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[Home](#) > [Improving Layer Control in Multi-Layered Polyester Films using Computational Fluid Dynamics \(CFD\)](#)

Improving Layer Control in Multi-Layered Polyester Films using Computational Fluid Dynamics (CFD)



Polyester based Multi-Layered Films (MLFs) form a major part of DuPont Teijin Films' (DTF) product portfolio.

Such MLFs are formed when different polymer melt layers come together in a process known as coextrusion. The main coextrusion geometries used at DTF are:

? an injector block linked to a die and

? a multi-manifold die.

As the thickness and melt flow properties of the layers become more differentiated, it becomes more difficult to control individual layer width and thickness of an MLF.

CD-adapco's STAR-CCM+ is used to improve the layer control of current MLFs, reducing the potential cost of running multiple experiments and improving product performance.

Coextrusion structures typical of DTF operation are created and meshed using the software.

The different fluids entering the geometries have identical properties to experimental rheological data on polyester melts. The volume of fluid method is used to track the interface between these fluids (or Eulerian phases).

The accompanying presentation shows comparisons between structures i) and ii) using CFD. The impact of varying the fluid: fluid viscosity ratio on the final MLF is also shown. The author has completed two years of this four year project, involving the University of Birmingham and DTF.

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Industries:

Products:

Conference:

[STAR Global Conference 2013](#)^[2]

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