Custom Aluminum Ring

by j626no on October 24, 2008

Table of Contents

Intro: Custom Aluminum Ring

I wanted a ring that was simple yet unique. I have really small fingers for a guy (size 7) and unfortunately every time I found a nice ring, it was too large. So I decided to make a pair of matching rings (one for me, the other for my girlfriend) out of a solid block of aluminum and the most basic of tools that almost anybody has at their disposal.

Overal Cost: **$0.00**

step 1: Cutting down your block

I looked many places for an aluminum block that was small enough to not cost a fortune yet big enough to make a ring out of. After exhausting my options, I decided to ask the machine shop down the street from my house. Three minutes later I left the shop with the perfect block of aluminum -- for free. So as long as you ask the right people, these rings will be completely free (but they are a fair amount of hard work).

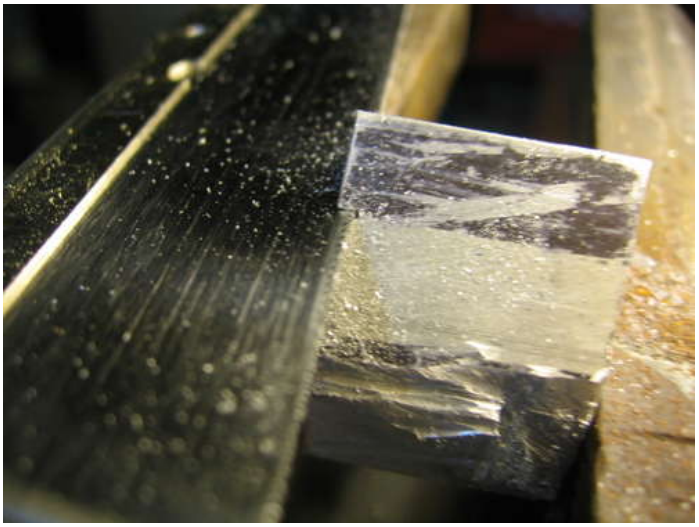
So the first thing to do when you get your block is to cut it down into a more manageable size. I used rectangular stock because that was all I had access to; however, round stock would obviously save a lot of time.

Image Notes
1. Mini Cut-Off saw is not near powerful enough....

step 2: Initial Shaping

Now that the block was cut down, you essentially have a small cube. Since the goal is a round ring, the corners must be cut off. I eyeballed the size ring I wanted and marked the corners. This way I knew what to cut off and what to leave.

I first tried cutting off the corners using the same hack saw I used to cut the block down; however, holding such a small cube still while cutting with a large saw proved unsuccessful. Next I tried my Dremel with a cut-off wheel; however, it walked entirely too much and the block became way to hot to handle. The method I finally ended up using (and by far the fastest) was to use my X-Acto saws that came with a little miter box setup. The fine teeth of the saws allowed them to cut through the aluminum with ease. I just place the cube in my vice and cut the corners off, rotating as I went.



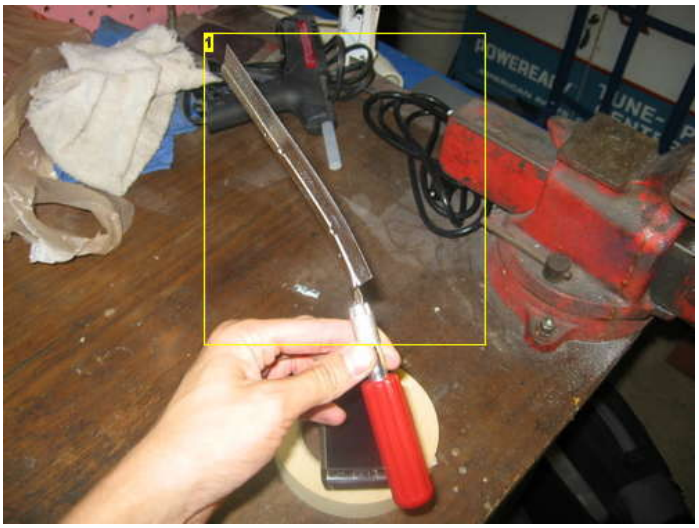


Image Notes
1. DON'T SAW TOO FAST!!!! I bent the blade...no big deal, it easily bent back.

