

" HOW COULD WE  
CREATE A NEW  
EXPERIENCE FOR  
FLEXIBILITY ...?"



By aggregating, editing and condensing what we have learned, synthesis enables us to establish a new perspective and identify opportunities for innovation.



# CASE PRO V5

## FIE

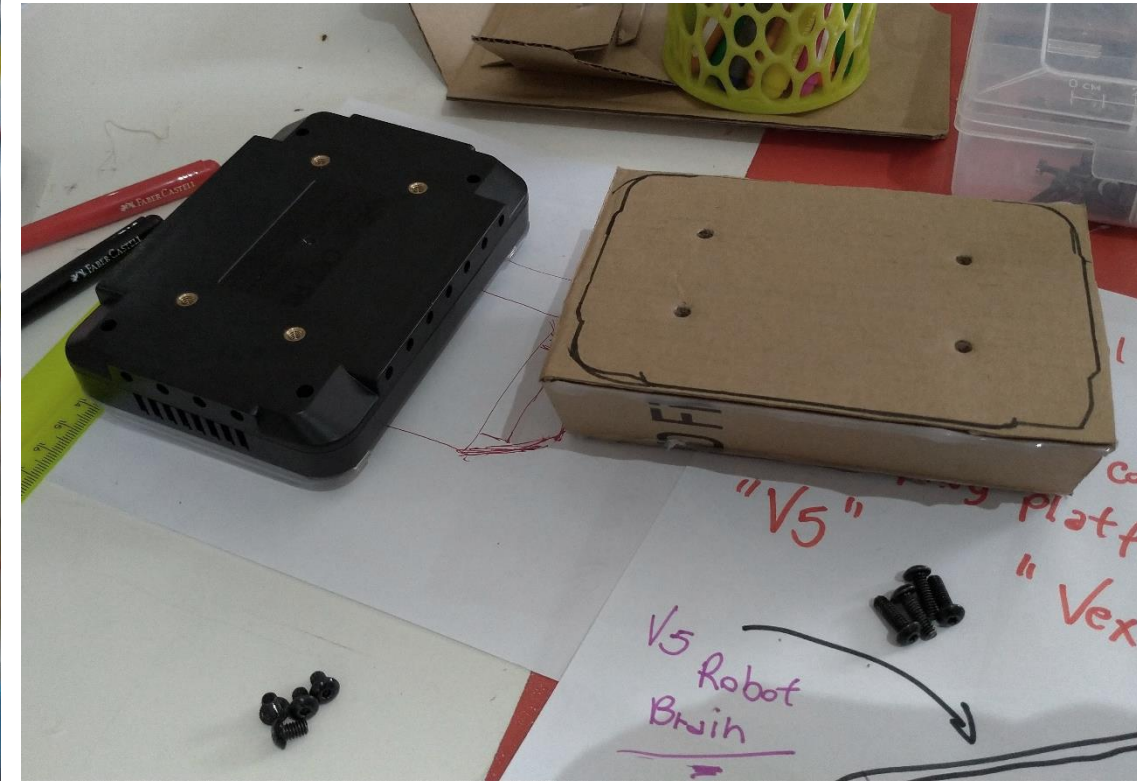
The new Case PRO V5 - VEX Robotics is a joint between three components that make life easier for the user (Programmer in his work activity) The Sigma (FIE) - Flexible, Integration and Ergonomic allow its users a new productive experience.

# DESIGN COMPONENTS

## IDENTIFICATION OF COMPONENTS







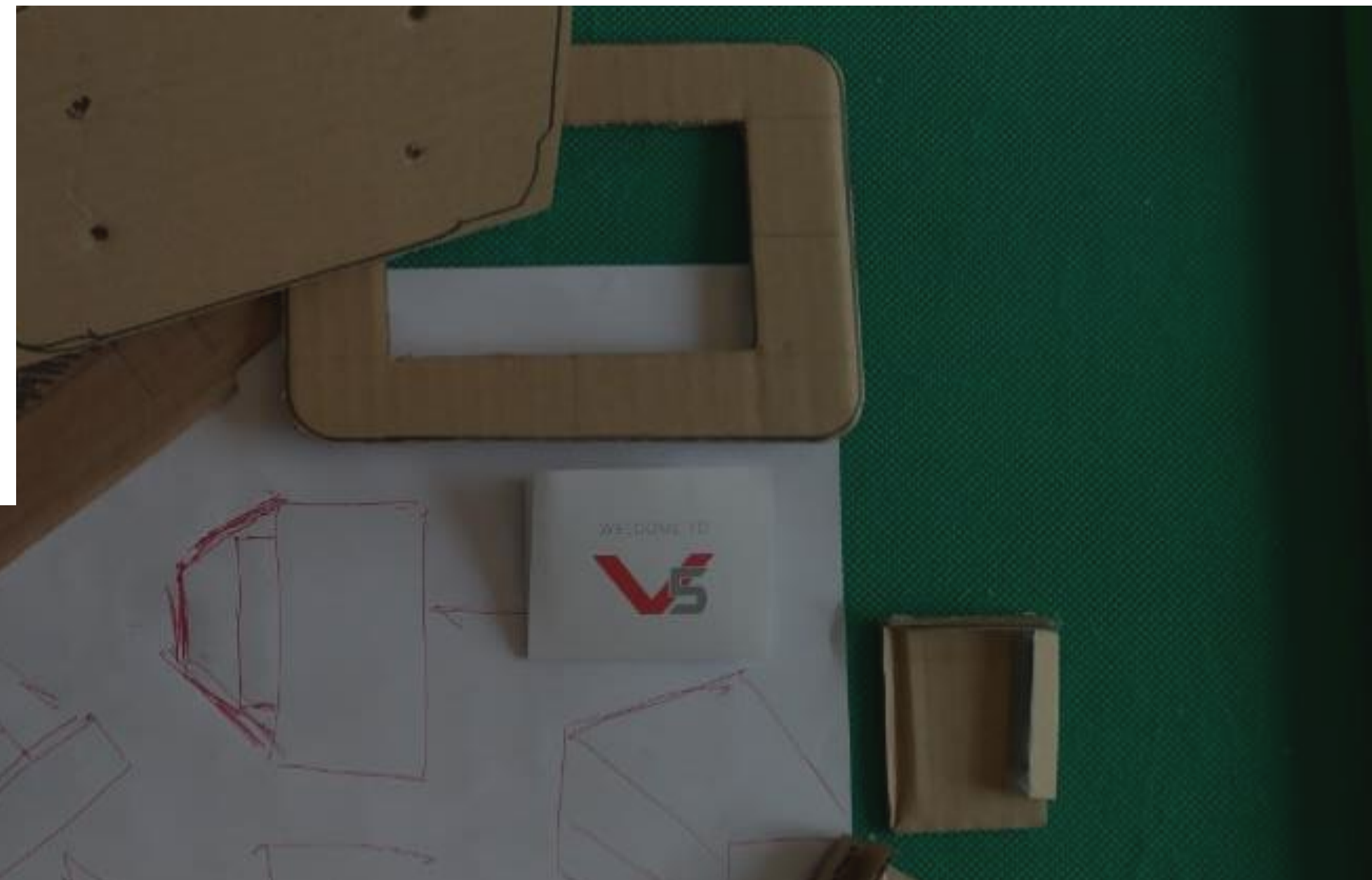
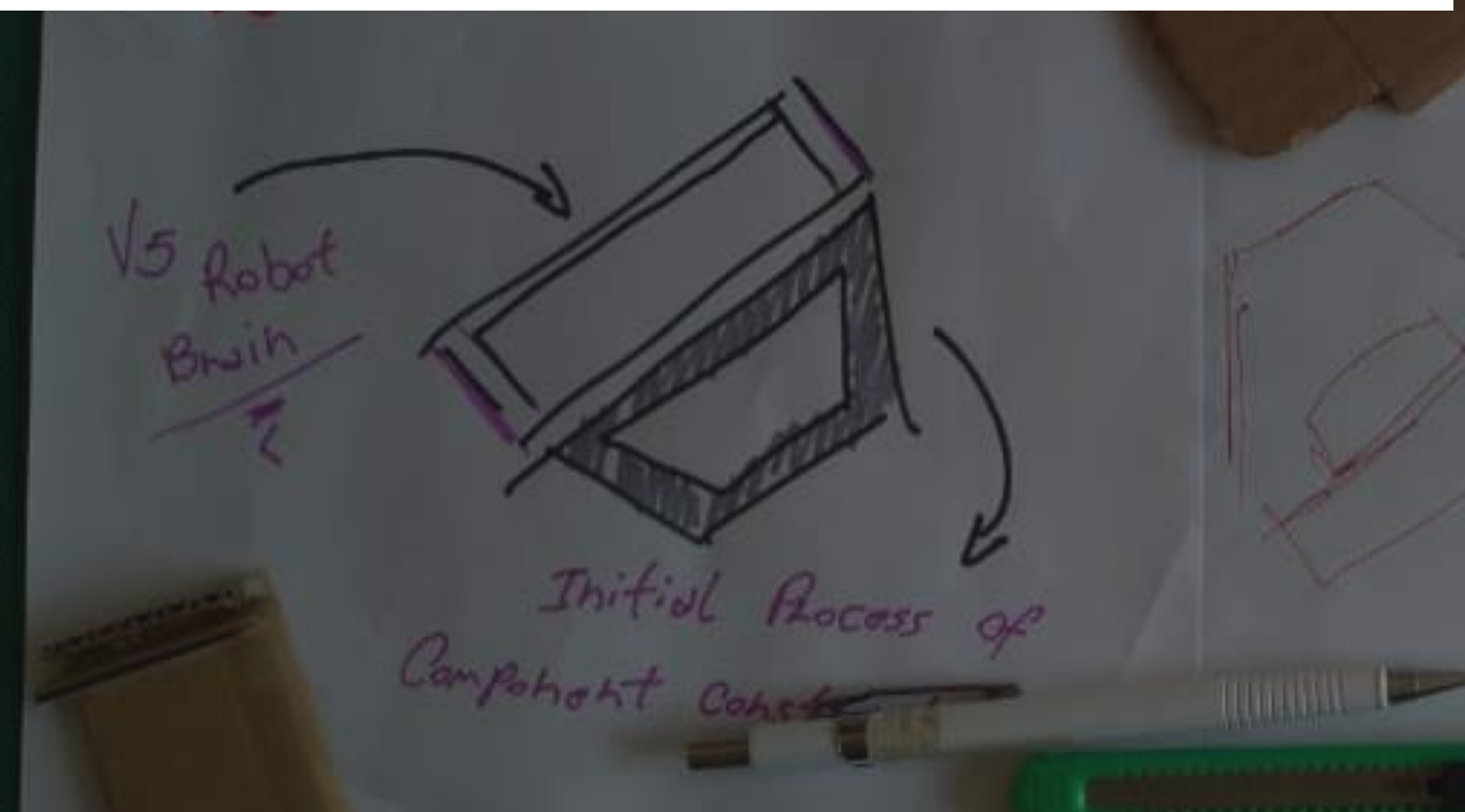
# DESIGN

