

Status Field Cage :

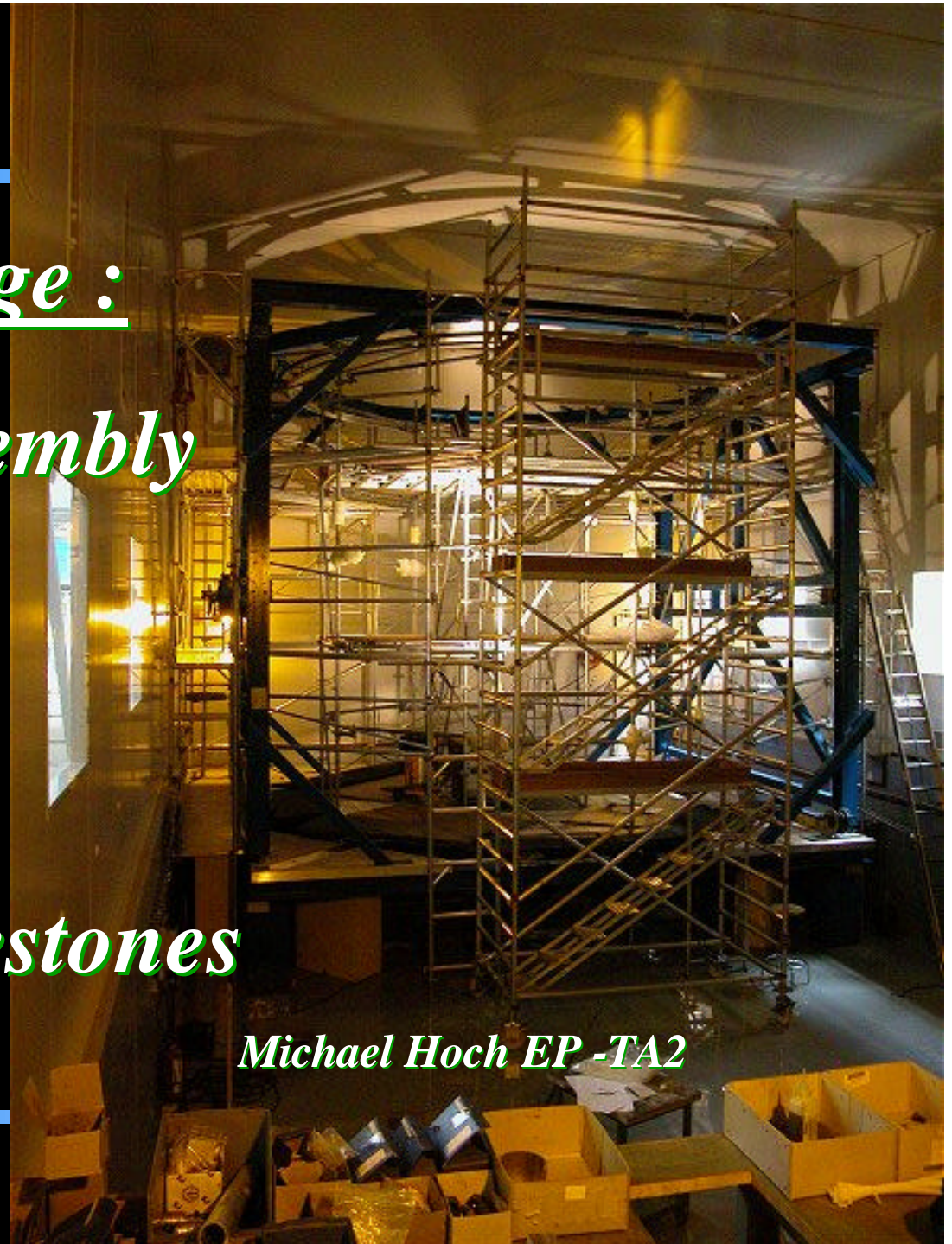
Field Cage Assembly

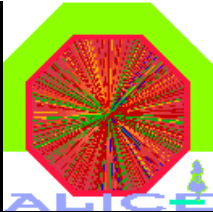
First HV Test

Leak Tests

Next Steps-Milestones

Michael Hoch EP-TA2

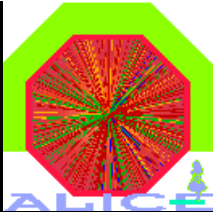




ICV and IFCC

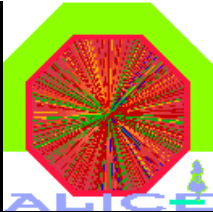
- IFCC assembled at FISCHER and shipped to Cern
small geometrical error corrected
- Aluminum cones
& inner drum for
ICV are ordered
- Delivery foreseen
November 2002
3 month delay





