UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

TEACHING COMPOSITE MATERIALS USING TECHNOLOGY

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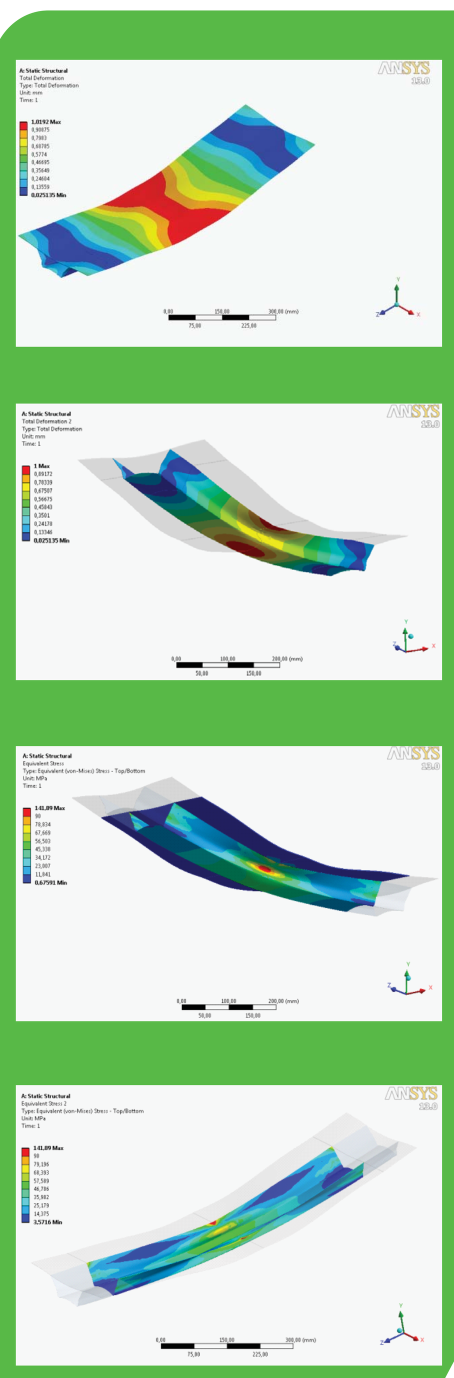
COMPUTER SIMULATION



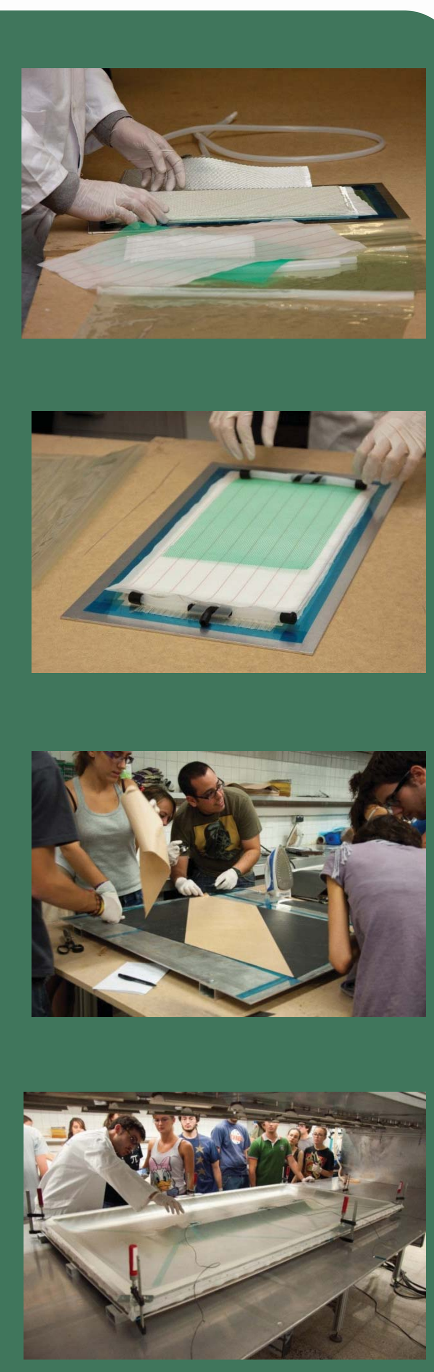
Modelling of stringers of an airplane wing using finite elements (type shell). Analytical calculation of the elastic properties of the composite with micromodelling. Fiber orientation produces orthotropic material properties.

