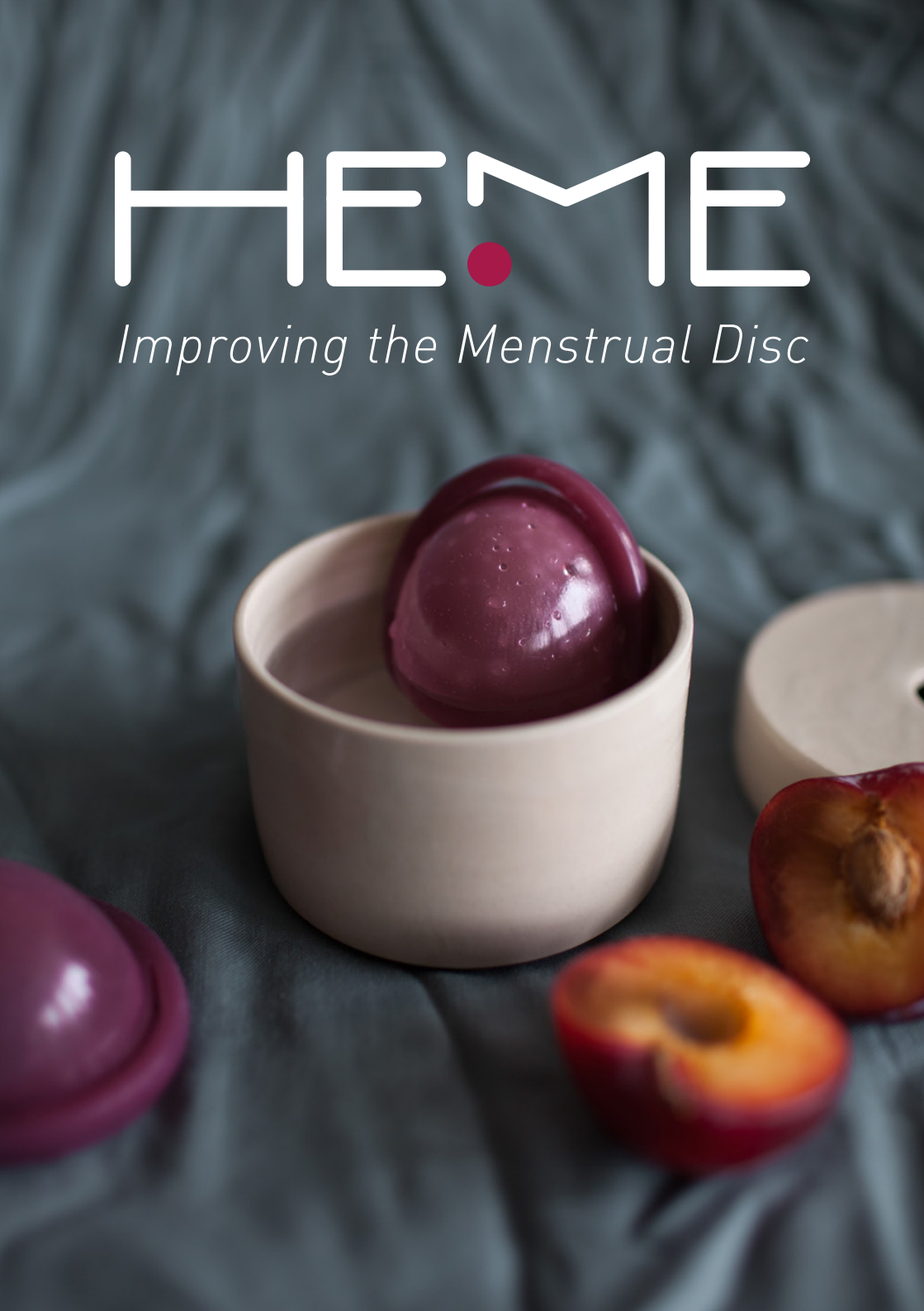
HE:ME

Improving the Menstrual Disc



HE:ME

Improving the Menstrual Disc

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Degree Project for Bachelor of Fine Arts in Design
Main Field of Study: Industrial Design from Lund University School of Industrial Design, Department of Design Sciences

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Supervisors: Professor Claus-Christian Eckhardt, Lecturer Anna Persson, Senior Lecturer Jasjit Singh, Senior Lecturer Charlotte Sjödell

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Thanks to Anna Persson for supervising me. Special thanks to Olof Janson for helping me out with my cast molds and for giving me excellent advice and support, you were like my second supervisor in this project. Big thanks to Stella at The Clay Lab for making my ceramic container.

And I am so grateful for the survey data Ingrid Odlén kindly shared with me, it helped a lot.

I don't think anyone can honestly say they enjoy bleeding from their vagina for days. But at least we can try to make the period experience more comfortable and easier.

4 February 2019.
Overheard in the changing room at Högevallsbadet, Lund.

"Now's the worst part" a young teen exclaimed.
"What?" asked the younger girl next to her.
"To take out the tampon" she explains as she take off her wet swimsuit and acknowledges it has leaked too.

Abstract

For this 15 credits bachelor project in industrial design I focused on menstruation, a biological function that occurs to half of the population. I explored the disposable and reusable period care products on the market today and how many products an average menstruating person will consume and their environmental impact. This led me to the idea of designing an internal reusable period care product. My brief for this project was to improve the silicone menstrual disc. Based on a survey of people's menstrual habits and choices I wanted to create a menstrual disc that was had improved features compared to existing reusable menstrual discs and menstrual cups. Throughout this project I learned how to cast silicone in 3D printed molds to make my prototypes. Besides the menstrual disc itself a storage container was also designed. The end result of this project is my silicone menstrual disc Heme and its ceramic container that can be used for both storage and sterilizing.

Sammanfattning

Under detta 15-hp kandidatprojekt i industridesign fokuserade jag på menstruation, en biologisk funktion som halv befolkningen upplever. Jag undersökte engångsskyddmensskydd och återanvändbara skydd som finns på dagens marknad och hur många produkter en person i genomsnitt använder under mensen samt dess miljöpåverkan. Detta gav mig idén att designa ett invändigt mensskydd. Mitt mål för projektet var att förbättra en menstrual disc (detta typ av mensskydd saknar fortfarande en svensk översättning). Baserat på en enkät om människors mensvanor och val ville jag skapa en menstrual disc med förbättrade egenskaper i jämförelse med dagens existerande menstrual discs och menskoppar. Genom detta projekt lärde jag mig att gjuta silikon i 3D-printade former för att skapa mina prototyper. Utöver min menstrual disc i sig själv designades även en förvaringsburk. Slutresultatet av projektet är min menstrual disc Heme och dess tillhörande keramikburk som kan användas för såväl förvaring och sterilisering.

Content

INTRODUCTION

Ideas and Problems

Menstruation was my topic of choice for the bachelor project. As a person who menstruates myself, it felt like a field I wanted to explore. Ever since I switched to using a menstrual cup four years ago I have been passionate about period care.

Products in this field have not had much development until the past years and menstruation itself has been stigmatized and was topic you did not speak about. It is still a taboo in parts of the world, but I still see changes happening on different levels. In Sweden there has been books written and published about menstruation and you can find menstrual cups in the aisle of any bigger supermarket apart from pharmacies.

I started off this project by coming up with ideas and problems that I noticed or had experienced by myself. These can be found in the mind map on the next spread.

disposables

environmental aspects

daily life

reusables

cost

changing outside of your home

swimming

sex

no trah can

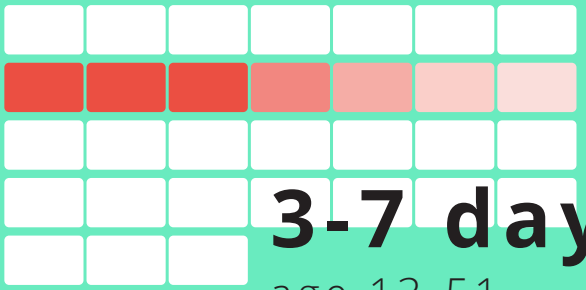
u a t i o n

roblems

bloody mess

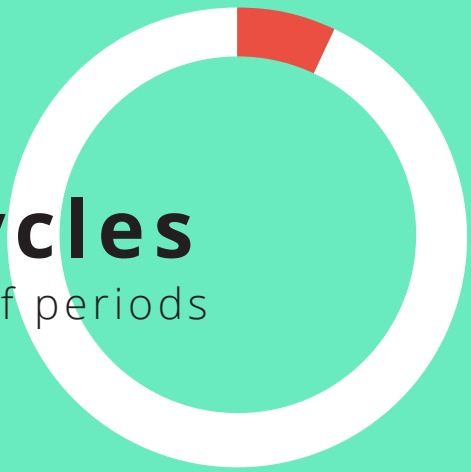
dependent on parents economy

young girls



3-7 days

age 13-51



456 cycles

2280 days of periods

12000 - 16000

disposables during a life

INITIAL RESEARCH

Menstruation

My next step was to look into the numbers of a menstruating person. On average a period lasts 3 to 7 days and occurs about once a month from the age of 13 until 51 (Huffpost, 2015). Note that menstruation does not occur during the months of a pregnancy. During one lifetime a person will experience 456 menstrual cycles, which equals 2280 days spent bleeding. That amount is roughly 7 percent of your whole life. If disposable period care products are consumed, one will go through 12000 to 16000 disposables in the form of tampons, pads and panty liners during a life (ImseVimse).

64 liters water

O.B ProComfort Normal tampon, 3.2 g

90% plastic

one pad equals 4 plastic bags

Disposables

Sanitary products for one time use create a lot of waste. The short time when the products are actually in use does not match up that well with the life cycle of the materials either. Take a tampon for example. The main component in a tampon is cotton. It takes 20000 liters of water to produce 1 kilogram of cotton. A O.B ProComfort Normal tampon weighs 3.2 grams (Johnson & Johnson, 2019). If we calculate this with the previous fact, it means that the material for this tampon required 64 liters of water in production. That is a lot of water for something you can wear for 8 hours at longest. In reality you seldom even get the maximum use out of a tampon on your heavier days before it starts leaking. A more realistic view would be that the average use is 6 tampons per day (HuffPost, 2015). You can only imagine how much water much water that wasted. Besides the quick water consumption non organic tampons also contain plastic fibers to give them a smooth outer layer.

