

A close-up photograph of a light-colored, tufted chair seat. The tufting consists of a grid of diamond-shaped sections, each with a central knot or button. A large, semi-transparent pink circle is overlaid in the center of the image, containing the text.

The Daydream Chair

The Chair Spring 2013
Wei Li



The Daydream Chair

A chair for daydreaming.

A chair to help you escape from reality and enter a wonderland that only exists in your imagination.

The right question to ask about this chair is not 'does it sit', but 'does it float?'

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Dimensions

42" w * 36" h * 33" d

Materials

Fiberglass, Knoll felt





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Buckminster Fuller:

“When I’m working on a problem, I never think about beauty but when I have finished, if the solution is not beautiful, I know it is wrong.”

To design is to address unsatisfied needs. However the best design never comes from the simple fact that there’s an unsatisfied need; it only happens when the designer himself associates strongly with the need. Thus all external motivations for a designer are actually internal. What comes out of a designer is a projection of the designer himself, of what he values and what he experiences. So for a designer the first thing is to be honest with himself; to find out who he is and what is truly important to him.

Design decisions can be rational and conscious but they can also be unexplainable and subconscious. A good designer is a master of his intuition.

The moment a design leaves the designer’s hands it becomes open to new uses, interpretations, experiences and stories. The design is still an object in itself, but the experiences/memories/sense of identity around it add an extra layer of meaning. In this sense an object is not only physical but also emotional; It’s not static but rather dynamic and evolving.



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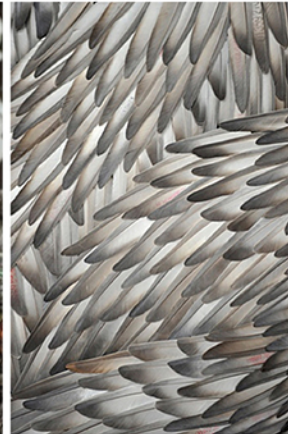
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The initial design was a fiberglass chair with wood legs. The fiberglass body would be fully upholstered.

Since it's technically challenging to secure the wood legs to the fiberglass body and provide a strong enough support, I later changed the material of the legs to fiberglass.

The renderings showed a few color options I considered for the chair.



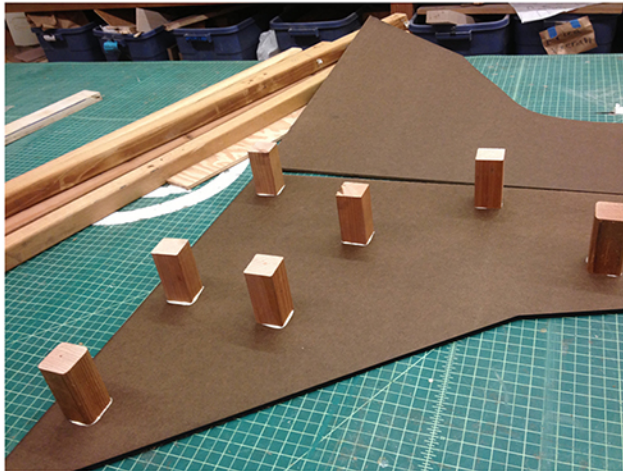


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A prototype to test the dimensions and ergonomics of the chair body. It was comfortable!

Profiles were cut on duron using laser-cam. Wood spacers were cut on table saw. They were then glued and nailed together.





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Profile patterns were cut using laser-cam on butcher paper.



Styrofoam sheets cut to shape according to patterns. The sheets were glued together with Super77 spray adhesive.



Cut styrofoam with hot wire cutter.

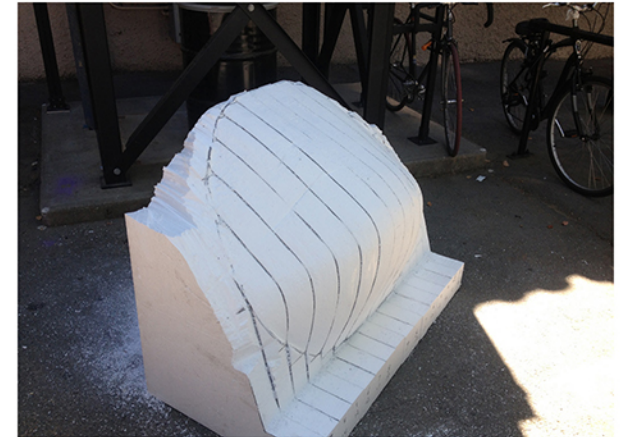


Lesson Working with styrofoam is messy because the particles easily get everywhere. Make sure to work in a relatively closed space so it's easier to clean up afterwards.

Male Mold vs. Female Mold:

Male mold with convex shape is generally easier to shape/sand than female mold with concave shape. Also when laying up fiberglass, concave shape will easily create air bubbles between the mold and the fabric.

Although female mold has the benefit of giving you a better sense of the dimensions, male mold is recommended in most cases.



