JÜLICH
FORSCHUNGSZENTRUM

TOPAS

Time Of Flight Polarization Analysis Spectrometer at FRM2 in Garching

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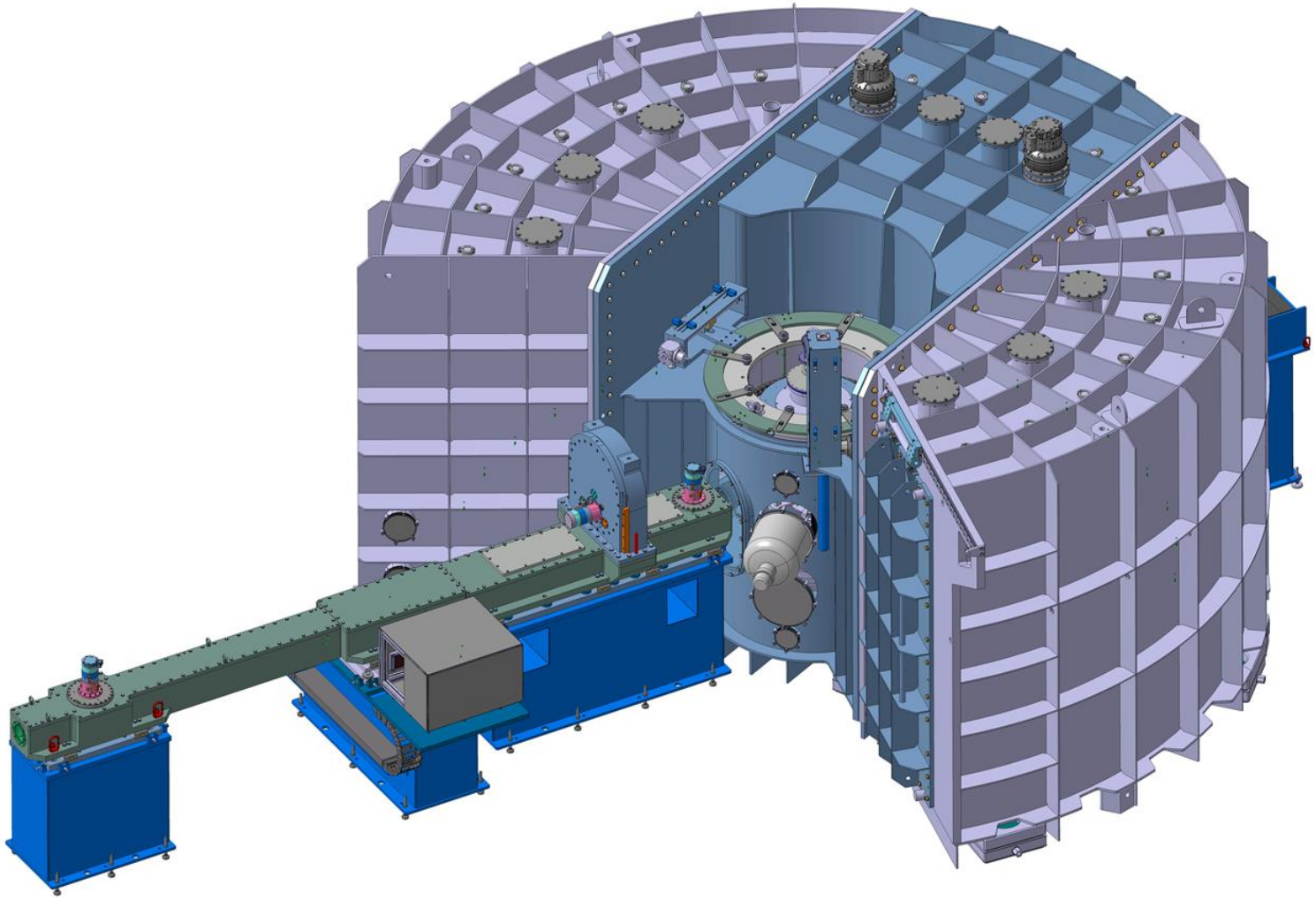
Abstract

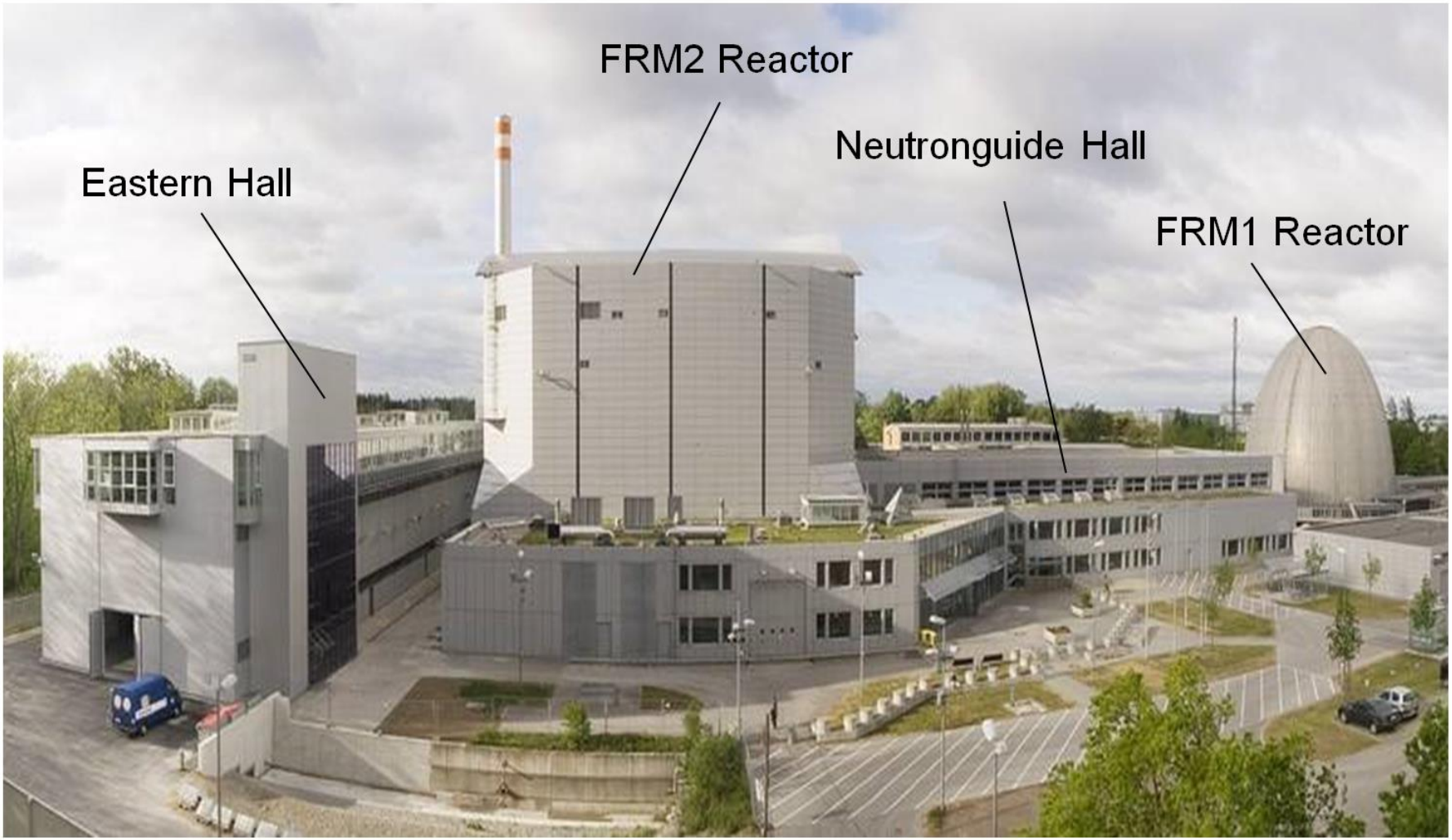
- In collaboration with the JCNS of the research center of Jülich we have to engineer and design the new Time Of Flight Spectrometer TOPAS. Our institute ZEA-1 is working on following parts of the spectrometer:

