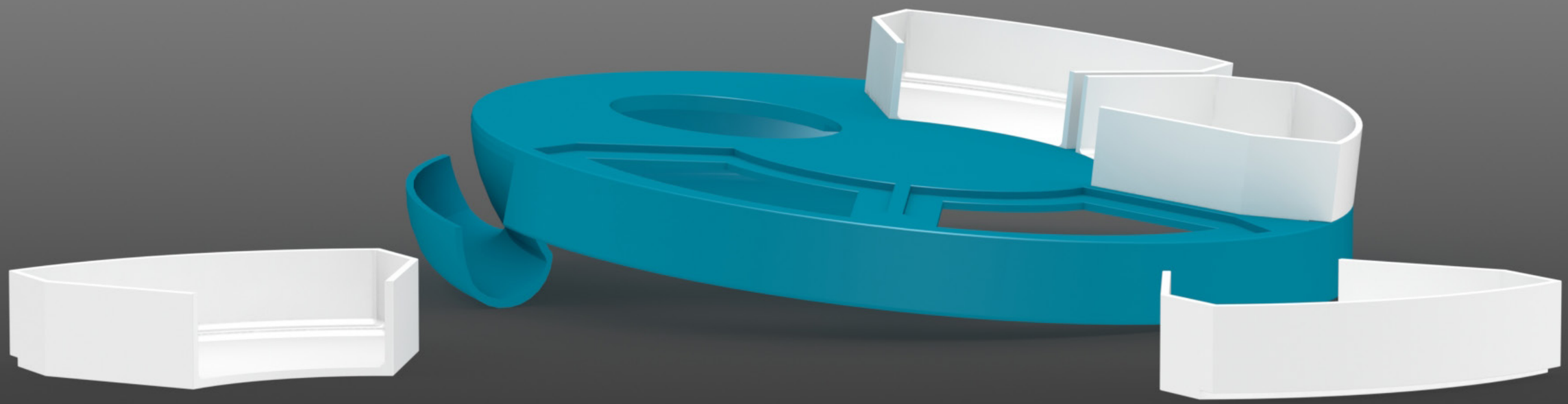
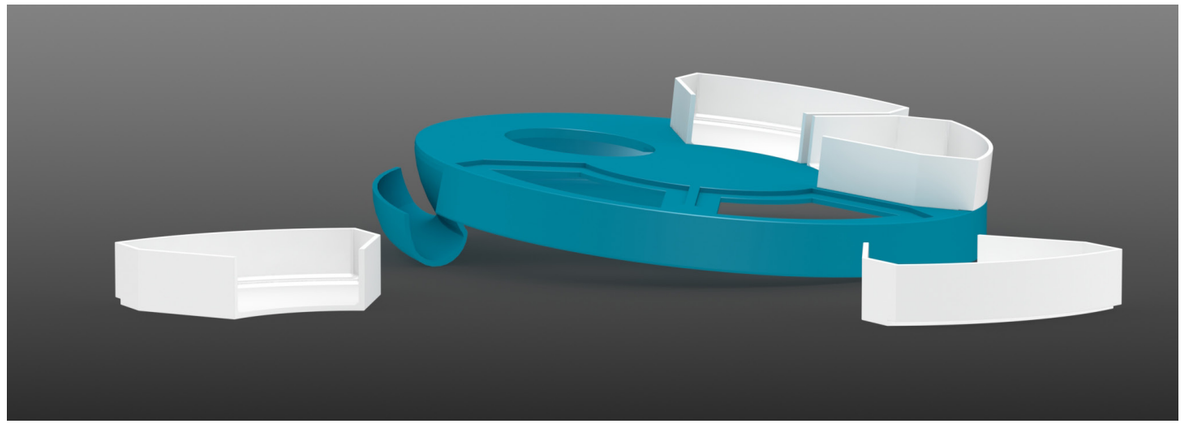
Social Colours

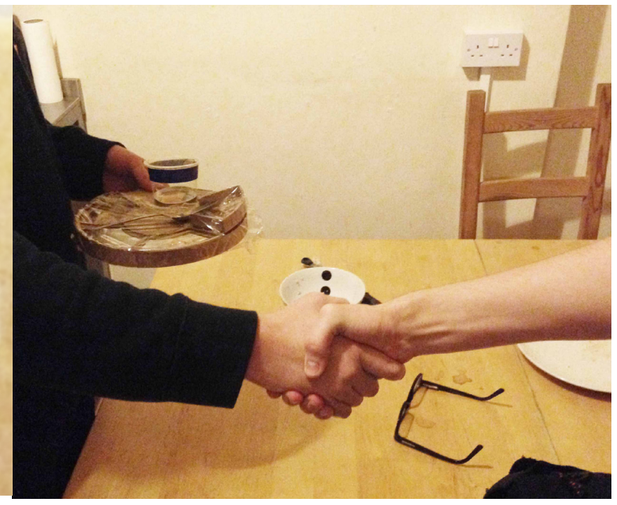


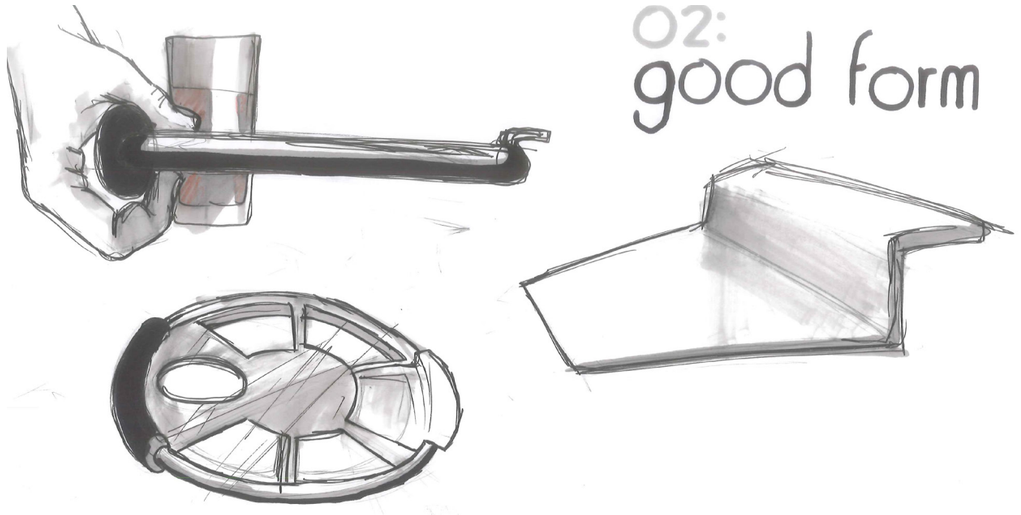
DUNCAN PATTULLO & TOM LEVER

Tom Lever Movable Feast PDE 3

Handover & Initial Thinking





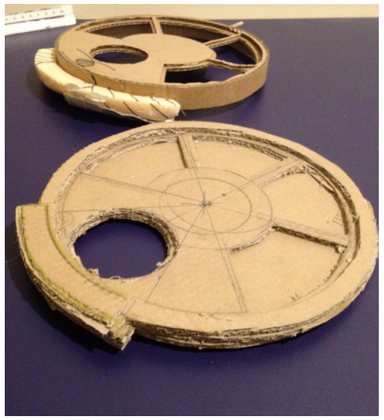


HANDOVER

The handover between Duncan and I went smoothly, and was on time. I received a rendering, storyboard, GA Drawing and some manufacturing details, along with the physical prototype.

The prototype was of good quality, and in the first week I analysed and tested the product, and came up with some initial ideas of where is should take the project. These drawings assessed the look, feel and practicalities of the handed over project.

We had a handover seminar, where we were asked to critically review the projects. These were useful to get ideas from others, but it was weird at first to receive criticism for an idea that wasn't yours.



NEXT STEPS

My next steps were to do some research on the application of the product. This was in the form of desk research. I found out some very useful things, but it's main purpose was to open my eyes to the wider application of the product.

I began to think that the product was very limited in it's affordances, and from here-on it became my ambition to widen the scope of the product to accept more different typed of serving situations.

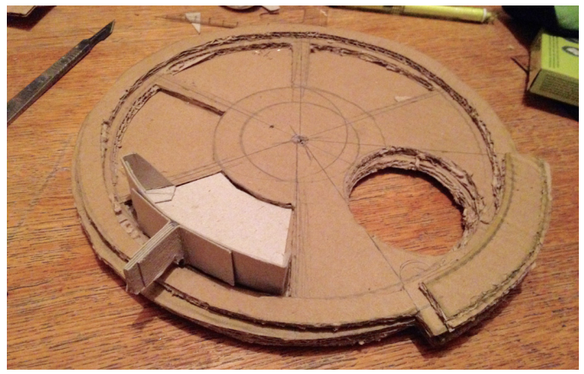
I made a physical prototype out of contours of cardboard sheet, which allowed me to quickly adapt the given design and test other ideas. This came in the form of removing more and more of the extra features until i had a product which could do everything with less.

The main draw from this initial thinking and research was a move away from the 'frame with holes' approach, and more to a device which could function both as a plate and as a pod holder.

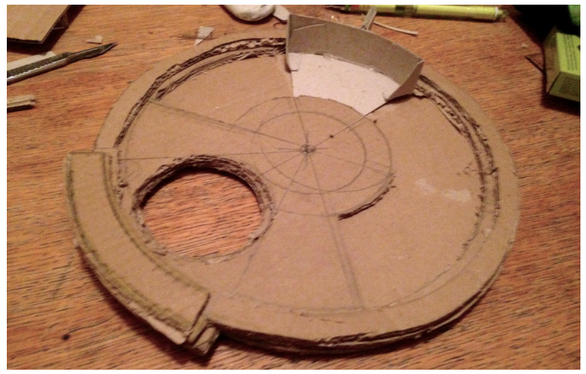
Prototyping

PROTOTYPE ONE

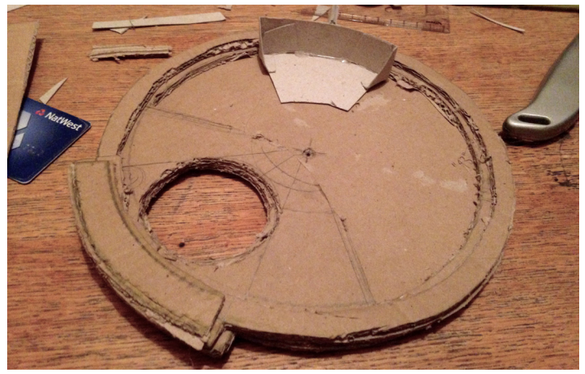
Layered cardboard



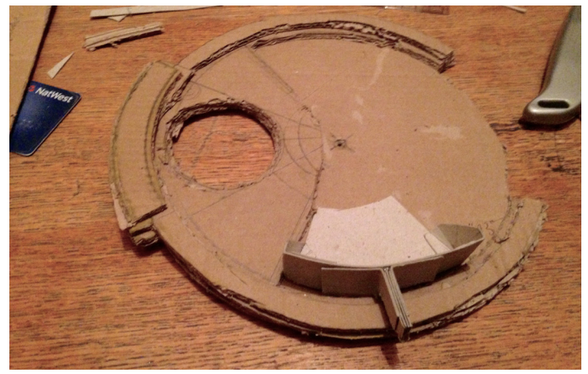
Iteration one was essentially a recreation of the first prototype. However, I have already included a solid base at this point, to allow the possibility of sloppy foods to be served directly onto the plate, in segments



Iteration two was an attempt to mix up the design further by removing the partitions. This allows for different sized pods, if specified, and means the pods can slide round the central circle in the groove.



