

Recycling and Repurposing of Plastic Waste for Advanced 3D Printing Applications

REPAIR3d Project

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JULES
VERNE

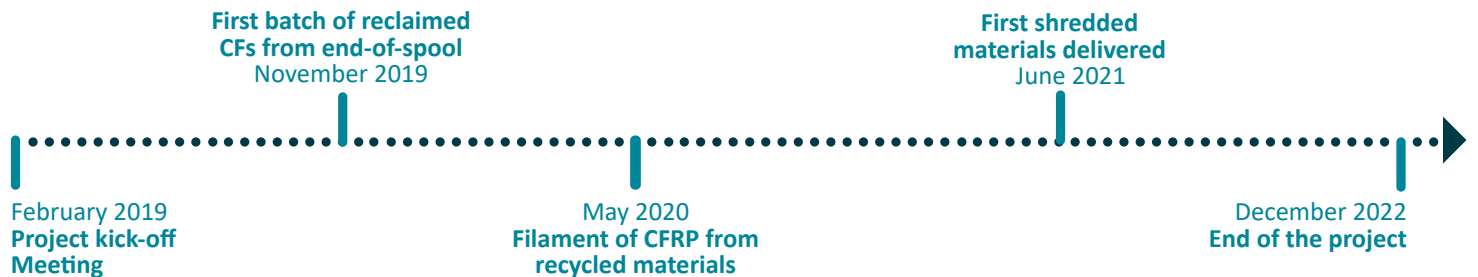
The project aims at the development of innovative reclamation and repurposing routes for end-of-life plastic and carbon fibre reinforced polymer (CFRP) components. This will be achieved by employing advanced nanotechnology solutions, Additive Manufacturing (AM) and recycled resources, for the production of high added value 3D printed products with advanced functionalities. In this way, the combination of AM, polymer processing and recycling technologies could constitute a new paradigm of a distributed recycling process, easily implemented at local scale in collaboration with the industrial sector and collection facilities, in order to create competitive, highly customisable products at lower production costs, in a flexible digital environment that fully unravels the potential of eco-design and allows for integration of smart intrinsic self-sensing, self-repairing and recycling options.

Technical and economic impacts

- ▶ New technologies and business opportunities for the recycling industry
- ▶ >50% reduction in landfill waste volume
- ▶ >30% reduction of the carbon footprint of the products

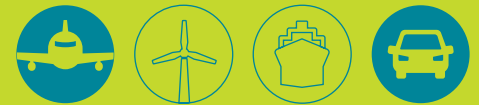
Keywords

Additive Manufacturing // CFRP // Carbon // Composites // Recycling



INDUSTRIAL CONTEXT

REPAIR3d project will significantly contribute to EU's circular economy and environment targets, especially related to the objectives of EOL of Vehicles Directive and Waste Electrical and Electronic Equipment Directive. By 2015, new vehicles must be 85% reusable or recyclable (by mass) and 95% recoverable. REPAIR3d will accelerate the transition to circularity through collaboration of key actors across the entire value chain: recycling plastic collectors and manufacturers, plastics compounders, designers and manufacturers.



INNOVATIVE FEATURES

- ▶ New recycling strategies for CFs and resin separation
- ▶ Innovative design for 3D printing and strategies for developing materials with intrinsic recycling abilities
- ▶ 3D printing of polymers and recycled CFs reinforced polymer composites
- ▶ Demonstration of the circular use of the constituent materials through separation and reprocessing

INDUSTRIAL APPLICATIONS

Progress in digital technologies and in key enabling technologies requires new policies for infrastructure, R&D, industrial value chains etc. Rather than reusing only the material or the energy they contain, products should be turned into competitive multi-life products. Once the product reaches the end of life, instead of scrapping the product, most of the functions should be reused in new products. If appropriate solutions are developed, second life products can become more competitive.

Partners

- ▶ ADAMANT COMPOSITES
- ▶ BIOG3D - NEW 3D PRINTING TECHNOLOGIES
- ▶ CAMBRIDGE NANOMATERIALS TECHNOLOGY LTD
- ▶ CALZATURIFICIO DAL BELLO SRL
- ▶ CENTRE SCIENTIFIQUE & TECHNIQUE DE L'INDUSTRIE TEXTILE BELGE
- ▶ FUNDACIO EURECAT
- ▶ GHENT UNIV.
- ▶ IRT JULES VERNE
- ▶ INNOVATION IN RESEARCH & ENGINEERING SOLUTIONS
- ▶ ITENE
- ▶ LAVRION TECHNOLOGICAL & CULTURAL PARK
- ▶ LEITAT
- ▶ MAIER SCOOP
- ▶ SIGMATEX LTD
- ▶ TECHEDGE SPA
- ▶ NATIONAL TECHNICAL UNIV. OF ATHENS
- ▶ WARRANT HUB SPA
- ▶ YOTIS ANONIMOS EMPORIKI & VIOMIXANIKI ETAIREIA

Budget

▶ 5 998 K€

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