

QC and assembly laboratories for the Mu2e Calorimeter

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MUSE Network General Meeting

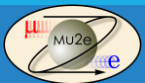
23 October 2018

Overview

QC Laboratory

- SiPM Procedures and Stations
- Crystal Procedures and Stations

Assembly Laboratory

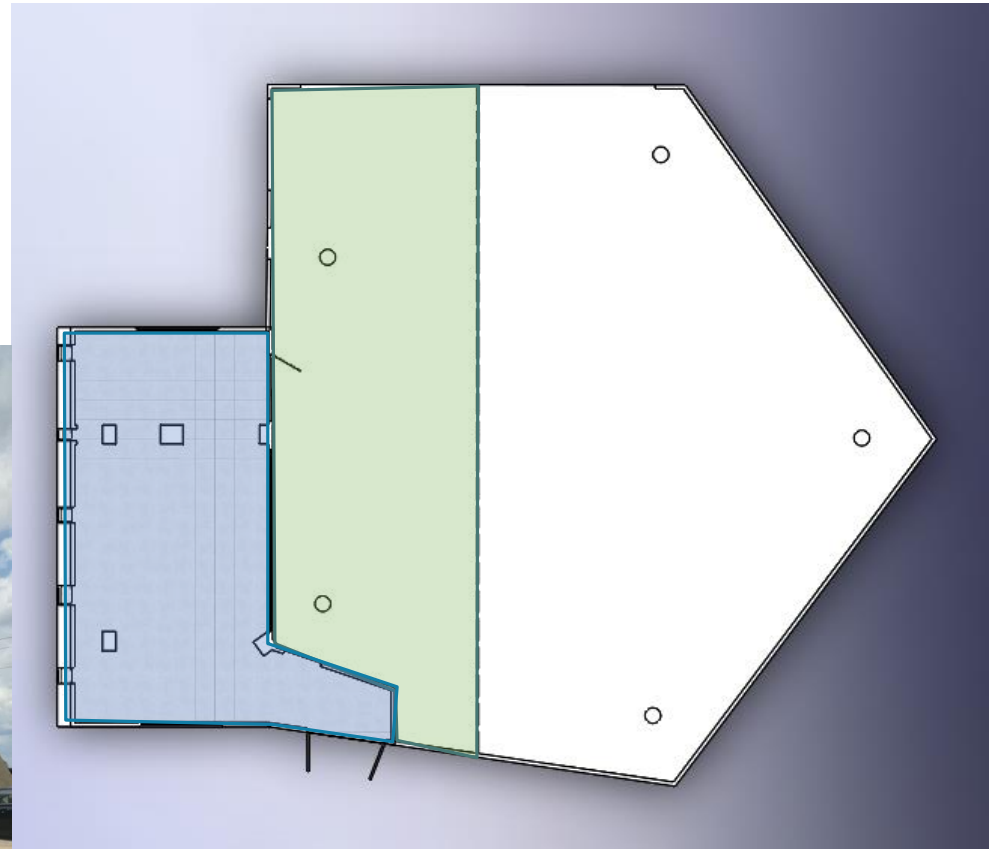


SiDet Laboratory

LabA @ Sidet

Two main areas:

