

BIKE LIGHT PROJECT

ADVANCED CAD AND CAM



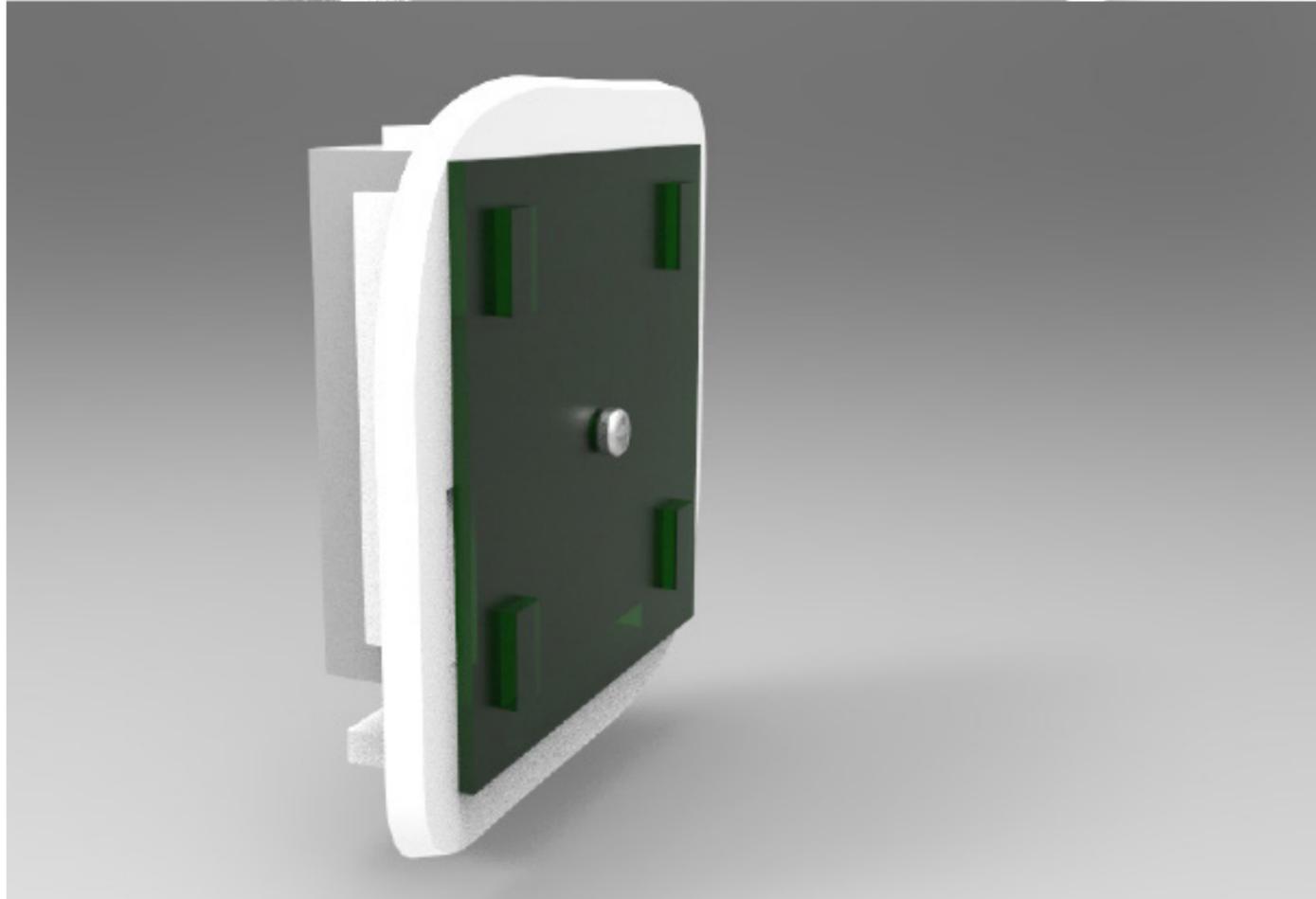
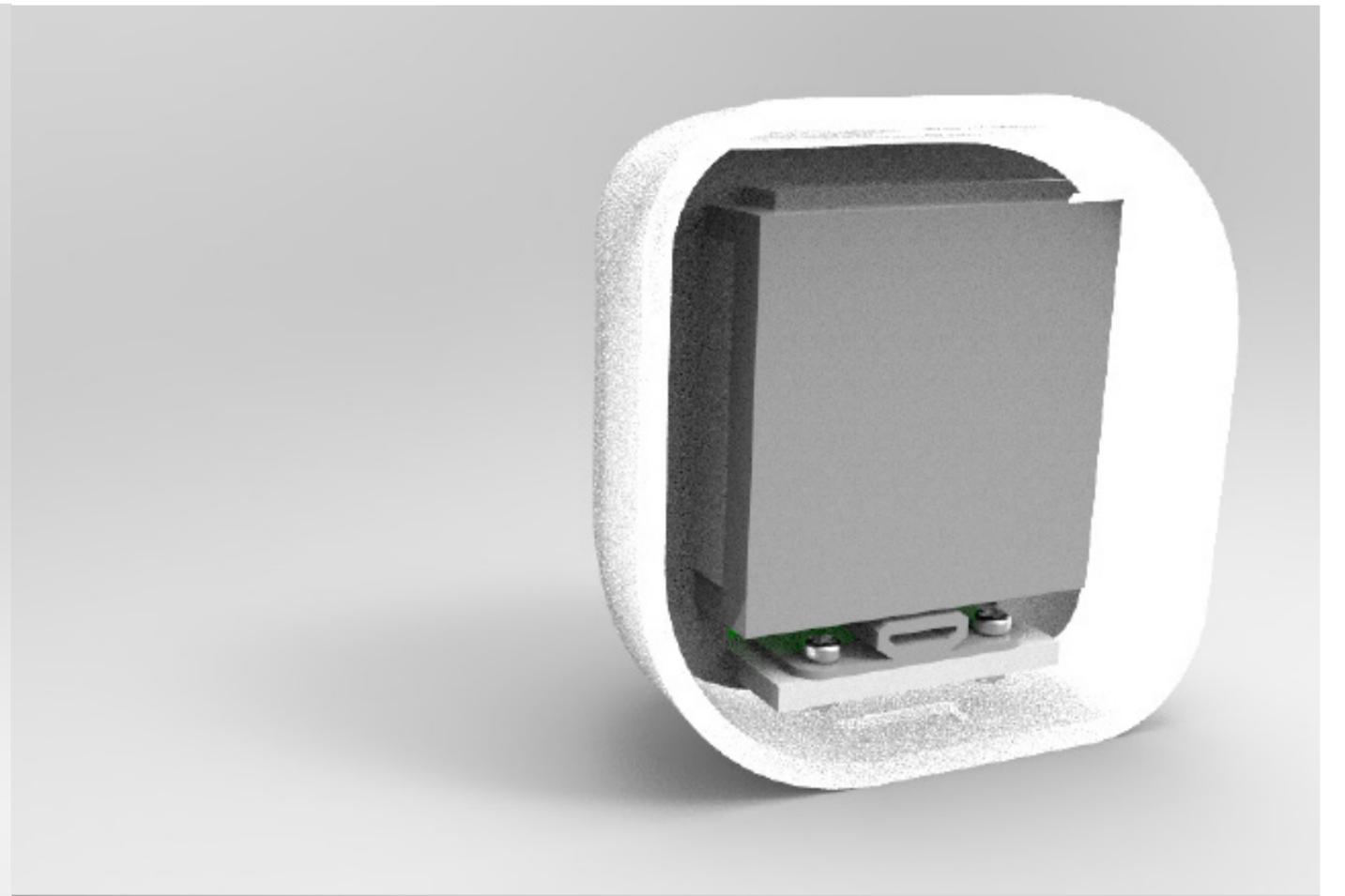
A3 boards

- o Renderings of the detailed design
- o Technical drawings of assembly and components, including batteries and PCB
- o Exploded view with bill of materials
- o Draft analysis
- o Plastic moulding analysis of one plastic injection moulded component – short shot and sink marks

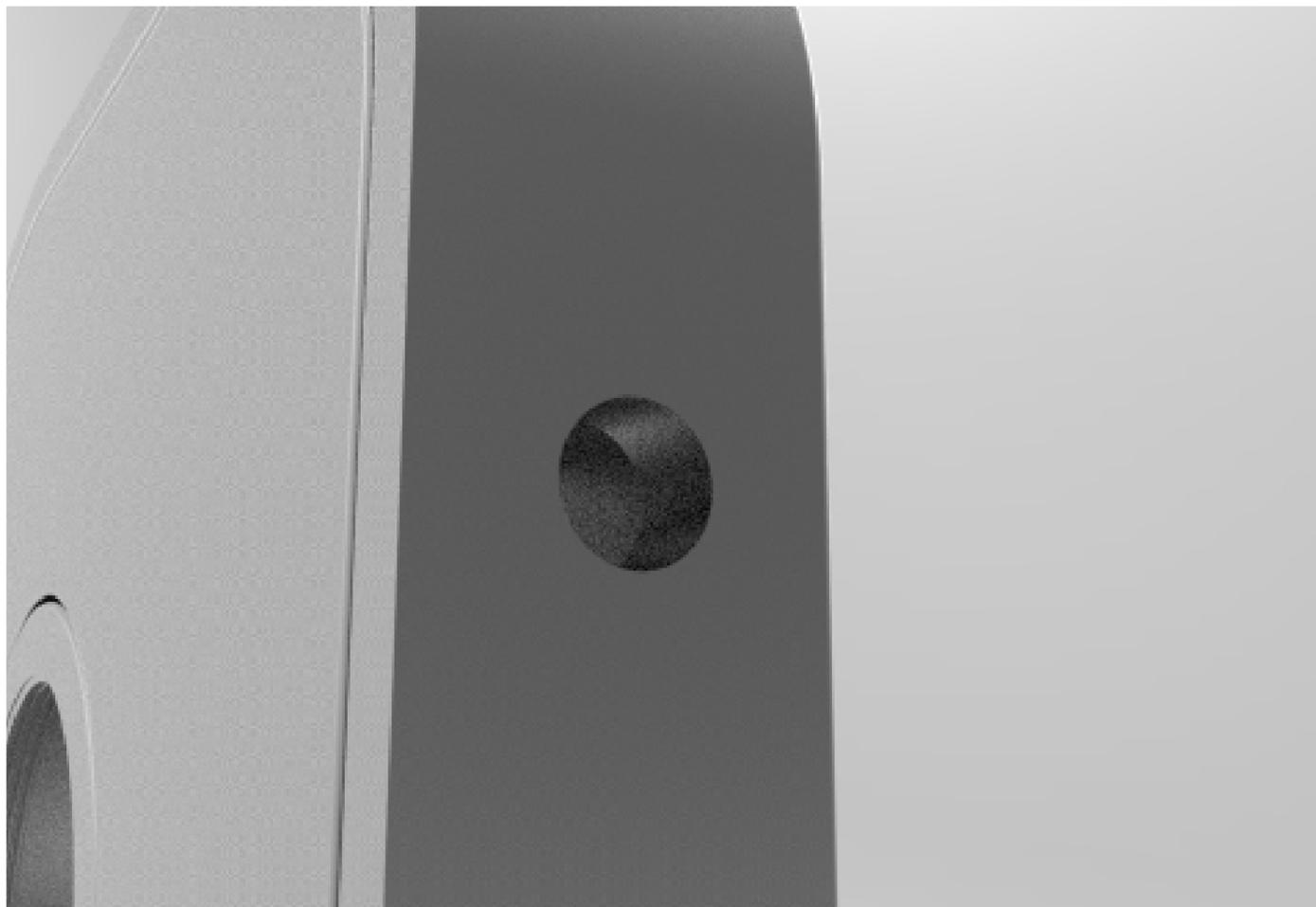
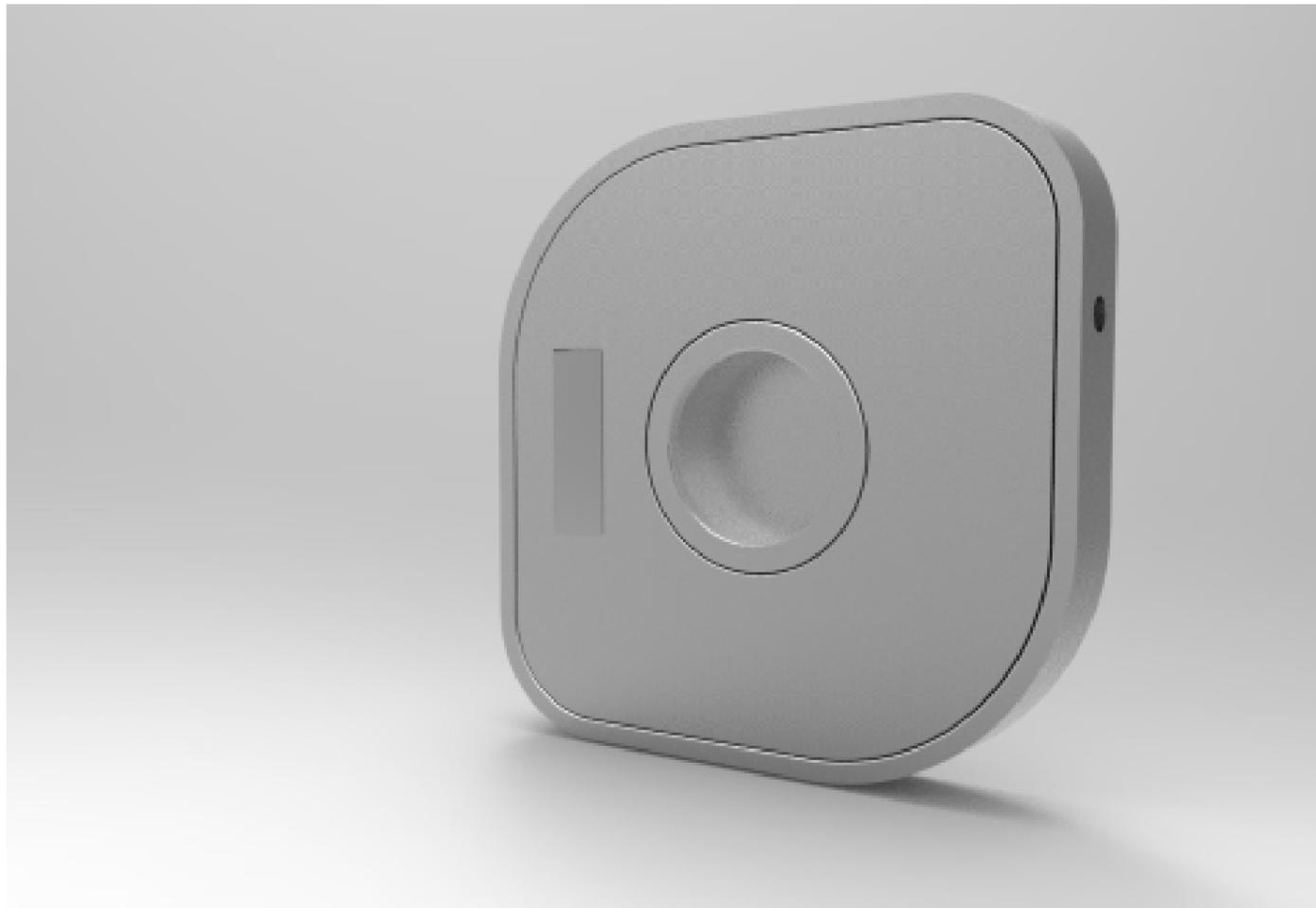
A3 boards technical research and development of ideas for this project.

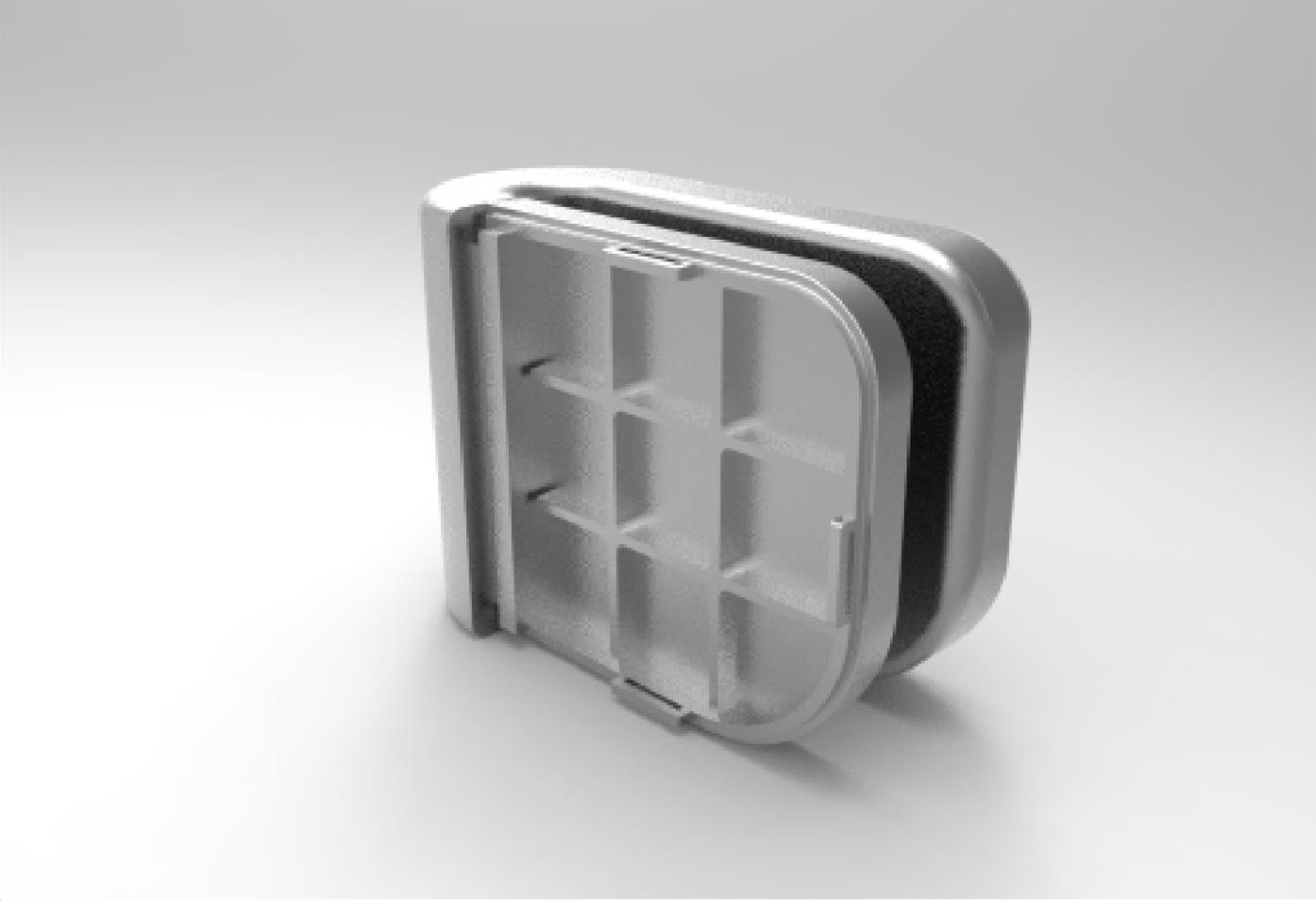
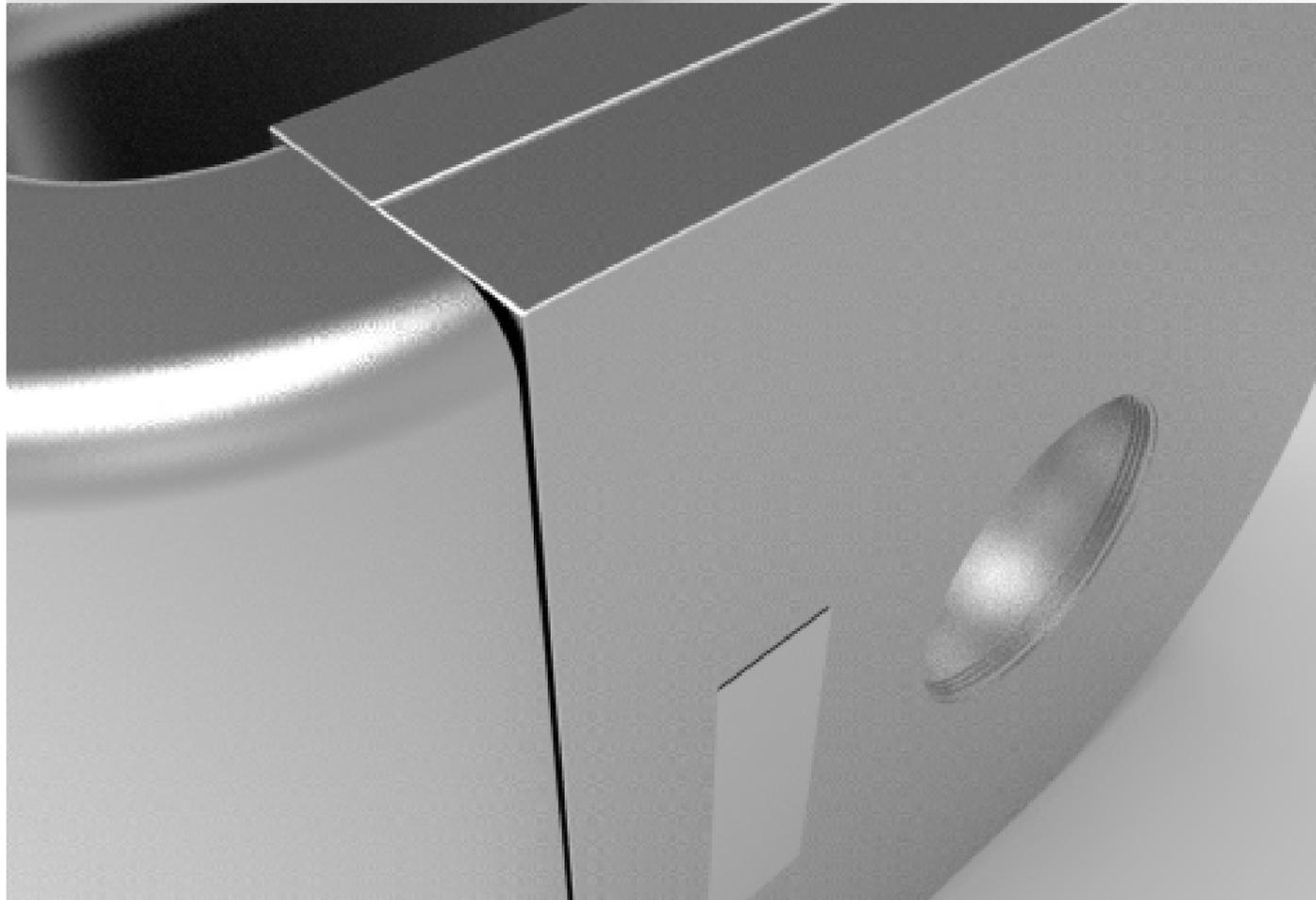
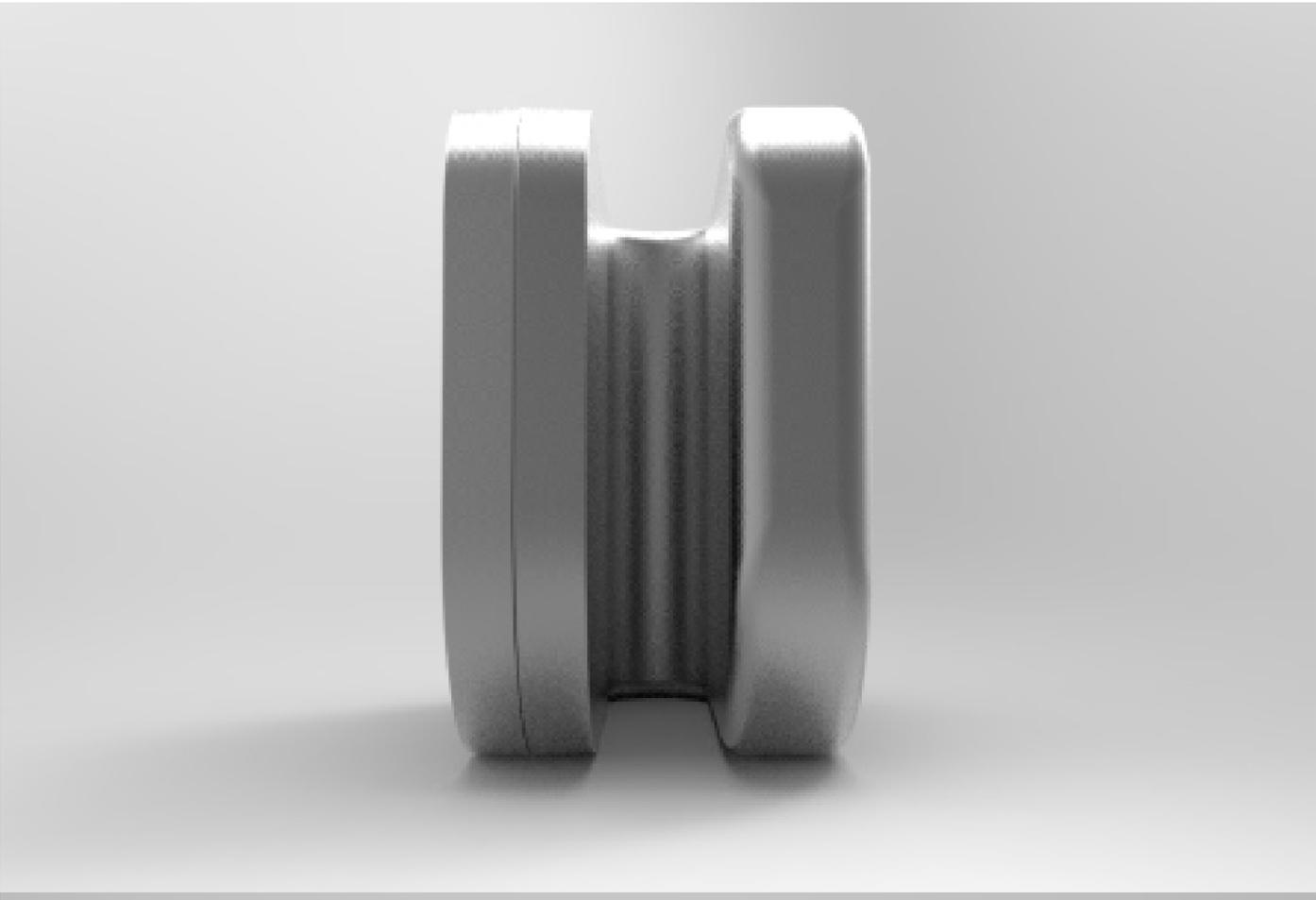
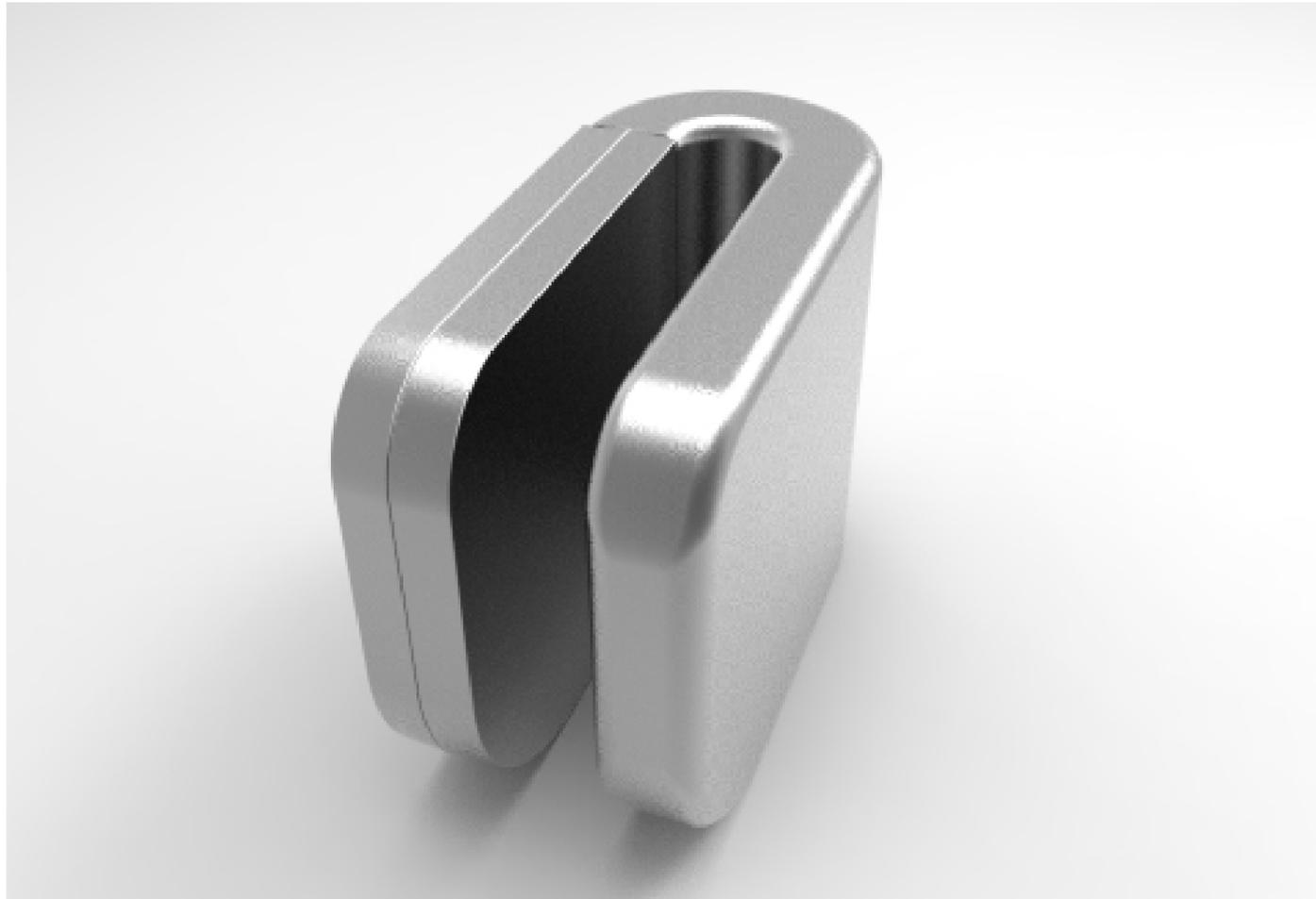
Finished prototype A3 photos

