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Abstract for Presentation

Curtain Coating at Low Web Speeds and Low Coat Weights

by

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Applications of low wet coat weights at low web speeds are in conflict with two physically different boundaries of the operating window of the curtain coating process. One of these boundaries is related to the stability of the liquid curtain, and the other one is associated with air entrainment between the impinging curtain and the substrate. The goals of this presentation are to explain the physical reasons for these boundaries, as well as to develop theoretical models in order to predict the loss of curtain stability and the onset of air entrainment as a function of relevant process parameters.

Both of these operating boundaries can be expressed in terms of a minimum volumetric flow rate/width. Since the flow rate/width is equal to the product of wet film thickness and web speed, the requirement of a minimum value is equivalent to a minimum web speed for a given film thickness, and/or a minimum film thickness for a given web speed.

The manufacturing of optical films is a typical application of thin films being coated at low substrate speeds. Curtain coating would be the ideal process, because it is able to meet the very high quality requirements of this product. Ideas will be discussed that will allow curtain coating to be used for the manufacturing of optical films.