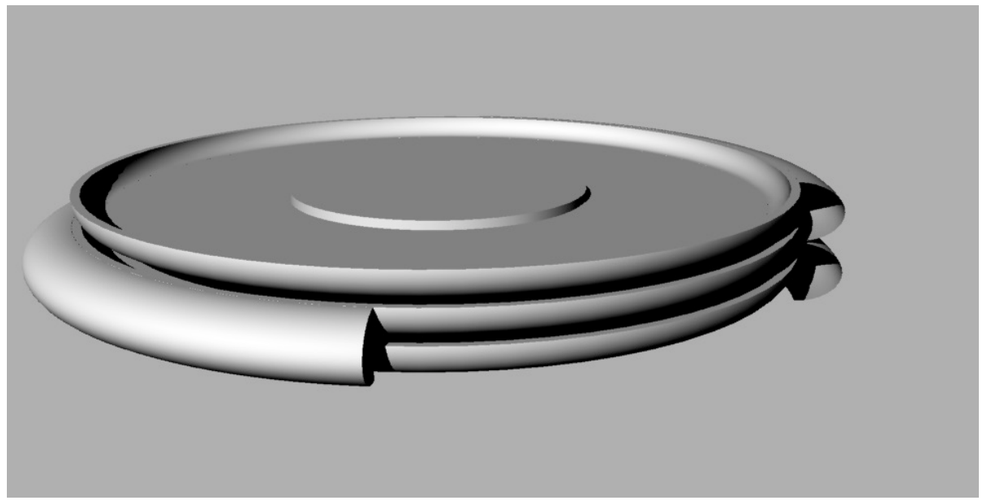
Iteration three removed the central circle altogether, in order to separate the food and the drink completely, and avoid dirtying the cup, This works in principle, but results in unsatisfactory pod placement, as there is no groove. A final design should probably have a three tier design which allows for separation and a groove.

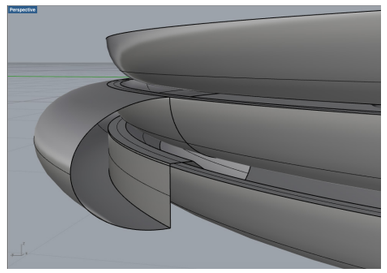


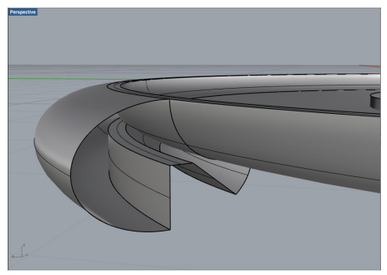
Iteration four cut away at the opposite side in an attempt at allowing stack-ability, which was not incorporated into the initial handover. This is a step too far, as sloppy food would fall out and it would be a challenge to locate pods.

DIGITAL PROTOTYPE

Rhinoceros 3D for mac, sketch model







I had visualised another potential solution on paper, which was extremely difficult to picture. I turned to Rhino 3D to generate a sketch model which would help to quickly validate the idea.

This proposal cuts a ridge through the bottom of the handle in order to accept the rim of the plate below.

Rhino is effective at creating quick mock-ups, and can also render them in a reasonable way. It's lack of accuracy and reliance on specification means it's is suited to sketch models and visualizations, but not so much for detailed CAD work.

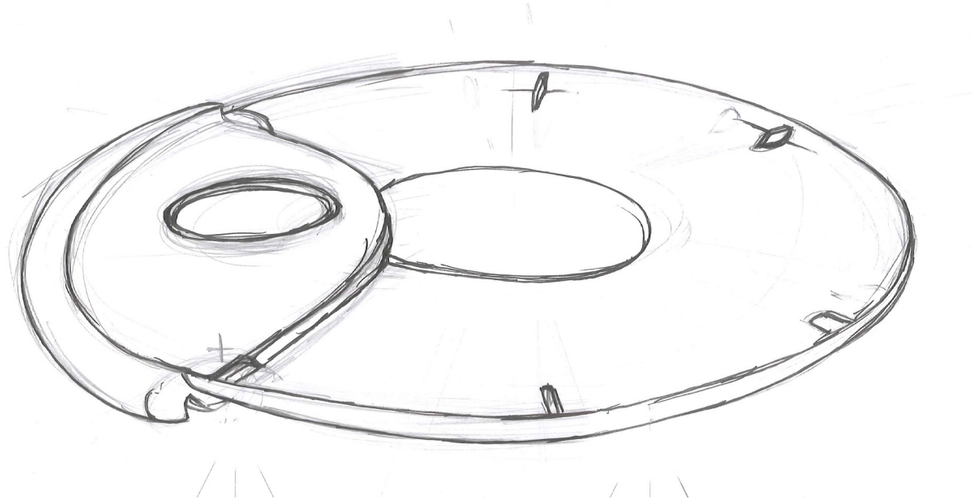
The work confirmed that the ridged handle was a valid idea, but how it would be physically implemented was still a mystery.

Comments

Physical prototyping is a great way of developing ideas. It was very helpful to be able to bang together a physical prototype early on so I can reference the idea and continue to use it to visualise ideas.

The main take-aways from the initial prototyping were the various ways of making the device stackable, and new ideas about the integration of pods.

Final Prototyping



PLAN

The product plan was outlined on paper before I proceeded with the making of the prototype. I intended to go with the ridged handle, three level surface to separate pods, plate and cup, and a general bowl, into which sloppy food can be served directly into, if the specific event does not call for the use of pods.

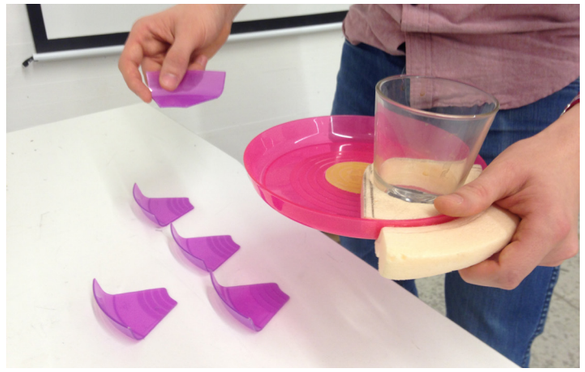
PRODUCTION

The final prototype was mainly based on a set of PP plates which were bought from IKEA. I chose these as they reflected the vibrancy and glossiness of my intended final product.

It was great to be back in the workshop and making tangible prototypes again, as the first stages of this project didn't permit much work with hard materials.

The process was great as it gave me a real understanding of the material properties, including the flex of the plastic, the feel of the material, and the ergonomics of the overall product.

It was limited in the sense that the proposed injection moulding was impossible to test for a one off, and therefore I did not gain much of an insight into how the product would really be produced. This would require a less material approach.



OUTCOME

The final prototype was a good statement of my intention. As it used off the shelf parts in the plate and the glass, the final shapes and sizes were not what I intended for the final product, but details such as radii and angles were carried over to the final model.

From top to bottom:

Image showing pods in use, as part of the plate - I went for a very minimal pod, as the gripping and placing of the pods was not as much of an issue as I initially thought.

Image showing layout of buffet - The plates lined up showing potential for buffet use.

Image showing stack-ability of plates - I decided to make a second plate in order to physically test and show the stacking application of the plates, they lie very securely.

FINAL CHANGES

I learnt a lot from the production of the plate and the subsequent seminar. I was in two minds about including some kind of slider to adjust the colour of the device, but everyone responded positively to the colours of the prototype.

I decided to keep the reduced form plate, but in order to accommodate sloppier foods, it is essential for the pods to at least have a slight ridge to keep in fluids.

I also decided to remove the ridges which existed on the initial plan. The sliding plates can accommodate various sizes of food, and produce less of an obstruction to served foods.

Design for Manufacture

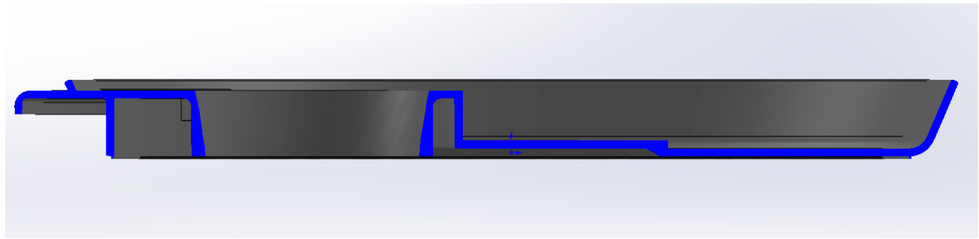
INJECTION MOULDING

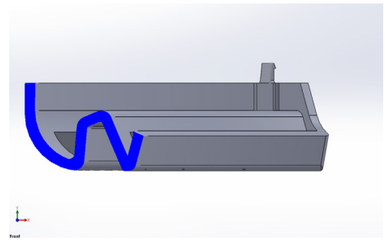
Injection moulding is the chosen manufacturing process. It is suitable for a wide variety of parts, and can deliver good surface finish.

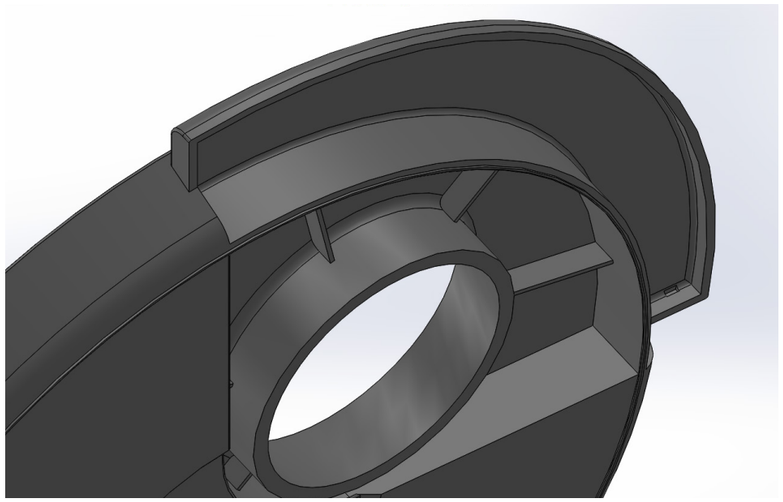
I researched some key points about the design and with injection moulding manufacture of parts.

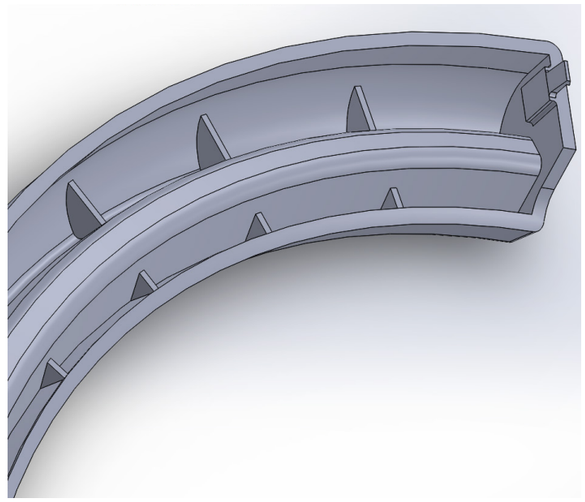
One major point of decision was how to have a solid handle. The handed over design had a thin walled handle, but I thought that would be visually and ergonomically wrong. In order to be suitable for moulding and also have the right geometry, i took the decision to separate the design into two parts.