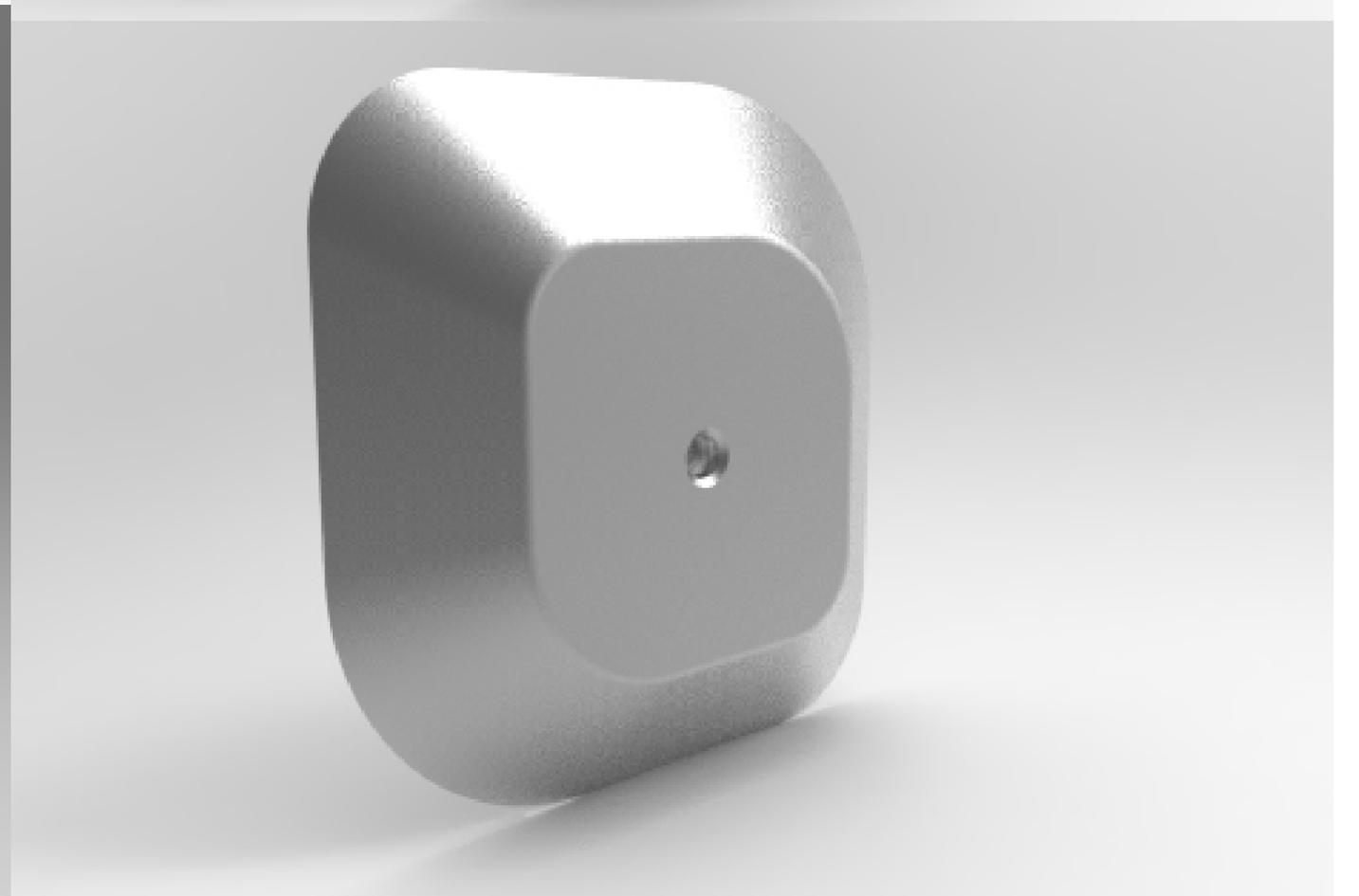
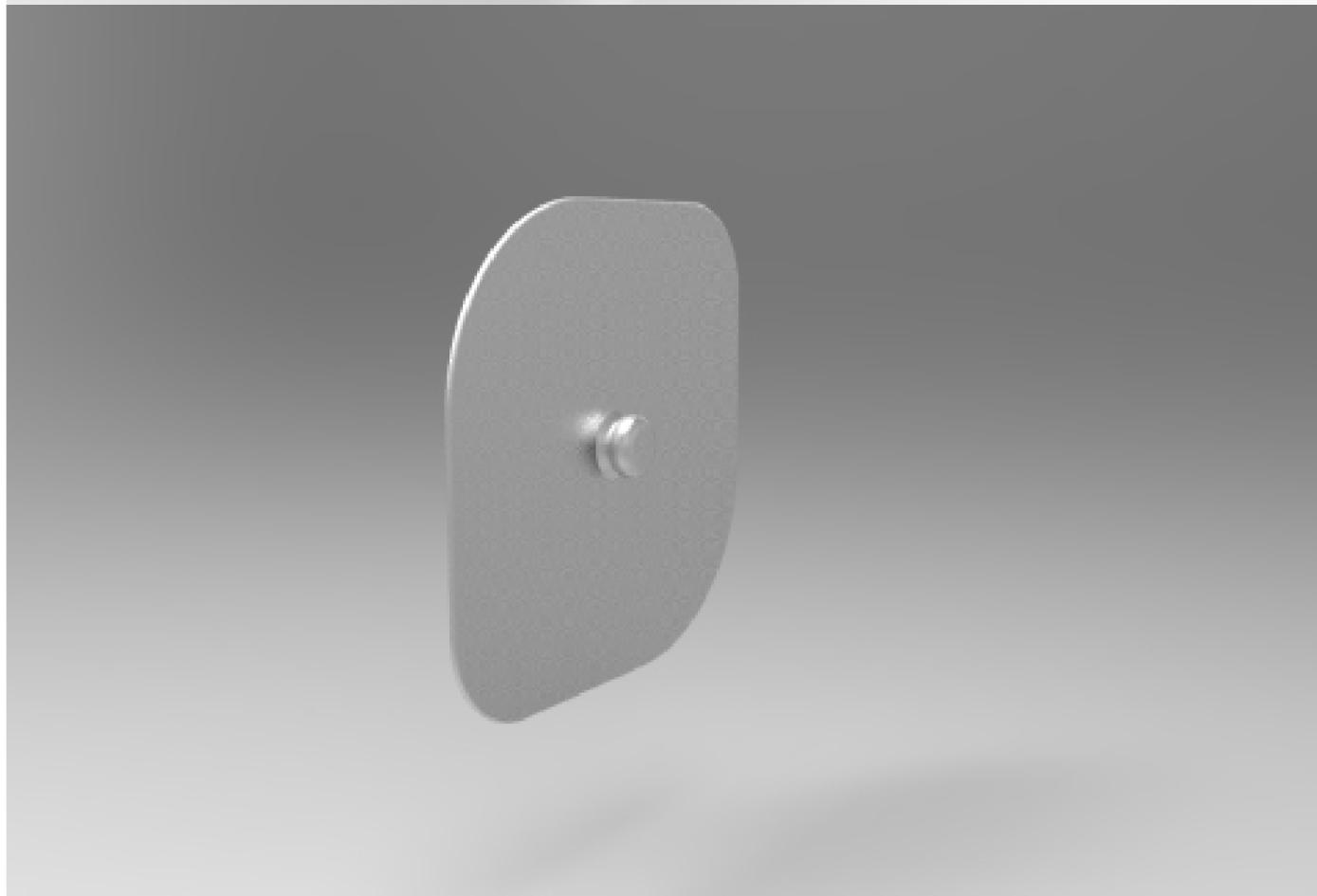
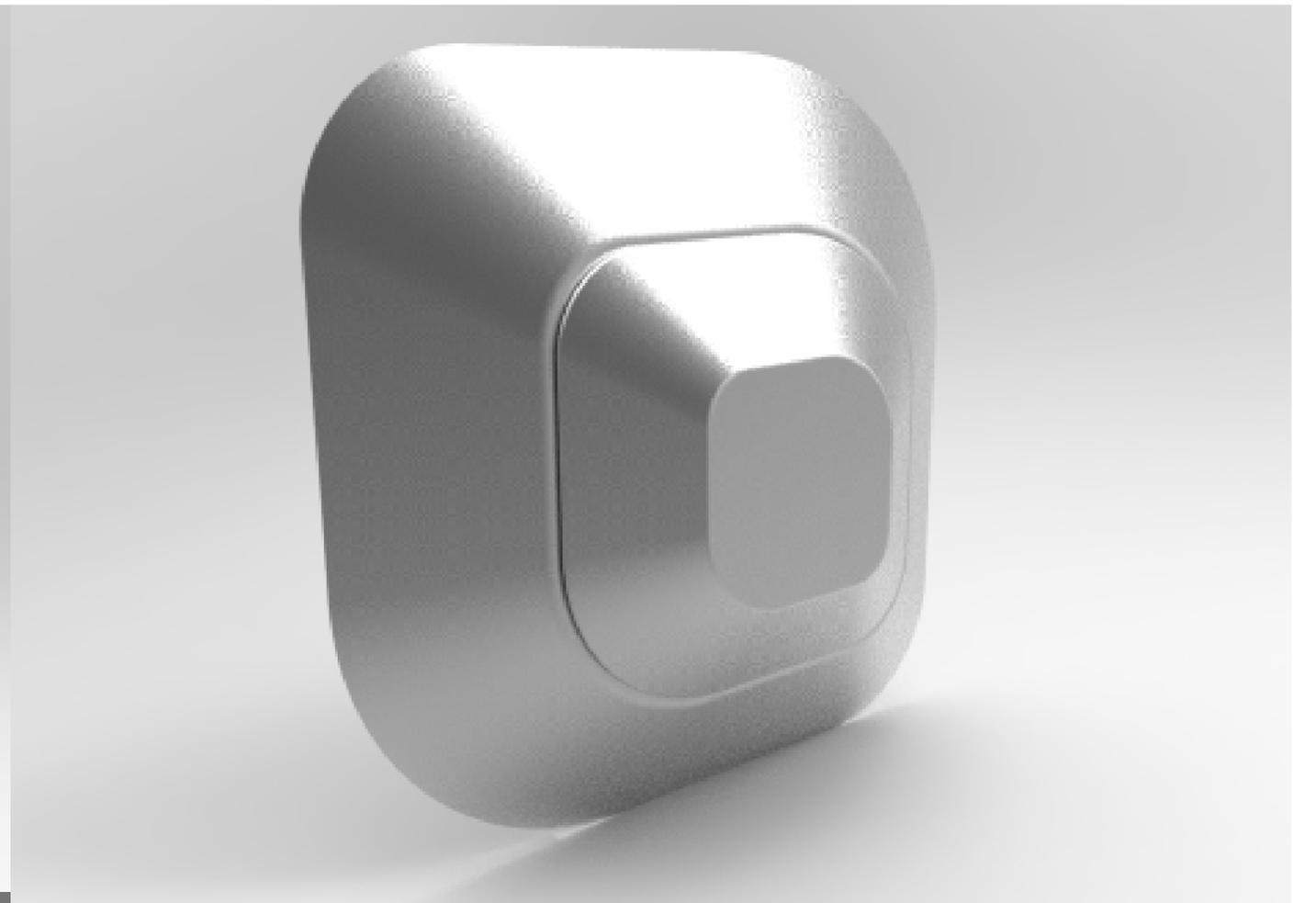
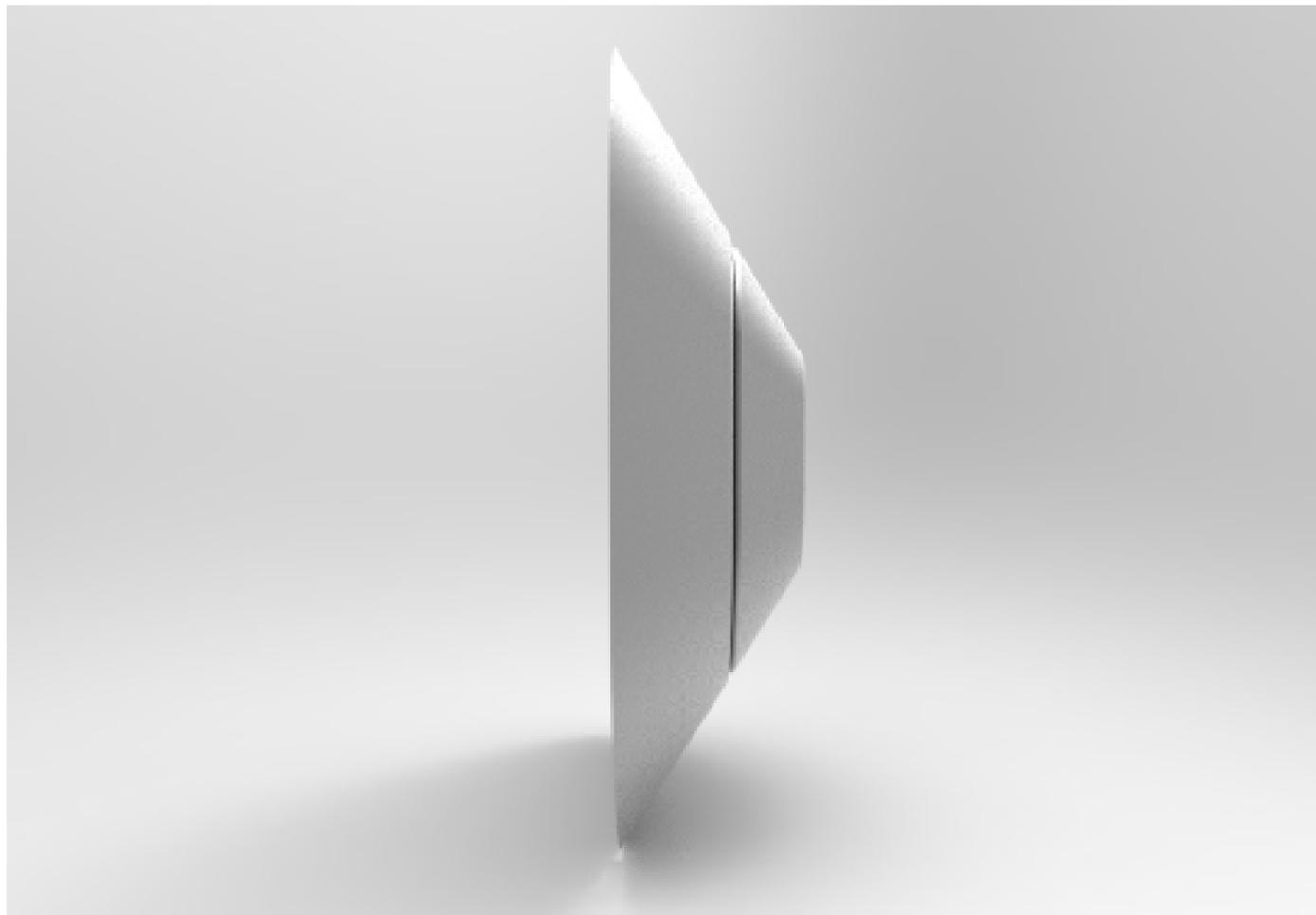
CONTENTS