Flanges production





Flanges machining





Flanges: preparation



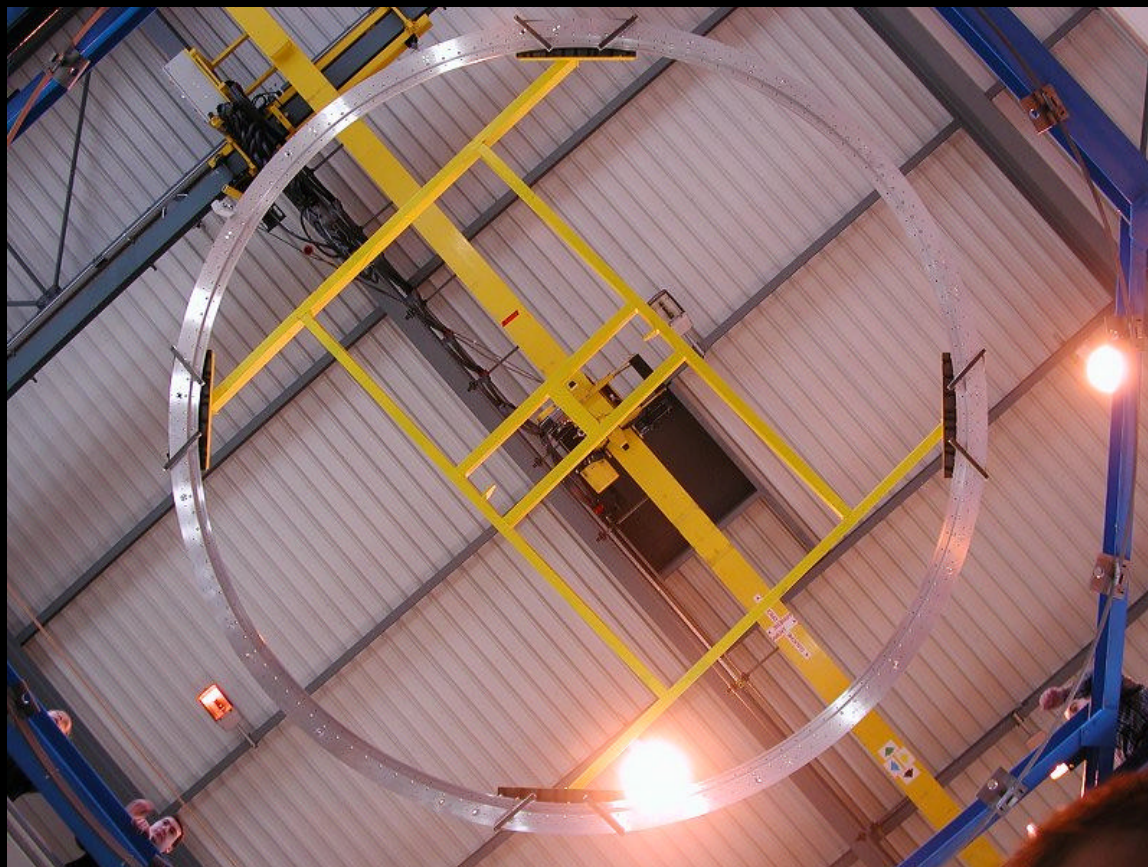


Flanges: preparation





Flanges: preparation

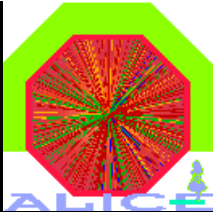




Flanges: Outer Containment Vessel

- Positioning flanges & Control





Flanges: Outer Containment Vessel





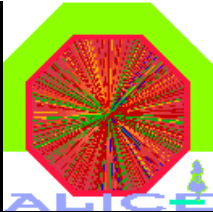
Assembly Outer FC Cylinder





Assembly Outer FC Cylinder





Assembly Outer FC Cylinder



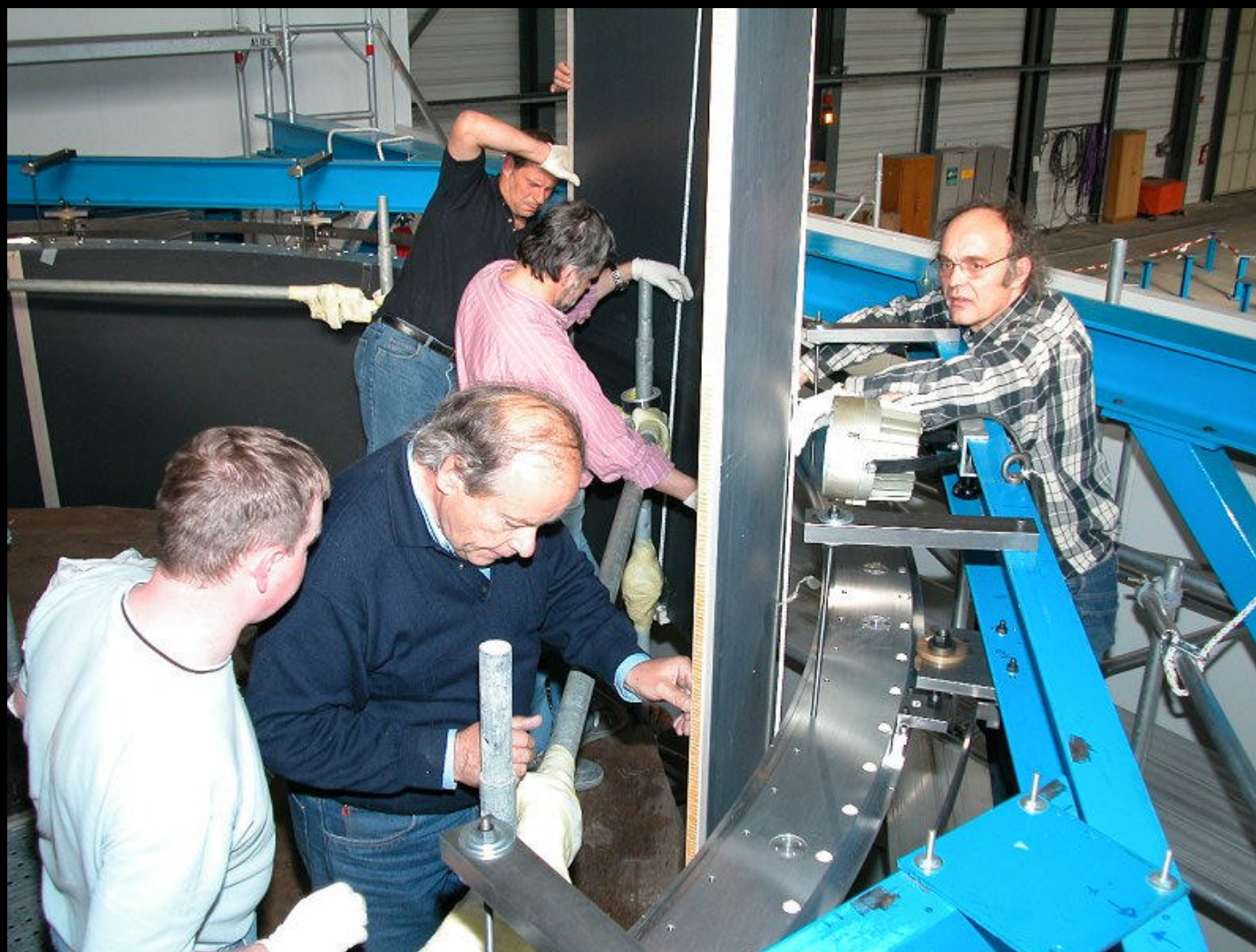


Assembly Outer FC Cylinder





Assembly Outer FC Cylinder





Assembly Outer FC Cylinder





Assembly Outer FC Cylinder



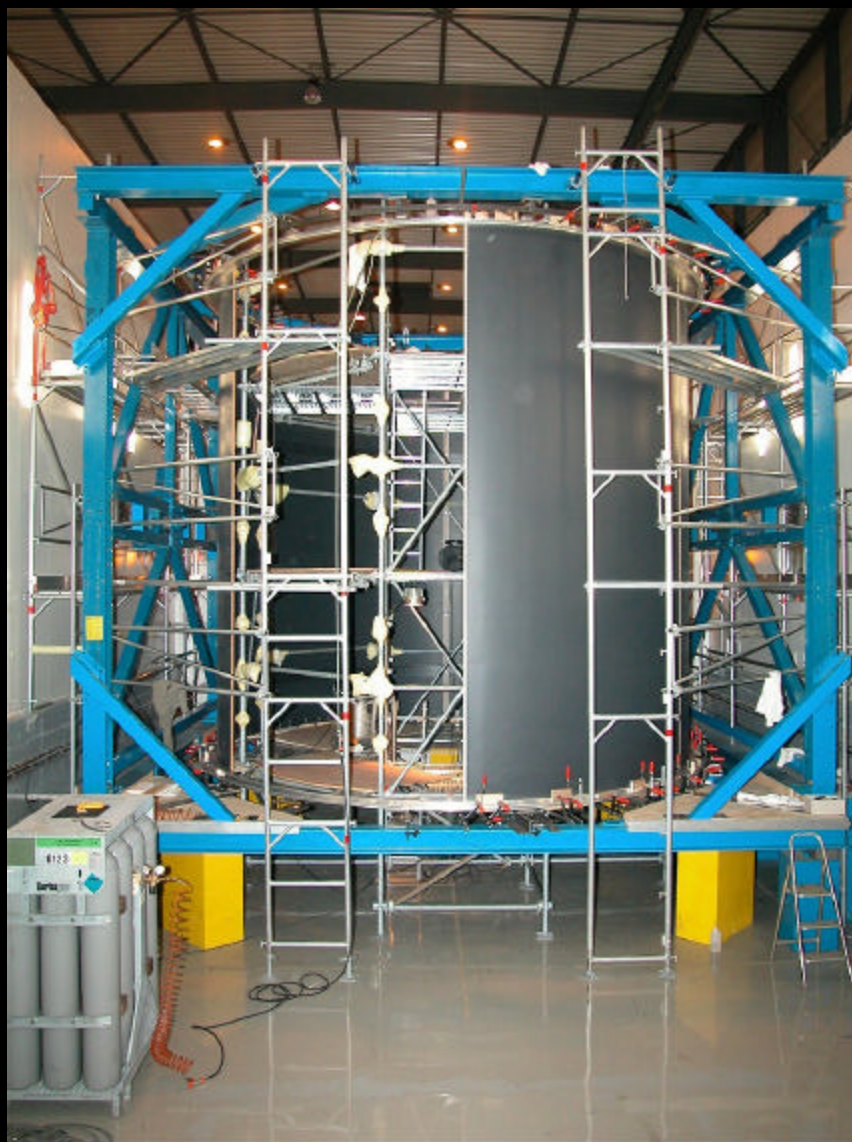


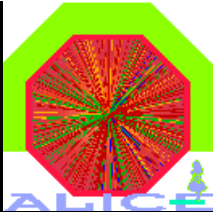
Assembly Outer FC Cylinder





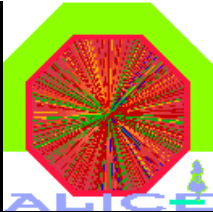
Assembly Outer FC Cylinder



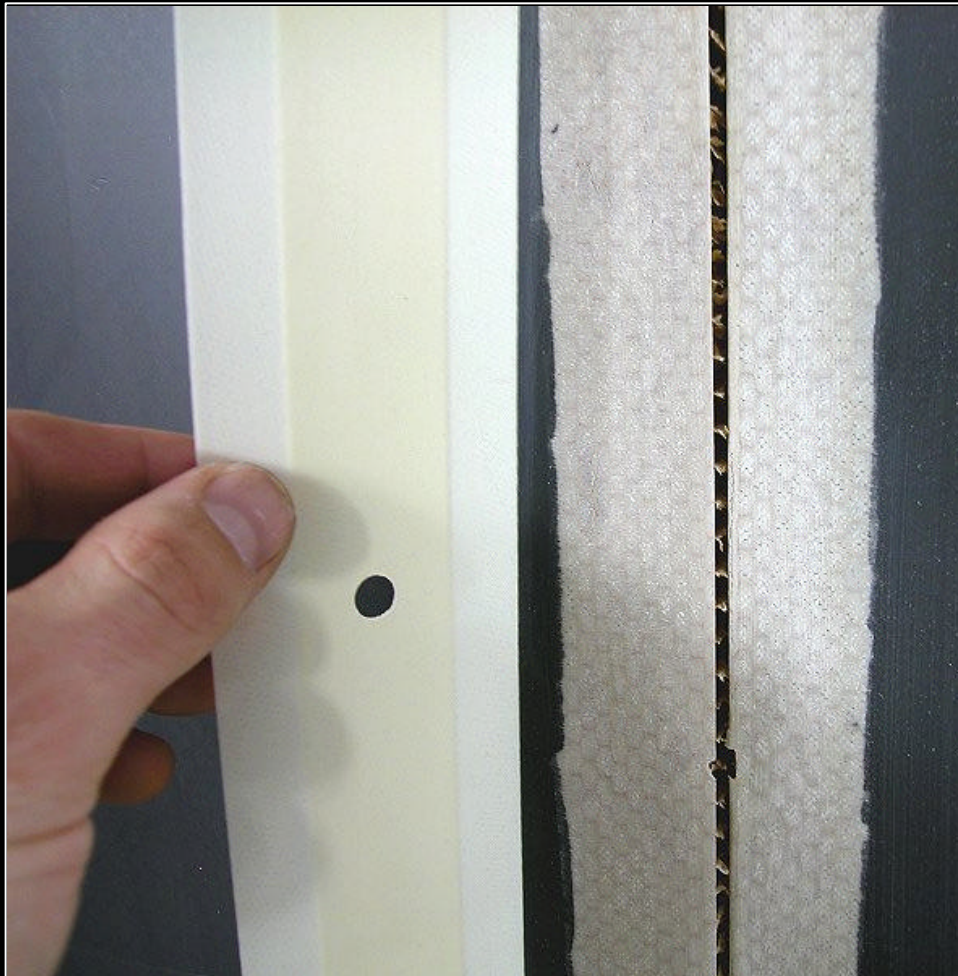


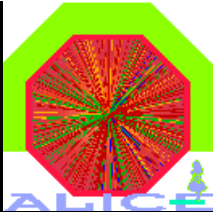
Outer FC Cylinder: Splicing





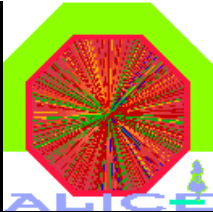
Outer FC Cylinder: Splicing





