

The Blue Card™ Program

Frequently asked questions

UL Solutions certification program for plastics for additive manufacturing



Safety. Science. Transformation.™

Your questions answered:

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- What is the value of third-party certification versus self-declared ratings?
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- How can I obtain a Blue Card for one of our internally developed materials? I would like to certify my materials for AM, but I don't want to publicize this information/all the details just yet. Does UL Solutions offer any other options?
- Several test properties, e.g., hot wire ignition (HWI), high-current (or high-amp) arc ignition (HAI) and comparative tracking index (CTI) are missing from the Blue Card for a material our machine processes. Were they not tested?
- How many parts do we need to submit for a 3D-printed part validation? How long does validation take?

Q: What is the UL Solutions Blue Card?

A: The Blue Card, formally known as the UL Solutions Blue Card Plastics for Additive Manufacturing, certifies plastic materials that are appropriate for 3D printing (3DP). More specifically, the Blue Card provides data to facilitate the preselection of 3D-printed materials and components intended for use in various end-product applications from automotive to appliances and many others. It helps deliver confidence and trust across the supply chain to both users and suppliers of 3D-printed articles in terms of their quality, safety, consistency and performance

Q: Why are certified materials important in additive manufacturing (AM)?

A: As the usage of 3DP expands beyond rapid prototyping and into serial production applications, manufacturers report materials-related issues as the biggest barrier to even faster mainstream growth. The current set of materials available for AM users to choose from is a small fraction of the materials available for traditional processes like injection molding. The challenges reported with current materials include cost, a lack of confidence in the reliability and consistency of the parts produced from them, and a lack of certified materials available in the marketplace.⁽¹⁾ These issues are magnified in more highly regulated industries such as aerospace and healthcare. Industry-wide AM standards and specifications for precursor materials need to be established and published. In their absence, the AM industry has relied on existing standards and specifications developed decades ago based on conventional manufacturing methods, which are often unsuitable for additive manufacturing.⁽²⁾

UL Solutions plastics experts conducted a systematic [study](#) to fill in the knowledge gap. To obtain the information needed, the team investigated the influence of various 3DP and build parameters on safety-critical performance properties, especially those defined in UL 94, the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, and UL 746A, the Standard for Polymeric Materials – Short Term Property Evaluations. Results were also compared to properties measured for injection-molded specimens. The learnings from this research led to the creation of the Blue Card. Certified materials help product/

part designers make intelligent material selection decisions while reducing their development time and meeting compliance requirements.

Q: What is the value of third-party certification versus self-declared ratings?

A: A certified material is a material that has gone through third-party testing and evaluation to validate its performance in accordance with a specific printer and settings. Third-party certification makes it easier for original equipment manufacturers (OEMs) to adopt materials for mainstream AM production as it reduces the required testing burden on their components and products. Blue Card certification provides users confidence that the material performance remains consistent as the material undergoes regular inspections through the UL Solutions Follow-Up Services program to ensure its continued compliance and certification. Self-declared ratings cannot be used to make certification decisions on end-products. Products utilizing self-declared material ratings face longer, more expensive certification pathways due to increased testing requirements versus products/components made from certified Blue Card materials.

Q: Why do I need a material certification for additive manufacturing (Blue Card)? What will AM material certification do for me? How can a Blue Card help my business?

A: For plastic material manufacturers, Blue Card certified data reduces the amount of testing that end users would need to do to get their products certified. Blue Card certification differentiates your materials from those with self-declared ratings and increases their marketability to users who print parts for applications that require certification. Once recognized, thousands of suppliers looking for materials that can meet their safety and performance requirements will be able to search for your products.

1. Jabil, “Current State of Additive Material and 3D Printing,” January 2019

2. Deloitte Insights, “3D opportunity for standards: Additive manufacturing measures up,” 2017

As a closed-source 3DP printer manufacturer, you need to convince your customers that your machines and materials can reliably print parts that meet application requirements and comply with industry standards. Your customers are often in regulated industries and need confidence that they can consistently make quality parts from your system.

The Blue Card gives your customers confidence that they can print parts that will meet end-product requirements using your machines and materials. It will help your customers receive their end-product certification more quickly and economically.

As a part designer, part manufacturer or end-product OEM, you need to know which materials and printers will help you make consistent-quality parts. The Blue Card provides the data integrity you need to make informed decisions. The Blue Card can help you save time and money in product development costs and certification. The UL Solutions Follow-Up Services program monitors your material suppliers to ensure that they are maintaining certification and ongoing compliance. The UL Solutions Recognized Fabricators program also provides you confidence that service bureaus are producing your parts in accordance with UL Solutions requirements and your internal specifications.