- Design, calculation, manufacture and mounting of
  - Vacuum chamber
  - Sample vessel
  - Detector supports
  - Fermi - and disc chopper
  - Chopper cascade

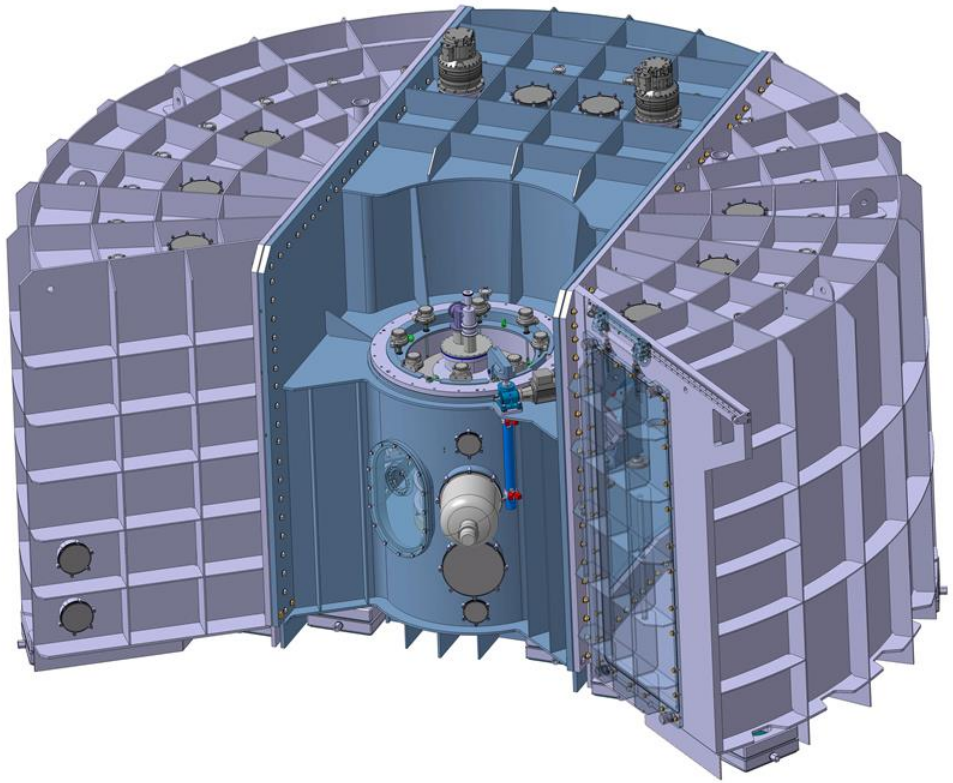
- Conception, installation, automatic control and test of the vacuum system

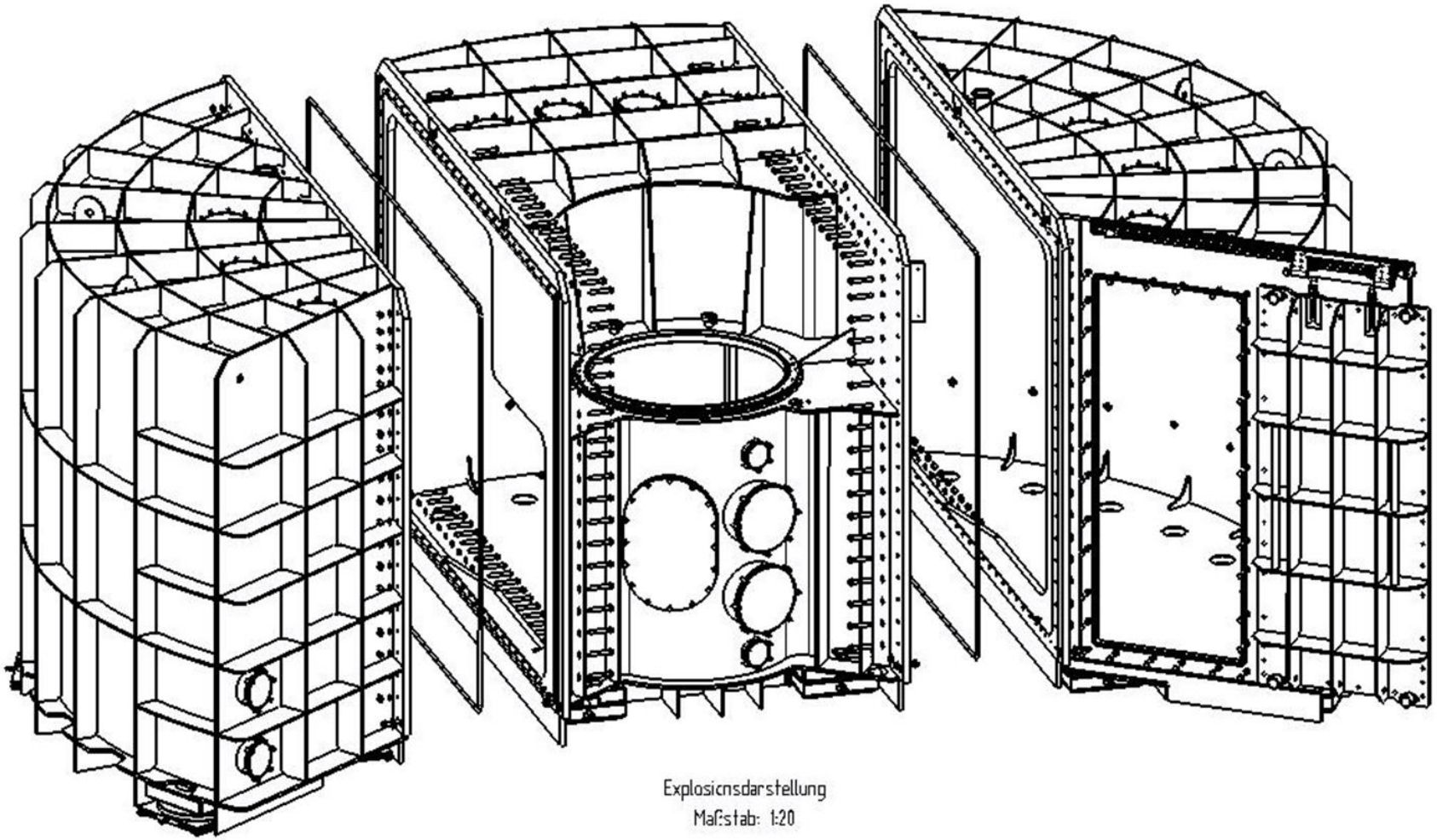
- In the following presentation I will talk about the vacuum chamber, the sample vessel and and the vacuum system

