Press release

New Composite Materials and solutions for Circular Aerospace Components Manufacturing

ZeroPol, the Innosuisse-supported flagship project *"Towards a NetZero Plastics Industry"*, announces a major milestone with the development of Best Carbon Footprint Materials, a new generation of polymeric solutions designed to drastically reduce the environmental impact of plastics and composites. The initiative reinforces Switzerland's ambition to build a circular, climate-friendly plastics ecosystem.

The project focuses on creating recyclable, high-performance materials derived from more sustainable, bio-attributed raw materials, aiming for substantial CO_2 reductions across the full product life cycle. Its core objectives include :

- Developing biomass-derived epoxy resins and next-generation vitrimers for high-performance carbon-fiber composites.
- Innovating debondable adhesive systems that enable easy disassembly and efficient recycling of multi-material assemblies.
- Establishing new circular routes to transform post-industrial and post-consumer waste, including waste from the food industry, into bio-based and biodegradable polymers.

A New Tool for Circular Composite Design

A key objective of the project is the development of a full-scale demonstrator based on the structural design of an aircraft composite sandwich component. Within the ZeroPol framework, the project team will re-engineer every layer, raw material, core structure, and interface to enable end-of-life separation and recycling, while maintaining the stringent performance required for aerospace-grade parts. These advances will be made possible through the integration of innovative materials and design approaches specifically tailored for circularity.

This breakthrough will be enabled by several innovations:

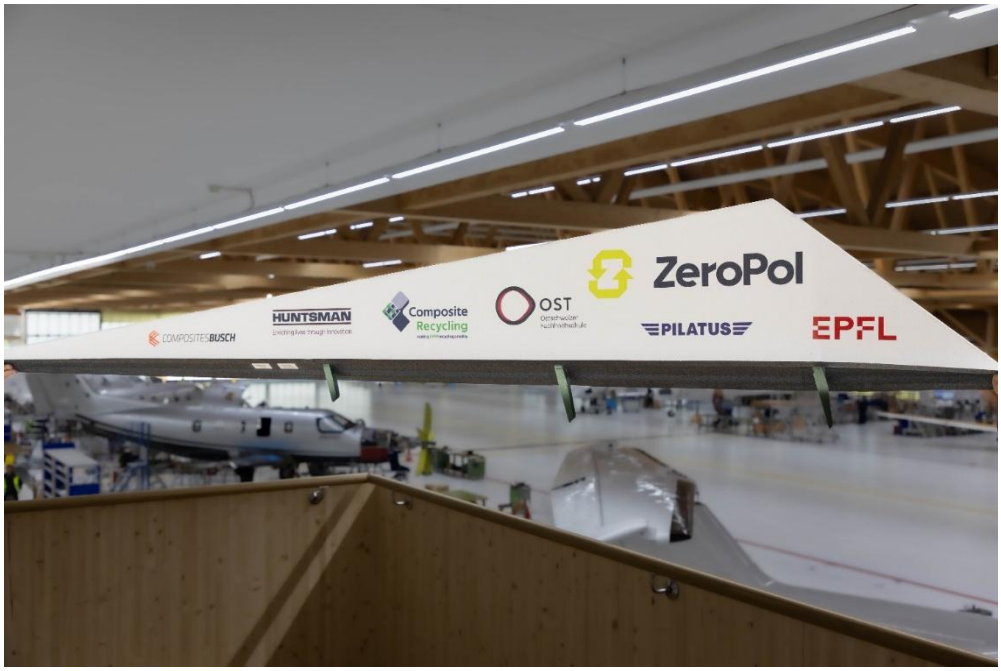
- The integration of mass-balanced carbon prepreg, reducing reliance on fossil resource feedstocks.
- The introduction of a debondable film, allowing clean separation of skins and core materials for reuse and recycling.

Traditional composite sandwiches are notoriously difficult to recycle due to the strong adhesion between the skins and the core. The combination of these innovations provides a practical and industry-ready pathway to separate and recover materials from aerospace-grade CFRP and PMI-foam structures, supporting global efforts to reduce waste and carbon footprint while maintaining structural integrity.

Industrialization-Ready Concept
Developed within the ZeroPol initiative, this technology will demonstrate how advanced interfacial design can open new avenues for eco-design, repairability, and circular engineering. By enabling clean disassembly at the end of life, it will support industrial sectors aiming to transition toward low-carbon, fully circular composite solutions.

Meet the Project Partners at JEC World in Paris
Visitors to JEC World in Paris are warmly invited to explore the booths of the project partners involved in this collaborative initiative. You will have the opportunity to discover the diverse application fields, technical expertise, and complementary know-how contributed by each organization to this breakthrough.

This collective presence offers a unique chance to meet the teams behind the project, learn about the various roles and innovations developed within the collaboration, and understand how this new debondable primer technology can pave the way for circular, repairable, and sustainable composite solutions across multiple industries.



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