

CK15 Electric Kettle

BSc Product Design Year 2 2014/15

William Woodford  
13413807

Design Project 2

3DD2009 PJ2



User Persona



Name: John Brown

Job Title: Financial Manager.

Domographics

Age: 49.

Gender: Male.

Salary: £55k per annum.

Location: London.

Education: University of Bath,  
Accounting and Finance BSc (Hons).

Family: Spouce and child.

Goals and Challenges:

Primary Goal: The primary goal of the user is to  
is to purchase a new kettle in the  
design style of Alessi.

Comment from John:

Johns Product Content Needs.

I am a real follower of Alessi and I have research  
many of there products. They have only designed  
two electric kettles in the last 21 years the most  
recent in 2009. I feel that they need to update them.  
I would like somthing thats easy to use with minimal  
buttons and looks great. The kettle must: use  
the deign style of Alessi, function properly, be  
innovative and inspiring, take environmental issues  
into concideration and possibly incorporate  
technology.

Current Alessi Products: TRINA pencil holder and  
the SG68 toaster.



Market Potential using Mosaic UK groups and types

Group B: Professional Rewards.

9.54% of the population.

8.23% of housholds in the UK.

Total UK population: 63,738,104 people.  
(14th March 2015)

Potential Users (UK): 2,139,800 households.

The sector that the heat pump is going to be designed for is the  
executive and managerial classes of the UK. This group of people  
are also know as the professional rewards sector comprises of  
people between the ages of 40 and 60. These people tend to have  
a large amount of disposable income making them the perfect  
target market.

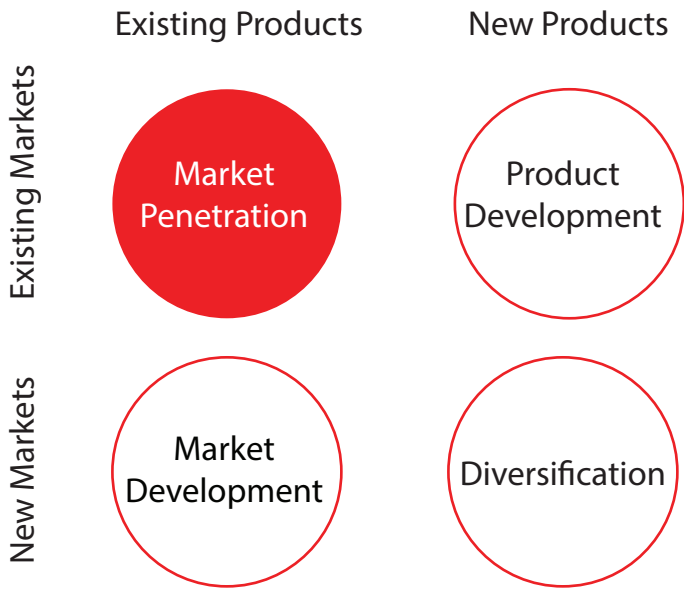
The professional rewards tend to be married and live in detached  
houses with four or more bedrooms. These houses are usually  
situated in the outer suburbs of cities or semi-rural villages. They  
prefer to find products that are value for money and tend to go for  
products they have a good brand loyalty too. This coupled with the  
fact that they like to invest money in various possessions and  
property makes them the perfect market for a newly designed and  
marketed heat pump. This group of people also takes time to make  
an informed decision before purchasing expensive items.

Kettle Environments



Market Scenario UK

ANSOFF Matrix

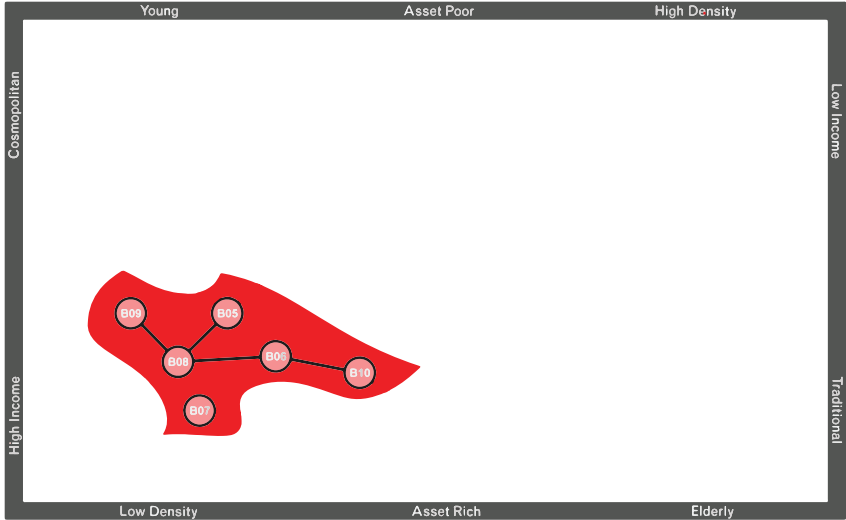


Market penetration is both a measure and a strategy. A business will utilize a market penetration strategy to attempt to enter a new market. The goal is to get in quickly with your product or service and capture a large share of the market. Market penetration is also a measure of the percentage of the market that your product or service is able to capture.

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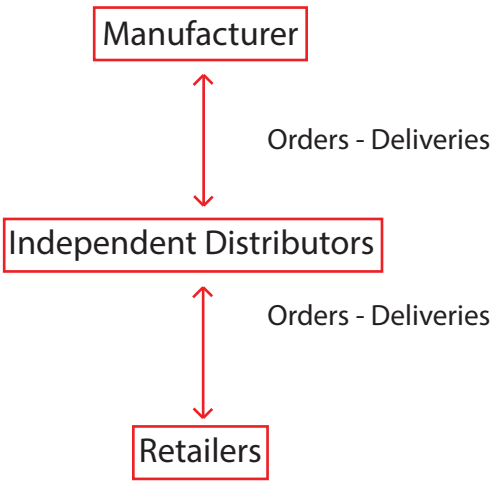


This graphic shows that the professional rewards population are a perfect user group for the new heat pump. Although it has a relitively low density of people they have more dispoisible income therefore they are more likely to purchase the heat pump.

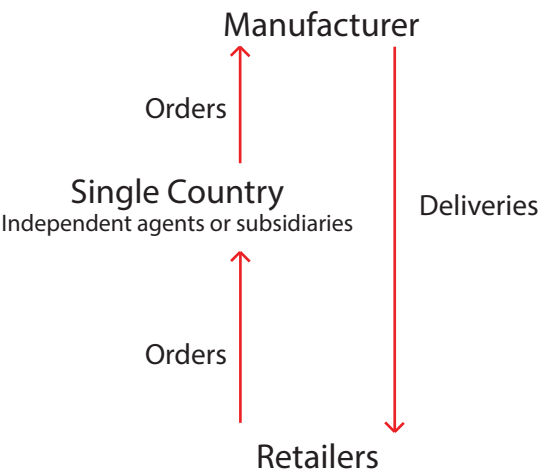
	%	%
B05 - Mid-career climbers.	2.90	2.30
B06 - Yesterday's Captains.	1.80	1.84
B07 - Distinctive Success.	0.48	0.48
B08 - Dormitory Villagers.	1.81	1.29
B09 - Escape to the country.	1.41	1.31
B10 - Parish Guardians.	1.14	1.00

Alessi Streamline Distribution System

Standard Distribution System



Alessi Streamline Distribution System





Alessi

Alessi was founded in 1921, initially they produced brass and nickel silver sheet metal, however they are now one of the worlds leading design companies. Alessi currently produce two electric kettles where as they produce five kettle for use on the hob. The aim of this project is to expand on this and produce a new kettle for the company.

