

MpoMeim28-001

Additive manufacturing for electromagnetic compatibility development and enhancement of polymer nanocomposites with carbon-based fillers

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Plenary: This lecture will address the cutting-edge development of polymer nanocomposites enhanced with carbon-based fillers designed for additive manufacturing (AM) and electromagnetic compatibility (EMC) applications. Focusing on recent advances, the lecture will explore the intersection of material extrusion (MEX) techniques and nanocomposite formulations, including multi-walled carbon nanotubes (MWCNT), graphene nanoplatelets (GNP), and carbon black (CB). Through the lens of two pioneering studies, it will be presented how the rheological behavior and resulting morphology of these nanocomposites significantly influence their electromagnetic performance. Key findings from these studies reveal how varying infill patterns, orientations, and thicknesses of MEX-manufactured parts can be fine-tuned to enhance electromagnetic interference (EMI) shielding.