RoHS/REACH

CERTIFICATE

HP Inc.
REACH and RoHS status of HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12

RoHS

HP complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.
We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.
We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.

To obtain a copy of the HP RoHS Compliance Statement, see:
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04935876

Parts printed on an HP Jet Fusion 3D printer using HP 3D600/3D700/3D710 Agents and HP 3D HR PA 12 were tested for soluble heavy metals and regulated phthalates. No soluble heavy metals were detected above the detection limit of 2.5 ppm using ASTM F963-11 section 8.3.
No regulated phthalates were detected above 50 ppm. The flame retardants, polybrominated byphenyls (PBB) and polybrominated diphenyl ether (PBDE) were not detected above the detection limit of 20 ppm in printed parts.

REACH

HP complies with the EU's Registration, Evaluation, Authorization, and Restriction of Chemical substances (REACH) legislation, which includes requirements for assessing and managing the risks posed by chemicals. We accomplish this by working closely with suppliers to gather information on listed substances that may be in HP product materials and providing related safety information to customers.

To obtain a copy of the HP REACH Compliance Statement, see:
http://www.hp.com/go/reach

Please note that we do not provide REACH information on a product level. Instead HP has created REACH Article 33 declarations on a product type level. These declarations meet all legal requirements and are available here: http://www.hp.com/hpinfo/globalcitizenship/environment/productdata/reachall-products.html

For aditional information about HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D HR PA 12, please contact our HP 3D Printing materials team at 3dmaterials@hp.com.

4AA7-0939ENW, June, 2018

This is an HP Indigo digital print.

Statement of Composition for Toy Applications

CERTIFICATE

HP Inc.
HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12
Statement of Composition for Toy Applications

Parts made with HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 have undergone the following tests:

1. Heavy Metal: No metals were detected in the study with a limit of detection of 2.5 ppm. The submitted samples comply with the soluble heavy metals requirements according to section 4.3.5.2 2(b) of ASTM F963-11.

2. Phthalates: No phthalates were detected down to 0.005% in the study. The submitted sample passed the applicable requirements for phthalates as recommended by the Consumer Product Safety Improvement Act of 2008, Section 108.

3. Bisphenol A (BPA): No Bisphenol A was detected in the sample down to 0.1 ppm.

4. In-polymer analysis: No unknown components were detected. All detected components were of the nylon polymer.

5. Migration study: The migration study with synthetic saliva and gastric fluid revealed no verifiable components leaching from the investigated material under room temperature conditions. The components detected performing the in-polymer investigations did not appear in the migration simulants. In addition, no additional compounds or unknowns were detected.

HP believes that the testing referred to above is typical of parts produced with HP 3D600/3D700/3D710 Fusing and Detailing Agents[1] and fresh HP 3D High Reusability PA 12 powder[2] on HP Jet Fusion 3D 4210/4200 Printing Solutions.

It is the responsibility of each customer to determine that its use of HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder is safe and technically suitable to the customer's intended applications and consistent with the relevant regulatory requirements applicable to the customer's final product. HP's testing focused on the chemical composition of the printed parts and

did not focus on physical requirements such as choking hazards. It is the responsibility of each customer to conduct their own testing to ensure that physical, mechanical, flammability, microbiological, acoustic, electrical, temperature, magnetism, and other relevant requirements for toys are met for their final product. Results may vary if the testing is performed under different conditions than those existing at HP's laboratories at testing time and those that applied for the purposes of the tests above. HP cannot guarantee compliance of HP 3D600/3D700/3D710 Fusing and Detailing Agents, HP 3D High Reusability PA 12 powder, or any printed parts made with HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 with any legislation or industry standard that may be applicable to toys. Because of possible changes in the relevant industry standards, FDA and EU guidance, and other legal or regulatory requirements, as well as possible changes in HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder, HP cannot guarantee that the status of HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder will remain unchanged.

For additional information about HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12, please contact our HP 3D Printing Materials team at 3dmaterials@hp.com.

1. 2-Methyl-2H-isothiazol-3-one is present in the HP 3D600/3D700/3D710 Fusing and Detailing Agents at <0.1% by weight in these formulations. Safety data sheets are available at www.hp.com/go/ecodata.
2. Testing performed with 100% fresh powder.

4AA7-2791ENW, May 2018

This is an HP Indigo digital print.

