

Simulation offered by AAC

FEM Simulation

AAC provide standard transient and steady state thermal, static structural, modal and multi-physical FE simulations including structural behavior of composite and hybrid composite – metal structures using different state of the art failure models for first ply failure and progressive damage.

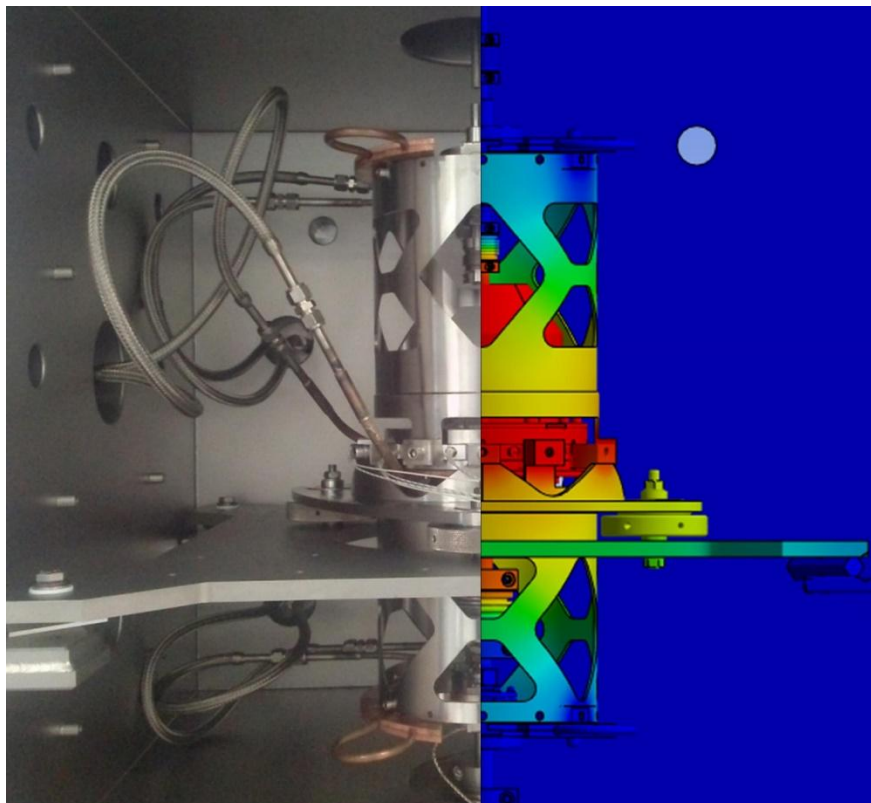


Figure 1: Thermal design of a testing facility

Furthermore, simulation of the behavior of smart materials such as piezo materials or shape memory alloys are offered to our customers to help in the design and optimization of sensors.

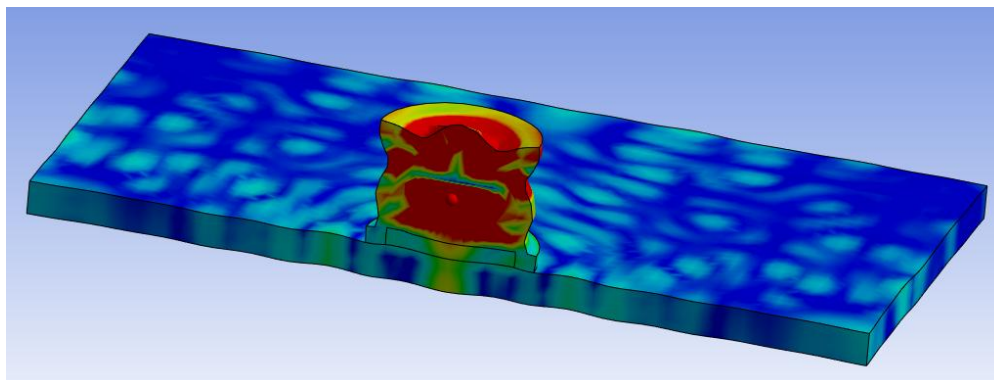


Figure 2: Vibration behaviour of a piezo sensor bonded to a composite plate

FEM Simulation of Composite Manufacturing Processes

Simulation is a very important step in the design, manufacturing and usage of composite parts. For the production of composites by resin infusion AAC can provide the information on the following aspects:

