



Design of MQXFS, MQXFA, MQXFB

P. Ferracin

on behalf of the MQXF collaboration

Technical meeting on MQXF longitudinal mechanics

April 6th, 2021

LBNL, Berkeley, CA, USA

Designs

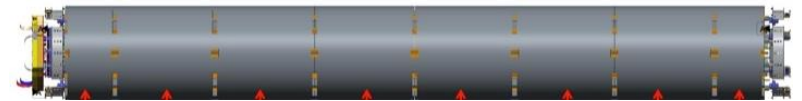
- MQXFS structure 1 & 2
 - MQXFS1, S6, S7
 - Basically identical to MQXFA



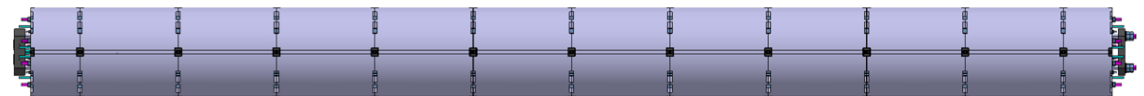
- MQXFS structure 3
 - MQXFS3, S4, S5



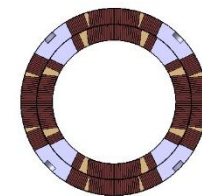
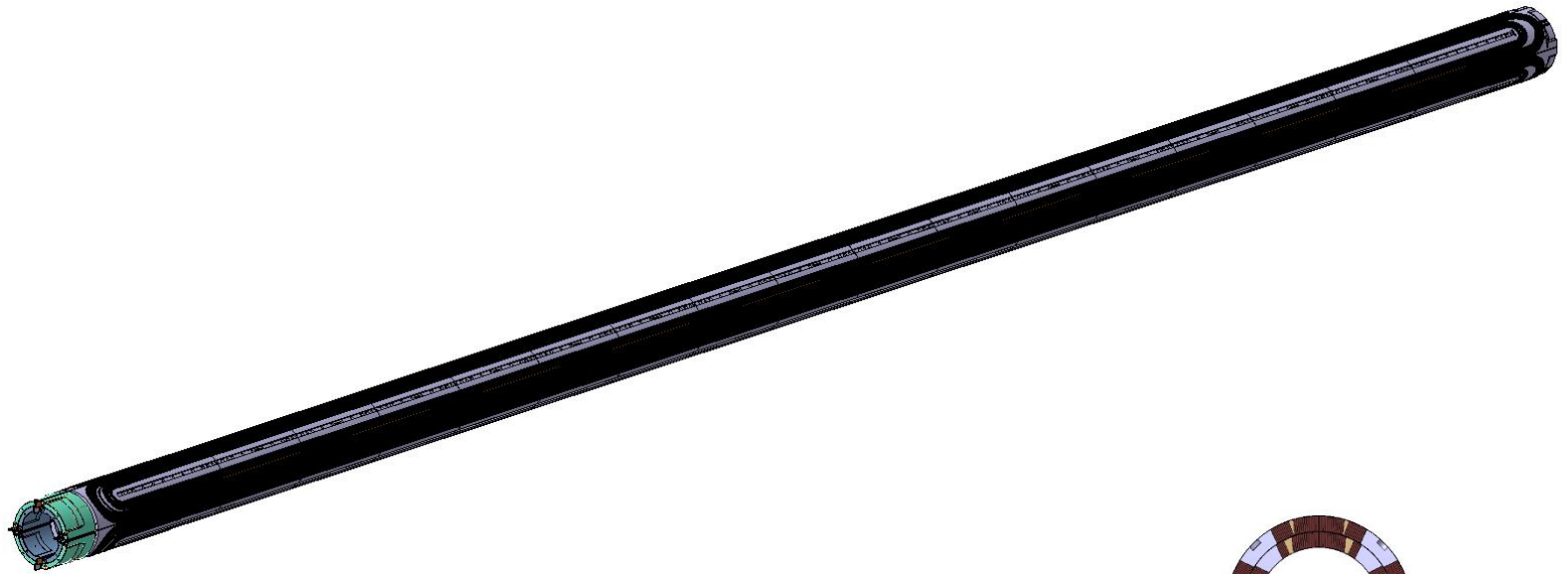
- MQXFA



- MQXFB

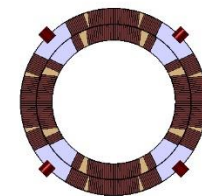
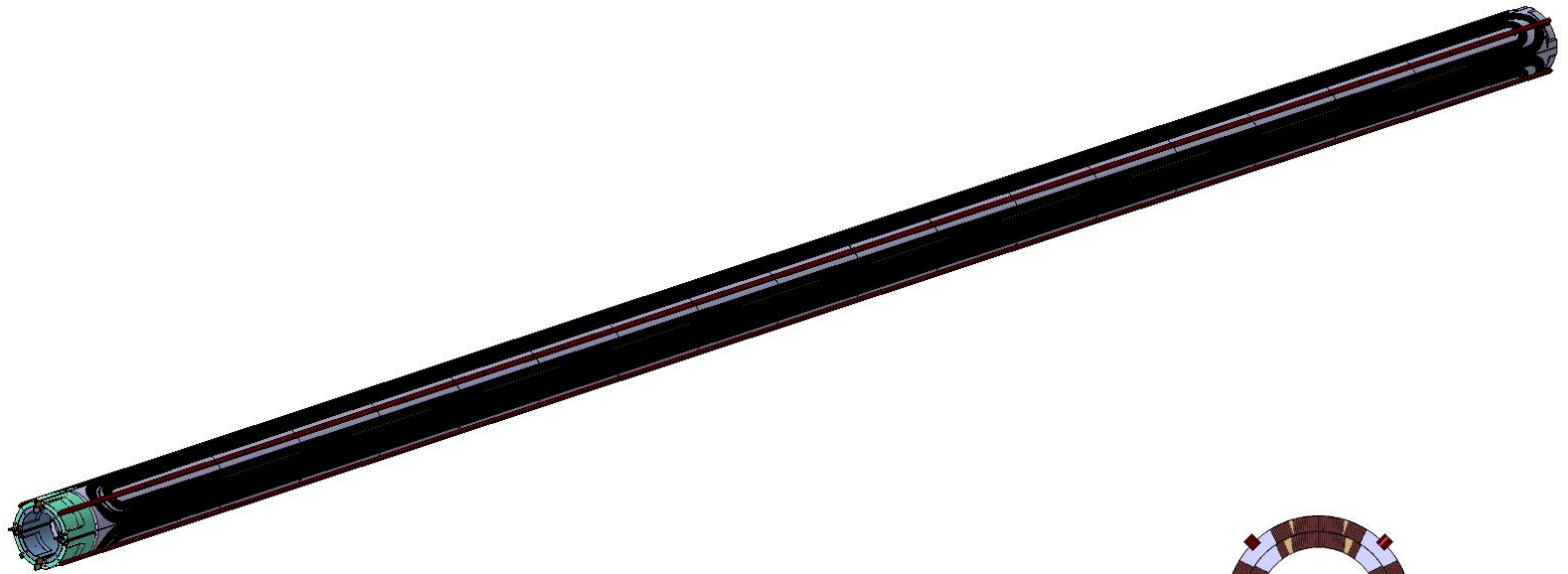


Magnet design MQXFB



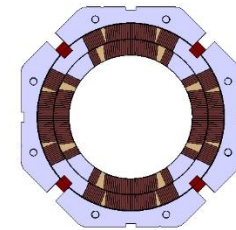
- Superconducting coil

Magnet design MQXFB



- Pole key for alignment

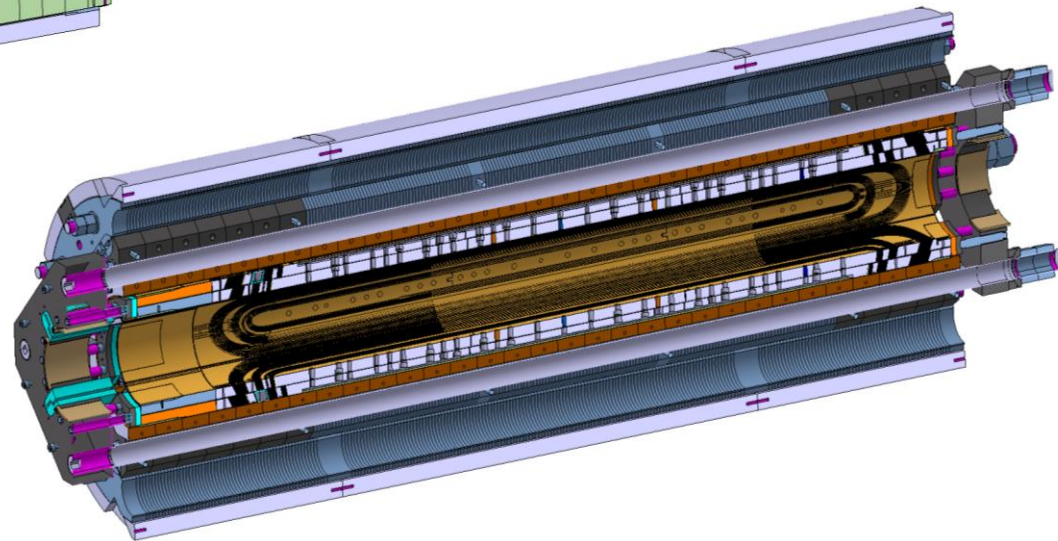
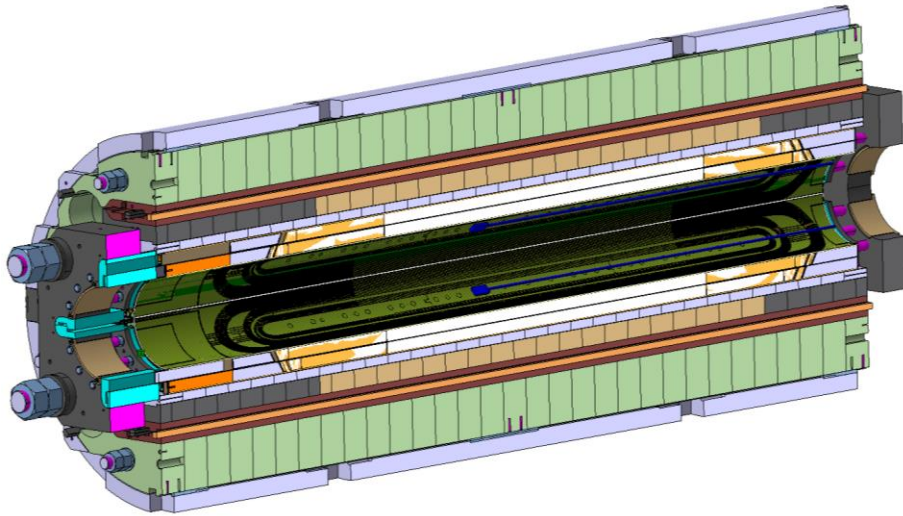
Magnet design MQXFB



