

AESTHETIC DURABILITY & REPAIR

APPENDIX

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APPENDIX 1 - PROJECT BRIEF

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according to the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name 6526
 initials given name
 student number 4598865
 street & no.
 zipcode & city
 country
 phone
 email

Your master programme (only select the options that apply to you):

IDE master(s): ☒ IPD ☐ Dfl ☐ SPD

2nd non-IDE master:

individual programme: - (give date of approval)

honours programme: ☐ Honours Programme Master

specialisation / annotation: ☐ Medisign

☐ Tech. in Sustainable Design

☐ Entrepreneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair Dr. ir. S.F.J. Flipsen dept. / section: Circular Product Desig
 ** mentor M. Filippi dept. / section: Aesthetics
 2nd mentor
 organisation:
 city: country:
 comments (optional)

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v.



Second mentor only applies in case the assignment is hosted by an external organisation.




Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

Procedural Checks - IDE Master Graduation

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Dr. ir. S.F.J. Flipsen date 26 - 5 - 2023 signature 

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

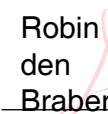
Master electives no. of EC accumulated in total: 30 EC

Of which, taking the conditional requirements into account, can be part of the exam programme 30 EC

List of electives obtained before the third semester without approval of the BoE

☒ YES all 1st year master courses passed

☐ NO missing 1st year master courses are:

name Robin den Braber date 31 - 05 - 2023 signature 

Robin
den
Braber
Digitaal
ondertekend
door Robin den
Braber
Datum:
2023.05.31
16:01:41 +02:00

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks?
- Does the composition of the supervisory team comply with the regulations and fit the assignment?

Content: ☒ APPROVED ☐ NOT APPROVED

Procedure: ☒ APPROVED ☐ NOT APPROVED

comments

name Joni Schuurman date 20 - 05 - 2023 signature 

The possibility and desire to repair: a case study on the toastie maker project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 15 - 05 - 2023

06 - 11 - 2023

end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

EASE OF REPAIR

The Ellen MacArthur Foundation's "Circular economy systems diagram" illustrates how within each stage of the technical cycle products are allowed to remain rather than becoming waste. The inner loop, maintaining and prolonging, is where most value can be captured as the product is kept whole (Ellen MacArthur Foundation, 2019). To incorporate this idea into design practice means, among other things, to "design for physical longevity" and to "design for reparability". This means designing products that are durable and can be easily repaired rather than being discarded when they break or become outdated. This is exactly what the European Commission's proposal of the "right to repair" (2023) is about. Both inside and outside the legal warranty period, repairs of goods should become easier and cheaper.

However, creating products that users want to keep and repair is not just a practical matter. Because how does one design things that users want to keep, take care of and repair? In other words, how does one design things that people get emotionally attached to? I am under no illusion that there is a clear-cut approach to achieve this. There are many different, personal reasons for people to get attached to the things they own. Due to this subjective nature, I do not believe, nor have the intention of persuading people towards forming a particular attachment with something. However, I do think that there are certain factors to bear in mind that could contribute to making a product more desirable for a user to maintain.

In their research on consumer-product attachment, Schifferstein & Zwartkruis-Pelgrim (2008) find that "to increase the sustainability of people's consumption patterns by stimulating the degree of attachment between people and the product they own [...] designers should design products that evoke enjoyment, or facilitate the formation of associations between products and people, places or events (memories)".

HAPTICS

The first factor asks for products that evoke sensory and aesthetic pleasure. As Schifferstein & Zwartkruis-Pelgrim (2008) state, "a design strategy for achieving this can begin by evaluating the signals emitted by the product and the corresponding sensations perceived by the sensory systems (such as vision, audition, touch, smell, and taste) during use. The designer can then aim for a pleasant combination of ways to stimulate the product user". Jasper Morrison's definition of haptics, as quoted by Kenya Hara (2015) in his book "Designing Design" provides a beautiful description of a similar train of thought. Morrison describes haptics as "to make the senses drool", on which Hara commented "When we're hungry, we salivate at the sight of an inviting dish or savoury grilled meat, but Morrison meant haptic as the experience of seeing something that made all the senses "drool". What a fantastic metaphor"