Make It Real CAD Engineering Challenge Sponsored by Autodesk®





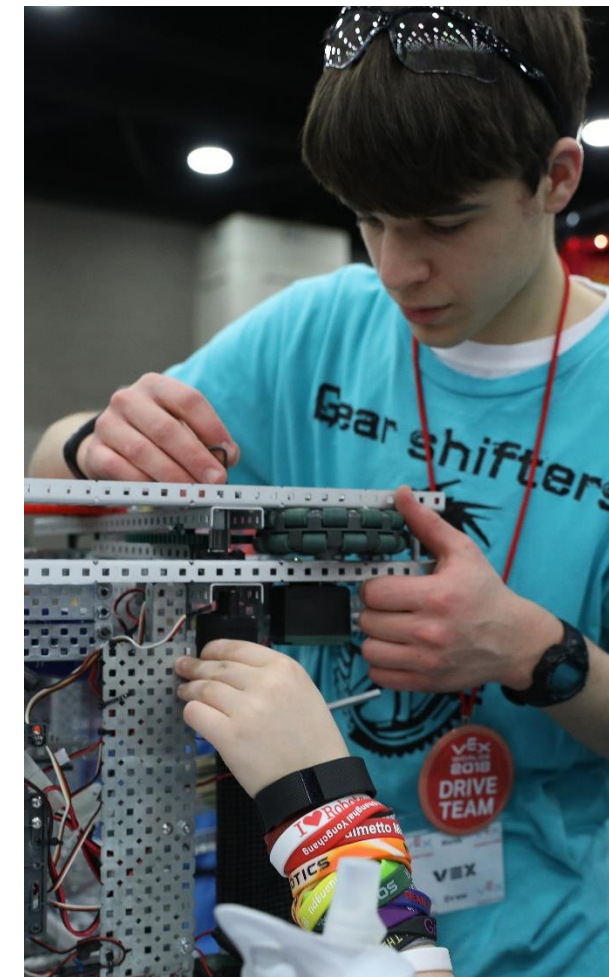
# A FLEXIBLE AN INTELLIGENT



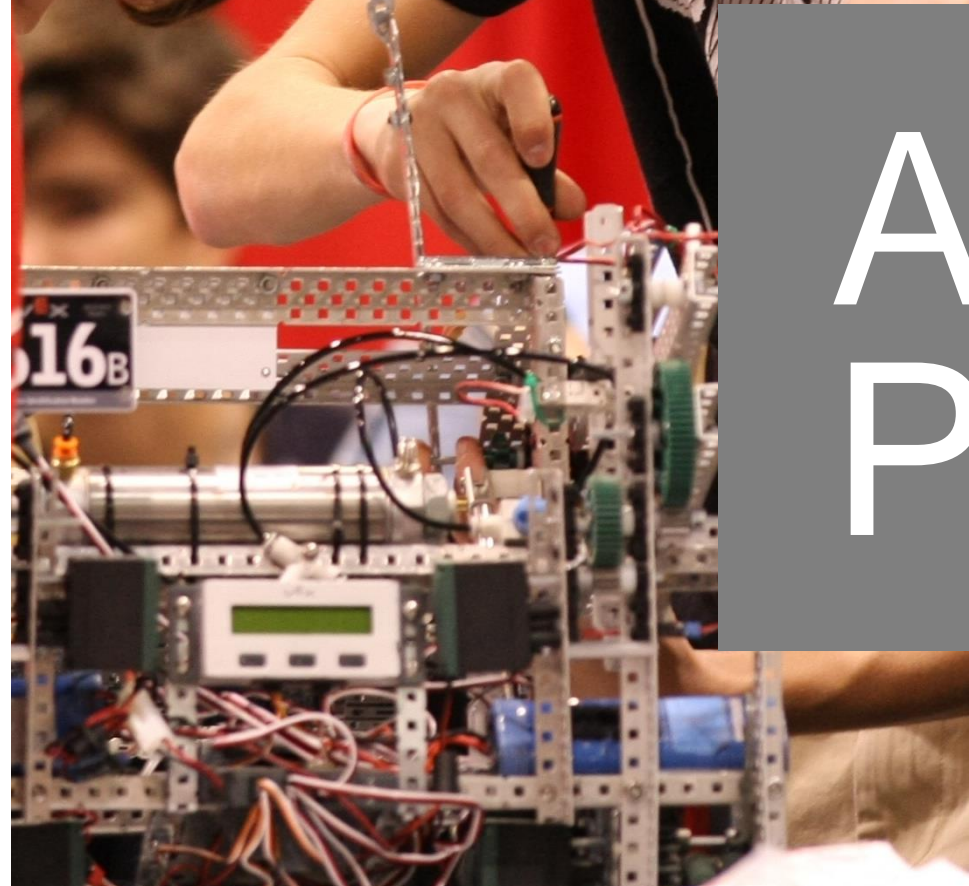
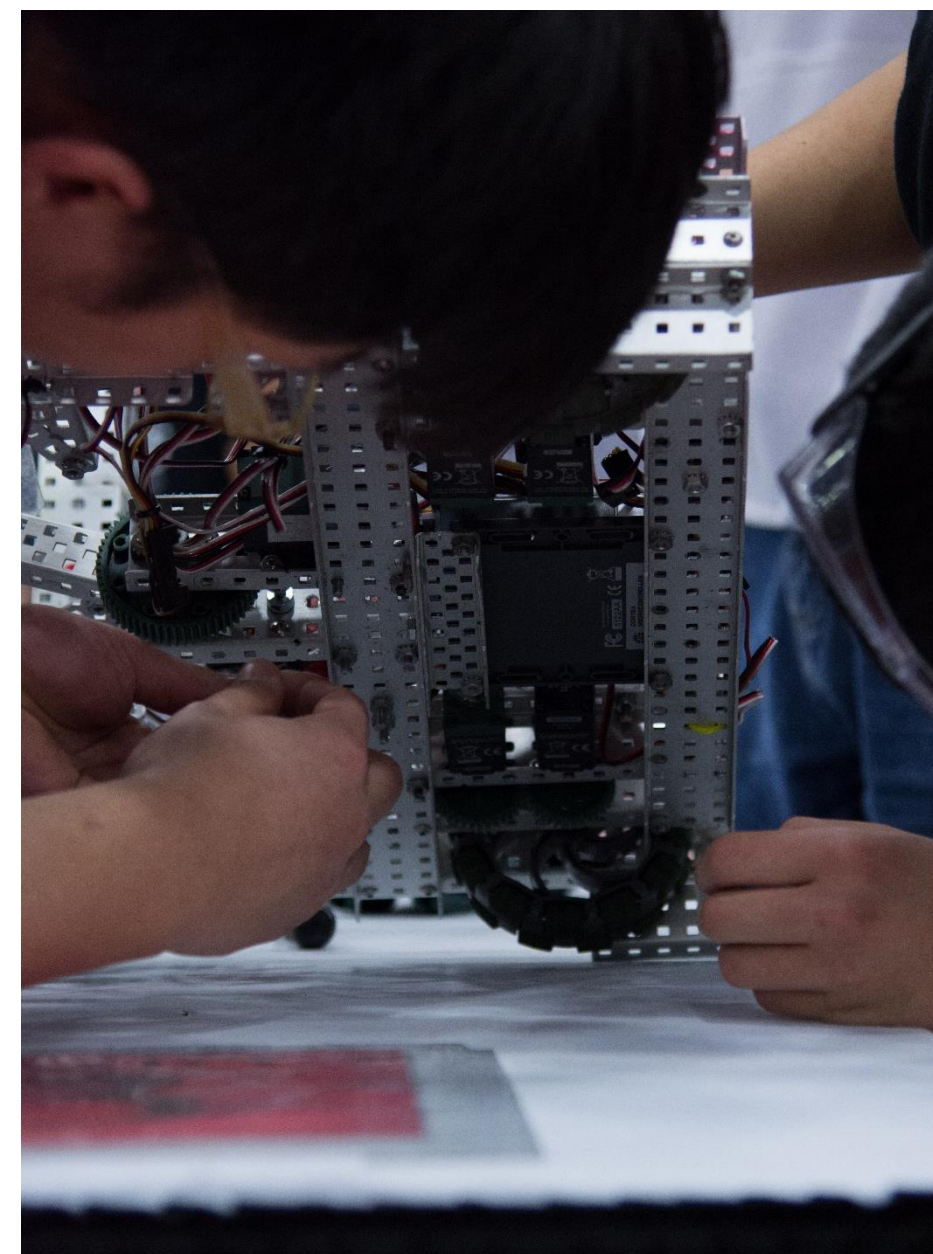
To provide a solution that enhances the experience of the user by eliminating the unwanted tasks during his competitions or any other type of activity.



The development of the new components promotes the integration between the V5 Robot Brain and the Robot Battery providing users with the easy monitoring and displacement of electronic components.



# AGILE PROCESS







# PRODUCT DEVELOPMENT PROCESS

## 01 ANALYZE

Work quickly on collecting and analyzing data from the V5 platform, then moving quickly to solution generation, prototyping and planning. Invest resources in the challenge. A format to encourage new ways of thinking.

# 02

## BRAIN STORMING

MY FIRST IDEA IS...

DETAILS:

Develop a new case for the V5 platform.

MY SECOND IDEA IS...

DETAILS:

Integrate platform components.

MY THIRD IDEA IS...

DETAILS:

Bring the best experience for the programmer and work with the concepts of ergonomics.



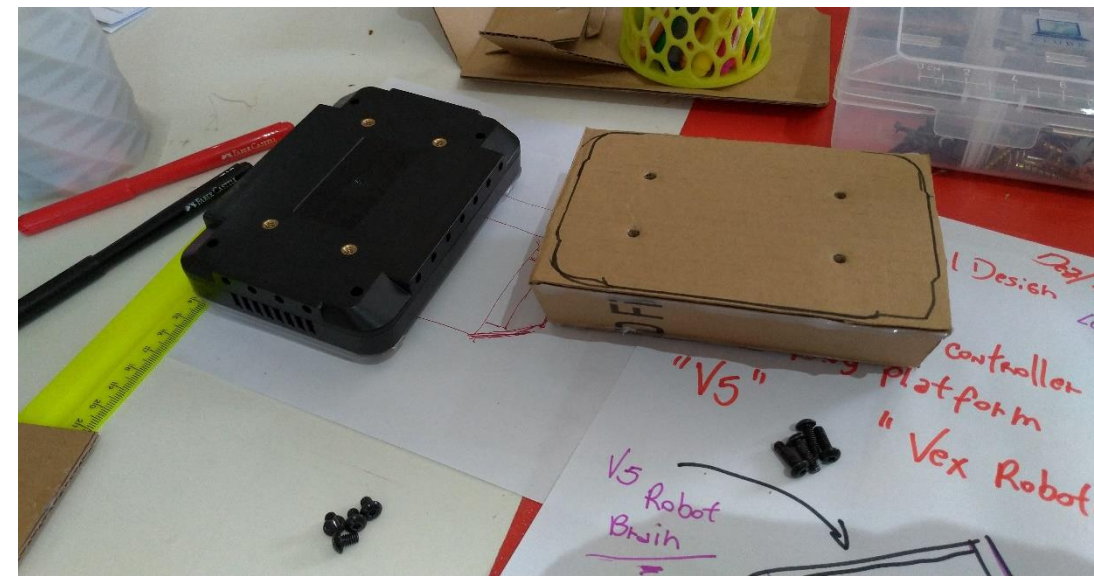
### BRAINSTORMING ORGANIZER

**TITLE:** Make It Real CAD Engineering

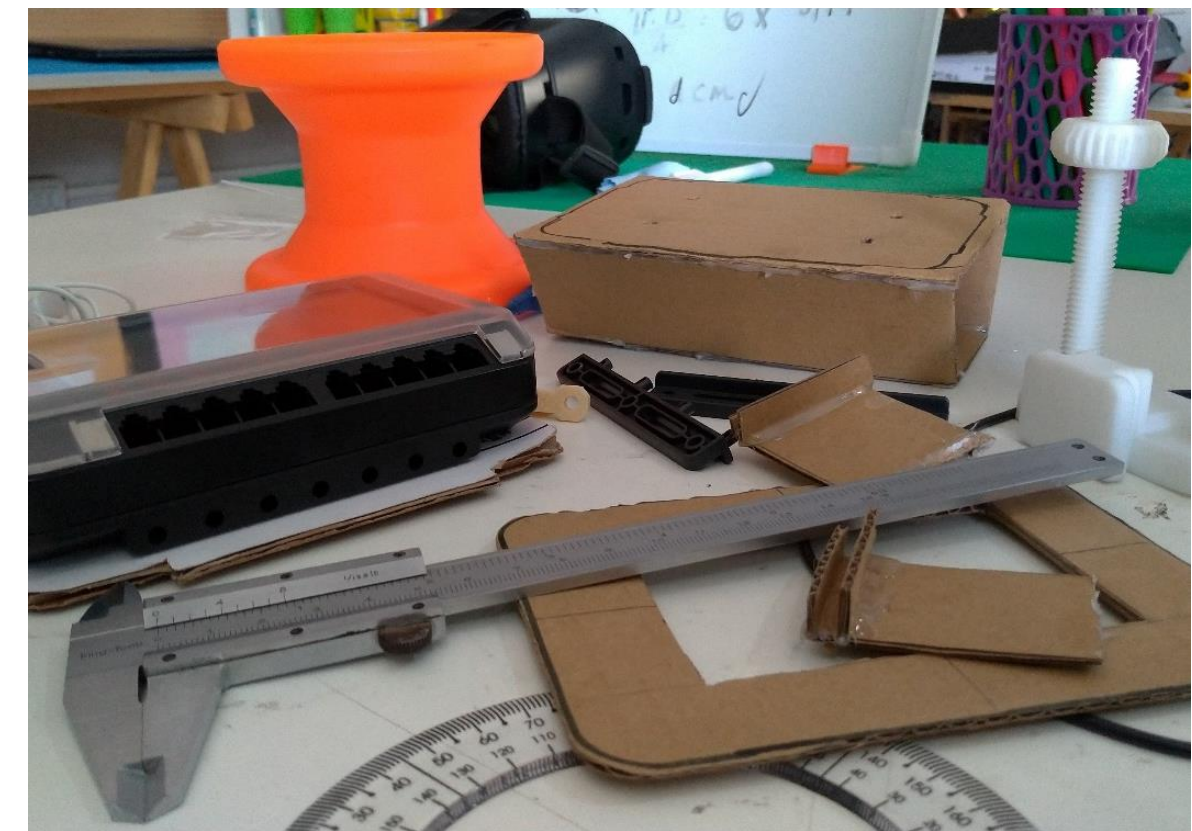


# 03

## IMAGINATION



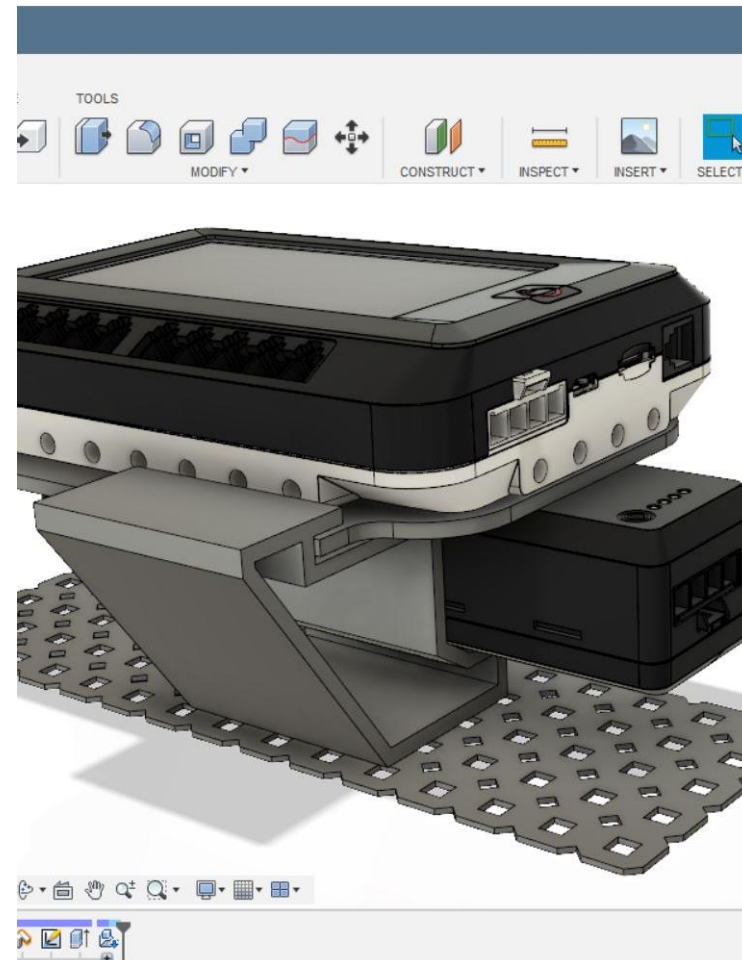
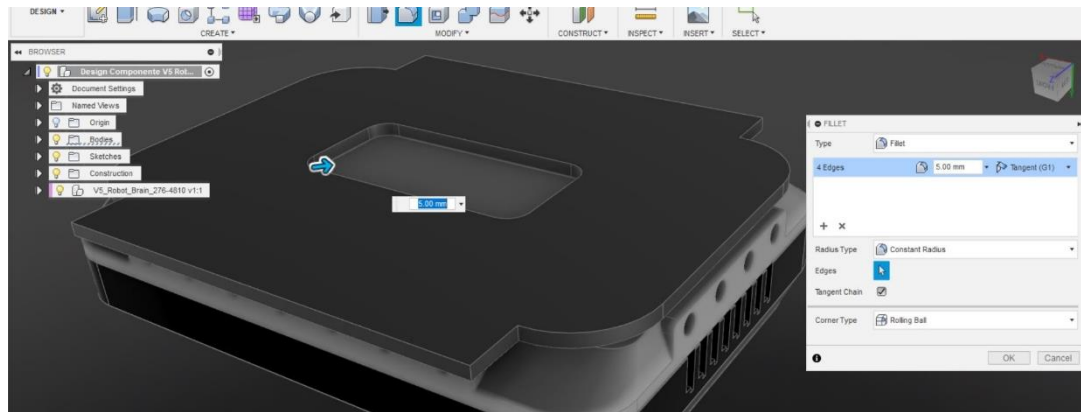
The physical model of a product, like the one presented above, causes an idea to come to life in three dimensions. Using simple, inexpensive material allows you to quickly build low-fidelity prototypes.



