



Status and developments of the dummy septum TPS15 for the CERN PS Multi-Turn Extraction

Current Proposal

The new dummy septum, 40 cm long, 7 cm high and 4.2 mm thick blade inside the beam tube.

Blade material Copper with conductive cooling to external heat sink

The wall thickness of the vacuum chamber is 4.8 mm, and the material is stainless steel 304L.

Main tank length 574mm and downstream chamber of 470mm which in total is 1044 mm for the complete assembly. (2mm allowed for vacuum joints)

All flanges are OD 332 mm and have maximum available aperture in horizontal and 70mm in vertical

Detail of Assembly

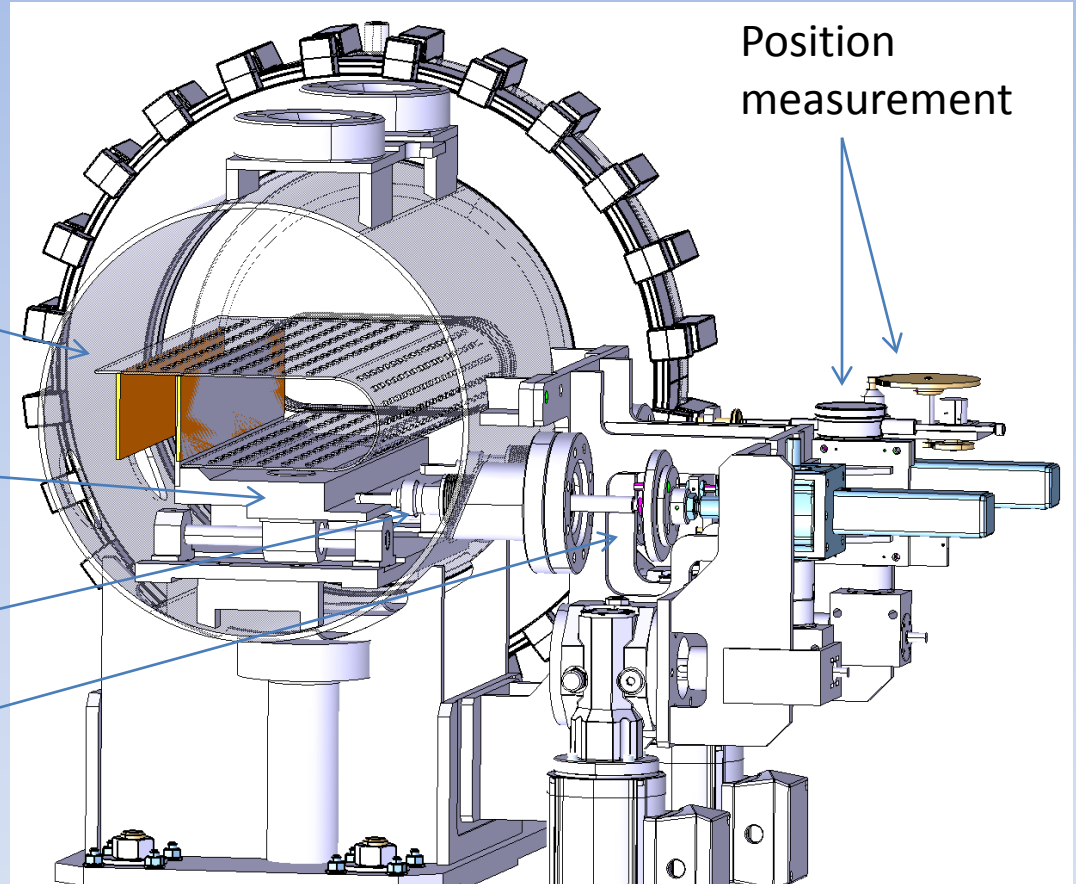
Impedance screen
to be studied

Copper Base (heat
sink)

