



Vertex Working Group Meeting

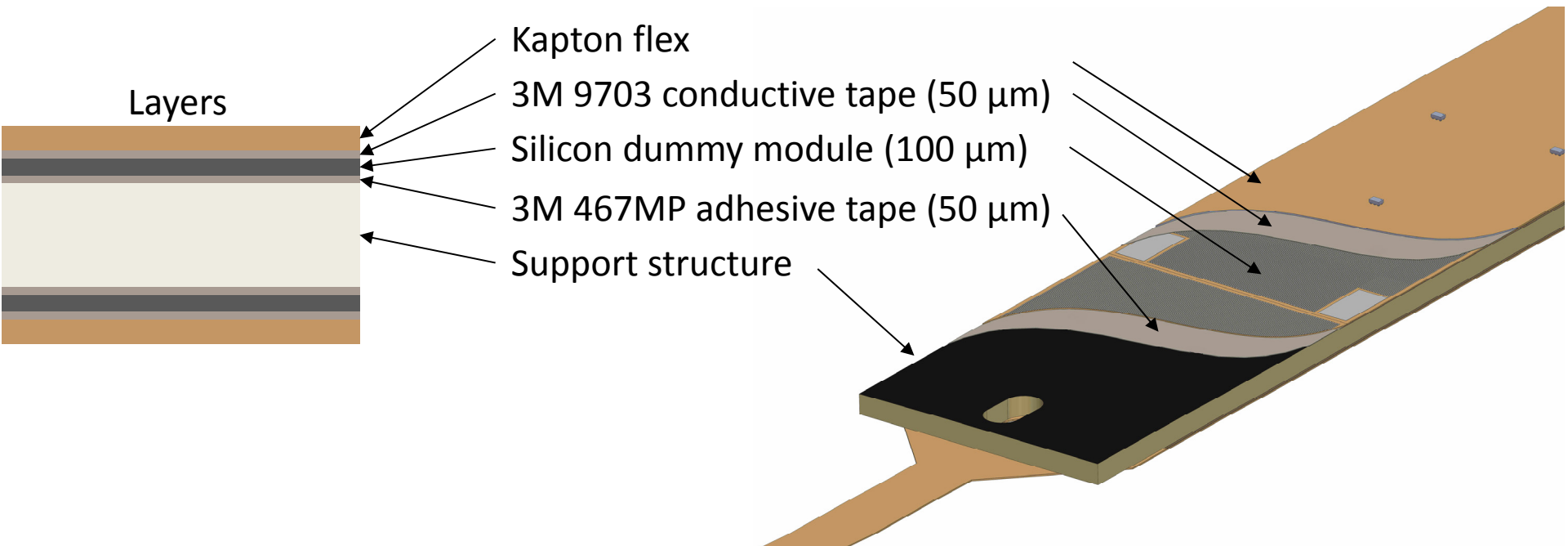
# Update on the thermal dummy staves design and production

F. Duarte Ramos, S. Kulis, E. Santin

September 29, 2016

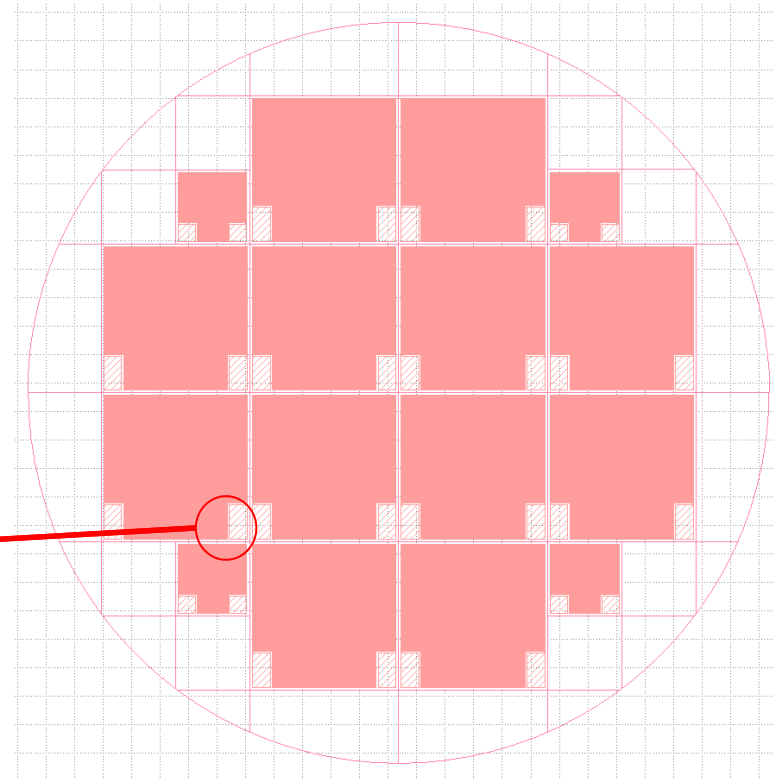
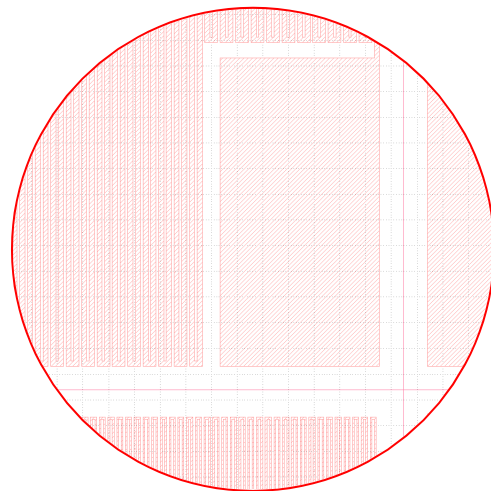
# Dummy thermal stove

- Double-sided stove for thermal tests;
- Realistic materials (Si, kapton flex, CFRP support structure, adhesive layers).



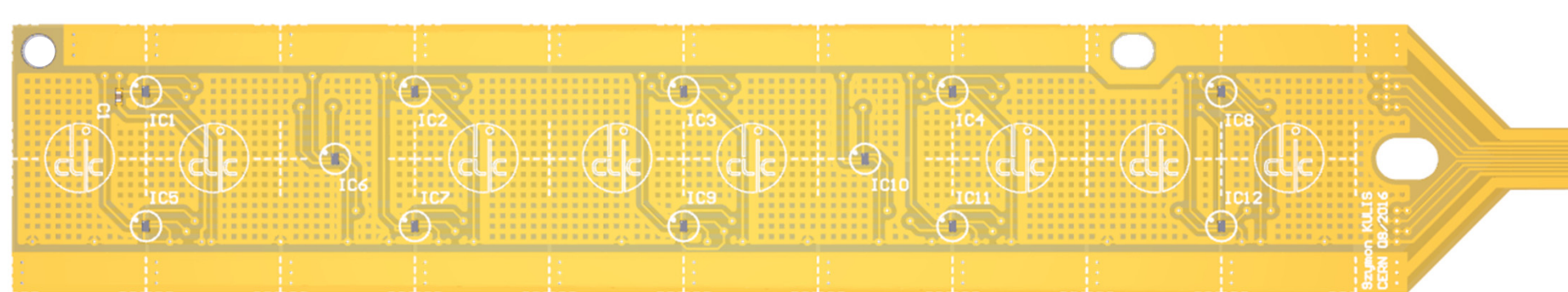
# Si dummy modules

- 100  $\mu\text{m}$  thick Si modules with Al resistive traces;
- 2 module sizes: 13x13 mm<sup>2</sup> and 26x26 mm<sup>2</sup>;
- 16 modules per 6'' wafer (4+12);
- 5 wafers ordered (3 staves);
- Delivery: in approx. 2 weeks.



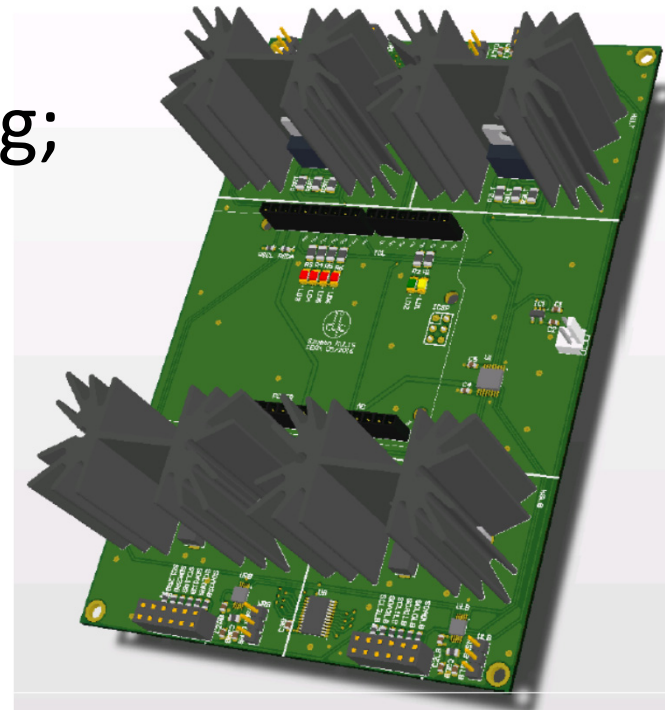
# Flex

- 4 flexes per stave;
- 12 NXP PCT2202 temperature sensors per flex on 3 I<sup>2</sup>C buses;
- Readout using Arduino boards;
- Design compatible with both module sizes;
- 2 designs: conductive tape or conductive glue;
- Delivery: 21<sup>st</sup> of October.



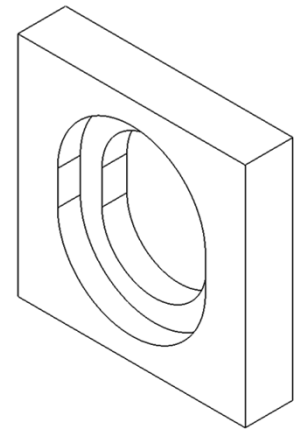
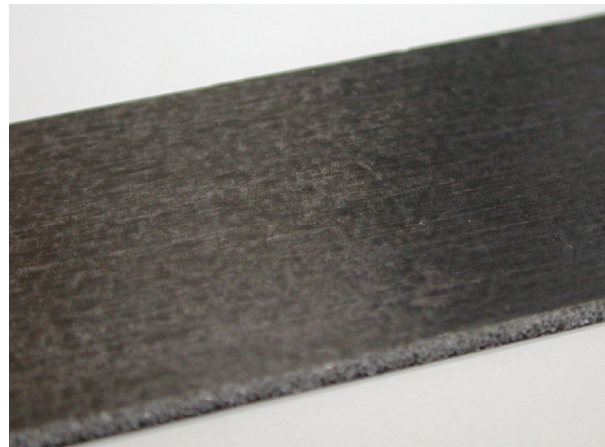
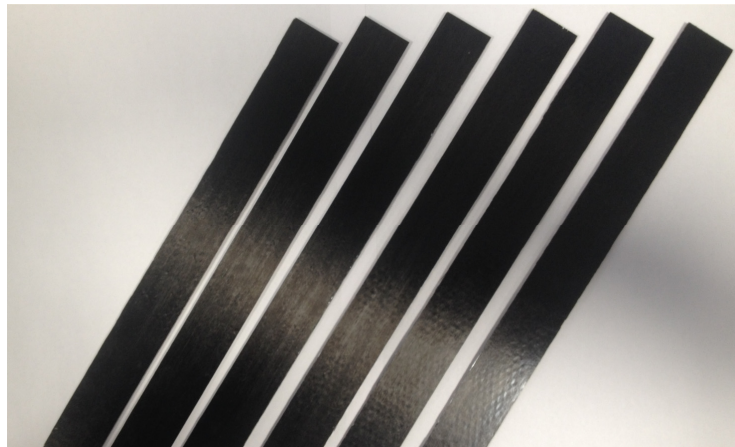
# Readout

- Arduino Uno shield:
  - 4 flexes, 48 temperature sensors;
- 4 digitally controllable voltage sources:
  - 3-30 V/150 mA;
- Current and voltage monitoring;
- Delivery: 21<sup>st</sup> of October.



