

TTM Technologies Uses ESD-Safe Materials to Reduce Customer's Time-to-Market

GLOBAL PCB, RF, AND SPECIALTY COMPONENTS MANUFACTURER USES ESSENTIUM MATERIALS TO SUPPORT ITS ONE-STOP-SHOP MANUFACTURING APPROACH

SITUATION OVERVIEW

As a top-five global printed circuit board (PCB) provider, TTM Technologies, Inc. (TTM) lives up to its name. The acronym, TTM, is an abbreviation for “time-to-market” which accurately describes its core mission to reduce development and production time for customers with its one-stop-shop manufacturing approach.

TTM's sales team, field applications professionals, and materials experts, partner with designers and manufacturing specialists to guide customers from development to assembly from start to finish. When it comes to circuit board manufacturing and assembly, customers can expect expertise at every stage.

During the customer journey, TTM uses groundbreaking technology to create the best solutions for each process. Many of these solutions are made possible with additive manufacturing. From ESD-safe stands, caps, and spacers to custom jigs and fixtures to hold products and equipment, if technicians and engineers at TTM can think of a 3D printed solution, they can implement it.

THE CHALLENGE

In electronics factories like TTM, one of the constant challenges is protecting products from electrostatic discharge (ESD) damage. In these ESD occurrences, static electricity can discharge into electronic devices and can harm the product. Static charge can build up if non-ESD-safe materials are present, electronic devices are mishandled, or even if the environment has low relative humidity. If a discharge is powerful enough, the damage to the device or its components can be catastrophic. For this reason, TTM goes to great lengths to ensure that its factory floor is ESD-safe, including the procurement of electrostatically dissipative filament for all additive manufacturing efforts.

Though there are many ESD-safe filaments on the market, through trial and error, TTM discovered that most of those products have a marring defect, presenting an added challenge. This defect can scratch, streak, or otherwise damage parts or equipment during manufacturing and can eventually diminish the efficacy of the filament.

To continue helping its customers reduce time-to-market, TTM started searching for a different material that was both ESD-safe and non-marring.

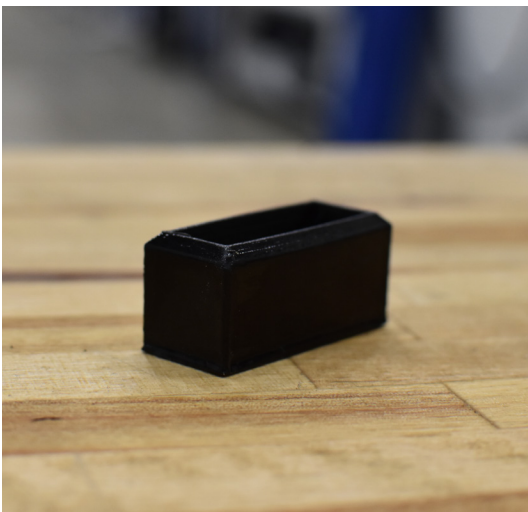
THE SOLUTION

Essentium's Z Collection of electrostatically dissipative materials proved to be the answer. This portfolio includes a variety of materials for different applications, all of which are specifically formulated to be ESD-safe and non-marring. For the additive efforts at TTM, Essentium PCTG-Z and TPU 95A-Z were the perfect fit.



Essentium PCTG-Z

This ESD-safe material is non-marring, low cost, and offers high printability, which allows for easy and safe PCB handling during manufacturing. TTM used this filament to print large fixtures for select high-volume, high-value parts. Without custom fixtures, the size of these parts increased the risk of handling damage and product waste. The custom fixtures allowed engineers and technicians to handle, transport, and work on the assembly without damage, saving TTM thousands of dollars.



Essentium TPU 95A-Z

In the conformal coating process during PCB assembly, caps are often used for masking to avoid painting over connectors. However, these caps are often in short supply, and manufacturers opt to use special masking tape instead. This process requires cutting multiple pieces of tape for each connector to ensure a tight seal. This process can be time-consuming and tricky to replicate. To save on labor time, TTM printed more than 2,000 masking caps for various connector sizes. For this job, they chose an Essentium TPU-Z material for its ESD-safe qualities, flexibility, and best-in-class tensile strength. The final product successfully alleviated a frequent bottleneck, saving more than five minutes per part. Additionally, these 3D printed caps were used many times before they were discarded, which reduced waste and saved money.

BUSINESS OUTCOMES

Protecting the factory floor from ESD occurrences is a top priority for TTM and ensuring that all filament meets those guidelines is a vital part of that process. However, when filament has a marring defect, it can cause damage to those same parts that TTM is trying to protect. By committing to finding filaments that are both ESD-safe and non-marring, like Essentium's Z Collection, not only ensures a quality product but positively affects the bottom line for TTM and their customers alike.

Essentium, Inc. provides industrial 3D printing solutions that are disrupting traditional manufacturing processes by bringing product strength and production speed together, at scale, with an open ecosystem and material set. Essentium manufactures and delivers innovative industrial 3D printers and materials enabling the world's top manufacturers to bridge the gap between 3D printing and machining and embrace the future of additive manufacturing.