



EUROPEAN RECYCLING & CIRCULARITY IN LARGE COMPOSITE COMPONENTS

Newsletter 01

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Dear Reader,

I am glad to share with you, the Issue#1 of the EuReComp Newsletter.

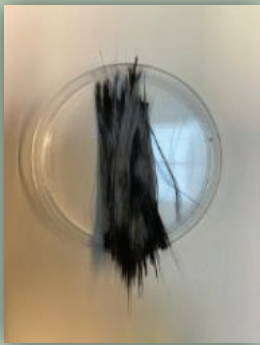
EuReComp project (European recycling and circularity in large composite components) started on April 2022 and aims on the development of innovative sustainable methods for reducing, recycling and reusing composite materials from components used in various industries, such as aeronautics and wind energy. To achieve this goal, EuReComp will develop demonstrators for automotive/ construction / architecture sectors from recycled/reused or repaired fibre reinforced composite materials, enabling circularity in composites.

Almost one year since the project started, several targets have been met highlighting EuReComp's progress, by analysing the market of composites materials, studying recycling technologies and implementing reuse and repair activities. EuReComp fosters on tutoring young researchers and employees on the advancements on composites recycling by organizing yearly workshops and training schools, delivering a lifelong learning module by the end of the project.

Enjoy the read & stay connected with EuReComp project via our website!!!



Circular Recycling and Reclamation



Glass and carbon fibers retrieved from the low-scale chemical solvolysis process at 190°C at ambient pressure after 6 hours (SUT)

Led by TU Dresden, the focus of this work is to promote circularity through recycling and reclamation, including the use of secondary raw materials. Progress highlights include the definition of recycled sample specifications, and successful tests of dissolving glass and carbon fiber composite waste using chemical-assisted solvolysis and plasma-enhanced solvolysis. In the EuReComp project, TU Dresden is finalizing the solvolysis facility and executing its first tests with composites.

Meanwhile, SUT is preparing for additional solvolysis experiments with new samples. UPAT is installing a new version of the plasma reactor and conducting additional tests for dissolution of samples. Finally, POLITO is computing the thermodynamic properties of different supercritical water models. The next steps include finalizing the solvolysis facility and conducting additional tests to recover glass and carbon fibers from wind blades and aircraft parts for reuse in new FRP parts.

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Separation Decision Making Tool for EoL Components

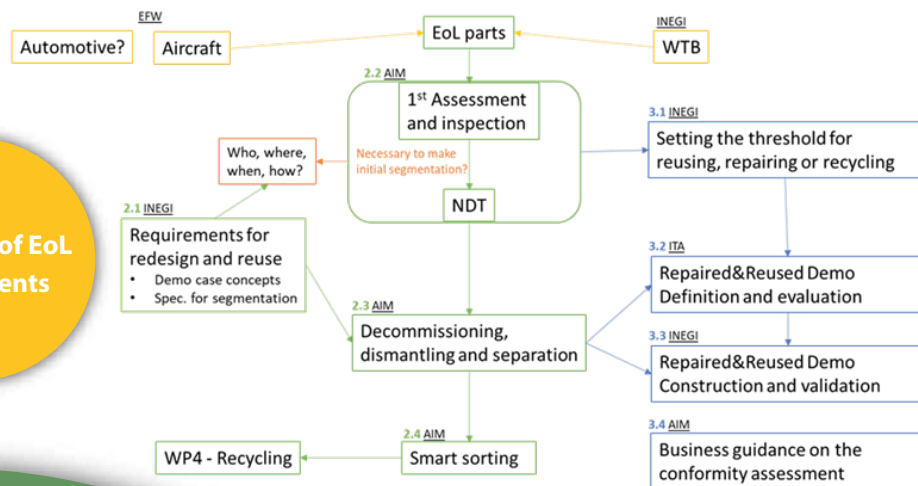


This part of the project will provide a smart decision support tool that will recommend the best route for every EoL component (reusing, recycling), based on its structural status. Under the leadership of AIMEN, the team aimed to develop a tool for end-of-life (EoL) component separation.

The main work carried out during the first six months period began with the definition of the workflow of EoL components (Figure). During that time, the team identified a supplier of waste-to-be-burned (WTB) EoL components, defined a smart inspection system using IR thermography and PA ultrasonic, and discussed initial ideas for smart sorting using spectroscopic techniques such as LIBS.

Initial discussions have been taken on how to face the dismantling and separation of EoL components. A first dismantling process would rely on in-situ visual inspection and logistic requirements to minimize transportation costs. In a second stage, the idea is to provide a cutting path planning based on NDT and reusable/repairable/recyclable thresholds defined within the project. The next steps include defining requirements for redesigning and reusing EoL composite parts, applying NDT to identify defects, and characterizing small samples of WTBs and aircraft components.

