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Multi-level Circular Process Chain for Carbon and Glass Fibre Composites

Funded by the European Union

MC4
A European project for a sustainable and performant carbon and glass fibre composites value chain

MC4 (Multi-level Circular Process Chain for Carbon and Glass Fibre Composites) is a European partnership **aiming to establish circular approaches for carbon and glass fibre composites**. These materials are essential in numerous technical applications, for which their lightweight properties and high performances are especially valued. However, the European carbon and glass fibre value chains need to be optimized on 2 major levels: the **environmental and economical efficiencies.**

Currently, up to 40% of the material is wasted in the production process, and after a lifetime of 15 to 30 years, 98% of the material ends up in a landfill with no hope to be recycled[1]. With a yearly use of about 110.000 tons of carbon fibre[2] composites parts and 4,5 million tons of glass fibre[3] composite, the environmental impact needs to be addressed.

In addition to these environmental issues, the current competitive position of Europe in these value chains needs to be improved in order to be less dependent from foreign sources. 80% of the virgin carbon and glass fibre manufacturing is done outside of Europe, and when the manufacturing is done in Europe, its technologies are often licensed from foreign countries[4].

MC4 will tackle these issues by implementing research and innovation actions taking into account the specific needs of the two value chains, by:

- **Establishing a multi-level circular process for carbon and glass fibre composites**, with processes developed for both a short term and a long-term impact on the industry
- **Developing performant and economically realistic processes** that are adapted to the specificities of the two value chains
- **Giving to the European industry the means to master and own its patented manufacturing processes** of recycled materials

More specifically, MC4 will base the development of the recycling processes on chemical matrix/fibre separation for carbon fibre, and on a new type of resin for the direct re-use of the composite material for glass fibre. As a result, and with the use of a proper quality grading of the recycled material, **MC4 will set up processes for reaching a 60% recycling rate within the supply chains, and will ensure the possibility to properly use the recycled materials in different applicative domains**.

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[1] https://www.materialstoday.com/composite-processing/features/new-lease-of-life-for-cfrps/, last checked 01/08/2021

[2] Carbon fibres: history, players and forecast to 2020, JEC Composites Publications

[3] https://www.statista.com/statistics/759404/worldwide-glass-fibre-demand-and-capacity/, last checked 01/08/2021

[4] Carbon fibre 2020 (Knoxville, Tenn, US) Preconference seminar by Tony Roberts, AJR Consultancy

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In order to achieve its objectives, MC4 gathers 15 partners covering the whole value chains: process developers, material manufacturers, end users manufacturing the composite parts. The association of the skills and know-how of the partners will enable the collaborative creation of a sustainable and viable circular process for composites. The consortium is coordinated by Profactor.

The partners of MC4 are **Profactor** (Austria), **FIDAMC** (Spain), **GAIKER** (Spain), **CIDETEC** (Spain), **STFI** (Germany), **3B Fibreglass** (Belgium), **VDL Fibertech Industries** (the Netherlands), **CEA** (France), **Techtera** (France), **Amura** (Spain), **Managing Composites** (Spain), **IRES** (Greece), **LAB23** (Italy), **Chomarat** (France), and **i-RED** (Austria).

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