

By Vadim Kraichuk

Heat in Sharpening

10 videos of experiments are on our [YouTube channel >>](#)

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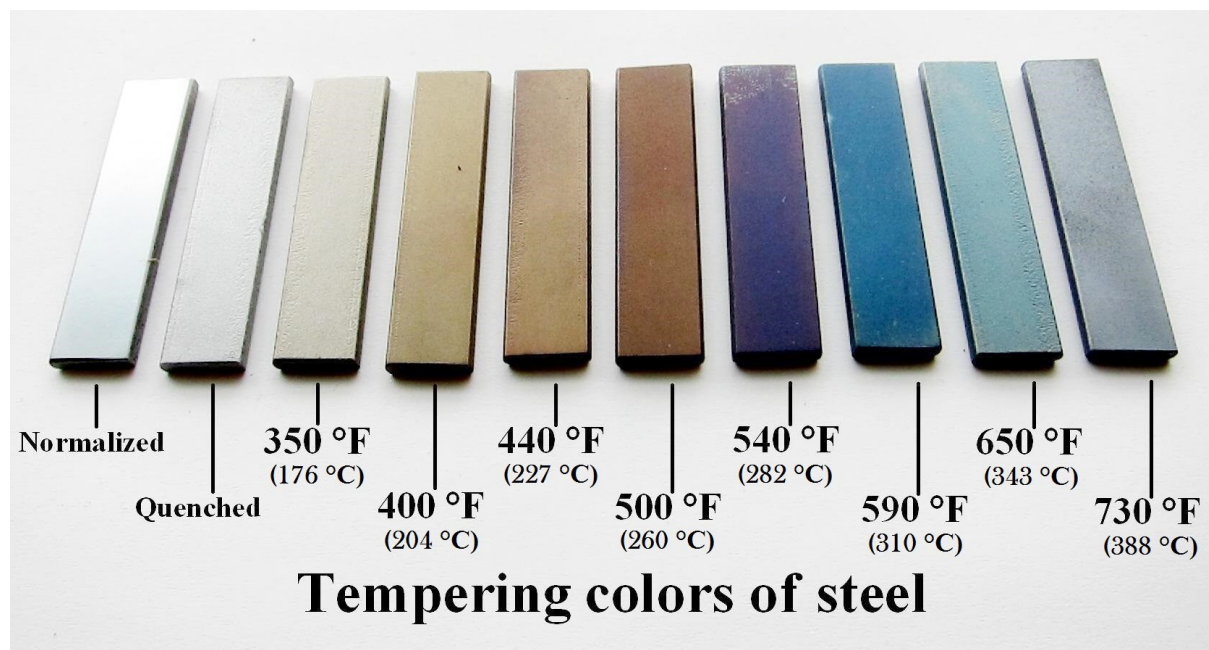
Many of us have experienced over-tempering of a tool when sharpening on a grinder. The edge changes colour to a straw and to a blue. We then know that the edge has softened and will no longer stay sharp and will not resist wear.

Of course, in sharpening knives we take measures against it by sharpening slow and cool. Nevertheless, honing can still overheat the very edge and the tip, in the thinnest parts of the blade.

Deburring and honing at high RPM over-temper (another term is “detempers”) the edge apex, compromising the edge retention and rendering it prone to rolling. These knives dull at a faster rate through the same usage cycle.

Knives are typically tempered at 150-370°C or 300-700F, and many at 150-260°C or 300-500F. Some excellent steels are tempered at even lower temperatures, e.g. ZDP-189 is tempered at 100-150°C <https://www.hitachi-metals.co.jp/e/yss/search/zdp189.html>. Tempering over 425°C(800F) is usually avoided because it reduces impact resistance.

Once the knife edge is heated to the temperature at which its steel was tempered, it softens.



In mainstream knives, heating the edge to any temperature over 150°C/300°F threatens the edge temper, between 200-260°C (400-500°F) edge in many knife steels over-temper and soften, and by 350-370°C or 650-700°F even quality mainstream knives lose their temper and soften. Only knives of high speed steel and some (but not all) wear-resistant “supersteels” can withstand heating up to 600°C/1000°F, provided that they were heat treated to its best.

Honing at high RPM can heat knife edge to the over-tempering temperatures even if your fingers on the blade do not feel hot.

Can we feel overheating by bare hands?

Our fingers feel intolerable heat at 44°C/ 111°F. At 55°C/ 131°F we get a burn with a blister. But because of the very small volume at the apex, it heats up much more quickly than the rest of the knife blade; holding the blade with bare hands is not likely to be sufficient since the heating occurs so quickly.

This has been demonstrated by Kiley Harris of New Zealand in his YouTube video “Will I feel the edge of my knife overheating from grinding with bare hands?”

Neither can we see DISCOLORATION from the heat in the first micron of the edge.

When the steel overheats, it first changes color to a straw yellow. Wavelength of the yellow light is 580 nm, and the edge must overheat to this depth from the apex for us to see it. 580 nm is 6 times the width of the apex of a shaving razor. In other words, by the time we can see yellow discoloration in the overheated edge, the edge is already softened to 6 times duller than the razor. Human eye physically is not able to see discoloration before that. It is more actually, because the softened apex will fold, unless you remove it by steeling.

The heat treatment loss is not reversing with cooling - as soon as the heating in the edge reaches the temperature at which the given knife was tempered, the edge softens irreversibly to the depth of the heat.

Every next sharpening step can remove steel that might have softened in the previous steps - that is why we focus on the final step, the honing, after which we get what we get – if the edge gets overheated in honing – we get a softened edge.

Detempered structure of the overheated metal in the edge causes the edge to fold over (roll) more readily and dull more quickly.

As temperature indicators we use temperature indicating lacquers, some producers call them “paints” or “liquids”.

Temperature sensitive material in them changes properties at the rated temperature. They are produced as a set of bottles rated from 80°C/175°F to 1090°C/2000°F

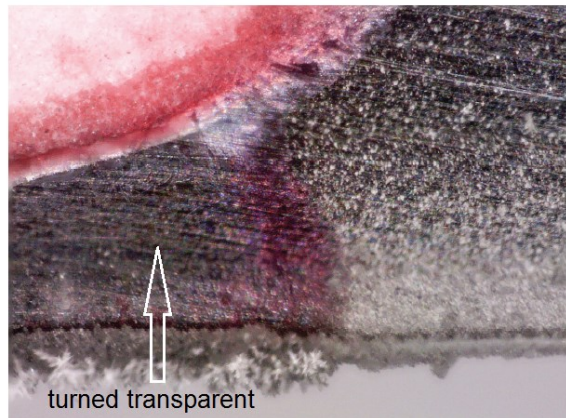
The original temperature indicating lacquer has opaque appearance. When the stated temperature is reached on heating, the lacquer liquefies sharply; response time is milliseconds. The melted lacquer turns transparent and stays transparent when cooled, making interpretation simple.

A temperature indicating lacquer/paint

Before rated temperature



At the rated temperature



Wide-known brands are Omegalaq and Tempilaq. They are widely used in industrial areas, where temperature control is critical.

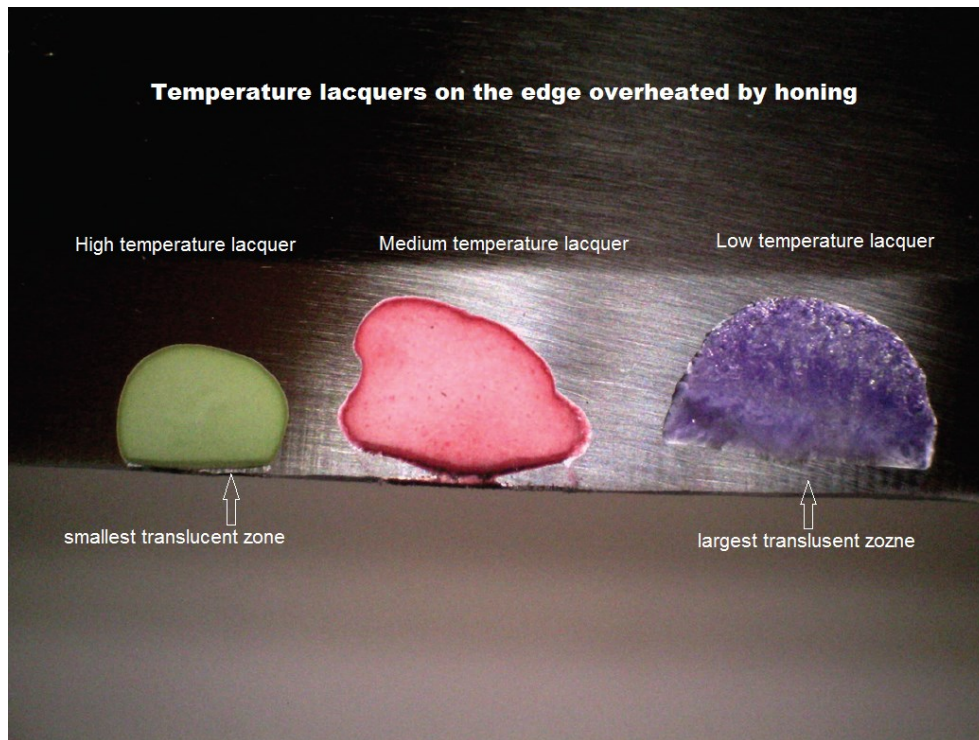
In our experiments we are using Tempilaq Advanced Temperature Indicating Liquid

As heat indicators we use 3 temperature indicating lacquers:

- #1 163°C/325°F – heating reaches the tempering range for knife steels
- #2 232°C/450°F – many knife steels over-temper and soften
- #3 371°C/700°F – all mainstream knives over-temper and soften



In heating caused by sharpening the temperature lacquer is changing over the thinnest parts of the edge, in the area adjacent to its apex. We even do not need a microscope to see the overheated translucent zone. Example of temperature lacquers on the edge overheated by honing follows.



The temperature lacquer response is mass-dependent, and it first turns transparent in its thinnest areas, at the corners of the smear near the edge.

We are not the first to use this method.

The previous photo is from the experiment on overheating in a Work Sharp belt sharpener, done by Anthony Spielberg 5 years ago. Tony used Omegalaq.

3 years ago Mike Brubacher tested a 42" belt grinder using Tempilaq... and Mark Reich tested a 72" belt grinder also with Tempilaq.

We will talk about their experiments in the next section about belt sharpeners and grinders.

Work Sharp, belt grinders and sanders

Generally, shorter and finer belts cause more heating. Longer belts have more time to cool. For example, a 42" or 48" belt grinder causes far less heating than the Work Sharp 12" belt.

Coarse abrasives heat up less as compared to fine thanks to the air circulation between the large grains.

A worn belt heats more than a new one.

Grinding on the belt against the platen heats more, while on the slack of the belt heats less.