Sand with 80-grit sand paper.



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The buck was covered with clear packing tape. Four coats of spray mold release were applied afterwards.



Prepare fiberglass fabric and coremat to rough size.



Fiberglass layup: make sure the fabric was totally soaked in resin. More resin is better than not enough, but avoid too much resin.



Unlike fiberglass, coremat does not conform to compound curves. It's better to cut out the exact shape before laying up.



I did seven layers in all (3 fiberglass + 1 coremat + 3 fiberglass). Peel-ply was added to the top to make the top surface smooth and ready for add-on layers.



After cured the fiberglass body was pulled off the mold with the help of a few wood wedges.



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Preparation:

Working with fiberglass is messy. Try to set up a big dustless working area, and protect the working surface with butcher paper or vacumm bagging material. Plan work precedence ahead, which means having all tools in reachable places, cutting fabrics to size, and making sure the mold is placed at a convenient position for you to layup. Prepare enough gloves!

Safety:

Epoxy resin is toxic and glass fibers cut your skin. Make sure to wear protective clothing and respirator all the time. Sanding fiberglass is most harmful because if you inhale the glass particles they will cut your lungs. Wet sanding will reduce the hazard dramatically.

Fiberglass & Resin Ratio: In theory the best strength and weight combination is achieved with 50% fiberglass and 50% resin (by weight). In practice you'll always end up with more resin to thoroughly soak up the fabrics. It doesn't matter much if weight is not your concern. Otherwise you can vacumm-bag the whole thing to get rid of extra resin.

Pay careful attention to the pot life of epoxy resin and don't mix too much at a time.

Tool Maintenance: It's very easy to get resin all over the tools. Acetone can clean uncured epoxy resin (but not very effective and super toxic). It's better to wait until the resin cures and then peel it off from the tools.



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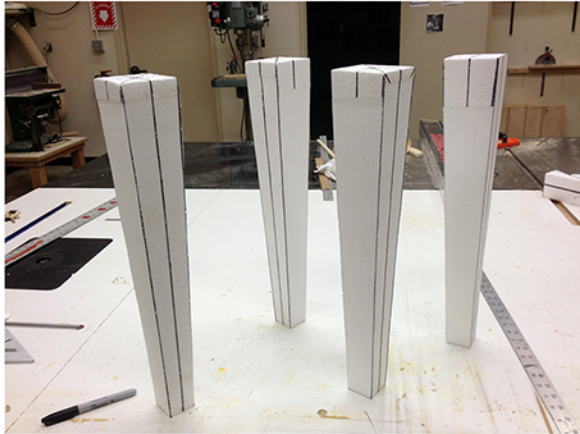
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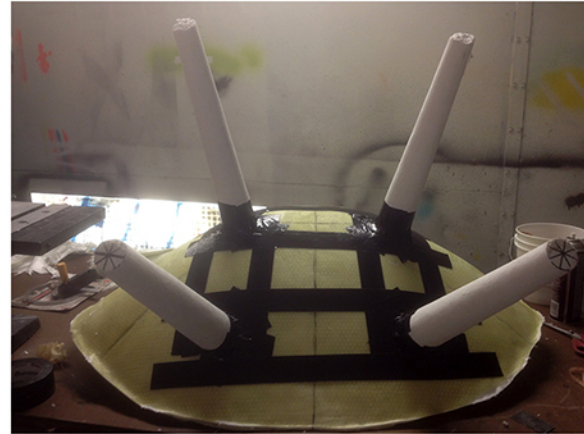
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The rough tapered shape of the legs (styrofoam) were cut on a band saw. They were then sanded to tapered cylinders using 80-grit sand paper.



The position of the legs was decided. To add more stiffness to the leg area I made fiberglass patches on where the legs will stay. The patches go from big to a little bit bigger than the radius of the legs. (not shown in image)



The legs were secured onto the chair body using epoxy mixed with glass microbeads. A transitional radius was created between the legs and the body.



Turned wood cylinders to add to the end of the styrofoam legs to provide more support. Gaps between wood and styrofoam is filled with epoxy mixed with glass microbeads.



Fiberglass layup (about 8 layers) around the legs. More fiberglass patches were made around the leg area afterwards.

Feet: The surfaces of the wood cylinders were scratched to allow better adhesion with glass microbeads mixture.

Epoxy mixed with glass microbeads: Mix until the mixture is at least as thick as peanut butter. Thin mixture tends to flow (and it's horrible).

Cut to length: The legs were cut to length using a hack saw. Then the chair was placed on a flat ground. The gaps between the feet and the ground were filled with glass microbeads mixture.



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Sand: Sanding is easy with an orbital sander. However to get the finish perfect is hard. Apply bondo to fill in the small holes/cracks on the surface and sand when bondo is dry. Repeat this process and gradually move up sand paper grit until the surface feels smooth with your hands.

