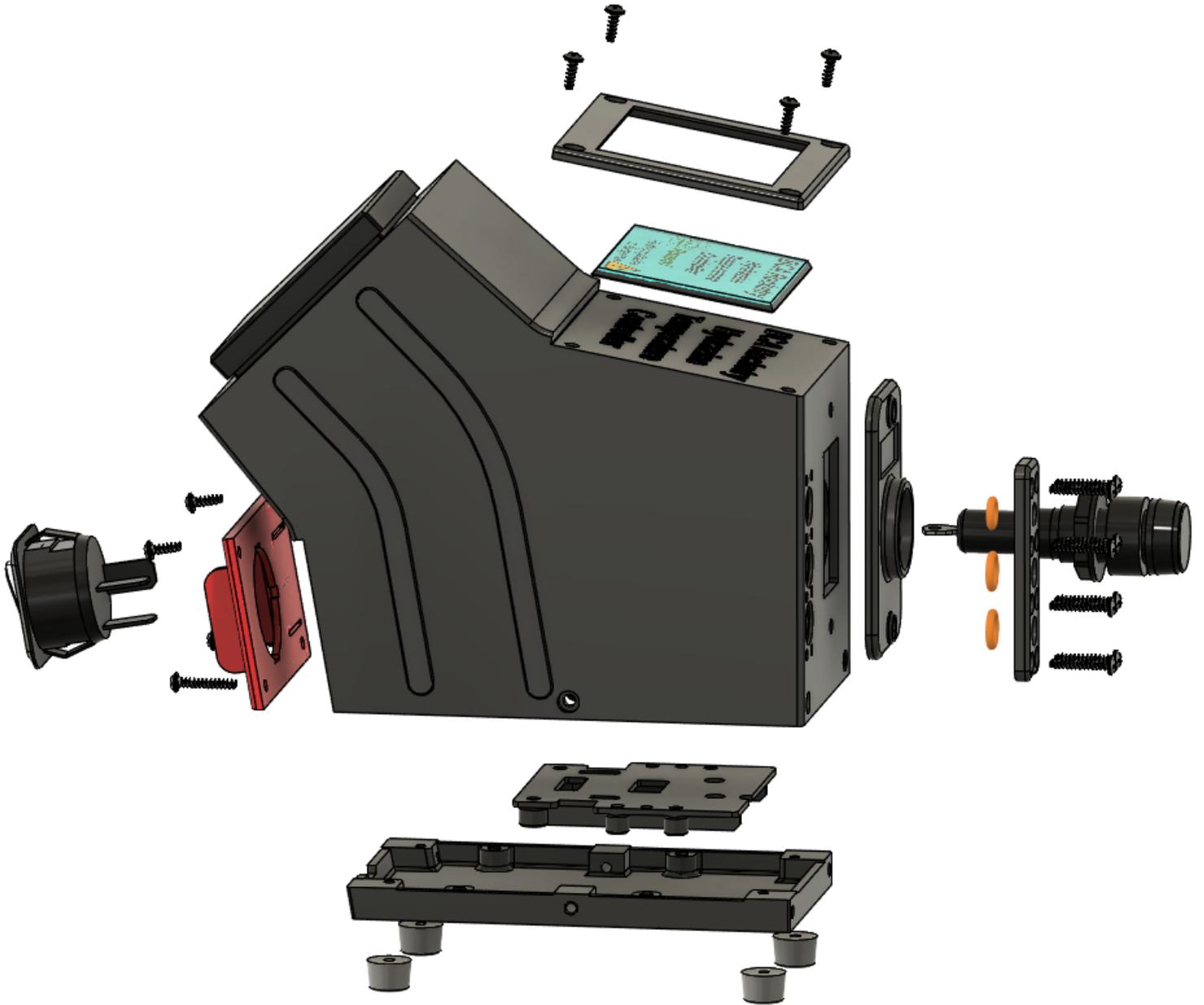# 3D Printed Temperature Controller