Numerical Modelling of Molding Compression Of Fibre-Reinforced Composites for Industrial applications
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Abstract
A transverse isotropic viscous model accounting for the anisotropy exhibited in fiber-reinforced composites is integrated in the numerical platform of the software Rem3D. Simulations under various mechanical loadings are tested for volume fiber concentrations of 3.5% and 14.7%. Equivalent stresses and equivalent strain rate deformations given by the software were compared to the ones coming from experimental data, finding very good agreements. As a second point developed on this paper, we comment on the slip condition between Die/Punch tool with the reinforced composite, whereas the no slip condition was assumed for viscosity values.

No-slip contact is given for high values of alpha
Slip contact is given for low values of alpha

Three cases has been set to validate our numerical integration in Rem3D. Simple compression, plane strain compression ans shear were the test used to obtain the rheology model [Dumont,2003]. In here; we repet such tests and validate – verified with experimental results.

Comparison Model with Experiments [Dumont et al. 2003]

Comparison Model with Numerical Simulations [Salazar et al. 2015]

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Comparaison Model with Experiment [Dumort et al. 2003]

Comparaison Model with Numerical Simulations [Salazar et al. 2015]

Comparison with friction

Numerical Resolution: Rheological Model for Reinforced Fibre composites is used to described the mechanics

Friction effect on the compression force

- Compression of fiber material with 14.7% weight fiber concentration.
- Friction coefficient has been set α = 2.10^4