

Making Materials

DG123

Assignor: Ward van der Houwen

Assumptions

Before I started this assignment I knew about a limited amount of production techniques. Not having thought about the three dimensionality of products and the problems this brings with them in taking them out of the cast, I assumed basically any shape could be cast using plastic or bronze. While I love watching programs like “How it’s made” in which the production process is followed in great detail, these shows almost always focus on processing a material, not creating it. Thinking back now there are numerous objects of which I couldn’t explain any of the production process back then, now I am pretty confident that of most mass-produced products I can say a lot about how it is made and why the specific material was used.

Realisations

The lecture at the start of the assignment quickly made me realise that there are many specifications for something to work with a mold. I learned for example that an “undercut” causes a lot of problems and extra costs for a cast that is already a huge investment.

Another is that, though I already knew there are a lot of plastics, that there are literally thousands of different kinds of plastic! Plastics that bend, can be coloured, are safe for food, are heat resistant, etc. Everyone has to be chosen thoroughly to both meet regulations, functions and looks.

But perhaps the most important thing I have learned is that nearly everything is visually optimized to be able to come out of a mold properly. There are parting lines, slanted edges and hidden filling points in well thought out places.

Products around me

As I am typing this I’m watching television, this is a classic big CRT box that I can barely carry on my own. The television is tapering towards the end, which makes sense because the tube is smaller towards the end. But the front panel gets wider towards the end which functionally doesn’t make any sense but clearly allows it to get out of the cast easier, which is essential because a part like this would be virtually impossible to loosen otherwise.



Figure 2 My television

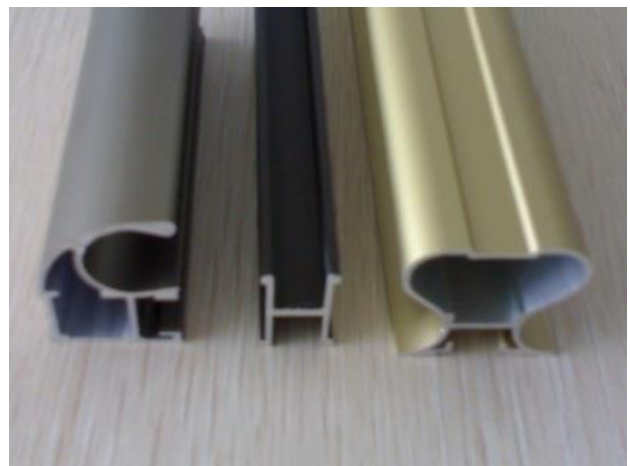


Figure 1 Sliding door frames

Another object that I wouldn't be able to explain before this assignment is the frame of my sliding door. The cross section of this frame is very complicated and would be very hard to injection mold or cast. Now I know that it is actually extruded to achieve the complex cross section easily, efficiently and cheaply.

Process

For my own cast I decided to pick a shape that is initially very easy to mold but give it my own twist. It made sense to pick a Philips lightbulb, because after all, isn't this what we all know Eindhoven for? I wanted to give the bulb a kind of twist and decided to make it a bell. Instead of an industrial made bulb giving light, I created a handmade bulb that makes sound.

First I put the bulb in loose sand up to the middle of it. Then I poured sand with resin on it to make one half of the cast.

After this I repeated the last step to create the other half of the cast.



Figure 3 First half

After this the real challenge started: making an inner mold to actually make the bulb hollow. After consulting with Rino I decided to first coat the inside of the cast with a thin layer of wax. Then close the cast and push metal pins into it from each side to suspend the cast.

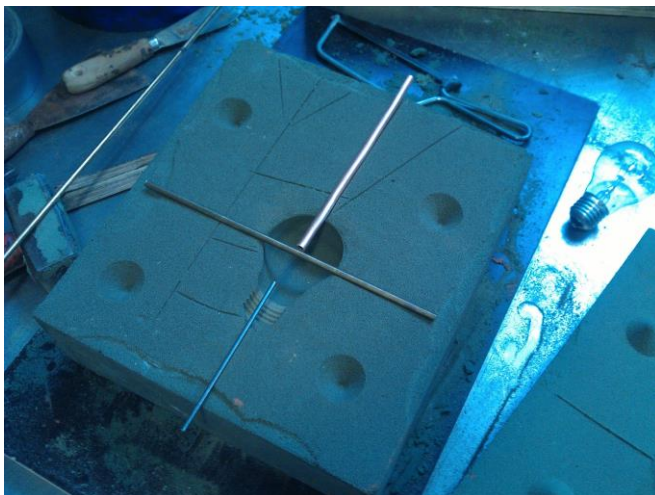


Figure 4 Suspension

After this I drilled a hole through the top of the cast to the cavity trough which I stuffed another load of sand with resin. After this set I opened up the cast again and removed the wax, which left me with my three part mold in which I only needed to make the canals anymore.

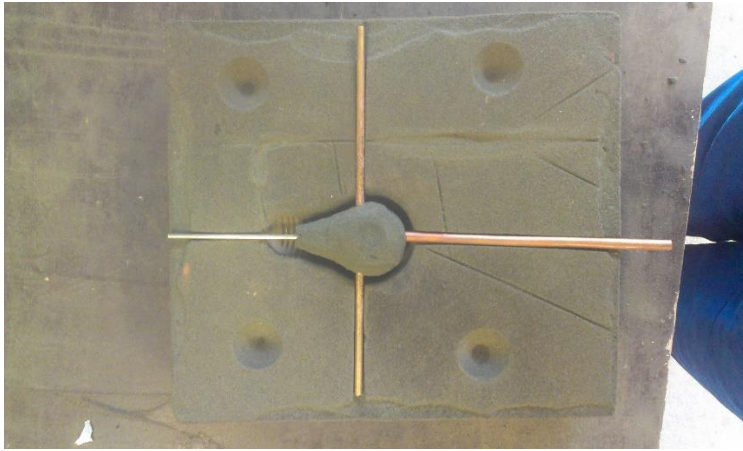


Figure 5 Three part mold

The pouring of the mold went spotless and after cutting of the residue and canals of my object I was left with a nice hollow bronze bulb.



Figure 6 The bulb

Looking back there are a few things that I would have done differently now.

- Make the bronze thinner, I was very careful because I did not know how the bulb would turn out if I made the bronze thinner, but now the bulb doesn't really make a bell sound when struck
- Use a bronze that contains more tin, while the bronze I used already contained a fair bit of tin (10%) I was told that real bells use even more tin in it (20%) because of improved tonal qualities.

- I think the horizontal suspension support was not absolutely needed since the inner mold can rotate without it influencing the end product.
- I would also put less time inbetween the making steps, the process above was spread out over four weeks which in my opinion would have benefited from being more intensive in a shorter time window.

Reflection

Competency wise I think I mainly developed three competencies, namely:

- **Ideas and Concepts:** After the first lecture I realised what was possible with a cast. I was forced to sit down and think what I wanted to make, and what would be able to be made. So generating a concept that was both valuable and feasible.
- **Socio-cultural Awareness:** DG123 learned me about the technical terms in a production process, it will help me to be able to communicate how a design should be produced and what kind of machines would be needed. More importantly though, the assignment gives a lot of insight in why things look like they do. As was pointed out in the assignment, a lot of surfaces are slanted, some surfaces are sanded smooth while others are not (functional planes) and seam lines are needed to join to halves. All of these points give insight in why products look like they do.
- **Form and Senses:** This is the most obvious competency. In learning about how products are created I also got the chance to experience it first-hand which I think was very valuable to the assignment. I can honestly say I learned a new skill in this assignment.