Prime: Remove all the dust from sanding first to get the surfaces ready for priming. Apply the primer in several light coats instead of one heavy coat until all surfaces are evenly covered.

Paint: Similar to applying primer. Keep hand in motion and apply several light coats instead of one heavy coat.



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I first planned the pattern with sharpie drawings on the chair. According to the pattern I cut foam into triangles, and then sewed a layer of cotton batting onto the foam to round the corners and edges. The next step is to sew the top fabric (Knoll felt) onto each triangles. All triangles are then hot glued onto the chair.

The edge of the chair was tricky because the front foam layer and the back foam layer didn't align well. I ended up with a lot of hot glue marks and wrinkles on the fabric along the edge.

Lesson Upholstery is a very professional skill and if you have no sewing experience don't do it yourself. It's very difficult to get the seams perfect. I didn't plan my pattern very precisely and ended up filling lots of small holes using scrap fabrics. Upholstery materials are pricy so it's better to be able to remove and wash the top fabric. Mine gets dirty easily and is not washable!





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materials / tools	cost	source
duron 1/4 " thickness 24" * 48" 9 sheets	72	Stanford PRL
white styrofoam 35" * 40" * 3" thickness 16 sheets	135.16	
9oz. satin weave fiberglass 38" width 26 yards 50" width soric XF Aero-Mat (coremat) 4 yards Frekote 700 Mold Release Spray	325.54	ACP Composites
314 epoxy resin 1 gal + 143 hardener 1/2 gal Cab-O-Sil glass microbead filler	170.52	TAP Plastics
super 77 spray adhesive 2 bottles vinyl speckling bondo clear packaging tape	62	ACE Hardware
Montana Black acrylic spray paint Lollipop 2 bottles Montata matte varnish acrylic spray paint 1 bottle	23	University Art
1" thickness * 12" width high-density foam 5 yards cotton batting	98	Joann Fabric
church pew foam 2" * 15" * 48" 3/4" thickness * 54" width bonded dacron 2 yards	27.8	DIY Upholstery Supply
Knoll felt, ivory 6 yards	361.43	Knoll Textiles
Miscellaneous: brushes, scrapers, sand paper, measuring cups, syringe, etc.	20	

total: 1295.45



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Design & Balance

To design a chair is such a temptation for every product designer. It's like having a baby, and you'll project all of your wishes and expectations onto it. You'll feel that you have to be ambitious, and that you have to make a statement with this chair. You'll easily want more, and more, and then you get lost.

I'm glad that early on I realized that this chair is about pushing the depth instead of the width of design. It doesn't matter how many crazy ideas I used to have; it only matters that one single idea that I finally held onto and distilled and executed.

Construction

I have poor engineering & construction background, which made me a little bit nervous when I thought about designing a structurally sound chair. I asked for advice from different people along the way, and some of them had serious concerns about whether my fiberglass legs with styrofoam core would be strong enough. I decided to give it a try and it turned out to be quite successful. I'm still not an expert in construction but now I know more about it. I feel proud that my chair is one of the strongest chairs in the class. It can actually hold two people's weight!

Compromise

I had a lot of compromises throughout the process. Some were because of my limited skills, like I changed the legs from wood to fiberglass just to make the construction easier and more straightforward. Some were because of time limit, like I didn't sand the legs as smooth as I wanted to. Some were simply bad luck, like the yellow felt I wanted for my upholstery was on reserve by someone else so I had to change to a different color. I hate compromises, but sometimes they bring opportunities. My chair won't look like this if none of these compromises happened. And I LOVE how it is now.

Responsibility

When you're struggling with deadline on something you seriously care about, you easily get selfish. It's always worthwhile to stop and think about this: you're never the only person who's in need of resources and other people's works are no less important than yours. If you're working with hazardous materials then it's not enough to wear protective clothing yourself; other people's health might be at risk as well. I sanded fiberglass once in the courtyard without considering anyone else and it was a shame!



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John Edmark, for providing a wonderful class and an amazing learning experience for all of us

Dan Parker, for giving great advice on working with fiberglass

Craig Milroy, for generously allowing us off-hour access to the PRL

Daniel Tiffany, Marlo Dreissigacker Kohn, Forest Nelson, Eric Slesinger, Danya Volkov, Wyles Vance and **Andreas Pena Doll**, for really helpful workshops that prepared us for fabrication

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David Bordow and **Kevin McElroy**, for the best hugs

Julie Shryne, for calling me pumpkin and honey bunny

The Chair Crew

To Michael Beck, Cam Bennett, Xander Bremer, Nicholas Chen, Lea Eaton, Na-Yeon Kim, Raviraj Pare, Julie Shryne, KT Zhou, Rupa Chaturvedi and Kevin McElroy, it's a great honor to be in the class with you and learn from all of you.

Loftees

Thank you all for being understanding and supportive the whole time. Sorry for making a mess and being an asshole sometimes but my love for you and the loft has never changed.







