



Aachen



CMS
BARREL MUON
DT CHAMBERS

Status of
Production
at Aachen

Hans Reithler
020611



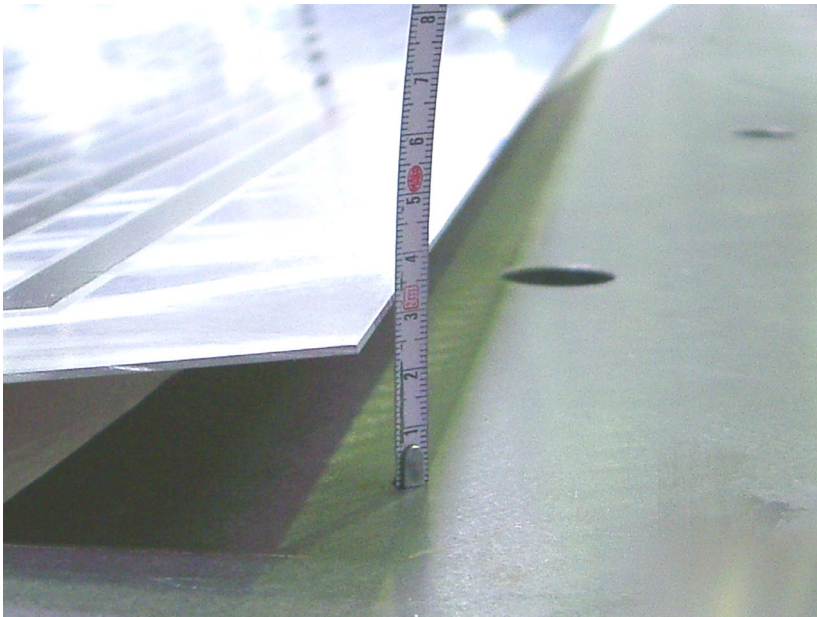
Status



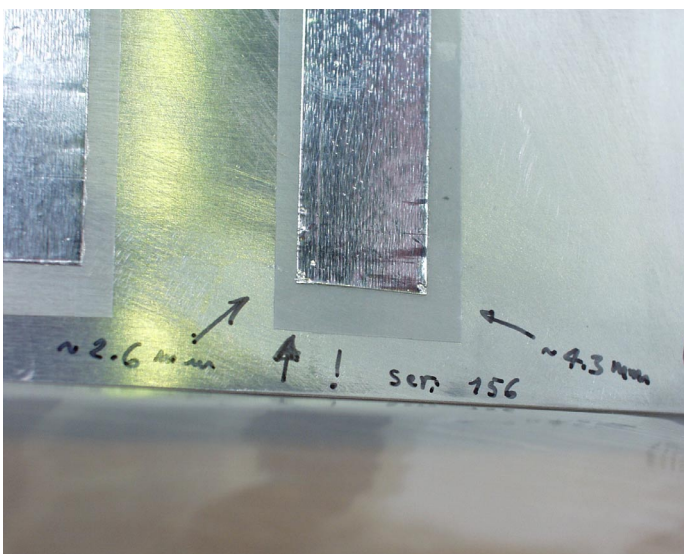
- Summary of SL/DT production:

SLs mech. finished	31
SLs cabled HV+FE	22 (incl. 1 damaged)
SLs HV recabled	16 (of 22); since 020515 - restart all tests
SLs HV test in Ar/CO2	9
SLs fully tested	6 (one of which was damaged)
DTs assembled	2

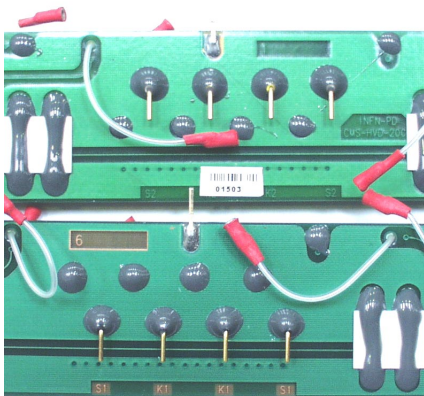
- M. De Giorgi and M. Pegoraro visited Aachen in May to help understanding problems encountered in SL tests. THANKS!
- Time consuming HV tests, due to varying results, seem now overcome. Training with higher current, substitution of HVBs with visible polymerization failure were main issues; see talk K. Hoepfner.
- Grounding and HV links also improved („soft HV GND“ to avoid loops).
- Should bundle HV cables (inside SL) at larger distance from PCBs; means recabling. Action started 020515.
- Noise rate ~30 Hz/cell: low and same for all SLs; see talk K. Hoepfner.
- Al plates: concern about Al strips too close to Mylar border. Which action to take when below 3 mm limit?
- Resume now assembly of DTs from SLs - SLs are satisfactorily tested and new tooling as well. Next DT assembled this week.
- Refurbishing of hall climatization will start next week. Implies ~1 month of reduced assembly work (no access to gluing tables). Continue recabling, testing and further HV+FE assembly of new SLs.
- Checked gluing of SL and of SL to honeycomb panel with a load test successfully.
- All 10 MB1 honeycomb panels measured on flat table. Planarity in all panels better than contractual limit of 2 mm. Are somewhat better than first batch.
- Problem found by Hexcel in skin gluing. Is understood and cured. Led to partial delivery, but are delivered in time, not affecting DT assembly.
- Pressure sensors can probably be operated at 5V (no extra supplies); irradiation test this week.
- Orders for gas and cooling components being processed. Savings through optimization and newest offers. Approval of hoses/flexible tubes (by safety) pending.



Newest batch of plates also contains plates with large bending (here ~33 mm).