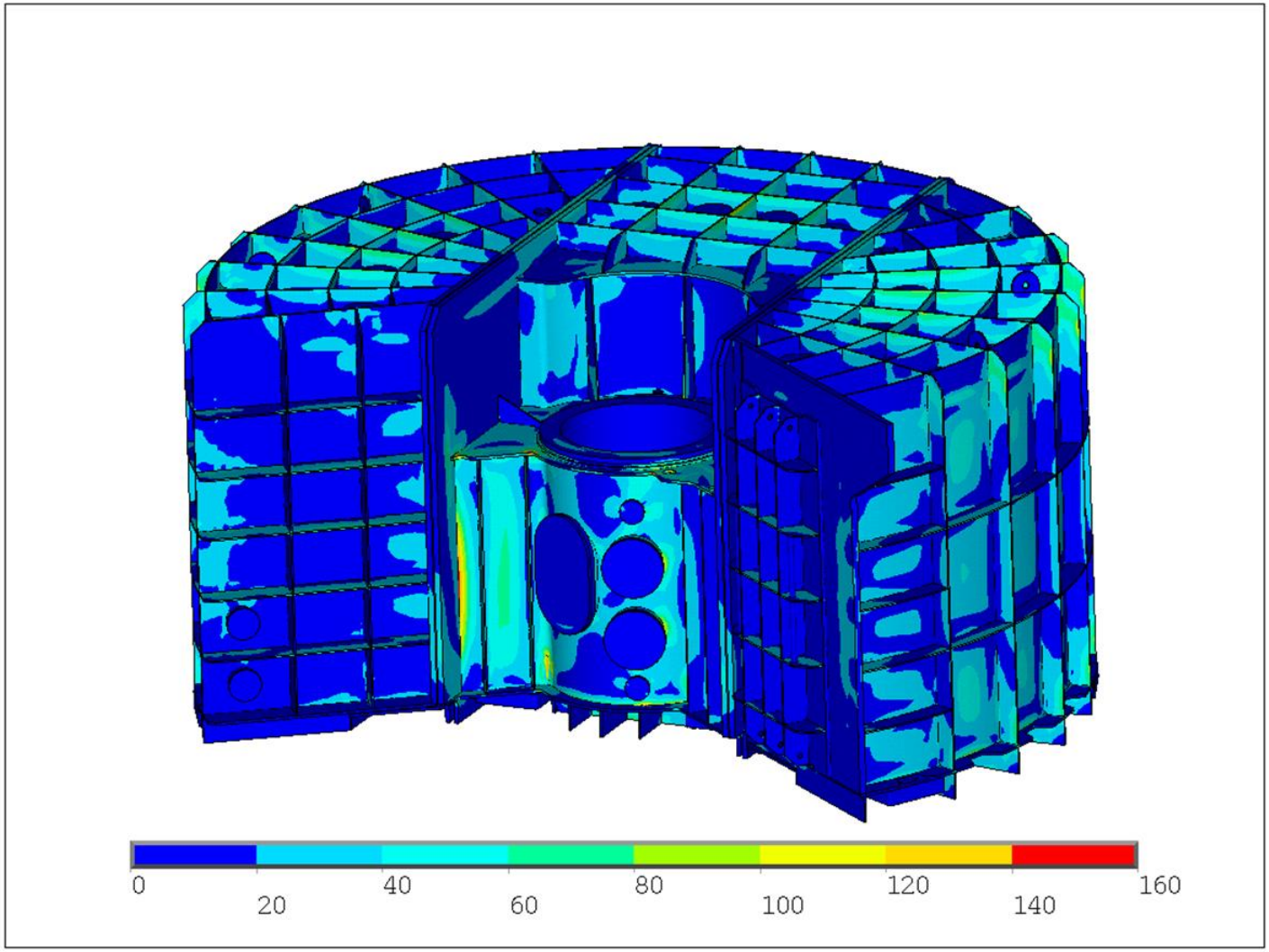



FRM2 Reactor
Eastern Hall
Neutronguide Hall
FRM1 Reactor

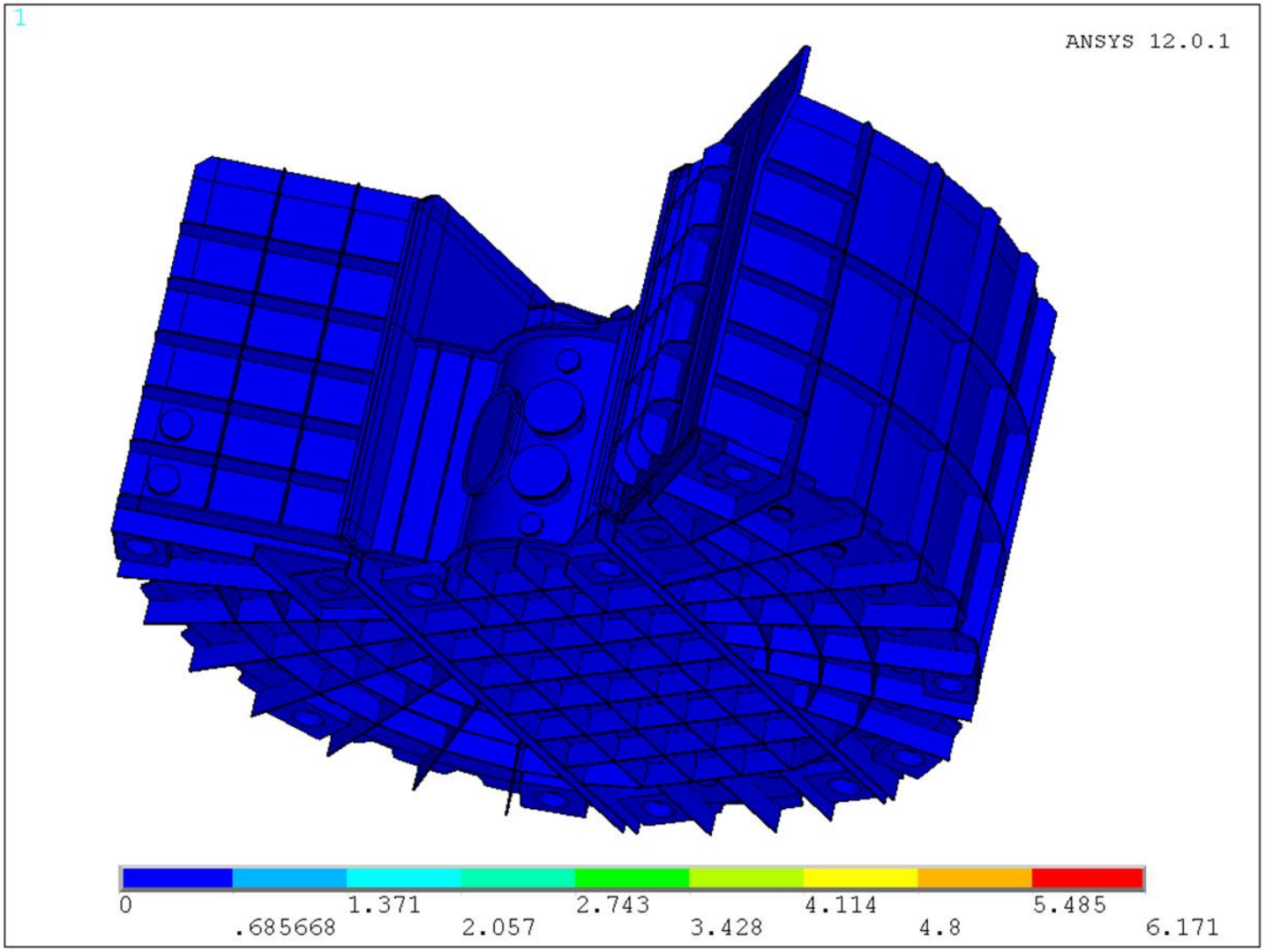
- **Vacuum chamber**
- **Material** **316 Ti**
  316 LN
- **Diameter** **6500 mm**
- **Height** **3200 mm**
- **Volume** **76 m^3**
- **Kryogen vacuum** **< 10^{-5} mbar**