Internal bellows

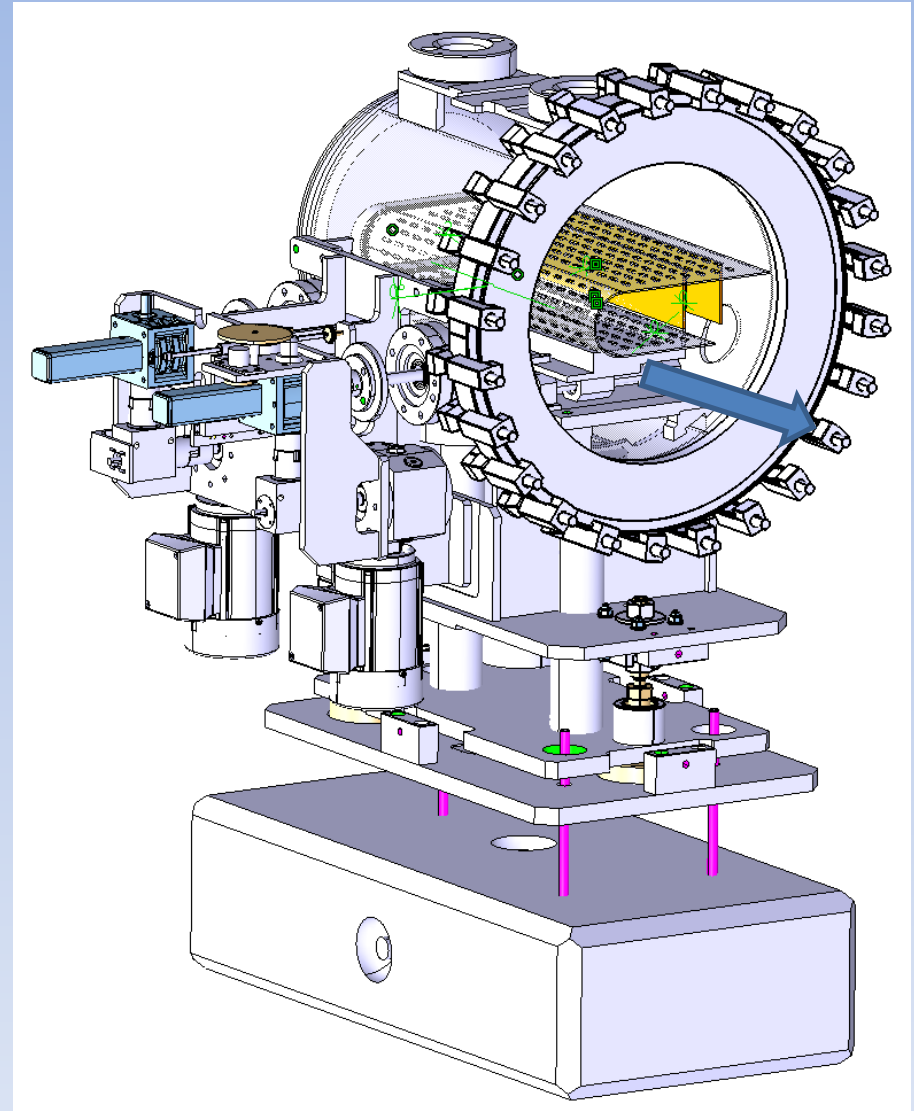
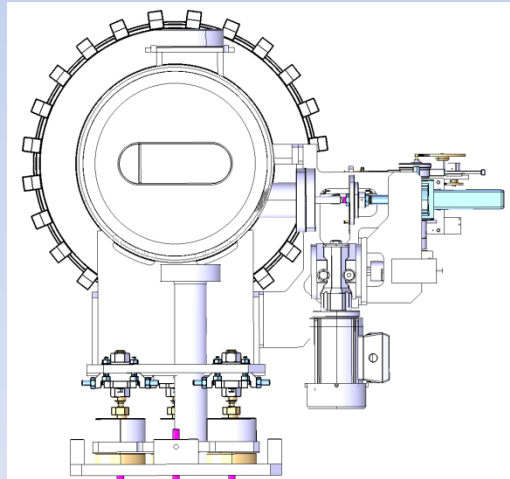
Drive system

Position
measurement



Tank Design

Tank dimensions have been fixed.
Downstream end of tank has full size demountable cover and upstream end is sealed.
All active mechanisms are on inside of ring.
Motors, drive system, position measurement and interlock switches have been positioned.
Standard rotary potentiometers and precision linear potentiometers have been included.

