Aviation

Sherloc project
QSP® is put to test in the aeronautics sector

Cetim was selected to manufacture five composite aircraft window frame demonstrators as part of the Sherloc European project, a project integrated into the Clean Sky 2 programme.

© Sherloc project

First the car manufacturing sector and now the aeronautics sector! Within the Sherloc European project (Structural Health Monitoring (SHM), Manufacturing and Repair Technologies for Life Management of Composite Fuselage), Cetim proves that it is now possible to make composite parts for the aeronautics sector at production rates and cost levels that are compatible with series production.

Manufacturing parts for the tests

Initiated in 2015 and scheduled to end in 2022, the Sherloc project is part of the Clean Sky 2 programme and aims to develop and assess non-destructive testing techniques which will be used to monitor the aging of composite parts of medium-haul aircraft. To that end and as part of a sub project named Sherloc QSP, Cetim was selected in 2017 to design and produce five demonstrators of aircaft window frame and skin fuselage assemblies made of PEEK and carbon fibre (a material certified for use in aviation applications) which will be bench tested during SHM campaigns."*As requested by the Imperial College of London, we optimised the design of these components then we developed the manufacturing process*", explains Thomas Jollivet from Cetim. Therefore, the window frames are produced using Cetim's high-speed thermoforming process, named Quilted Stratum Process (QSP), and bonded to a fuselage skin.
The advantage of this process is that it makes it possible to obtain "Net Shape" parts right from the thermoforming step, that is to say without the need for any finishing operation, and the parts made can be instrumented so that material health monitoring can be performed during their service life.
The production cycle is also considerably faster than that of conventional processes, to the point that making 50,000 parts per year and per production line seems to be possible.
The first tests started in 2018. The final parts are scheduled for bench testing before the end of 2019. *"If the test results are satisfactory, this will prove that such a process can be used to mass produce composite windows"*, says Thomas Jollivet.

THE PROJECT

Objectives
Sherloc (Structural Health Monitoring, Manufacturing and Repair Technologies or Life Management of Composite Fuselage) is a project which aims to develop and assess technologies which will be used to monitor the aging of aircraft composite parts. Its sub project, named Sherloc QSP, focuses on the production of parts using the Quilted Stratum Process.

Pasrtners
Sherloc is led by a consortium of partners coordinated by the Imperial College of London. Sherloc QSP involves Cetim as well as Compose Tools and PEI.

Budget
Scheduled to take place from 2015 to 2022, Sherloc was allocated a budget of 9 million euros, 80% of which is funded by the European Community.

Cetim's asset

Cetim has the required expertise to design, compute and implement processes to carry out industrial projects which involve composite materials. For production, Cetim relies, in particular, on its Quilted Stratum Process (QSP) platform.

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