Image Notes
1. Marks left after cutting off corners....am I alone in thinking that it looks like the cube from the transfomers a little bit?

step 3: More Shaping

After cutting off the corners, the block now resembles a stop sign. In order to round off the corners, I used a large file that used to be my grandfather's (we actually have an entire drawer of files). I placed the block in the vice and filed, rotating as a I went to eventually create a round object. Don't rush the rounding shaping stages as they will take a long time, but the reward is worth the effort.

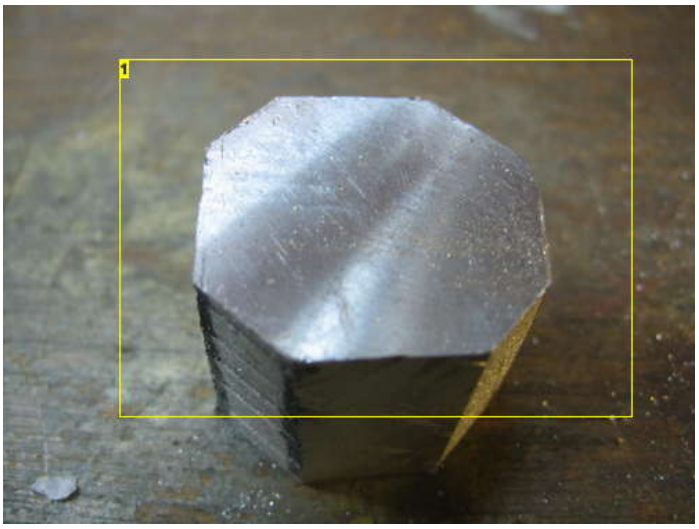


Image Notes
1. STOP sign...see

Image Notes
1. Aluminum dust....there will be A LOT of this

Image Notes
1. told you....

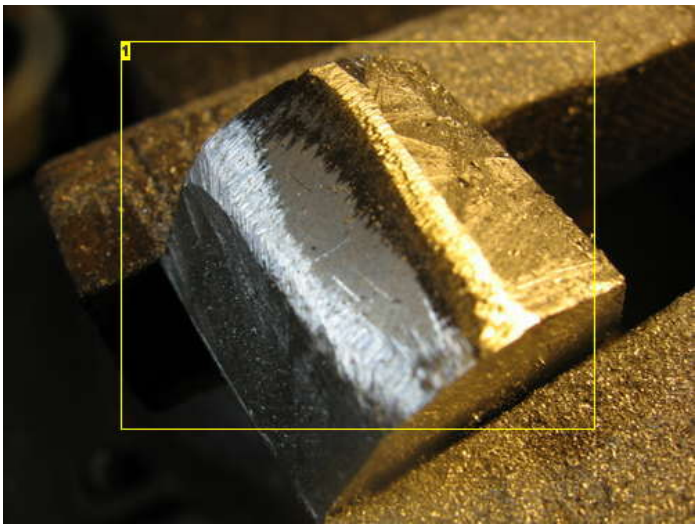
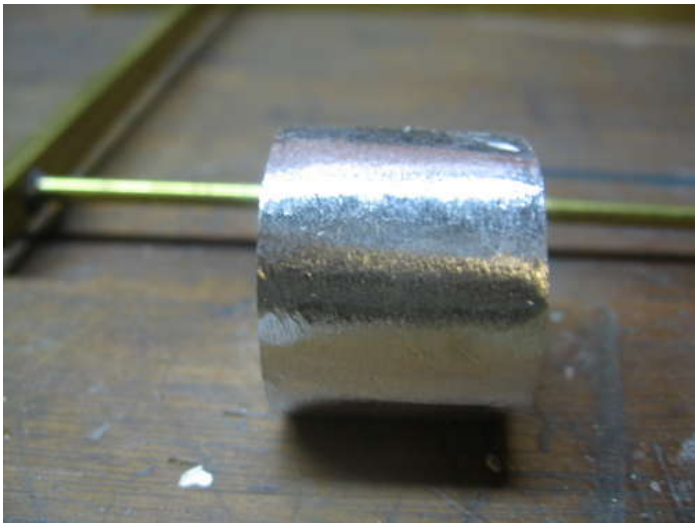


Image Notes
1. It surprisingly rounds over pretty quick as aluminum is a rather soft metal.



