EURECOMP- European recycling and circularity in large composites components

Dionisis Semitekolos, National Technical University of Athens – R-NanoLab & EuReComp

Open Innovation Workshop

Processes and methods for recycling, reuse, and recovery of advanced composite materials in the transport sector

REPOXYBLE - Depolymerizable bio-based multifunctional closed loop recyclable epoxy systems for energy efficient structures
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repoxyble
BIO-BASED MULTIFUNCTIONAL RECYCLABLE COMPOSITES

EURECOMP Project: European recycling and circularity in large composite components

Repoxyble open innovation workshop

07/06/2024

Dionisis Semitekolos / R-Nano NTUA

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R-NANO

EuReComp in a nutshell

DURATION
48 months

9 EU countries

COORDINATOR
Prof C. Charitidis

STARTING DATE
01/04/2022

20 partners

BUDGET
~9 M euros

PROJECT ACRONYM/TITLE
EuReComp
European recycling & circularity in large composite components

GA NUMBER
101058089
CALL: A digitized, resource-efficient and resilient industry 2021

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EuReComp Consortium

20 Industrial and **academic partners** with **complementary and multidisciplinary expertise!**

- ✓ **2 IND**
- ✓ **11 RTO**
- ✓ **7 SME**

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EuReComp Mission

The **cumulating composite wastes** are more prominent than the needed new composites. The **aircraft** and **wind energy** sectors contribute to a major share.

Across all industries about 60% of waste **fibre reinforced** composites is **landfilled**, causing severe **societal and environmental issues**.

EU's **Circular Economy plan** seeks to reduce the landfill down to 10% by increasing the rate of **recycling.**

Stakeholders seek **advanced technologies** and **end-of-life options**, which promote the **recycling** of carbon fibres.

EuReComp project has a strong focus on **circularity**, setting out to provide **sustainable methods towards recycling and reuse of composite materials**, coming from components used in various industries, such as aeronautics and wind energy.

EuReComp pathways towards circularity:

- Repairing, repurposing and redesigning parts from end-of-life large scale products and
- Recycling and reclamation of the materials used in such parts

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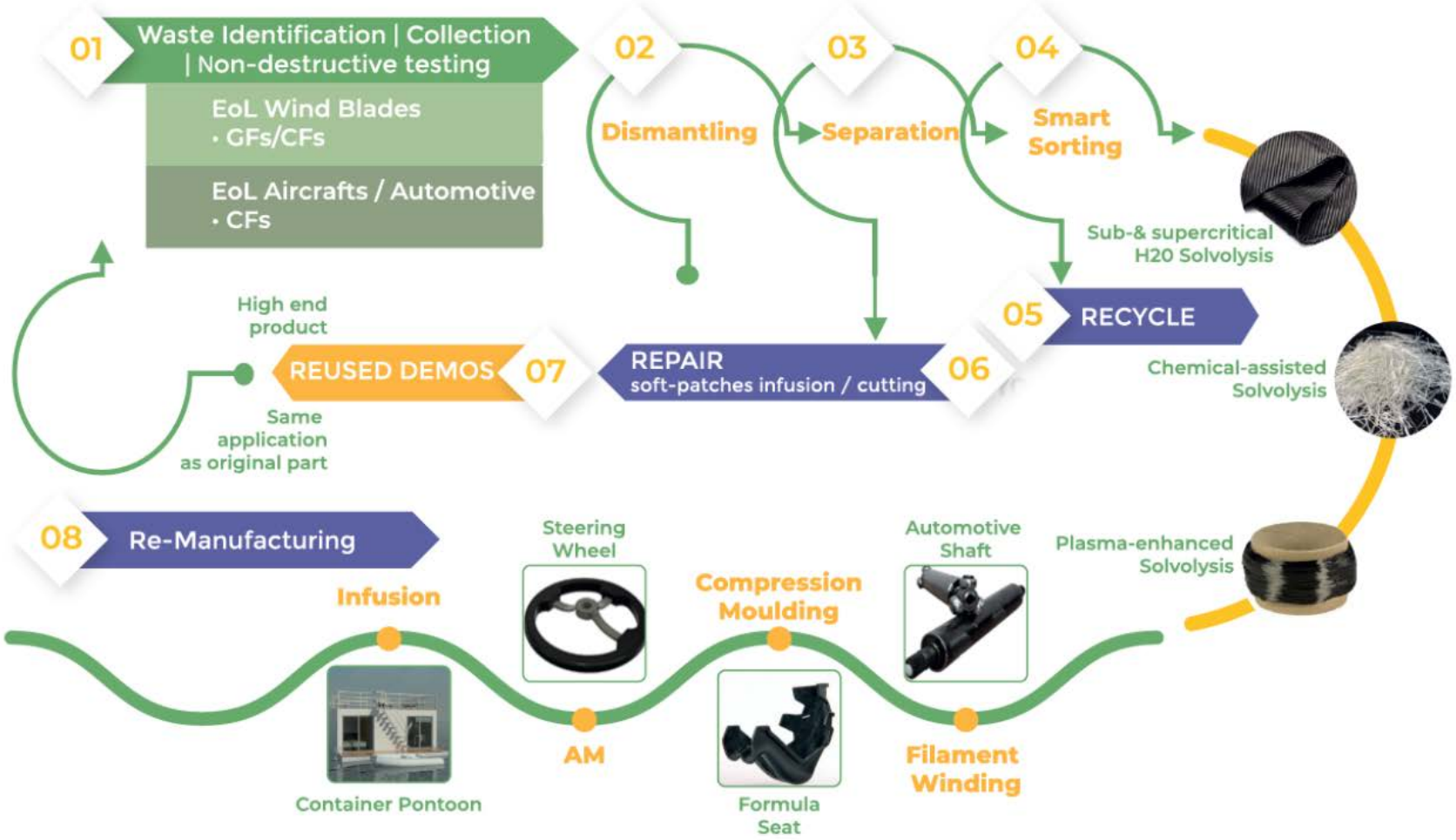
EuReComp Concept