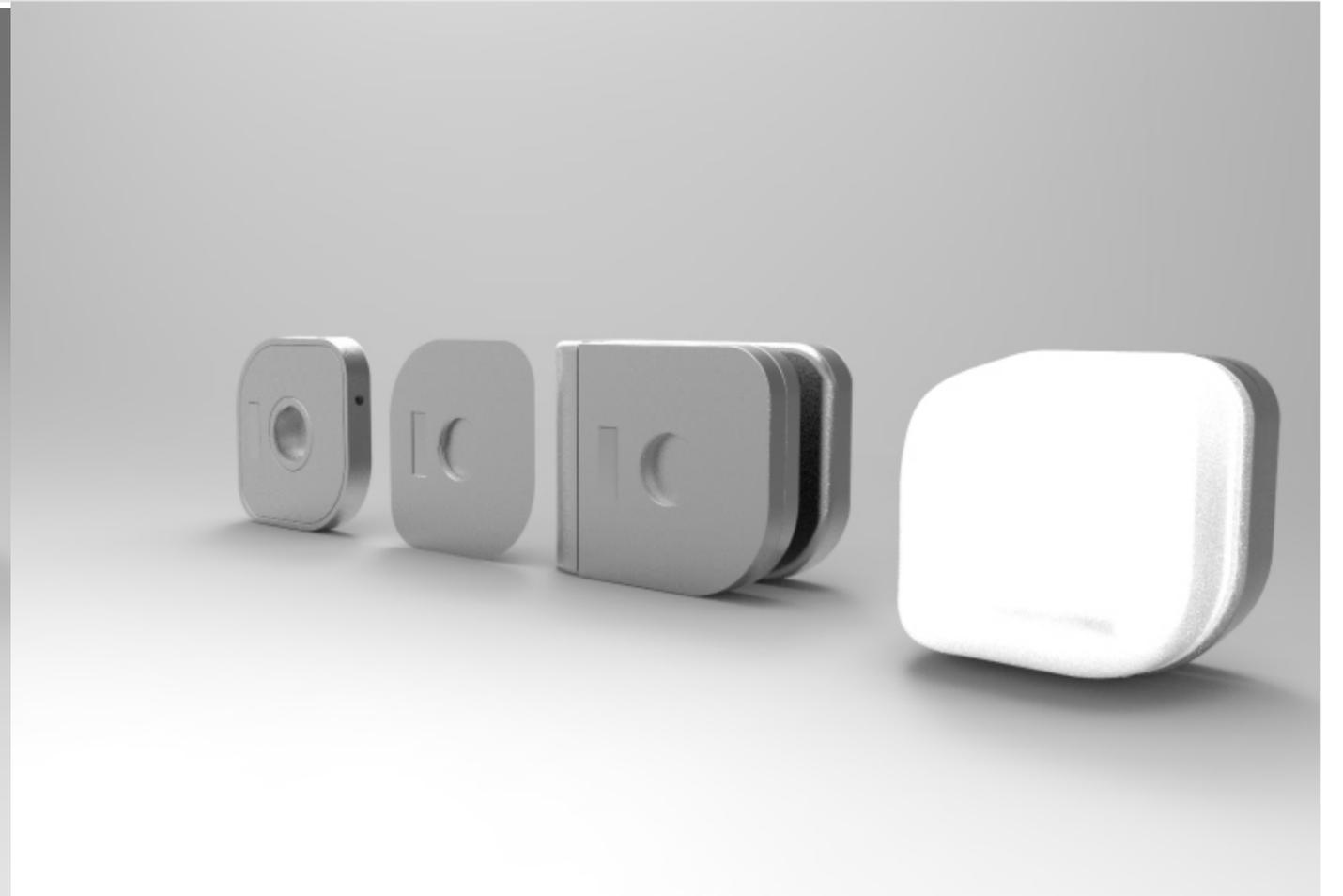
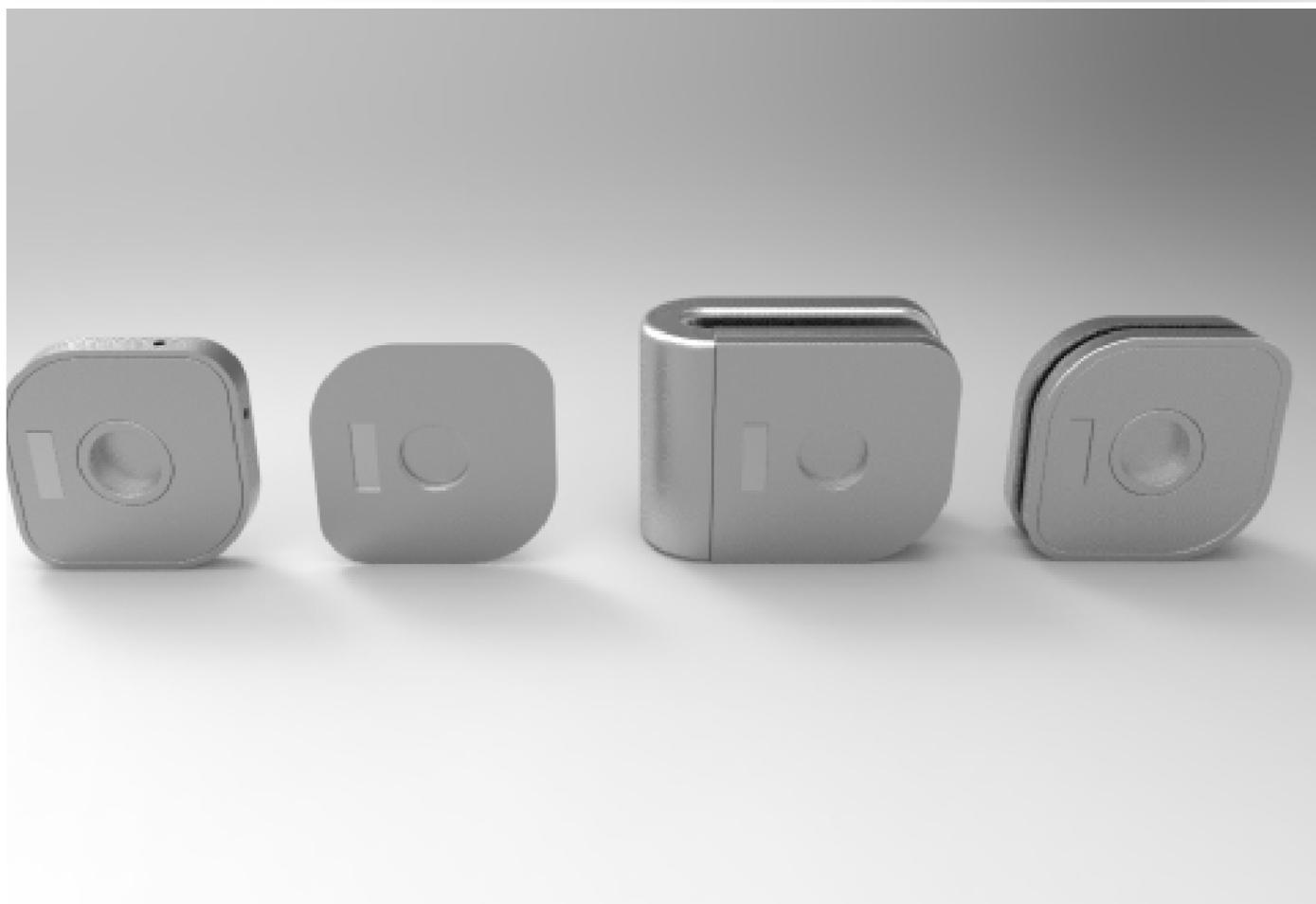
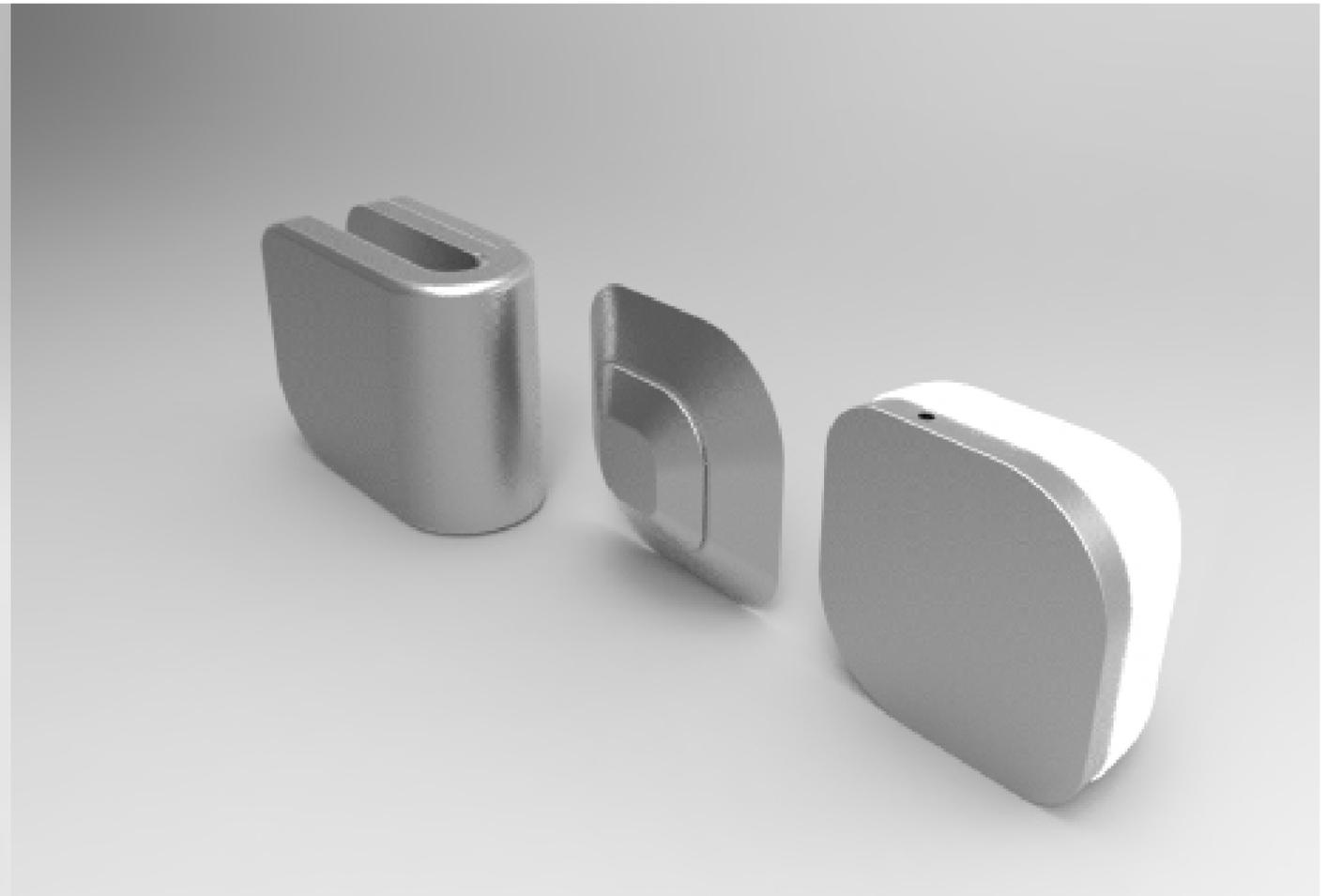
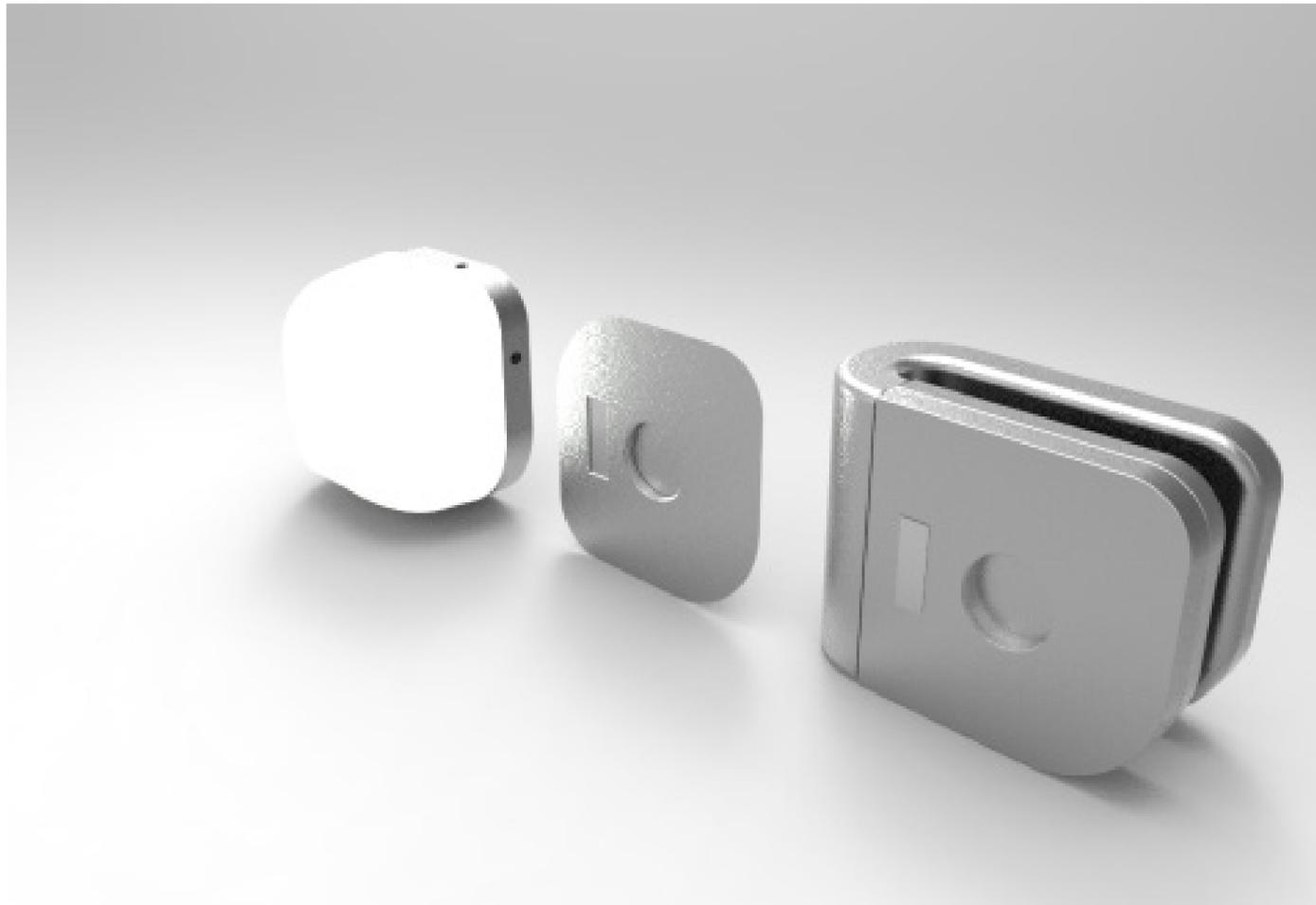


renders









8 7 6 5 4 3 2 1

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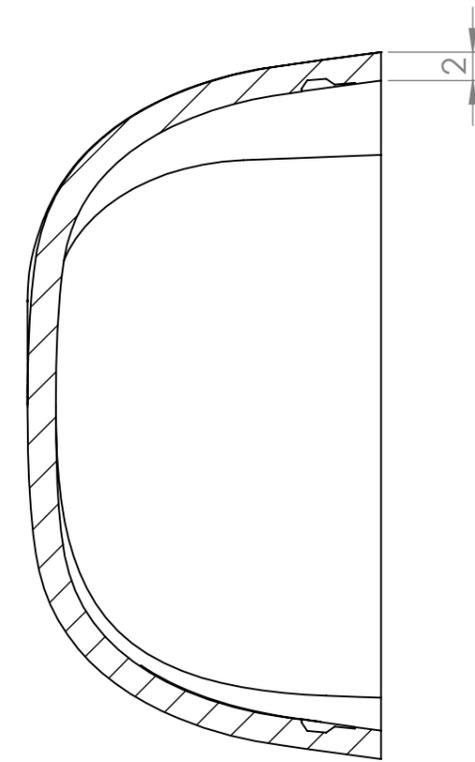
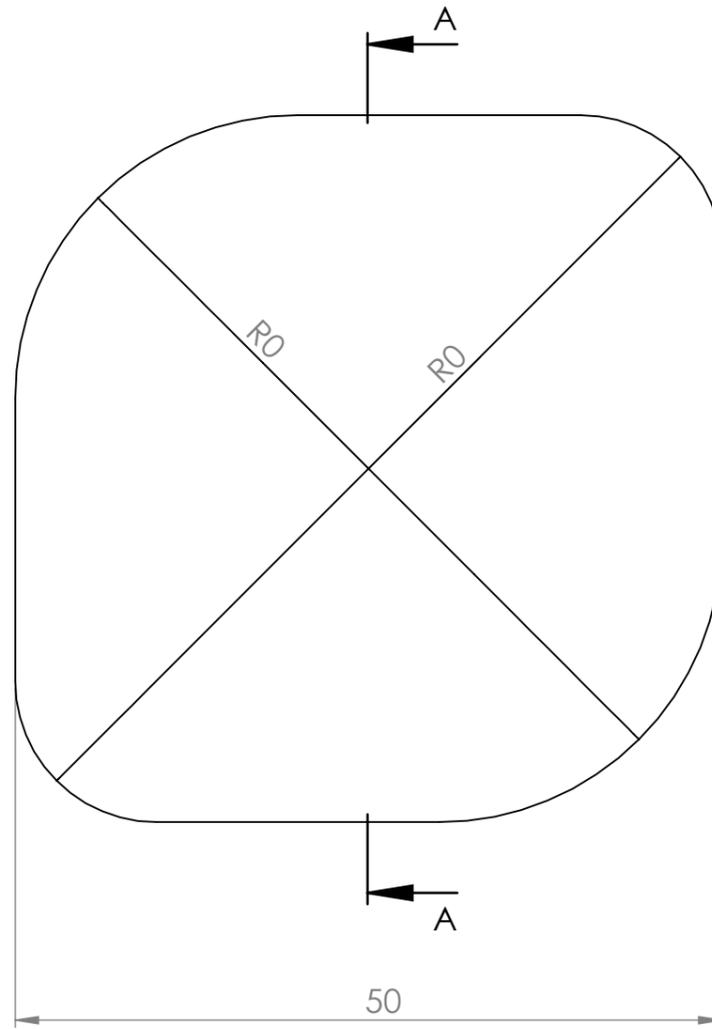
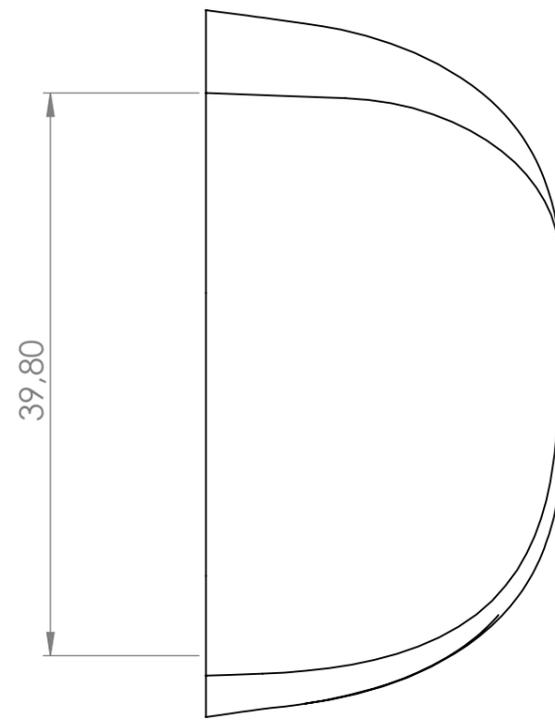
C

B

B

A

A



technical drawings

NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		LIGHT TRANSLUCID COVER	A3
SCALE: 1:1		PAPER 1 OF 18	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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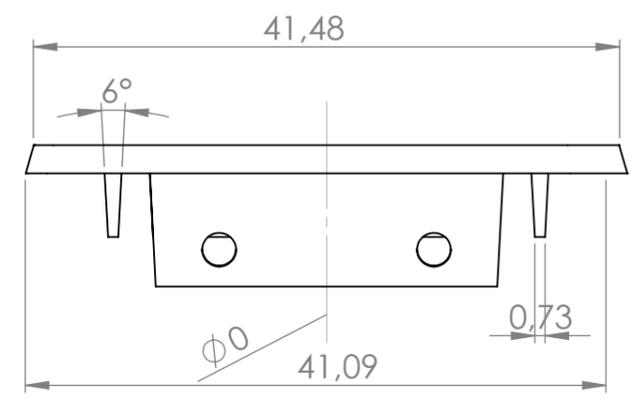
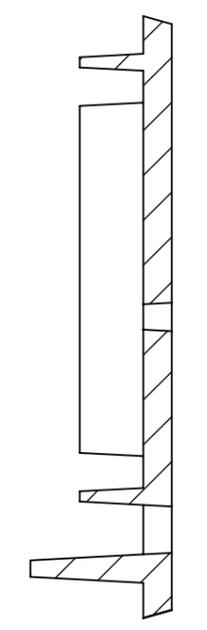
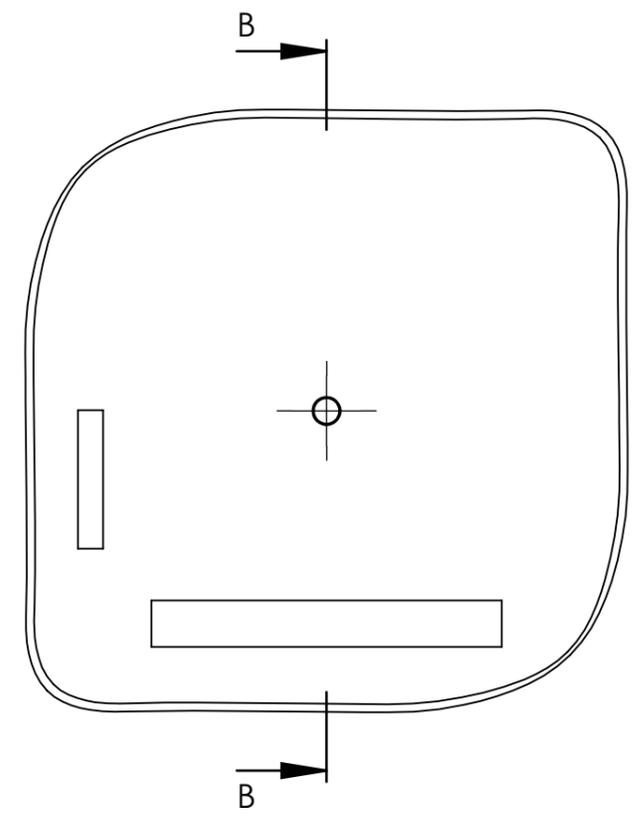
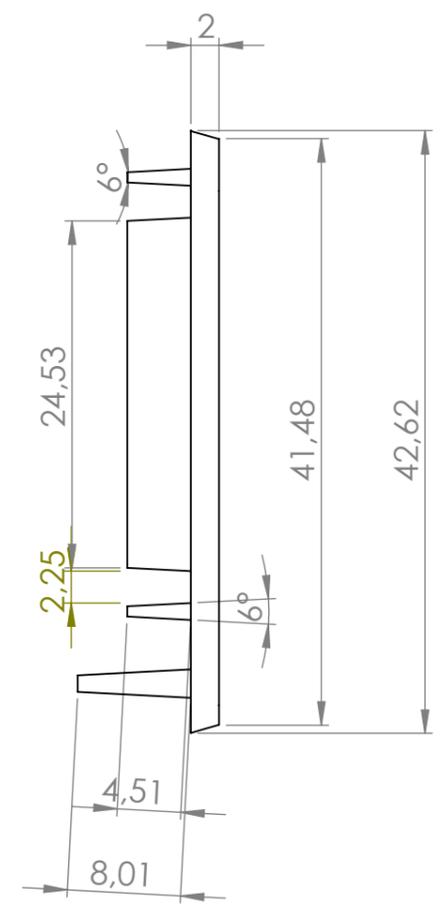
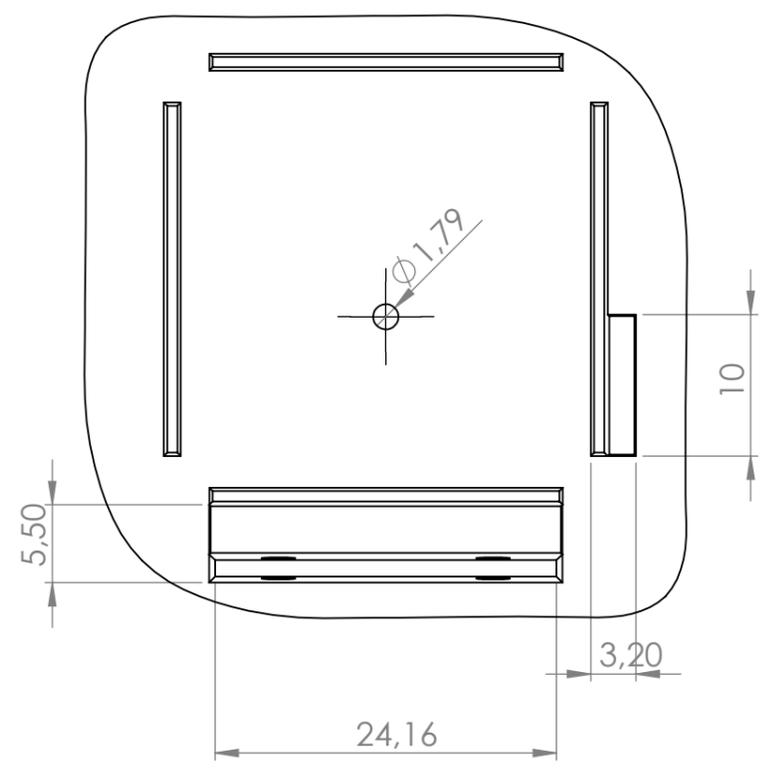
C