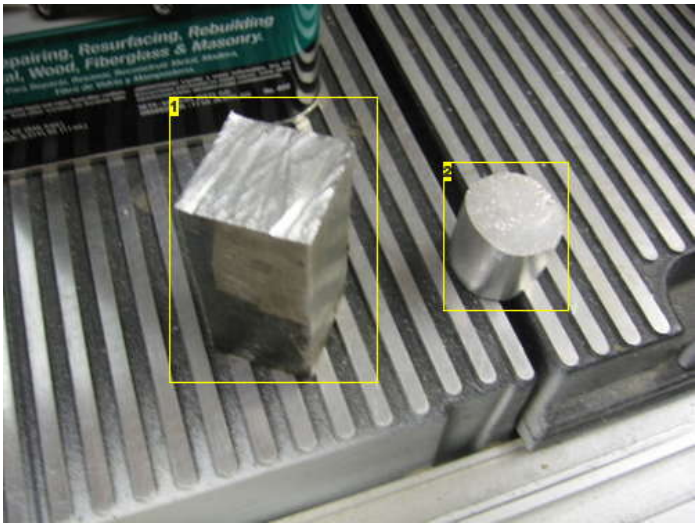
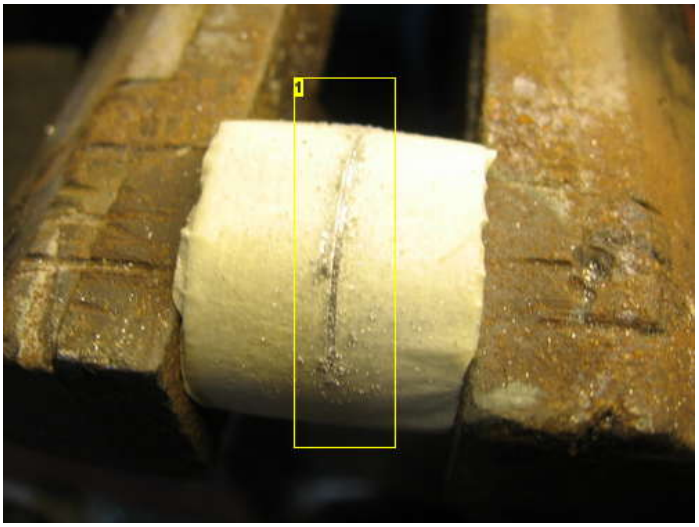


Image Notes
1. Original hunk (minus cube)
2. rounded "cube"

step 4: Drilling the Rings

Now we have a fairly round chunk of aluminum that needs to be drilled out so it will fit over somebody's finger. Before it can be drilled however, it needs to be cut in half length-wise to that we get two similarly sized pieces. I wrapped the chunk in masking tape prior to cutting -- I've found this helps to prevent the saw blade from sliding around on a smooth surface. After cutting it in half, I used my class ring as reference and found a drill bit that was ***just*** smaller than the ID of my class ring, in my case a 21/32" bit. I wanted something that was slightly smaller so that i could carefully enlarge it later to ensure that the ring would fit.

Using a drill press with the a special vice made for the base of the press, I began to drill out the hole. I used cutting oil to keep the temperature low and reduce the amount of aluminum shavings scattered around. The small holes in the center had another intention in mind (see comments), but they proved to be useful as pilot holes after all. So i **would** suggest drilling a small hole in the center first prior to drilling the larger hole.



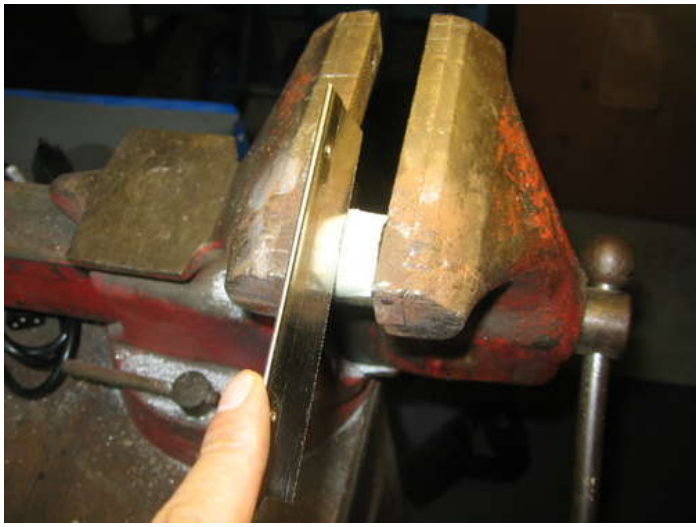


Image Notes
1. The masking tape is really helpful when trying to cut along a line on a smooth surface...prevents the blade from bouncing around.