- Aluminium collar

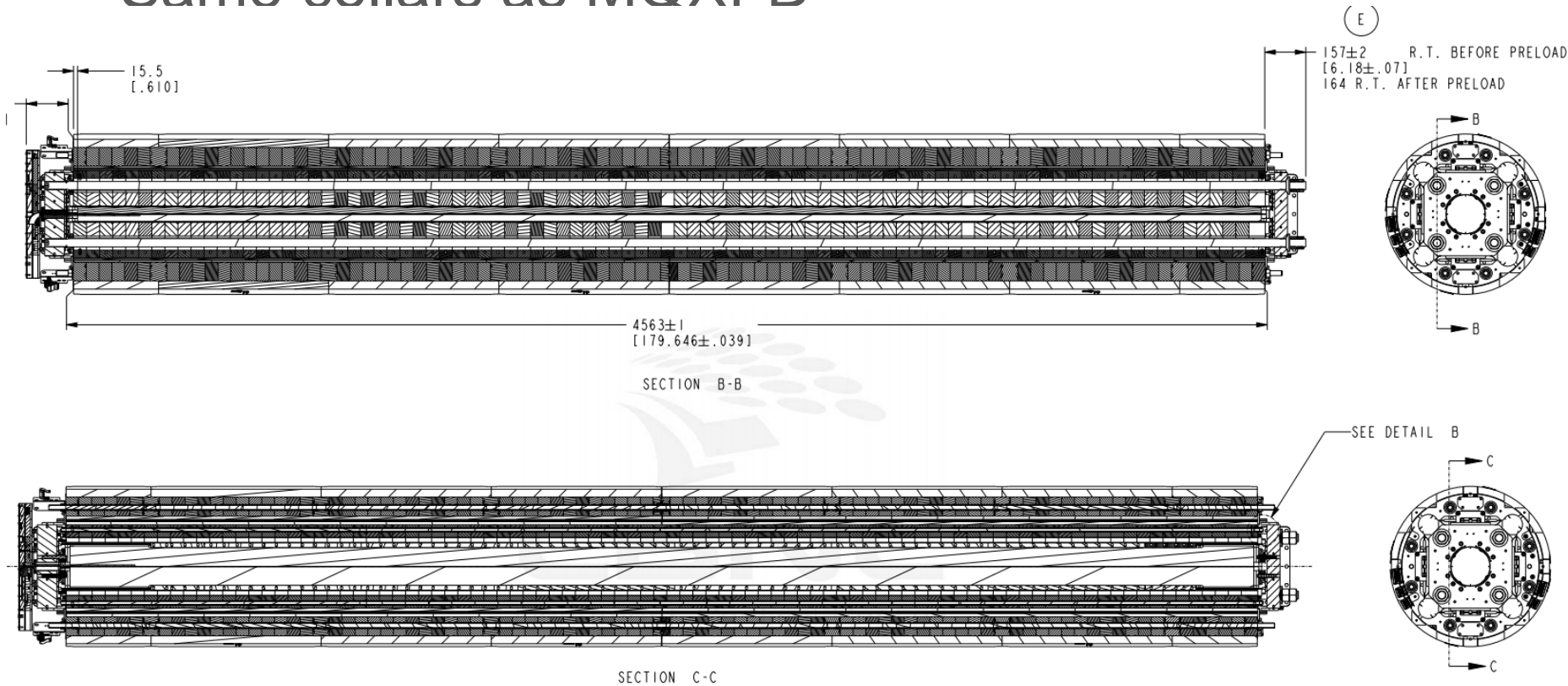
MQXFS structure 1-2 and 3

- Same aluminum collars as in MQXFB

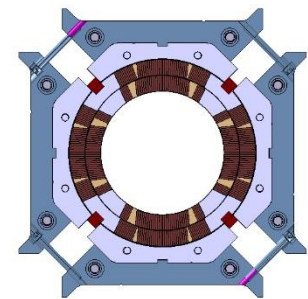
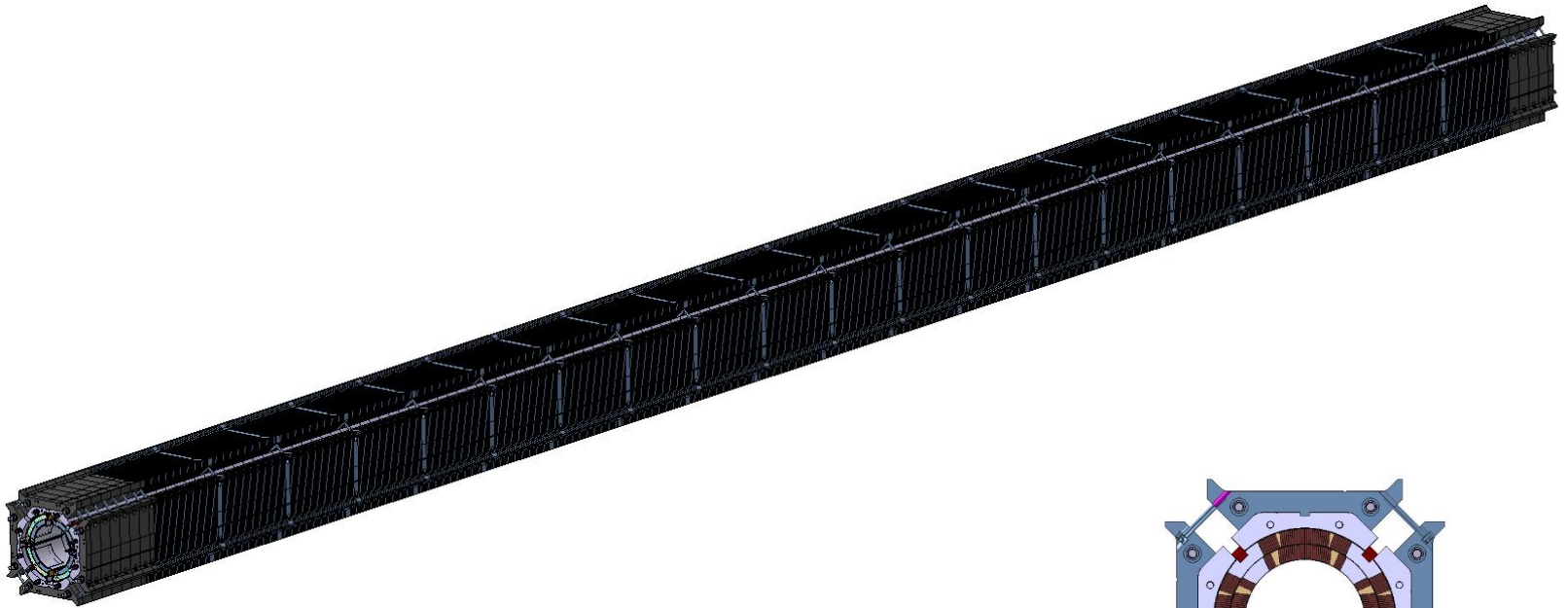


MQXFA

- Same collars as MQXFB



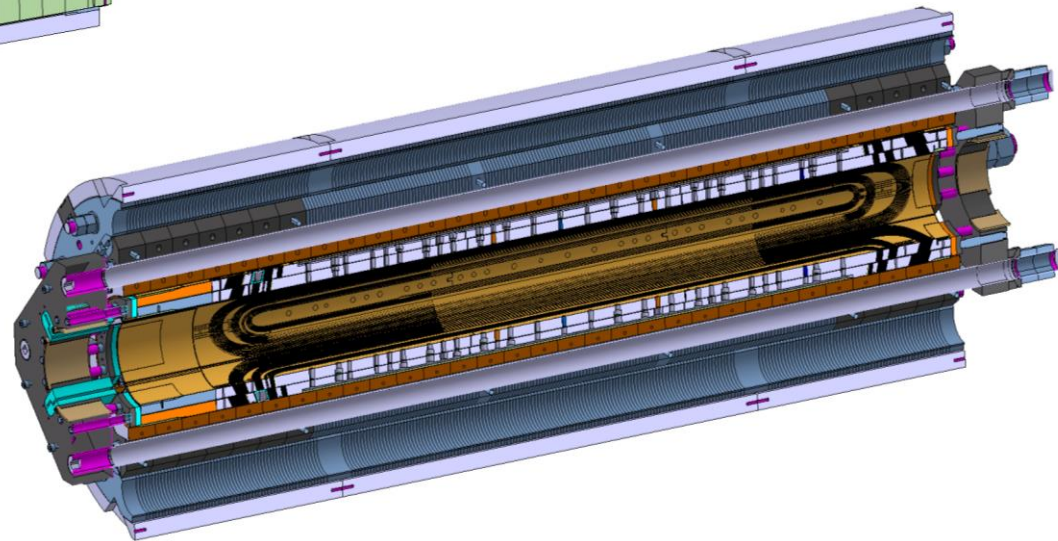
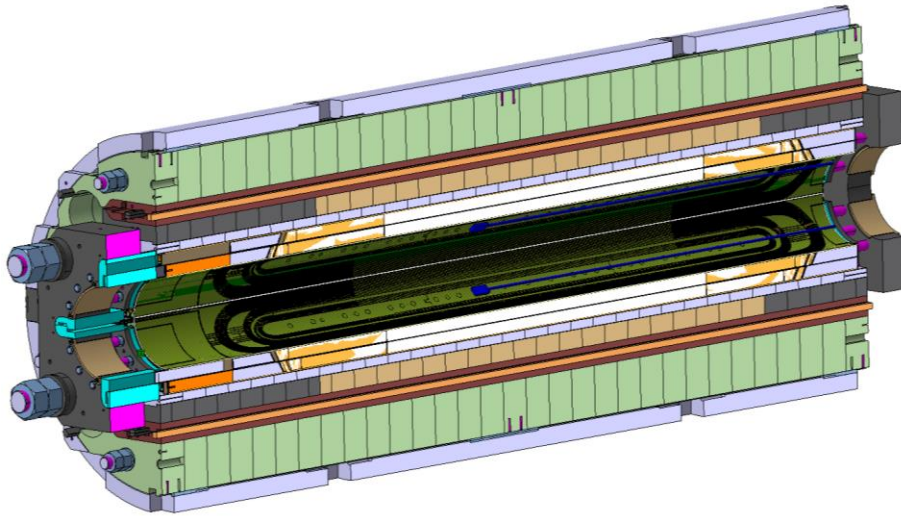
Magnet design MQXFB