- Draping simulation for the determination of fiber orientation and searing of the dry preform.
- Infiltration simulation for the determination of the process time, determination of critical location in the part like pores and dry spots, definition of the best suited injection strategy
- Spring-In simulation – deformation of the part after de-molding, redesign of the mold for the compensation of spring-in effects
- Thermal simulation for the determination of heating- and cooling time, determination of thermal gradients, definition of best suited heating / cooling strategies
- Mechanical simulation – determination of deformations due to injection pressure, design of molding concepts

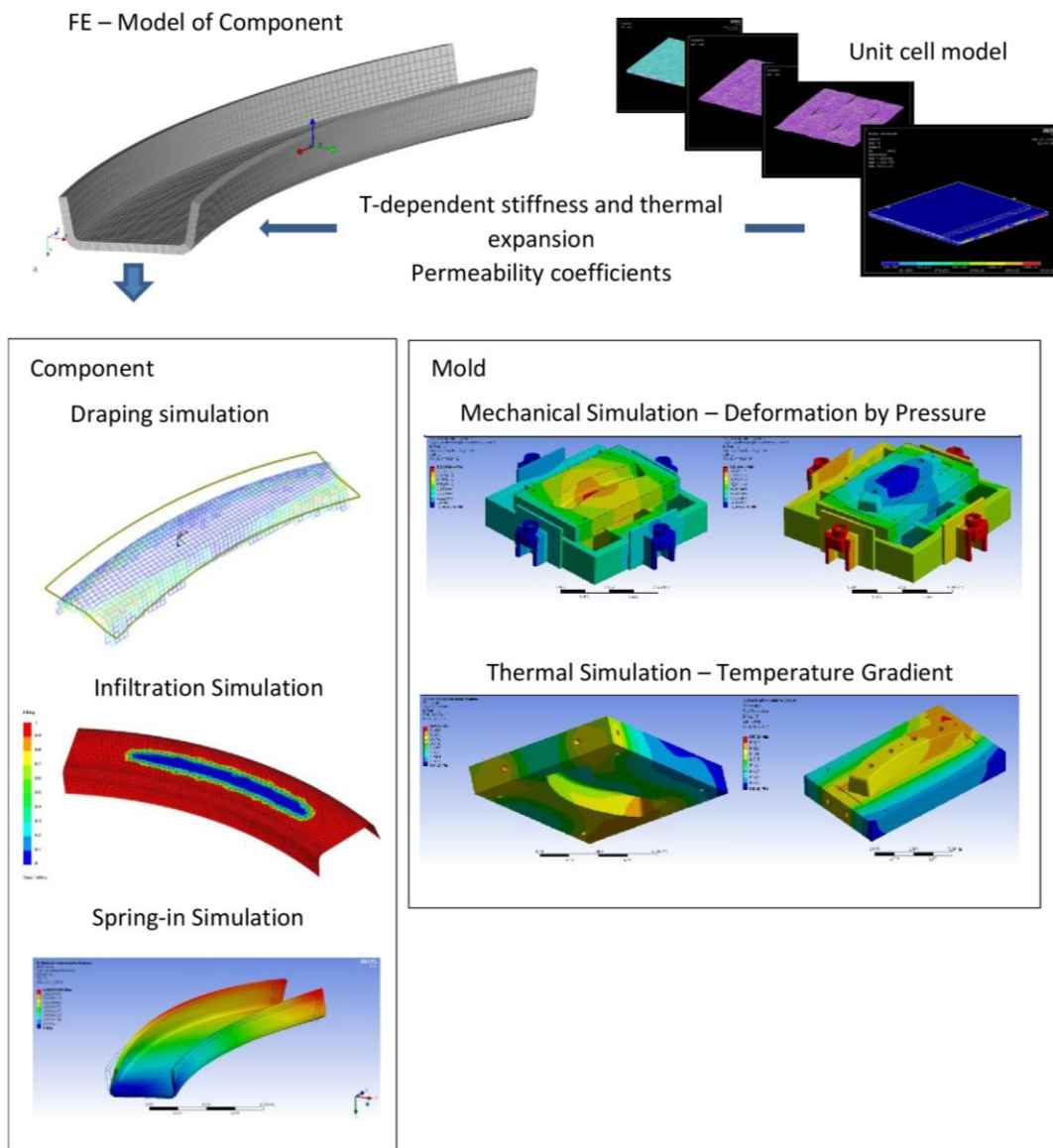


Figure 2: Different Steps for process simulation of composite parts

The following simulation tools are available at AAC

Sensors and Data Acquisition Systems @ AAC	
Finite Element Simulation	ANSYS Mechanical Professional with Ansys Composite PrePost
Resin Infusion Simulation	PAM RTM with Visual Studio
Data Evaluation	Matlab