Image Notes
1. These holes were intended for something else, but they work amazingly as pilot holes for the larger drill bit.

step 5: Shaping, Shaping, Shaping

As you could see in the last picture, the chunks that I thought were round were not quite so round. I actually created a lot more work for myself by overestimating the thickness that I wanted for the rings and had to actually do the final shaping process twice...try not to make the same mistake as me. The mistake I made was that i thought the rings should be much thicker than they really should be. In the first couple of pictures, the red marker shows how much I intended to file off, and you can see that the ring would have been massive if I didn't make a second pass later. To ensure that the thickness is uniform all the way around I used a vernier caliper to constantly check the wall thickness.

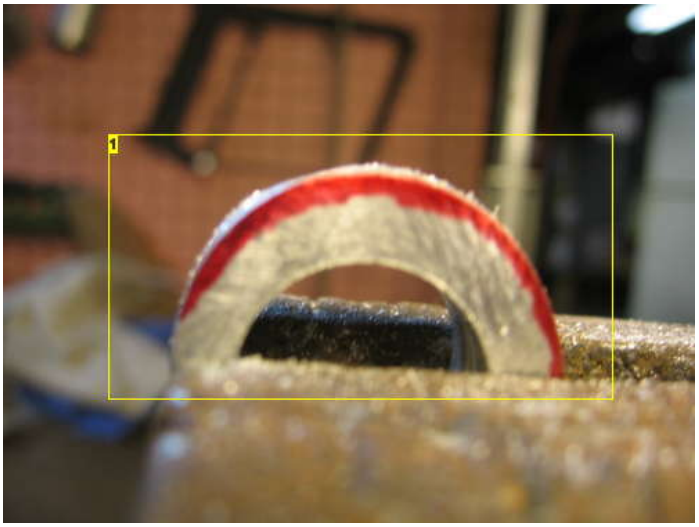


Image Notes
1. I usually take better macro pictures than this, my apologies. As you can see, I underestimated how much I wanted to file off for the thickness of the ring.

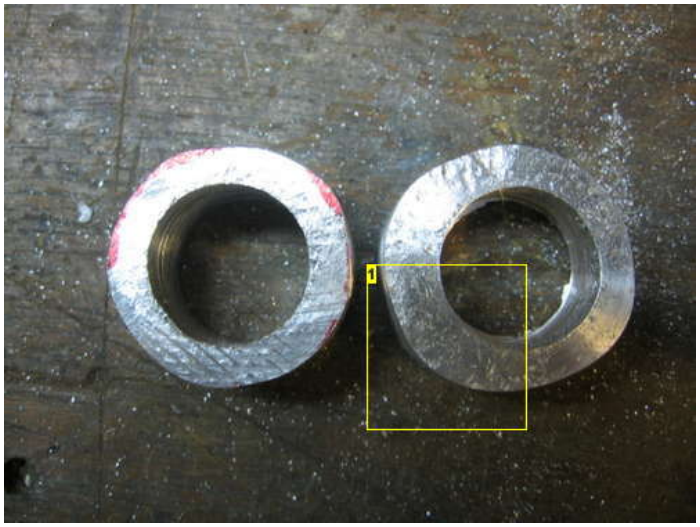


Image Notes
1. That's a pretty thick ring.

Image Notes
1. Vernier caliper used to make sure wall thickness was uniform.

step 6: Enlarging the Opening

When I drilled out the rings, I intentionally drilled them slightly undersized. My reason for doing so was so that I could carefully enlarge the opening by hand to guarantee that the rings would fit (and that my hard work wasn't for nothing). To enlarge the opening, I searched through my drawer of files and found a round file that fit nicely into the opening (by nicely I mean that it was large enough that it could fit into the ring and file the entire inside uniformly). Then I just held on to the ring and began filing it back and forth, checking every few strokes, until it fit. There was a point when it would just fit over my knuckle, but was still tight, so I carefully and lightly filed it a little more and it was a perfect fit.