Disposable pads are made of 90 percent plastic, an amount of plastic which equals 4 plastic bags (BBC, 2018). The plastic in sanitary products such as pads or the fibres in tampont cannot be recycled after usage because of the contamination with blood. While there are products with biodegradable plastic, there is still the issue of degradation and taking care of the waste.

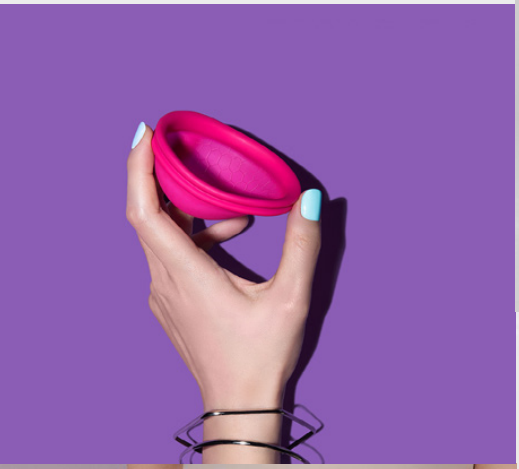
125 - 150 kg

waste from disposables are thrown away by the average user in a lifetime

During a lifetime the average menstruating person will generate 125 to 150 kilogram of sanitary waste if disposables are used. This waste consists of tampons, applicators, pads, packaging and wrapping (OrganiCup, 2018). This is waste that will only be burned, as it cannot be recycled. You could recycle the outer packaging and the parts that have not been in contact with your menstrual fluids. But there is still only so much you can recycle.

One could argue that the waste management and recycling in Sweden is quite functional. As long as people throw their waste correctly. But the waste issue is bigger in other parts of the world and these kind of disposables with plastics take years to degrade naturally, and could remain on earth long after the user's lifetime.

Using disposable sanitary products will also cost money. The average cost of having a menstruation in Sweden is in total 78000 kronor in terms of disposables (Amelia, 2015).




re.t.a

Reusables

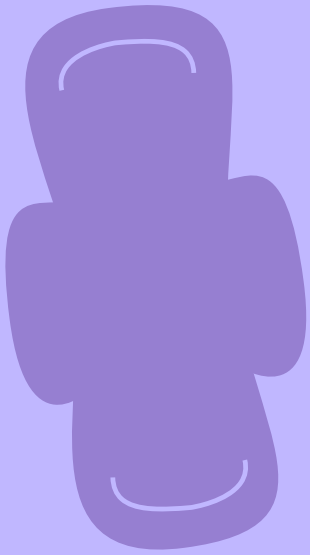
The amount of waste generated by disposables and the plastic that is burned as it cannot be recycled made me look into the market of reusable menstrual care products. On the current market we have reusable pads. These are normally made out of fabric and perhaps cotton, but the cotton in these have a longer life cycle than in a tampon. There are also menstrual sponges that are used internally, kind of like tampons. These sponges are either synthetic or natural sea sponges. Synthetic sponges do contain plastic, but just like the reusable pads the material here has a longer life cycle than in disposables. If you are into applicator tampons you can make the switch to a reusable applicator instead of regularly throwing away applicators in cardboard or plastic. There is even such a thing as reusable tampons. Although reusable tampons can mainly be found on Etsy made by crafters in yarn or fabric. There are a few instructions and patterns on the internet on how to make your own. We can also find period panties or even period shorts or pants with built in panties. Lastly we have the silicone menstrual cups and menstrual discs. Reusable variations in rubber or TPE can also be found.

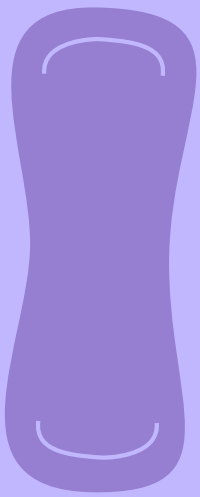
cheaper

longer wear

less waste

less plastic

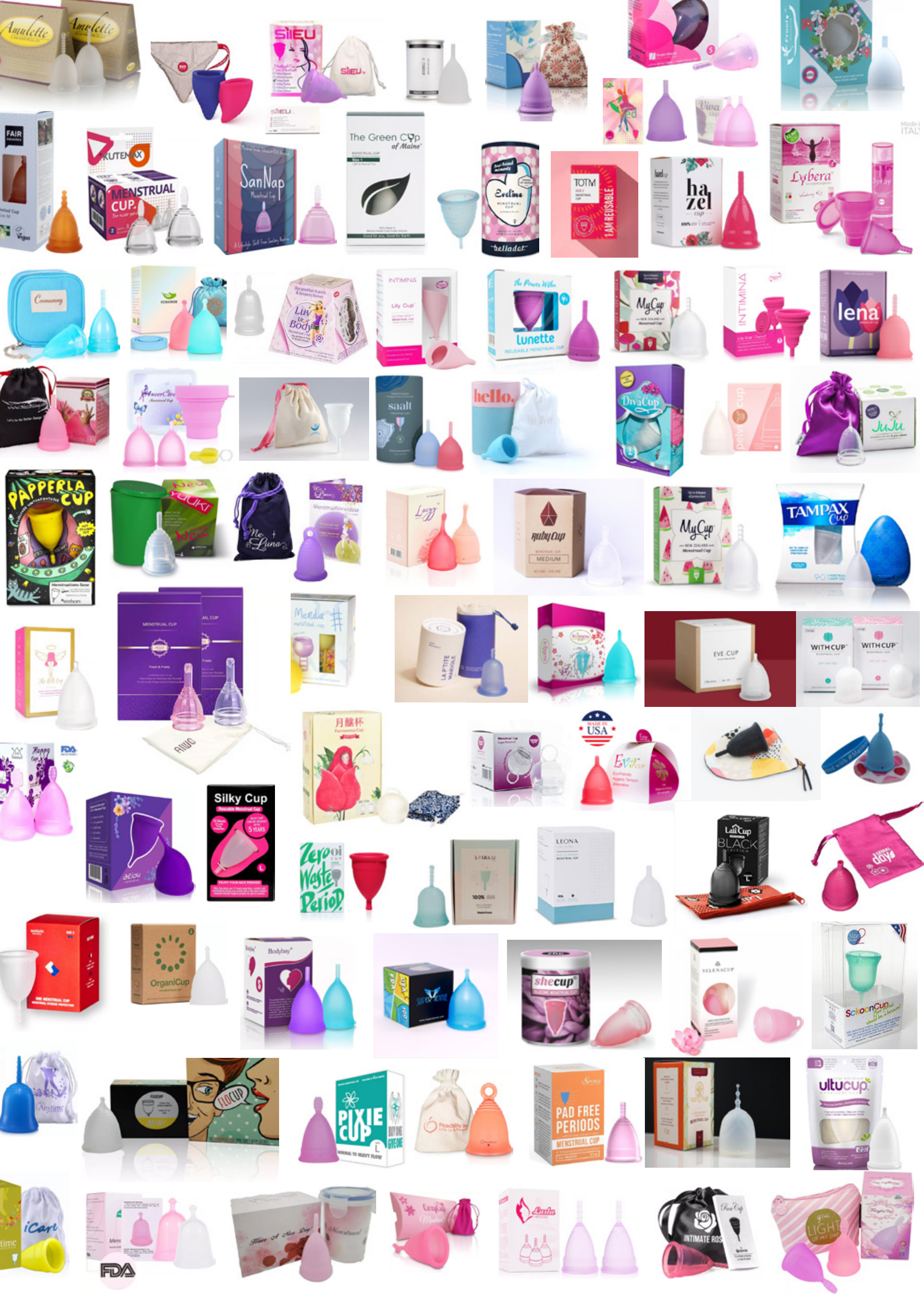




FOCUS AREA

Cups and Discs

At this point I decided I wanted to focus on the reusable menstrual cups and menstrual discs in silicone becuse of the economical, environmental and convenience aspect. These menstrual products are cheaper than disposables in the long run, as one will not have to buy new consumer products monthly. One menstrual cup or disc can last from 5 to 10 years depending on how well you take care of it. This means that they create less waste as well. They also offer longer wear, as they hold more blood than disposables and other reusable options. Finally silicone menstrual cups and discs does not contain plastic like disposables. The few cups that are made of TPE plastic though, have a longer life cycle than the plastic in disposable pads and tampons and in the long run the amount of plastic in one cup over 5 years is less than the volume of plastic in the hundreds of disposables over the same time. Plastic in the form of packaging will also be reduced as you do not have to stock up on products regularly.

