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01.10.2017

Project title:	Development of a hybrid reinforcing fibre with high filament orientation for the production of thermo-plastic fibre composites (Oriented-Hybridroving)
Partners:	TEC-KNIT CreativCentrum für Technische Textilien GmbH, München Institut für Textiltechnik (ITA) of RWTH Aachen University
Duration:	09/2017 – 08/2019
Funding agencies:	Zentrales Innovationsprogramm Mittelstand - ZIM

Mission statement:

Thermoplastic fibre reinforced plastics (FRP) are experiencing high growth rates. Double-digit annual growth rates are predicted, which are primarily based on the automotive industry. In addition to organo sheets, thermoplastic hybrid yarns are particularly promising for this purpose. Two types of carbon fibre thermoplastic hybrid yarns are currently available:
Commingled hybrid yarns are characterized by their simple manufacturability and comparatively low cost. However, they have low blending characteristics and low fibre orientation, which have a negative effect on processing and the properties of the composite material.
Stretch-broken yarns, on the other hand, are highly oriented and have good blending characteristics. However, the mechanical properties of FRP are greatly reduced by broken, non-continuous filaments.
Necessary for high mechanical properties and short cycle times are hybrid yarns with highly oriented, continuous filaments and a high degree of blending, which result in short flow paths.

Solution:

The aim of the project is the development of carbon-thermoplastic hybrid rovings with highly oriented (max. 5° misorientation), continuous filaments and a high blending ratios (max. 15 µm flow path). These new hybrid rovings enable the production of T-CFRP with high strength (15 % higher than components made from conventional hybrid yarns) with low cycle times in component production (at least 10 % lower than conventional commingled hybrid yarns).

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