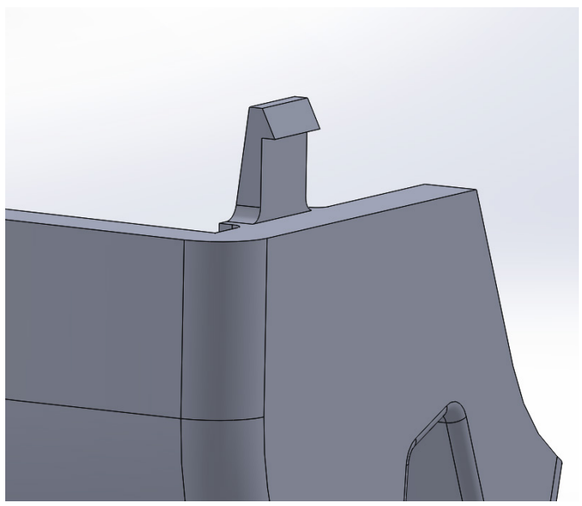
The decision was then how to assemble the two parts. Ultrasonic welding and gluing were some considerations, but in the end I went for a manually assembled snap fit.

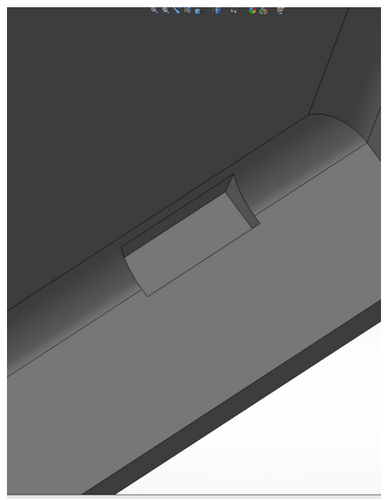


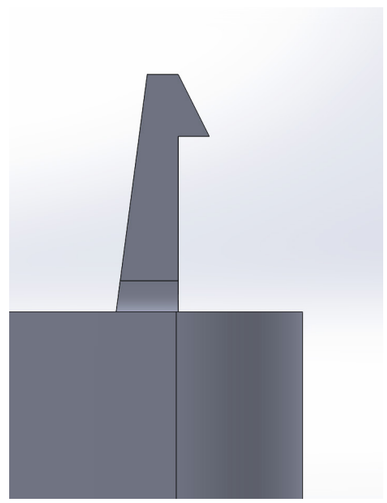












Sources

Bayer - Snap fit joints for plastics
http://fab.cba.mit.edu/classes/S62.12/people/vernelle.noel/Plastic_Snap_fit_design.pdf

GE Plastics -Injection moulding design
http://plasticwright.com/files/8314/0476/4159/GE_plastic_design.pdf

Consistent Wall thickness
An inconsistent wall thickness causes inconsistent filling of the mould and cooling.

I have kept the wall thickness at around 2mm throughout the both parts, and attempted smooth transitions.

Draft Angles
Draft angles are slight geometric slants introduced to vertical parts, to ease the parts removal from the mould.

Draft angles have not been introduced on the CAD model, but guidelines say for injection moulding these should be st least 1degree. I have introduced natural tapering into the product where possible, such as at the rim, and inside the handle.

Ribbing
Ribbing helps to strengthen the parts in day to day use, while retaining the consistent wall thickness. It does this by adding to the second moment of area for any cross section.

It also helps to alleviate post mould warpage, by keeping thin vertical walls upright, as they tend to want to sag inward towards the voids.

Guidelines state that ribbing should be 50 - 60 % of the thickness, and the height should be around 3 times the wall thickness. this enables smooth consistent filling of ribs.

Snap Fits
The prior decision to use a snap fit prompted some more research on the technicalities of snap fits. Polypropylene is naturally good for snap fits, as it is comparatively flexible.

My research showed me that the ideal kind of proportions for a snap fit: a lower attachment radius of at least 0.6in and a width that tapers by half over the full length

Social Colours

WHO?

SELLING DIRECT TO CATERING COMPANIES

TARGETED AT BUSINESS PEOPLE

WHAT?

PLATE, GLASS AND PODS

POLYPROPYLENE PLATE TAKES 5 PP PODS

INJECTION MOULDED 2 PARTS

WHERE?

TAKEN WITH CATERING COMPANIES TO VARIOUS EVENTS

WHEN?

CORPORATE AND NETWORKING EVENTS.

DURING BUFFET DINNERS

HOW?

SELECT DRINKS

PICK UP PLATE

COLLECT PRE FILLED BUFFET PODS

Critical Review

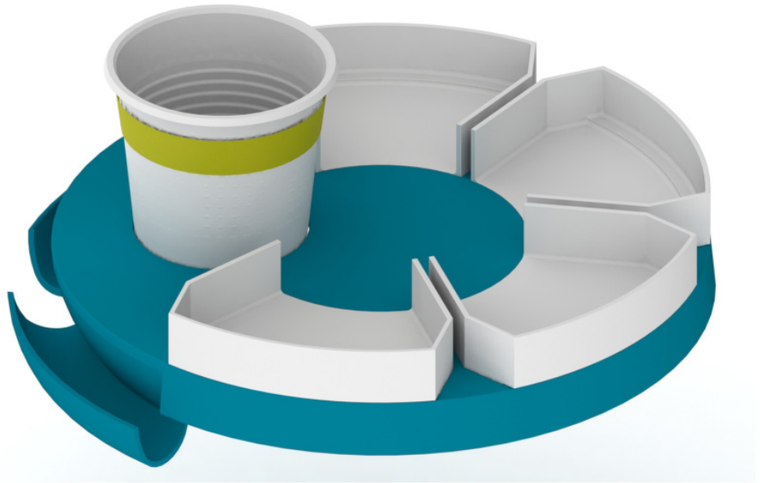
SOCIAL COLOURS

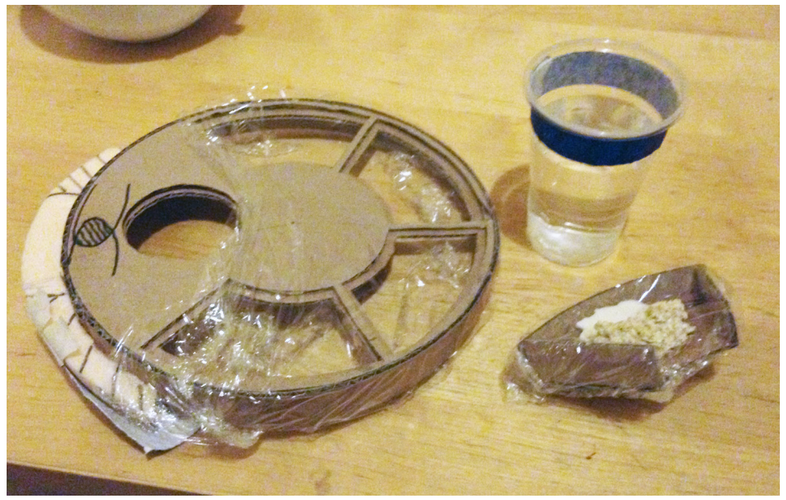
Social colours is a plate-based networking system, featuring the plate, a special cup, and pods, which can be combined to deliver the meal.

The assumed problem is that people in conferencing events often lack tables, and this product provides them with a way of eating and drinking, while keeping a hand free in order to exchange details, and shake hands etc.

The system also has a secondary benefit in that seems to allow it's users to associate colors to areas of interest, which may be of benefit to people at conference events.

From the documentation I have received, it seems clear that a great amount of research has been done into ergonomics, product form, and materials and processing. So for this next stage of the project I have a good foundation to continue from.





REACTION

Eugh, those colors are atrocious

I also wonder if coloring the whole product is a bit garish

I don't think i'd want to eat of a brightly coloured surface, that's why plates are generally white

I wonder why the cup's ridged like that?

Are we designing the fork as well?

there is a weird mix of soft curves and sharp angles, not sure what aesthetic we're going for

Yeah i definitely think the colors need to seem more businessy or something.

That cup looks cheap, are we injection moulding that?

Those angled pod corners are for ergonomics, but what is the ideal pinch size? They seem still too broad

What if i want a big thing? is there more slotted plates? or servings which fit over two holes?

Do i want to drink all drinks out of that cheap looking cup?

That handle doesn't look inviting.

There are a lot of free gaps and edges, will food get stuck in them? how will i dislodge it with one hand?

Also won't (wet) food smear over the edges of the cup?

Maybe having one big handle and no other surfaces is over constraining the user.

How will we teach the users how and what the etiquette is ? can we make the product self-explanatory?

I'd like it to lie flat and/or be a stackable unit.

REVIEW

Manufacture
The manufacturing situation with this product has been well looked into. The product as it stands is well defined in terms of it's construction, with numerous examples of products which had achieved the desired effects.

Material
The material, as defined is polypropylene. It would be good to see a few examples of this material in a variety of finishes in order to assess it's appropriateness.

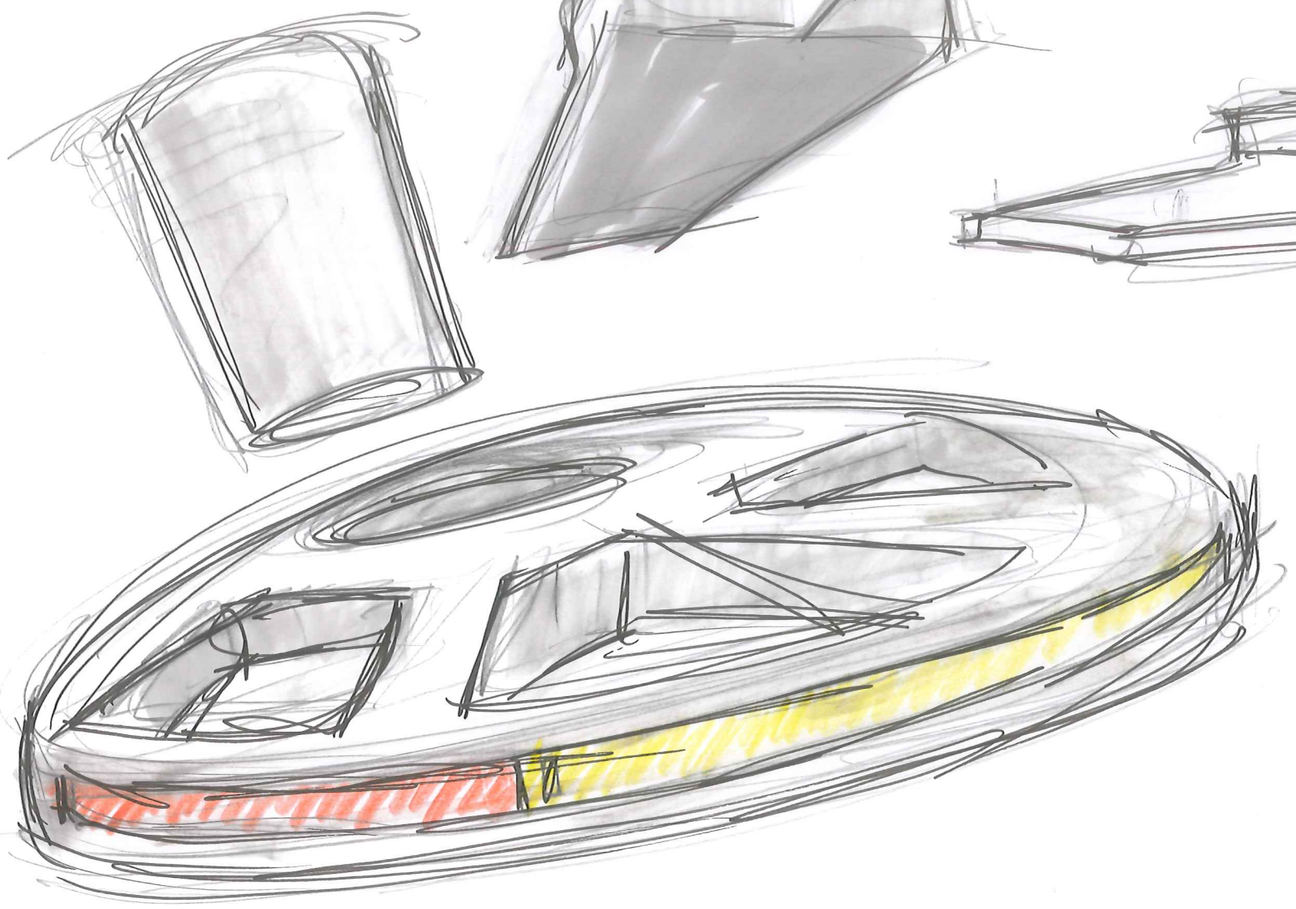
Aesthetics
Visually, I think the product needs work. The first thing that strikes me is the colors. The dark, slightly unsaturated colors don't do it for me, and I don't think it's nice to eat directly off a coloured surface. In terms of form, I think there is a slightly off putting collection of soft shapes, thin profiles and hard edges.

