ALICE

ITS3 activities in Bari

BBM6

BBM6 TTA - SUMMARY TABLE

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L0, L1, L2 heaters + powering cables	
L0, L1, L2 air ducts	
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Patch-panel	
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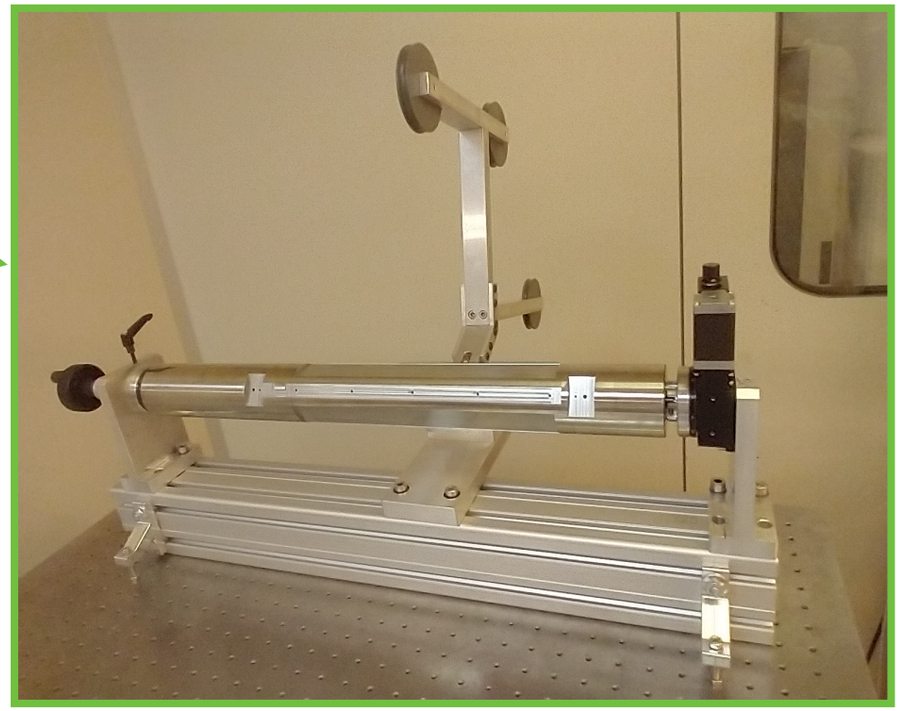

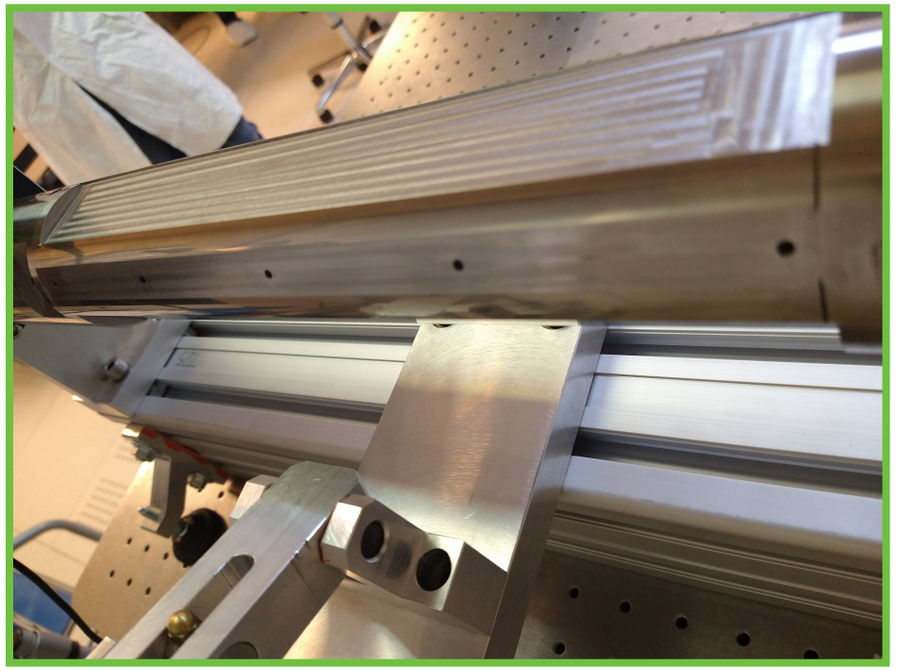

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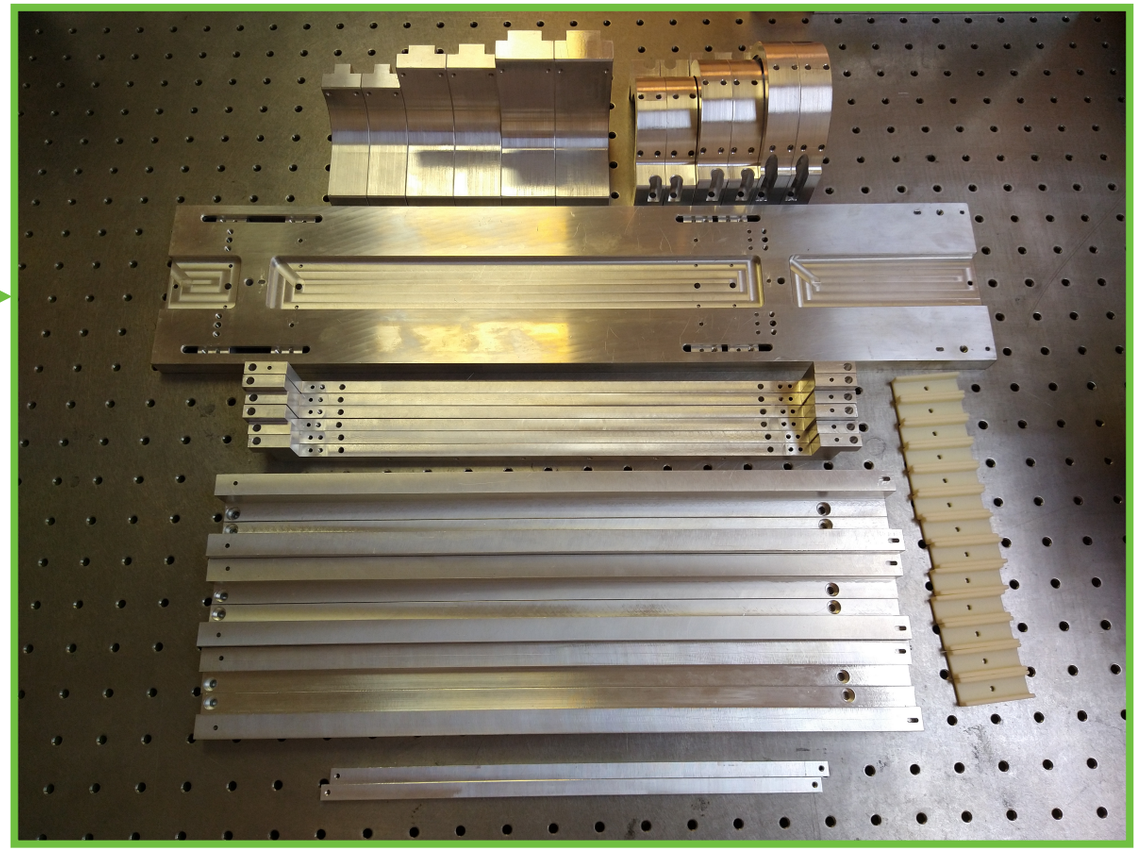

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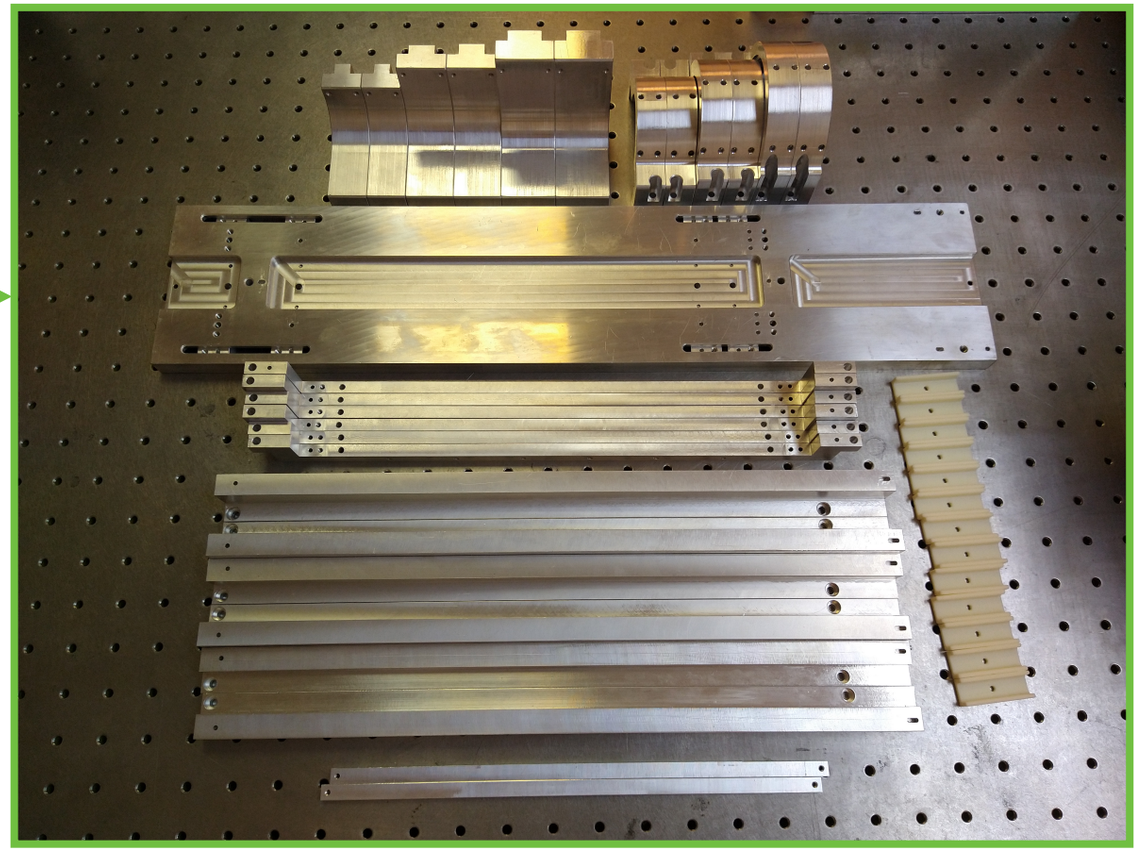

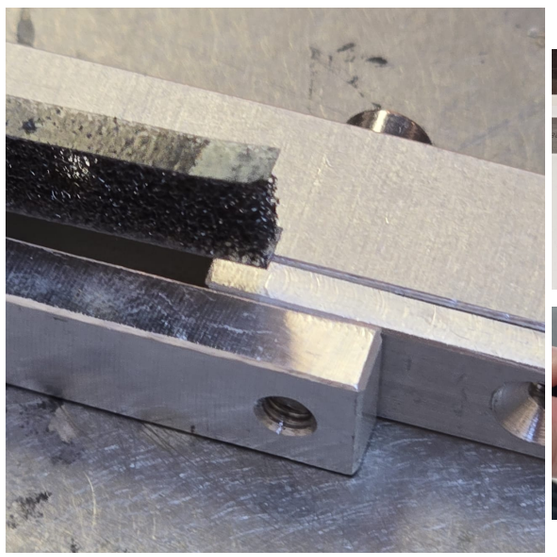

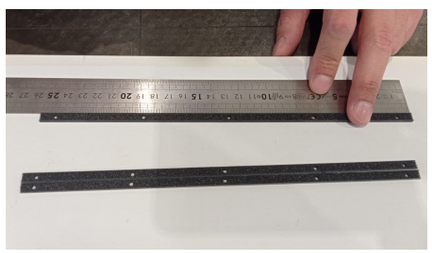

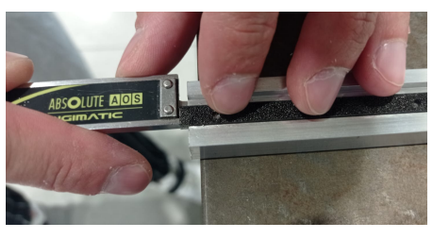

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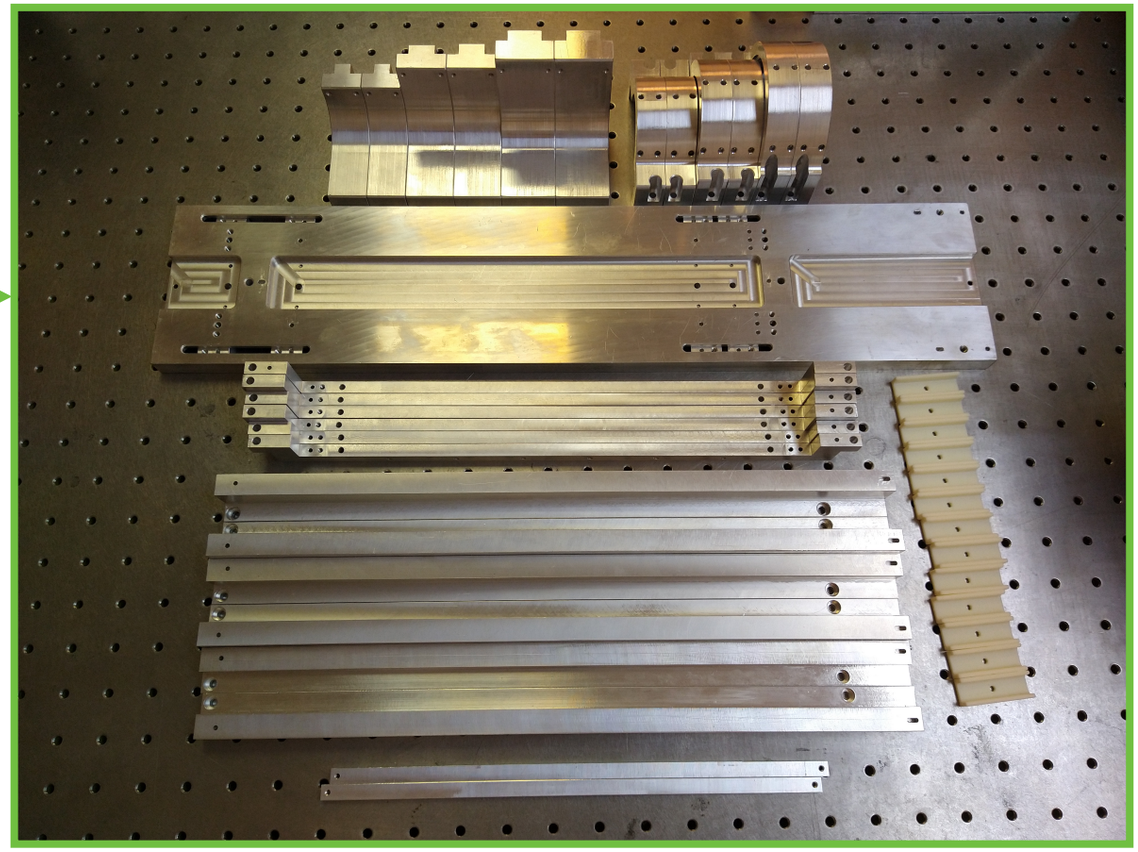
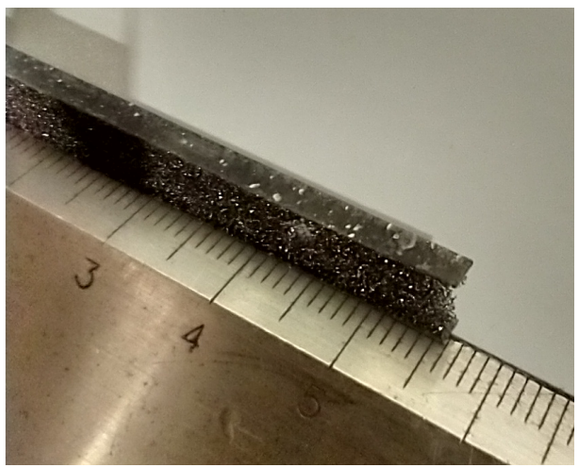


First attempt successful.

Intervention to be executed during the week for all the other 8 samples.

Ten longerons without holes for cables available at CERN for shipping.



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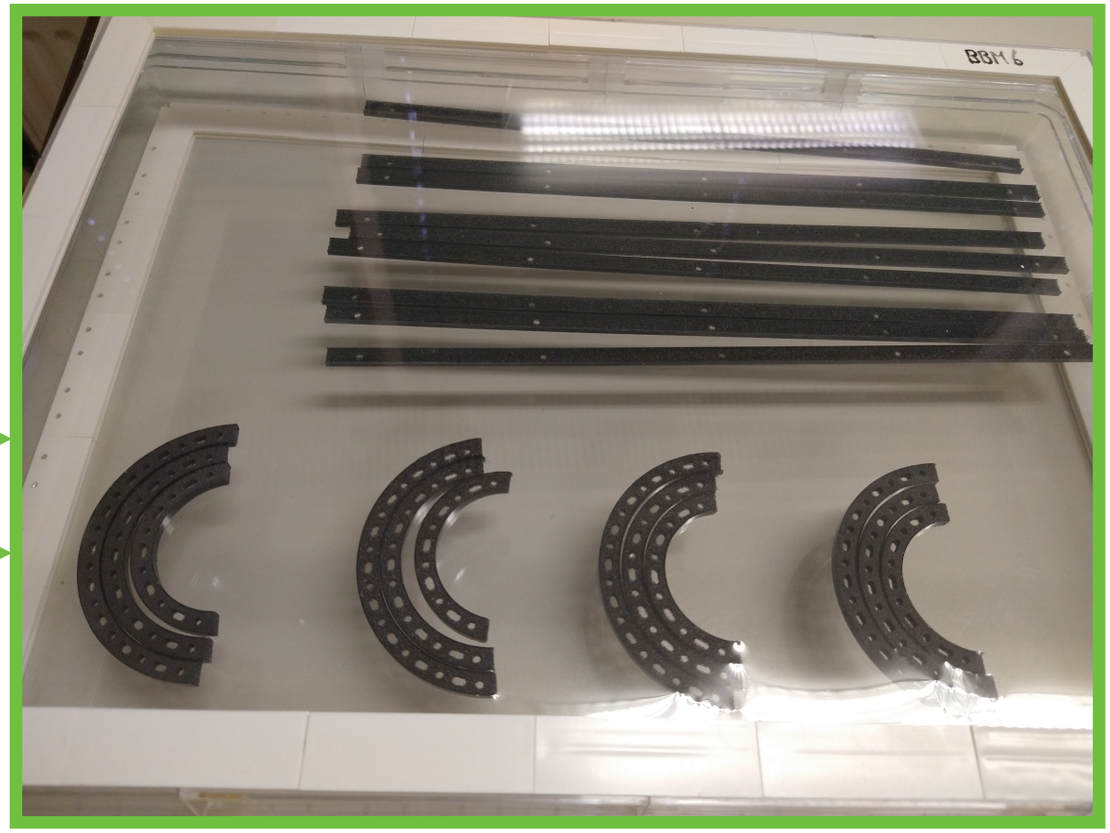
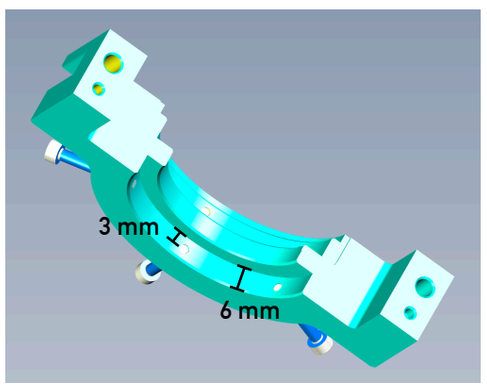
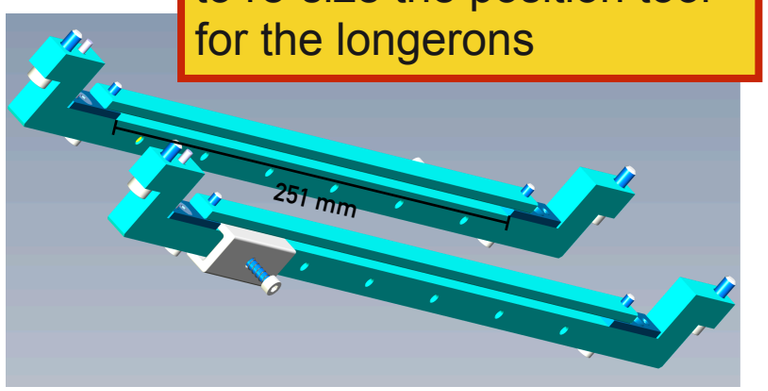


Half-rings thickness moved from 6 mm to of 3 mm
→ Logerons length moved from 251 mm to 256 mm