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NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		INTERNAL STRUCTURE	A3
SCALE: 2:1		PAPER 2 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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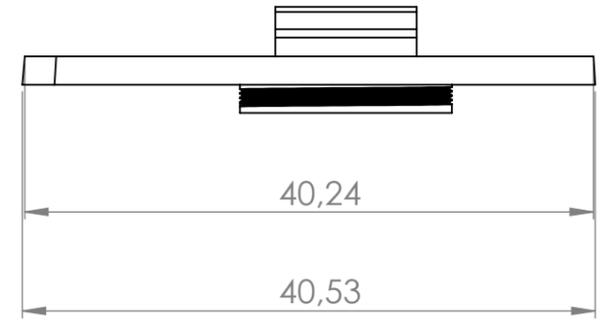
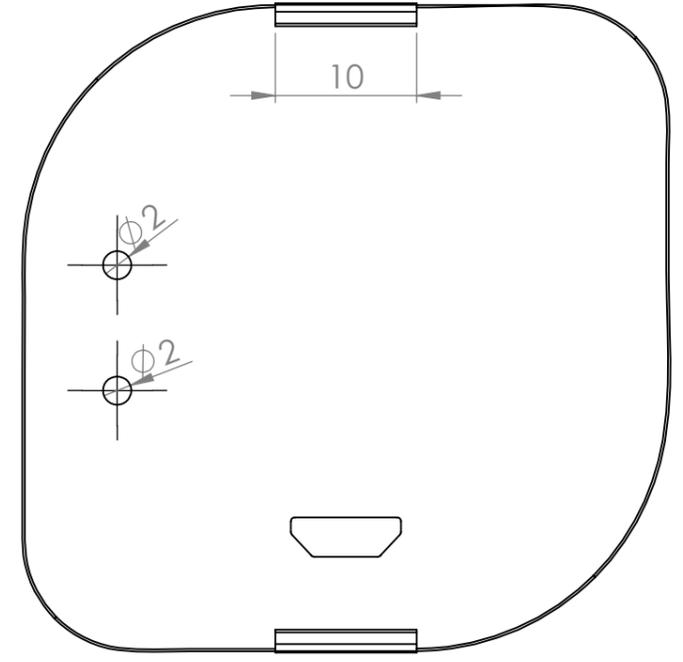
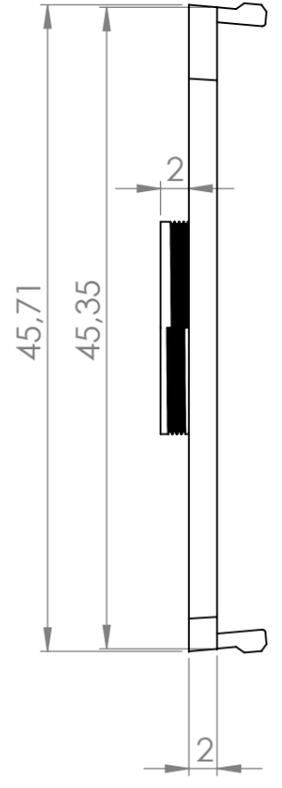
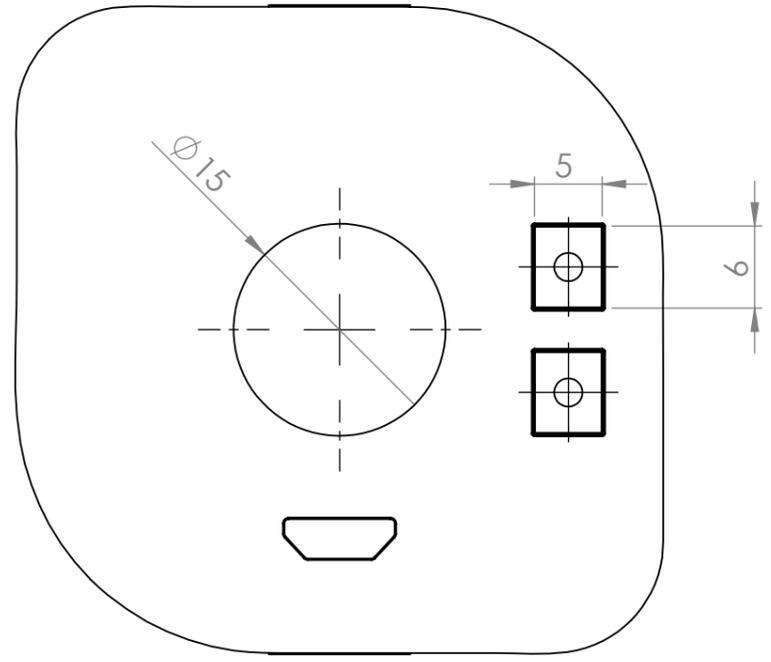
C

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NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		LIGHT BACK LID	A3
SCALE: 2:1		PAPER 2 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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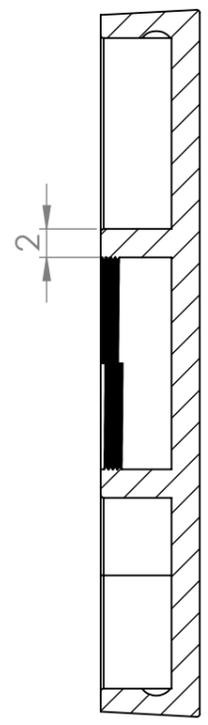
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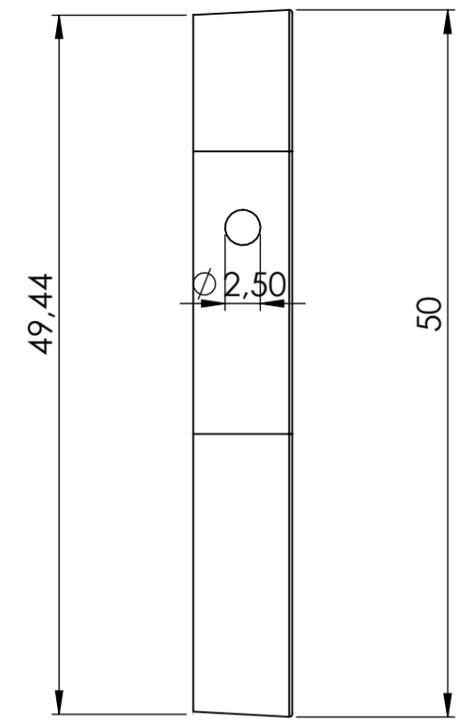
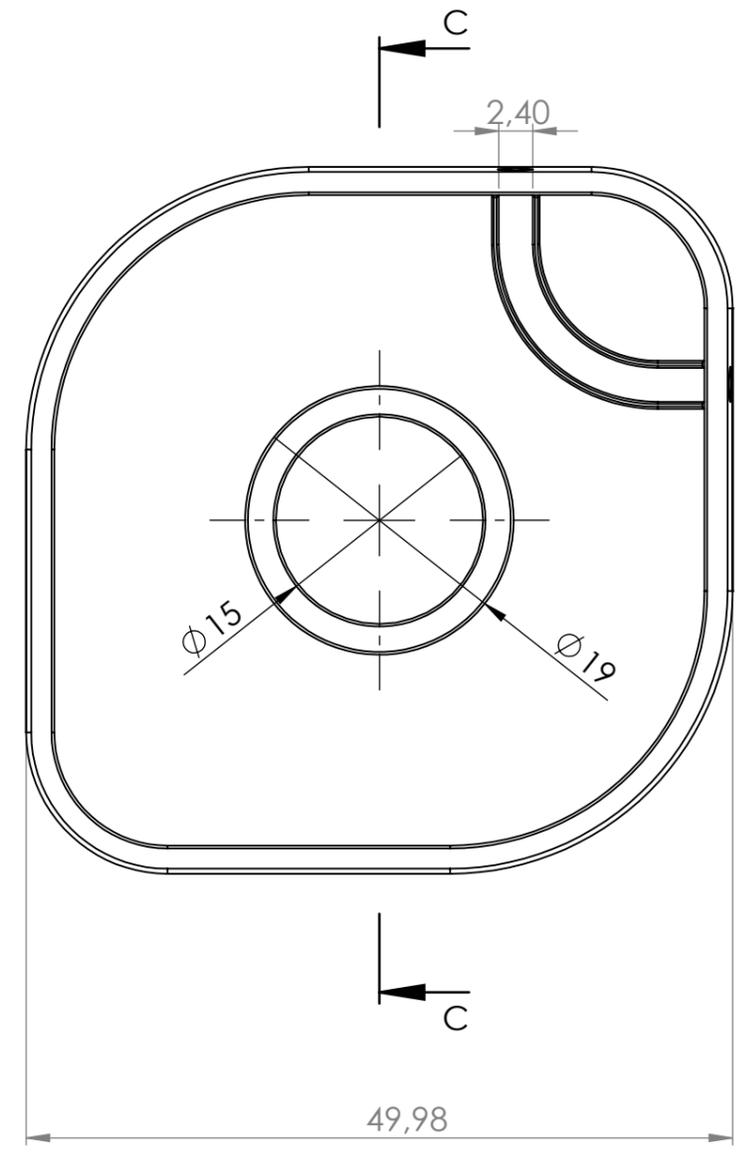
B

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A



SECTION C-C



NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		NECKLACE ATTACHMENT	A3
SCALE: 2:1		PAPER 4 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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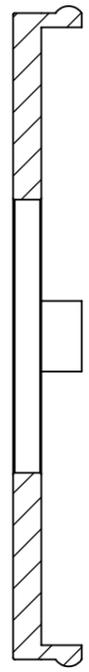
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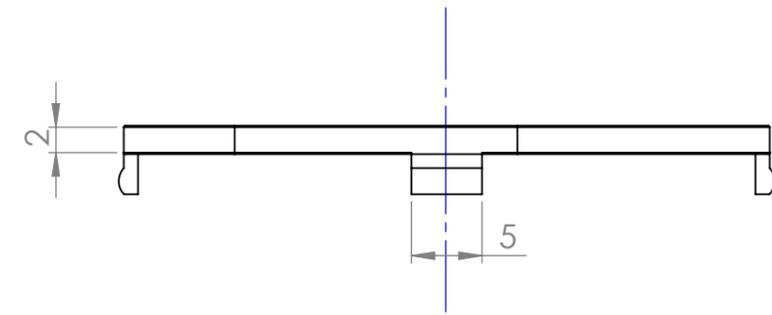
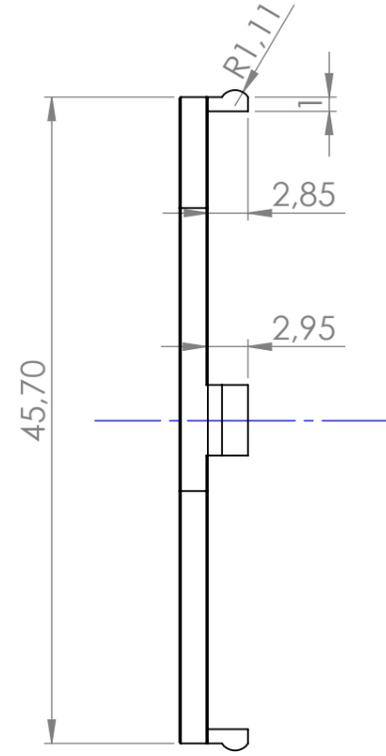
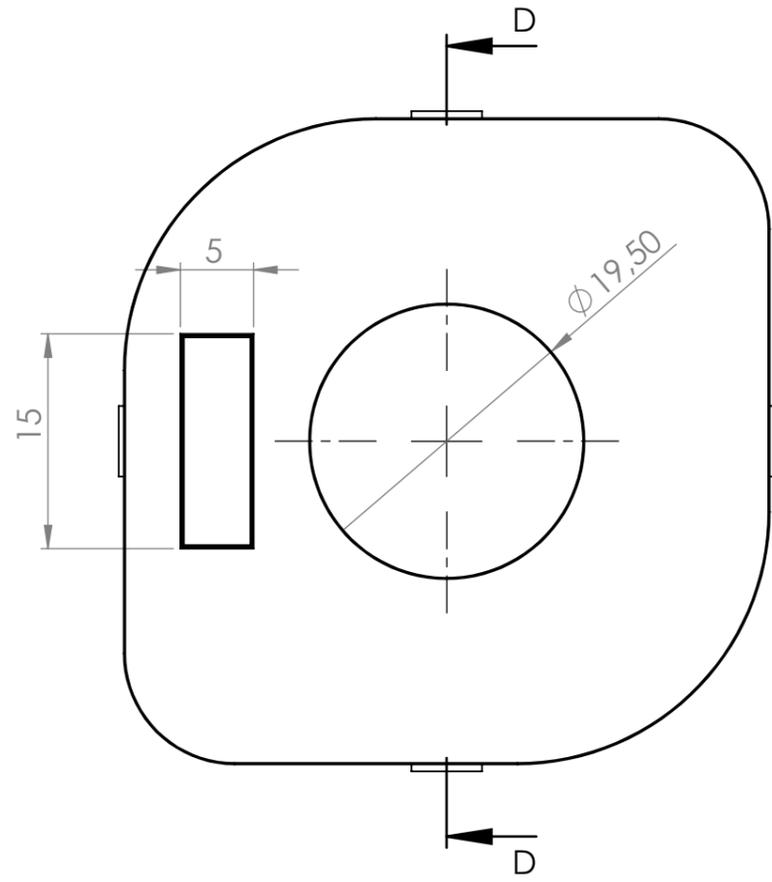
B

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SECTION D-D



NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		ATTACHMENT COVER MODEL 1	A3
SCALE: 2:1		PAPER 5 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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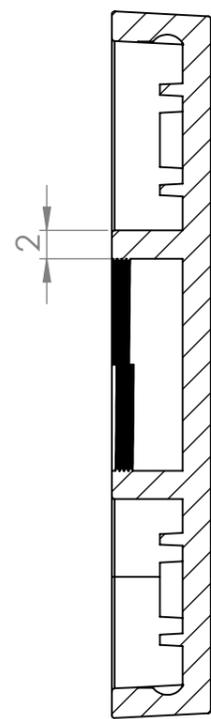
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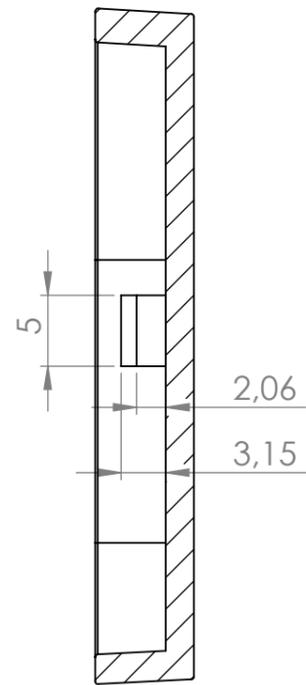
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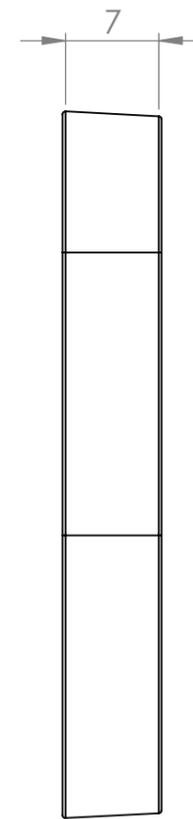
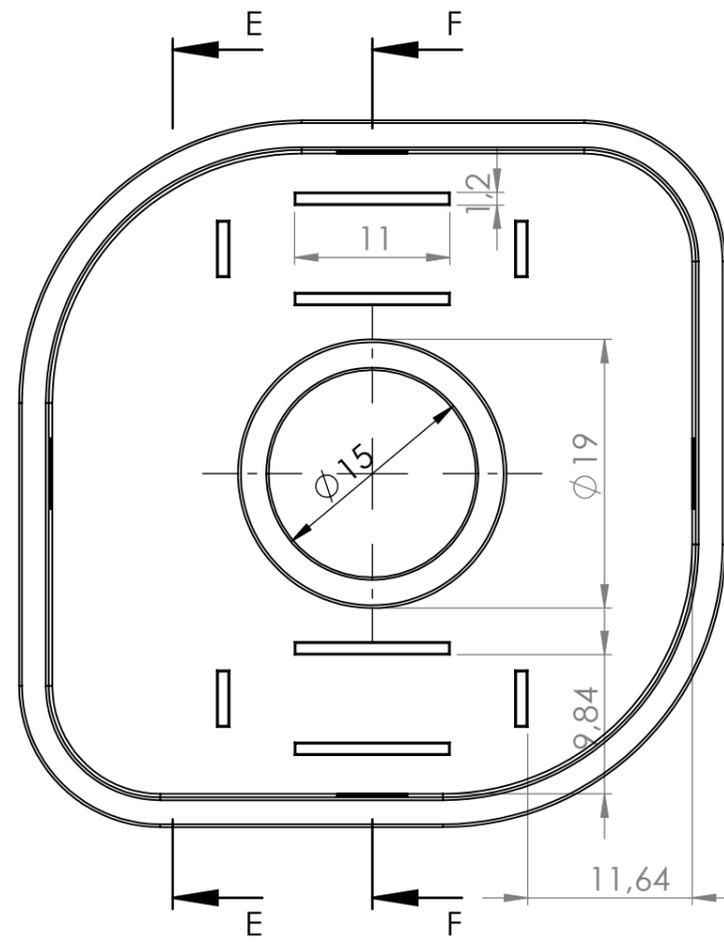
A



SECTION F-F



SECTION E-E



NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		MAGNET ATTACHMENT TOP	A3
SCALE: 2:1		PAPER 6 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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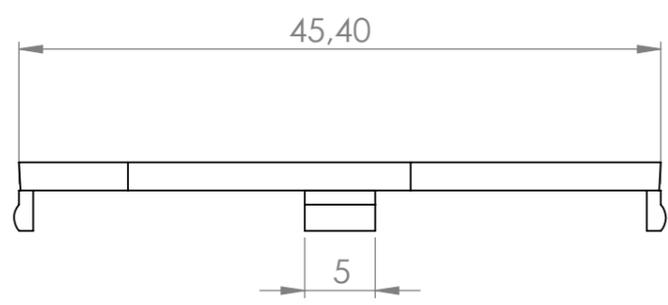
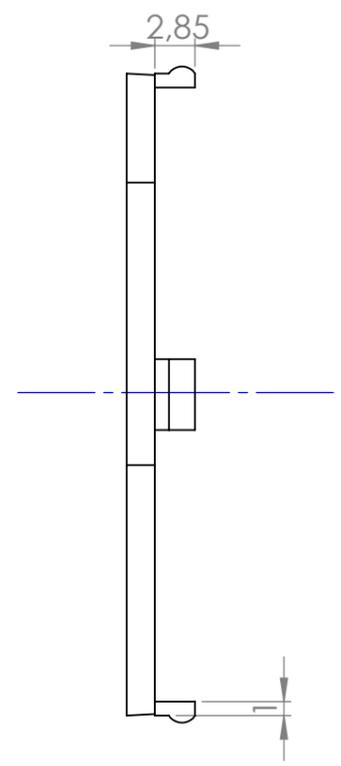
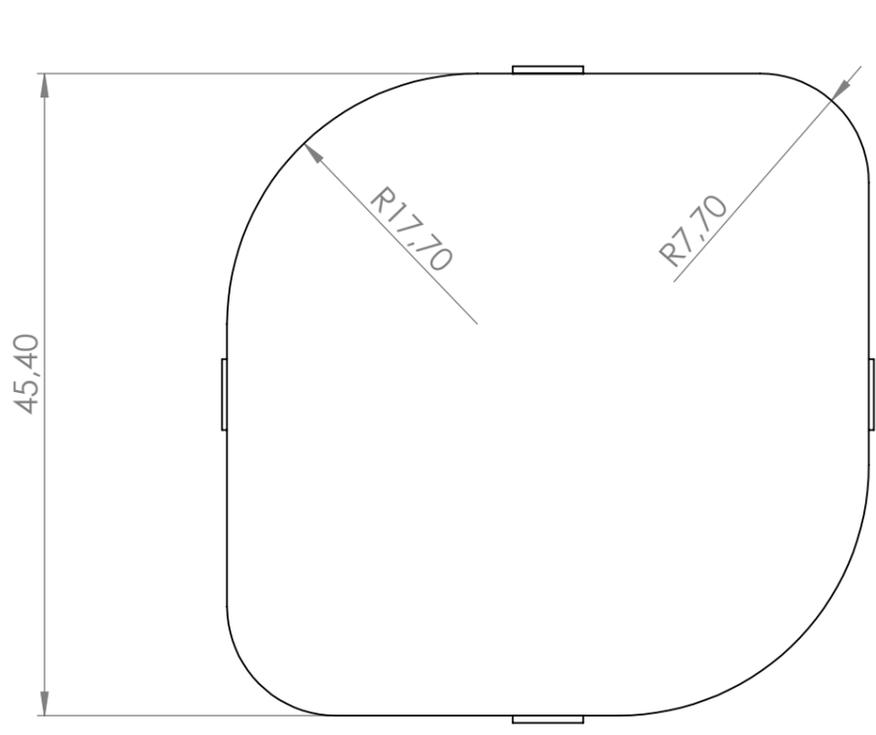
C

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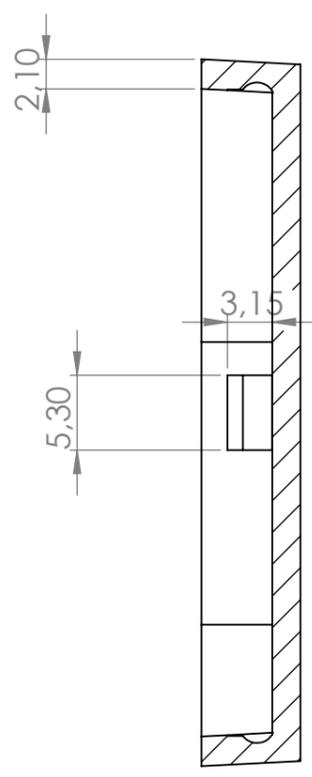
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DRAW		MAGNET COVER BACK	A3
SCALE: 2:1		PAPER 7 OF 16	

8 7 6 5 4 3 2 1

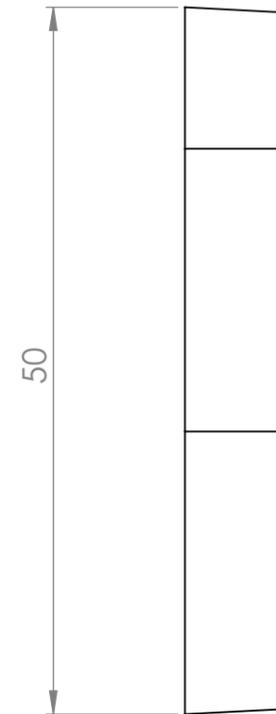
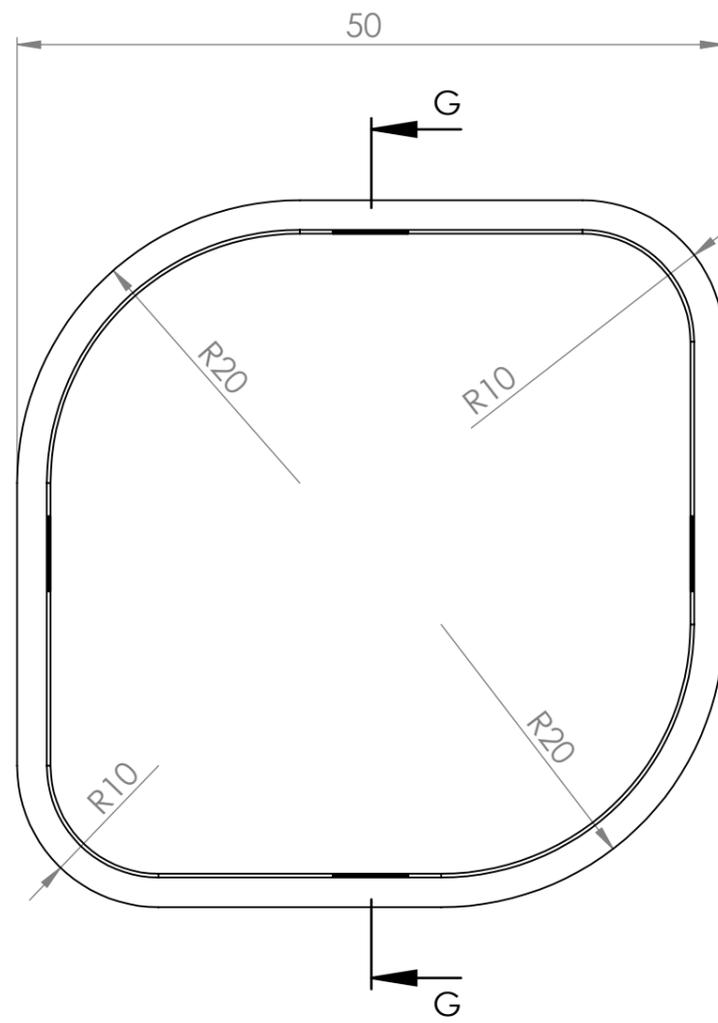
8 7 6 5 4 3 2 1

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F



SECTION G-G



C

C

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8 7 6 5 4 3 2 1

NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		MAGNET ATTACHMENT BACK	A3
SCALE: 2:1		PAPER 8 OF 16	