Situation

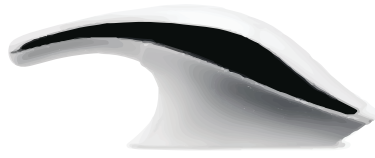
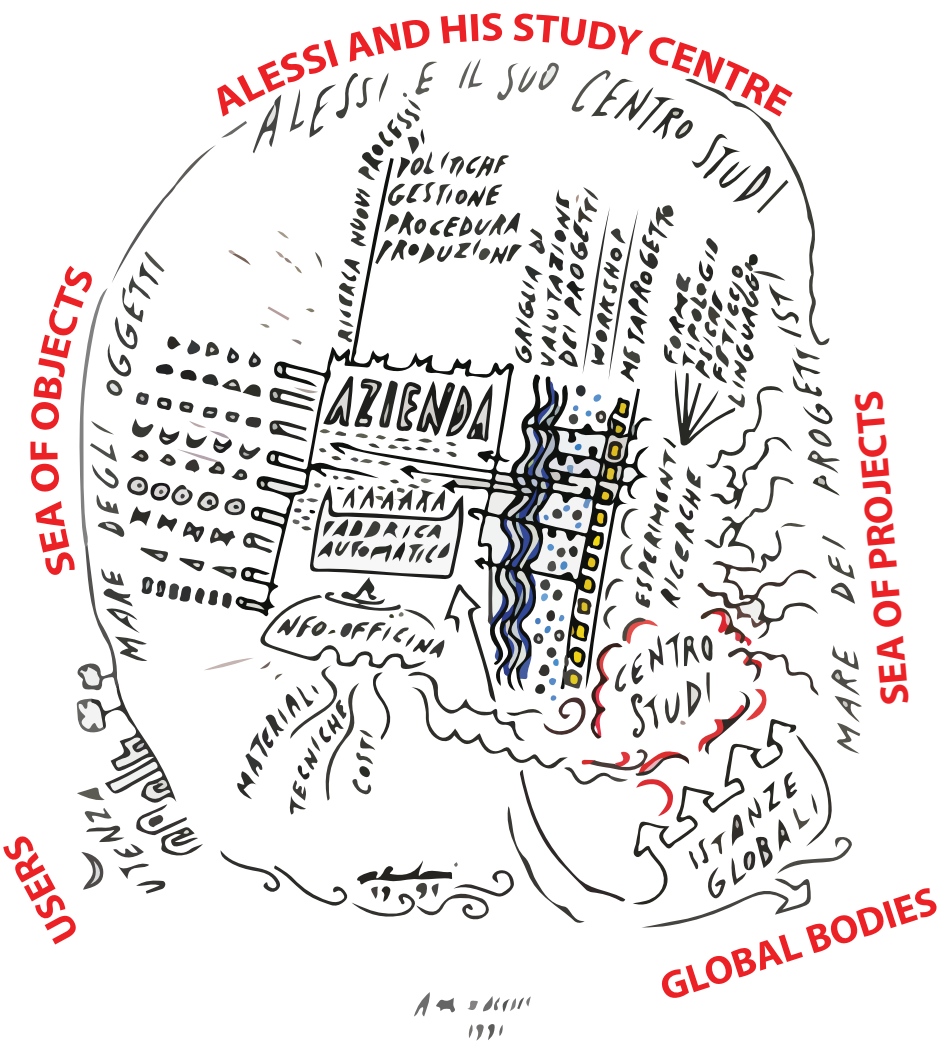
There are 2,139,800 houtholds in the UK alone within the professional rewards sector of the Mosaic UK brochure 2009 this shows there is a large market for high end items of this nature. Alessi have only produced two electric kettles in the last 21 years most recently in 2009.

Brief

Alessi are well known for their innovative and inspiring products however there is a need for an updated electric kettle. There are many Alessi products to influence the new design. The brief is to design and manufacture a series of models and a final prototype of an electric kettle in the design style of Alessi. In order to do this current products from Alessi and other existing kettles must be analysed in order to gain a better understanding of how a kettle works (internal components) and the design style of Alessi.

There are many aspects of the brand that need to be researched such as the colours, materials used, target user and manufacturing processes. The target market for the product remains the same as current Alessi products however this needs to be researched further. The kettle has to be functional and aesthetically pleasing. One of the other aspects of the Alessi design culture is the incorporation of animals into there products.

As well as these factors the sustainability of the product must also be taken into concideration, if an LCA report requires an alteration of materials or manufacturing techniques changes will be made.





## Current Products



SG67 Handheld vacuum cleaner

Designed by Stefano Giovannoni. Charger in thermoplastic resin with integrated crevice tool and wet nozzle. European plug.



MG 32 Electric kettle

This celebrated kettle with the bird that sings when the water has boiled was a great success when it was introduced in 1985, and for Alessi it represented a meeting of great design and mass production methods, a combination that Michael Graves worked hard to achieve, applying his personal visual code which fused influences from Art Deco to Pop Art and even the language of cartoons.

Kettle in 18/10 stainless steel mirror polished with handle and small bird-shaped whistle in PA, light blue. Magnetic steel bottom suitable for induction cooking.



HOT.IT

Arets' sensitivity in the use of steel in this object for the table has led to a highly sophisticated result, an expressive intensity that generates the unique feel of Lightness and Consistency that hallmarks in his work.

Materials: Polished 18/10 stainless steel. Inside, handle and lid in thermoplastic resin, black or white.



SCOIATTOLO  
design Andrea Branzi

Andrea Branzi has designed the Nutcracker "Scoiattolo" (squirrel) and is very attentive to the environment and to natural forms. His family of object can be easily recognized, thanks to its extended forms, and includes, among the others, also the funny Toothpick holder and the bottle-opener "Ercolino".



BANANA BROS  
SALT AND PEPPER SET  
design Stefano Giovannoni

The close contact with the National Palace Museum of Taiwan's artistic collections offered by the "Chin Family" project has allowed Stefano Giovannoni's imagination to run wild, pushing him to measure himself against, and apply his contemporary and very personal interpretation to, the millennia-old tradition of Chinese applied arts. The result is a family of characters, flowers and fruits, each of which interprets a domestic functional role, echoing the grace of seventeenth-century ceramic objects while at the same time openly declaring their modernness.

## Material Considerations

Polished Stainless Steel or Aluminium for outer casing.

Low-density plastic - Thermoplastic resin.

Polypropylene (PP).  
Polyethylene (LDPE).

Heat treated Glass

Concepts



Summative Assesment

March 16,2015

WGW

William Woodford's Design Portfolio

HOME

PORTFOLIO

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Summative Assessment, Alessi Kettle, Design Project 2

March 16, 2015

William Woodford

Screen Shot 2015-03-16 at 19.25.34.png

After presenting work to fellow students there was a discution regarding the next steps that should be taken regarding the development of the project...



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March 16, 2015

William Woodford



After presenting work to fellow students there was a discution regarding the next steps that should be taken regarding the development of the project. The information provided included:

- Researching the luxury demographic.
- Child safety.
- Mode of handling.
- Dimentions.
- Volume of internals, quantity of liquid held.
- Battery or mains powered.

- Anotation of concepts.
- Super imposed images to create the correct form.
- Mobile app feature.

This information will all be taken into account and added into the workbook, hopefully aiding the concept development stage and overall depth of understanding through out the project.



Development Model 1



The form of this physical model derives from some of the early concept drawings. It is a fairly complex shape with many organic curves and edges. The legs are present for two reasons: to mimic the animal incorporation of a rooster and to raise it off the kitchen counter for use with the automated pouring system.

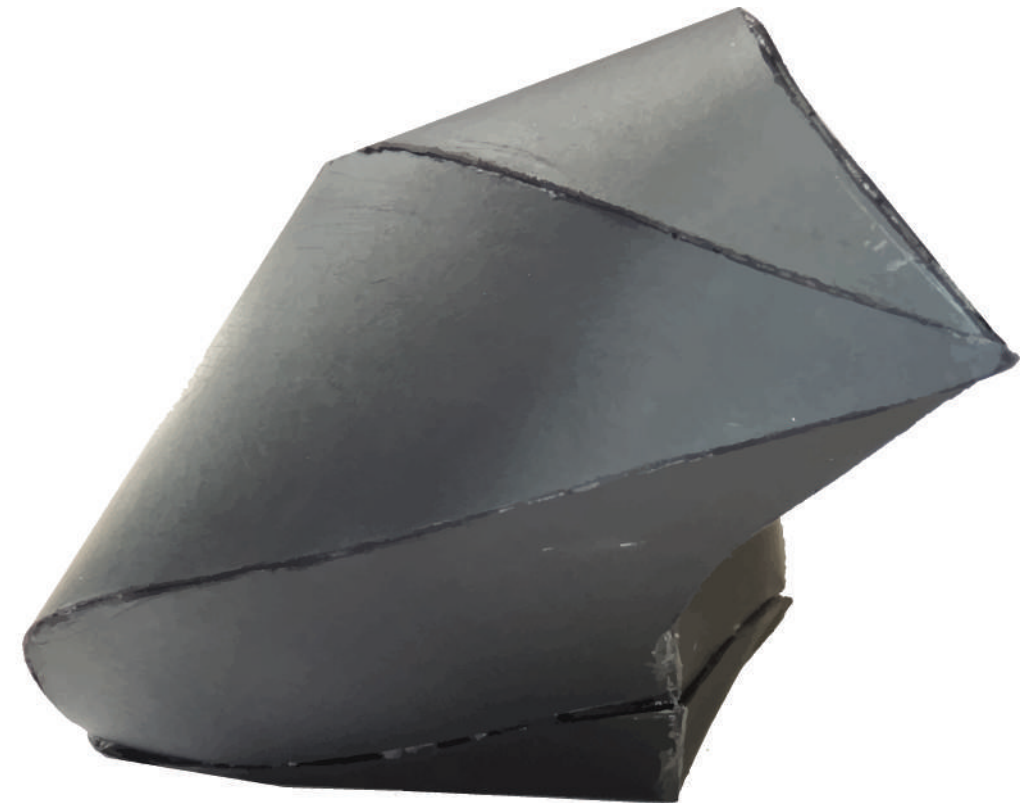
Thoughts on the automated pouring system:

The idea of an automatic system works perfectly in theory however practically it comes with too many issues of its own. Firstly safety, a flow of boiling water easily triggered by movement could harm to its users, especially children.

