Andrew Simpson

Industrial designer

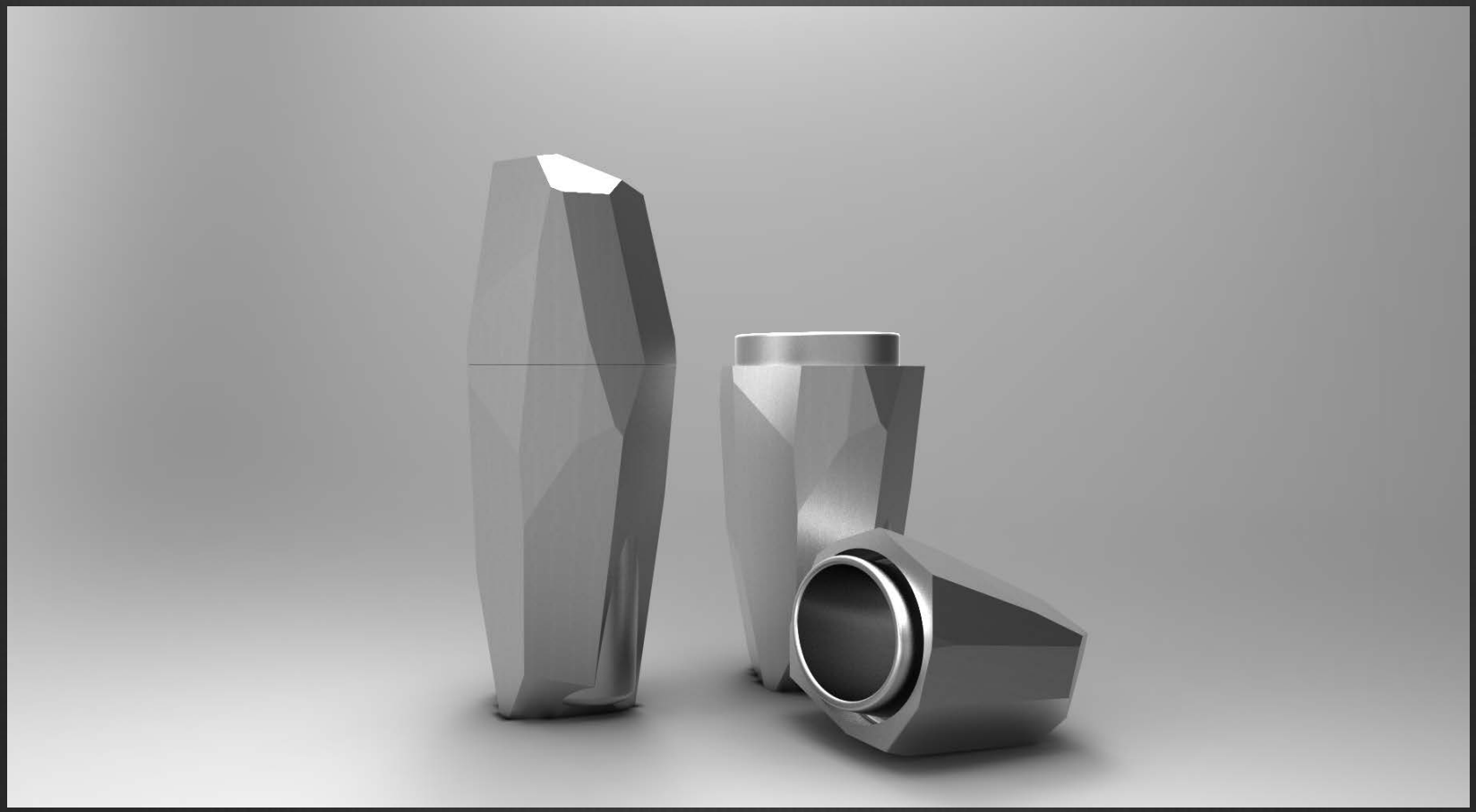
www.andrewsimpson.net

www.vertdesign.com.au

My work

www.thebalmainboatcompany.com

My work



My work

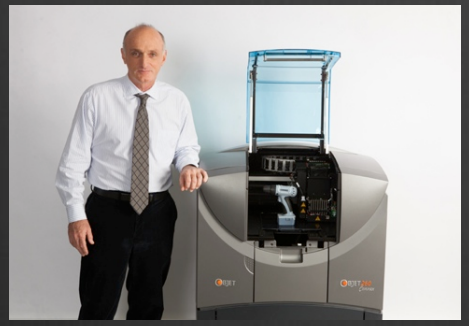
My work

3D printing a quick overview

One of the simplest ways to understand the 3D printing market place is that it closely resembles the paper printing market place of the early 90's.

