Demonstrator - Assembly

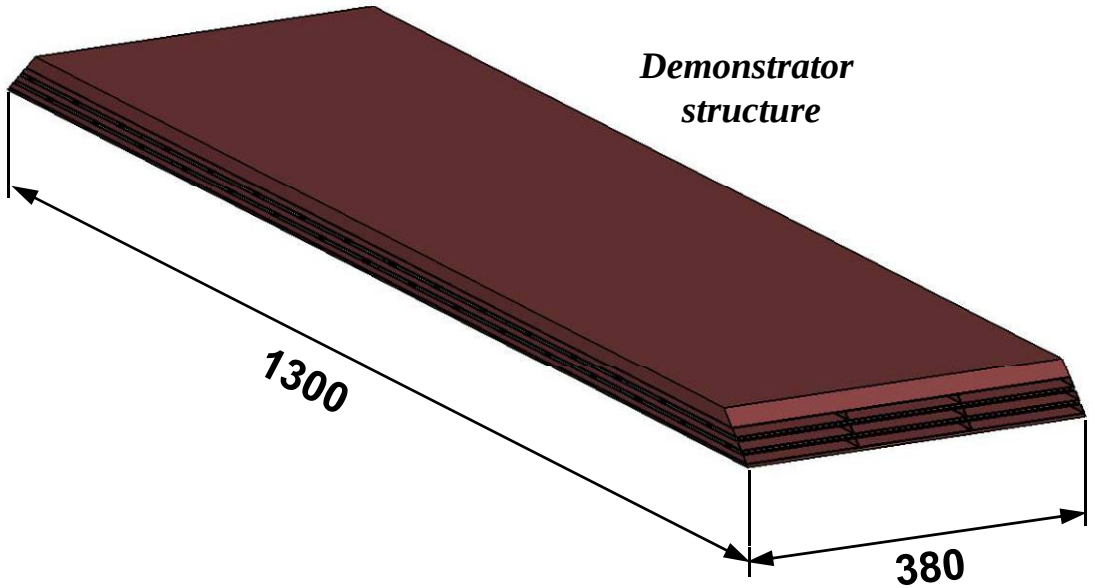
EVO meeting

Marc Anduze – 03/03/2009

Demonstrator design

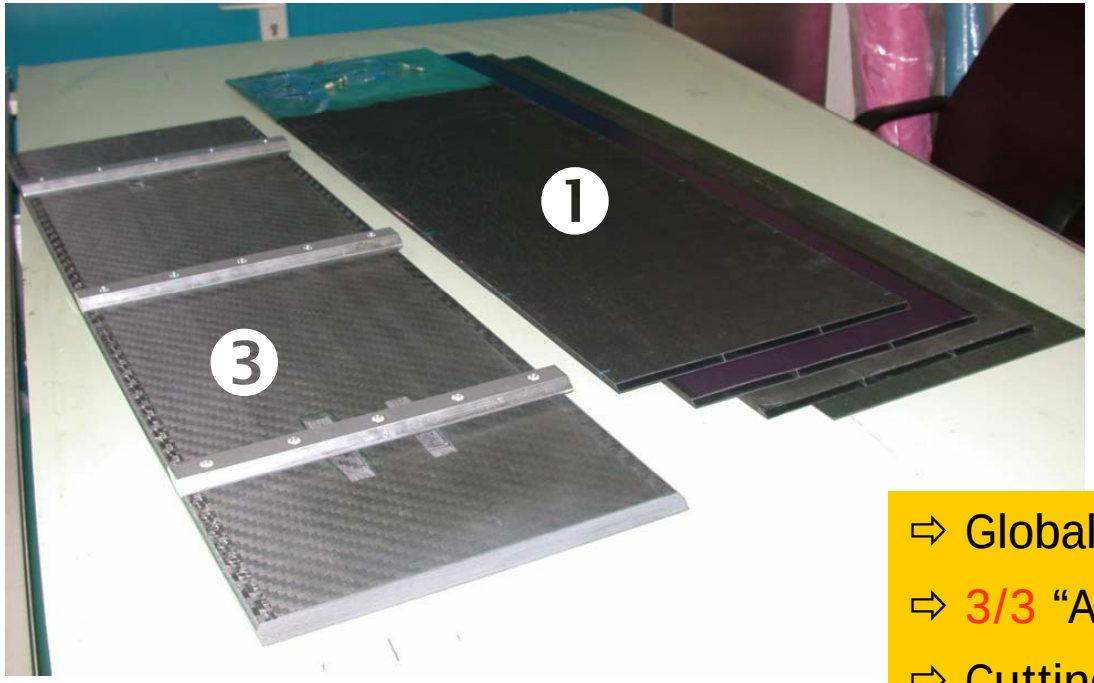
- We planed to build a first small demonstrator to validate all composite process before the EUDET module
- Width is based on physic prototype (124 mm)
- Used for thermal studies and analysis : design of a thermal PCB and cooling system.
- First test of slab integration (gluing, interconnection ...)