Small intervention required to re-size the position tool for the longerons





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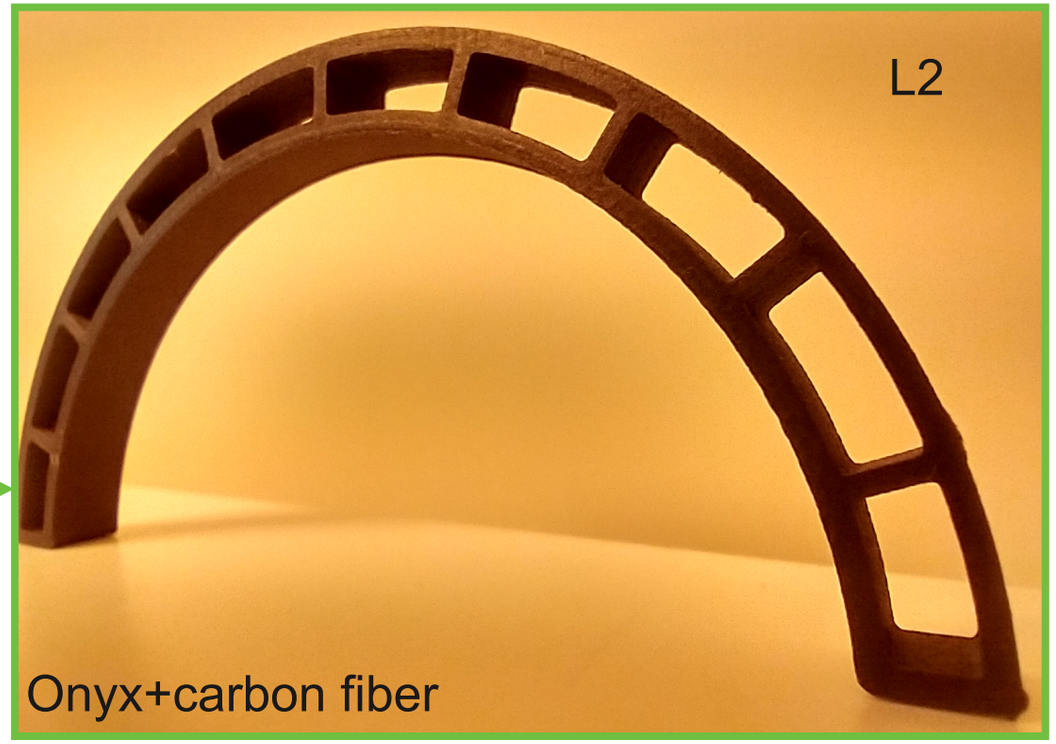

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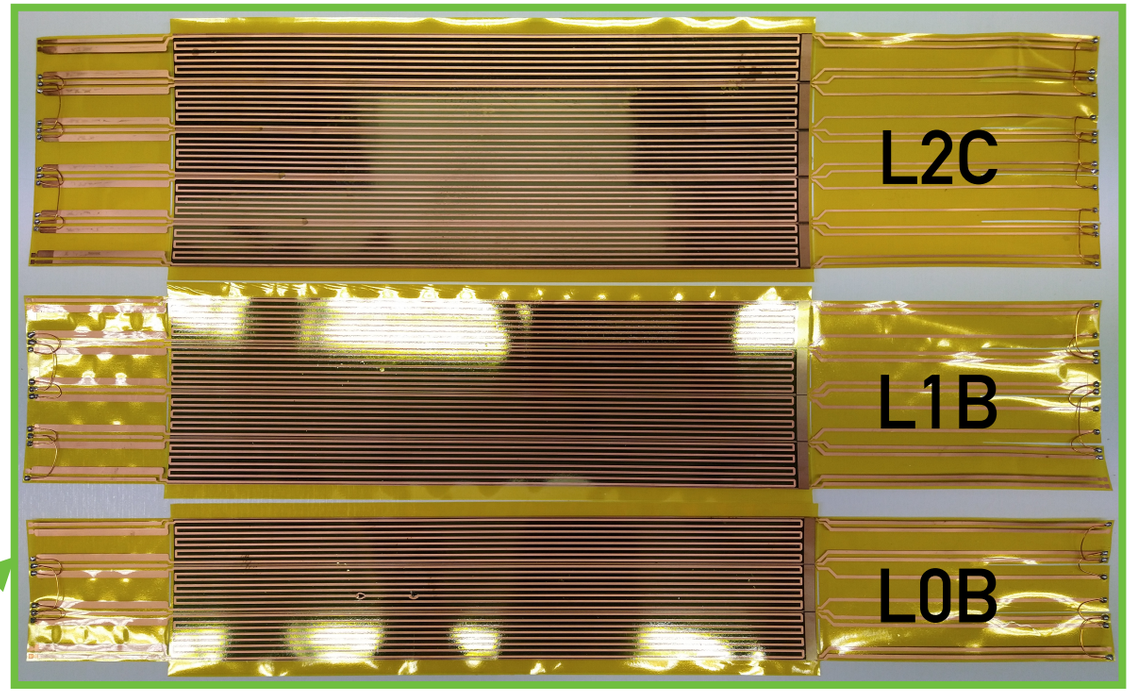

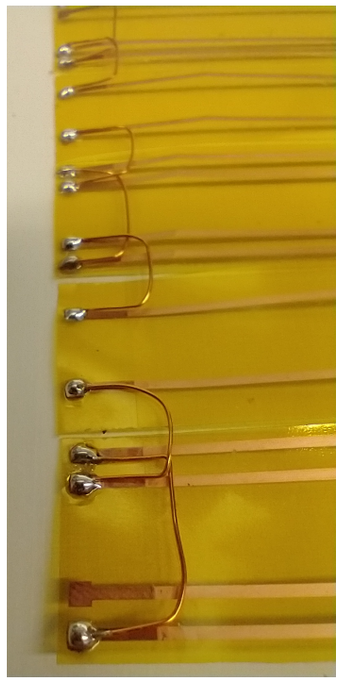

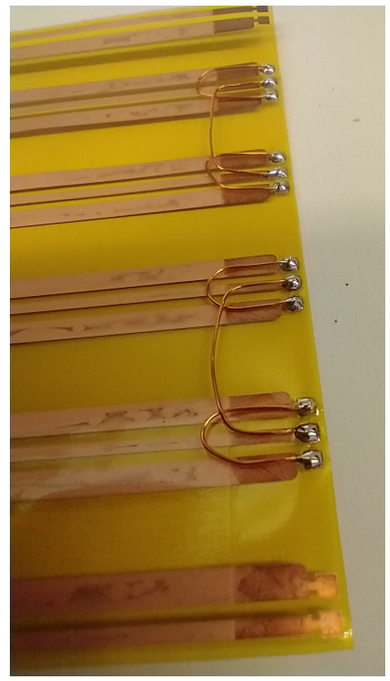

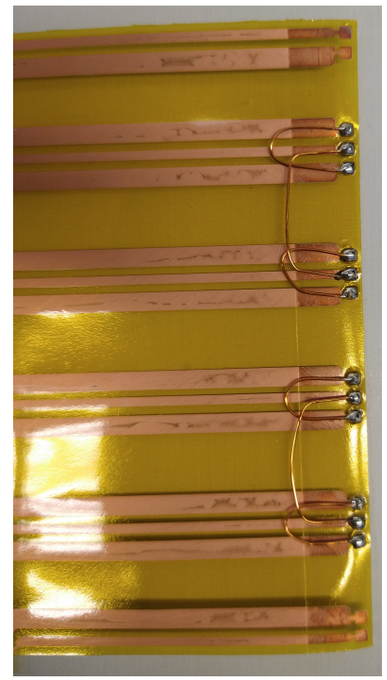

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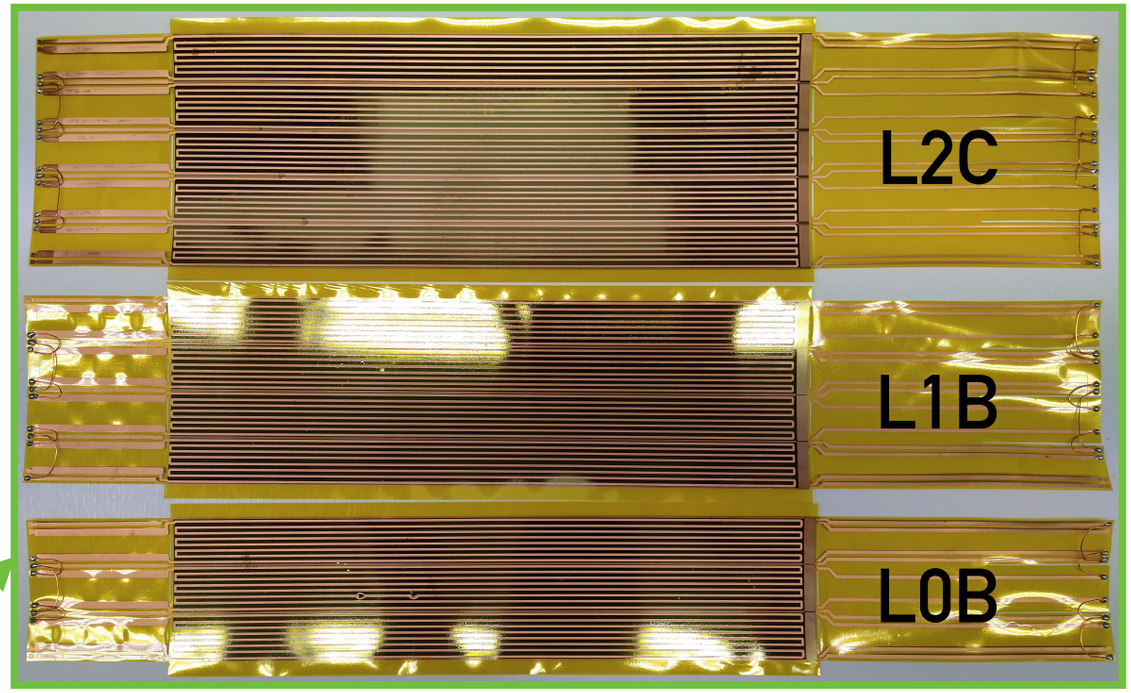

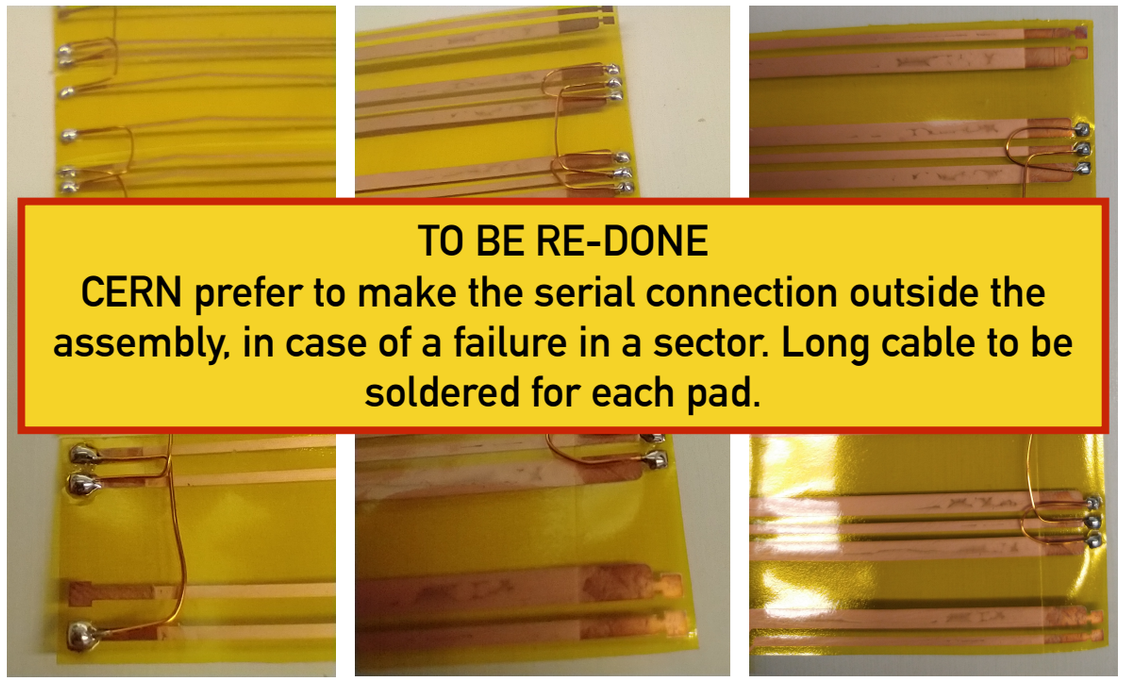

TO BE RE-DONE
CERN prefer to make the serial connection outside the assembly, in case of a failure in a sector. Long cable to be soldered for each pad.

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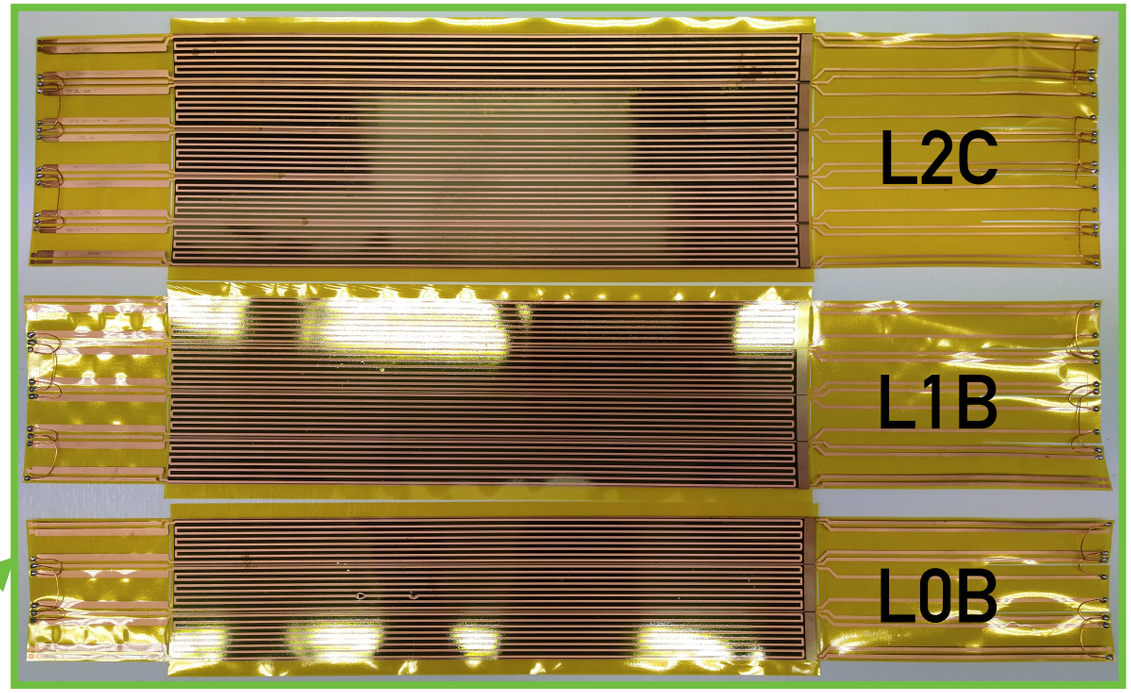

L0B
Left end-cup 77.3 Ω
Pixel matrix 25.1 Ω
Periphery 106.9 Ω

L1B
Left end-cup 102.7 Ω
Pixel matrix 32 Ω
Periphery 147.7 Ω

L2C
Left end-cup 148.6 Ω
Pixel matrix 43.8 Ω
Periphery 192.1 Ω

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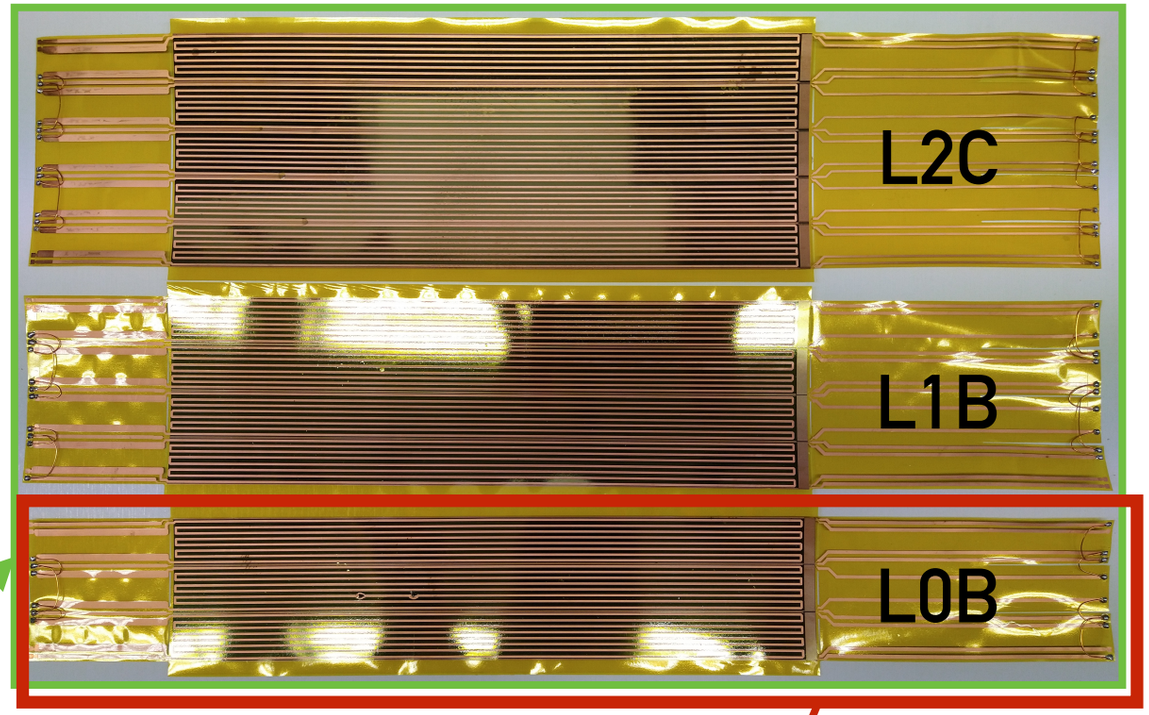

PROPOSED MEASUREMENT
Needed to verify if during the ITS3 assembly, at the sensor verification in the different step a cooling is also needed.

Proposal: bent an heater, power a sector and measure using thermo-camera the reached temperature,

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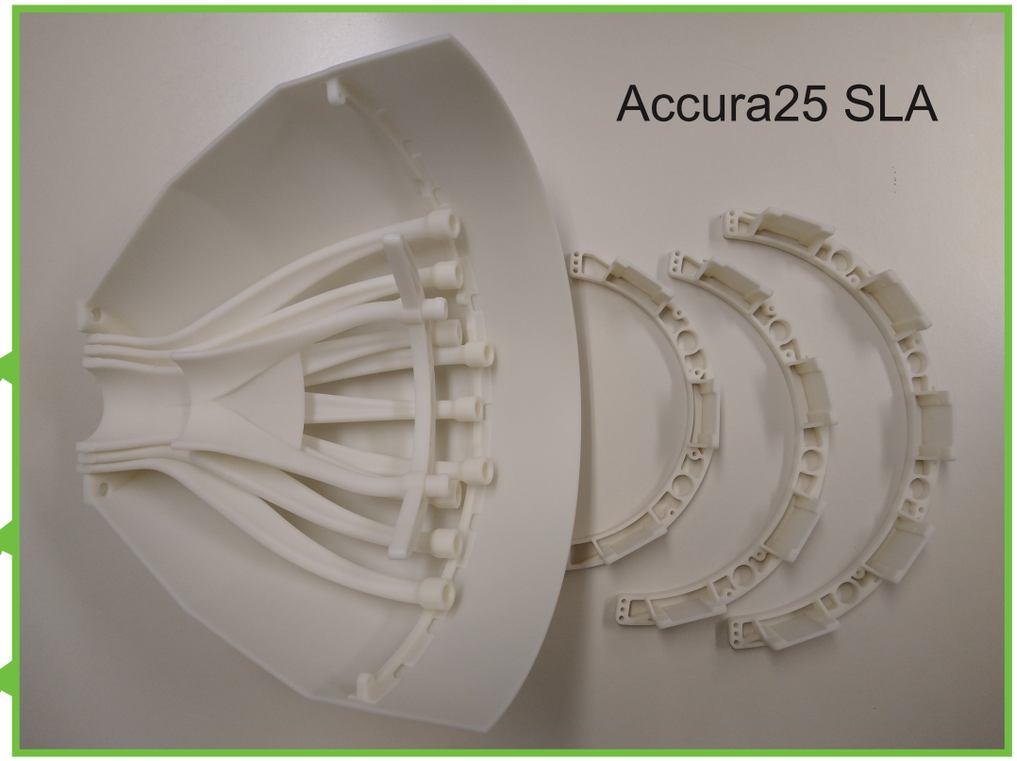