- Crystals and SiPMs QA procedures
- Calorimeter assembling



QC Laboratory

Controlled environment: 40HR, 20°C with e-mail alarms

'Soft' clean room

Storage of processed crystals and SiPMs



SiPMs procedures and stations

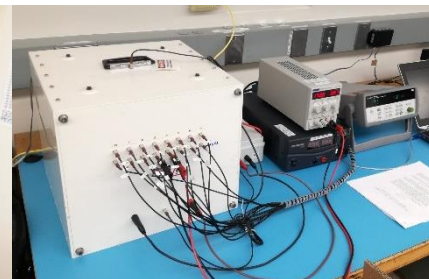
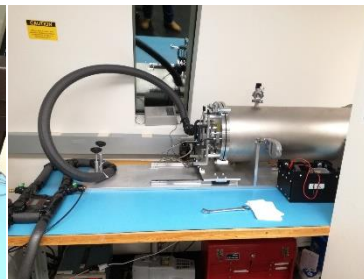
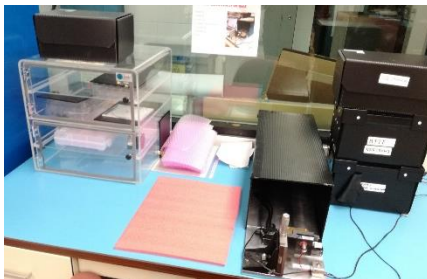
S0: SiPM shipping unpacking

S1: SiPM visual and mechanical check

S2: SiPM (I_{dark} -V curve, V_{op} , PDE_{ex}Gain measurements

S3: SiPM MTTF

S4: SiPM shipping packing



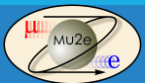
SiPMs data

280 SiPMs per month (4000 SiPMs total) from Hamamatsu

Approximately 3 weeks needed for measurements per batch

≈2000 SiPMs tested at the moment

≈ 0.6% SiPMs Rejected at the moment



Crystal procedures and stations

C0: Crystal shipping unpacking

C1: Crystal visual check and measurements (in CMM area)

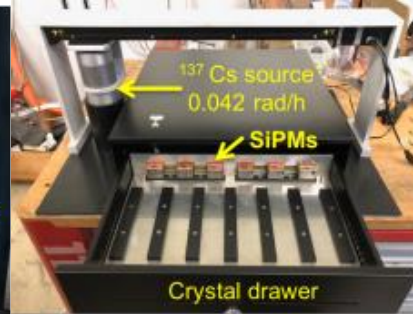
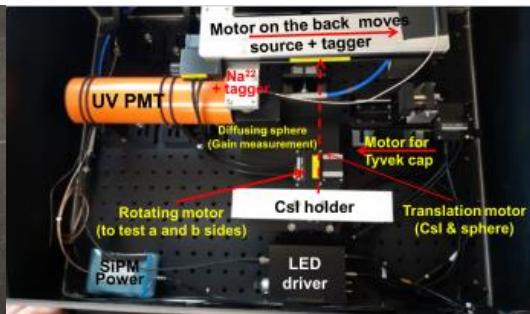
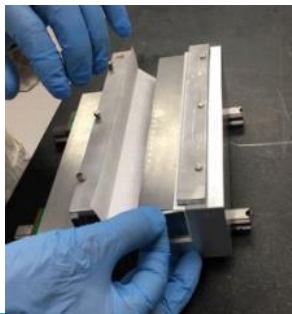
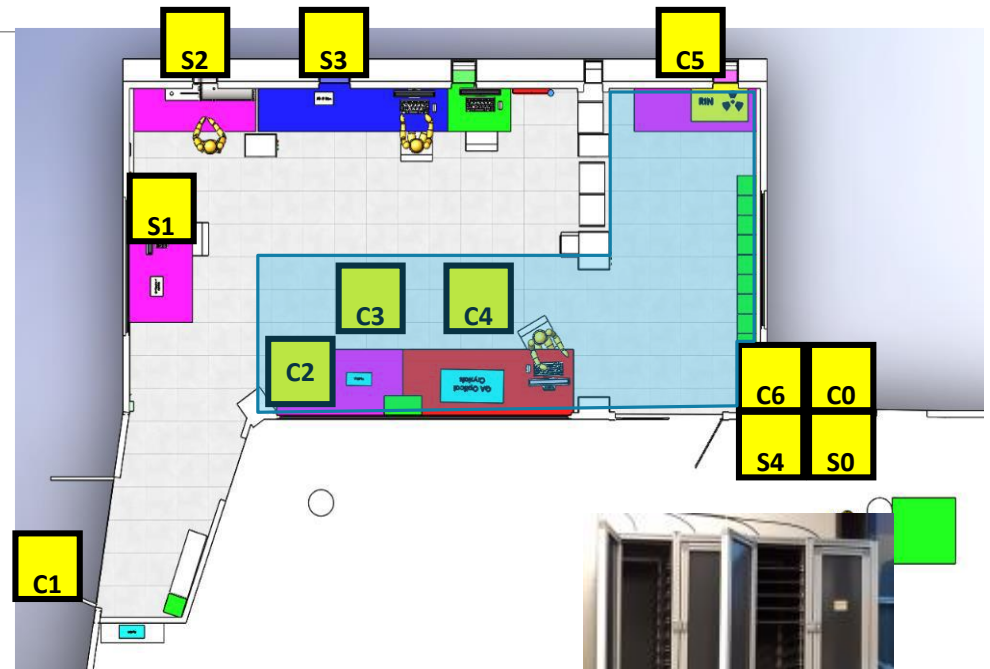
C2: Crystal wrapping