Effective stress (N/mm2) of the evacuated chamber

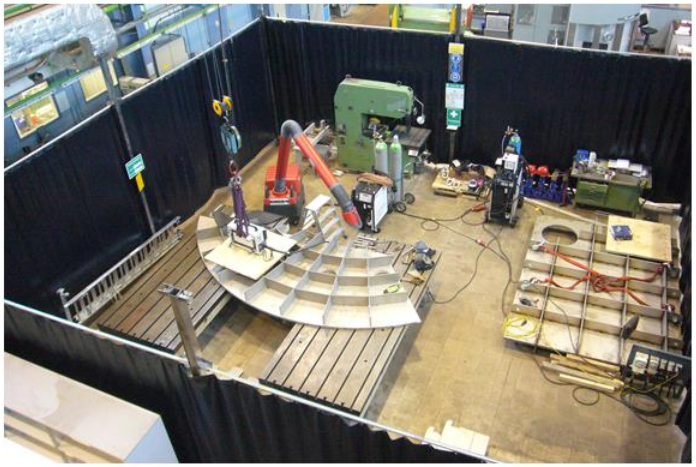


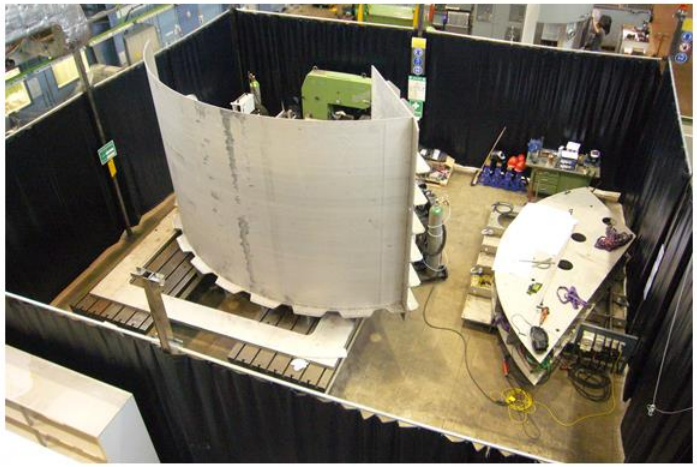
Deflection of the evacuated chamber in mm

- **The welding of the chambers**

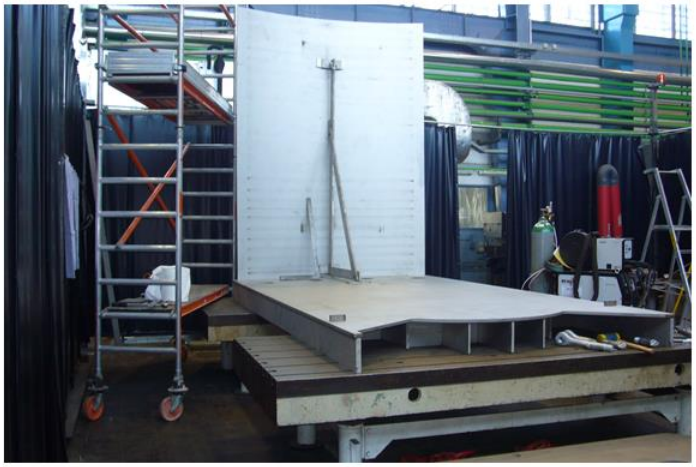
  all chambers were welded in the workshop of ZEA-1

