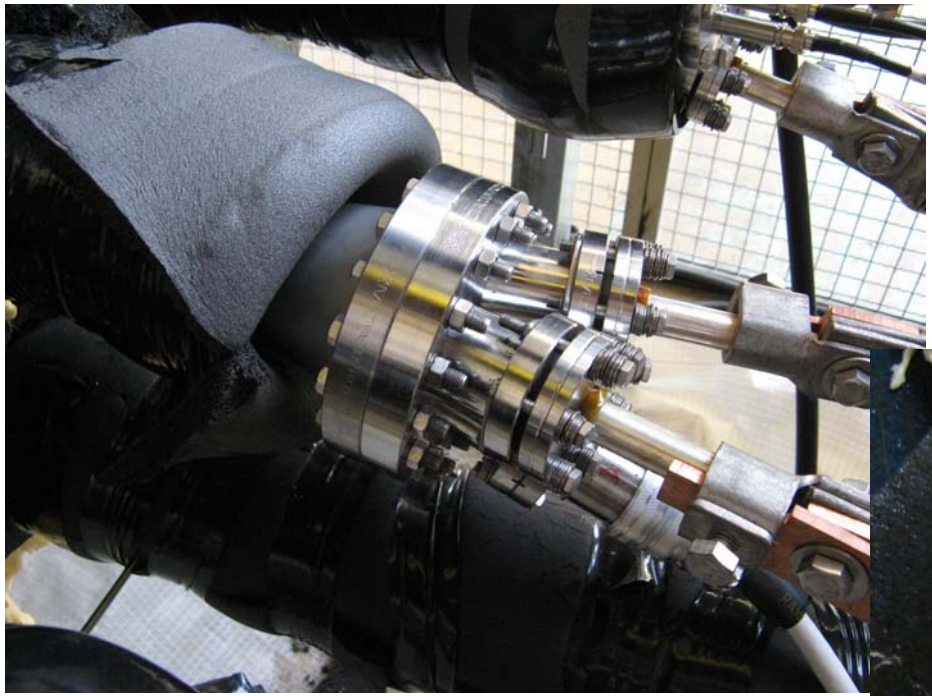
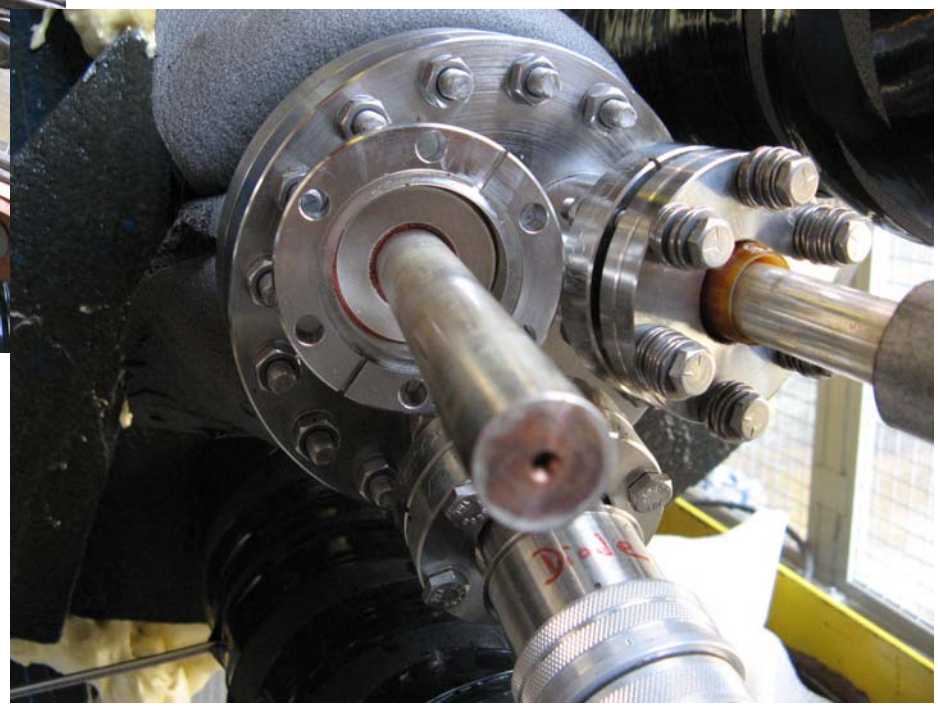
MERIT Solenoid Update