C3: Crystal sealing

C4: Crystal optical QA

C5: Crystal RIN

C6: Crystal shipping packing



Crystal numbers

120 crystals per month (1500 crystals total) from Saint-Gobain and SICCAS (half and half)

Less than 3 weeks needed for measurements per batch

≈500 crystals tested at the moment

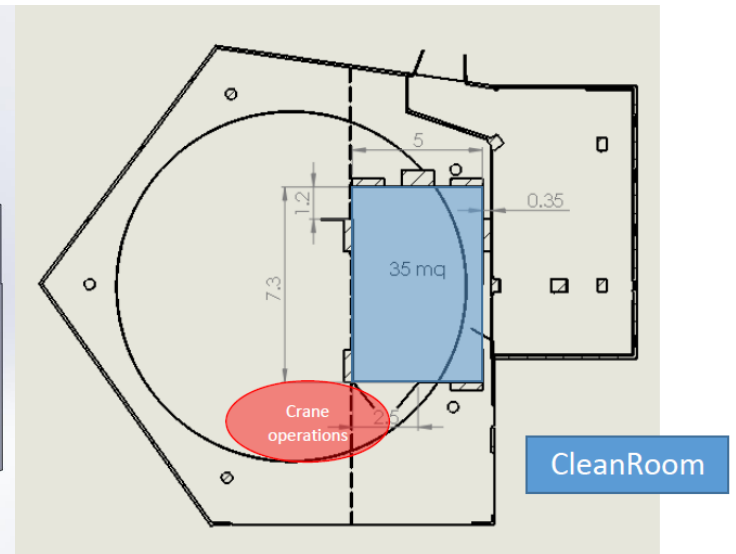
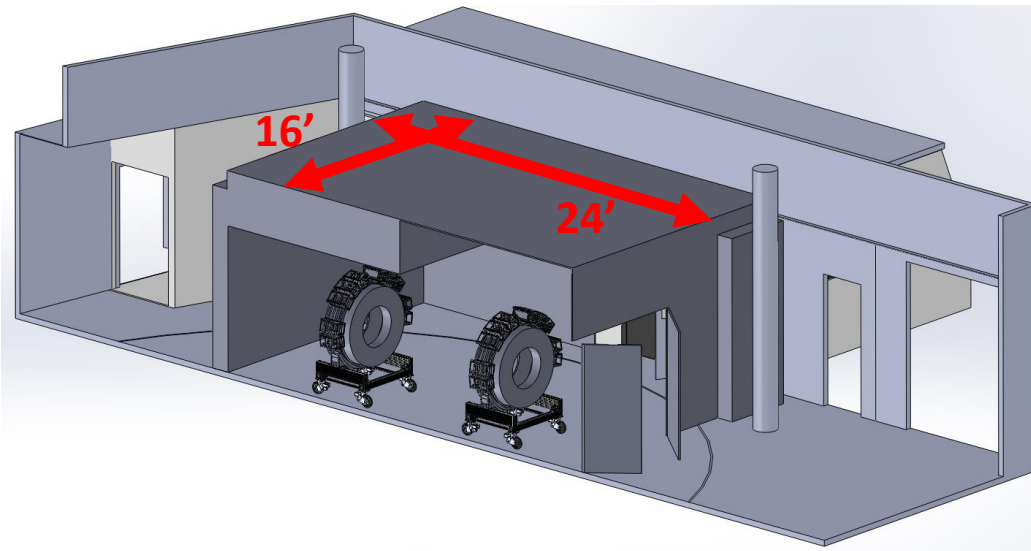
≈ 45% Saint Gobain rejected (dimensional troubles) -> back in production now

