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Projekttitel:	InduPull – Development of an Induction-Based Heating System to Increase Productivity for a Braiding Pultrusion Process of FRPs with Thermoplastic Matrix
Partner:	**IFF GmbH, Ismaning**
Laufzeit:	09/20187 – 12/2020
Förderträger:	Zentrales Innovationsprogramm Mittelstand (ZIM) des Bundesministeriums für Wirtschaft und Energie

Mission Statement

Fiber Reinforced Plastics (FRP) are increasingly being used in lightweight engineering where performance and energy efficiency play important roles. Pultruded profiles can be used in roof structures of automobiles with special reinforcing properties. In addition to conventional materials such as steel and aluminum FRPs are usually impregnated with a thermoset matrix. Due to the long curing times, the lightweight construction potential cannot be fully exploited. FRPs with thermoplastic matrix offer new opportunities for fast and efficient processing technology since thermoplastics have no cross-linking time. Moreover, thermoplastic matrix systems can be back molded or recycled by melting the matrix. The main challenge of processing such composites is the high viscosity of the thermoplastic matrix.

The aim of this research project named InduPull, funded by Federal Ministry for Economic Affairs and Energy (BMWi) through Central Innovation Program for SMEs (ZIM), is the production of pultruded load-oriented semi-finished profiles in a continuous process. The approach is to extend the braiding process with a pultrusion system including heating system. Thus, the thermoplastic matrix is melted by heating up electrically conductive carbon fibers of the braid. An innovative heating technique based on an inductive heating process is developed in this project to achieve homogenous temperature profile within the cross section. A load-compliant design of the component is realized and an increased process speed from up to 1 m/min is aimed by this innovative heating technology.

Carbon fiber-based commercial hybrid yarns (CF/Nylon 6) are investigated at the Institut für Textiltechnik (ITA) of RWTH Aachen University regarding their inductive heat-up potential and processability into braids. The IFF GmbH, Ismaning, Germany develops an induction-based system, which is integrated into the braiding pultrusion process developed at ITA. Finally, the heating method is examined considering process speed and specimen quality.

Acknowledgement

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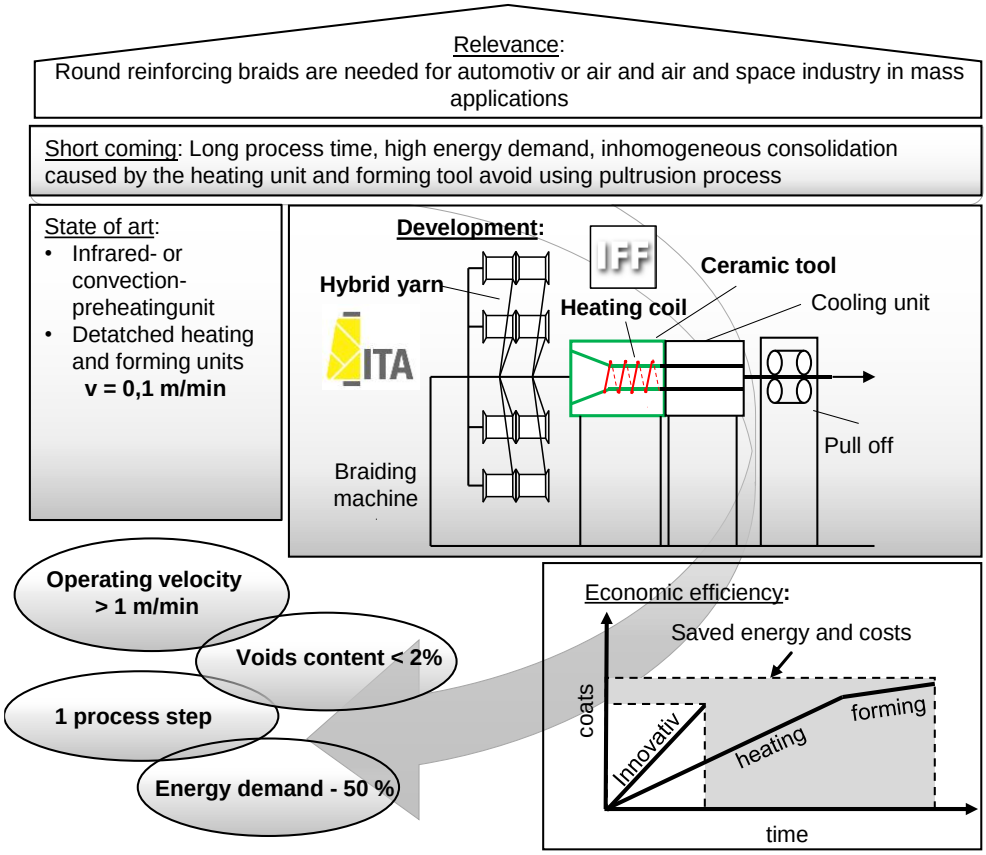

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