Outer FC Cylinder: Guard-Rings





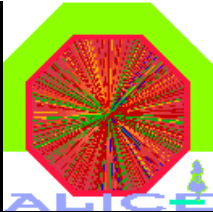
Outer FC Cylinder: Guard-Rings





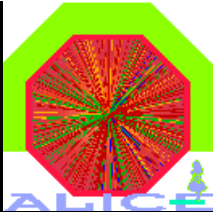
Guard-Rings: el. feed through





Guard-Rings: el. feed through





Guard-Rings: el. feed through





Outer FC Cylinder





He-Leak test : el.feed through



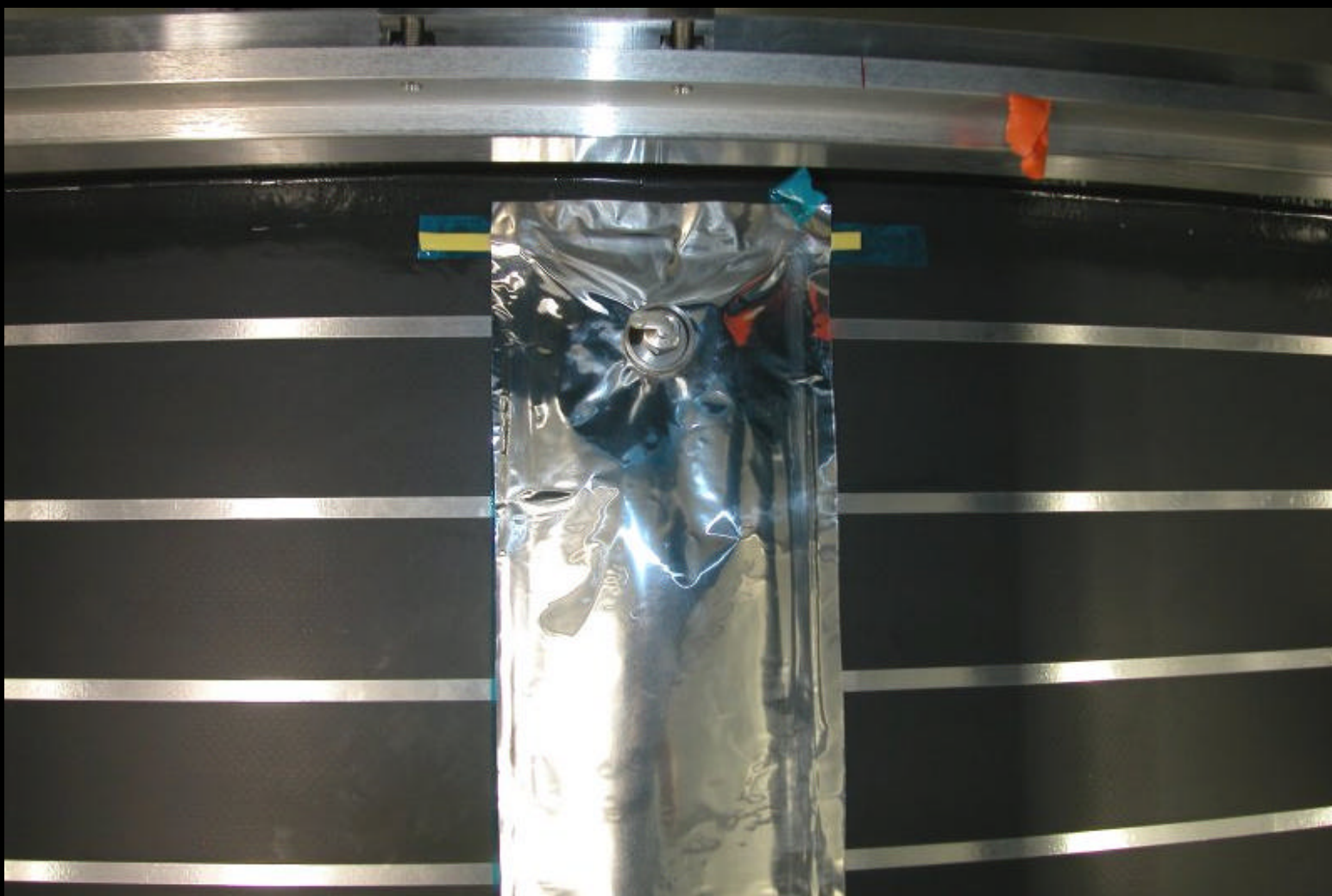


He-Leak test : el.feed through





He-Leak test : el.feed through



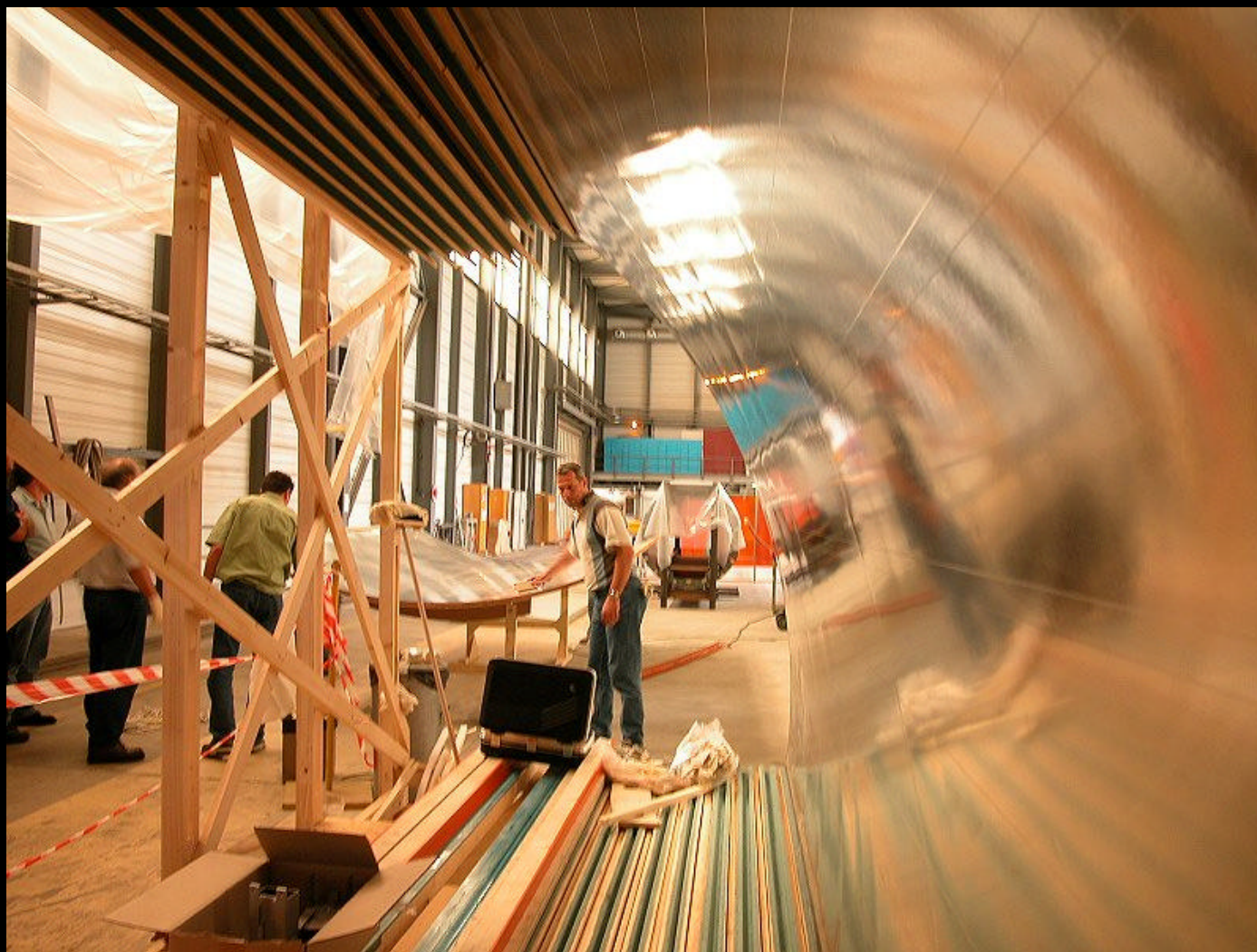


Assembly Outer FC Vessel





Assembly Outer FC Vessel





Assembly Outer FC Vessel





Assembly Outer FC Vessel





Assembly Outer FC Vessel





Assembly Outer FC Vessel





Assembly Outer FC Vessel



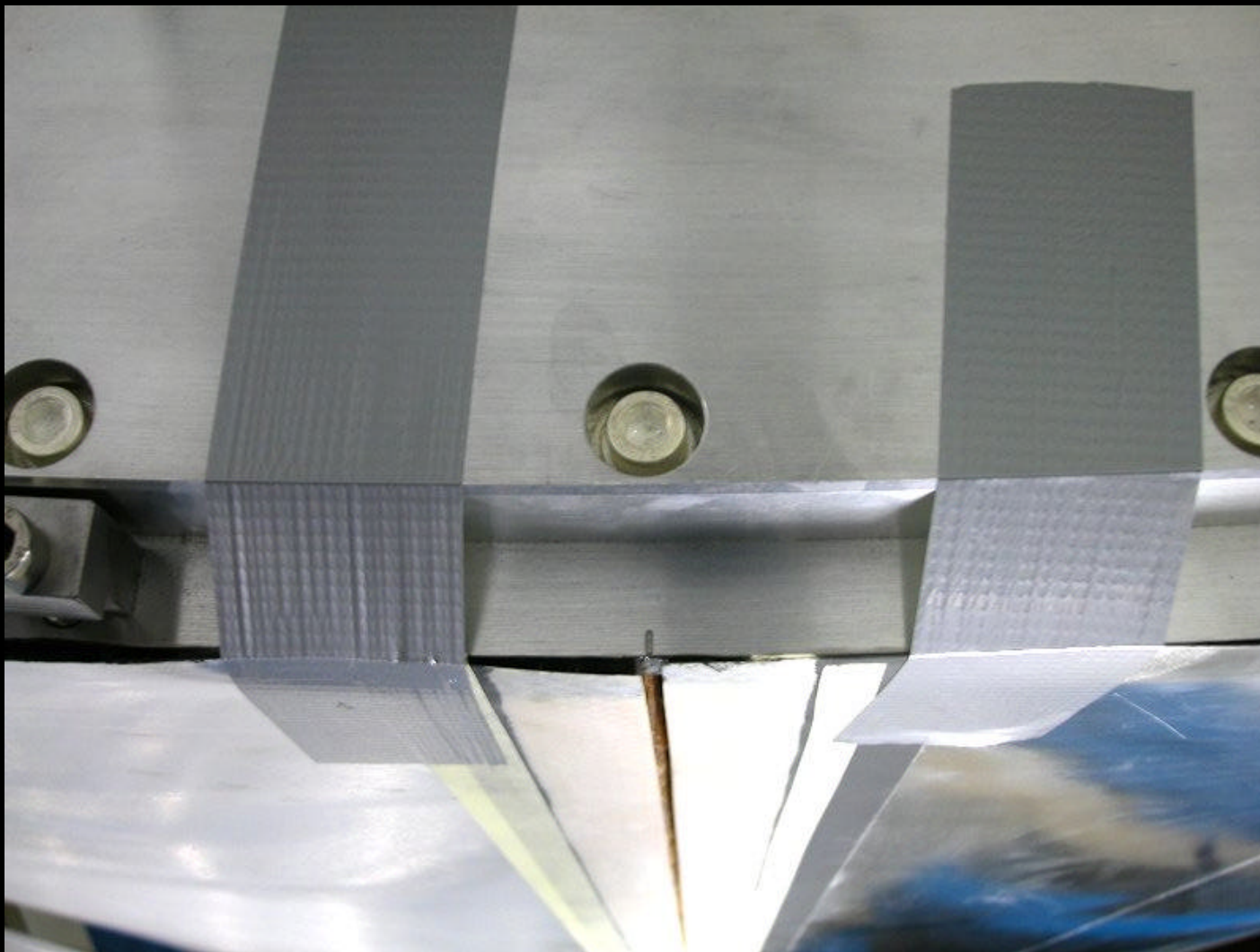


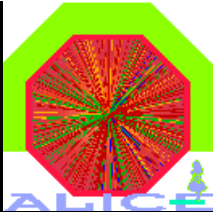
Assembly Outer FC Vessel





Assembly Outer FC Vessel





Assembly Outer FC Vessel



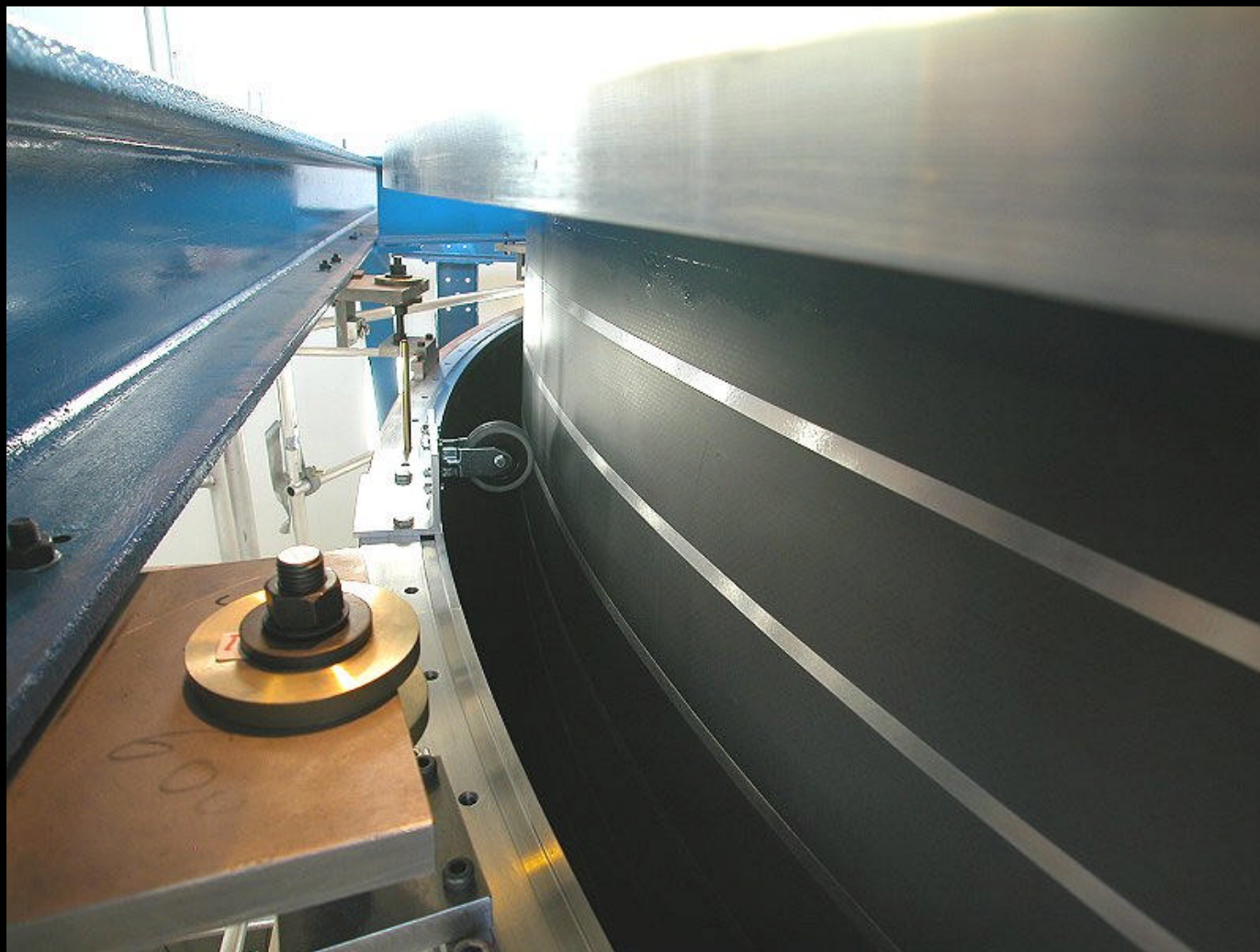


Dismantle out Outer FC Cylinders





Dismantle out Outer FC Cylinders