≈1% SICCAS rejected

Assembly room layout

For the assembling of the two calorimeters

Recycled Class 100 clean room from Argonne laboratory



Argonne Clean room



Assembly room characteristics

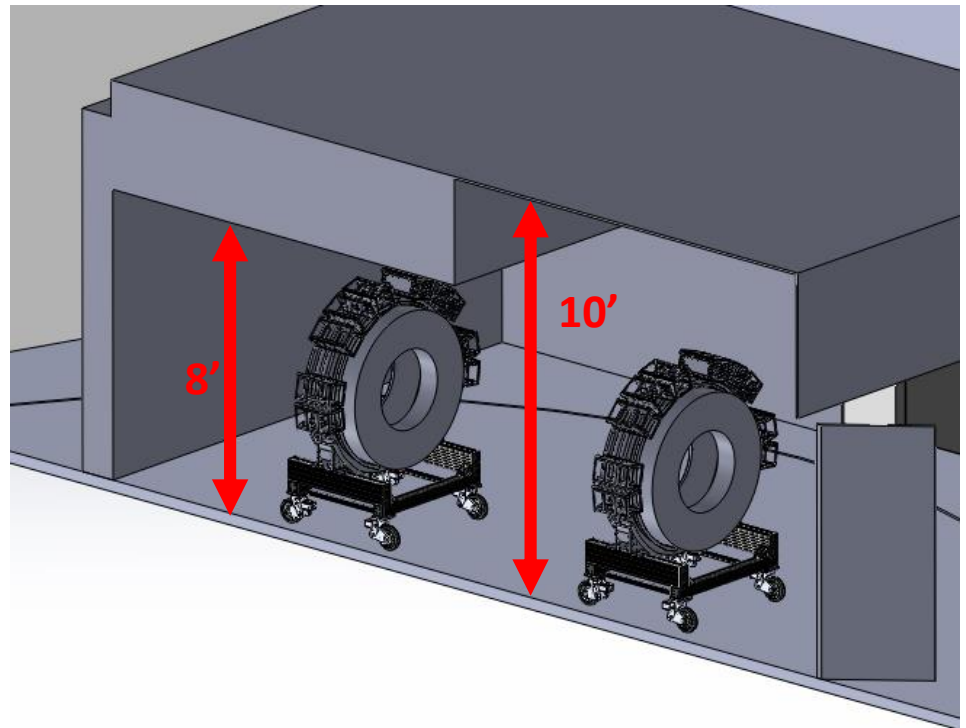
Two different areas with different heights