Work Sharp coarse belt

Even though the Work Sharp nominally has 2 speeds, and Ken Onion edition 3 speeds, practically people hardly ever use the “low speed” because of the slow sharpening – in real-life sharpening, people run the Work Sharp at its “high speed”.

In 2016 Anthony Spielberg showed in his tests that re-sharpening at the edge angle on the Work Sharp coarse belt does not overheat the edge.

In our test we will re-ground the edge from 20 to 16 degrees, using the #120 belt that in Ken Onion Work Sharp is called “extra-coarse”. In regular Work Sharp it is called just “coarse”. The Work Sharp manual recommends “high speed” and feed rate 1 inch per second – it is just under a second per the belt width.

We did as many strokes as needed on the coarse belt to grind one side of the edge from 20 down to 16 degrees. We stopped as soon as raised the burr, and estimated the degree of heating by changes in the temperature lacquers on the other side of the blade.

The 3 temperature lacquers did not change in this test. The coarse belt has no risk of overheating when re-sharpening at the existing edge angle OR re-grinding to a lower angle.

Work Sharp fine belt

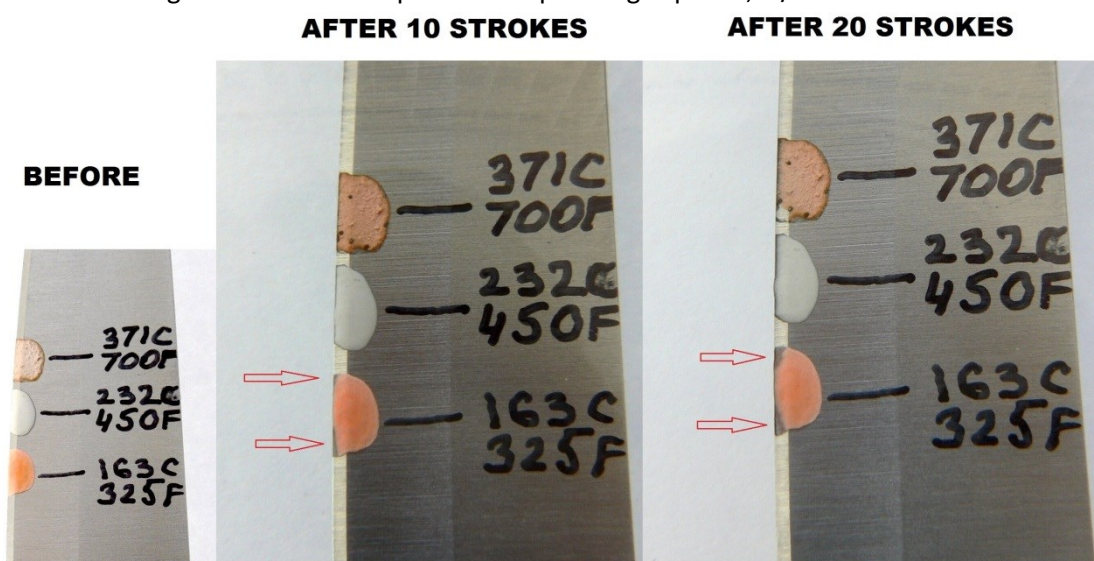
As per the Work Sharp manual, honing on the fine 4-micron belt is done by 10 strokes each side at a feed rate 1 inch per second. 10 strokes each side of a double-edge knife sums up to 20 strokes. So we gave our knife total of 20 strokes on one side and estimated the heating by changes in the temperature lacquers on the other side.

We tested high speed and low speed.

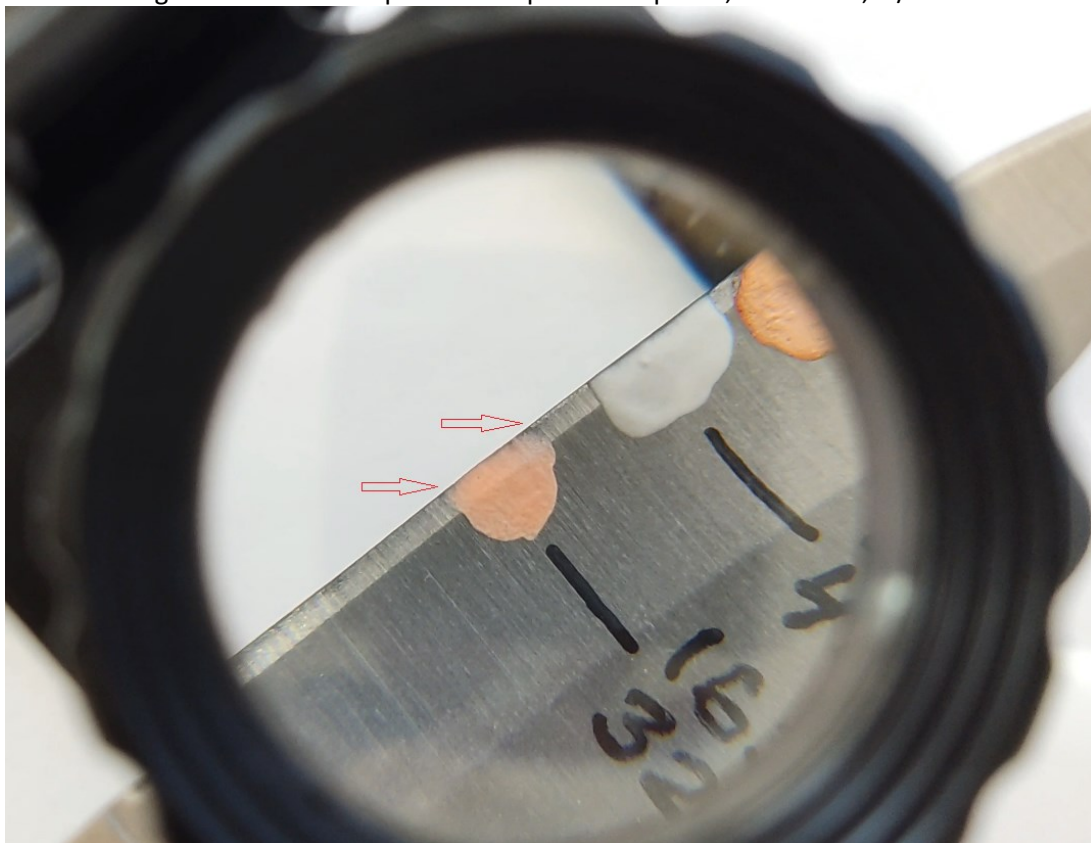
The Work Sharp fine belt at “high speed” heats up the edge of the blade to over 163°C/325°F not exceeding 232°C/450°F.

The Work Sharp fine belt at “low speed” heats up the edge of the blade to 163°C/325°F. 163°C/325°F – heating reaches the tempering range for knife steels.

Honing on the Work Sharp fine belt 4μ at “high speed”, w/o coolant



Honing on the Work Sharp fine belt 4μ at “low speed”, 20 strokes, w/o coolant



Red arrows show areas where the 163°C/325°F lacquer turned transparent.

This result did not come as a surprise, because in 2016 Anthony Spielberg showed heating of a Sandvic knife to over 200°C/400°F in a similar experiment with temperature lacquers.

Tony honed a Sandvic Morakniv outdoor knife of 12C27 steel on the WorkSharp fine belt for 20 seconds.

Tony's experiment

sharpened the blade on the WSKO/BGA for 20 seconds, keeping the blade immobile, using firm pressure. I felt the blade get slightly warm, but nowhere near uncomfortably hot.

After this brief sharpening, all three areas of lacquer showed evidence of transition.

400F lacquer before honing



400F lacquer after honing



Work Sharp fine belt with HONING COOLANT

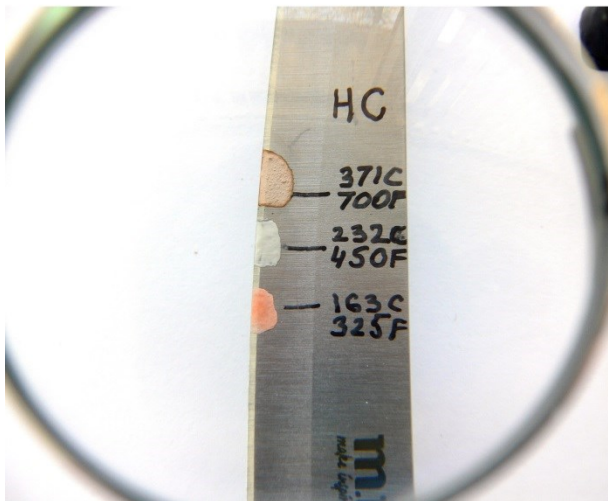
We re-applied the temperature lacquers to the knife that showed overheating.

We turned the Work Sharp speed to the maximum, and did exactly the same test, only with our HONONG COOLANT on the belt.

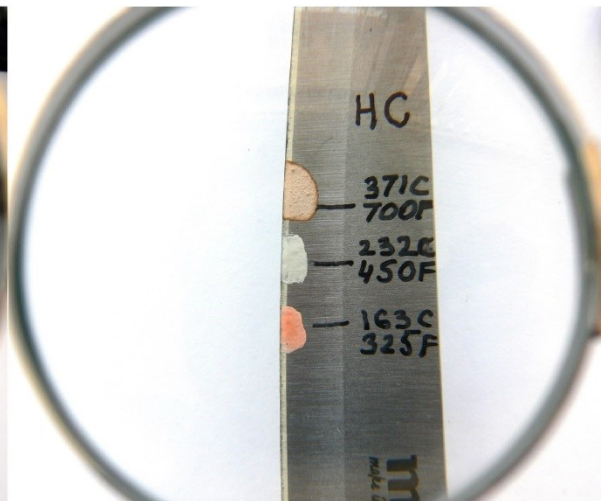
Fine belt with the HONING COOLANT shows no signs of overheating.

**Honing on the Work Sharp fine belt 4μ x 20 strokes at "high speed"
with HONING COOLANT**

BEFORE



AFTER



Both our and Tony's experiments have shown that honing on the Work Sharp fine belt can overheat the edge, compromising heat treatment and edge retention.