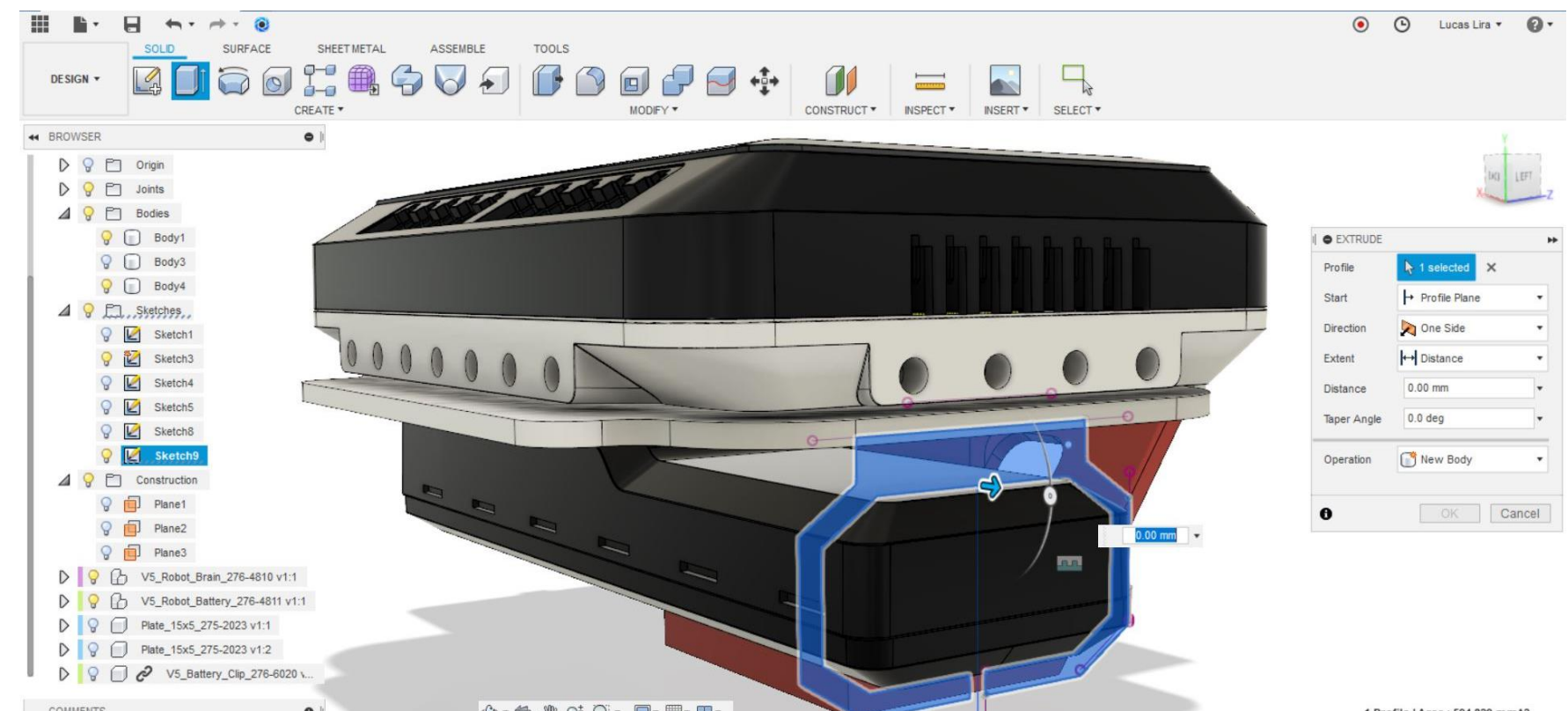


# 04

## ROUGH SKETCH



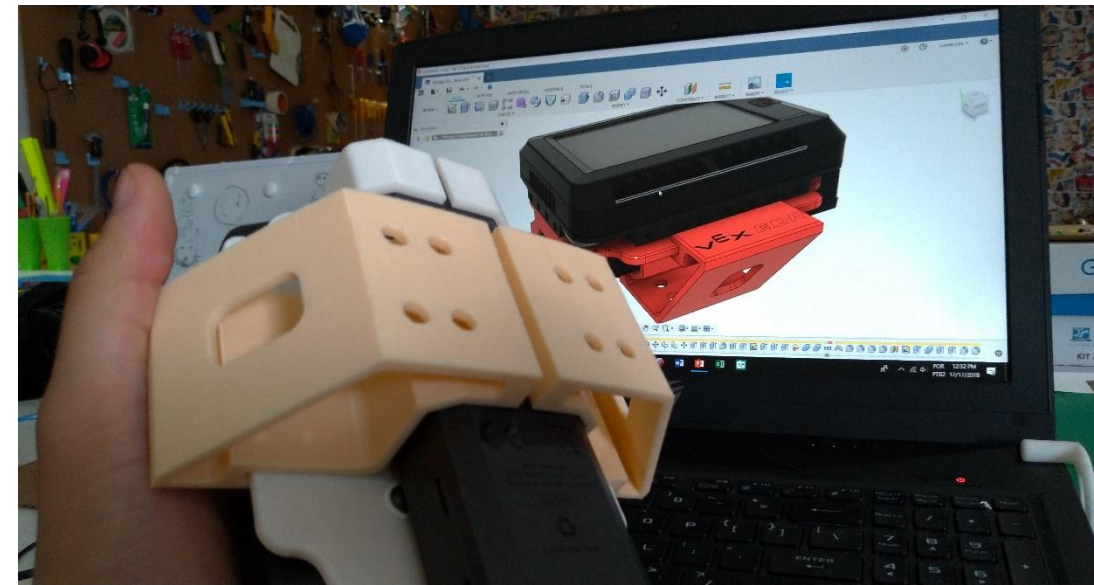
Component development with Fusion 360 software. The features implemented are inspired by the new V5 platform design. Autodesk Fusion 360 with its capabilities boosts innovation over 3D modeling, creating a sophisticated design of parts and assemblies quickly and efficiently.





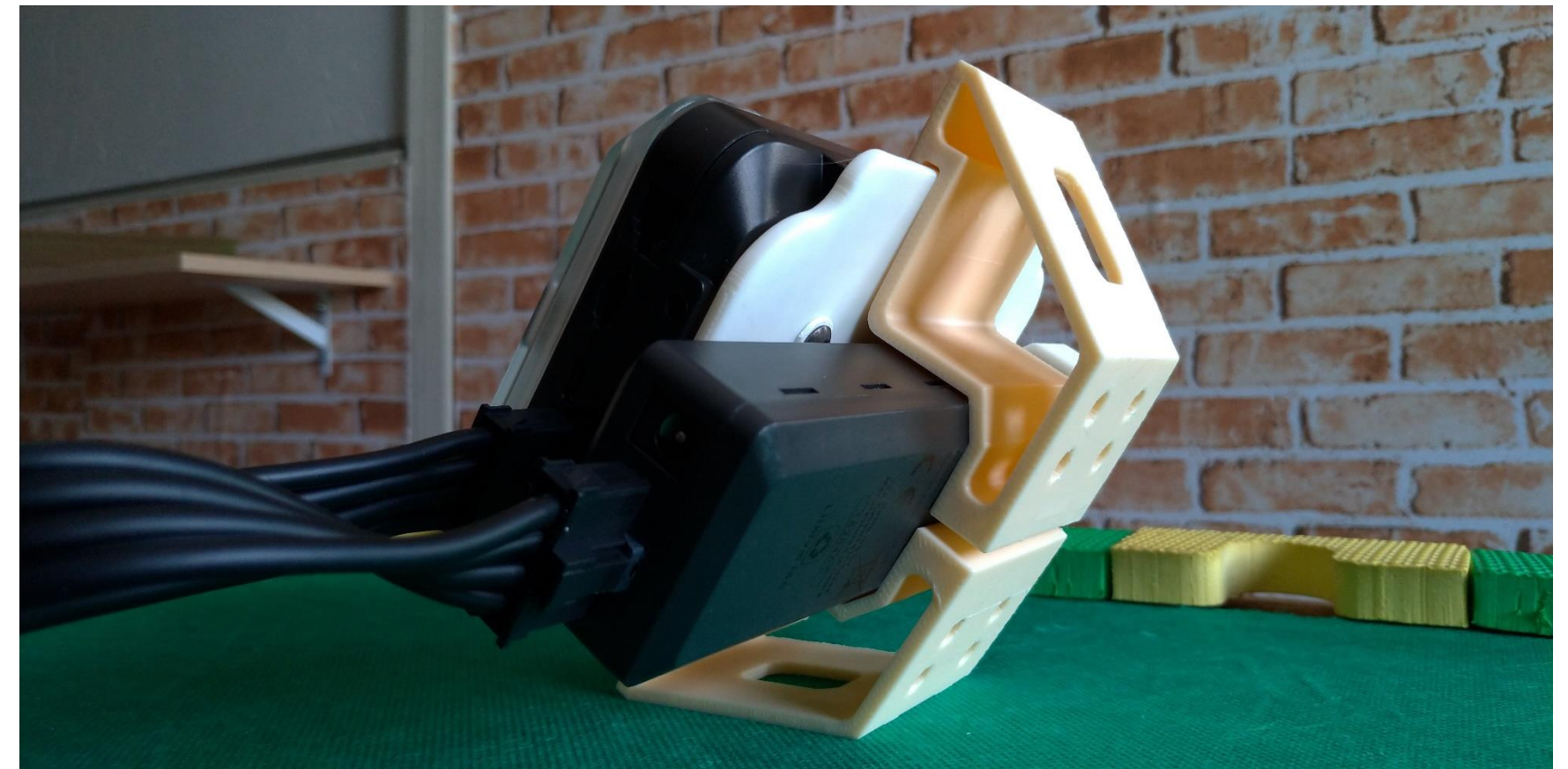
# 05

## PROTOTYPING



Think realistically about how users of V5 platform components interact with the concept.

SIMPLE, FAST, CORRECT





06

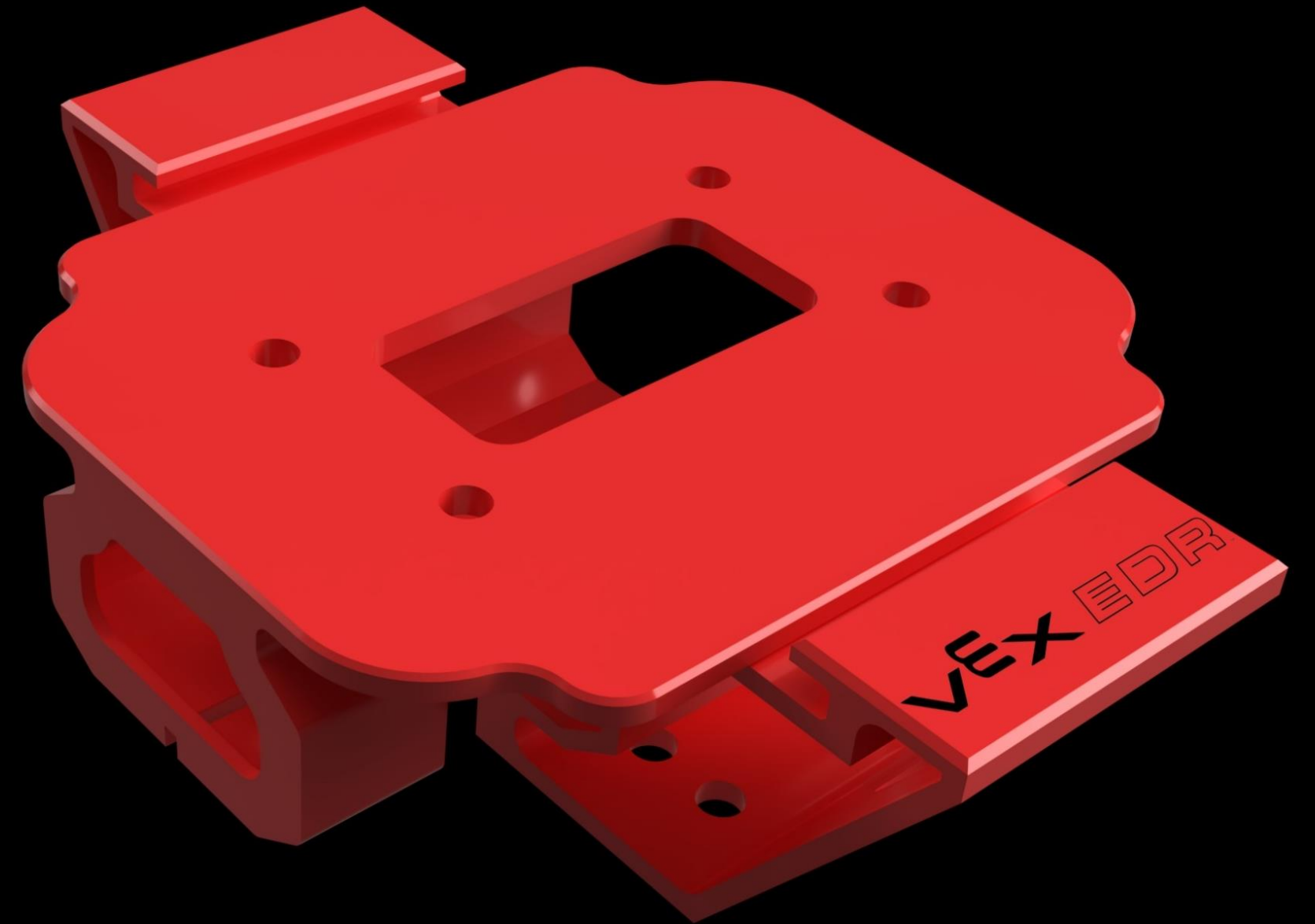


# EVALUATION



# DESIGN COMPONENTS

Provide a new experience





IMAGINATION  
MEANS  
NOTHING  
WITHOUT  
DOING





# ADJUSTING YOUR WORKING PATTERN

Why ergonomics?

Many students and competitors spend long hours a day in front of a computer and also V5 Brain.



# WHY ERGONOMICS

To perform the schedules for the robotic platform without thinking about the impact on their bodies. They physically stress their bodies daily, unknowingly, bowing, sitting unsupported and struggling to look at displays.





# WHY ERGONOMICS



These practices can lead to cumulative traumatic disorders or repetitive strain injuries that create a vital health impact.

Symptoms may include pain, muscle fatigue, loss of sensation, tingling and reduced performance.





# APPLICATION FOR PRODUCT DEVELOPMENT

Case PRO V5 – FIE

The Ergonomics applied in the development of CASE PRO V5 FIE is a way that tries to minimize these daily risks faced by programmers. The goal is to implement geometric features that may favor the monitoring process in the main goal of the new Brain V5 interaction between its touchscreen panel.