Possibility to build two Calos in parallel

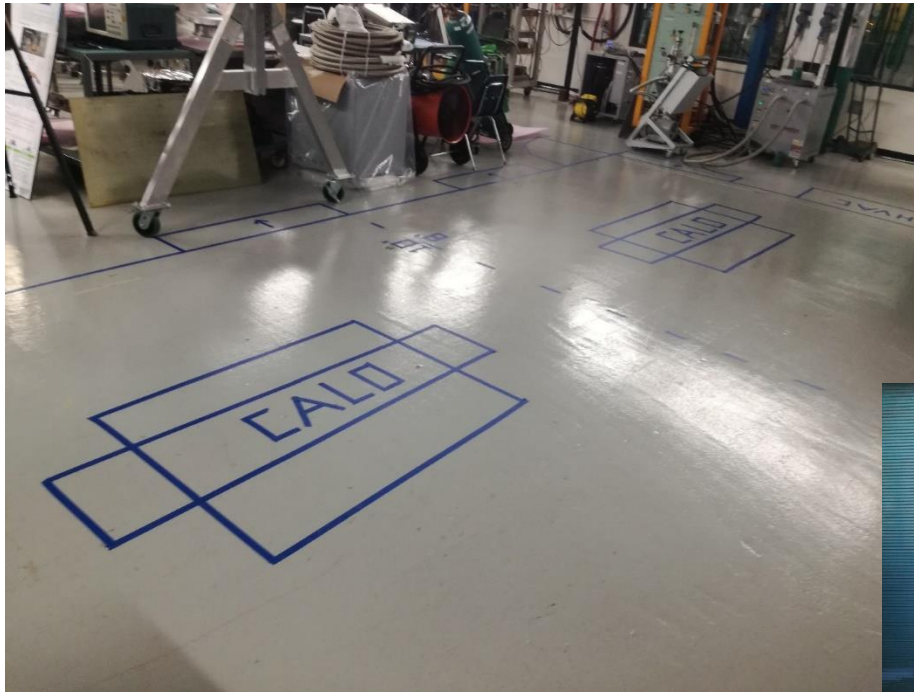
HEPA and HVAC systems

Dehumidification system

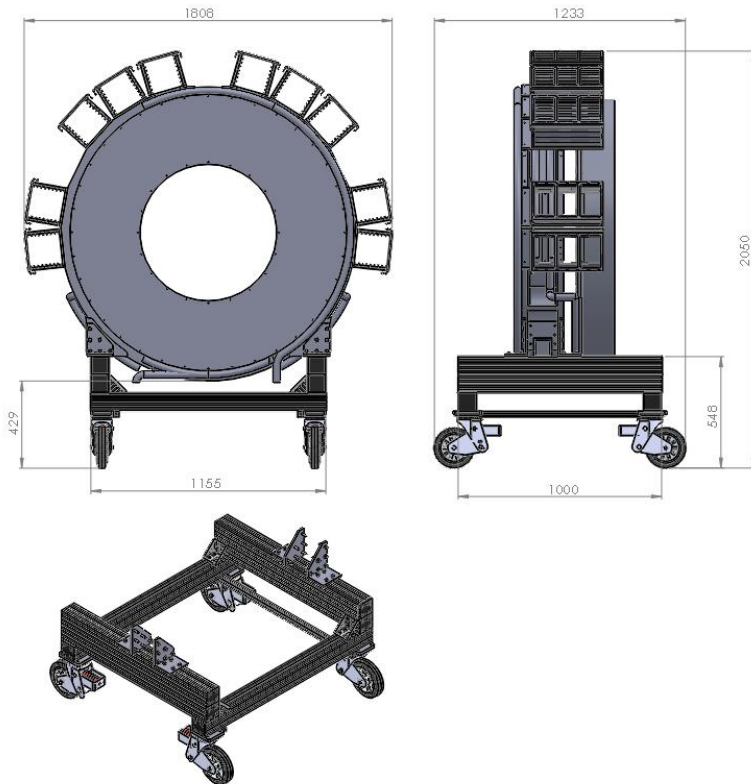
Nitrogen outlet



Some pictures



Calorimeter support table for assembling



Structure made of Aluminum extruded profiles

Spinning damping wheels holding up to 2000 kg total

Low quantity of custom machined components -> **fast to get!**

To be integrated with Calorimeter lifting device

To be suitable for cosmic test

Thanks for your attention