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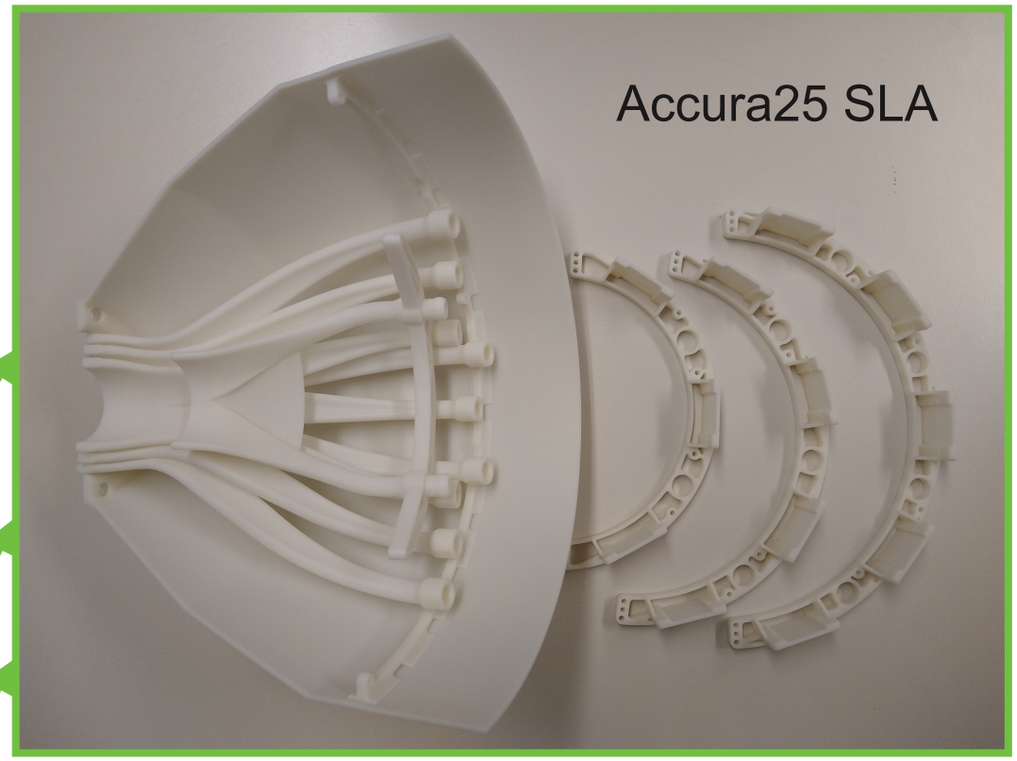

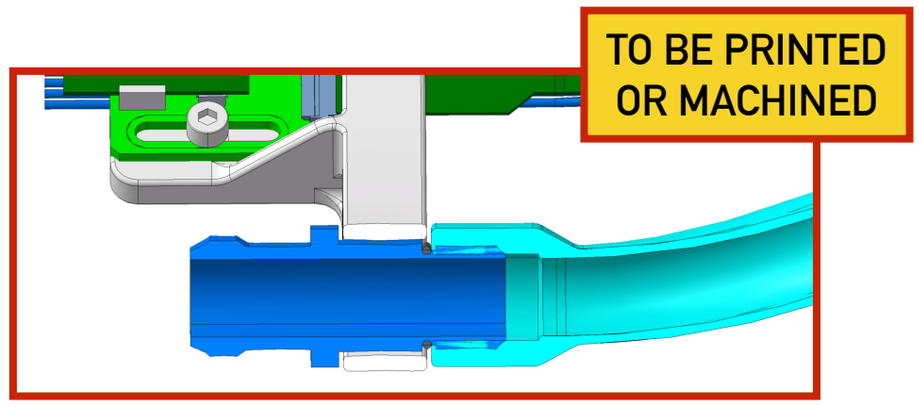

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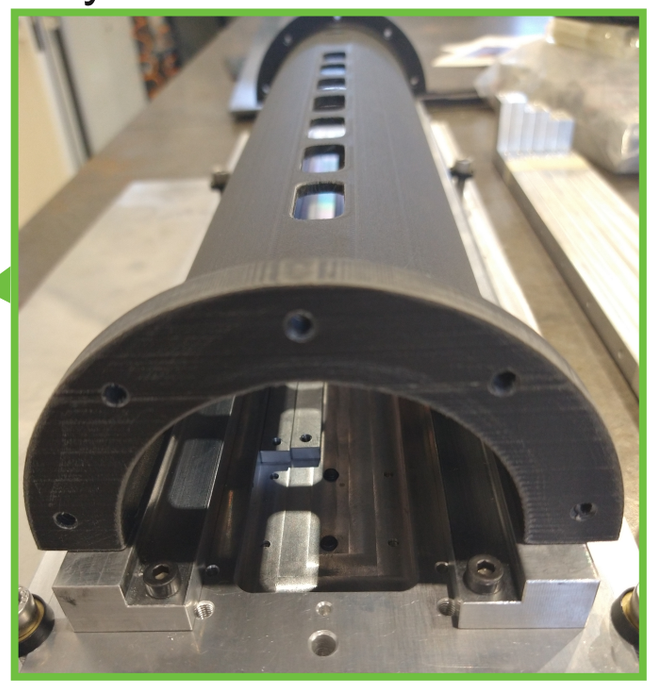
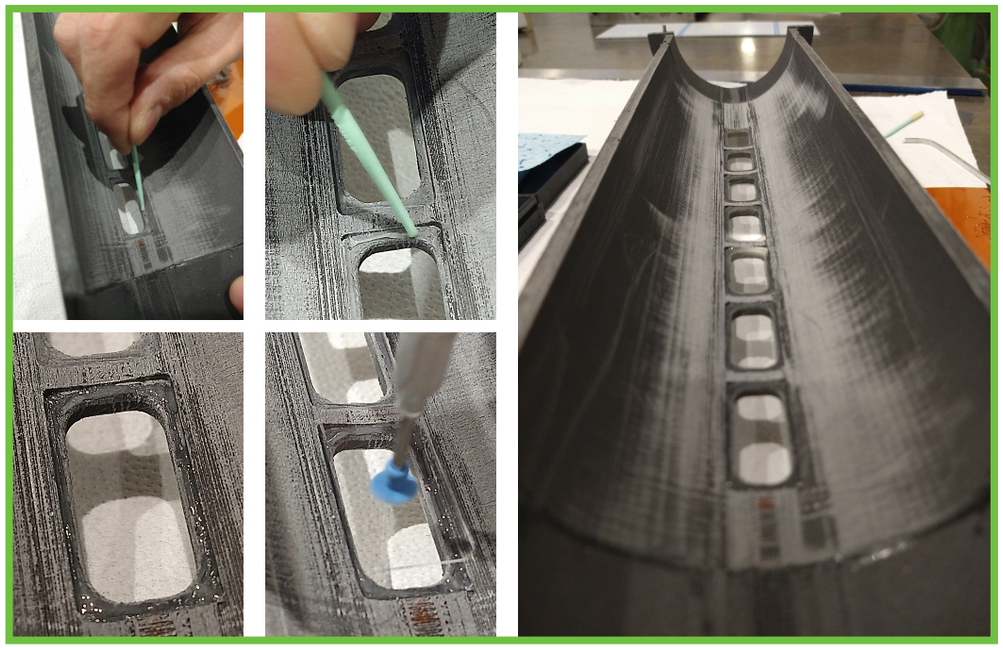
Onyx+carbon fiber





Glasses glued

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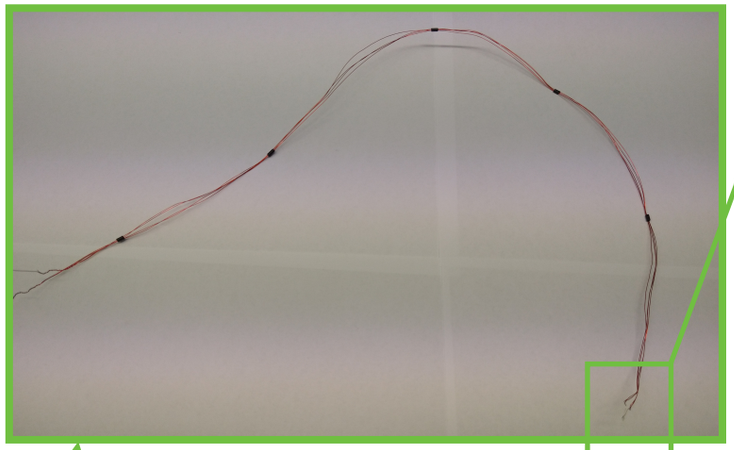
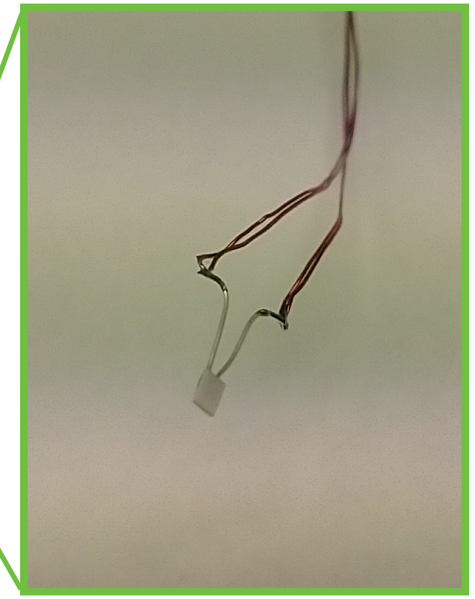
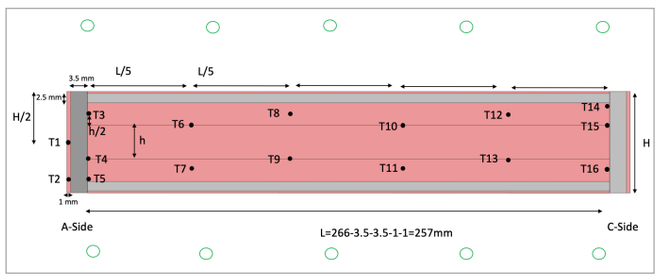
Conical shell	
Patch-panel	
PT1000 sensors + cables	
Covering plexiglass	@Bari
Assembly support	@Bari

General condition:

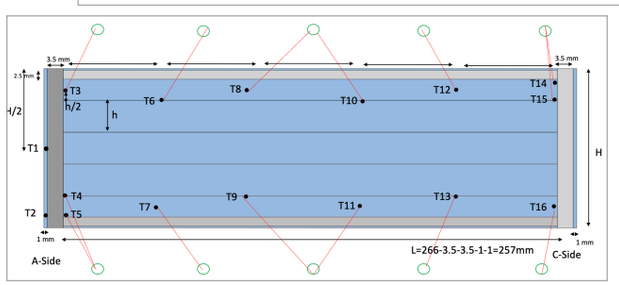
- Conductive glue: Epoxies 50-3150 FR + Catalyst: EE-190-13
- PT1000 sensor equipped with 4 wires

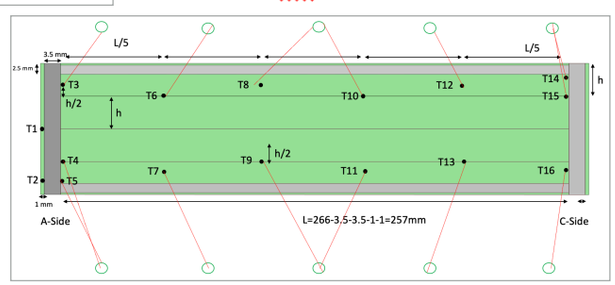






Complex version:
L0→16, L1→16, L2→16
TOTAL→48





Fori nei longerons
Cavi da PT1000

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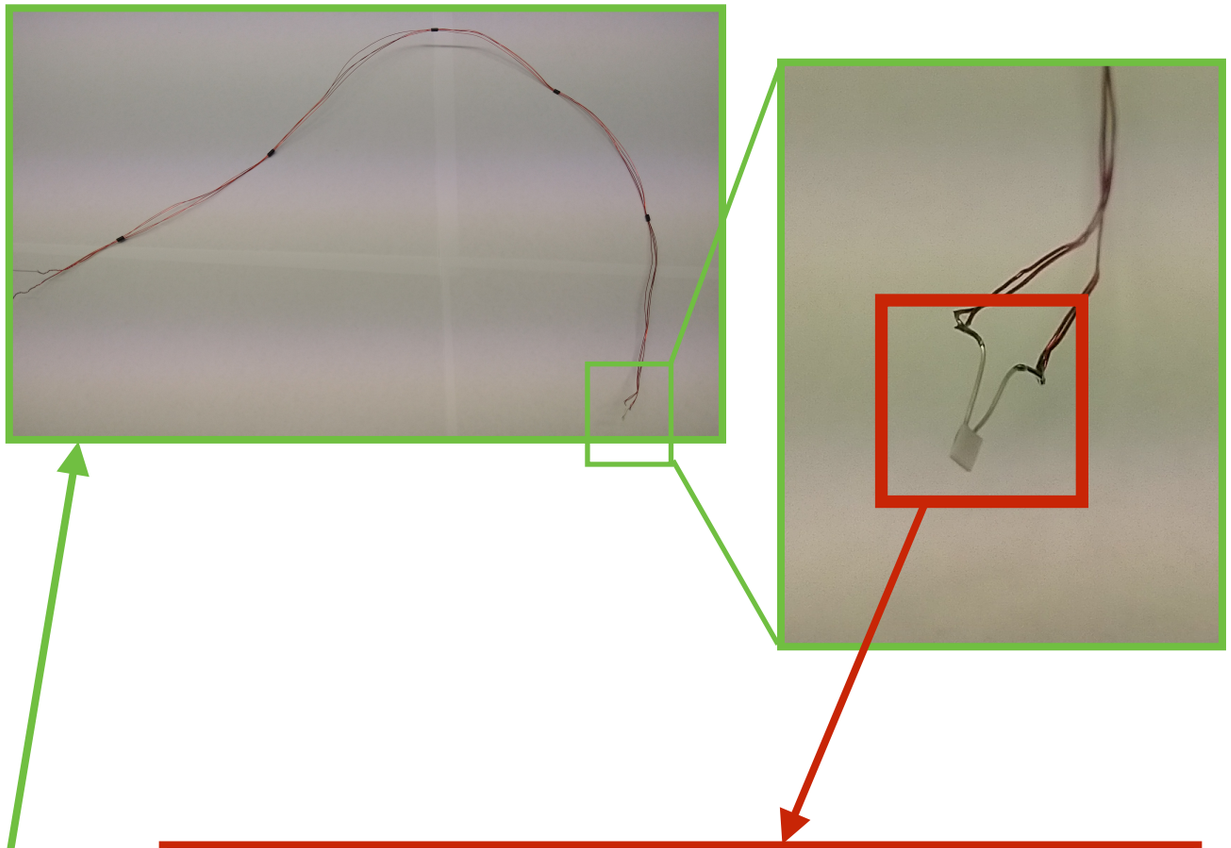
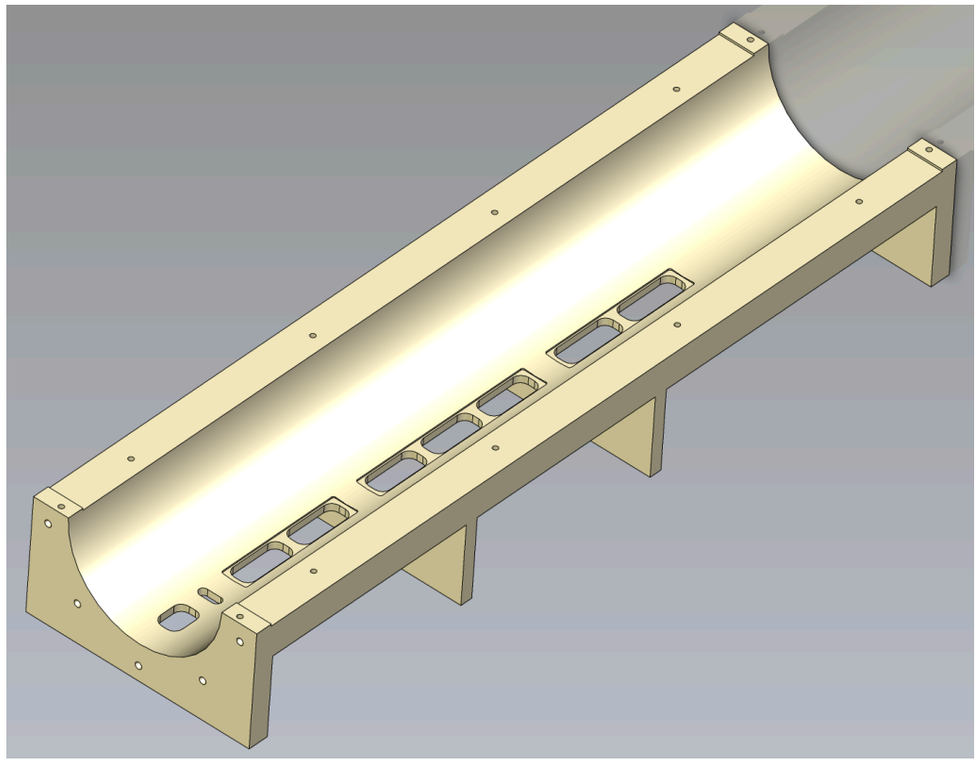


To be understood if wires require to be thermal isolated
Test will be performed at CERN

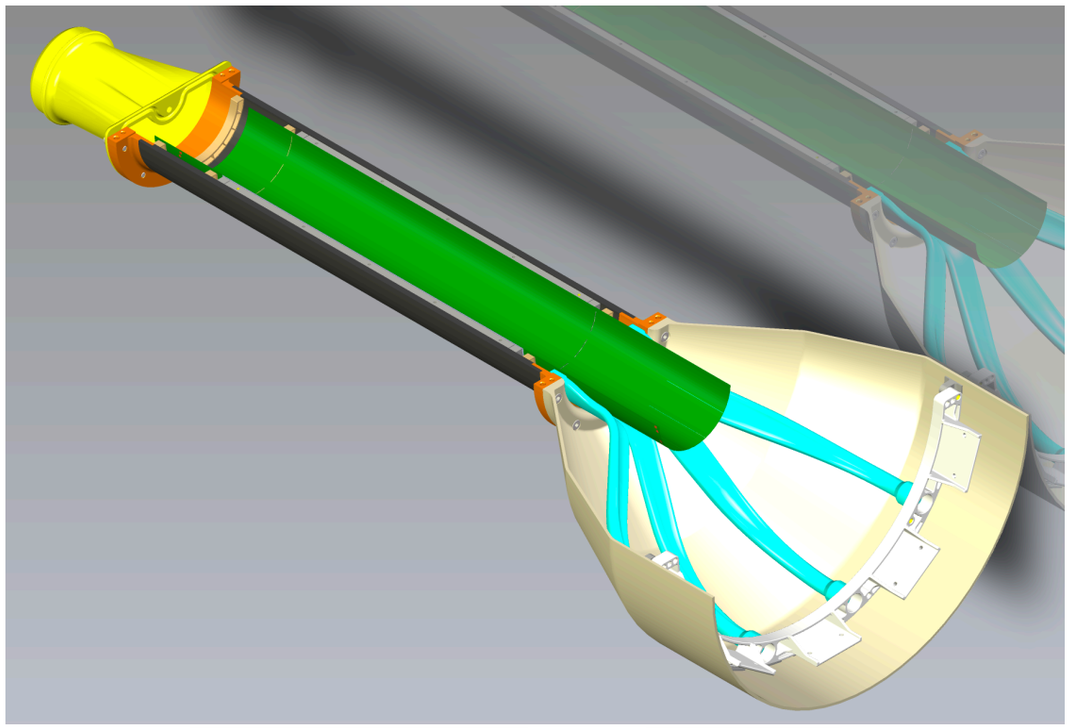
BACKUP

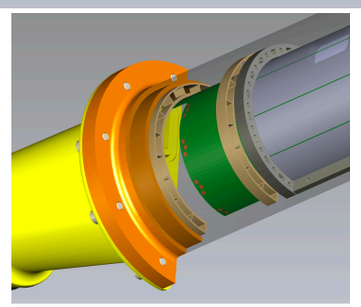
BBM6 TTA - CYSS

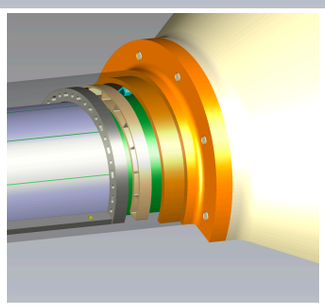


As agreed, the CYSS will be produced in plastic material. We choose the bakelite for the higher precision.

As an alternative, working on the production of a CYSS in carbon fibre.