# Support structure

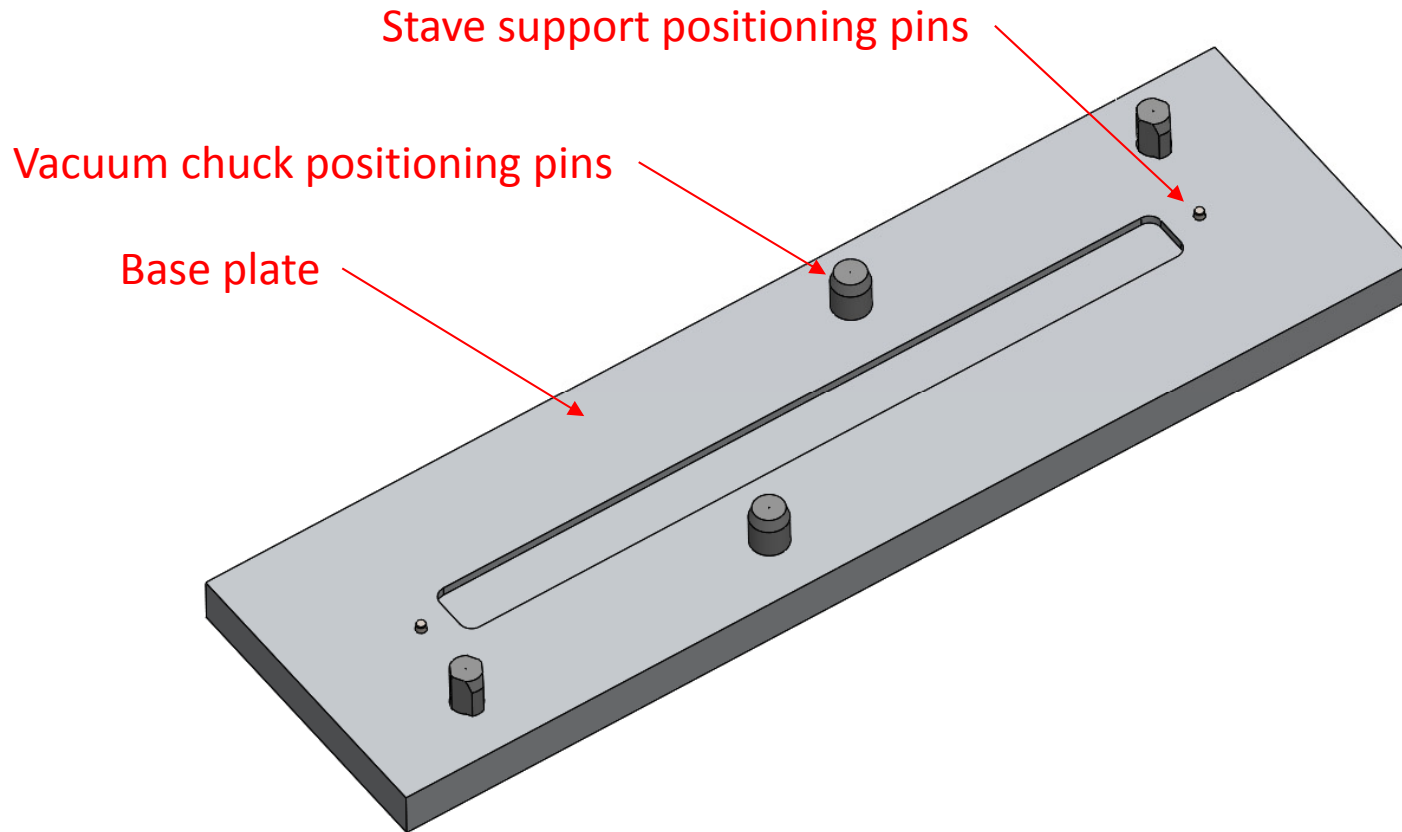
- Composite sandwich structure:
  - 2x 30  $\mu\text{m}$  thick skins of M55JB;
  - 2x 30  $\mu\text{m}$  epoxy adhesive;
  - 2 mm thick Rohacell 51 core;
- Peek inserts at the ends for mounting;
- $\sim 0.06\% X/X_0$ .



# Stave assembly

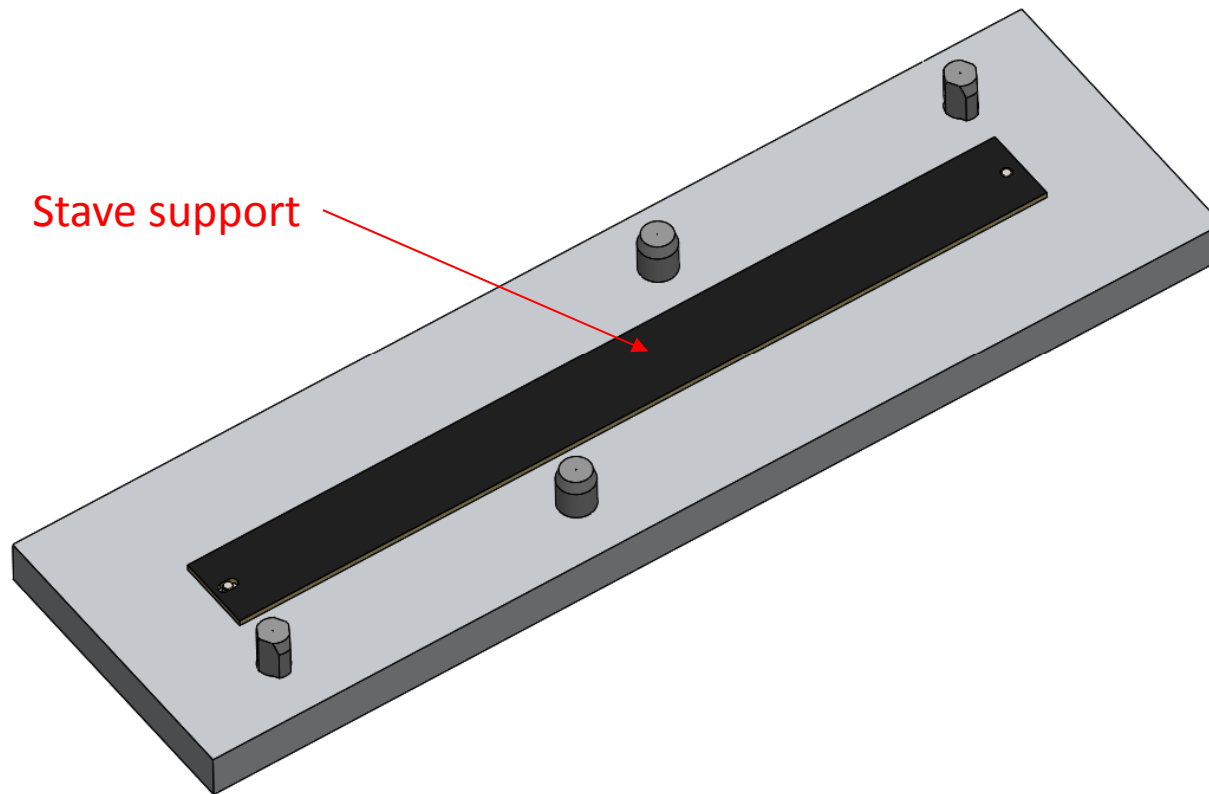
- 3M 467MP adhesive tape (50  $\mu\text{m}$ ) for module placement on support structure:
  - Soft decoupling adhesive (as used in STAR HFT PXL);
  - $-40^{\circ}\text{C}$  to  $+149^{\circ}\text{C}$ ;
- 3M 9703 conductive tape (50  $\mu\text{m}$ ) for module to flex connection:
  - Anisotropic electrical conductivity;
  - $<0.3\Omega$  for  $6\text{ mm}^2$ ;
  - $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ;