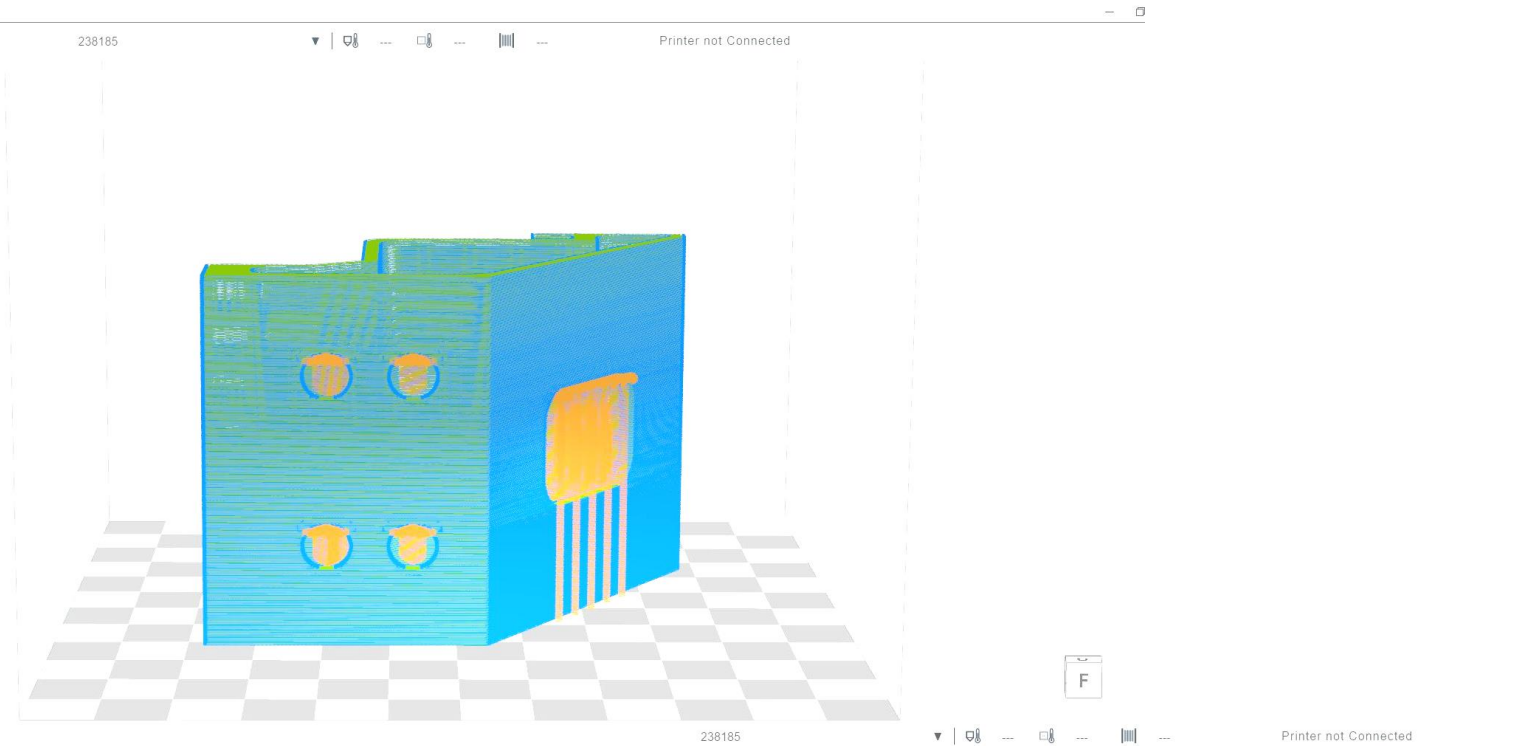


PROCESS  
OF  
MAKING REAL  
AND  
**TANGIBLE  
IDEAS**

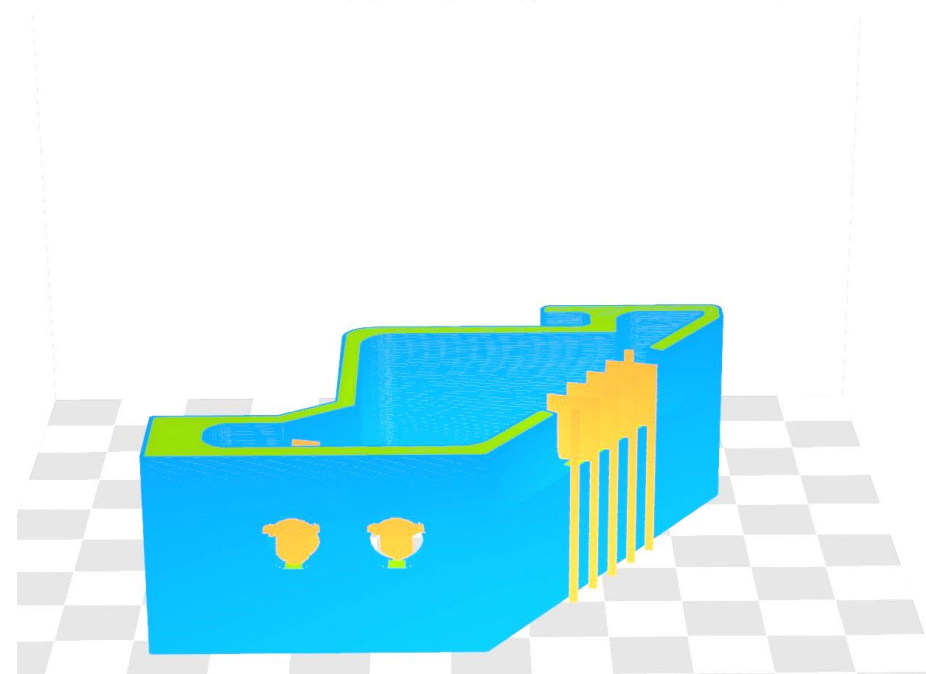




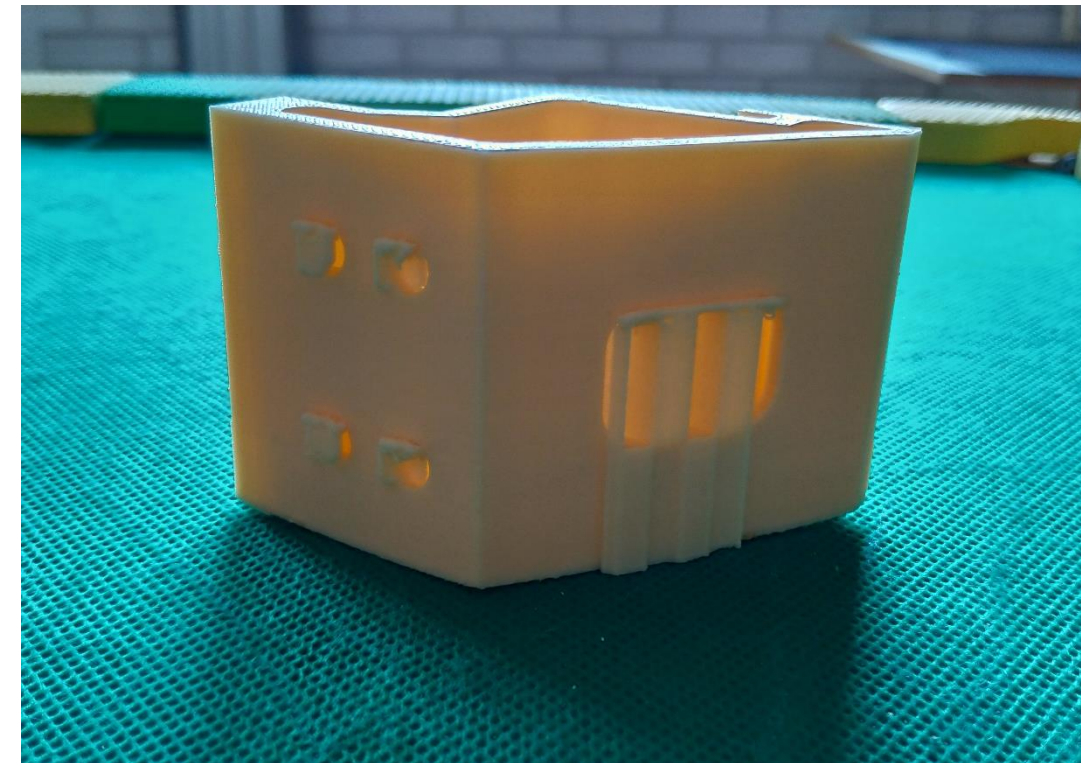
# MANUFACTURING PROCESS



Process of making the first component using the 3D printing process. Material extrusion prints using a string of solid thermoplastic material (filament).



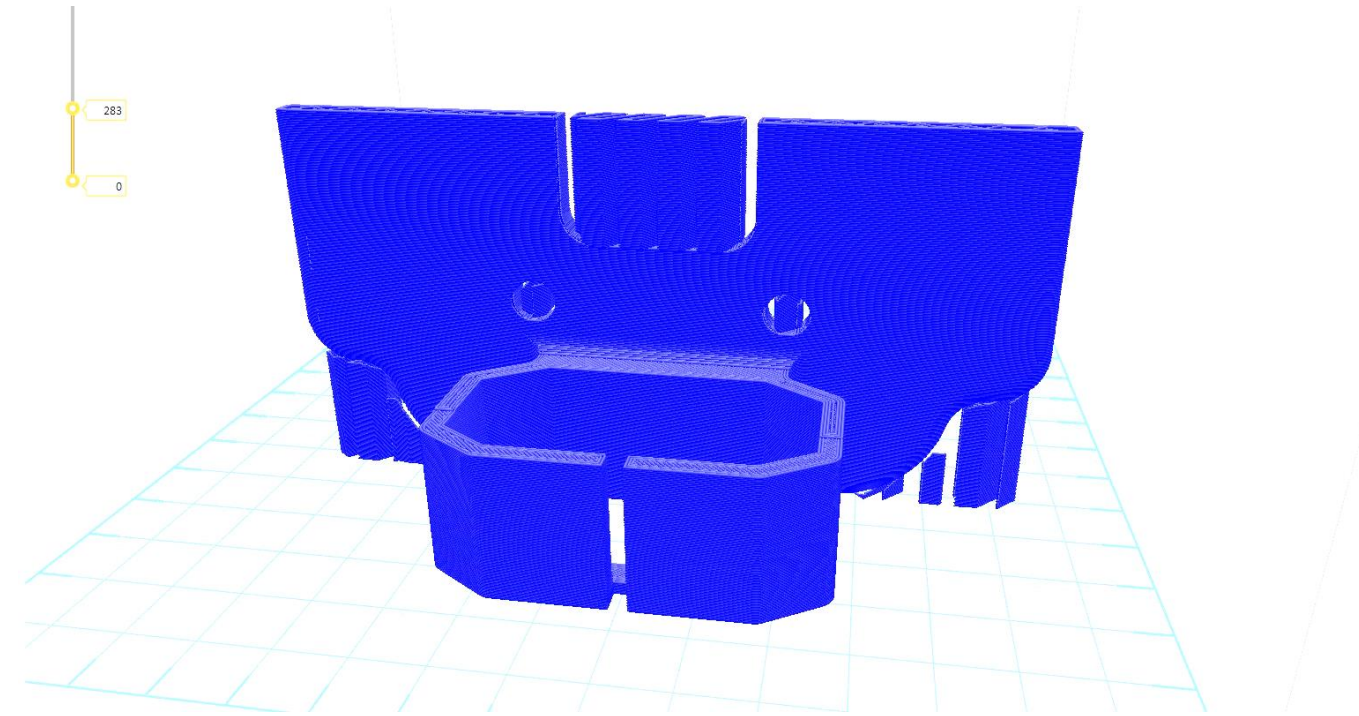
## PROTOTYPES OF ANALYSIS



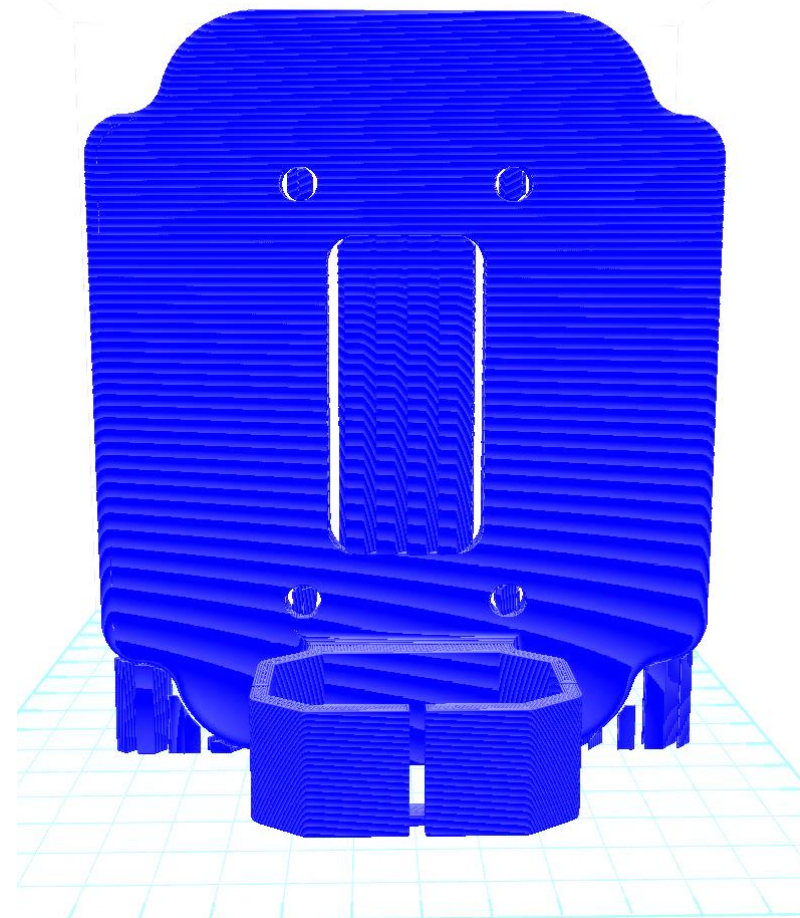
Final component finished materialization process, support are added on the structure of the component to maintain accuracy of exposed holes in the part.



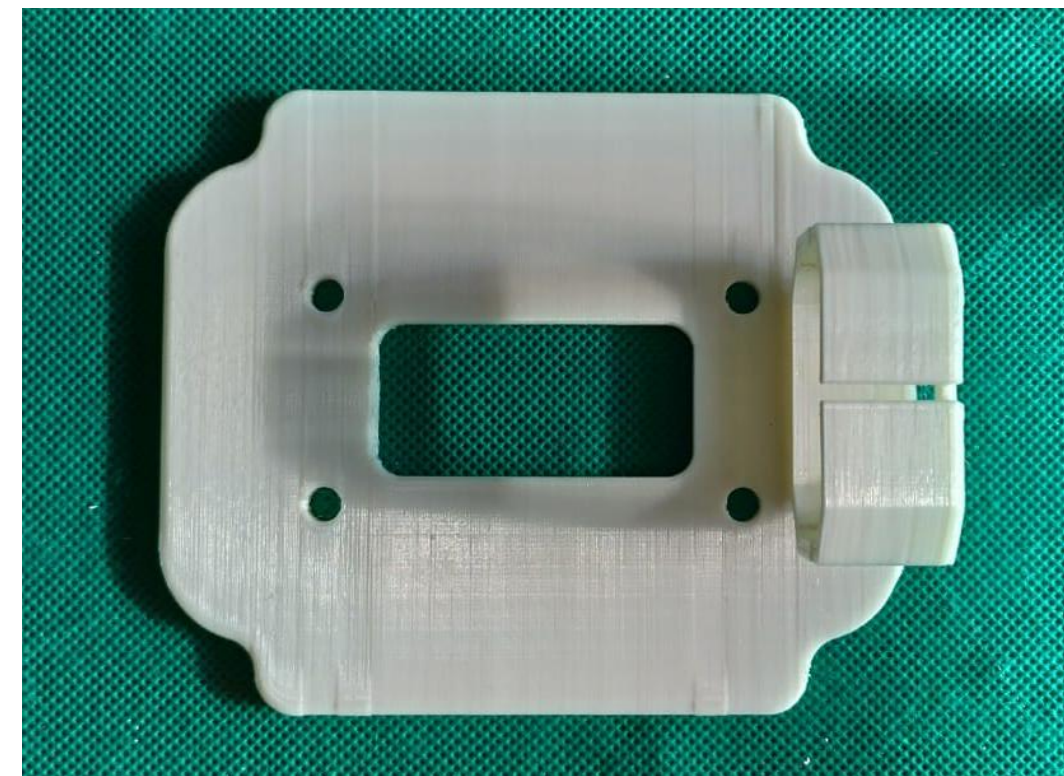
## MANUFACTURING PROCESS



Additive Manufacturing Process  
for the construction of the  
second component.



## PROTOTYPES OF ANALYSIS



Component physical view.



