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Subject: Water Mill

Posted by [stonysmith](#) on Wed, 07 Aug 2013 23:41:33 GMT

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The whole reason that I got into 3d printing was so that I could make houses/buildings for my model railroad.

I'm incapable of painting such tiny details myself, but they come out looking great in FCS.

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Subject: Re: Water Mill

Posted by [SavlsSavvy](#) on Thu, 08 Aug 2013 03:19:32 GMT

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Stony, this is really great! Thank you for sharing.

There really is no better feeling than fulfilling a dream, is there?

Happy to hear we helped power yours. Can't wait to see what's next

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Subject: Re: Water Mill

Posted by [MitchellJetten](#) on Thu, 08 Aug 2013 08:47:58 GMT

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Awesome Stony!

I actually have the same problem, can't paint myself but I can print in FCS.

The building is 1:220?

These are my trains in 1:450

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#### File Attachments

1) [IMG\\_20130318\\_131628.jpg](#), downloaded 451 times

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Subject: Re: Water Mill

Posted by [Tresob](#) on Thu, 08 Aug 2013 12:43:54 GMT

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That looks great!

I now have to reconsider FCS. I've been avoiding it because I thought I would lose most of the details on my pieces...but you seem to have some mighty tiny details on those windows (assuming that is an actual-sized quarter!).

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Subject: Re: Water Mill

Posted by [stonysmith](#) on Thu, 08 Aug 2013 16:19:35 GMT

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@SavIsSavvy: words can't express how extremely satisfying it is to design something in the virtual world and then hold it in your hand.

@MitchellJetten: yes, 1:220 or "Z" scale.

@Tresob: no photographic trickery here.. the only shrinkage of the quarter is in it's value due to the economy. <grin>

I wish that I could have included the waterwheel in the model, and made it rotate all in one print. But, the shaft would have to have been 2mm in diameter, and the hole for it would have been nearly 4mm.. it would have looked odd.

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Subject: Re: Water Mill

Posted by [lensman](#) on Fri, 16 Aug 2013 22:56:32 GMT

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Very impressive and much easier than painting...

A question re train scale modeling: Is there one overwhelmingly popular scale for trains? When designing the models is it a lot of work calculating measurements when transferring down in scale? Of course one must know what the actual size is of the real building / item...

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Subject: Re: Water Mill

Posted by [coaster](#) on Sat, 17 Aug 2013 00:23:52 GMT

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Lensman.....I model in 1:120,so any real life thing I want modelled...just divide actual

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measurements of reallife item by 120.Same with any scale.

Stony..... amazing taken in account of scale.Have seen stuff you done in 1:440??it is amasing.

cheers  
stu

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Subject: Re: Water Mill  
Posted by [lensman](#) on Sat, 17 Aug 2013 00:37:58 GMT  
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Thanks, Stu. I guess, really, the hardest part is finding out what the real size is... but then we do have the Internet!

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Subject: Re: Water Mill  
Posted by [stonysmith](#) on Sat, 17 Aug 2013 15:44:17 GMT  
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@coaster, @lensman: Thanks for the compliments.

No offense to any metric folks, but I grew up on the Imperial system, but I'm also an engineer. When I design things, I use real world (1:1) dimensions in decimal feet. This building is 16 feet square, so the length of a side, whether I'm using Truespace, OpenSCAD, or Blender, is 16 units.

That way, I can take my trusty tape measure and go validate that some object is the correct size.

As a final post-processing step before uploading to Shapeways, (for 1:220 models) I multiply "feet" by 1.385 to get "millimeters". It's just that simple.

To handle the wall thickness requirements, then when I'm designing for FUD, I make sure that everything is at least 3" (0.25 feet) thick. For FCS, it has to be 1.5 feet thick. As I'm drawing, I don't think of it in terms of units the printer needs, I just keep that 0.25 foot limit in mind.

I will grant you that those who use the metric system have it a bit easier.. they just measure in millimeters and then divide by their scale. I'm perhaps a bit too old of a dawg to learn that trick.

What is rather interesting about doing miniatures is that humans tend to perceive the size of buildings based on being on inside of them, rather than the outside size of the structure. We tend to lose sight of the 'real size' of a building quickly. I grew up camping in a one-room log cabin that was 12x20 feet. Today, that cabin would actually fit inside my living room. But, if you take

the two models and compare their exteriors, your brain says "one of those is not in the proper scale". But.. I can prove that both models are the proper scale.. I've got my trusty tape measure. <grin>

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Subject: Re: Water Mill  
Posted by [stonysmith](#) on Sat, 17 Aug 2013 16:10:55 GMT  
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lensman wrote on Fri, 16 August 2013 22:56 Is there one overwhelmingly popular scale for trains?

To incite a flame war: No there is no single "most popular" size. <grin>  
In the US commercial market, there is HO and N scale readily available everywhere.. Even Walmart has HO scale.  
But.. if you ask any modeller.. he'll tell you that HIS choice of scale is the best. <grin>

I chose Z scale because I can get a LOT of track in a very small space. My wife won't (yet) let me take over the upstairs game room with a layout, so I needed a layout that would fit into my office. Zscale (1:220) allows me in a space just 2.5 by 3 feet to have the same amount of track that you'd find in HO to take up a full 4x8 foot sheet of plywood.

