CURTAIN COATING TECHNOLOGY

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Coating Tech Slot Dies
CURTAIN COATING
CURTAIN COATING

• Advantages
  • Large gap (irregular surfaces)
  • Reduced lines and streaks
  • Increased fluid velocity (hydrodynamic assist)
  • Higher line speed

• Disadvantages
  • Air
  • Vibration
  • Minimum line speed & flow rate
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• Advantages
  • Large gap (irregular surfaces)
Adjustable slot die height from substrate
(250 mm)
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• Advantages
  • Increased fluid velocity (hydrodynamic assist)

Hydrodynamic assist of curtain enables high coating speeds (0.5 cm³/s)
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- Multilayer Slide Curtain Coating
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- Disadvantages
  - Air
  - Vibration
  - Minimum line speed & flow rate
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- Disadvantages
  - Air

**Air Shields**
- Air entrainment at dynamic wetting line
- Environmental air disturbances
- 3D concern
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• Disadvantages
  • Vibration

  **Edge Guides**

• Fluid affinity for edge surface
• Overcoat
• Solvent feed along edge
• 3D design to carry fluid by mechanical means
Disadvantages

Minimum line speed & flow rate

\[ We = \frac{\rho Q V}{\sigma} \]

- We = Weber number
- \( \rho \) = density
- \( Q \) = volumetric flow rate
- \( V \) = impingement velocity
- \( \sigma \) = surface tension

\[ Re = \frac{\rho Q}{\mu} \]

- Re = Reynolds number
- \( \rho \) = density
- \( Q \) = volumetric flow rate
- \( \mu \) = viscosity
- \( U/V \)
- \( U \) = web speed
- \( V \) = impingement velocity
CURTAIN COATING

- Balance of liquid momentum and surface tension
- Uniform pressure across fluid flow between edge guides
- If the coating thickness is smaller, then the web velocity has to be higher
- Sharp lip edge geometry
The science of slot dies