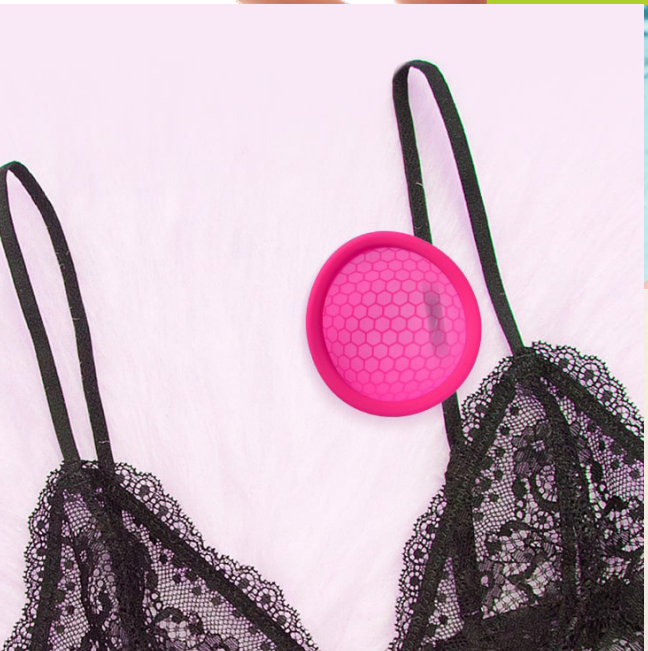


Amulette
SilEU
FAIR
MENSTRUAL CUP
SanNap
The Green Cup of Maine
Evelina
TOTM
I AM REUSABLE
hazel cup
Lybera
Spray
INTIMINA
Lily Cup
Luv Ur Body
lunette
MyCup
lena
saalt
hello.
DivaCup
JuJu
PAPPERLA CUP
YUUKI
Me Luna
Menstruationstasse
Lucy
Ruby Cup
MEDIUM
TAMPAX Cup
MENSTRUAL CUP
Merula
LA P'TITE MARGUERITE
EVE CUP
WITHCUP
月藤杯
MADE IN USA
Eva
FDA
Silky Cup
Zero Waste Period
LEONA
BLACK
day
OrganiCup
Bodybay
shecup
SckoonCup
FLOCUP
Anytime
PIXIE CUP
PAD FREE PERIODS
MENSTRUAL CUP
ultucup
iCare
FDA
Have A Nice Day!
INTIMATE ROSE
LIGHT

Cups on the Market

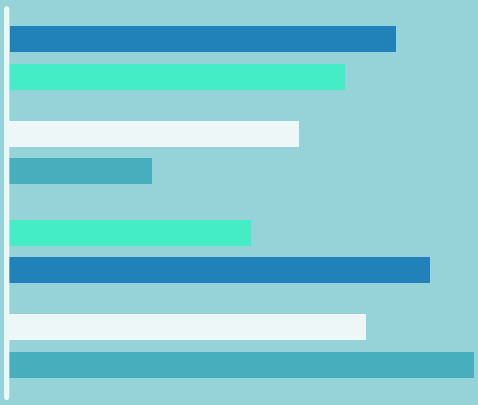
There hundreds of menstrual cup brands on the market. The ones showed to the left are only a handful. There are official brands and cheaper copies. A large variation of sizes, shapes and colors are offered.

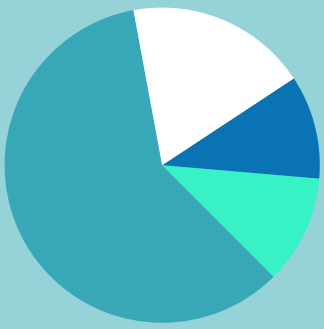

nixit
period.



Discs on the Market

To this day there are only 6 brands on the market that sell menstrual discs. Two of these are disposable and made of plastic. One is made of silicone and semi disposable, according to the company it can only be used for 3 month because the circular rim will form after your body and after that time it will be more susceptible to leaking. The rest of the discs are also made of silicone, but these are marketed as reusables and should last for years.





Survey

One month into the project I met up with Ingrid Odlén, a student at Lund University that as a side project has been developing a new kind of period care product. I first heard about her when Sydsvenska, a local newspaper, wrote an article back in January. We had a conversation about menstruation and she shared a survey with me that she did in 2018 as part of her own project. This survey was mainly shared in Swedish Facebook groups where people discussed sexual health and period care. The survey received almost 600 responses from menstruating people all over Sweden and even gained some responses from neighbour countries by people that happened to be in the groups. Ingrid Odlén's survey had its focus on the usage of menstrual cups. Since I wanted my project to target silicone reusables the data from this survey could be applied. The people that replied that they did use a menstrual cup got a follow up question about what they were missing in a cup. The responders that said they did not use a cup or perhaps had tried but did not use it now were asked about why they had made the choice not to use it. These questions allowed for a free text answer and I collected some of the reoccuring opinions on the next spreads.

no discoloration

container for microwave sterilization

simple removal

what are y

in a mens

possibility to have sex

smaller sizes and bigger sizes

possibility to empty without
access to water

customed for low cervix

ou missing

strual cup

better storage

mess free removal

aid for insertion

hard to insert

feels big

hard to unfold

have an IUD

annoying cleaning

no string like tampons

doesn't fit me

cups give me yeast infections

cups glide out after having given birth

you chosen

menstrual cup

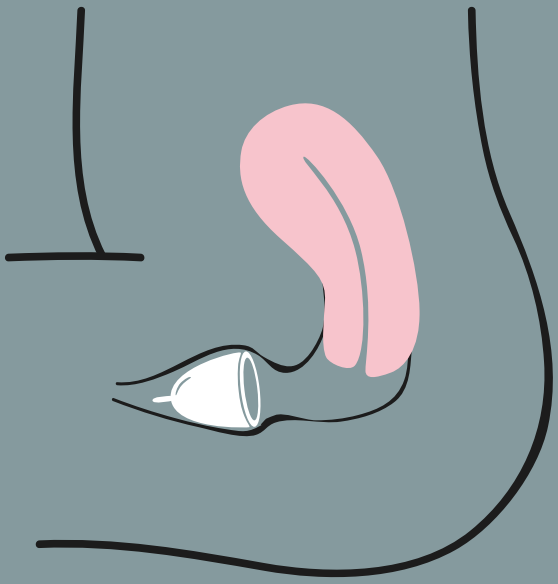
risk of spilling blood

have to squeeze the cup to release the suction

hard to remove

menstrual disc in
the vaginal fornix

menstrual cup in
the vaginal canal



Disc vs Cup

So far I have been more or less put discs and cups in the same category. They both collect menstrual fluids internally. The difference between them lies in how the are positioned in the vagina. A disc sits in the vaginal fornix. This is why so many discs are marketed as devices that allows for mess free period sex. Just like the contraceptive diaphragm it does no sit in the way for penetrative sex. A menstrual cup on the other hand sits in the vaginal canal. There is also the distinction that a disc only has one way to be folded, pinched in half. Whereas a cup can be folded in several ways and you have to figure out which fold works for you and the firmness your cup by trial and error.

easier insertion and removal

works during sex

easy to fold for insertion

Advantages of a Disc

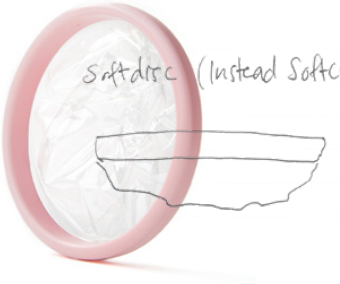
From personal experience a disc in easier to insert than a cup. It resembles inserting a longer tampon minus the unpleasant friction from the cotton or the plastic fiber coating. A cup also glides in pretty effortlessly by now, after having used it for the years. But I remember back when I was trying it out for the first. It was hard to simultaneously pinch the cup into a fold while sliding it in and not accidentally letting go of it too soon. I find emptying and removing a disc to be easier than with a cup. With a disc I can push it out slightly with my pelvic muscles when sitting on a toilet and let the contents drip out. Then I can easily grip the front rim and pull it out. With a cup you normally have to pinch the base to release the suction before removal. You cannot push it out with your muscles. All of my statements are based of personal experience and I know that there are people with different opinions and people that cannot push a disc out with their pelvic muscles.

THE BRIEF

Design Brief

Based on my research I came to the decision to make my project about improving the menstrual disc. There are still very few discs on the market compared to the alternatives you will find among disposables or cups. The aim of the bachelor project would be to improve the features that people in the survey mentioned. I wanted a menstrual disc that would:

- be less messy and easier to remove and empty.
- be encouraging to use during the period.
- have a selection of sizes, because one size does not fit all.
- have a color that should disguise the discoloration that is inevitable with a product that comes in contact with blood.
- come with a thought through brand and storage solution.