TEMPORALITY

The second factor, as suggested by Schifferstein & Zwartkruis-Pelgrim, involves designing products that support the accumulation of memories. They talk about products showing physical signs of events and ageing with dignity, adding to the richness of the shared history of the owner and product. However, I feel this concept can be viewed more broadly, as it can also apply to the temporal relationship between product and environment, visible signs of how a product is produced, or any other temporal characteristic of an object. In her book "Aesthetic Sustainability", Kristine Harper (2018) describes how "as an object becomes a container of time – and thus physical, material, or concrete stories – it is charged with emotional and

space available for images / figures on next page

introduction (continued): space for images



Ease of Repair
Disassembled toaster by Todd McLellan



Haptics
Paper cabbage bowls by Yasuhiro Suzuki



Temporality
Do hit chair by Marijn van der Poll for Droog

image / figure 1: A few images to illustrate the topics of repair, haptics and temporality as outlined in the introduction



image / figure 2: A €10,95 toastie maker from Action

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Sustainable product design has become increasingly urgent and is fortunately receiving much-needed attention. However, determining what qualifies as a sustainable product is challenging, as there are many ways to view this from a design perspective. The approach of this exploration stays close to the product's essence, aiming to design products that are long lasting in the physical and emotional sense, as this is how products will be kept whole and in use as long as possible. Two main questions will be explored within this research, through a case study of the toastie maker.

1. SPECULATE

What would the toastie maker look like if it were designed prioritizing the possibility and desire to repair? (How would this impact designers' perception of appliance design?)

2. REALISE

What could a realistic embodiment look like, and how would it fit into our current world? (What aspects of it would be realistic, and what wouldn't?)

The questions will be explored through theory and methods on the possibility and desire to repair, as outlined in the introduction.

Ease of Repair - To be able to repair
Haptics - To make the senses drool
Temporality - To charge with time

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

The project aims to research and demonstrate the possibility and desire to repair of products through a case study on redesigning the toastie maker. This will be approached through embodiment design, based on theory and methods on repair and product attachment.

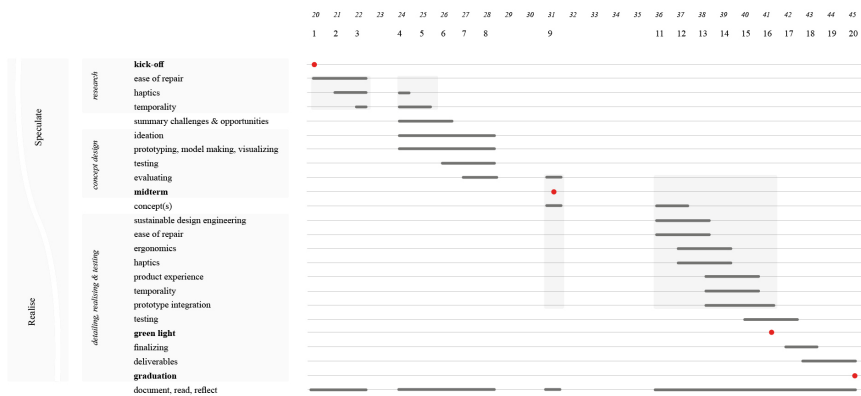
While the toastie maker is a cheap appliance found in most Dutch households, its prevalence often leads to its use becoming so self-evident that it goes unnoticed. While it may not be the most glamorous and even a bit of a silly kitchen appliance, it remains true to its purpose without any pretense or deception. Its authenticity and everydayness make it an ideal subject for my exploration, as it has the potential to reveal new design perspectives clearly. In addition to its suitable character, the toastie maker is also difficult to repair and so cheap that it is often treated as disposable. Even though it may be used frequently and provide enjoyment, it fails to develop a sense of attachment with users and is readily replaced when breaking down.

