



Sirris Leuven Composites Application Lab



Belgian Textile Research Centre

COLLECTIVE RESEARCH PROJECT

PRESS FORMING OF REINFORCED THERMOPLASTICS

BACKGROUND TO THE RESEARCH

Reinforced plastics or composites are being used in a growing number of products worldwide. The advantages of composites, over metals, have been clearly shown in practice over the past few decades:

- lightweight: high specific strength and stiffness
- greater freedom of design
- high fatigue resistance
- good chemical resistance
- corrosion-free

Traditionally, composites are fabricated by impregnating the reinforcement with thermosetting resins. Unfortunately, this production technique does have a few drawbacks (especially as regards the cycle time) which stand in the way of automated production on a large scale. At present, the use of thermoplastic raw materials is a growing success in the composite industry. Thermoplastic composites can, after adding heat and pressure, be molded in cycles of a few minutes at most. This speeds up production considerably, which makes mass production realistic. Thermoplastics can have an immense impact on the use of composite materials in the automotive industry, among others, where low weight, mass production and recycling are very important aspects.

The fabrication of such composites creates not only big opportunities for manufacturers of lightweight panels but also for sub-suppliers in the textile industry. The extrusion of matrix materials as well as the production and further processing of hybrid materials (yarn, fleece, woven fabrics and knitwear) offer very lucrative opportunities for innovation inside textile companies. Via this project we shall bring the possibilities into sharper focus and develop know-how for an optimal implementation.

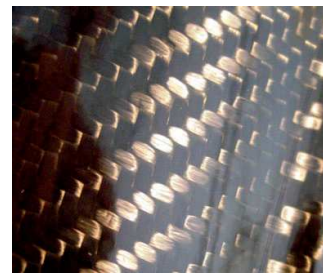
Start: 1 May 2009

End: 30 April 2013

OBJECT OF THE RESEARCH

In this project we bring into focus the needs and boundary conditions for the assembly of quality composite materials and their implementation in test cases, in which the following goals are key:

- knowledge acquisition and knowledge transfer about processing techniques and process development, with a clear focus on optimal quality, efficient usage of materials, pre-consolidation of the composite, process simulation tools and costs
- development of textiles which cater optimally to the requirements of the composites, incl. selection of the matrix and reinforcing material, and composition of the optimized blend and texture
- realization of the test rig for flat and 3-dimensional composites
- by means of case studies, insight will be provided into the industrial possibilities and the cost structure of thermoplastic composites



TARGET GROUP

This joint research project is aimed at 3 groups:

1. Composite part suppliers
2. Textile companies that produce or are able to develop basic products, such as fibers, yarns, tapes, monofilaments and fabric structures made from those materials, including blended yarns, knitwear, woven fabrics, non-wovens and multi-layer fabric structures
3. Firms which are able to incorporate composite components in their product development (like, for example, in the transport sector)

The project is carried out in close cooperation between Sirris and Centexbel. The object is to kick-start communication and cooperation between the target group and encourage them to proceed with industrial implementation.

The project began on 1 May 2009 for a term of 4 years. A users committee, spanning the respective sub-sectors, is briefed periodically on the project results and can capitalize on these developments by contributing its own prototype materials or product requirements. Participation in the project is free for the members of Centexbel and Sirris, provided they sign the declaration of intent to cooperate.

CONTACT

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