Softdisc (Instead Softcup)
1994


Flex
2016


Intimina Ziggy Cup
2018


Softcup
2018


Nixit
2019
double rim, sits
better in place

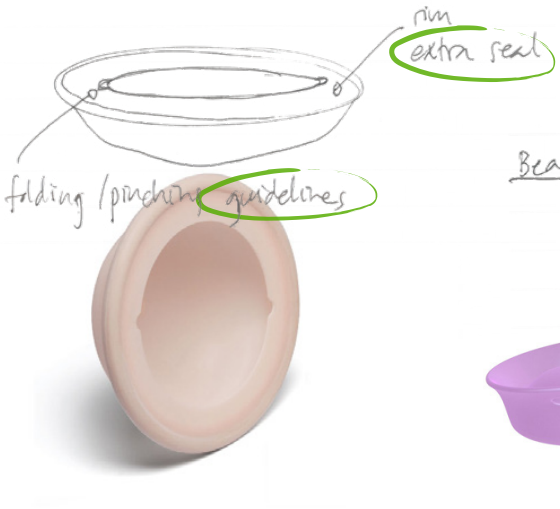

Lumma Unique
2018

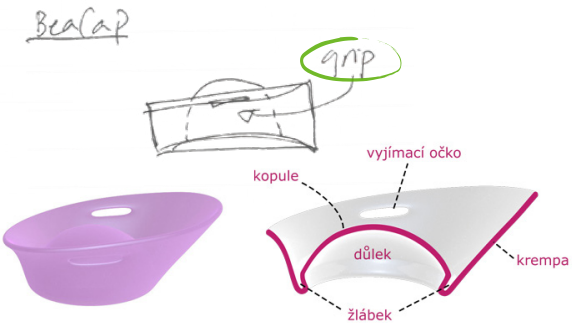

2019

FURTHER RESEARCH

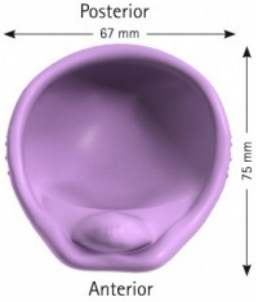
A Closer Look on Discs

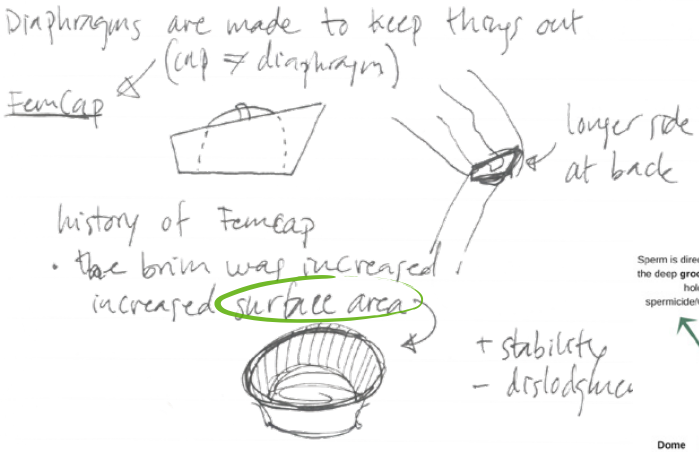
As mentioned in *Discs on the Market* there are 6 different brands of of now. Softdisc from USA was the first one to launch in 1994 and was sold as a disposable menstrual cup. It is made in plastic and meant for single use. Flex, also American, came several years later as the one and only competitor within discs. Their disc is almost exactly the same as Softdisc except for the rim color. Flex even bought Softdisc and the two brands are now run by the same company. Then came the Swedish Intimina's Ziggy Cup, the first reusable menstrual disc in medical grade silicone. Intimina had previously already established themselves as a well know menstrual cup brand. Softcup from South Africa lanched later in the same year, although there was little activity and marketing on the Softcup's social media until recently. Softcup only lasts 3 menstrual cycles according to the company, since the medical grade silicone will form to your body and after 3 cycles it could be more prone to leaking after that as it has been deformed. The Canadian company Nixit entered the market just a few months ago with a disc similar to the Ziggy Cup. Lastly we have Lumma from Brazil. Their Lumma Unique was first released in late 2018, but the production slowed down quickly thereafter. Months later, in March 2019, they announced the launch of a new design featuring a silicone string. By the beginning of my bachelor project I made the conclusion that none of the discs on a market had a removal feature. But that changed right before the kick off presentation in March when Lumma released the new design.

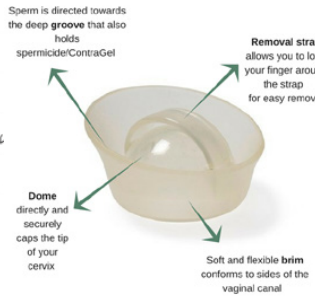

rim
extra seal
folding / pinching guidelines


BeaCap
grip
vyjímací očko
kopule
důlek
krempa
žlábek


Caya
removal dome
rim (nylon)
back
grip
guide for pinching to insert
cup (silicone)

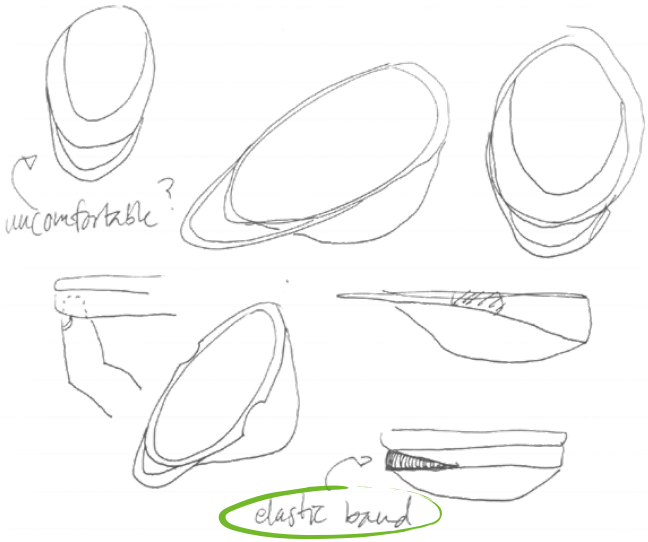

Posterior
67 mm
75 mm
Anterior


Diaphragms are made to keep things out
(cup ≠ diaphragm)
FemCap
longer side at back
history of Femcap
• the brim was increased
increased surface area
+ stability
- dislodgment

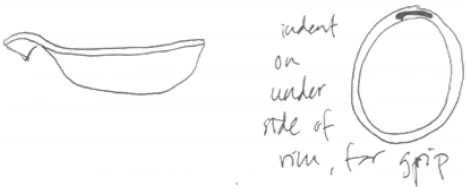

Sperm is directed towards the deep groove that also holds spermicide/ContraGel
Removal strap allows you to loop your finger around the strap for easy removal
Dome directly and securely caps the tip of your cervix
Soft and flexible brim conforms to sides of the vaginal canal

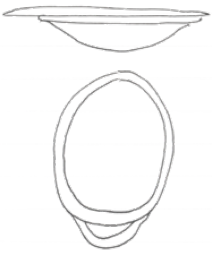
Diaphragms and Caps

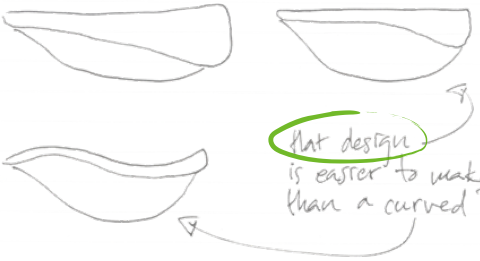
Contraceptive diaphragms are positioned in the vaginal fornix exactly like menstrual discs. The only difference is that the function of a diaphragm is to create a barrier for sperm and prevent them from getting in. A disc also works as a sort of barrier, but from the other end and should collect menstrual fluids and prevent them from leaving the body. Cervical caps has the same function as a diaphragm, except they only cover the cervix instead of the entire cervical fornix. I do not have any hands on experience with cervical caps, but the midwife Birgit Linderoth (see Appendix), also known in Sweden as Gröna Barnmorska, was kind to send me the Caya diaphragm. This was the first new design on a diaphragm after decades of no development. Birgit Linderoth herself told me she used her Prentif diaphragm as a menstrual collection device starting in 1979 until she later switched to using her cervical cap FemCap as a cup. After reading on different social media I realised that there are more people in the world that used their diaphragms as period care before cups and discs even gained popularity. I myself tried out Caya to collect my menstruation. It worked perfectly. I even gave it a try during sex on my period and I did not see a hint of blood leaking. It worked exactly as well as the Ziggy Cup during menstruation and intercourse. The major difference in design between diaphragms and cervical caps in that they usually are more shallow than discs, as they do not have to collect anything. A lot of barrier contraceptives are also available in several sizes to ensure they provide the best fit and seal.

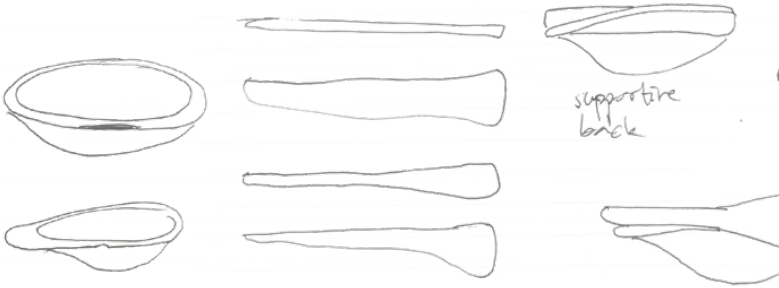

uncomfortable?
elastic band


the tab would be annoying during sex?
yes, that tab would be annoying


indent on under side of rim, for grip


platinum grade silicone
How to produce silicone cup?
How did the design process go?


that design is easier to make than a curved?