Dismantle out Outer FC Cylinders





Dismantle out Outer FC Cylinders





Dismantle out Outer FC Cylinders





Dismantle out Outer FC Cylinders



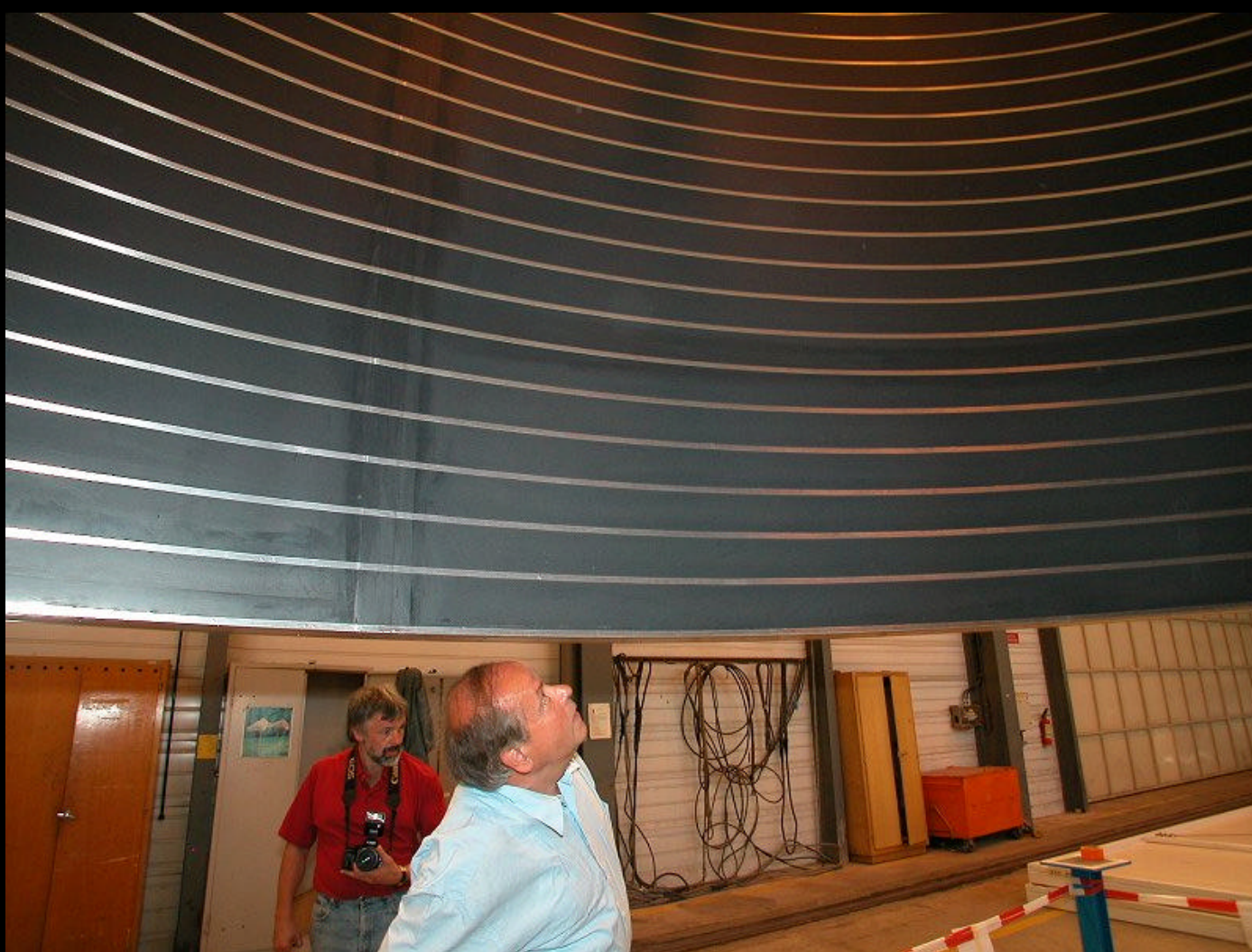


Dismantle out Outer FC Cylinders



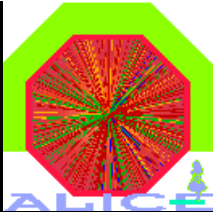


Dismantle out Outer FC Cylinders





FC Cylinders



Outer FC Vessel: Splicing





Assembly of the Outer Cylinders





Assembly of the Outer Cylinders

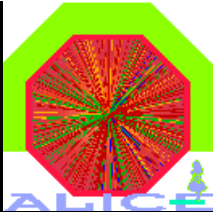




A



Cylinders



Assembly of the Outer Cylinders



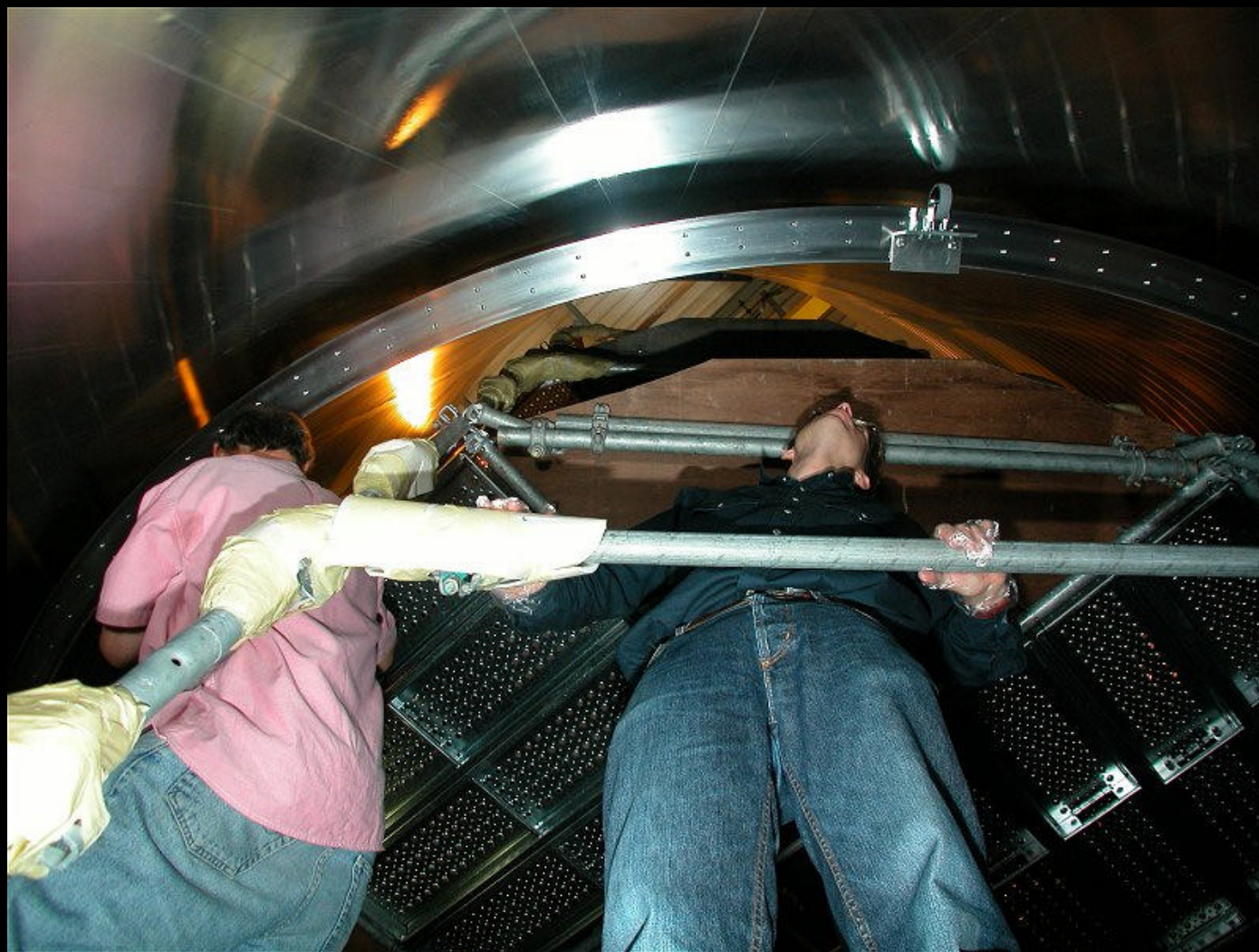


Assembly of the Outer Cylinders





Assembly of the Outer Cylinders





Assembly of the Outer Cylinders



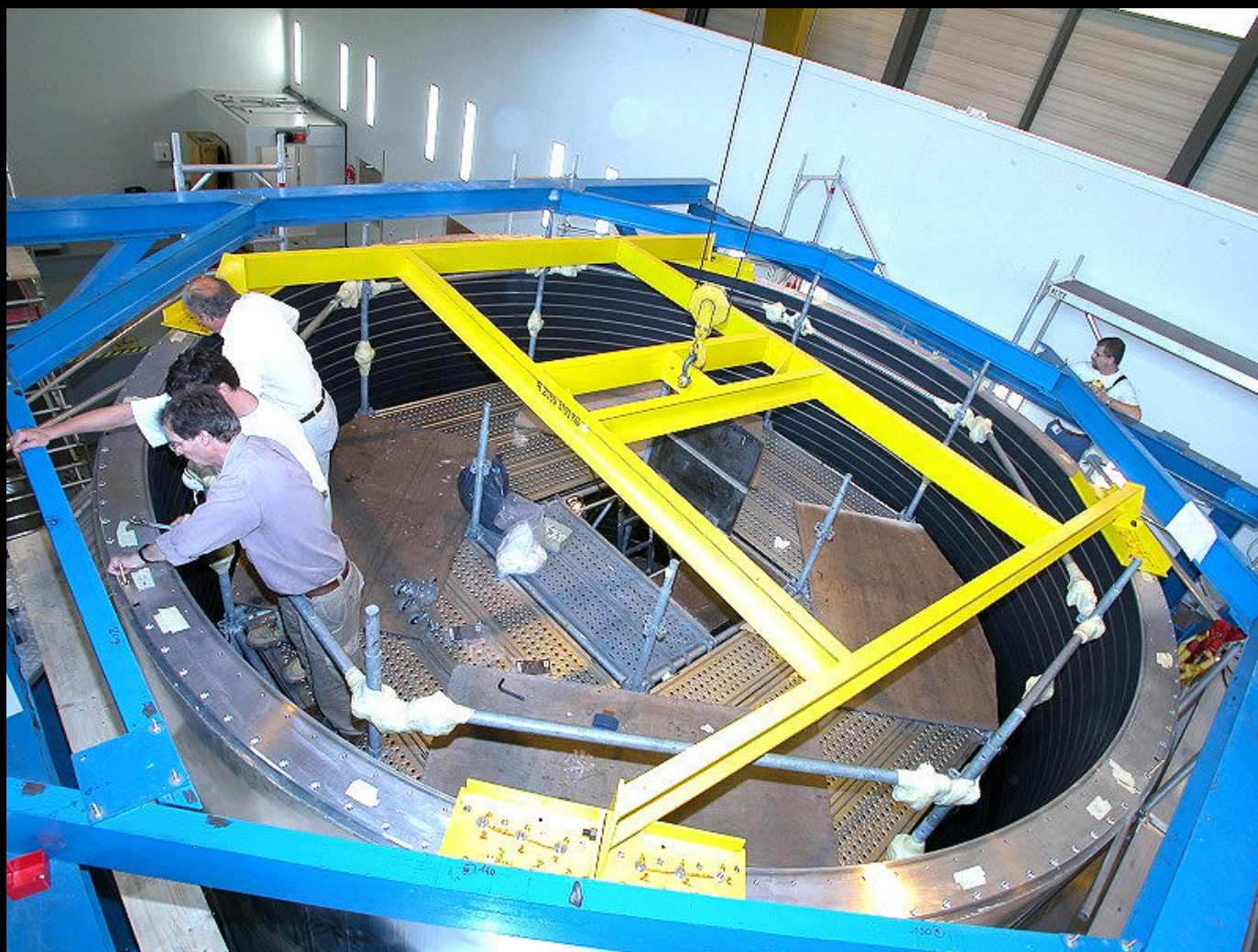


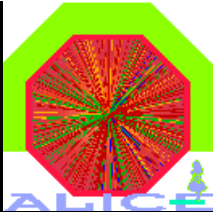
Assembly of the Outer Cylinders





Assembly of the Outer Cylinders





He-Leak Test Outer Cylinders

Leaks sensitivity

✂ 3×10^{-6} mbar l/sec

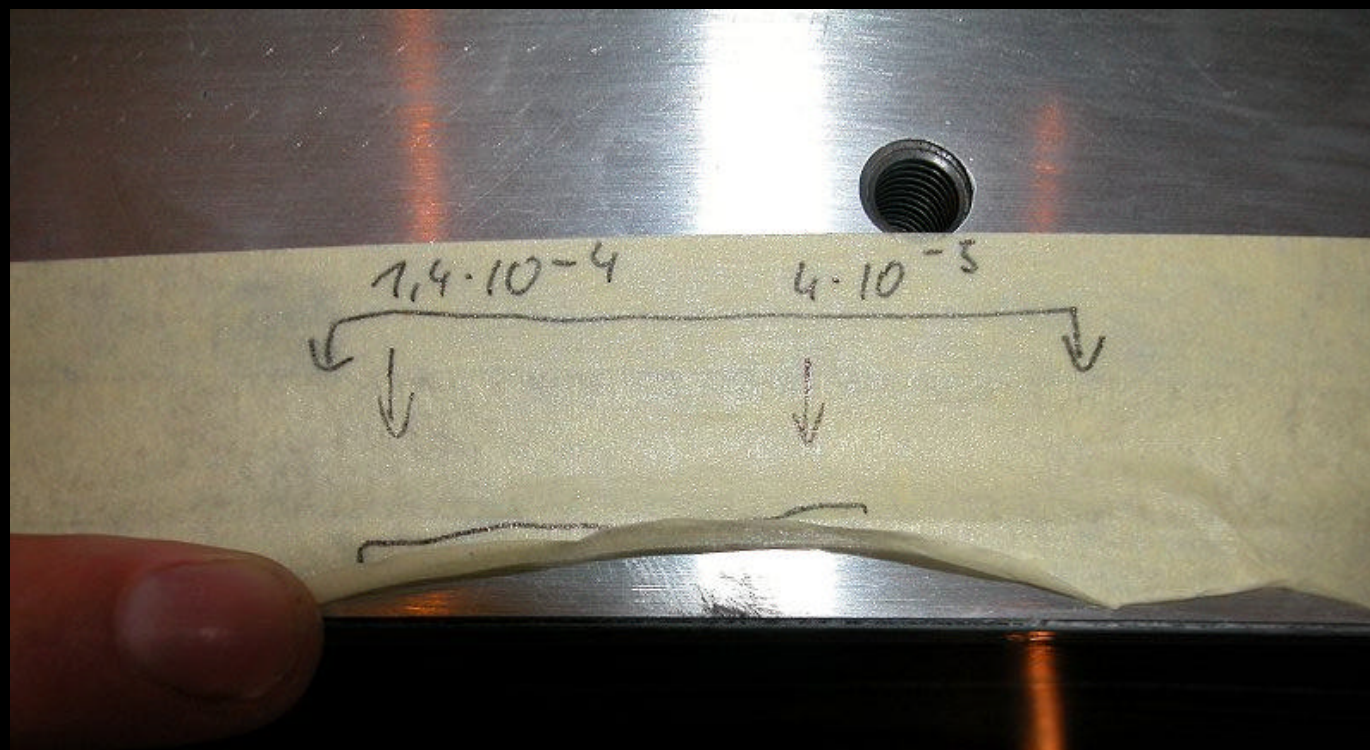
Ca 1000x smaller then
requested overall leak
rate