# VIRTUAL ANALYSIS



### Versatile Plastic

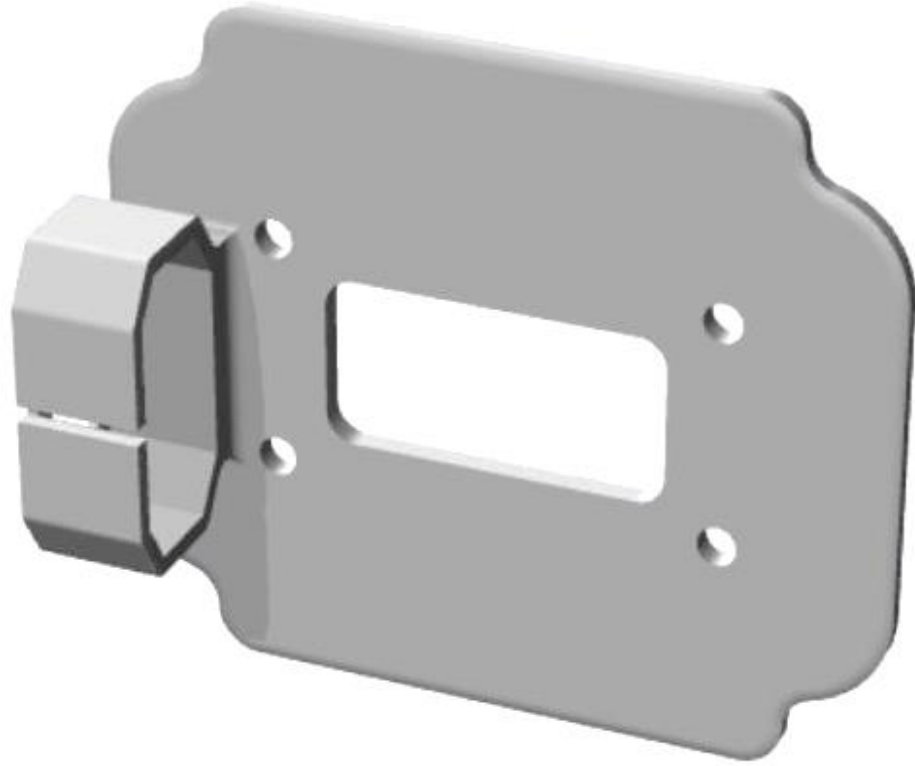
A nylon plastic used for a variety of applications, ranging from functional to decorative products.

#### Characteristics

- Strong & Durable
- Skin-safe
- Supports thin features

#### Common Uses

- Tech Accessories
- Home Decor
- Prosthetics



### Versatile Plastic

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# ADDITIVE MANUFACTURE

Manufacturability analysis

### 3D printing - FDM


Failed checks


 **Mesh integrity** Poor

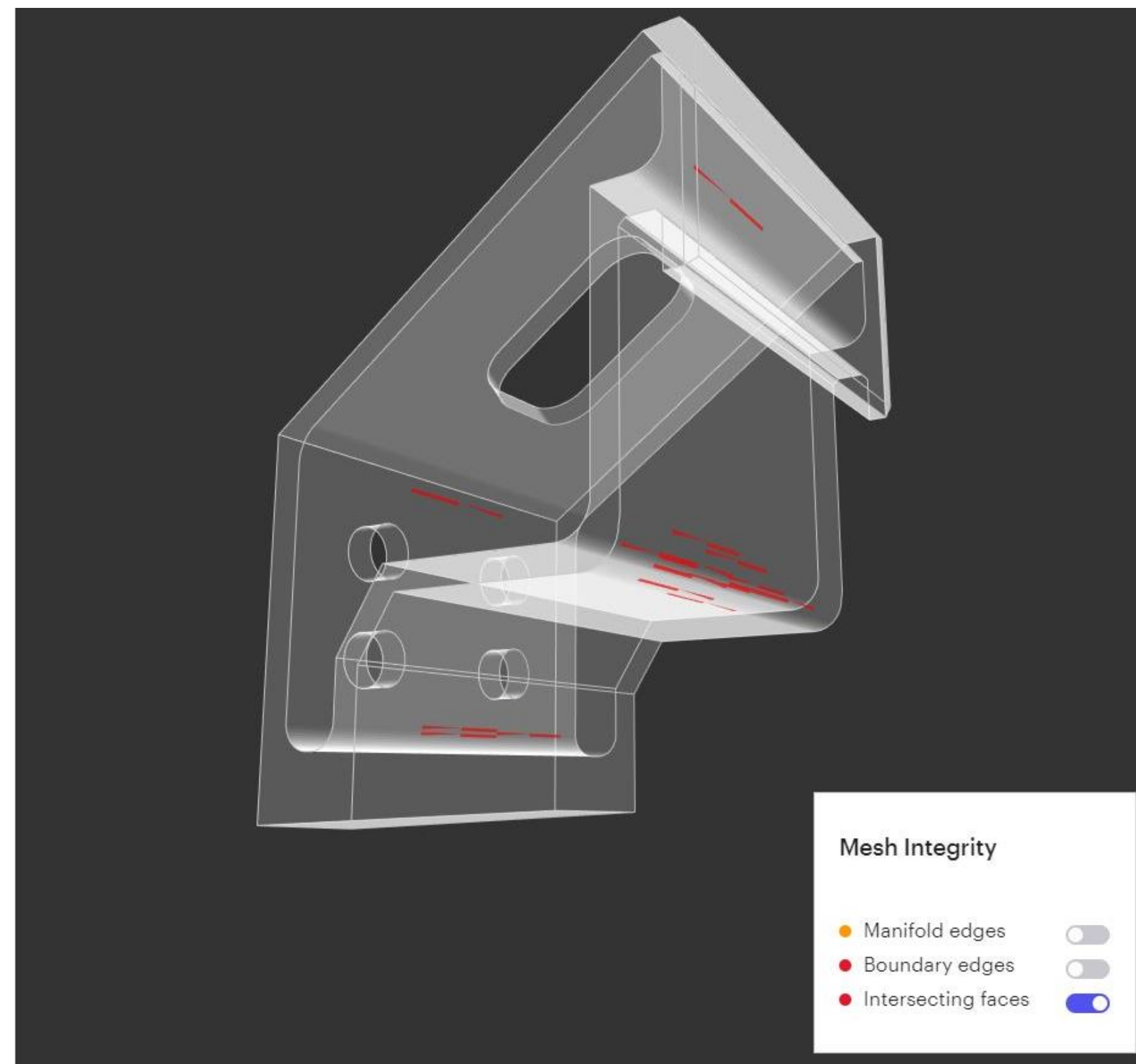
 47 Intersecting faces

Passed checks

 **Thin walls** Very good

 **Intricate details** Very good

 **Hard to remove support** Very good





V5 MASTER 01.stl [Delete](#)52.0 × 75.0 × 55.4 mm [Change units](#)[Review printability issues](#)Qty: [Show bulk pricing](#)

\$10.43

Material

Type of ABS

Process

PLA

Standard ABS

FDM

ABS

Resin

Nylon

PETG

TPU

ASA

PEI

Stainless steel

Aluminum

Selected material

[Close](#) ^

Standard ABS - FDM

[Show material description](#)

Infill - 6 options

20%



Layer height - 3 options

200 μm



Color - 7 options

Black



Subtotal

\$10.43

Manufacturability analysis

### 3D printing - FDM

Failed checks

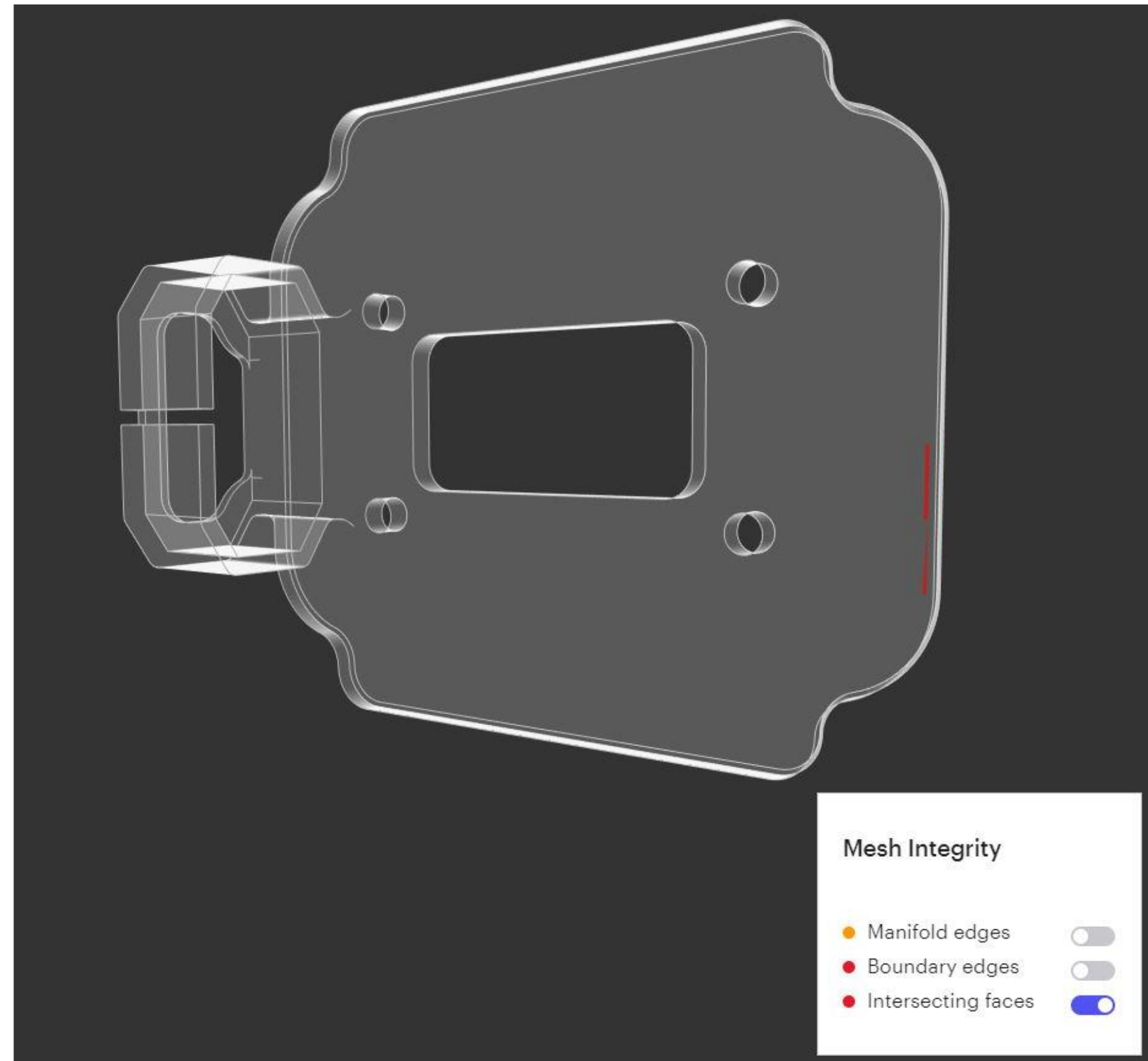
 **Mesh integrity** Poor  
 3 Intersecting faces

Passed checks

 **Thin walls** Very good

 **Intricate details** Very good


 **Hard to remove support** Very good





PRO V5 CASE.stl [Delete](#)38.6 × 113.4 × 134.9 mm [Change units](#)[Review printability issues](#)Qty: [Show bulk pricing](#)

\$15.74

Material	Type of ABS	Process	Selected material	<a href="#">Close</a> ^
PLA	<input type="radio"/>	<input type="radio"/>	 <b>Standard ABS - FDM</b> <a href="#">Show material description</a>	
<b>ABS</b>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Infill - 6 options <input type="text" value="20%"/>	
Resin	<input type="radio"/>	<input type="radio"/>	Layer height - 3 options <input type="text" value="200 μm"/>	
Nylon	<input type="radio"/>	<input type="radio"/>	Color - 7 options <input type="text" value="Black"/>	
PETG	<input type="radio"/>	<input type="radio"/>		
TPU	<input type="radio"/>	<input type="radio"/>		
ASA	<input type="radio"/>	<input type="radio"/>		
PEI	<input type="radio"/>	<input type="radio"/>		
Stainless steel	<input type="radio"/>	<input type="radio"/>		
Aluminum	<input type="radio"/>	<input type="radio"/>		
			<b>Subtotal</b>	<b>\$15.74</b>

# PHYSICAL PRODUCT MODEL



# COMPONENT MATERIALIZATION





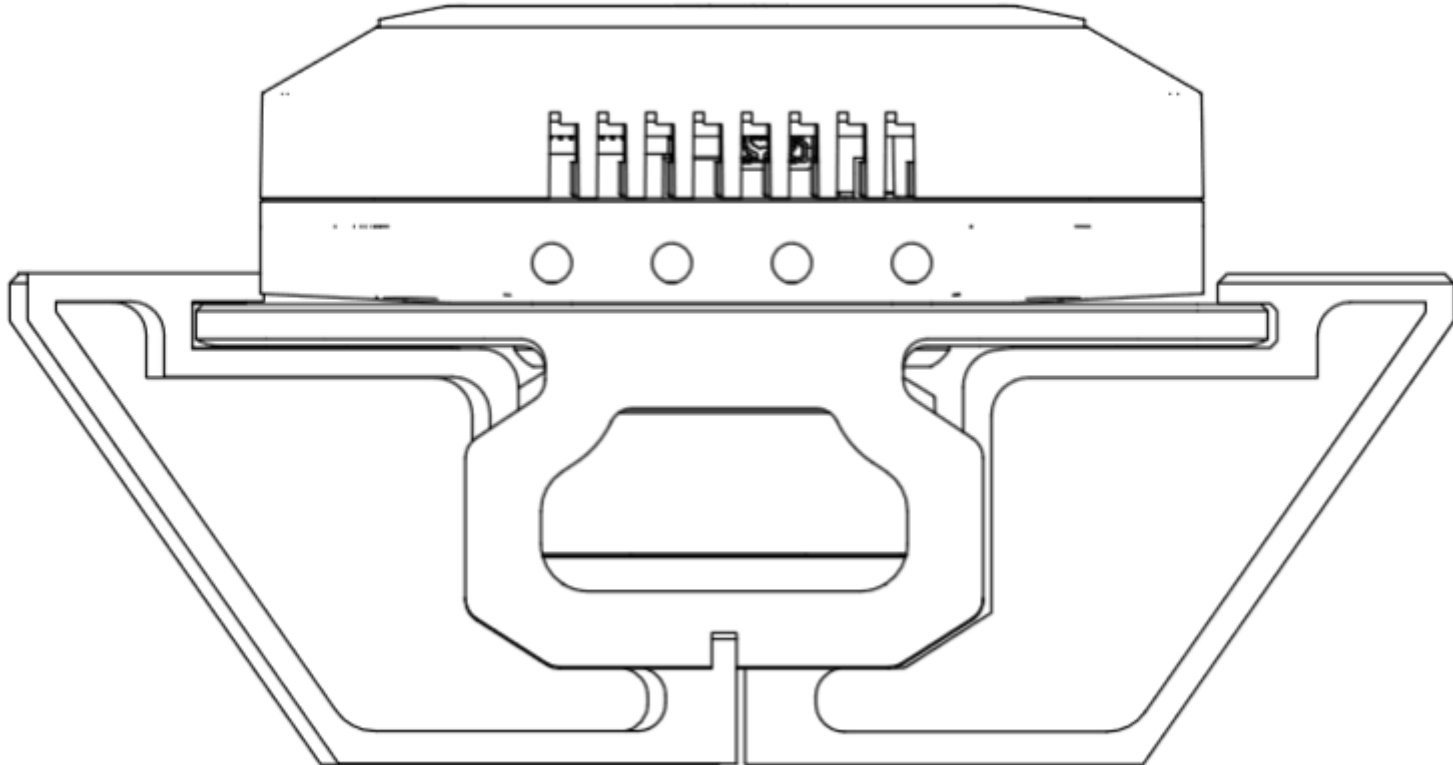
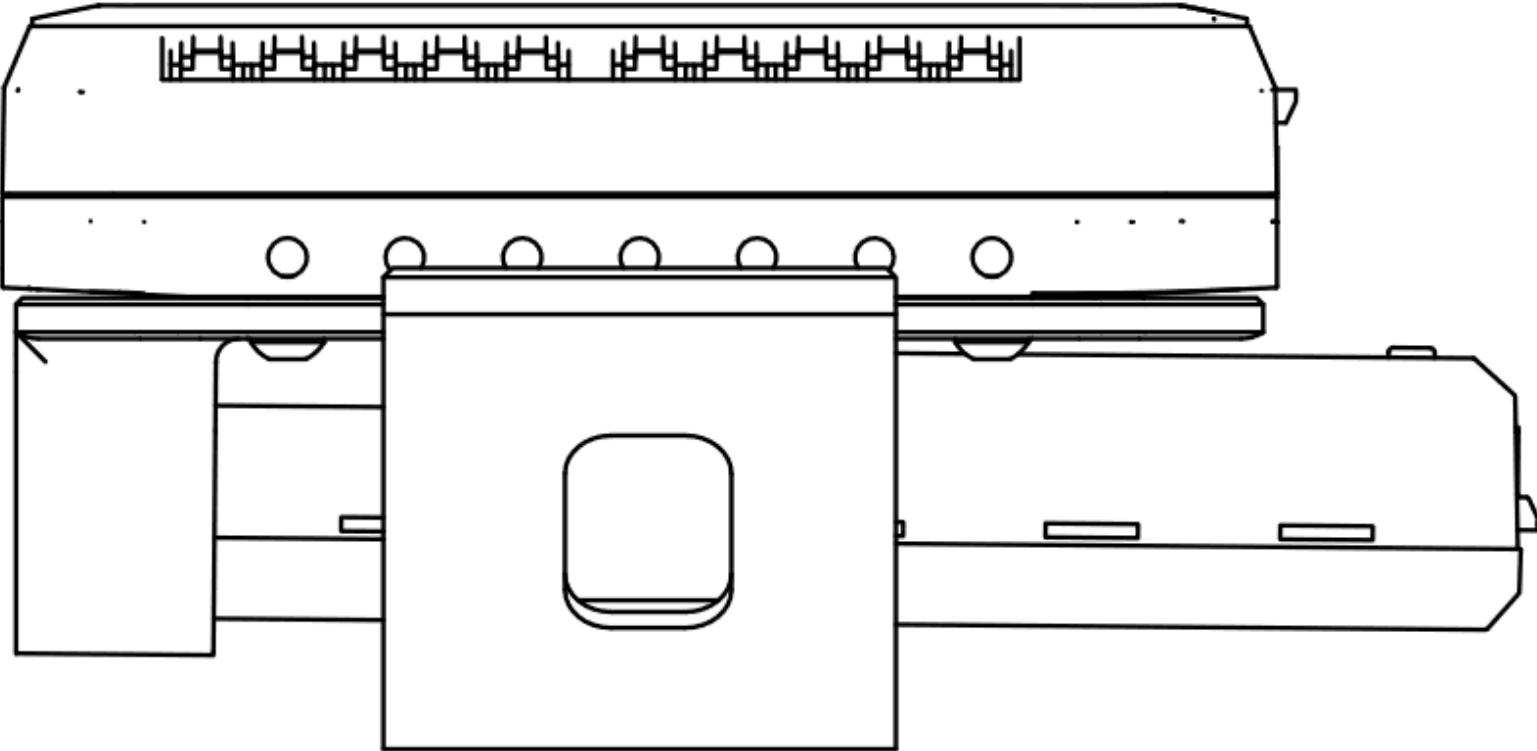


