Subject: Dragon Feasibility
Posted by TurtlesAreCool on Mon, 06 Feb 2012 00:10:23 GMT
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This is still the early stages of the project, but with a basic topology for the body and the wings, I'm considering the aspects of the end result. Specifically, I want to print this in metal. Obviously, I can't skim the design rules on this one, so the wings will definitely be 3mm thick, and I'll have to make sure they thicken where they meet the body.
The part I'm not sure about is the hollowing. I seem to recall that metal pieces beyond a certain thickness need to be hollow (due to uneven cooling between inside and outside). The body is ~13-15 mm thick at present. However, I don't want to have a big obvious hole in the bottom. So, here are the questions:

1. Do I have to make a single hole through which all the stainless powder from inside can be drained easily? Does it have to be hollow at all?
2. Would several small gaps along the underbelly (hopefully hidden by the armor plates) be sufficient?
3. Does anyone have creative suggestions for subtle holes?

EDIT: Apparently, the design rules no longer say that models with large volume have to be hollow. I seem to recall a maximum thickness defined (10mm?), but maybe that was just ceramic.

## File Attachments

1) combined.jpg, downloaded 630 times

Subject: Re: Dragon Feasibility
Posted by Roy_Stevens on Mon, 06 Feb 2012 05:12:59 GMT
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I wouldn't call your dragon 'large' and have seen much larger solid things printed in SS, so I wouldn't worry about whether the rules require you to make it hollow. What I would worry about is the much higher price if you decide to keep it solid.

Subject: Re: Dragon Feasibility
Posted by GlenG on Mon, 06 Feb 2012 16:12:09 GMT
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If you make smooth transitions of the wings to the body (fillets or blends) you could make the wings thinner  and more natural in appearence. Leave the leading edge of wings thicker then taper to the trailing edge. But leave enough thickness at the trailing edge to prevent chipping during processing.  Across the "chord" of the wing, on a design this size try a leading edge of 2.5mm tapering to 1mm.  Hollow the body to save some $$ on material costs.  Maybe a series of holes along the belly for easy drainage of loose powder?

-G

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Subject: Re: Dragon Feasibility
Posted by TurtlesAreCool on Tue, 07 Feb 2012 14:25:03 GMT
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Thanks for the advice, Glen and Johnny. I'll see what I can do about the holes; I certainly would like to save volume if possible. Once I get into the final stages, I should be able to to taper the wing, also.

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Subject: Re: Dragon Feasibility
Posted by rcshop on Tue, 07 Feb 2012 16:03:42 GMT
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Well, you don't want obvious holes, but what about putting holes where they naturally belong. You could build up the nostrils in the snout and add holes where they cannot be seen without peeking into the nose.

And of course there's the mouth and eyes.

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Subject: Re: Dragon Feasibility
Posted by TurtlesAreCool on Tue, 07 Feb 2012 16:49:43 GMT
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@rcshop
Certainly, I could do that. The mouth is actually a pretty good idea. The nostrils and eyes would not be large enough holes to actually let much powder out. I could easily make tiny holes that would allow the software to think the model is hollow, but keep the model essentially solid. However, I do not want to be a cheapskate in that manner, as it does not save Shapeways any money. So, I'm trying to ensure that I make large enough holes that most of the powder could be emptied without trouble.

So, along those lines, the question is: how large is a good size for drainage of metal powder? I can spend some time searching the forums for an answer tonight; I'm sure the question has been asked already.

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Subject: Re: Dragon Feasibility
Posted by rcshop on Tue, 07 Feb 2012 17:03:51 GMT
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For  SWF, the holes need to be 2mm in diameter.

RC Shop

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Subject: Re: Dragon Feasibility
Posted by GlenG on Tue, 07 Feb 2012 18:19:03 GMT
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Because the metal powder is relatively heavy it will drain from very small holes. In a thin wall model like this a 1mm hole should suffice. Any smaller and there is a risk that the holes might become plugged up during printing.  You could experiment by adding a few extra .5mm holes, just to see if they print well. You could put a row of these down the belly, maybe even make them a design element?  Triangular or oval shaped holes might simulate dragon scales?

Also, i have seen some insect models (scarab beetle) that left fine slits where body sections joined up.  If the dragon had belly scales, like a snake, small gaps could be created to drain powder.  This is more complex modeling but I always thought that, learning by doing, was time well spent.

-G

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Subject: Re: Dragon Feasibility
Posted by TurtlesAreCool on Mon, 26 Mar 2012 04:12:29 GMT
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Well, work has been really busy, and I had to redo the scales three times. I think I'm happy with the way it's looking, so we're on to minor tweaks. I still haven't figured out how to include drain holes as a design element, though. I'm hoping that I can hide some crevices on the underside.

Anyway, how do you folks think it looks overall? Note that I rendered with a slight reflectivity to the

material - I probably should have left that alone, but oh well.

## File Attachments

1) combined.jpg, downloaded 372 times

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Subject: Re: Dragon Feasibility
Posted by Lightbringer on Mon, 26 Mar 2012 05:59:55 GMT
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You could even have two "armor plates" on the belly where one goes over the other, with a gap between, so powder can drain but you need to look up and in at the right angle to see the inside of the dragon. Think like roof shingles, but with a spacer between them.

If you want to be clever, you could leave the mouth open/roaring, and have a model of a lady or a gemstone inside his belly that you can see through the mouth, though remember it needs to be all of one solid piece.

For the wings, you might be able to get away with thinner areas if you have enough thicker ribs, like bones supporting the wing in a bat. I'm concerned about where the wings meet the body for when they are handling it in the green state and getting it to the kiln, making the wings lighter will help avoid that problem.

The look is very nice, no question. I think it would be quite striking in a red strong and flexible, maybe with some painted highlights to bring out details.

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Subject: Re: Dragon Feasibility
Posted by TurtlesAreCool on Fri, 13 Apr 2012 01:54:08 GMT
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It arrived!

http://www.shapeways.com/forum/index.php?t=msg&goto=4690 5&#msg_46905

Thanks to all for the help, particularly Glen.

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Subject: Re: Dragon Feasibility
Posted by GlenG on Wed, 18 Apr 2012 20:54:06 GMT
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Aw shucks Nice job on it!
-G