3 leaks found and
repaired





Repair of 3 small Leaks





Repair of 3 small Leaks





Guard ring resistors Outer FC



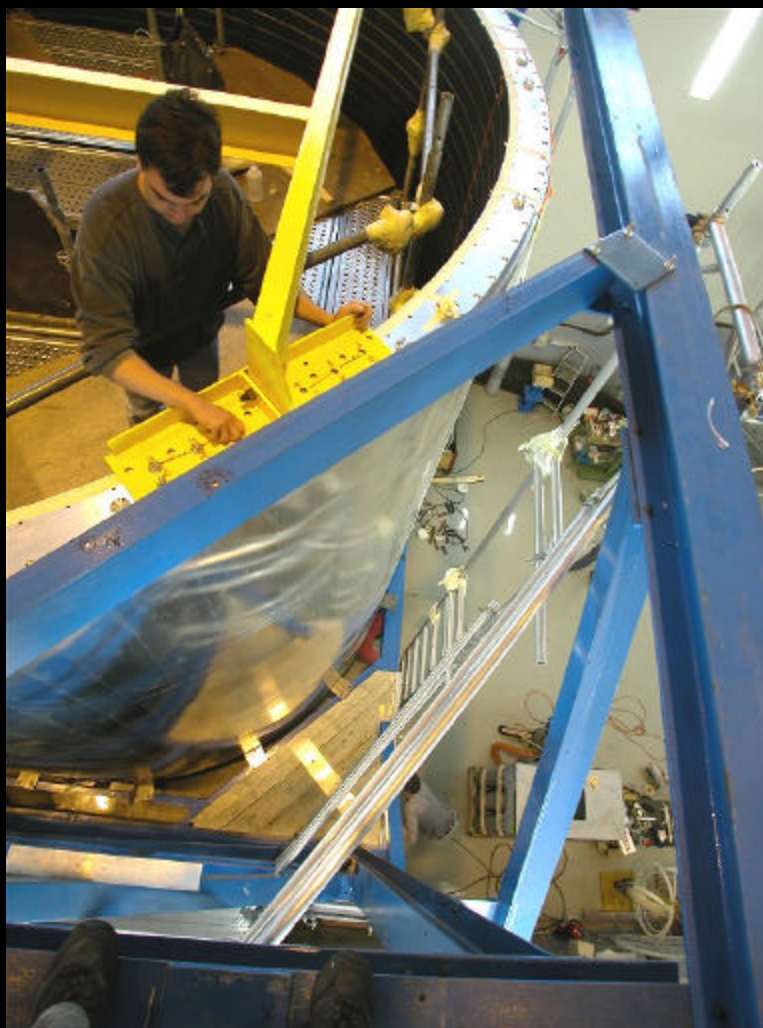


Guard ring resistors Outer FC





Outer FC leaves Clean Room





Outer FC leaves Clean Room





Outer FC leaves Clean Room





Outer FC leaves Clean Room





Outer FC leaves Clean Room





Outer FC leaves Clean Room





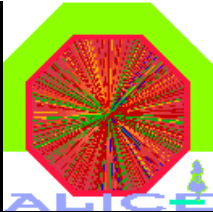
Outer FC leaves Clean Room





Outer FC leaves Clean Room





Outer FC leaves Clean Room





Outer FC leaves Clean Room





Outer FC leaves Clean Room





Endplates arrive at Cern



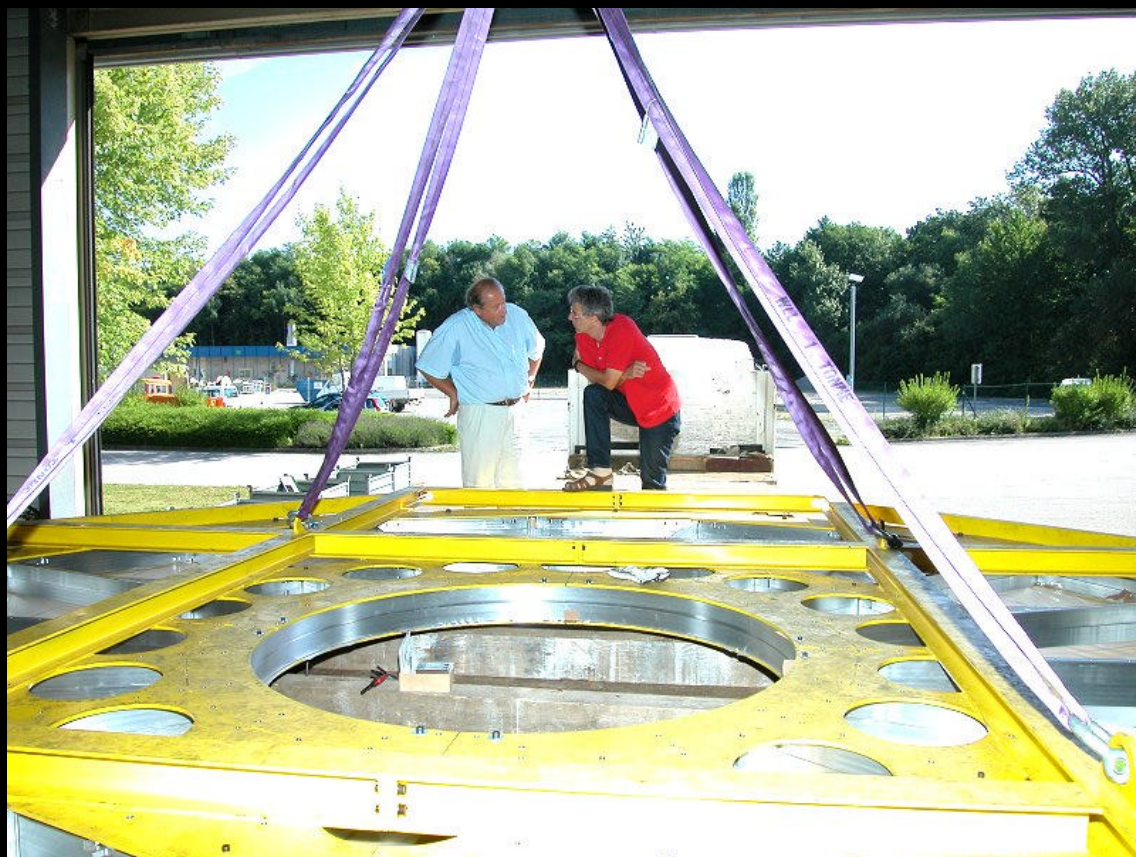


Endplates arrive at Cern





Endplates arrive at Cern





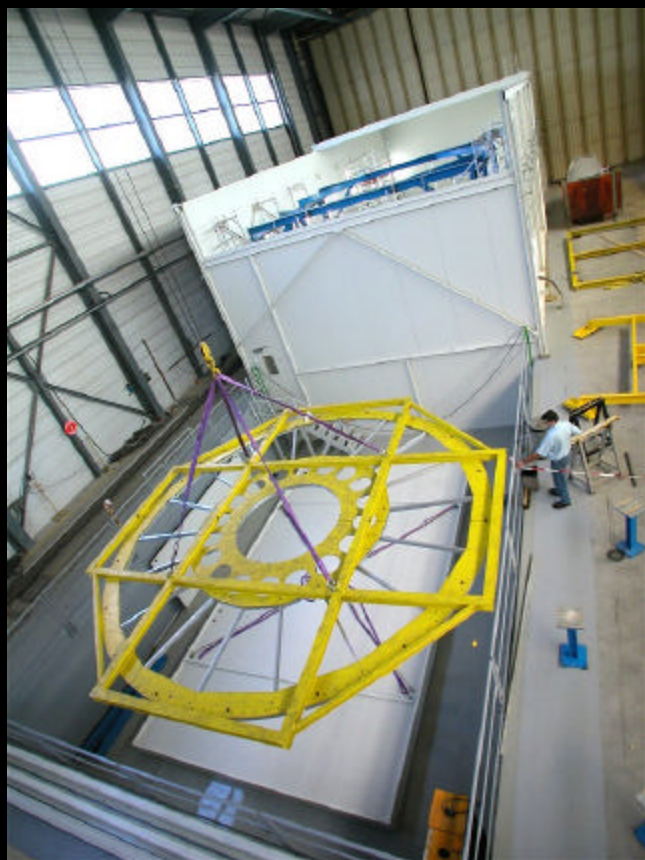
Endplates arrive at Cern







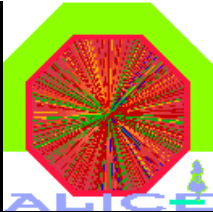
Endplates arrive at Cern





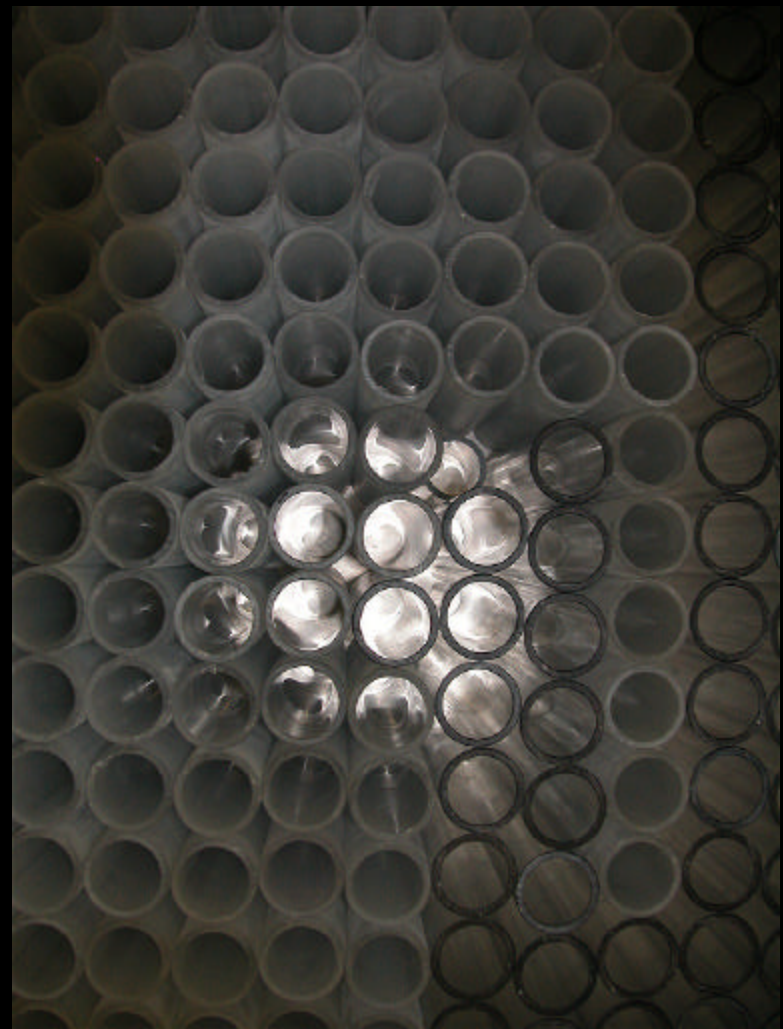
Endplates arrive at Cern

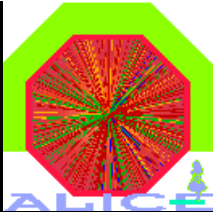




Status Rods

- Makrolon raw material cut & annealed
- Shipped 50% to Polydiam for machining will arrive this week
- 50% are being Cu coated at Cern ready end of September 2002