# Assembly & tooling

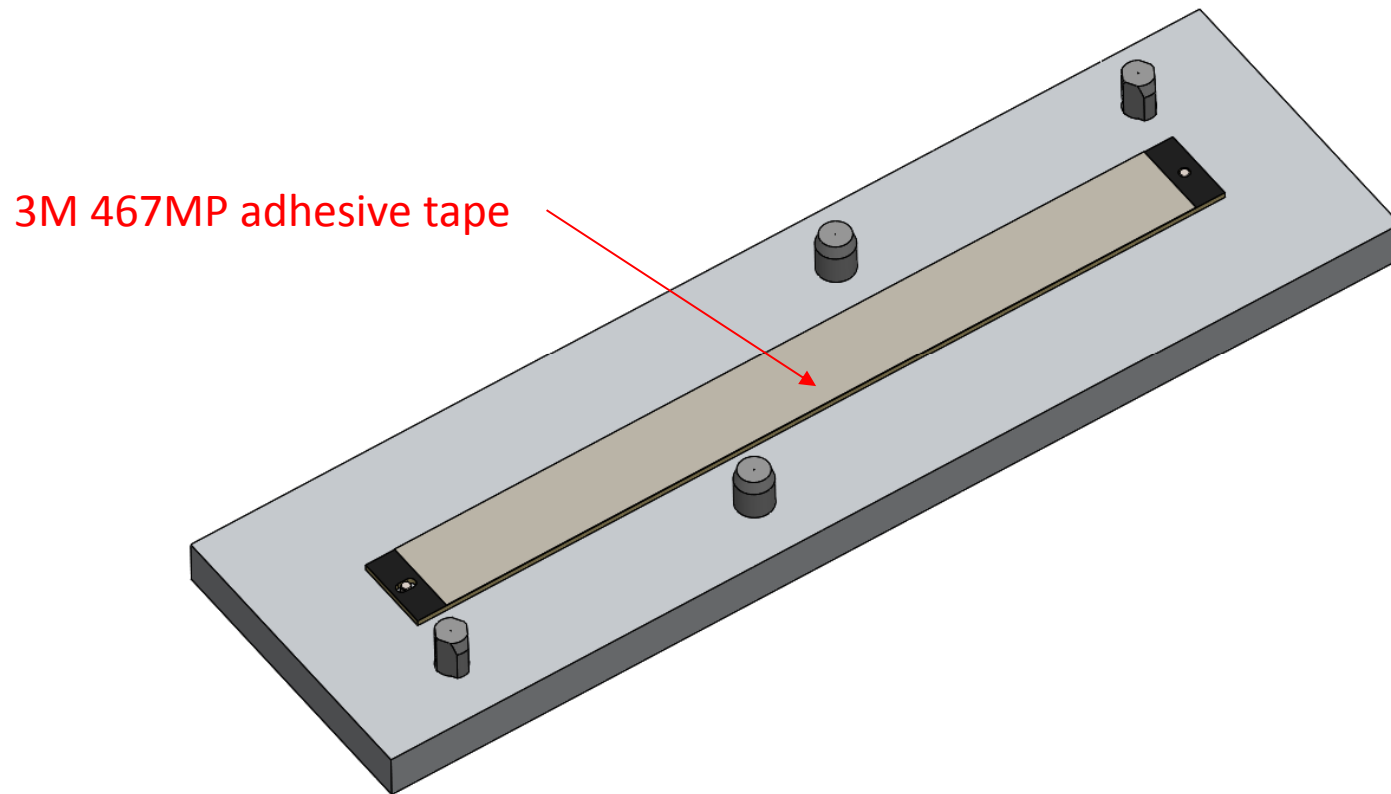




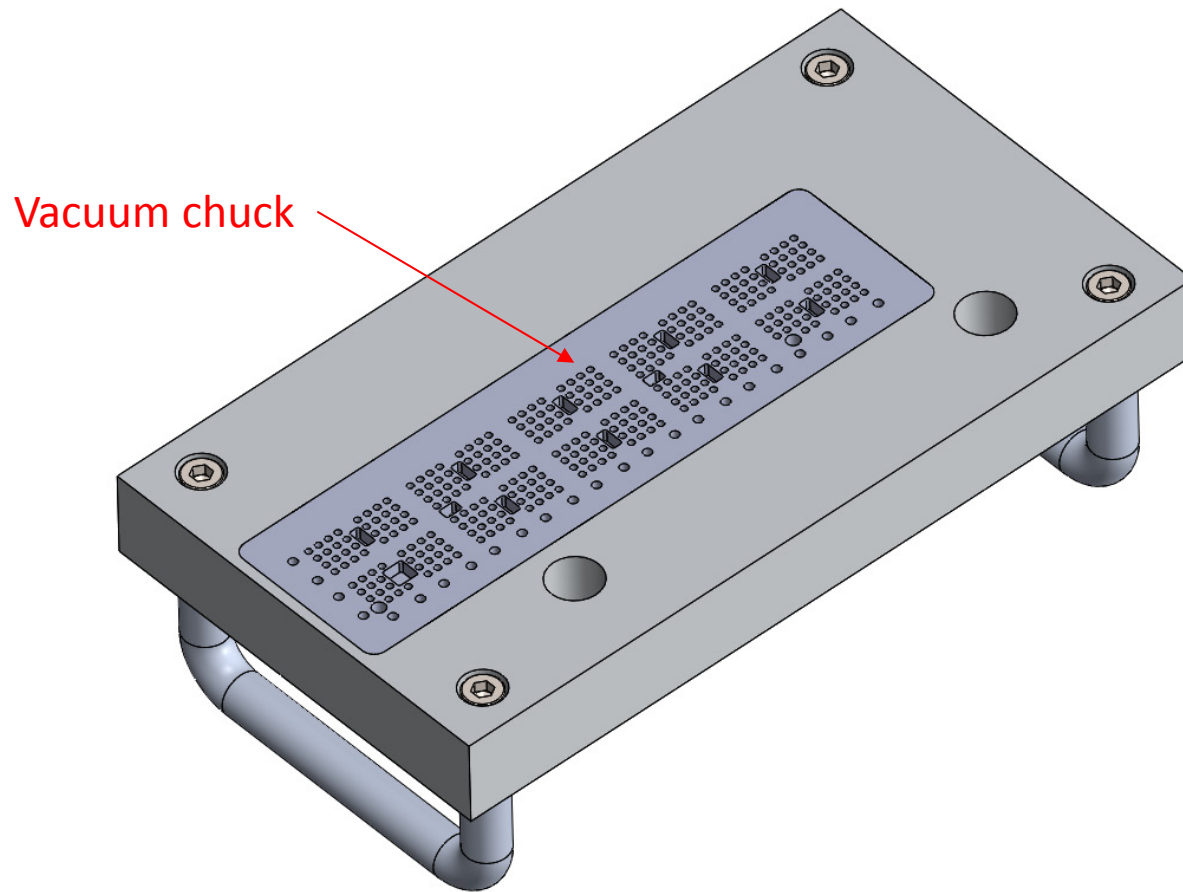
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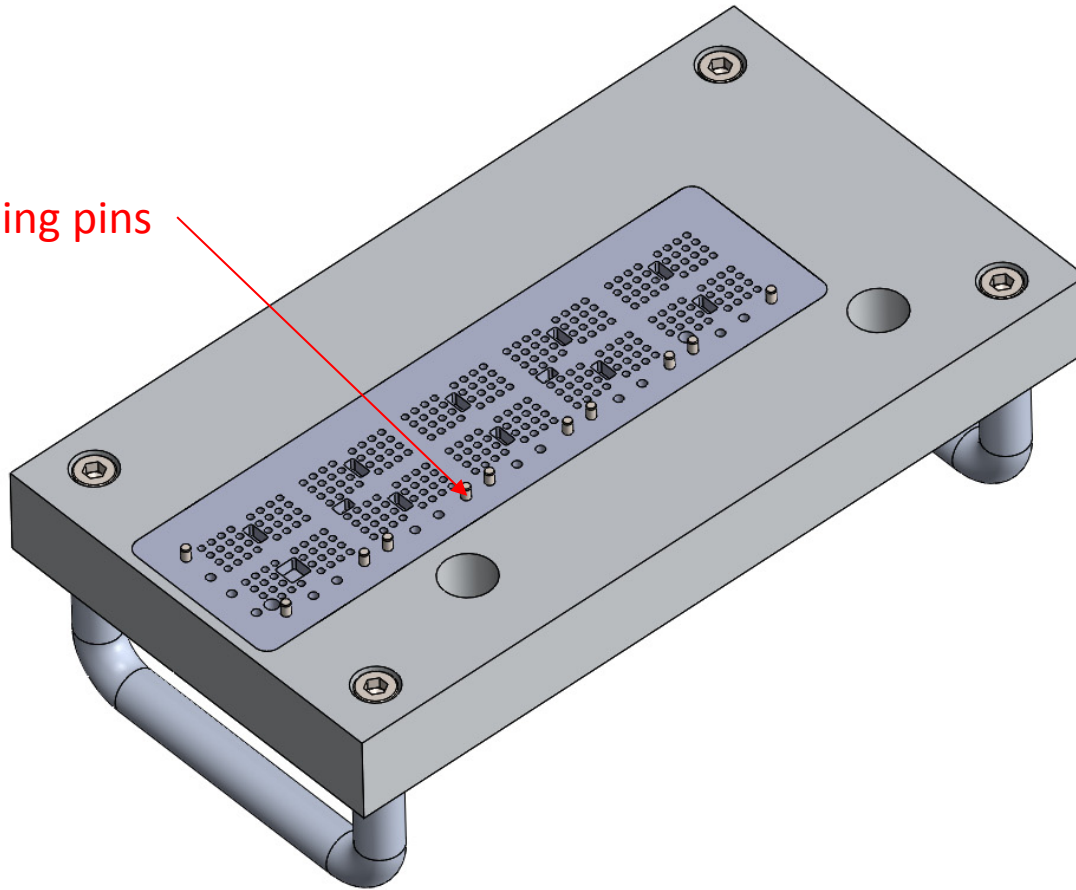


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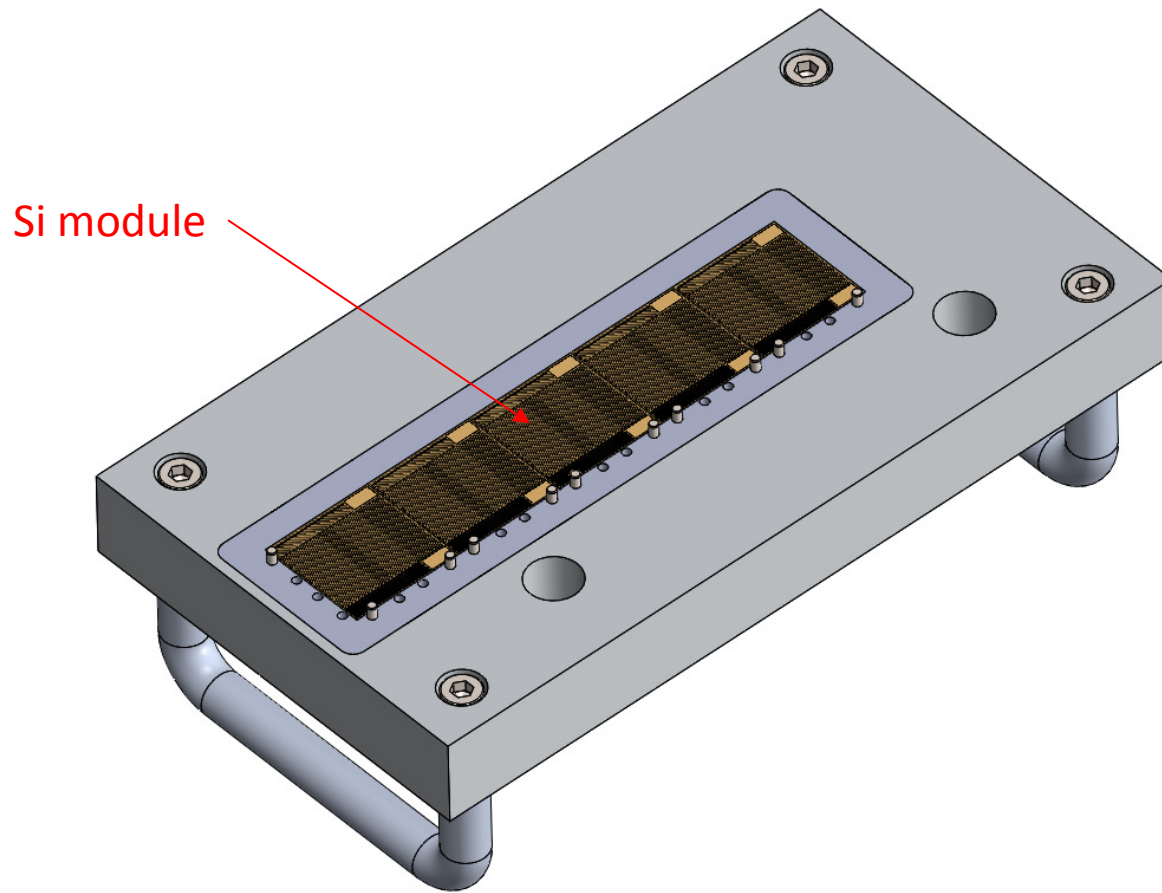


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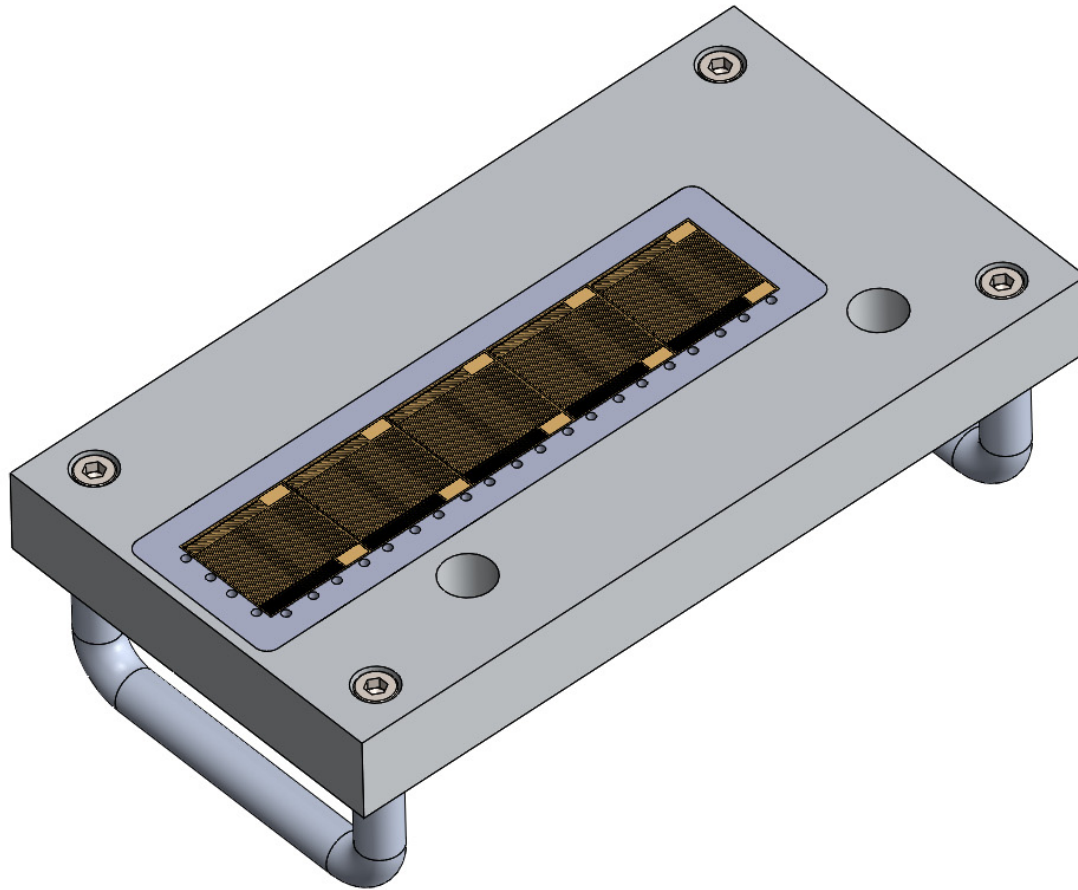
Si module positioning pins