# PHYSICAL PRODUCT MODEL



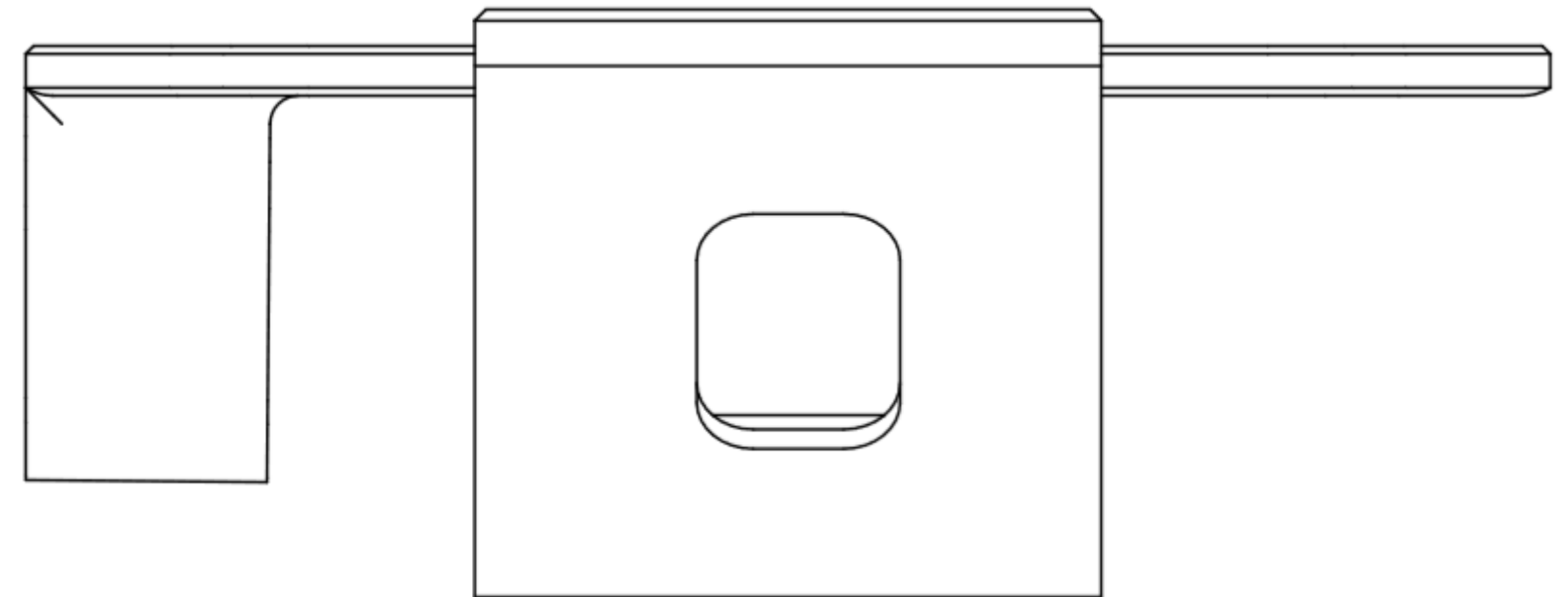
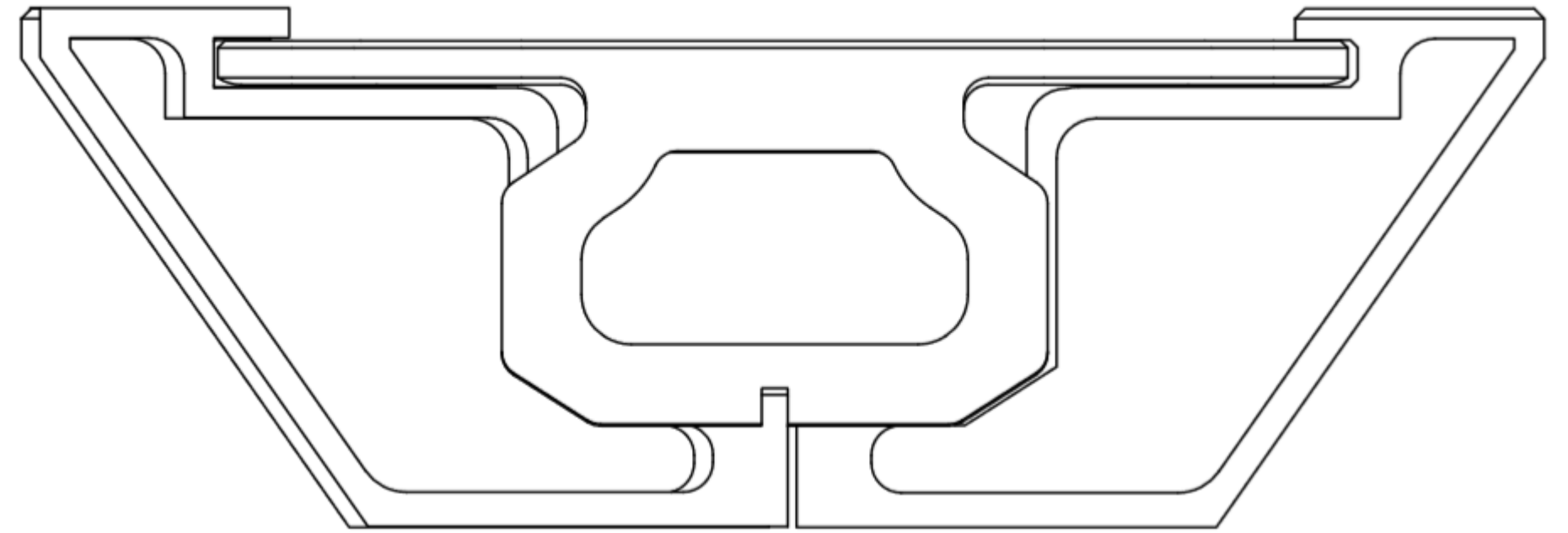
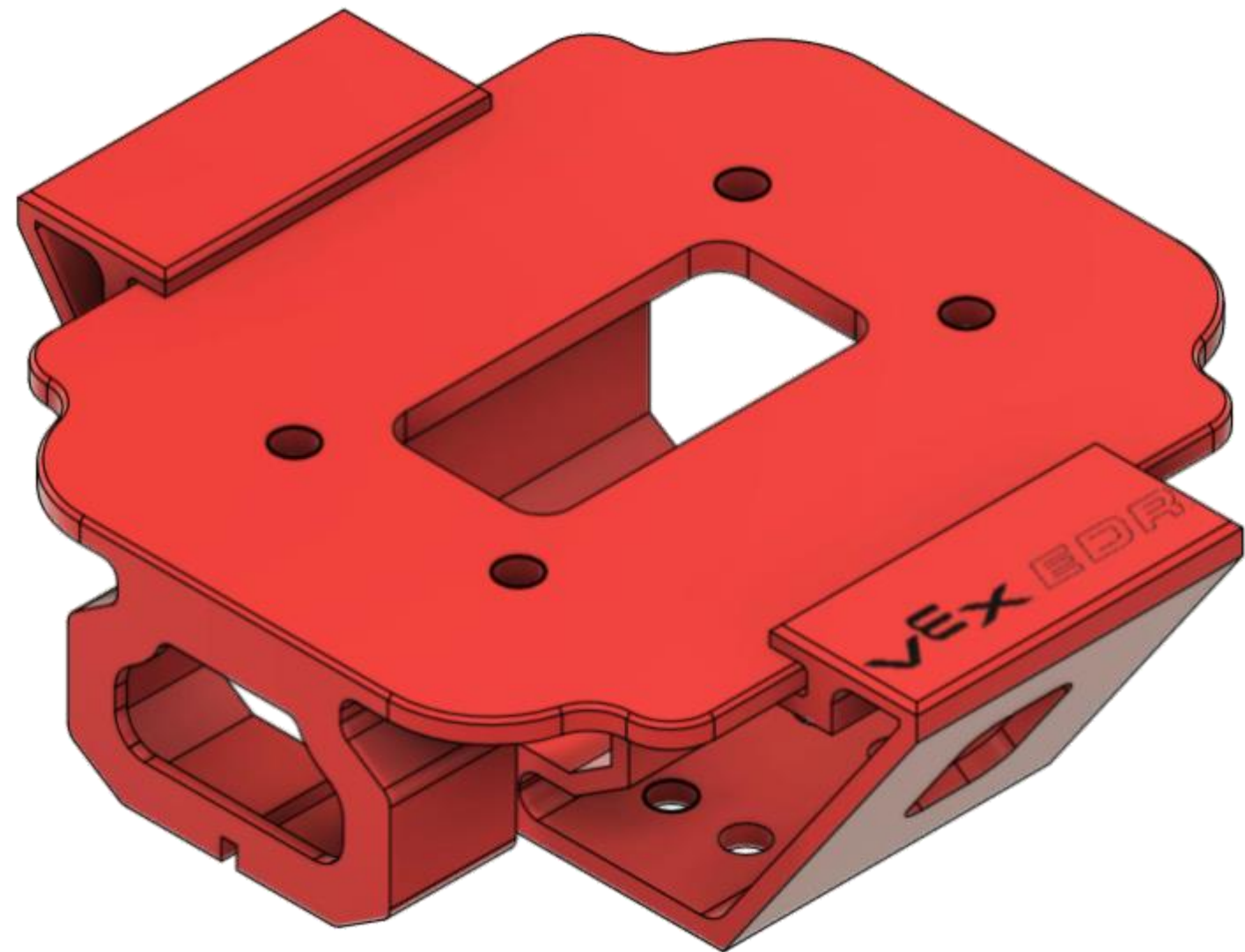
# COMPONENT MATERIALIZATION