- Bolted iron pad

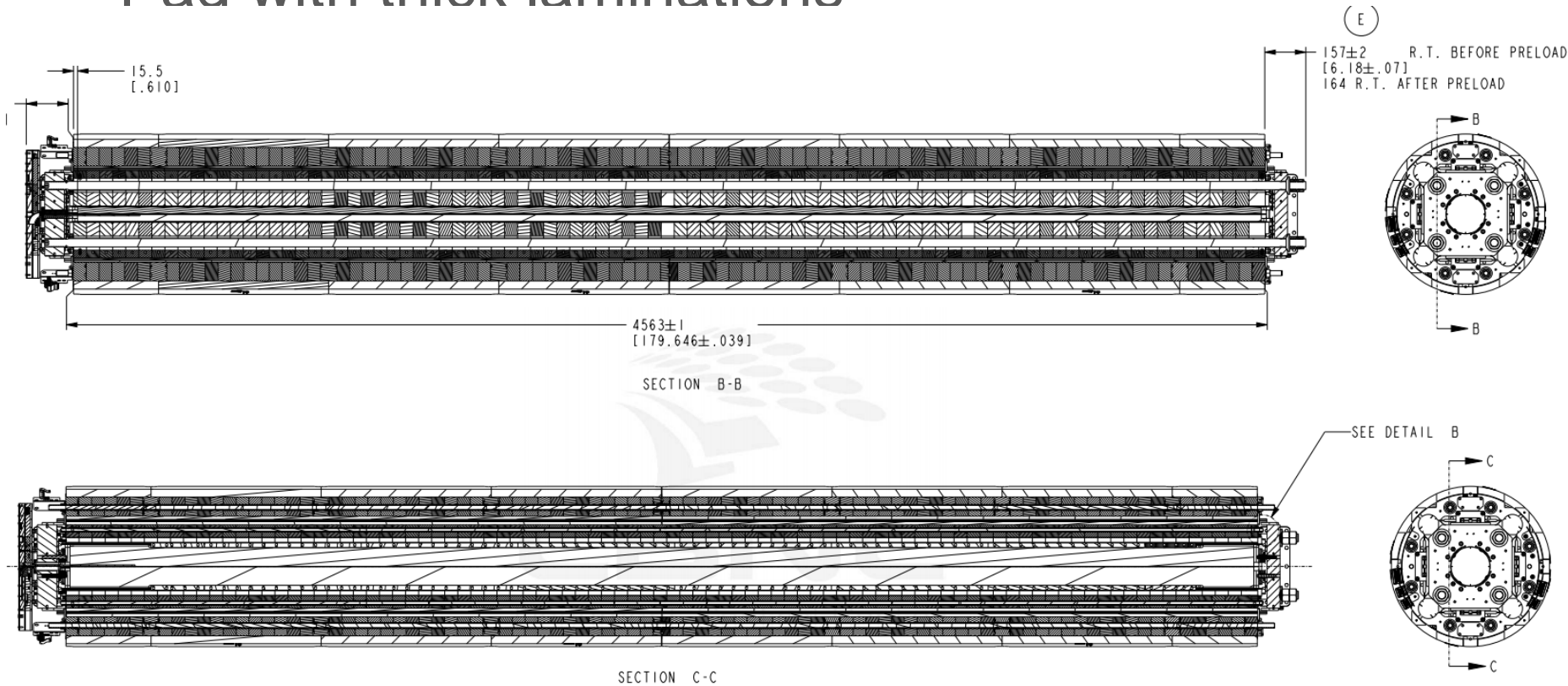
MQXFS structure 1-2 and 3

- Pad with thick laminations in 1-2, thin in 3

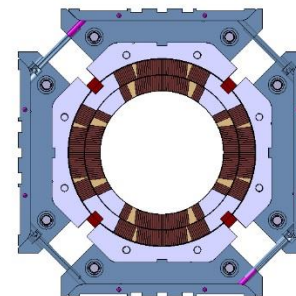
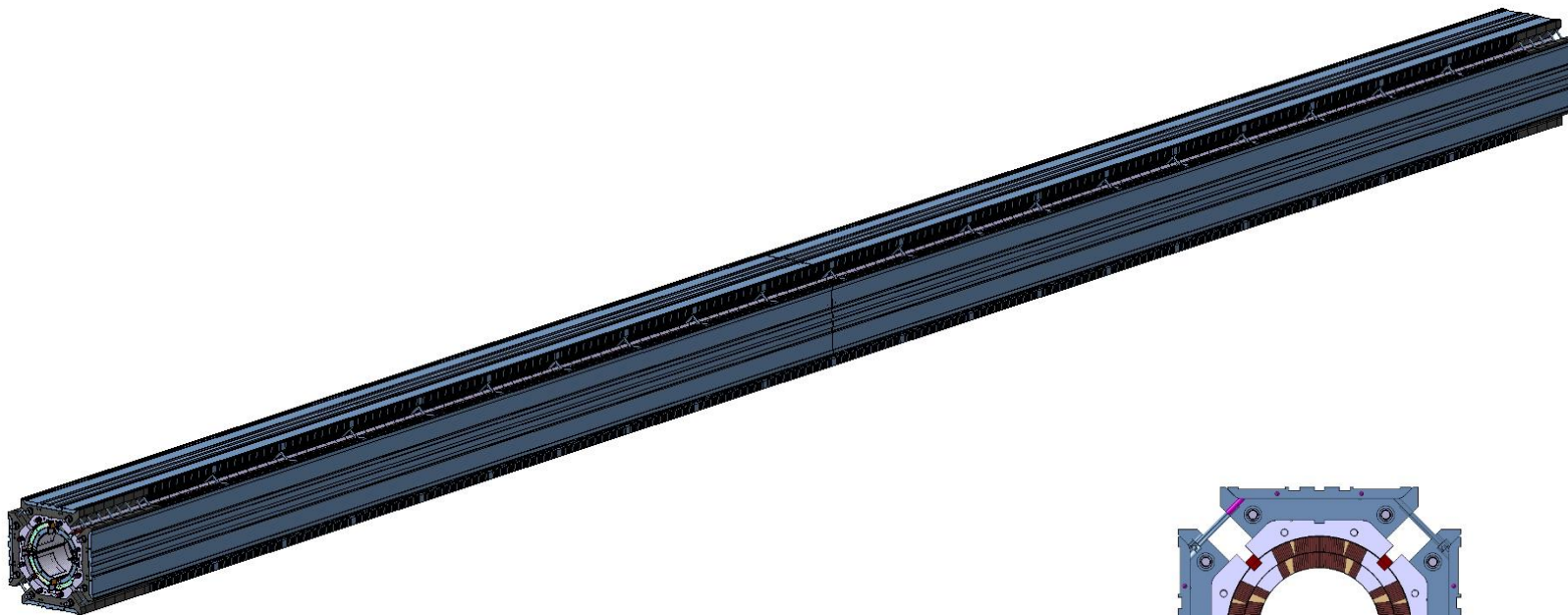


MQXFA

- Pad with thick laminations

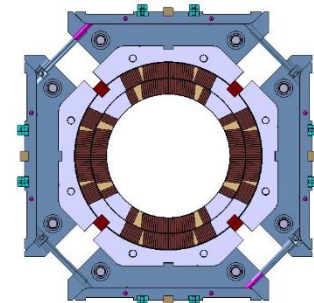
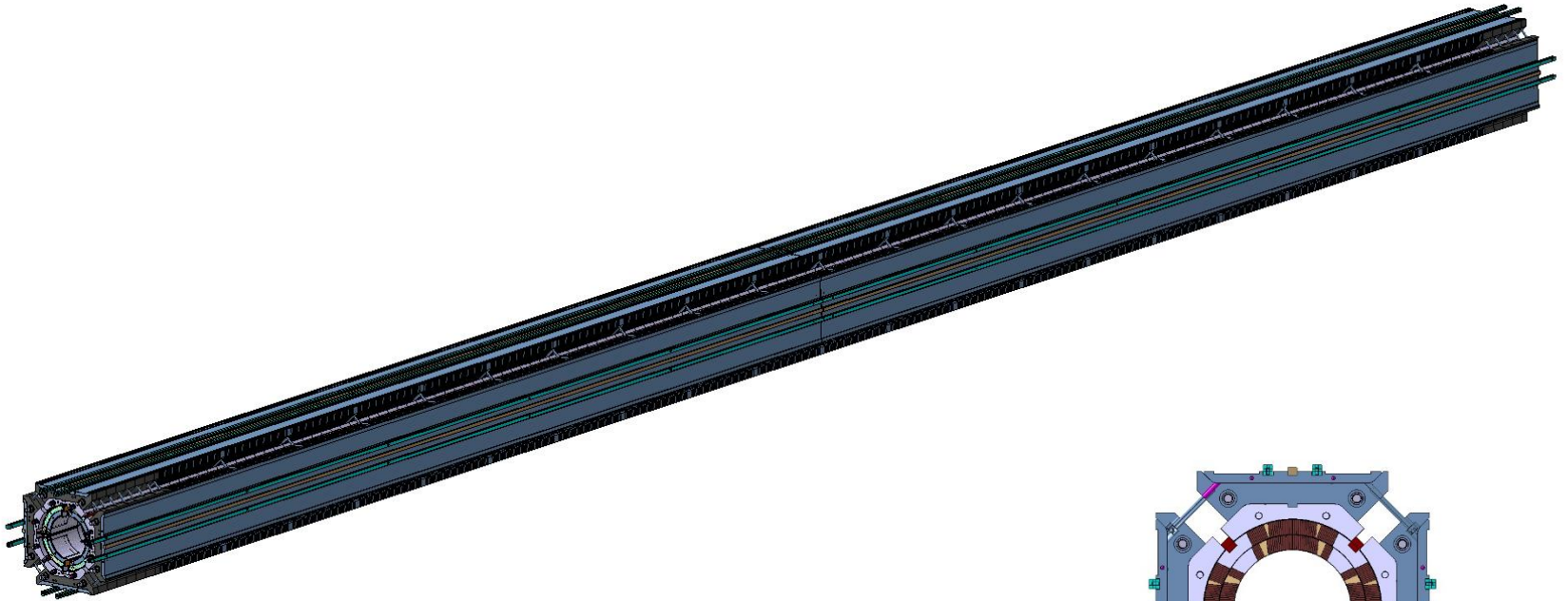


Magnet design MQXFB



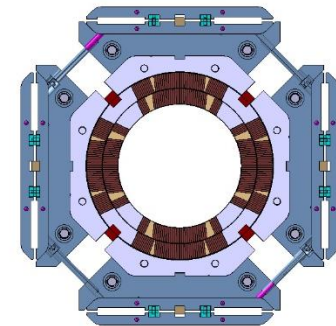
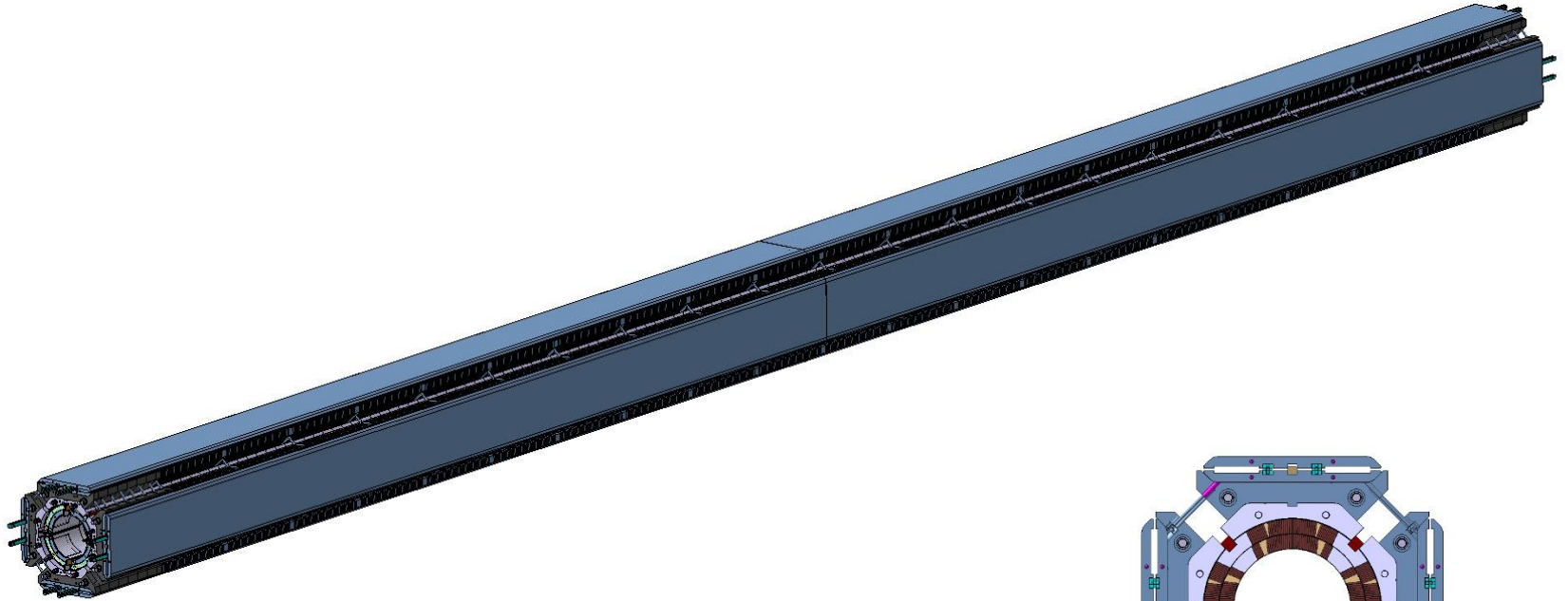
- **Iron master**
 - Half-length plates for bladders and keys