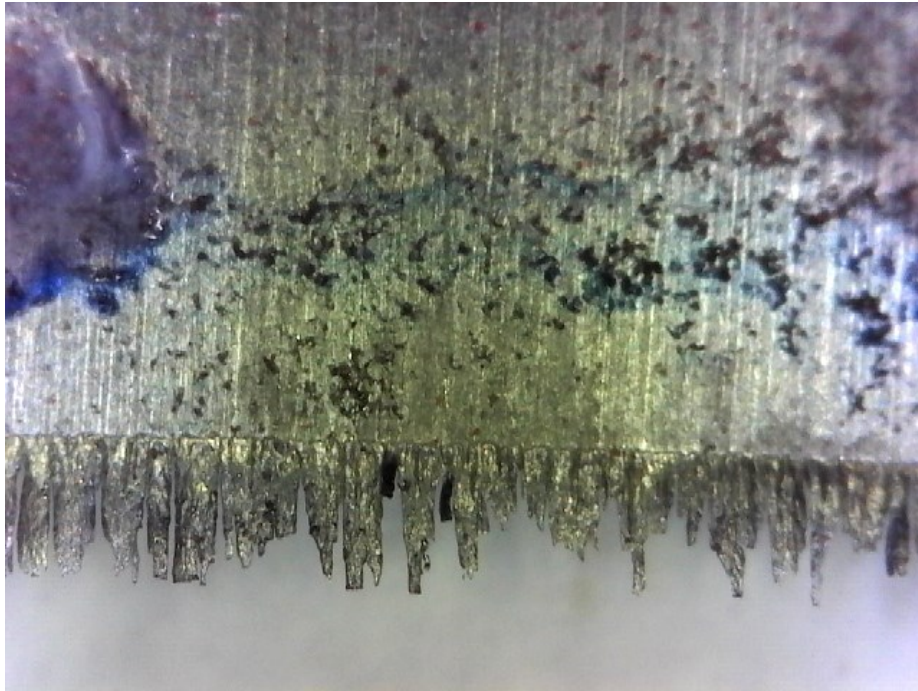
As we see it, the only remedy is to work with frequent breaks to let the blade cool, or use a honing coolant.

Belt grinders

In 2018 Mike Brubacher tested a 1x42" belt grinder in regular sharpening, using 163°C/325°F Tempilaq.

Mike found no overheating in regular sharpening, however saw overheating when grinding in one spot for 2 seconds – a quote:

"We simply held the blade/edge in one spot for 2 seconds) against the belt with maybe a pound of force. Here's the final picture - Tempilaq has all but fully triggered."



Mark Reich, a US knife maker, found that grinding in one spot on a 1x72" belt (#220) took about 2 seconds on the butcher knife and 1 second on the paring knife to trigger the 150°C/300°F Tempilaq.

Ground side of the blade



Side with 300°F (150°C) Tempilaq melted



Took about 2 seconds on the butcher knife and 1 second on the paring knife

The recommendation is to grind with caution, as belt grinding in one spot over 1 second changes the steel temper.

Give the belt sharpening every opportunity not to overheat the edge.

Maintain contact with the belt under 1 sec per 1 inch of the blade, do not overly press the blade, use water to cool, and do everything you reasonably can to avoid overheating.

Belt sanders

In our sharpening workshop we use the belt sander to straighten the edge line in worn knives, to remove large chips, and to reduce the bolster.

We use a #120 belt for this. The belt is 914mm (36") long, the belt speed is 7.5 m/s (1476 feet/min).

In this test we straighten edge line in a worn knife.



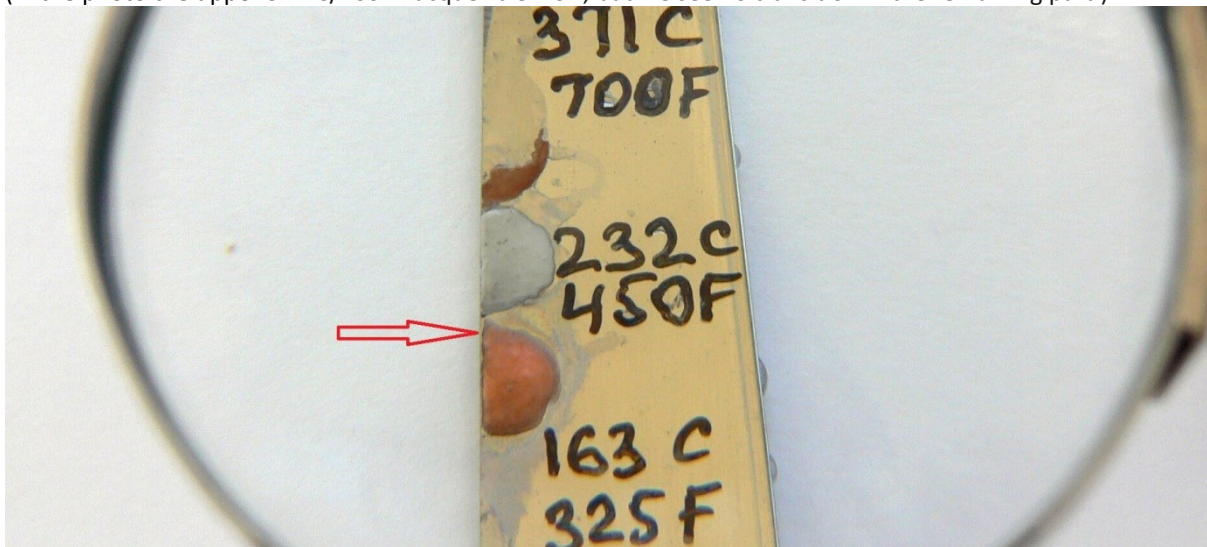
First, we did it dry, maintaining contact of the blade with the belt for about 1 second, and pausing for about 1 sec after each contact to let it air-cool.



Halfway through the job, we saw signs of overheat: all 3 lacquers “triggered” 163°C/325°F, 232°C/450°F and 371°C/700°F



So we re-applied the lacquers and continued dipping in water after each contact. The water-cooled grinding did not show overheat in the edge-straightening on the belt sander – we see only a small area of heating to 163°C/325°F at the very edge. (In the photo the upper 371°C/700°F lacquer blew off, but we see no transition in the remaining part.)



That small mildly overheated area will be ground off during sharpening.

Paper wheels

The Full speed grinder used in the test runs at 2850 RPM
Our low (half) speed grinders run at 1425 RPM

Paper wheels, regular sharpening

For regular paper wheel sharpening they use only full speed grinders.

Note that paper wheels are for re-sharpening at the existing edge angle. They do not work well in re-profiling the edge to a lower angle, and we do not test this.

A regular paper wheel kit has a grinding wheel with silicon carbide and a slotted honing wheel.

Gritted wheel

The grinding wheel is usually grit #180, but some producers make it #220.

The gritted wheel should be used with a wax for cooling. The instructions read: "Touch the wax to the wheel each time you start to sharpen."

But we first tried without the wax – this would tell us how much the wax cools.

Sharpening usually requires 3-4 passes each side, so in our experiment we did 6 passes on one side and estimated heating by the temperature lacquers on the other side.

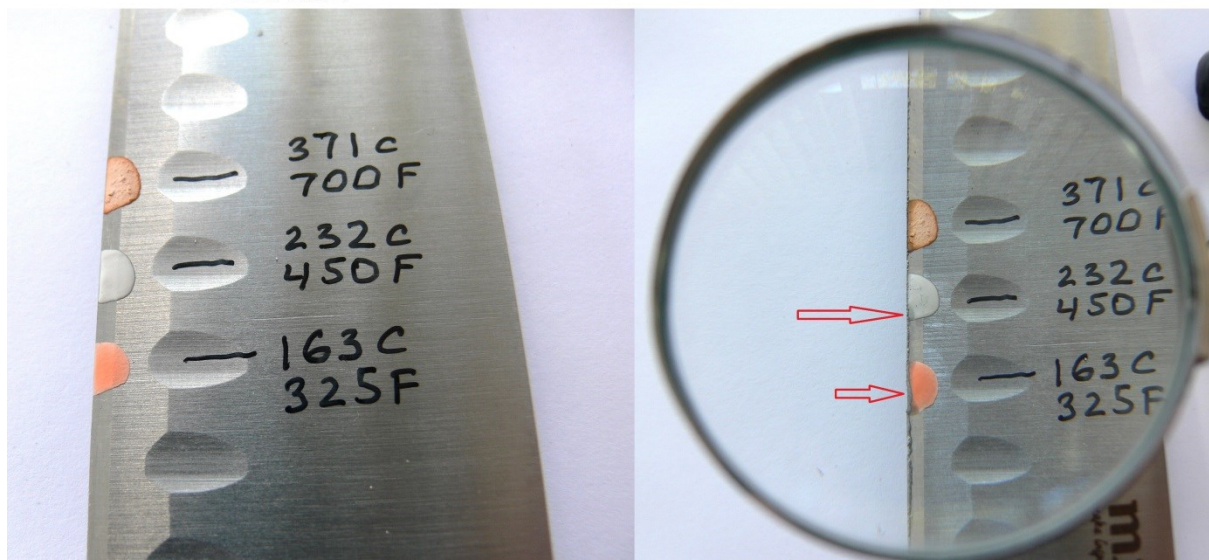
6 passes without the wax overheat the edge over 232°C/450°F.

Then we did 8 passes the right way, with the wax.

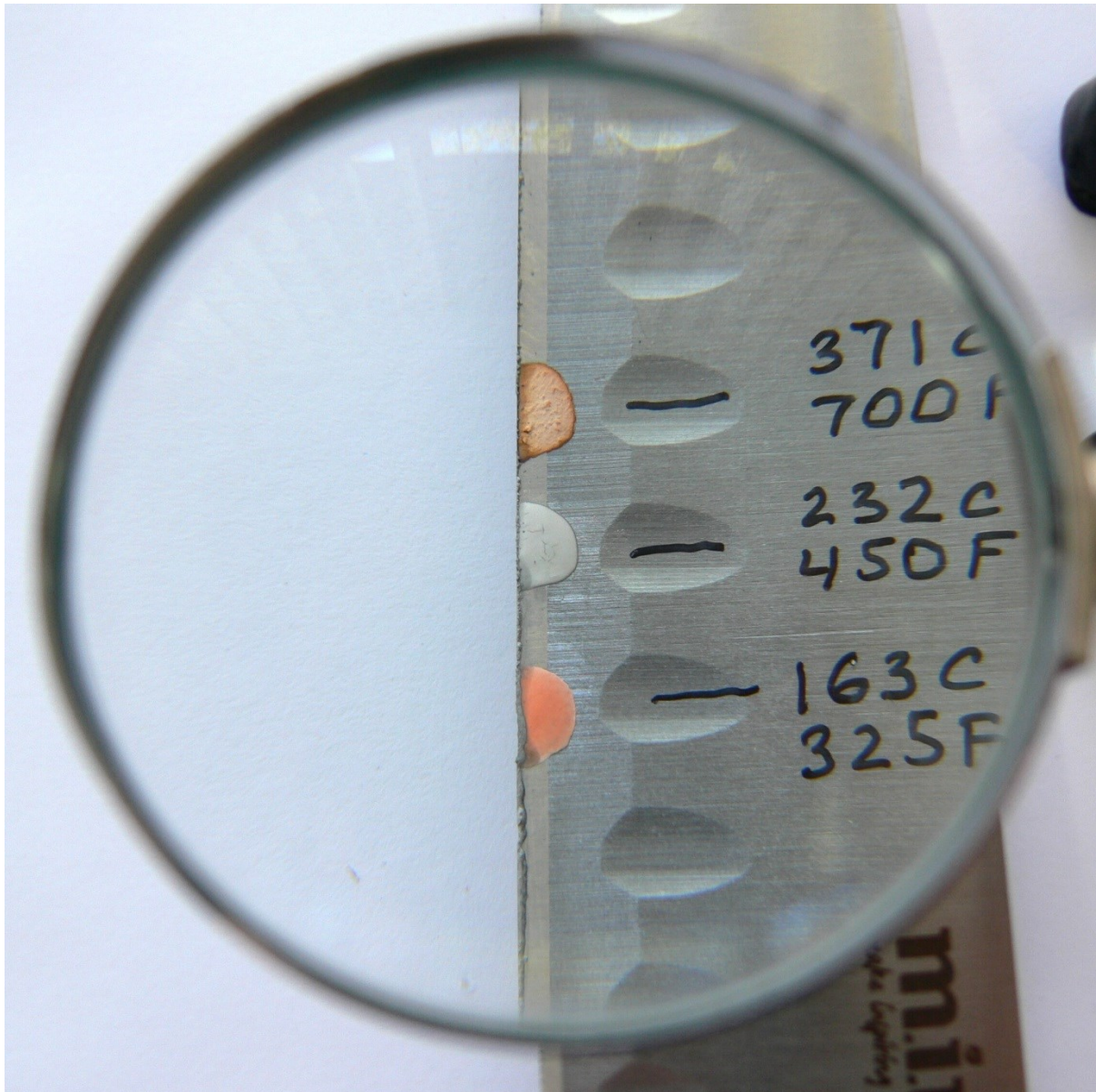
Gritted paper wheel with wax, full speed, 8 passes