# DRAWING CASE PRO V5 FIE

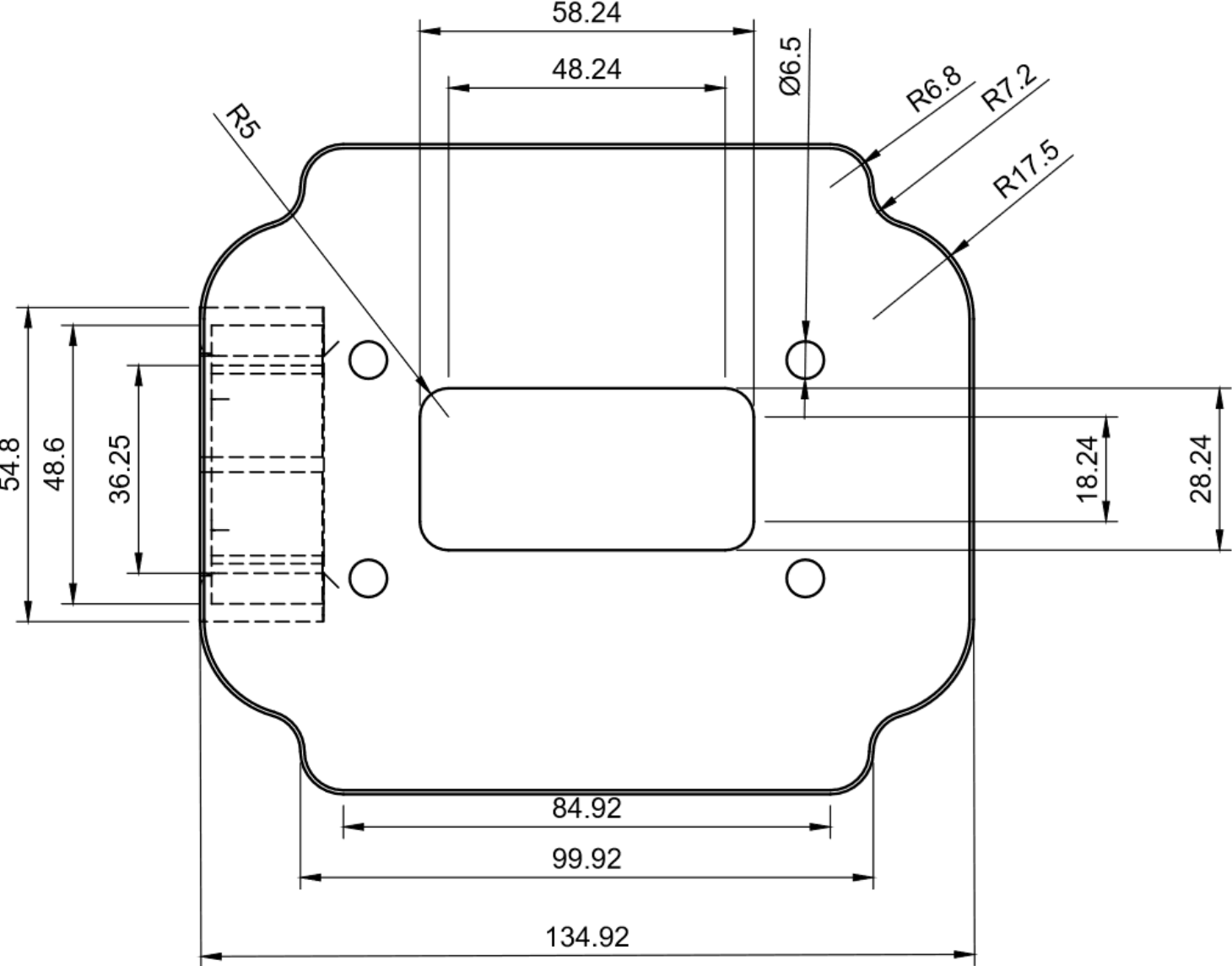
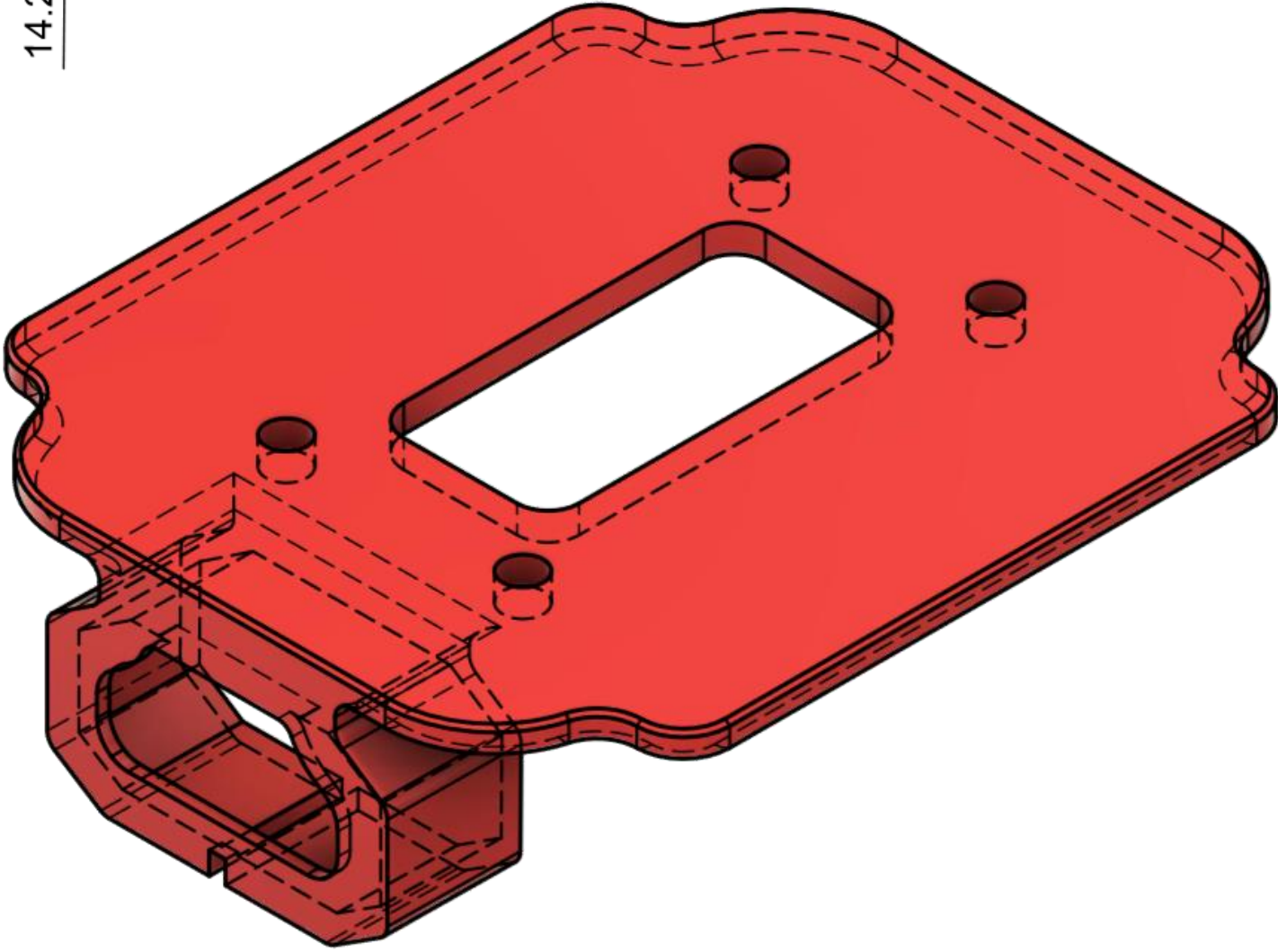
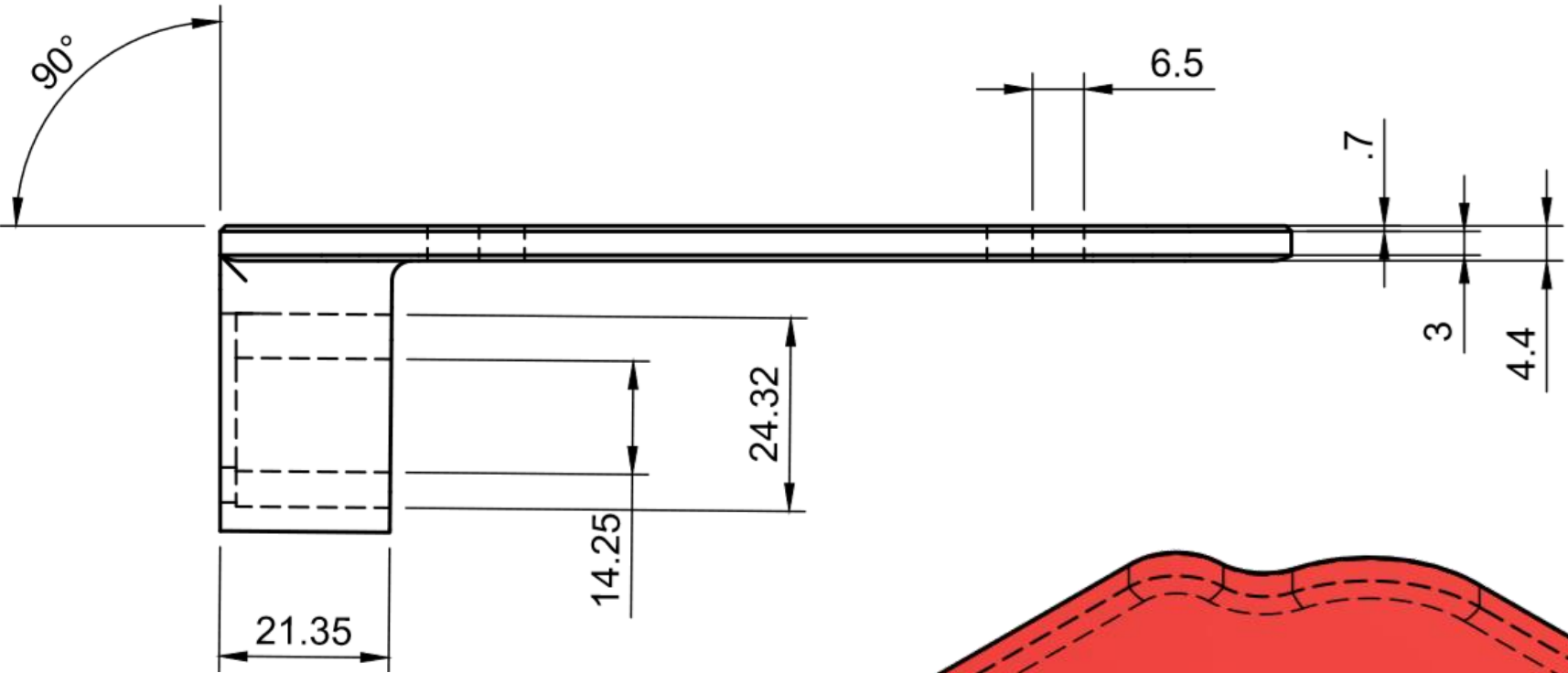




# DRAWING CASE PRO V5 FIE



# DRAWING CASE PRO V5 FIE

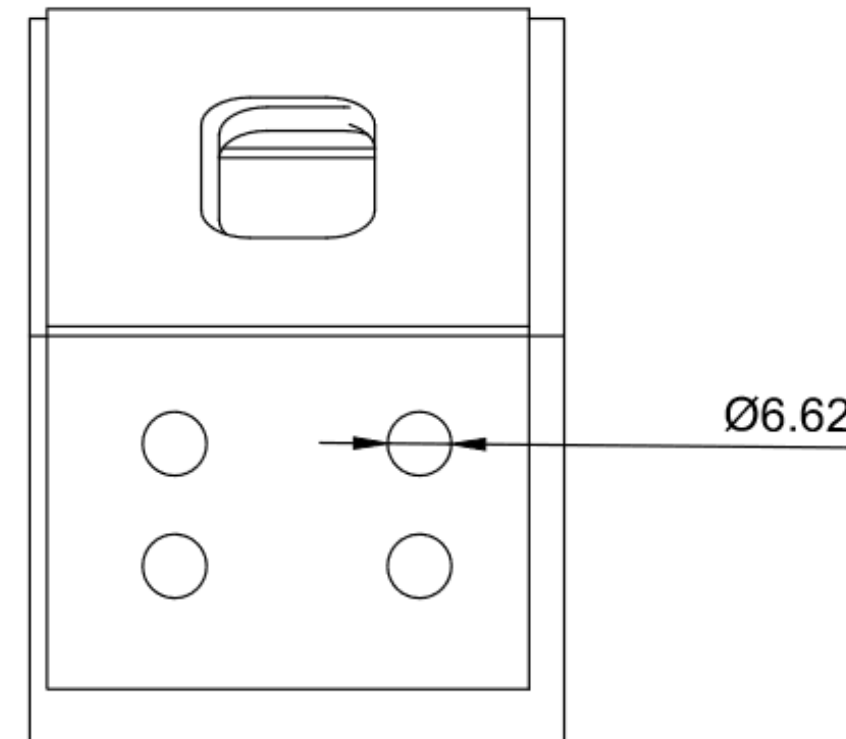
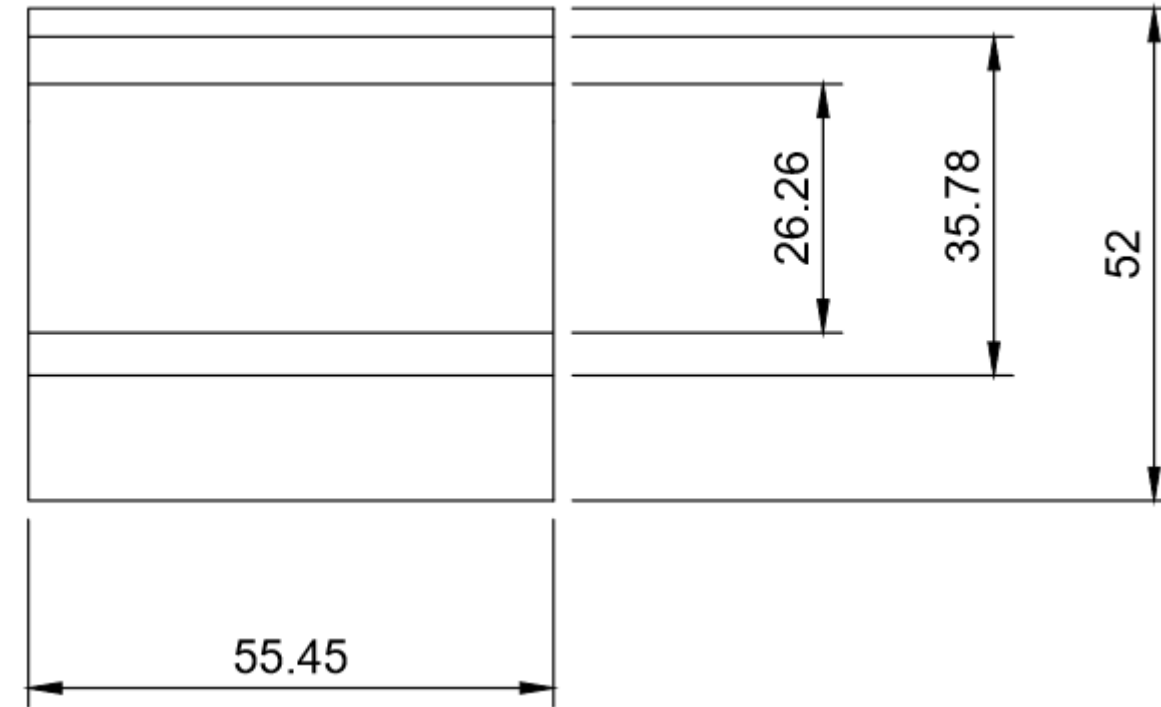
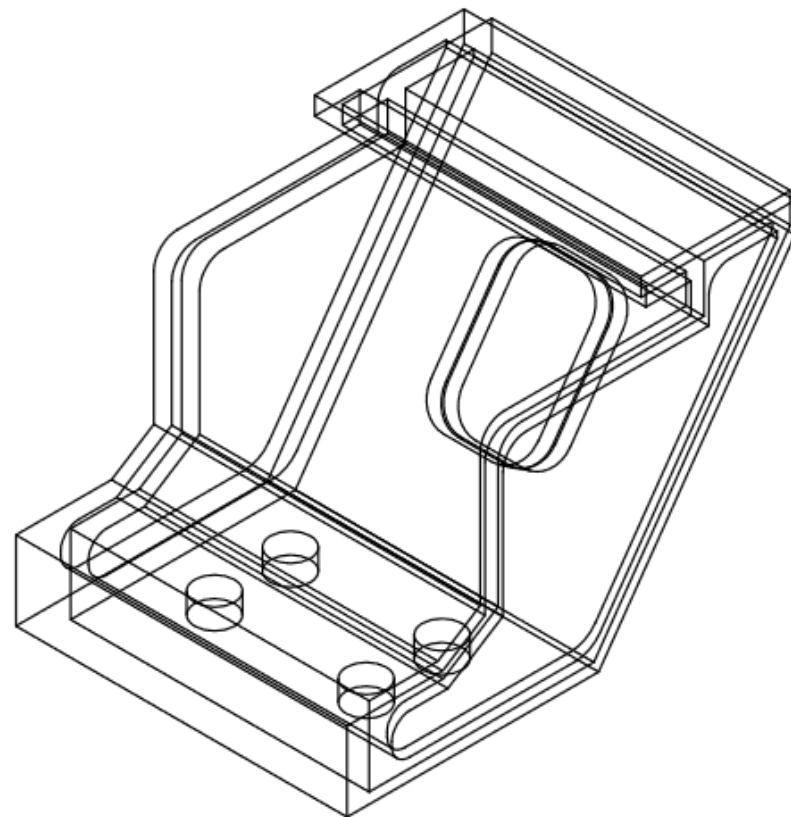
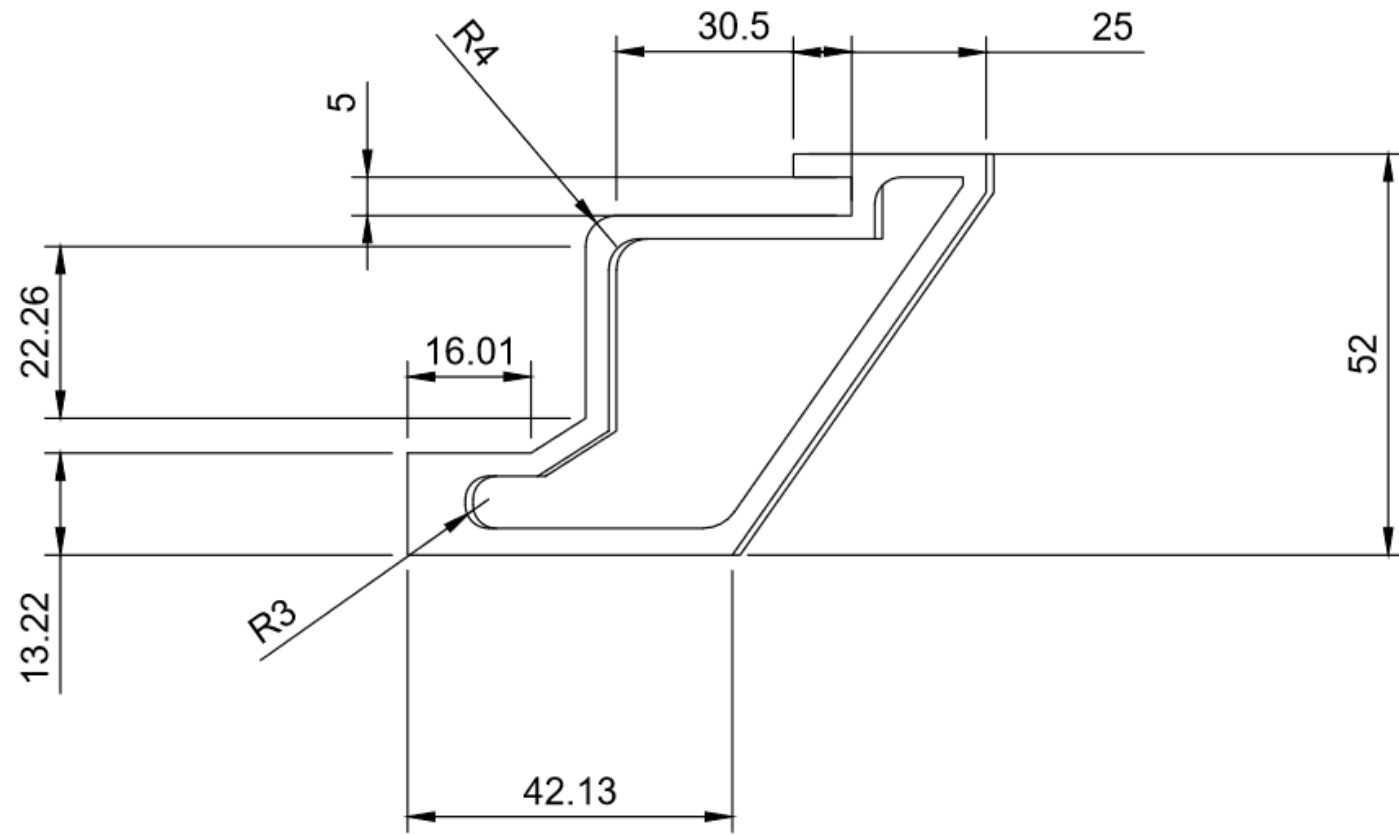