- **3 alveolar layers + 2 W layers**
- **3 columns of cells : representative cells in the middle of the structure**
- **Thermal studies support**
- **Width of cells : 126 mm**
- **Identical global length : 1.3m and shape (trapezoidal)**
- **Fastening system ECAL/HCAL**
- **weight : ~ 60 Kg**



Demonstrator – Alveolar structure

Assembled structure : Each alveolar layer ❶ are done independently , cut to the right length and angle (❷) and bonded alternatively with W plates in a second curing step. The assembling is closed by 2 composite plates ❸ of 15 mm and 2 mm thick (from LPSC)



Cutting tests

⇨ Global design : ***OK***

⇨ 3/3 "Alveolar layer" structure ❶ : ***OK***

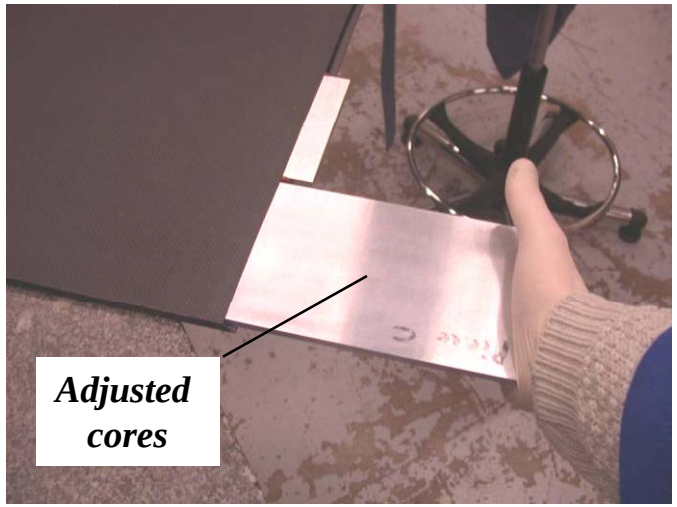
⇨ Cutting test ❷ : ***OK***

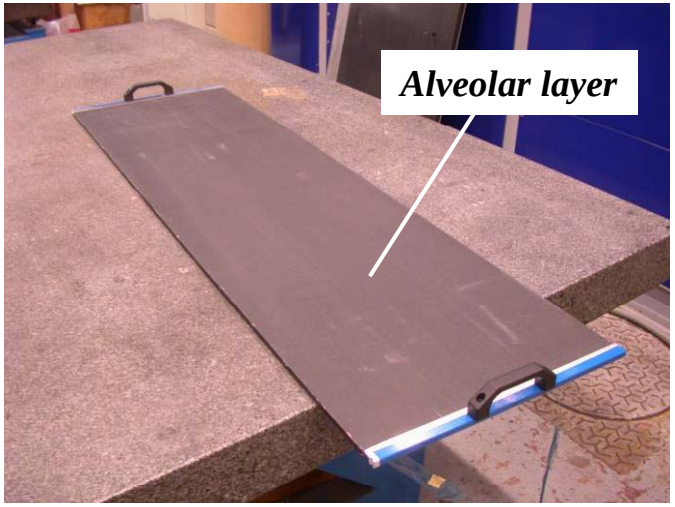
⇨ Composite plates ❸ (LPSC) : ***OK***

⇨ W plates (12) : ***OK***

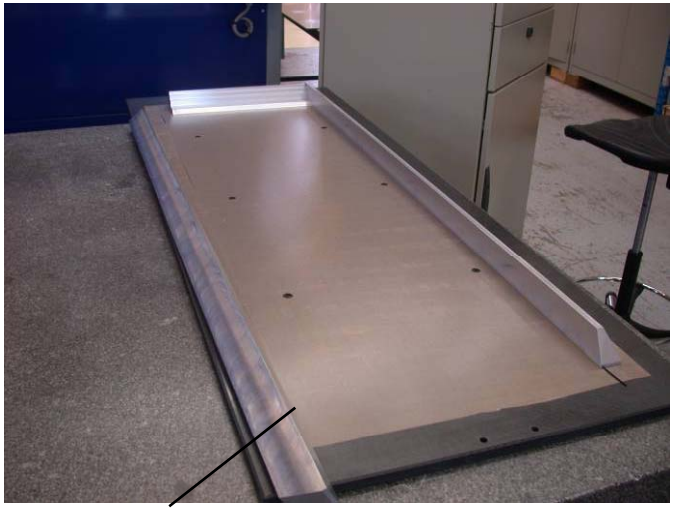
Assembly Steps (1/5)