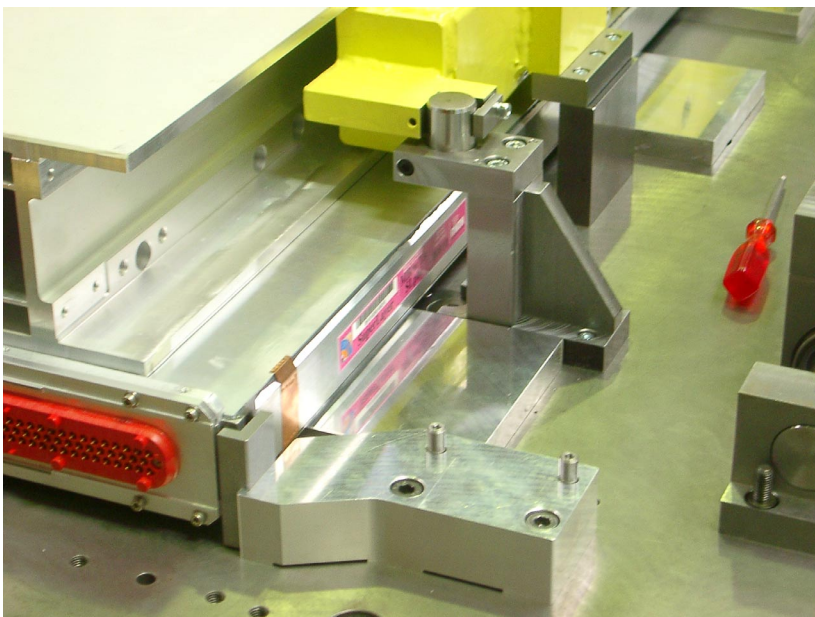
Concern: HV risk due to small insulator border outside specs (here 2.6 mm). Known problem at strip ends. In latest batch, on 63 faces found 315 strips with border < 3 mm. What to do, when below 3 mm limit (beyond another 4 kV / 10 min. HV test in air)? Attempt to remove ~1 mm Al at narrow border?



Two HVBs from two different batches (distinguish at layer numbering fields, at bottom here). Those from the batch at the bottom look all fine... but only ~500 pieces were delivered by this producer (from MDG).



Positioning an SL for DT assembly.



Referencing of the SL and of the honeycomb panel use the same precision holes in the tables as used during SL assembly.



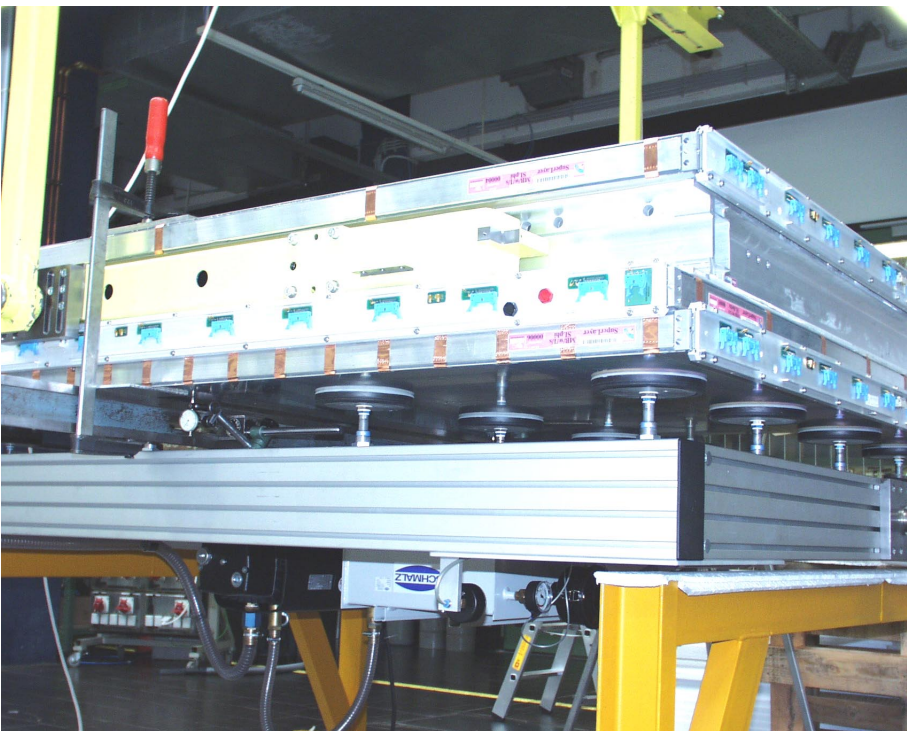
The vacuum lift is placed upside down on a support. The 24 vacuum pads are visible at the top.

The system is hold, hanging from the crane and with the vacuum lift activated but serving merely as load under the DT, ~2 cm above the support for 1 hour.

This additional load amounts to 270 kg, i.e. about **200% of the load from an RPC**.

The tension forces between load and honeycomb pass through 2 SLs.

3 precision gauges (one is visible here), mounted on a ruler underneath the DT, monitor deformations of the bottom face of the DT.



Load test performed on an MB1 chamber, to test the gluing of SLs and of SL to honeycomb panel. Result: within the test duration, no sound was heard and no deformation observed.



Routine test of honeycomb panel, here being performed by workers from Hexcel at Aachen to recheck the panels delivered. Hit gently with a hammer; if a region of the skin is not well glued, a difference in the sound is clearly noticed.



Surface of a panel being returned for repair, with the questioned areas marked by hand. This shows that even very small regions of bad gluing can be spotted.

The origin of the problem is understood and the panels are repaired.



Detail of the frame from the worst panel found (an MB3), after dismantling. The rests of honeycomb along the vertical part confirm that it was well glued to the lateral C-profile, as it should.

Summary: a problem was found and solved. Panel delivery still done within deadline, thus not affecting DT assembly.