

Low Flow Limit of Slide-Extrusion Coating Operation

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Abstract

For certain products, such as water-proof glossy digital photo papers and other ink jet media, two or three coated layers are necessary and usually the top layer is much thinner than the rest of layers. Conventional simultaneous multi-layered coating devices such as coextrusion of slide coating fail to deliver stable coating layers for these products because of large viscosity or thickness differences. A lab coating die which is a combination of slide and extrusion coating with slide coating on top was constructed. The objective is to use this die to determine the low flow limit, or the minimum wet thickness of the top layer. Newtonian polyvinyl alcohol(PVA) solutions were prepared as test fluids and two layered coating solutions were deposited simultaneously on a chrome-plated steel roller for observation. It was found that the top layer can be much thinner than that of the coextrusion process; wet thickness of 5 microns is possible. Stable coating for large viscosity and flow rate ratios are also possible. If a stable liquid film can be established on the slide, then the two layered slide-extrusion coating is feasible.