Measurements on L3 chamber (mechanical aspect)

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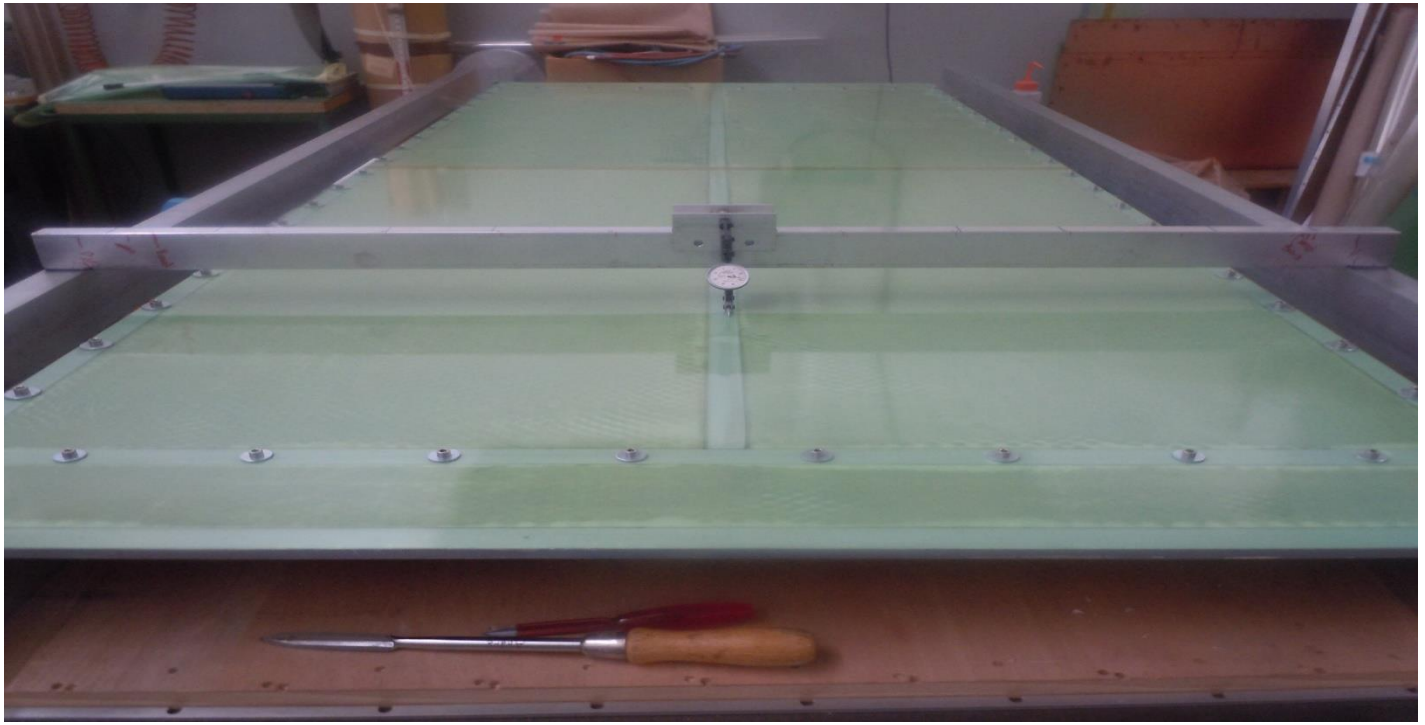
Overview

A dedicate measurement on the L3 Drift and Readout panels have been performed in order to evaluate the deformations produced by the mesh tension and gas flow.