The first phase of the project will be a broad and speculative exploration of ease of repair, haptics and temporality through prototyping. Research and concept design are closely intertwined and have a significant influence on each other: theory will be translated into tangible outcomes through speculative prototyping, model making, and visualizing. The expected results are several experimental (sub)concepts, collected in a booklet. Moving to the second phase, the goal is to detail one of the, or a combination of concepts from the first phase and create an integrated, functioning prototype that represents a realistic embodiment. Technological and aesthetic perspectives will continuously shift and merge throughout both phases.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 15 - 5 - 2023 6 - 11 - 2023 end date



The project is intended to be a full-time endeavour with two main phases of speculating and realizing that involve an ongoing loop of documenting, reading, and reflecting, as well as necessary meetings.

EASE OF REPAIR - 3 to 5 products will be dismantled and analysed through disassembly maps and hotspot analysis, leading to new concepts through ideation and prototyping.

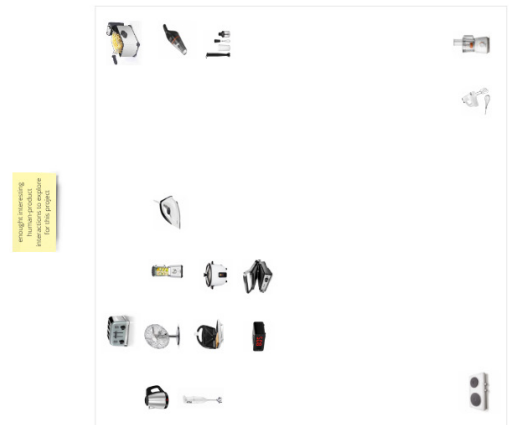
HAPTICS - In the assignment for his Haptics exhibition, Hara emphasizes the importance of prioritizing designing to tickle the human senses, rather than starting from shape or colour. The design process will involve researching materials, textures, details and mechanisms through sensory imagination and user testing. Rather than limiting the design to the traditional five senses, haptics will be explored through experiences such as "sense of pressure," "sense of temperature," and "sense of weight," recognizing the interconnectedness of all sensory experiences.

TEMPORALITY - Drawing from research on "A Feeling of Temporal Empathy" conducted by my brother Tom during his architecture graduation project at the TU Delft, the (dismantled) products will be viewed through twelve different temporal lenses, including "cycles," "ritual," "memory," "growth," and "deterioration." Models of potential designs will be built and tested against existing references and contextual factors to explore the temporal dimensions.












I anticipate taking several weeks off in the middle of the holidays, with the midterm planned before the summer, in consultation with the mentor and chair. I have also planned in one week off due to Dutch national holidays and a visit to Milan.

APPENDIX 2 - CASE STUDY SELECTION

Making the selection based on the criteria



Weight distribution of criteria

														
100	right level of complexity	4	5	5	2	2	5	3	2	5	17	12	3	
80	reliability	4	2	1	3	5	4	4	4	4	17	12	3	
50	cost independent performance	3	3	1	4	5	5	3	3	3	17	12	2	
50	product originality	3	4	3	5	5	1	3	2	5	17	12	4	
	without weight	14	14	10	14	17	15	13	12	17	17	12		
	with weight	1020	1010	780	890	1100	1120	920	870	1220	1100	840		

APPENDIX 3 - HOTSPOT MAP

HotSpot Mapping Datasheet

General project information

Brand name	Action
Product category	Sandwich toaster
Authors	C. Vooren
Date	mei-23
Location	IDE TU Delft

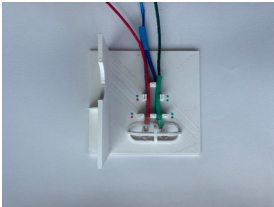
Overall HotSpot Results

	Average:		14.1 sec/step	
Total:	- time to disassemble	282 sec	- time per step	
	- number of tasks	47	- force	5 [1=low .. 5=high .. 10=extreme]
	- number of steps	20	- accessibility	3 [1=clear .. 5=moderate .. 10=difficult]
	- number of tools	2	- positioning	5 [1=easy .. 5=moderate .. 10=difficult]

[illegible]

APPENDIX 3 - RE-DESIGN PROCESS IMAGES

Prototyping experiments,
including several failed ones



APPENDIX 4 - DDW RESEARCH

Translating fundamental needs to experiential qualities



Experiential qualities and their fundamental need

Feeling that your conditions and environment keep you safe from harm and threats, rather than feeling that the world is dangerous, risky or a place of undernourishment.

