2000x Grit Specific Studies

Posted by wickededge - 08 Oct 2012 11:39

To kick off this thread, I polished the sample down to .25um with the kangaroo strops. The plan here is to develop a clean baseline from which to the lay in the scratches from a specific stone or strop so that we can isolate the scratches of that abrasive and not worry that we're seeing leftover scratches from a previous abrasive. I didn't go for total perfection in the polish since it's time consuming enough that doing it for each and every grit we have available would be prohibitive. At this level, we have a clean enough slate that it will work very well for our purposes. I've imaged the blade at 200x, 800x and 2000x. The bevel is slightly curved since I was working from a blade that already had a micro-bevel. The shoulder of this edge is at 20 degrees and the edge is at 25 degrees. To study the different abrasives, I'll work at 25 degrees so that we have a smooth shoulder to compare against and should be able to see the entire mirco-bevel in the field of view. Here are the images:

200x:

800x

2000x

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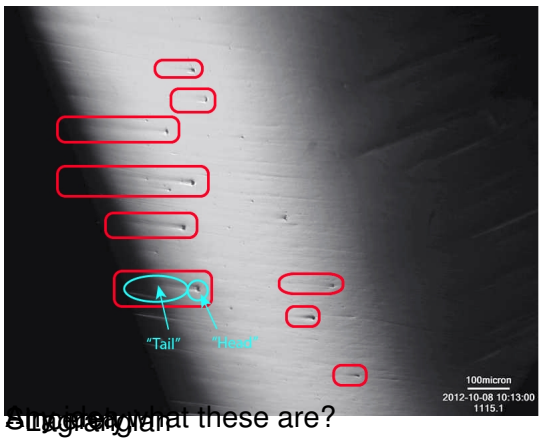
Re: 2000x Grit Specific Studies

Posted by AnthonyYan - 10 Oct 2012 15:04

Hi Clay,

Wow! I'm fascinated by these photos.

In particular, I'm quite curious about what look like comets in your photos.... Dark spots with tails on them. I marked some on one of your photos:



Sorry, just what these are?

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Re: 2000x Grit Specific Studies

Posted by wickededge - 10 Oct 2012 20:24

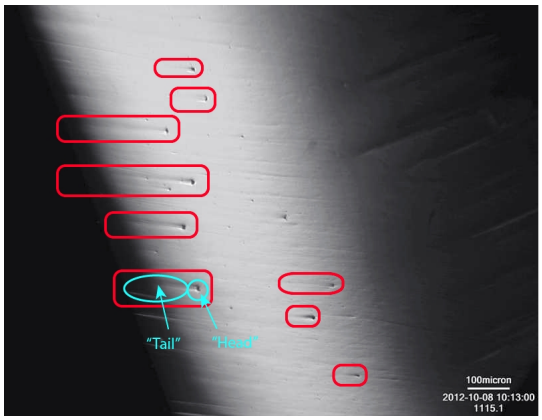
I see these a lot when I go to a higher polish. I think they are either inclusions getting pulled free or little pockets in the metal. Because there is a tail, I speculate that they are inclusions that dig a little furrow as they're ripped out and pushed along the bevel toward the edge.

AnthonyYan wrote:

Hi Clay,

Wow! I'm fascinated by these photos.

In particular, I'm quite curious about what look like comets in your photos.... Dark spots with tails on them. I marked some on one of your photos:



Any idea what these are?

Sincerely,

--Lagrangian

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Re: 2000x Grit Specific Studies
Posted by AnthonyYan - 11 Oct 2012 10:29

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wickededge wrote:

I see these a lot when I go to a higher polish. I think they are either inclusions getting pulled free or little pockets in the metal. Because there is a tail, I speculate that they are inclusions that dig a little furrow as they're ripped out and pushed along the bevel toward the edge.

Wow... pretty interesting.
Would be neat to get an idea of how big those inclusions are, especially the ones that tear out, and their relative size to grit ratings.

I wonder what the inclusions are actually made of. Are they carbides, or slag impurities? Maybe someday, we can track down an metallurgist and ask.

btw, have you ever considered doing a metallographic etch of metal for your microscope samples? Hmm... maybe not a good idea after all, since some of those chemicals are pretty toxic...

Sincerely,

--Lagrangian

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Re: 2000x Grit Specific Studies
Posted by PhilipPasteur - 11 Oct 2012 19:46

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This should be good Clay!

I can't wait to see how the different grits look over the baseline finish.

I can't see why you would want to do any etching in this test series. I do understand why it is done in certain situations (detecting grain size and shape, inclusions, etc.), but I would think that it could possibly mask some of the results that you are trying to capture. I would guess that we should get great information about the scratch patterns without any etching.

Phil

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Re: 2000x Grit Specific Studies

Posted by AnthonyYan - 12 Oct 2012 00:07

Hi PhilipPasteur,

Oh, I didn't mean specifically for this test. Possibly a bad idea to etch for these tests, since we're interested in how the abrasive affects the surface, and don't want that confused with how the etching could affect it.

I was wondering etching might be useful in other ways. Maybe? Not sure.

Sincerely,

--Lagrangian

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Re: 2000x Grit Specific Studies

Posted by cbwx34 - 12 Oct 2012 06:51

AnthonyYan wrote:

I was wondering etching might be useful in other ways. Maybe? Not sure.

I know there's occassional discussions about "carbide tearout" in sharpening. Maybe a reason?

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