

Numerical simulation of viscoelastic particle suspensions : a first step towards modeling flow induced crystallization in filled polymers

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NUMERICAL SIMULATION OF VISCOELASTIC PARTICLE SUSPENSIONS; A FIRST STEP TOWARDS MODELING FLOW INDUCED CRYSTALLIZATION IN FILLED POLYMERS.

Wook R. Hwang, Martien A. Hulsen, Gerrit W.M. Peters, Han E.H. Meijer

Eindhoven University of Technology, Materials Technology, Department of mechanical Engineering,
Dutch polymer Institute, P.O. Box 513, 5600MB Eindhoven, The Netherlands

ABSTRACT

A new finite element model has been developed for direct simulation of inertialess particle suspensions in simple shear flow. Distinctive features are:

- *The force-free torque-free rigid body motion is assigned by the Lagrangian multipliers, but on the particle boundary only*
- *A sliding window concept is introduced to impose the bi-periodicity of simple shear flow and it is implemented by mortar element methods.*
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The project was initiated by the need to understand the micro-structural rheological behaviour of the particle-filled polymer melt flow, especially for the application to flow induced crystallization kinetics of such systems.