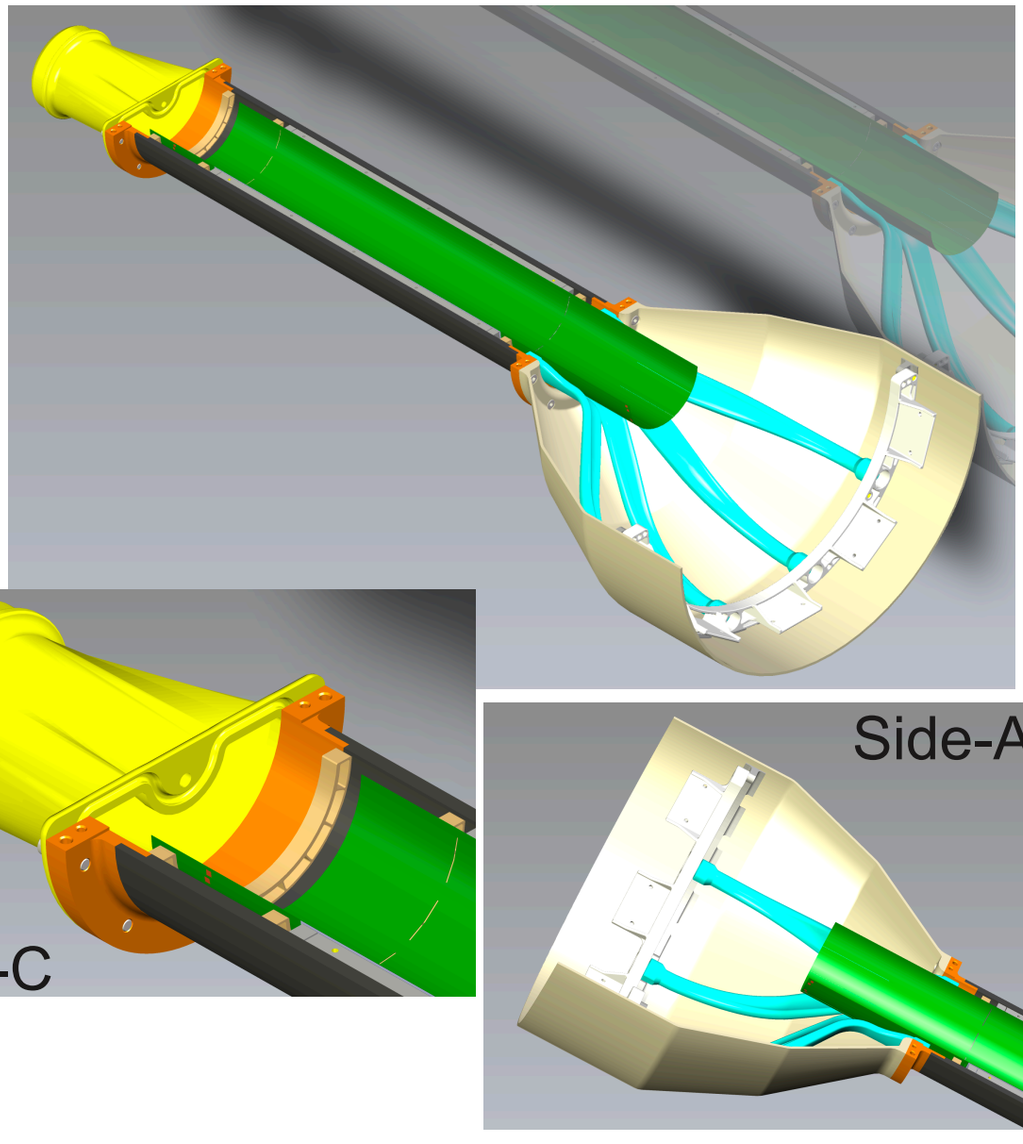




BBM6 TTA - CYSS

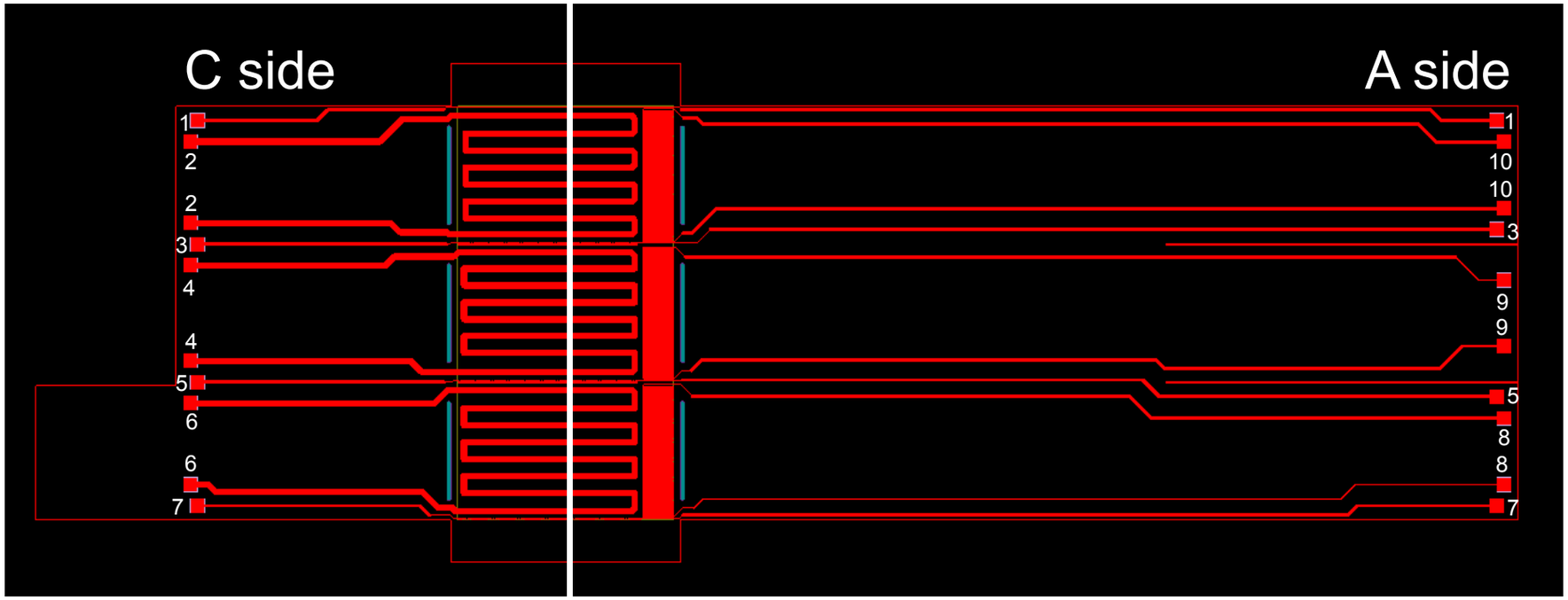
- Identified a potential producer, very close to Bari and already working with INFN for other projects (CMS and ATLAS): CETMA

- The shell will be made at the best dimensions to fit BBM6
  - Internal skin removed and CYSS internal radius consequently adapted. Total thickness ~4.7 mm.
  - Half-rings adaptors: re-designed to adapt the already produced components (conical shell and air collector side-C)



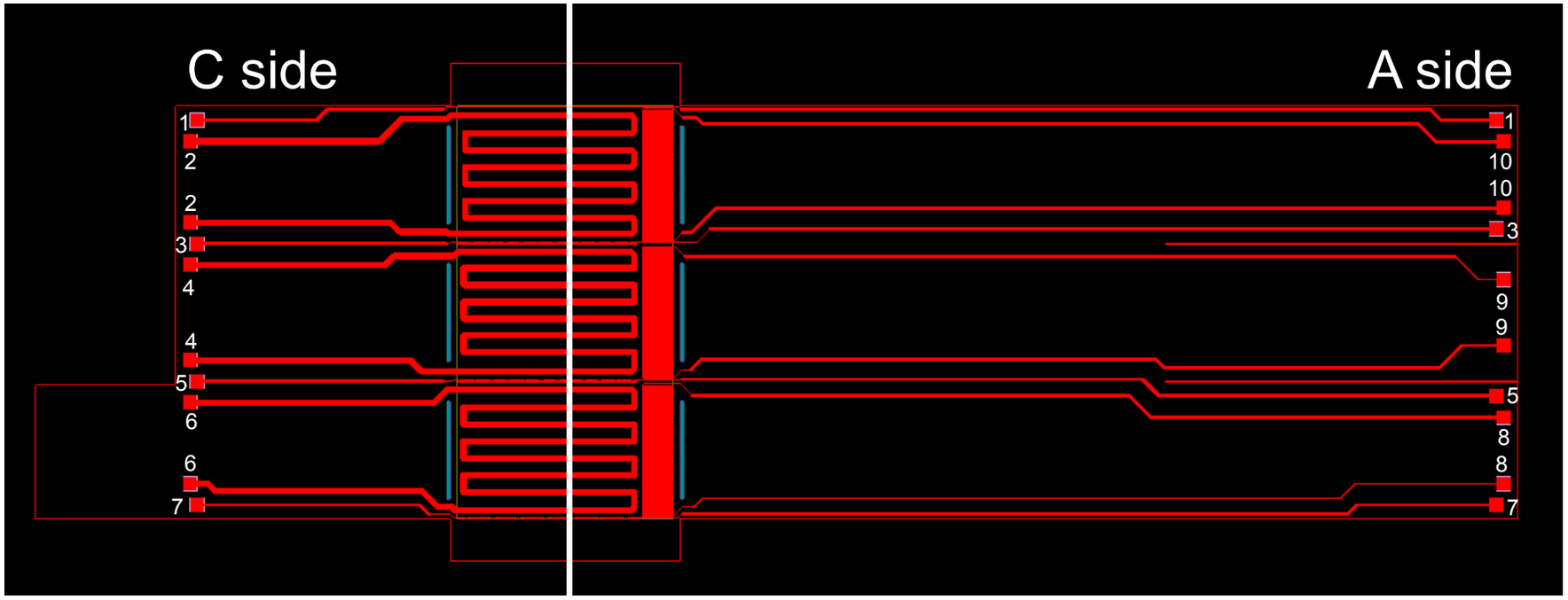
Taken from BBM3

		Resistivity [ohm]		
		Maximum	Nominal	Minimum
LE	Left end cap	48	40	30
PM	Pixel matrix	11	8	5
RP-2	Readout periphery (2lines)	65	50	40
RP-1	Readout periphery (1line)	32	25	20

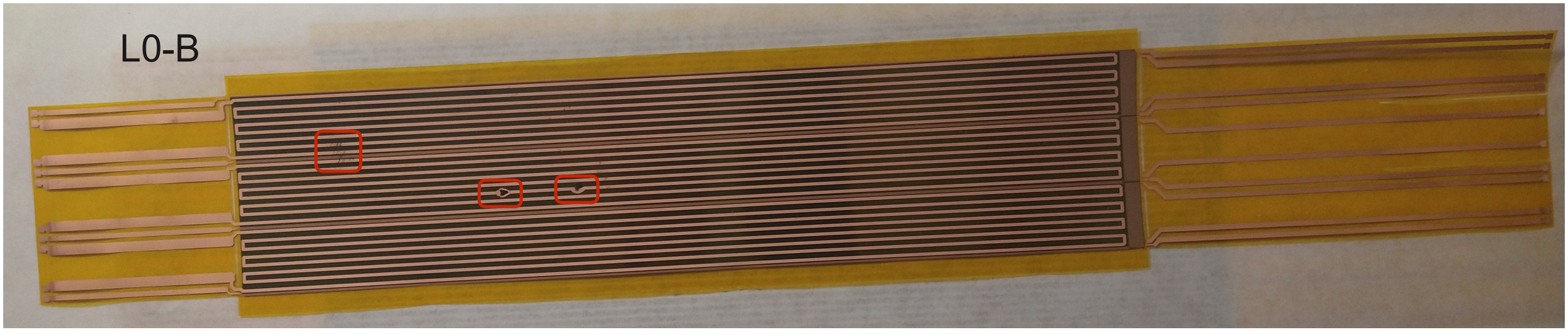


1	RP-1	22.6	6	PM	8.5
2	PM	8.5	7	RP-1	22.6
3	RP-2	48.0	8	LE	32.2
4	PM	8.5	9	LE	31.2
5	RP-2	47.4	10	LE	32.5

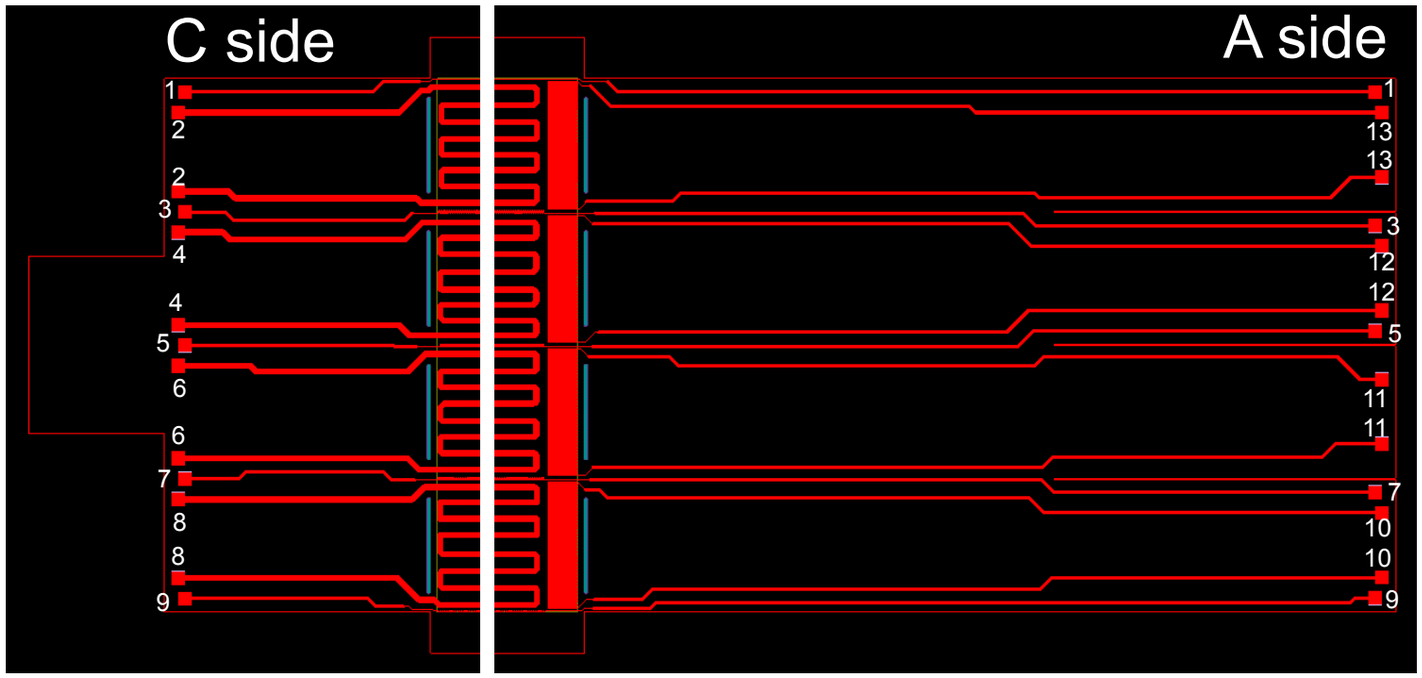
		Resistivity [ohm]		
		Maximum	Nominal	Minimum
LE	Left end cap	48	40	30
PM	Pixel matrix	11	8	5
RP-2	Readout periphery (2lines)	65	50	40
RP-1	Readout periphery (1line)	32	25	20



1	RP-1	17.2	6	PM	8.4
2	PM	8.4	7	RP-1	16.9
3	RP-2	36.5	8	LE	25.9
4	PM	8.4	9	LE	26.1
5	RP-2	37.0	10	LE	25.5

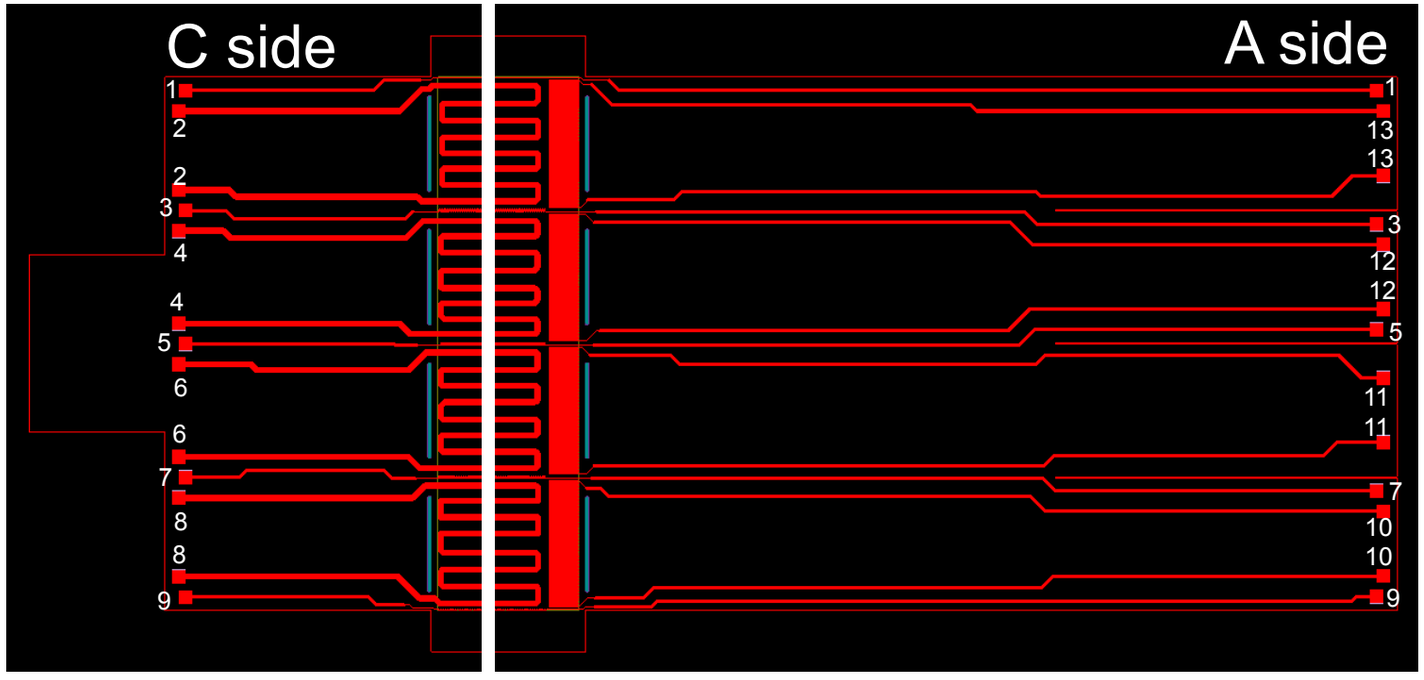


		Resistivity [ohm]		
		Maximum	Nominal	Minimum
LE	Left end cap	48	40	30
PM	Pixel matrix	11	8	5
RP-2	Readout periphery (2lines)	65	50	40
RP-1	Readout periphery (1line)	32	25	20

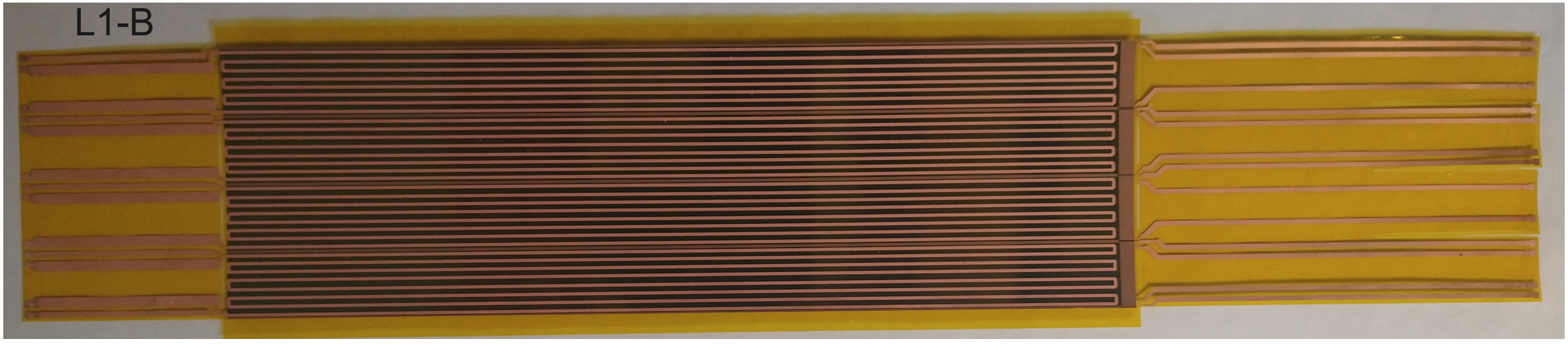


1	RP-1	17.6	8	PM	8.2
2	PM	8.2	9	RP-1	17.3
3	RP-2	37.8	10	LE	24.6
4	PM	8.2	11	LE	24.0
5	RP-2	37.8	12	LE	25.0
6	PM	8.3	13	LE	24.2
7	RP-2	37.8			