L3 transversal section

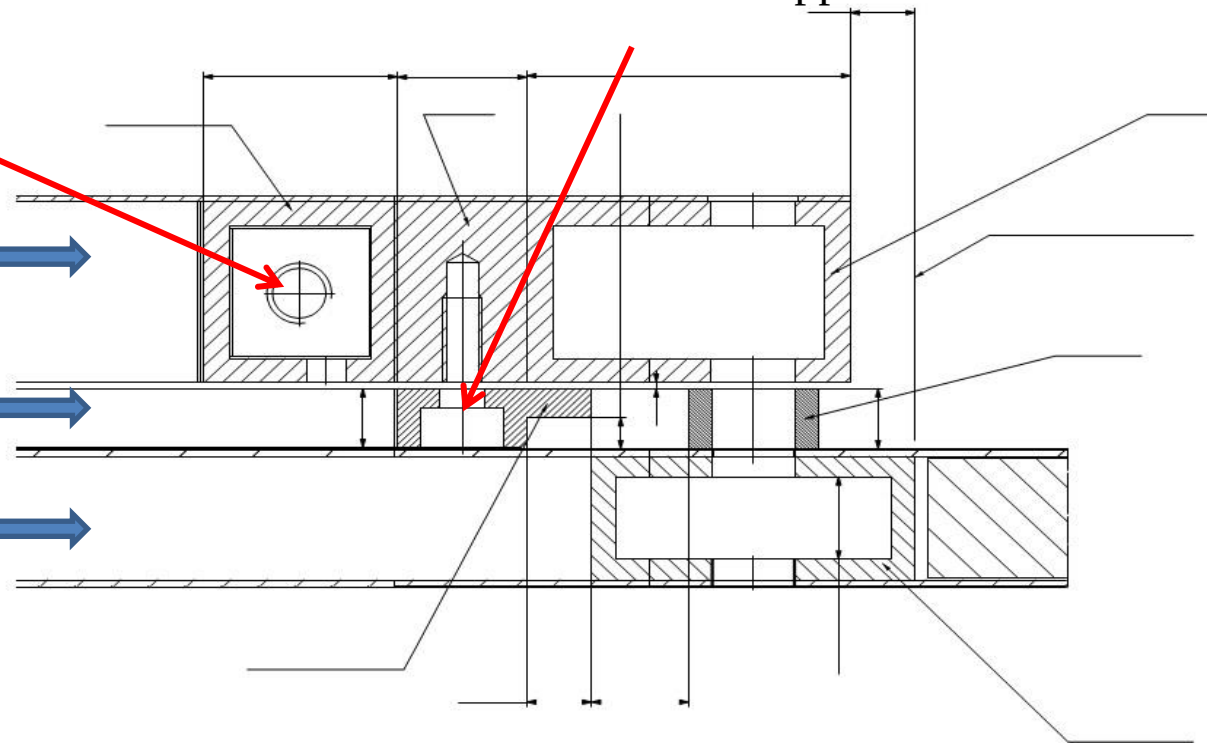
Gas distribution

Mesh frame support

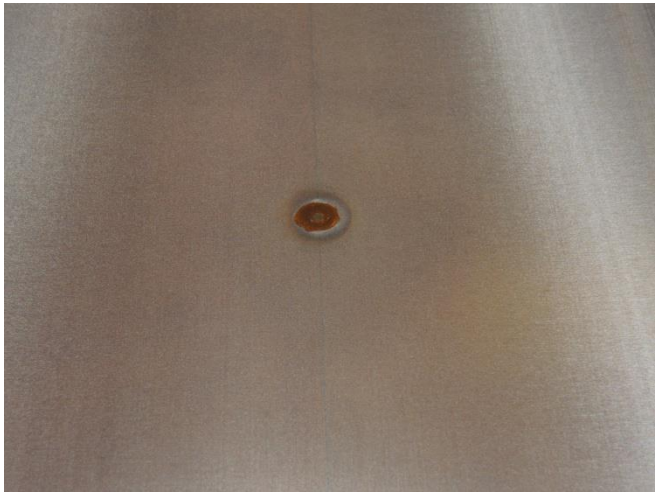
Drift Panel **(15 mm thick)**

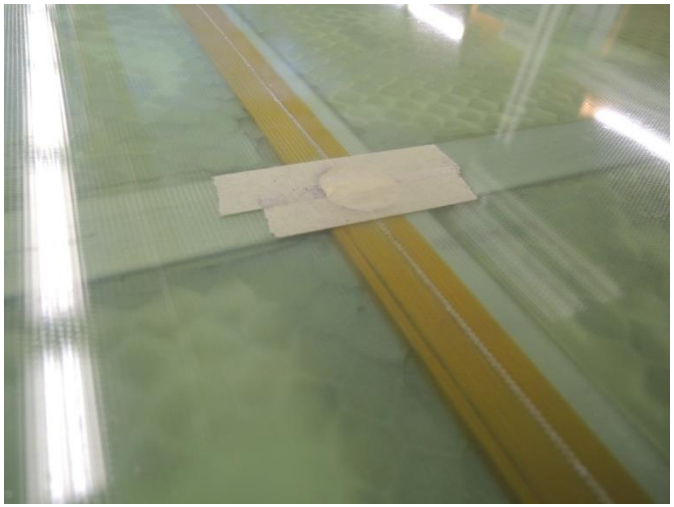