  - Six welding layers
  - The chambers were welded from the inner side
  - First layer: Tungsten inert gas welding
  - The other layers: Metal active gas welding
  - The length of all seams is about 3 km
  - The section of all welding seams is 10 mm

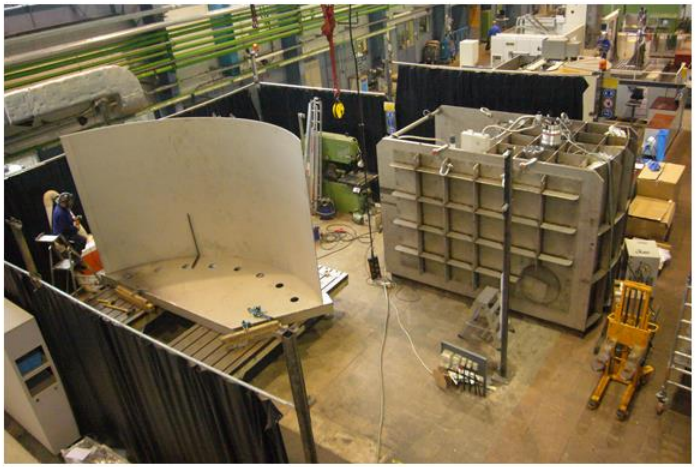
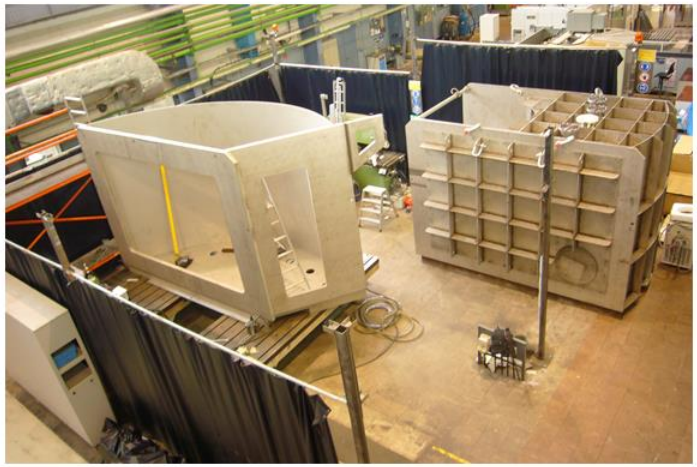
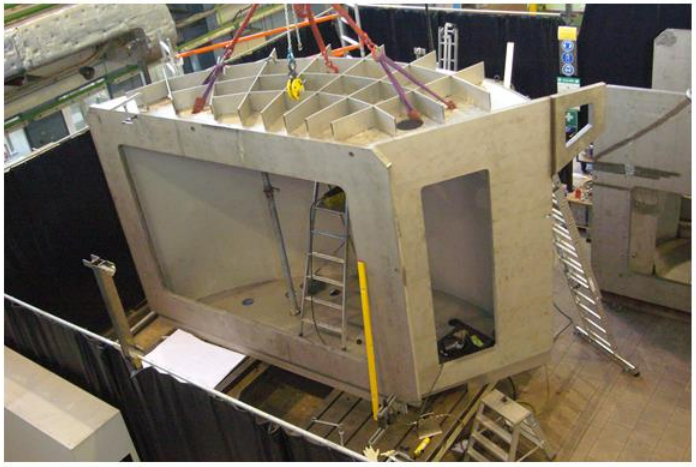




