SSD Assembling in Lecce
Tips and Tricks

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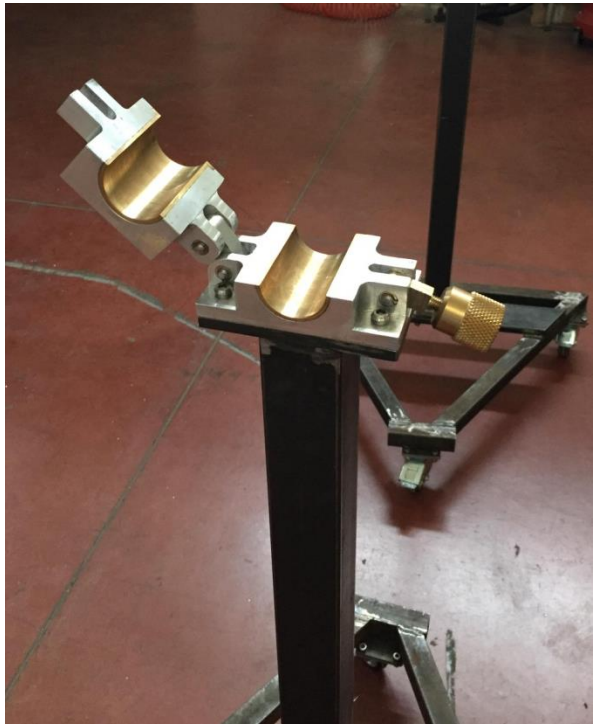
Lecce Auger Group

