

PROJECT

CUSTOMISIZE

New tailor-made sizing strategies for recycled carbon fibres to improve the mechanical properties of polymeric and cementitious composites

Funding: European (Horizon 2020)

Duration: Apr 2019 - Sep 2021

Status: Ongoing

Total project cost: €499,859

EU contribution: €499,859



Call for proposal: H2020-CS2-CFP08-2018-01

[CORDIS RCN : 221223](#)

Objectives:

The CUSTOMISIZE project aims to develop a new family of carbon fibres' sizing in order to improve the interfacial adhesion between recycled carbon fibre (rCF) and polymers (thermoset and thermoplastics) and cementitious matrices. The goal of this is to improve the strength, toughness and environmental stability of the composites prepared with the resized fibre. The specific sizing will be developed for non-woven mat and chopped tow of recycled carbon fibres. The new upgraded recycled carbon fibre will be used to produce new composites with cementitious or polymeric matrices (thermoset and thermoplastic).

The proposed strategy is the development of specific sizing's for different polymeric and cementitious matrices through the incorporation of coupling agents along with the sizing materials, which through different mechanisms (covalent bond, hydrogen bond, Van der Waals interactions...) will create active points at the CF surface. Those will be responsible for chemical interactions with the matrix. New approaches as the use of Polyhedral Oligomeric Silesquioxanes (POSS), which consist of a rigid organic cubic silica-oxygen core surrounded by eight organic groups, will be used. CUSTOMISIZE also proposes to validate Steam Water Thermolysis, a current method to recycle CF, in the process to introduce chemical functionalities on the fibres that will be able to interact with the sizing. In addition, plasma viability will be studied due to its capability to create new chemical functionalities on fibres and also, the advantages that has compared to industrial electrochemical processes. It is expected to increase the interfacial shear strengths (IFSS) between rCF and the different matrices by up to 90%.

A detailed Life Cycle Assessment (LCA) of the materials and processes will be carried out. This data will be used to assess the impact of the new sizing and its incorporation into different materials, and to support the success of the new developments in terms of sustainability.

Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Other programmes: JTI-CS2-2018-CfP08-AIR-03-03 Sizing for recycled carbon fibres to optimise adhesion in organic/inorganic composite materials

Lead Organisation:

Acondicionamiento Tarrasense Associacion

Address:

Carrer De La Innovacio 2

8225 Terrassa
Spain

EU Contribution: €251,080

Partner Organisations:

Rescoll

Address:

ALLEE GEOFFROY SAINT HILAIRE 8
33600 PESSAC
France

Organisation Website:

<http://www.rescoll.fr>

EU Contribution: €126,945

Alpha Recyclage Composites

Address:

4 RUE JULES VEDRINES
31000 TOULOUSE
France

EU Contribution: €121,834

Technologies:

Composite materials
Thermoplastic-based composite materials

Development phase: Research/Invention

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other