INNOVATIVE POLYMERS AND COMPOSITES

Plateau technique
compositic :
Université Bretagne Sud

compositic.fr

A University
providing technological support to its territory

While Lorient Composites Valley today reflects the ambitions of the Lorient region in terms of economic development, ComposiTIC was a forerunner in the pooling of advanced technological resources between companies and the University of Bretagne Sud.

For the past 10 years, the ComposiTIC technical platform, supported by the Univeristy (UBS), the French government, the Brittany Region and the Lorient Conurbation, has focused on 3 missions: R&D, the transfer of know-how and training. The aim is to help local SMEs that have mastered traditional composite and polymer processing technologies to move towards automated or robotised technologies. This results in services provided for SMEs and R&D projects aimed at controlling the impact of the development of composite structures, not only economically and environmentally, but also in terms of health and social issues, particularly for workers.

In practical terms, ComposiTIC carries out scientific monitoring missions (trade fairs, conferences, technical days), training days and numerous one-to-one meetings to define needs and to help manufacturers make their technological choices.

ComposiTIC relies on strong partnerships with IRMA, IRDL, Xsea, Coriolis, AVEL Robotics, Nanovia, Sense'in, SMM, ACTUPLAST and many others. The annual turnover achieved by ComposiTIC with its 120 client companies is €1.7m a year.

In addition, the national Technological Platform (PFT – Plateforme Technologique) certification strengthens ComposiTIC's partnership with local secondary schools, offering a range of activities to popularise science, educational workshops and training courses for students in the network.

ComposiTIC's projects for the future focus on hydrogen, with the design and manufacture of new storage systems, the increased recyclability of composites as a result of automated manufacturing processes, and support for the low-carbon ship propulsion sector driven by the Brittany Region and the Lorient Conurbation.

Yves Grohens
Manager of ComposiTIC

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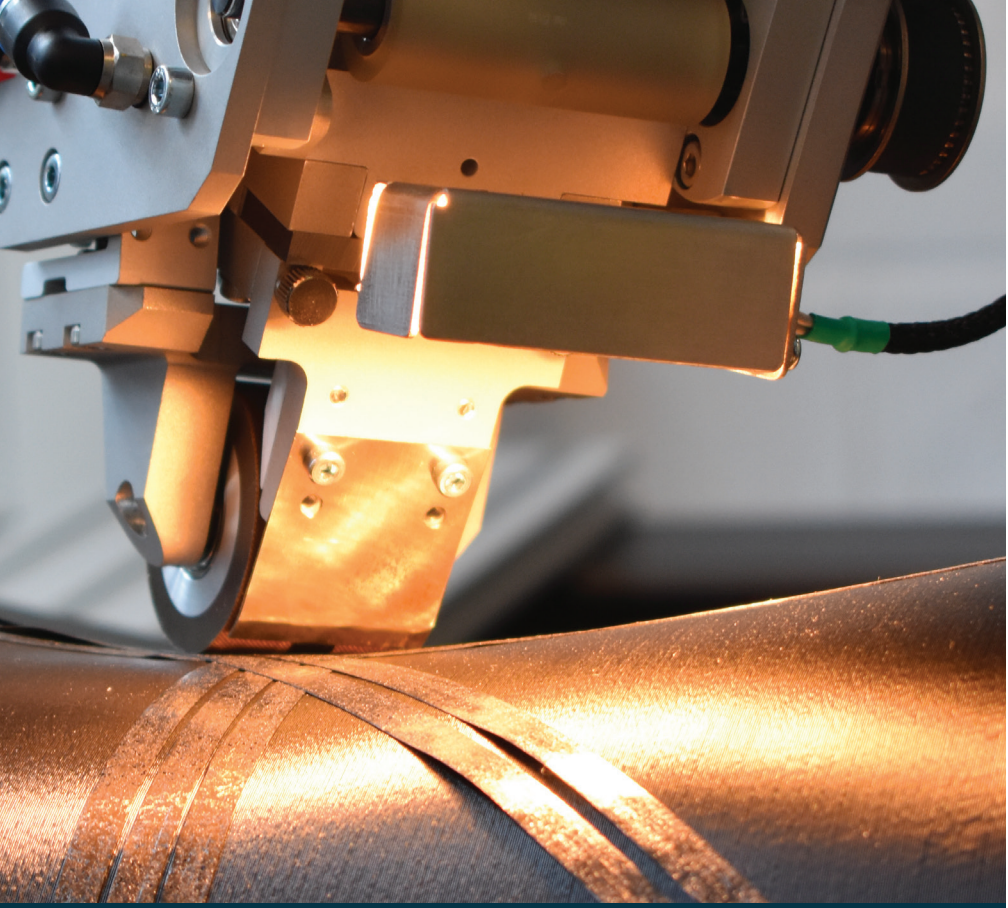