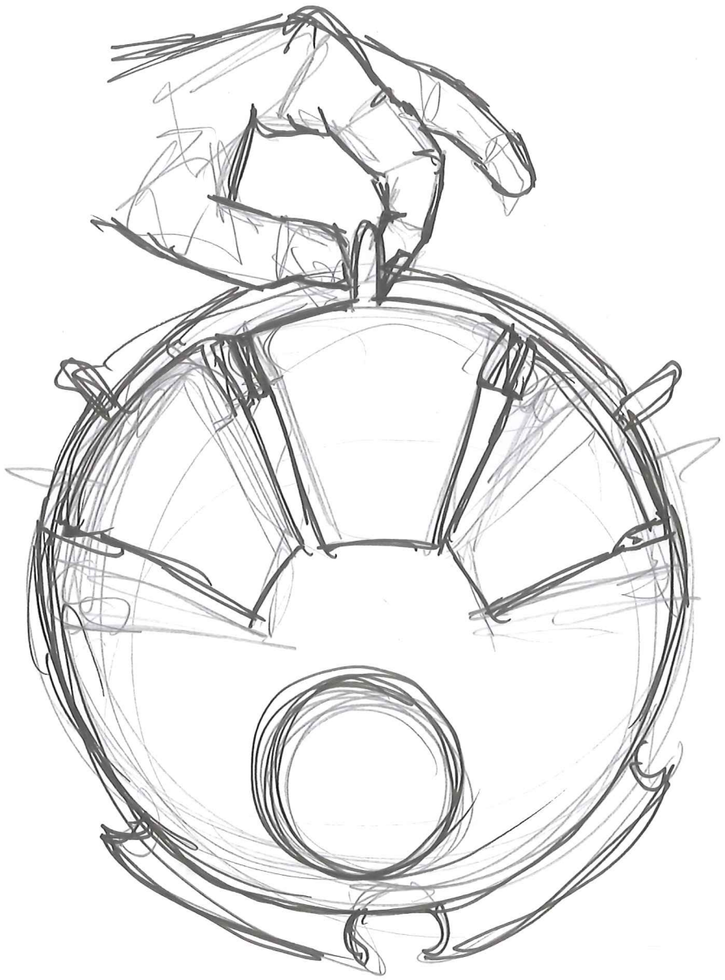
Ergonomics
The Physical prototype, when tested, had very well conceived ergonomics. A lot of thought had obviously been placed on the form of the main handle, which was moulded from foam. The physical pods however, were not easy to manipulate, it is unclear whether the changes in the CAD model will have the best possible effect.

Performance
The cardboard prototype was tested ,with the addition of some cling-film. I thought it performed very well, especially in terms of general comfort. I think the design does need some adjustment however, I think the plate could benefit from some curved slides, like on a bowl, to enable better scooping up of food. And there needs to be a way of covering the holes up if unused, and also potential to protect the cup from mess.

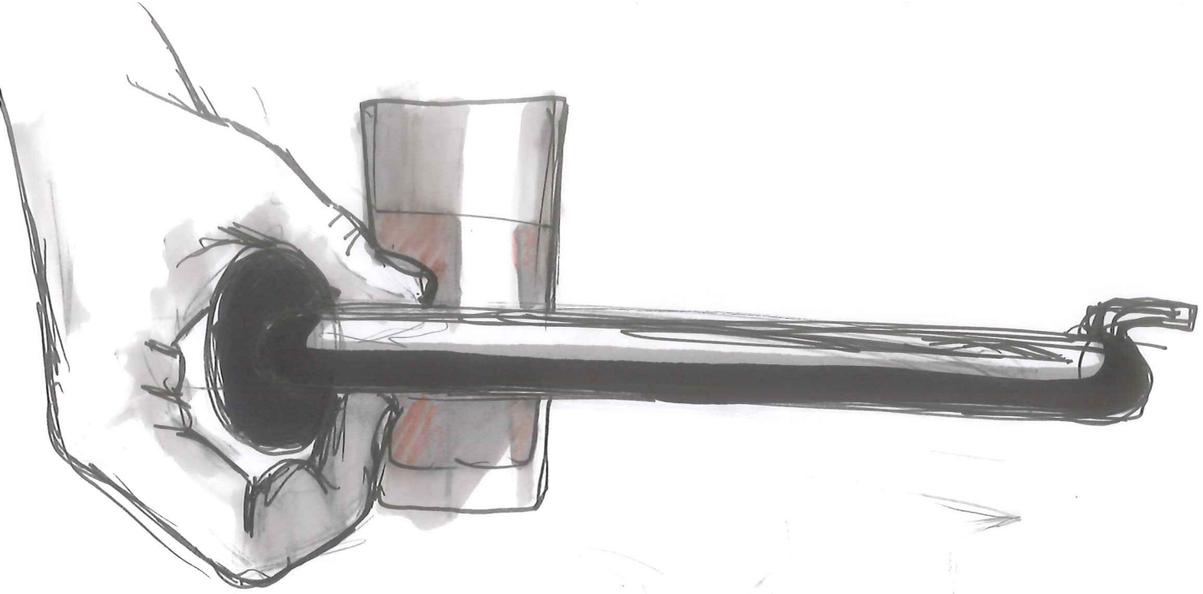
Appropreatness
My gut feeling is that the bright garish colors, and plastic construction may not be the best fit for a business setting. Although i am aware that a lot of practical market research has taken place.

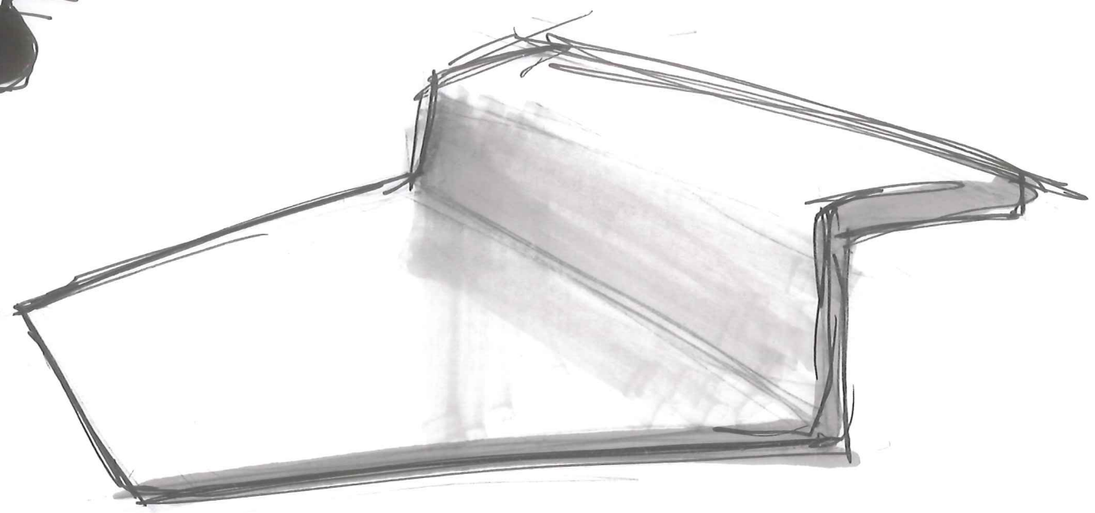
01 : NEW IDEAS

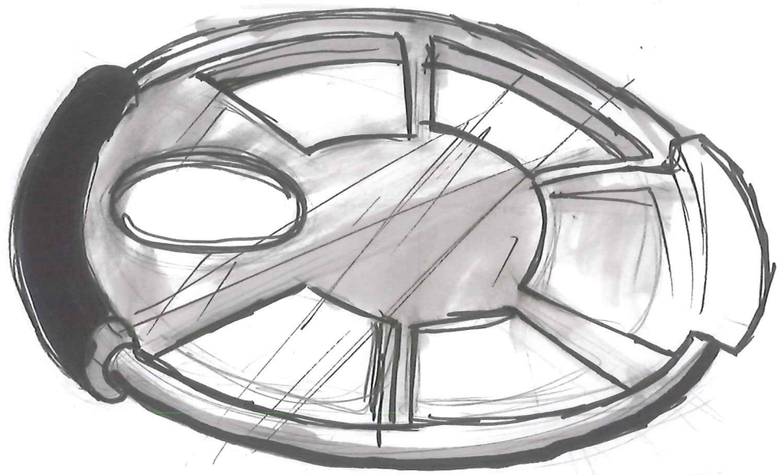




02:
good form





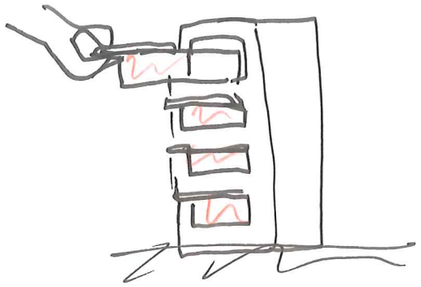


Oz Novelty

ICE CREAM BOAT

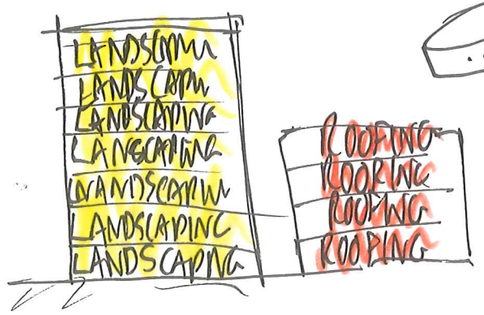
OBVIOUS SIGNAGE

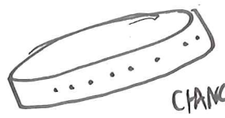
DISPLAY:



TRUFFLE TOWERS

TRUFFLE TRUCKS





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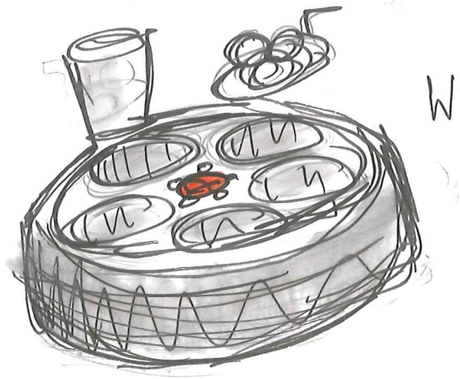
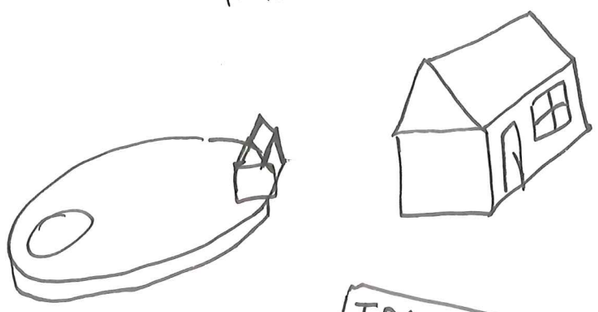


WHEEL GOOD FOOD!

