



# r-LightBioCom

New bio-based and sustainable Raw Materials enabling Circular Value Chains of High Performance Lightweight BioComposites

## Promoting a paradigm shift

- in the way high-performance composites are manufactured and recycled
- from current linear composite value chains to circular ones.

## Objectives

The **main objective** of r-LightBioCom is to reduce environmental impact of the new lightweight high-performance composites, not only during their production but also during their operational life and after achieving their final lifetime due to inherent recyclability properties, while providing improved mechanical properties, weight reduction and new functionalities.

In detail:

Develop new bio based resins with improved recyclability and tailored to the HPC needs in terms of performance and processing technologies.

### Objective 1

Enhance the properties of lightweight composites for applications in various sectors of different requirement demands.

### Objective 2

Unveil and re-design processing technologies for manufacturing new lightweight HPC components and structures based on sustainable fibres and bio-resins.

### Objective 3

Develop new fast curing methods together with new processing techniques for composite fabrication with lower process energy and time demand.

### Objective 4

Validation of new r-LightBioCom raw materials and processes in targeted sectors (road transport, infrastructures, and aeronautics).

### Objective 5

Develop a sustainable-by-design framework with a focus on enhancing recycling and modelling to generate and enable a change of paradigm towards circular value chains.

### Objective 6

Standardisation of r-LightBioCom's HPC manufacturing processes to facilitate replicability, reducing time to market.

### Objective 7



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## Expected outcomes

### Material and processing results

- 3 types of advanced bio-based resin compounds
- 4 new additives based on functionalized and reactive biomass-derived nanofillers
- 4-5 new formulations for bio-resins including the bio-additives
- 3 families of sustainable textiles products for HPC components and structures
- 3 sustainable and bio-based types of components for lightweight HPC
- 2 new fast curing technologies

### Sustainability results

- New recycling technologies
- Holistic optimisation tools for sustainable composite structures
- Tools for composite material modelling and validation

**Validation** will be **based on use cases** in the sectors:

- a) Automotive
  - 1: Spoiler (exterior)
  - 2: Trunk floor (interior)
- b) Infrastructure
  - Composite pultruded profiles for tunnel lining
- c) Aeronautics
  - Leading edge panel of a control surface



## Consortium

Coordinated by AITEX, the project brings together a multidisciplinary consortium consisting of

- 4 research institutions,
- 3 universities and
- 8 industrial partners

from the automotive, aeronautics and construction industry from across Europe.



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