BEFORE

AFTER



As we can see by the 1st lacquer, the temperature raised over 163°C/325°F, and on the corner of the 2nd lacquer we see that the temperature lacquer triggered. Which means that the temperature reached 232°C/450°F, but not exceeded.



232°C/450°F – many knife steels over-temper and soften

As a matter of fact, in the instructions they say to apply the wax "sparingly", because if we apply too much of it, the grit grinding effectiveness decreases.

Slotted wheel

The slotted honing wheel is used with an aluminium oxide buffing compound, usually White Rouge. Slots in the honing wheel work as fan and cool the blade, plus the buffing compound has around 30% of waxes and fats that also reduce heat through melting and reduction of friction.

On the honing wheel we typically deburr by 2-3 passes each side.

We gave it 6 passes and estimated the heating.



We clearly see that the slotted honing wheel with the buffing compound does not overheat the blade. The temperature has not reached 163°C/325°F.

In summary, paper wheels, used the regular way by the producer recommendations, do overheat the edge because of the gritted wheel.

As we've seen, the slots really do their cooling job very well.

But the makers cannot make the gritted "grinding" wheel slotted, because the grit must be re-glued every 200-300 knives, and when glued, it would fill in the slots.

Slotted paper wheel with diamonds on a half-speed grinder

In this test we used a slotted 10" paper wheel with diamonds.

We use oil-based diamond paste on our slotted paper wheels.

We did it on the slow grinder, because this is what we use ourselves and recommend.

Honing on a paper wheel with diamonds is usually done by 2-4 passes on each side of the blade. So, in our experiment we did 8 passes on one side and estimated the heating by the temperature lacquers on the other side.

We did not see signs of overheating - the 163°C/325°F lacquer did not turn transparent.

Solid paper wheel with diamonds on a half-speed grinder

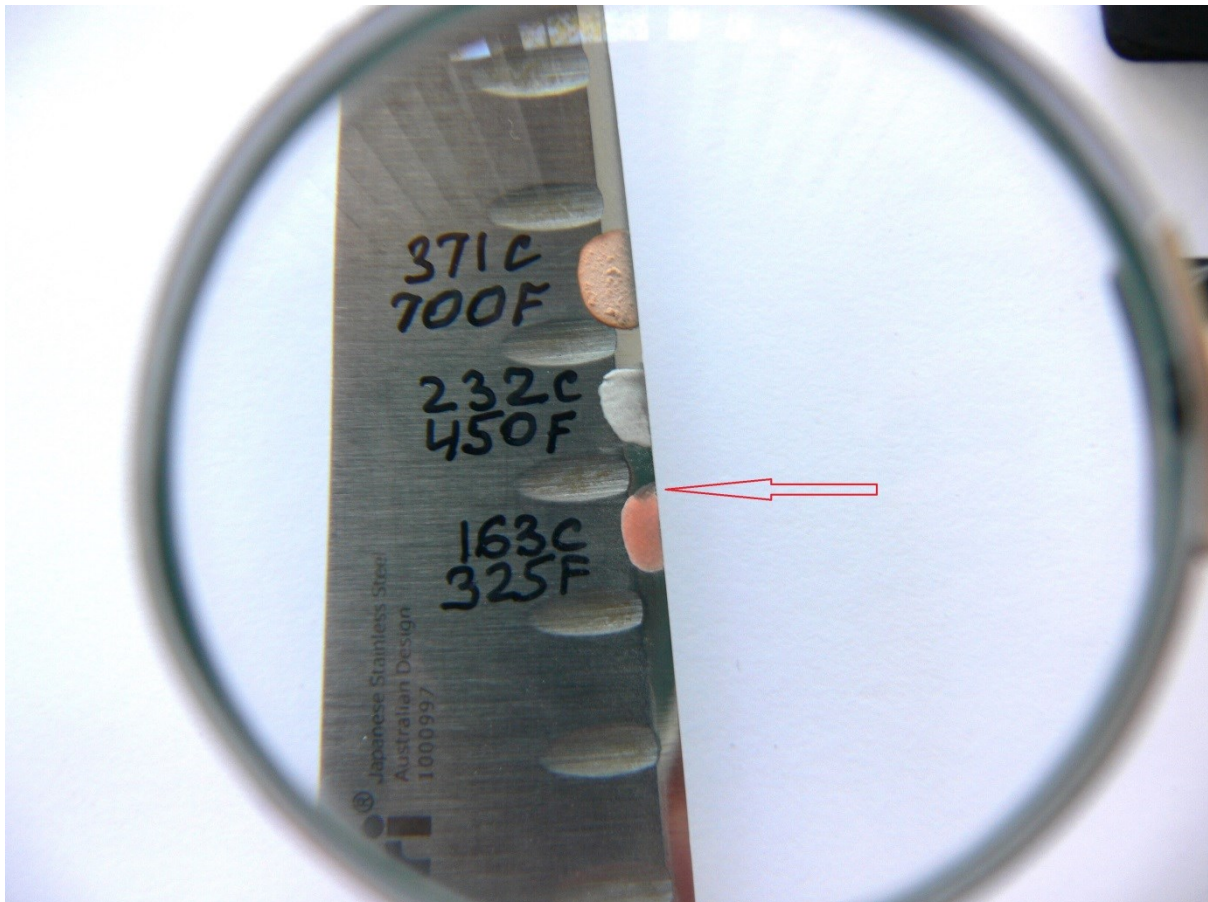
Although we do not use solid paper wheel with diamonds, only slotted, I know people who use solid paper wheel with diamonds on a half-speed grinder – so, we estimated the heating for them.

There were no signs of overheating after 8 passes.

Slotted paper wheel with Autosol on half-speed grinder, without HONING COOLANT

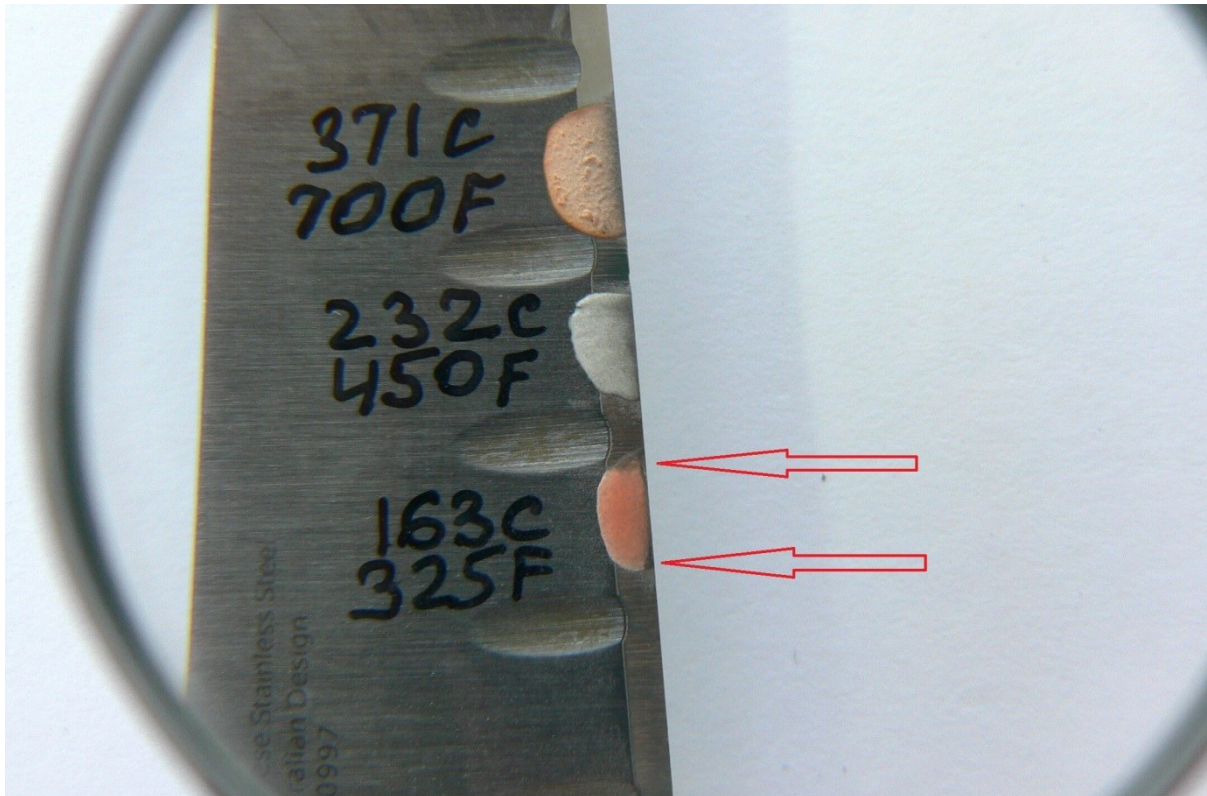
Honing on a paper wheel with Autosol is usually done by 2-4 passes on each side of the blade. So, in our experiment we did 4 passes on one side and estimated the heating by the temperature lacquers on the other side, and then 8 passes and estimated the heating.