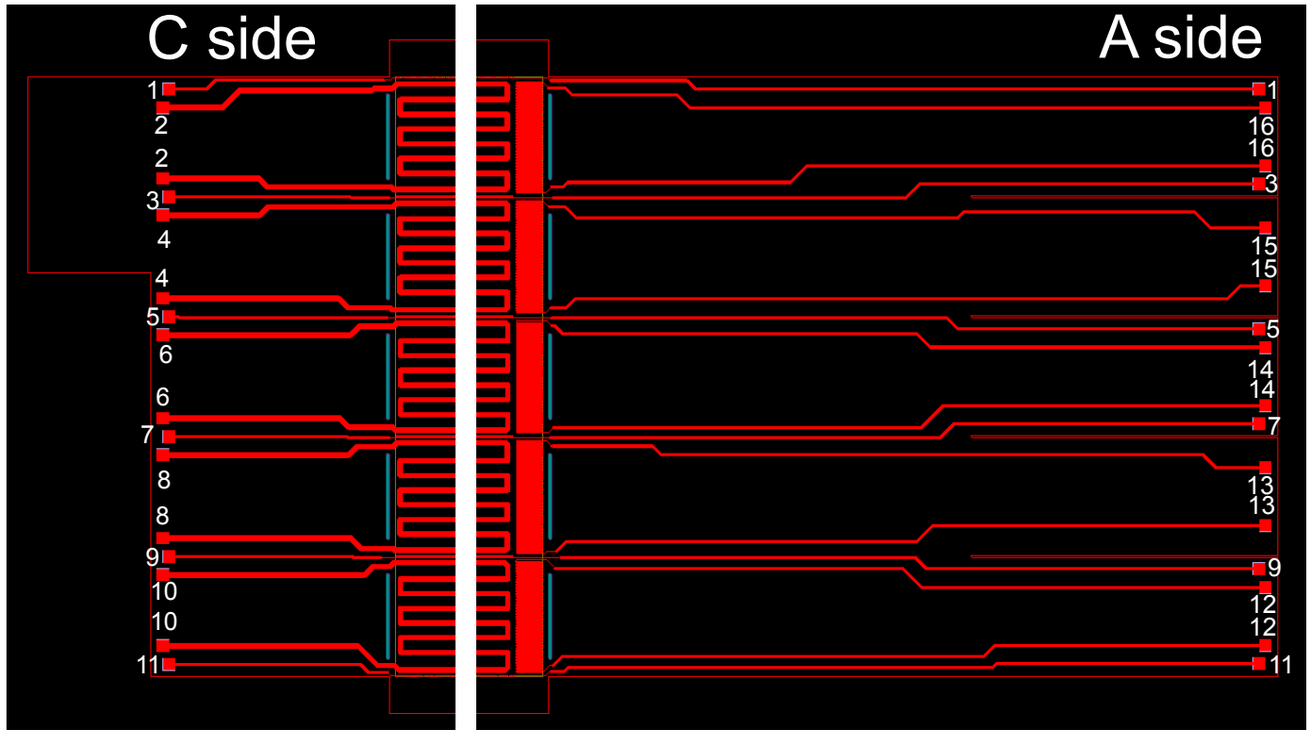
		Resistivity [ohm]		
		Maximum	Nominal	Minimum
LE	Left end cap	48	40	30
PM	Pixel matrix	11	8	5
RP-2	Readout periphery (2lines)	65	50	40
RP-1	Readout periphery (1line)	32	25	20



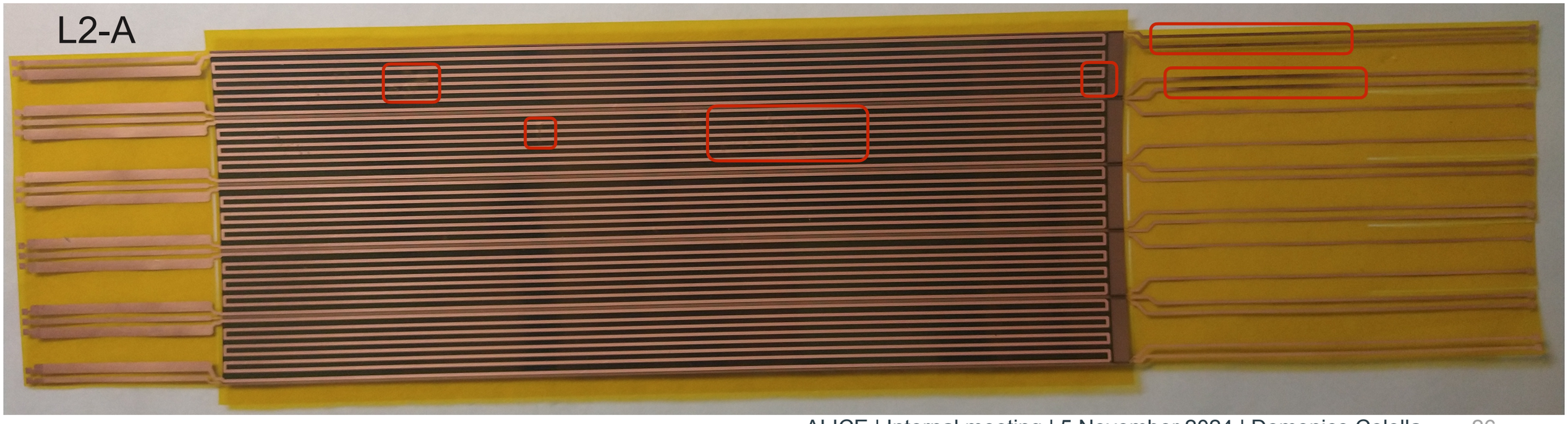
1	RP-1	18.3	8	PM	8.3
2	PM	8.5	9	RP-1	18.1
3	RP-2	37.6	10	LE	26.9
4	PM	8.3	11	LE	25.7
5	RP-2	37.6	12	LE	25.7
6	PM	8.3	13	LE	26.2
7	RP-2	38.4			



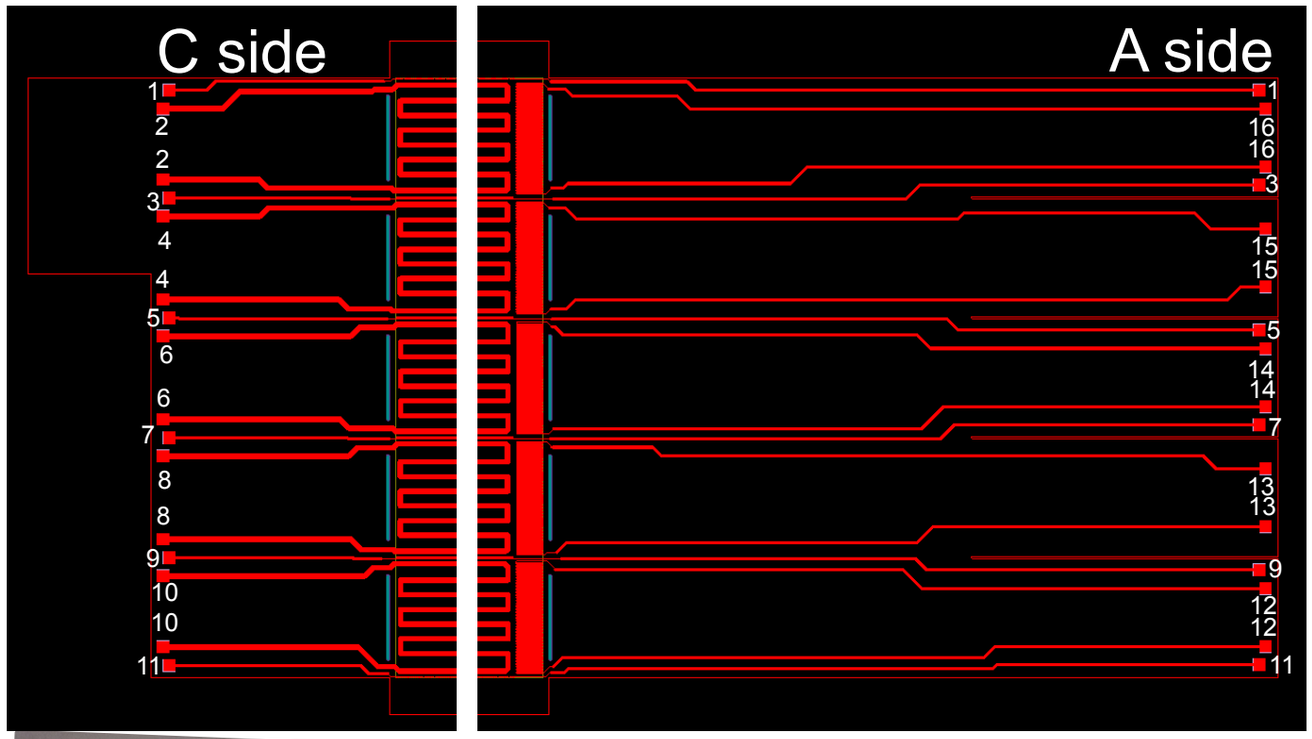
		Resistivity [ohm]		
		Maximum	Nominal	Minimum
LE	Left end cap	48	40	30
PM	Pixel matrix	11	8	5
RP-2	Readout periphery (2lines)	65	50	40
RP-1	Readout periphery (1line)	32	25	20



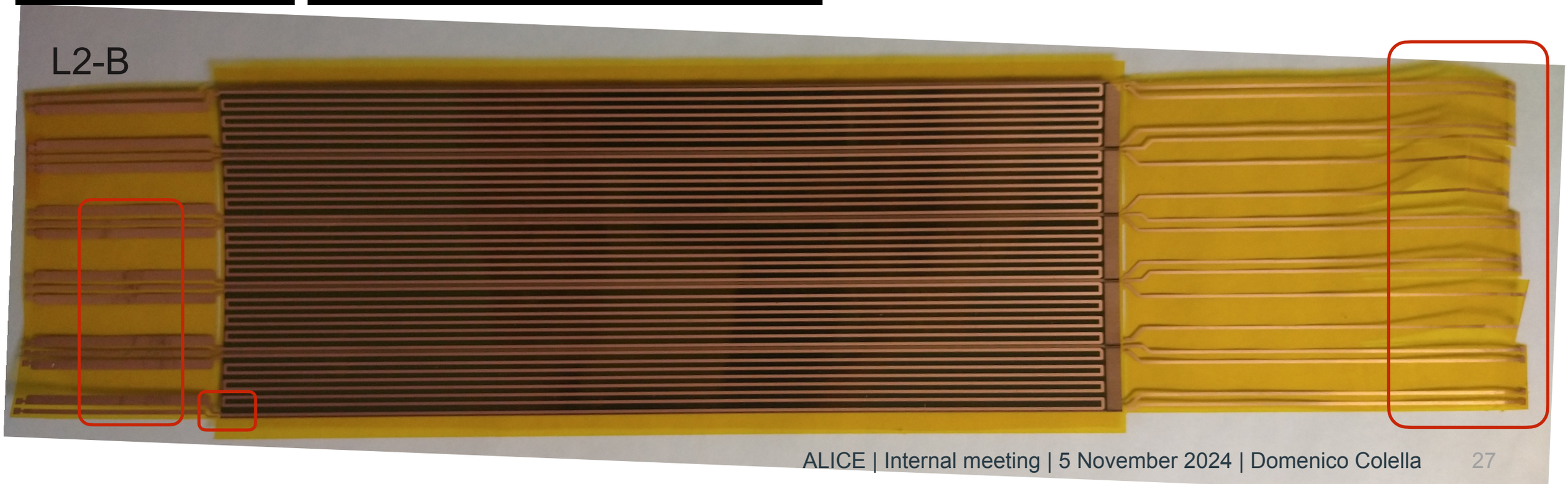
1	RP-1	19.8	9	RP-2	42.0
2	PM	8.7	10	PM	8.7
3	RP-2	42.2	11	RP-1	19.8
4	PM	8.5	12	LE	28.4
5	RP-2	42.5	13	LE	29.1
6	PM	8.5	14	LE	27.5
7	RP-2	42.3	15	LE	28.2
8	PM	8.5	16	LE	27.0



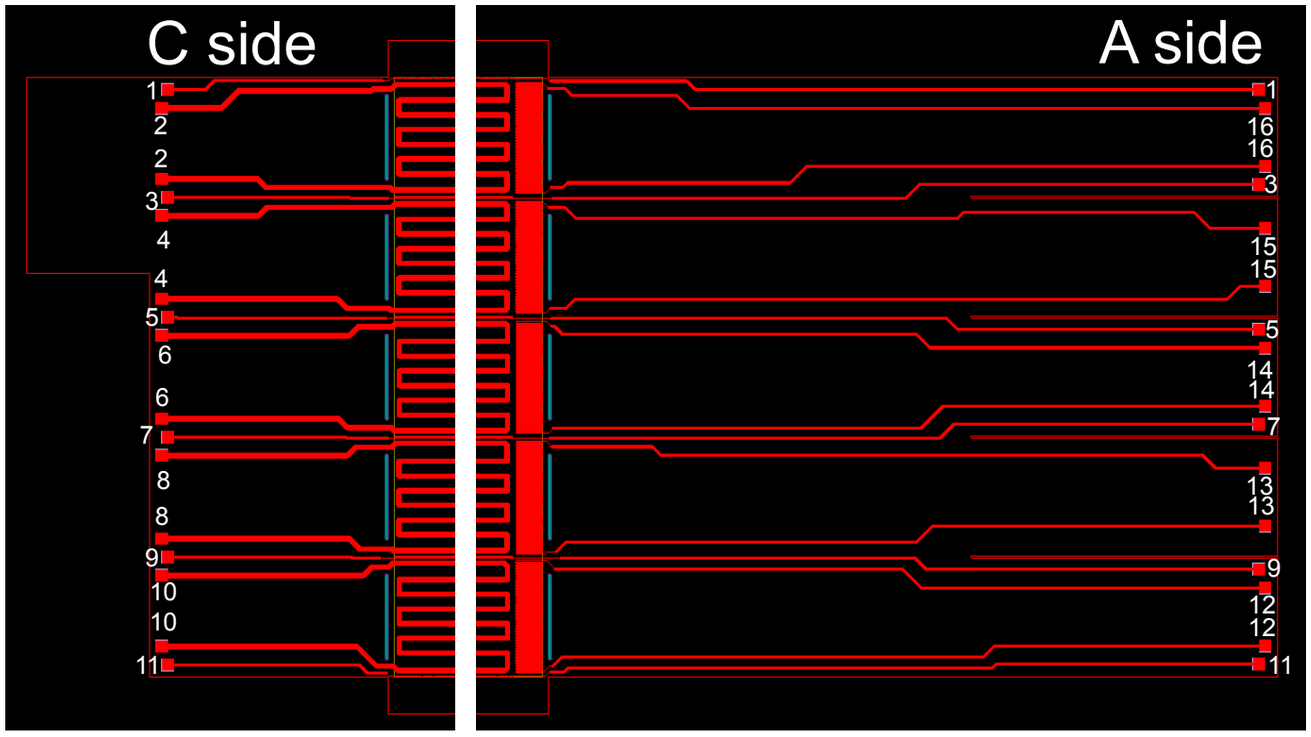
		Resistivity [ohm]		
		Maximum	Nominal	Minimum
LE	Left end cap	48	40	30
PM	Pixel matrix	11	8	5
RP-2	Readout periphery (2lines)	65	50	40
RP-1	Readout periphery (1line)	32	25	20



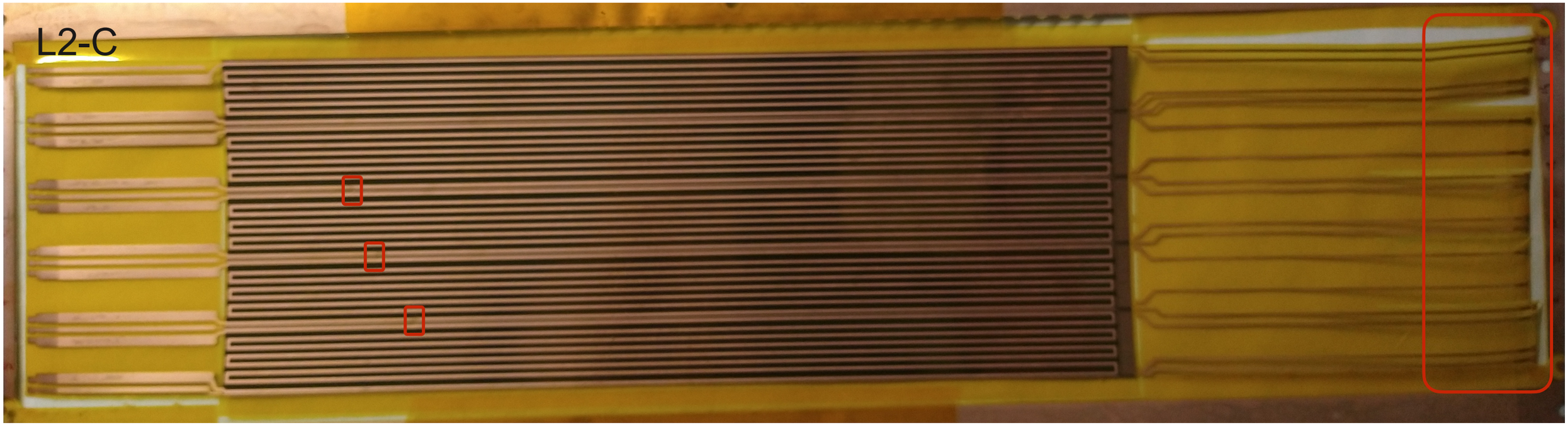
1	RP-1	19.4	9	RP-2	39.2
2	PM	9.1	10	PM	9.2
3	RP-2	39.8	11	RP-1	19.2
4	PM	9.2	12	LE	26.0
5	RP-2	39.9	13	LE	27.0
6	PM	9.2	14	LE	26.6
7	RP-2	39.9	15	LE	26.7
8	PM	9.3	16	LE	26.5



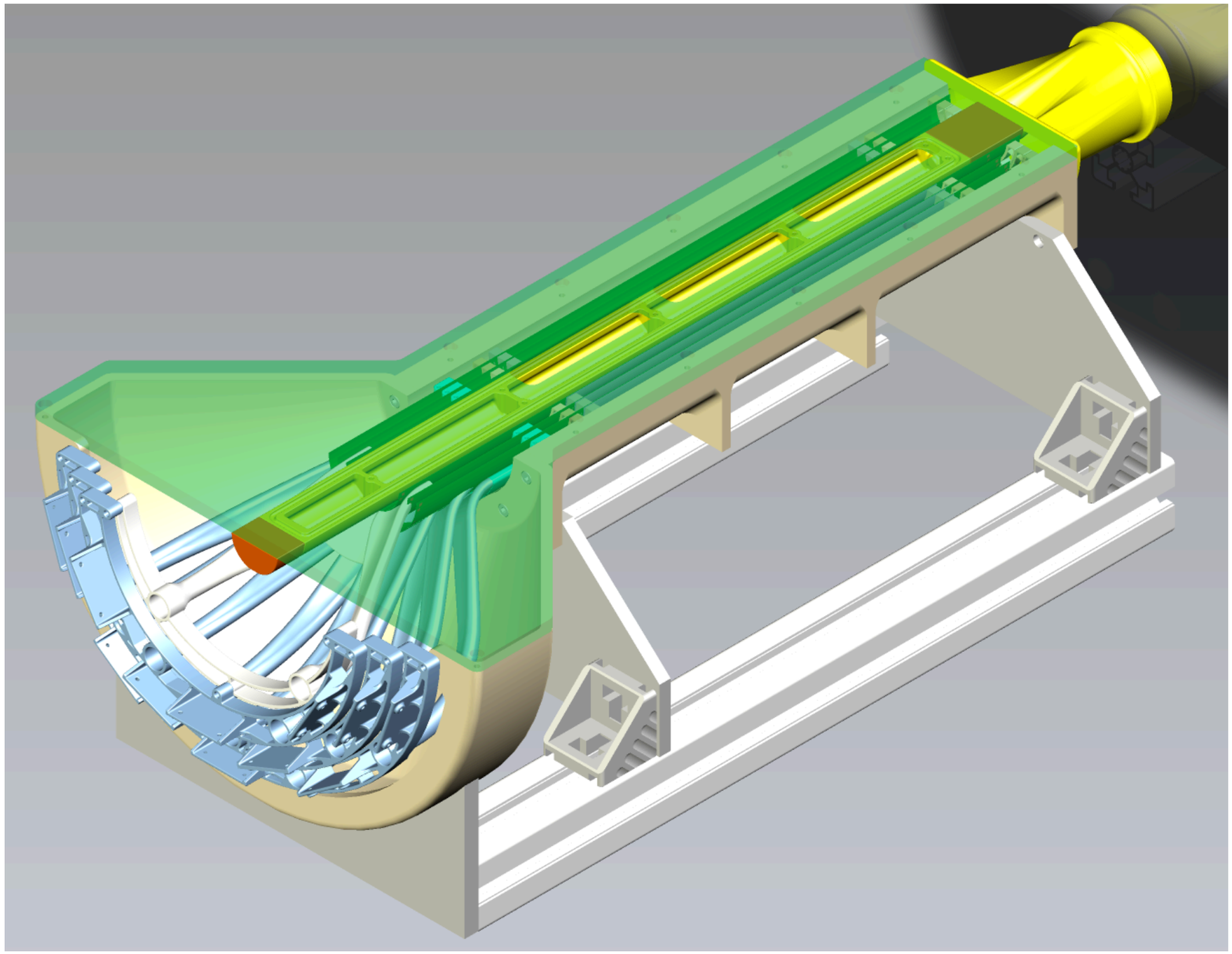
		Resistivity [ohm]		
		Maximum	Nominal	Minimum
LE	Left end cap	48	40	30
PM	Pixel matrix	11	8	5
RP-2	Readout periphery (2lines)	65	50	40
RP-1	Readout periphery (1line)	32	25	20