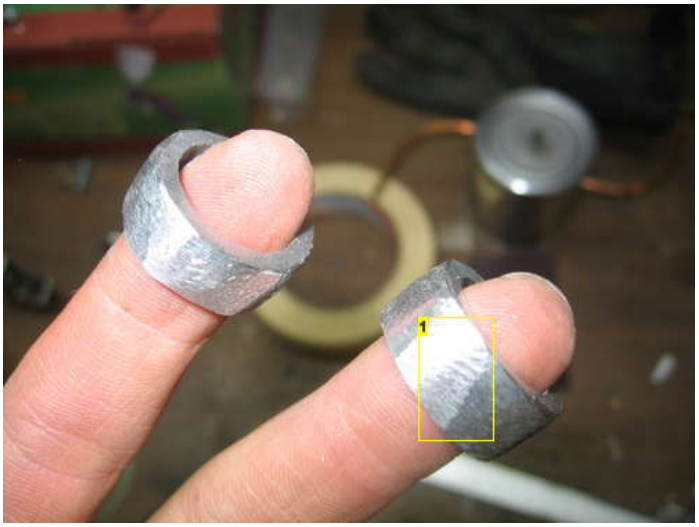


Image Notes
1. The filing left unique impressions on the surface of the rings that I decided to leave on the final product as I felt they were attractive

step 7: Shaping, Shaping, Shaping, Shaping....you get the idea

As I had said, I made the wall thickness entirely too large, so I had to make a second grueling pass to shave off most of the thickness to create a comfortable ring. This took a lot of time and effort as filing by hand is not the most expedient of processes. Sure I could have used a grinder, but I felt like the rings would have more value and meaning if I did as much of it by hand as I could.

As I already mentioned, wielding a large file and monotonously filing for over an hour only to realize you did it wrong lowers both your moral and your strength (its a hell of an upper body workout actually). So for my second (or third...or fourth?) round of shaping, I decided to have the file be stationary and scare the rings along it. As you will notice, I have my fingers wrapped in masking tape...why you ask? Well, as it turns out, filing a tiny object on a course file does have its complications....such as the ring stopping while my hand continues forward and my fingers scrape. After about 10 bad scrapes (its over a month ago I made these rings and my thumb nail still has the gouges in it), I decided I had to do something. I tried gloves but they were too loose at the finger tips and I only ended up filing the fingers off the gloves rather than the aluminum from the ring. I still had the roll of masking tape out so I tried it...it worked *amazingly* . My fingers would still slip off, but the tape would protect me from getting cut up any further.

Once I got the walls of the ring to a uniform thickness that I liked (checking consistently with the vernier caliper of course), I lad the rings on end and filed the ends flat. Even though it was 3:00AM and I was exhausted, I was so close that I had to finish the rings that day.

Image Notes
1. And this is how we hurt ourselves.....

Image Notes
1. Before second round of shaping....

Image Notes
1. ....after...much better
2. 2-2.5 mm thick when finished.

step 8: Finishing

The final step in making the rings was to use a sponge-style sanding block with a medium grid paper to polish up the edges. The filing process left unique indentations in the ring that I found attractive, so I only sanded it lightly to make it smooth. Sand the outside and inside (be careful not to sand too much from the inside or else it maybe not fit correctly anymore). After the sanding was complete, I washed the rings with soap and water, dried it, and put it on my finger.

All in all, I made two of these rings in the course of one day while working on many other things...I'd say maybe 5 hours to make two rings. As I said, the effort is certainly worth the reward of such an original and pretty ring. Feel free to comment or ask any questions about the process of making the rings. Best of luck and enjoy!

