Subject: Milling stainless steel parts
Posted by Nieuwendijk on Tue, 09 Feb 2010 11:42:50 GMT
View Forum Message <> Reply to Message

Hi everybody,

I'm about to order my first parts from shapeways, if the answer to the next question is positive. Is it possible to do any milling or machining to parts created from stainless steel?

The tolerance of the 3d printed parts is unfortunately not high enough for my application. Does anybody have any experience with machining these stainless steel parts? If this is possible, is it sufficient to add about 0.1mm to the object to be able to mill it to the right size?

Subject: Re: Milling stainless steel parts
Posted by rawkstar320 on Tue, 09 Feb 2010 15:03:32 GMT
View Forum Message <> Reply to Message

Im not sure what will happen, maybe someone else does. But something to keep in mind is that the metal is Stainless Steel that is sintered, then infused with bronze. So its a 2 phase material of 2 somewhat softer metals, so it shouldnt be too difficult to machine. But, im not sure if you would have problems with the material breaking off in chunks or not due to the nature of a 2 phase material.

I dont know that that would happen, but is just something that ive though about, feel free to shoot me down if someone has experience machining the stainless!

Subject: Re: Milling stainless steel parts
Posted by virtox on Tue, 09 Feb 2010 18:16:08 GMT
View Forum Message <> Reply to Message

Hi,

There was a piece on steel a while back...

Let me see, ah yes :

Quote:As far as post processing the 3D prints are concerned you can weld it, machine it and drill it. If you do want to drill it, we'd advise you to use carbide drill bits.

from :

http://www.shapeways.com/blog/archives/273-Stainless-Steel-f or-all.html

Hope its useful !

Tip : Google finds things well on shapeways
http://www.google.nl/search?q=shapeways+drilling+stainless+s teel

---

Subject: Re: Milling stainless steel parts
Posted by Nieuwendijk on Wed, 10 Feb 2010 09:36:17 GMT
View Forum Message <> Reply to Message

Thank you both for your replies. Especially the tip of using google. There is too much information on this site to find it directly.
As the parts needed are quite small, the best and cheapest option is probably to just try it out. Let's see what the results are if we put it in a lathe. Do you think adding 0.1mm to the dimensions is enough to result in the right thickness after machining?

Subject: Re: Milling stainless steel parts
Posted by virtox on Wed, 10 Feb 2010 11:06:36 GMT
View Forum Message <> Reply to Message

Not sure what the tolerances are, but I'd go for 0.25 or even 0.5 mm myself. In small parts the cost wouldn't be that much more.
And at least you'd be sure it won't be to small...

Subject: Re: Milling stainless steel parts
Posted by GlenG on Sat, 13 Feb 2010 06:55:13 GMT
View Forum Message <> Reply to Message

This material is hard and abrasive. You will absolutely need to use carbide tooling for ALL machining operations! Standard Hi Speed steel cutters and bits will give up the ghost after one or two cuts. Speeds and feeds should be lower, than as for normal stainless steel. The stainless used in SW prints is alloy 420. Which is harder and more difficult to machine than 300 series stainless. Plus the sintering process itself seems to add factors that make machining difficult. But it definitely can be done to tight tolerances.

-G

Subject: Re: Milling stainless steel parts
Posted by Nieuwendijk on Wed, 14 Apr 2010 11:37:53 GMT
View Forum Message <> Reply to Message

Well, I finally got my parts milled. I printed the parts both in stainless steel and white/black detailed with a diameter of 5.4mm, which was machined down to 5mm with a tolerance of +0.00 and -0.02.

Working the stainless steel parts was like working with brass, so no problems at all. The same holds for the detailed material. Very easy to work with and a perfect surface finish.
For my applications, the tolerance of the 3d printing is way too much, but combining it with some machining looks to be a vey promising and fast production method.

Subject: Re: Milling stainless steel parts
Posted by qkarmark on Tue, 04 May 2010 15:02:25 GMT
View Forum Message <> Reply to Message

Congrats.... I think the community would love to see photos (before and after if possible)?

was it a solid piece (rod) or thin-walled (pipe) model etc?

thanks for sharing

Subject: Re: Milling stainless steel parts
Posted by HollowPoint on Thu, 23 Sep 2010 22:04:42 GMT
View Forum Message <> Reply to Message

Greetings from Arizona:

I was just looking around the internet for 3D Printers that will print metal objects when I stumbled

onto this site and this particular thread.

In regard to milling a printed stainless steel part; I was wondering if a person could print a bullet-mold out of one of the metals available for printing?

If so, is the finish of the parts (in this case, two halves of a metal bullet mold) so rough that it would need to be polished in order to get it to the exact dimensions I was looking for?

Also, what kind of heat can these printed metal parts withstand?

When casting lead bullets, my melting pot can reach about 800 degrees. Will this type of heat cause the printed metal part to decompose over time?

Right now it's a toss up between the price of a CNC Mill and corresponding tooling or, if the technology is accurate enough, the price of a new 3D Metal Printer.

I'm wanting to upgrade from manual milling machines and metal lathes to CNC machines; however, if what I'm wanting to build can be "3D Printed" accurately, then CNC machines won't be necessary.

Thanks.
HollowPoint

Subject: Re: Milling stainless steel parts
Posted by GlenG on Thu, 30 Sep 2010 16:20:53 GMT
View Forum Message <> Reply to Message

Yes,
you would need to machine the mold surfaces to finished tolerances. The material itself will withstand hi temp, at least up to the melting point of the bronze component of the printed metal. Unprotected the material will start to form fire scale at around 1000 F. It can be hard soldered with silver materials that flow at 1300F. Remember this material is NOT pure stainless, rather a composite of 60% alloy 420 SS which is infiltrated with a bronze alloy during the sintering process. And regardless of what an earlier post said about "working like brass" this is not the case. It is a bitch to machine and definitely requires carbide tooling and slow feed rates.

-G

Subject: Re: Milling stainless steel parts
Posted by powers74 on Wed, 12 Oct 2011 02:17:46 GMT
View Forum Message <> Reply to Message

Yes, this is good news! post some Pics!

Subject: Re: Milling stainless steel parts
Posted by mctrivia on Wed, 12 Oct 2011 11:25:45 GMT
View Forum Message <> Reply to Message

I have had pretty good experience with both carbide, and diamond blades on steel prints. Would rather mill from a block of steel though as it is easier and cheaper.