

## ASSESSING THE CAPABILITY OF OPENFOAM® TO SUPPORT THE DESIGN OF COEXTRUSION DIES

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Due to the increasingly demands on performance, several products that were in the past manufactured using just one material, are nowadays designed to incorporate more than one. This allows to take advantage of the specific properties of each material employed, like mechanical, barrier, chemical resistance, etc. However, the difficulties to anticipate the flow of several rheologically complex materials inside the production tools, are significantly increased when more than one material flows at the same time. Numerical modelling tools may play an important role to support the designer activity, especially in products for which there is no previous experience.

This work aims to evaluate the capability of using OpenFOAM® to support the design of coextrusion processing tools. The assessment was started with verification studies, accomplished by the comparison of the results obtained with OpenFOAM® with similar ones published in the literature. Subsequently the assessment is performed with two experimental case studies, corresponding to extrusion dies to produce mono and coextruded filaments. The results obtained show clearly that OpenFOAM® was able to capture several flow effects and thus seems to be adequate to support the design of coextrusion production tools.