PW Autosol – after 4 passes



The lower lacquer has triggered at the corner showed by the arrow. So, in this spot the temperature reached 163°C/325°F.

PW Autosol – after 8 passes



After 8 passes we see heating to 163°C/325°F, but not over.

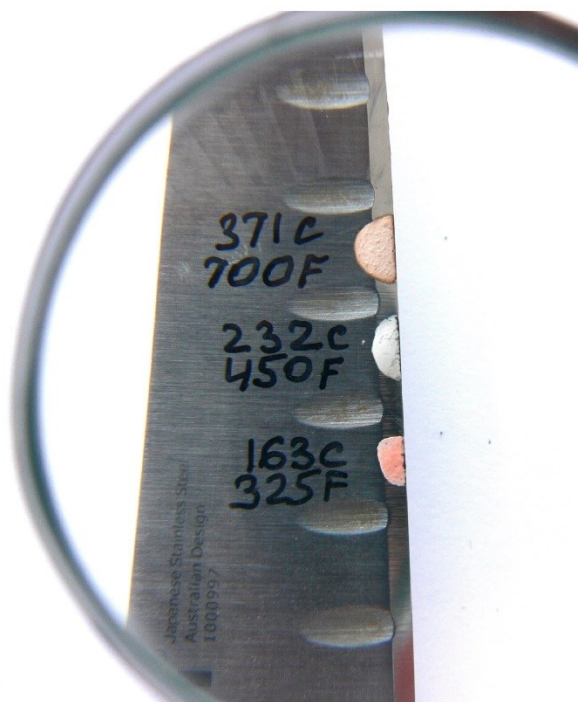
Slotted paper wheel with Autosol on half-speed grinder, with HONING COOLANT

We repeated the same test, but this time with the HONING COOLANT.

BEFORE



AFTER



We clearly see no signs of overheating.

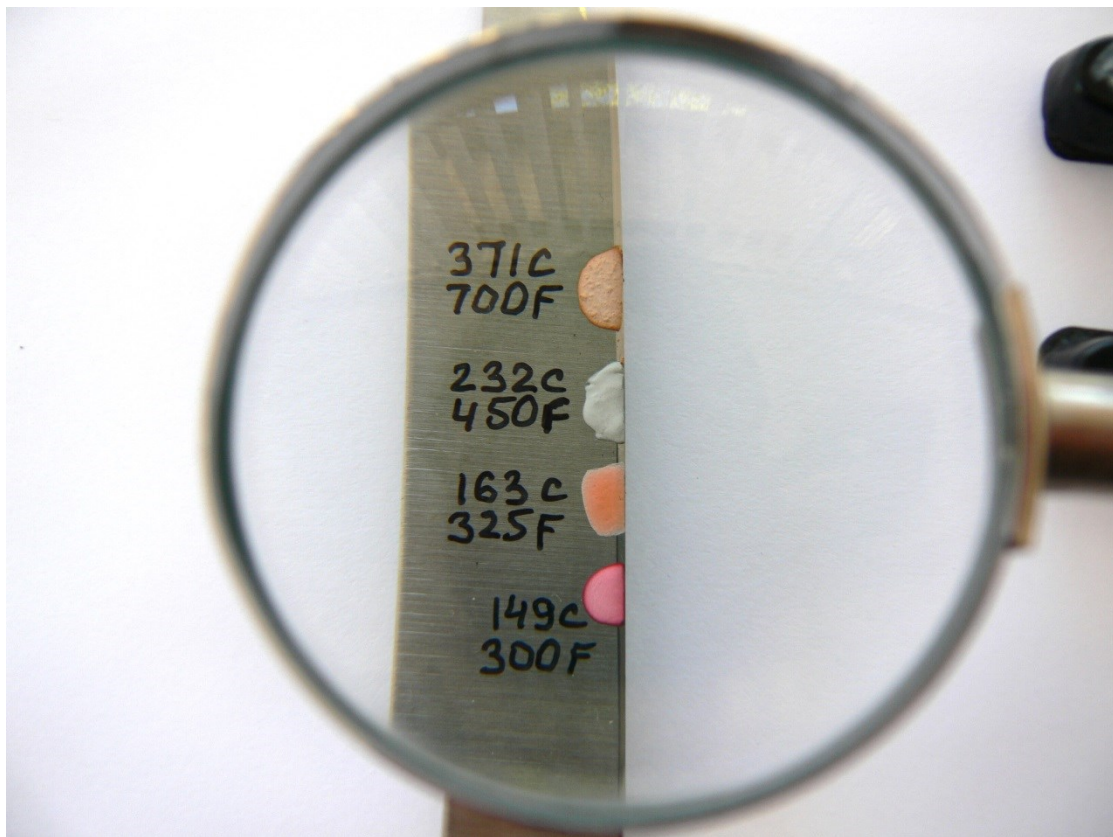
Finishing slotted paper wheel with pure chromium oxide Cr₂O₃ in linseed oil, on half-speed grinder

For finishing paper wheels we used to mix chromium oxide Cr₂O₃ in liquid paraffin, but recently switched to Cr₂O₃ in linseed oil, as it is less messy. The liquid paraffin stays liquid on the paper wheel for long time, and every time we hone on it, spatters around. While the linseed oil dries on the paper wheel, as in an artist's oil painting.

Finishing on a paper wheel with chromium oxide is done by 1-2 passes each side of the blade. So, in our experiment we will do 4 passes on one side and estimate the heating by the temperature lacquers on the other side.

None of the three lacquers triggered. No overheating

Then we tried on the chromium oxide wheel the same number of passes that we did on the diamond paper wheel.



The same – after 8 passes none of the lacquers triggered.

As you see, on this knife we added one more temperature lacquer that triggers at 150°C/300°F. I am so pedantic about heating in the finishing wheel, because we do not use HONING COOLANT with it. And we do not use HONING COOLANT with it, because honing with the coolant may draw a foil on the edge, while the main purpose of the finishing is getting rid of the foil.

Slotted paper wheel with diamonds on a full speed grinder

We did 8 passes at full speed - none of the 3 temperature lacquers triggered.

Felt & buffing wheels

Our full speed grinder runs at 2850 RPM.

Our low speed grinders run at 1425 RPM, i.e. half the regular speed.

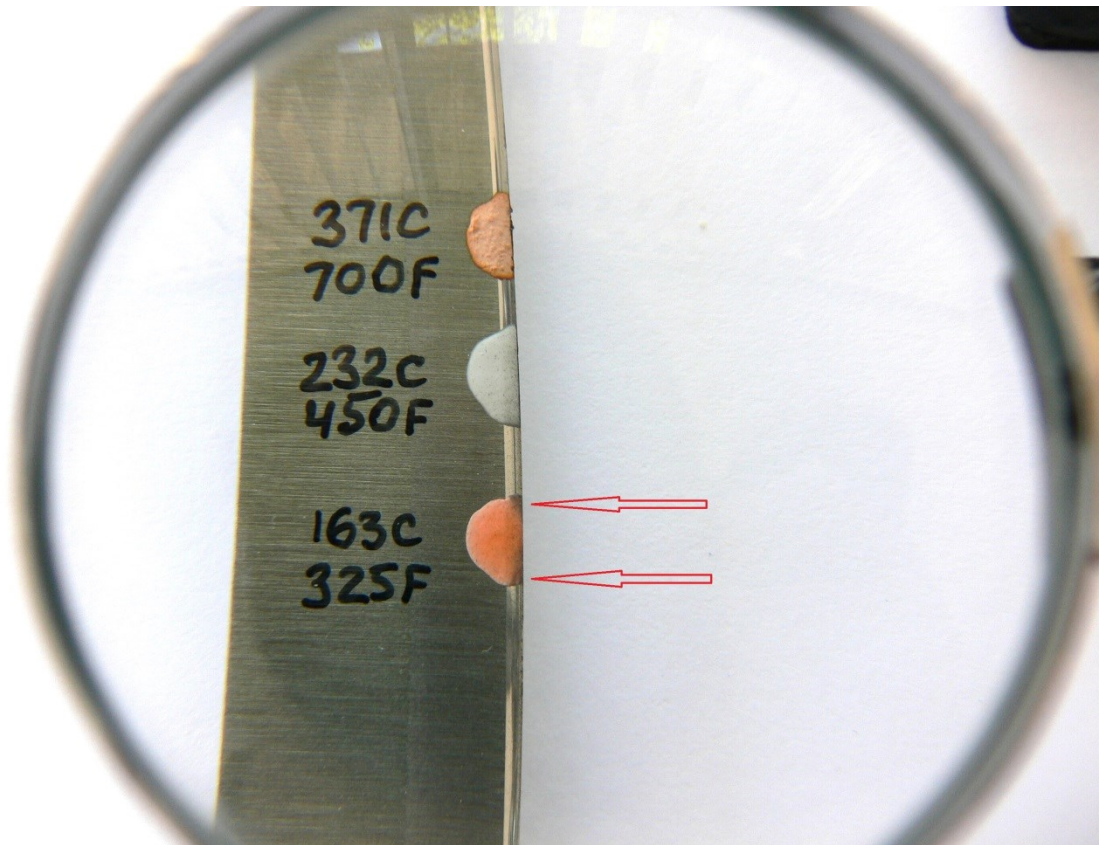
FELT WHEELS

Solid felt wheel with diamonds on a half-speed grinder

The felt wheel with diamonds runs practically dry. Even if we apply diamonds in the form of an oil paste, the oil soaks into the felt, and the wheel is dry on the surface.

Dry felt on a full-speed grinder burns the edge in less than a second.

In our test a rock-hard felt wheel sprayed with diamonds, run on a half-speed grinder, heated the edge to 163°C/325°F, i.e. temperature in the edge reaches the tempering range for knife steels.



Slotted Felt wheel with Autosol on a half-speed buffer

In our sharpening for commercial kitchens for deburring we often use this slotted felt wheel with Autosol on a half-speed buffer. Problem with Autosol is that it dries pretty quickly.

