



Liberty Electronics

Use Case – Epoxy Holding Fixture

Customer Profile

Liberty Electronics, founded in 1985, is a leader in the design and manufacture of electronic wiring harnesses, cable assemblies, complete cabinet and panel assemblies, and electro-mechanical assemblies. The Military-Aerospace Business Unit based in Franklin, Pennsylvania, stays on the cutting edge of manufacturing by investing in 3D printing and prototyping.

Challenge

Liberty Electronics relies on fixtures to assist in the manufacture of various electronic components. They need to be strong, ESD-capable (electro-static dissipative), and both heat and chemical resistant. One particular scenario required a fixture to precisely mount and secure a ceramic capacitor and temperature sensor component during a high temperature cure cycle of a structural epoxy. The fixture not only needed to withstand the high temperatures but also provide ESD protection to the electronic assembly. The fixture could be machined but would require post-processing for ESD compliance and lead time was longer than desired.

Solution

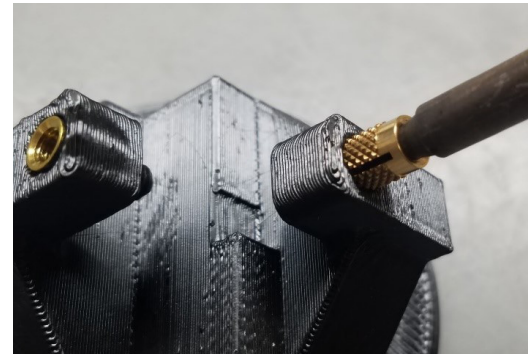
Instead of machining the fixture out of Aluminum 6061 and post processing for ESD properties, Liberty Electronics printed the fixture using PEKK-based Antero™ 840CN03 thermoplastic on their in-house Fortus 450mc™ 3D printer. Antero 840CN03 fulfilled all the requirements of strength, heat resistance and ESD capability, while offering the following benefits:

- Significantly reduced lead time
- Lower material costs
- Little to no post-processing due to the good surface finish
- ESD compliance

Additive manufacturing also allowed for the addition of metal inserts in post-production.

Impact

In-house production of the fixture using FDM® additive manufacturing and Antero 840CN03 reduced lead time from two weeks to two days. This represents a time savings of 86% compared to outsourcing to have the part machined from 6061 aluminum. In-house production also resulted in a cost savings of 89%.



Threaded brass inserts are placed in the Antero 840CN03 fixture after printing to accommodate 8-32 machine screws.

Material Cost Savings



89%

Lead Time Savings



86%