Drift gap **(5 mm thick)**

R/O Panel **(10 mm thick)**



Internal spacers



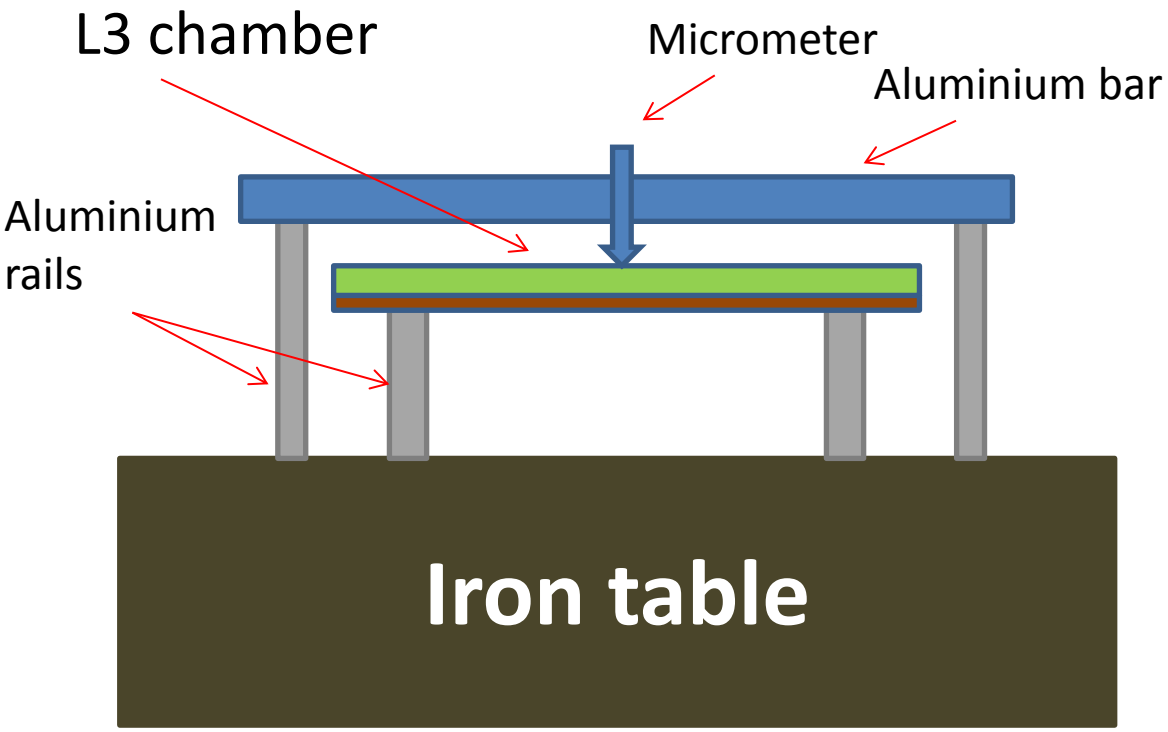


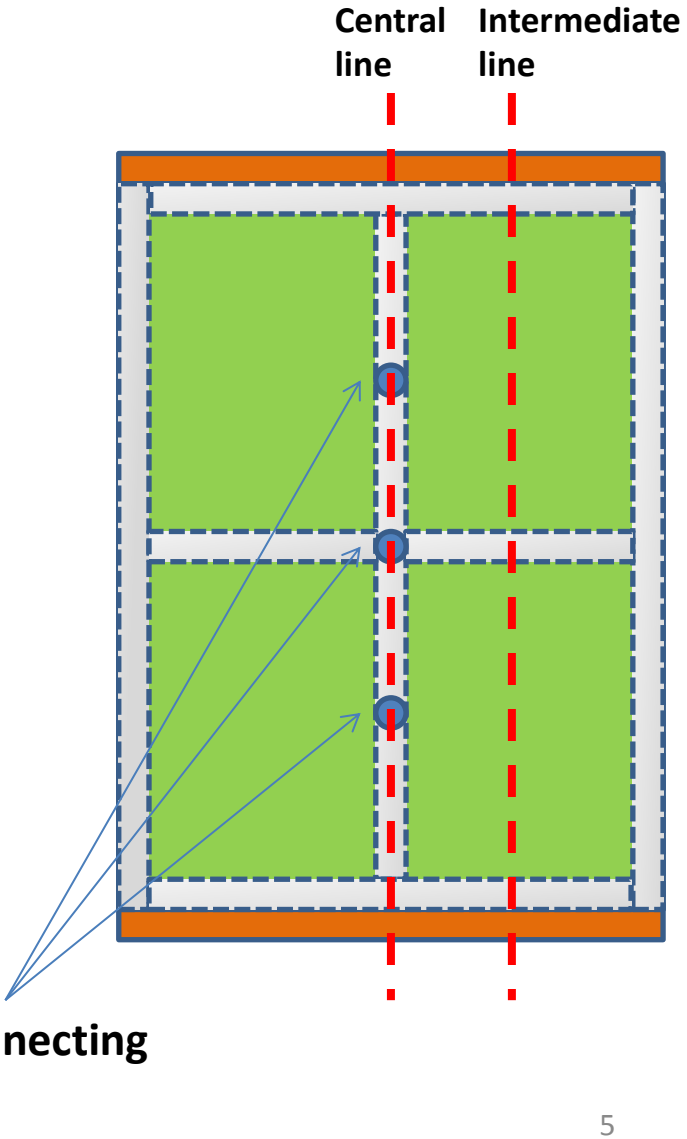
Hole in the mesh to accommodate the screw.