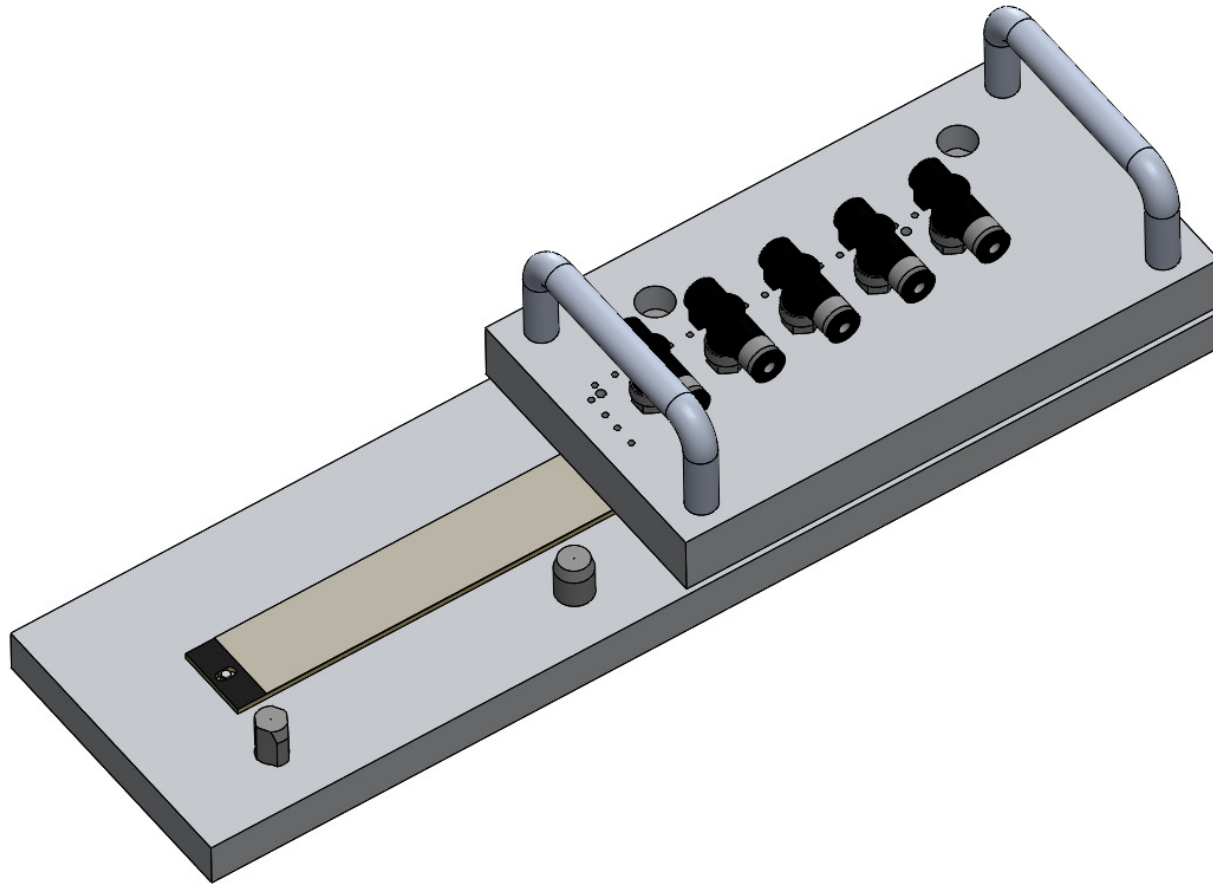
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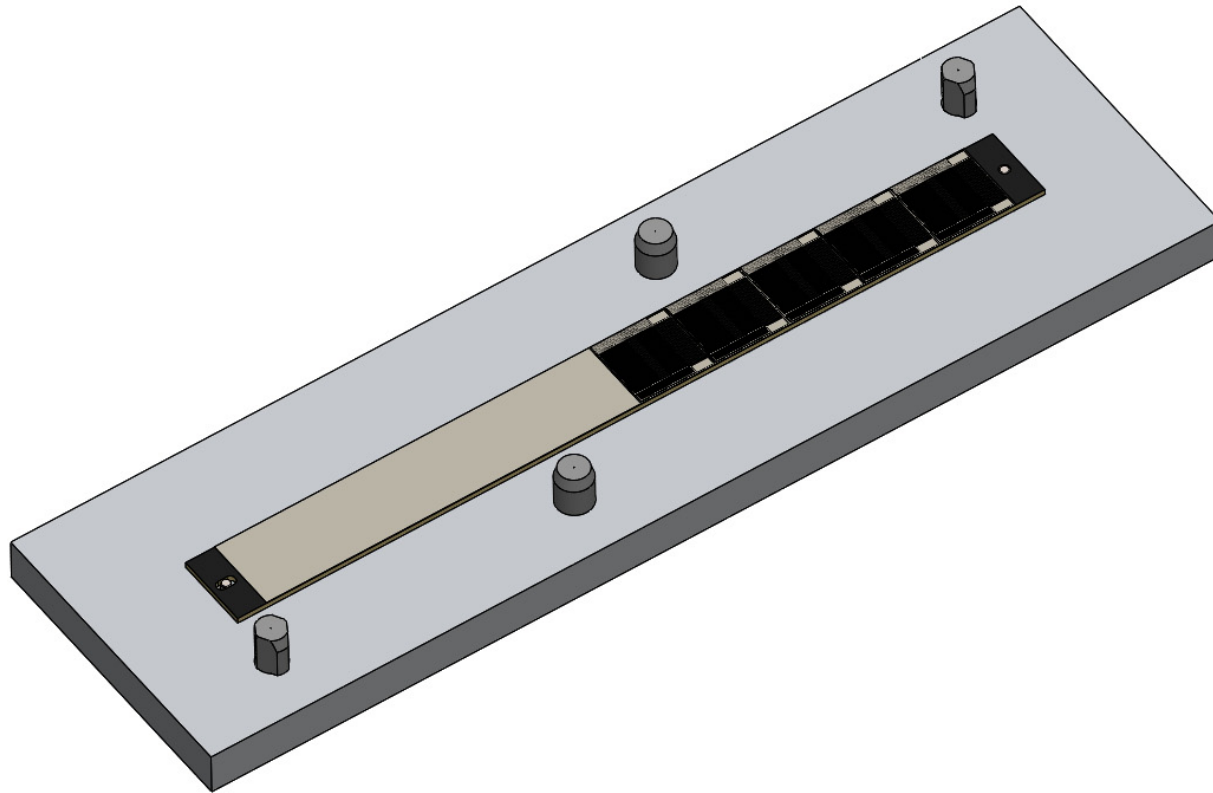
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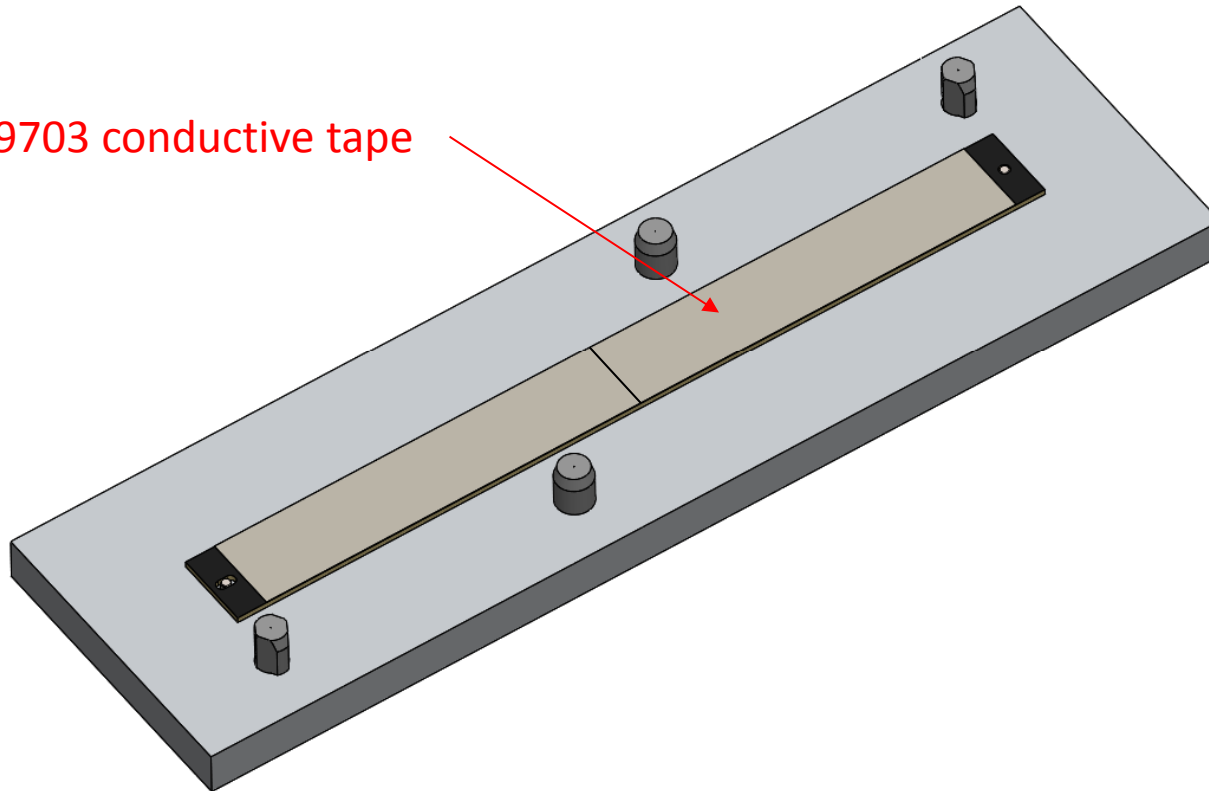
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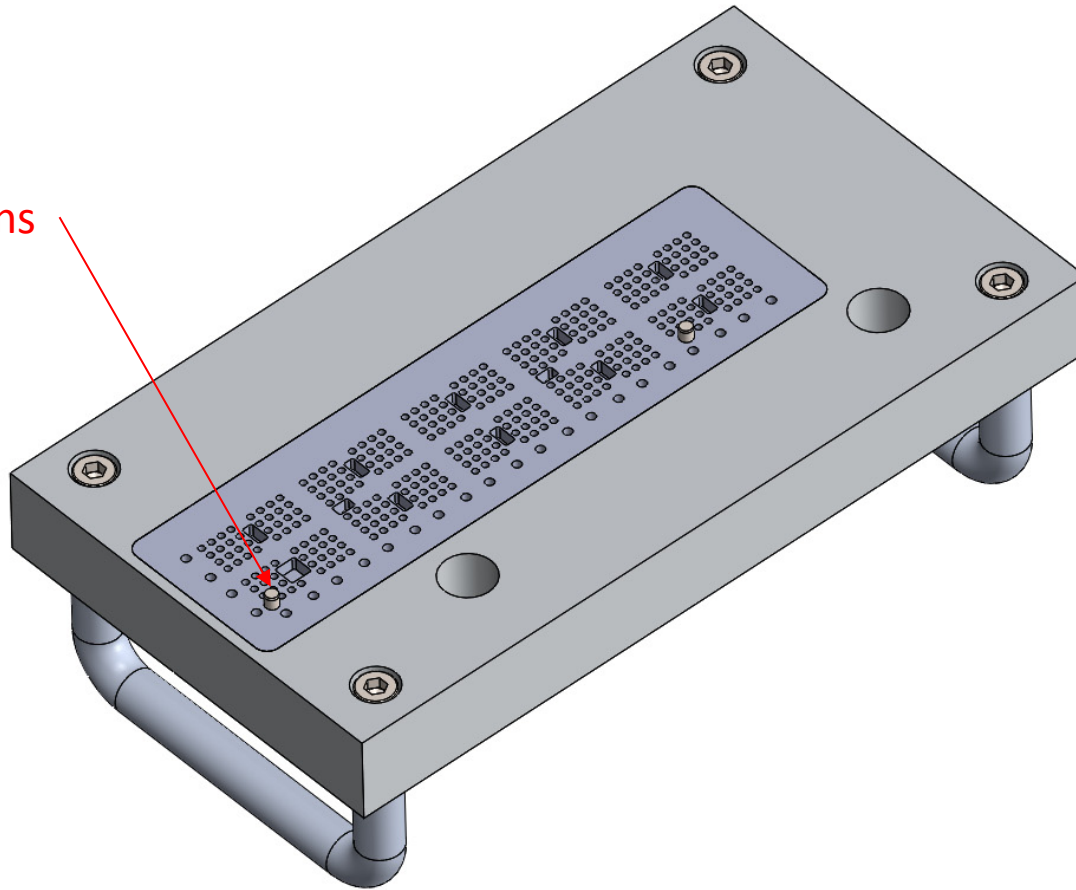
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3M 9703 conductive tape