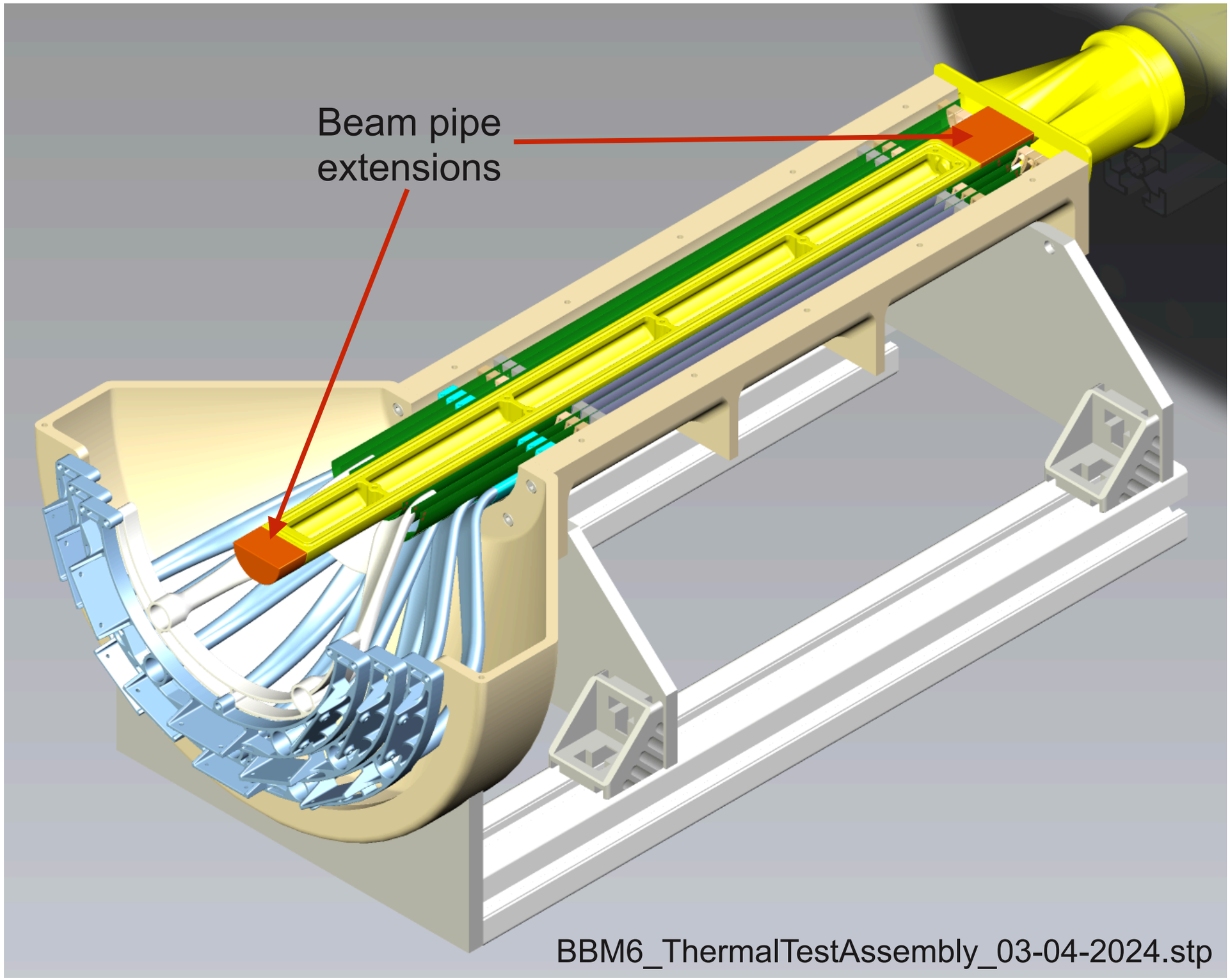
1	RP-1	20.1	9	RP-2	39.9
2	PM	9.6	10	PM	9.6
3	RP-2	39.8	11	RP-1	20.0
4	PM	9.5	12	LE	30.8
5	RP-2	38.8	13	LE	31.0
6	PM	9.5	14	LE	30.8
7	RP-2	39.8	15	LE	31.1
8	PM	9.5	16	LE	30.5



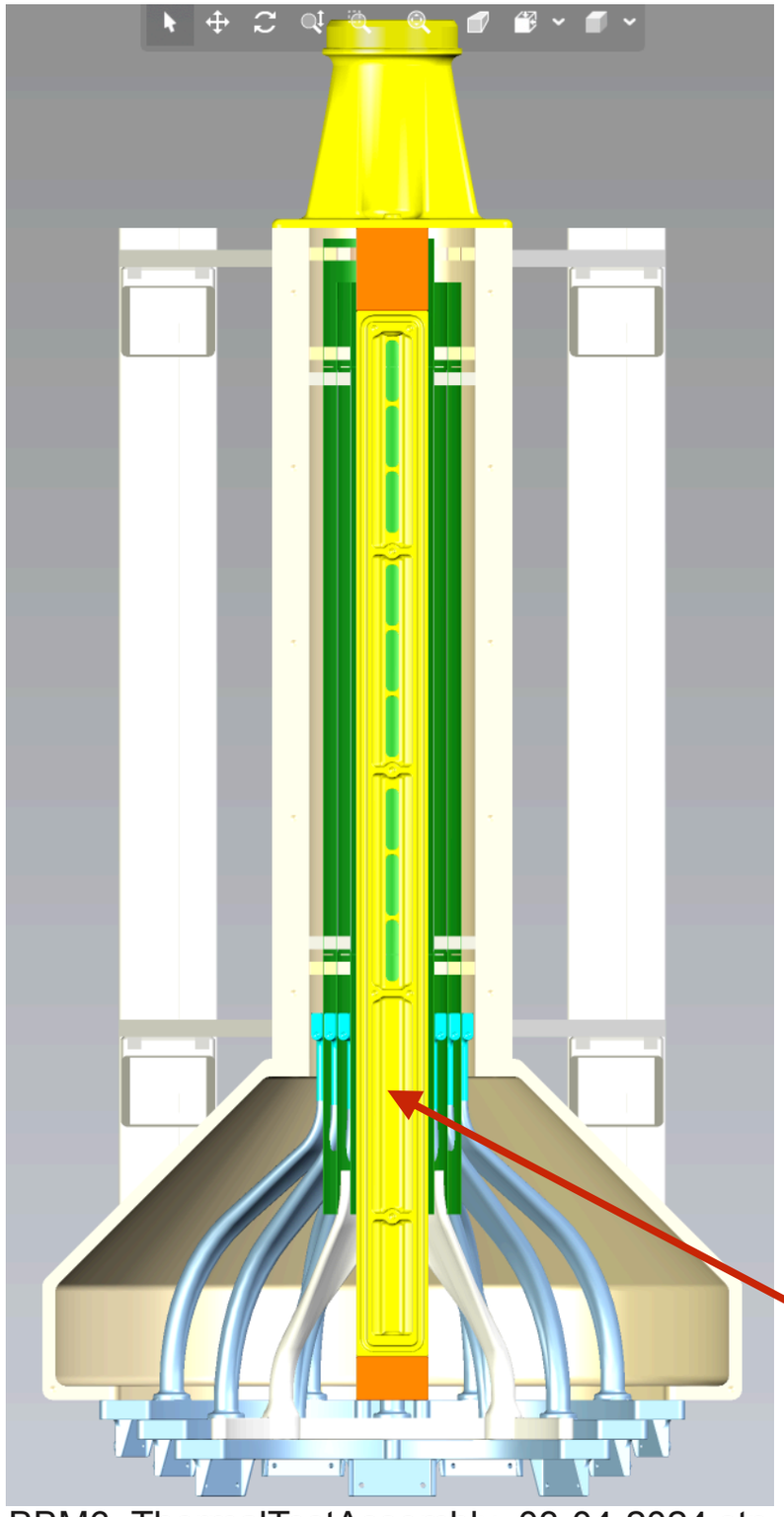
BBM6_ThermalTestAssembly_03-04-2024.stp



1) BEAM PIPE POSITION



1) BEAM PIPE POSITION



BBM6_ThermalTestAssembly_03-04-2024.stp

Is the positioning of the beam pipe (and particularly of the windows) fine with you?
Present position is entering windows in the sensor area.

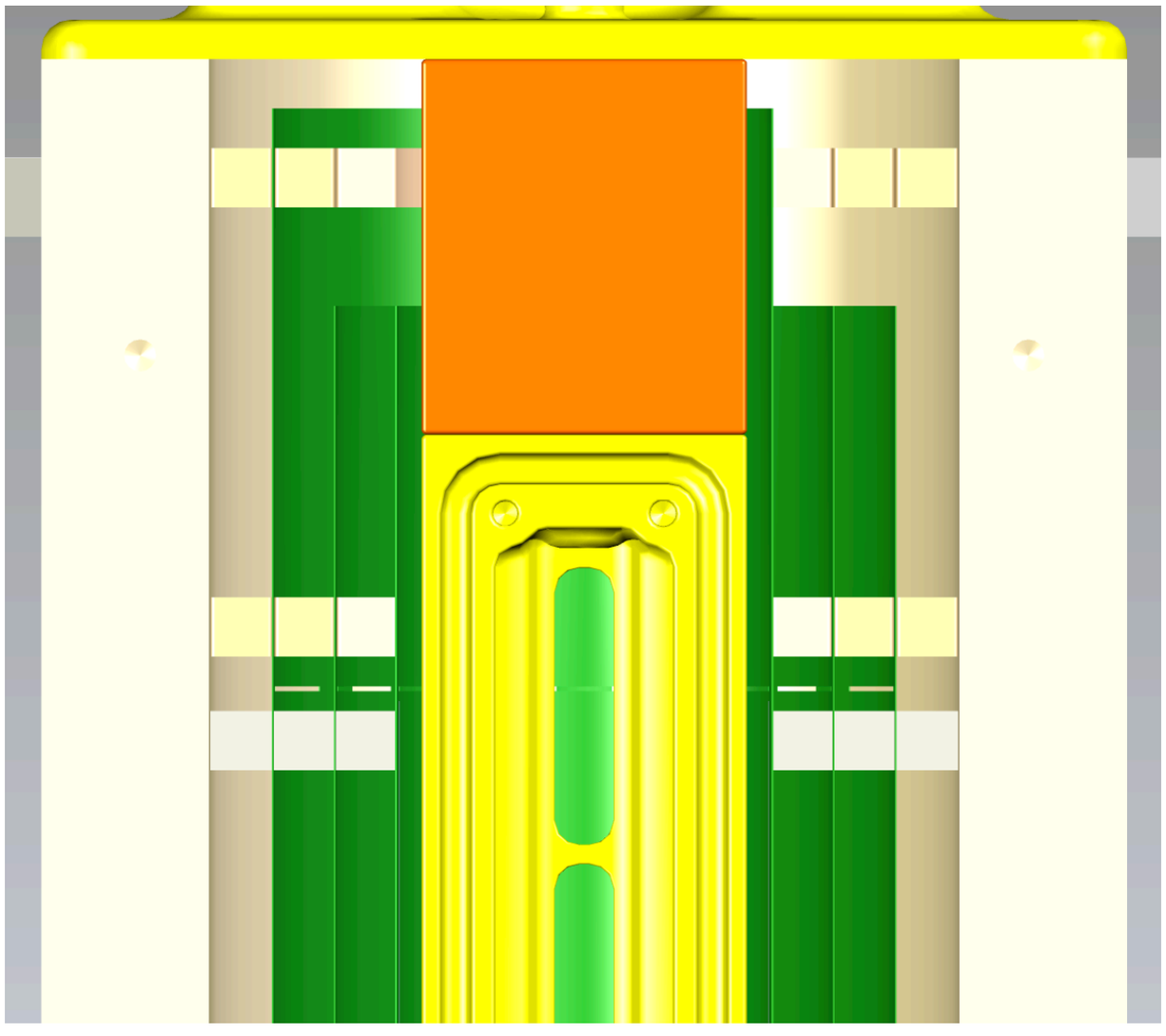
Alternative solution, if you need to have windows also in the FPC are, is to shift everything on the C-side and open windows in the last beam-pipe section.

Fixing of the extensions to the beam-pipe not yet defined in the CAD.

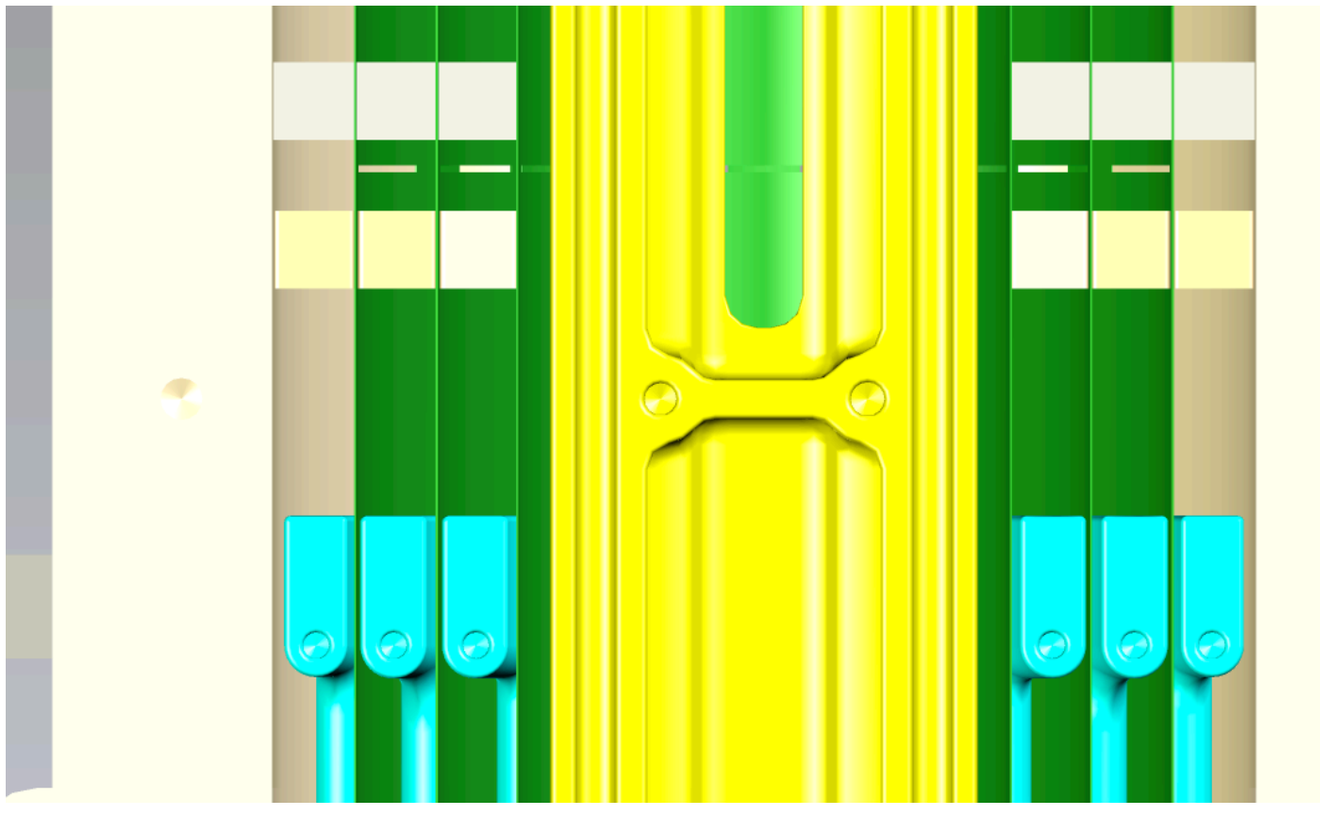
Potentially, open new windows here

1) BEAM PIPE POSITION

C-side

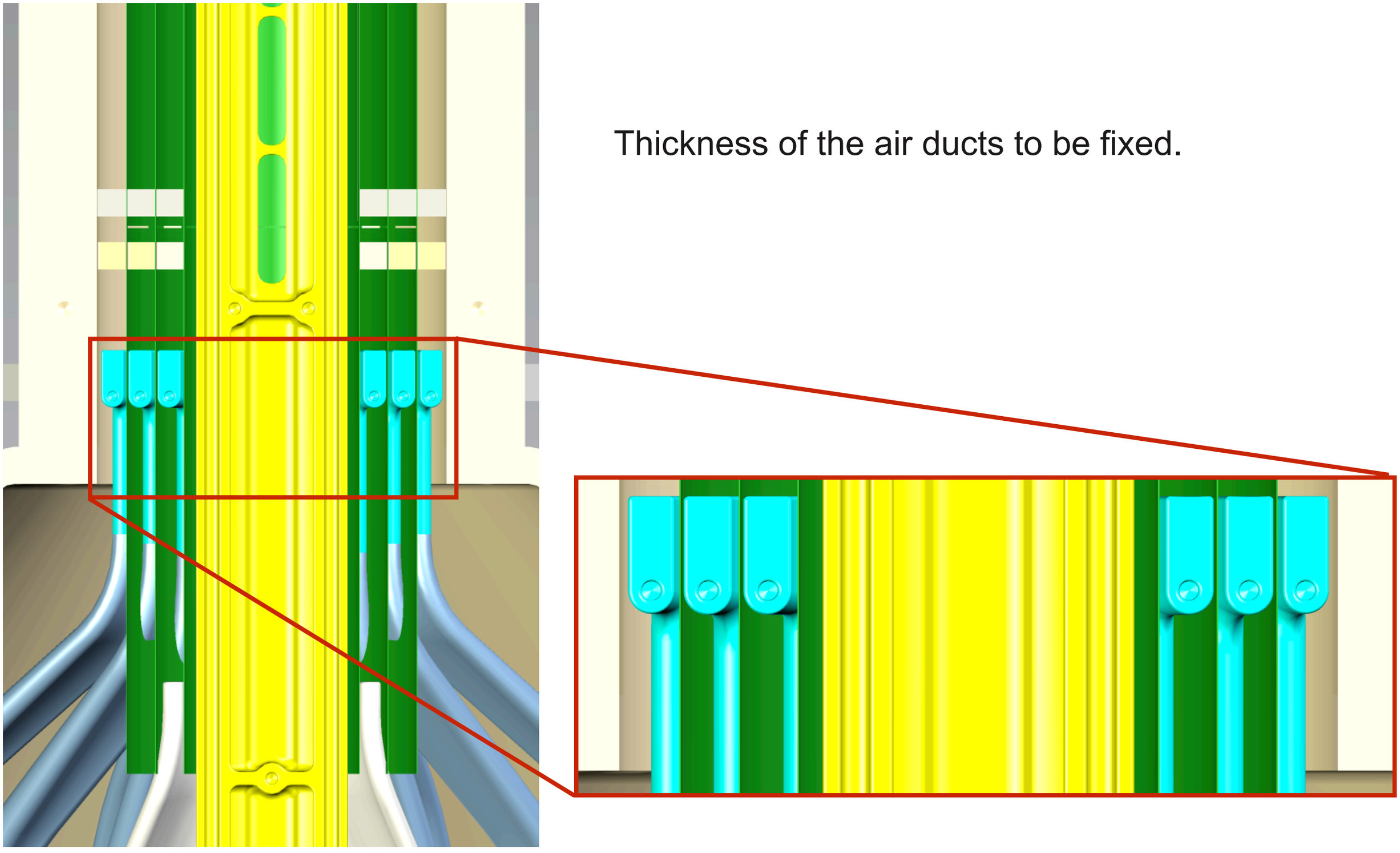


A-side



BBM6_ThermalTestAssembly_03-04-2024.stp

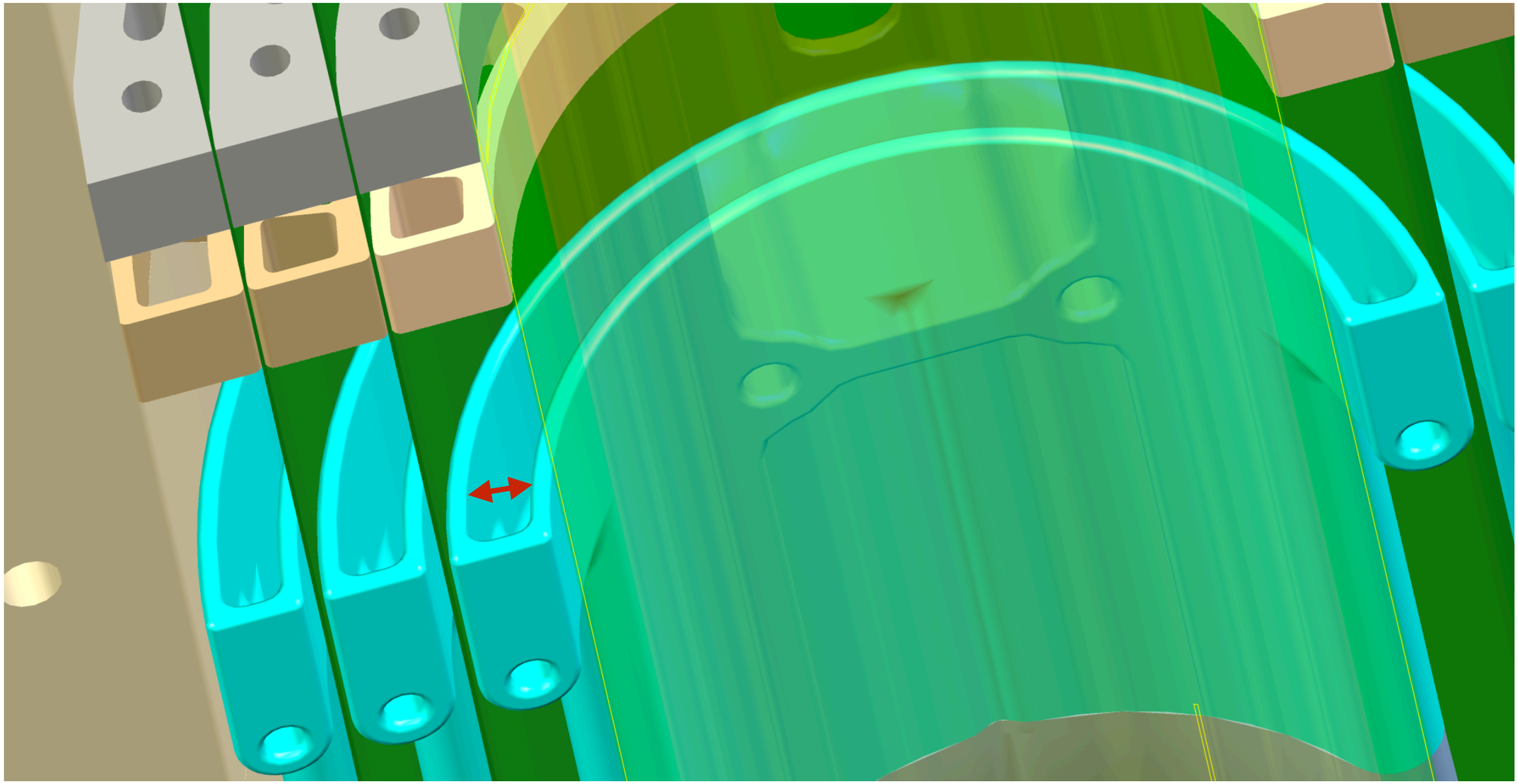
2) AIR DUCTS



Thickness of the air ducts to be fixed.