AugerPrime SSD Meeting
28-29 March 2018
Grenoble

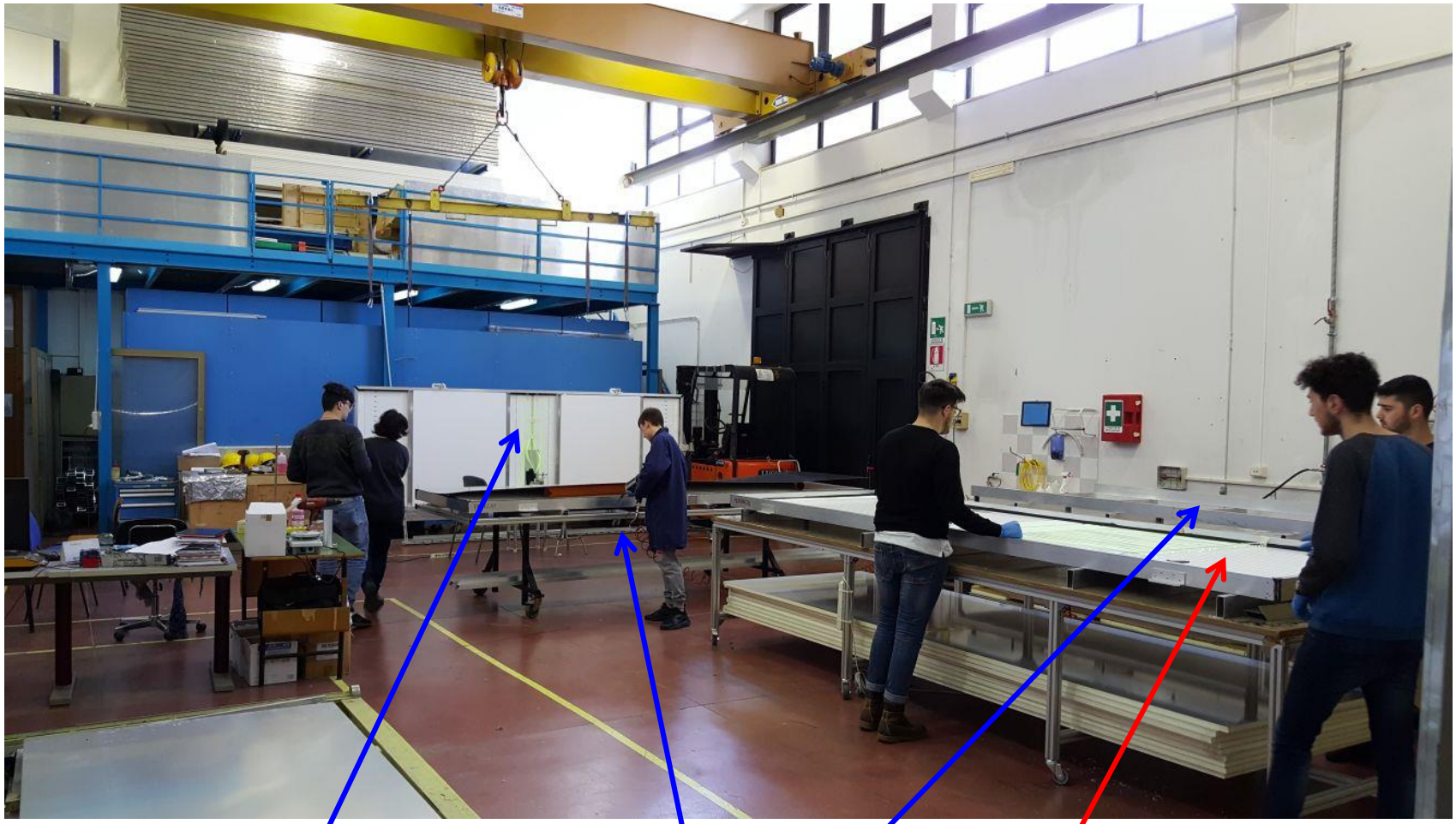
Assemblig Site

- Hangar with overhead crane
- 4 assembling tables
  - 2 fixed tables
    - Frame assembling
    - Scintillator bars positioning
    - Optical fiber insertion
  - 1 movable-rotating table (with wheels)
    - Optical fiber allignment
    - Cookie cement procedure
  - 1 movable table (with wheels)
    - Lower than the others for top drilling
    - Detector closing
    - Detector moving outside the hangar

Tables I



TABLES II