Workflow of EoL components



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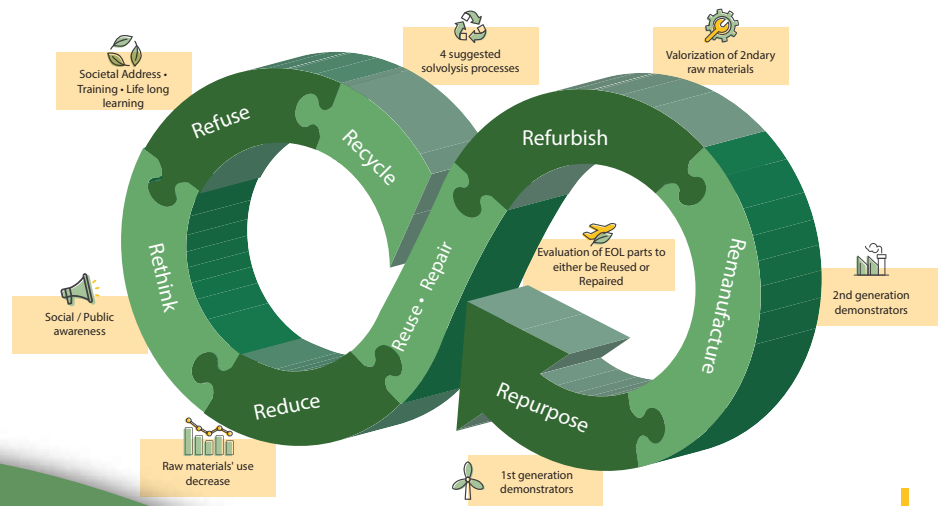
R6-strategy for waste streams management

Project Task R6-strategy for waste streams management is being led by HTWK. The purpose of this task is to develop a strategic approach for returning decommissioned composite parts back into the material chain. The Multi-Tiered System of Recycling (MTS-R) aims for waste reduction, energy and emission savings and consists of the six R's of reuse, repair, refurbish, remanufacture, repurpose, and recycling.

The task has achieved several important milestones so far, including the evaluation of the increasing importance of the circular economy in the composite industry through a market study, the development of the R6-strategy for composite material circularity, and the submission of the MS1-document by the end of September. In addition, the consortium has collected information about all available composite components and specified the strategic workflow.

The next steps of this project task include further market analysis, the definition of circular design strategies, and the assessment of data needs of relevant stakeholders. The team will also interview specific stakeholders of the value chain of FRP to evaluate possible exploitation routes and develop representative and scalable eco-settings based on validated data.

The contribution of this project task to the overall EuReComp scope is significant as it proposes a strategic circular approach for returning EoL composites into the material chain and represents the strategic workflow within the consortium.



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Training & Life-long learning



In this project task, questionnaires were issued to gather information about the training status of project partners. The results showed that all partners engage in training activities, with a focus on entry level employees for companies and mid-level researchers for institutes. Physical trainings are preferred, but all partners would like to incorporate e-learning in the future.

The open-source platform "Moodle" was selected, installed, and tested as a learning platform. A basic scheme has been drawn up for the structuring of the life-long learning concept, which serves as an orientation for the structure of the classroom training courses and the digital learning platform. The simplified basic scheme is shown in the Figure below.

- Overview/ General information
- WTB/ Aircraft/ Automotive
- Prevention
- EoL criteria
- Condition analysis
- Repair
- Reuse
- Chemical Recycling/ Solvolysis
- End user technologies
- Safety - Environment - Performance
- Conclusion



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Next Steps



The next steps in this project task include the finalization of the basic concept for the lifelong learning modules. A workshop is planned to present the first training sessions and brainstorm with the partners. The Moodle content will also be enhanced and further tested for functionality. The aim of this project task is to establish a lifelong learning concept for the technology developed in the project, including the creation of modular training courses on recycling of large composite structures and integration of innovative learning methods.

This project task contributes to the overall EuReComp scope by providing professional qualification and life-long learning opportunities to employees in the research and business environment. The establishment of a life-long learning concept and the integration of innovative teaching methods will help employees adapt to new technologies and ensure their success in the field.



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Events

1st EuReComp Open Workshop 2023

The 1st EuReComp Open Workshop 2023 on April 20th for updates on composite recycling and composites technology. Learn from industry experts, participate in a guided visit to TUD-ILK facilities, and network with leading researchers. Open to the entire composite community. Register now: <https://eurecomp.eu/events/1st-eurecomp-workshop>



EUROPEAN RECYCLING AND CIRCULARITY IN LARGE COMPOSITE COMPONENTS

1ST OPEN WORKSHOP

20 APRIL 2023
08:30 - 15:00
ILK, TU DRESDEN, GERMANY / ONLINE*



Team EuReComp will also participate in the following events:

JEC World Exhibition 2023, Paris | 25 April – 27 April

JEC WORLD
2023 The Leading International
Composites Show
April 25-27, 2023 | PARIS-NORD
VILLEPINTE

International Conference on composite materials, Belfast | 30 July – 4 August



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Our Team

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