For service bureaus, the Blue Card serves as a kind of cheat sheet to help you quickly identify material and machine combinations that enable production of parts that are UL Standard-compliant. This will help you reduce internal testing and design of experiments (DOEs). When combined with the UL Solutions Recognized Fabricators program, the Blue Card provides a high level of confidence and quality assurance to OEMs looking for a trusted source of UL Certified parts.

Q: Who applies for the Blue Card?

A: Anyone in the AM supply chain can apply for the Blue Card. For example, a 3D printer manufacturer or material manufacturer can apply for the Blue Card. Whoever applies for the Blue Card is called the applicant and, upon approval, earns the right to apply the UL Recognition Mark to the product. It is possible to have two Blue Cards or a joint Blue Card — one with the material manufacturer and the second with the printer manufacturer. This enables both the material manufacturer and printer manufacturer to market the material individually. Since it's the same investigation, we can divide the project in half and the applicants can split the costs.

Q: What is the process for achieving Blue Card Recognition?

A: Because there are many variables surrounding recognition of additive manufacturing materials, the process to obtain a Blue Card starts with a certification requirement investigation project. We work directly with you to determine pertinent variables such as printer models, printing and build parameters, and any post-processing information to accurately determine what is required. After these requirements are finalized, we provide a detailed quotation for the full investigation along with sample requirements and an outline of the testing to be performed. Once your project is underway, we provide secure online access to your project status through the [myUL® Client Portal](#) while you work with dedicated engineering resources to help ensure timely material certification.

Q: How do my customers find my materials once I have achieved UL certification/recognition? Once I have materials recognized, how do my customers find it?

A: Once your material is UL Certified, it will appear in the online UL [Product iQ®](#) certification database, making it immediately visible to thousands of designers, engineers and suppliers searching for materials intended for 3DP. Only UL Certified materials appear in Product iQ, so you know that the material has been evaluated by an independent third party.

Q: I am already using UL recognized/ Yellow Card Certified material for my AM printing application. Do these ratings apply?

A: Due to the printing process, ratings from the Yellow Card do not carry over to the AM materials, which have to be evaluated separately with the specific printer and parameters. This is due to the possibility of different equipment resulting in different performance. UL Solutions plastics experts completed a 14-month-long study on this. You can download the detailed report [here](#).

Q: Should I get a separate Blue Card for each printer/material combination?

A: Each material grade should have a separate Blue Card. A given Blue Card can include multiple printers if the print parameters and performance properties are the same for the different printers. If print parameters and/or the printed properties differ for different model printers, multiple Blue Cards can be issued or multiple printer/processing designations can be used to highlight differences.

For example, if a material obtains a V-0 rating with one model printer and a V-2 with a different model printer, we would establish two Blue Cards to differentiate their performances.

Q: If I already have a Blue Card and change the printer model, do I need a new Blue Card?

A: Not necessarily. We will work with you to evaluate printer equivalency. If there are differences, we will work with you to develop a reduced test program to help ensure consistent performance of the material across both platforms. A revised or new Blue Card will be issued to capture the usability of materials across both platforms.

Q: How can I obtain a Blue Card for one of our internally developed materials? I would like to certify my materials for AM, but I don't want to publicize this information/all the details just yet. Does UL Solutions offer any other options?

A: UL Solutions does offer a confidential service. It is possible to have a **proprietary** Blue Card. Proprietary cards are still accessible via the Product iQ database, so it will still be visible to the thousands of individuals searching the database

for recognized materials, but the only publicly viewable information is your company name. No product names or ratings are viewable. The process to obtain a proprietary Blue Card is the same as a published Blue Card.

Q: Several test properties, e.g., hot wire ignition (HWI), high-current (or high-amp) arc ignition (HAI) and comparative tracking index (CTI) are missing from the Blue Card for a material our machine processes. Were they not tested?

A: The applicant decides what testing properties they would like listed on the Blue Card. Typically, flammability is always performed and, depending on the application of the material, other testing may be requested. Only UL-evaluated material performance properties are listed on the material's Blue Card. If properties are not listed, either UL Solutions has not evaluated the property or the applicant decided not to publish that information.

Q: How many parts do we need to submit for a 3D-printed part validation? How long does validation take?

A: The number of parts and time required for validation ultimately depends on the product category. Validation of a 3D-printed part will be the same as a conventionally manufactured part, provided both are made from UL Recognized materials. Due to reduced testing, evaluations for 3D-printed parts made using Blue Card Recognized materials are faster than for parts made using unrecognized materials.

For more information, visit
www.UL.com/BlueCard



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