===

Now, if your question is about profitability - making sales on Shapeways - I'd have to say N scale. There are PLENTY of N scale buyers out there, and the objects are not so large as to price yourself totally out of the market with 3d printed items. HO is just plain too big for the cost of 3d printing - it is hard to compete with the glut of cheap items available commercially. Nscale is "just about right" in terms of scale vs cost. But for myself, I have found a niche market in Z purely because there is a dearth of items available.

The trick with selling to N scale is that you've got to hyper-detail your items. The buyers tend to be really picky. That's part of the benefit.. in Zscale, I can omit certain details, because only someone with a microscope would be looking for them. <grin>

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Subject: Re: Water Mill  
Posted by [lensman](#) on Sat, 17 Aug 2013 20:23:09 GMT  
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Thanks very much for those informative answers. Yes, partly my question was regarding profitability, but also in trying to judge what would be "easiest" to model in.

Regarding Imperial and Metric: I was born into an Imperial world in the UK, which then switched to more or less all Metric. I now live in an all Metric world in Canada... Sorry, but I don't miss yards (three feet three inches!), furlongs, shillings and gallons to name just a few... But I still like a nice pint to drink

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Subject: Re: Water Mill  
Posted by [coaster](#) on Sat, 17 Aug 2013 21:11:12 GMT  
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Hmmmmmm.....pint!!!! yum yum,we from downunder like "jugs"saves walking to bar

Anyway.....as being a modeller goes working in an "odd" scale(1:120 run on Nscale track gives us right guage for kiwi railroad) theres a lot of items that you just cant buy so that's why I love what shapeways has brought to my little world.Im never going to make a lot of dosh.....a wee bit,but not much.But that's not why Im doing it.

And the biggest influence in getting me into this was actually "Stony" after seeing some of the stuff he had done at a lot littler scale

Sorry for wandering your thread off a wee bit Stony!

Cheers  
Stu

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Subject: Re: Water Mill  
Posted by [ivo\\_knutsel](#) on Mon, 16 Sep 2013 07:13:48 GMT  
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What is the diameter of the waterwheel ? Can you put the axle on the house and give the waterwheel a hole ?

Subject: Re: Water Mill

Posted by [stonysmith](#) on Tue, 17 Sep 2013 13:25:21 GMT

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FullColorSandstone (FCS) would require a 2mm axle, a 1mm gap around the axle, plus a 1mm gap on each side of the waterwheel.

In addition, the "blades" of the wheel would be required to be 2mm thick and the "walls" of the wheel would have to be 2mm thick also.

It just wouldn't look right. I would have considered doing the wheel in FUD, but at over \$5 for the part, I felt it wasn't economical.

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Subject: Re: Water Mill

Posted by [shaperscott](#) on Tue, 17 Sep 2013 16:24:17 GMT

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Thanks for sharing all your advice throughout this forum. I'm looking to do something very similar for dioramas in Z and possibly T scales. I have been modeling in Sketchup for years but brand new to 3d Printing. I understand the wall thickness issues scaling my 1:1 buildings down, what I'm still trying to figure out how to work with details and the minimum dimensions of the materials. In your 1:1 model of this mill how far does your window trim project and how thin are your muntins?

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Subject: Re: Water Mill

Posted by [stonysmith](#) on Tue, 17 Sep 2013 17:01:28 GMT

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Here's some measurements of the model as uploaded to Shapeways.

If you talk about 1:1 dimensions, that usually implies the measurement on the prototype. 0.31mm at 1:220 is 2.68 inches @ 1:1

These same items are raised only 0.17mm from the surface - approx. 1.5 inches @ 1:1

I commonly design for 3 inches @ 1:1 or 0.346mm on the final model.

Note: if you note the column here that measures 0.35mm, then look very carefully at my pictures above, you'll notice that a section of that trim broke off the print. It would have been better if I had filleted those exterior edges rather than leaving them square.

## File Attachments

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1) [WaterMill.jpg](#), downloaded 112 times

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Subject: Re: Water Mill

Posted by [shaperscott](#) on Tue, 17 Sep 2013 17:20:04 GMT

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Thanks for confirming this. On my smaller scale model I was coming up with a (real life) projection of about 3" to create the minium emboss which looks very odd in my model but is apparently correct. I might just skip this level of detail all together for my first print at this scale but I do like the look of yours!

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Subject: Re: Water Mill

Posted by [stonysmith](#) on Tue, 17 Sep 2013 18:48:39 GMT

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That is the trouble and the magic of making all of this work.. trading the minimum thickness rules for what is noticeable to the human eye.

I assume you've heard of the "three foot rule"?

If it looks right from three feet, it's good enough.

One secret in this case is that the trim here was a different color than the base.. with a significant shade difference between the tan and the brown, it looks sharper than it really is. (from three feet <grin>)

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