1 - Alveolar layers preparation

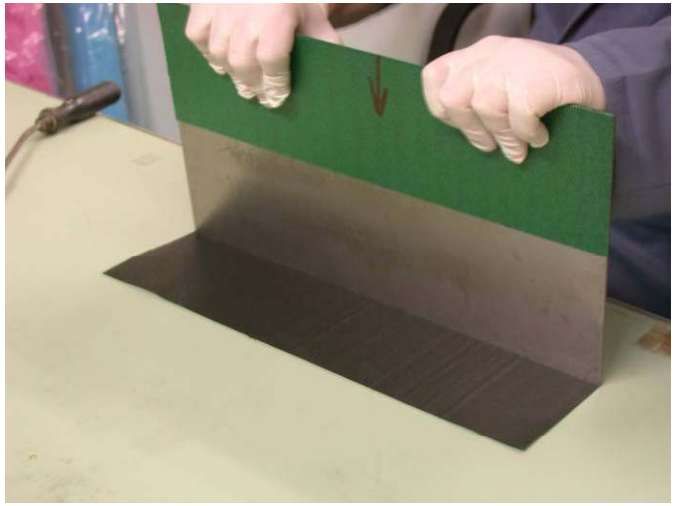




2 - Mould preparation

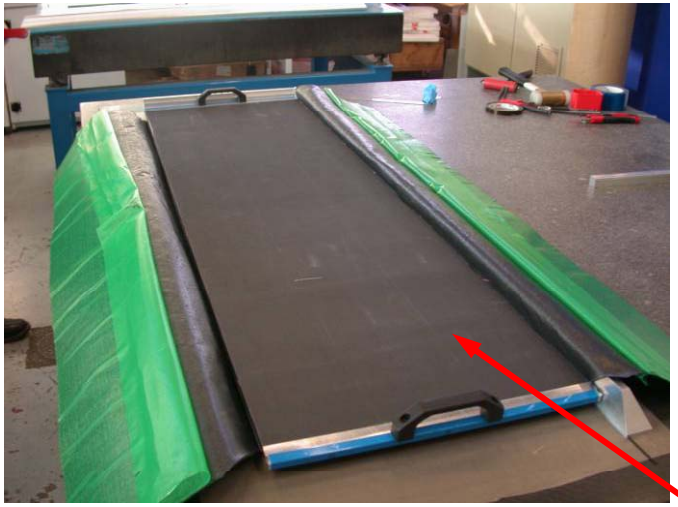


3 - Wrapping (W plates)

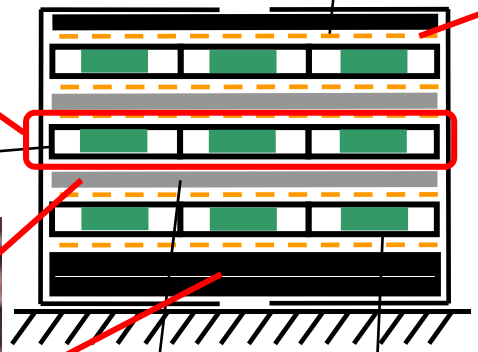


Assembly Steps (2/5) :

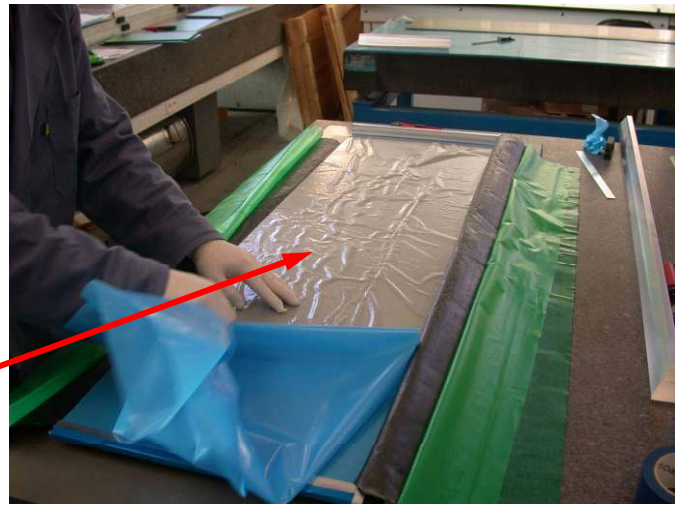
4 – Assembly in the mould (3 alveolar layers + 2 W layers)