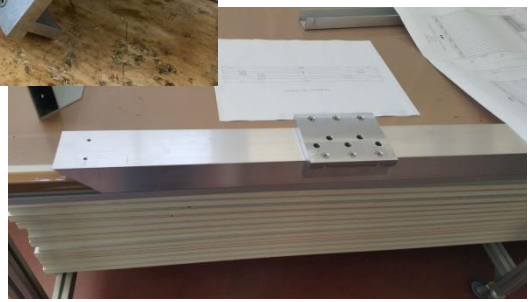


With the solutions of “4” tables we can perform in one day all the steps nedeed to “completely finish” one detector (frame assembling – fiber insertion – cookie allignement/cement – top closing).

Frame Assembling

- Drilling templates for corner connectors and for brackets

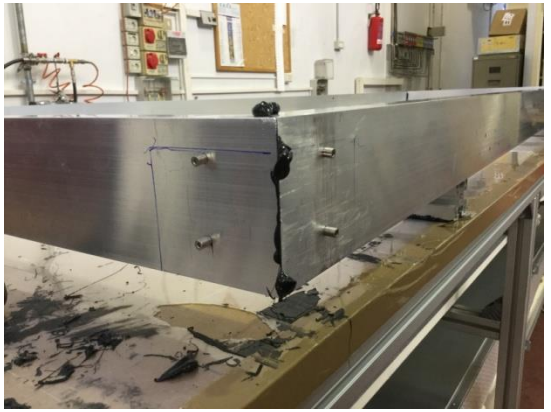



- Frame assemblig with corners: we used a “skewer”







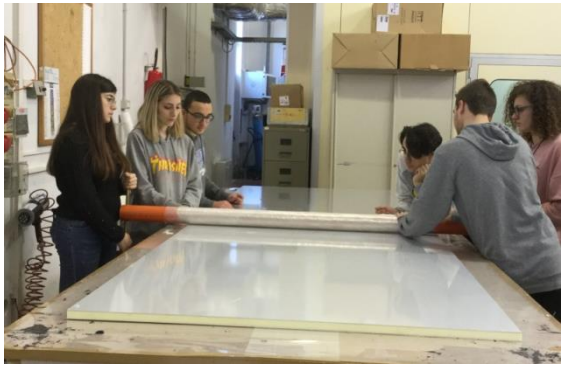
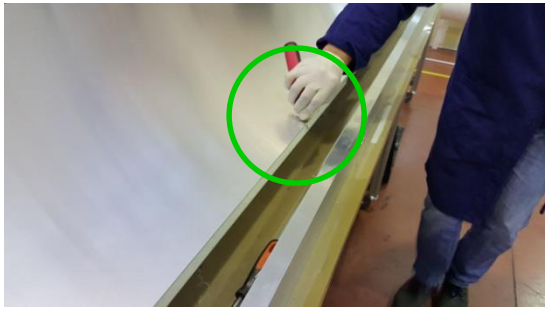
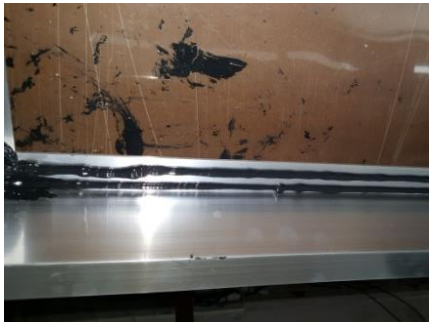
Frame Assembling II

