CFD Simulation of Jet Wiping Process
A comparison with analytical model and experiments

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Gas-jet wiping is a hydrodynamic method of controlling the final thickness of the resulting substrate in coating techniques, with application in industrial processes such as photographic film manufacturing, wire sleeving and in the iron and steel industry. In the gas-jet wiping process a turbulent slot jet is used to wipe the coating film dragged by a moving substrate. The wiping mechanism relies on the interaction between the gas jet and the liquid film taking place on the moving surface. The paper presents and discusses a comparison between results obtained by numerical simulation conducted with Fluent, using volume of fluid (VOF) model in combination with laminar flow, k-ε turbulence modeling and large eddy simulation, with the results obtained from an analytical model and experiments conducted on a dedicated facility.
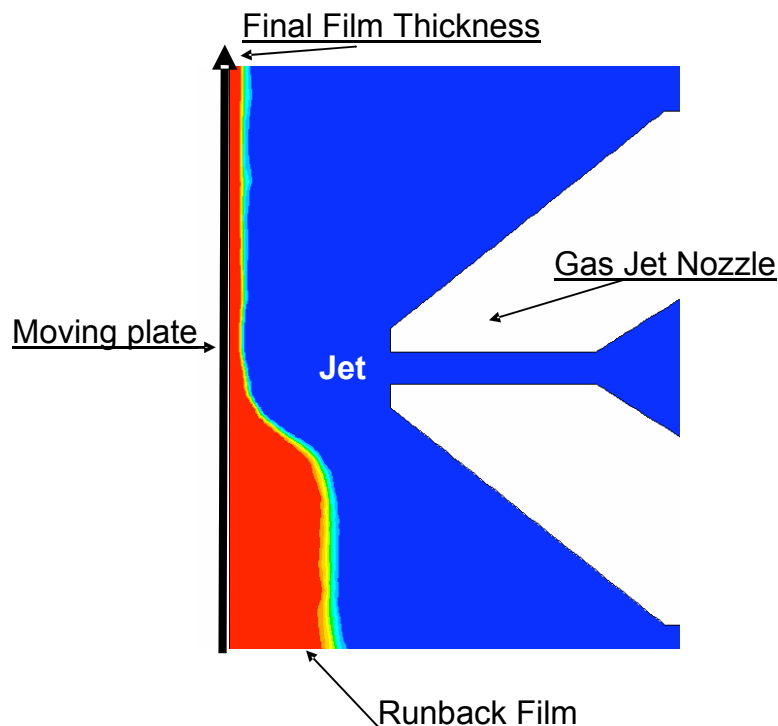
Figure 1. Contours of volume fraction representing a typical interface in gas-jet wiping process (CFD simulation).

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