BIOCOMPATIBILITY
CERTIFICATE

HP Inc.
HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12
USP Class I-VI and FDA Intact Skin Surface Devices Certification

HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 have met the requirements of USP Class I-VI and US FDA's guidance for Intact Skin Surface Devices. This conclusion is based on following tests and guidelines used:

1. **Cytotoxicity** – ISO 10993-5, Biological evaluation of medical devices – part 5: Tests for in vitro cytotoxicity.
2. **Sensitization and irritation** – ISO 10993-10, Biological evaluation of medical devices – Part 10: Tests for irritation and skin sensitization.
3. **Acute systemic toxicity** – ISO 10993-11, Biological evaluation of medical devices – Part 11: Tests for systemic toxicity.
4. **Muscle implantation** – USP, General Chapter <88>, Biological Reactivity Tests, In vivo – Muscle implantation

HP believes that the testing referred to above is representative of parts produced with HP 3D600/3D700/3D710 Fusing and Detailing Agents and fresh HP 3D High Reusability PA 12 powder[1] on the HP Jet Fusion 3D 4210 and 4200 Printing Solutions. Based on these results, HP expects that similar articles made from these materials, under similar conditions will meet the compliance requirements of USP Class I-VI and FDA's guidance for Intact Skin Surface Devices.

It is the responsibility of each customer to determine that its use of HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder is safe and technically suitable to the customer's intended applications and consistent with the relevant regulatory requirements (including FDA requirements) applicable to the customer's final product. Customers should conduct their own testing to ensure that this is the case. Results may vary if the testing is performed under different conditions than those existing at HP's laboratories at testing time and those that applied for the purposes of the biocompatibility tests as referenced above. Because of possible changes in the relevant industry standards, FDA guidance, and other legal or regulatory requirements, as well as possible changes in HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder, HP cannot guarantee that the status of HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder will remain unchanged or that it will qualify for USP Class I-VI Certification and or comply with FDA's guidance for Intact Skin Surface Devices in any particular use.

For additional information about HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12, please contact our HP 3D Printing Materials team at 3dmaterials@hp.com.

[1] Testing performed with 100% fresh powder.

4AA7-0331ENW, May, 2018

This is an HP Indigo digital print.

PAHs

CERTIFICATE

(Polycyclic Aromatic Hydrocarbons)

HP Inc.
PAHs status of HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12

Parts printed on an HP Jet Fusion 3D Printer using HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12 were tested for PAHs (Polycyclic Aromatic Hydrocarbons). No PAHs stated in the below table were detected above the detection limit of 1 ppb using GC/MS.

PAHs tested:

- Naphthalene
- Acenaphthylene
- Acenaphthene
- Fluorene
- Phenanthrene
- Anthracene
- Fluoranthrene
- Pyrene
- Benzo[c]phenanthrene
- Benzo[a]anthracene
- Chrysene
- Benzo[b]fluoranthene
- Benzo[k]fluoranthene
- Benzo[j]fluoranthene
- Benzo[a]pyrene
- Benzo[e]pyrene
- 3-Methylcholanthrene
- Dibenzo[a,h]anthracene
- Indeno[1,2,3-cd]pyrene
- Benzo[g,h,i]perylene

For aditional information about HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D HR PA 12, please contact our HP 3D Printing materials team at 3dmaterials@hp.com.

4AA7-1264ENW, June, 2018

This is an HP Indigo digital print.

RoHS/REACH

CERTIFICATE

HP Inc.
REACH and RoHS status of HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 12

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4AA7-0939ENW, June, 2018

This is an HP Indigo digital print.

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

HP 3D High Reusability PA 12 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**, thus being the thinnest 3D printing plastic material, 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[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 material is insulating against electric conductivity, with **Dielectric strength** values obtained of **2.8 kV/mm** 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.[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 **700° C to 800° C**[1] depending on the dimensions and thickness of the part. The fact that this material has a Glow Wire rating of 700° C at a minimum thickness means that it can be considered acceptable when application requirements specify temperatures below 700° C. For example, in those cases when IEC requirements specify 550° C.[2] It is important to highlight that HP 3D High Reusability PA 12[1] was the only 3D printing plastic material whose Glow Wire Flammability and Ignition performance had been certified by UL when the White Card was obtained.[2]

Finally, the **IEC Ball Pressure** or abnormal heat resistance test has delivered a result of **172° 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 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, 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=103600424.

1. Testing performed for HP 3D High Reusability PA 12 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 and HP 3D600/3D700/3D710 Fusing and Detailing Agents published in the UL IQ™ QMTC2 Plastics for Additive Manufacturing Database on the 13th March 2018.

4AA7-2792EEW, May 2018

This is an HP Indigo digital print.