Bottom panel: template for aluminum tube – tube for plastic foil removal - two glue strips for gluing the panel to the frame - deburring of aluminum edges







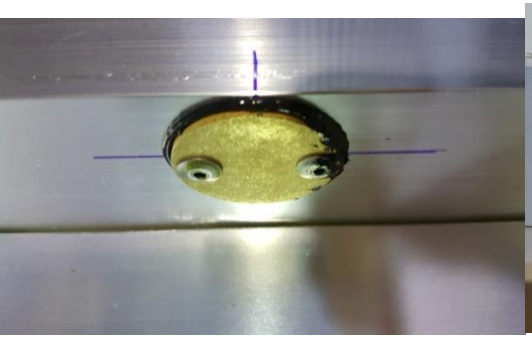





Frame Assembling III

- Bottom panel positioning with two vacuum lifting tools

C-clamps

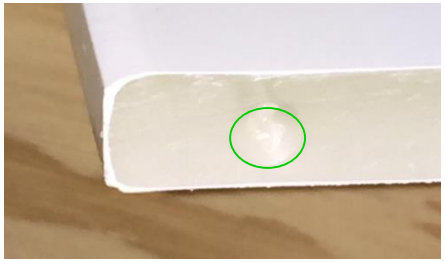
- Sintered – flange – alum. Ring – alum. tube orientation



Scintillator Bars

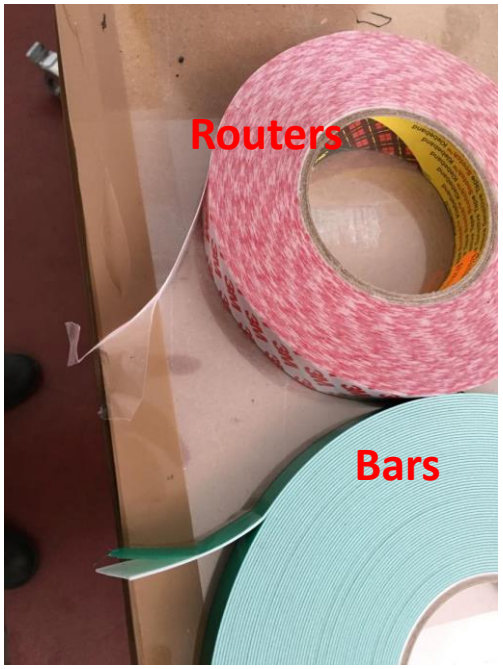
- Bar holes rounded with a countersink drill
  - easier optical fibers insertion
    - No accidental breaks due to the asymmetrical hole
    - Low insertion time

Before



After

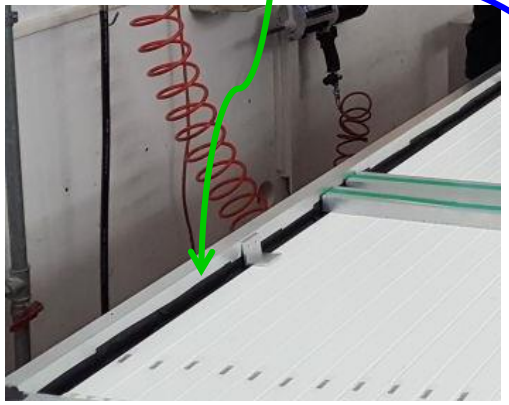
Scintillator Bars Positioning

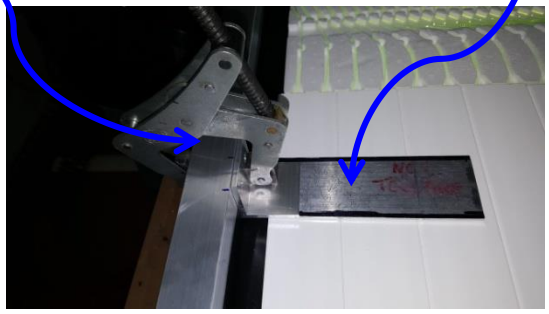


- Thiner tape for the routers

» routers and the bar holes at the same height to simplify the fiber insertion

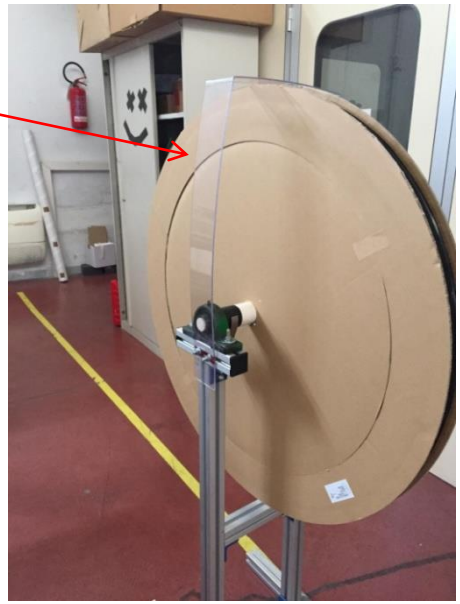
- pressured air for bars holes
- Black tape all over the inside structure
- Small clamp and small alum. bar for drilling