A Kapton ring has been applied to avoid shortcuts between mesh and resistive strips.

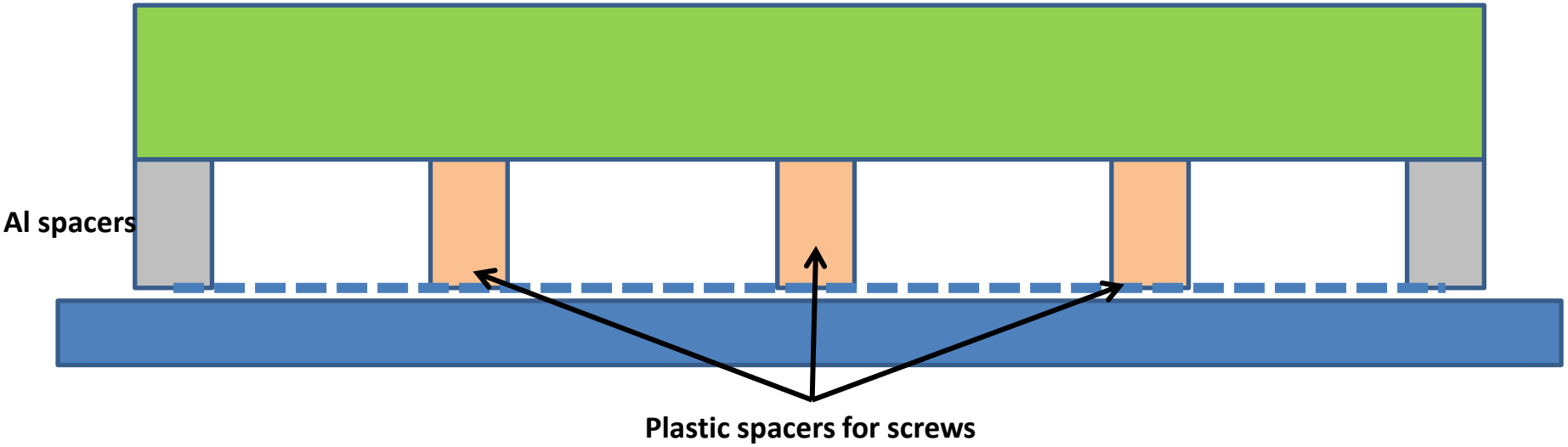
Screws which keep the distance fixed, are provided with an o'ring to assure the perfect gas tight.