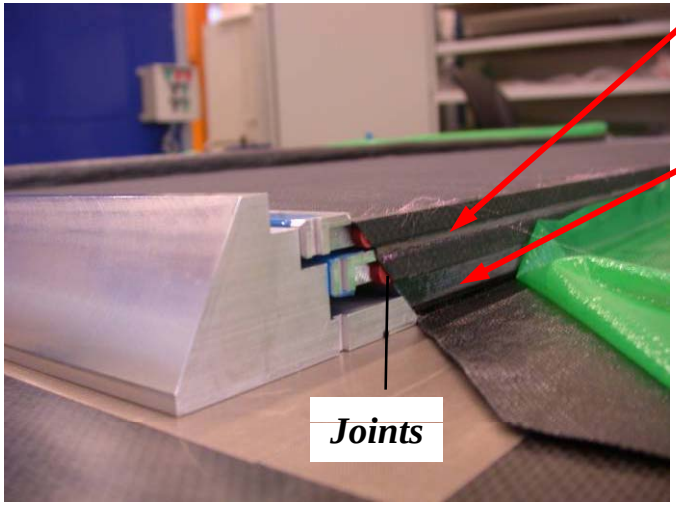


Alveolar layer structure



Adhesive film : (Structil 1035)





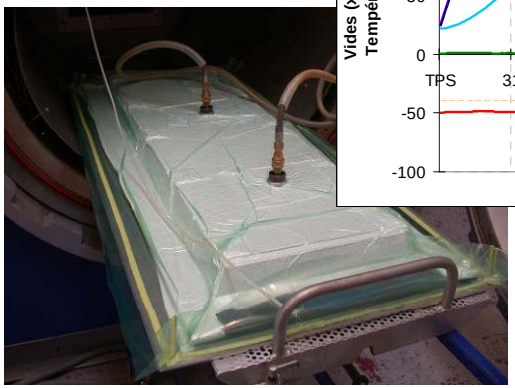
Joints

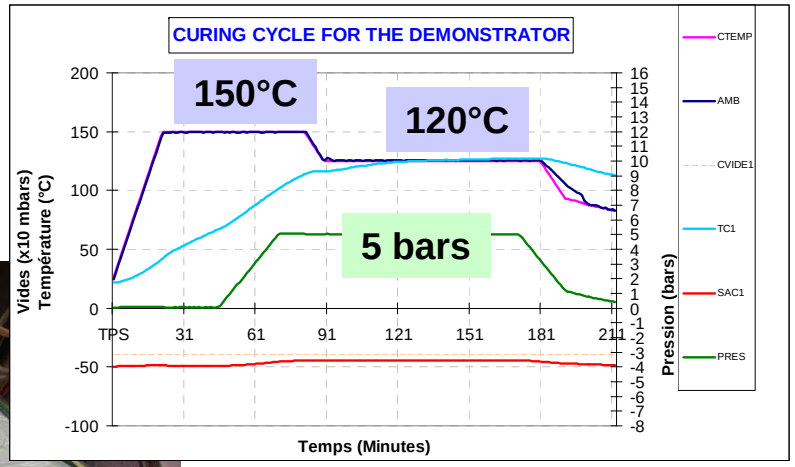
W plates

Adjusted cores

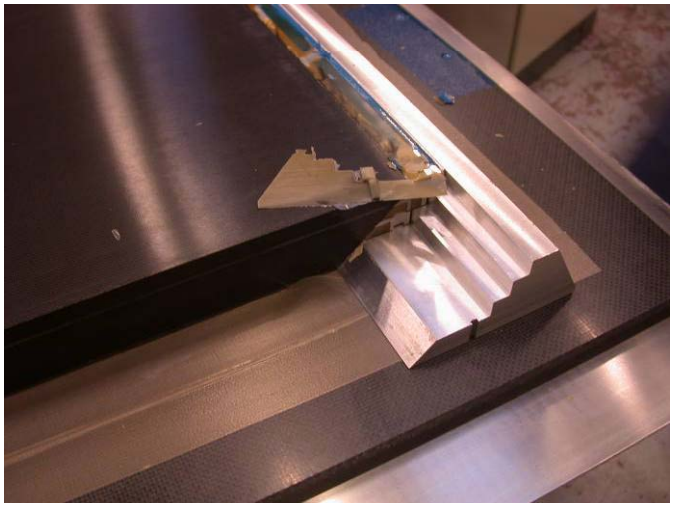
Assembly Steps (3/5)