Compositic
In figures

17
employees

112
industrial partnerships in 2022

45
state-of-the-art machines

1,7M€
turnover in 2022

Skills

Digital design

Product and process simulation
Design and sizing
Digital twin

Additive processes

3D printing
Automated fibre placement (AFP)
Post-consolidation
Filament winding

Material design

Thermoplastic and composite formulation
Synthesis of natural polymers
Processing of semi-finished products

Characterisation

Mechanical
Morphological
Thermal
Physico-chemical

Environmental impact

Natural and accelerated ageing
Toxicological evaluation
Biodegradation
Integration of recycled materials

Achievements

NAVAL

- Additive manufacturing
- Characterisation and sizing of composite structures

TRANSPORTS

- New materials
- Support for the transition from thermosetting technologies to thermoplastic technologies

MEDICAL

- Additive manufacturing
- Formulation of materials for specific parts

HYDROGEN

- Characterisation and development of processes / materials from the fold to the tank

RECYCLING

- Qualification, formulation and processing of deposits

Technical platform

Status:
Attached to the Dupuy de Lôme Research Institute (UMR CNRS 6027)

Date of creation:
2014

Composition:
Design Engineers and Research Engineers, University Professors and Lecturers, PHD students, post-doctoral researchers and administrative staff.

Scientific manager:
Yves GROHENS, University Professor

State-of-the-art technical facilities

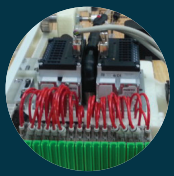

State-of-the-art technical facilities


Composite filament extrusion and impregnation line


Analysis systems for part defects


Material formulation


Material characterisation


Additional techniques in electronics


3D printers

CORIOLIS

Our 10 years of collaboration with ComposiTIC have boosted our entry into the marine and automotive markets. »

Clémentine Gallet,
CEO Coriolis Composites

Based in Lorient, Coriolis Composites is the world leader in the design of robots for the aeronautics industry, composite parts and associated software. The company equips some of the biggest names in aviation, including Airbus, Safran, Premium Aerotech, Stelia and Bombardier. Today, Coriolis Composites is expanding internationally and into new markets such as the automotive and shipbuilding industries.