Dot Matrix = FDM

Laser printing =SLS



Inkjet = objet/projet

Types of prints

Paper Iris

SLA

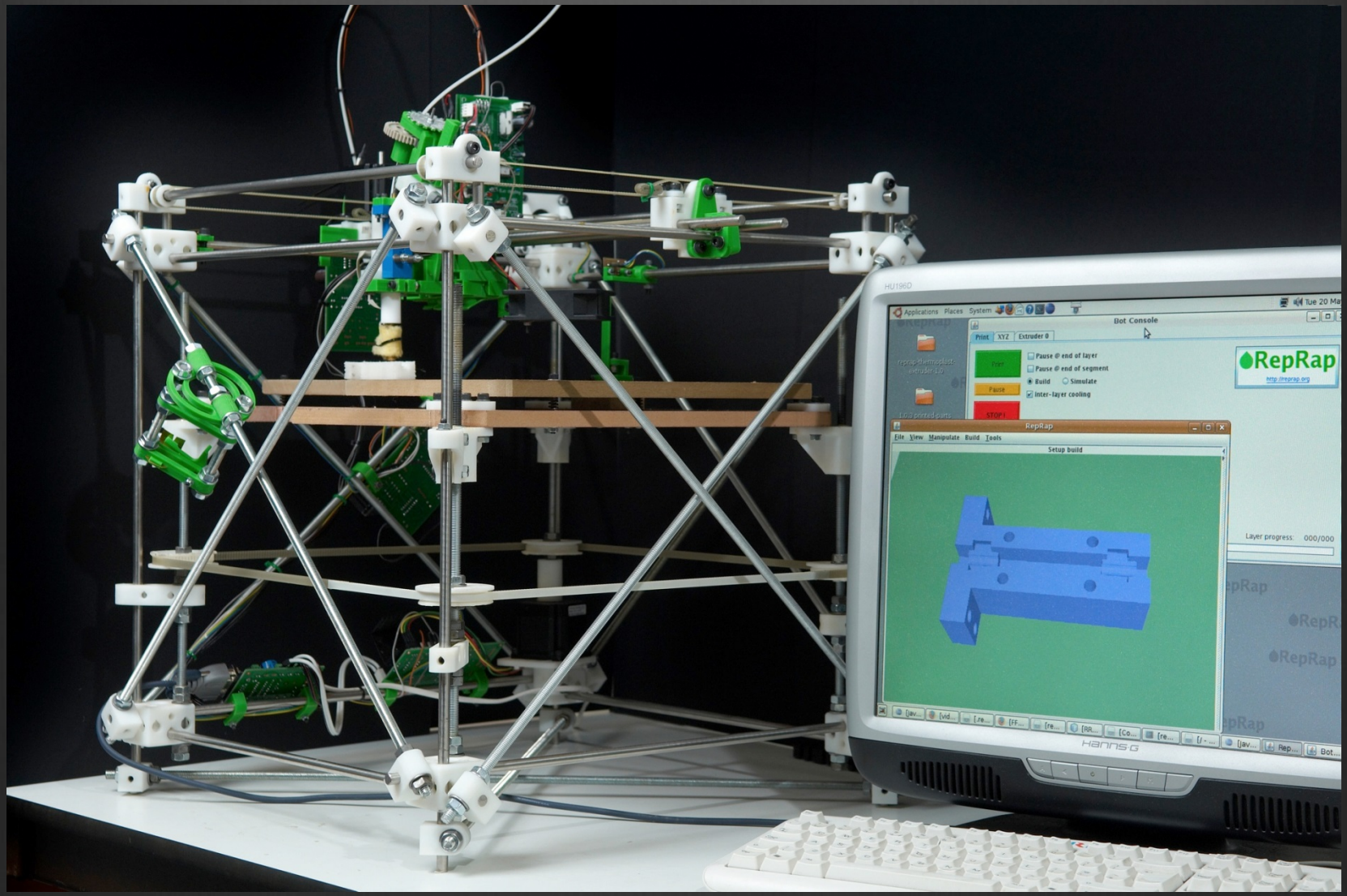
SLS metal

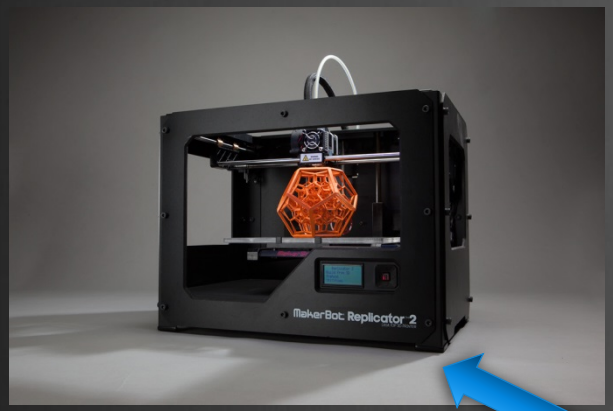
OBJET

FDM

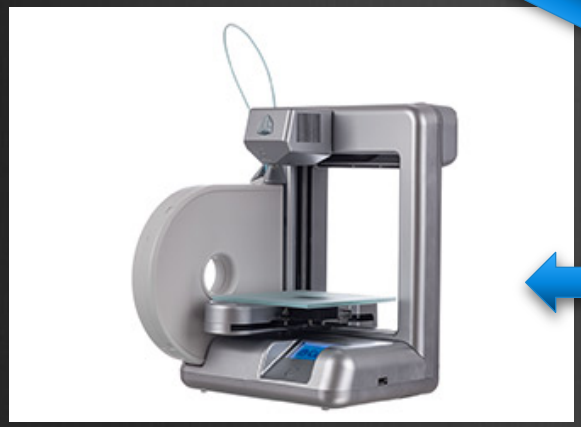
SLS

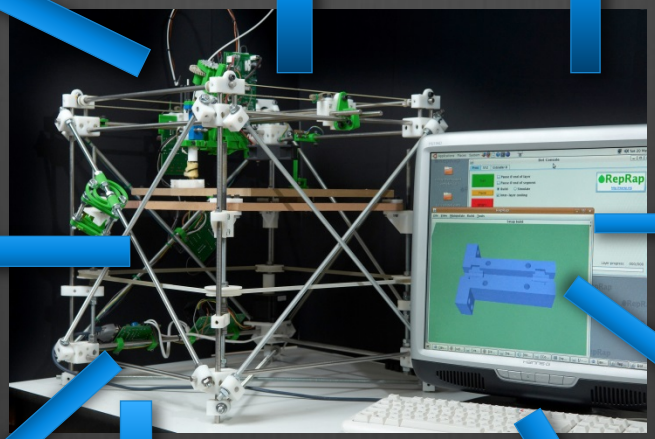
REPPAP -2005 (started the 3D printing boom)
http://en.wikipedia.org/wiki/RepRap_Project

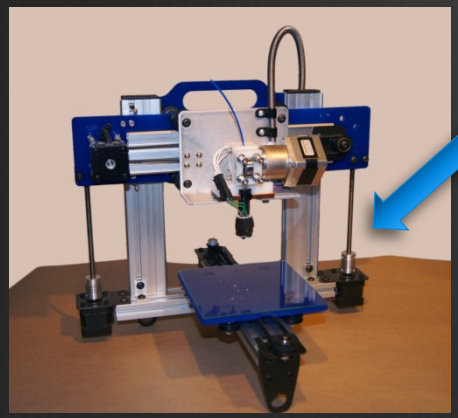


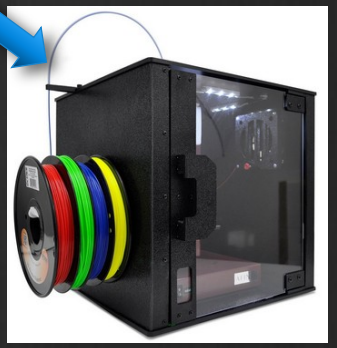

MakerBot Replicator 2


Replicator
MakerBot




RepRap





How do I use 3D printing?

- I have been using 3D printing for 12 years as a means of prototyping designs prior to production (this is still the main way I use the technology). I use the different types of printing depending on what the prototype needs to do.

- Types of prototypes
  - Basic form studies=FDM (also paper or foam models)
  - Functional testing=SLA, FDM, SLA
  - Presentation model=CNC, Low Pressure Injection, painted SLS
  - Working part=CNC, SLS, Low Pressure Injection
  - Marketing feedback=CNC, Low Pressure Injection, Resin cast




Fall in the cost of printing is changing how we use the technology

In late 2009 there was a big fall in the cost of 3D printing as a result of the entry of 2 online printing companies:
www.ponoko.com closely followed by www.shapeways.com

In 2010, printed parts that would have cost $300 in 2009, were now available for $30.

This led to a change in the way we started using 3D printing, as it was now feasible to use it for making parts, not just prototypes.

The question then became ‘what should we be making?’

