



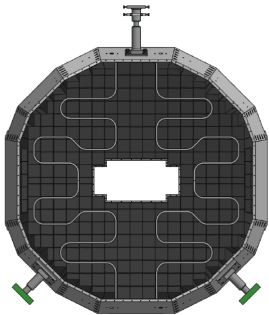
Mechanics Forward Endcap EMC

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Cooling: Front Cooling Pipes



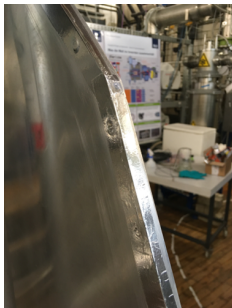
- 1st half of cooling lines finished
- 2nd half under construction
- Gluing to aluminum lid by means of UV-ray curing glue (Dymax 6-621)

Cooling: Front Lid



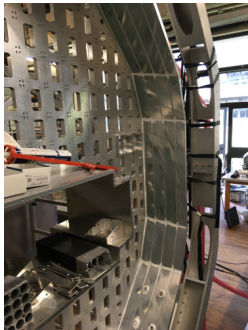
- Preparation of aluminum lid:
Gluing of 0.8 mm plate to 1 cm aluminum frame
- Glued in upright position, held in place by studs

Cooling: Front Lid



- Electromagnetic shielding by means of self-adhesive aluminum tape (3M EMI Aluminum Shielding Tape 1170)
- Fitting test with M5 studs, needed to increase hole diameter by 0.1 mm for easy insertion
- Studs will serve as tool during build-up of lid sealing, front lid installation aid (subsequently replaced by special flat head screws)

Cooling: Sealing



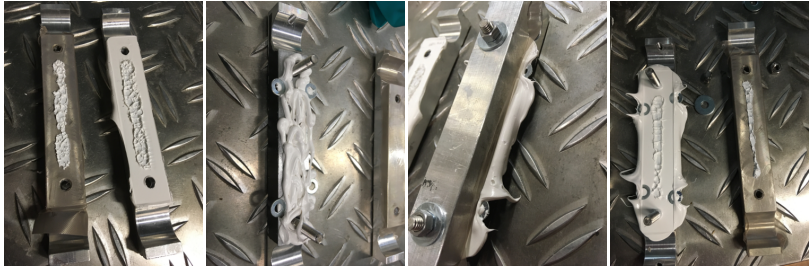
- Sealing of backplane - stiffener ring joints
- All sealings and glueings done with Sikaflex 295UV polyurethane compound (moisture curing - 24 h)
- Preparation of aluminum surfaces: cleaning (alcohol), sanding, activating (Sika Activator), priming (Sika Marine Primer)

Cooling: Sealing of Removable Front Lid



- Special case: Front lid to stiffener ring sealing (lid removable)
- Application of Sikaflex 295UV w/o bonding to front lid frame (0.08 mm self adhesive PTFE tape)
- Test pieces:
Aluminum bars w/ screw holes to mimic front lid frame

Cooling: Sealing of Removable Front Lid



- Width to height ratio of sealing does not allow proper curing of inner region within 24 h
- Remedy?
 - ▶ Increase of curing time (test: 1 week)
 - ▶ Increase of height: 0.4 mm to 0.8 mm (M4 screw washer)
- ⇒ Only minor improvement

Cooling: Sealing of Removable Front Lid



- Brute force: Water? → No adhesion to PTFE
- Even more brute force: Directly wetting the compound by spray
- Defined seal height by use of M5 washers on the studs
- ⇒ Completely cured seals after 24 h
- Test seal currently at Strahlencentrum Gießen for radiation hardness test (PU expected to be radiation hard, may harden somewhat)

Cooling: Ordering of Parts

- 7 cooling pipe heaters (4.5 kW each)
- 7 corresponding 40 A thyristor actuators
- 6 flow sensors 9-150 l/min (4-20 mA output) plus adaptor pipes
- PCBs for heater regulation and sensor readout