Welding of the left chamber

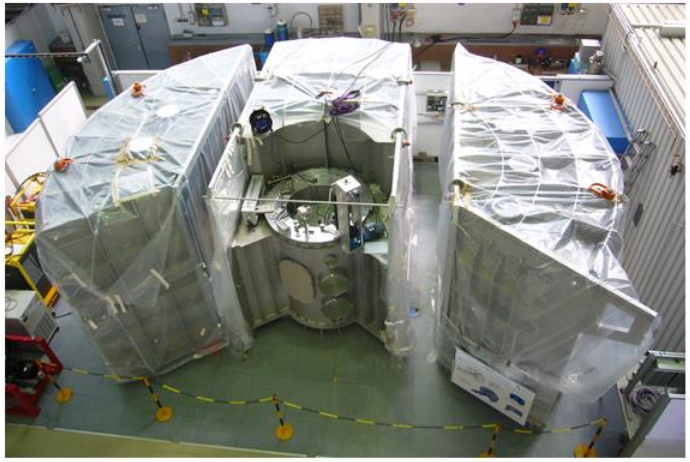


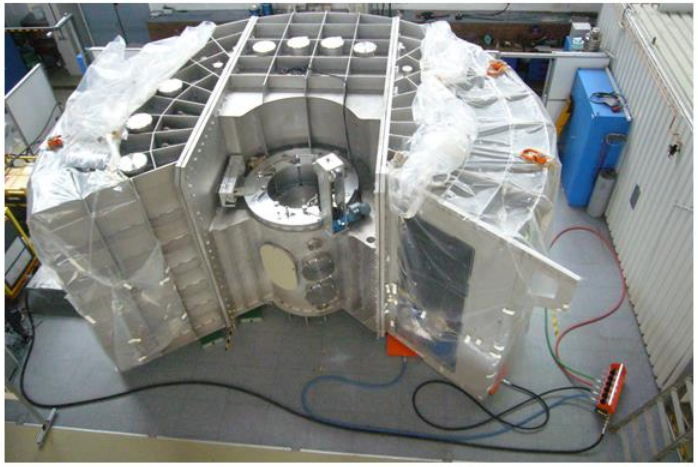
Welding of the central chamber

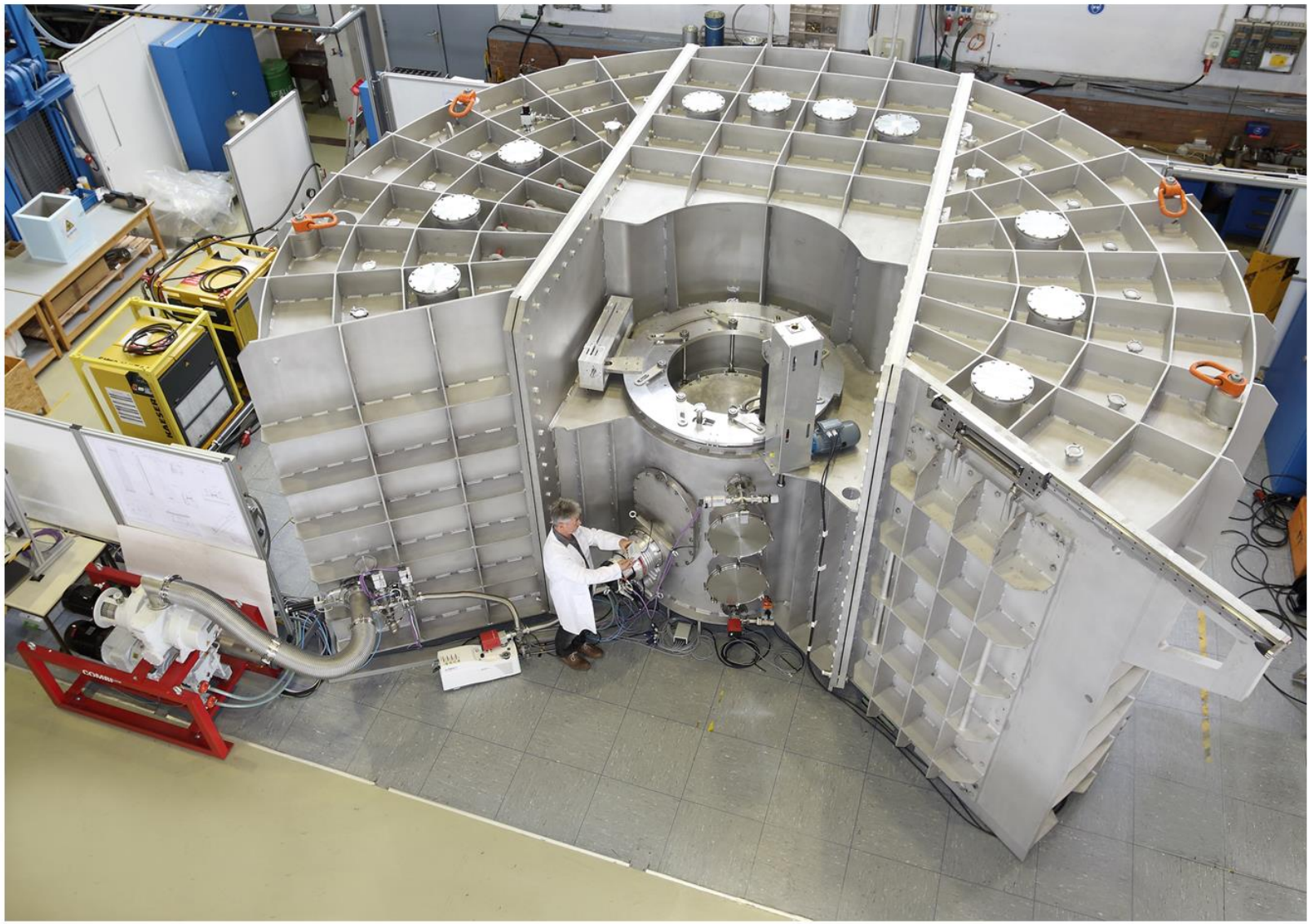

Welding of the right chamber

Leaktest of the chambers after the welding

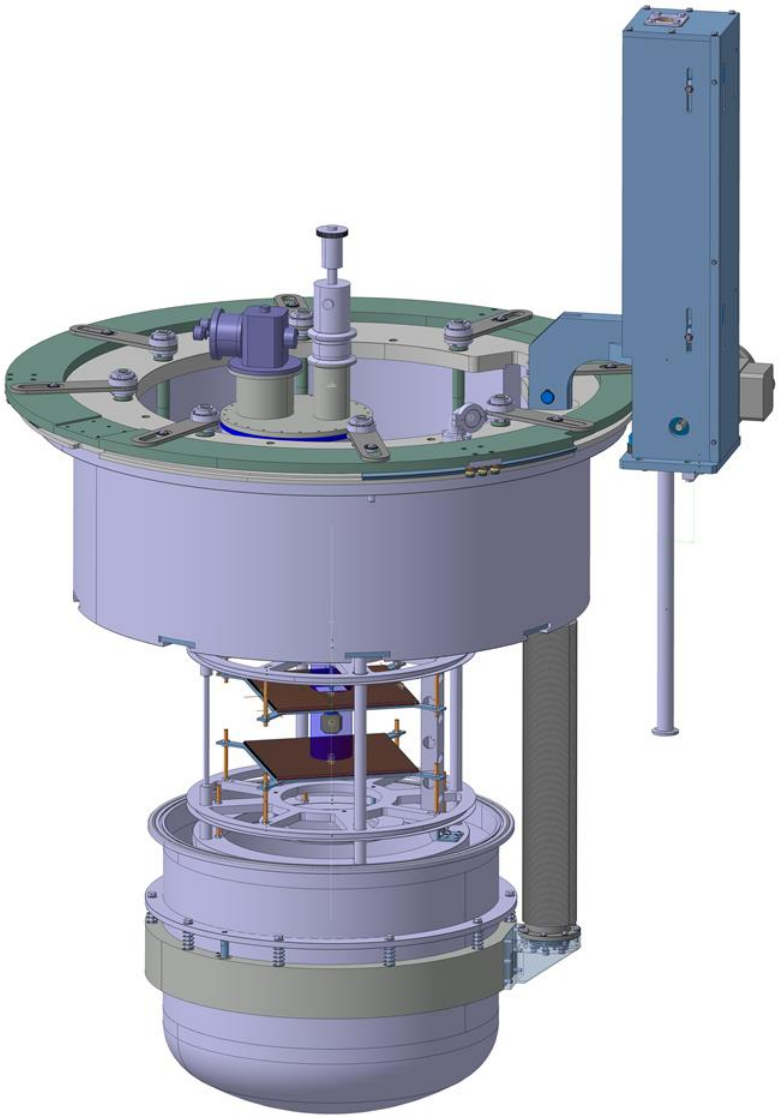




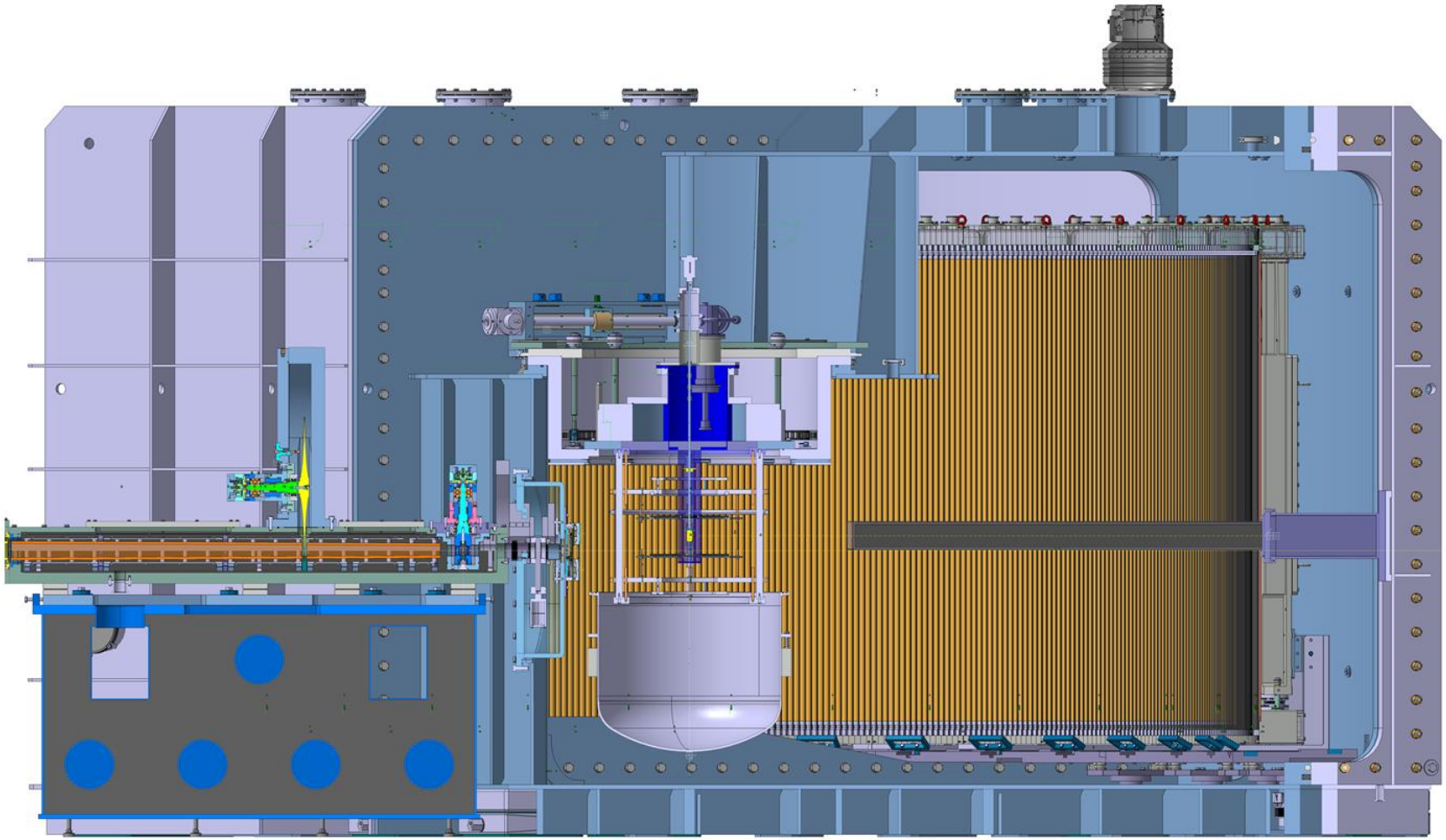