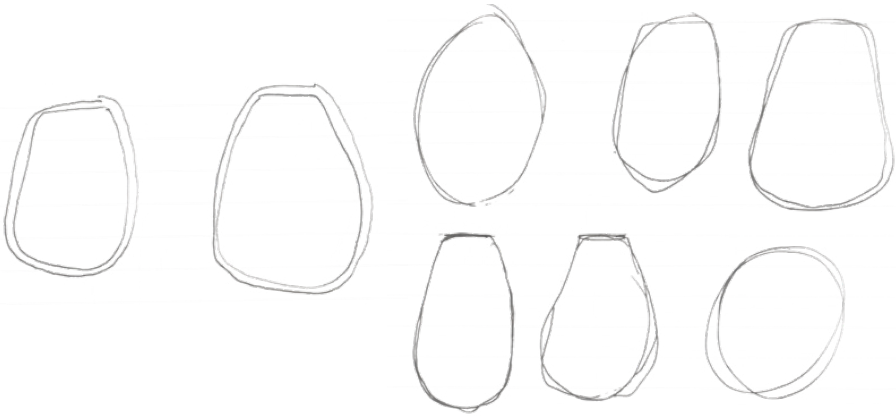

supportive back

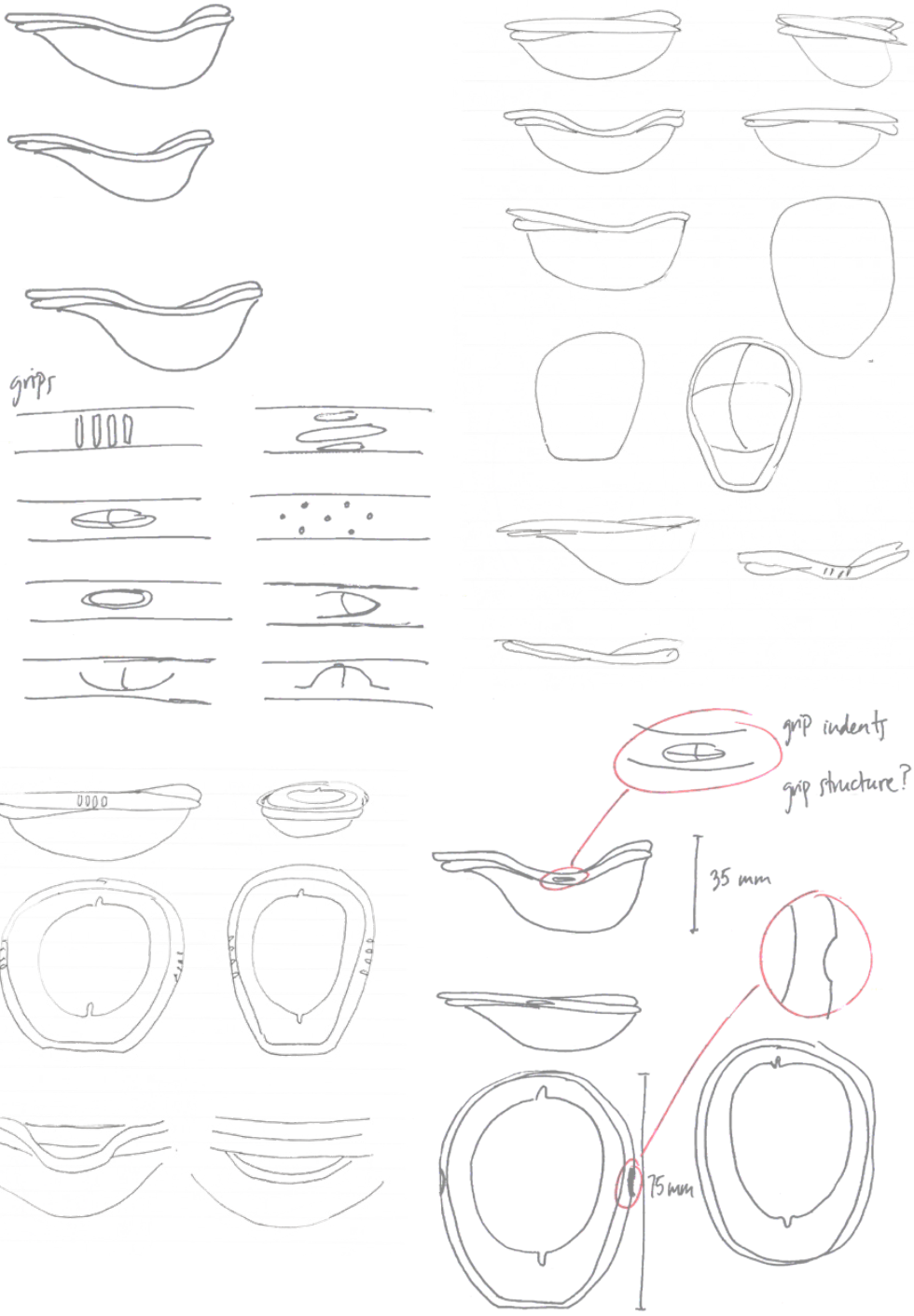

this sort of cover would restrict it to a certain shape

IDEATION

Sketches

After analyzing and finding inspiration in the features on diaphragms and cervical caps I started sketching on ideas for my menstrual disc. Some sort of feature to aid removal was desired as no of the current discs offered it, until Lumma redesigned their disc halfway into this project that is. Another feature I wanted was a rim to make removing a disc filled with blood less messy. The rim should also be soft and rounded, as I noticed a sharper rim was more noticeable during sex in certain positions. This disc should be available in more than one size just like some diaphragms. Lumma is so far the only company offering different sizes on their discs.




grips
grip indents
grip structure?
35 mm
75 mm


space for cerux

Prototyping

The next step in the project was to figure out how start creating prototypes. I was looking for materials and for potential help from companies for creating prototypes in silicone. At the same time I was trying to make some rough prototypes using balloons, which did not exactly turn out as I imagined. Birgit Linderoth, the midwife that gave me the Caya diaphragm, had told me to try contacting Kateřina Kadlecová Makrlíková (see Appendix). Kateřina is the owner of a Czech webshop for diaphragms and was one of the founders of the cervical cap Evanella. I did get in touch with her and she told me all about the developing process for Evanella that was done with a Czech silicone manufacturer. She also provided me with some insight and personal experiences with diaphragms and menstrual discs. But I quickly realised that having an external company produce prototypes for me and for them to make a prototype mold in aluminium would cost way more than I could afford, regardless of the manufacturer and country. Instead I began looking for silicone I could work with on my own. The important aspect for this project was to create prototypes in a type of silicone that resembled the real life feeling of the product I was aiming for. My menstrual disc in this project should be made of medically grade silicone, but medically grade silicone is expensive and hard to find small batches to buy as a private person and not a company. Therefore the following pages concerning the model making is not focusing on any pf the medical the properties of the used silicone or its health aspects, as I could purchase medically grade silicone.


Giftiga
ämnen

Silicone

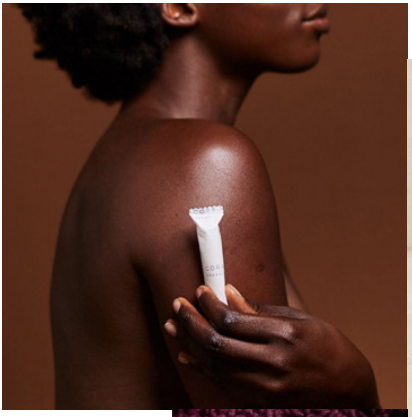
I contacted Helsingborgs Gummifabrik AB and talked to their CEO Filip Olsson. They had a lot moldable silicone, similar to Sugru or a clay, at the factory and Filip invited me to come visit to get a feel of it. I went there together with my classmate Natalia Lauritzen and got a small tour of the factory, looked at colored silicone and learned that silicone could be coated with talc to achieve a matte surface.

Filip offered to color some moldable silicone for me and send it to Lund. This silicone had the consistency of clay in room temperature and needed to be cured in 200°C.

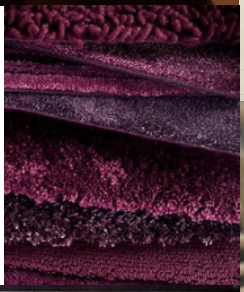

© ADRIAN DELSI PHOTO

Color

After my visit to Helsingborgs Gummifabrik AB I began thinking of what color I wanted my menstrual disc to be. The color of the silicone should disguise the discoloration and staining caused by blood. Black would be ideal to hide staining and since there limited menstrual products in the color black this dark shade would also stand out among the others. Black is also a neutral color that appeals to a lot of people. Although this kind of dark shade would also hide the blood that you potentially missed to rinse off. In the end I decided on a hue with red and violet tones to make the connection to blood. This color would also allow the user to see potential unclean spots and damages, such as scratches on the silicone surface that could accumulate bacteria, on the product.




Abel
white vetiver




BASIC BIOLOGY. PERIOD.
DON'T HIDE IT. PERIOD.
DONTHIDEITPERIOD.COM

Moodboard

After having considered the color of the product itself I created a moodboard to find the feeling I wanted my entire product and everything around it to achieve. The red and violet colors in combination with the more neutral shades in off white and beige worked well as the color scheme. I started to think a little about being a trans man and having your period and read a few blog posts and article on the issue. This and the obvious fact that not everyone appreciates the baby pink, purple and green packaging with flowery details on a lot of disposable period care product motivated me to pick a neutral palette.

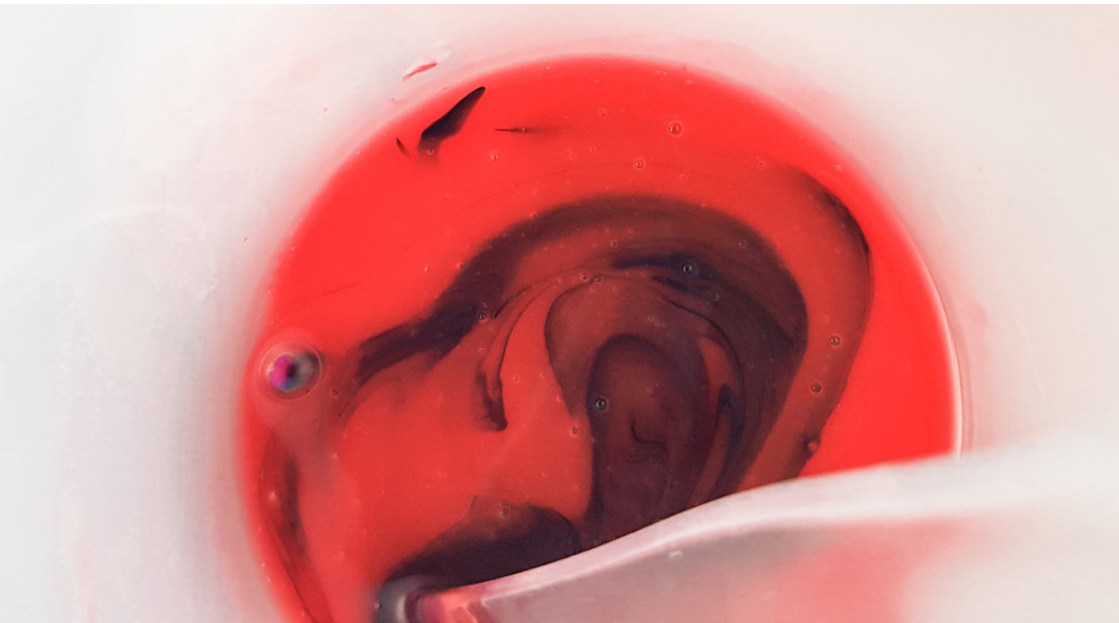
SILICONE PROTOTYPING

Model Making

Before I received my silicone from Helsingborgs Gummifabrik I proceeded with creating simple mockups in 3D print and with the Intimina Ziggy Cup, paper and tape. I wanted a rim on top to make the user experience less messy and a feature to aid removal. During the earlier sketching stage of the project I had many different ideas on how the removal detail could look like. At this point I went with the idea of having a removal strap that would sit closely to the rest of the menstrual disc. I did not want an flimsy strap or string that might be annoying and make the design appear bulky.

