

New Material Gives New Dimension to 3D Printed Circuit Board Testing

Improved Method Saved Time and Money for International Train Manufacturer



Railway systems manufacturer CAF Power & Automation sought a better method to test the printed circuit board cards used in its line of railcars. To reduce costs and minimize time and risk associated with testing inside operational trains, the customer simultaneously moved to an accelerated testing method and explored the merits of 3D printing technology. Could the harsh insulation conditions such as vibration, impact resistance and extreme temperatures be simulated effectively to meet the industry's rigorous testing standards?

Nexeo Plastics' 3D printing team knew the success of the project lay in choosing a filament material robust enough to pass the rigorous Eurocard testing parameters known as burn and HALT, or highly accelerated life testing — along with the precise printer settings to achieve a successful 3D printed shell in which the cards could be tested. After carefully considering the trains' operating conditions, the team recommended DSM Novamid®ID 1070, a strong polymer known to perform well in harsh environments at high temperatures. Using the Novamid®ID 1070 replicated the insulation conditions inside the train, performing successfully at 60 Gs of acceleration and at temperatures between -40°C (-40°F) and 150°C (302°F).

The 3D printed shell using Novamid®ID 1070 passed both Eurocard tests with flying colors, paving the way for CAF Power & Automation to replace its traditional inside-the-train testing method with the faster, less expensive, customizable and highly repeatable 3D testing method.

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Recorded Benefits

- Reduced overall testing time and expenses
- Offered a highly customizable and repeatable solution
- Eliminated risk and logistics of traditional on-train testing

Challenge

A railcar manufacturer needed a more effective method to test printed circuit boards under harsh real-world conditions and looked to 3D printing technology for a solution

Solution

Nexeo Plastics recommended a shell filament material that passed both industry testing standards and made a 3D printing application viable.

Result

Using 3D printing to test the circuit boards saved time and expenses while minimizing risk and optimizing the testing method in place.