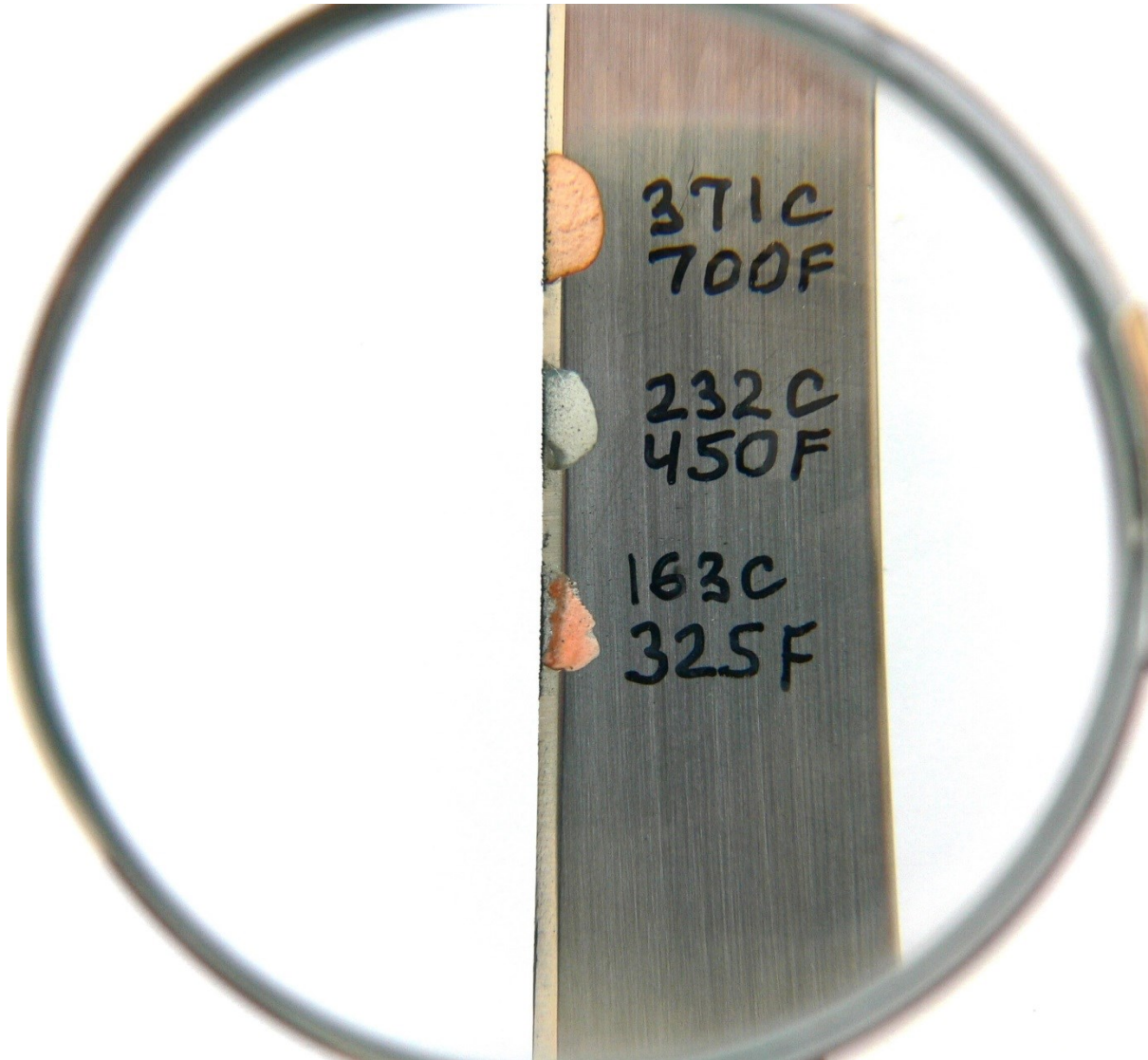
6 passes on this wheel did not trigger the lacquers – no overheating.

Slots in the wheel work as fan and cool the blade, so we expect less heating than on the solid felt wheel. Compared to the solid felt wheel, the slotted wheel indeed runs cooler.

Solid Felt wheel with Green Rouge on a full-speed grinder

Deburring is usually done by 2-3 passes on each side of the blade.

So, in our experiment we will did 6 passes on one side and estimate heating by the temperature lacquers on the other side.



As we can see, lower 2 lacquers triggered and temperature in the edge reached 232°C/450°F. At 232°C/450°F many knife steels over-temper and soften.

I know that many sharpeners deburr on felt wheels with “green compound” on full speed grinders/buffers, thinking that loading them with a buffing compound saves the edge from burning. But as we see in our experiment, it does not save the very edge which gets the most of the heat.

Solid Felt wheel with Green Rouge on a half-speed grinder

After 6 passes none of the lacquers triggered, no signs of overheating.

BUFFING WHEELS

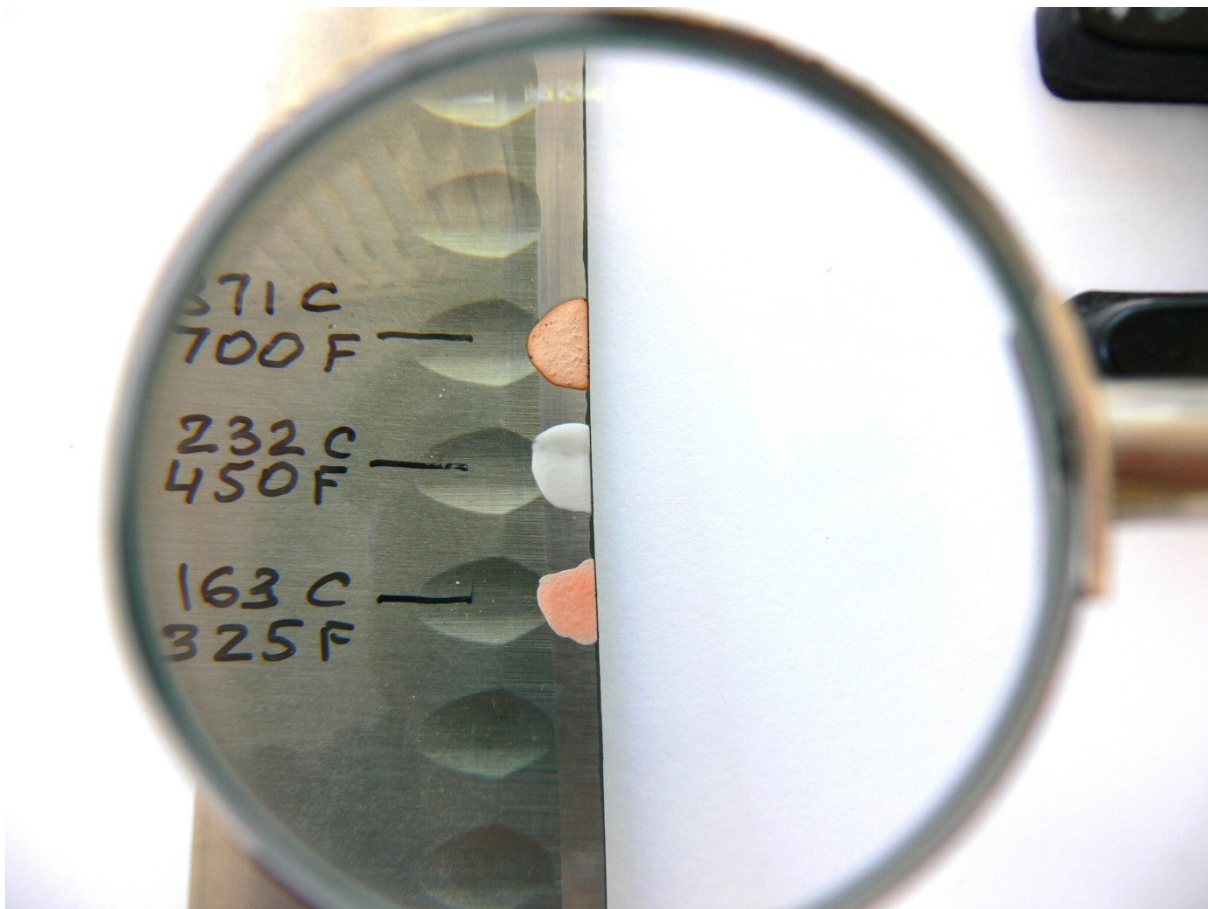
Buffing wheels are widely used for deburring by knife makers. As a buffing compound they use a “green compound” or Green Rouge.

Buffing wheel with Green Rouge on a full-speed grinder

We did 10 passes and estimated the heating. 10 passes is more than usually done on these wheels.

As expected, no signs of overheating by the buffing wheel.

Buffing wheels hone cool, no overheating at all even at full speed.



Stone wheel grinder

In the variable speed 8" grinder used in this experiment:

"Low speed" = 1630 RPM

"Full speed" = 2750 RPM

Uncooled dry stone wheel on a full-speed grinder vs half-speed grinder

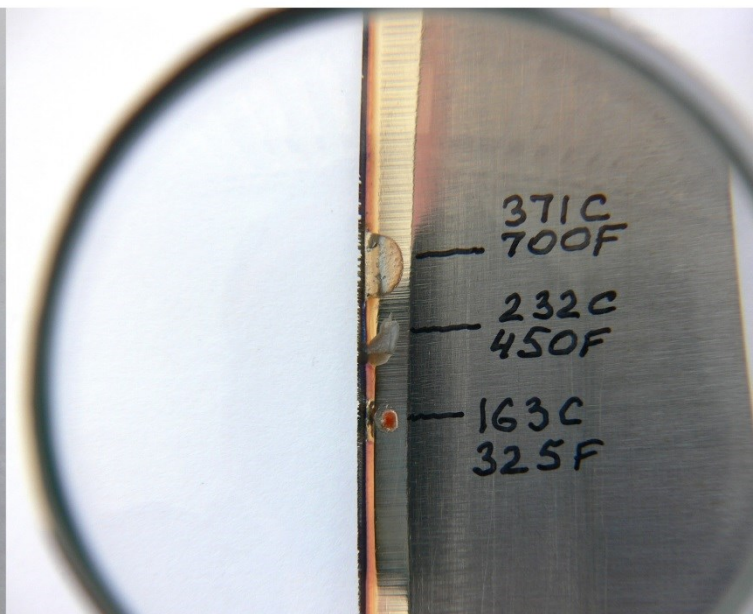
Sharpening usually requires minimum 2 passes each side, so in our experiment we did 4 passes on one side and estimate the heating by the temperature lacquers on the other side.