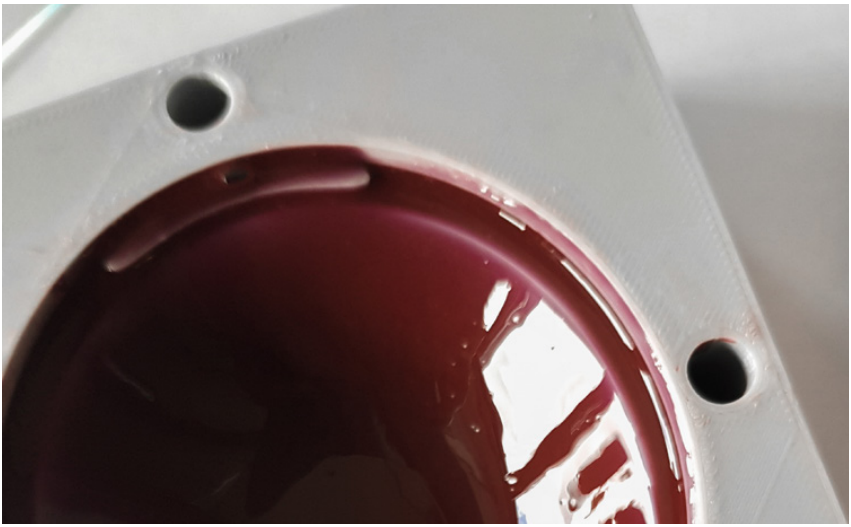
Mock Up

The silicone from Helsingborgs Gummifabrik arrived via mail. It was colored and ready to be used. I pressed out different shapes with my hands onto aluminium foil and into a small ceramics dip bowl. These parts were then cured in my kitchen oven at 200°C for 20 minutes. This time was enough to harden the silicone. But if I wanted the full potential of the silicone properties to develop I should have been in the oven for more hours. The aspect of the silicone properties was not the main focus here, it was to see how the silicone was to work with. My realisation here was that the silicone unfortunately was too big of a hassle to work with. The air bubbles were hard to remove and even push out because of the extremely low viscosity, imagine the silicone having the sensation of clay or play dough. Besides I did not find a feasible way to create a heat resistant mold in aluminium for creating my menstrual disc. It was impossible to push the silicone out into one mold and then transfer it into a heat resistant one without curing it, as the silicone was soft and stuck to the surfaces. The only way to work with it was shape it directly in a heat resistant mold that would follow into the oven. But as I mentioned the air bubbles issue was also a big obstacle.



First Try Casting

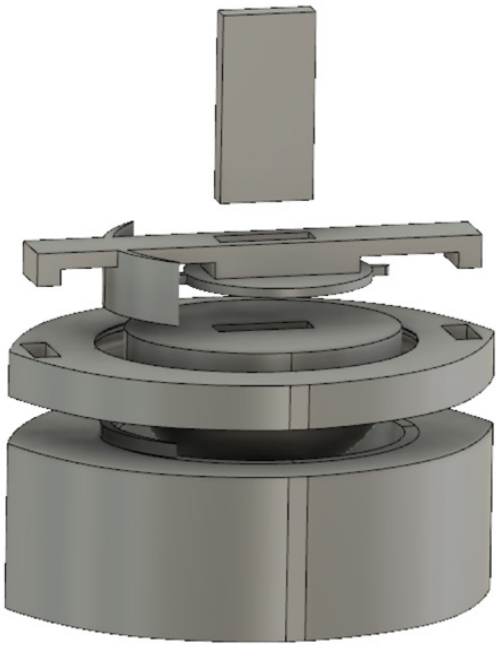
I moved away from the silicone provided by Helsingborgs Gummifabrik and purchased silicone and catalyst at Slöjd-Detaljer and blue and red silicone pigments from Kinn. This felt like a more conceivable solution mock up wise, as this silicone would harden in room temperature and only needed post curing in 200°C. I 3D printed a mold made in Fusion 360 and casted two silicone discs. The realisation here was that I had to learn how to use Fusion 360 for this project, I have a hard time picturing a CAD file on my screen in reality despite seeing the measurements and I had to redesign the mold. Just having the tiny indent to help with removal was not successful functionality wise for the menstrual disc. Neither was it possible to reach all the surfaces of the mold to sand them down, which was an issue concering the cast mold. Silicone takes on any texture it is casted on, therefore a smooth surface was of importance. This two part mold was also hard to take apart once the silicone hardened.

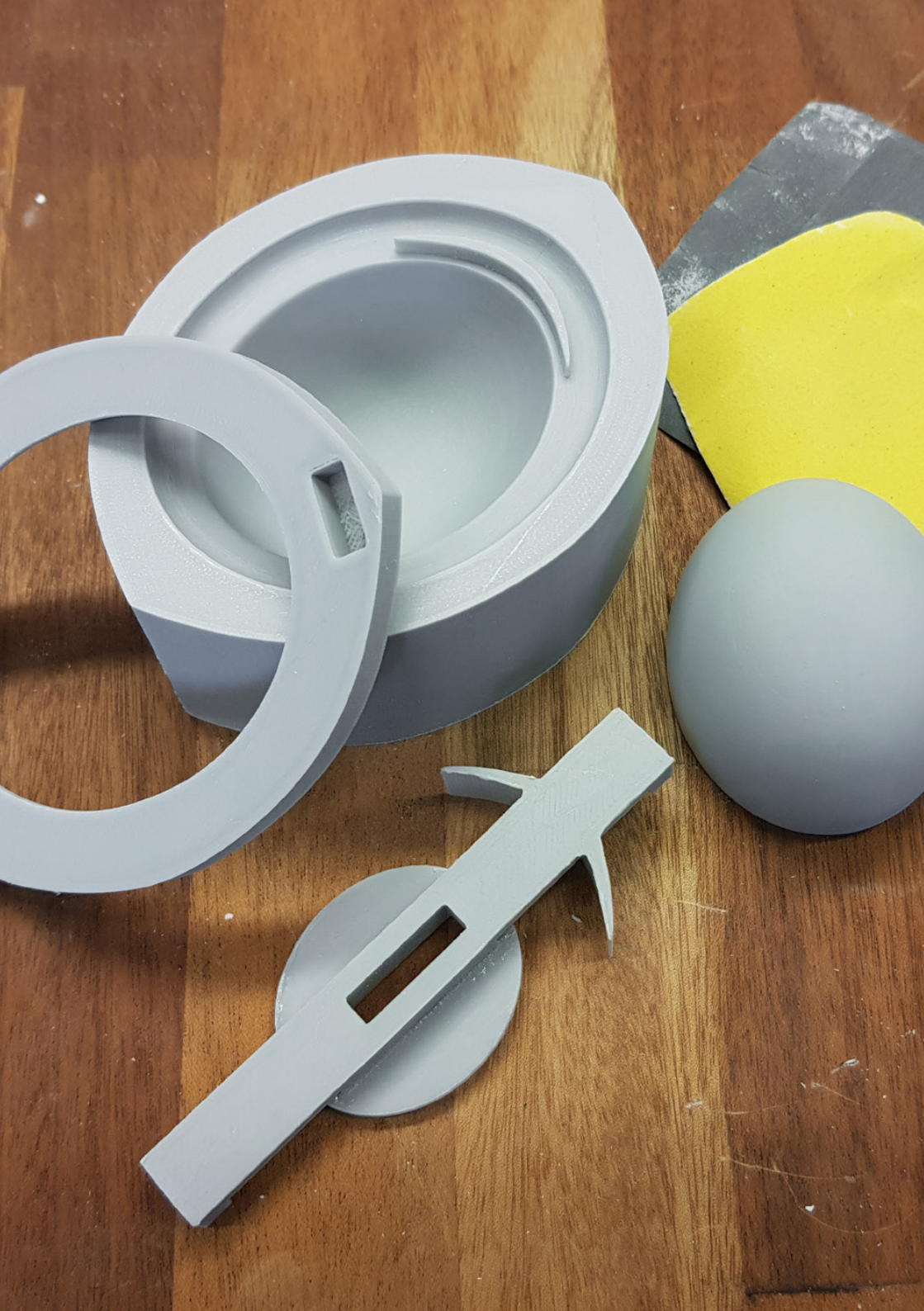



Ultimaker 3

Second Try Casting

I made a new cast mold in Fusion 360 after having discussed with Olof Janson and Paul de Medeiros at IKDC. The mold was split into 5 separate pieces to avoid having parts with support material and surfaces that would be in contact with silicone. I figured splitting it into more parts would also help with removing the hardened silicone from the cast mold. The design of the menstrual disc was also changed for this mold. The useless removal indent was replaced with a pull tab and the dome shape was made more concave and less flat. After the mold was printed I spent many hours on sanding the surface smooth. The mold was then coated in clear spray varnish to make the surface even smoother and to fill the tiny scratches and minor unevenness.