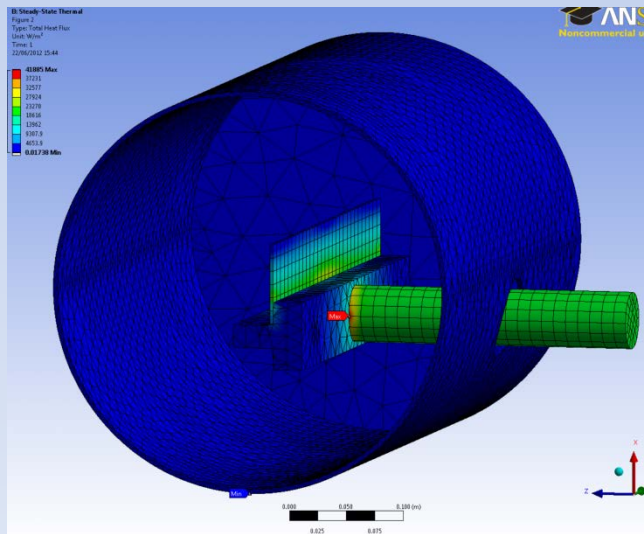


Cooling

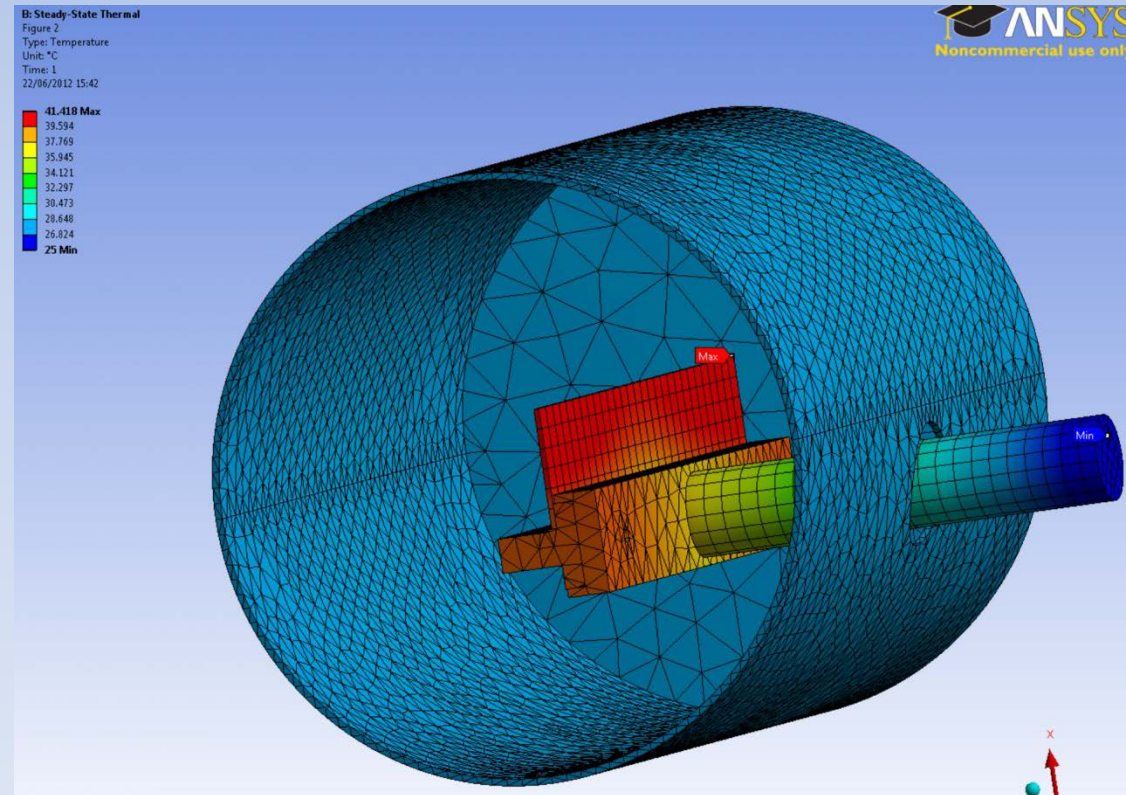
Cooling shall be by conduction and incorporate a copper rod of diameter 50mm approx. This will ensure that the blade does not reach excessive temperatures.

Ansys modelling has shown a maximum temperature of 42 C on the upper surface of the 4.2mm blade.

One end of the rod shall be maintained at 25C max by an external cooling jacket connected to the 25 Bar demineralised water supply for SMH16.