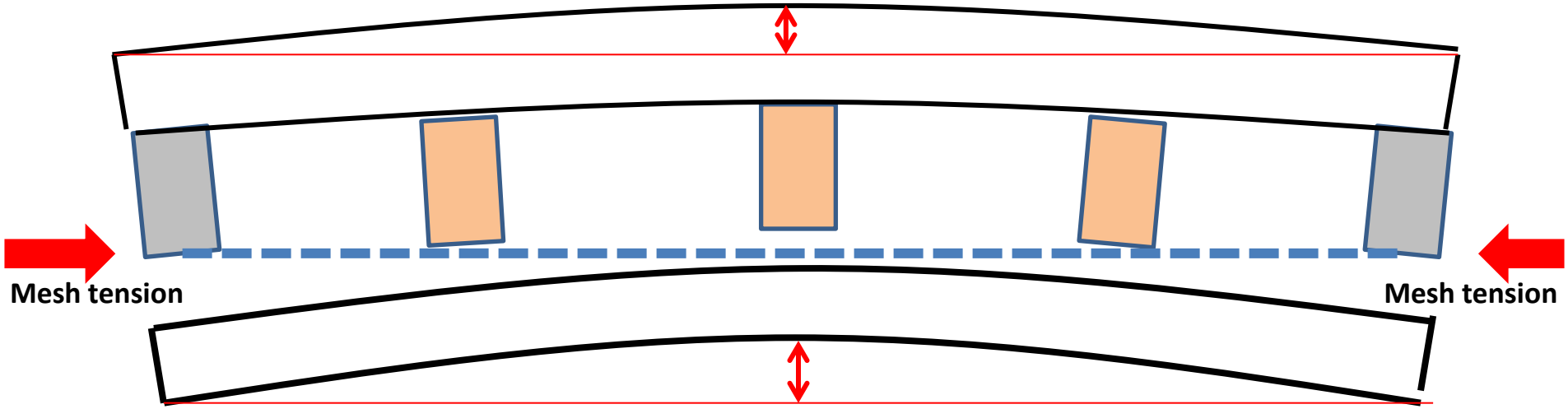
Test setup


L3 chamber
Micrometer
Aluminium bar
Aluminium rails
Iron table

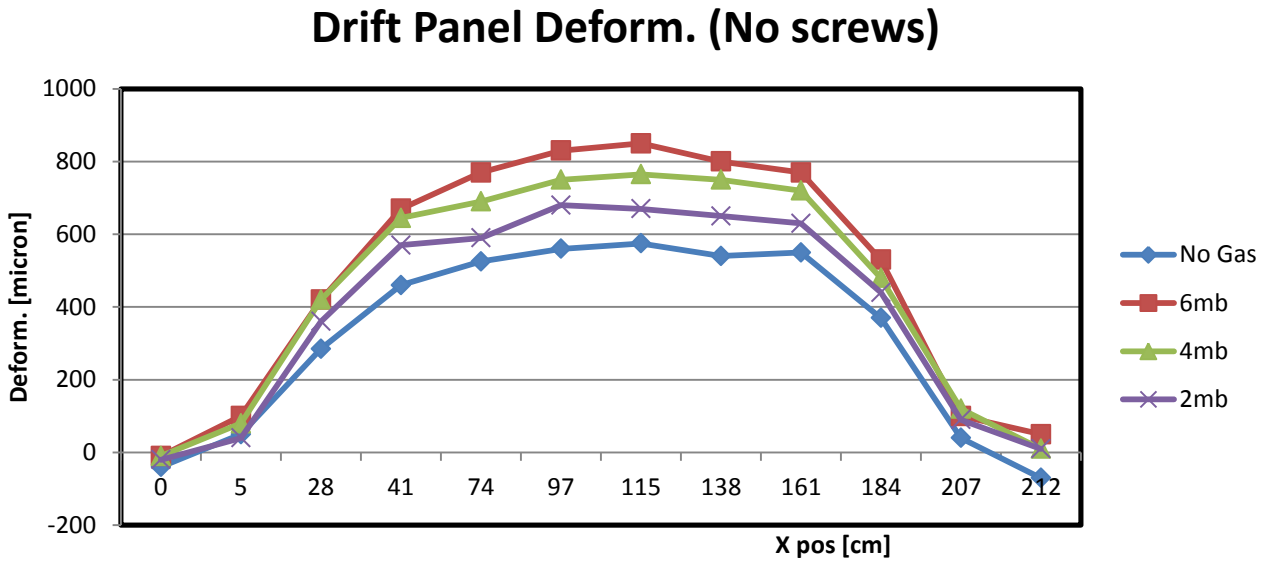

Central line
Intermediate line
Interconnecting screws

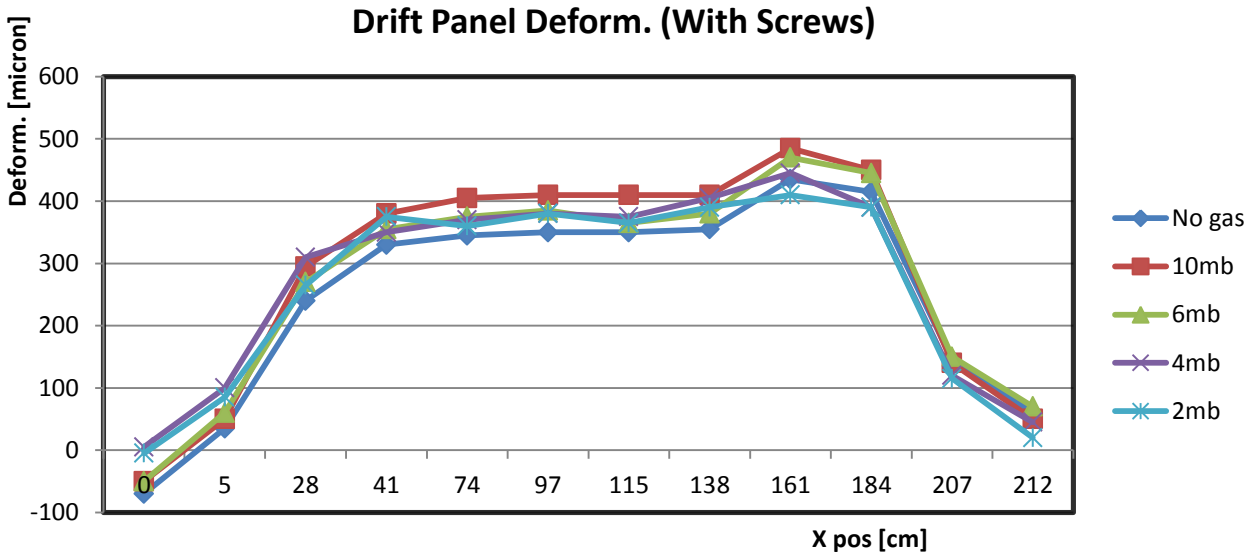
Expected deformations



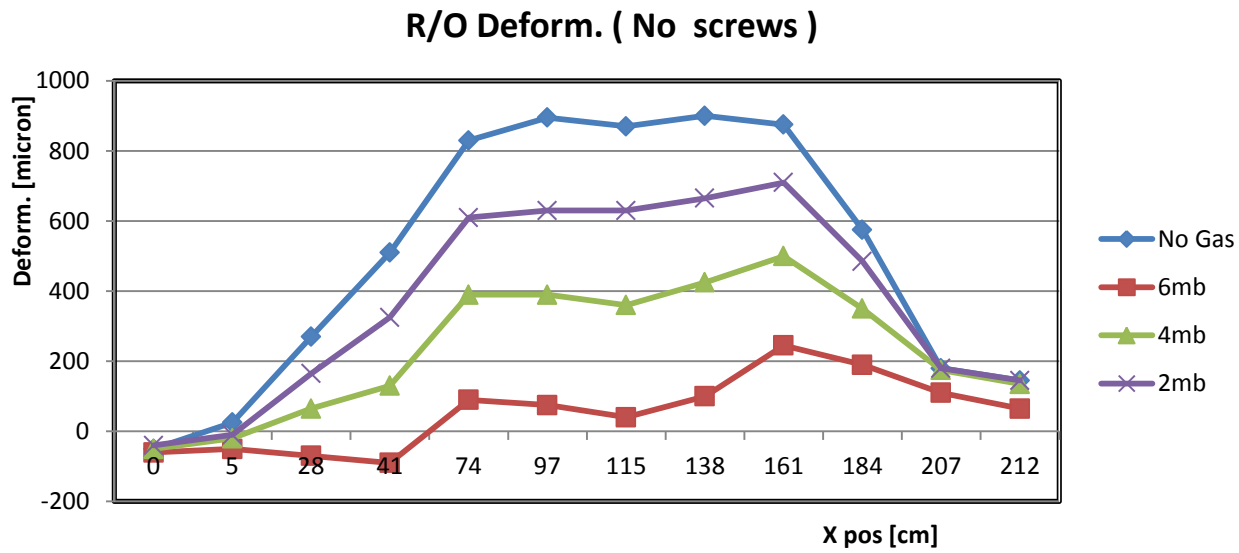


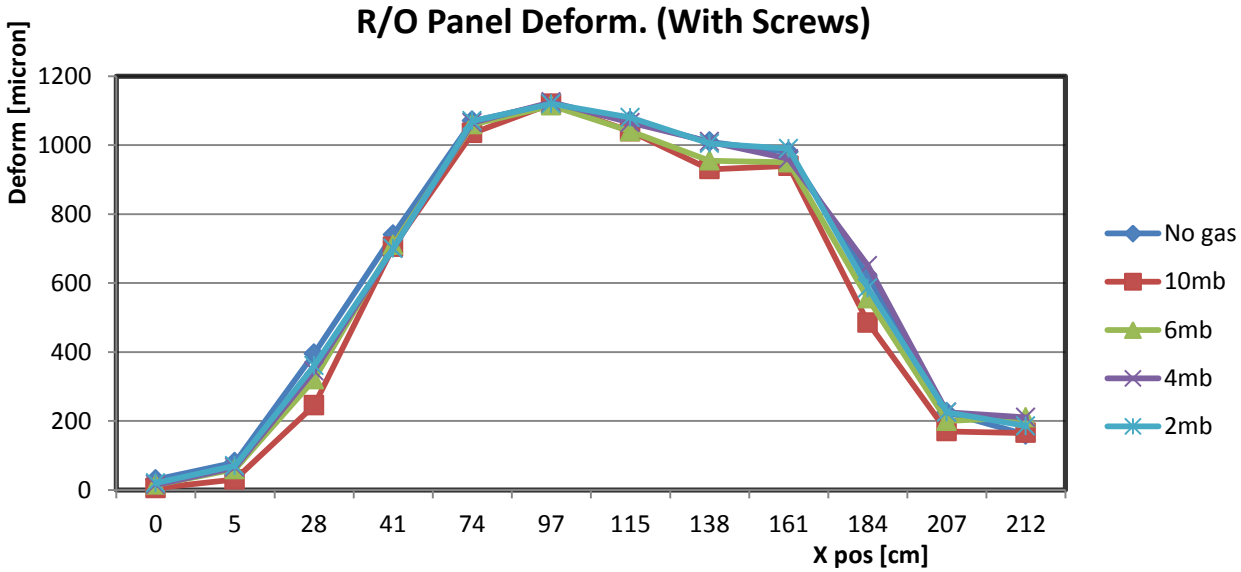
Drift panel results





Readout panel results





Conclusions and plans

- The Drift and Readout panels are deformed under the effect of the mesh tension.
- Without external constraints (interconnecting screws), the deformation varies according the internal gas overpressure.
- The panels deformations are reduced applying the interconnecting screws.
- The deformations induced by the gas overpressure are extremely reduced while the interconnecting screws are applied.
- Measurements on the intermediate line have to be analyzed
- Dedicate measurements on the Drift and R/O panel decoupled, have to be performed in order to evaluate the deformations on each single panel.