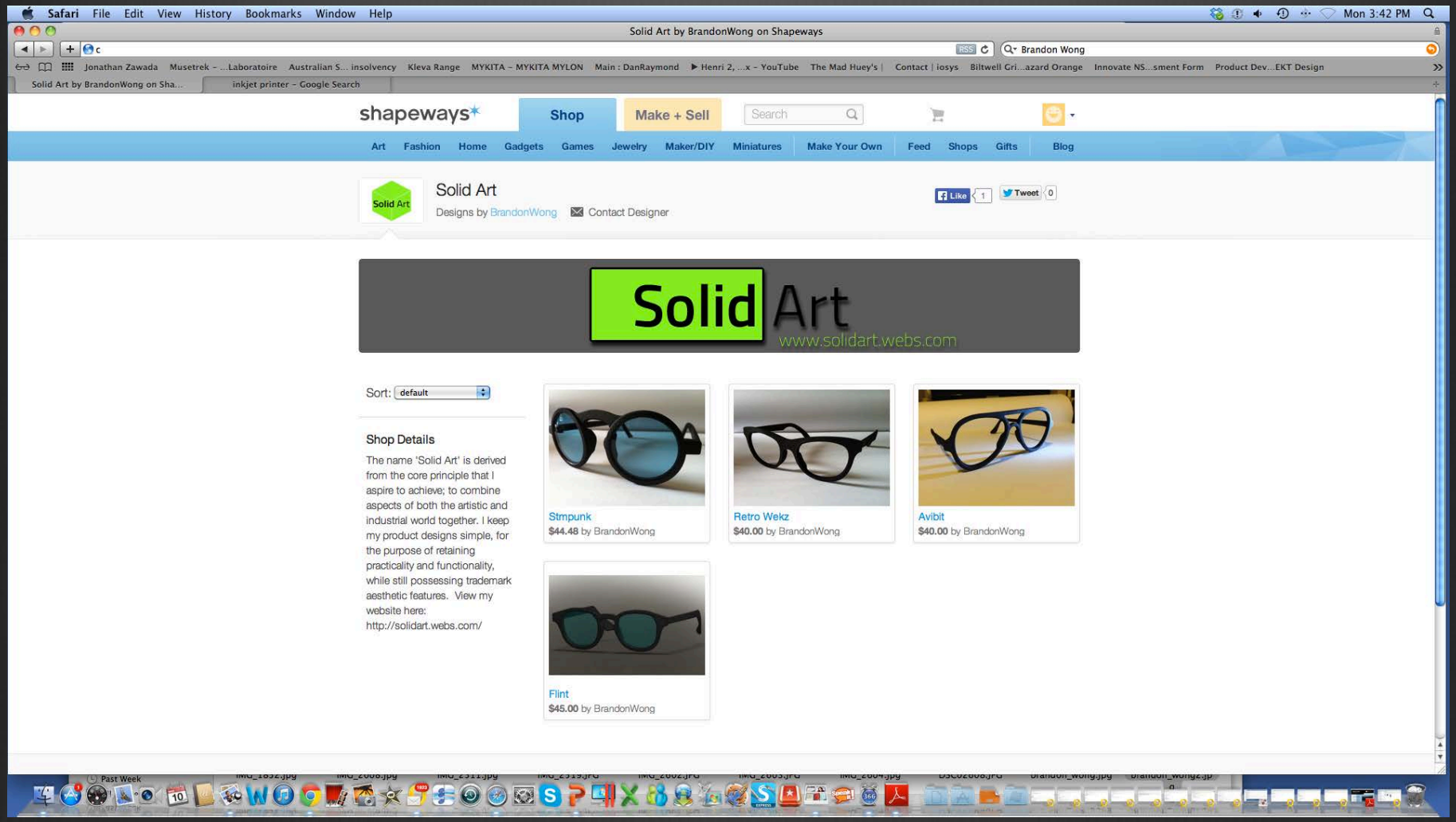
3D printed glasses

3D printed glasses were a logical use for the technology as they are high value items for the weight and size, so they can be printed at a profit. They also have low load bearing requirement.

Brandon Wong

Brandon was a Year 10 work experience student (who was the son of a client). We took Brandon on as a favour to his father, thinking that there would be little a Year 10 student could do given a week. However is 5 days Brandon was able to learn our CAD system, CAD model his own designs and print them.

We then helped him set up an on line store through Shapeways and he now sells his designs. https://www.shapeways.com/shops/S9D



Where is 3D printing right?

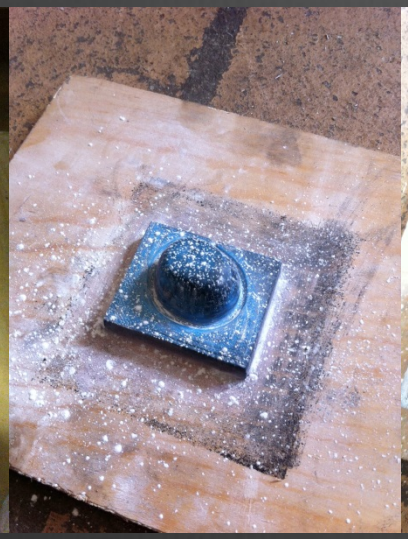
Things of a certain size (under 100mm cubed)

