# Here's a few mods, tips, & tricks I did to my WEPS

Posted by MODiFiEDZ - 01 Apr 2012 04:35

---

Here is a video I uploaded to MODiFiEDZ YouTube channel about some modifications I did to clean, lube & protect the sharpener as well as consistently get mirror polished edges & even hair whittling sharp edges everytime. There's some more Wicked Edge sharpening videos on my channel if you'd like to check them out.

[video size=100 width=640 height=360 type=youtube]

==========

# Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by wickededge - 04 Apr 2012 08:04

---

These are great, thank you for sharing!

==========

# Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by razoredgeknives - 04 Apr 2012 12:33

---

np... you see what I'm saying about extending the square arm on the mod to be about 3" long? you could then slide the rod arm base up and down on it, which would then allow for even scissors =) unfortunately (hind sight is 20/20 lol) I didn't make them long enough so I still can't do scissors =(

==========

# Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by razoredgeknives - 13 Apr 2012 08:10

---

Hey, just so everyone knows if your interested.... I reinforced the joints on my rod arm bases. It didn't work as planned at first, so I adapted and now its great. I used a "nut and bolt" style instead of threading the actual aluminum base itself. For the larger part of the base (i.e. the blue part), you will need to drill it out with a 1/8" drill bit (and bore it out a little to widen it) and use a 6/32" screw to go through. For the top part (i.e. the black part of the base) I used a slightly smaller screw, which was 4/40" (if I remember correctly).

Using these items I am now able to (with the help of loctite) tighten the nut just perfectly to where it will

still allow free movement but not so loose as to allow any play. This in combination with the Subway straw idea and there is hardly any noticeable play!

==========

## Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by BruceGuignard - 14 Apr 2012 20:38

_____

Great video. Thanks for the suggestions. I feel like the farmer's anxious rooster - just looking for something to ****, ah.. sharpen.

==========

## Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by mark76 - 05 May 2012 01:30

_____

I decided to try out the magnet idea from the video: a magnet to keep the WEPS and its base clean. That was fun!

I had no idea how strong a magnet I should get. Since I guessed it should be pretty strong to attract steel dust from the air, I ordered a 38 kilogram magnet. That is not a magnet that weighs 38 kilograms, but a magnet with an attractive force of 38 kilograms. Still it is not very large: a disk with an intersection of a little over one inch and a height of half an inch.

I had no clue how strong 38 kilograms would be in practice.

The fun started when the package arrived. I used my EDC to open the package and immediately my

knife was drawn strongly towards the center of the package. It took me quite some force to remove the knife and I had to open the package by hand .

I wanted to know how strong the magnet really was and kept it next to my pocket knife. That was a loud bang! And then I had to remove the pocket knife... Well, I must say that 38 kilos is a lot of force to apply to a small and open pocket knife. Definitely not safe! (But fun :)

What was less fun was that this magnet caused the battery of the flashlight of my camera to sparkle when I took the above picture. I think I wisely kept this magnet away from cell phones and computers.

How well does it perform on the Wicked Edge? Well, it definitely draws some steel dust from the air to it. But not a lot; there is still some dust that comes down elsewhere. Perhaps that is not so surprising if you know that the magnetic force probably decreases with much more than the inverse square of the distance.

And to be honest, the dry stones on the WEPS do not cause much dust. The magnet works well in attracting the steel dust, however, if you move it over the base, close to the base. However, so does a wet cloth.

And I now have a new problem: how to remove the steel filings from the magnet? I think this magnet will have to leave our house...

==========

## Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by DennisHibar - 05 May 2012 04:23

_____

That's one strong magnet!! A while ago, I took a slightly different route. I glued a small magnet to a Popsicle stick. When I am done sharpening, I just run the magnet over and under the WE to pick-up any steel dust. After that I use a hand-held vac over the WE, to make sure I get any grit out of critical areas, like the arm pivots, that may have been missed with the magnet.