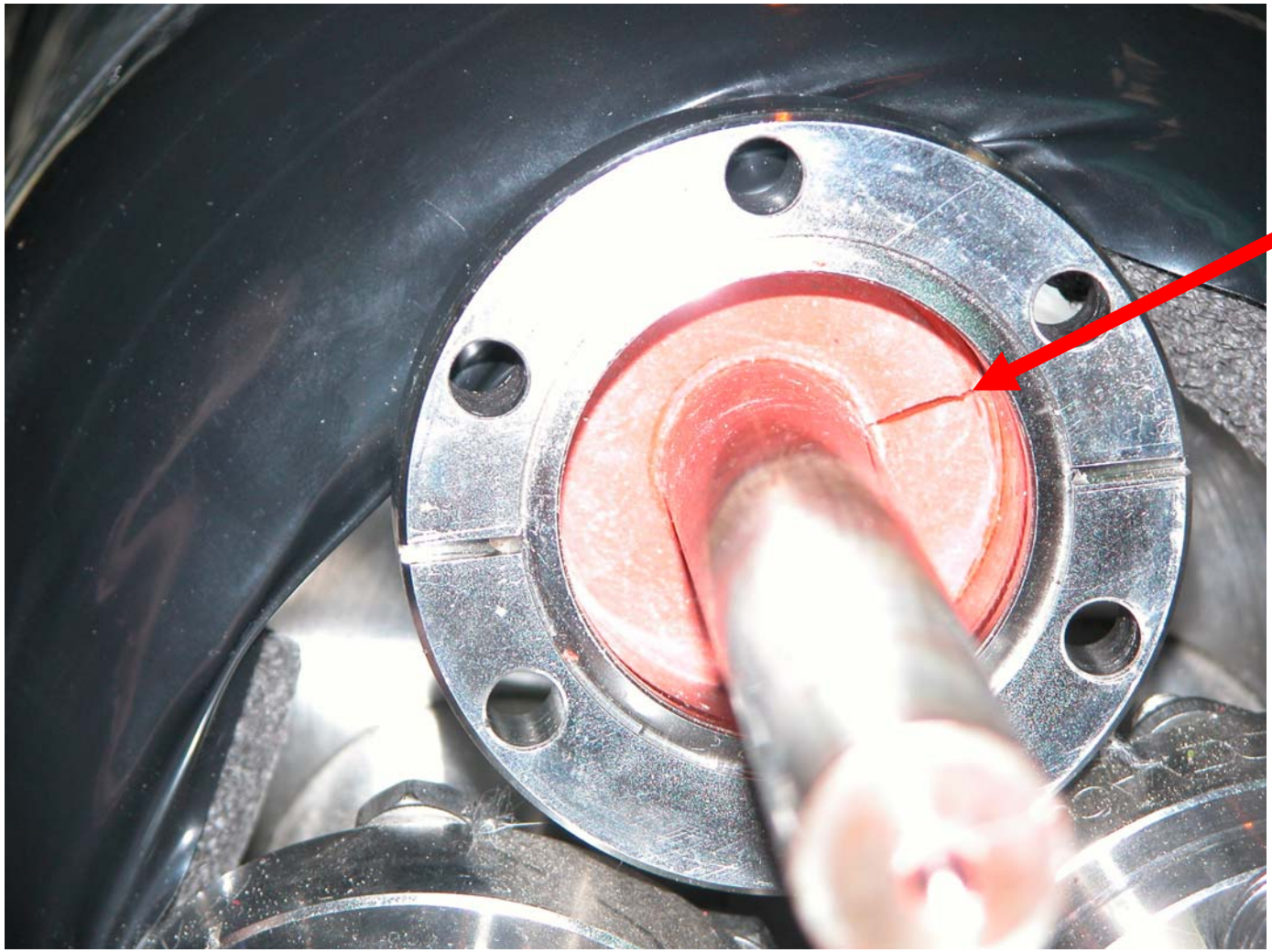
- At the MIT system integration test a leak of LN_2 was observed when the cryostat was filled with LN_2 and 5bar pressure was applied to force a purge of the liquid.
- Some escaping gaseous N_2 was also observed
- Attempts were made at MIT to mitigate the problem before shipment to CERN but reception testing above ground demonstrated that the problem persisted.