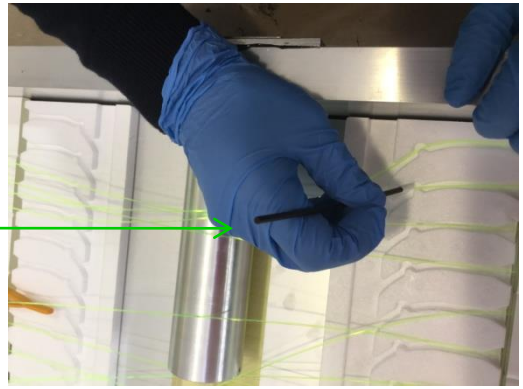


Fibers

- Fiber wheel on a support that can be positioned close to the frame
  - Support having a plastic strip to avoid uncontrolled unrolling of the fibers
    - Fiber tangle!!!!



- Cotton swabs



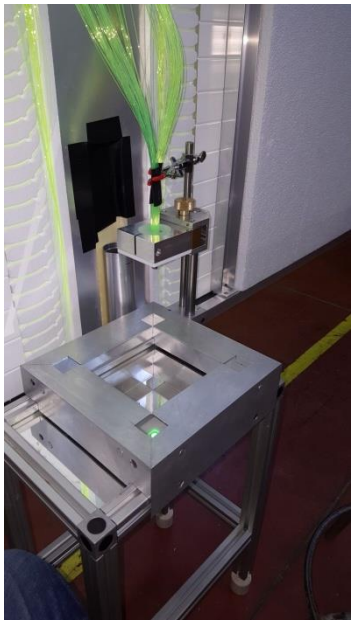
- Fiber cutting at 1.25 m from the bars ending
  - At the end we have the fibers

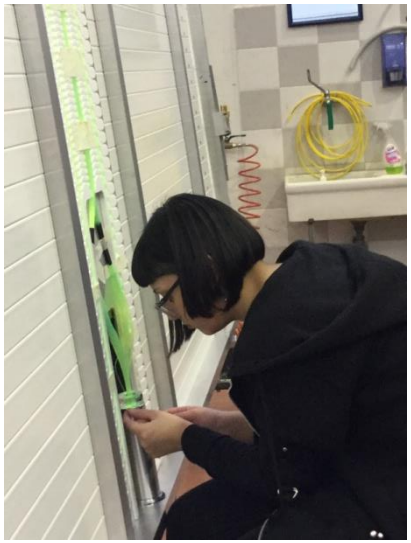
    2-3 cm longer in order to be safe

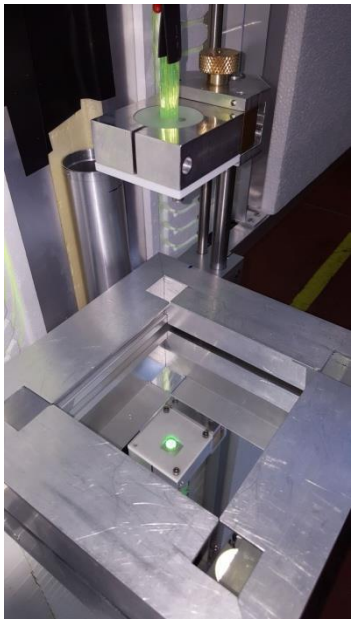
Cookie

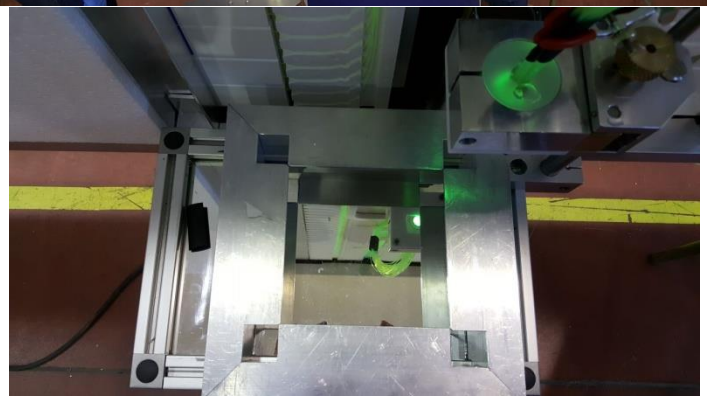
- Rotating Table
  - Allows to perform the fiber melting and alignment in vertical position facilitating all the operations
- Cookie Table
  - Melting
  - Allignment
  - Cement
- Small vacuum chamber for optical cement degassing: NO AIR BUBBLES!!!
  - Small glass vessel
  - Rotary pomp