Enclosure
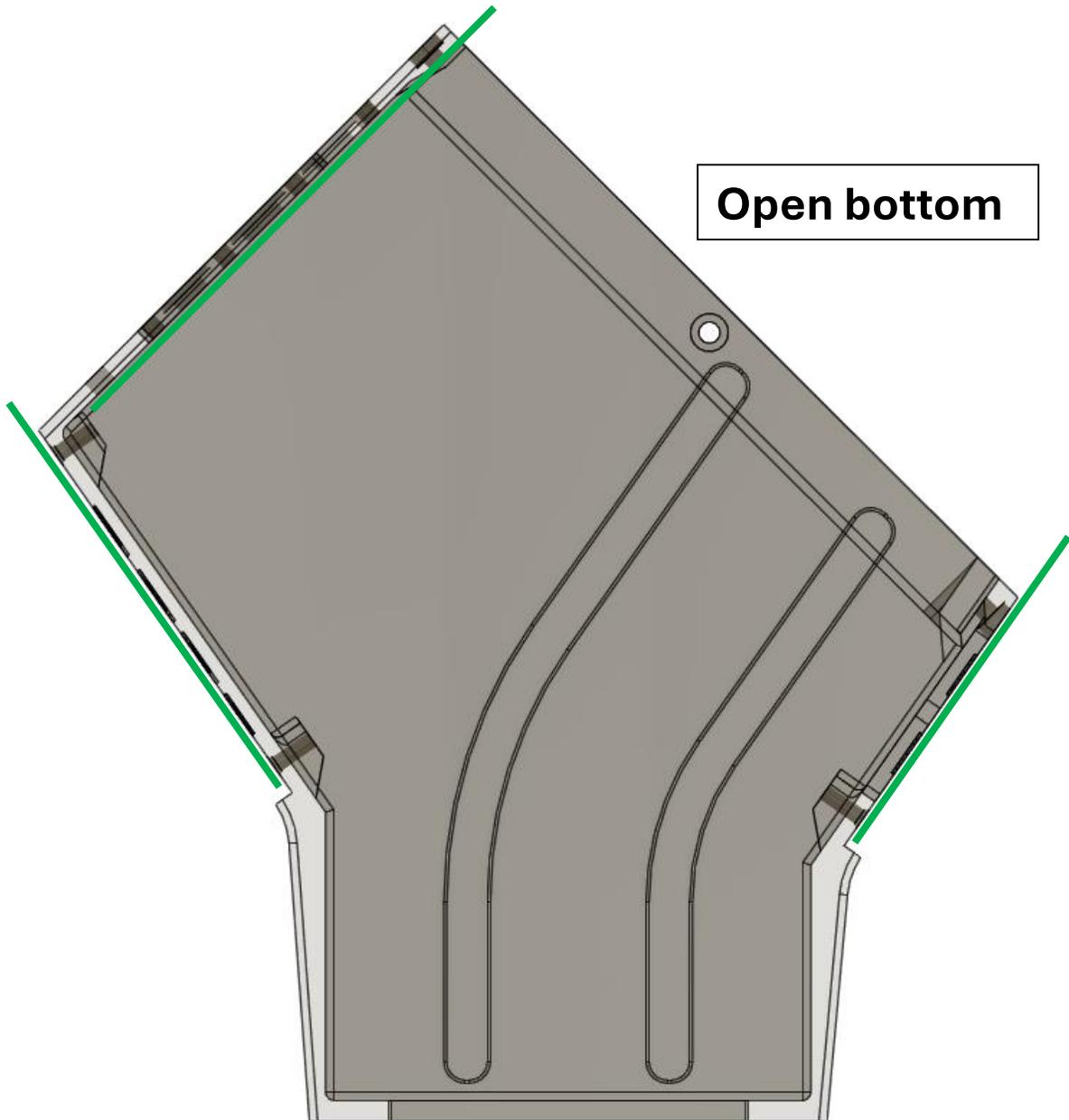
Exploded View