8 7 6 5 4 3 2 1

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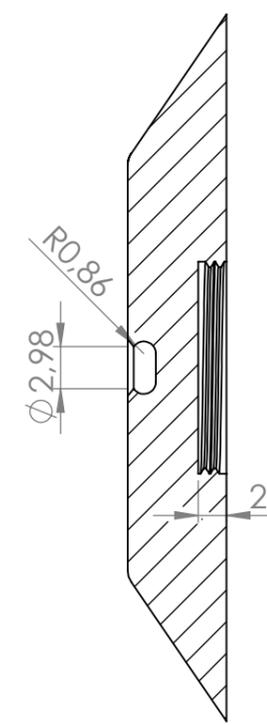
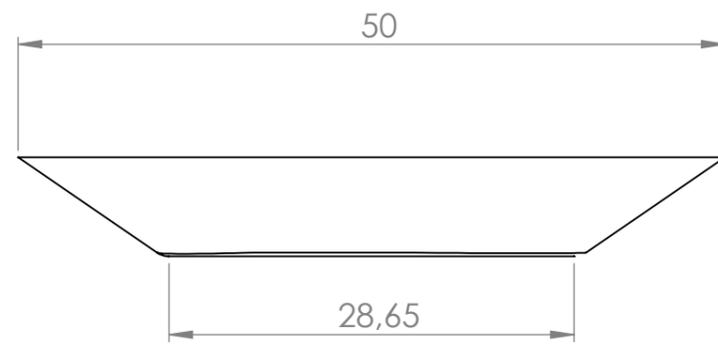
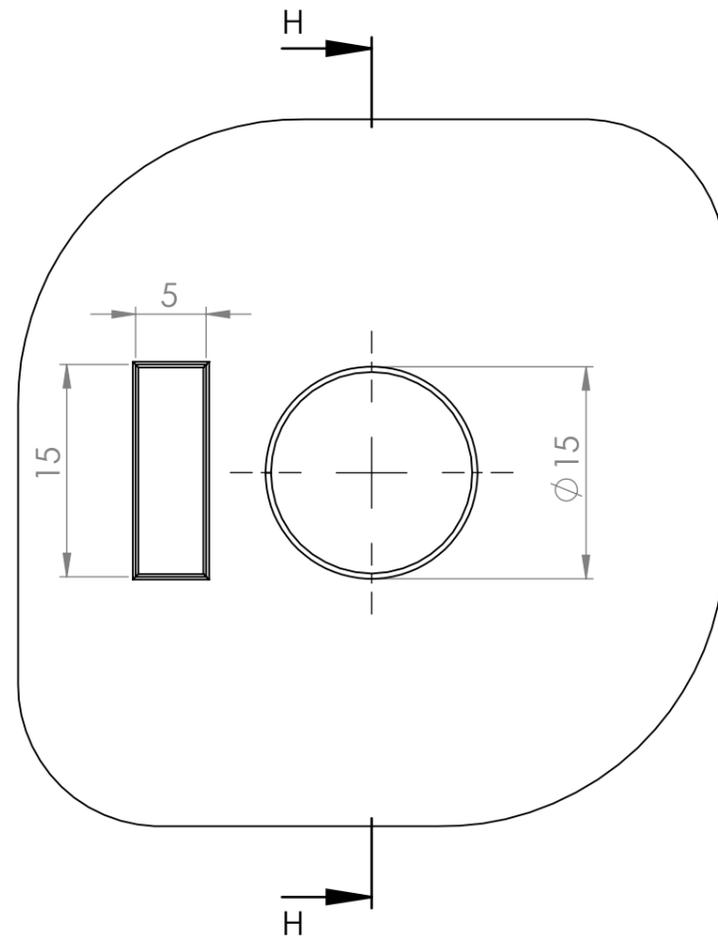
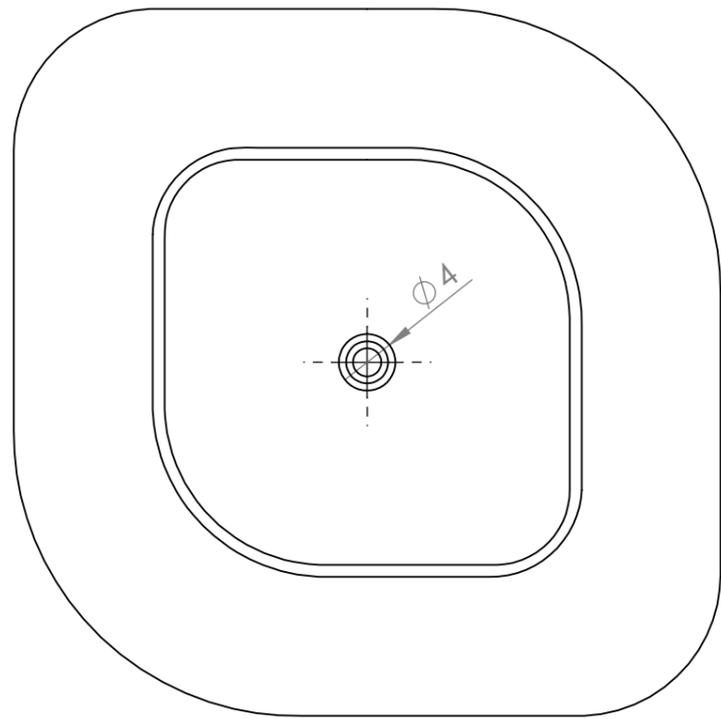
C

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SECTION H-H

NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		POPPER MOTHER	A3
SCALE: 2:1		PAPER 9 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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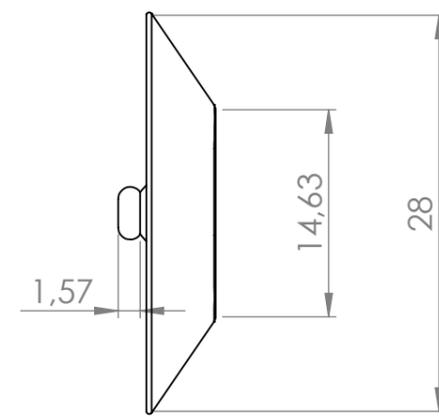
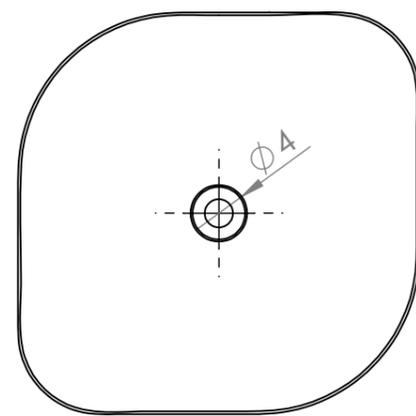
C

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NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		POPPER FATHER	A3
SCALE: 2:1		PAPER 10 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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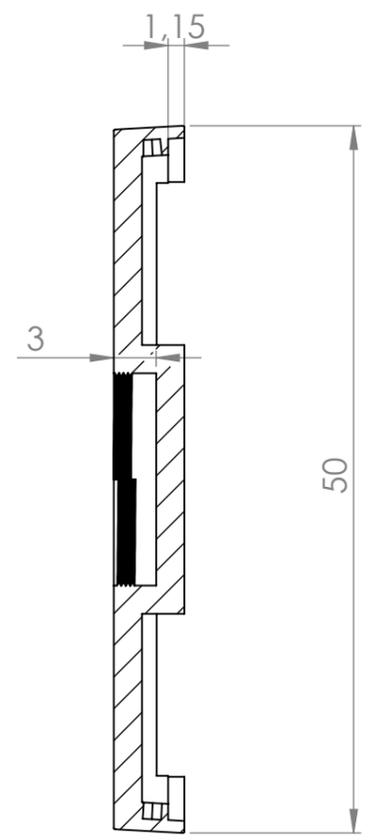
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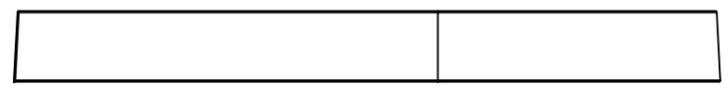
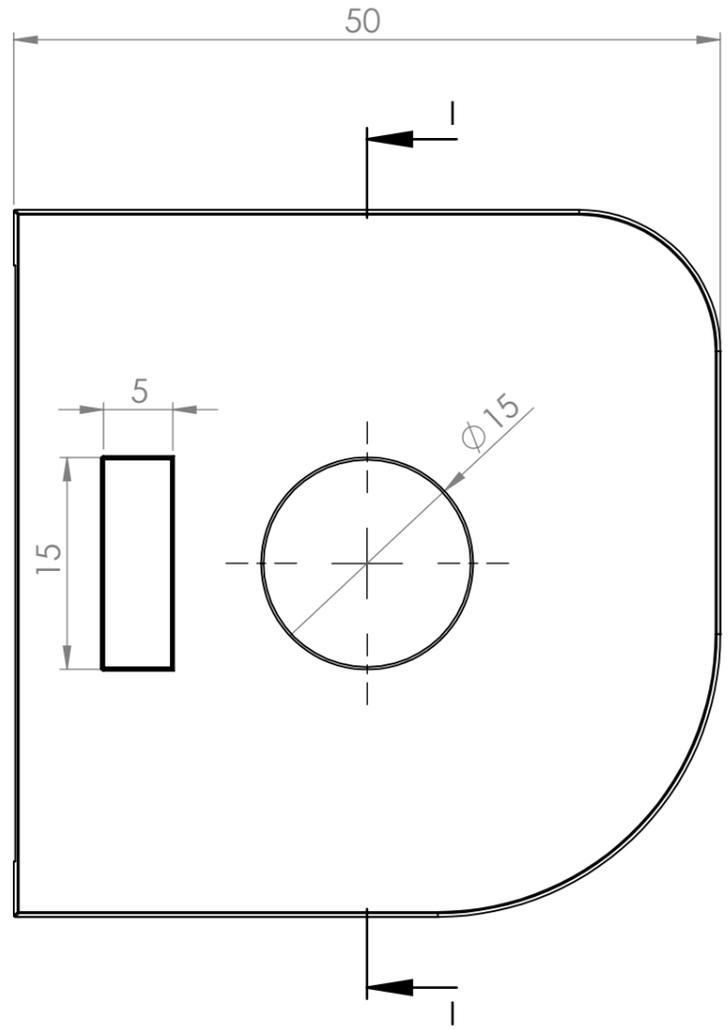
B

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SECTION I-I



NAME	TECHNICAL DRAWING COMPONENTS	
DRAW	CLIP TOP	A3
SCALE: 2:1	PAPER 11 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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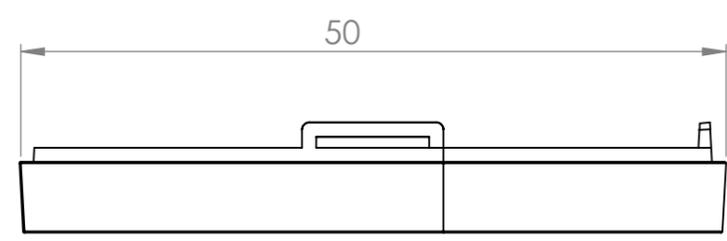
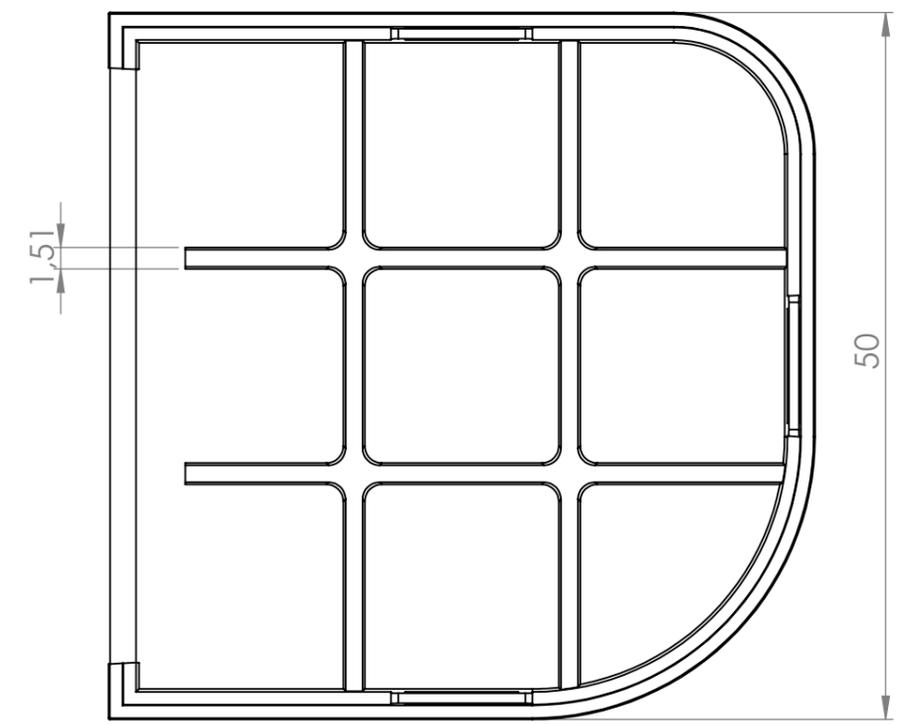
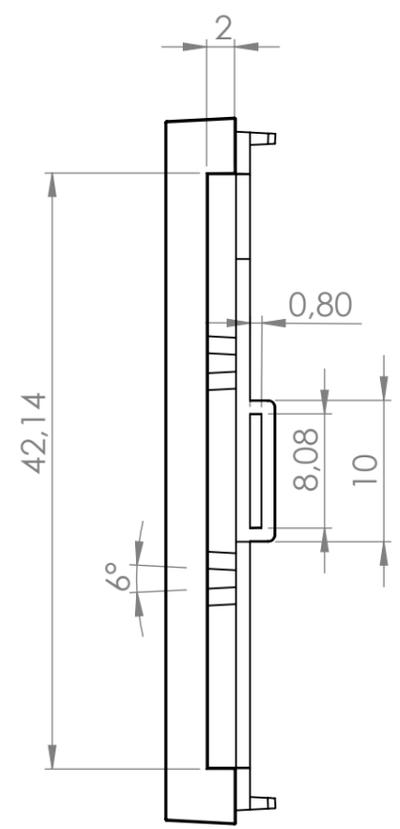
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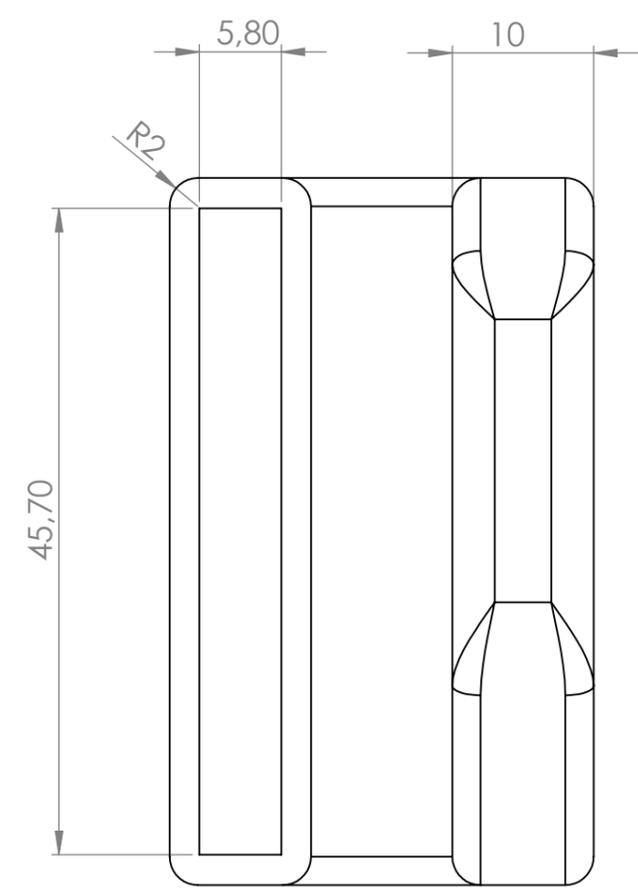
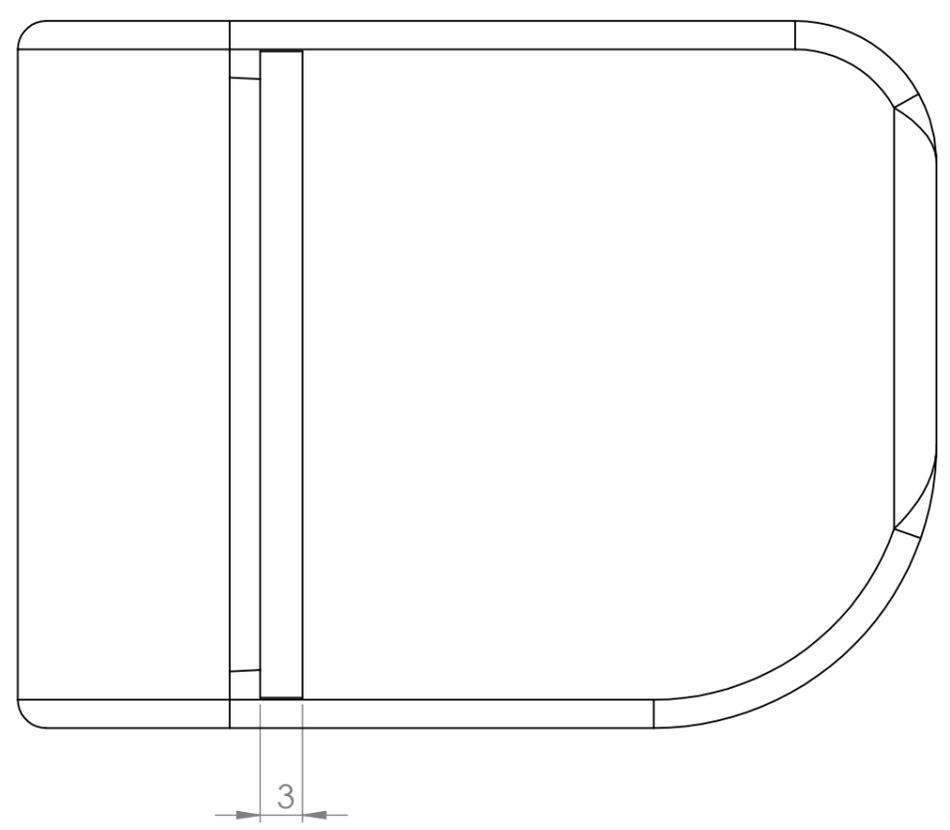
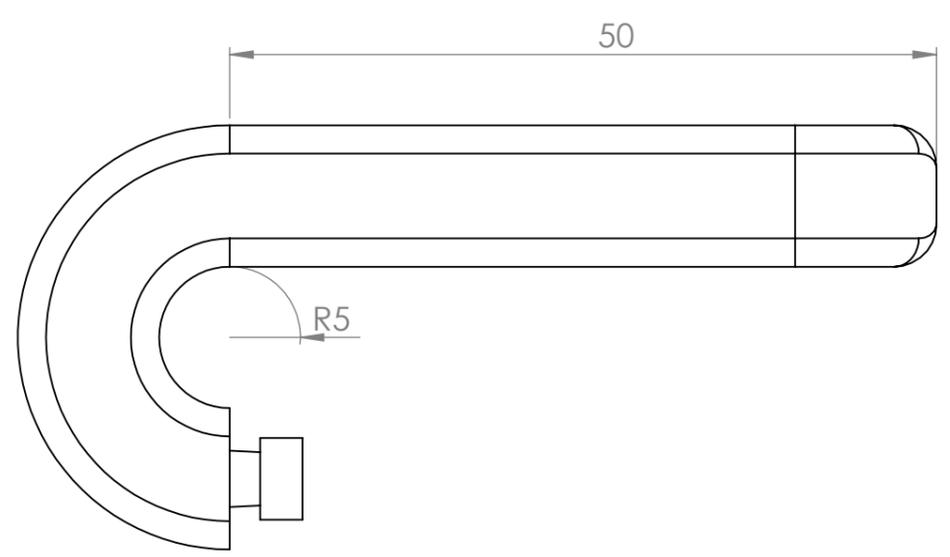
NAME	TECHNICAL DRAWING COMPONENTS	
DRAW	CLIP BACK	A3
SCALE: 2:1	PAPER 13 OF 16	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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8 7 6 5 4 3 2 1

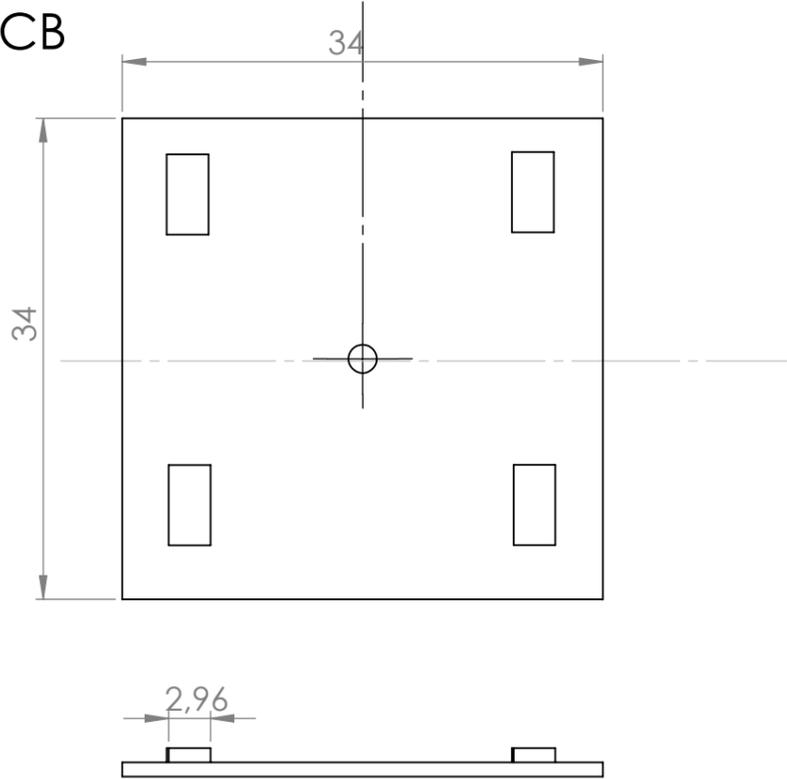
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DRAW	CLIP RUBBER	A3
SCALE: 2:1	PAPER 13 OF 16	

8 7 6 5 4 3 2 1

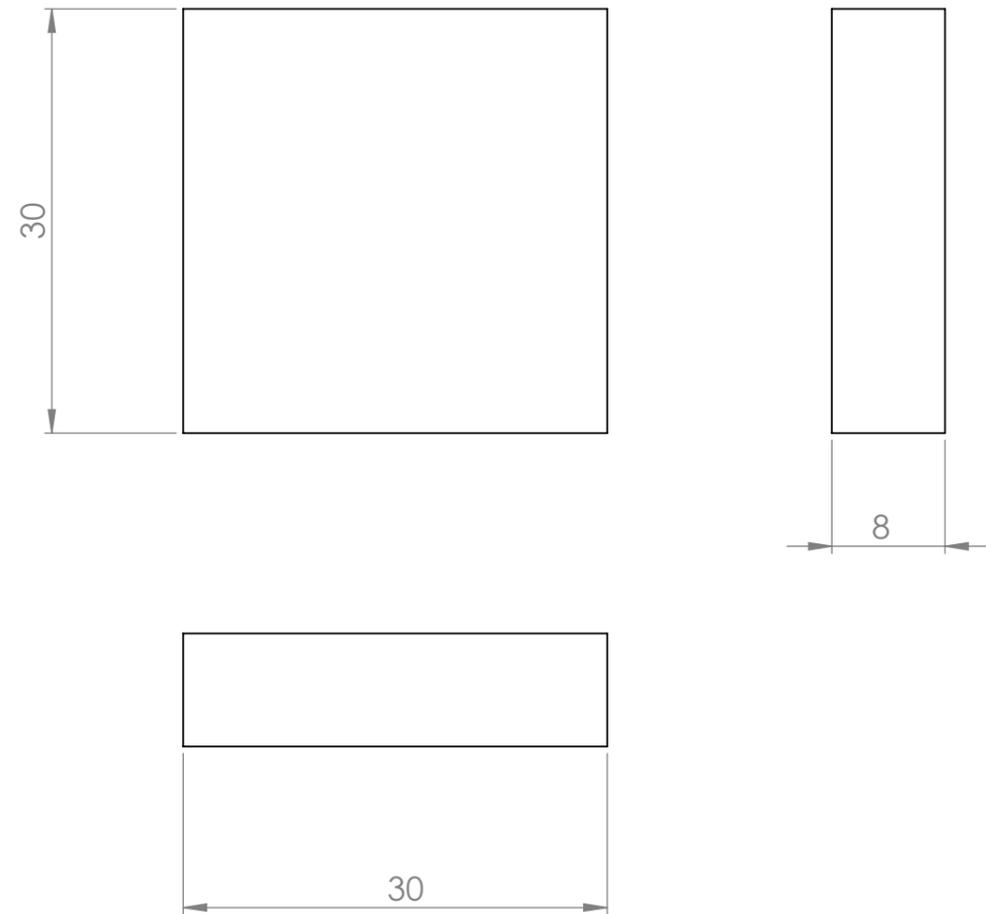
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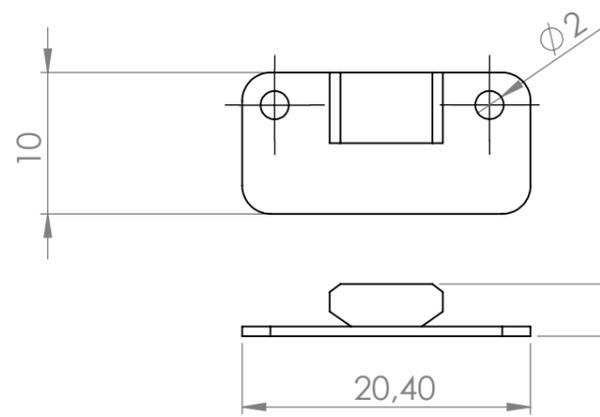
PCB