When asked about the concept the potential user was not too keen and ensured that the standard method was far better. He said: 'Every day there is a need to pick up the kettle and transport it, whether that's to fill it up or filling a saucepan to cook pasta. I think that this function could hinder rather than help me.'

The response was pretty clear in regards to the automatic pouring function. This will now be dropped as a concept for now however further developments need to be made in regards to the form. The legs make the kettle unstable and they don't allow it to be moved without unplugging it. This will be addressed using more physical models.

Development Model 2



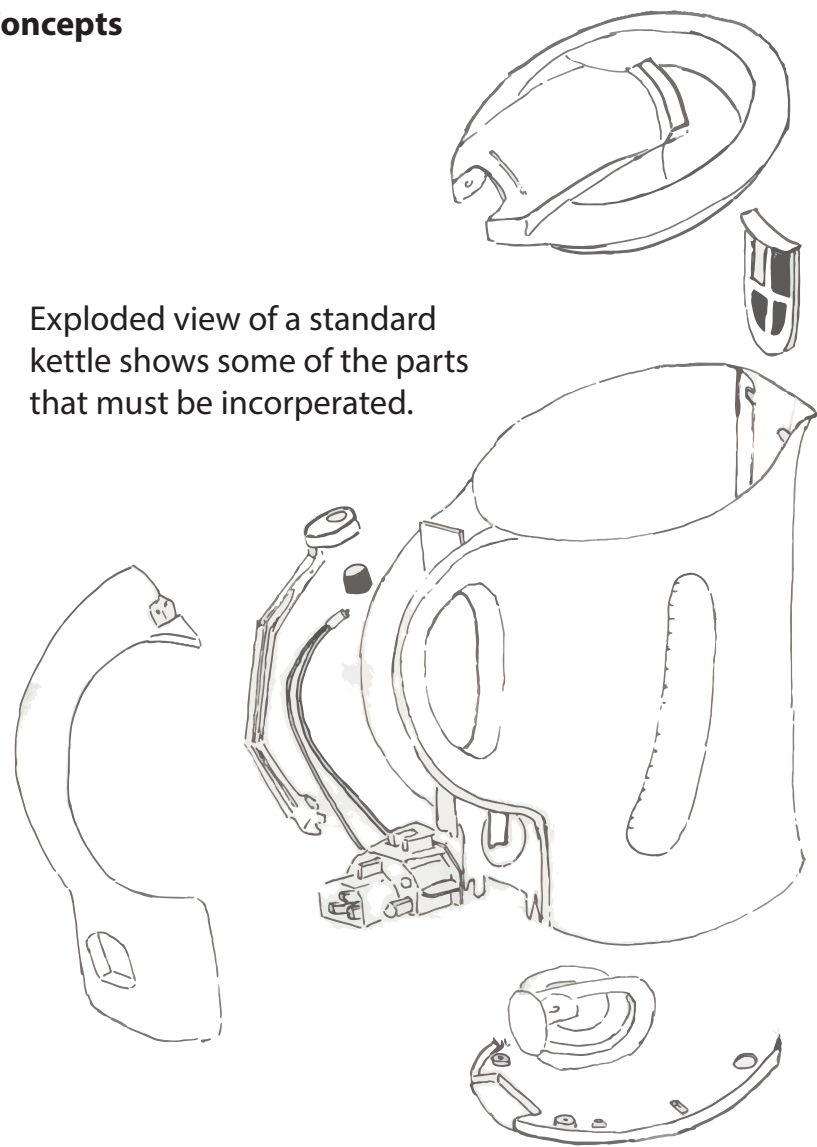
This model is a progression of last, presented on the left. The addition of the base stabilizes the kettle, making it safer for the user. It also allows the kettle to be physically picked up and moved to the kitchen sink or cooking area. The only aspect that is missing is the handle, this will need to be developed.

Users comment:

'This is a much better idea the addition of the base is perfect it almost looks like it isn't there. With the colour scheme you told me about I can see how in an abstract sense it would still look like the body and legs of a rooster.'

This positive response is a good start, it shows that the form of the main body of the kettle is aesthetically pleasing. However a few issues were flagged up. The shape is over complicated and would be more difficult to produce. Perhaps a more simplified version would be better.

Concepts



Exploded view of a standard kettle shows some of the parts that must be incorporated.

The exploded view of the kettle allows an internal view of all the major parts that allow it to work. Aspects such as the on/off/ switch, heating element, handle, base and mains connection are paramount to any kettle.

In order to design a aesthetically pleasing product that also functions as intended these parts must be included. The configuration can be altered dramatically allowing greater freedom with the form of the product.

Lid

Water level gauge.

Handle.

All in one structure.

Heating element.

Mains connection.

Spout needs further investigation.

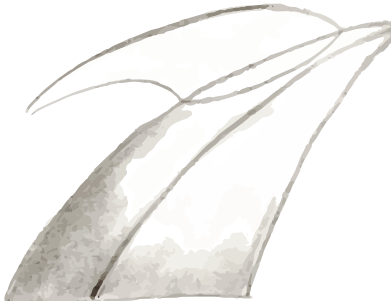
~ Material research.

~ Is there going to be a base?



Possible form over function.

How will the water get in/out?

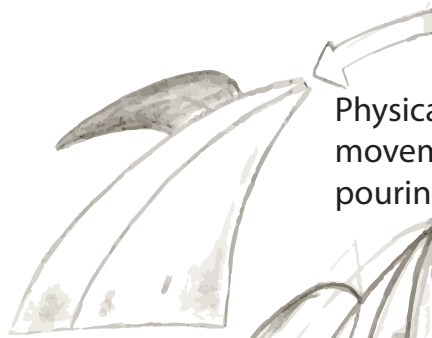


Automatic pouring.

Senors.

Safety issues.

Physical movement/ pouring.

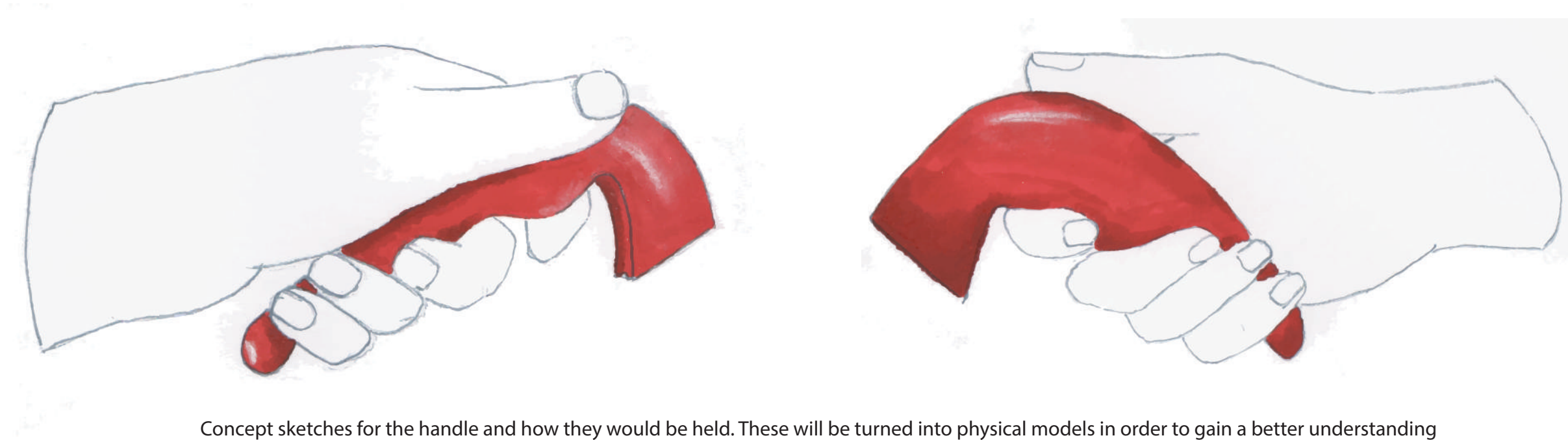


Animal inspiration (rooster).

Chromed outer surface with a thermoset plastic internal.



## Handle Sketches and Concept Artwork



Concept sketches for the handle and how they would be held. These will be turned into physical models in order to gain a better understanding of how the user would interact with them. The physical models will also provide a better understanding of the ergonomics of the concepts.



Hand generated image and edited in photoshop to produce a comic rendering if the concept.



Handle Evaluation

After presenting the model handles to the user they were asked how comfortable and how practical they thought the handle was.



Material: Acrylic

Process: Extruded acrylic and strip heater to form.

User Comment: 'I thought this handle was ok, however there were a few issues with it. The grip was to thin for me and it didnt provide enough grip, as well as this the grip was to close to the product its self and when the kettle heats up I would be able to use it.'