TAKE ME HOME??



Litlle cars

Buffets

Some further research is required before we can embark on the rest of the development stage. Specifically, research into the situation on the catering side. It is assumed that buffets are often in use for corporate events, but I am not sure how the product will fit into the current climate of buffet serving.

The following comes primarily from brakes.com 's comprehensive guide to setting up for parties and events

FOOD TYPES

Finger Food

Finger food consists of small bites, hot or cold, which are suitable to pick up and eat with fingers. This category includes:

Canapes
Mini Pastries
Sandwiches
Meat and Poultry
Sweets

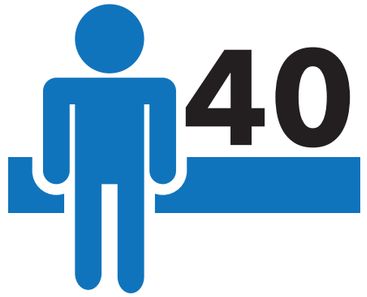
The design as handed over has some capability for finger food, but if the food is to be handed over and eaten by hand, the pods seem extraneous.

Fork Food

Fork food is what the design seems to have been intended for primarily, but as well as sloppy food such as the presented meatballs, there is other things such as roast meats etc. The category also includes more complex pies and quiches, and pastas such as lasagna.

The design as handed over included the basic functionality to deal with these foods, but there must be extended capability for things like roast meats and especially wet food.

PLANNING

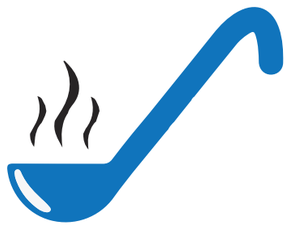


Forty guests per table
It is suggested that the optimum table size for buffet events is 40 guests per table, otherwise, tables can be mirrored, or two identical tables be placed in different areas.

It is important to consider the rhythm and the pace of the buffet, considering the whole idea is about making them more efficient.

Beware of Drips
Wet food can drip onto the floor or other peoples clothes. It is suggested that wet foods should be placed closer to the user.

It is also vital that I consider wet foods in all aspects of the design, making sure they are unlikely to drip when in transit.



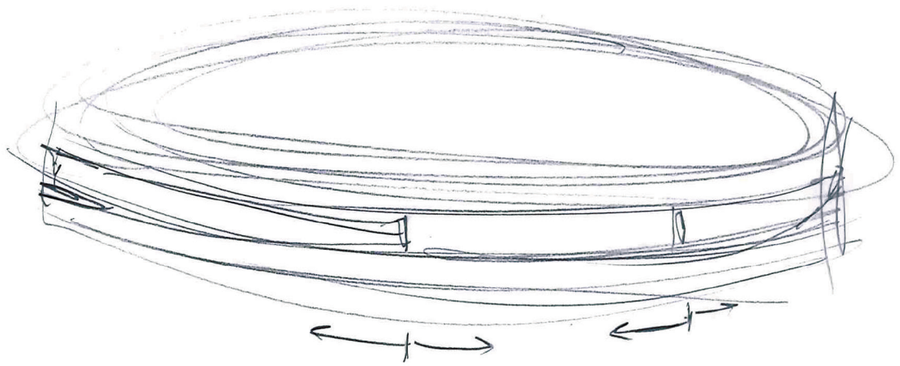
Served or Self Served?
Self serve party food reduces the number of staff requited and is suitable for close knit events. It is suggested that in addition, to a buffet, members of staff could serve out items such as carved roast beef.

This increases the perceived value of the food, but also sneakily allows for cost control over the high value foods. How can the product be adapted to incorporate served food?

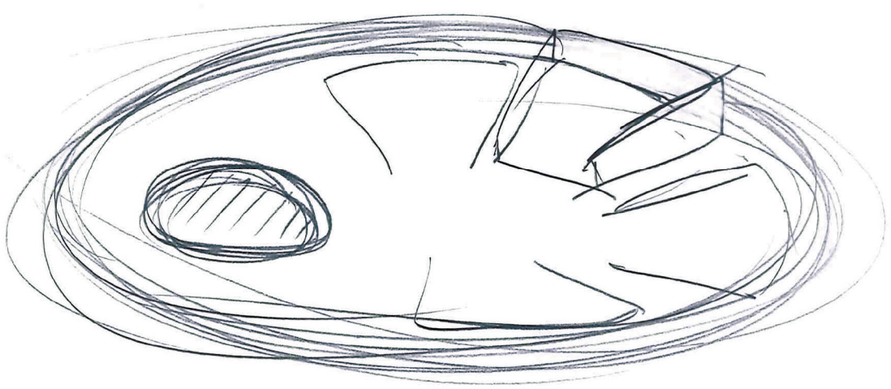
Visual appeal
The look and layout of the buffet is very important to caterers, who strive to have their food presented in the best possible way.

I think that a major opportunity of this concept is in the presentation of food. Consistent rows of pods across the whole table has the potential for wow factor.

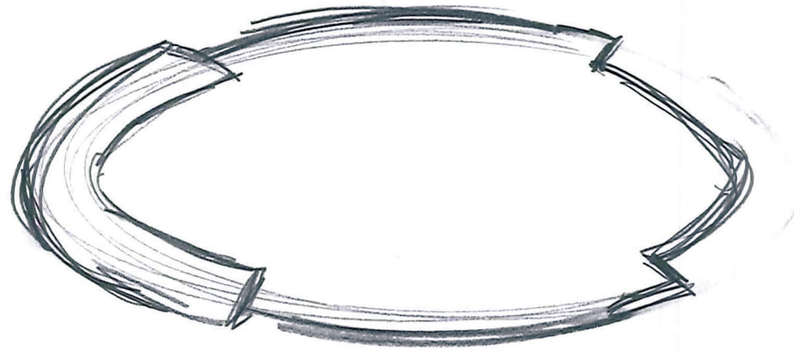
IDEA MUST BE CHANGEABLE - WHAT IF A DIFFERENT NUMBER OF EACH GROUP TURN UP?



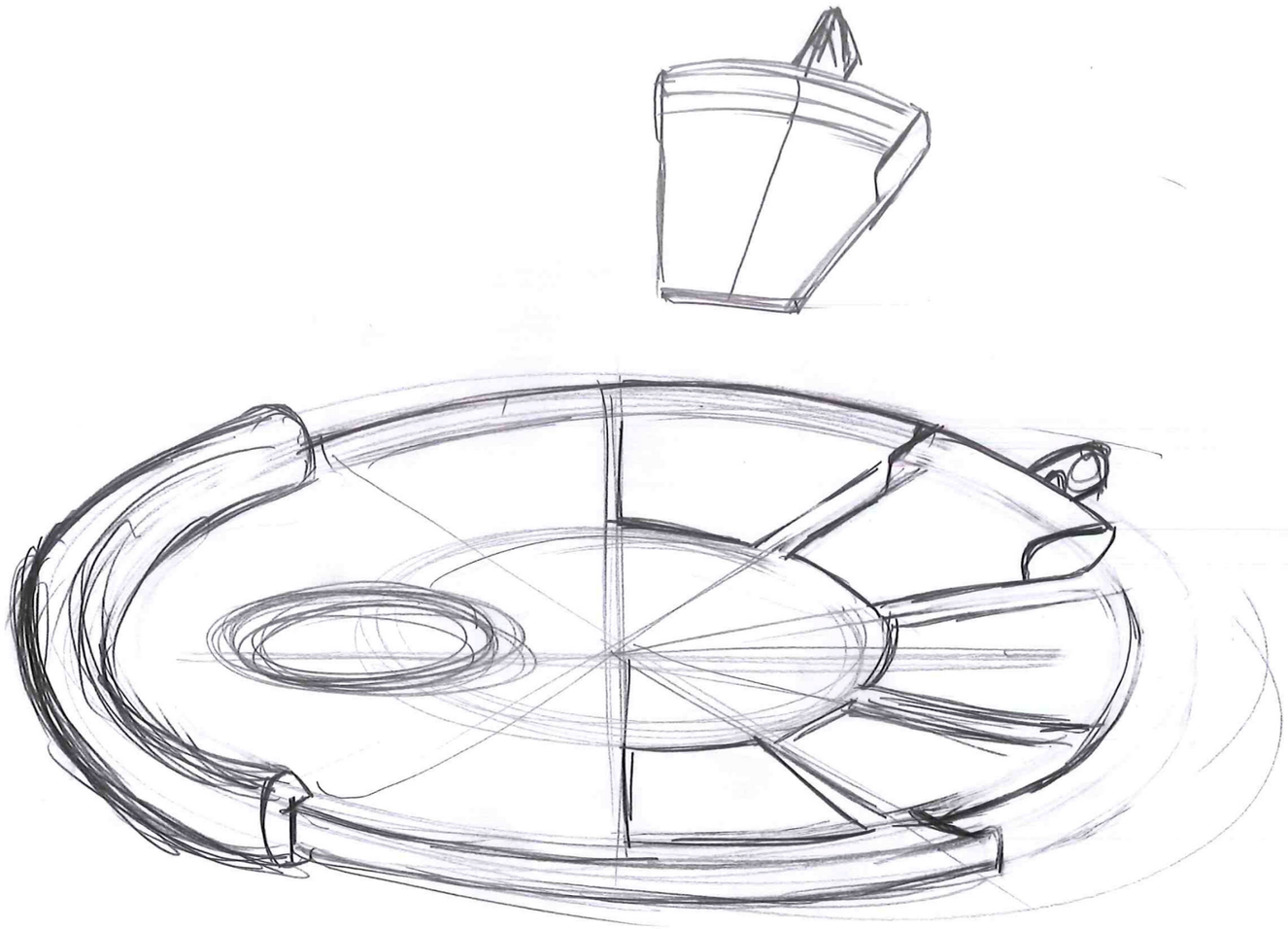
WILL INCORPORATE SOLID-BOTTOMED BAYS- TO ALLOW POSSIBILITY FOR DIRECTLY SERVED FOODS
- IN CASE SOMEONE DOESN'T TAKE 4 PODS.



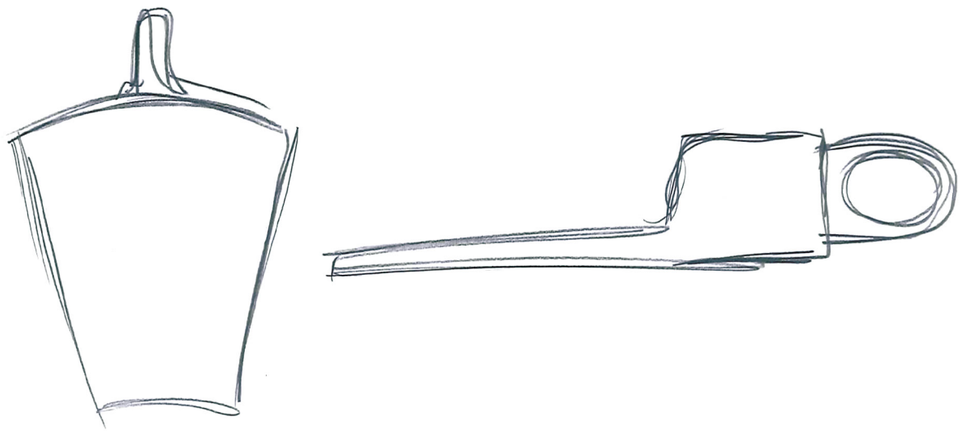
To Aid Stackability, will cut out opposite end.