Solenoid Electrical Feedthrough





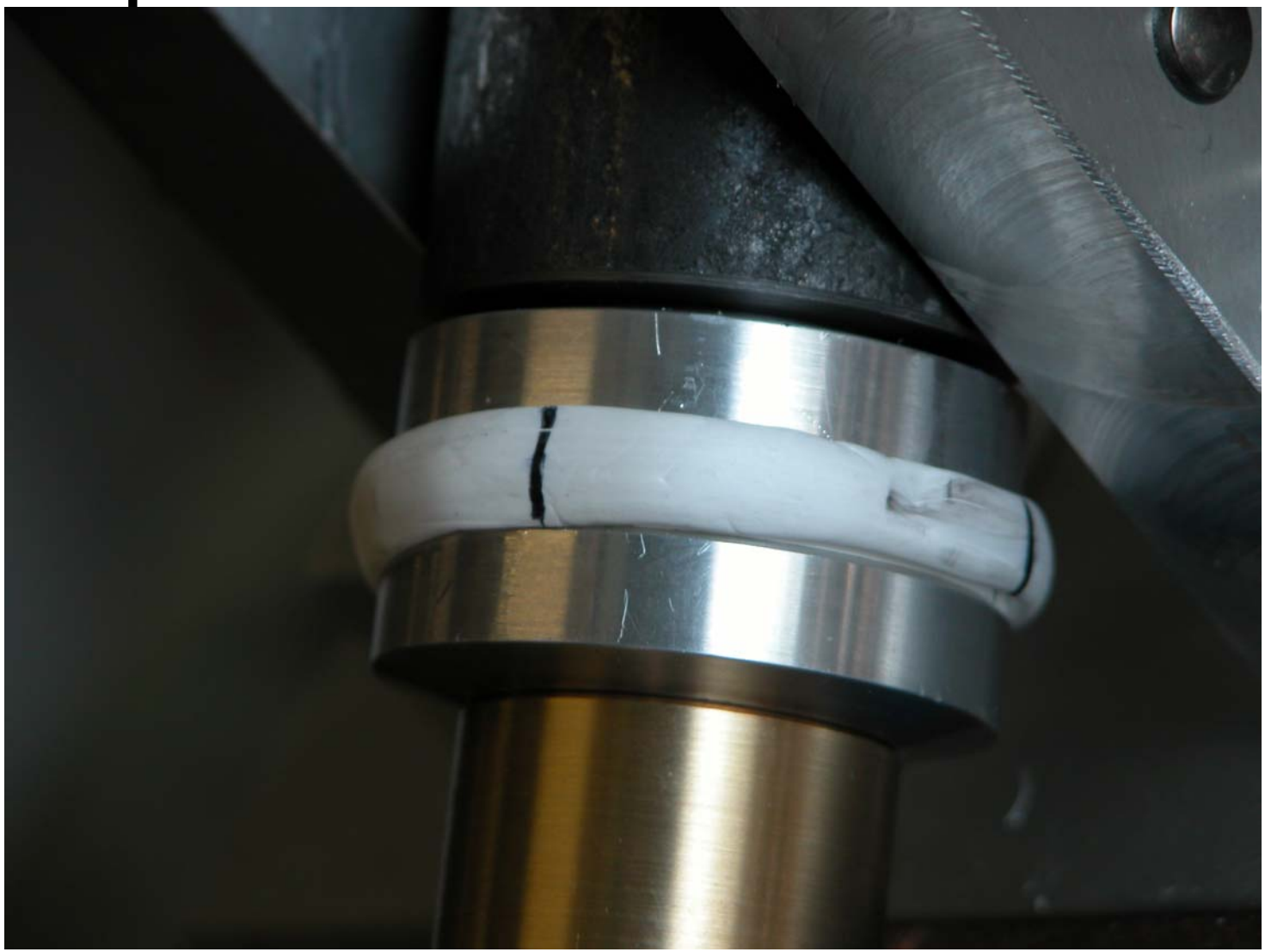
Source of the problem located



Radial cracks observed in several silicone packing disks

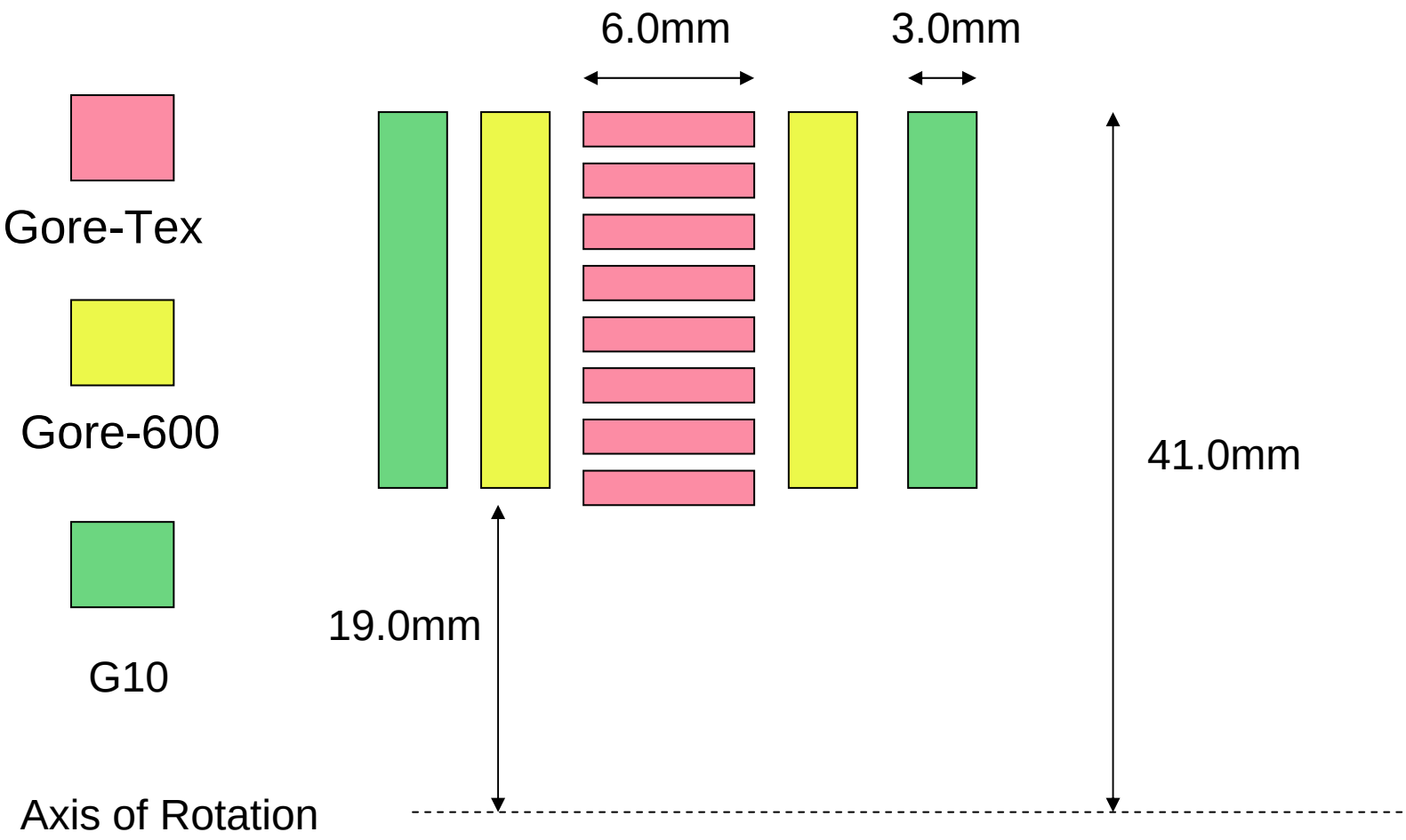
Compression
Fixture

