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COMPOSITES TESTING FOR THE AEROSPACE INDUSTRY

#innovative materials #mechanical engineering #composite materials
#materials engineering #characterization of materials #aerospace
#mechanical engineering

Composite materials' behavior must comply with set standards for use in the aerospace industry, as defined by The National Centre for Space Studies (CNES / Centre National d'Etudes Spatiales). The verification process includes advanced mechanical tests that require specialized expertise in the mechanical behavior of materials. A leading player in the aerospace industry chose to collaborate with Capacités' engineers to conduct measurements for use in its digital simulation tools.

FROM THE TEST BENCH TO CME MEASUREMENT ANALYSES

This manufacturer of specialized space equipment first needed to determine the coefficient of moisture expansion (CME) of several composite materials. Their behavior in operating conditions in space then needed to be digitally simulated. Capacités' specialists in materials and mechanical engineering applied a comprehensive approach to this research, from implementing customized tests to analyzing results.

The experts first developed a test bench with temperature control, a vacuum chamber and a hot plate, in compliance with the CNES standard recommended testing conditions. The testing device developed for this purpose allowed a wide array of measurements to

be taken, including dimensions, mass and CME. They completed the device with a laser capture tool that measured the samples' elongation or shrinkage. The engineers then analyzed the results, which have now been integrated into the client's digital simulation tools.

To successfully complete this project, the Capacités' experts benefited from support and technical equipment from the GEM laboratory (Research Institute for Civil and Mechanical Engineering), joint research unit of the Université de Nantes, Centrale Nantes engineering school and CNRS (The French National Centre for Scientific Research). ■

Expertises:

- Mechanical engineering
- Materials 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.



UNIVERSITÉ DE NANTES



Commercial Contact
deveco@capacites.fr
(+33)2.72.64.88.94



Communication – PR Contact
communication@capacites.fr
(+33) 06.36.13.36.56