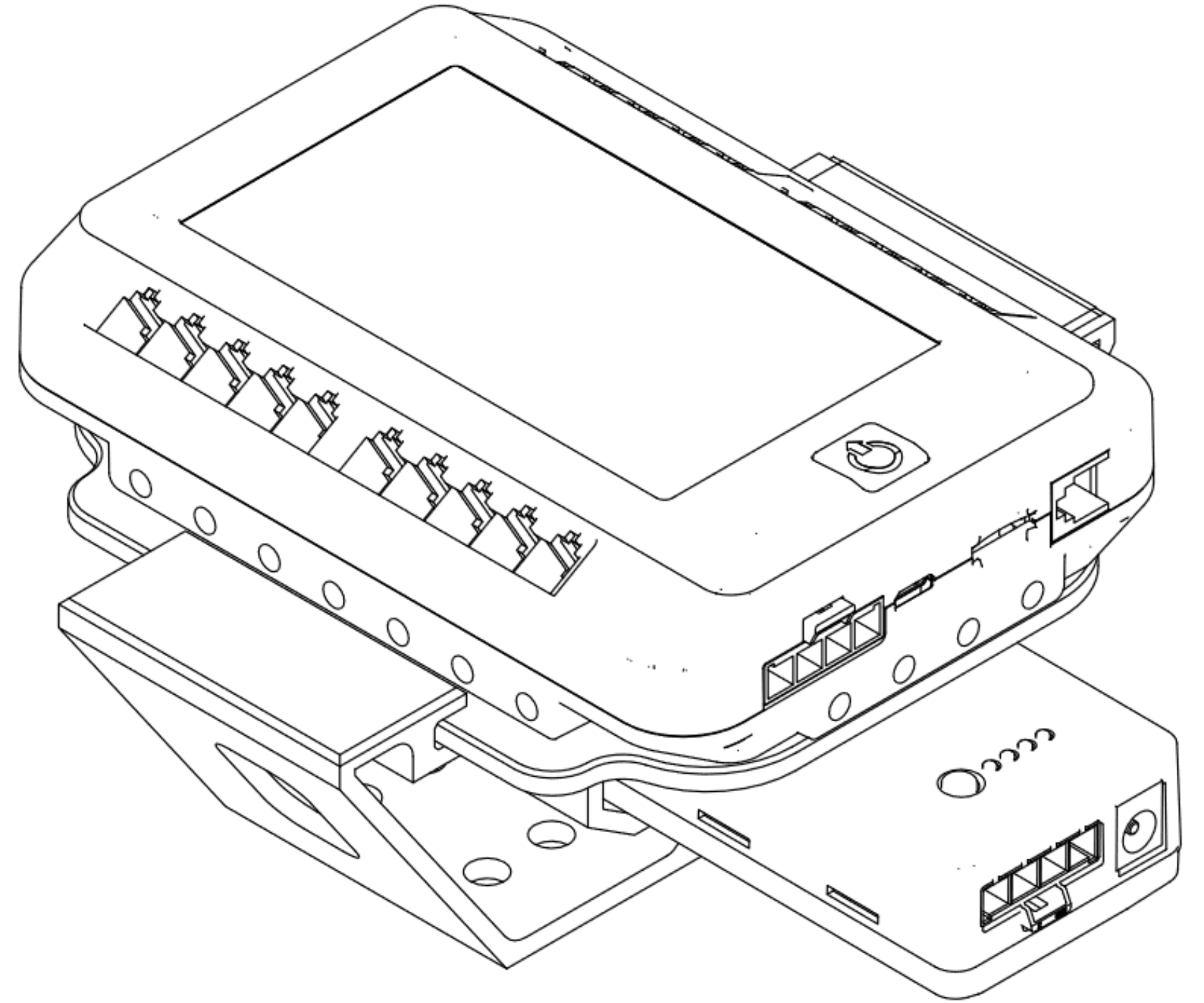
# DRAWING CASE PRO V5 FIE



FUSION 360



# DRAWING CASE PRO V5 FIE





# CASE PRO V5 – FIE VEX Robotics

A modern education solution at your fingertips



## V5 – All Products

The new Case PRO V5 - VEX Robotics is a joint between three components that make life easier for the user (Programmer in his work activity) The Sigma (FIE) - Flexible, Integration and Ergonomic allow its users a new productive experience.

Price:

\$22.99

~~\$30.95~~

Colors:



Design by:

**Lucas Lira – Fábrica de Nerdes**

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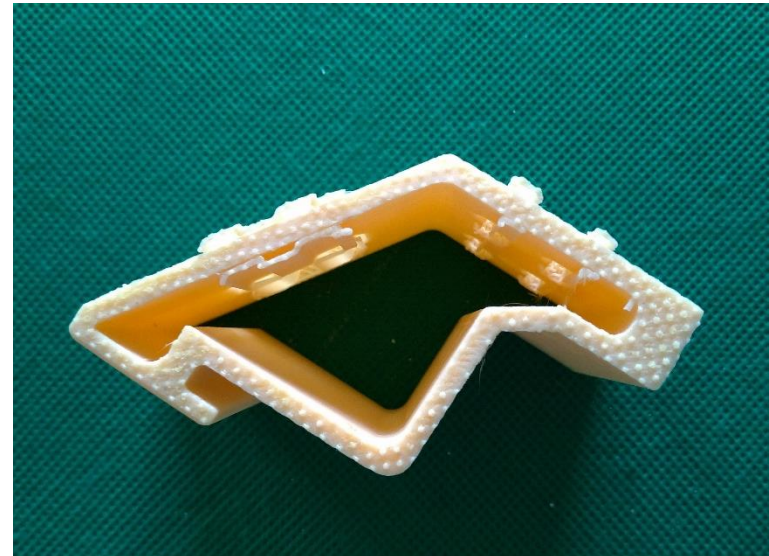
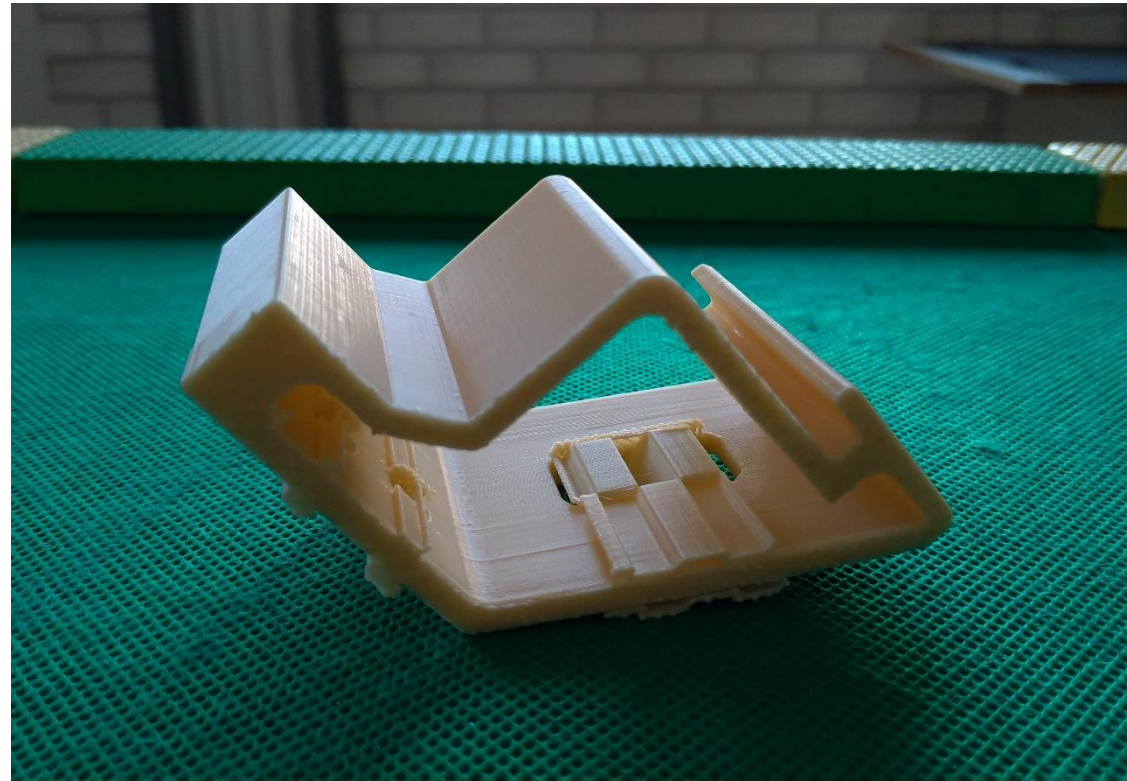
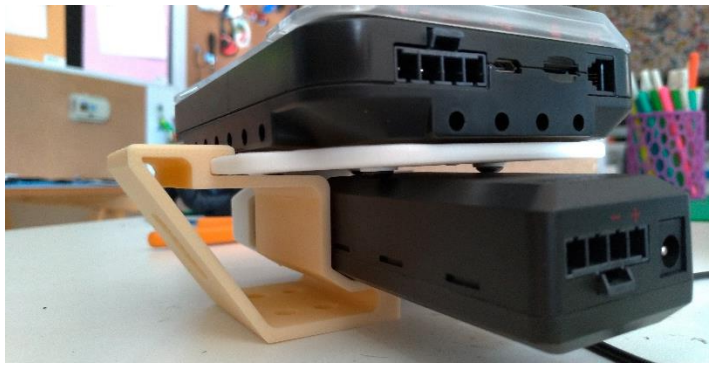
 Fast Delivery

 Free Shipping

 Product Guaranty



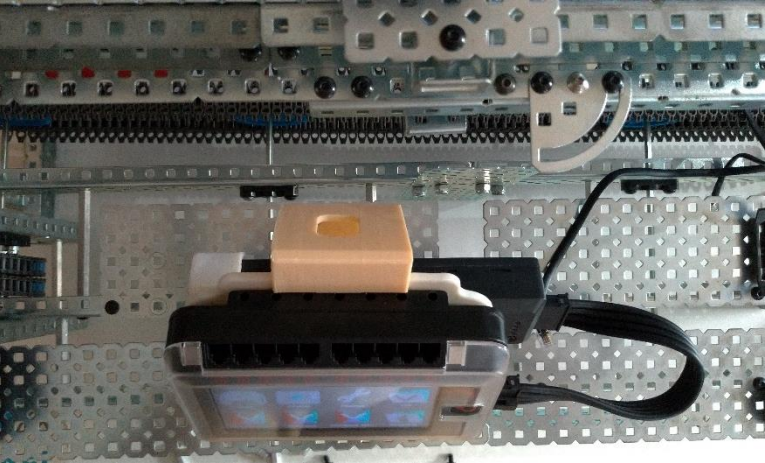




# CASE PRO V5 - FIE

 **AUTODESK.** Make anything.

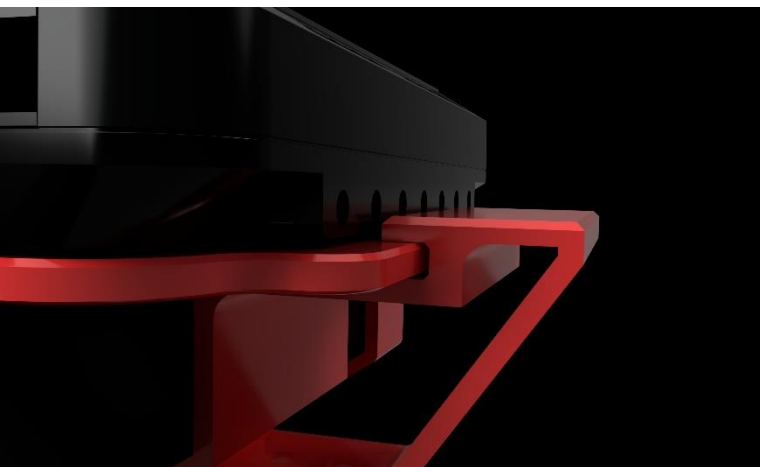




# CASE PRO V5 - FIE

 **AUTODESK.** Make anything.





# CASE PRO V5 - FIE



 AUTODESK® FUSION 360™



# Case PRO. V5 FIE.

HOW COULD WE CREATE A NEW EXPERIENCE  
FOR FLEXIBILITY ...?"

Flexible



Integration



and  
Ergonomic



FIE.

The new Case PRO V5 - VEX  
Robotics



# FLEV5

A modern  
education solution  
at your fingertips

THANK YOU  
FOR  
WATCHING!







# Lucas Lira Santos

Student Ambassador Autodesk / Microsoft MIEE

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- [linkedin.com/in/lucaslirasantos](https://linkedin.com/in/lucaslirasantos)
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