

### Effect of viscoplasticity in slot coating flow

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Slot die coating is a versatile materials processing method to form thin-film products with relatively high speed. The coating solution used for this method may contain various particles, additives, and solid contents. When the amount of solvent decreases, the solution becomes a dense suspension and may not flow below a yield stress. This threshold stress can affect the desirable range of coating operations. In this study, the slot coating visualization experiments are done for the viscoplastic Carbopol solution. The shape and location of the gas/liquid interfaces, or menisci are visually tracked. When they touch die lip corners, corresponding operating conditions, dimensionless vacuum pressure and gap-to-thickness ratio are collected to construct the coating window. Beside this vacuum shift, the viscoplastic solution delays the low flow limit by changing behavior of the die shoulder wetting. In sum, the weakly viscoplastic coating solution may require slightly higher vacuum, but it may allow to coat thinner or faster than Newtonian solution with comparable viscosity. ㄱ