

► **IRT Jules Verne continues to extend its additive manufacturing platform with two new items of equipment devoted to the production of parts made of complex composites**

IRT Jules Verne, a mutualized industrial research centre dedicated to advanced manufacturing technologies, has acquired two new pieces of equipment designed to assess and validate the performance levels of two additive manufacturing technologies: high-temperature fused filament fabrication and powder-bed sintering for high-temperature polymers. These two devices will be used within the FACT (Additive CompositEs Manufacture) project.

IRT Jules Verne is working towards the introduction of innovative technologies in the field of additive manufacturing for subsequent rollout to factories. Modern manufacturing imposes certain constraints in terms of the design and production of components: complex shapes, reduced weight, short manufacturing times and decreased costs. The air transport sector is subject to intense competition and requires increasingly economical aircraft. Improved energy efficiency relies primarily on reducing aircraft weight through extensive use of composite materials in aircraft frames and equipment. 3D polymer printing thus offers a solution for the manufacture of high-performance complex parts in small runs and with complete cost control.

These constraints are duly considered within the FACT project, and two items of equipment recently acquired by IRT Jules Verne open up new vistas for polymer additive manufacturing technologies allowing the use of materials with the desired mechanical properties and high temperature resistance.



components.

- The Tobeca 3D printer for use with high-performance composites will enable evaluation of the performance of fused filament fabrication (FFF) techniques. This machine can be calibrated specifically for the requirements of the project and will facilitate both the development of new materials within the project and the production of demonstrators required by end-users. Thanks to its robust mechanical design, the printer operates at incredibly high temperatures, with the print nozzles operating at up to 500°C and the build chamber itself up to 250°C, thereby allowing large components to be printed while minimising warping and delamination of individual layers. Finally, the machine will enable us to validate the use of this FFF technology in the manufacture of large components.
- The EOS P810 laser sintering machine, the second piece of equipment acquired by IRT Jules Verne, with co-funding from the Pays de la Loire Region and the European Regional Development Fund (FEDER), will enable evaluation of performance levels for the process involving these demanding materials as well as the testing of new powders to meet the standards imposed by the aeronautics sector. This machine is the only model using this technology able to handle high-temperature materials such as PEKK and loaded PEKK and, to date, it is the only installation of its kind in the whole of France. Furthermore, IRT enjoys the recognised expertise of the E.O.S company, which supplied the machine and is a partner in the project.



The **FACT** project in a nutshell

Project director: Verena Schnitzler-Duval

Partners: Airbus, Arkema, Arts Et Métiers (PIMM), Canoë, CNRS (PIMM and LTEN), Daher, Dedicene, Eos, Liebherr-Aerospace Toulouse, Safran, Zodiac Engineering, Université de Nantes (LTEN), Tobeca

Budget: €6.5 M

Duration: 4 years

Aims: to create innovative manufacturing processes by developing new high-performance composite materials suited to the production of parts able to withstand extreme mechanical stress.

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*“The acquisition of these two new pieces of equipment enables IRT Jules Verne to extend its additive manufacturing platform to meet the needs of the aeronautics industry, while opening up new possibilities in both the land transport sector and the aerospace sector”, says **Serge Prigent**, Director of the Additive Manufacturing Technology Research Team at IRT Jules Verne. “These machines will enable representative parts to be manufactured by September 2020, in keeping with the project management schedule”.*

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About IRT Jules Verne – www.irt-jules-verne.fr

The *Institut de Recherche Technologique Jules Verne* is a mutualized industrial research centre dedicated to manufacturing. Focusing on the requirements of strategic industrial sectors – aeronautics, automobile, energy and naval – its team carries out collaborative research that brings together the finest industrial and academic resources in the manufacturing field. Together, they work on designing innovative technologies that will be rolled out to factories in the short and middle terms in three key areas: integrated product/process design, innovative processes, and flexible, intelligent production systems. Using an array of exclusive equipment, IRT Jules Verne is able to offer global solutions ranging from demonstrators to scale 1.