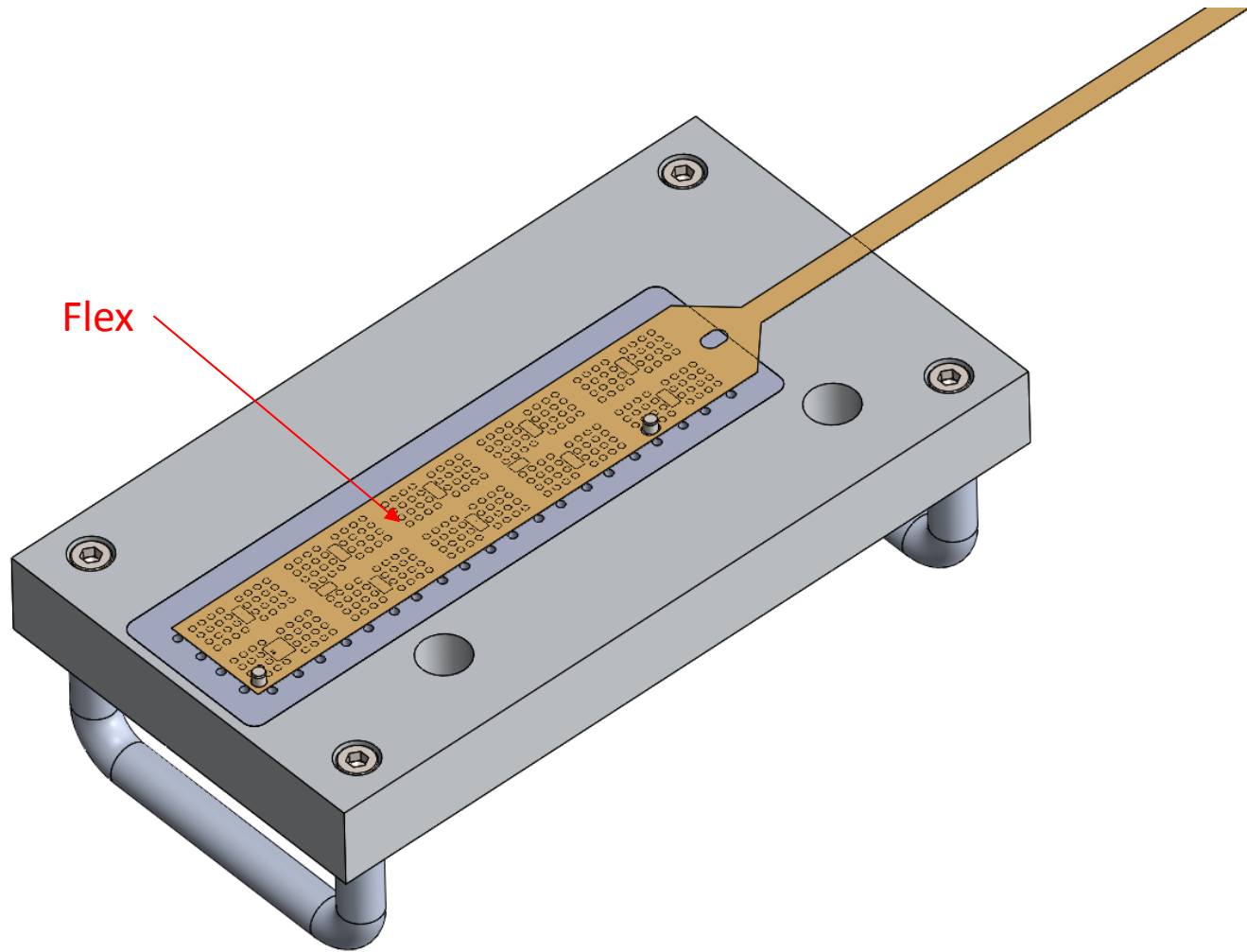


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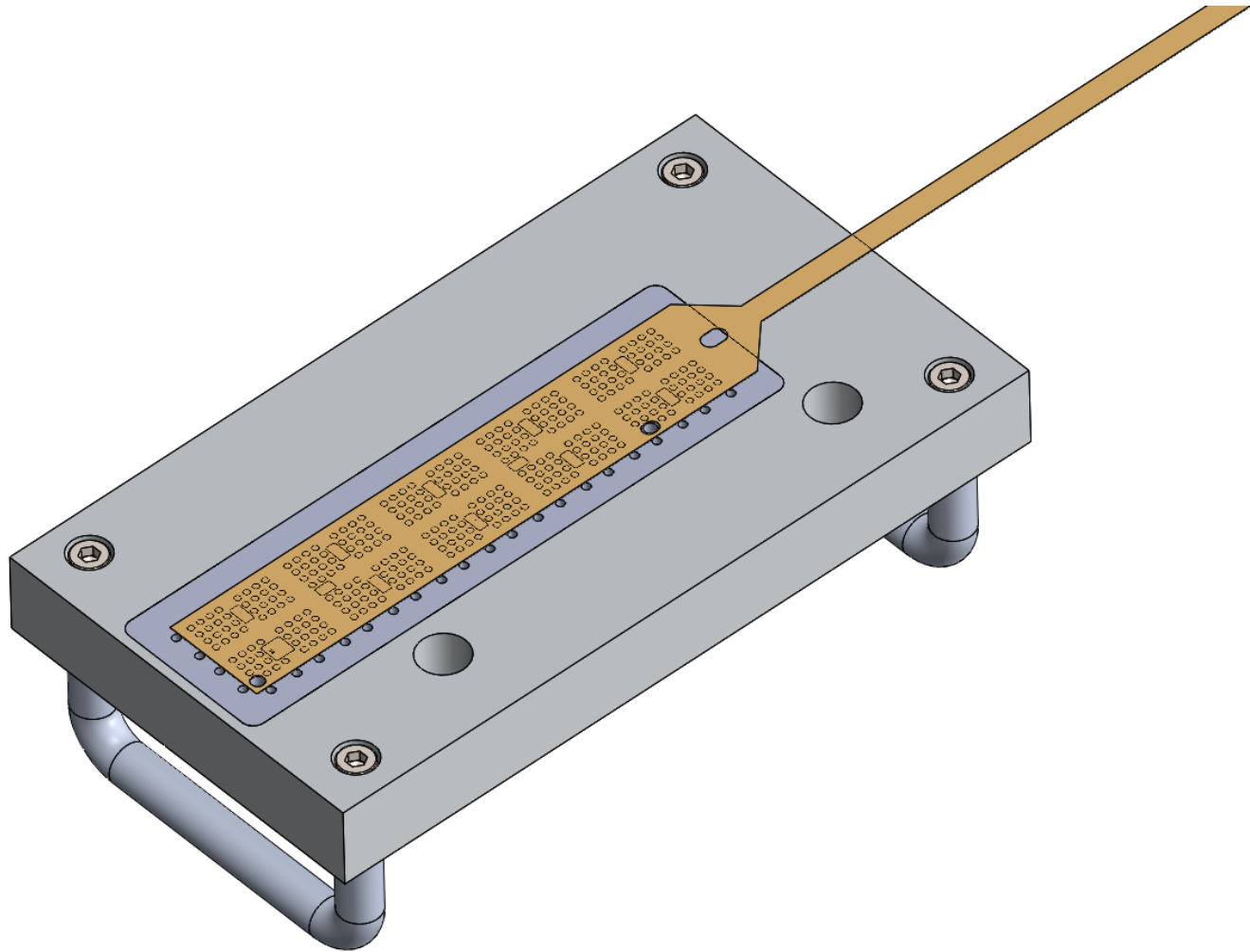
Flex positioning pins



