In reading this, a question comes to mind about contamination on the strops. I'm guessing you keep them pretty well protected, but if they've picked up metal filing and/or sloughed of diamonds, they could easily dig big scratches.

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by jendeindustries - 25 Feb 2012 03:11

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OK! Chosera WEPS microscope progression is up!

jendeindustries.wordpress.com/2012/02/25...oscopic-progression/

I touched on the concepts of the critical leap and the difference between a paste and a slurry.

Enjoy!

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by JoyalTaylor - 25 Feb 2012 10:56

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Thanks Tom.

That's amazing.

I have a question. Since I have the diamond/ceramic stones through 1600

and the Chosera 2000 is close to the Ceramic 1600,

would you suggest that I continue the progression, after the Ceramic 1600,

starting with the Chosera 2000

or would it be better to back down to the 1000 or even lower?

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by mark76 - 25 Feb 2012 12:26

A couple more posts and we are all ready to start our professional sharpening businesses

In connection to the critical leap: you are quite meticulous in your stone progression. Did you miss the 8K "snow white"? Or was it just a few more strokes on the 10K? I hear people who hardly seem to be able to live without their snow white and people who couldn't care less.

Thanks again!

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Re: Diamond &Ceramic Plates - Microscope progression

Posted by jendeindustries - 25 Feb 2012 18:54

JoyalTaylor wrote:

Thanks Tom.

That's amazing.

I have a question. Since I have the diamond/ceramic stones through 1600

and the Chosera 2000 is close to the Ceramic 1600,

would you suggest that I continue the progression, after the Ceramic 1600,

starting with the Chosera 2000

or would it be better to back down to the 1000 or even lower?

Thanks Joyal!

I would go tot he 2K or 3K Chosera from the 1600 Ceramic. You could jump to the 5K Chosera from the 1600, but I'm a firm believer of more "lateral" moves when crossing over at the medium grit level. (At the fine grit levels, you can jump "forward".)

If you spend the time on the 800/1K WEPS diamonds and the 1200 and 1600 WEPS ceramics, then you really don't need to go back to the 1K Chosera. However, if you want to *really* make sure, then going back a step to the 1K or even 800 Choseras can sometimes save you time in the long run. For example, on straight razors I use diamonds up to 1200 grit, then go back to the 800 Chosera with slurry and work my way up through all the of Choseras.

One of the things I haven't really touched upon yet is the difference of the speeds between the mediums, and am sort of saving that for the final installment after the Shapton progression goes up. 🙂

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