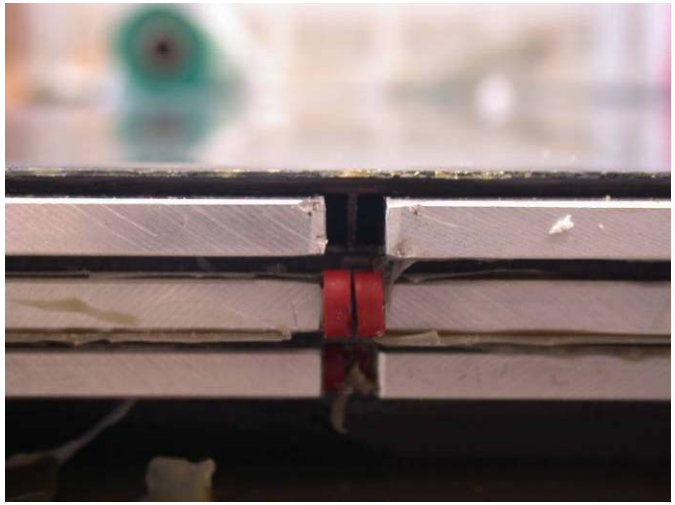
5 - Curing





6 - Dismounting

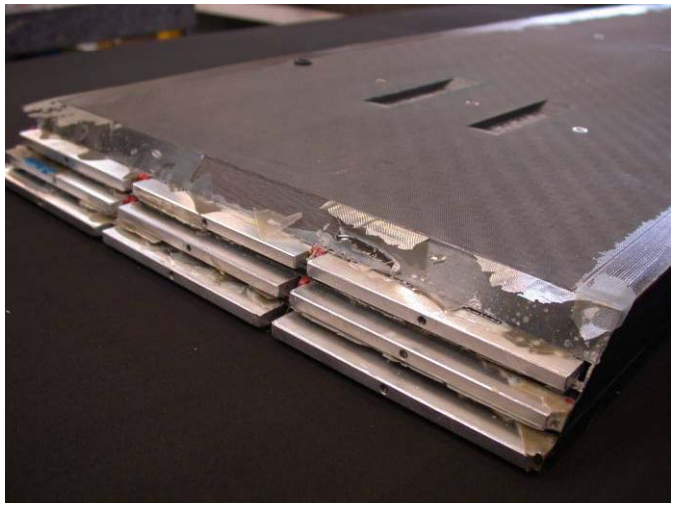


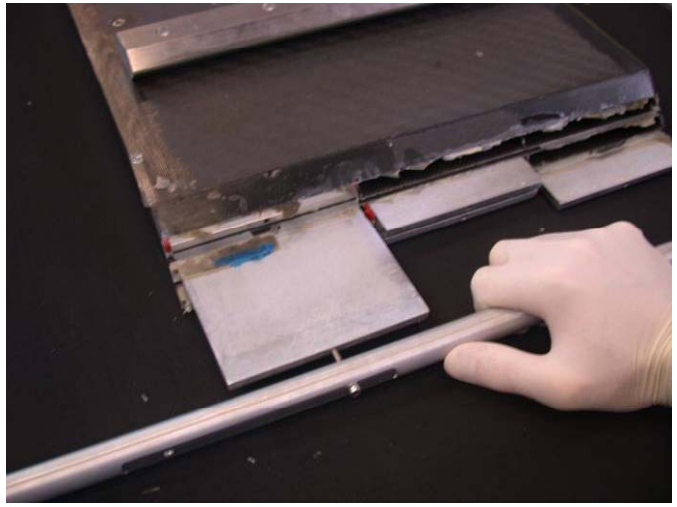


Assembly Steps (4/5)