Magnet design MQXFB



- Loading and alignment keys
 - Half length

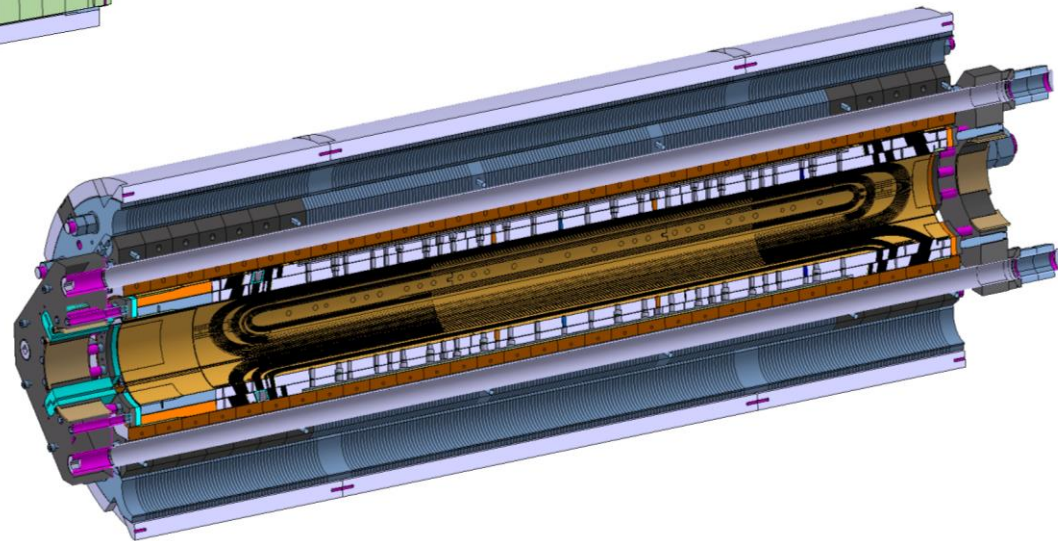
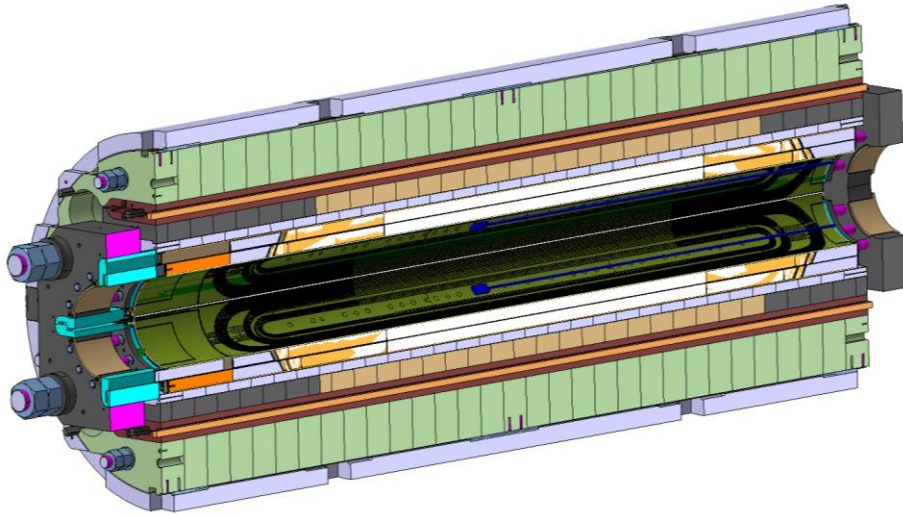
Magnet design MQXFB