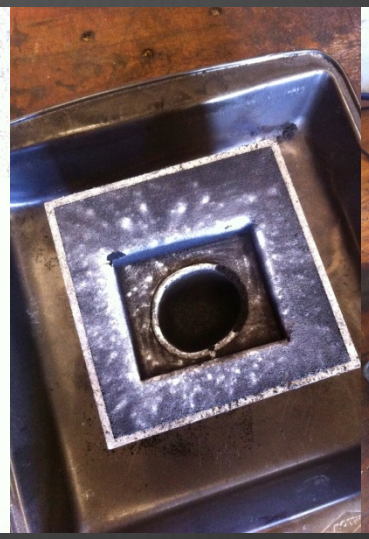






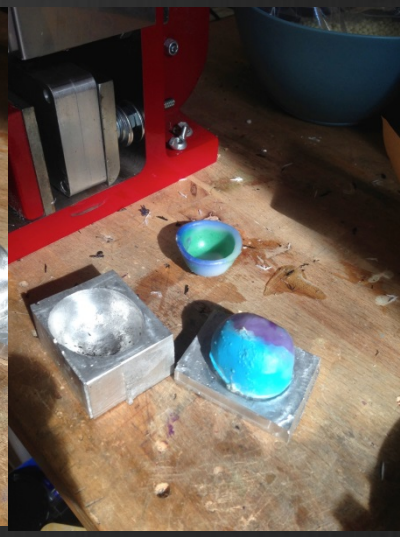
Printing as part of manufacturing



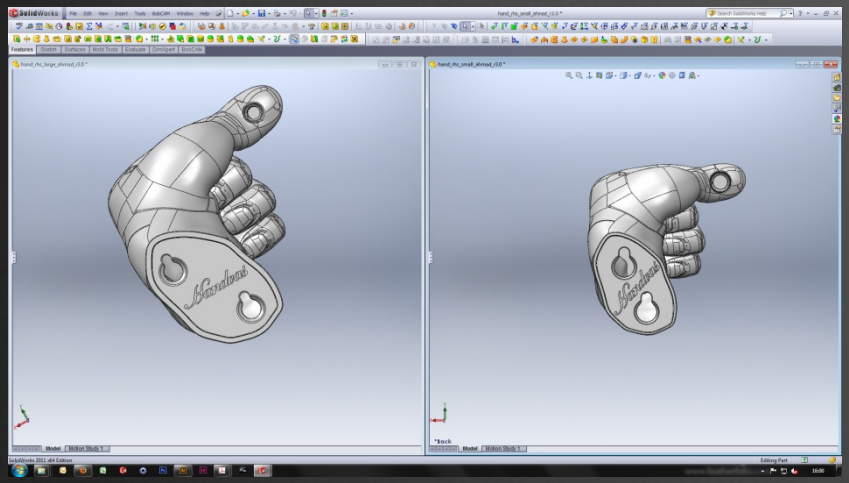




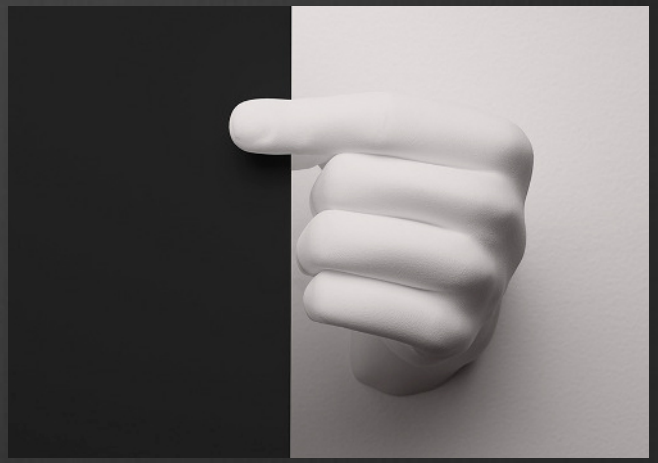
Low volume production

http://www.handvas.com/



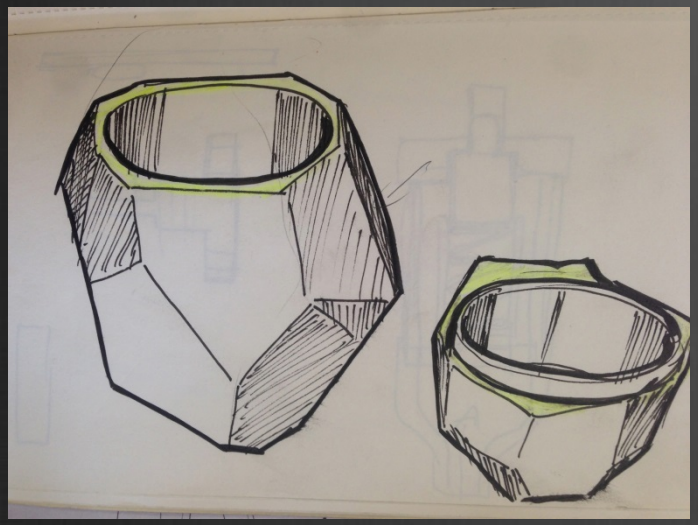
FDM prototype

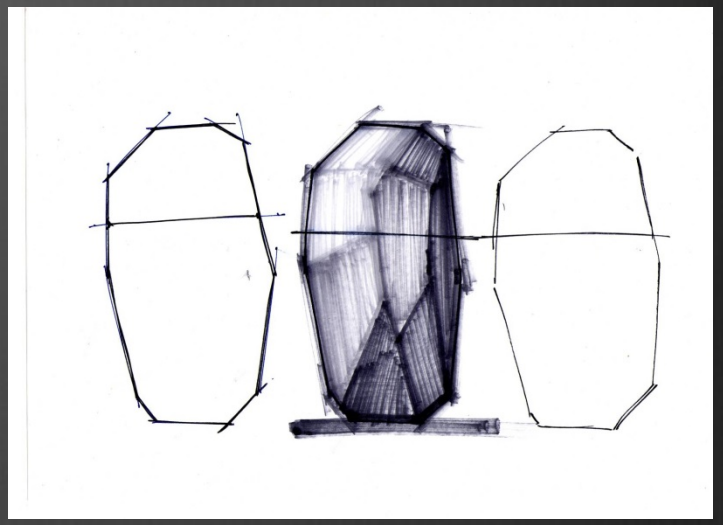
Hand made cast

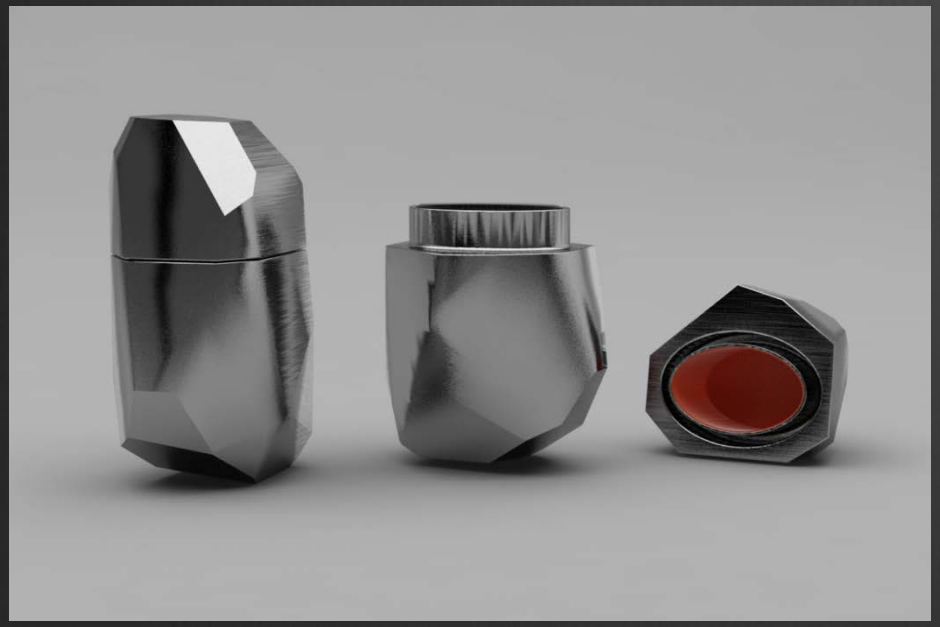


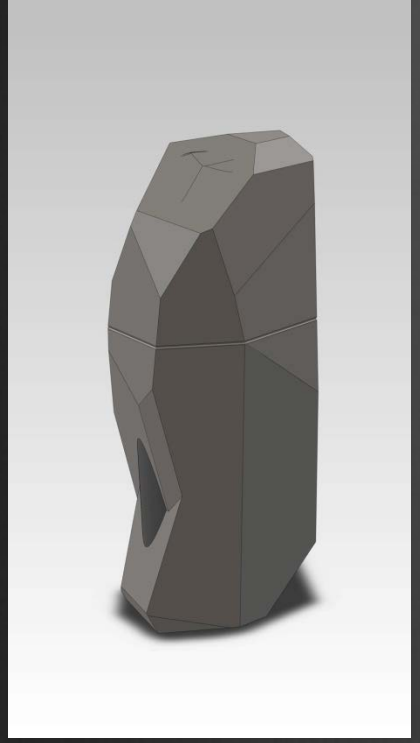