4 passes at full speed

BEFORE



AFTER

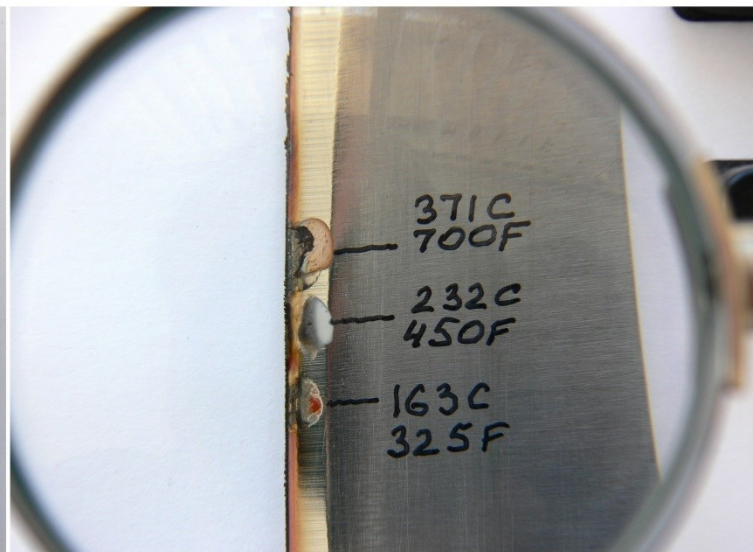


4 passes at low speed

BEFORE

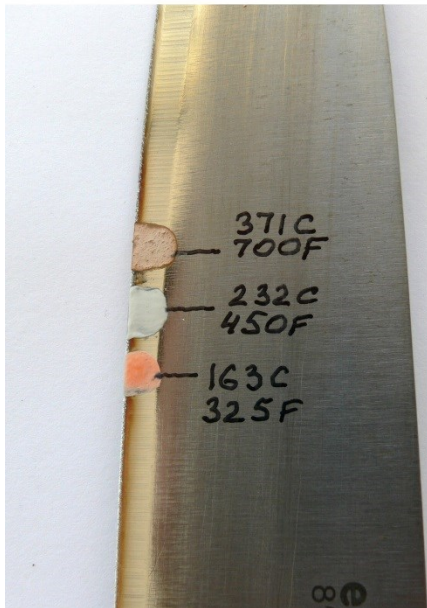


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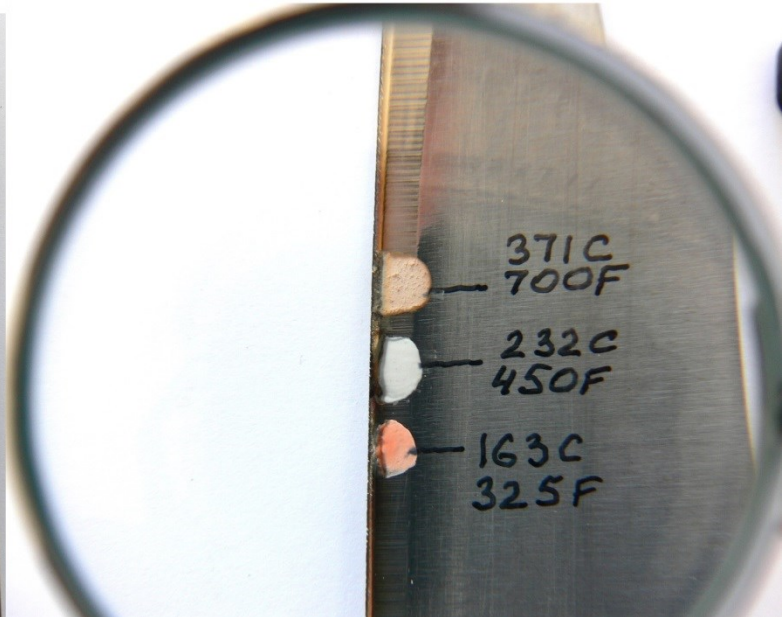


Finally, we tried 2 passes at low speed – in real sharpening this would equal 1 pass each side.

BEFORE



AFTER



In all cases temperature in the edge raised over 371°C/700°F – all mainstream knives over-temper and soften.

Stone wheel, the blade oiled, on a half-speed grinder

There was also a suggestion to use an oil to “protect the blade”, so we will test that as well.

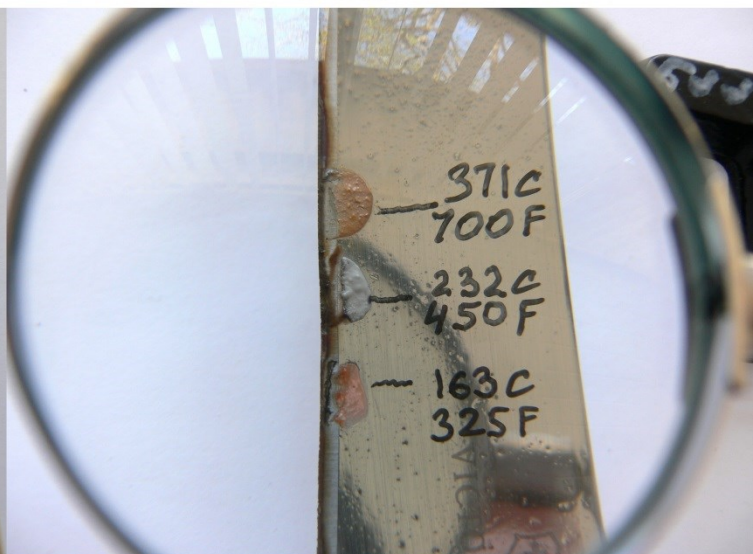
In this test we use an even slower grinder running at 1450 RPM.

2 passes of oiled blade at 1450 RPM with the wheel rotation – all 3 temperature lacquers triggered, and discoloration in the edge.

BEFORE



AFTER

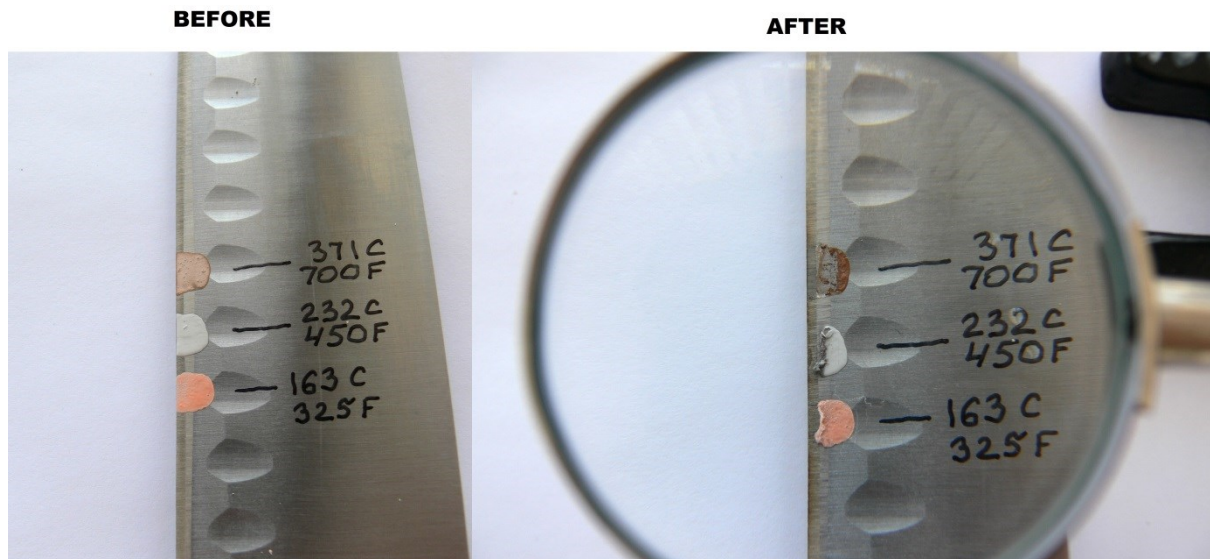


Temperature in the edge raised over 371°C/700°F – all mainstream knives over-temper and soften.

Stone wheel, dipping the blade in water, half-speed grinder

By what we have seen so far, only dipping in the water after every pass has a chance to save the blade from overheating.

We tried the sequence: 1st pass - water dip – 2nd pass



All 3 lacquers have triggered; discoloration of the edge.

Temperature in the edge went over 371°C/700°F – all mainstream knives over-temper and soften.

Summary: full speed, or half speed grinder, there is no safe way to sharpen on stone wheel.

CBN wheels at high RPM

We tested #80, #400 and #1000 CBN wheels on full and half-speed grinders.

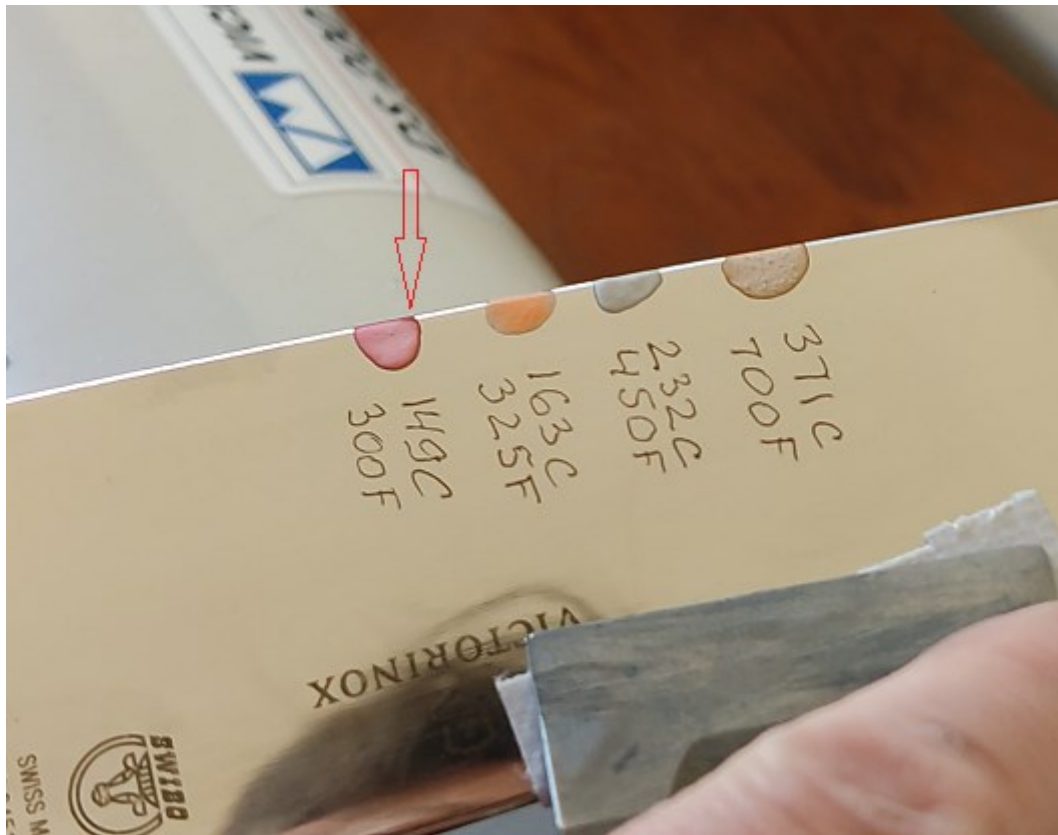
CBN #80 on a half-speed grinder, grinding an edge from 20 to 12 dps, without Honing Coolant