Boundary conditions according real mechanical test.

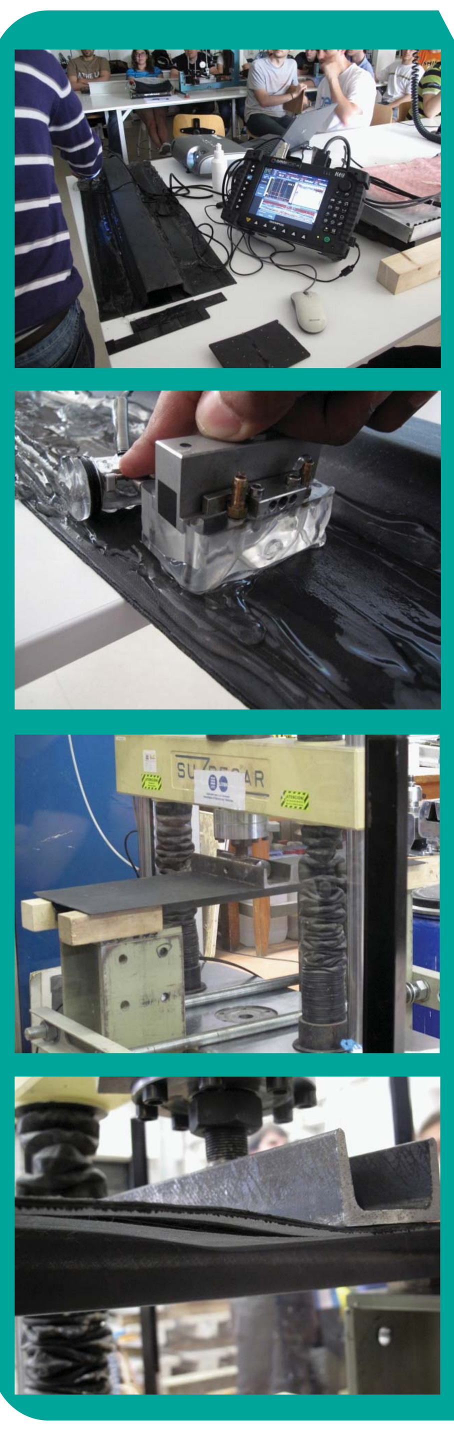
MATERIAL DESIGN

Manufacturing of a multilayer of glass fibers and epoxy resin. Vacuum infusion process.

Layering and moulding for manufacturing a stringer with pre-pregs. Longitudinal reinforcement.



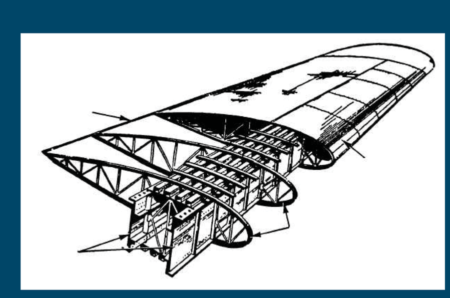
EXPERIMENTAL TESTING

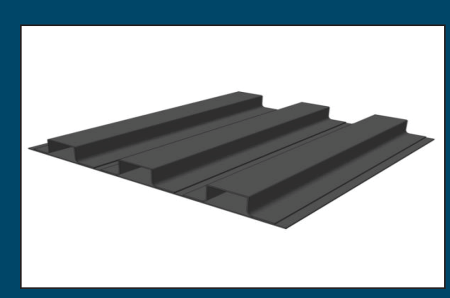


The experimental work performs two activities: firstly, a non-destructive inspection with ultrasounds to identify defects and manufacturing damages; secondly, a mechanical destructuve three-points bending test.

Non destructive test NDT performs a phase-array 3D scan of the stringer.

STRUCTURAL DESIGN





Use Mic-Mac software to calculate the structural performance of a stringer of an aircraft component part with composite laminates. Evaluate the stacking sequence, ply properties and failure criteria.