All the screws used are **#2 self-threading** screws with a **black-oxide finish** for aestetics.
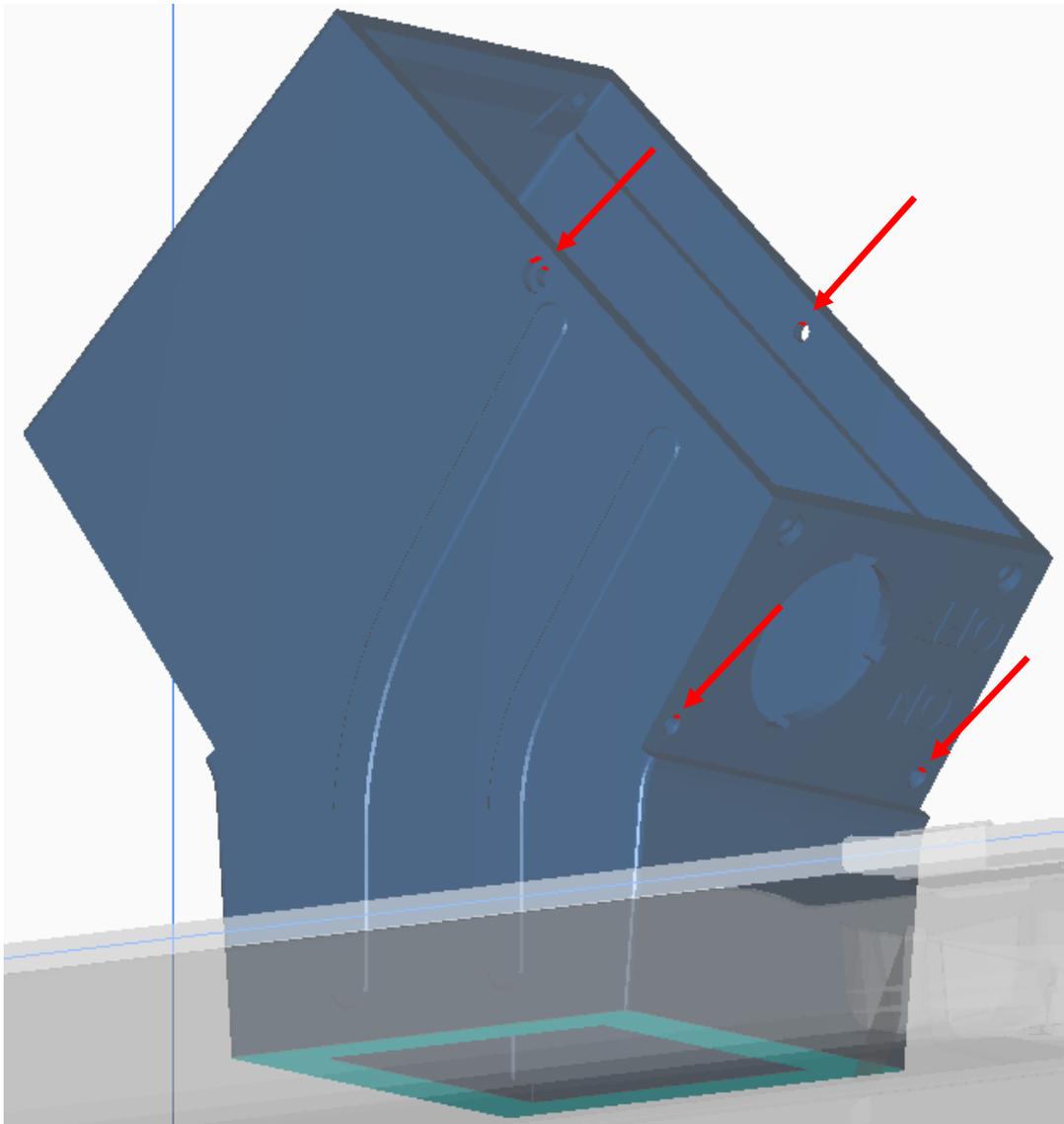
Designed for no added supports

