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Seminararbeit

am Institut für Polymer Extrusion und Compounding

zum Thema

Numerical Simulation of Fiber Orientation in Extrusion Dies

Introduction:

Short-fiber reinforced polymer composites are widely used in manufacturing industries due to their high strength to weight ratio and enhanced mechanical properties compared to pure polymer products. During extrusion processes, the fibers orient themselves due to flow and interactions between neighboring fibers and /or cavity wall [1]. In order to be able to understand the flow behaviour of the polymer-fiber matrix, the accurate prediction of the fiber orientation is very important to know during those processes. Moreover fibers adopt a preferential orientation that can vary significantly across the geometry. Due to the flow and orientation are strongly coupled, the essential model of the coupled flow/fiber orientation problems should be good formulated. A continuum models are often used to describe the orientation of fibers in a flow. By means of some fiber orientation solvers developed with the aid of a free, open source CFD software package OpenFOAM, an investigation of the fiber-filled flow can be simulated.

Objective:

Simulation of Fiber Orientation in extrusion dies (Solver is already available) and Validation against measurement.

Contact person:

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Literature:

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