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Subject: Standard Chess Set

Posted by [ararara\\_](#) on Sat, 22 Sep 2012 01:00:17 GMT

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Well, I've not been nearly as active as I would have liked. I have a couple of 'simple' projects to help me learn the tools, and as you can no doubt see, I've not done quite as much as I would have liked. Ahh, free time, where are you now?

One project I have started (last night, in fact), is a standard chess set. I've only got a pawn so far, but I'll post the rest here as I go.

[pawn \(View in 3D\)](#)

A question about walls: It has a less than 2mm wall (I think), and I can apparently print it in stainless steel, which requires a minimum wall of 3mm. Is that because of the shape?

Another one on patents. I assume this design isn't covered anymore, as it was originally patented in 1849, and I don't think patents last that long, but I know they can be renewed and thought I should ask if anyone knew how to check? Given that it is now used everywhere, I am assuming that it has long expired, but better safe than sorry.

EDIT:

[Rook \(View in 3D\)](#)

p3d.in is freaking out in a couple of corners, but shapeways doesn't seem to mind. I think that the issue is to do with the proximity of some of the vertices in the obj file. It doesn't seem to be creating a face that should be there.

[bishop \(View in 3D\)](#)

Considering they take so little time to spit out, I should really be finished with these by now.

EDIT 2 - Royals

[king \(View in 3D\)](#)

[queen \(View in 3D\)](#)

EDIT 3 - Knight

knight (View in 3D)

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Subject: Re: Standard Chess Set

Posted by [TurtlesAreCool](#) on Tue, 25 Sep 2012 01:48:54 GMT

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I'm not sure when the thickness processing kicks in, but I don't think that is really done until you actually order the print. If that is correct, then your available materials are not being filtered yet for that reason.

Incidentally, unless you have a fair amount of cash lying around, I doubt that you would want to print a chess set in stainless steel.

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Subject: Re: Standard Chess Set

Posted by [ararara\\_](#) on Mon, 01 Oct 2012 05:28:31 GMT

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TurtlesAreCool: Maybe, but it has filtered out quite a few materials. In any case, I'll probably not print them in stainless steel. They are coming out between \$10 and \$20 a piece. I might have a go at further optimising them, to see if I can get some more savings, though.

JoseZachary: It would entirely depend on what you want. If you want a functional chess set, then the cheapest material possible would be fine, as long as you could order them in different colours. As it currently is, that pawn weighs in at 3.99 cm<sup>3</sup>, so it prints in strong and flexible coloured plastics for under \$9. A full chess set needs eight pawns per side, with two rooks, two knights, two bishops, one king and one queen. Every piece is quite a bit larger than the pawn, so you are looking at (at a guess) probably less than \$200 a side if you print it in the plastic. That is quite expensive for a chess set. Usually you would pay that kind of money for a very good quality one.

As it currently is, printing them in one of the nicer materials will probably cost an arm and a leg, as TurtlesAreCool has mentioned. I will do a bit of work on them to get the costs down, which shouldn't be hard as I'm sure these models don't need the base I've given them, but it may prove cheaper to go and buy a chess set from your local games shop. The design will be the same (this design is apparently 200 odd years old, and used everywhere (there are already some versions of

them on shapeways, even)), and you wont have to construct your own board.

By the by, I've edited the first post with more models.

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Subject: Re: Standard Chess Set  
Posted by [JoseZachary](#) on Mon, 01 Oct 2012 05:51:57 GMT  
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ararara: well thanks a tone for your tips will keep them in mind.  
As far now not going with costlier set so satisfied with those cheapest one.

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Subject: Re: Standard Chess Set  
Posted by [ararara\\_](#) on Mon, 01 Oct 2012 08:56:51 GMT  
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I've updated the first post to include the royals.

I've also modified the pawn, to have narrower walls. I've got it down to 2.28 cm<sup>3</sup>, which reduces the cost some what (less than \$6 for one pawn in the plastic). However, in the material list, in the picture, there is a big red exclamation mark for the strong and flexible plastics. This is, I'm guessing, a warning of some kind. Can anyone tell me what that pertains too?

Edit: I removed the hole in the bottom, leaving it hollow, and uploaded it again, and interestingly enough, it says it comes out at 7.13 cm<sup>3</sup>. I would have thought it would have added 8mm<sup>3</sup>, because that was about the size of my hole. I guess I have done something wrong, but I thought you could have models filled with plastic? Am I miss understanding something?