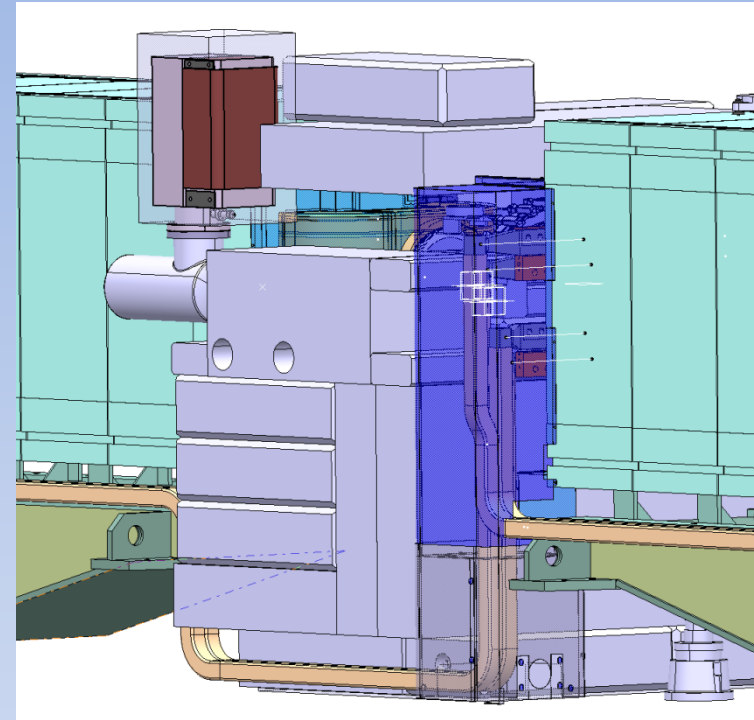
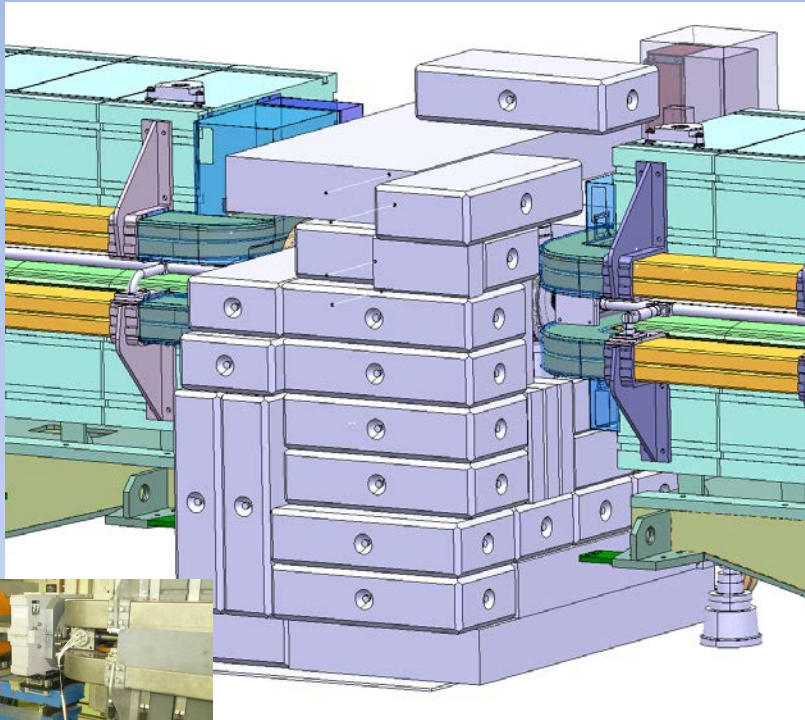


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Integration & Shielding SS15



- First study on shielding configuration
- To be discussed with Transport
- Busbars kept accessible and max shielding on downstream

Summary

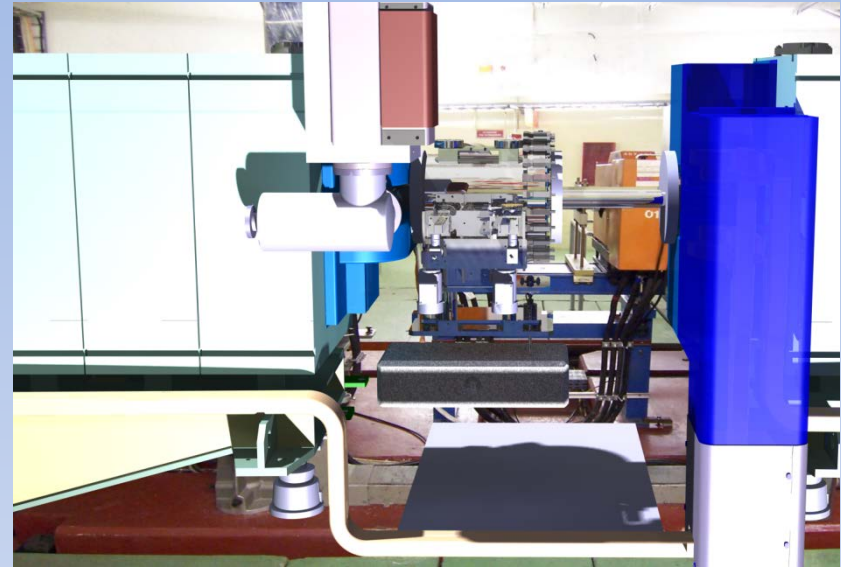
Concept has been defined,

Remaining issues to be addressed are:

- Beam Impedance

- Final design of cooling mechanisms,

- Shielding layout



The 3d model in Catia/Smarteam indicates clearance between flanges of 1060mm. Following checks in the PS during TS2 and the vacuum chamber distance between flanges is 1050mm.

Note: The drawing PS_LM_0040 1 E indicates a distance between flanges of 1045mm

This should be corrected !!!

Questions ??