Our joint projects

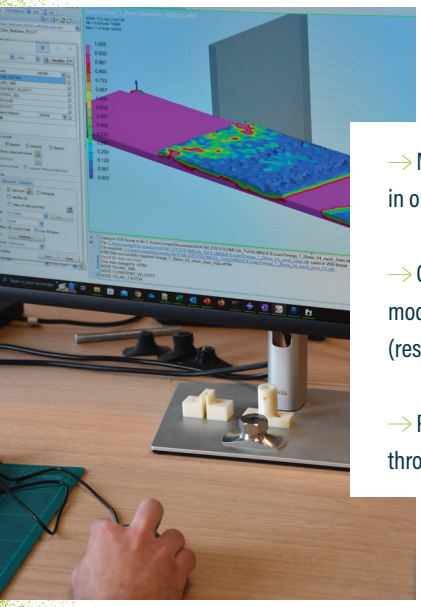
DYNAFIB: Production of anti-vibration parts made from thermoplastic composite with localised reinforcements in continuous fibre (2013-2017)
WOLF TP: Improvements to the automation of thermoplastic pre-impregnated dispensing processes (2013-2016) UD
STAMP: Placement of thermoplastic fibres to produce a high rate of output of automotive structural parts (2015-2018)
HYDROFAN: Development of a strong, competitive composite wind turbine blade (2015-2018)
SURMOUL3D: Development of multi-axis plastic and metal additive manufacturing technologies. (2016-2019)
AVATAR: Development of a manufacturing monitoring solution (pressure/temperature monitoring) during the AFP process and consolidation (2019-2021)
AVATAR 2: Digital twin for aeronautical composite processes (2021-2024)
FRANCE RELANCE HYDROGEN PROJECT: Development of the hydrogen tank production chain for transport (2021-2023)

Avatar2

Guaranteeing the level of conformity of parts via its digital twin by adjusting the process using digital simulation and Artificial Intelligence

Project

CORIOLIS x **AIRBUS** x **EDIXIA** x **COMPOSITIC** x
ALBATROS x **LOIRETECH** x **POTEZ** x **CENTRALE NANTES** x **STELIA COMPOSITES**



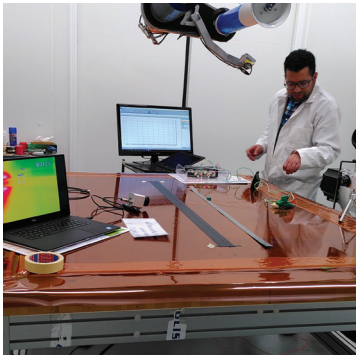
→ Manufacturing a representative prototype of a pressurised aircraft door in one single LRI composite infusion.

→ Combining simulation of the process with an Artificial Intelligence model to predict the main characteristics of the part during manufacture (resin front, necessary sensors, pressure, etc.).

→ Producing a digital twin of the part to establish its conformity throughout the manufacturing process.

Duration **36 months (2021-2024)**

Budget **1,2 M€ (Total : 11,6 M€)**



Supports

dgac

FRANCE RELANCE

Financé par l'Union européenne
NextGenerationEU

Dynamill

Pilot-scale development of eco-responsible tapes for automated fibre placement (AFP) and filament winding to specific specifications.

Project

CONTINENTAL CONTITECH x **COMPOSITIC** x **NAUTIX**

→ Pilot-scale development of eco-responsible tapes for automated fibre placement (AFP) and filament winding to specific specifications.

→ Characterisation and adaptation of manufacturing processes (AFP, filament winding and injection over-moulding) to ensure appropriate compatibility between the recycled and/or bio-based materials making up the inserts and the injected matrix.

→ Production and assessment of demonstrator prototypes.

Duration **24 months (2022-2024)**

Budget **146 k€ (Total : 924 k€)**

Supports

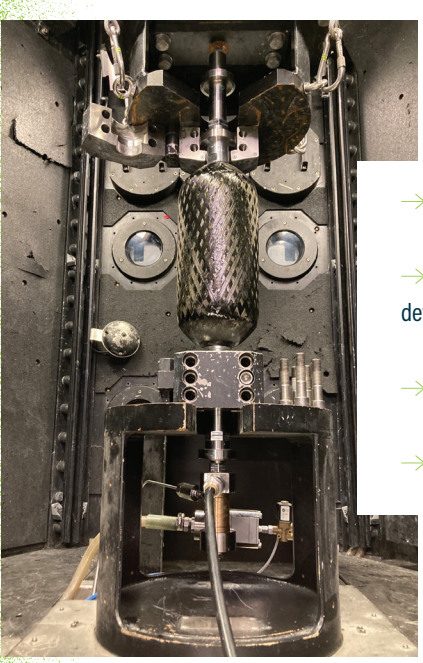
HYDROGEN

Phare

Development of connected hyperbaric hydrogen storage tanks with high production rates

Project

COMPOSITIC x **SENSE IN**



→ Increasing the skills of local players.

