

## Bioeconomy in Textiles: Innovative Biocomposites

Sustainability, as a concept and practice, has boosted the research and development of new raw materials from renewable sources, and processes with a lower environmental impact for different industrial sectors, particularly those using composites such as Mobility and Transport, Construction, Sports, Furniture and Defence industries. Companies operating in these markets, where the textile industry plays a leading role, have aligned themselves with a structured sustainable development strategy, revealing the growing paradigm shift towards "more environmentally friendly" products.

Following this strategy, the Portuguese funded project **be@T** includes an initiative (PI.I3.M8-M11) aiming the development of textile-based biocomposites, where **CITEVE** and **CeNTI** are collaborating with industrial companies **ERT** and **TMG Automotive** to develop new solutions for continuous filament 3D printing, hybrid yarns, bioprepregs, biocoatings, bioSMCs among others. The injection moulding and thermo-compression processes are being studied, for developing more ecological and sustainable textile-reinforced biocomposites, reducing the dependency on fossil fuels and gas emissions, as well as their impact through biodegradability and the possibility that, at the end of life, the process can be restarted by incorporating the biomatrix into, for example, a new biocomposite.



So far, different promising biocomposite solutions have been studied and developed, demonstrating that alternative bio-based fibres and raw materials, circular concepts and technologies, and innovative business models are viable under a new sustainable textile scenario.

## About be@t

Led by CITEVE - Technological Centre for the Textile and Clothing Industries of Portugal, the **be@t – Textile Bioeconomy** project (TC-C12-i01, Sustainable Bioeconomy No. 02/C12-i01/2022) brings together a consortium of 54 entities, including companies, universities, technology centres and others. Together, the consortium is developing new raw materials as an alternative to fossil fuels, new technologies and manufacturing and processing equipment, promoting circularity and the reuse of fibres and waste. At the same time, the project intends to empower and involve society in raising awareness and firmly changing standards, starting with the highly pollutant textile and fashion industries.

The project is supported by the Recovery and Resilience Plan (PRR), Next Generation EU Funds, for the period 2021 – 2026, with an investment of around 139 million euros in the sustainable bioeconomy of Portugal.

## About CITEVE

CITEVE is a textile technological centre being a reference within the national and European scene regarding research, innovation, and technology transfer promotion for the Textile Industry, promoting quality improvement and providing instrumental support for the definition of industrial policies for the sector.

CITEVE is equipped with high-end technologies for textile material and product testing (e.g. chemical and physical testing, new functionalities, toxicological substances, microbiological tests), and for prototyping. Specialized staff with expertise in the most advanced and innovative textile technologies manage these infrastructures. Also has a high track record in R&D for Sustainable Processes and Materials, Circular Economy, Sustainable Dyeing and Finishing, Functional Coatings, Functional Fibres and Fabrics, for different sectors. It has more than 100 R&D projects, with national and international R&D funding, an active participation in several networks of excellence, more than 25 IPR's registered and a significant number of scientific and technical articles published in its background.

## About CeNTI

Founded in 2006, CeNTI – Centre for Nanotechnology and Smart Materials, is a reference private non-profit Technology and Innovation Centre, with a multi-sectoral and multidisciplinary orientation. equipped with cutting-edge technology, and providing applied R&D for industrial endogenization, product engineering and technology transfer for companies, via B2B approach.

CeNTI has currently a multidisciplinary team with more than 150 full-time researchers and its mission is to drive the development and validation of new technologies and disruptive solutions, across multi-TRL stages, based on Nanotechnology, Advanced Materials and Smart Systems innovation, targeting a wide range of application for "Automotive & Aeronautics", "Construction & Smart Buildings", "Health, Protection & Well-being" and "Energy".

With a strong link and close support to business ecosystem, both national and international, CeNTI has participated in more than 170 projects and has a portfolio of more than 60 patent applications.