

Project title: CompositesReloaded – Collaborative robots and flexible automation for composites production

Partner: Sirris

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Mission Statement

In the wake of demands for increasing energy efficiency, lightweight construction solutions in particular are playing a key role. Such solutions are already being used regularly in the automotive and aerospace industries. However, there is also a steadily increasing demand in other sectors such as mechanical engineering, energy generation and sports.

Fiber reinforced plastics (FRP) are the most promising alternative to traditional materials such as metal, aluminum or wood, especially under the premise of lightweight construction. They are characterized by low weight combined with outstanding mechanical properties.

However, FRP production is under constant pressure from low-wage regions. In particular, the production of small batches of medium to high complexity is predominantly carried out in labor-intensive processes in Asia. Large corporations such as BMW or Airbus have found their own ways to automate production with specially manufactured systems. However, these are extremely expensive and not affordable for small and medium-sized enterprises (SMEs). This is due to the fact that the core competence as well as the competitive advantage SMEs does not lie in the production of large series, but is characterized above all by the great flexibility in production.

Ziel

The aim of the CompositesReloaded project is to enable SMEs in the FRP industry to flexibly automate their processes by introducing collaborating robots and semi-automated manufacturing cells. The following aspects will be investigated:

1. Benchmark of Off-the-Shelf-Systems

- Cost, complexity, implementation opportunities for flexible, semi-automated SME environments
 - Guided visits and interactive workshops
2. Development of automation strategies and building blocks
 - Lightweight gripper technology & forming tools for handling of textiles and preforms
 - Design for automation guidelines for flexible, semi-automated environments
 3. Demonstration and validation
 - Development of three technology evaluators for different applications and process families
 - Setup of a small-scale pilot line using collaborative robots, where the developed strategies and technologies are integrated and validated

Danksagung

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