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**Novel Model to Predict Minimum Coating Thickness for High Speed Slot Coating** ILHOON JANG, SIMON SONG, Department of Mechanical Engineering, Hanyang Univ., Korea — Recently slot coating is often applied to printed electronics for a flat display and in battery industry due to advantages such as the fast production rate and cost effectiveness. The accurate prediction of minimum coating thickness, closely related to coating stability, is a key issue in slot coating. It is because trial-and-error should be minimized when determining operating conditions of slot coating of which inks with metallic nano-particles are very expensive. So far, the viscocapillay model is known to provide good physical insight in a range of a low or moderate coating speed. However, its predictions are inaccurate for high coating speed since it doesn't consider the inertia of the ink flow arising at the high speed coating. In this study, we propose a novel model which accounts for the inertial effects. We performed detailed numerical analysis on ink flows of a slot coating to find out the cause of inaccurate prediction at a high speed coating and minimum coating thicknesses under various operating conditions. We found that the novel model prediction and numerical results are in excellent agreement in a wide coating speed range and that the new model can be applicable to an operating Reynolds number of an order higher than the viscocapillary model.

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