Production units SLS prints

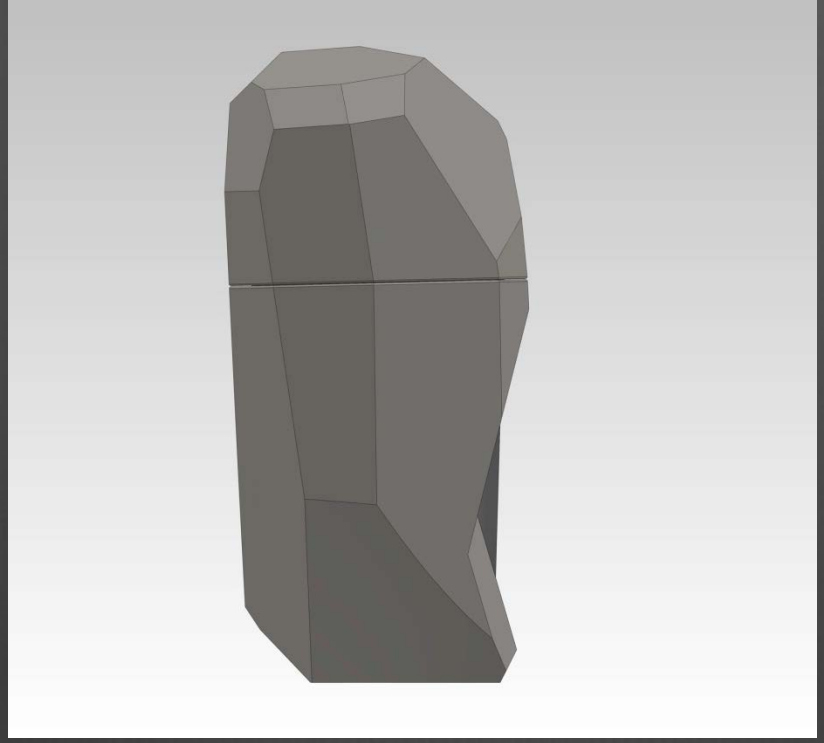
An in house design project

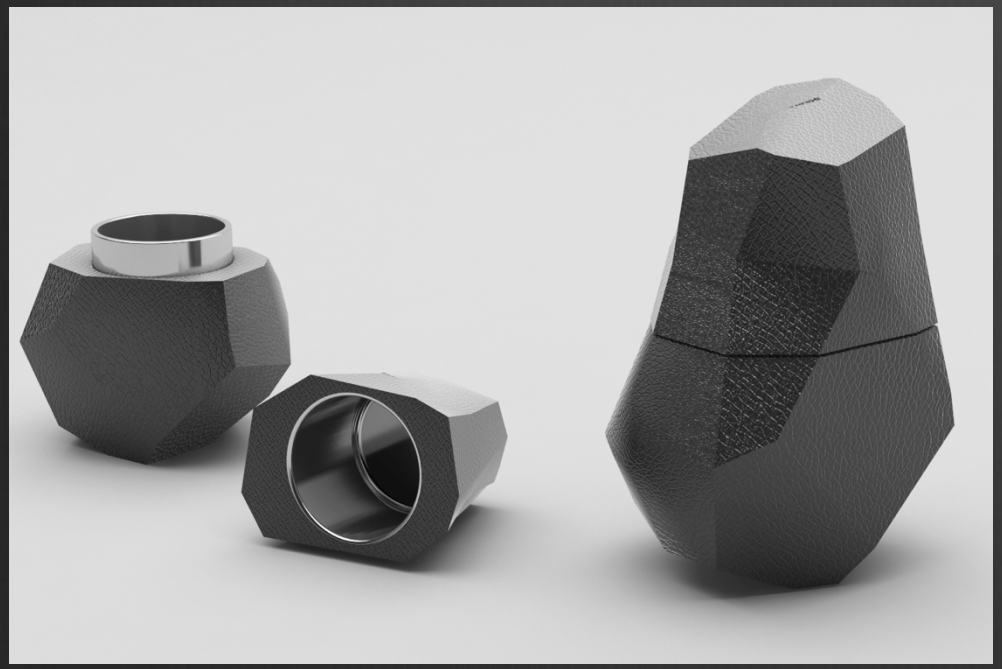


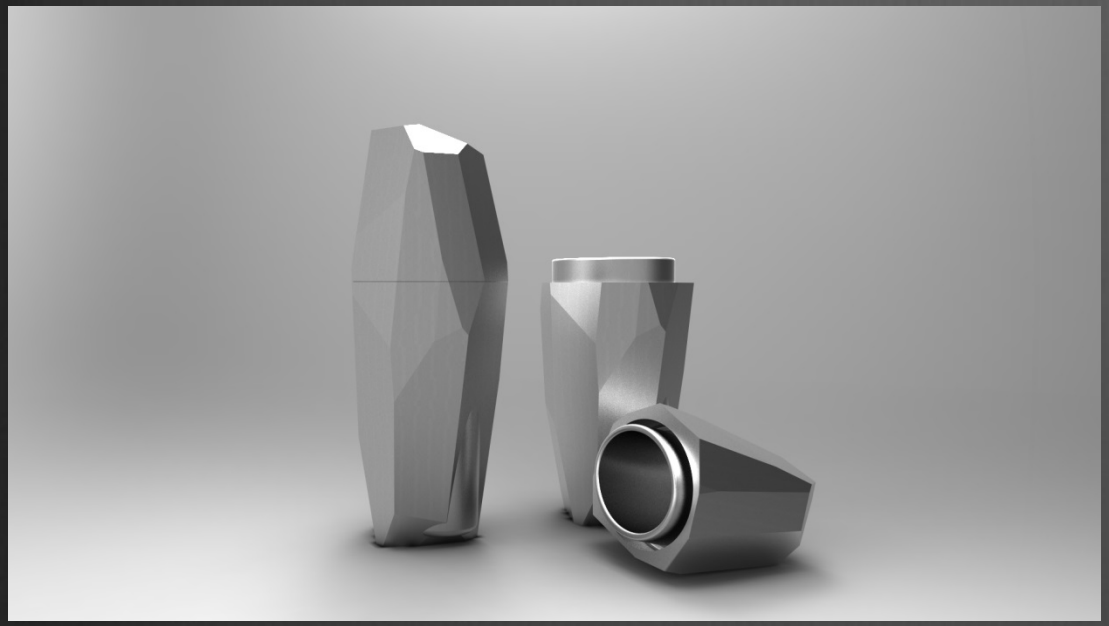


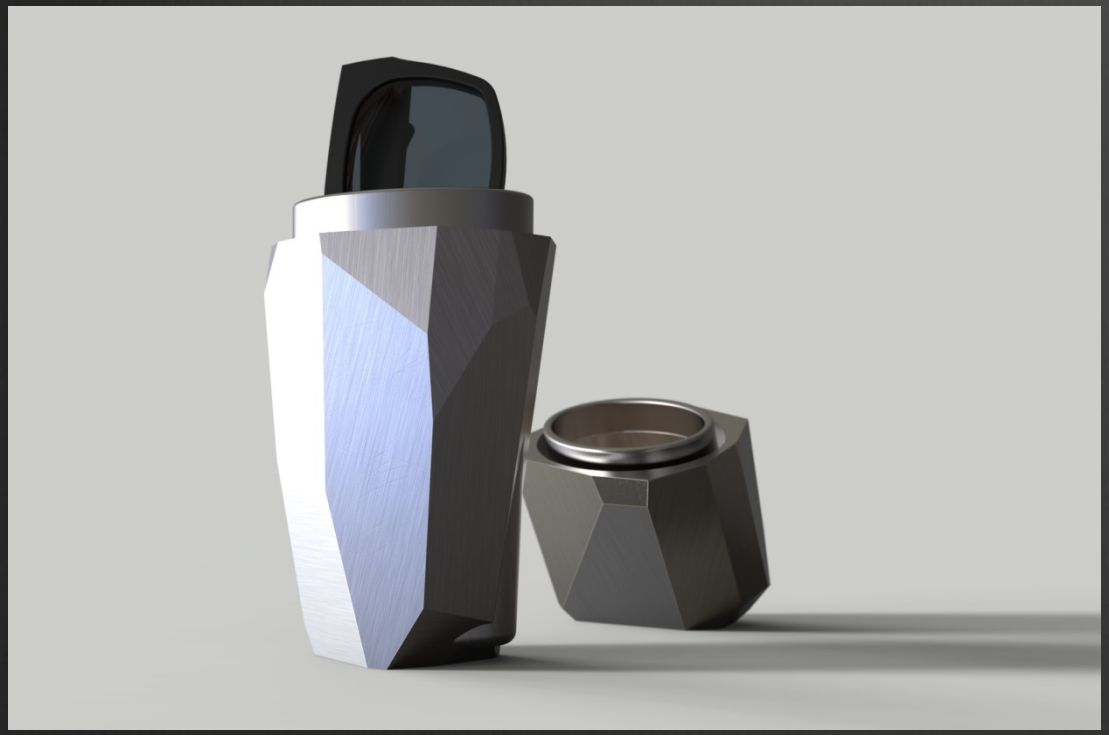


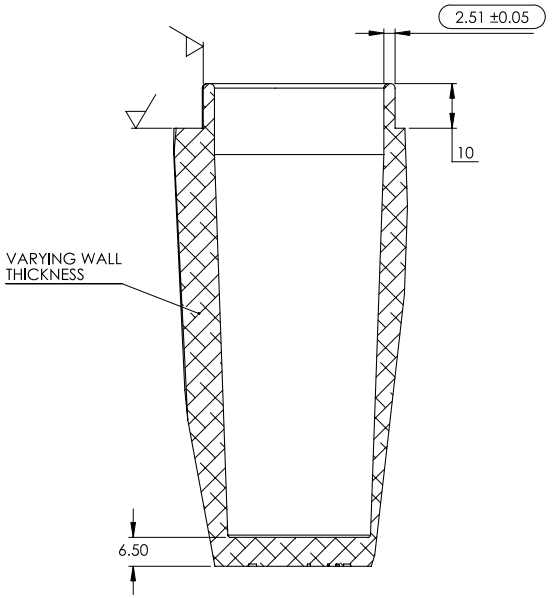




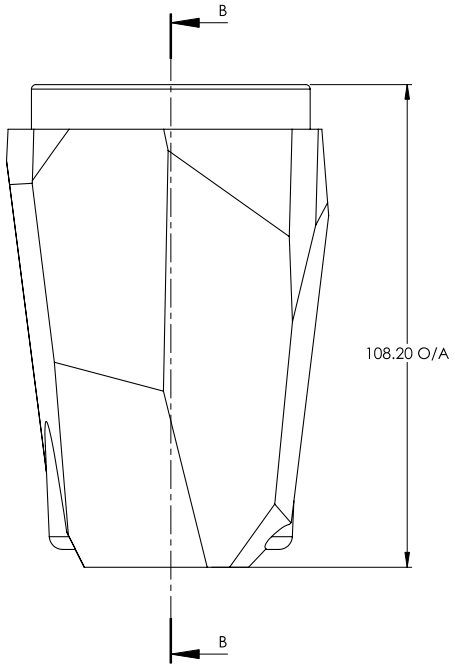


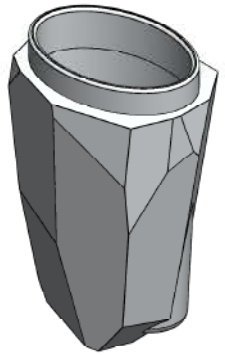


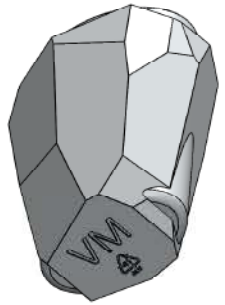




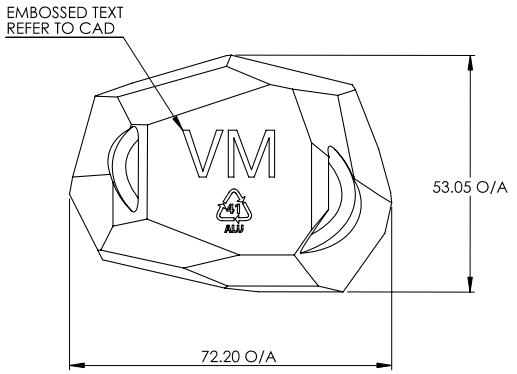
SECTION B-B