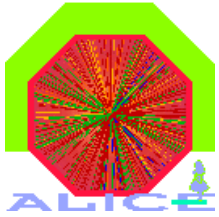




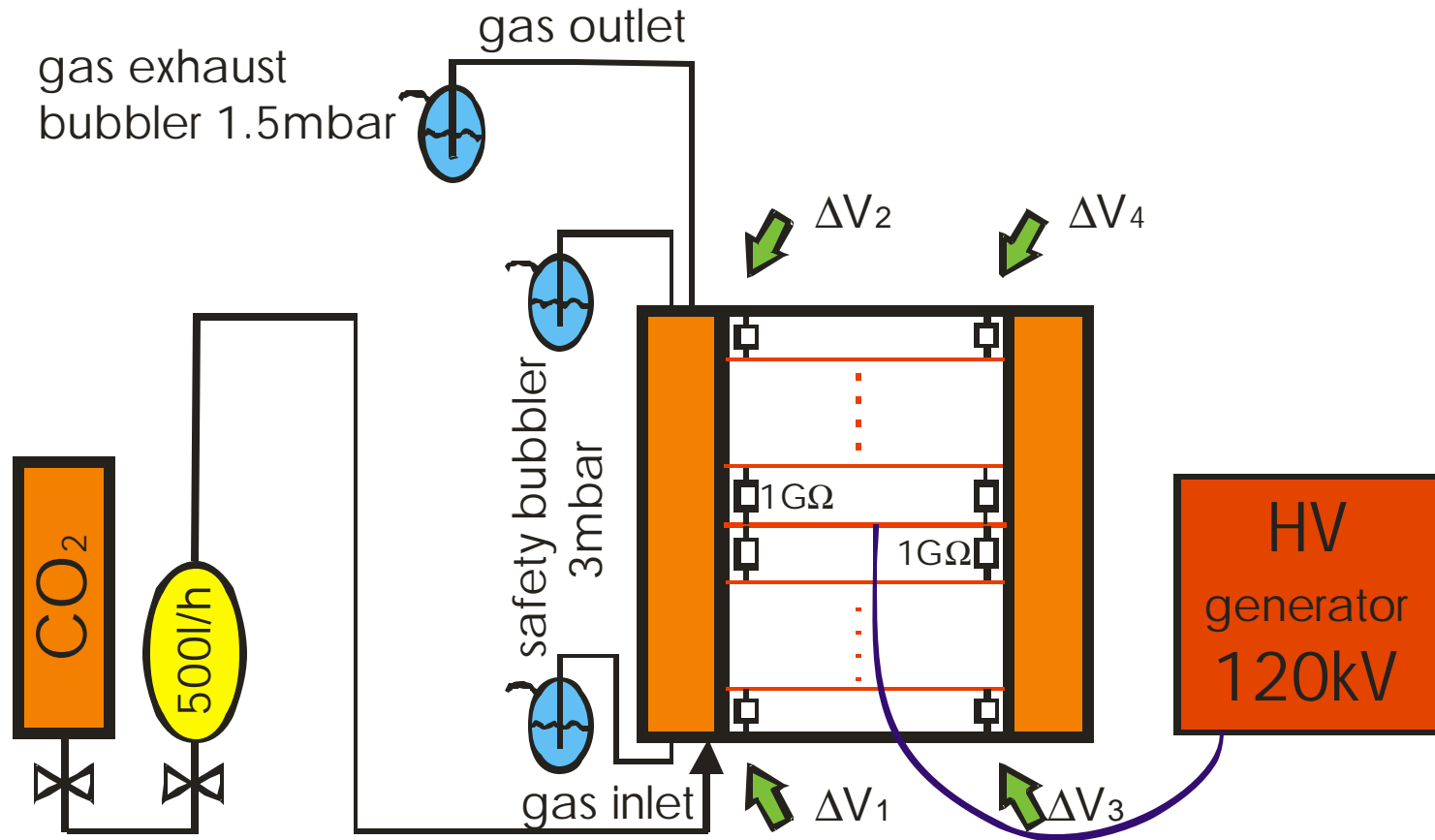
Status Rods



- Tender for tooling ongoing
- Tooling for 'taquets' in fabrication
- **Glue has to be defined !**

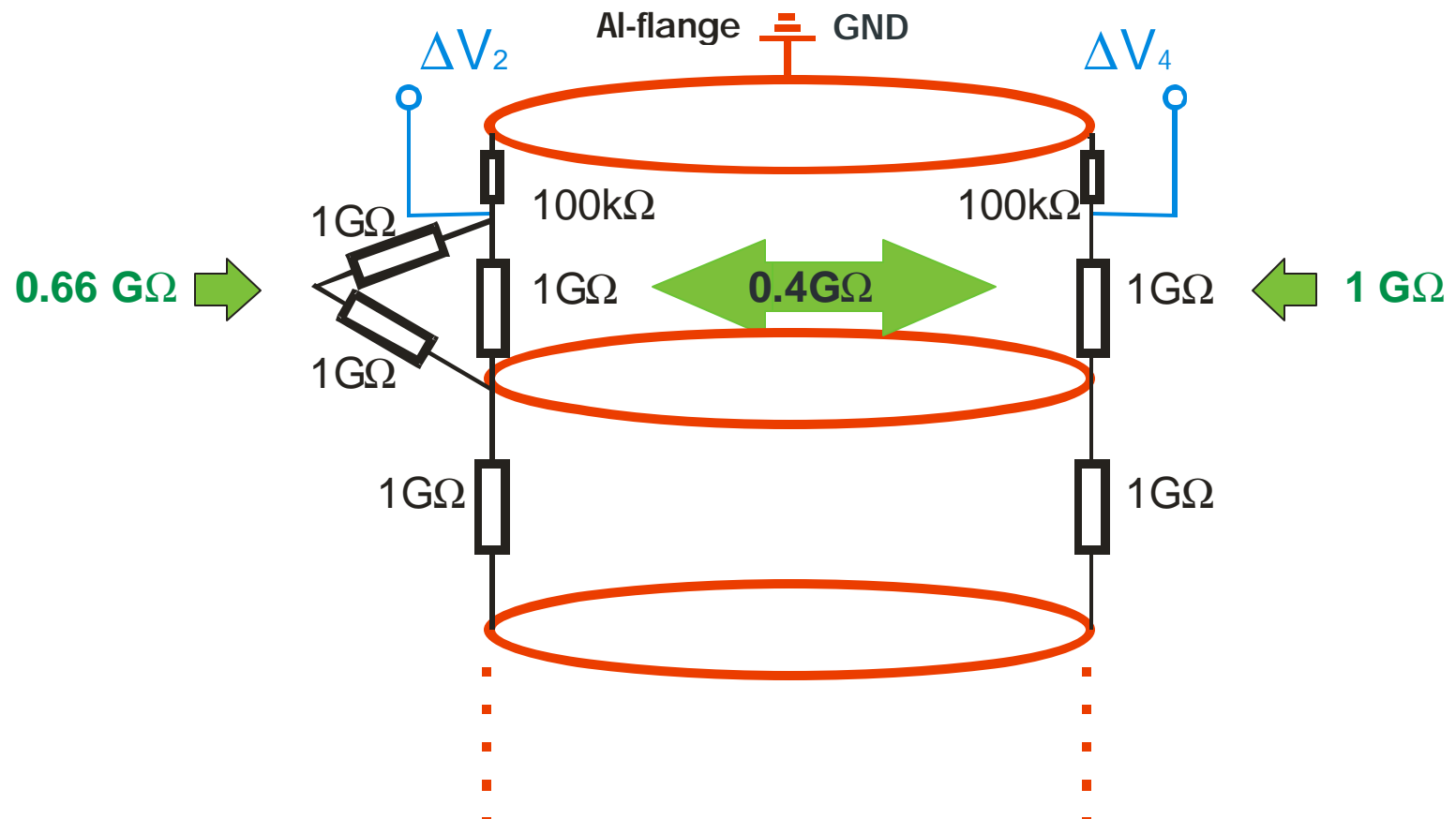


HV Test Guard Strips Outer FC





HV Test Guard Strips Outer FC





HV Test Guard Strips Outer FC



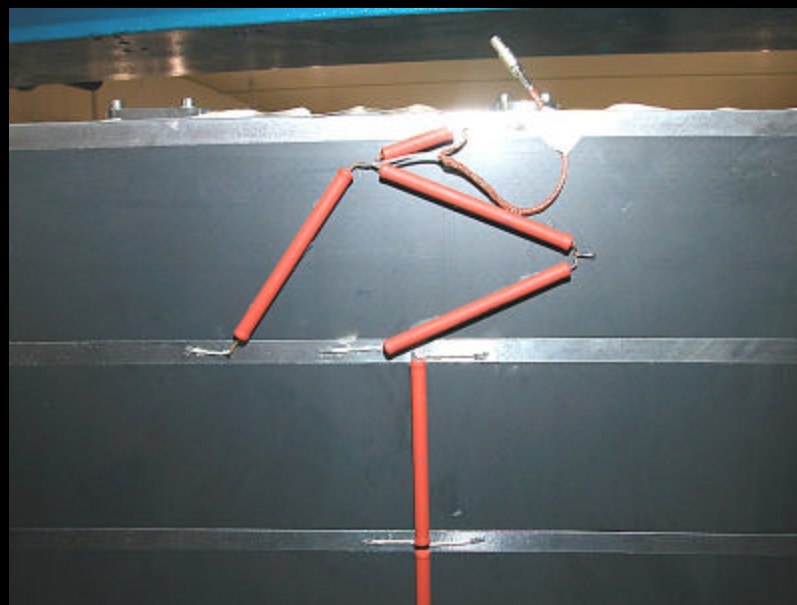
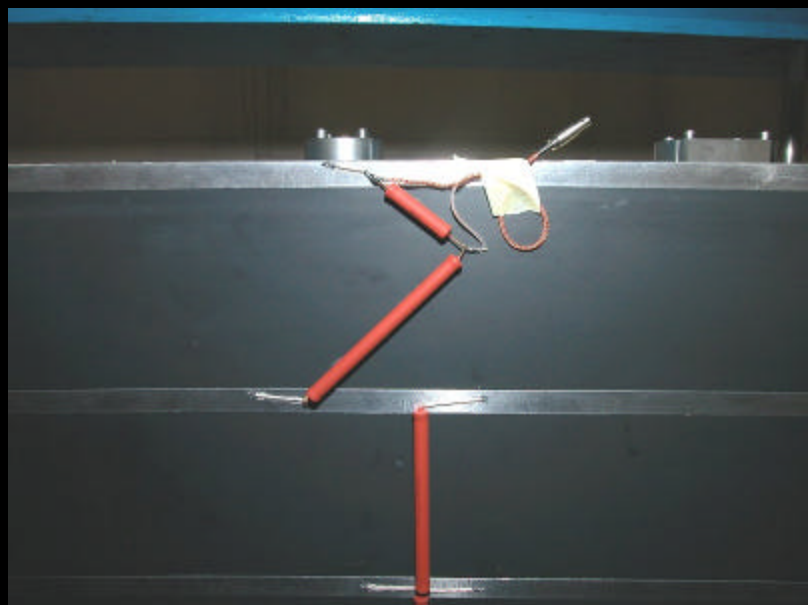