The enclosure was designed so that when printed on its "display face" all exterior or interior surfaces adhere to the **45 degree rule** and thus do not need supports.

Open bottom

Enclosure opened in Cura

Note that Cura is only showing top inner surfaces of holes as violating the 45 degree rule. See red arrows.

Designing custom supports

If there is a section one is concerned about, a custom support can be designed.

There was a concern about the small amount of wall material above the large hole.

As shown below, the attachment of the support is **only 0.02" wide** and will break off easily and cleanly.
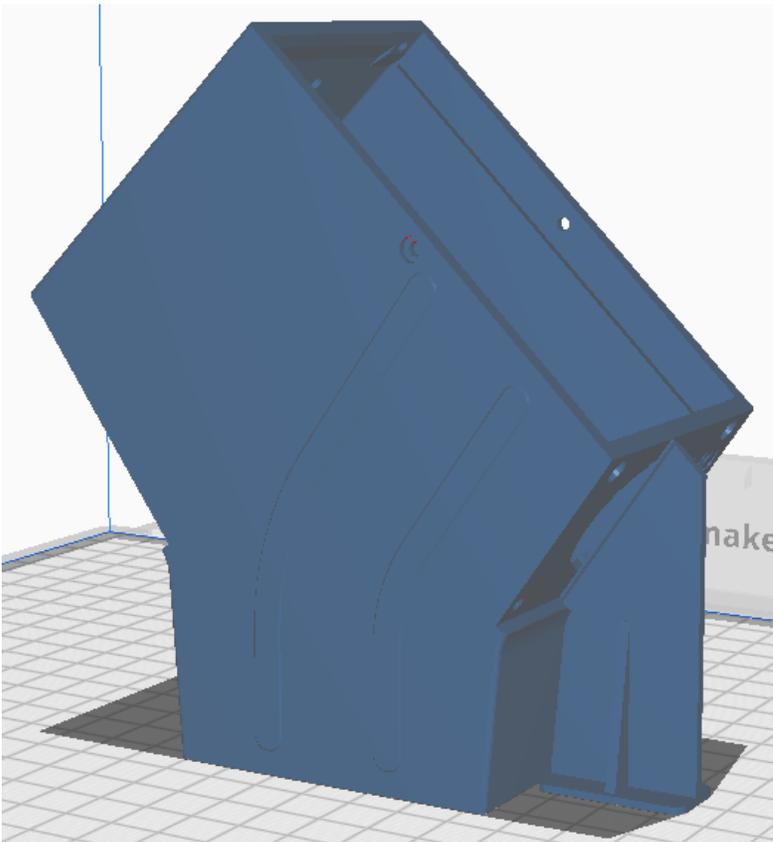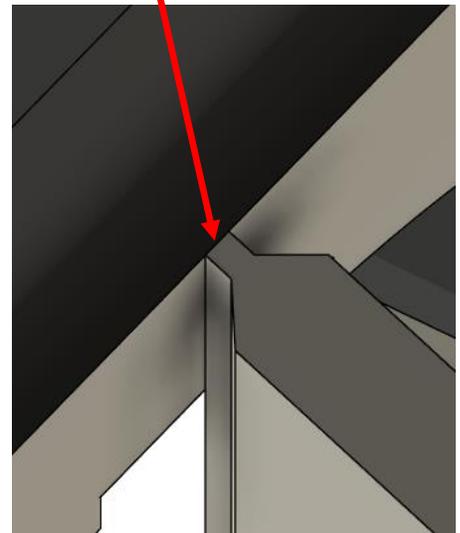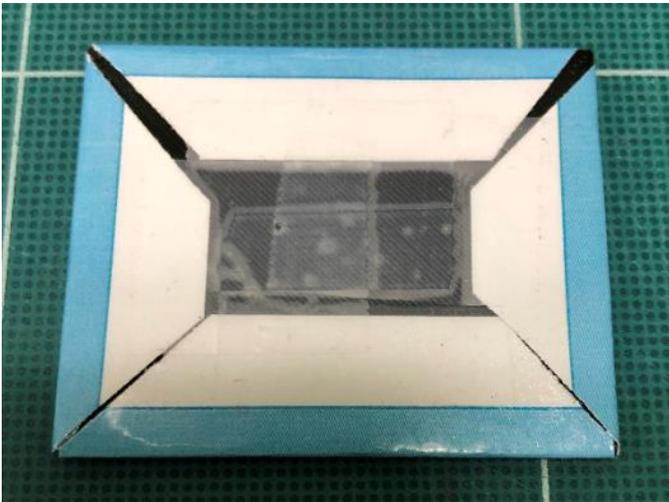
Mounting a secure label

A label, **printed with a color laser printer or inkjet printer on normal paper**, is wrapped around a 3D printed **0.07 in** thick *blank*.

Wide clear packaging tape can be applied over the label or a clear acrylic spray can be applied to toughen the label surface.

The label is taped behind the blank. Note that the label was cut so that there would be no overlap of label sections.