Compression Test with GoreTex



The GoreTex after compression

Test Packing Scheme

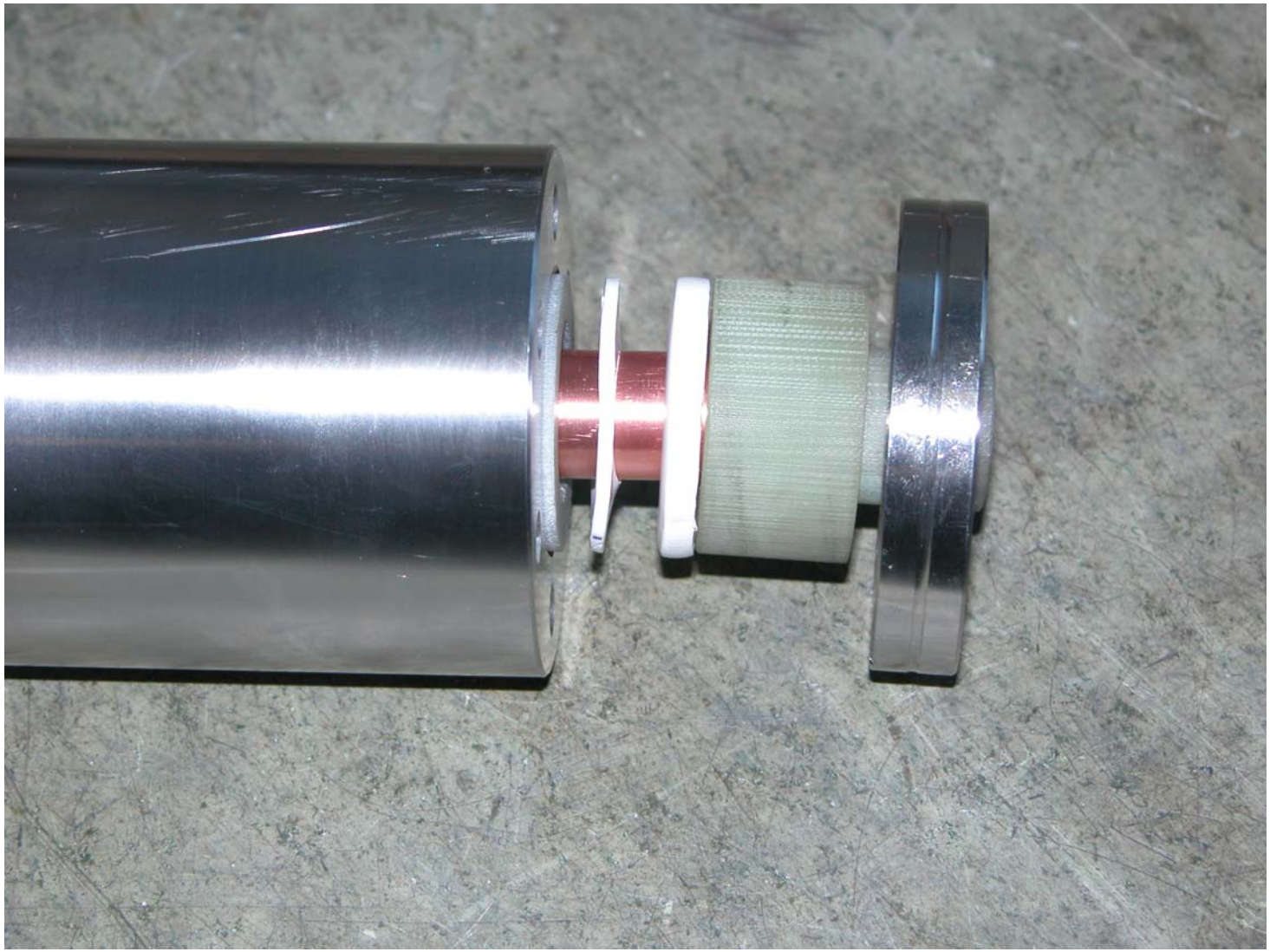


The packing test fixture

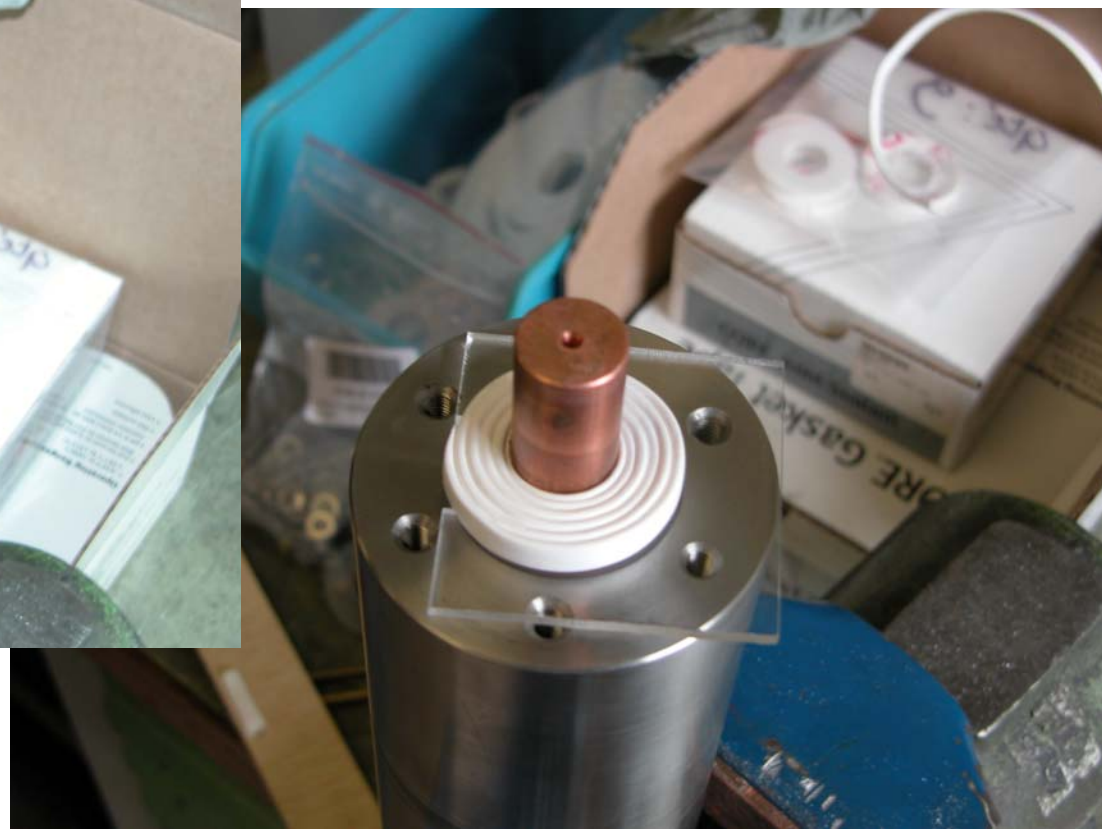
The loading end

The “lead” end

With washers



