Siemens PLM Software develops flow simulation software for infusion processes

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Linde De Vriese

Siemens PLM Software develops software for virtual testing and simulation of composite production processes. Siemens takes a leading position in the development of Digital Twin solutions for companies through the close integration of 3D computer-aided engineering (CAE) and tests. Accurate flow simulations can, for example, be carried out for composite production processes using Simcenter 3D (Siemens product life cycle management (PLM) Software). Sirris supported Siemens PLM Software (Leuven) when validating the results of this advanced simulation system.

Flow simulations can be carried out using Simcenter 3D for composite production processes including liquid resin infusion in a dry fibre reinforcement under pressure, among others. Such simulations can be applied by companies when designing a robust and controlled production process to reduce the probability of defects occurring during production.

B-pillar

Sirris supported Siemens PLM Software in validating the results of this flow simulation for a resin transfer moulding (RTM) process. A B-pillar for a passenger car was manufactured in Sirris's Composite Lab. The flow process was followed during the process using optical fibres enriched with fibre Bragg gratings (FBGs). The FBGs help determine the location of the flow limit without disrupting the flow pattern. The Composite Lab has the facilities to perform the RTM process and also has extensive experience in embedding these sensors in the production process. It was, therefore, in just the right position to perform the measurement.

The last step was to compare the results of the simulation to the measurements taken during the flow process. A good match was found. The development of the software is entering the next phase at Siemens PLM Software. The Composite Lab is currently carrying out further research into the applicability and maturity of the software in collaboration with Siemens PLM Software.

The results of the research were presented at EUROMECH Colloquium 602 in Nantes in March 2019.

Authors

Linde De Vriese