

Fraunhofer Project Centre @ Western

Compression Moulding Technology



What is Compression Moulding Technology?

Compression Moulding Technology offers an innovative way for manufacturing lightweight composite parts for medium to high production volumes. Sheet Moulding Compound (SMC), Long Fiber Reinforced Thermoplastics (LFT) and Resin Transfer Moulding (RTM) are examples of material preparation processes that can be used with compression moulding.

At the Fraunhofer Project Centre @ Western, the compression moulding research focuses on material and process development, moulding of reinforcing structures (such as continuous fibres or metallic inserts) and the simulation of the flow behavior in the mould. Achieving Class-A surface qualities is also an active area of research in combination with the upstream processes SMC, LFT and RTM.

Compression Moulding with Carbon Fibres

In addition to studying the incorporation of carbon fibres within the different manufacturing technologies into the polymeric matrices, compression moulding also needs to be investigated. Due to the differences in fibre diameter, fibre sizing and fibre architecture, the flow behavior of carbon fibre loaded materials is different from glass fibre reinforcement. Therefore, the compression moulding cycle needs to be investigated and adapted towards these boundary conditions. Additional process features, such as vacuum assisted moulding or in-mould coating, are also of interest.



Equipment and Facilities

- Hydraulic press with maximum clamping force of 25,000 kN, parallelism control and a table size of 3m x 2m
- Maximum closing speed is 800mm/sec
- Capable for SMC, LFT, High Pressure RTM materials and processes
- Process data acquisition like energy consumption over time or pressure built up
- Additional features are Foaming Cycle, Vacuum Assisted Moulding, In-Mould Coating
- Hot air oven for pre-heating of co-moulding structures
- Mould heating and cooling with water up to 180C and with oil up to 300C
- All equipment is equipped for the use of carbon fibres

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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