- **Second iron master**
 - Half-length plates for bladders and ke

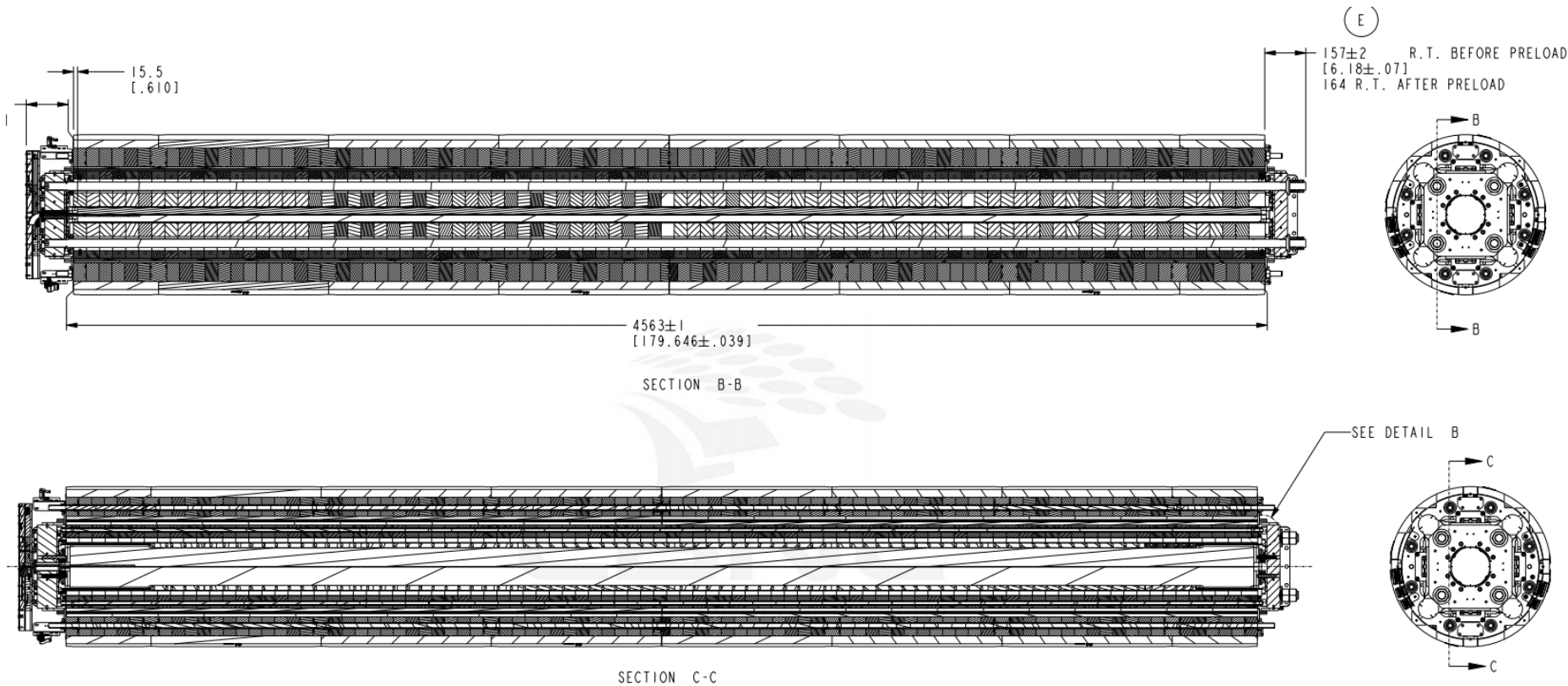
MQXFS structure 1-2 and 3

- Full length masters and keys

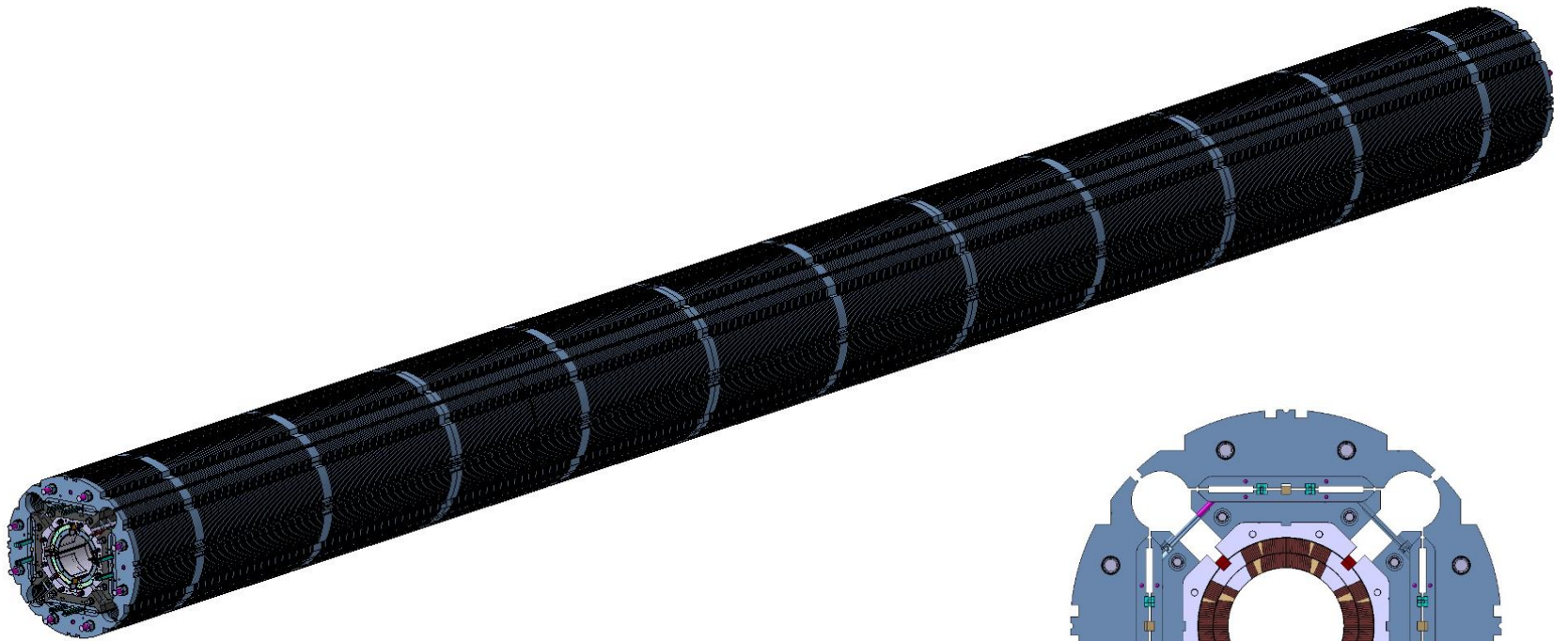


MQXFA

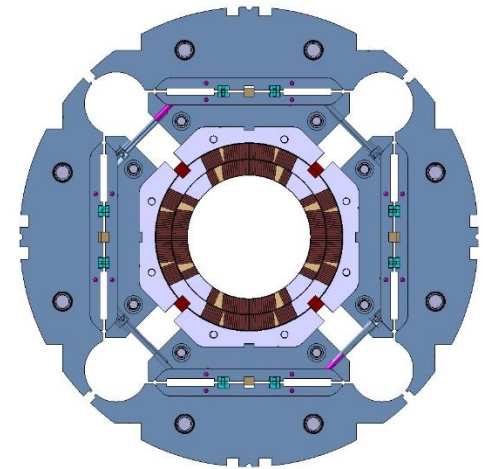
- Half-length masters keys



Magnet design MQXFB

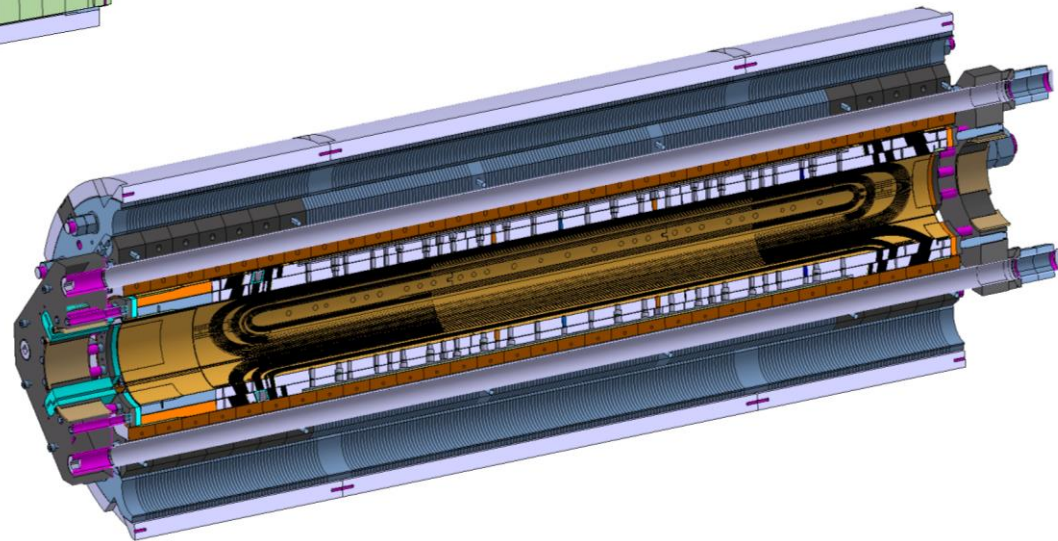
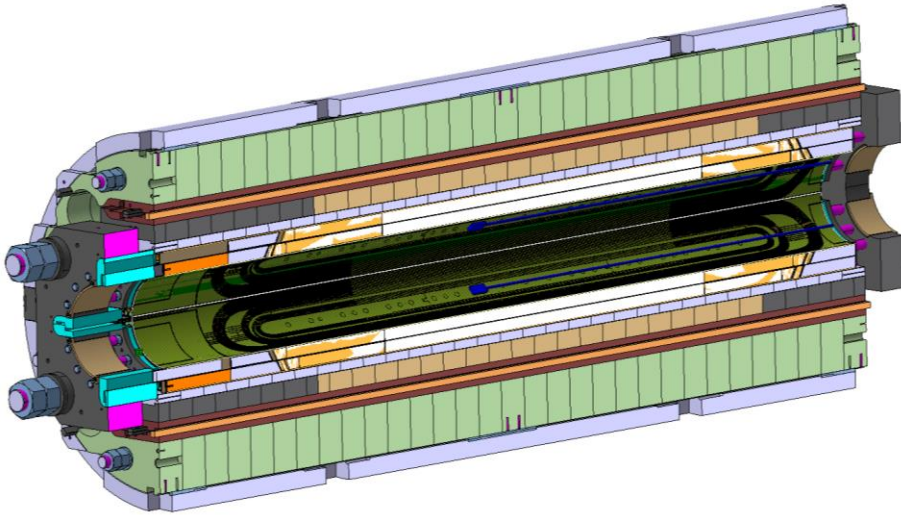


- Iron yoke laminations



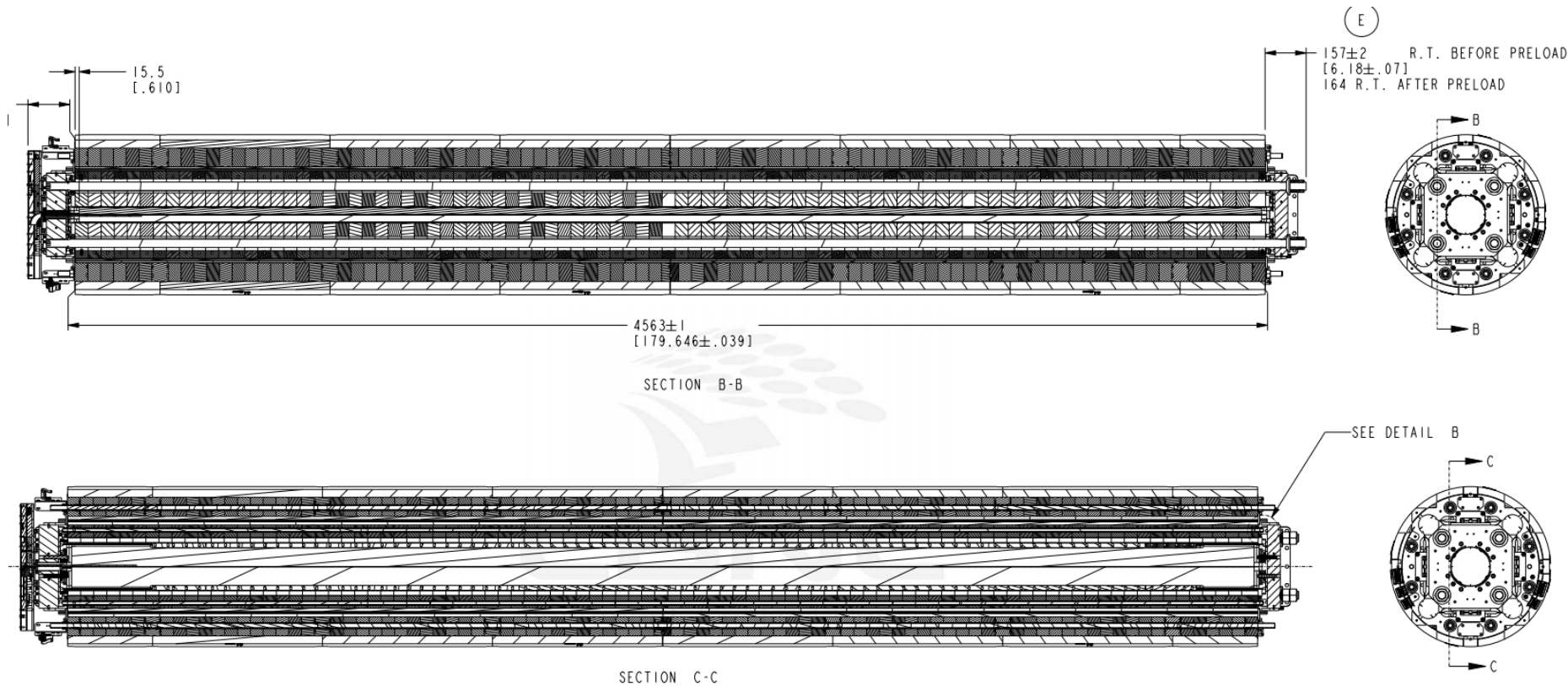
MQXFS structure 1-2 and 3

- Yoke with thick laminations in 1-2, thin in 3

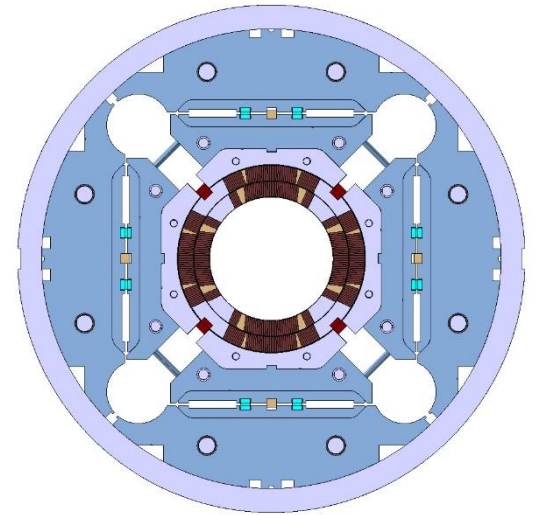
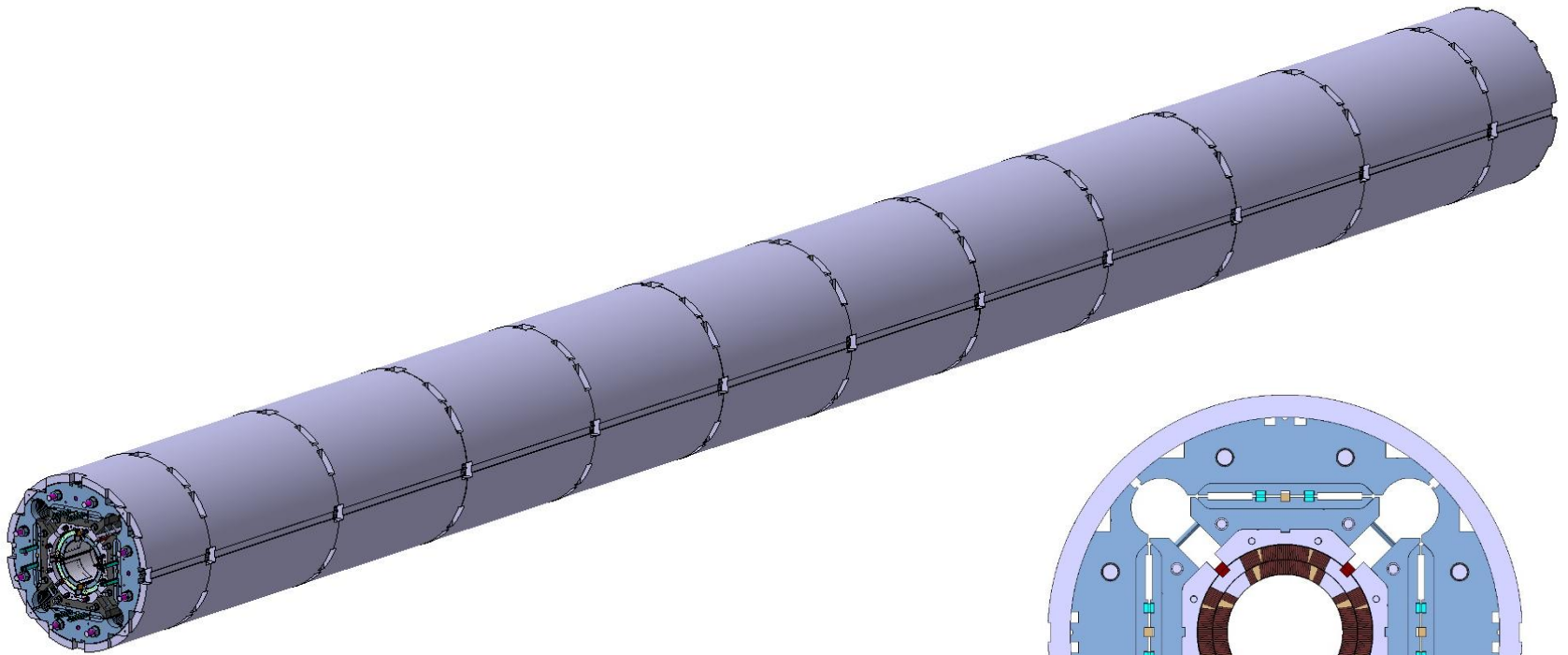


