What is Resin Transfer Moulding?

Resin Transfer Moulding includes high performance composite components with continuous fibre reinforcements based on textile structures made from glass, carbon and aramide fibres are finding increasing applications in the aeronautic and automobile industry. These innovative materials allow lightweight high performance structures to be created, as an alternative to conventional metal structures. The manufacturing of small number of components is carried out using RTM process.

Thermosetting matrices

The manufacturing for high performance composite components made from thermosetting matrices, such as epoxy and phenolic resins, is already established in the aeronautic industry, and also finds niche application in the automotive industry. The Fraunhofer ICT is carrying out intensive research to improve production and processing technology to create new fields of applications. Scientific objectives include the application of microwaves to increase the fluidity of the resin and improve the infiltration of the reinforcing fabric structures, and the microwave associated curing of the thermosetting resins (Cure on Demand).

Thermoplastic matrices

A further innovative research topic at the Fraunhofer ICT is the material and process development for the manufacturing of components with in-situ polymerising thermoplastic matrix systems. The use of thermoplastic matrices for the production of continuous fibre reinforced composites have a number of advantages, including:

- Excellent fibre impregnation
- High fibre volume content
- Recyclability
- Increased impact strength
Fraunhofer Project Centre @ Western

Western University and the Fraunhofer Institute of Chemical Technology ICT have partnered to provide joint expertise for industry needs.

Together, Western and Fraunhofer will develop lightweight composites for the transportation and building materials sectors, focusing on applied research in the fields of methods, materials and manufacturing technologies for composite materials.

Collaborations

With Industry

• Develop industrial processes
• Apply developed innovative processes
• Optimize existing processes and materials

With Fraunhofer

• Process and material development
• Scientific research at intermediate level
• Transfer from basic research to industrial scale

With Universities

• Basic research on fibre matrix phenomena
• Simulation and design
• Investigation of fundamental interests

Equipment and Facilities

• Dieffenbacher hydraulic presses with maximum clamping force of 25,000 kN and parallelism control
• Injection equipment; Krauss Maffei high pressure and Wolfangel low pressure RTM equipment, both with resin pre-heating capabilities
• Linear and multi-axis robot systems for automated preform handling
• Capable of processing different resin types including epoxy, unsaturated polyester and polyurethane