2 passes burnt the edge



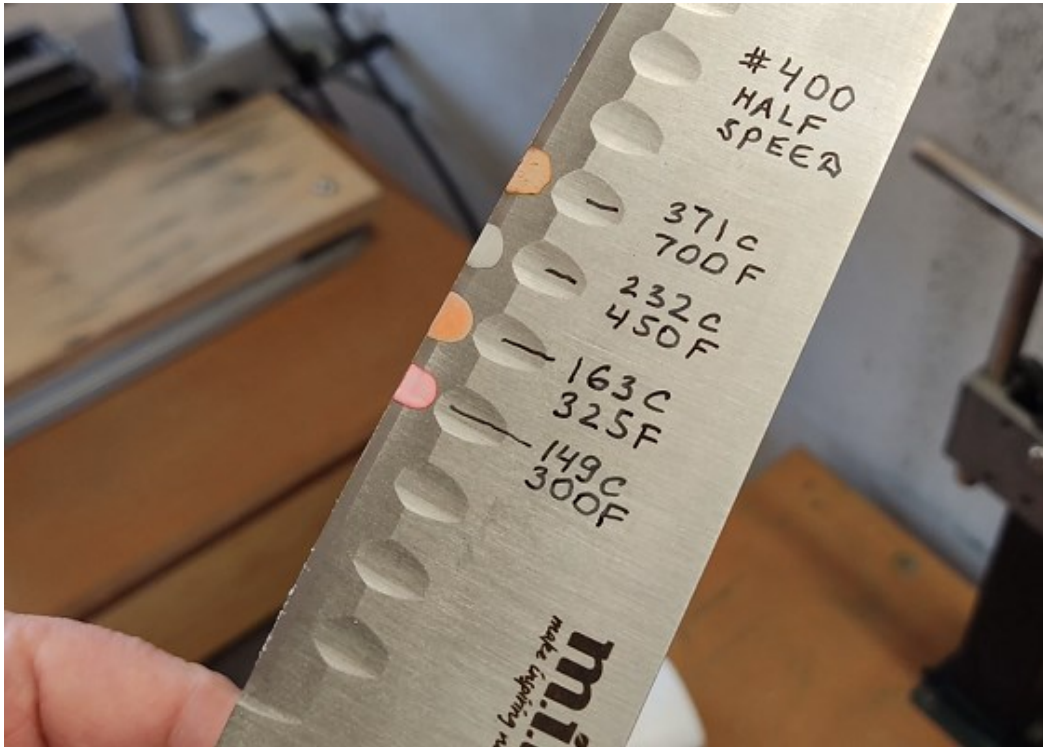
2 passes on a dry CBN wheel run on a half-speed grinder raise temperature in the edge to 232°C/450°F – many knife steels over-temper and soften.

CBN #80 on a half-speed grinder, grinding an edge from 20 to 12 dps,
with Honing Coolant



Temperature in the edge has not reached the tempering range for knife steels.
There is a hint of the lacquer transition in one corner at the very edge shown by the red arrow at 149°C/300°F, but temperature definitely has not risen over that.

**CBN #400, 4 passes on a half-speed grinder,
with Honing Coolant**



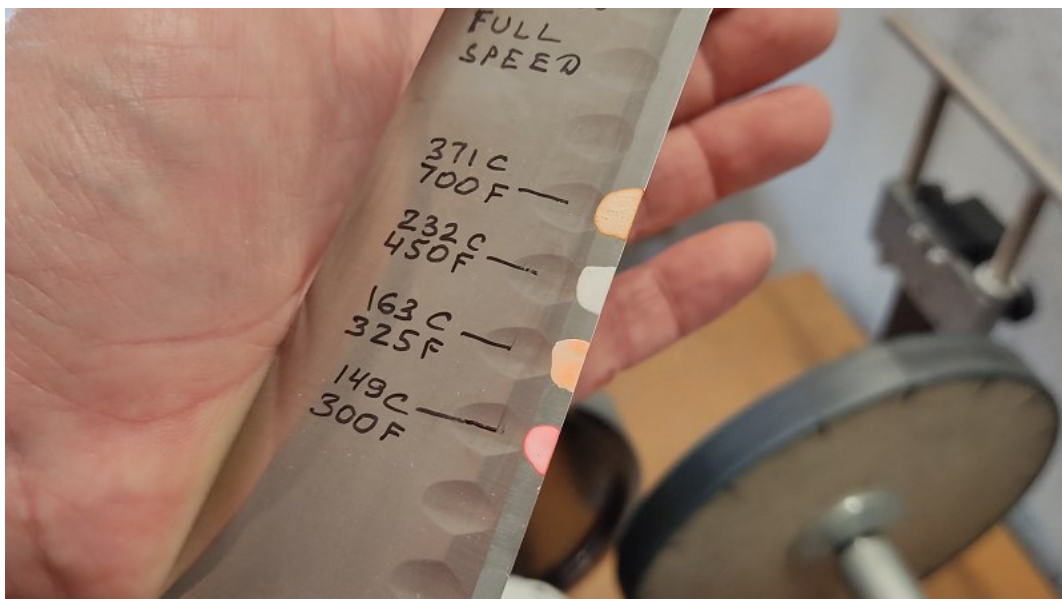
None of the lacquers triggered, no overheating at all.

The next test is the most challenging in sense of heating.

This knife edge is 10 degrees per side.

The CBN grit is extra-fine # 1000. The grinder speed is full 2750 RPM.

CBN #1000, 4 passes on a full speed grinder, with honing coolant



None of the lacquers triggered, no overheating at all.

For the record, we did not test heating in CBN wheels made of other materials, like steel or nylon.

Our diamond honing wheels

At high RPM our diamond honing wheels are used with our HONING COOLANT; we use them dry only on slow grinders like Tormek.

Used with the honing coolant, they do not overheat the edge, neither on half-speed, nor on full-speed grinders/buffers.

SUMMARY OF RESULTS

By results of our testing, the worst offenders are -

2850-3500 RPM grinders/buffers: stone wheels, solid paper wheels and solid felt wheels, including those run with oil/wax;

1425-2000 RPM grinders/buffers: stone wheels, dry solid paper wheels, dry solid felt wheels.

Work Sharp fine belt at “high speed” used without a coolant;

Belt grinders used dry and at a slow feed rate;

Belt sanders used dry.

WORK SHARP

The Work Sharp coarse belt has no risk of overheating when re-sharpening at the existing edge angle or re-grinding to a lower angle.

The fine belt at “high speed” heats the edge to between 163°C/325°F and 200°C/400°F.

The fine belt at “low speed” heats the edge to 163°C/325°F.

163°C/325°F – heating reaches the tempering range for knife steels

200°C/400°F – many knife steels over-temper and soften

Use of a honing coolant makes Work Sharp sharpening completely safe.

BELT GRINDERS

42” and 72” belt grinders can overheat the edge if ground in one spot for about 2 seconds in the butcher/kitchen knife and 1 second in smaller knives.

Shorter and finer belts cause more heating. Longer belts have more time to cool.

Coarse abrasives heat up less as compared to fine thanks to the air circulation between the large grains.

A worn belt heats more than a new one.

Grinding on the belt against the platen heats more, while on the slack of the belt heats less.

Avoid continuous dry grinding – water the workpiece frequently.

Use of a honing coolant makes the belt grinding safe.

For more hints on how to control heat in belt grinding see a very good YouTube video by Don Nguen Knives “How to grind thin edges without overheating them” <https://youtu.be/khG7WCYogrQ>

BELT SANDERS

The tested belt sander belt speed is 7.5 m/s (1476 feet/min).

Dry sanding overheats the edge over 371°C/700°F, even when paused every second for 1 second to air-cool the blade. 371°C/700°F – all mainstream knives over-temper and soften.

Water-cooled sanding heats the edge to 163°C/325°F at the very edge.

You have to dip the blade in water every second.

That small mildly overheated area can be ground off by slow and cool sharpening.

GRINDERS SUMMARY

On 2850-3500 RPM grinders do not overheat the edge CBN wheels, buffing wheels, and slotted paper wheels unless dry.

On 1425-2000 RPM grinders do not overheat the edge CBN wheels, slotted felt wheels, and solid and slotted paper wheels unless dry.

PAPER WHEELS

Paper wheels, used the regular way by the producer recommendations, overheat the edge because of the gritted wheel to 232°C/450°F.

232°C/450°F – many knife steels over-temper and soften.

The slotted honing paper wheel with a buffing compound does not overheat the blade by itself.

Slotted paper wheel with diamonds in an oil-based paste does not overheat the edge, whether run on half- or full-speed grinder/buffer.

Slotted paper wheel with Autosol on a half-speed grinder heats the edge to 163°C/325°F.

Running it with the HONING COOLANT prevents overheating.

Finishing slotted paper wheel with pure chromium oxide, either in paraffin oil or linseed oil, does not overheat the edge.

FELT WHEELS

Dry felt on a full-speed grinder burns the edge in less than a second.

Solid felt wheel with diamonds on a half-speed grinder heats the edge to 163°C/325°F.

163°C/325°F – heating reaches the tempering range for knife steels.

Solid felt wheel with Green Rouge on a full-speed grinder/buffer overheats the edge to 232°C/450°F.
232°C/450°F – many knife steels over-temper and soften.

Solid Felt wheel with Green Rouge on a half-speed grinder does not overheat the edge.

Slotted Felt wheel with Autosol on a half-speed buffer does not overheat the edge. Compared to the solid felt wheel, the slotted wheel indeed runs cooler.

BUFFING WHEELS

Buffing wheels with a buffing compound hone cool, no overheating at all even at full speed.

STONE WHEEL GRINDER

There is no safe way to sharpen knives on grinders – even run at half a regular speed, with oil or water, they overheat the edge over 371°C/700°F.

371°C/700°F – all mainstream knives over-temper and soften

CBN WHEEL GRINDER

CBN wheels are the single biggest advance in sharpening in a very long time, yet used without a coolant they burn edge in knife sharpening.

On a dry CBN wheel run on a half-speed grinder temperature in the edge reaches 232°C/450°F - at this temperature many knife steels over-temper and soften. The Honing Coolant prevents this – temperature in the edge of knives ground on CBN wheels with the Honing Coolant does not go over 150°C/300°F.

Our CBN wheels with their massive 2.2kg aluminium body dissipate heat well, and do not cause overheating, even extra fine, and even on full speed grinders – **provided that** they are used with our HONING COOLANT.

We did not test heating in CBN wheels made of other materials, like steel or nylon. But it is a common knowledge, that heat dissipation is worse in them as compared to aluminium.

OUR DIAMOND HONING WHEELS

At high RPM our diamond honing wheels are used with our HONING COOLANT; we use them dry only on slow grinders like Tormek.

Used with the honing coolant, they do not overheat the edge, neither on half-speed, nor on full-speed grinders/buffers.