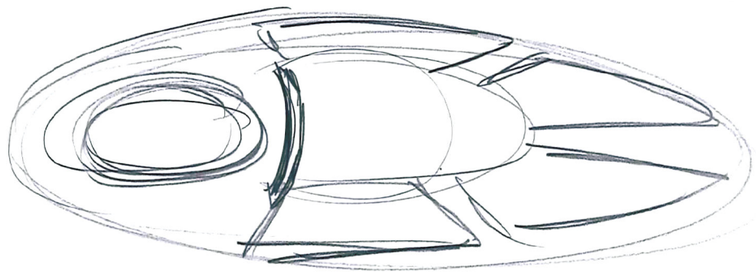
Possible conflict.



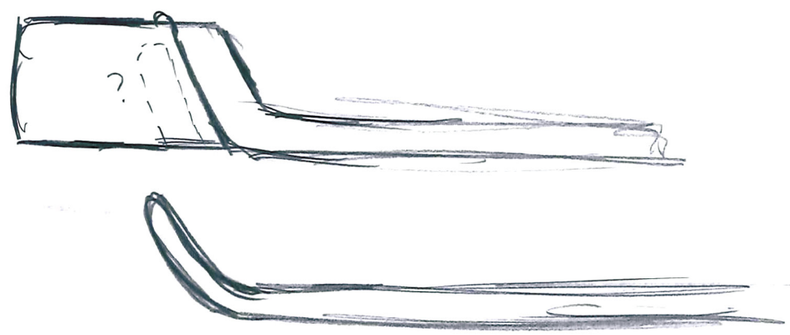
Will include pinching pods - easier to hold.

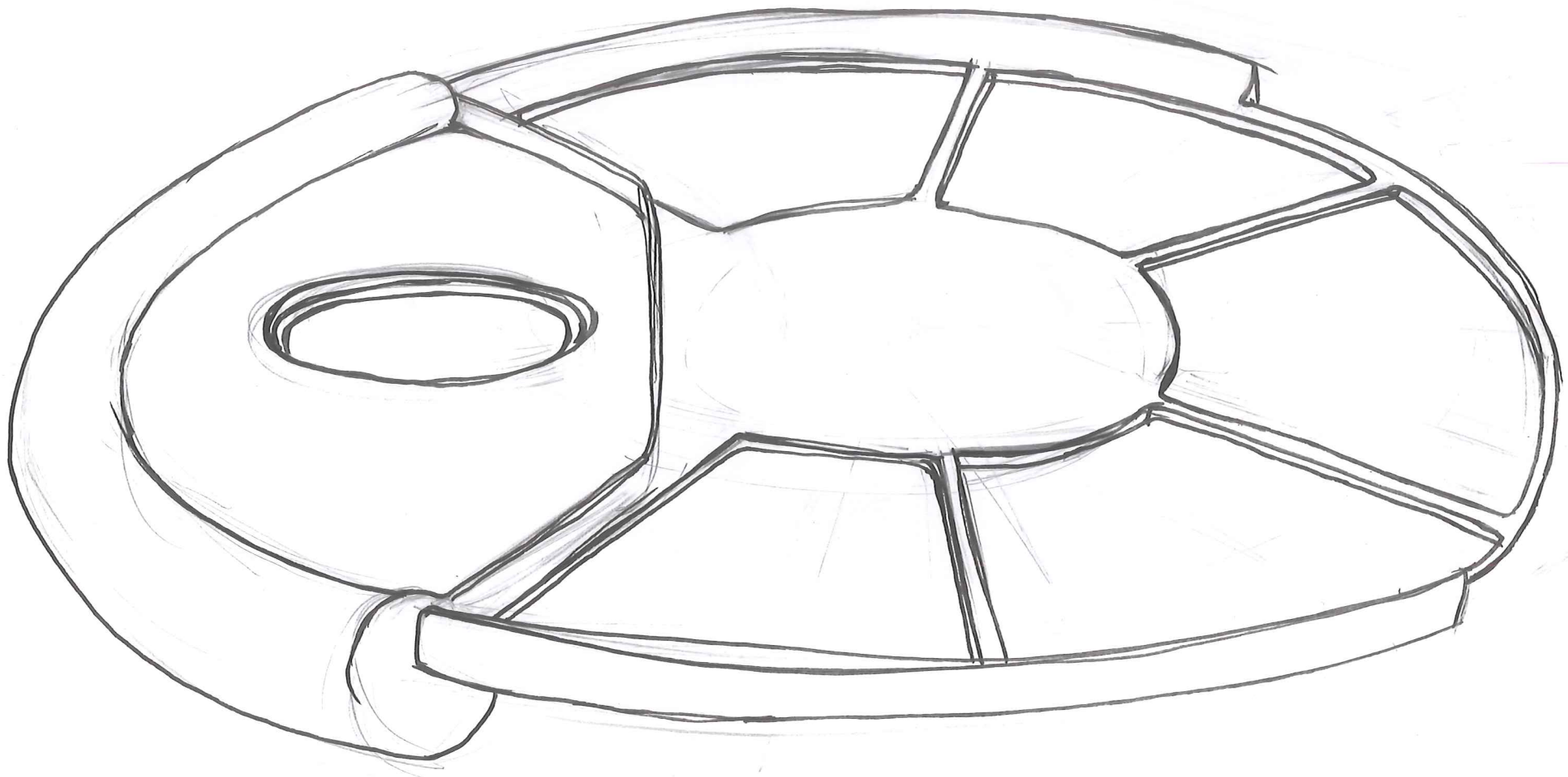


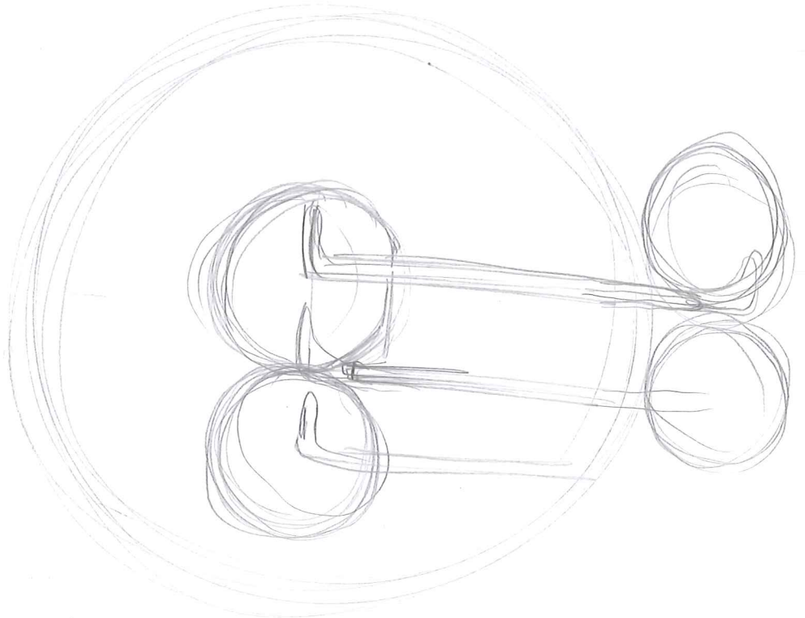
Will include a separator between cup & food

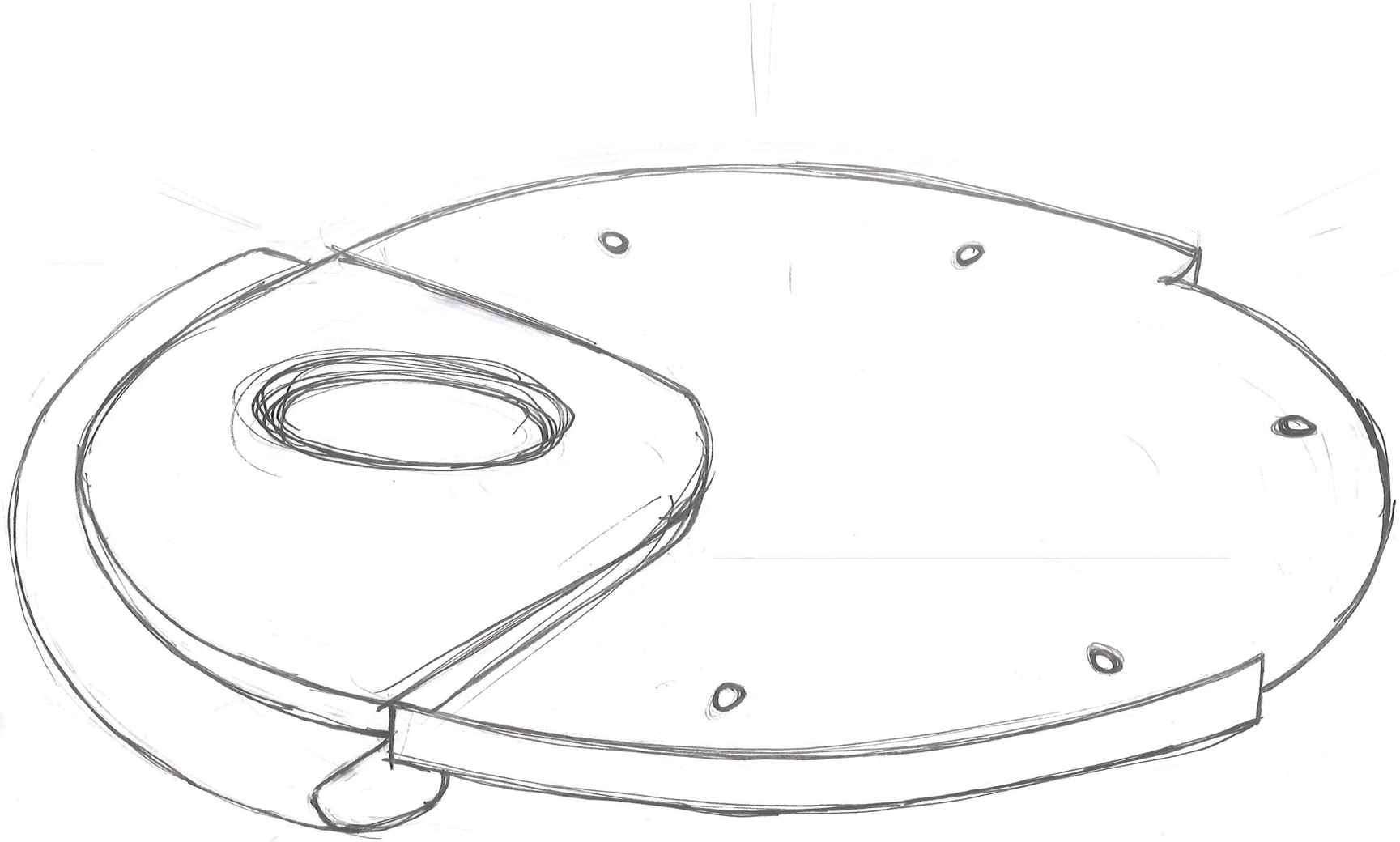


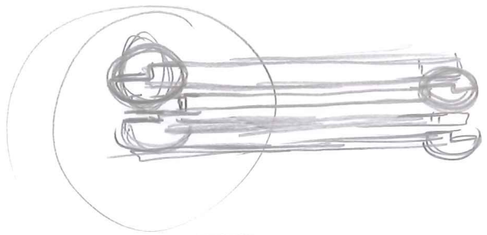
Will curve edges of product & pod - for easy food