User Rating: ●●○○○



Material: Thermoset Resin

Process: A foam model was produced, and vacuum formed to provide a mould tool.

User Comment: 'This handle was far better in regards to grip and comfort. The finger grip would definatly allow more people to hold the kettle comfortably. I also really like the button position, it is tucked away be is still really accessible. The only down side to it is that it is rather chunky and heavy.'

User Rating: ●●●●○



Material: Thermoset Resin

Process: A foam model was produced, and vacuum formed to provide a mould tool.

User Comment: 'This handle is more similar to what I image in regards to form. The pronounced waves replicate the incorporation of the rooster into the design far more than the others do. however it isnt very comfortable to hold I dont believe that many people could use it.'

User Rating: ●●●○○

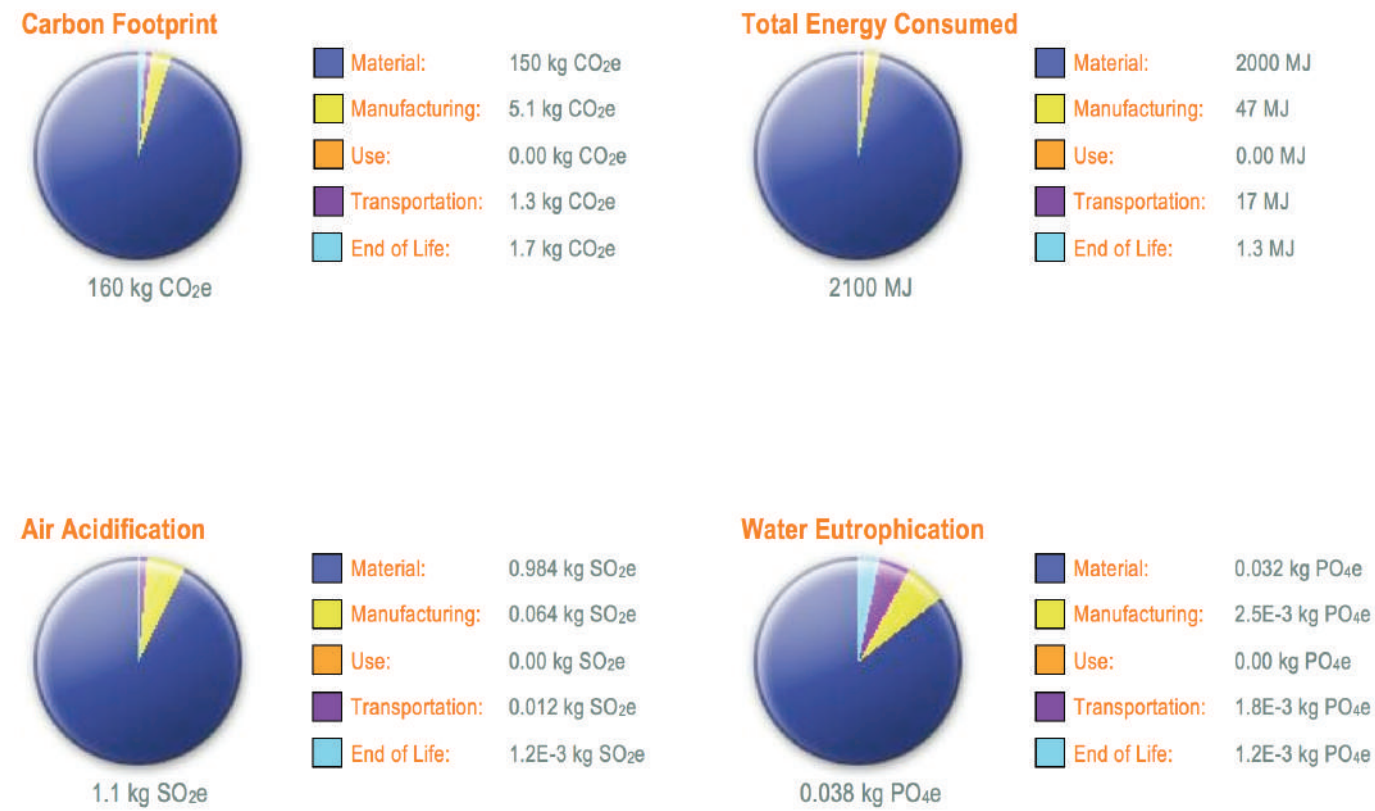
Using the information provided by the potential user it has been decided that the middle handle would be the most effective. It provides comfort for a higher percentage of the population and despite the contemporary style of the first handle it is more inkeeping with the products design culture.

LCA

The material chosen at first was sheet stainless steel. In order to gain a better understanding of the sustainability of the product an LCA evaluation was carried out.

The LCA used for the baseline contained stainless steel for the outer casing. When an aluminum alloy was selected there was a drop in all of the factors.

The information provided by the LCA indectates that a change in material is necessary.



Total Energy Consumed

Material:

2000 MJ

Manufacturing:

47 MJ

Use:

0.00 MJ

Transportation:

17 MJ

End of Life:

1.3 MJ

2100 MJ

Air Acidification

Material:

0.984 kg SO<sub>2</sub>e

Manufacturing:

0.064 kg SO<sub>2</sub>e

Use:

0.00 kg SO<sub>2</sub>e

Transportation:

0.012 kg SO<sub>2</sub>e

End of Life:

1.2E-3 kg SO<sub>2</sub>e

1.1 kg SO<sub>2</sub>e

Water Eutrophication

Material:

0.032 kg PO<sub>4</sub>e

Manufacturing:

2.5E-3 kg PO<sub>4</sub>e

Use:

0.00 kg PO<sub>4</sub>e

Transportation:

1.8E-3 kg PO<sub>4</sub>e

End of Life:

1.2E-3 kg PO<sub>4</sub>e

0.038 kg PO<sub>4</sub>e

The reduction in carbon emissions also comes with the added bonus of a decrease in the production costs of the kettle. The cost of manufacturing the Alessi kettle would be £20.70.

If the Kettle was to be sold at £103.95 there would be an £80 profit on each unit sold. Taking into account the potential market size in the UK the CK15 kettle could be worth upto:

£80 profit, 50% is accounted to overheads and further product development.

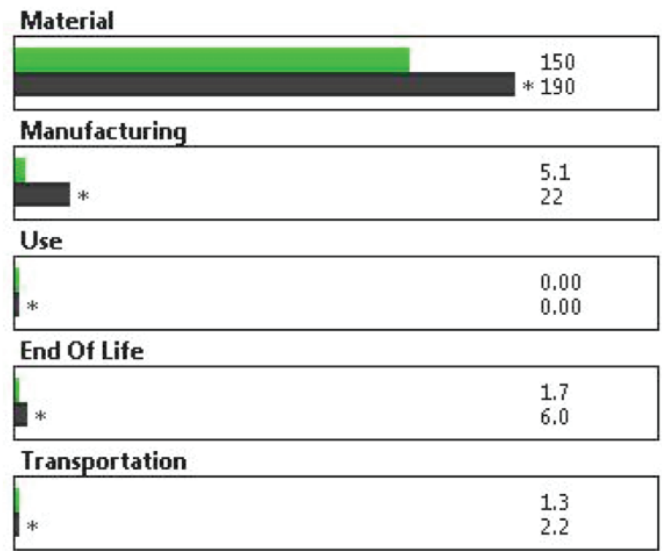
£40 x 10% of potential users in the first year (213,980).

Producing a yearly turnover of £8,559,200 within the UK.

