

Inauguration of a semi-industrial pilot line for low-cost carbon fibre

On 18 October 2018, the Canoe technology centre and the IRT Jules Verne technological research institute inaugurated a pilot line for low-cost carbon fibre. The project, called Force, was initiated back in 2014, the goal being to produce carbon fibre that would be 40% less expensive than the materials currently found on the market (€8/kg compared to a minimum €14/kg).

With a production capacity of two metric tons (MT) of carbon fibre per year, the new equipment is set up in the Canoe Chemparc building at Lacq (in France's Nouvelle-Aquitaine region). The pilot carbon-fibre production line will be made available for services and collaborative projects that require an innovative material costing less than the polyacrylonitrile (PAN) fibre used primarily in the industry.

A necessary investment

The cost of the equipment is €1.6M and is co-financed by the Nouvelle-Aquitaine Regional Council (€1.1), the Canoe technology centre, and the IRT Jules Verne technological research institute. It consists of a multipurpose carbonization line that can process up to ten 12K tows in parallel, with a production capacity of about two MT/year. The maximum carbonization temperature is 1150°C. The production line is available to the project's industrial partners, and will also be open to any company or academic institution with their own project. Industry in general is making

more and more use of composites to produce ever stronger, more lightweight parts. This is the case particularly in the transportation sector, where reducing the weight of vehicles is essential if we are to meet the goals for lower CO₂ emissions.

The performance of composite parts depends in part on the use of carbon reinforcement fibres. Unfortunately, the high price of this material remains an obstacle to its use in many sectors that have to deal with heavy price con-

straints. The aim of the five-year Force project that was launched in 2014 is to find a solution for this situation.

An alternative to PAN

The Force project was initiated by IRT Jules Verne, with the support of the French automotive industry platform (PFA). It brings together manufacturers from different sectors—the chemical sector of course, but also automotive and leisure—whether they are composite producers or users.

Fig. 1: Pilot line for low-cost carbon fibre



The carbon fibre developed under the project is designed to be an alternative to polyacrylonitrile (PAN) fibre, the benchmark material in use today, but which is too expensive for the constraints of the automotive industry. To dramatically reduce the cost, the Force teams turned to alternative biosourced or recycled materials such as biomass derivatives, working to simplify the converting processes through optimization or elimination of certain steps.

Unique in Europe

The pilot line is a showcase for the technological know-how of the Canoe platform and IRT Jules Verne. It is also unique in Europe due to its availability. The partners have already presented a spool of carbon fibre from the new process at the 2018 JEC World, the global trade show for composites. In May of this year, they will meet with professionals in the textile sector at the 2019 Techtexil show in Frankfurt. □

More information:

www.irt-jules-verne.fr
www.platforme-canoe.com

The FORCE project in short

Project Manager: Céline Largeau

Partners: IRT Jules Verne, Canoe, Groupe PSA, Arkema, Mersen, Plastic Omnium, Chomarat, Renault, Decathlon, Total, Faurecia, Stelia Composites, Tembec

Budget: €17M

Duration: 5 years

Goals: To obtain a low-cost carbon fibre that costs less than €8/kg, with a breaking strength of about 2500 MPa and a Young's modulus of 250 GPa.

Canoe

The Canoe platform is the Composites and Advanced Materials technology centre for the Nouvelle-Aquitaine region. It specializes in formulation and manufacturing processes for the development of finished and semi-finished products in fields such as aerospace, transportation (automotive, yachting) and renewable energies (photovoltaic, wind, sustainable chemistry). Our goal is to help companies develop new products and innovative processes to meet industrial needs. Canoe works with small businesses and large groups in the field of composite and advanced-material technologies. The platform was created in 2008 at the initiative of the Nouvelle-Aquitaine regional council, and is equipped with the necessary pilot resources for making prototypes and preseries.

IRT Jules Verne

The Jules Verne technological research institute is a centre for pooled research that is dedicated to advanced production technologies. Focusing on the needs of strategic industrial supply chains such as aerospace, automotive, energy and shipbuilding, its team carries out collaborative research, working with top industrial and academic resources in the manufacturing field.

At the same time, the team develops innovative technologies to be used in factories over the short or medium term in three major areas: integrated product/process design; innovative processes; and smart, flexible production systems. The IRT Jules Verne relies on a set of exclusive equipment to propose global solutions up to scale-1 demonstrators.

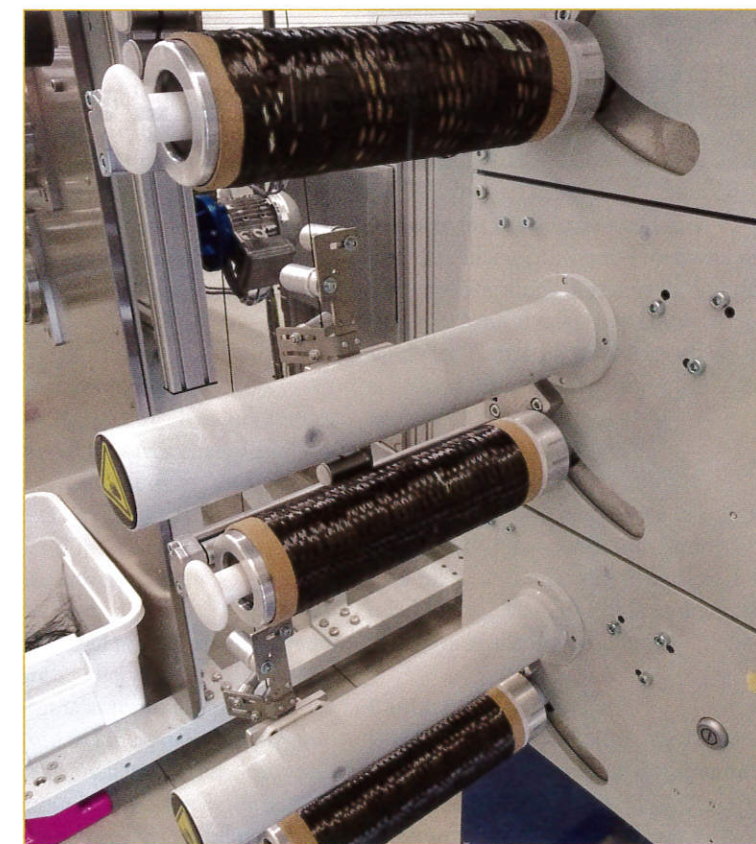


Fig. 2: Non-PAN Carbon Fibres