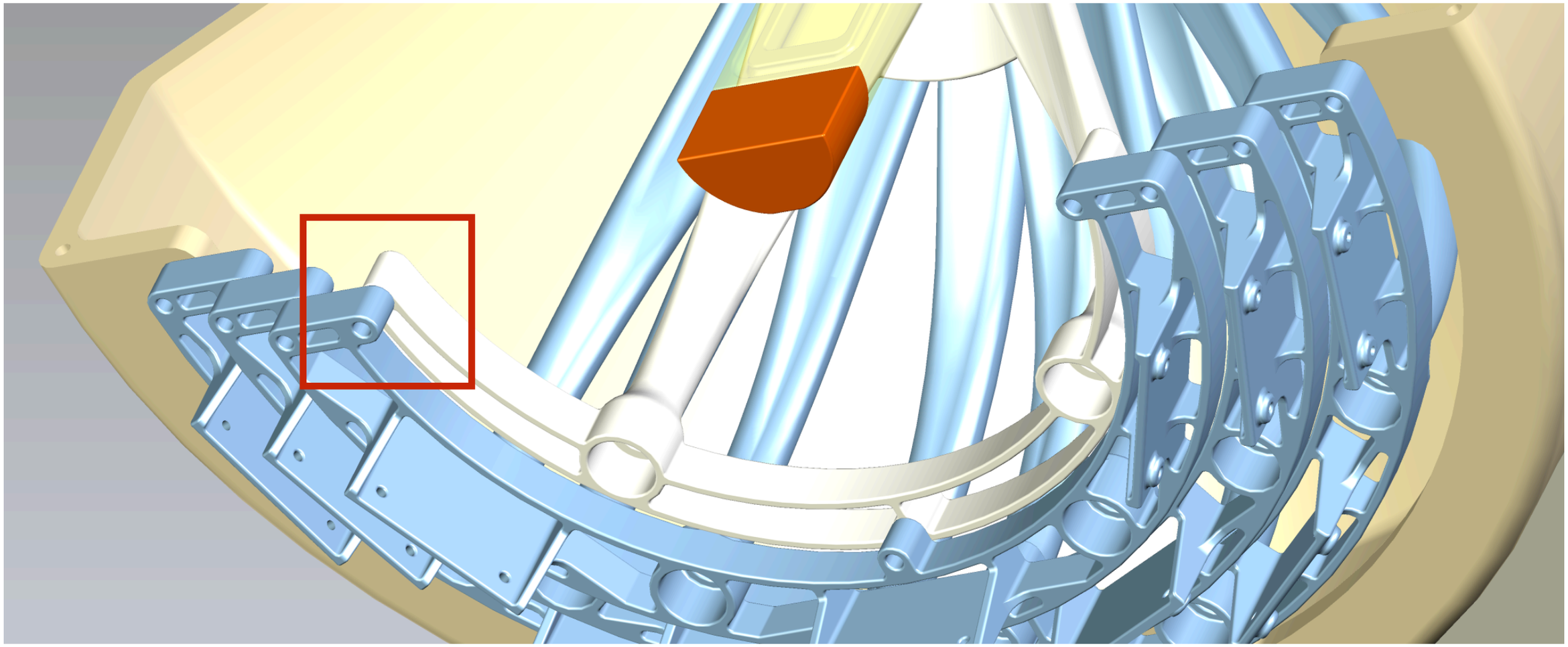
BBM6_ThermalTestAssembly_03-04-2024.stp

2) AIR DUCTS



If no update from Gael, proposed solution is to keep fixed internal dimension and make thicker wall from external side, filling the missing volume.

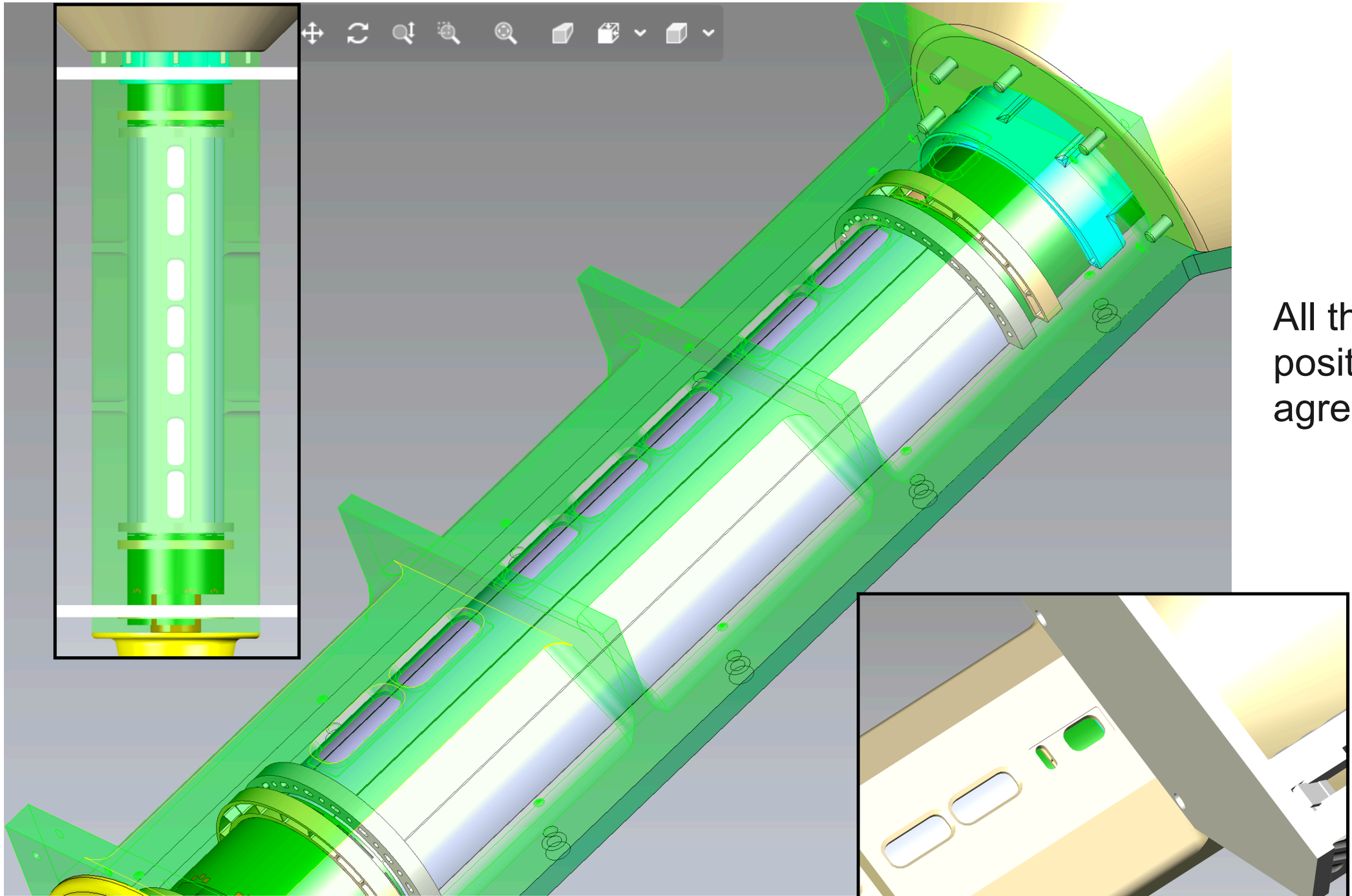
3) AIR DUCTS CONNECTION TO THE SHELLS



Can you give us details about the connection between the end of air ducts and the patch panel?
Do we actually need to have the patch panel?

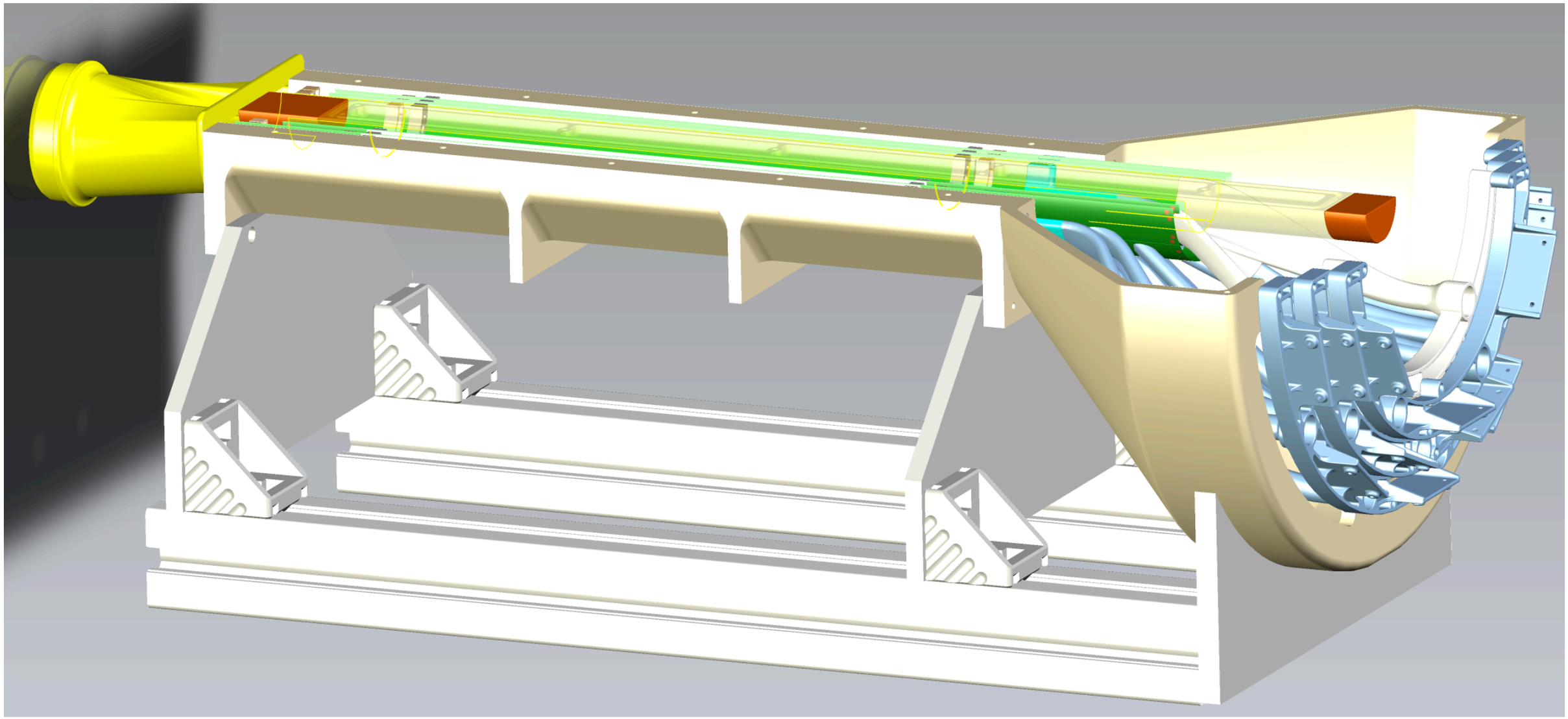
BBM6_ThermalTestAssembly_03-04-2024.stp

4) WINDOWS POSITION IN THE CYSS



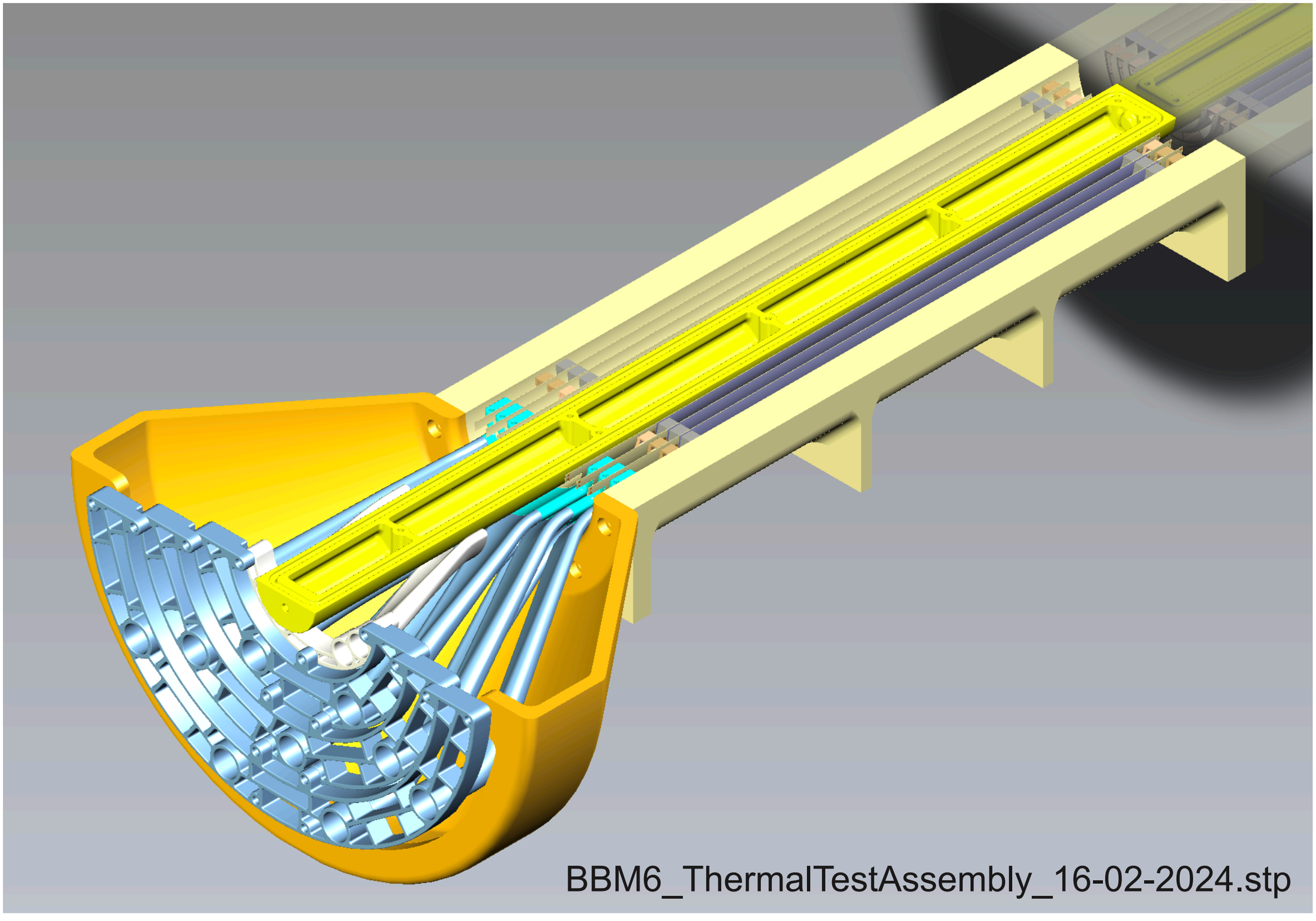
All the windows positioned in the agreed places

5) SUPPORT STRUCTURE

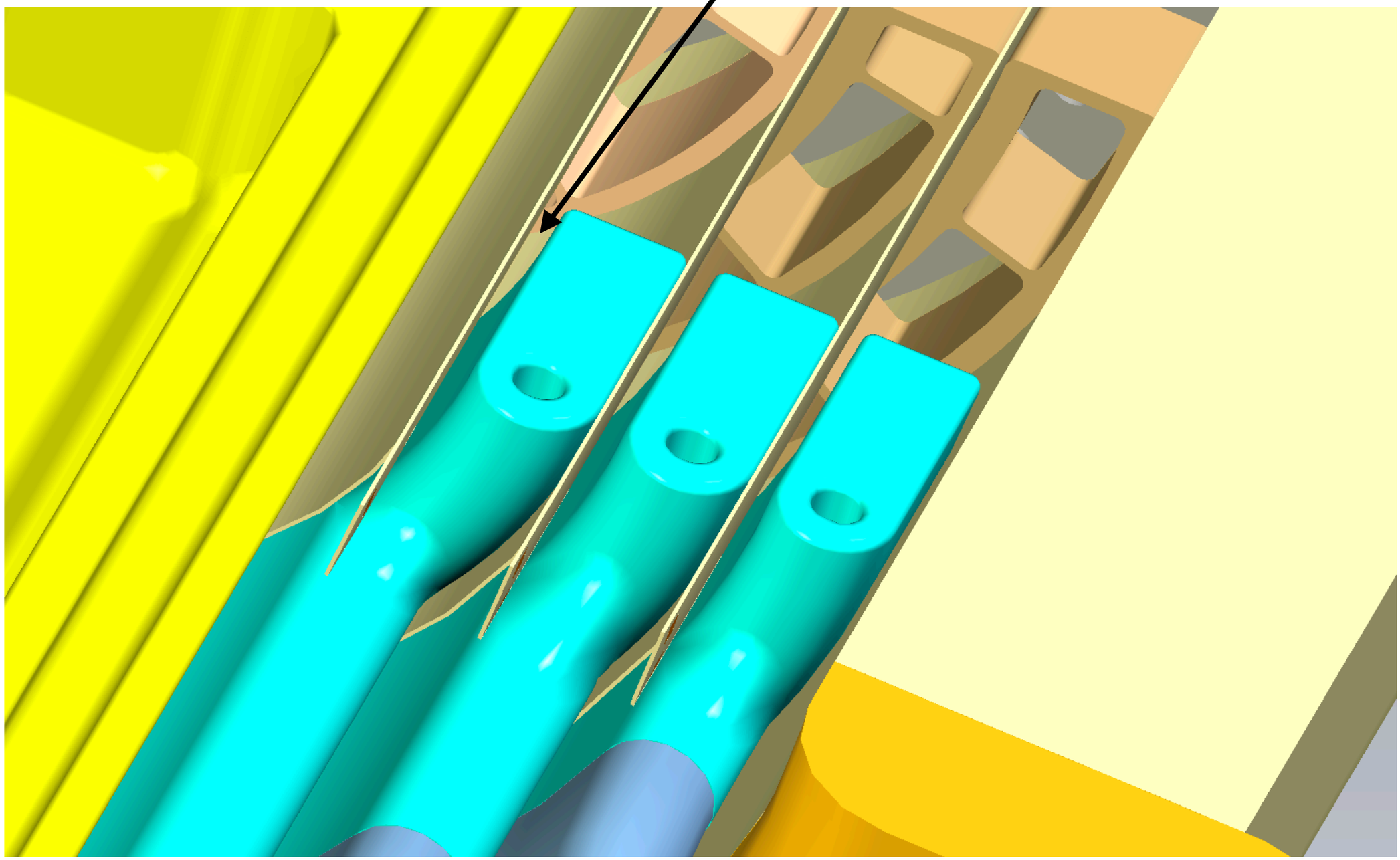


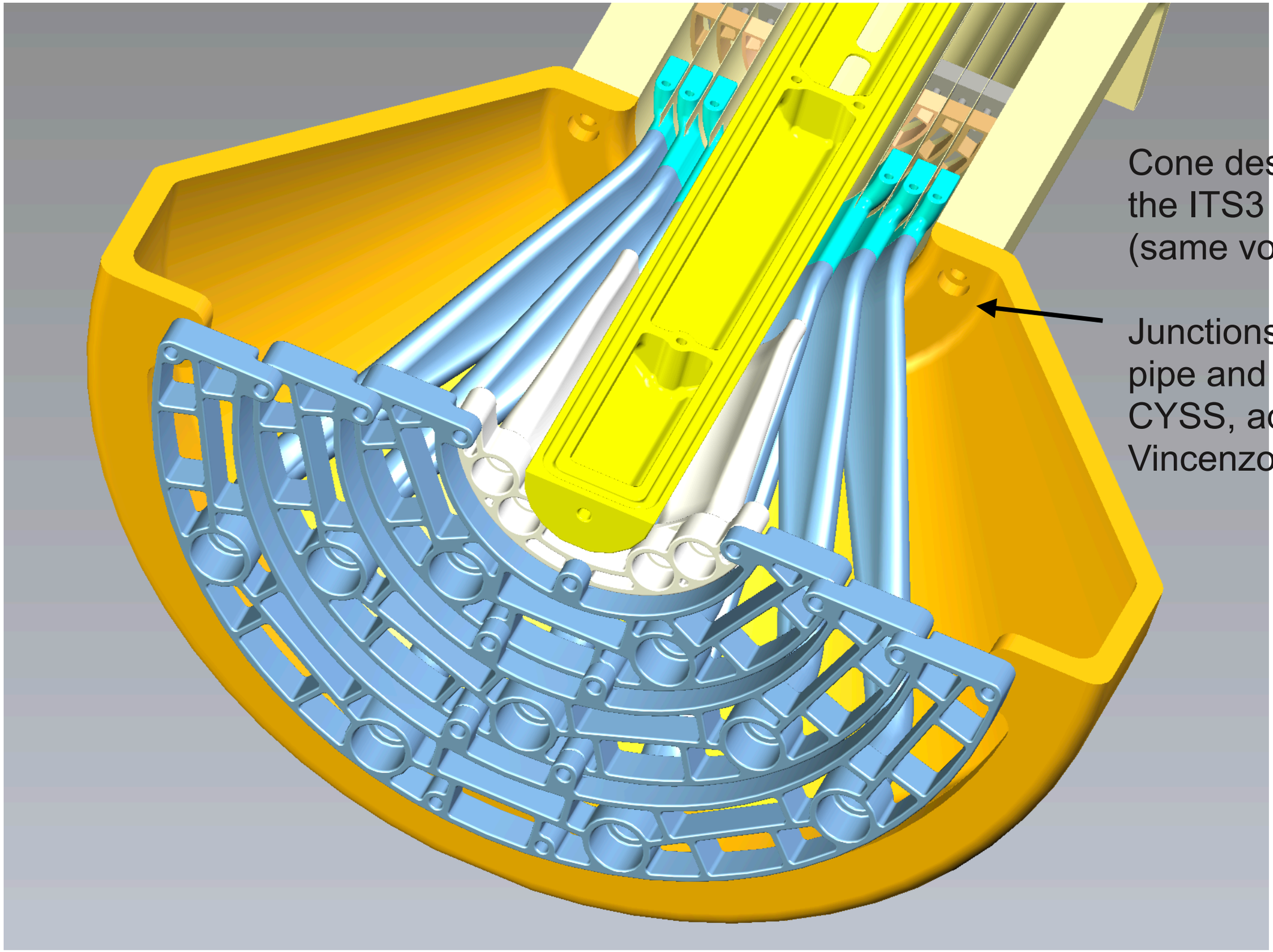
Is this solution compatible with wind tunnel?

