**Polyamide family**

**Material selection**

**Introduction**

HP is working hard to enable new materials innovations that break down some of the traditional barriers to 3D printing adoption—cost, quality performance, and diversity.

Therefore, a selected range of polyamide-based materials has been engineered for HP Multi Jet Fusion technology, thus offering engineering-grade thermoplastics that provide optimal output quality and high reusability at a low cost per part.¹

**HP 3D Printing polyamide-based materials for HP Jet Fusion 4200 3D Printing Solution and HP Jet Fusion 5200 Series 3D Printing Solutions**

HP 3D Printing polyamide-based materials for HP Jet Fusion 3D 4200 3D Printing Solution and HP Jet Fusion 5200 Series 3D Printing Solutions include HP 3D High Reusability PA 12 (HP 3D HR PA 12), HP 3D High Reusability PA 12 Glass Beads (HP HR PA 12 GB), and HP 3D High Reusability PA 11 (HP HR PA 11).

**HP 3D HR PA 12: Ideal for producing strong, functional, detailed complex parts**

- Robust thermoplastic that produces high-density parts with balanced property profiles and strong structures.
- Provides excellent chemical resistance to oils, greases, aliphatic hydrocarbons, and alkalies.²
- Meets biocompatibility certifications such as USP Class I-VI and US FDA guidance for Intact Skin Surface Devices.³
- Provides the best balance between performance and cost compared with other HP 3D Printing polyamide-based materials.
- Engineered to produce final parts and functional prototypes with fine detail and dimensional accuracy, and designed for the production of functional parts across a variety of industries.
- Ideal for complex assemblies, housings, enclosures, and watertight applications, achieving watertight properties without any additional post-processing.
- Compatible with the HP Jet Fusion 4200 3D Printing Solution and the HP Jet Fusion 5200 Series 3D Printing Solutions.

**HP 3D HR PA 12 Glass Beads: Ideal for producing stiff, functional parts**

- 40% glass bead filled thermoplastic material with both optimal mechanical properties and high reusability.⁴
- Provides dimensional stability as well as repeatability.⁵
- Engineered to produce common glass bead applications with detail and dimensional accuracy, and designed for production of functional parts across a variety of industries.
- Ideal for applications requiring high stiffness like enclosures, housings, fixtures, and tooling.
- Compatible with the HP Jet Fusion 4200 3D Printing Solution.
HP 3D HR PA 11: Ideal for producing strong, ductile, functional parts

- Thermoplastic material with renewable raw material from vegetable castor oil (reduced environmental impact). It delivers optimal mechanical properties, providing an excellent chemical resistance and enhanced elongation-at-break.
- Easy-to-process material that enables high productivity and less waste.
- Engineered to reliably produce final parts and functional prototypes with fine detail and dimensional accuracy, and designed for the production of functional and final parts across a variety of industries.
- Provides impact resistance and ductility for prostheses, insoles, sporting goods, snap-fits, living hinges, and more.
- Compatible with the HP Jet Fusion 4200 3D Printing Solution and the HP Jet Fusion 5200 Series 3D Printing Solutions.

HP 3D HR PA 11: presentation models, and functional prototypes.

- Designed for the production of functional and final parts across a variety of industries.
- Easy-to-process material that enables high productivity and less waste.
- Thermoplastic material with renewable raw material from vegetable castor oil (reduced environmental impact). It delivers optimal mechanical properties, providing an excellent chemical resistance and enhanced elongation-at-break.
- Engineered to reliably produce final parts and functional prototypes with fine detail and dimensional accuracy, and designed for the production of functional and final parts across a variety of industries.
- Provides impact resistance and ductility for prostheses, insoles, sporting goods, snap-fits, living hinges, and more.
- Compatible with the HP Jet Fusion 4200 3D Printing Solution and the HP Jet Fusion 5200 Series 3D Printing Solutions.

For more information please visit:
hp.com/go/3DMaterials

1. Based on internal testing and public data for solutions on market as of April, 2016. Cost analysis based on standard solution configuration price, supplies price, and maintenance costs recommended by manufacturer. Cost criteria: printing 1.4 full build chambers of parts per day/5 days per week over 1 year of 30 cm parts at 10Fk packing density on fast print mode using HP 3D High Reusability PA 12 material, and the powder reusability ratio recommended by manufacturer, and printing under certain build conditions and part geometries.

2. Testing with diluted alcohols, concentrated alcohols, chlorine salts, alcohol, esters, ethers, ketones, aliphatic hydrocarbons, unlabeled petrol, motor oil, aromatic hydrocarbons, toluene, and DOT 3 brake fluid.

3. Based on HP internal testing, June 2017. HP 3D600/3D700/3D710 Fusing and Detailing Agents and HP 3D High Reusability PA 11 and HP 3D High Reusability PA 12 powders meet USP Class-I and US FDA’s guidance for intact Skin Surface Devices. Tested according to USP Class-I including irritation, acute systemic toxicity, and implantation; cytotoxicity per ISO 10993-5, Biological evaluation of medical devices-part 5: Tests for in vitro cytotoxicity; and sensitization per ISO 10993-10, Biological evaluation of medical devices-Part 10: Tests for irritation and skin sensitization. It is the responsibility of the customer to determine that its use of the fusing and detailing agents and powder is safe and technically suitable to the intended applications and consistent with the relevant regulatory requirements (including FDA requirements) applicable to the customer’s final product. For more information, see hp.com/go/3DMaterials.

4. Based on using recommended packing densities, offers high reusability of surplus powder. Liters refers to the materials container size and not the actual materials volume. Materials are measured in kilograms.


6. Thermoplastic material with renewable raw material from vegetable castor oil (reduced environmental impact). It delivers optimal mechanical properties, providing an excellent chemical resistance and enhanced elongation-at-break.

7. Easier to process than standard HP 3 High Reusability PA 12, providing proper fusing along with good spreadability and compatibility due to its small particle size.

8. Full color parts applicable only with the HP Jet Fusion 3D80 Color 3D Printer. General availability second half 2019.