

Bachelor's Thesis, Semester Thesis, Master's Thesis

Parameter Studies on effect of process variables on laminate compaction behavior

Thermoplastic (TP) composites, especially CF-PEEK, offer a promising alternative to the more common thermoset-based structures. Some of the main advantages of those materials are their weldability, their increased mechanical performance, especially at elevated temperature, and their increased chemical resistance. Automated Fiber Placement (AFP) for TPs is a suitable process for the automated manufacturing of high performance parts.

For the efficient structural design of composite structures, it is inevitable to know about the lamina and laminate thickness. Within this thesis the influences of different process variables, such as compaction pressure and compaction speed, temperature or laminate lay-up, on the compaction behavior of TP laminates should be evaluated. Therefore, the relevant variables should be identified and a design of experiments (DoE) should be applied. The designed experiments should be performed on LCC's testing equipment to gather further understanding about the compaction behavior and the underlying rheology of thermoplastic composites.

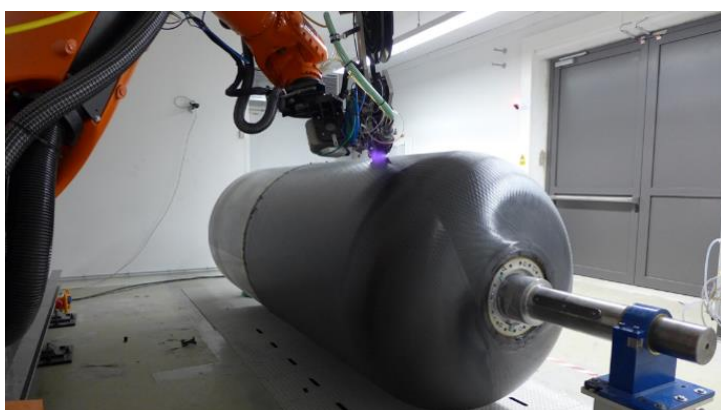


Figure: LCC's TP-AFP machine

Research focus of the thesis

- Literature research on the compaction of thermoplastic composites and rheology of polymer materials
- Determination of process variables influencing thickness of TP-laminates
- Design of Experiments
- Performance and Evaluation of Experiments
- Documentation and Presentation of results

Requirements

- Basic Knowledge of fiber composites
- Basic knowledge of rheological material behavior (optional)
- High motivation and ability to work independently
- Structured working method
- Profound knowledge of German and/or English (C1 or higher)

Starting date: Now

For more details please contact:

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