Subject: Super Perler Pegboards
Posted by rxninja on Wed, 15 Feb 2012 23:10:38 GMT
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Background: So there are these plastic beads that you can make art from. You put them one by one on pegboards, then you iron them and they fuse together. The process is called bead spriting. There's a pretty active community of people who make these (usually doing awesome, retro video game sprites and whatnot) and we use cheap, plastic pegboards from Perler to do it. The problem is that ironing directly over the pegboard tends to warp them pretty quickly, so we have to keep buying these interlocking boards over and over again (or do this crazy, high-risk masking tape method to remove the sprites from the pegboards before ironing).

What I'm thinking: Since plastic really isn't suited to be ironed on and it's also a pain in the butt to own several dozen of these 29x29 peg pegboards, I thought, "Wouldn't it be really cool to make one that's the size of, say, 5 boards by 5 boards and made out of a heat-resistant substance?" Enter Shapeways, where I think this might be possible.

Where I'm at: I know nothing about 3D modeling. I'm a graduate student (not in the arts), so I think I can get 3DS Max or Maya for free, but where would I even start? I'd need to get the dimensions exactly right to be a perfect replica of a single pegboard, then copy it to turn it into a jumbo pegboard. There's some fine detail in there, so I don't know how accurate I could really be with the various materials available. I could really use some guidance or hand-holding in making this happen.

For reference, you can see examples of what we do over at http://beadsprites.reddit.com.

To see what I'm trying to recreate in metal, check out this product page http://perler.eksuccessbrands.com/Product/2+Large+Square+Peg boards.aspx#. The final result would be like 25 of those put together in a 5x5 arrangement. I don't have more exact dimensions than what's on that page, though I could measure what I've got.

I appreciate any and all help that I can get on this one. Thanks, everyone!

Subject: Re: Super Perler Pegboards
Posted by OracleofWuffing on Thu, 16 Feb 2012 00:57:59 GMT
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The first concern I would have would be that the smallest wall width of Stainless Steel would be 3 millimeters. If the pegs on your boards are smaller than that (a caliper would be nice for this sort of thing), Stainless Steel is a no-go for a replica.

...

Or so you'd think! It might actually be more feasible to make holes for the beads themselves rather than pegs for the beads. Something like this:

The next concern I'd have for you there is that, for your purposes, the largest you could print in Stainless Steel would be 100cm x 45cm (39 in x ~17.75 in). Now, hypothetically, let's say that you're making these boards 0.5 cm high. Your volume would come out to 2250cm3, (this is before subtracting for the "holes" for the beads, which would save you a bit here). An eyeballed estimate would start at $18,006. Certainly, using smaller dimensions would help, but then you'd be making the project smaller.

So, yeah, sorry if I scared you away for a bit there, but I do want to have a sort of positive note here. Really, due to the mostly two-dimensional nature of your plan, you're not going to be taking advantage entirely of what 3D Printing has to offer. Laser Cutting might be more suited to this application- you would just have the circles raster engraved rather than cut for your purposes, and as long as the engraving is deep enough to hold the beads, there shouldn't be too much of a problem. Sadly, I've not (yet!) had first-hand experience with laser cutting services, so I can't tell you how well the end product would be or how much it'd cost you. You'd probably be best of searching "Customer Laser Cutting" to find out more about who can do that for you, and what materials they can do it with.

However you flip the coin, though, you do want to get measurements on either a perler bead or the pegs on the perler board.

Edit after the fact: Of course, if you really wanted to make something for 3D printing, you could always just use your perler plans to make a 3D model that you'd print, just using full color sandstone, and have no holes in the model.

File Attachments

1) Screen shot 2012-02-15 at 6.35.14 PM.png, downloaded 677 times

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Subject: Re: Super Perler Pegboards
Posted by rxninja on Thu, 16 Feb 2012 01:23:53 GMT
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It's a neat suggestion, but cutting holes isn't going to work. The reason is that when you iron the beads, they melt and flatten out. There's nowhere to go if they're sitting in cylindrical holes. The little pegboard spikes are the only way to go.

I don't have calipers, but I've done some searching and eyeballing and it looks like beads are 5mm in diameter. That means I'd be looking to make a 72.5x72.5cm board that's about 3-5mm thick with conical spikes that are maybe 1.5mm wide and 2-3mm tall.

That...hmm. That actually sounds kind of insane in terms of material cost. About 2,600 cubic centimeters of insane.

I guess my next question would be if it would be: is it possible to make an interlocking design (like the pegboards Perler makes already), make it extremely thin, produce several, and make it out of alumide or something? Ceramic?