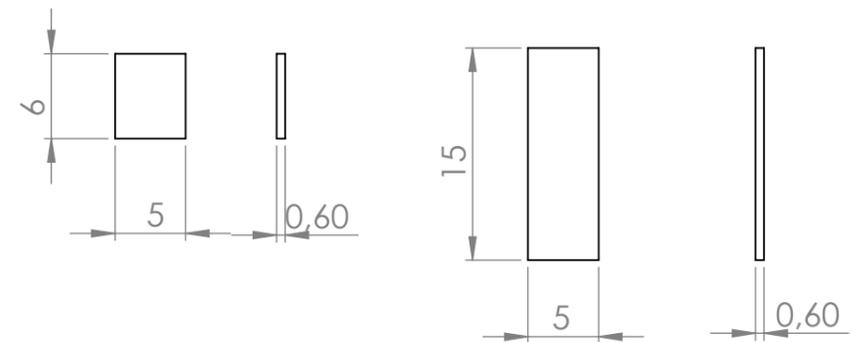
BATTERY



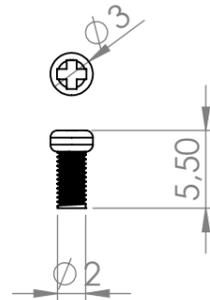
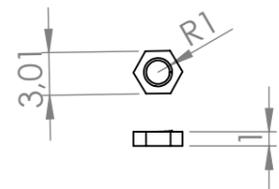
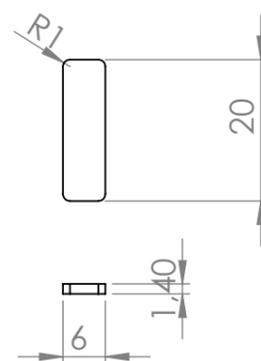
MICRO USB CHARGER



SWITCH PLATES



MAGNET



BOLT

SCREW

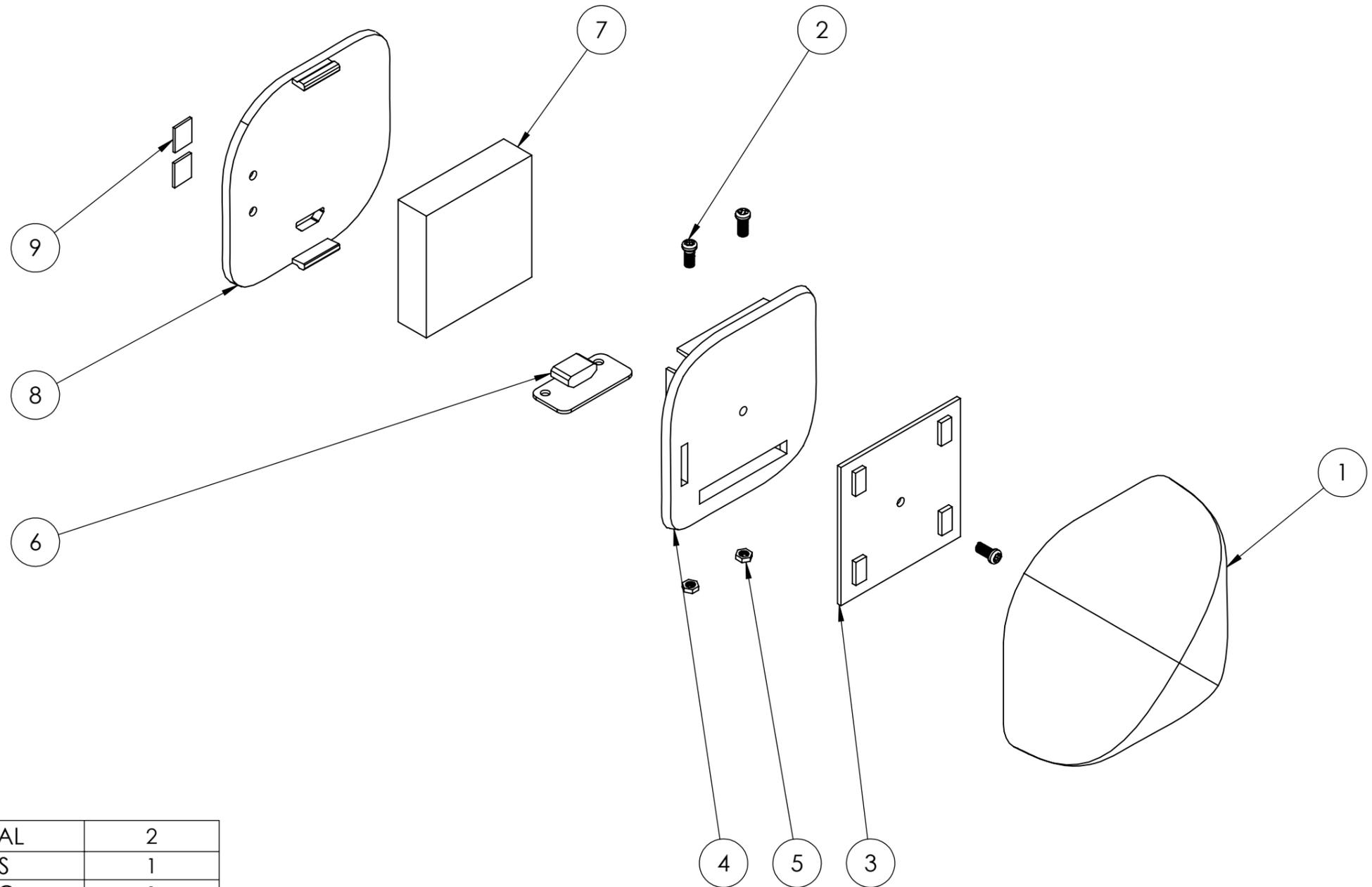
A

A

NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		ELECTRONICS AND COMPONENTS	A3
SCALE: 2:1		PAPER 14 OF 16	

8 7 6 5 4 3 2 1

exploded view



9	SWITCH	METAL	2
8	LID	ABS	1
7	BATTERY	LI PO	1
6	MICROUSB	ABS	1
5	BOLT	METAL	2
4	STRUCTURE	ABS	1
3	PCB	METAL	1
2	SCREW	METAL	3
1	COVER	ABS	1
NUMBER	NAME	MATERIAL	QUANTITY

NAME TECHNICAL DRAWING COMPONENTS	
DRAW EXPLODED VIEW LIGHT	A3
SCALE: 1:1	PAPER 15 OF 16

8 7 6 5 4 3 2 1

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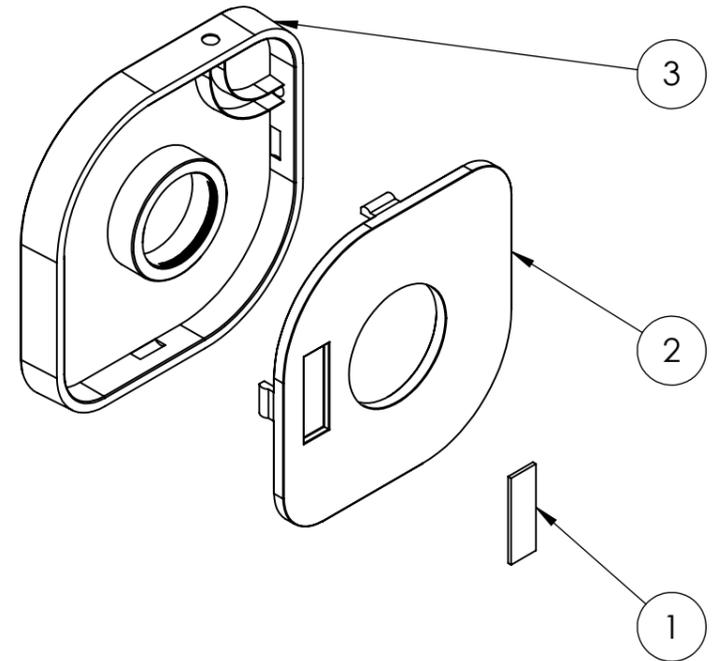
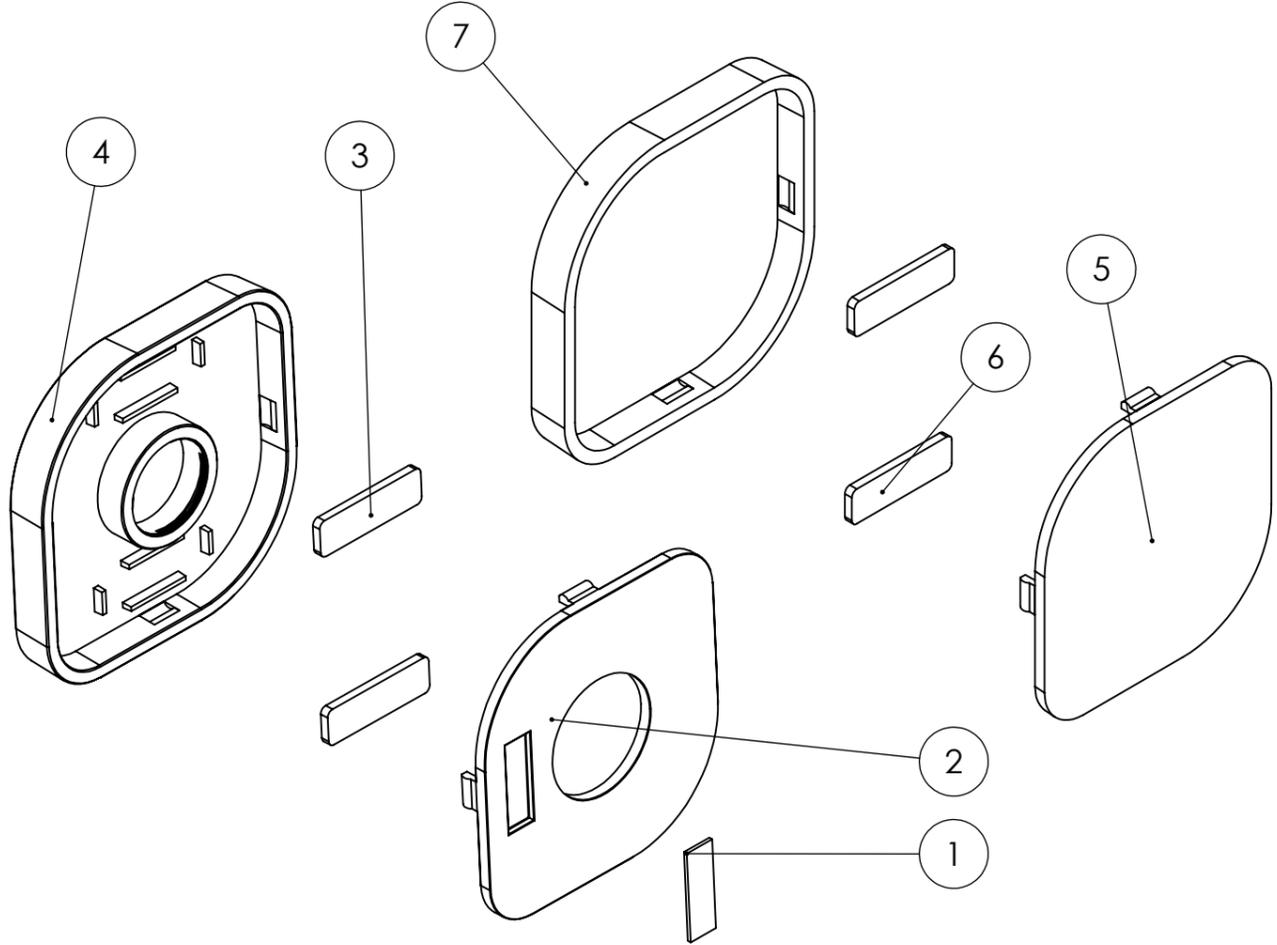
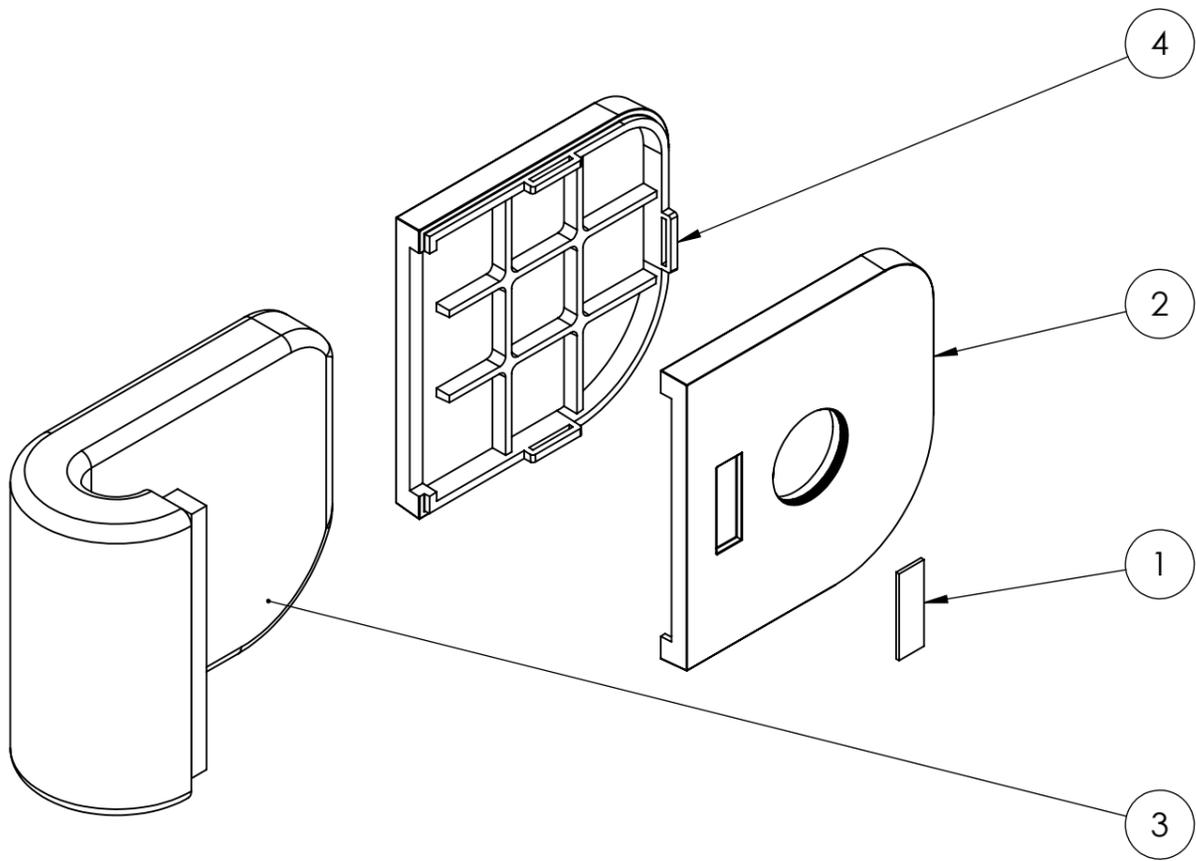
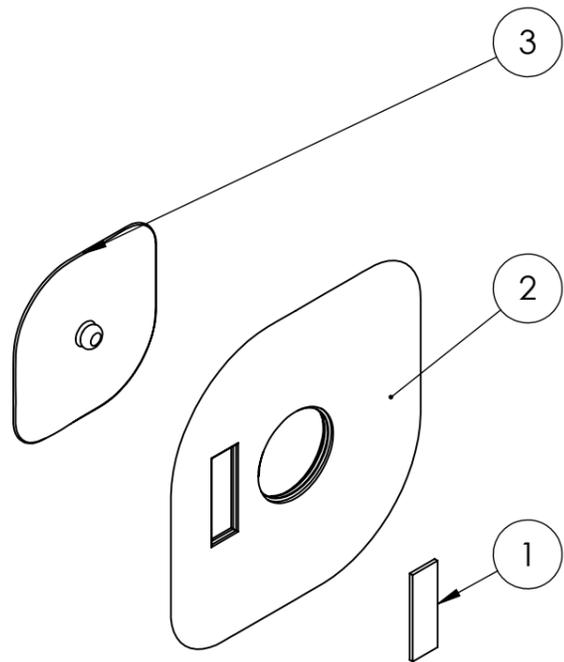
A

3	POPPER FATHER	ABS	1
2	POPPER FEMALE	ABS	1
1	SWITCH	METAL	1
NUMBER	PIECE	DESCRIPCIÓN	QUANTITY

4	CLIP BACK	ABS	1
3	CLIP RUBBER	RUBBER	1
2	CLIP TOP	ABS	1
1	SWITCH	METAL	1
NUMBER	PIECE	MATERIAL	QUANTITY

3	NECKLACE	ABS	1
2	COVER	ABS	1
1	SWITCH	METAL	1
NUMBER	PIECE	MATERIAL	QUANTITY

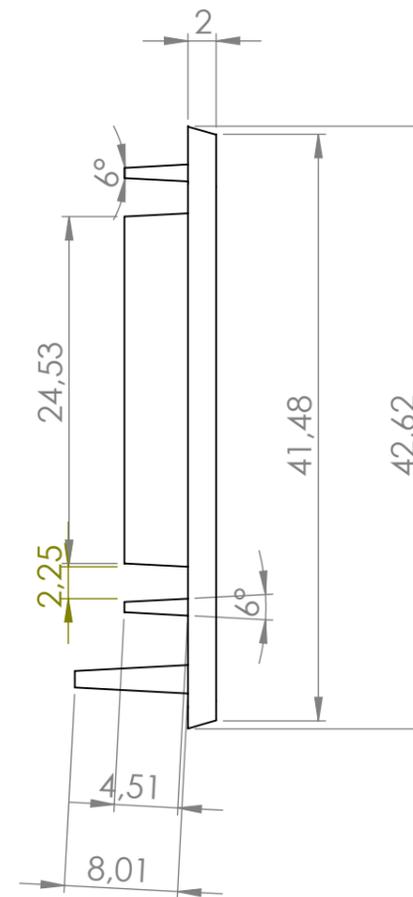
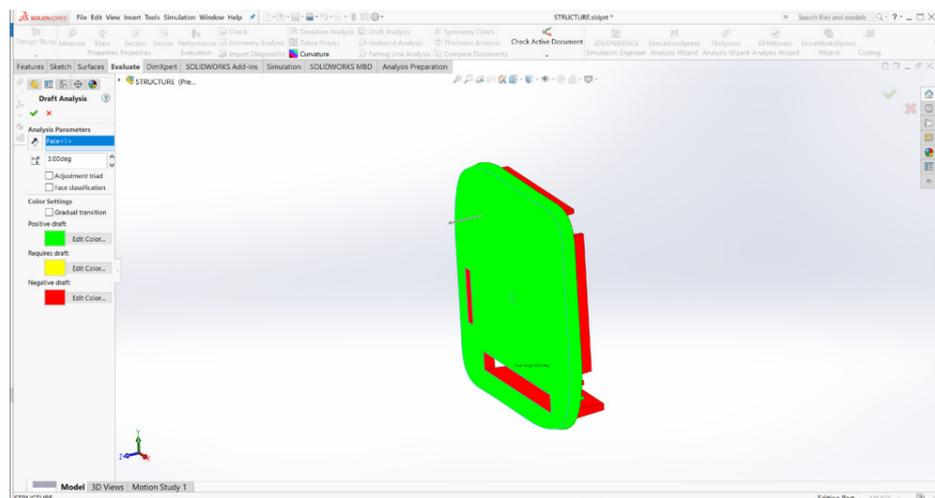
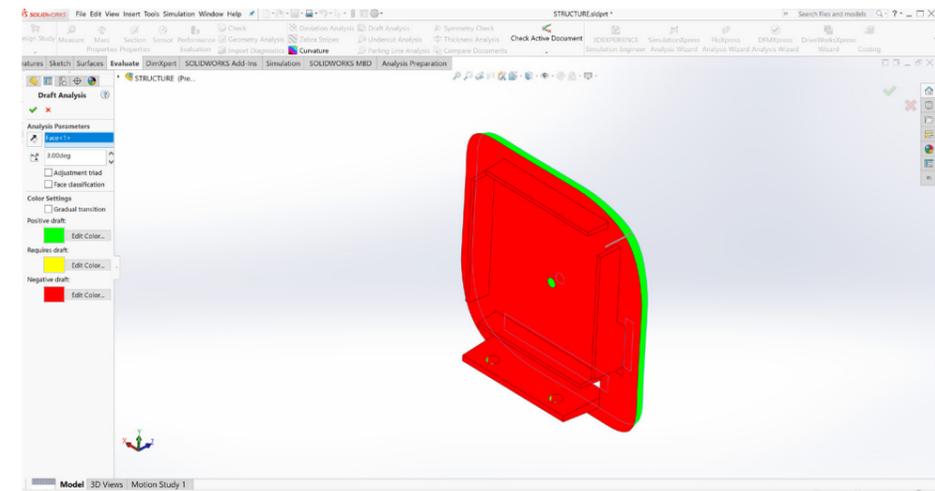
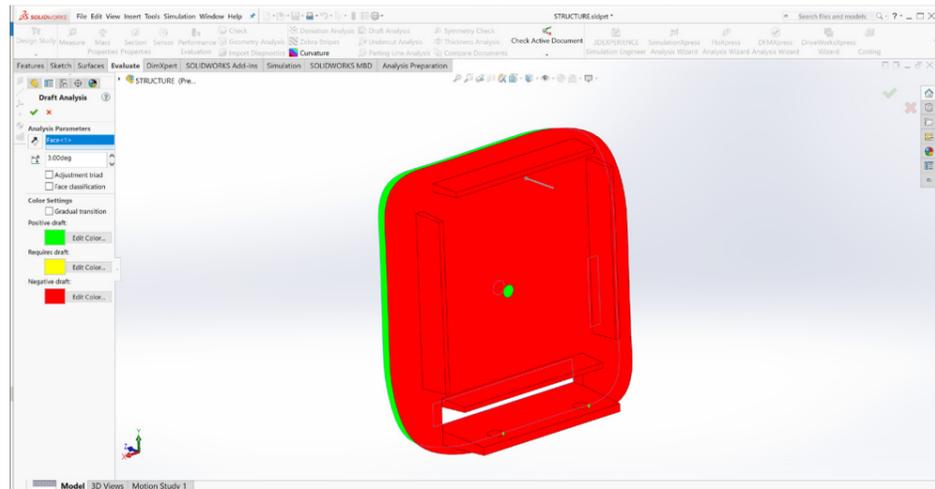
NUMBER	PIECE	MATERIAL	QUANTITY
1	SWITCH	METAL	1
2	COVER	ABS	1
3	MAGNET	METAL	2
4	MAGNET TOP	ABS	1
5	COVER FULL	ABS	1
6	MAGNET	METAL	2
7	MAGNET BACK	ABS	1



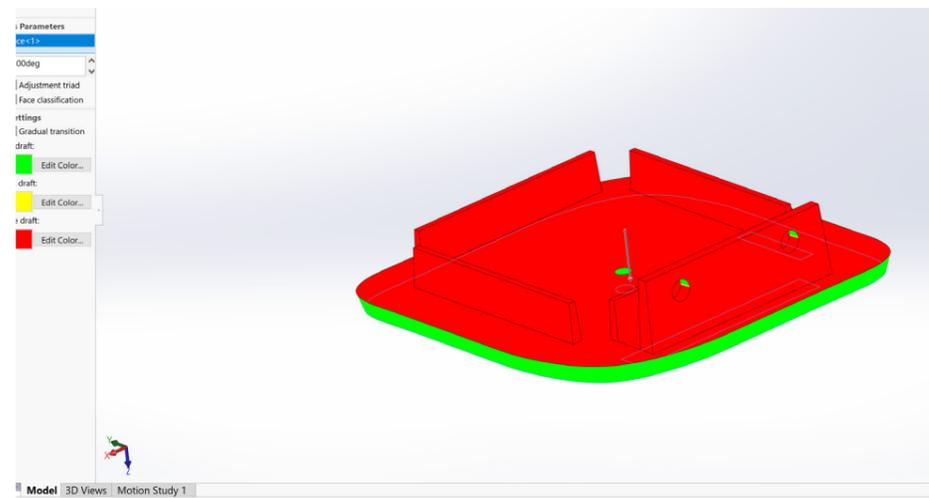
NAME		TECHNICAL DRAWING COMPONENTS	
DRAW		EXPLODED VIEW ATTACHMENTS	
SCALE: 1:1		PAPER 16 OF 16	
		A3	