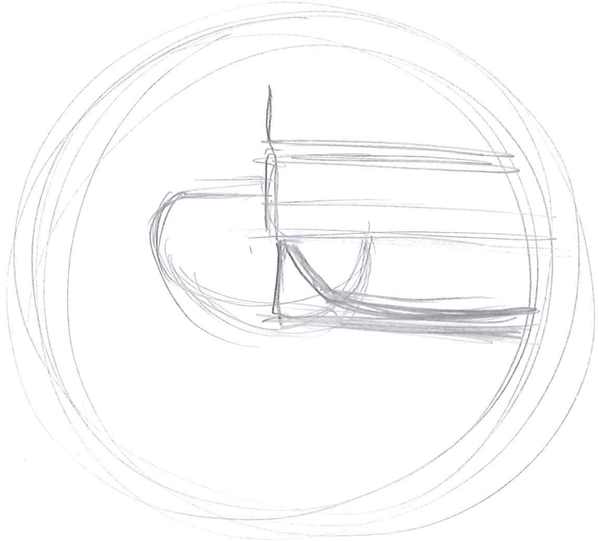


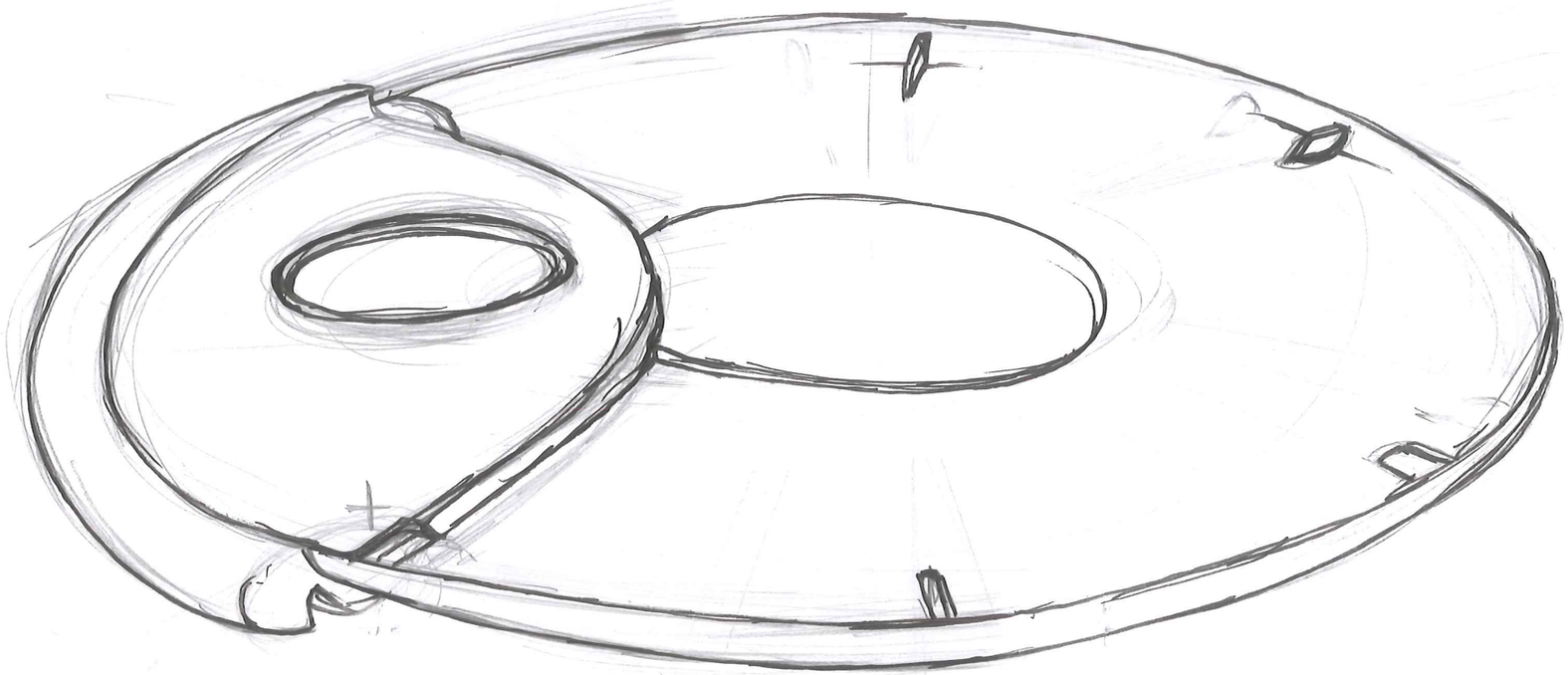


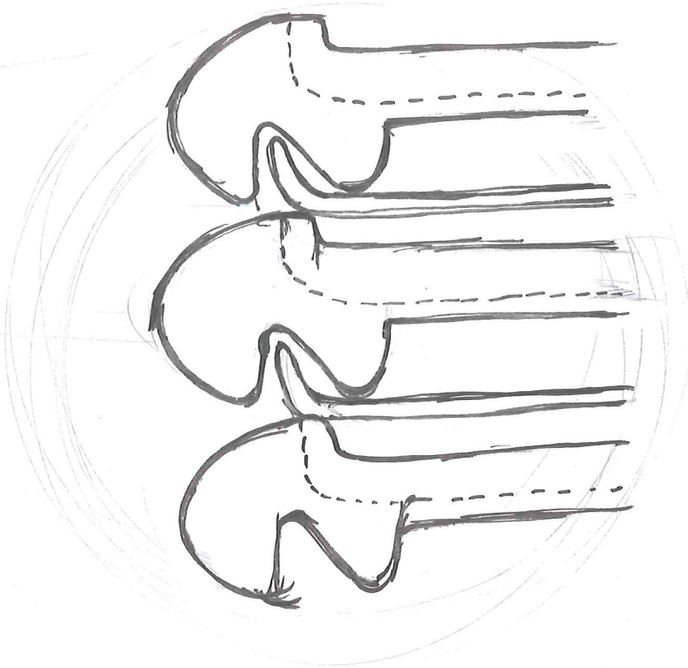


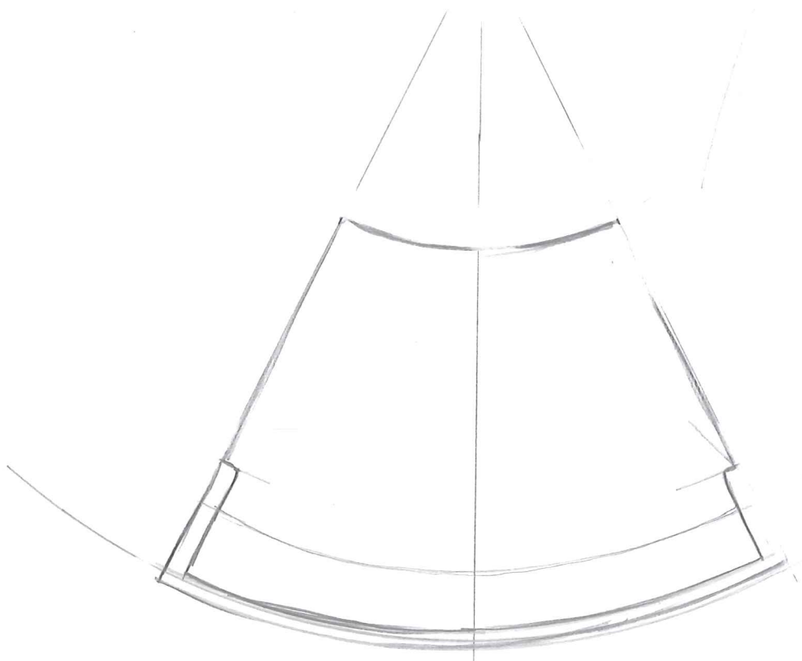


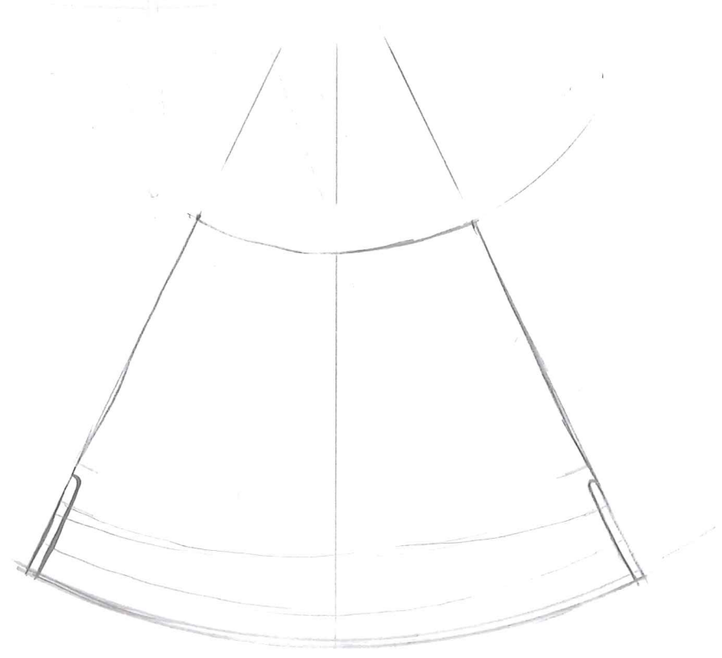


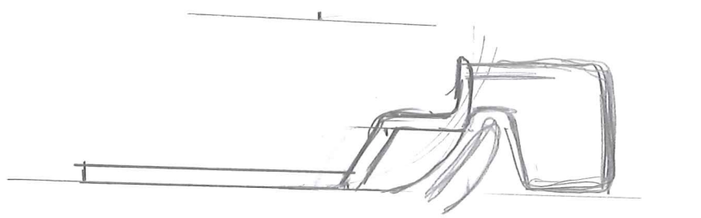


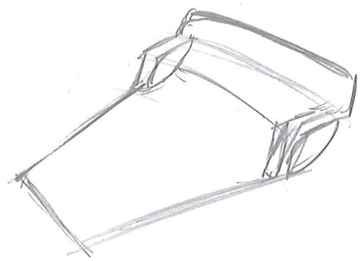


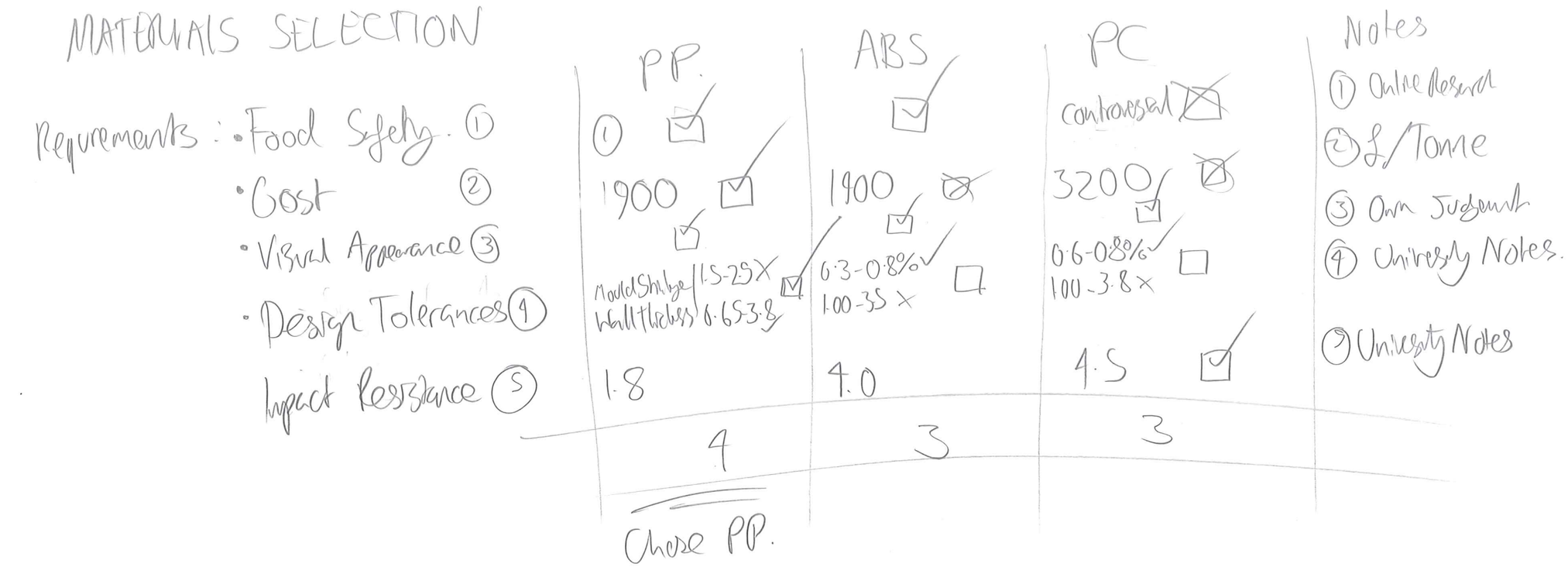


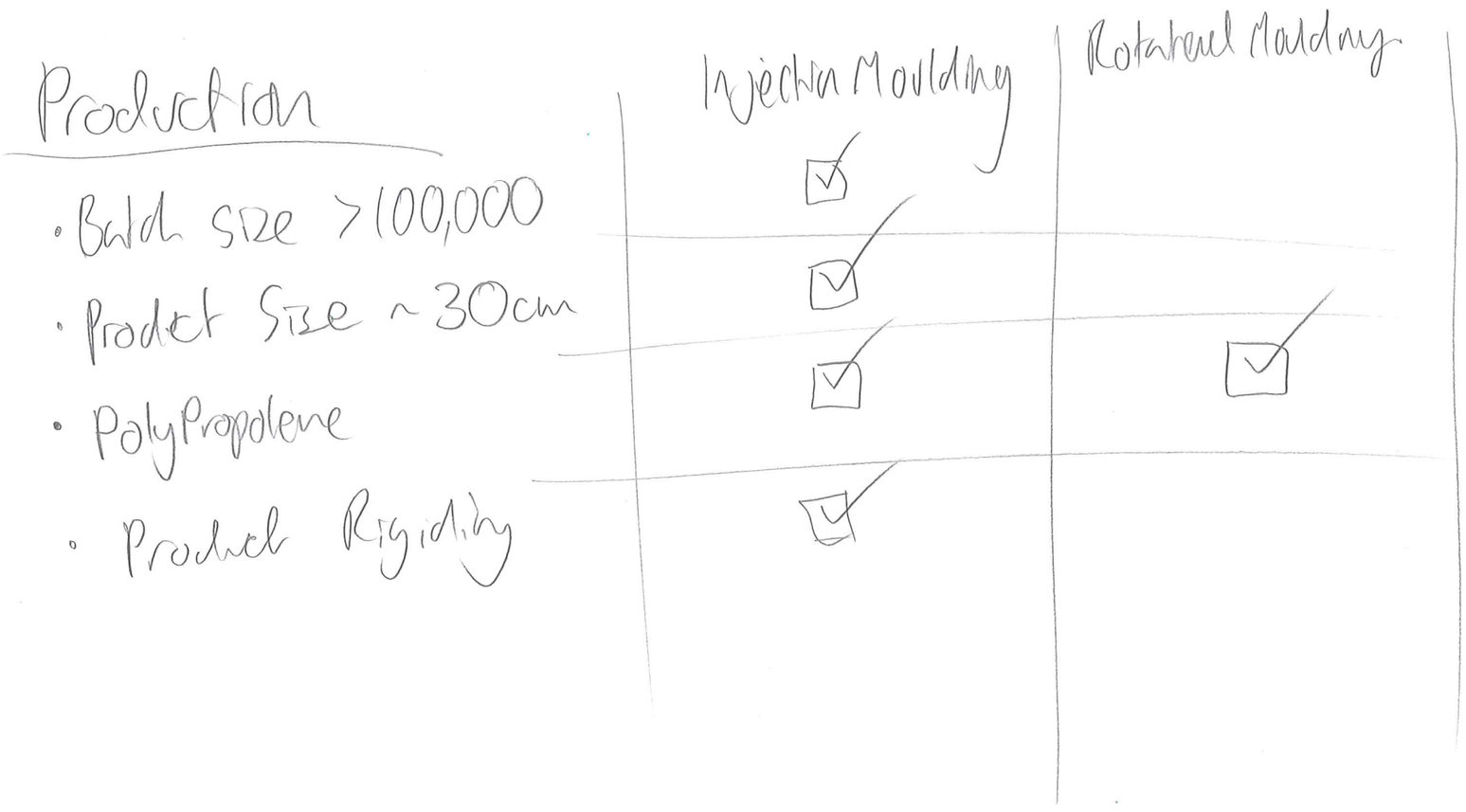












MATERIALS SELECTION

Applying the subjective method, from university, to mateials and process selection, confirms the adequacy of Polypropolene and Injection Moulding as the material and process of choice.

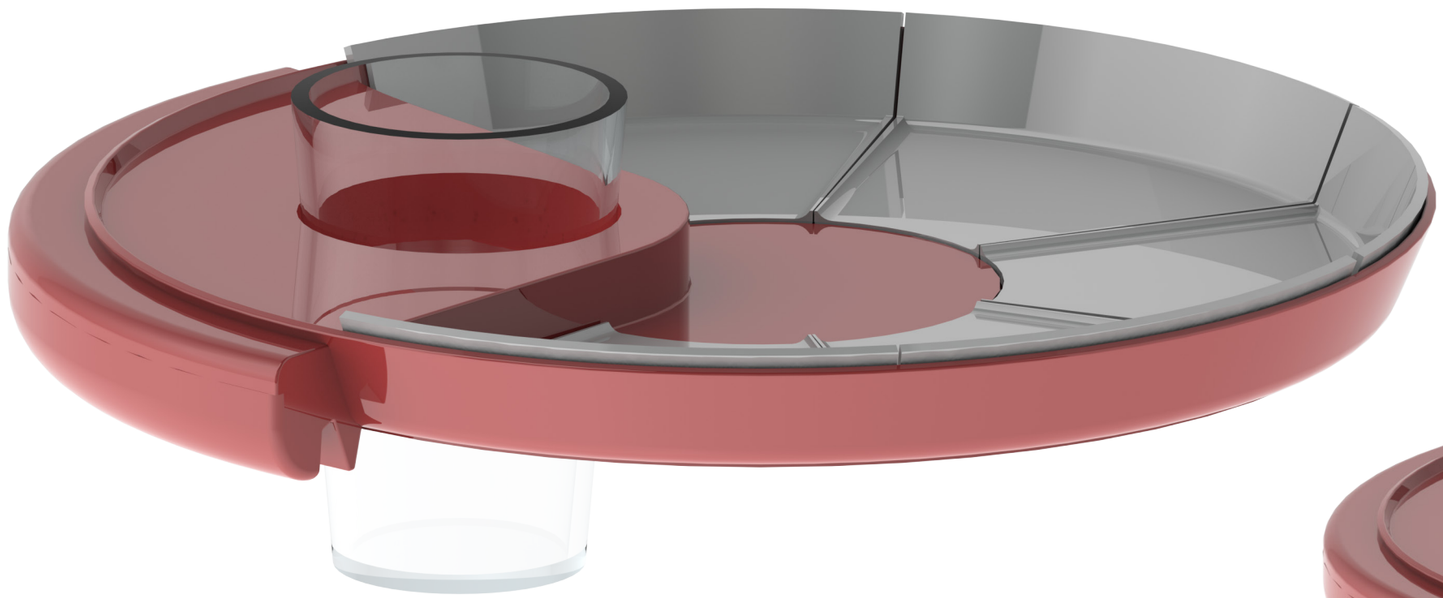
Polypropolene is a Lightweight, Food Safe, Impact resistant plastic. My investigations in person confirm that it can come out with a vey good surface finish.

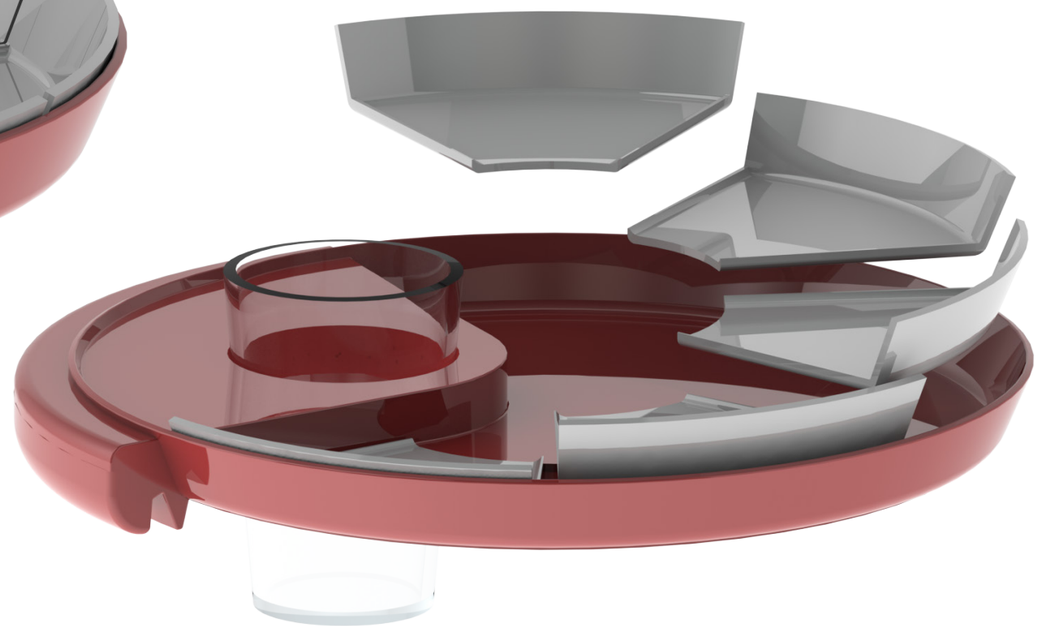
Injection moulding is a very efficient process, capable of producing thousands, even millions of parts. The only drawback is the assumption that enough units will be sold to validify the cost of the mould.