MQXFA

- Yoke with thick laminations



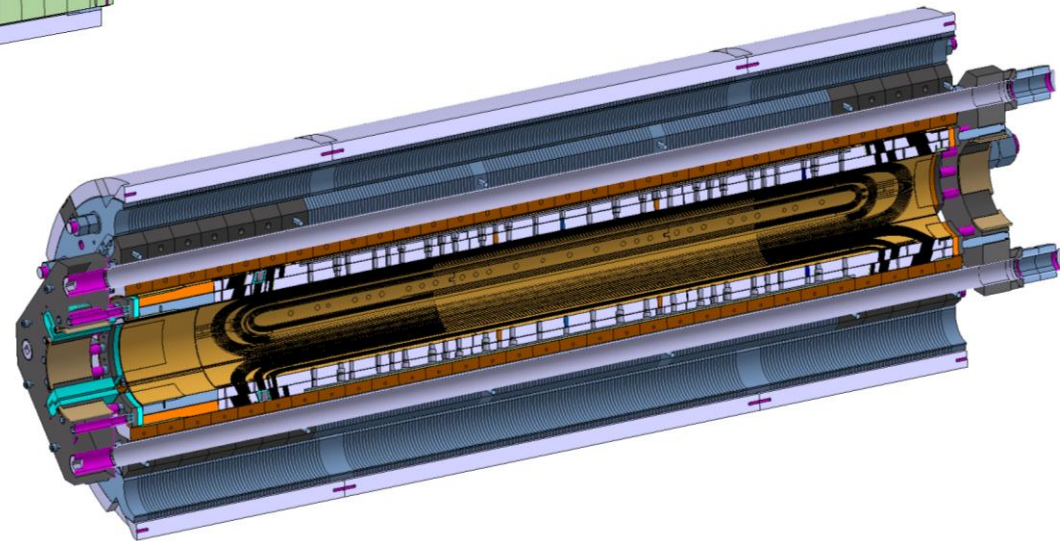
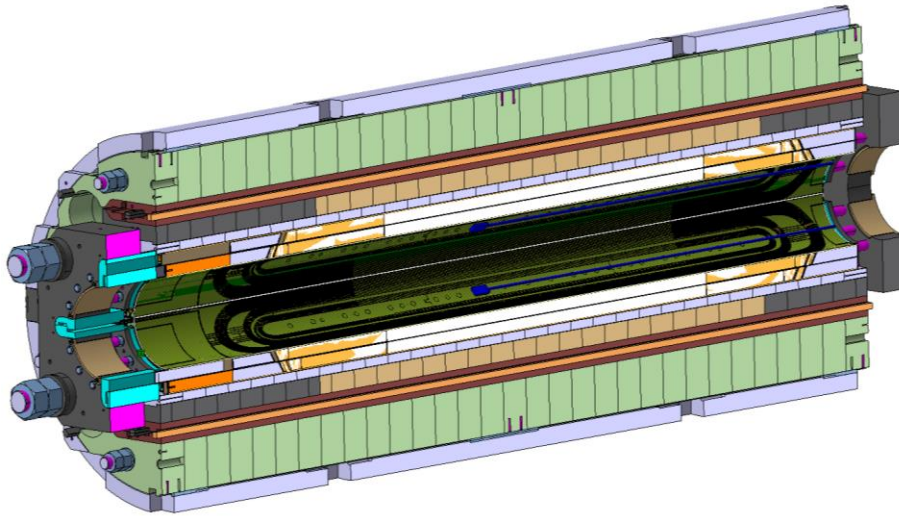
Magnet design MQXFB



- Segmented aluminium shell

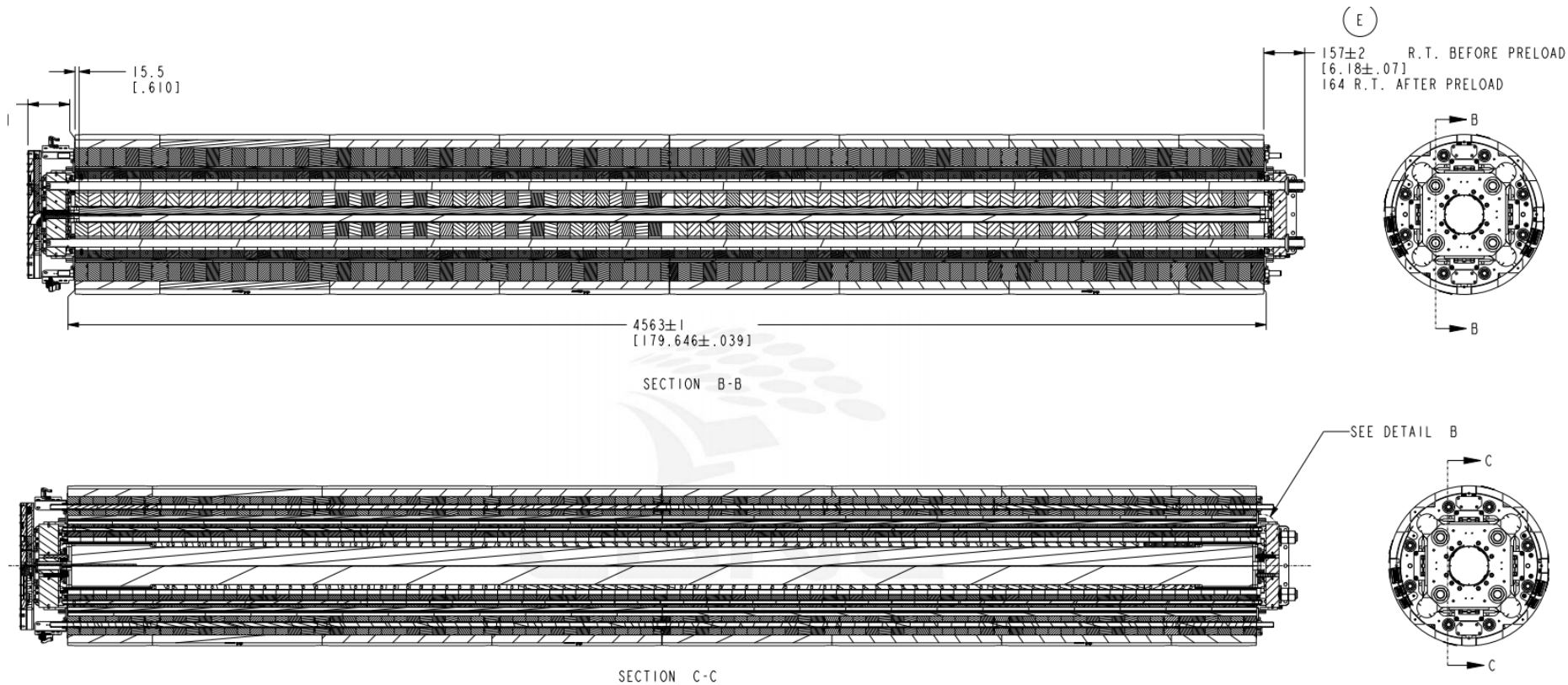
MQXFS structure 1-2 and 3

- Segmented shell

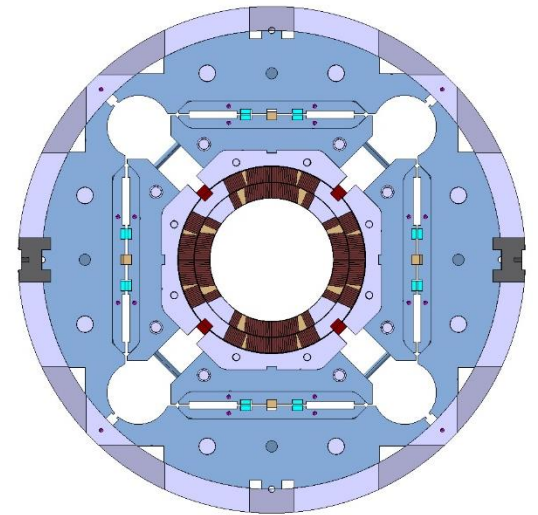
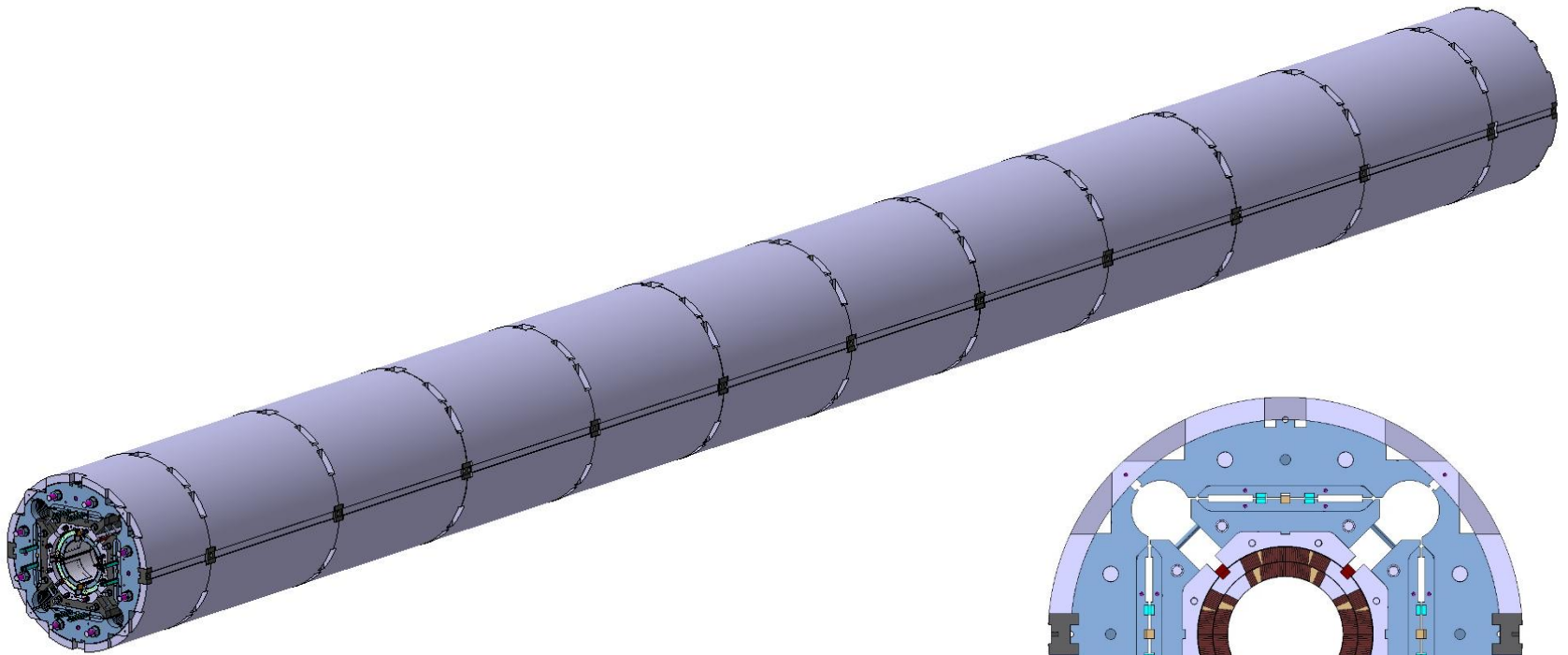