Cookie Table II

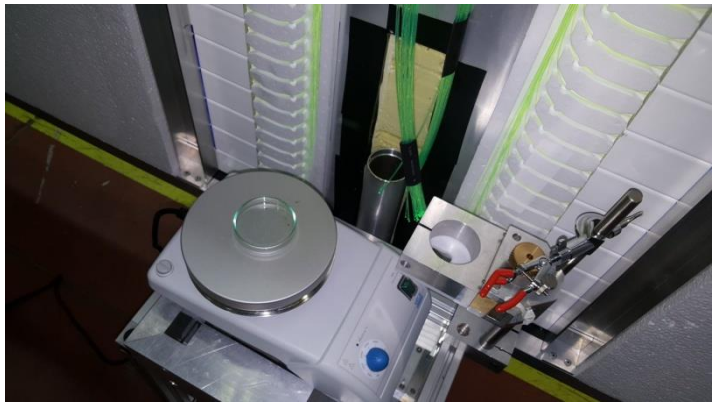


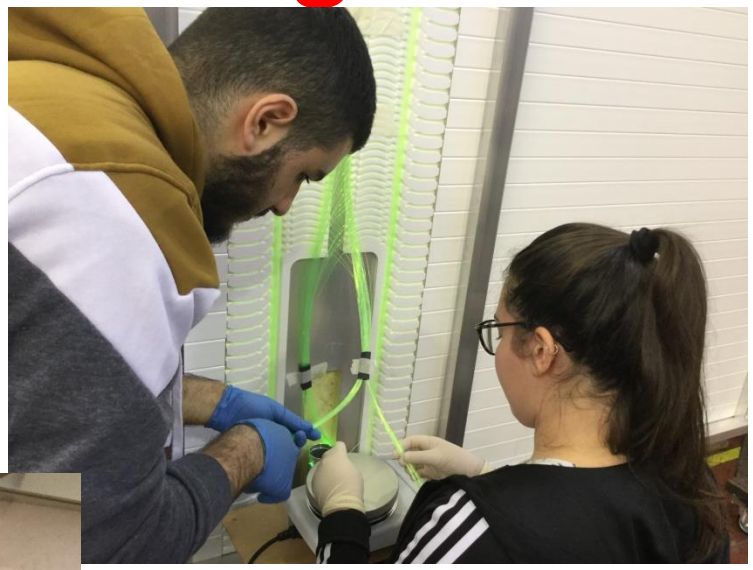




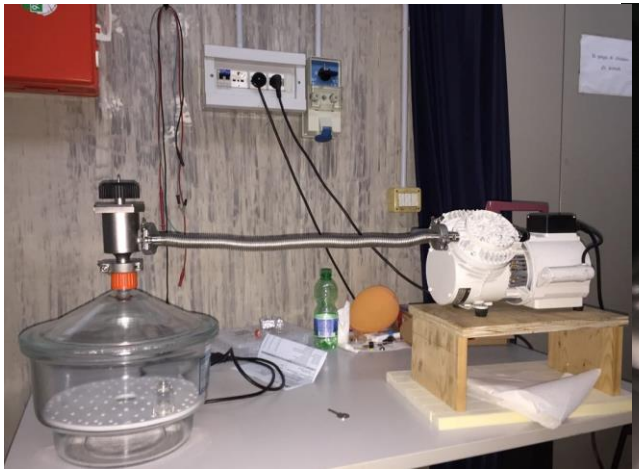


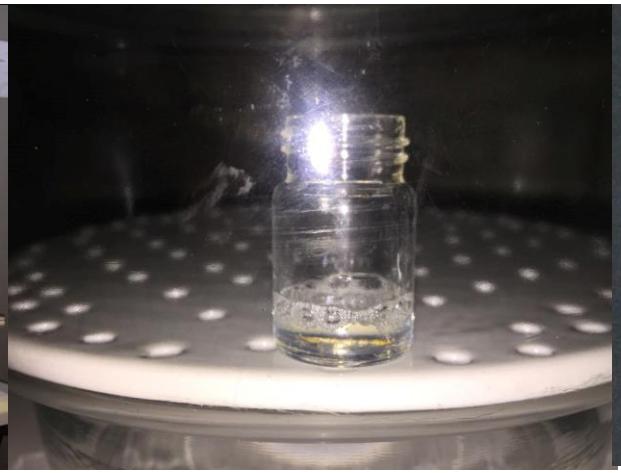
Optical Fiber Melting

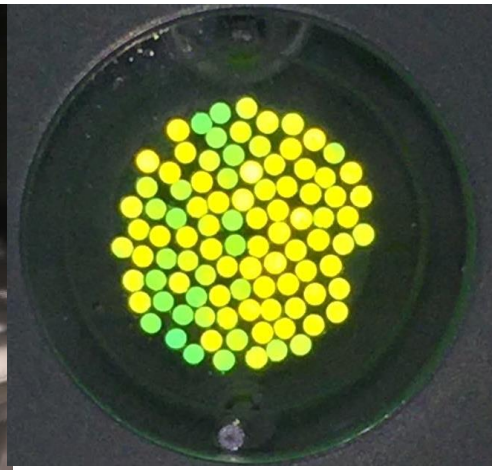


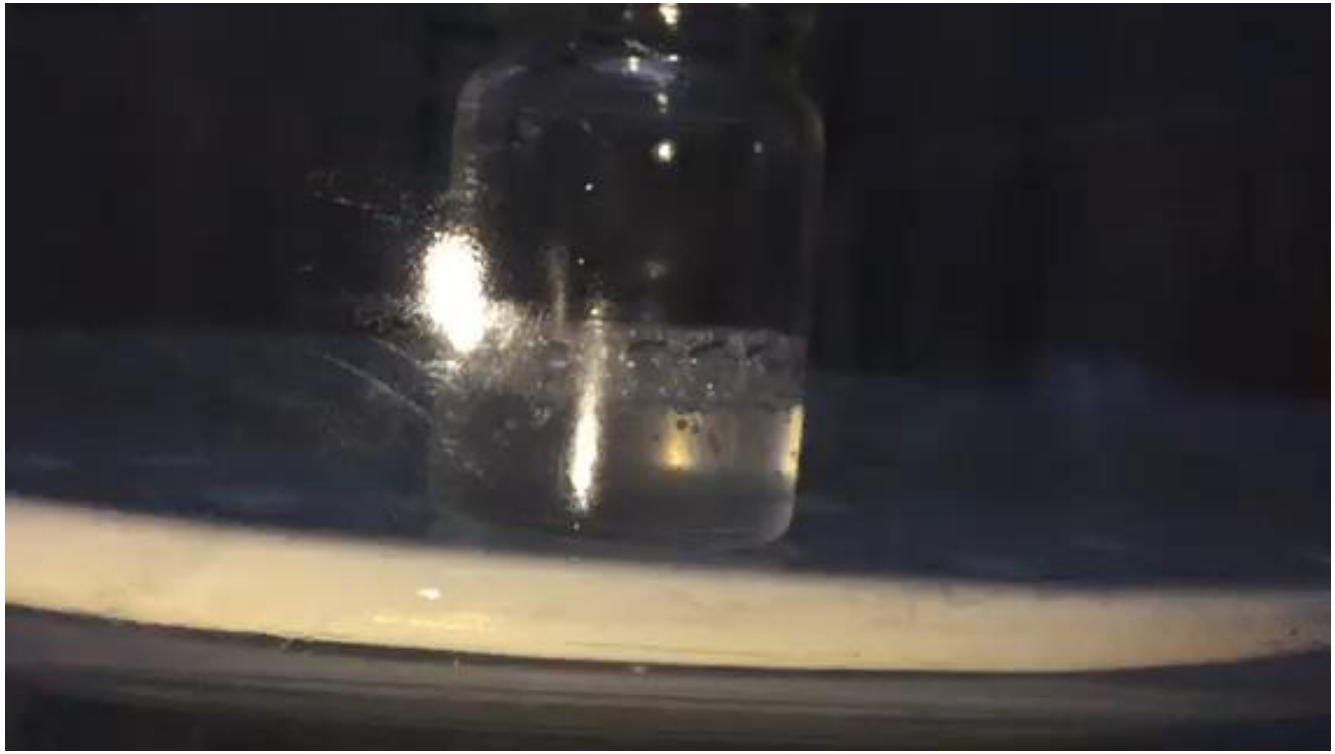


Vacuum Procedure





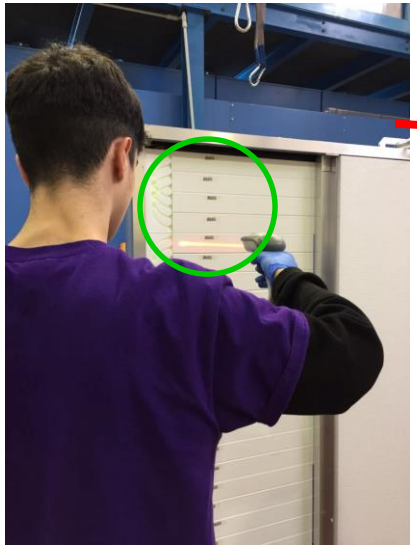


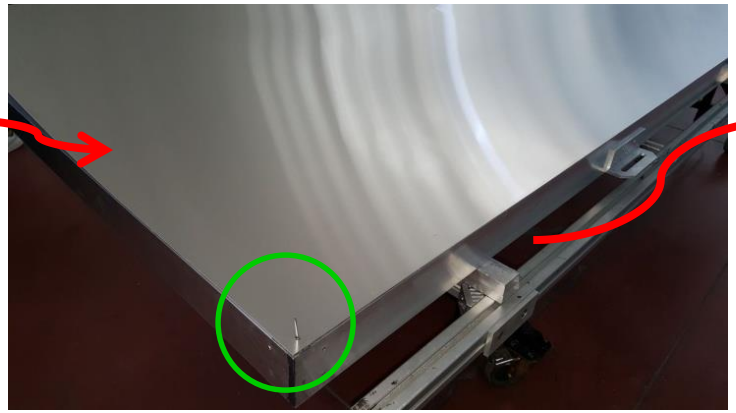


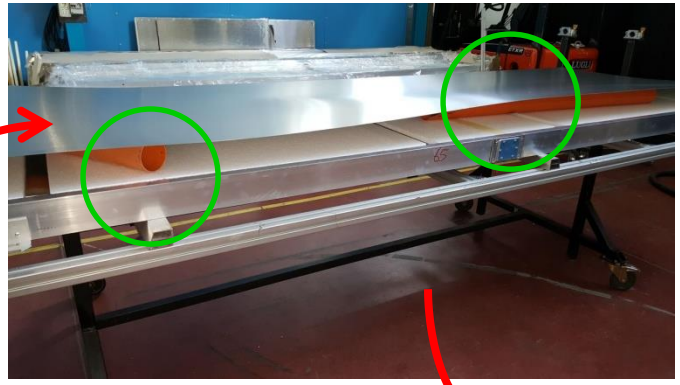
Detector Closing

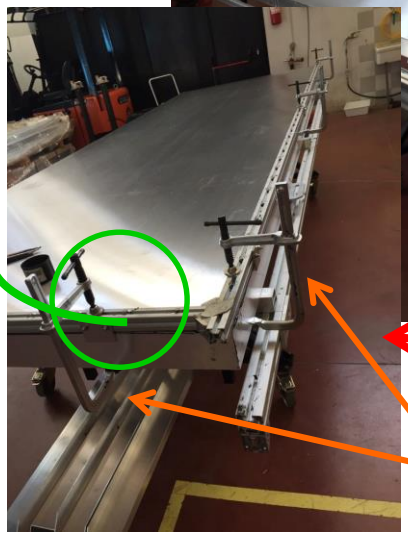
- Bar code scan
- Detector from rotating table to movable table
  - Check for the glue on the rear panel (glue syringes)
- Top alluminum foil positioned on the SSD
- 4 reference holes (Ø 3.5 mm) at the corners
- Glue in 2 strips along the border
  - 2 plastic tubes used for positioning glue
- 4 hours for glue drying
- Holes for rivets performed using a template