Environmental Impact Comparison

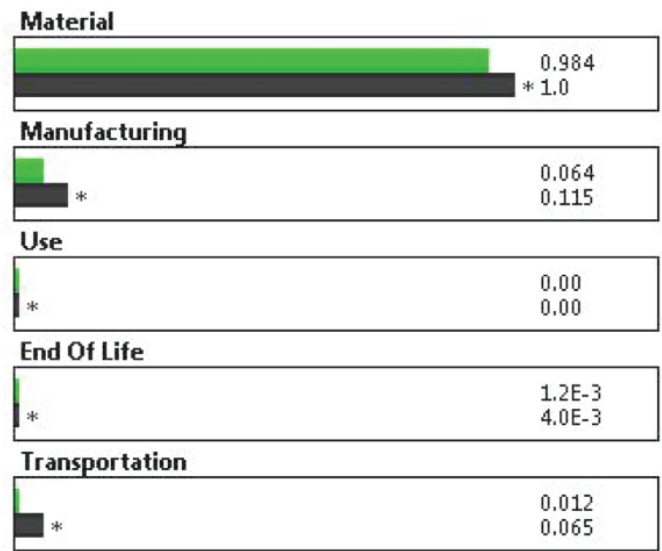
Carbon Footprint - Comparison

Total	: 160 kg CO <sub>2</sub> e
	: 220 kg CO <sub>2</sub> e



Air Acidification - Comparison

Total	: 1.1 kg SO <sub>2</sub> e
	: 1.2 kg SO <sub>2</sub> e

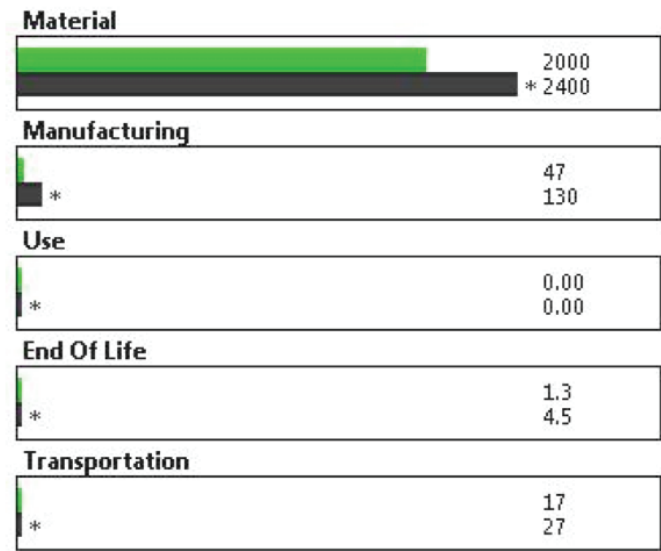


New Design:  
Better Worse

Original Design:  
Baseline

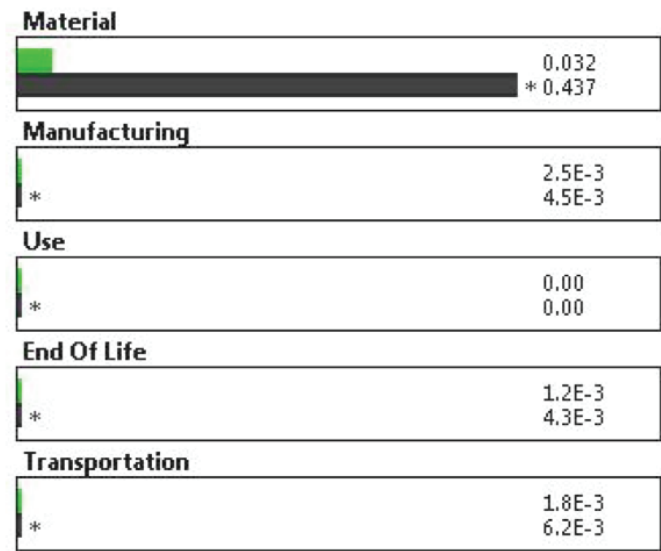
Total Energy Consumed - Comparison

Total	: 2100 MJ
	: 2600 MJ



Water Eutrophication - Comparison

Total	: 0.038 kg PO <sub>4</sub> e
	: 0.450 kg PO <sub>4</sub> e



Chosen Design and Concept Development

The concept presented below has been chosen to develop further. The simplicity of the design mimics that of the Alessis design culture. In order to develop the design further a few aspects need to be added and/or altered.

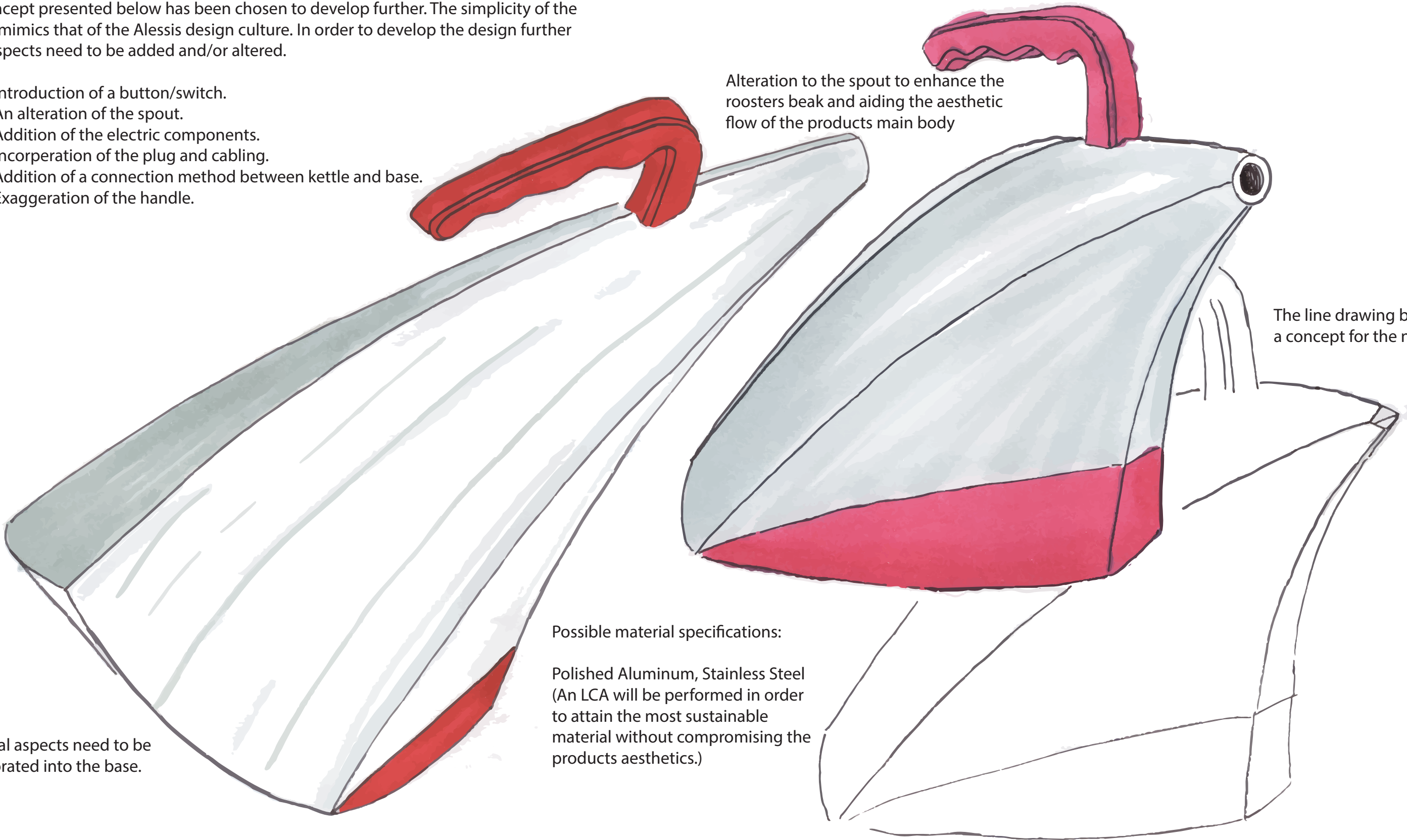
- Introduction of a button/switch.
- An alteration of the spout.
- Addition of the electric components.
- Incorporation of the plug and cabling.
- Addition of a connection method between kettle and base.
- Exaggeration of the handle.

Electrical aspects need to be incorporated into the base.