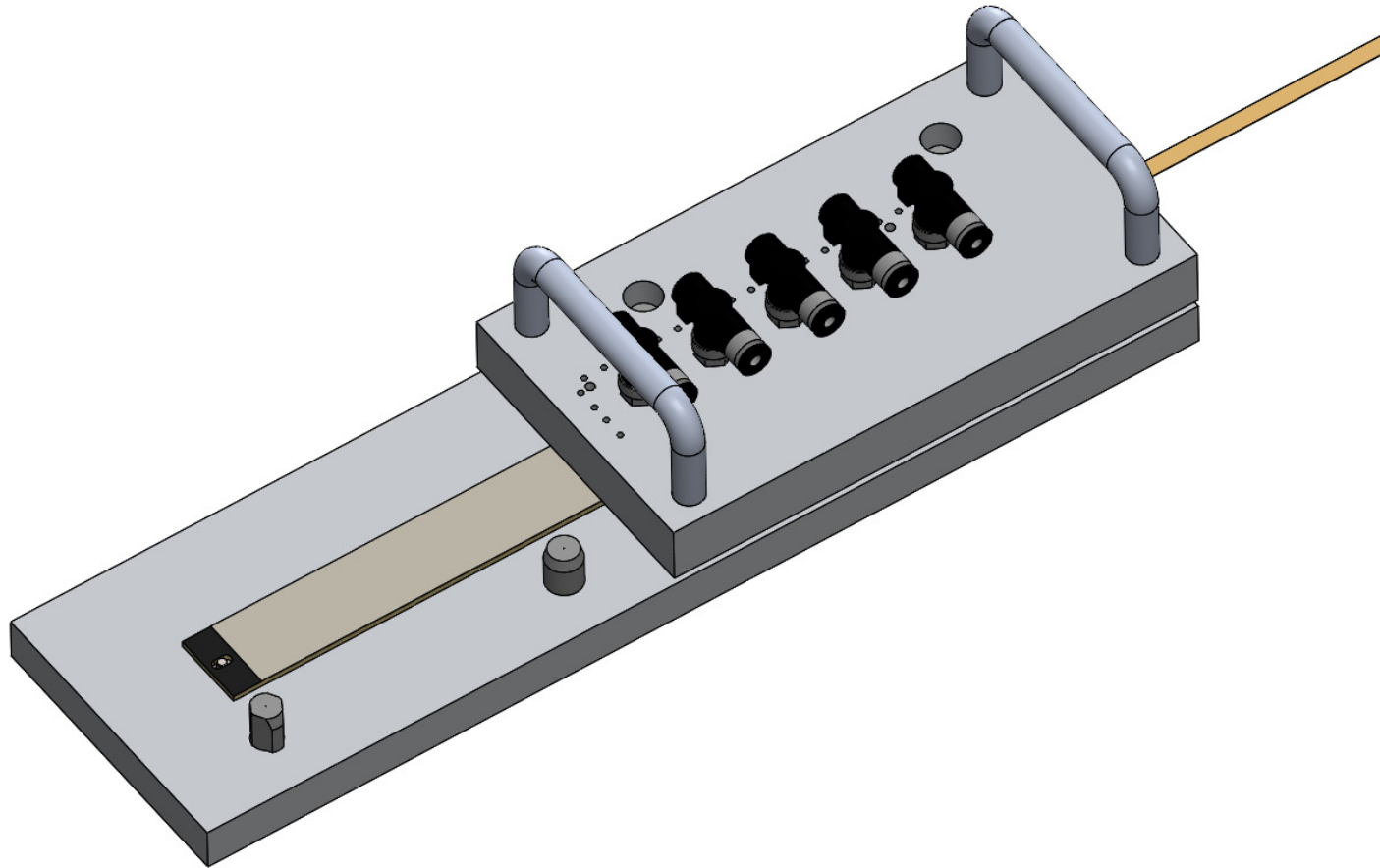
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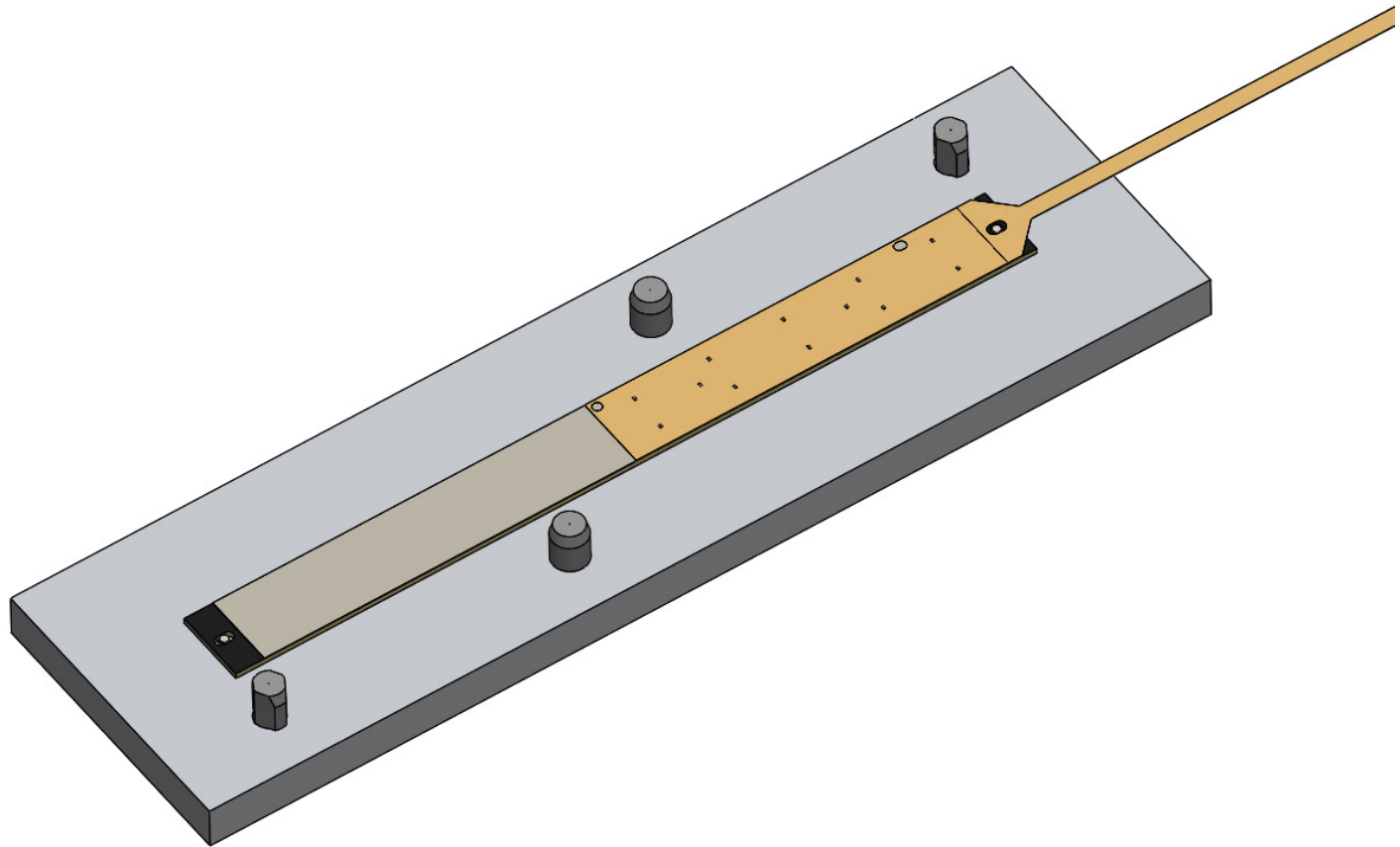
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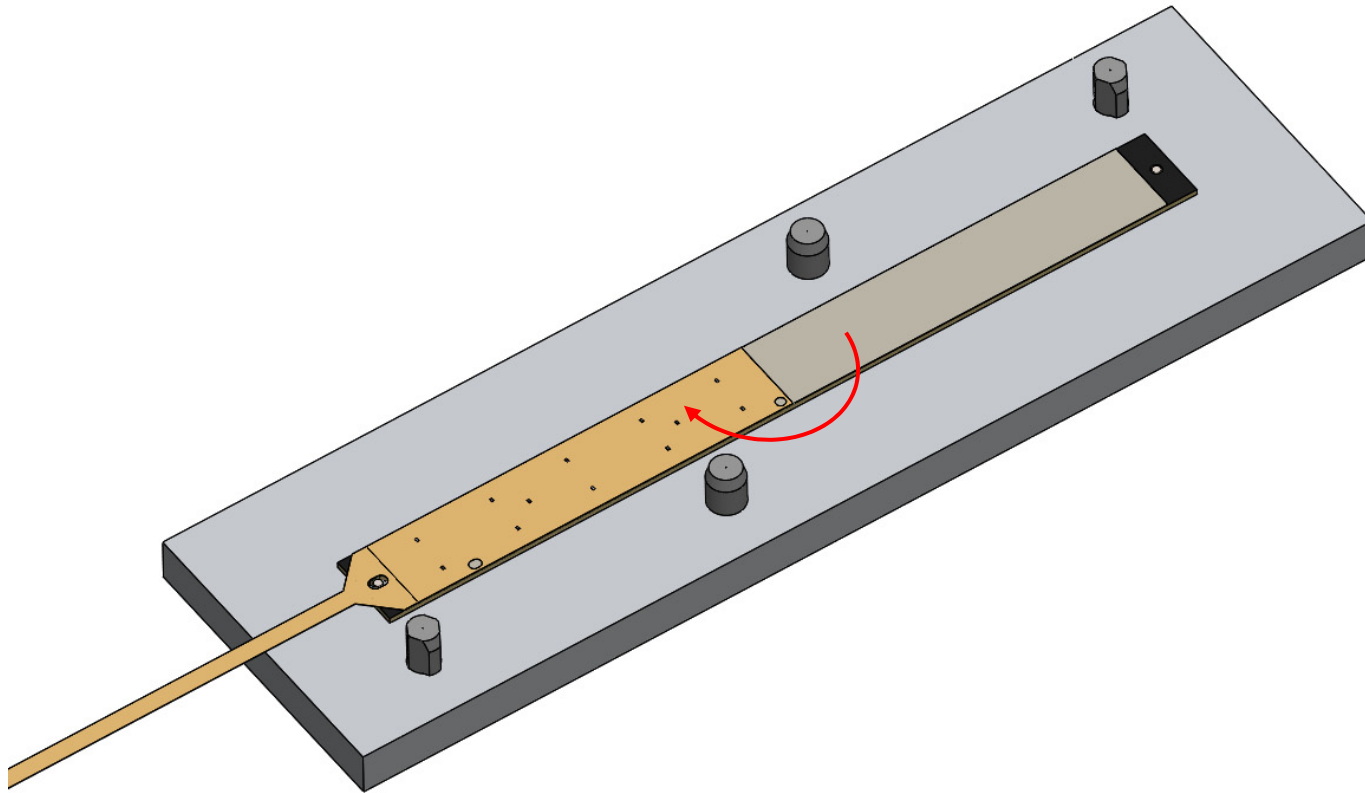
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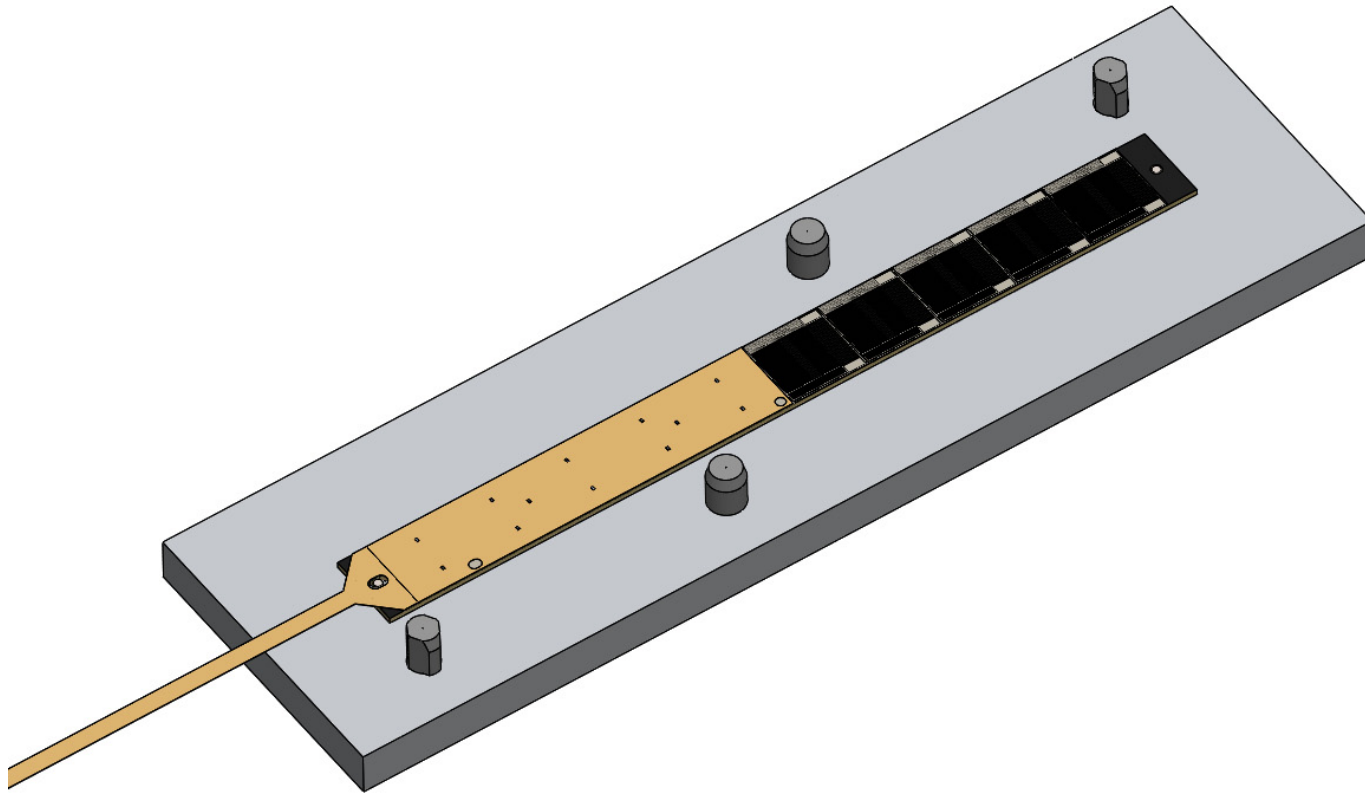
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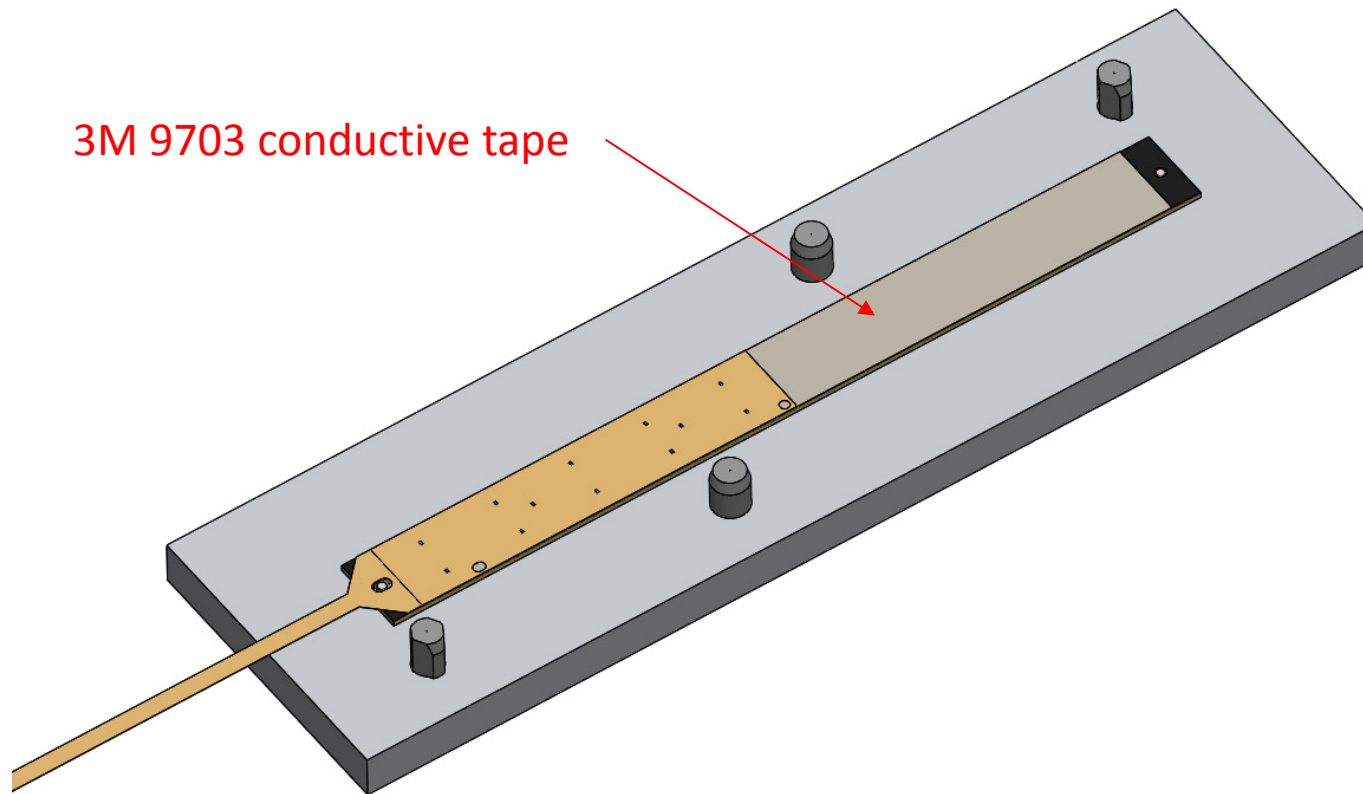