Edit 2: Found my answer, on the exclamation mark. Apparently that is it failing the wall thickness checking... which is interesting because it only failed for strong and flexible plastics, which have a minimum wall thickness of 0.7mm, which is the same as fine detail plastic, and smaller than everything except frosted detail plastic and silver.

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Subject: Re: Standard Chess Set  
Posted by [ararara\\_](#) on Mon, 08 Oct 2012 07:00:03 GMT  
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I've updated the first post with a knight.

As to the thickness of my pawn, I've increased it to 2.57 cm<sup>3</sup> and had it printed in some of the plastics. While I am yet to have them shipped to me, I've only heard of problems with the detailed plastic model; the other plastics, at this stage, seem to be working with the current wall thickness. I'll leave them until I get the pawns, and then thin them out and print them too.

The only problem is the knight. Usually, I would use the shell modifier in Max, and IIRC (it has been a long time since I wanted to hollow something), it would deal with overlapping edges, to an extent. Blender's counterpart, solidify, just seems to do a reverse extrude. This is a good start, but that and Remove duplicates were producing uncertain results for me.

Does anyone have any advice on hollowing complex models in blender?

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Subject: Re: Standard Chess Set  
Posted by [Dragoman](#) on Mon, 08 Oct 2012 13:32:39 GMT  
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I use Blender, and normally do the hollowing out by hand by rather crude means, which may not result in the thinnest possible wall, but is well controllable.

For your knight I would start hollowing it out by doing a Boolean tool operation - take a difference between the figure and a vertical cylinder that has a radius 1 mm less than the narrowest part of the figure. Repeat with a cylinder along the head. You can switch to edit mode, and sculpt the inner hole to come closer to the outside wall. It helps to get this right if you "hide" the parts you are not working on at the moment.

What I also use is an extra item in the model: A small sphere of 1mm (or whatever your minimum thickness is) that I move around and into the walls. If it does not poke out of the walls, the thickness is OK. When selecting the model to export, don't select the sphere.

Greetings  
Dragoman

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Subject: Re: Standard Chess Set  
Posted by [ararara\\_](#) on Fri, 12 Oct 2012 09:16:16 GMT  
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Thanks for the advice. I had a feeling that this is how it would have been. Had a play with Max's shell at work, too. Same result as blender's solidify. I sculpted the head in 3D Coat, so I'm going to see if I can hollow it out in there, but I have a feeling I'll actually hollow it by hand. I'm thinking I'll

hide sections, and then extrude the bottom up, inside out.

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Subject: Re: Standard Chess Set

Posted by [Fredd](#) on Fri, 12 Oct 2012 17:21:57 GMT

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With Blenders solidify modifier you also can just have it effect assigned vertex groups in the mesh instead of the whole mesh. So assign a vertex group including the head, another the base, apply the solidify mod to both groups separately. Applying scale/rotation before using the mod will allow you to create exact wall thickness with the sliders values. Then use a boolean difference mod to create a tunnel connecting the outer surface to the two inner ones

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Subject: Re: Standard Chess Set

Posted by [lensman](#) on Fri, 12 Oct 2012 17:29:55 GMT

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While I applaud your efforts, and it's always good to practice your modeling skills, is this set something that you intend to sell? The reason I ask is because long ago I had a similar plan to model a "classic" chess set to sell. Then I had to ask myself who the heck would buy such a set at, what?, many more times the cost of a similar set in a store? Most popular 3D printed models seem to be items that are unusual and out of the ordinary to items for sale in "regular" outlets.

Glenn

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Subject: Re: Standard Chess Set

Posted by [ararara\\_](#) on Sat, 13 Oct 2012 23:29:48 GMT

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The main goal was learn blender and gain some experience with printing with something relatively simple. I chose a chess set because a pawn is one of those common beginner items to do. I had thought that perhaps I could sell it, if it was cheap enough, but it was an afterthought. I don't actually see these selling.

You can see I did some preliminary maths in a previous post, and with some of the models optimised a bit, it is going to come out at around \$160 for a full set in plastic. I can't see many people buying that, when there are better speciality sets that can be gotten. Alternatively, if you want to buy an expensive set, you could go down to your games shop and pick up a standard set in a nice material. You can probably get expensive metal versions for less than the shapeways

printing cost.

I will probably get myself a set in plastic, but after that I don't think anything will become of it.

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Subject: Re: Standard Chess Set  
Posted by [ararara\\_](#) on Thu, 18 Oct 2012 09:11:15 GMT  
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I got a few pawns in a range of the different plastics. Gives a good idea of how they would turn out.

#### File Attachments

1) [DSCN03972.jpg](#), downloaded 70 times

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