

High-Temperature Polymer Composite Additive Manufacturing For Electronic Tooling

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This presentation delves into the practical application of high-temperature polymer composite additive manufacturing, specifically focusing on Polyether Ether Ketone (PEEK) with carbon fiber and fiberglass reinforcement. In the electronics industry, this material combination provides exceptional thermal and chemical resistance during the soldering process, capable of withstanding thousands of cycles without material degradation or warping.

Composite-Based Additive Manufacturing (CBAM) offers increased design flexibility, allowing for a departure from traditional constraints in electronic component production. The incorporation of fiber-reinforced ESD materials with high-temperature PEEK polymers contributes to more efficient and cost-effective solutions for wave, selective, and point-to-point soldering processes.

The presentation emphasizes the functional benefits of fiber-reinforced PEEK tooling, with a specific focus on wave solder pallets and high-temperature fixtures. These components play a vital role in the manufacturing process by reducing setup time, enhancing solder flow, minimizing issues like bridging and solder skipping, eliminating labor-intensive hand masking, and safeguarding heat-sensitive components.

Furthermore, the session shares insights and lessons learned from practical experiences in implementing high-temperature polymer composite additive manufacturing with case studies from other industries including mobility (drones) and consumer products. Attendees will gain a nuanced understanding of how CBAM, coupled with fiber-reinforced materials and high performance polymers, addresses challenges and enhances efficiency in the mass production.

In summary, this presentation provides insights for users seeking practical applications and efficiencies using the composite based additive manufacturing process.

Learning Objectives

Understand the benefits of using carbon fiber-reinforced ESD materials with high-temperature PEEK polymers in composite additive manufacturing for electronic tooling in the electronics industry.

Explore the functional advantages of wave solder pallets and high-temperature fixtures produced through Composite-Based Additive Manufacturing (CBAM) with PEEK and carbon fiber-reinforced ESD materials.

Gain insights into the practical implementation of high-temperature polymer composite additive manufacturing, focusing on lessons learned and efficiencies achieved in the mass production of printed circuit boards.