==========

## Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by TonyPettersen - 05 May 2012 05:06

_____

i have tried to use a Neodymium magnet that size and i put a film of plastic over it and taped it down, so i

could remove steel powder from the magnet.. and it just ended up magnetizing stuff.. i scrapped that idea and continued to look for the smaller magnets i have somewhere.. stuck to something

==========

## Re: Here's a few mods, tips, & tricks I did to my WEPS

Posted by AnthonyYan - 05 May 2012 09:22

_____

Hi Mark76,

Your magnet can lift 38 Kilograms? So, 38 Kilograms * 2.2 Pounds/Kilogram = 83.6 Pounds. That is one VERY strong magnet.

Most magnets (not all) have a dipole or dipole-like field, so their strength drops off extremely rapidly with distance. But with such a strong magnet, it's still powerful enough to demagnetize your credit card from a fair distance, and induce voltages in nearby moving metal objects the same way that happens in a dynamo/electric-generator (like inducing voltages in your camera). And don't let anything metal nearby accelerate into the magnet; at up to 80+ lbs of force, that could cause serious bruising of a finger, or the impact could shatter/chip the magnet (which is actually fairly brittle). And never never let two such magnets click together! You can separate them if you are very strong, but the impact will most likely chip one or both magnets and crush anything in between them.

One possible problem with magnets is only the metal swarf from the knife is magnetic. Most abrasives (SiC, AlO, Diamond, etc.) are not magnetic. So the small amount of abrasive released won't be attracted to the magnet.

Maybe, a simpler solution is to use a fan or vacuum, to blow the swarf away from your sharpener. You could try a saw-dust collection scheme like those in a wood-shop (where air is used to suck sawdust into a collection bin/filter).

This picture is of a vacuum nozzle on a wood drill press. (It is not a coolant sprayer!)

www.leevalley.com/US/wood/page.aspx?p=58...=1,42401,62604,58751

www.woodcraft.com/product/2001850/3121/m...t-collector-set.aspx

For me, I would hate to do this, because I find sharpening very relaxing and meditative. So having a loud vacuum running would just annoy me. Unless maybe the vacuum itself was far away in another room, and one ran a very long suction hose to the WEPS...

Instead, I like to keep a small amount of water on the stones, so that a swarf slurry drips off which I find easier to clean. Although, you don't want that slurry to drip into your folding knife's pivot, or the WEPS joints.

A much more complicated solution, is to use the opposite of electrostatic powder-paint coating. In powder-coating (for say for automotive and industrial), the paint particles are given an opposite electrostatic charge as the object to be painted. That way, they are attracted to and stick onto the surface for an even coat, and so that they can be permanently baked on in an oven. I suppose the opposite could work: Just hook up the WEPS and knife up to a Van Der Graff generator and give everything the same charge, so the swarf is all electrostatically repelled away. Just try to ignore sparks you will get from touching a metal door knob etc. And don't bother to comb your hair, as it will all stand up anyways.

Of course, I'm totally joking!

Sincerely,

--Lagrangian

---

"What grit sharpens the mind?" --Zen Sharpening Koan

==========

# Re: Here's a few mods, tips, & tricks I did to my WEPS
Posted by mark76 - 05 May 2012 11:56

---

ROFL!!

==========

# Re: Here's a few mods, tips, & tricks I did to my WEPS
Posted by AnthonyYan - 06 May 2012 07:12

---

**mark76 wrote:**

And I now have a new problem: how to remove the steel filings from the magnet?
I think this magnet will have to leave our house...

I have three thoughts about this, but don't know if any of them would work:

(1) Duct tape is the solution to everything?

Tape up your dirty magnet, and then peel it off... Hopefully the filings stick more to the adhesive in duct tape than they are attracted by the magnet. If it works great. But the worst case scenario is that things get worse when the duct tape leaves adhesive residue on the magnet.... But presumably you can clean that off with Goo Gone or other solvent.

(2) Hot glue?

Same idea as (1). Put on hot glue, let it cool and solidify. Then hopefully it peels off with the metal

shavings.

(3) In the future, maybe keep the magnet in a Zip-Lock bag, or wrapped in aluminum foil?  Then to clean, just replace the bag and/or foil.

Oh, if that super-magnet needs to leave your house, maybe it can visit my house?

Sincerely,

--Lagrangian

---

"What grit sharpens the mind?"