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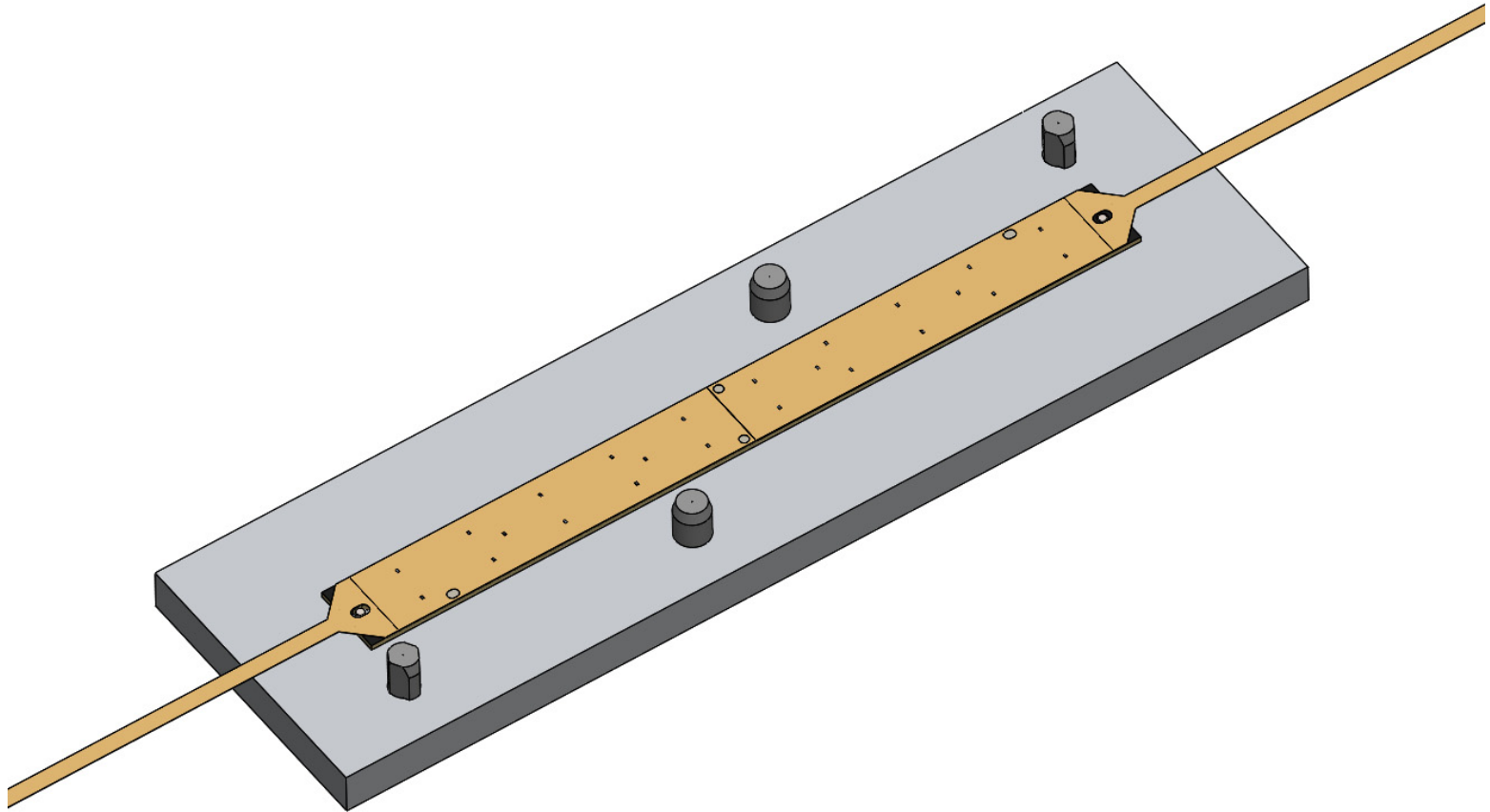