6 - Dismounting

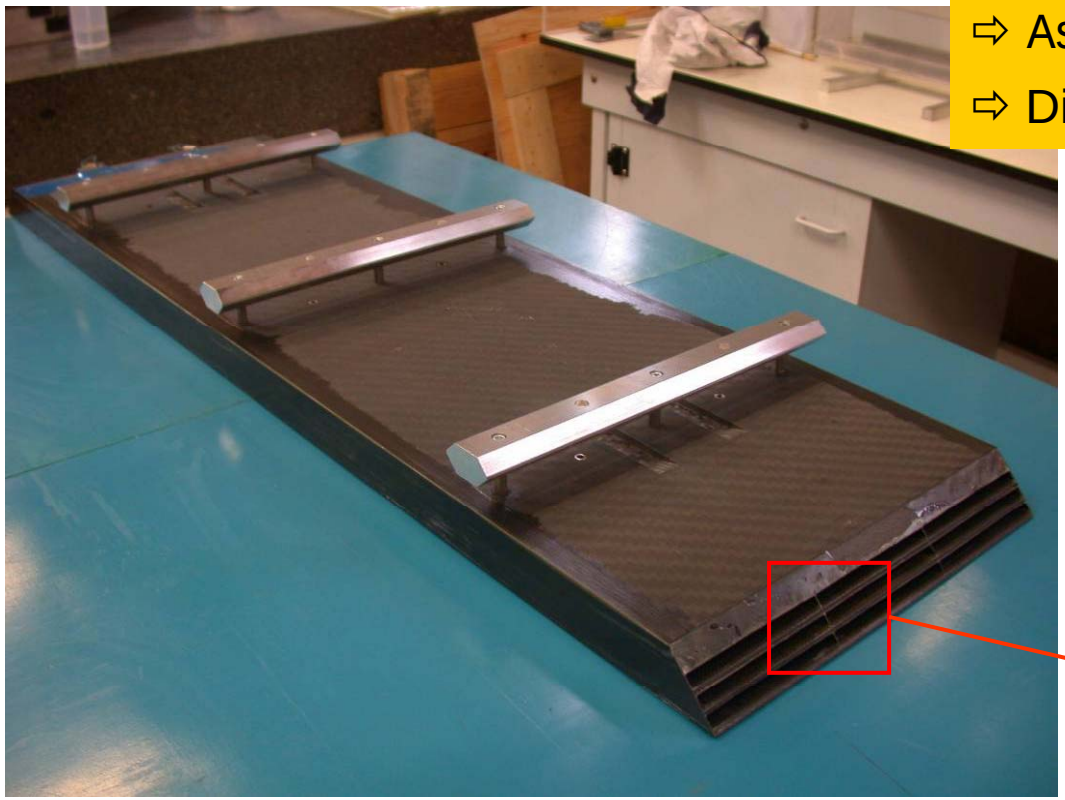
7 - Cleaning

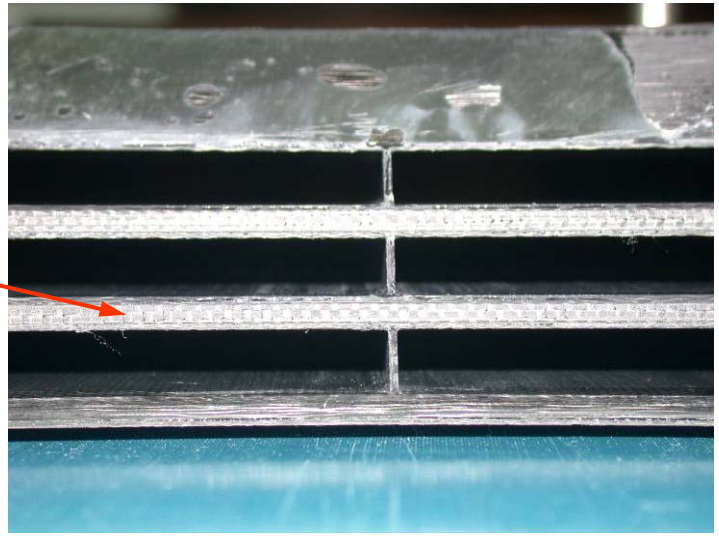




Assembly Steps (5/5)

- ⇨ Alveolar layer mould principle : ***OK***
- ⇨ Cutting process : ***OK***
- ⇨ Assembly mould principle: ***OK***
- ⇨ Dimensional inspection : ***on going***





Conclusion : schedule

- Demonstrator :
  - Demonstrator (3 layers) assembled — **Fev 09**
- Eudet module :
  - “Alveolar layer” mould reception — **Apr 08**
  - Composite reception — **Apr 08**
  - “Assembly mould” design (with thermal curing studies) — **Jun 09**
  - Alveolar layers & H production — **Apr 09**
  - Eudet structure assembled — **Sep 09**