Chair of Carbon Composites
TUM School of Engineering and Design
Technical University of Munich

Bachelor's Thesis, Term Paper, Master's Thesis

Effects of moisture on the processing of Reactive Thermoplastic Resins

Liquid Composite Moulding (LCM) processes for composite parts require resin systems with sufficiently low viscosity to allow proper impregnation of the reinforcement fiber. Typically, this is achieved by using a reactive thermosetting resin system, with inherent challenges regarding repairability and recycling of the matrix materials. Over the last years, reactive thermoplastic resins have emerged that allow the production of thermoplastic matrix composites using LCM processes. During processing, these materials show different behavior than typical thermoset resins that must be accounted for in order to achieve a high laminate quality.

Topic of this thesis is to investigate the processing behavior of a reactive thermoplastic resin with regard to its tendency to absorb moisture and possible ways to reduce moisture content in order to mitigate its detrimental effects.

Figure: Structure of an amorphous thermoplastic resin

Figure: Imperfections (pores) in laminates produced with reactive thermoplastic resin

Research focus of the thesis

- Literature review on composite LCM processing with special regard to reactive thermoplastic resins
- Literature review on moisture absorption behavior of reactive thermoplastic resins
- Experimental evaluation of the effects of moisture content on reactive thermoplastic resin and laminate sample quality
- Experimental evaluation of possible ways to decrease moisture content of resin components
- Documentation

Requirements

- Interest and general understanding of composite production processes
- Interest in experimental work
- Organized and thorough working style

Note: Please expect a reply only after 20th April 2026.

Starting date: End of April 2026

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