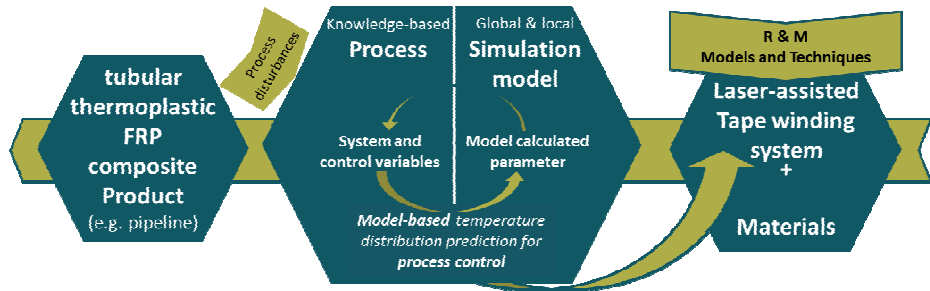


adaptive model-based control for laser assisted Fibre reinforced tape winding

Project overview

ambliFibre aims at fulfilling the demand for tubular components made of fibre-reinforced plastic composites (FRP) by improving the diode laser-assisted tape winding process, systems and assisting software solutions to enable an efficient and flexible production for such advanced tubular composite products out of thermoplastic unidirectional (UD) fibre-reinforced pre-impregnated raw stock material.



ambliFibre expected results

- Increase of the process speed
- Reduction of maintenance costs and machine downtimes
- Reduction of changeover times
- Reduction of waste material and pre-trials
- Reduction of personnel training

Technical objectives:

- Development of process data mining algorithms integrated in machine control and **easy-to-use programming software**
- Building-up an **integral process and machine simulation model** for laser-assisted tape winding
- Provide the **inline monitoring solution** for quality assurance
- Development of an active optics for **dynamic redistribution of laser irradiation** based on a novel infrared camera and the simulation model results
- Demonstration of a **flexible machine concept** which can produce continuously and discontinuously
- Development of **R&M models** for the laser-assisted tape winding machine and **evaluation of life cycle cost**
- **Evaluation of the environmental impact** of the ambliFibre materials, processes and components
- **Demonstration and validation** of the **model-based controlled** ambliFibre system technology