security

TRUST

Feeling that the world is a place of elegance, coherence, and harmony. Rather than feeling that the world is disharmonious, unspeaking, or ugly.

beauty

BEAUTY

Being the cause of your actions and feeling that you can do things your own way. Rather than feeling that external conditions and other people determine your actions.

autonomy

INDEPENDENCE

Having warm, mutual, trusting relationships with people who you care about, rather than feeling isolated or unable to make personal connections.

relatedness

FAMILIARITY

CONNECTION

Having an easy, simple, relaxing life, rather than experiencing strain, difficulty or overstimulation.

comfort

CONVENIENCE

SIMPLICITY

Feeling that the world is a place of clarity and simplicity.

Being mentally and physically stimulated by novel, varied, and relevant impulses and stimuli, rather than feeling bored, indifferent or apathetic.

stimulation

PLEASURE

NOVELTY

Having new and varied experiences or impulses.

Having control over your environment and being able to exercise your skills to master challenges, rather than feeling that you are incompetent or ineffective.

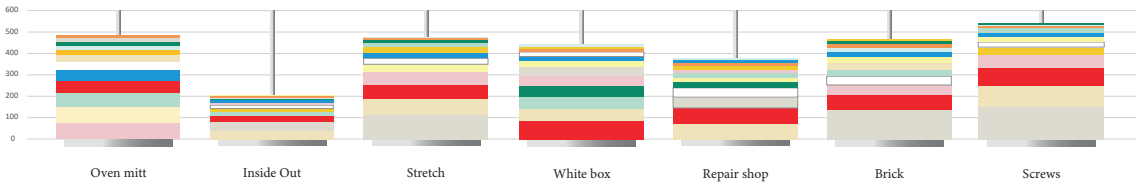
competence

DISCOVERY

EXCITEMENT

Vote counting

Day 9 Trust	6	Discovery	1	Novelty	2	Excitement	6	Pleasure	1	Familiarity	5	Convenience	4	Simplicity	5	Beauty	11	Independence	2	Connection	(other)	2	TOTAL	34
Day 8 Trust	12	Discovery	4	Novelty	3	Excitement	6	Pleasure	10	Familiarity	1	Convenience	6	Simplicity	2	Beauty	11	Independence	1	Connection	(other)	13	84	
Day 7 Trust	8	Discovery	5	Novelty	3	Excitement	4	Pleasure	1	Familiarity	4	Convenience	3	Simplicity	1	Beauty	8	Independence	3	Connection	(other)	5	58	
Day 6 Trust	7	Discovery	2	Novelty	5	Excitement	5	Pleasure	6	Familiarity	3	Convenience	1	Simplicity	2	Beauty	11	Independence	2	Connection	(other)	4	54	
Day 5 Trust	3	Discovery	5	Novelty	6	Excitement	8	Pleasure	8	Familiarity	2	Convenience	2	Simplicity	2	Beauty	8	Independence	1	Connection	(other)	4	46	
Day 4 Trust	7	Discovery	2	Novelty	4	Excitement	11	Pleasure	8	Familiarity	2	Convenience	7	Simplicity	2	Beauty	9	Independence	3	Connection	(other)	3	64	
Day 3 Trust	5	Discovery	2	Novelty	2	Excitement	12	Pleasure	3	Familiarity	3	Convenience	3	Simplicity	3	Beauty	3	Independence	2	Connection	(other)	1	45	
Day 2 Trust	4	Discovery	2	Novelty	1	Excitement	5	Pleasure	9	Familiarity	4	Convenience	3	Simplicity	3	Beauty	15	Independence	2	Connection	(other)	6	54	
Day 1 Trust	4	Discovery	1	Novelty	2	Excitement	13	Pleasure	4	Familiarity	4	Convenience	3	Simplicity	6	Beauty	6	Independence	5	Connection	(other)	5	48	
																					75	37	487	





