

Simulation and Control of the LCM-process with Future Matrix Systems

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ABSTRACT

To establish the LCM-Process as an economic competitive process to produce parts out of FRP, it is important to design the whole process computer based. This includes the design of the mould with the location of the vents and gates. Also the injection time is important to calculate the complete cycle time of a part. Furthermore, the control of the injection process can be simulated during the design stage by a filling simulation program like PAM-RTM or LIMS. To get short cycle times with high fiber volume fractions it is important to use a resin providing a low viscosity in combination with optimal process parameters. This for example could be the new thermoplastic resin CBT™ developed by Cyclics Corporation. CBT™ is a resin which can be easily injected at a temperature above 150°C and polymerizes inside the mould to PBT (poly butylene terephthalate). This paper presents effects such as the influence of the gate geometry, the local anisotropy of the fiber reinforcement, and the change of viscosity caused by the polymerization, that have to be taken into account to get a proper process simulation. Preliminary experimental work will be compared to the simulation results.