Test assembly in FZ-Juelich



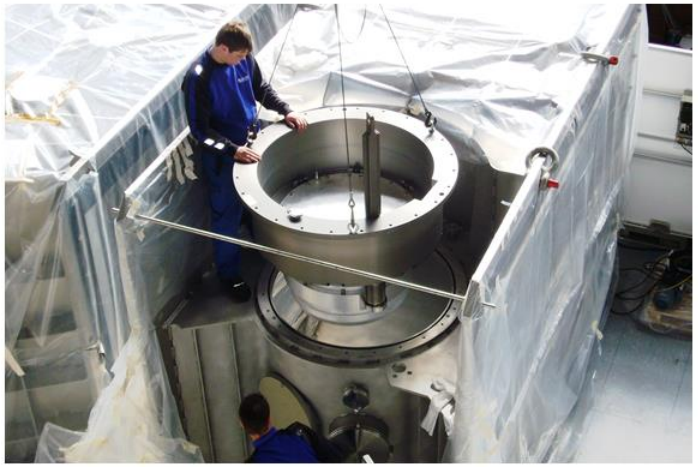
Test assembly in FZ-Juelich



- **Sample vessel**
  - Volume 0,3 m^3
  - Material aluminum alloy AlMg4,5Mn
  - Lifting gear
  - Lifting 600 mm
  - Fixed with 8 locking bars
  - Sealed with an o-ring in the flange of the sample chamber
- TOPAS-Testbehaelter2.avi