BBM6_ThermalTestAssembly_03-04-2024.stp


BBM6_ThermalTestAssembly_16-02-2024.stp

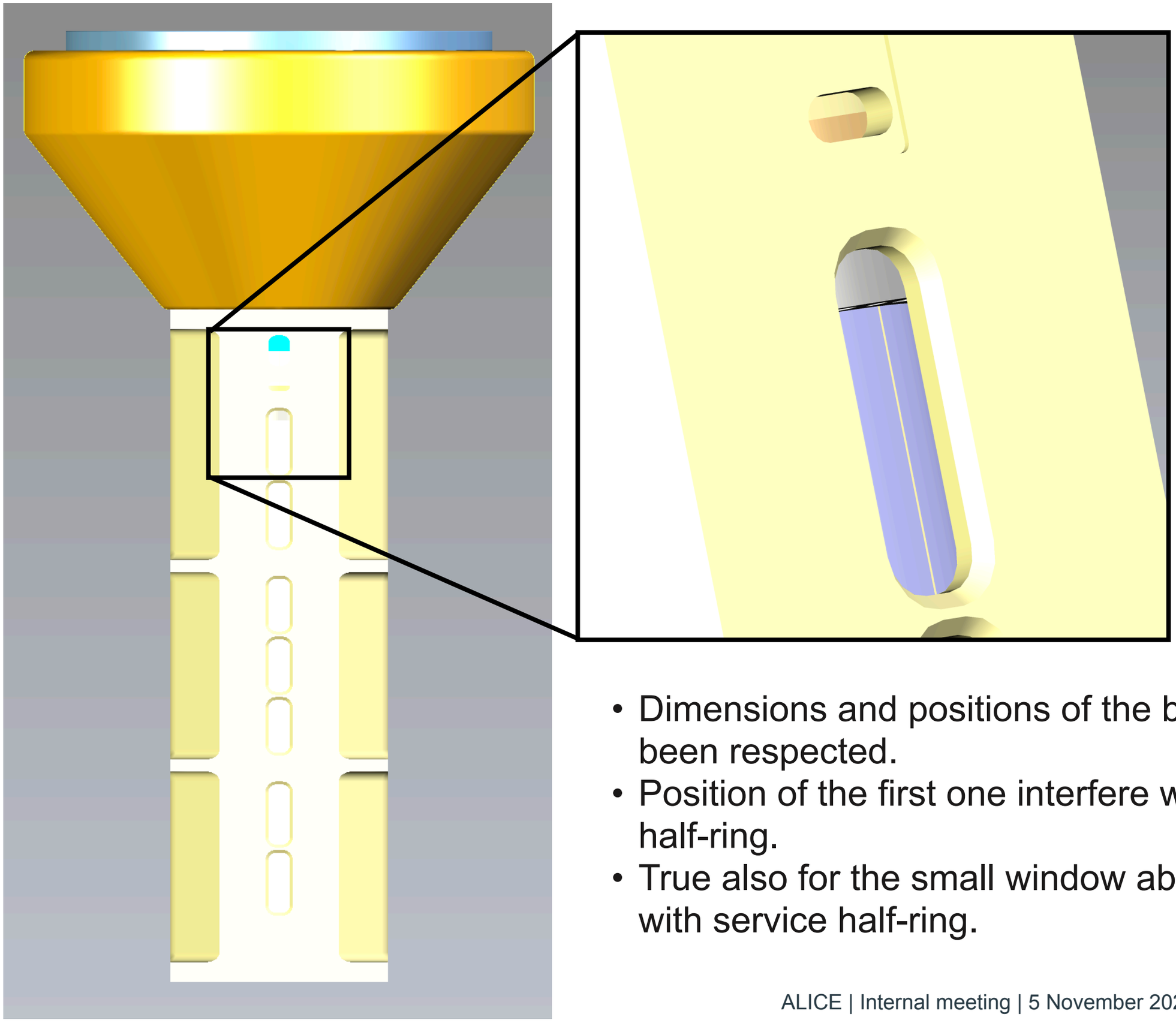
Changing layers radii and layers separation distance the cooling pipe thicknesses need to be adjusted



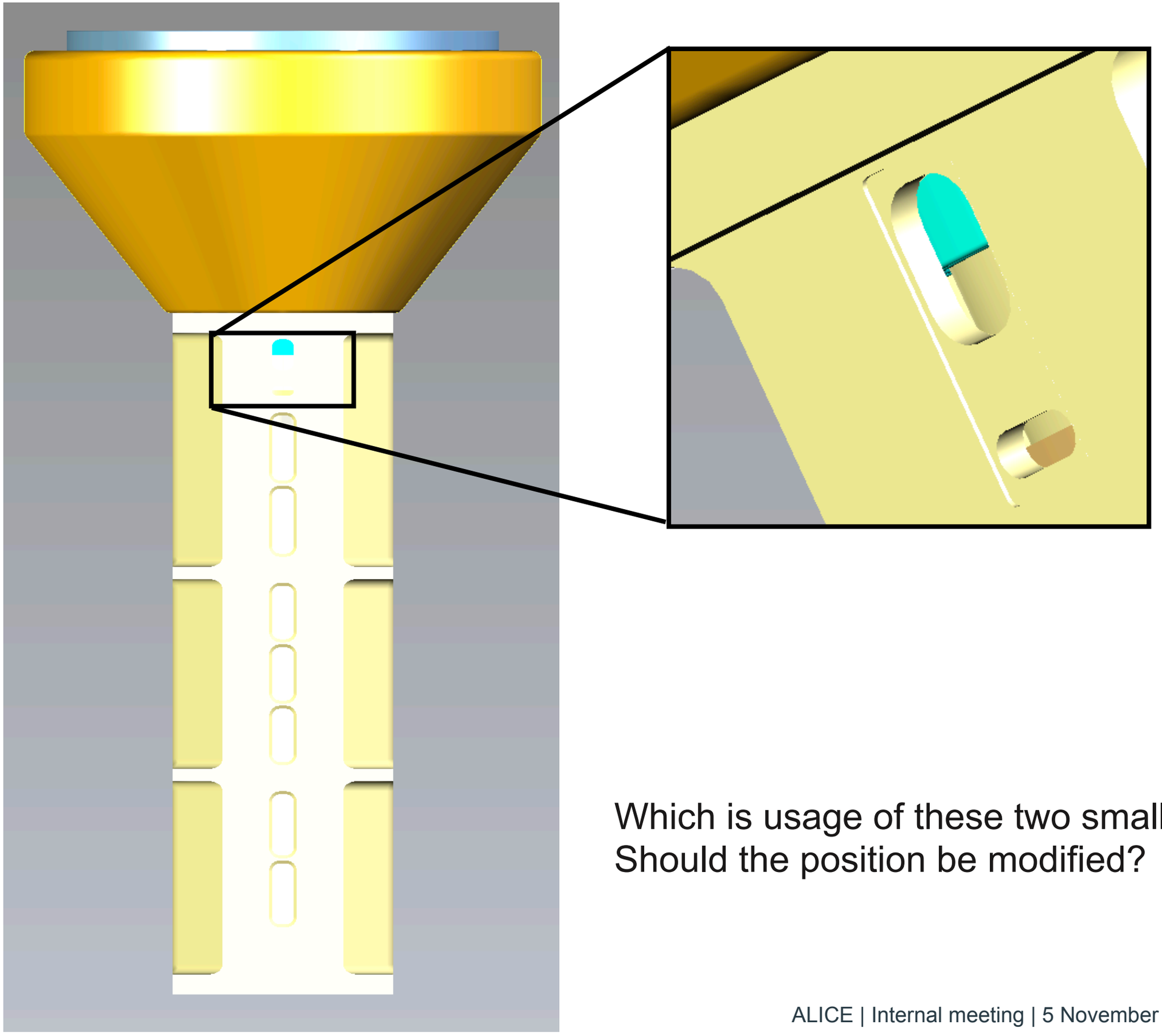


Cone design based on the ITS3 cone model (same volume).

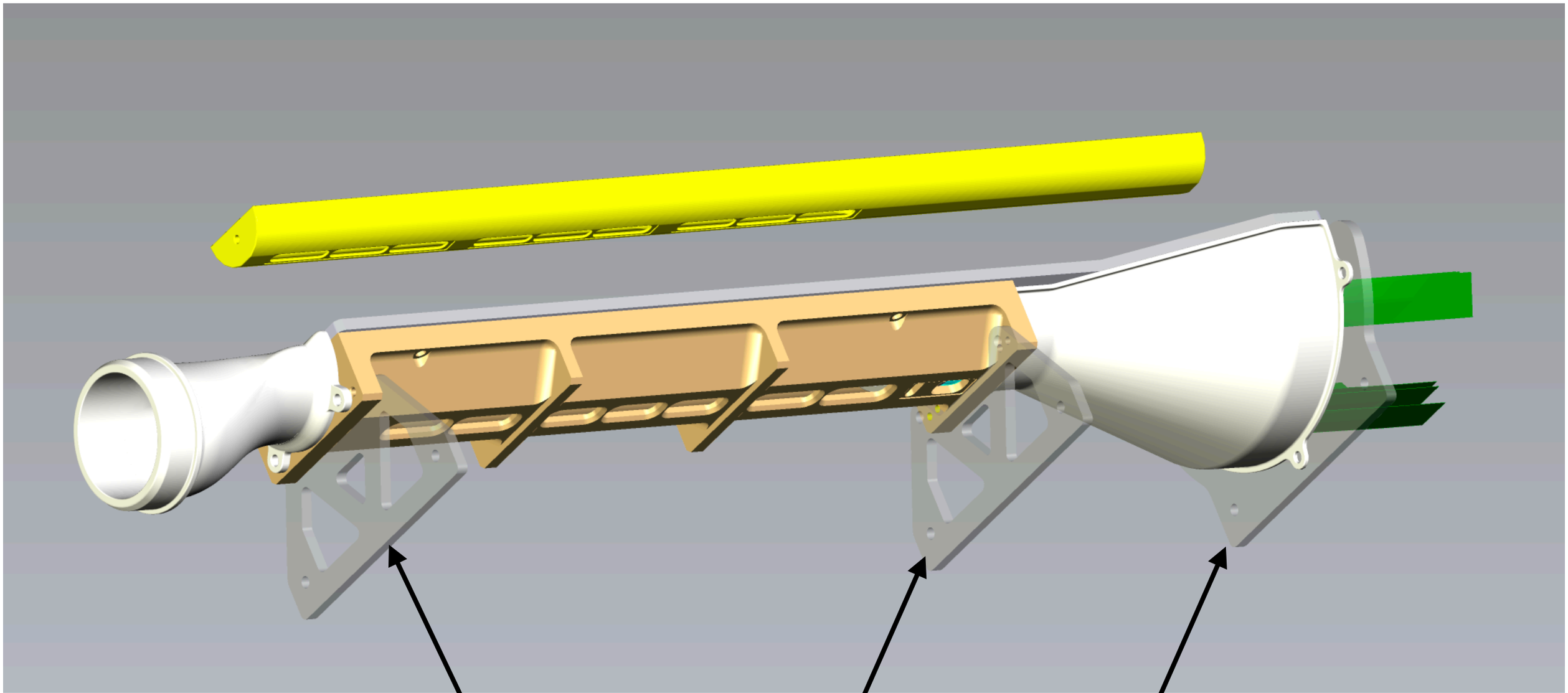
Junctions to the cooling pipe and specific CYSS, added by Vincenzo.



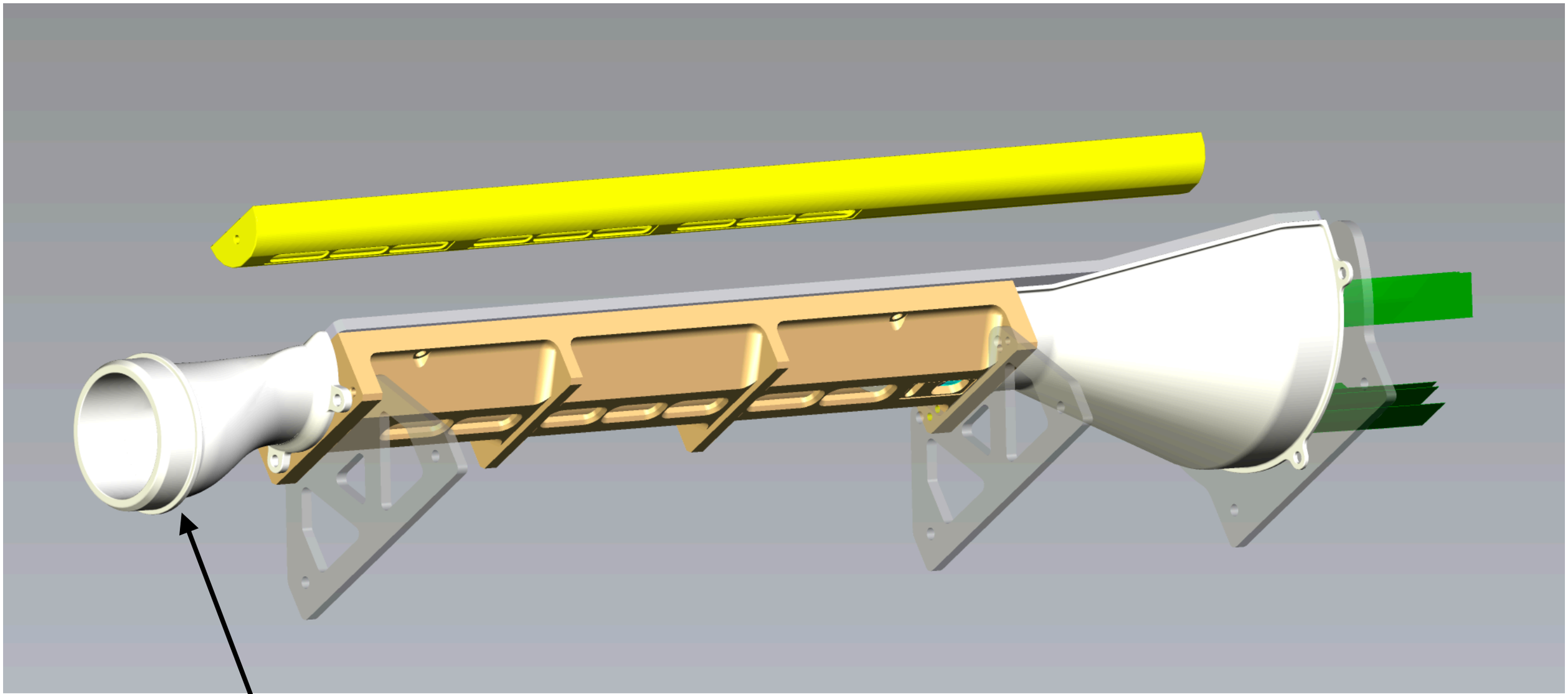
- Dimensions and positions of the big openings have been respected.
- Position of the first one interfere with the below half-ring.
- True also for the small window above interfering with service half-ring.



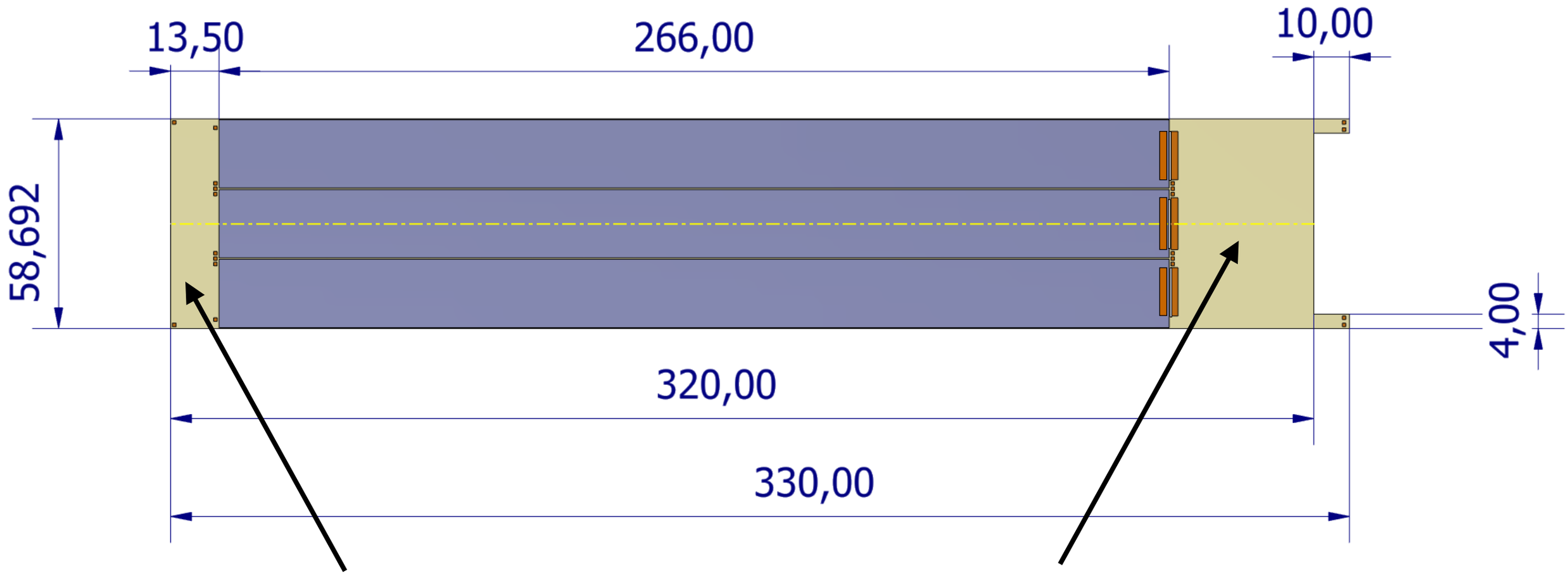
Which is usage of these two smaller windows?
Should the position be modified?



Are these supports used?
The holes in the bottom part of the supports have a special meaning and should be kept?



This needs to be redesigned.
Should we do it or you prefer to implement special constrains?
I assume that the diameter of the output should be kept.



Maybe question to Rui/Serge.
Total thickness in the sensor region 160 um, from Massimo’s slides.
What would be the thickness in the region without sensor?
Should we look for a thickness close to the FPC one?