→ Defining a multi-scale characterisation approach for R&D tank development and modelling.

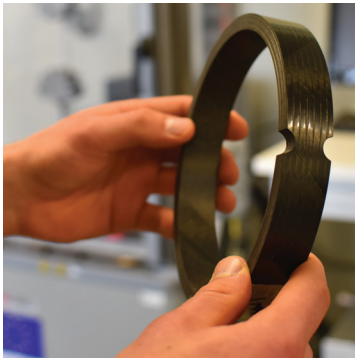
→ Monitoring material health during production and use.

→ Acquisition of an instrumented burst and tank cycling test bench.

Duration **18 months (2022-2024)**

Budget **143 k€ (Total : 425k€)**

Supports



Gwalenn du

Manufacture of filament-wound recyclable composite fishing rods and spars

Project

FIIISH x **NAUTIX** x **IRMA** x **IRDL** x **COMPOSITIC**

→ Limiting the environmental impact of fishing rods while improving and optimising performance.

→ Producing the first 100% recyclable rods and spars.

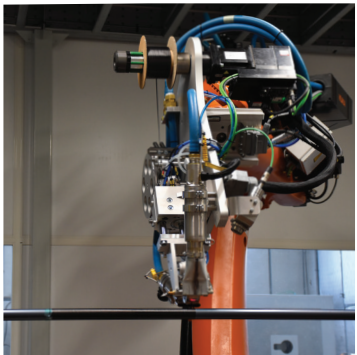
→ Proposing a recycling procedure involving product recall, recycling and re-use.

→ Mastering the filament winding process for thermoplastic matrix composites.

Duration **36 months (2019-2023)**

Budget **190 k€ (Total : 1M€)**

Supports



Avel Robotics got off the ground thanks to the pooling of technological resources in the Lorient area by ComposiTIC and IRMA. »

Luc Talbourdet,
CEO Avel Robotics

Avel Robotics designs and produces high-performance composite parts thanks to the AFP (Automated Fibre Placement) process.
The company makes next-generation 4D composites available to the naval, marine, renewable energy and aerospace industries.

Our joint projects

FOIL ADDICT - Composite additive manufacturing and flying boats (2017-2018)
FOIL CONNECTION - Structural health monitoring of composite foils manufactured by AFP (2019-2021)

ComposiTIC enables us to successfully carry out our developments with an innovative technical dimension, multiple skills and a network of partners.
In addition to ComposiTIC's expertise and skills, we appreciate the availability, professionalism and quality of our relations with the teams.
ComposiTIC's main assets: Expertise, innovation, professionalism, proximity, availability and interpersonal skills. »

Laurent Pezé,
Founder - Partner of Friendly Frenchy

Friendly Frenchy is a Morbihan-based company which proposes its «shell glasses», made in France and using locally-produced eco-materials.
As part of its eco-innovation approach, ComposiTIC is working with Friendly Frenchy on its projects for the development and recycling of materials.

Foiladdict

Development of the automated manufacture of composite foils

Project

COMPOSITIC x **AVEL ROBOTICS** x **SEAIR**

→ Use of automated fibre placement processes and 3D printing to produce foils of optimum quality.

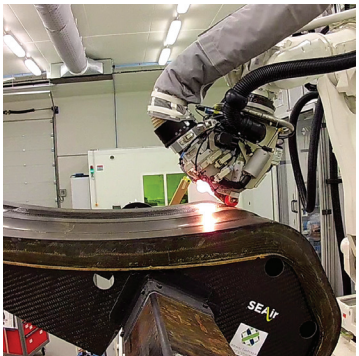
→ Validation of technical suitability through geometric and mechanical characterisation.

→ Economic assessment, from design to manufacture, for both single foils and series of foils.