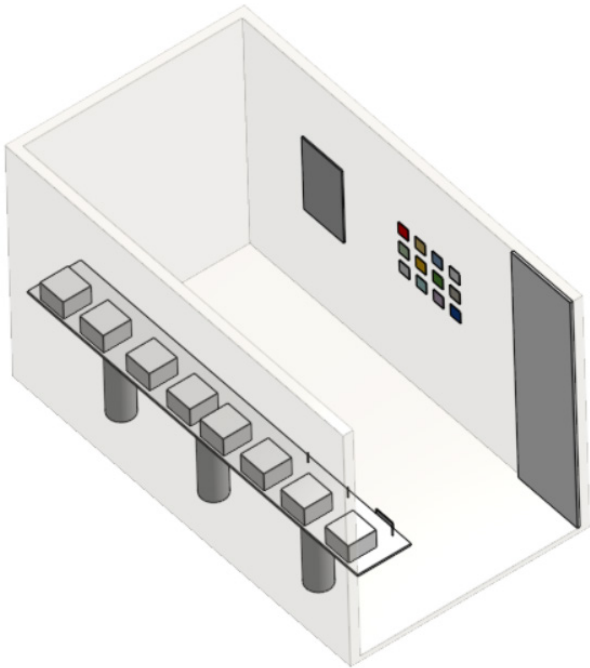
Example of coding the responses on 'connection' in Atlas.ti

Correlation between prototypes,
Correlation between experiential qualities

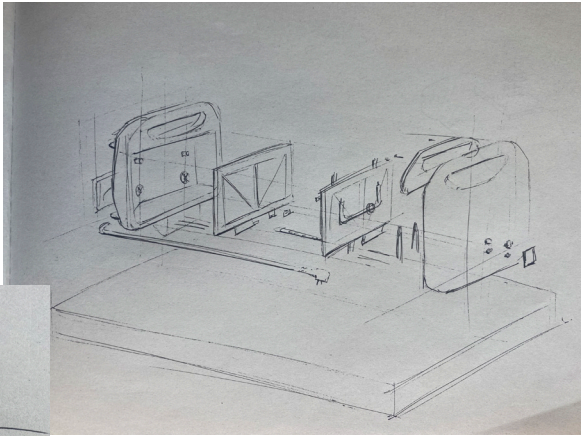
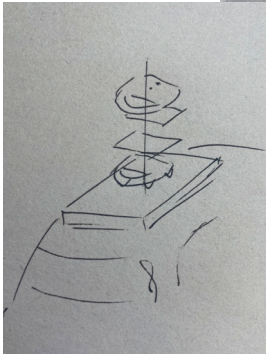
	Oven mitt	Inside out	Vacuum	Transparent	Car repair	Clay	Screws
Oven mitt	1						
Inside out	-0,106900029	1					
Vacuum	0,098867426	0,830873553	1				
Transparent	0,321373195	0,602750913	0,509655892	1			
Car repair	-0,00319697	0,873197575	0,721136441	0,788470809	1		
Clay	0,008328779	0,636683941	0,849207482	0,415832898	0,521889949	1	
Screws	-0,02402693	0,8922235668	0,983385619	0,499258206	0,75084757	0,856453649	1

	Trust	Discovery	Novelty	Excitement	Pleasure	Familiarity	Convenience	Simplicity	Beauty	Independence	Connection
Trust	1										
Discovery	0,498538277	1									
Novelty	0,010374381	0,0565206	1								
Excitement	0,19635097	0,532848275	0,745792108	1							
Pleasure	-0,039937431	-0,024933023	0,68707703	0,764446281	1						
Familiarity	0,050330697	-0,424683633	-0,416078044	-0,188494428	0,215407918	1					
Convenience	0,479012273	-0,051425362	-0,763494179	-0,479826254	-0,374572299	0,712112328	1				
Simplicity	0,42357751	-0,46051996	-0,12178717	-0,458768247	-0,207248942	0,28643916	0,434686689	1			
Beauty	0,325015846	-0,0577733441	0,377952667	0,538360009	0,795419674	0,543728532	0,123395776	0,275580166	1		
Independence	0,70971977	0,438565842	0,309778471	0,214534664	0,046657183	-0,4477704416	-0,052441371	0,180235191	0,022554673	1	
Connection	0,075159548	0,103826615	0,638267455	0,768737435	0,973247013	0,165568116	-0,322429025	-0,253196829	0,75224945	0,218269378	1

