

Dynamics and stability of Newtonian and non-Newtonian fluids in slot coating

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Slot coating process has been widely used for the many precise coating products, especially, in IT industries manufacturing flat panel displays and long life batteries. However, producing very thin uniform coating film at high speeds is a difficult task because of the occurrence of unexpected coating defects such as leaking, air entrainments, ribbing, rivulets and barring during the coating operations. We have investigated flow characteristics and stability of slot coating flow in coating bead region. Dynamics and coating windows by viscoelastic and shear thinning fluids have been experimentally compared with those by Newtonian one. And also, coating windows for various coating liquids have been theoretically established, providing a good agreement with experiemntal data.