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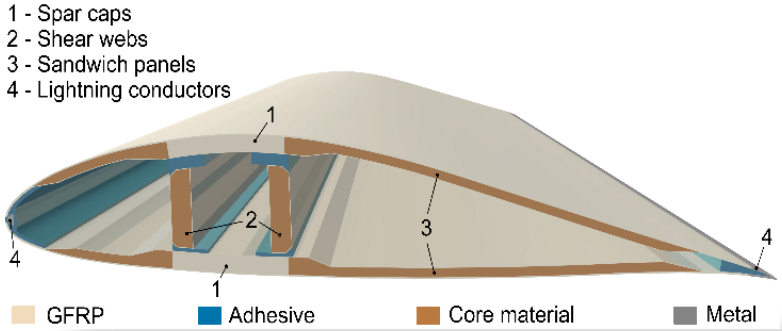
RE-use cases

Watertank cutting areas

Tables from an EoL watertank (TU Dresden – Institute for Lightweight Engineering and Polymer Technology)



Float test with PV-floating system

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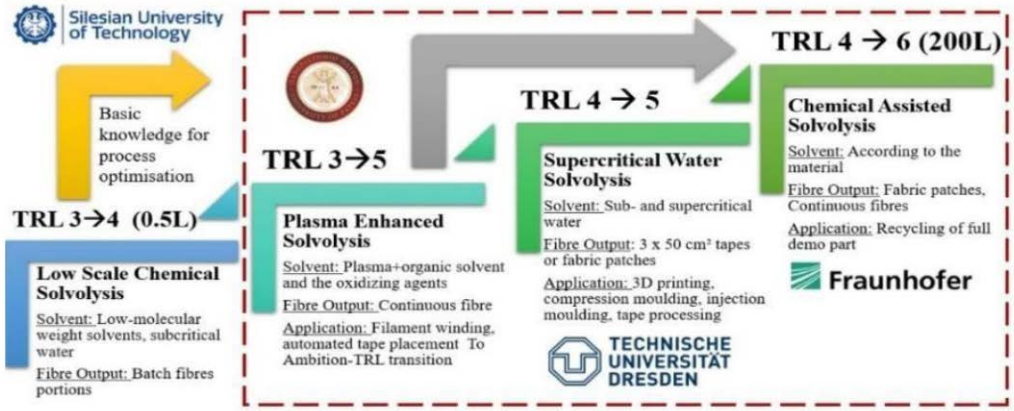
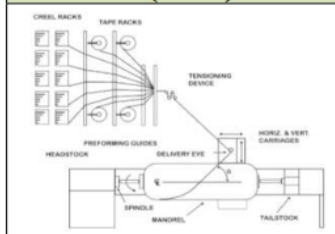
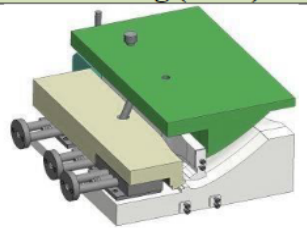
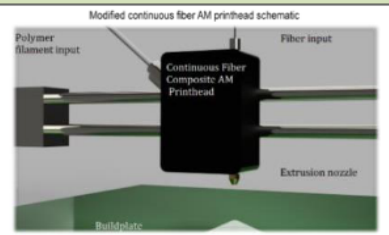
Demos with recycled materials



- *Continuous fibres*
- *CFs fabric patches*
- *Chopped CFs*

Filament Winding (B&T)	Compression Moulding (DAL)	3D printing (BIO)	Vacuum Infusion (APM)
			