The outer edges of the blank and inner edges of the bezel are given a 55 deg angle. Note that there is clearance around the blank for the label and tape underneath.
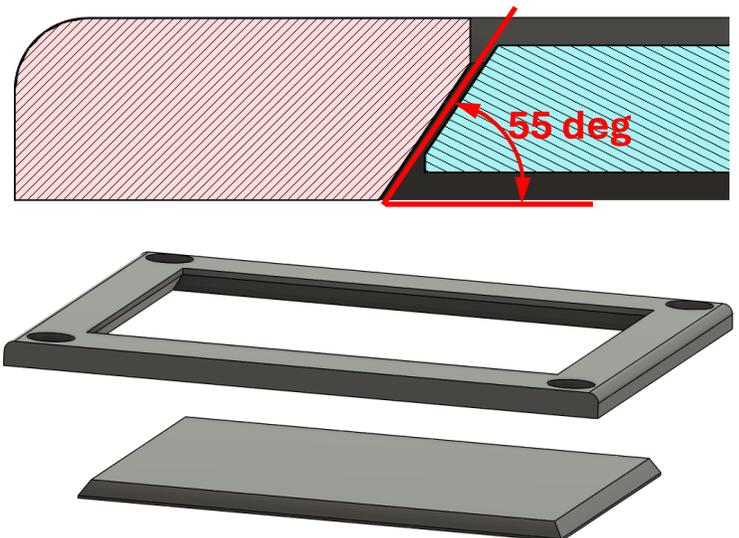
Front label uses another method
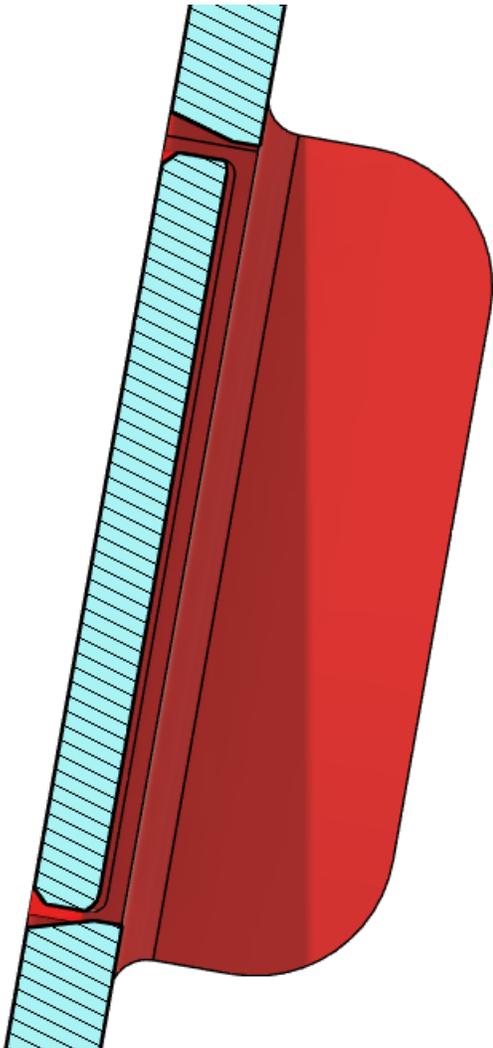
This method does not use a separate "blank". As the cross-section shows, there is a **small slot above and below the label region**. The top and bottom of the label has extra material to pass through the slot and get taped to the rear.

BOM (Bill of Materials), includes 13 3D printed parts

Line	Qty	Type	Description	Part Num	Price
1	11	screw	#2 1/2"L RoundedHead Phillips ThreadForming Steel BlackZincPlated	92295A113	$7.78(50)
2	18	screw	#2 1/4"L RoundedHead Phillips ThreadForming Black ZincPlated Steel	92295A111	$7.46(100)
3	4	bumper	3/8"OD 1/4"H 3/32"ID SBR Rubber Unthreaded Durometer 70A	9540K901	$5.08(50)
4	1	o-ring	0.07"W 0.145"ID 0.285"OD Soft Silicone Durometer50A	1173N007	$4.09(25)
5	2	o-ring	0.07"W 0.208"ID 0.348"OD Soft Silicone Durometer50A	1173N009	$4.30(25)
6	1	printPLA	EnclosureMainBody		
7	1	printPLA	FrontBezel		
8	1	printPLA	EnclosureTopBezel		
9	1	printPLA	EnclosureTopBezelInsert		
10	1	printPLA	TopBezelAssem		
11	1	printPLA	EnclosureBot		
12	1	printPLA	RelayPCBMount		
13	1	printPLA	USB Power Block		
14	1	printPLA	PowerSupplyMount		
15	1	printPLA	CableMount-Outer		
16	1	printPLA	CableMount-Inner		
17	1	printPLA	RearPlate		
18	1	printPLA	RearPanelInnerMount		
19	1	undef	Switch-Rocker		
20	1	undef	RelayBoard		
21	1	undef	Controller		
22	1	undef	FuseHolder		