

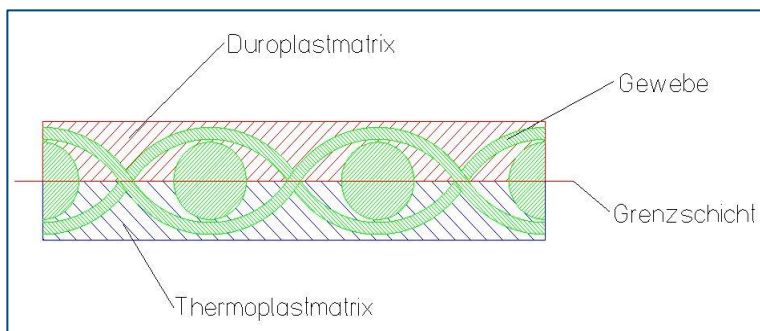
## Matrix Hybrids – Thermoset Laminates with Thermoplastic Cover

### Innovation

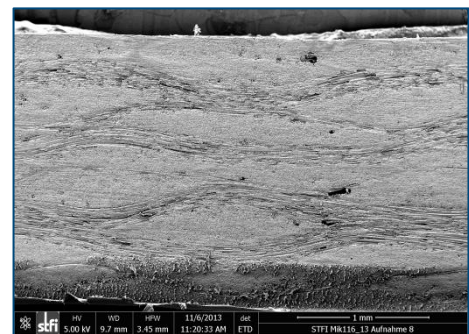
- **thermoset-based structure elements with one- or both-sided thermoplastic laminate surfaces**
- **welding technology (e.g. ultrasonic welding) as assembling process**

Thermosetting plastics or thermoplastics are used as matrix material for fibre-reinforced plastics (FRP). Both materials provide pros and cons for future component properties as well as for suitable processing technologies. The research project „Matrix Hybrids” pursues the goal to join both matrix materials into one component. This opens up new and innovative options for constructing engineers and technologists with reference to construction methods and assembling technologies.

The basic idea is to combine both matrix systems with the use of a fabric layer whose warp and weft threads switch the side of the matrix alternately. The adhesion of thermoset and thermoplast will be achieved by high-tensile reinforcement fibres.



Draft of a matrix-hybrid compound



REM image of a hybrid material sample

### Technology

Partial-consolidated thermoplastic prepregs, where a fabric layer is compacted up to the middle with the thermoplast, will be manufactured during the first step. Technologies of choice could be compression moulding or continuous procedures. For the second case, the partial-consolidated prepregs come as rolled goods.

The second technology step can be proceeded as:

- continuous manufacturing of matrix-hybrid prepregs by impregnating the open side of the fabric with resins for further processing by autoclaving or
- element-related cut of partial-consolidated prepregs and texturing of the thermoset laminate layers with a compression moulding or injection process

### Projectpartner:

Sächsisches Textilforschungsinstitut e.V.  
Cetex Institut für Textil- und Verarbeitungsmaschinen gemeinnützige GmbH

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