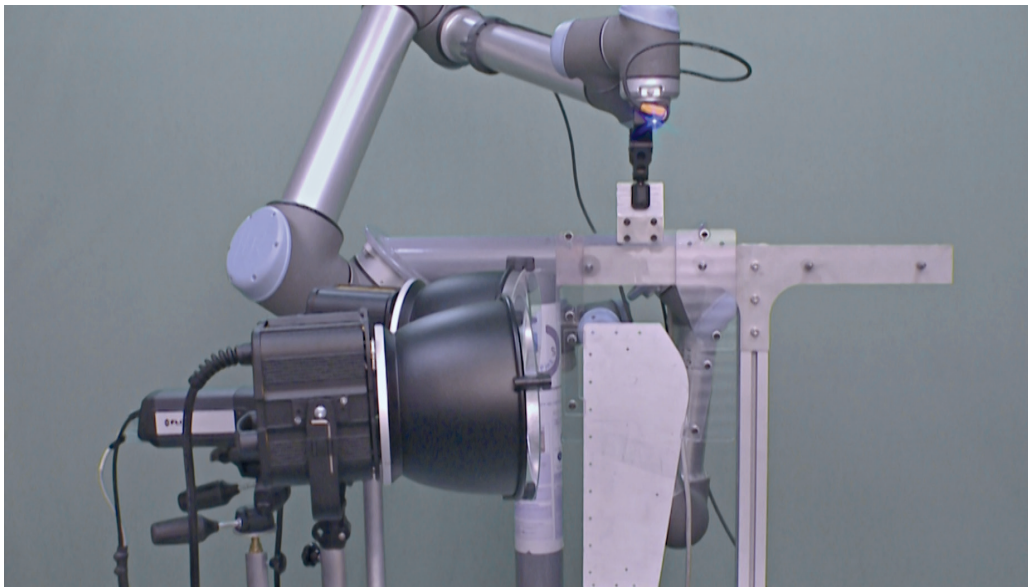


TACT project

# Automated non-destructive testing of **composite** parts

As part of a collaborative project dedicated to the manufacturing of composite parts, Cetim has developed an automated non-destructive testing process for this type of parts.



© TACT project

## THE PROJECT

### Partners

Nimitech (leader of the project), Cetim Sud-Ouest, Airbus, Liebherr Aerospace, ESI Group and Institut Clément Ader (Mines d'Albi).

### Funding

This project was selected by the French single interministerial fund (Fonds Unique Interministériel, FUI) and was awarded a label by the Aerospace Valley competitiveness cluster. It is funded by BPI France and the Nouvelle Aquitaine and Occitanie French regions.

**D**esigning an automated Non-Destructive Testing (NDT) process for composite parts, such is the challenge taken up by Cetim as part of the TACT project (Technologies for warm composite airframes). This collaborative R&D project, run from 2015 to 2018, focused on challenging the TA6V titanium alloy with composite materials to produce the maintenance hatches located in the warm area (approx. temperature: 300°C) of the pylons which support the engines of the Airbus 350. The objectives were to reduce the weight and the production costs of these parts by 30%. For this purpose, the partners of this project

made several prototype parts using the Resin Transfer Moulding (RTM) process. Cetim's work specifically focused on studying and automating an NDT system for these new hatches.

### A two-step study

Initially, Cetim evaluated several NDT methods, in particular: phased array ultrasonic testing, active infrared thermography testing and air-coupled ultrasonic testing. The results of the study showed that active infrared thermography is particularly suitable for composite materials. This technology heats (by excitation) the area to be tested and analyses the heat propagation with a thermal camera

in order to detect any delaminations or lacks of resin within the material. Works continued with the automation of the NDT process using a collaborative robot.

The demonstrator covers the positioning of the part by the robot, the synchronized activation of heating by two halogen lights, the acquisition of the thermal sequence by the camera, the processing of the signal and the automatic detection of defects by image analysis. The conformity of the part is then validated by the operator.

Next stage: setting up for other composite parts or assemblies.

## Cetim's asset

Cetim supports industrial manufacturers to help them to develop systems for the non-destructive testing of materials, products and equipment.