It's starting to sound like this is a prohibitively expensive project. I might be better off just molding the pegboards I have and finding some sort of molding material that can withstand high heat without warping.

/sigh

Subject: Re: Super Perler Pegboards
Posted by OracleofWuffing on Thu, 16 Feb 2012 02:18:41 GMT
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You can certainly make interlocking designs- many of the 3D puzzles you'll see here are based on that principle, and I think tedparsec did something like that. Here's another one that not only features interlocking, but also cast and molding. The bottom line is that casting and molding, when possible, will simply be more cost efficient than 3D Printing (And the kind of model you're thinking of is pretty well meant to be molded). The rest of the post will talk about 3D Printing if you still want to do that, but if that statement alone sets you on your way, feel free to skip it.

The best combination of thinness, price, and strength on Shapeways would be White Strong and Flexible, period. Because you're going with a peg-based design, you probably do not want ceramic: that material's pricing runs off of the surface area of your model, which is going to be very large, and the glaze is going to make it quite difficult to get the exact measurements you need for this. Relatively speaking, ceramic has a much higher thickness requirement, too. Er, I had a thought or two about Alumide here, but I see my facts were wrong, and I don't have the time to get everything back in order right now.

Problem is, WSF's heat resistance goes up to 80 C / 176 F... I think you probably are aiming for something higher than that.

With WSF, most would recommend that you keep the base of your model 1-2mm (0.1cm) thick

just to make sure it doesn't get bendy. Keep in mind that your model does have to fit in a 66x35x55cm bounding box when printing, too. So, say you wanted to make a 13cm square (about 5 inches) interlocking model. Your base volume would be 13x13x0.1, so before you add the volume of the pegs, you'd be at 16.9cm3. If pegs add half the volume of the board again to the model, you'd be at 25.35cm3 for a single simple board (approximately $37, there might be a discount on that but I'm not too certain).

If you do go ceramic, and again, I'm not too certain on the viability given glaze thickness and wall thickness requirements, you are safer temperature-wise at 600 C / 1112 F Edit: Check that. Minimum wall thickness is 3 mm, so it will not be able to print 1mm wide pegs. The board itself is going to be at least 3 mm tall. Let's go with the 13 cm square above for discussion's sake. So, your dimensions are 13x13x0.3. Just a reminder, though, that glazed ceramic is measured by surface area instead of volume, so your total surface area is 353.6cm2. That will come out to ~$63.65, and that is before you add the pegs to the board, which will add a whole lot more to that volume.

Edit: Okay, time for alumide. 172 C / 341 F. The thinnest you'll go is 1.5 mm, which is a little bit more workable than ceramic. 13x13x0.15=25.35cm3. Again, assuming pegs add half the volume again, gets you 38.03cm3, which would be ~$77.17

Subject: Re: Super Perler Pegboards
Posted by Roy_Stevens on Sun, 19 Feb 2012 05:43:50 GMT
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I hate to suggest you go old-school on a Shapeways forum board, but this is really something that would be best done in CNC drilled, laser, or water jet cut aluminum. Knock out a bunch of holes and then JB-weld aluminum pins into them. A 2'x4' sheet of aluminum with a couple thousand holes in it would cost much less than anything comparable done with a RP machine. I have a Zenbot in my basement just for things like this.

Subject: Re: Super Perler Pegboards
Posted by rxninja on Sun, 19 Feb 2012 17:29:06 GMT
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Oracle of Wuffling said...Really detailed, useful stuff that sounds awesome and expensive.

All of that sounds really fantastic but waaaaay too expensive. Heat resistance is only part of the problem while constructing a uniform, jumbo-sized pegboard is the other part. Interlocking would be neat, but each board is about 5"x5" and it seems like the price just adds up too fast. I really

appreciate all of your help, but I think the consensus here is that 3D printing an object of this size is impractical and expensive.

johnnylingo wrote on Sun, 19 February 2012 05:43I hate to suggest you go old-school on a Shapeways forum board, but this is really something that would be best done in CNC drilled, laser, or water jet cut aluminum. Knock out a bunch of holes and then JB-weld aluminum pins into them. A 2'x4' sheet of aluminum with a couple thousand holes in it would cost much less than anything comparable done with a RP machine. I have a Zenbot in my basement just for things like this.

I know little to nothing about CNC drilling, but this sounds like an amazing idea. I hadn't considered drilling holes and welding pins, but it seems like it just might work. Do pins exist in precise lengths and widths like that? How accurate can this sort of project get? What kinds of costs are involved?