8 7 6 5 4 3 2 1

draft analysis



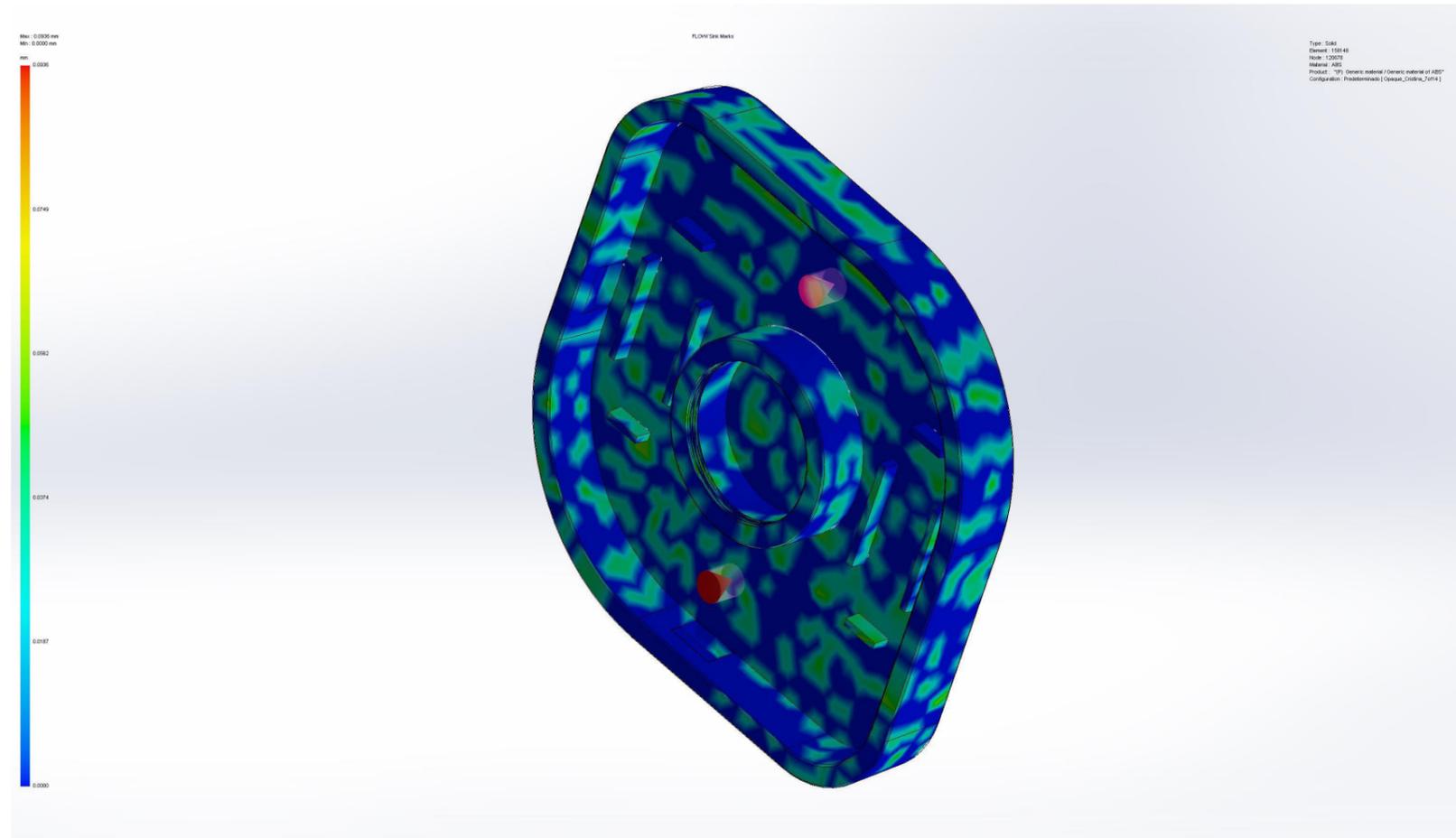
SECTION B-B



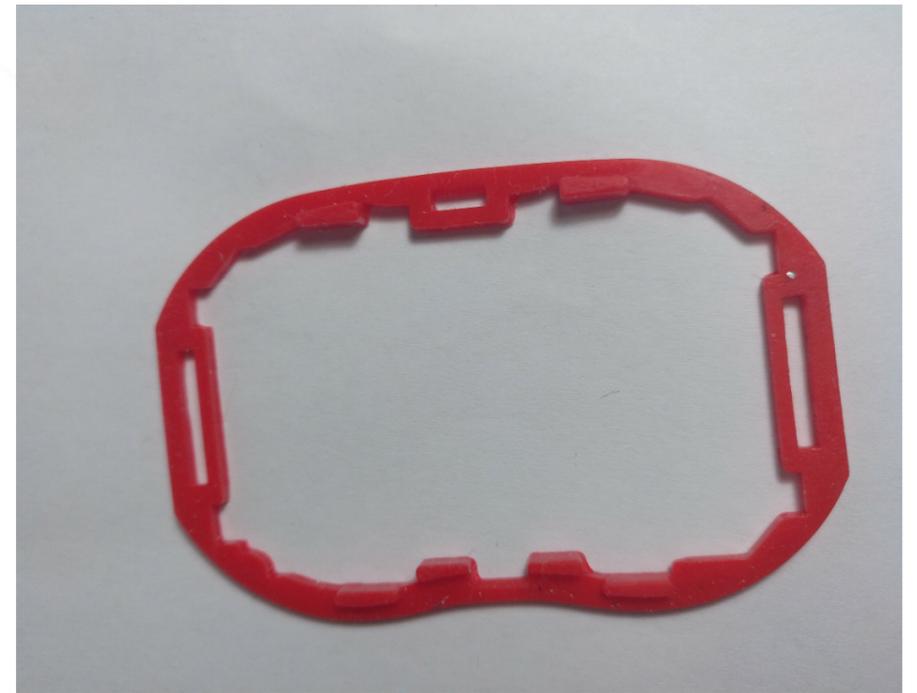
As it can be seen, there are no right angles, walls have been extruded with a 3 degrees angle, even the hole for the different screw.

The injection points would be in the front face, even though this is an internal component, that face would be holding the pcb and the injection points won't be seen.

As we can see, there are areas where the color is different, but as is quite close to the blue (meaning sink mark of 0.0000 mm) they are not dangerous.



sink marks and short shots
plastic moulding analysis

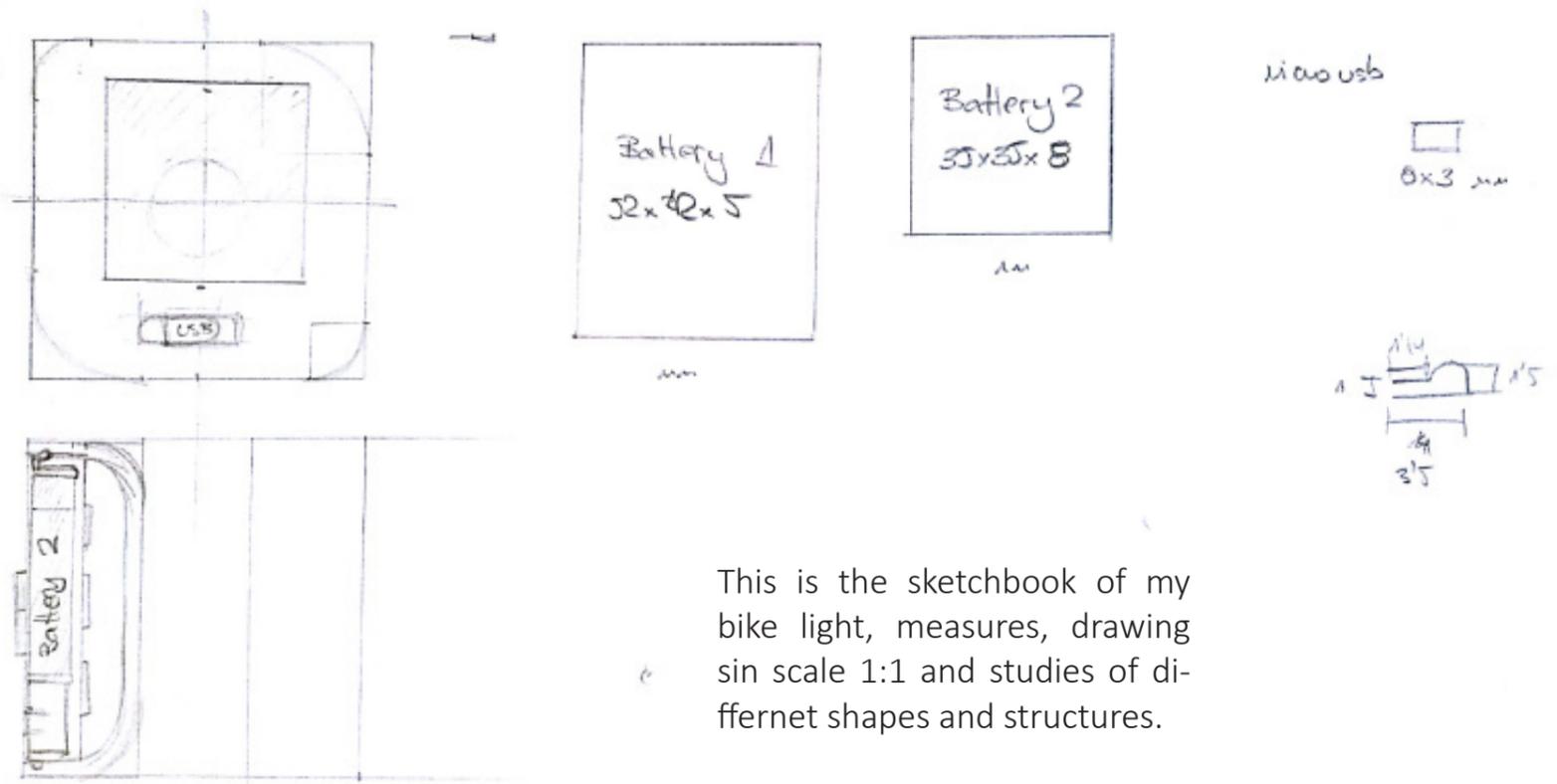
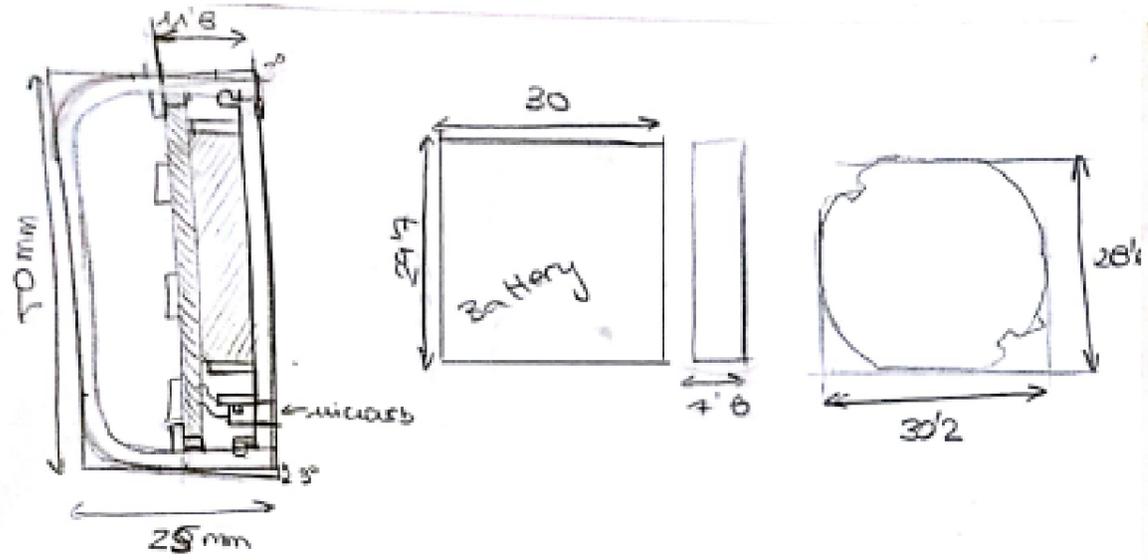


These are some of the real bike light that I used as an inspiration for the technical issues. For example, the snapfits of the black light for the my light itself and the snapfits of the white product in the clip attachment to join all the pieces together.

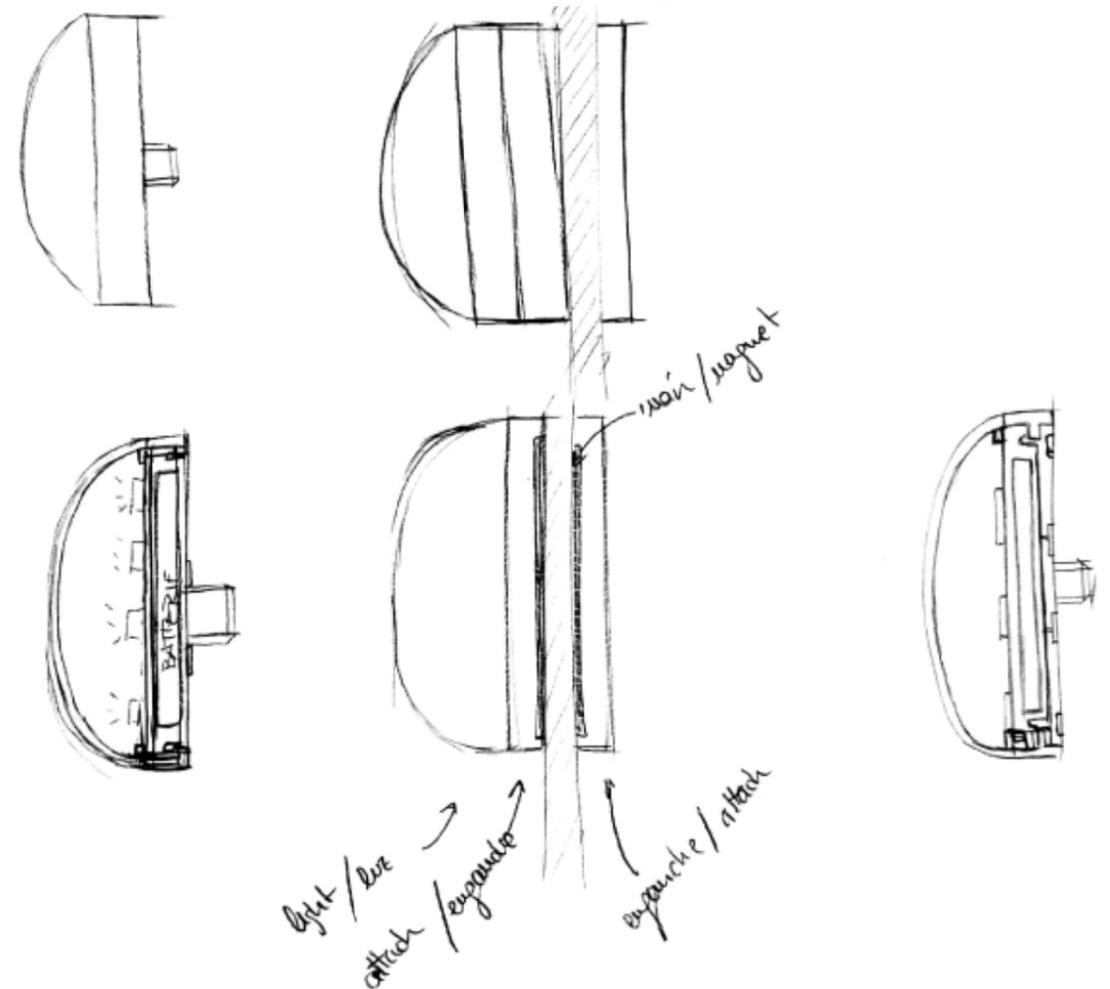
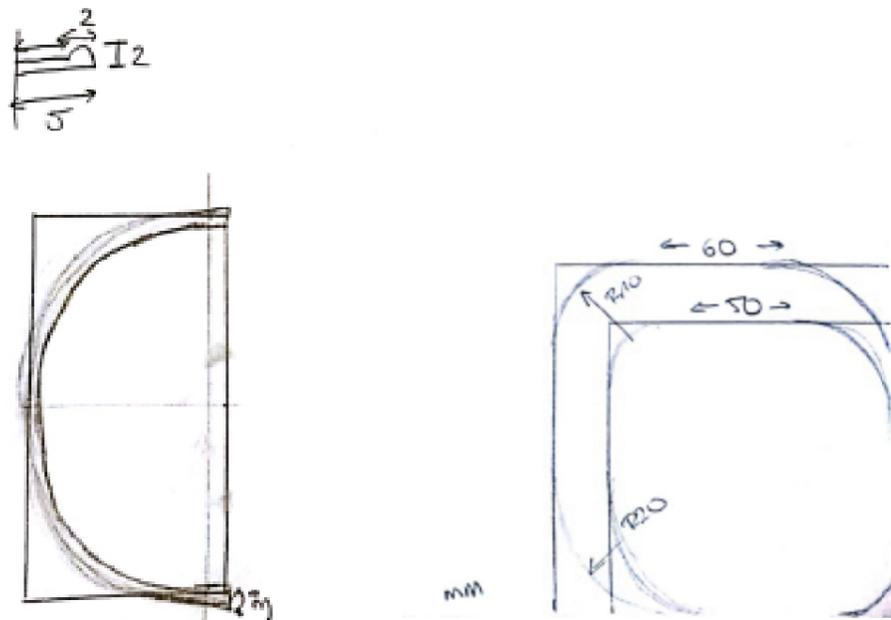
Also, the screw in the bike light at the bottom left corner as an inspiration to join light and attachment.



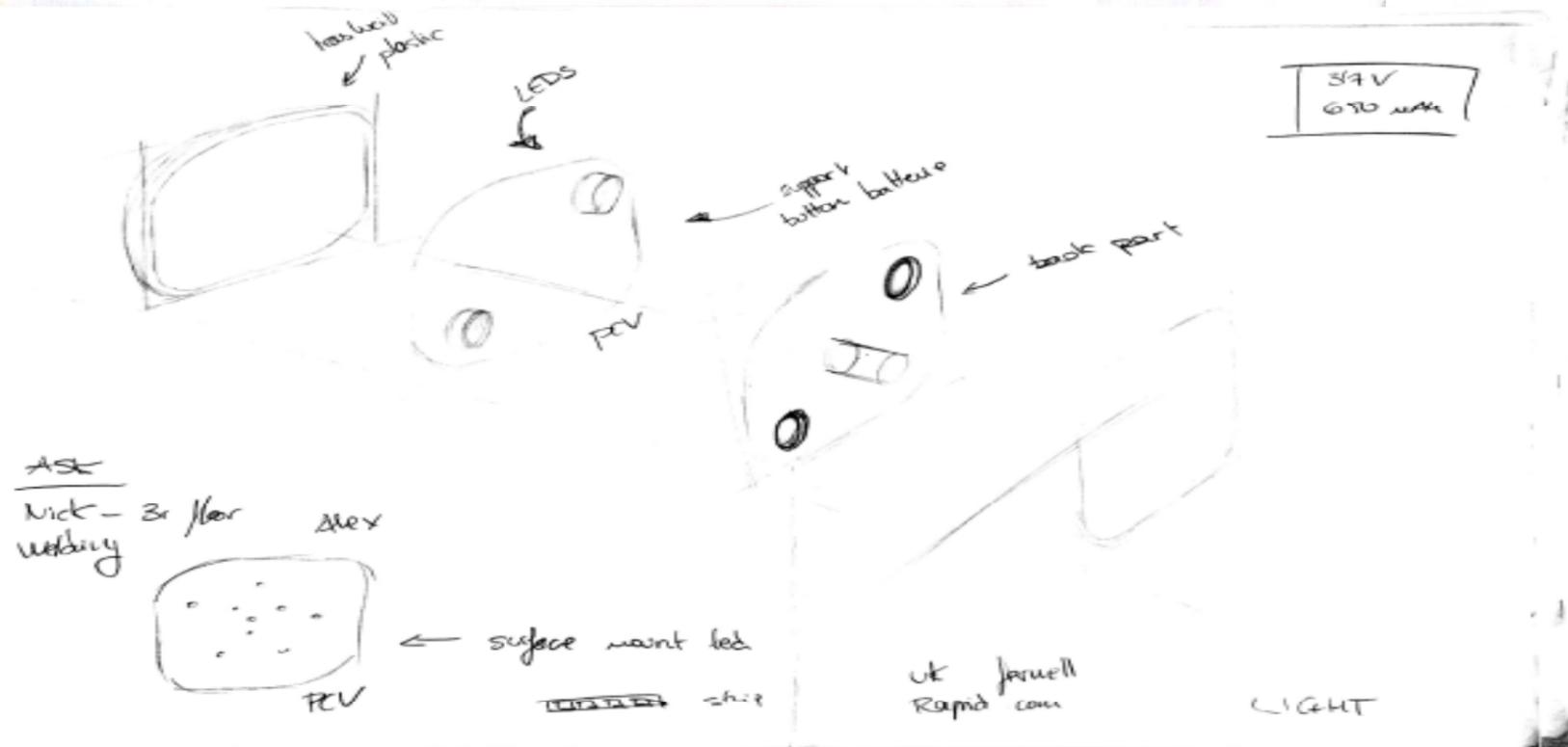
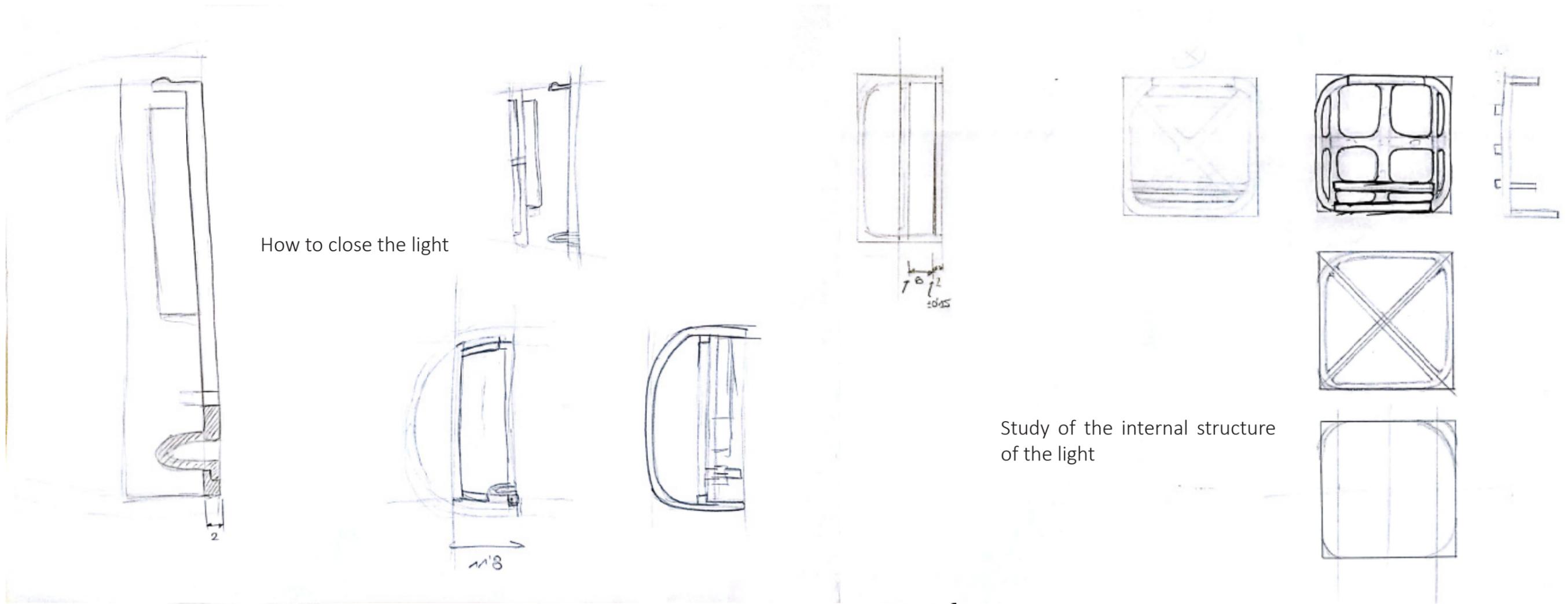
technical research



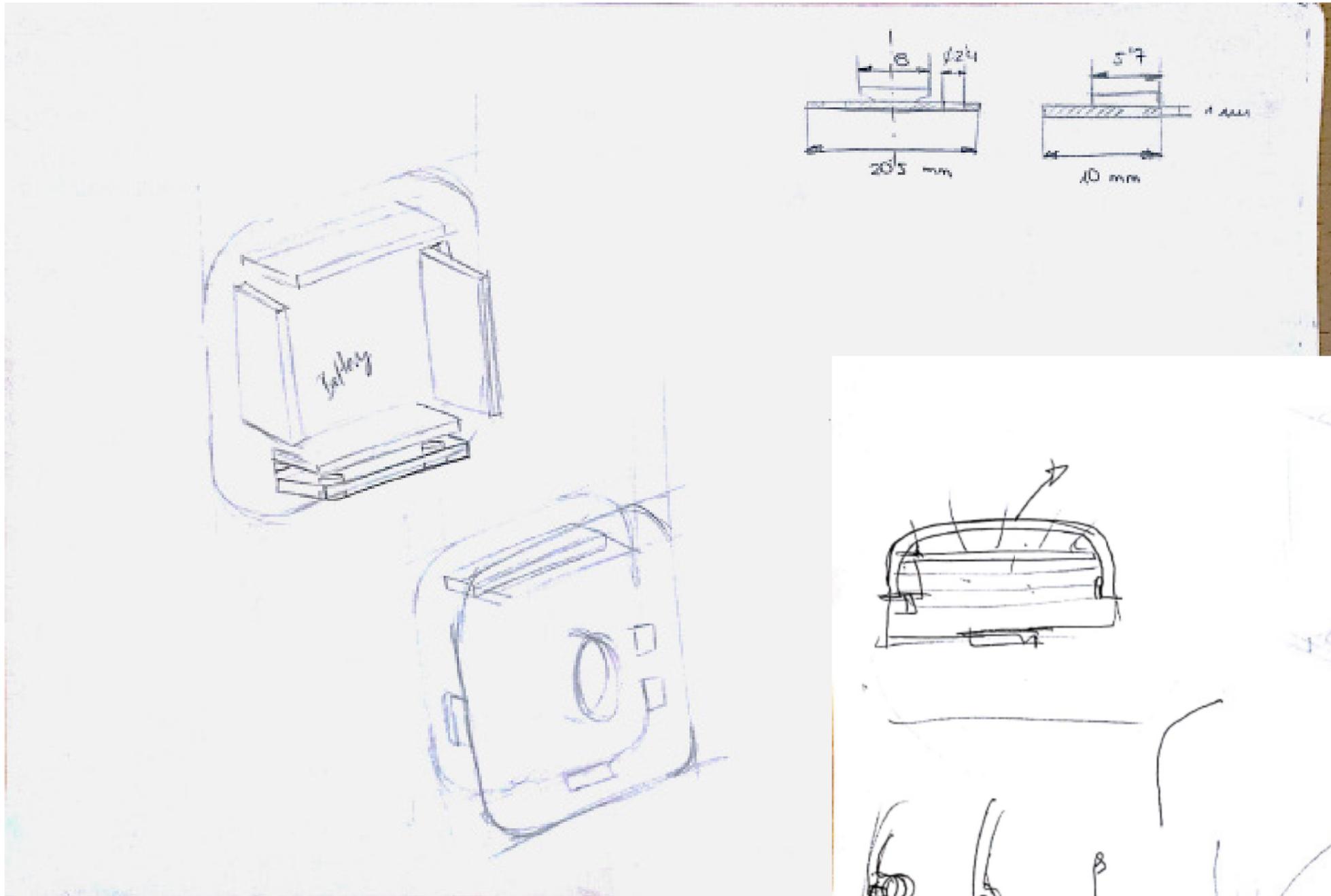
This is the sketchbook of my bike light, measures, drawing in scale 1:1 and studies of different shapes and structures.



