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CONTRIBUTING TO THE DEVELOPMENT OF A NEW AERONAUTICAL COMPOSITE MATERIAL

#mechanical engineering #thermal #composite material #fatigue testing #aeronautics #shaping

A leading aeronautical equipment manufacturer turned to the experts at Capacités to assist in completing the final stages in the development of their novel composite material. Objectives: measuring its performance and optimising its shaping parameters. By combining their know-how in materials characterisation with their mastery in composite shaping and thermoplastics, the mechanical and thermal experts at Capacités were able to comprehensively address the equipment manufacturer's needs.

A TAILOR-MADE **STRATEGY AND TESTING RESOURCES**

As part of a product innovation initiative, this aeronautical equipment manufacturer developed a new ultra-light composite material.
Before its launch, Capacités was entrusted with the final performance testing of this novel material.
Their specialists firstly conducted a thorough study of competing for state-of-the-art materials and of the fatigue of structures containing a polymeric foam. They then designed a dedicated test bench and ran a series of tests that allowed them to master the formation mechanisms of the material during the polymer's foaming phase. In the course of this process, the comparative strength and fatigue tests of the material were chiefly derived from an analysis of the fracture surface via micro-tomography and thermal readings. The results of these trials attested to the high performance capabilities of this new material.

Capacités's experts, capitalising on their newly acquired testing resources, were able to determine the best parameters for shaping the material. They thus provided the client's teams with the key to controlling temperatures and optimising the finishing operations of this novel composite material: folding, covers lipping and repair.

To successfully complete this project, the Capacités' experts benefited from support and technical equipment from two laboratories : the LTeN laboratory (Heat Transfer and Energy Laboratory), joint research unit of the University of Nantes and the CNRS ; the GEM laboratory (Research Institute for Civil and Mechanical Engineering), joint research unit of the University of Nantes, Centrale Nantes engineering school and CNRS (The French National Centre for Scientific Research). ■

Expertises:

- Mechanical engineering
- Thermal engineering

CAPACITÉS
Created in 2005, Capacités is the private engineering and research valorisation subsidiary of the University of Nantes. It employs 90 employees, mainly engineers and PhDs, who work directly with scientists in the research laboratories.

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