--Zen Sharpening Koan

---

P.S. This is both semi-theoretical and semi-practical: many situations involve competing effects of volume to surface area:

(1) The metal particles have an attraction to the magnet which is proportional to their volume.

(Basically true if the particles are close to the magnet, and much smaller than the magnet so that the volume of the particle covers a region of uniform magnetic field.)

(2) The metal particles have an adhesion to the duct-tape/hot-glue which is proportional to their surface area.

(Assuming that if the surface makes good and complete contact with the tape/hot-glue, and assuming that the surface physics of the particles does not change when they very (very, very) tiny, then this is true).)

So the smaller the metal particles, the easier they will be to clean off the magnet surface:

Total Force = c1*V - c2*A

where V is the volume of the particle, and A is the surface area of the particle. The c1 and c2 are constants involving how strong the magnet is, and how sticky the tape/glue is for the metal. I'm using the convention where a positive force sticks the particle to the magnet, and a negative force pulls the particle away from the magnet.

So if the particles are (more or less) spherical we get:

Total Force = k1*(r^3) - k2*(r^2)

where r is the diameter of the spherical particle. The k1 and k2 are constants, and I had them adsorb the constants c1 and c2, as well as constant factors for a sphere's volume and area (ie: sphere volume = (4/3)*pi*(r^3), sphere area = 4*pi*(r^2)).

Finally we notice this: For a tiny number r, its cube (r^3) is smaller than its square (r^2). As r becomes smaller and smaller, the attractive force to the magnet gets small faster than the adhesion to tape/glue. So we reach our final conclusion (given the simplifying assumptions mentioned above):

For removing metal particles from a magnet by tape/glue:

it is easier to remove small particles than big ones.

---

In physics, chemistry, and engineering, we very often see effects like this. We call it,"Surface Area to Volume Ratio", "Scaling Laws" (how do things grow/shrink when you change the size r?), and sometimes "Dimensional Analysis" (similar to unit analysis: area versus volume).

The canonical example of surface-area-to-volume ratio are dust explosions (such as in wheat grain silos): Materials burn on their surface. The more surface area a pound of material has, the faster it can burn. The energy released is proportional to the total amount of material (ie: total volume and/or total weight). Particles of powder have surface area proportional to r^2, and volume proportional to r^3. So if you work it out, the surface-area-to-volume ratio of a powder is insanely huge (surface area per pound of

material). So if the powder is mixed in air, it can burn insanely quickly. And that means a low-level explosion (not technically a detonation, but a very fast conflagration). After many grain-silos blew up, they started monitoring silo temperature, humidity, and amount of grain-dust.

---

Surface-area-to-volume ratio also affects liquid abrasive sprays, such as those used on strops for knife sharpening. In these liquid sprays, you have tiny (sub-micron) particles of abrasive, such as mono-crystaline diamond, poly-crystaline diamond, boron carbide, cubic boron nitride, aluminum oxide, etc. These tiny particles sometimes like to stick together and/or settle out of solution. I won't go into all the details because I'm not a chemist. But you can see how it could matter: particles stick together with their surfaces (surface area), and part of why they settle out of solution is their weight, which is proportional to their volume. If the particles stick together strongly enough, they can, in effect, form a larger grit particle. This is called "particle aggregation". So people like Ken Schwartz optimize their abrasive sprays to minimize particle aggregation by changing particle size, as well as concentration of various additives that affect surface-attraction and viscosity. Many of these effects are not important for coarse grits, but as the grit gets finer and finer (sub-micron), they begin to matter more and more.

I don't know (not a chemist), but believe this is not significant factor in wax-based stropping compounds (because there the particles probably like to stick to wax very much, possibly more than they like to stick to each other, and the particles cannot easily move around in the solid wax). But please don't shoot me if you talk to a real chemist, and he shows me to be wrong.

---

The overall point isn't whether the effects surface-area-to-volume ratio are absolutely correct in complete detail for all the situations described. The point is that surface-to-volume ratio is just another tool for how to understand things. Just like energy and force. Depending on the situation, one tool may be better than another.

---

I didn't mean to give a mini-tutorial on surface-area-to-volume ratio; but since I did, I think I'll just leave it be. I love being a physics major. ☺

==========