ISOMETRIC VIEW (NTS)



APPROXIMATE PART WEIGHT 280GRAMS
CALCULATED 1060 ALLOY

NOTES:

1. FUNCTIONAL DIMENSIONS SHOWN ONLY. REFER TO 3D CAD FILE FOR ALL OTHER DIMENSIONS
2. 'I.P.' INDICATES ONE OR BOTH POINTS OF DIMENSION TAKEN AT THEORETICAL INTERSECTION POINT OF 2 LINES
3. 'O/A' INDICATES OVERALL DIMENSION
4. ALL DIMENSIONS IN mm
5. TOLERANCE UNLESS SPECIFIED OTHERWISE:

   LINEAR ±0.2
   ANGULAR ±0.5
6. PARTS TO BE FREE FROM SCRATCHES & DAMAGE
7. ALL SURFACES TO BE SMOOTH, CLEAN & FREE OF ANY IMPERFECTIONS

REV	DESCRIPTION	DRAWN	DATE
A	RELEASE FOR QUOTE	MT	20/9/13

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TITLE	BASE
CLIENT	VERT DESIGN
MATERIAL	ALUMINIUM - GRADE TBA
PROJECT	TESSELATED CASE
FINISH-COLOUR	SMOOTH
PART No.	TESSELATED_CASE_BASE_C1
MODEL REVISION	1.0
DRAWING REVISION	A
ASSEMBLY	
SCALE	1:1
DRAWN	MT
DATE	25/06/13
SHEET	1 OF 1
	A3

Design

In house 3D prints

CNC prototype

Design changes

Final design