HV Test Guard Strips Outer FC



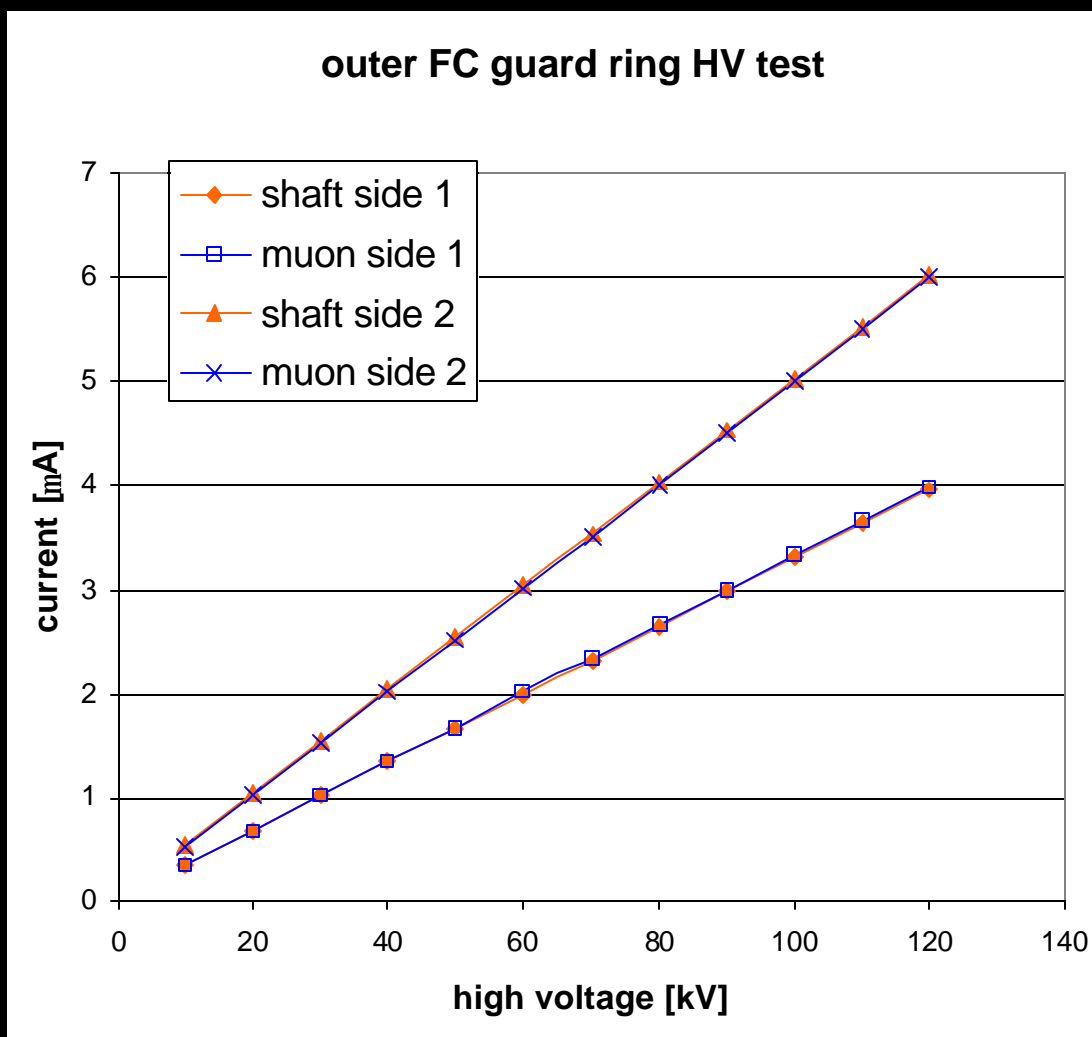


HV Test Guard Strips Outer FC



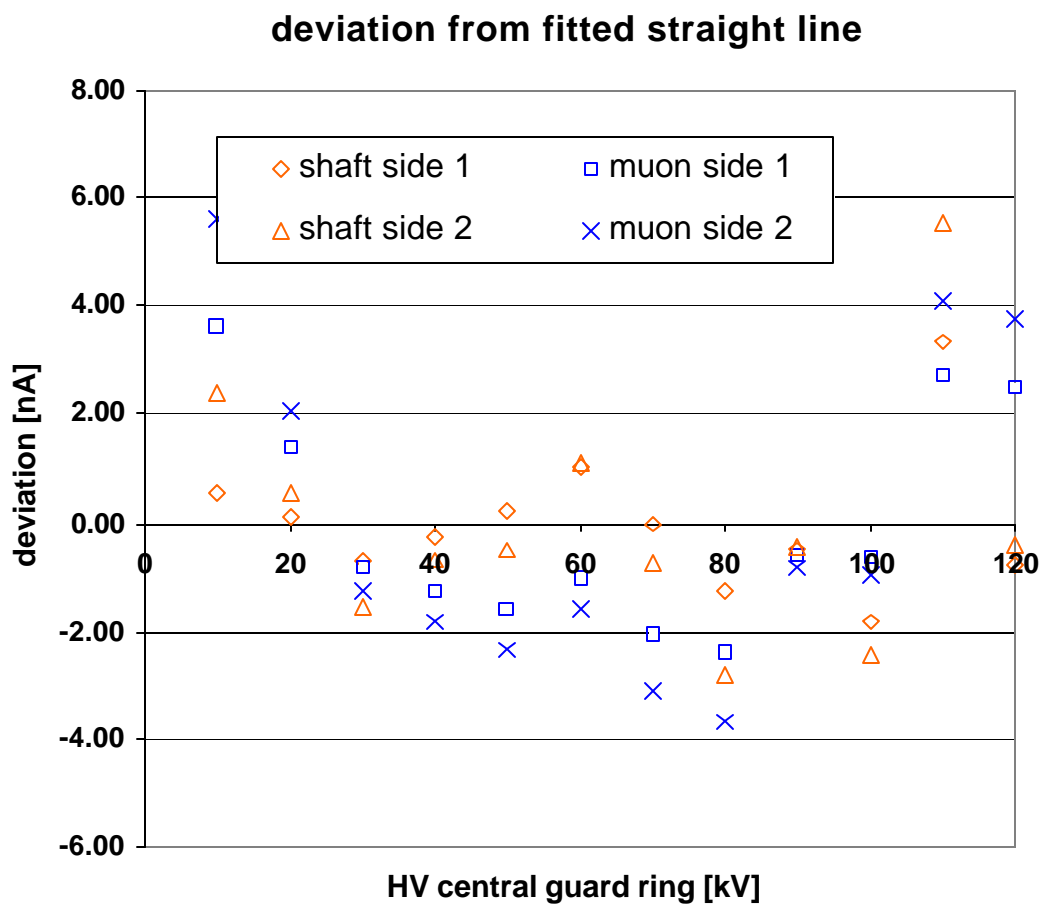


HV Test Guard Strips Outer FC



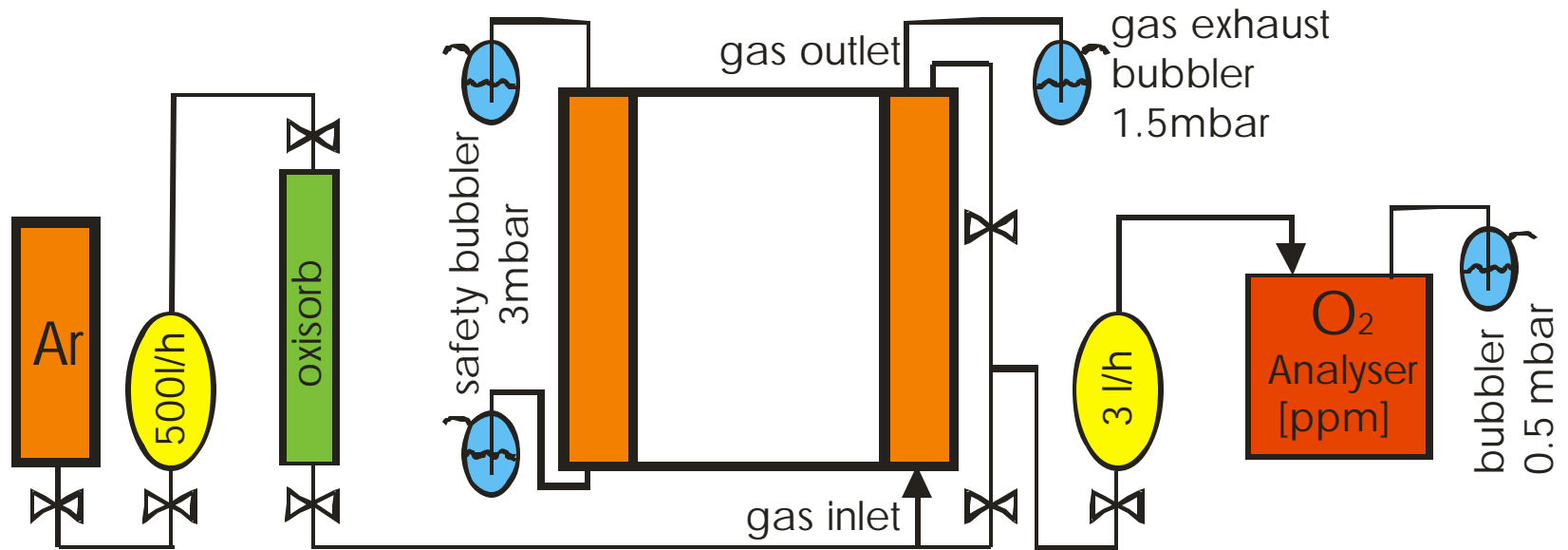


HV Test Guard Strips Outer FC





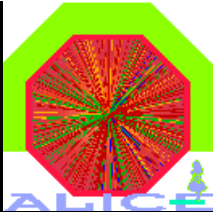
O₂ Leak Test Outer FC





O₂ Leak Test Outer FC



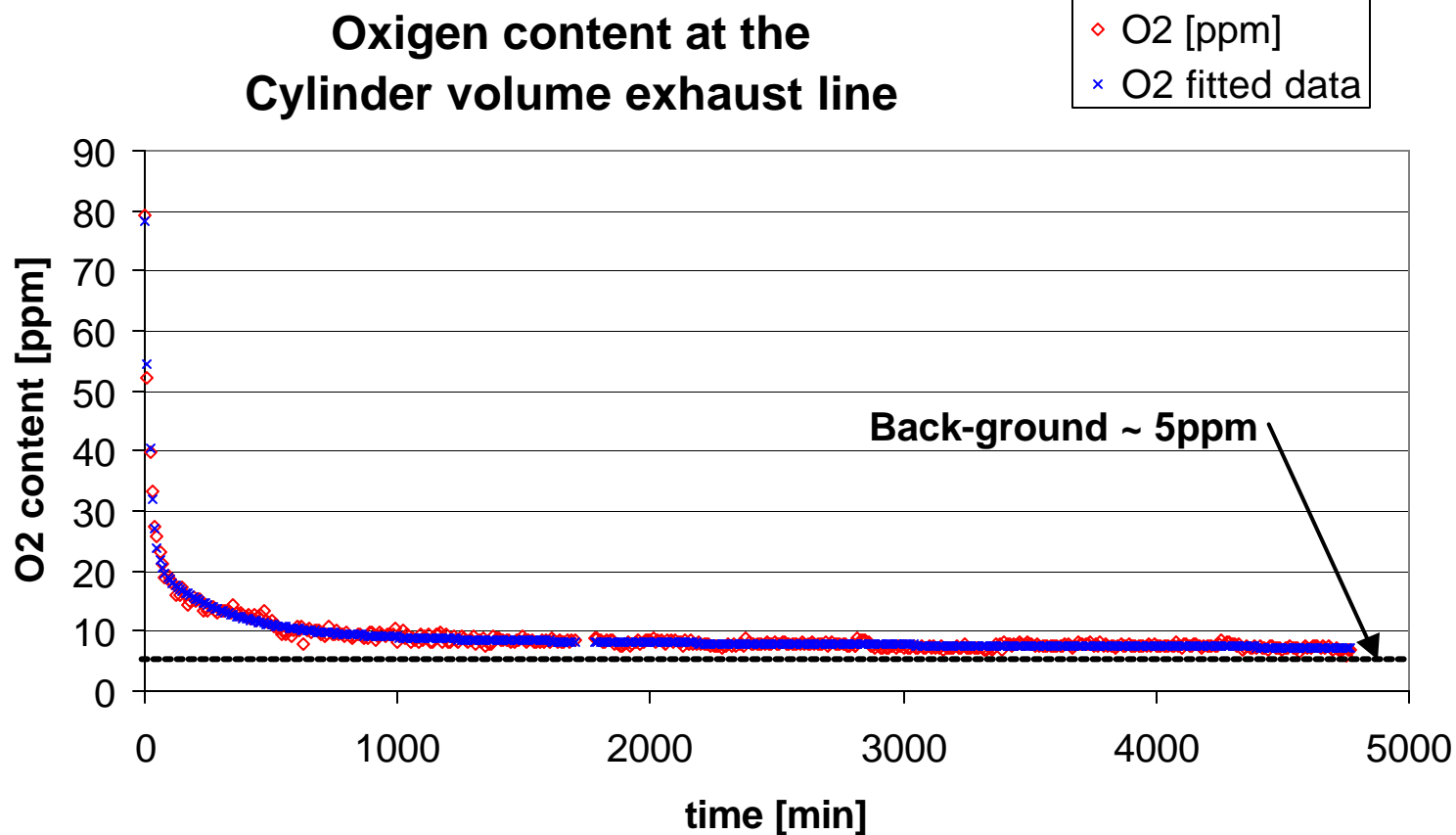


O₂ Leak Test Outer FC

- Max allowed contamination (TDR): 5 ppm O₂ in drift gas
- O₂ content in outer insulation volume measured (run conditions much better)
- Measured value \approx 7 ppm at 500 l/h flow
- Experimental offset \diamond 5ppm (due to leak in analyzer and low flow in circuit)
- ⑨ O₂ content in cylinders \approx 2ppm flow
- Nominal flow in drift volume during running period \diamond 4.6 m³/h (⌚ 1 vol/day)
- ⑨ O₂ contribution from outer cylinders expected to be \approx **0.3 ppm** in run conditions
- ⑨ **Outer cylinders are leak tight (for our purposes)**