Installing the GoreTex



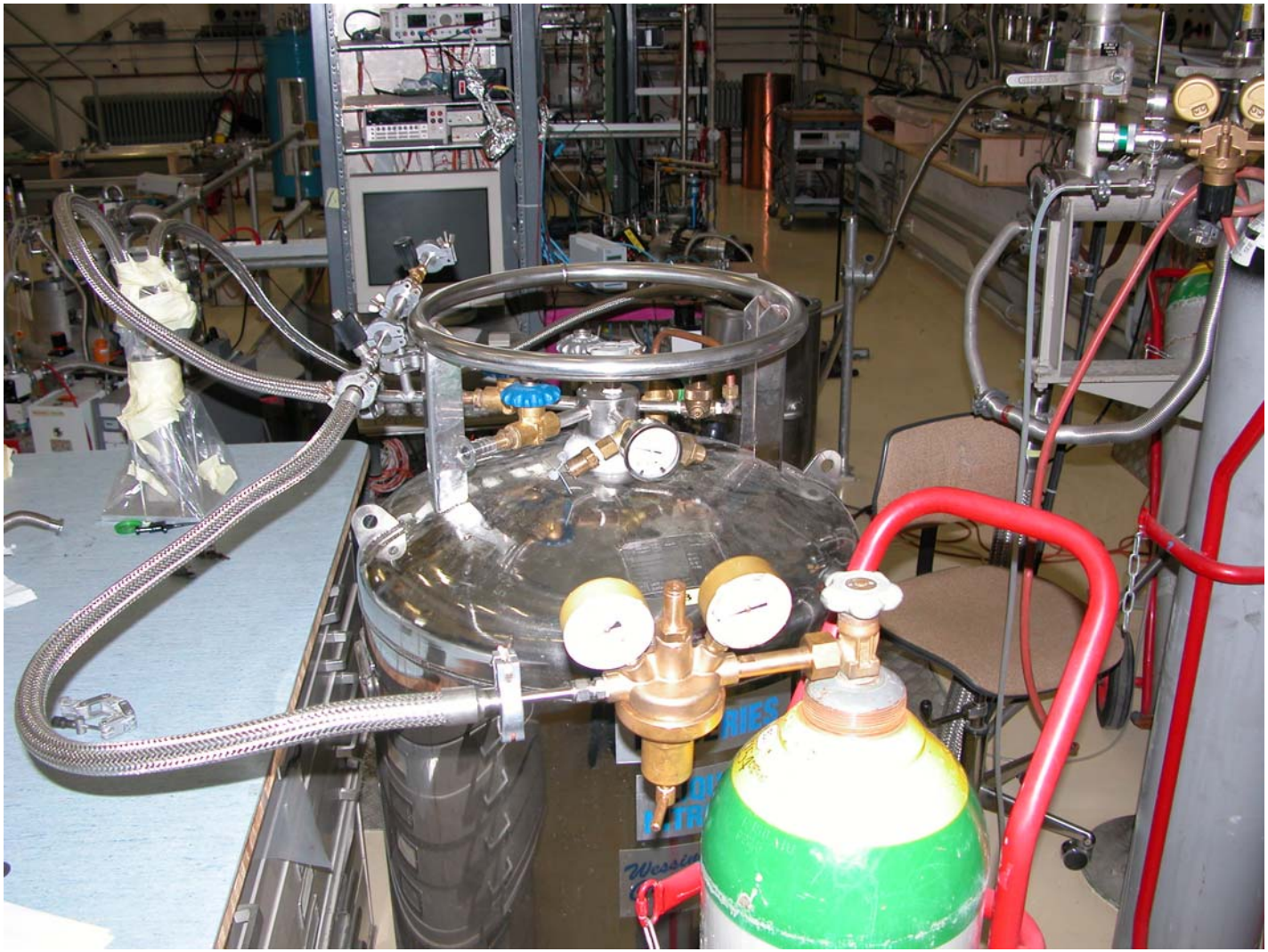
Introducing LN2

Filled with LN_2
No leaks observed
With 1 bar ambient pressure

10bar Water Test
No Leaks observed

Test with 10bar He
No Leaks observed at room temperature

10bar He at 77ºK



Cryo Testing Results

- 2.5×10^{-5} mbar l /s Ambient Background
- No observed leak at 10bar Room Temp
- Initial cooldown, flush: substantial leak
- Further tighten by closing gap 1.3mm
- 1.3×10^{-3} mbar l /s leak rate
- Shock cooled in LN_2 bath
- 3rd cycle cooldown
- 0.8×10^{-3} mbar l /s leak rate ➔ 12 mg/day

The Reassembly Work

May 29, 2007

Status as of 31 May

- We are now prepared to test the revised packing solution with a cryotest of the solenoid at 80^0K.