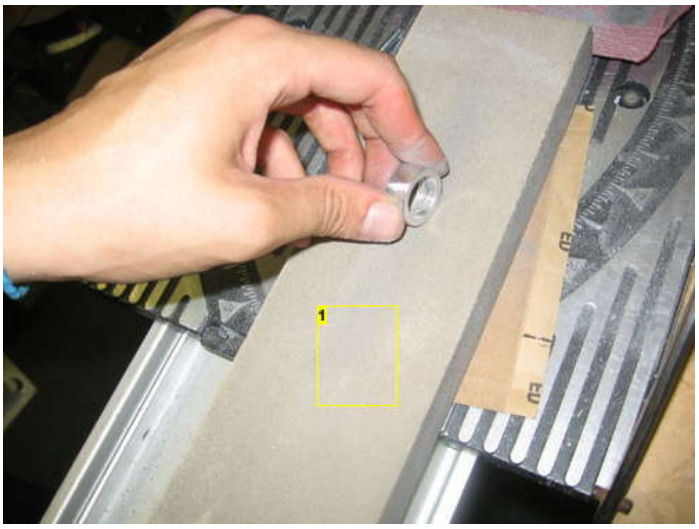


Image Notes
1. foam sanding block

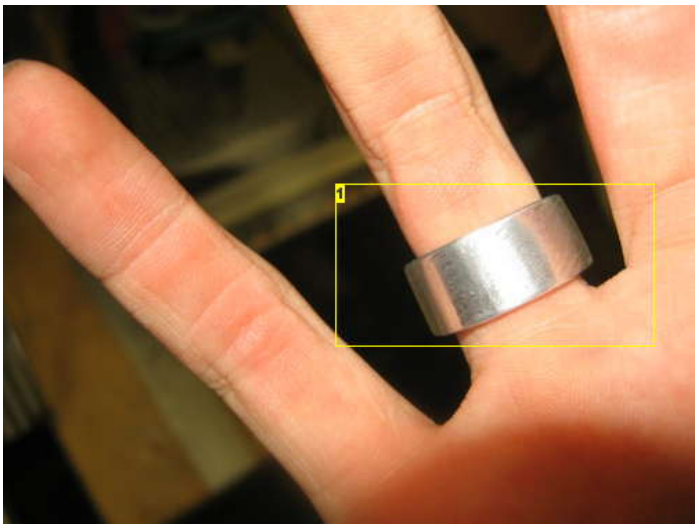


Image Notes
1. fits like a glove....i mean ring

Related Instructables

Jewelry or Serviette holder by puffin_juice

Resin Jewelry Tutorial with John W. Golden Part 3 (video) by johnwgolden

Resin Jewelry Tutorial with John W. Golden Part 2 (video) by johnwgolden

A Simple Wire Ring by totemic

Build a furnace, create custom molds, cast a piece of jewelry, then mount a custom cut stone by kraker89

Green Jewelry (guide) by scoochmaroo

How to make a Ring out of Aluminium Foil by metaknight2550

A begginners guide to making chainmaille jewelry. by taz2020

Comments

25 comments **Add Comment**

cowscankill says: Oct 5, 2009. 6:05 AM **REPLY**
Those look really nice! But I think it would be easier to build a forge and make some molds for multiple rings cast out of aluminium :P

j626no says: Oct 5, 2009. 7:10 AM **REPLY**
that is true, but I liked that it was actually crafted from my own two hands. I made another one since that i actually used my dremel with a polishing wheel and it gave it a perfectly smooth mirror finish. it was a gorgeous ring -- looked like a wedding band and only took 3 hours to make.

craftxxchick says: Oct 8, 2009. 4:20 PM **REPLY**
that's really sweet. was the wedding band for your girlfriend?

cowscankill says: Oct 5, 2009. 2:13 PM **REPLY**

Nice. I might look into doing one of these! (I want to build a forge first :D)

Nautilus34 says: Apr 25, 2009. 7:13 AM **REPLY**

i've taken on way too many tasks lately...but i love this idea. i just collected a bunch of over-sized aluminum rings from some old hard drives (another instructable) they fit my thumb, but i want to find a way to bring it down a few sizes. any ideas?

Robotrix says: Oct 24, 2008. 9:46 AM **REPLY**

what did your final wall thickness turn out to be in the end? They look pretty hefty, but i bet the aluminum doesn't weigh too much. Very nice looking set in the end! Do you have problems with the finish getting marked very easily?

j626no says: Oct 24, 2008. 10:04 AM **REPLY**

wall thickness is about 2-2.5 mm. real light. and its weird....aluminum is very reactive, but aluminum oxide prevents it from completely oxidizing. my ring has the same sheen that it's had from day one...maybe even shinier from brushing against clothing and stuff. The weird thing is that my girlfriends ring is almost black, as if it's oxidized. i dont understand why since (to the best of my knowledge) aluminum only oxidizes in the presence of mercury (in any form) and bases. so my thoughts were her shampoo? or maybe just the salts from perspiration. but like i said, i'm not entirely sure.

