

Sustainable Lightweight Membrane Structures

Institute of Aircraft Design, University of Stuttgart

Institut for aircraft Design – University of Stuttgart



Dr.-Ing. Stefan Carosella

Deputy Head of Division

Manufacturing processes in
aviation



Leightweight Design

FEM-Simulation, Process
Simulation, Multiscale
Simulation, Virtual Process
Chain



Composite Technology

Automated Preforming, Digital
Processes, Digital and
Functionalized Composite
Structures

Project idea: Sustainable Lightweight Membrane Structures

Call area: No. 3



Contact

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Project Description

The project follows a circular economy approach to lightweight structures. Injection Moulding of Large-Scale Structural Lightweight Membrane Structures with Recycled Long-Fibre Reinforced Polymers and Local Fibre Reinforcements for Enhanced Impact Strength.

Project Objectives

- Circular Economy: Utilization of 90 % Recyclat
- Lightweight Design for resource efficiency and low CO2 footprint
- PP (60% GF) with local textile GF reinforcement
- Enhanced Impact Strength between -40°C and +80°C
- UV Stability
- Insert Integration for Practical Assembly

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Our know-how...

- > 60 yr. of Expertise in Composite Manufacturing, Engineering and Process Development
- Comprehensive Practice and Know-How in the field of Textile Reinforced Manufacturing
- Strong Background in Numerical Simulation of Composite Components
- Deep Understanding of mech. Behaviour of Composite Structures
- Extensive Experience Multi-Scale Testing of Composite Parts (Coupon Level to Full Scale Testing)

We are looking for...

- Press Manufacturer
- Tool Manufacturer
 - Heating Channel Technology
- Raw Material Producer (PP and Glass Fibre)
- OEM or Tier 1 supplier for Automotive, Industry Equipment, Medicine and Construction.