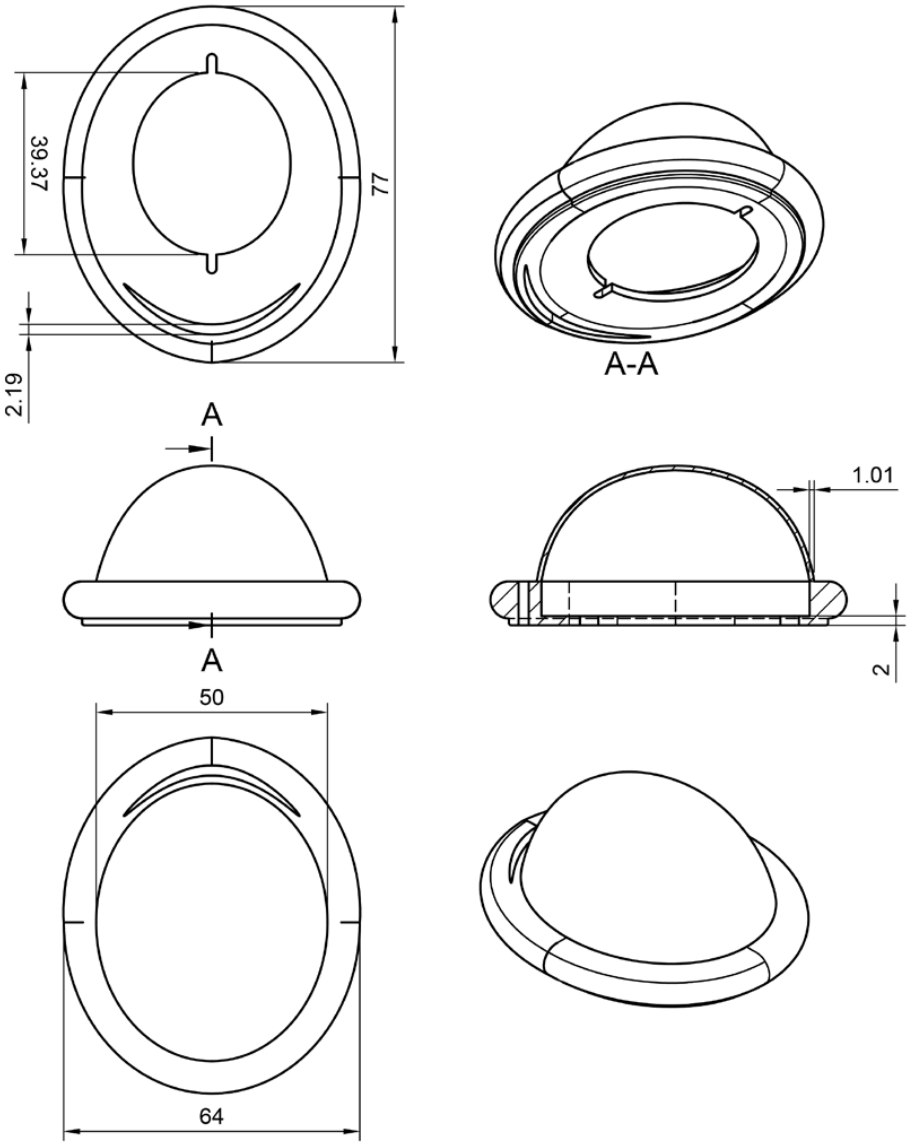



BILTEMA
Art. 36-7415
Klarlack
Klarlakk
Kirkaslakkaa
Klarlak

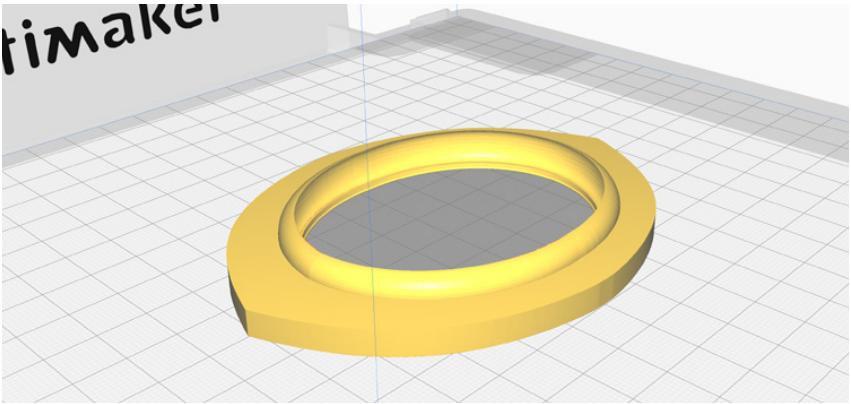
Yet again I mixed blue and red silicone pigments and casted in this new mold. It was hard to mix the pigments as even the smallest amount was extremely rich in color. Just like the cast mold for the first try I learned that it was still very hard for me to picture how a 3D object I created on my laptop would look like in reality. Prior to this project I had worked very little with 3D and rather focused on creating models directly in reality. The rim of this casted menstrual disc was a bit thicker than I imagined when I actually held it in my hands, which made the disc feel huge when folding it for insertion. Other than that everything turned out as it should. The hardened silicone was a little difficult to remove from the lower part of the mold and required a lot of pulling and breaking my nails. This could have been simplified by applying vaseline to the mold as a release agent before pouring the silicone in, but as this was an extra step in the process I did not do it. Reflecting back to this point I could also have split the lower part of the mold in two, but that would give me a split line. Vaseline could also have been beneficial for removing the inner dome part of the mold from the silicone. Although rinsing the hardened silicone part in water and getting water between the silicone and the mold worked well. It was also important to cut the excess silicone on the no spill rim before attempting to pull the dome part of the mold out of it. One small tear easily led to ripping the silicone apart.

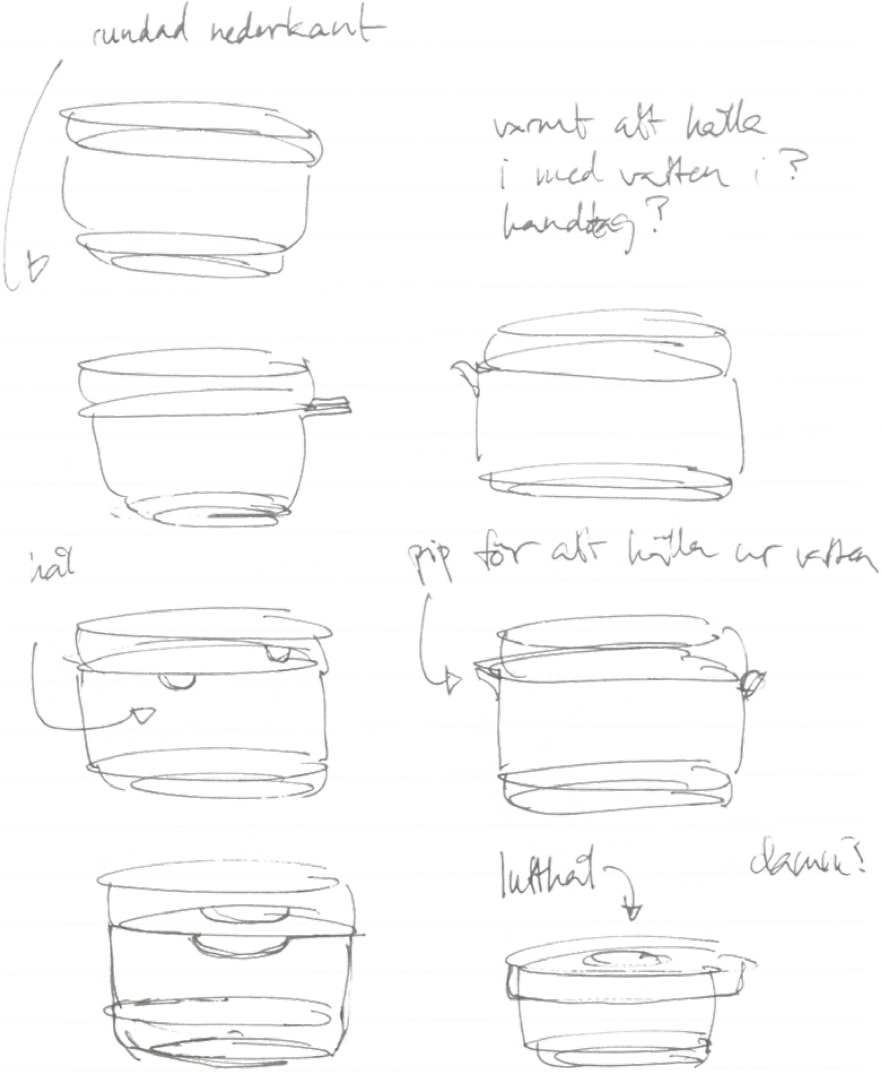
Third Try Casting

Since the rim ended up thicker than I wished I printed a new interchangeable part to the mold to make the rim thinner. This ended up being my final mold. In reality I would have liked the no spill rim to be thinner as well. But I did not do this with my prototypes as I believe that would increase the risk of the silicone tearing when removing the inner dome part of the mold. The silicone I used from Slöjd-Detaljer had some elasticity, but it was not elastic enough to have been stretched in that way.


39.37
77
2.19
A-A
A
A
1.01
2
50
64

The new interchangeable rim part of the mold was sketched directly as one piece in Fusion 360, without altering my sketches of the menstrual disc. As I am finishing up this documentation a few months after the project, I ended up messing up my project files in Fusion 360 by accidentally deleting a few sketch lines. As stated earlier on, I am a beginner at Fusion 360 and I still haven't figured out a way to restore my mistakes, if there is one. The drawing to the left are actually showing the measurements from the second casting. For this third casting the measurements of the outer rim was decreased by a couple millimeters using the new rim part for the mold, see the image below. Some edges that are shown on the drawing are further not existing in the actual mold and on the final prototypes, as I changed my mind about these after the printing and ended up removing the edges by hand with sandpaper.