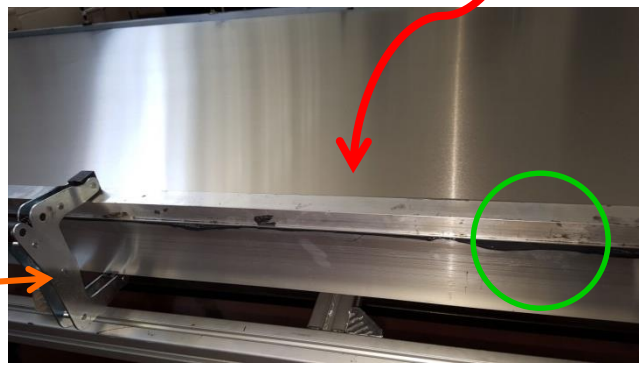
Detector Closing II







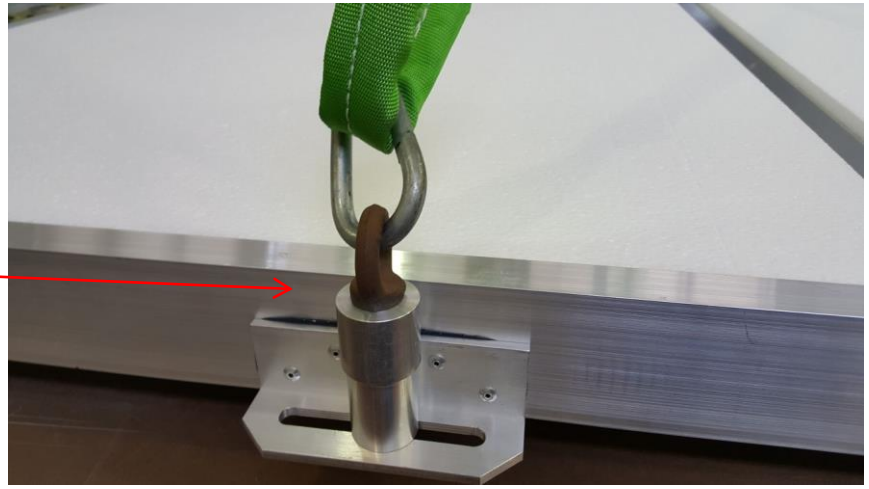




C-clamps

Detector Moving

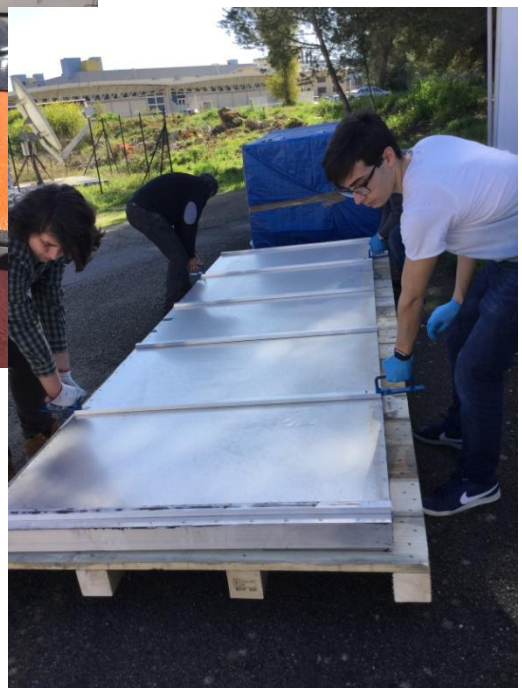
lifting eyebolts



Outside SSD Storage

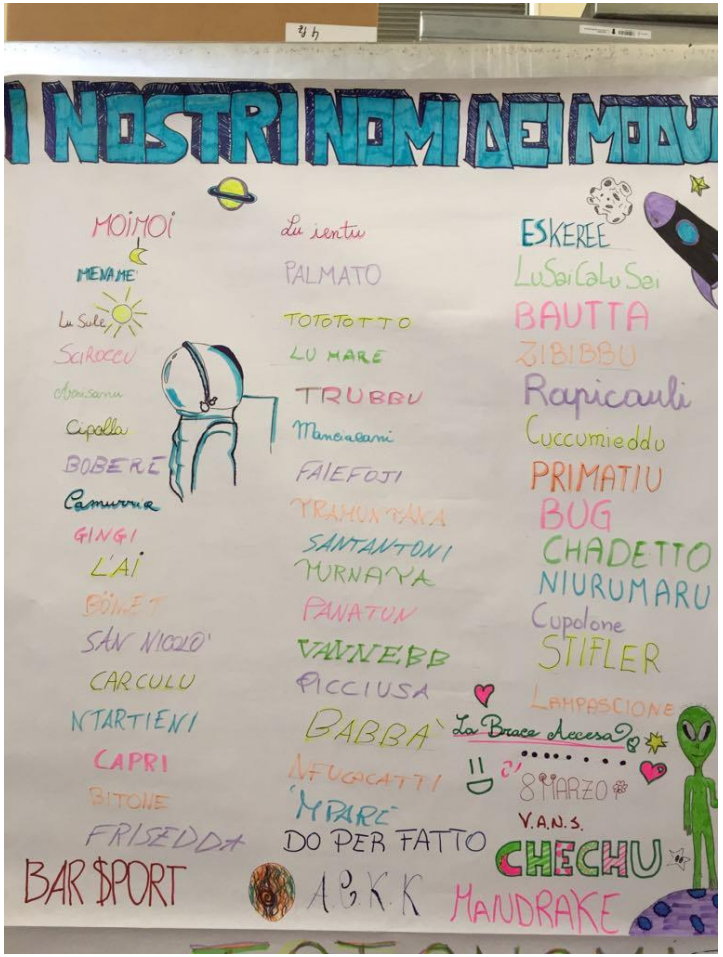
- movable table
- forklift
- handles for small movements
- Bracket to move up to three SSD per time

Outside SSD Storage II



Flange Protection

Detector Name



SSD Assembled in Lecce

- 68 SSD
  - Top closing: first glue than rivets 66 SSD
  - Optical cement degassing from SSD n.35 (Eskeree)
  - Rotating table from SSD n. 37 (Bautta)
  - Black tape from SSD n. 48 (Capoca)

High School Student