Black Cat says: Apr 10, 2009. 6:44 AM **REPLY**

happens to me too with an ali ring i got once in singapore. has something to do with acid levels in someones skin i think...or something along those lines anyway...DO NO laquer it watever u do. that just makes it go black un-uniformly as the laquer wears and harder to clean n such...

j626no says: Apr 10, 2009. 6:46 AM **REPLY**

Thanks for the advice...I actually contacted an industrial metal coating company and got them to clear anodize the rings as a "trial" batch. haven't turned black since, hardly noticeable (the anodizing that is)

Shadowfury says: Feb 19, 2009. 10:09 PM **REPLY**

Well, mercury and gallium. Oxidizing acids have a way of oxidizing aluminium as well.

Oscelot says: Feb 19, 2009. 12:12 PM **REPLY**

I work in chainmaille, and my preferred metal is aluminum.. whenever I get my bright aluminum rings in, I clean them by putting them in a bath of lemon juice and sticking them in the fridge for a few hours, being sure to mix them up every once in a while to make sure everything gets clean. Just thought it might be a useful tip. _

j626no says: Feb 19, 2009. 11:12 PM **REPLY**

Alright...I'll have to give that a try with my girlfriend's ring. Currently we need to clean it every other week because it gets so black. Do you know of anything I could coat it in to prevent this from happing?

Hands Without Shadows says: Oct 24, 2008. 6:39 PM **REPLY**

Women have a lower skin surface Ph level than men.

I made my own ring too, except I have a lathe ;-)

xproplayer says: Apr 4, 2009. 11:23 PM **REPLY**

sp what are the right words and people to say them to to get a block of aluminum?

j626no says: Apr 5, 2009. 1:10 AM **REPLY**

i just went to a local mechanic and asked if they had a small block of aluminum lying around....if you are friendly enough, you can usually get a small "scrap" piece for free

wats-a-username says: Nov 25, 2008. 4:41 AM **REPLY**

no man ur not alone in thinking that

sarah_ashley4113 says: Oct 26, 2008. 4:23 PM **REPLY**

Need I say more? =D

Scammah says: Oct 24, 2008. 8:18 PM **REPLY**

This reminds me of making rings out of quarters. Great job.

Hands Without Shadows says: Oct 24, 2008. 6:40 PM **REPLY**

Using your tools I would have drilled the hole first and cut around it. That way you end up with a centered hole and its easy to keep the wall thickness consistant.

TechnoGeek95 says: Oct 24, 2008. 6:07 PM **REPLY**

Wow! That's amazing! Great job!

frollard says: Oct 24, 2008. 6:15 AM **REPLY**

That's pretty awesome!

You must definitely get a lot of passion in your project to start with square stock instead of round :D

I see you used a drill-press for drilling the centre. I would try to do a makeshift lathe once the centres were drilled. It would make the outer profile much easier to shape 'round'.

Tip: If you have a *lot* of material to remove from the block, filing some regular chalk (calcium carbonate?). This fills the depths of the grooves in your file; and lubricates the file against your material - preventing the teeth from jamming up = less cleaning your file.

j626no says: Oct 24, 2008. 8:13 AM **REPLY**

well that's what those "don't ask" holes were for. i actually put a bolt through there and put it in the drill press to make the makeshift lathe you were talking about....only it had a slight wobble so it was making an elliptical shape (highly polished though) and was really slow...faster if i just did it by hand.

CaCo3 is a good idea though. thanks.

nosemeat says: Oct 24, 2008. 4:50 PM **REPLY**

this is pretty cool.
i think if you had left the blank in the same shape as that last picture, it would've made a pretty neat ring that wasn't perfectly round

Doc Workingday says: Oct 24, 2008. 9:26 AM **REPLY**

Nice work :-)

The small "lathe mounting hole" in the workpiece helped the drilling in step 4 by providing a guide for the larger drill bit. So it was very much not wasted effort.

gmjhowe says: Oct 24, 2008. 6:15 AM **REPLY**

wow great work! The final thing looks really good.