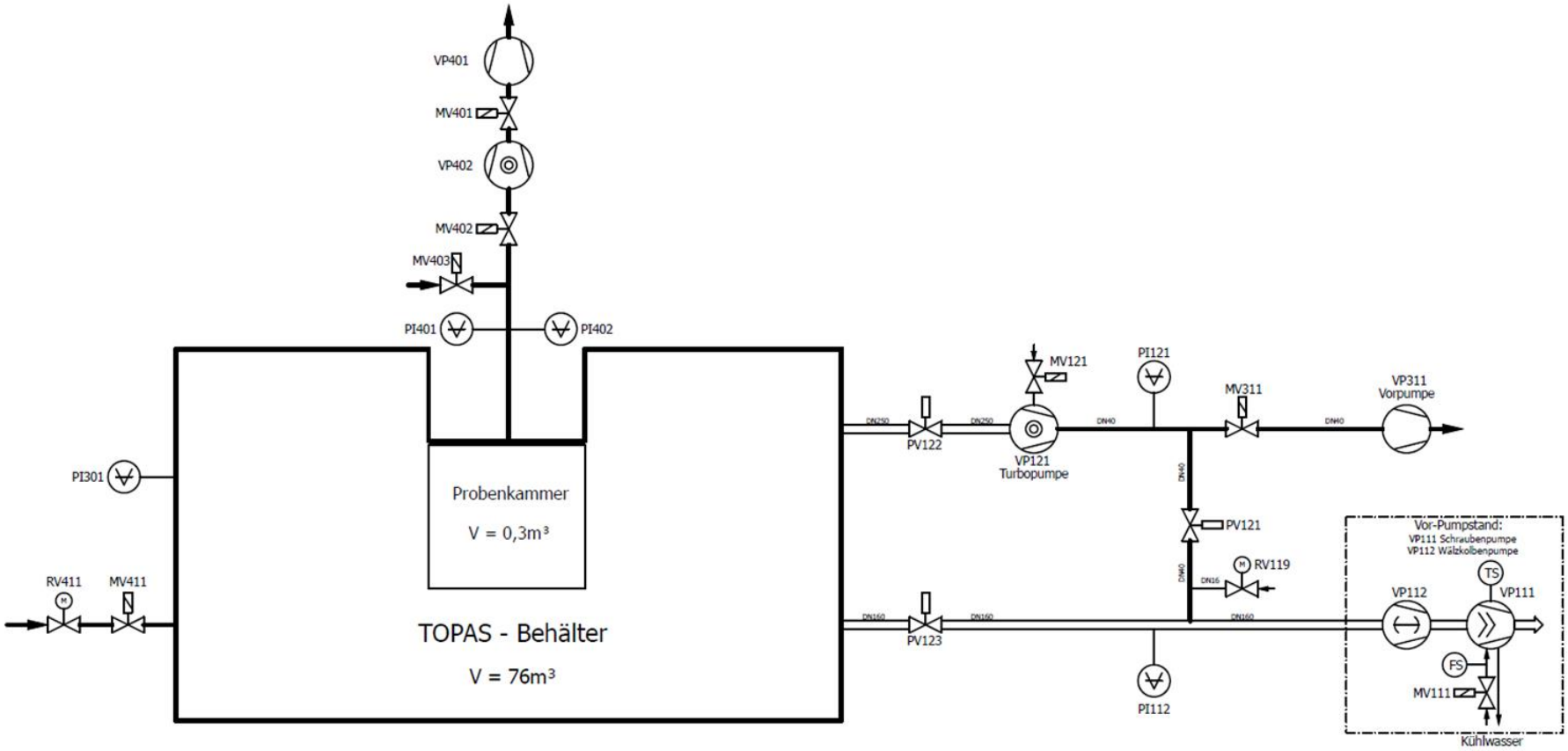


Cut through the central chamber with the opened sample vessel

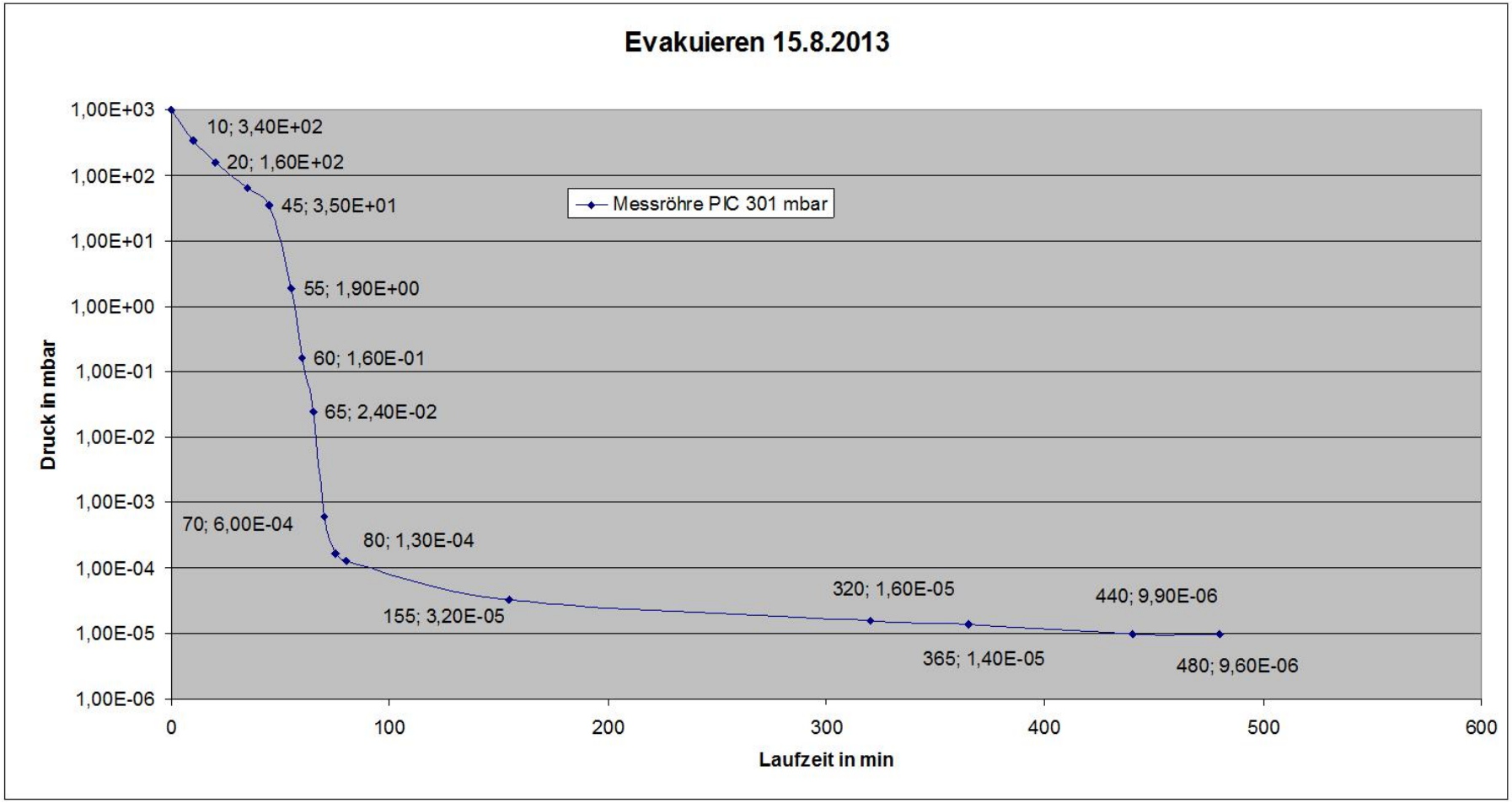


The mounting of the sample chamber

Vacuum pumps for the test run



Schema: vacuumsystem for the test run in FZ - Jülich



Evacuation test run

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Thank you for your attention