Exhibition development



Design ride development

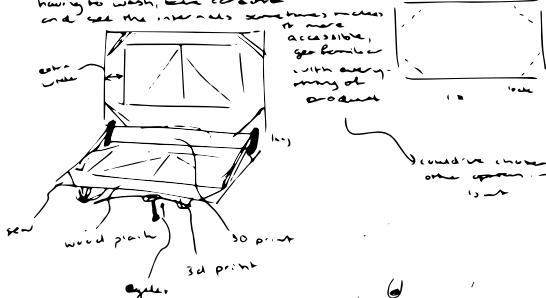


APPENDIX 5 - A STEP FURTHER PROCESS IMAGES

Simple sketches for
further development

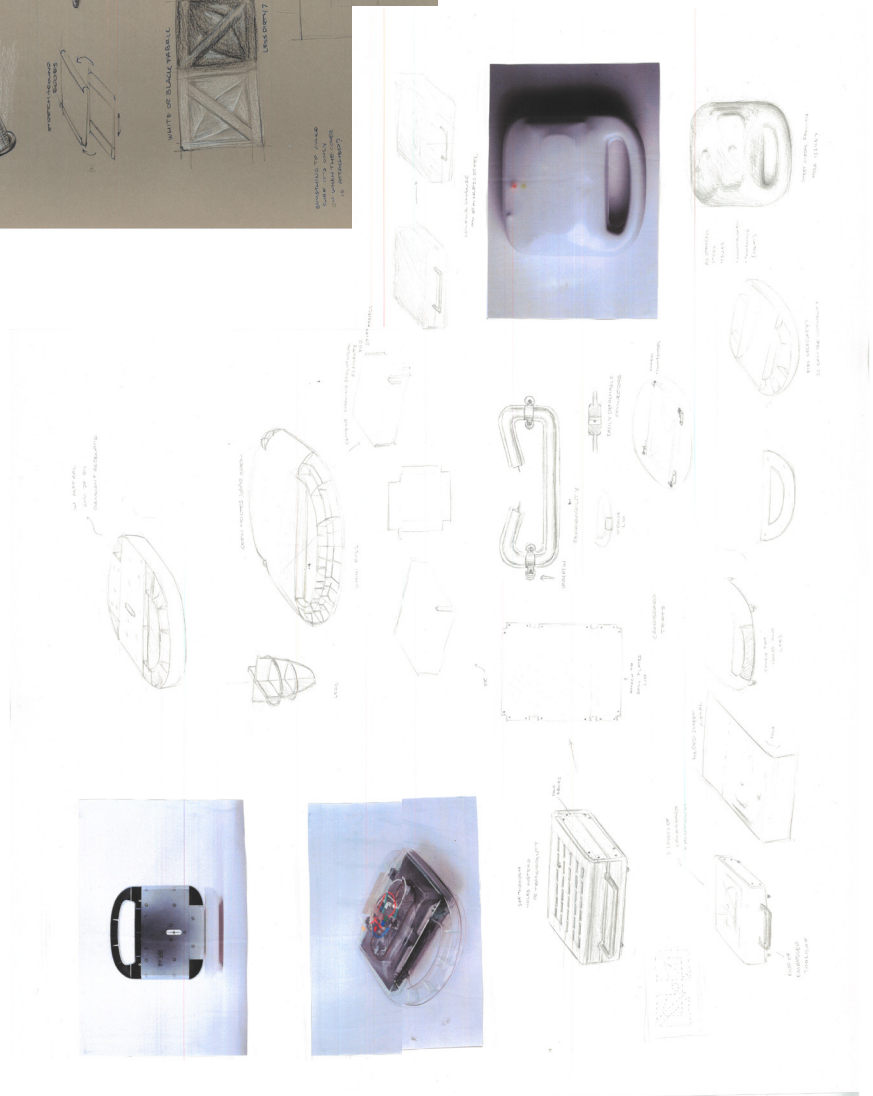
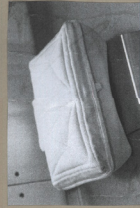
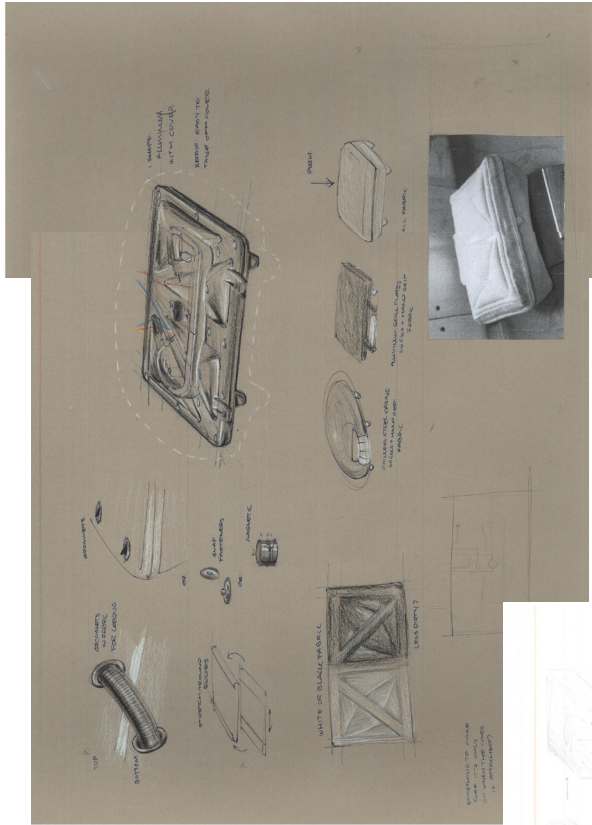


