

**Project title:** „Preformtransport“ - Development of packaging and transport solutions for textile 3D preforms

**Partner:** Institut für Beratung, Forschung, Systemplanung, Verpackungsentwicklung und -prüfung an der HAW Hamburg

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**Homepage:** [www.preformtransport.de](http://www.preformtransport.de)

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#### Initial situation:

There are currently no standardised packaging and transport systems for the external and internal logistics of preforms along the interdisciplinary value chain of components made of fibre composite plastics (FRP). The production of FRP components in the currently practised central production is not economically feasible due to the high production widths required.

#### Problem

The lack of standardized external logistics systems prevents decentralization of the process chain to several companies with high vertical integration. In addition, there is a lack of standardized packaging and transport systems within the companies that meet the required quality standards of conventional series production. In order to be able to involve several companies in the production of components, standardised external transport and handling processes between the company locations are required. Here, high risks are to be expected with regard to damage to the textile starting material due to the stresses that occur (e.g. vibrations, shocks, stack pressure as well as temperature and humidity).

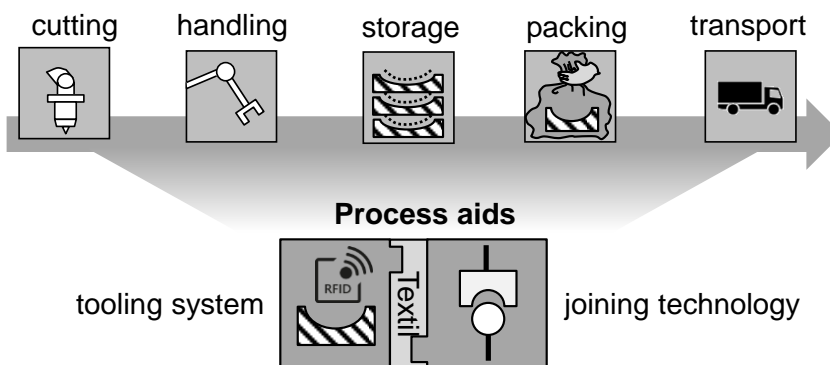
#### Aim

The aim of the planned research project is therefore the development of standardised packaging and transport systems for the external and internal logistics of preforms, which enable the production of the required quantities as well as the transport in compliance with the quality requirements. These are adapted to the value chain and accompany the structure from preform production to the finished component.

## Solution

In order to achieve the research objective, a four-stage approach is pursued.

The first step is to analyze the current logistics of preforms and collect data. The focus is on the transport, handling and storage loads (TUL loads) of the textile preforms. In a second step, a process chain for the optimized logistics concept will be developed taking into account the interface problems (material and data flow along the entire process and value-added chain). Standardized packaging and transport solutions are then developed according to the requirements determined. The last step towards achieving the goal is the integration of an intelligent tool system (process aids) that runs along with the process, whereupon the textile preform is temporarily added for the subsequent processes.



The temporary joining of the textile layers is intended for the process steps necessary for the preforming process: Cutting, handling, storage, transport and placement in the impregnation tool for protection against fibre damage, fibre disorientation and changes in geometry.

One of the central technical results of the project is the description of the TUL loads of textile preforms in internal and external logistics. These include quantified loads for impact, vibration, temperature and humidity. In addition to a newly developed process chain, a packaging and transport solution is available for three specific demonstrator geometries. In addition, there is a design guideline for the production of geometry-adapted process aids, which is validated on the basis of the demonstrator geometries. At the end of the project, standardized packaging and transport systems are available for the external and internal logistics of preforms. These make it possible for SMEs to transport preforms in compliance with industrially required quality standards.

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