Automotive Shaft 	Formula Seat 	Steering Wheel 	Container Pontoon 

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Recycling progress

Recycling progress

Composite specimen manufactured with Filament Winding

Plasma Treatment

Continuous Carbon Fibre Reclamation through Plasma Treatment

Fibre rearrangement

Fibre winding

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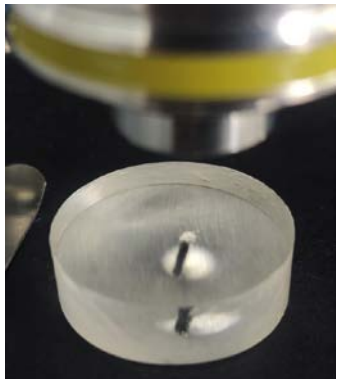
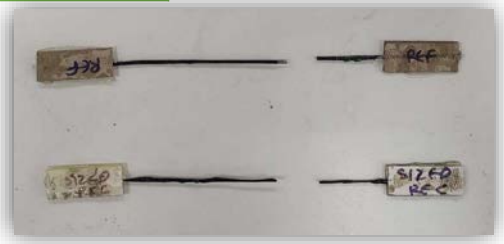
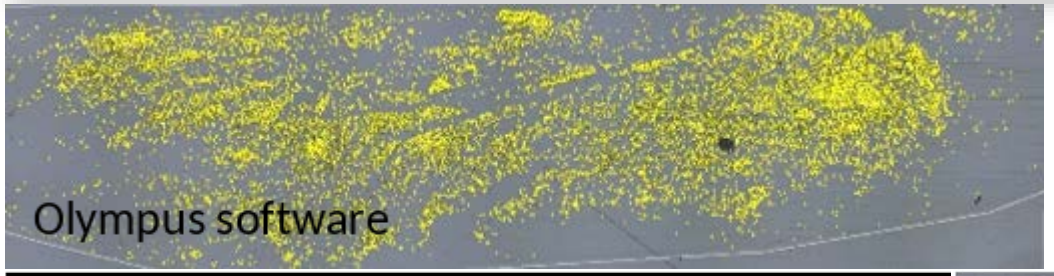
Fibre upgrading

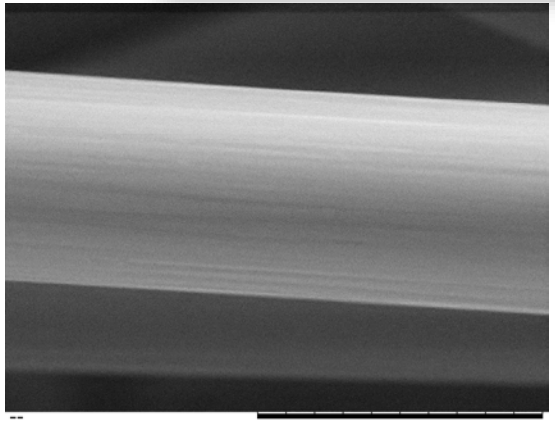
	Tensile Strength (GPa)
Reference	3.45 ± 0.41
Recycled	2.71 ± 0.32
Sized Recycled	3.12 ± 0.28



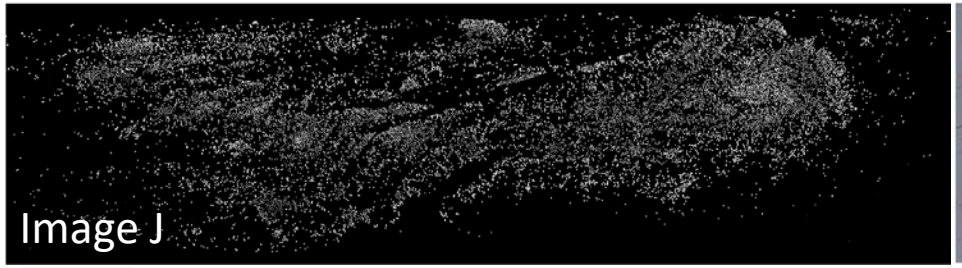
Impregnated fibre discs for optical microscopy

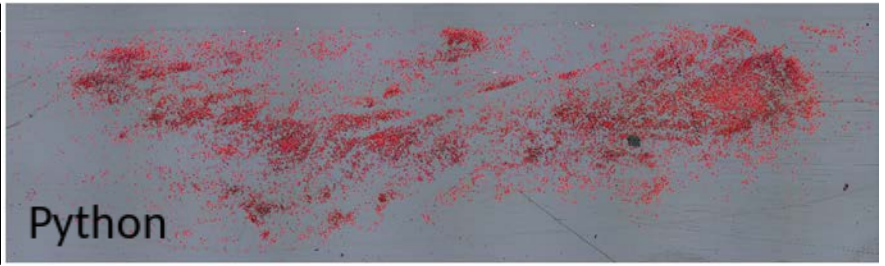






Recycled Fibre x9000





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Thank you!

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