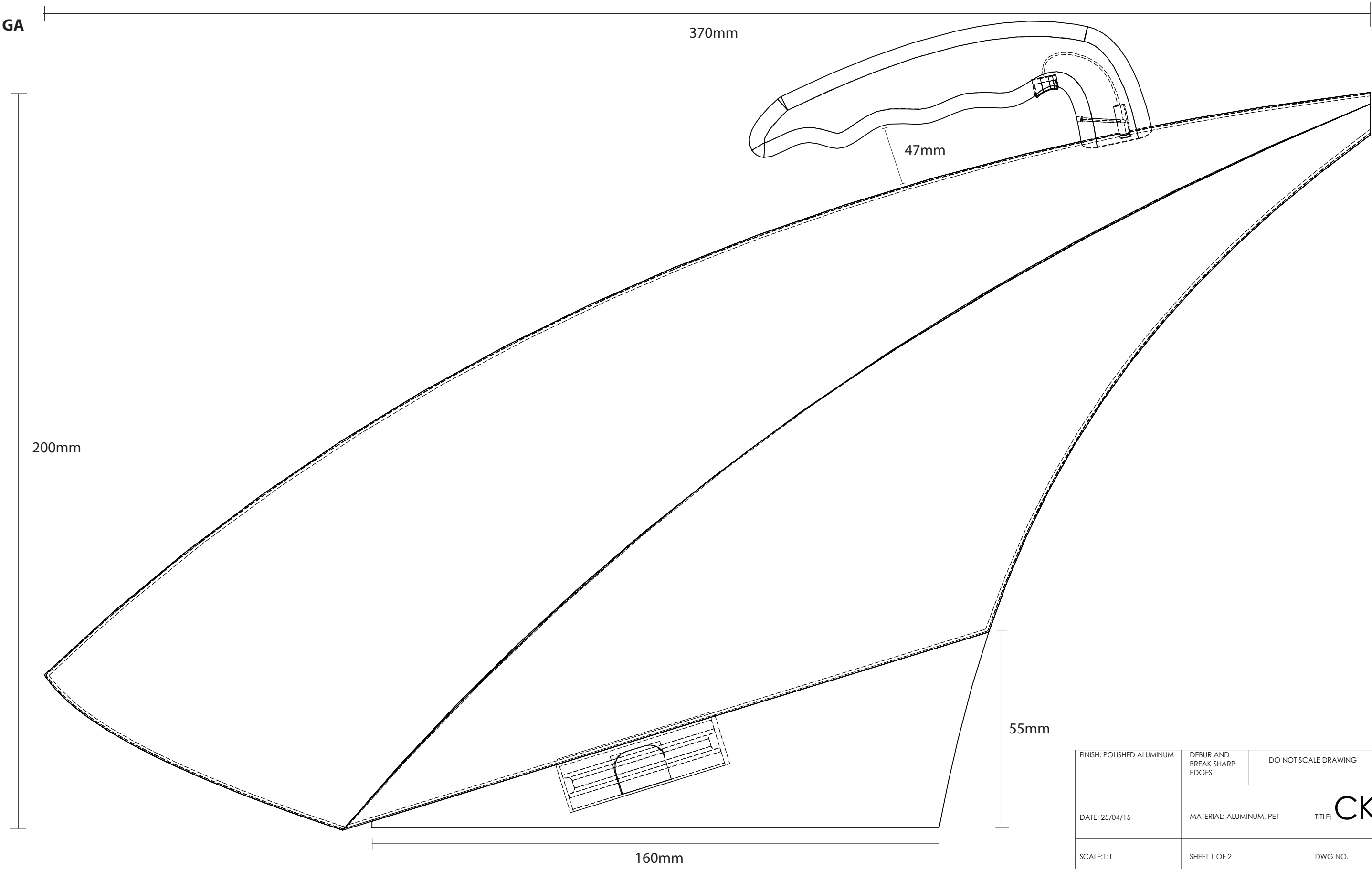
Possible material specifications:  
  
Polished Aluminum, Stainless Steel  
(An LCA will be performed in order to attain the most sustainable material without compromising the products aesthetics.)

Alteration to the spout to enhance the roosters beak and aiding the aesthetic flow of the products main body

The line drawing below shows a concept for the new spout.

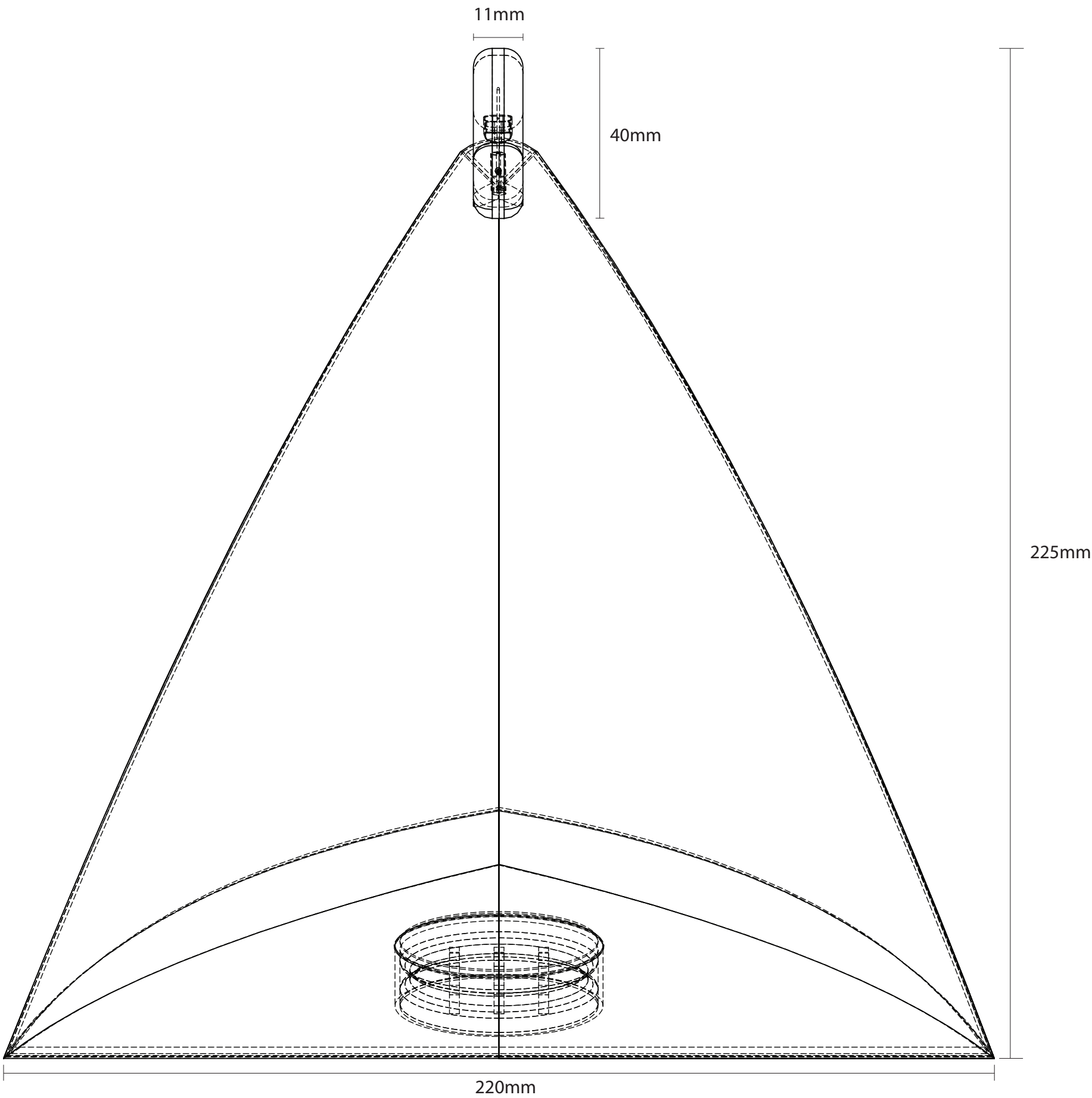






FINISH: POLISHED ALUMINUM	DEBUR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION: 1
DATE: 25/04/15	MATERIAL: ALUMINUM, PET	TITLE: CK15	
SCALE:1:1	SHEET 1 OF 2	DWG NO.	1 A3

GA



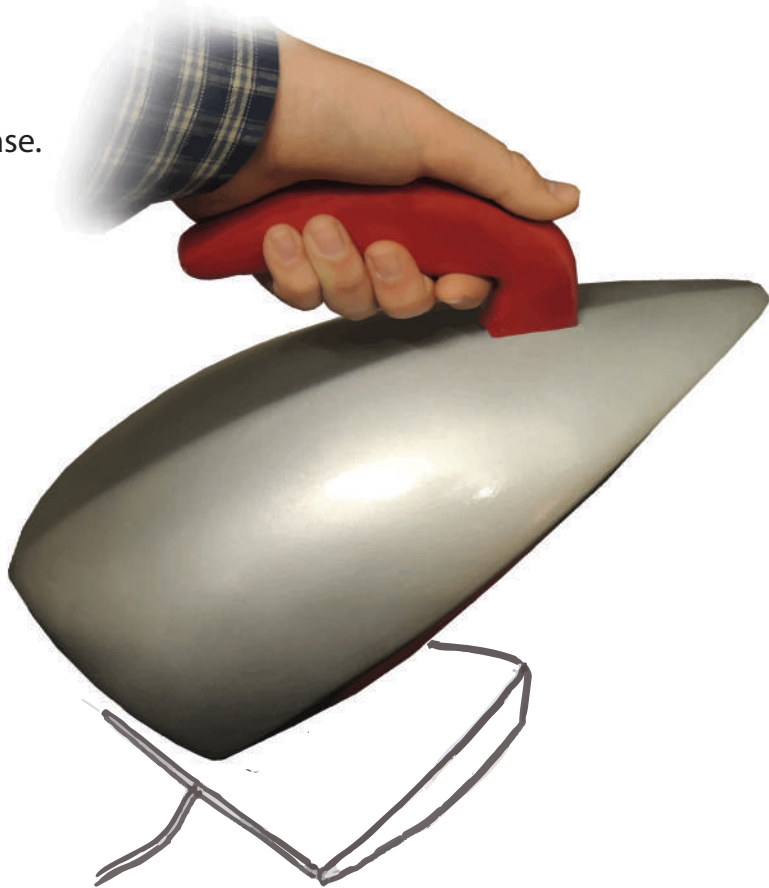
FINISH: POLISHED ALUMINUM	DEBUR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING	REVISION: 1
DATE: 25/04/15	MATERIAL: ALUMINUM, PET	TITLE: CK15	
SCALE:1:1	SHEET 2 OF 2	DWG NO.	2 A3

User Experiance Storyboard

1) Fill up.