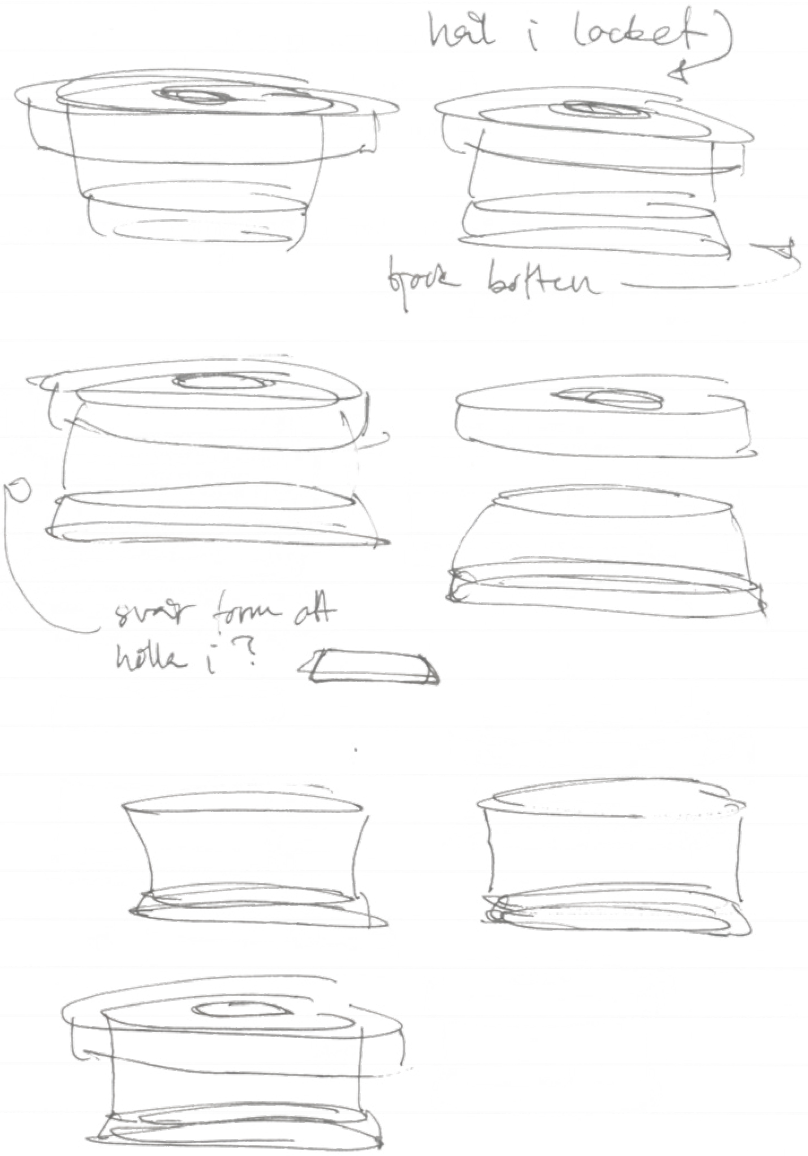



rundad nederkant
varmt att hälla i med vatten i?
handtag?
rör
pip för att hälla ur vatten
lufthål
damm?

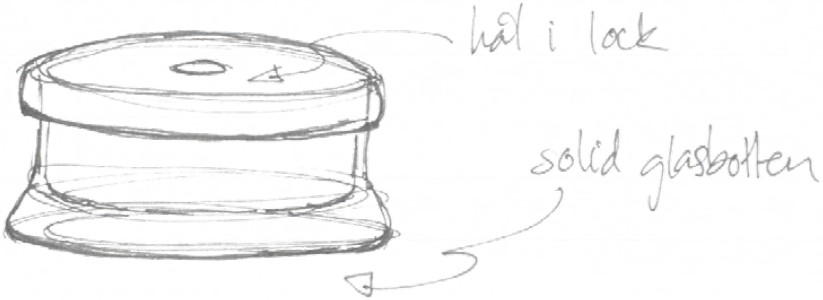
STORAGE

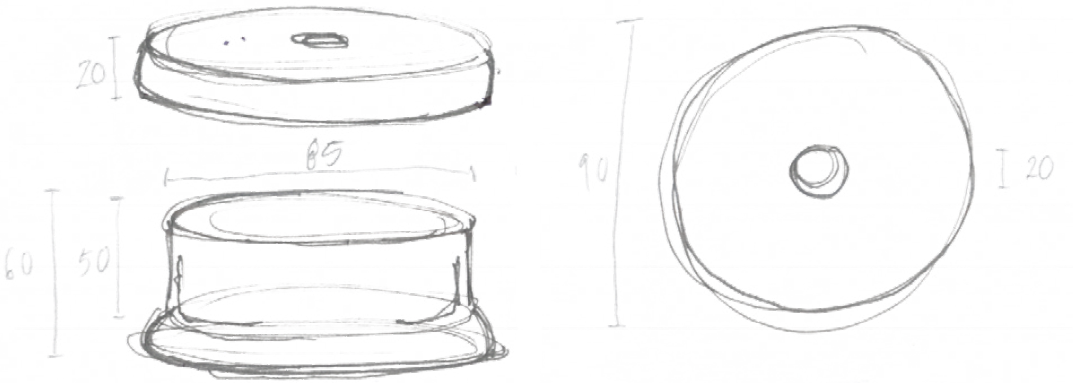
Storing the Disc

A lot of menstrual discs and menstrual cups on the market today are either sold with a textile or silicone pouch for storing your product in between your cycles. The storage needs to be airy as bacteria can start growing in a sealed up moist environment. You can also find some foldable silicone mugs for either storage and to be used to sterilize your device in by filling it up with water, placing your product inside and then putting it in the microwave for a few minutes for the water to heat up. A menstrual disc or cup is supposed to be sterilized between uses with boiling water. I wanted the storage of my disc to encourage sterilizing it. I also wanted it to be something you did not feel like you had to hide in your bathroom drawer. My inspiration was bathroom storage solutions, such as toothbrush holders and jars for cotton pads. The storage should be something you could put in an open bathroom shelf if desired. It should also be water resistant, be microwave safe, heat resistant and have air holes to allow the disc to breathe when stored to prevent bacteria growth. I was deciding between having a storage in ceramics or glass.


hål i locket
tryck botten
svår form att
hålla i?

Burk med lock






The Clay Lab
Keramikverkstad, Ateljé och Butik

The Clay Lab

I went to The Clay Lab in Malmö and having a storage jar made in ceramics then became the first step. When meeting the the studio owner Stella I mentioned my initial idea of potentially creating the same jar in glass as well. She pointed out that a glass jar would allow you to see everything in it. Would it be disgusting to see the menstrual disc floating around in it during sterilization and perhaps see some tiny dried up blood particles floating around, depending on how well you rinsed it in water before sterilizing. Stella did have a point. Regardless of the glass being colored or not it would still be transparent to some point. This statement made me decide on making a ceramic jar. The storage jar in itself was kept on a conceptual stage. For further development there are more considerations that could be made, such as how the hot jar should be handled after microwaving it and how this could be produced industrially.


CERAMA

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heme heme

HeMe
Heme

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mmmm...

heme heme heme heme

HEME HEME HEME heme

•HEME heme heme

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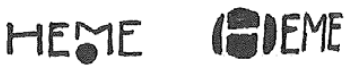
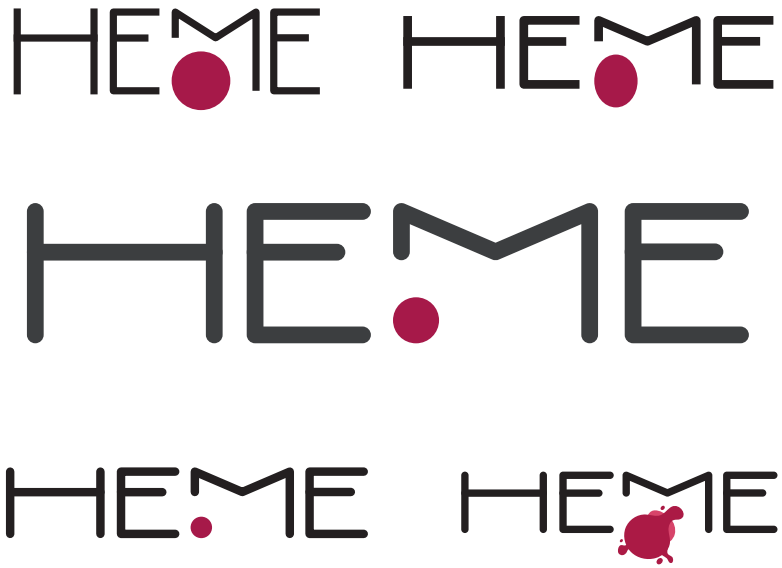
heme



BRANDING

The Brand

One of my last things to do was to find a brand name for my menstrual disc. I decided on the name Heme. Heme is a chemical coordination complex that is a component of hemoglobin, which is found in blood and gives it its red color. The word heme comes from the Greek word for blood. I played around with different logotypes before I finally settled on one with rounded capital letters with a red detail, symbolizing either a drop of blood or the menstrual disc itself.



FINAL PRODUCT

Heme

Heme is a menstrual disc for your period. It is made out of medically grade silicone and can be reused for years. Heme features a no spill rim to make removal of a blood filled menstrual disc less messy. It it easy to fold in half for insertion and has a pull tab which you can hook a finger into for easier removal. Heme comes with a ceramic storage container that can also be used to sterilize your menstrual disc in between your cycles. Simply put your disc in the container and fill it up with water. Microwave the container for a few minutes to heat up the water and sterilize Heme. Let it cool off and pour the water out. Heme can now be stored in the container until your next period. The hole in the lid allows for air flow and prevents bacteria growth.

Reflection

Looking back on this project I learned how to use Fusion 360 to create my product in 3D in order to make the 3D cast molds. I got a better insight in silicone casting throughout my experimentations. I did not really do anything about the issue with not having several sizes in menstrual disc as I addressed in my brief. Although the concept for Heme would be that it should be available in different sizes, despite the fact that I did not have time to make different sized prototypes as it took a lot of time to sand the mold and achieve the smooth surface. Apart from menstruating people, I did not further specify the target group for Heme as I did not explore the cultural aspects of period care. The survey featured in this documentation had its focus on menstruating people in Sweden. Sweden is at the moment one of the target countries four Heme. In the future more research could be done on menstrual norms based on cultural aspects to further determine where Heme could have its user group and what these people want. Lastly I would like to make a working prototype in medically grade silicone that could be tested.

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Appendix

Kateřina Kadlecová Makrlíková

Owner of Pesarshop, a Czech webshop for diaphragms. She is one of the founders of the cervical cap Evanella. Kateřina Kadlecová Makrlíková has worked in the field on non hormonal contraception since 2010.

Birgit Linderoth

Also known as Gröna Barnmorskan, the company she started back in 2009. She is promoting the use of non hormonal contraception the FemmyCycle menstrual cup. Birgit Linderoth is a midwife based in Falun, Sweden.

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Christina Zhou