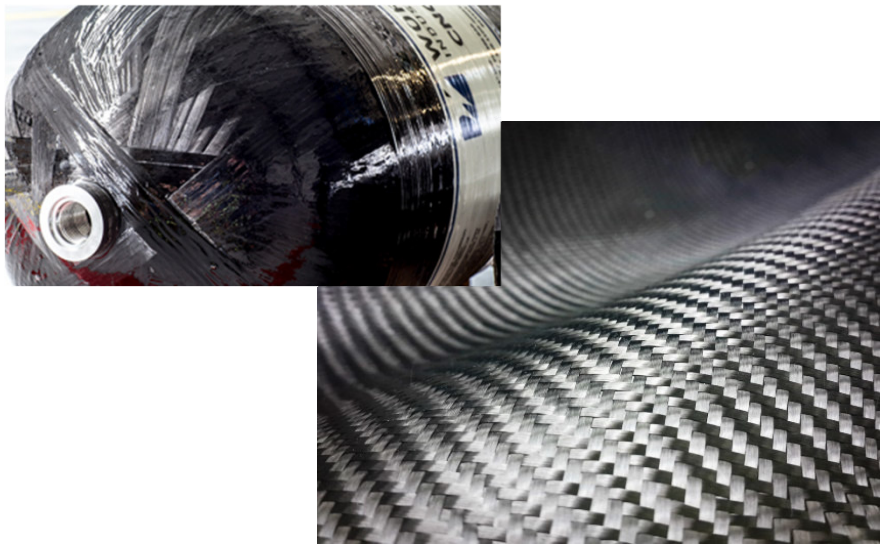
Review of current and future production processes for carbon fibres

Description

Compressed gaseous hydrogen (CGH2) tanks for mobile and transportable applications are usually made of carbon-fibre-reinforced polymers. Carbon fibres with high strength and high Young's modulus are necessary to produce lightweight and robust tanks for hydrogen at pressures up to 700 bar.

Conventional industrial production processes for carbon fibres involve fossil-based precursors, complex machinery, and heat treatment of the fibres at temperatures of up to 2500 °C, which are reasons for the large carbon footprint of carbon fibres.

Aim of this work is to create an outline of common and established production processes of carbon fibres as well as novel and promising future methods (e. g. plasma treatment, microwave treatment) and determine factors as carbon footprint and fibre product quality.



Sources: Worthington Industries/Freeform Technologies

Work Packages

- Definition of necessary material properties of carbon fibres for the production of compressed gaseous hydrogen tanks (2 weeks)
- Analysis of status quo of carbon fibre production (2 weeks)
- Overview of novel and possible future methods of carbon fibre production (2 weeks)
- Comparison of production processes and carbon fibre properties (2 weeks)
- Written thesis (2 weeks)

- **Start**: immediately
- **Duration**: approx. 3 months
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