2) Place on base.



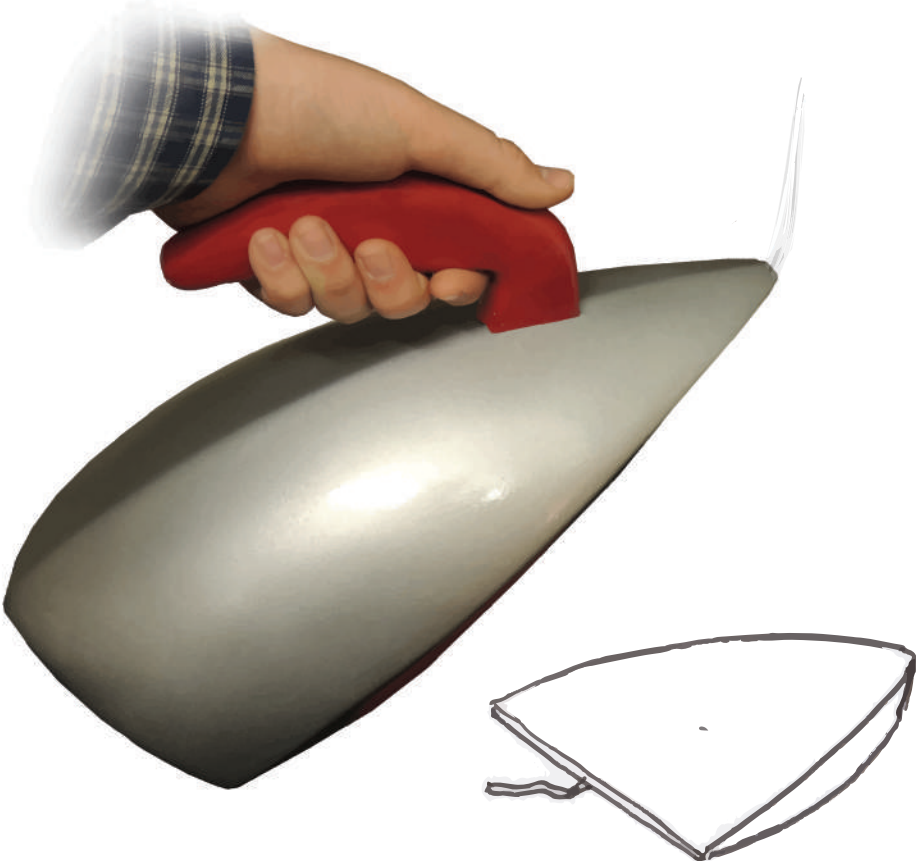
3)



4) Press button to turn on.



5) Remove kettle from base.

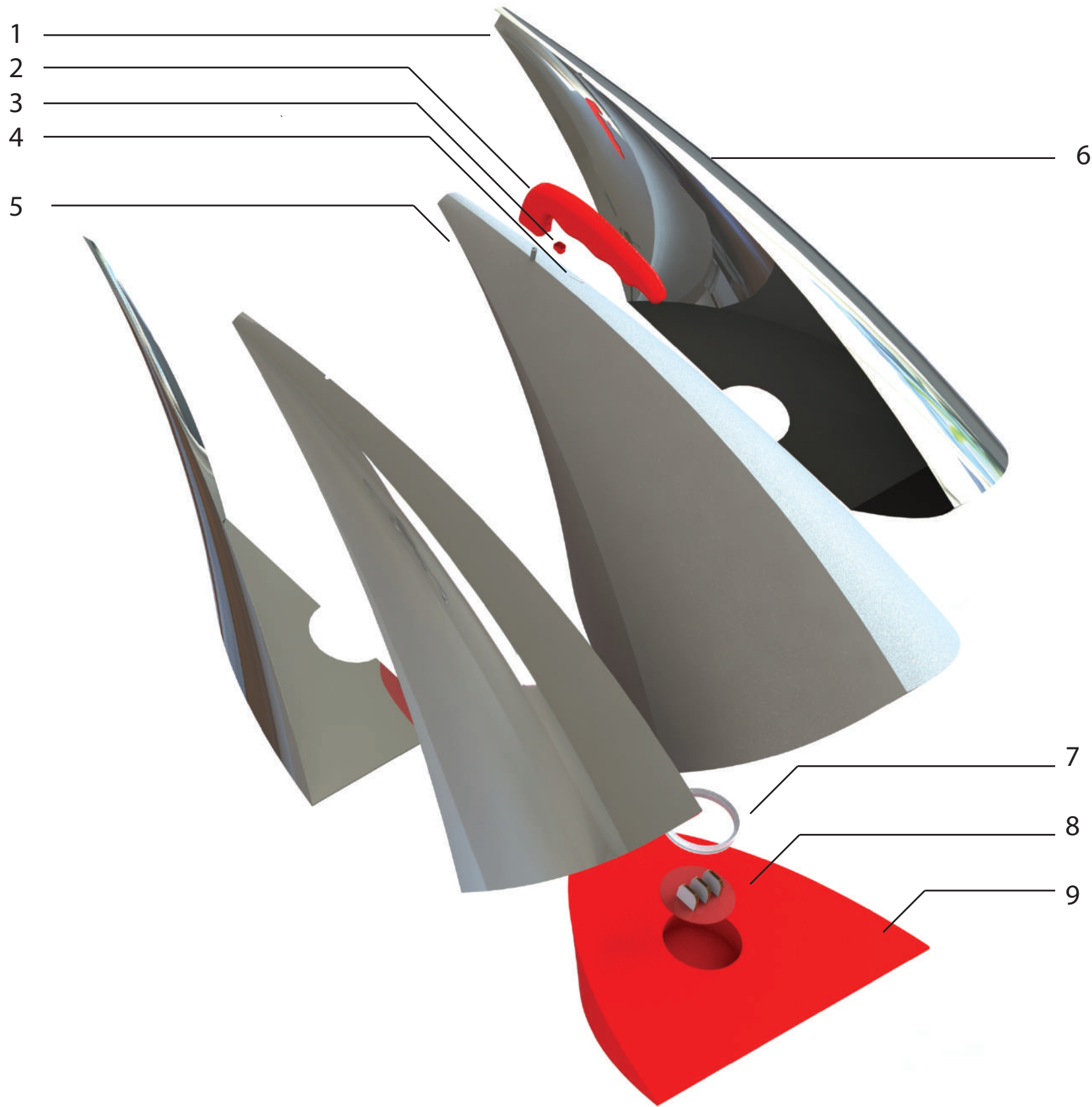


6) Pour the boiling water.





Exploded View and BOM



Item	Description	Material	Quantity
1	Outer Casing (bottom)	Aluminum	2
2	Handle	PP	1
3	Button/Switch	PP	1
4	Screw	Low Grade Steel	1
5	Inner Body	PP	1
6	Outer Casing (top)	Aluminum	2
7	Fixing Ring	Silicone	1
8	Electrical Connection	Copper	1
9	Base	PP	1



