Abstract Submitted
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Shaping of Charged Sprays PAUL W. VESELY[1], RUDOLF J. SCHICK, Spraying Systems Co. — Spraying oil by conventional hydraulic and air-assisted nozzles presents issues with overspray and uneven application. Electrostatic atomization provides an alternative method to spray oils and other electrically insulating fluids, utilizing the repulsive force of like charges instead of high fluid and air pressure. A spray plume of charged droplets provides a very high transfer efficiency when spraying onto grounded conductive substrates. A plane-to-plane electrostatic atomization nozzle produces a full cone spray plume, but for many conveyor coating processes, a flat spray is required to provide a uniform coating across a substrate. Flat plate electrodes were added outside of the electrostatic atomization nozzle near the orifice to generate an electric field that acts on the negatively charged spray plume shaping it into a flat fan plume. Variously shaped and sized electrodes operating at a range of voltages of negative polarity were investigated for their effectiveness in forming the full cone spray into a flat fan spray plume. High-speed imaging, phase Doppler interferometry, and particle imaging velocimetry systems were used to investigate the effect of the external electrode configurations tested.

[1]Membership pending

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