story - 1 shape aluminum
1 layer, peel off
having to wash, use cradle
and see the internal sometimes makes

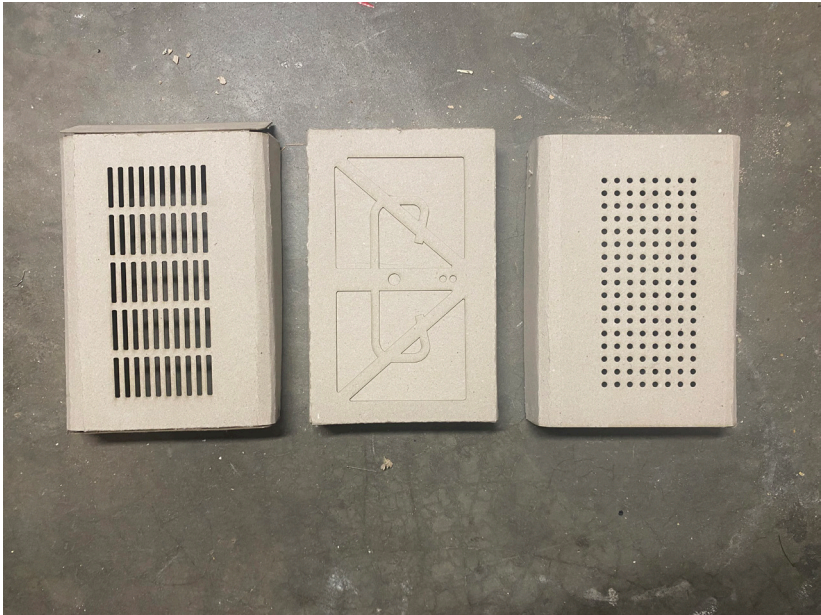


42

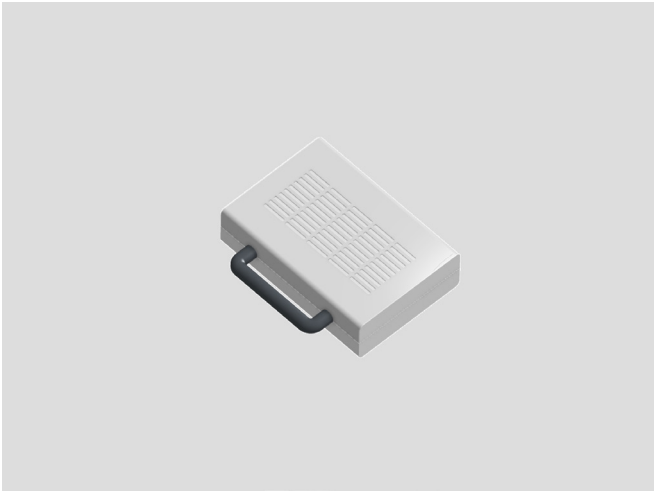
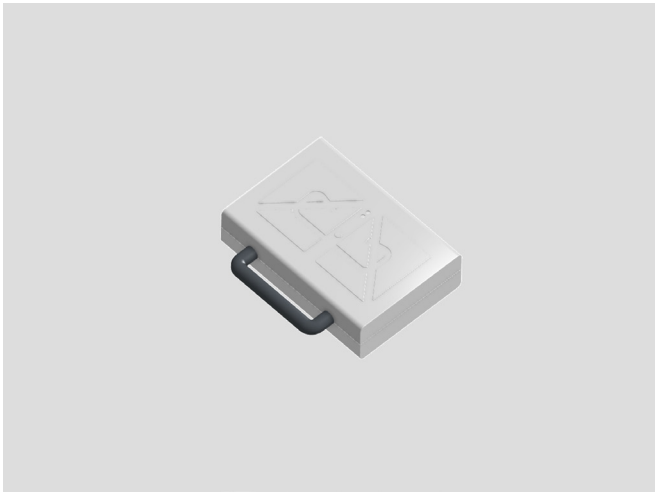
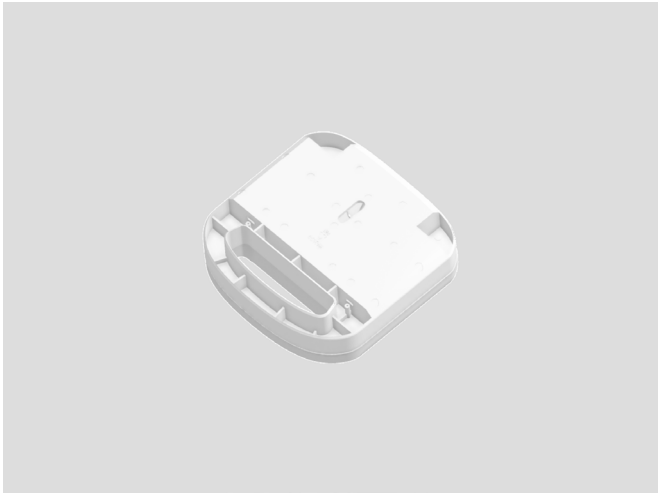
Elaborated sketches for further development



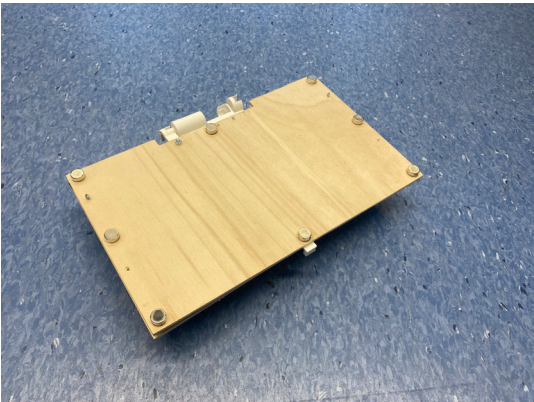
Cardboard tryouts



Digital exploration



Mechanism / textile testing for final prototype



APPENDIX 7 - OVEN MITT HOTSPOT MAP

HotSpot Mapping Datasheet

General project information

Brand name	Action
Product category	Sandwich toaster
Authors	C. Vooren
Date	mei-23
Location	IDE TU Delft

Overall HotSpot Results

Total:	Average:		17.4 sec/step	 3  3  5	[1=low .. 5=high .. 10=extreme] [1=clear .. 5=moderate .. 10=difficult] [1=easy .. 5=moderate .. 10=difficult]
	- time to disassemble	- time per step			
- number of tasks	45	- force			
- number of steps	16	- accessibility			
- number of tools	2	- positioning			

[illegible]