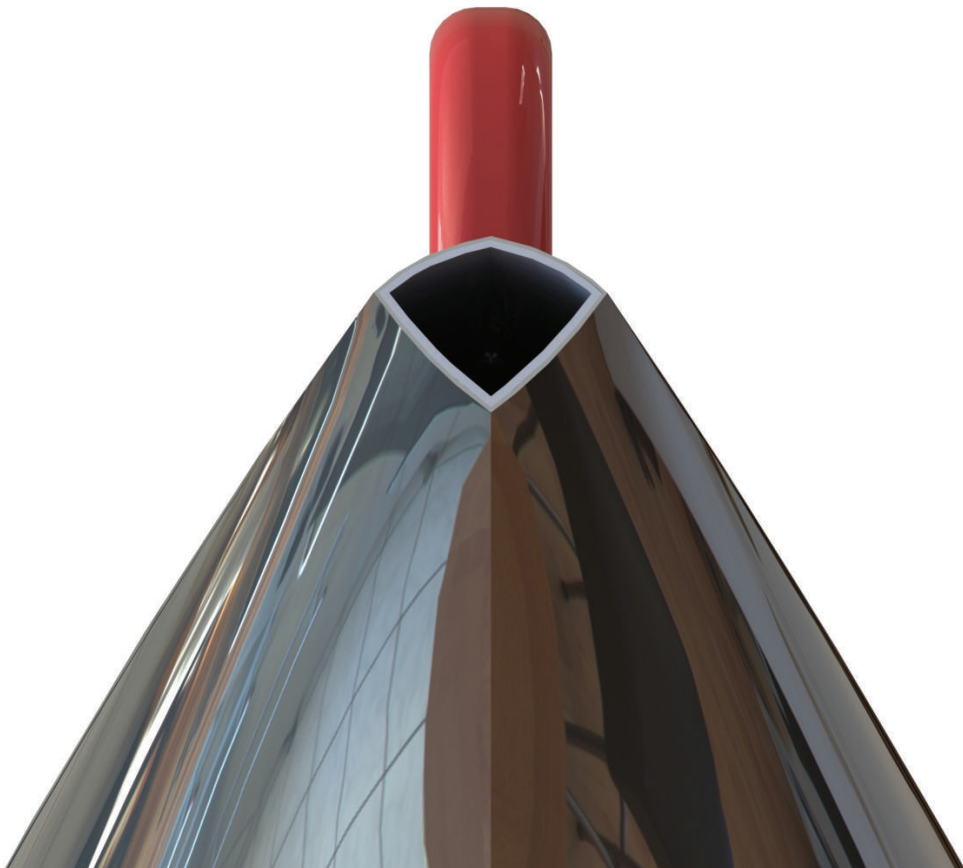




Further Developments



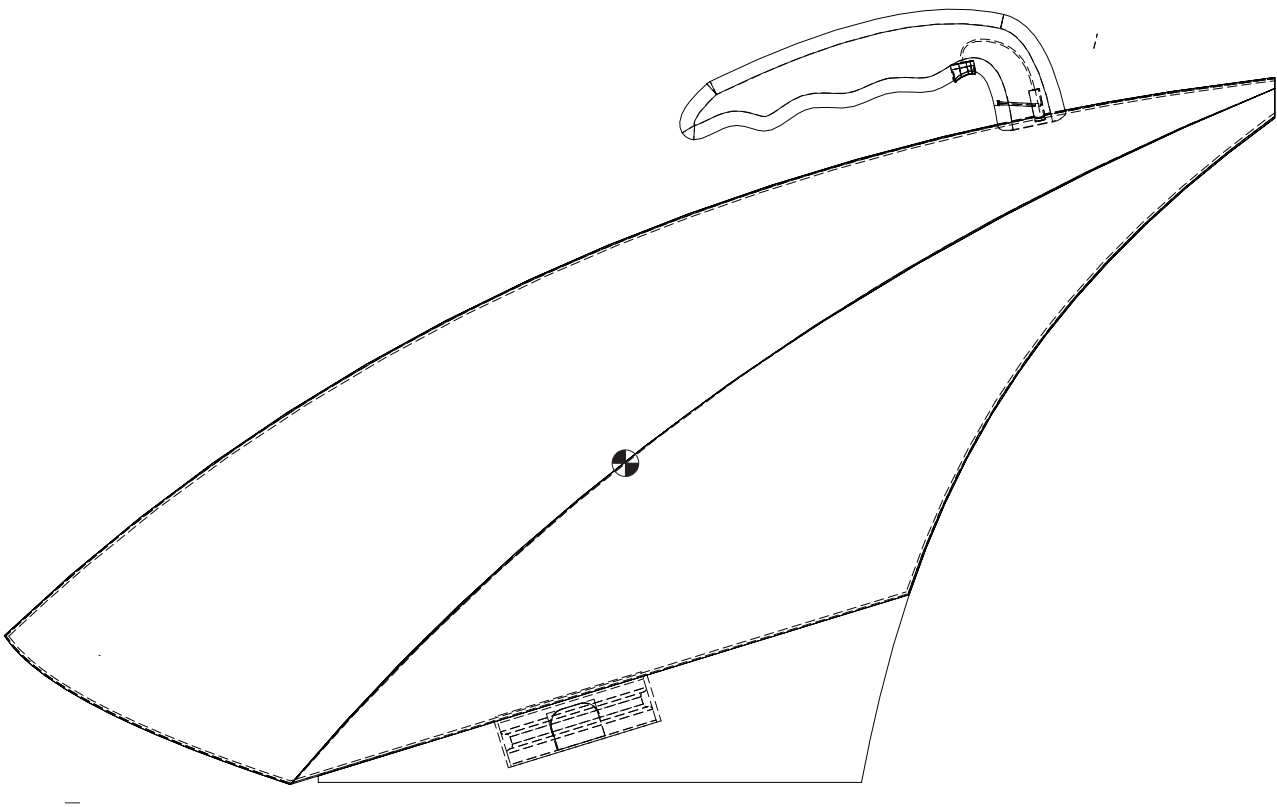
The addition of a new material for the on/off switch in the form of a soft touch plastic will provide a better haptic feedback response to the user.



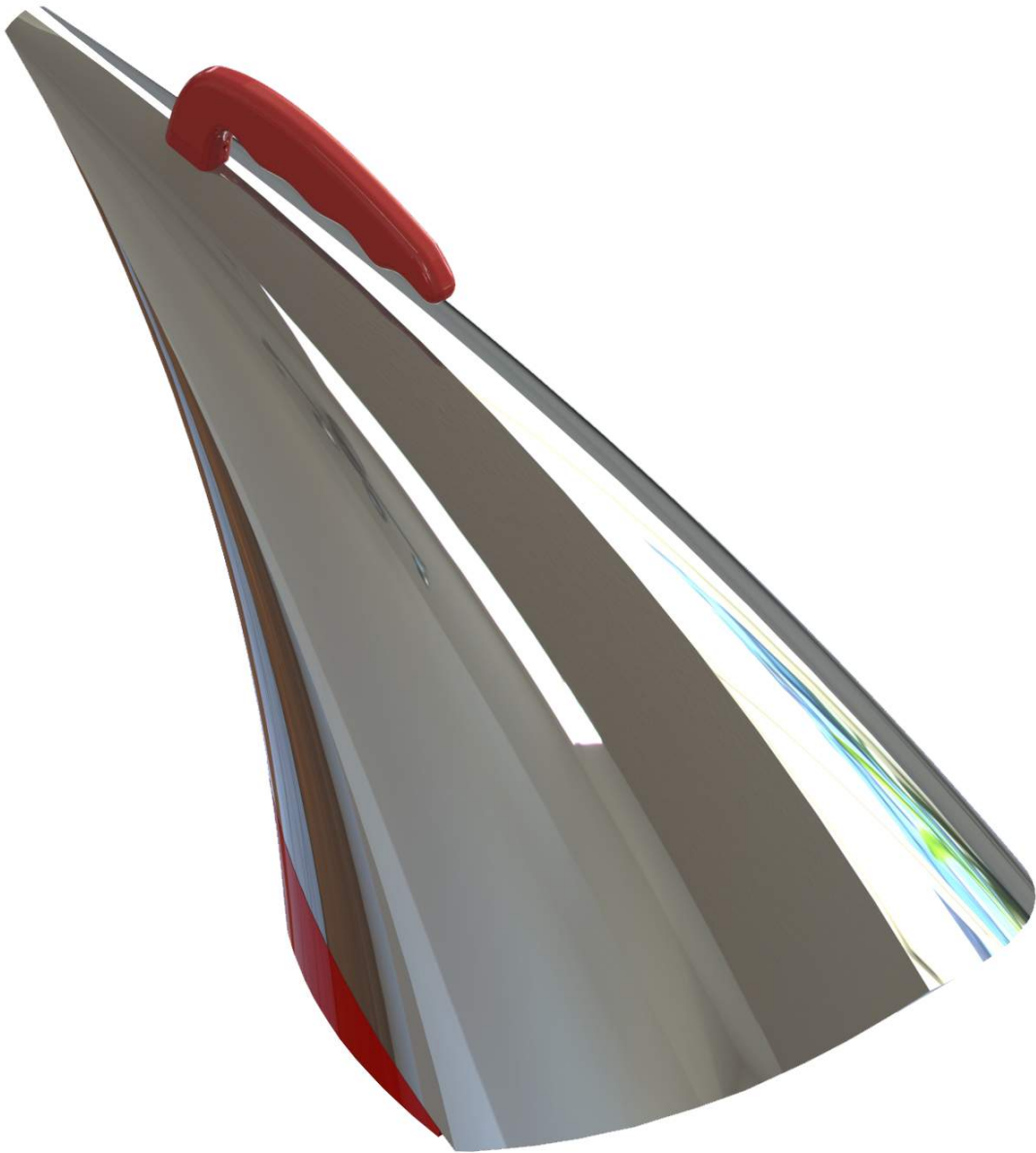
An expansion in the size of the spout was necessary in order to allow easier water input and output.



Transition between concept to reality.



The centre of gravity is a very important issue. In regards to the solidworks model it is about right. However the physical model has a centre of gravity closer to the spout. The centre of gravity in the diagram presented above is perfect.








Electrical appliances > Electrical appliances


# CK15

ELECTRIC KETTLE

design William Woodford

The design of this unique kettle in which design and form have been combined to produce an outstanding product.

 BUY

 WHERE TO BUY

CK15  
£103.95

Electric kettle in polished aluminum.  
Inside, base and handle PP, red and grey. English Plug.

ITEM CODE: CK15  
COLOUR: POLISHED SILVER  
HEIGHT(MM): 225 MM  
LENGTH(MM): 370 MM  
WIDTH(MM): 220 MM  
CAPACITY: 1.5 LITRES

QUANTITY 

1

ADD TO CART

ADD TO WISHLIST

