



DEVELOPMENT OF JUTE-FIBER-REINFORCED BIO-COMPOSITES FOR INDUSTRIAL-SCALE APPLICATIONS

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Motivation and objectives

Jute is an easily available agricultural product. Its use as a reinforcement fiber does not threaten global food security in any way, but rather would enhance the social and economic status of jute cultivators and thus the national economy.

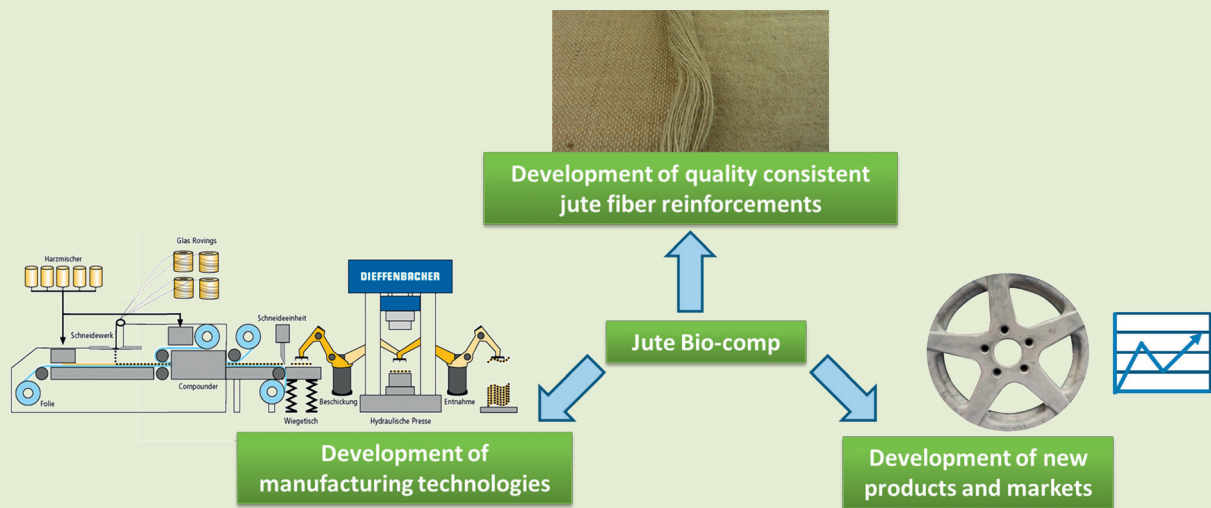
A large proportion of jute is cultivated in India. The surplus of cultivated jute has not yet been used in value-added products such as high-performance composites.

Even though the market trends suggest an extensive growth in future, there are still several drawbacks and anomalies in the use of natural fibers (NFs) in composite applications. The main disadvantage is the affinity to water, which affects the

processability and mechanical properties of the fibers. A lack of interfacial adhesion, a low melting point and poor moisture resistance also hinder the use of NFs in composite applications. Processing of the NFs by state-of-the-art composite manufacturing technologies is also a complex task which needs a multidisciplinary and holistic approach.

Approach

The international project Jute Bio-Comp will develop jute-fiber-reinforced composites that can be used in demanding, high-value technical applications fulfilling requirements of the international market. The composites will be developed by an integrated approach.



Thus material and process development will be combined in the fields of:

- Analysis and modification of jute fibers to increase compatibility with polymers
- Quality-consistent, jute-fiber-based reinforcements such as yarns, slivers, rovings, woven and nonwoven fabrics
- Diversity of composite manufacturing process technologies and process chains like RTM (resin transfer molding), SMC and BMC (sheet and bulk molding compound)
- Exemplary manufacturing of demonstrator structures for specific applications from the civil engineering and automotive fields
- Market development for these new materials and production technologies in Germany, India and finally worldwide

Project partners

An international consortium has been assembled for this research project. On the research side of the project, Fraunhofer ICT works together with the Institute for Vehicle Systems Technology of the KIT and the Indian-based Kamarhatty Company Limited. In addition, the project is supported by the German industrial partners KraussMaffei Technologies GmbH and Dieffenbacher GmbH and the Thai company Aditya Birla Chemicals.



Acknowledgment

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