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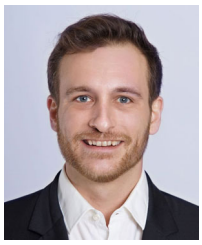

HIGH PRECISION MANUFACTURING OF SLOT- AND CURTAIN COATING DIES AND THE RESULTING QUALITY OF THE COATED FILM

ABSTRACT

Premetered coating processes are widely used for applying adhesive and functional layers onto continuously running substrates in converting, finishing and flexible packaging applications – beside other coating tasks. They enable precise control of coat weight and film thickness, excellent uniformity in both cross-web and machine direction, and reliable scale-up from laboratory and pilot trials to full production.

The presentation shows how high-precision design and manufacturing of slot dies and curtain slide dies influences coating stability, reproducibility and the resulting quality of the coated films. This is particularly relevant for pressure-sensitive adhesives, reactive formulations and other demanding coating liquids, where uniform layer thickness, clean coating edges and stable process windows are essential for product performance and efficient production. With the unique, optimized dual cavity die design and precise manufacturing the coating facilities benefit from saving precious coating liquids, which – especially in a high volume production – leads to extensive savings of operating cost.

Flow channels, distribution systems, die lips, sealing surfaces and assembly interfaces must be manufactured, finished and assembled with high accuracy. Even small deviations can affect fluid distribution, coating stability, coat weight uniformity and the final film thickness profile.

A particular focus on slot dies is placed on fixed-lip and flexible-lip designs. Fixed-lip dies provide a mechanically stable and highly reproducible geometry with minimal adjustment effort. Flexible-lip dies allow controlled profile correction and process adaptation when product properties, coating conditions or operating windows vary. Both concepts require optimized design and precise manufacturing to achieve their full performance potential.

By linking manufacturing accuracy, lip design and coating performance, the presentation highlights how precision coating dies contribute to improved coated film quality, reduced start-up losses, lower waste, easier scale-up and more efficient long-term production in adhesive and various finishing applications.