O₂ Leak Test Outer FC





O₂ Leak Test Outer FC

Fit with 3 exponentials:

$$F = a * e^{-\frac{t}{t1}} + b * e^{-\frac{t}{t2}} + c * e^{-\frac{t}{t3}} + d$$

Results:

d = 7.2 [-0.3,0.2] ppm

t1 = 18 [-0.6,1.1] min (gas flow in analyzer)

t2 = 4.2 [-0.5,0.9] h (analyzer cell constant)

t3 = 27 [-7,21] h (gas flow = 1 vol / 24h)



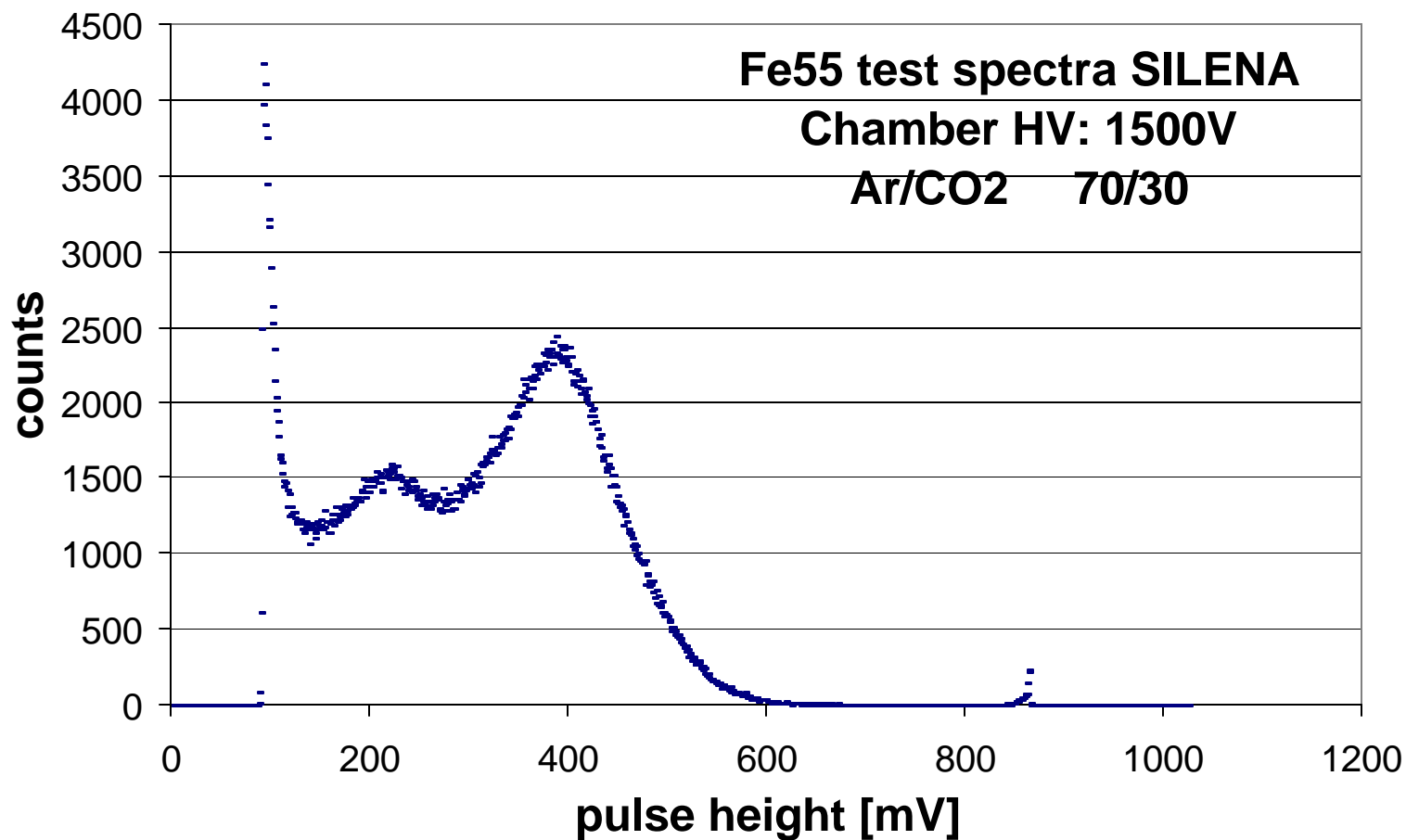
Test TPC for e Attachment

- Drift length : 120cm
- HV = 60KV
- Drift field = 400V/cm



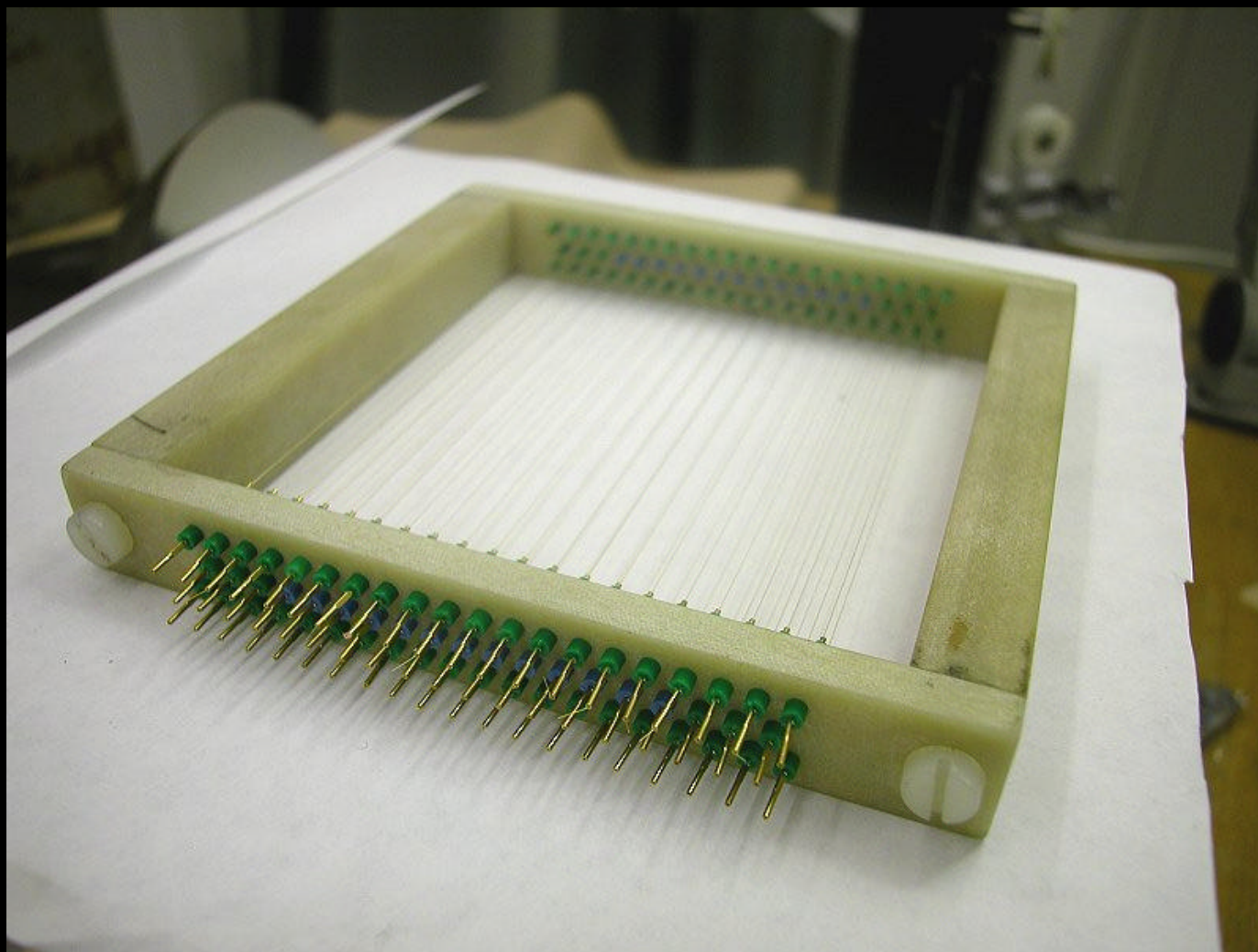


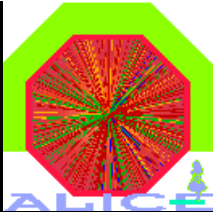
Test TPC for e Attachment





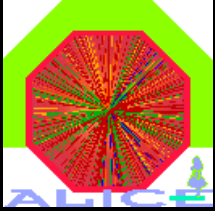
Test TPC for e Attachment





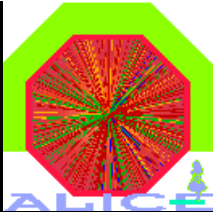
Next Steps – Milestones - Rods

- Tooling to glue rod fixations pieces to be delivered in 9/02
Assembly in 10/02
 - Rod fixations in price inquiry
 - Rod fixations to be glued on Cylinders
by end 2002
-



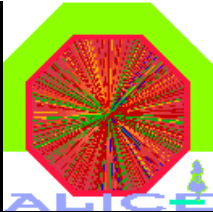
Next Steps – Milestones - Rods

- Tooling for assembly of rods in price inquiry
 - Assembly in 10/02
 - Start of rod gluing mid 11/02
 - 2/03 gluing of laser rods
-



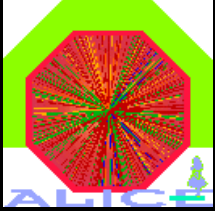
Next Steps – Milestones - IF'CV

- Machining of aluminum cones ordered
 - Central drum ordered with Fischer
 - Delivery foreseen November 2002
-



Next Steps – Milestones – End Plate

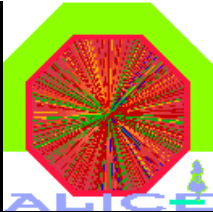
- Polishing of O-ring grooves in end plates starts now, finished by 10/02
 - 11/02 Leak test (He)
-



Next Steps – Milestones HV Electrode

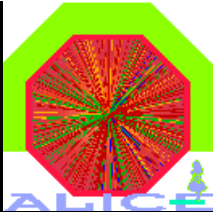
- HV membrane foil in gluing process
- Alu pieces in price inquiry
- Tooling in construction, ready by 12/02





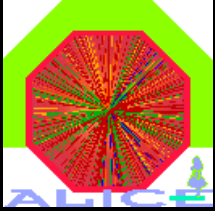
Next Steps – Milestones - Frame

- Modification of DELPHI support frame has started
 - Finished in 10/02
-



Next Steps – Milestones - Assembly

- Final assembly of first half TPC starts in spring 2003
 - Turning of TPC by summer 2003
 - TPC ready for tests end 2003
 - TPC delivery 4/2004
-



Conclusions

- OFCV, OFCC and IFCC ready
 - IFCV (cones and drum) ready by 11/02
 - Delivery of "small" material longer then expected
 - Up to now final delivery date not changed but time contingency getting smaller
-