Duration **24 months (2017-2018)**

Budget **250 k€ (Total : 1,4 M€)**

Supports



INdIGO

Reducing marine plastic pollution generated by fishing and aquaculture activities

Project

UBS x **NATUREPLAST** x **SMEL** x **IFREMER** x **FILT** x **CEFAS** x **UNIVERSITY OF PORTSMOUTH** x **MARINE SOUTHEAST** x **IRMA** x **UNIVERSITY OF PLYMOUTH**

→ Designing and manufacturing prototype fishing gear that biodegrades in the marine environment.

→ Studying ageing, biodegradation and ecotoxicity in the marine environment.

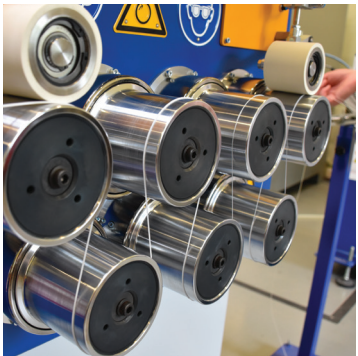
→ Identifying plastics associated with fishing equipment found at sea or on the coast through citizen science .

→ Encouraging and facilitating the recycling of used fishing gear.

→ Involving fishing and aquaculture professionals and raising public awareness of the problem of plastic pollution at sea.

Duration **45 months (2019-2023)**

Budget **1,2 M€ (Total : 4,2M€)**



Supports

UNION EUROPEENNE

Interreg France (Channel Manche) England

MarinOSS

Development of bone regeneration substrates incorporating co-products from the processing of fishery resources.

Project

COMPOSITIC x **IDMER** x **INSTITUT DES SCIENCES CHIMIQUES DE RENNES**

→ Development of bicompatible formulations with controlled porosity incorporating a biopolymer matrix and a hybrid mineral/organic filler derived from fish scales.

→ Implementation of semi-finished products for FFF (Fused Filament Fabrication) additive manufacturing.

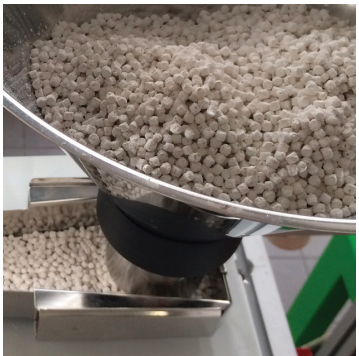
→ Production of implants using FFF additive manufacturing for 'in vivo' integration tests.

Duration **16 months (2017-2018)**

Budget **25 k€ (Total : 80k€)**

Supports

TREMPLIN CARNOT AgriFood Transition
R&D de l'alimentation durable, pour la santé de l'homme et son environnement



Ever since its creation, NANOVIA has been working closely with ComposiTIC. Our cooperation has enabled NANOVIA to rapidly acquire R&D skills which are compatible on an SME scale.
Our relationship has been developed and consolidated through collaboration with ComposiTIC on several collaborative projects, enabling both organisations to extend their respective skills and fields of activity. A win-win partnership. »

Jacques Pelleter,
Director of Nanovia

NANOVIA is a company located in the Côtes d'Armor and which has been developing and producing filaments for 3D printers since 2014. It distributes a range of over 40 references of thermoplastic, composite, metallic and ceramic filaments for additive manufacturing and injection dedicated to industrial applications, as well as a range of consumables. NANOVIA has been working with cutting-edge industries in the aeronautical, naval, automotive, paramedical and defence sectors since 2014, with products tailored to their needs.