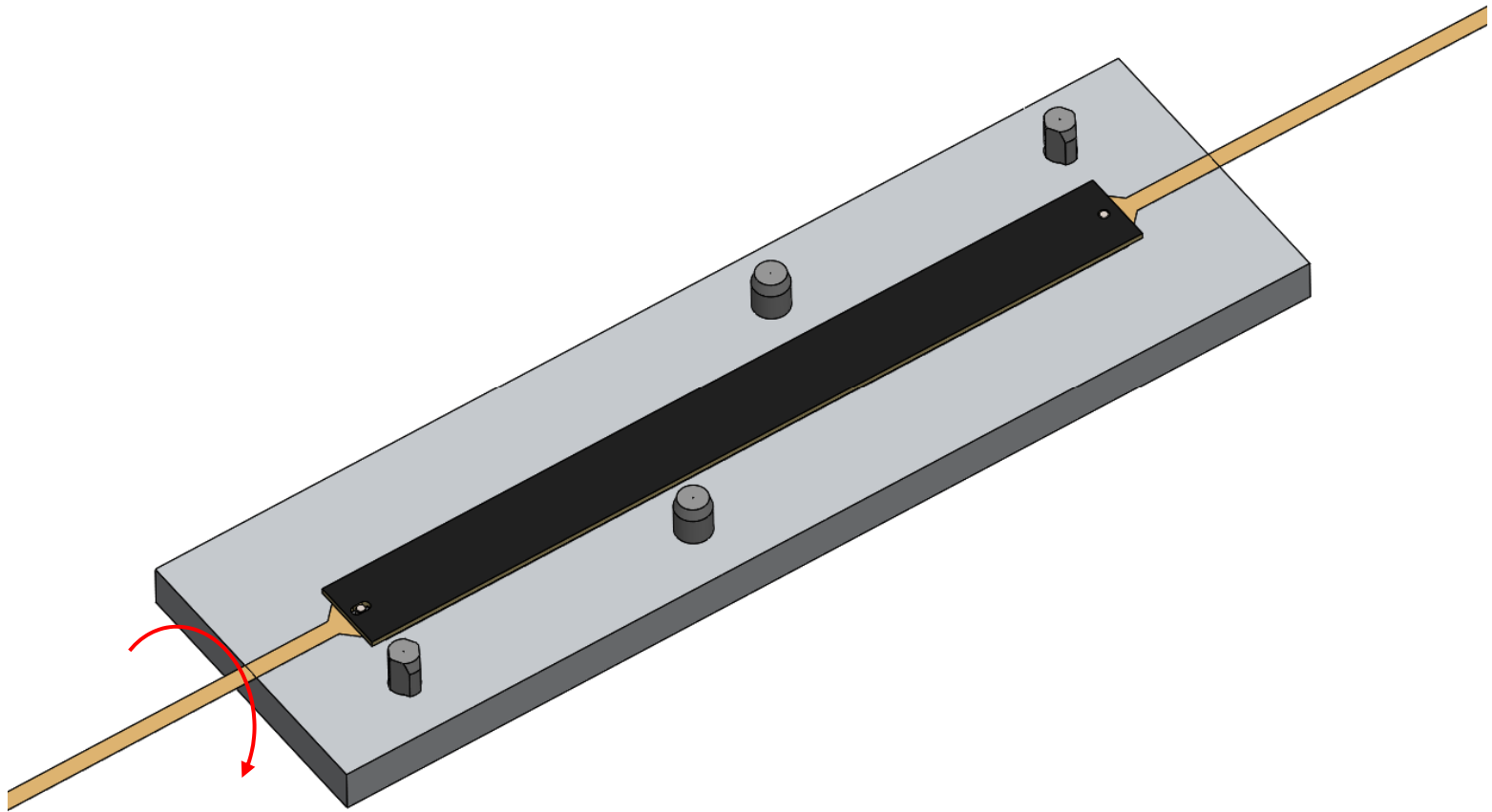
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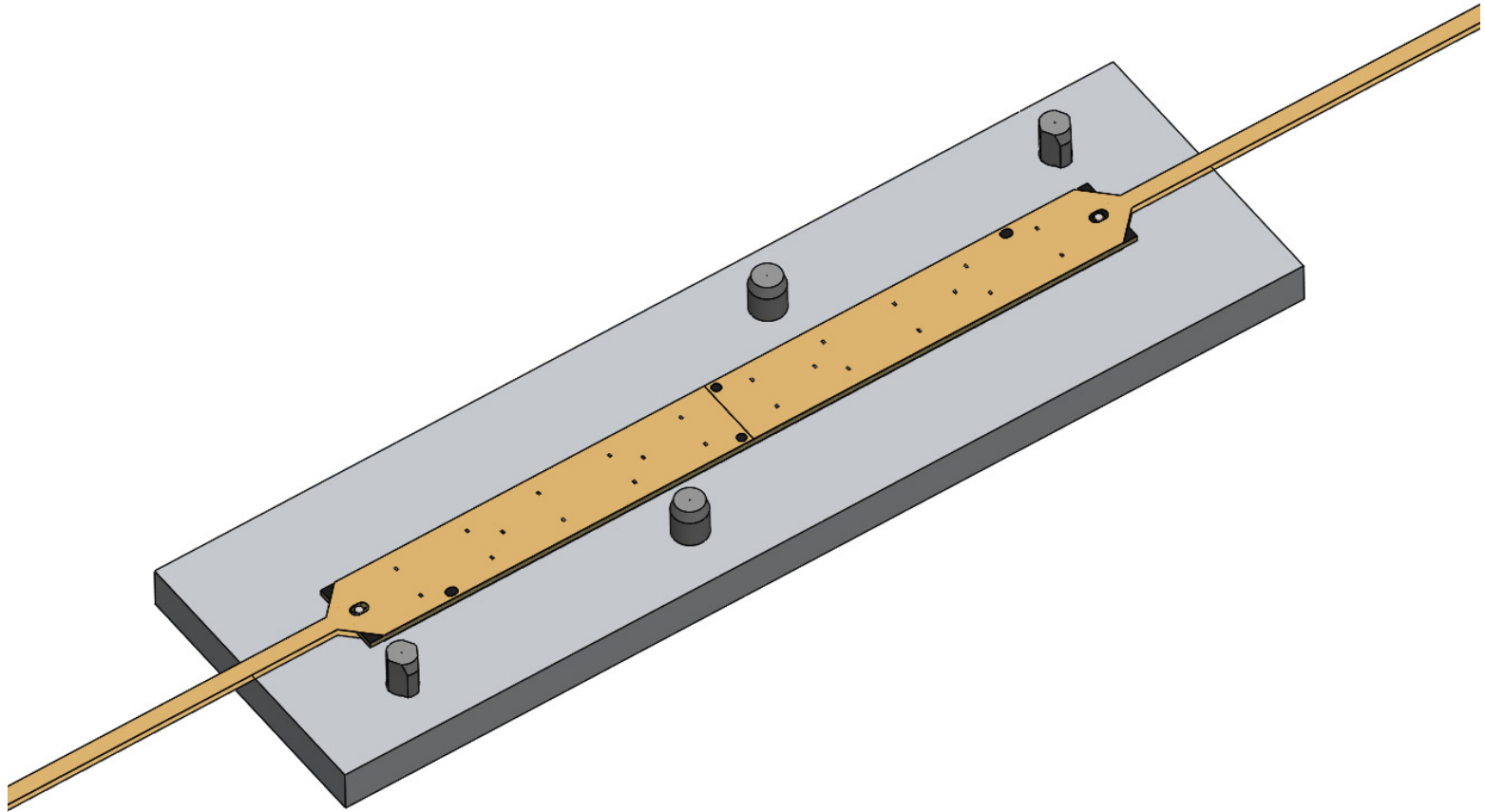
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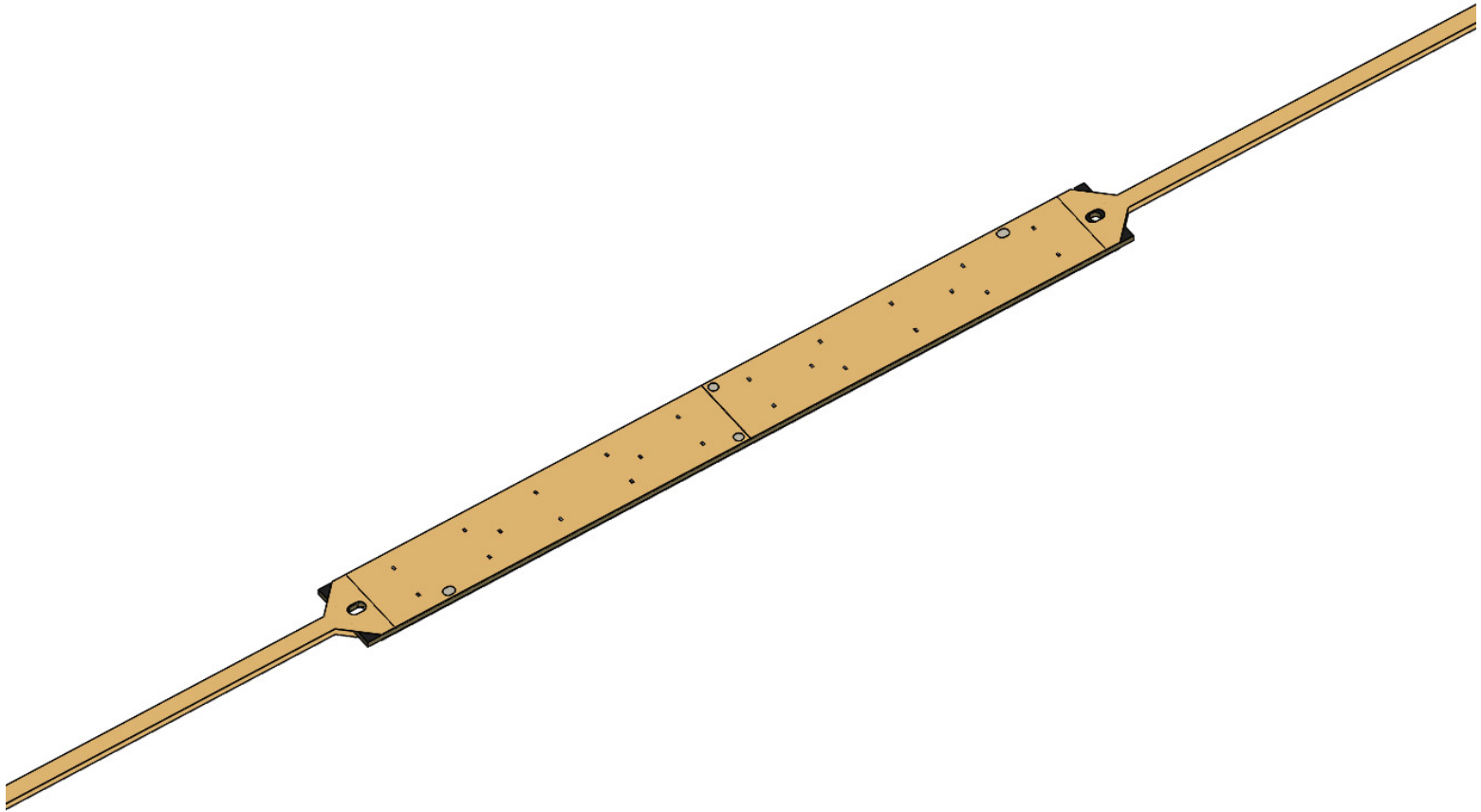
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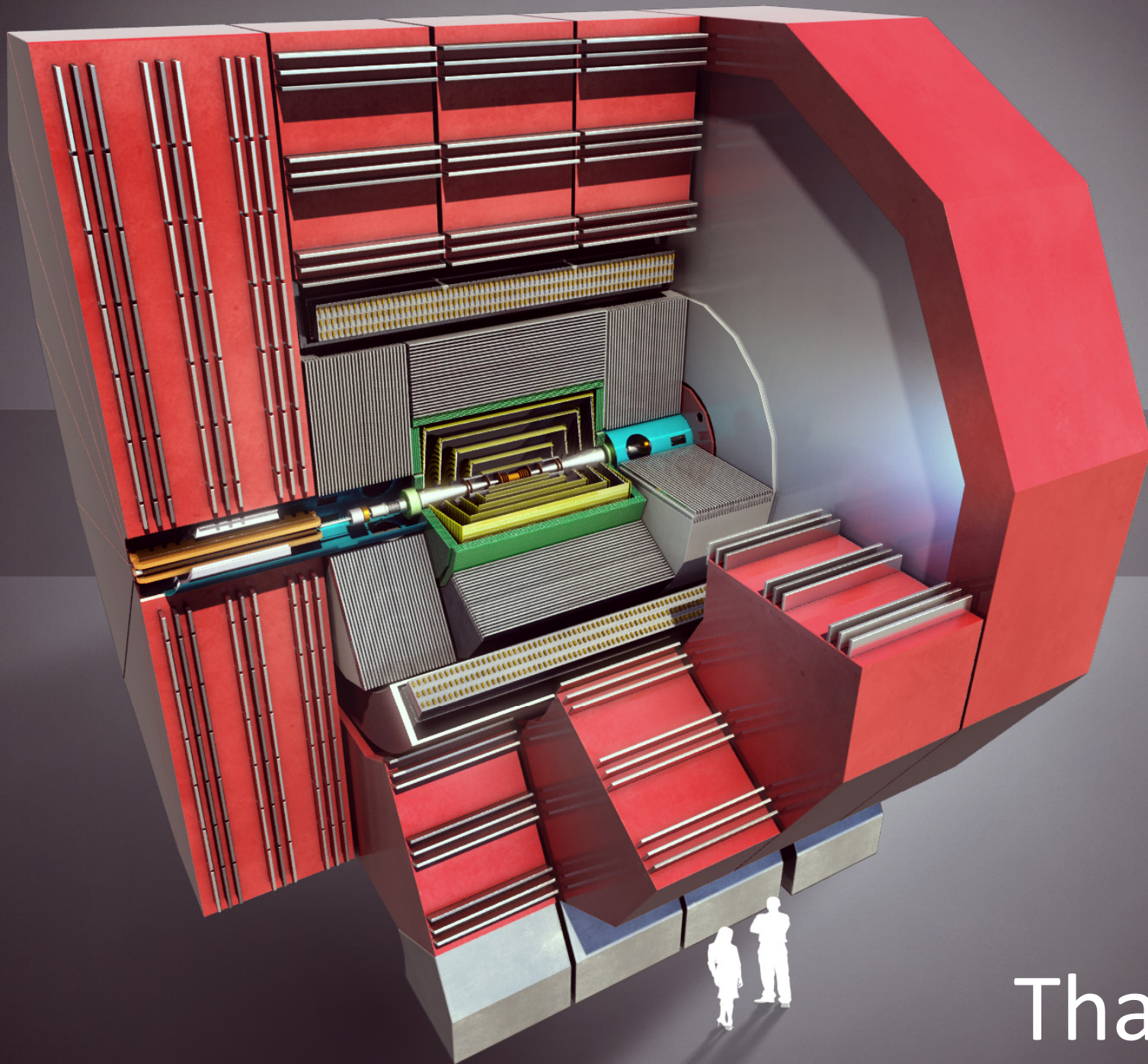


# Assembly & tooling



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Detector

Thank you