Social Colours

REMOVABLE PODS

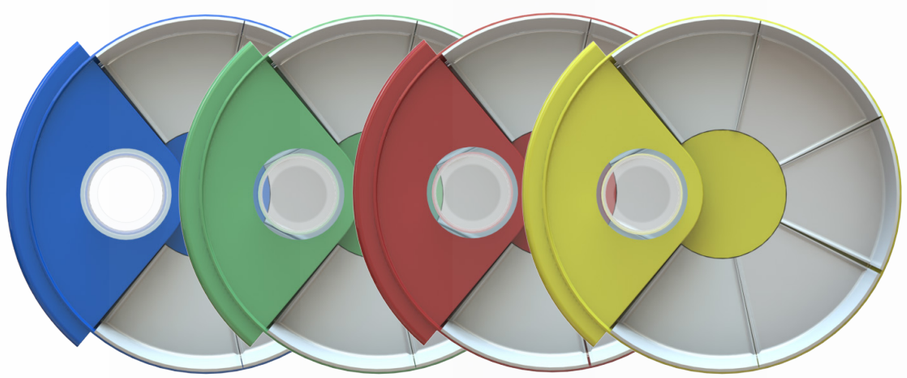
Pods speed up buffet times by removing the confusion of portion control





MULTIPLE COLOURS

Colours signify the user's area of business, providing a new means of icebreaking and introduction



Or, for a more adaptable product, or for discreet occasions.

The suprise descison to allow the negation of color in the product offering, is to open the product up to a wider variety of events. This small change opens up opportunites for weddings, christenings, and funerals. It opens up the idea to more aloof business crowds, who may not want to have colour, and it opens the idea up to locations where perhaps colour would distract from the location, such as the Macintosh house for an art lover. It also frees catering companies from having to predict the exact number of people coming to an event, if they don't want to.