MQXFA

- Segmented shell

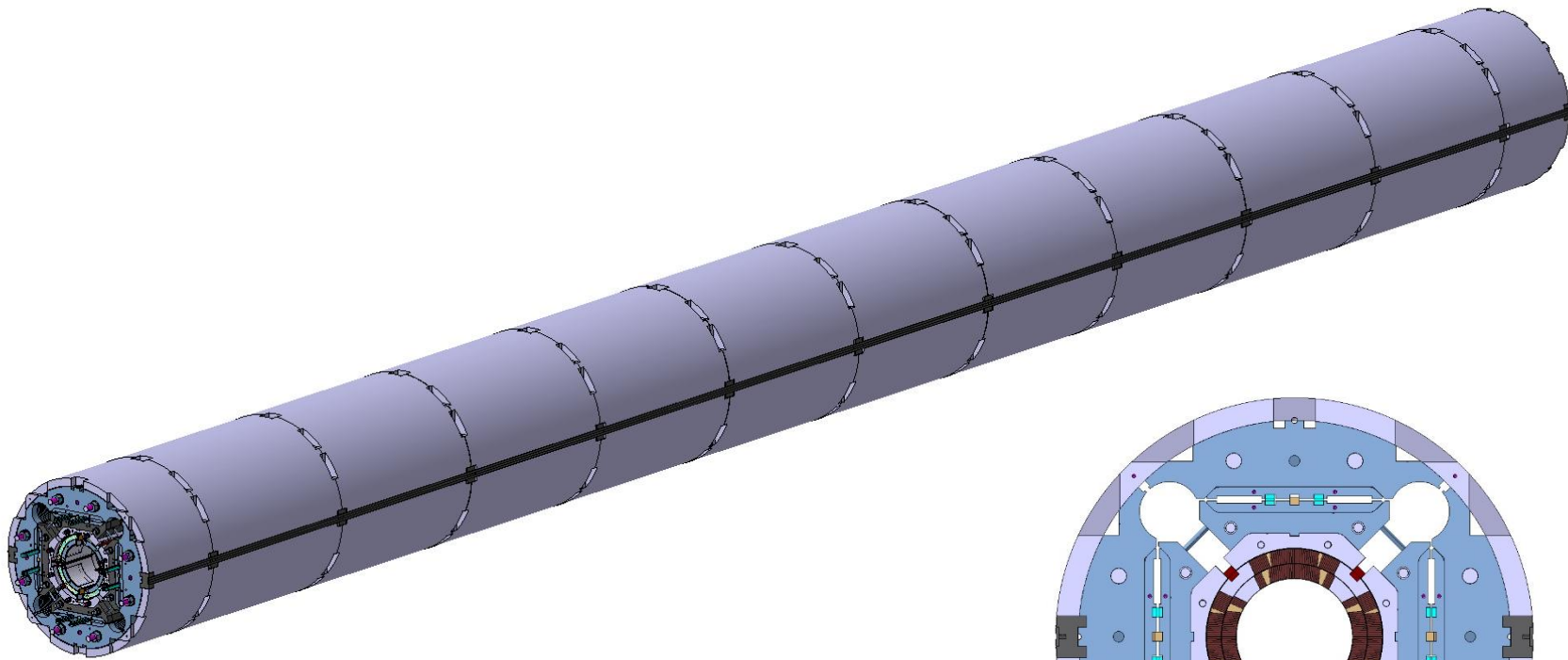


Magnet design MQXFB



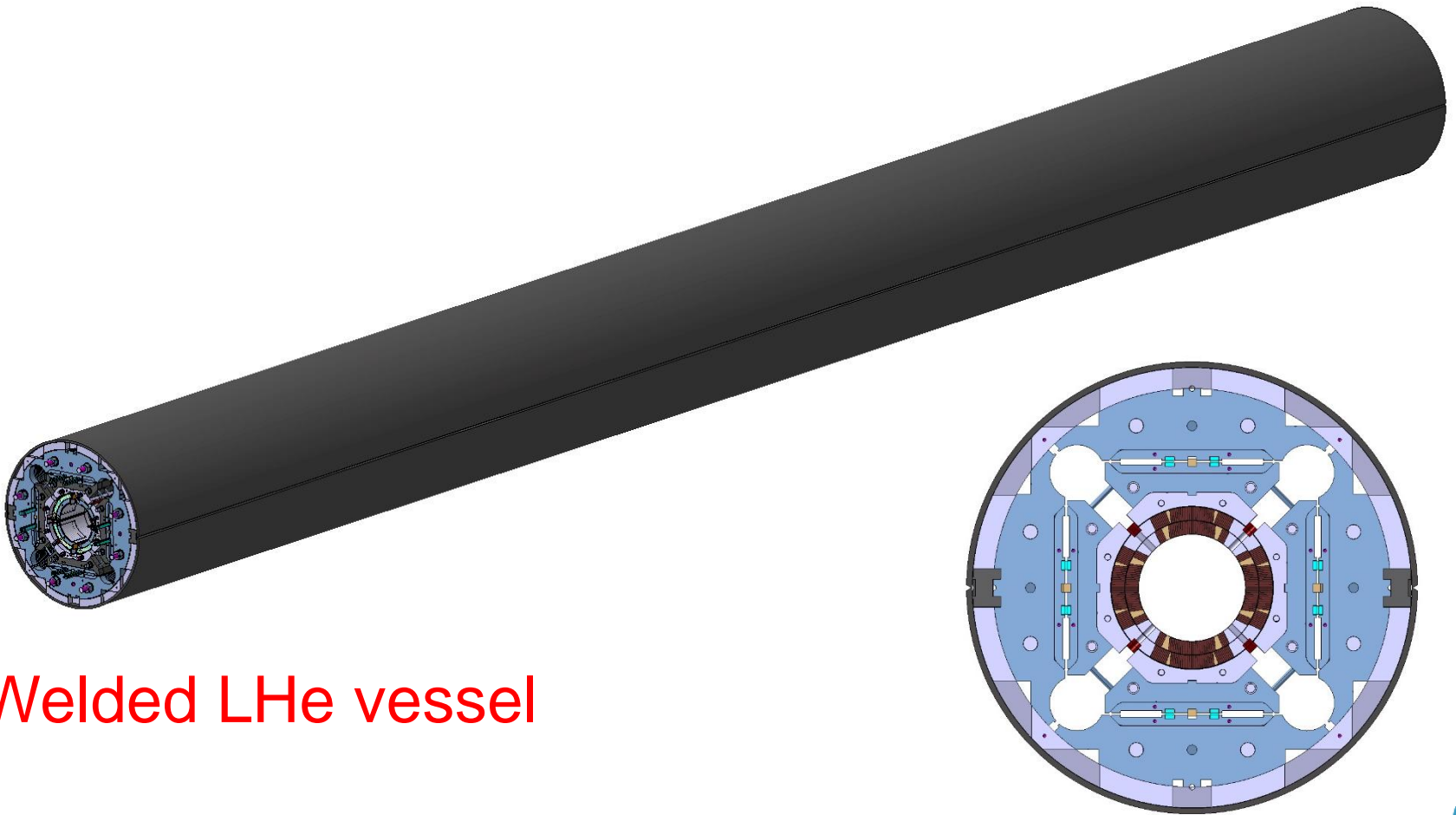
- **Tack-welding blocks**
 - Bolted to the yoke with slots for sliding

Magnet design MQXFB



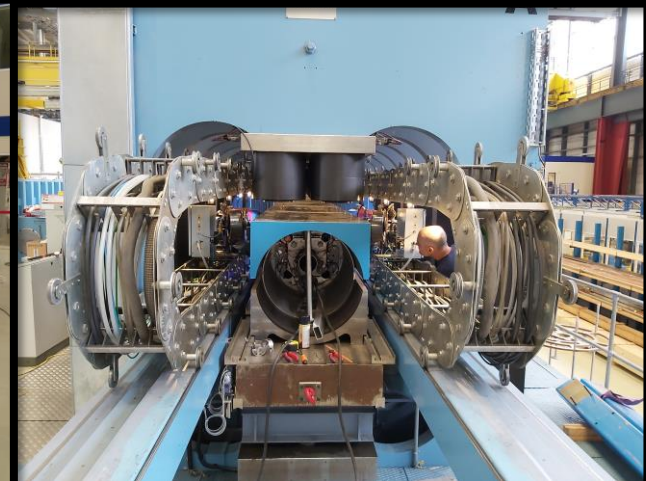
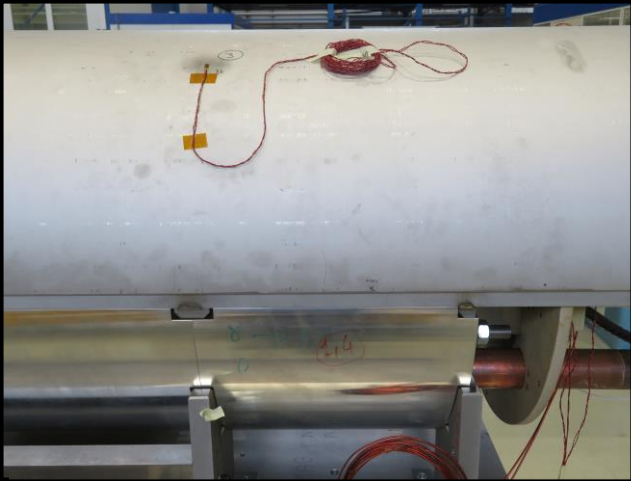
- **Backing strip**
 - Tack welded to the blocks

