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Cavity Transfer Mixer Modelling

G. Grosso¹, M.A. Hulsen¹, A. Overend², P.D. Anderson¹

¹ TU Eindhoven – The Netherlands
² ColorMatrix, PolyOne – United Kingdom

Introduction
The blending of different materials is an important process in many industrial applications. In particular, in polymer industry, where a good mixing is essential to guarantee appropriate and uniform characteristics of the finished product. The Cavity Transfer Mixer (CTM) is mounted downstream of classical extruders in order to improve distributive mixing.[2,3] The inner part rotates, whereas the outer remains still, while a pressure load pushes the fluid downstream.

Objectives & Approach
The goal of the project is to support the device optimization by developing a mathematical model of the CTM able to assess the impact of geometrical and functioning variables on mixing.

Results
Flow and mixing simulations reveal that the mixing driving mechanism is the material shuffling between the cavities.

Conclusions and future work
A full three dimensional model of the CTM is now available. In the future, the model will be used to run a broad range of simulations assessing the impact on mixing of geometrical and functioning parameters. Guidelines for the system optimization will be derived.

References