Our joint projects

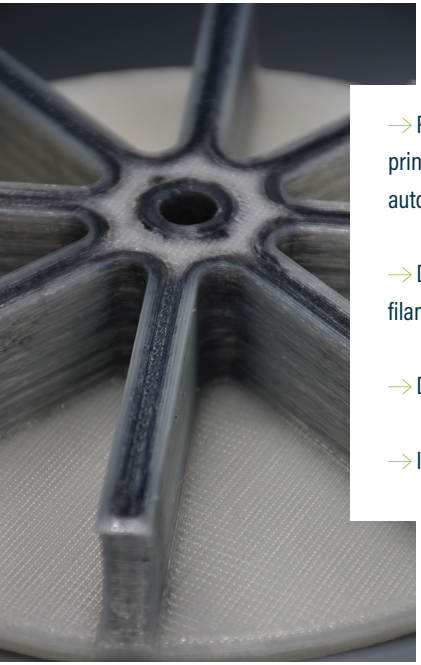
FIL3D PRO Development of new functional materials for FDM 3D printing (2014-2016)
FILSLIT Pilot-scale development of continuous fibre filaments (CFF) for 3D printing using by-products from cutting UD webs into tapes for automated fibre placement (AFP) (2018-2021)
SPRING Formulating, simulating and shaping high-temperature matrix composite parts with long-fibre reinforcements using FDM (2019-2021)
SAMFAST Rapid additive manufacturing of plastic injection tool cavities (2021-2023)
FRANCE RELANCE RODFIB PROJECT Developing recycled composite reinforcement bars for civil engineering (2021-2023)

FiISIiT

Development of continuous fibre filaments from AFP co-products

Project

OMEGA SYSTEMES x **COMPOSITIC** x **NANOVIA**



→ Pilot-scale development of continuous fibre filaments (CFF) for 3D printing using co-products from the cutting of UD cloth into tapes for automated fibre placement (AFP).

→ Development of a specific print head for laying continuous fibre filaments and a suitable slicer.

→ Demonstrators.

→ Industrialisation of the CFF manufacturing process.

Duration **36 months (2018-2021)**

Budget **130 k€ (Total : 361 k€)**

Supports

TRANSPORT | SPACE

Alpha Mission

Development of protective foams made from biodegradable and recyclable eco-materials using additive manufacturing for space exploration.

Project

COMPOSITIC x **CNES** x **JEAN HENAFF** x **INNOVONS À 360°**

→ Development of porous thermoplastics based on polyhydroxyalkanoate, a biodegradable and recyclable bio-polyester derived from bacterial synthesis.

→ Development of alveolar structures using additive manufacturing to match the mechanical performance of standard petrol-sourced foams.

→ Production of protective containers for prototyping, qualification and flight models.

Duration **24 months (2020-2022)**

Budget **30 k€**

Supports

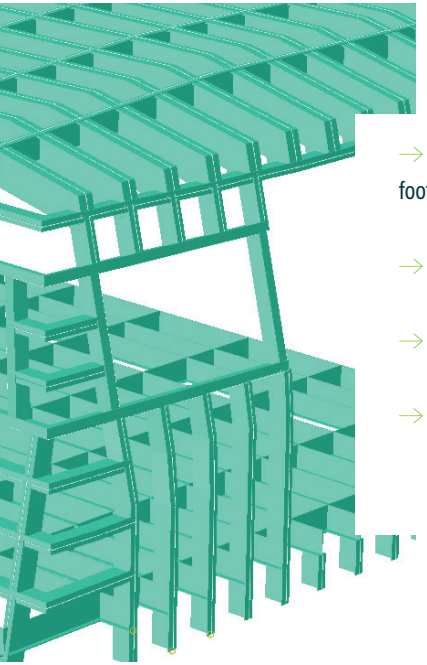
cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

Zeph$_2$

Hydrogen hybridisation
Using composites for making lighter superstructures

Project

ZÉPHYR & BORÉE x **PIRIOU** x **ENTECH** x **SOFRESID** x **COMPOSITIC**



→ Creating an offshore maintenance vessel with a low carbon footprint thanks to hybrid hydrogen propulsion.

→ Decarbonising use by 50% compared with traditional propulsion.

→ Using composite materials to lighten superstructures.

→ Analysing the life-cycle of the carbon-free ship.

Duration **18 months (2022-2024)**

Budget **122k€ (Total : 600k€)**

Supports

A technical research platform to support your development.

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