Magnet design MQXFB

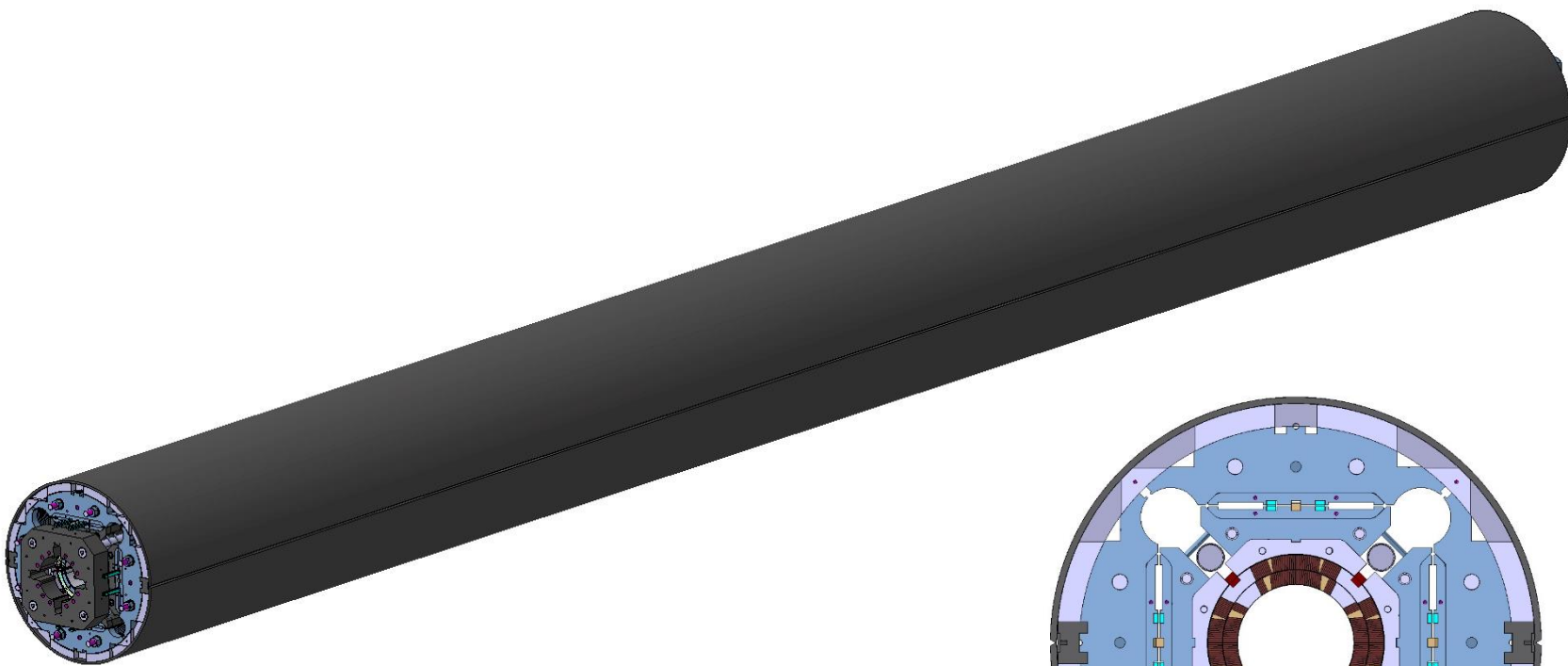


- Welded LHe vessel

Shell welding



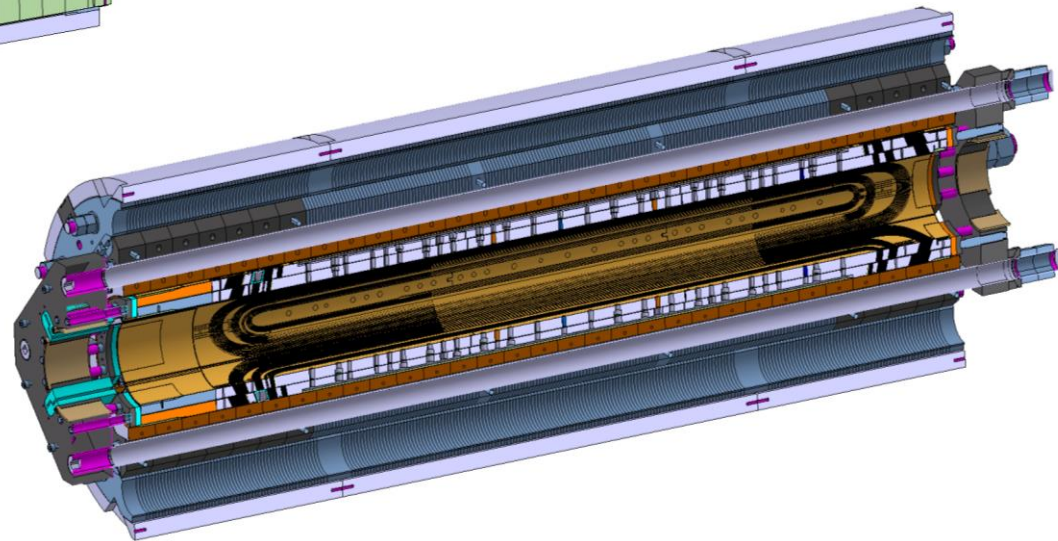
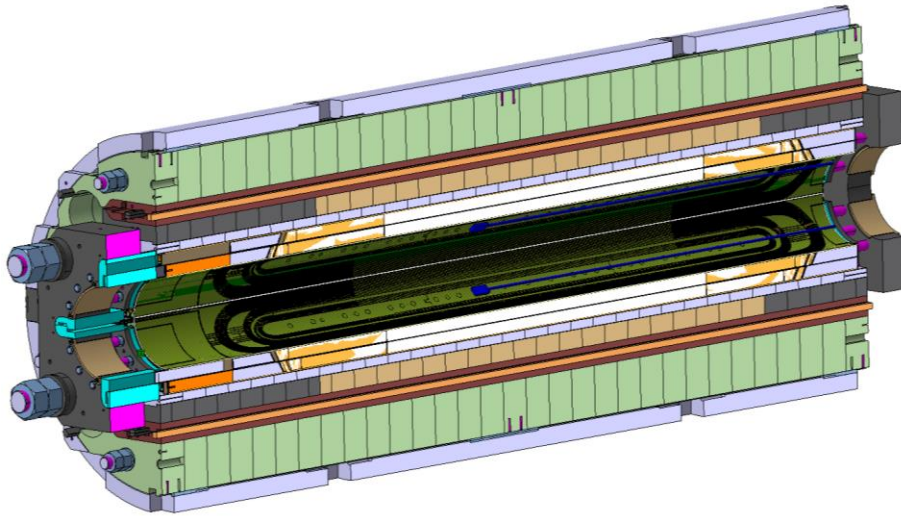
Magnet design MQXFB



- Axial support system
 - SS rods and end-plates

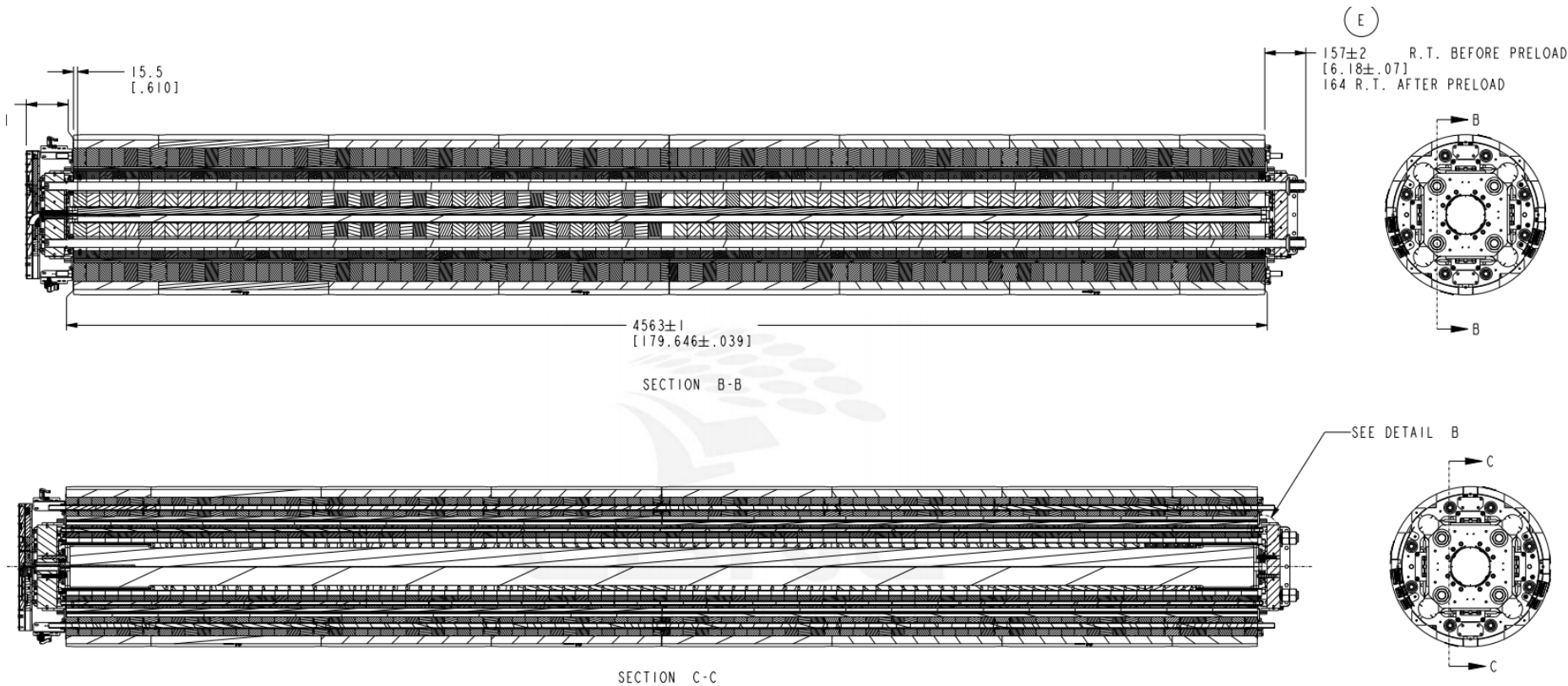
MQXFS structure 1-2 and 3

- Same system but with aluminum rods



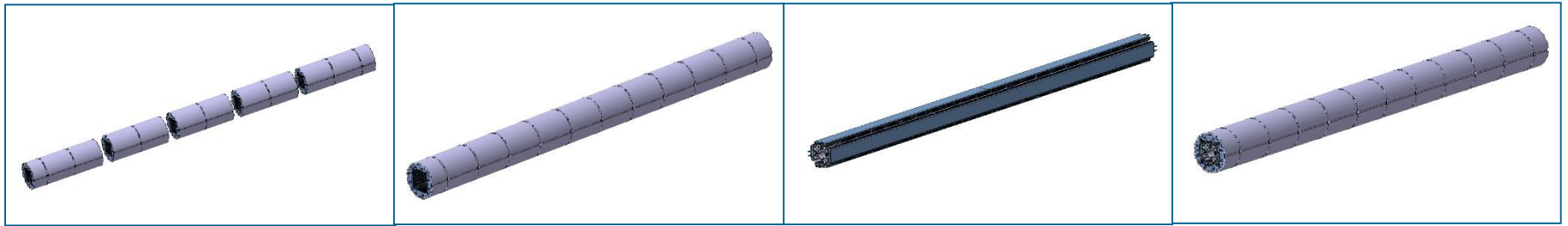
MQXFA

- Same system (with ss rods)



Assembly

- In MQXFB, 5 shell-yoke modules, each assembled vertically

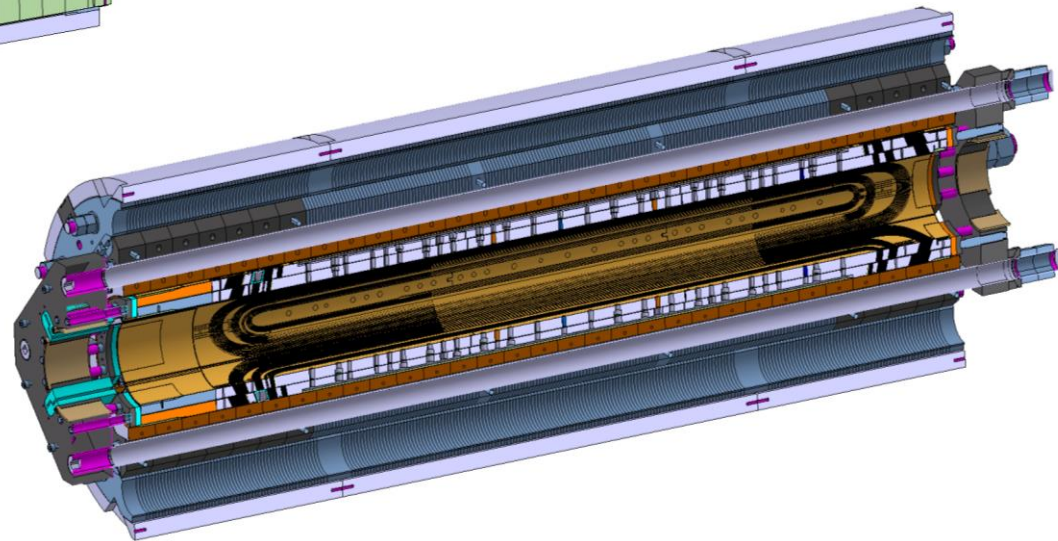
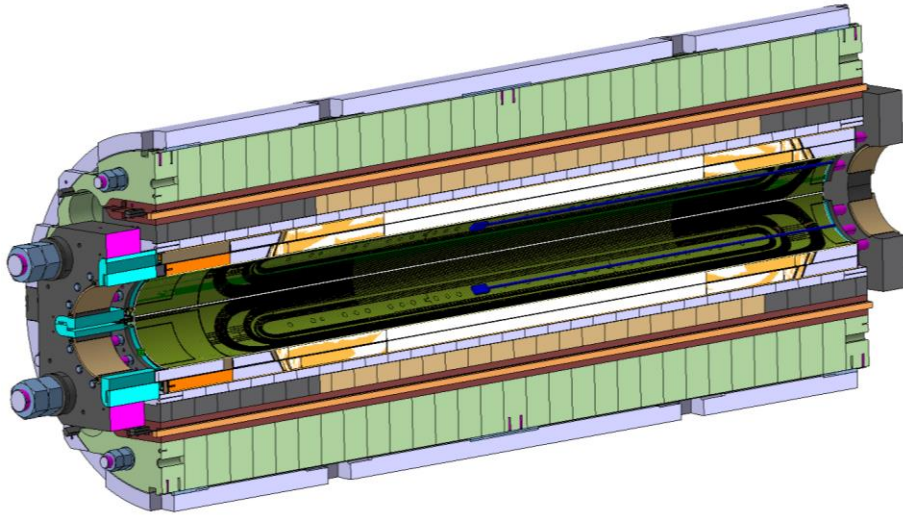


- In MQXFA, 2 shell-yoke modules, each assembled vertically (like LQ)



Assembly

- In MQXFS, 2 shell-yoke modules.



Loading

- In MQXFB and MQXFA, half length bladders (and masters, and keys)
- In MQXFS, full length bladders (and masters, and keys)