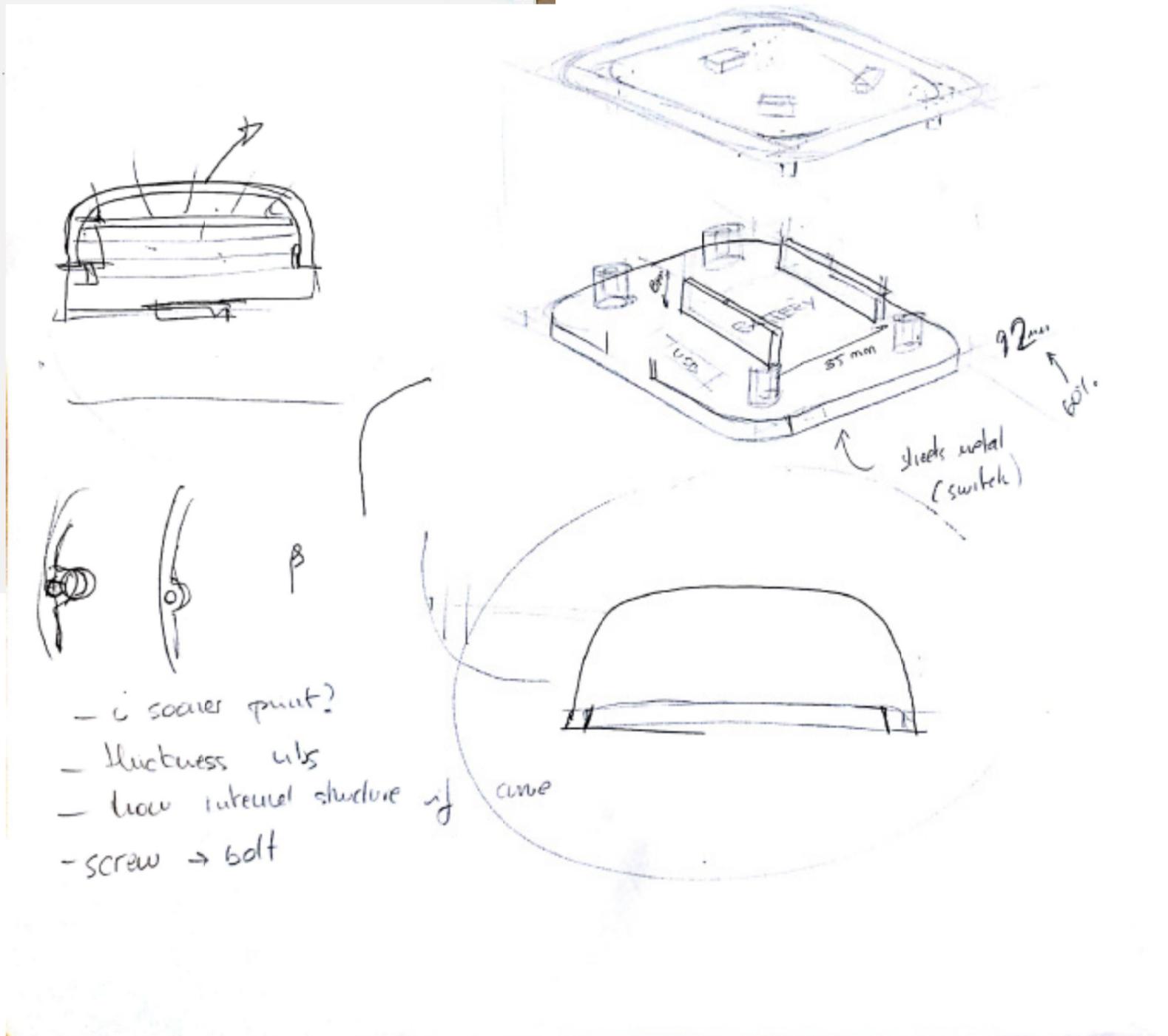
sketchbook
technical research



Exploded view of an early sketch of the bike light

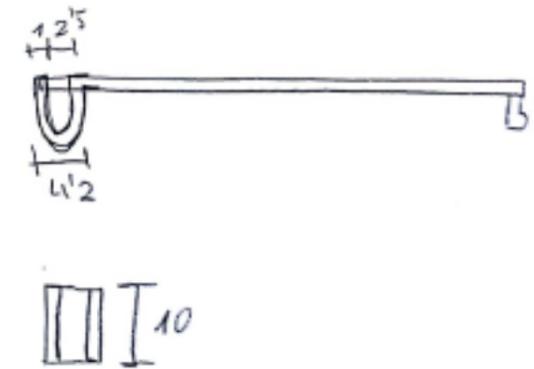
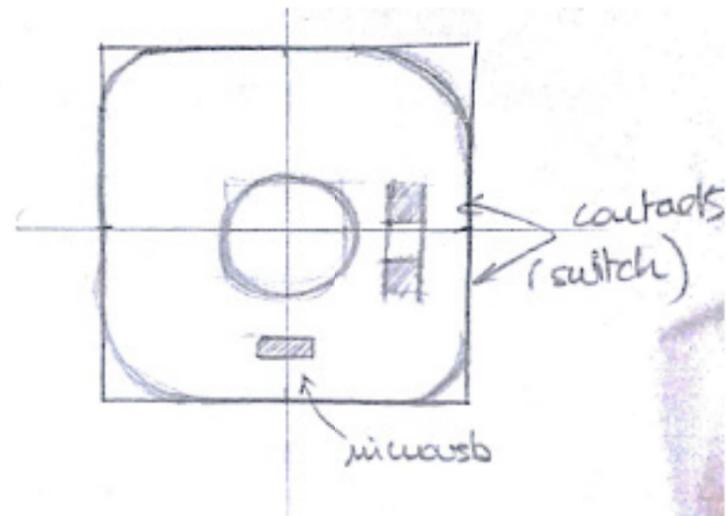
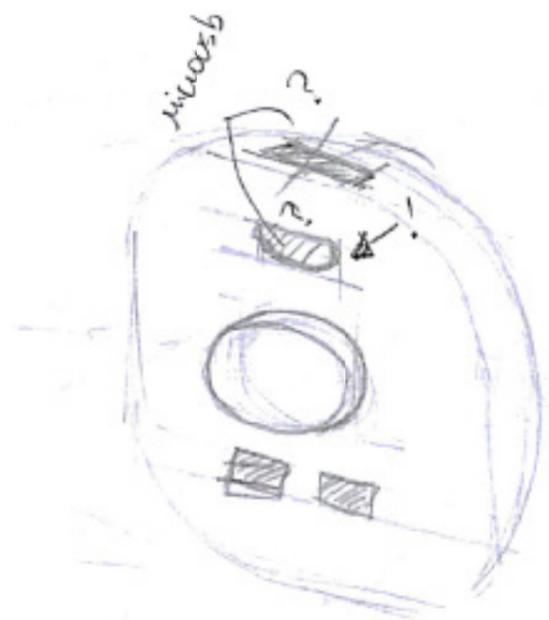
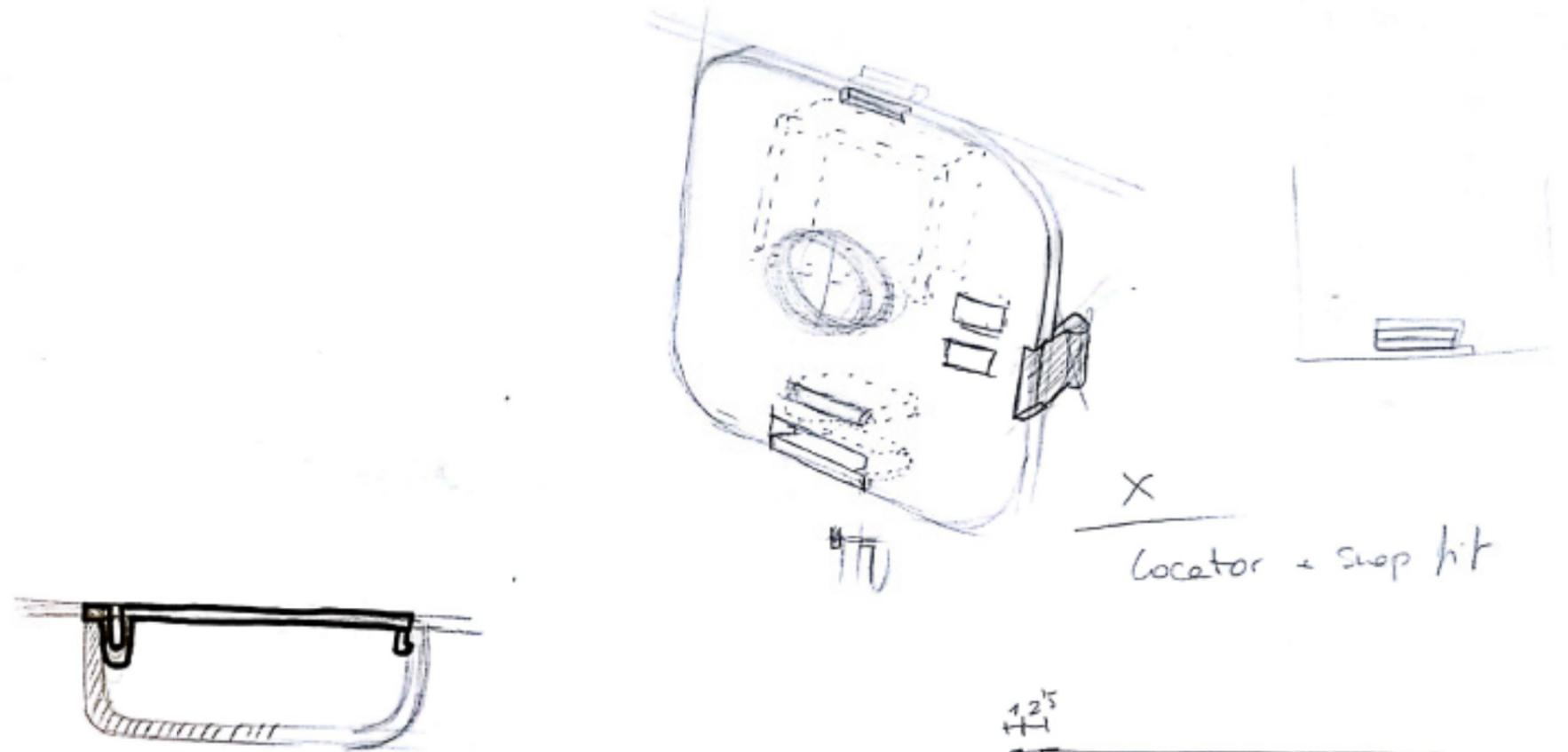


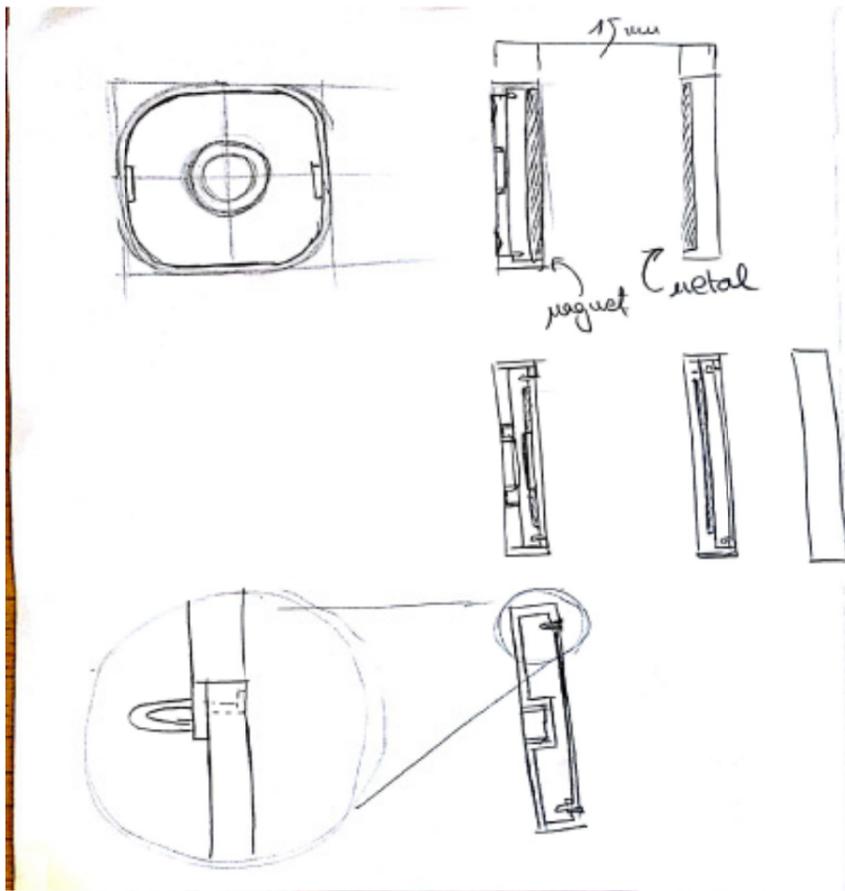
More studies on the internal structure that holds the battery and the pcb



- is screw part?
- thickness w/b
- how internal structure of case
- screw → bolt

Cover of the light, with the plates that will work as a switch and the screw to join this piece to the attachments. Study of the position of the micro usb charger.

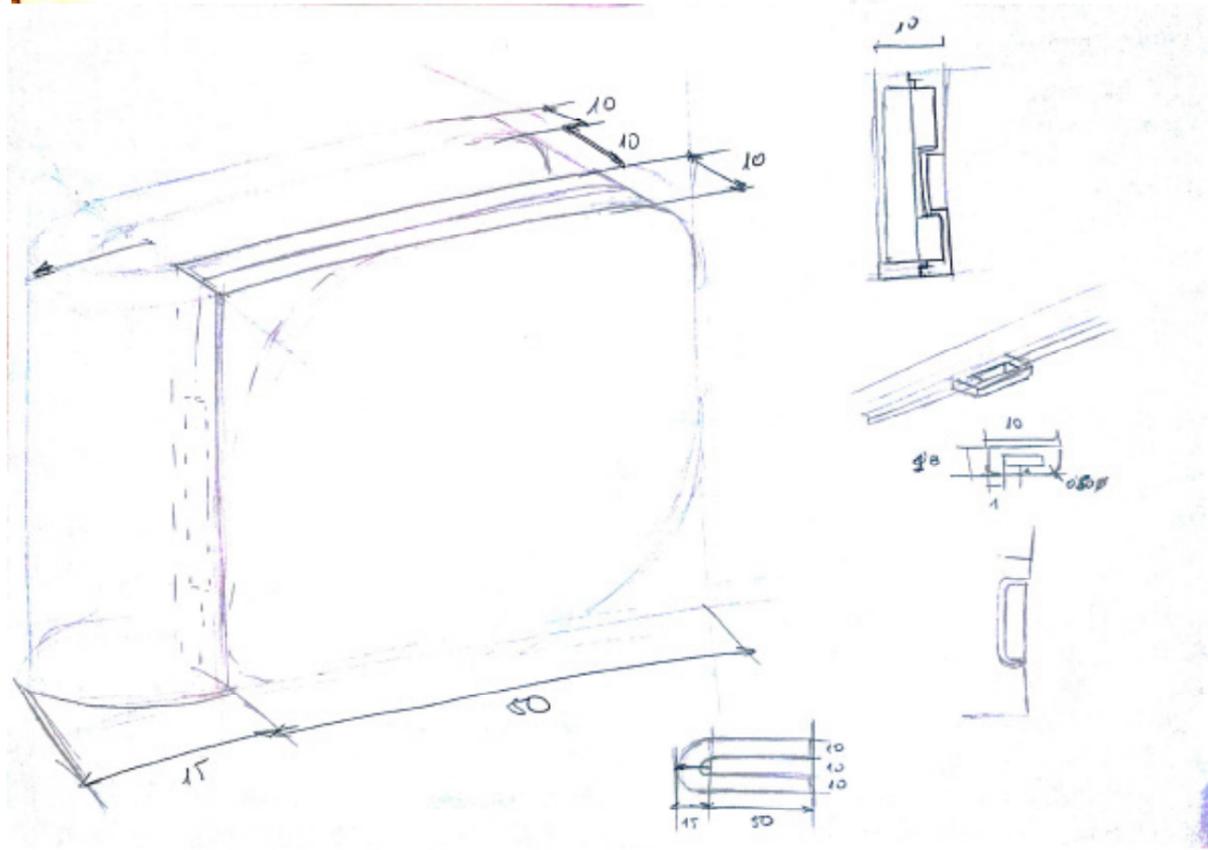
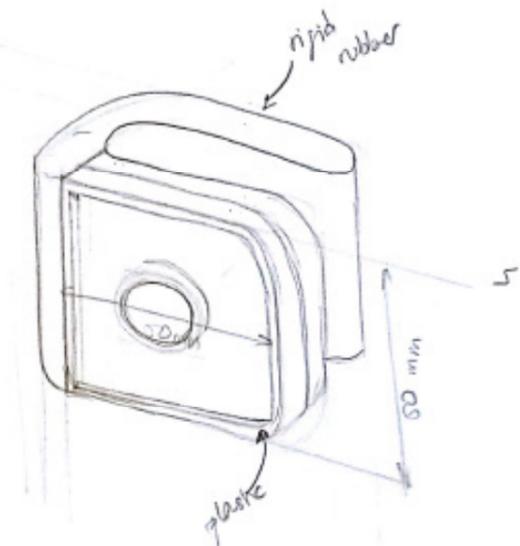


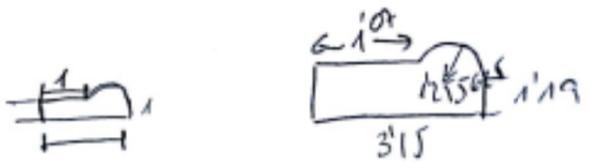
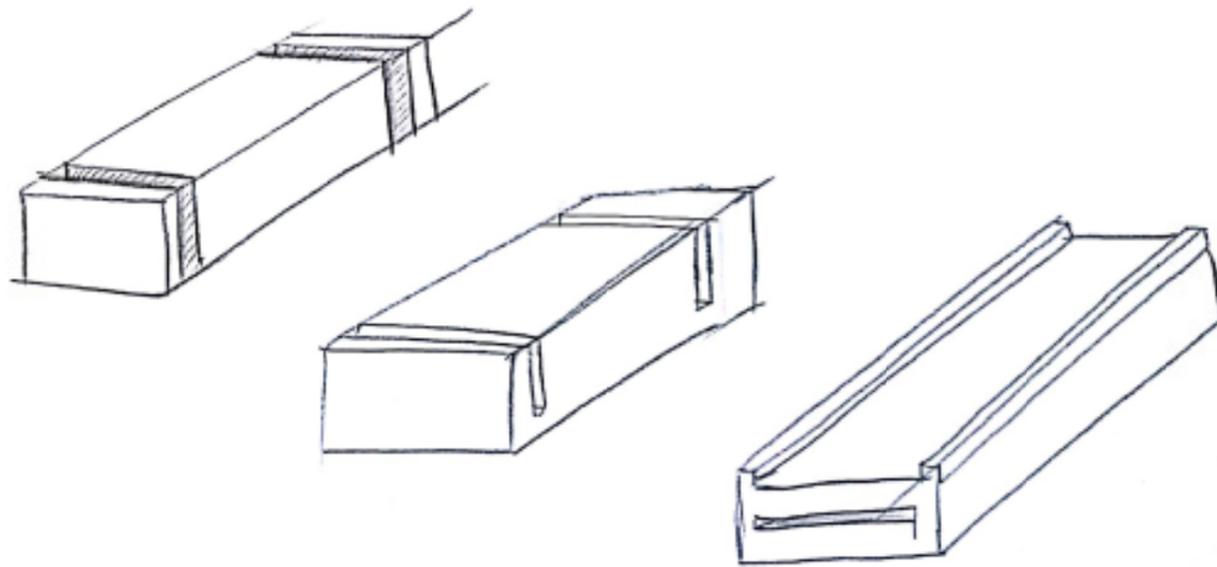


magnet size $\rightarrow 20 \times 6 \times 15$

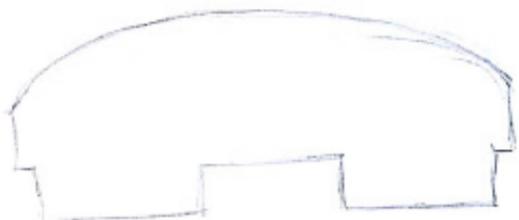


Sketches on the different attachments and their internal structure.

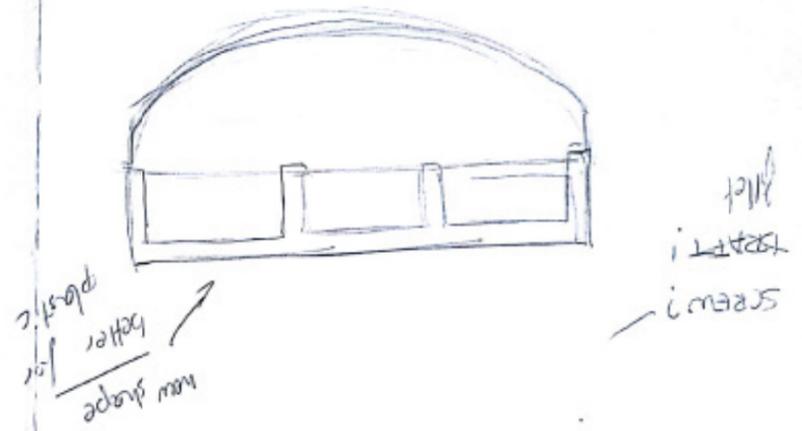




Study on how to hold the plates



New structure, due to injection molding





final product

