HP 3D High Reusability PA 12 Glass Beads[1] Plastics for Additive Manufacturing UL 94 and UL 746A Certification Technical Note

HP 3D High Reusability PA 12 Glass Beads with HP 3D600/3D700/3D710 Fusing and Detailing Agents has been certified by UL according to the UL 94 Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances testing and the UL 746A Standard for Polymeric Materials to measure Short Term Property Evaluations, and has obtained the corresponding UL Plastics for Additive Manufacturing Certificate (Blue Card), currently published on the UL IQ™ database.

Blue Card

UL 94 certification serves as a preliminary indication of a plastic's acceptability for use as part of a device or appliance with respect to its flammability. The standard determines the material's tendency to either extinguish or spread the flame once the specimen has been ignited.

Additionally, the Blue Card also provides **UL 746A** Certification information, which covers short-term test procedures for the evaluation of materials used for parts intended for specific applications in electrical end products.

The flammability degree obtained and certified by UL is **HB** at a **0.75 mm thickness** for all the orientations tested, thus being the thinnest 3D printing plastic material, along with HP 3D High Reusability PA 12, that UL has certified as HB when the Blue Card was obtained.[2] This means that the material tolerates slow burning on a horizontal position (at a burning rate ≤ 75 mm/min for thicknesses < 3 mm or burning stops before 100 mm). With this rating, HP 3D High Reusability PA 12 Glass Beads[1] can target any application that is not exposed to flame hazard.

Electric conductivity behavior of the material, obtained and certified according to the **UL 746A** standard, indicates that the HP 3D High Reusability PA 12 Glass Beads material is insulating against electric conductivity, with **Dielectric strength** values obtained of **3.38 kV/mm[3]** and **7.29 kV/mm[4]** depending on orientation and **Volume Resistivity** values of **10^{14} ohm-cm**.

White Card: Additional testing

The White Card, an extension at the bottom of a Blue Card, displays and certifies additional information related to materials performance evaluated using international standards.

In particular, Glow Wire Ignition Testing, Glow Wire Flammability Index, and IEC Ball Pressure have been included in the White Card for HP 3D High Reusability PA 12 Glass Beads.[1]

Glow Wire Ignition and Flammability testing has been performed on the material.[1] The results obtained certify that the material can resist exposure to a range of 650° C to 725° C[1] depending on the orientation, dimension, and thickness of the part. The fact that this material with a Glow Wire rating ranges between these values means that, at a minimum thickness, it can be considered acceptable when application requirements specify temperatures below this number. For example, in those cases when requirements specify a minimum temperature of 550° C.[2]

Finally, the **IEC Ball Pressure** or abnormal heat resistance test has delivered a result of **170° C**, which is acceptable and above the required temperature in those cases when the application requirement states that 75° C or 125° C are considered acceptable.

Based on these results, UL certifies that similar articles made from this material,[1] under the same conditions of printing, will meet the performance obtained as per the UL 94 and UL 746A tests. This performance is verified by UL annually to certify that both the material[1] and the additive manufacturing process conditions provide the same performance stated in the Blue Card and White Card published in the UL IQ™ database.

It is the responsibility of each customer to determine that its use of HP 3D High Reusability PA 12 Glass Beads powder and HP 3D600/3D700/3D710 Fusing and Detailing Agents are safe and technically suitable to the customer's intended applications and consistent with the relevant regulatory requirements applicable to the customer's final product. Customers should conduct their own testing to ensure that this is the case.

For additional information about HP 3D High Reusability PA 12 Glass Beads, please contact our HP 3D Printing Materials team at 3dmaterials@hp.com.

To see the UL Blue Card and White Card certificates, please visit http://iq.ul.com/ul/cert.aspx?ULID=103651195.

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1. Testing performed for HP 3D High Reusability PA 12 Glass Beads and HP 3D600/3D700/3D710 Fusing and Detailing Agents with HP Jet Fusion 3D 4210 and 4200 Printing Solutions. Samples were prepared with up to maximum 80% reused powder. Reuse of the material could be up to 20 times. HP considers the samples representative of the printing process.
2. UL Blue Card and White Card for HP 3D High Reusability PA 12 Glass Beads and HP 3D600/3D700/3D710 Fusing and Detailing Agents published in the UL IQ™ QMTC2 Plastics for Additive Manufacturing Database in April, 2018.
3. Results obtained with specimens printed in horizontal orientations.
4. Results obtained with specimens printed in vertical orientations.

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