

Master's Thesis

Process-oriented optimization of bio-plastic synthesis

Lost core materials cause a high waste production at mold manufacturing. Therefore, a kernel material is formed into a complex shape. Afterwards, it is covered with a fibre-reinforced material and resin. After curing and isolation of the developed material, the core is wasted. These core materials consist usually of salts, plasters or plastics. Recycling processes cause a high energy consumption and are difficult to establish into the process. Therefore, the application of hydrophilic, bio-based thermoplasts shall be determined. You can wash these out of the hydrophobic resin-based material. After drying and re-melting the core material, it can be re-used for core material application. Therefore, you can implement a closed-loop system and increase the sustainability in industrial processes of e.g. aerospace, automotive, architecture and 3D printing application.



Figure: Moldings processed with lost core injection for building application (1).

Aim of this thesis is the development and process optimization of bio-based plastics for sustainable core material application. Therefore, you will evaluate the synthesis parameters and analyse the developed materials according its chemical, thermal, rheological and mechanical parameters.

Main focus on this thesis:

- Synthesis of different bio-plastics
- Material characterisation

Requirements:

- Safe handling with chemicals
- Experience with synthesis
- Background knowledge in thermal and mechanical analytics
- Hands-on thinking

(1) https://www.baunetzwissen.de/imgs/1/0/3/7/5/7/9/Formteile_Seite4-f739a33d90e810ea.jpg

Start: anytime

Contact for application and questions:

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