HP 3D High Reusability PA 12

Strong, lowest cost,¹ quality parts

Produce strong, functional, detailed complex parts

- Robust thermoplastic produces high-density parts with balanced property profiles and strong structures.
- Provides excellent chemical resistance to oils, greases, aliphatic hydrocarbons, and alkalies.²
- Ideal for complex assemblies, housings, enclosures, and watertight applications.
- Biocompatibility certifications—meets USP Class I-VI and US FDA guidance for Intact Skin Surface Devices.³

Quality at the lowest cost per part¹

- Achieve the lowest cost per part¹ and reduce your total cost of ownership.⁴
- Minimize waste—reuse surplus powder batch after batch and get functional parts, no throwing away anymore.⁵
- Get consistent performance while achieving 80% surplus powder reusability.⁶
- Optimize cost and part quality—cost-efficient material with industry-leading surplus powder reusability.⁵

Engineered for HP Multi Jet Fusion technology

- Designed for production of functional parts across a variety of industries.
- Provides the best balance between performance and reusability.⁷
- Achieves watertight properties without any additional post-processing.
- Engineered to produce final parts and functional prototypes with fine detail and dimensional accuracy.

For more information, please visit hp.com/go/3DMaterials
5. Based on using recommended packing densities and compared to selective laser sintering (SLS) technology, HP Jet Fusion 3D 4210/4200 Printing Solution average printing cost per part per day is half the average cost of comparable fused deposition modeling (FDM) and selective laser sintering (SLS) printer solutions from $100,000 to $300,000 USD and is 50% lower versus the average cost of comparable fused deposition modeling (FDM) and selective laser sintering (SLS) printer solutions from $100,000 to $300,000 USD and is 50% lower versus the average cost of comparable SLS systems for better material properties and material reuse rates, minimizing waste.

4. Compared to selective laser sintering (SLS) and fused deposition modeling (FDM) technologies, HP Multi Jet Fusion technology can reduce the overall energy requirements needed to attain full fusing and reduce the system requirements for large, vacuum-sealed ovens. In addition, HP Multi Jet Fusion technology uses less heating power than SLS systems for better material properties and material reuse rates, minimizing waste.

3. Tested with diluted alkalies, concentrated alkalies, chlorine salts, alcohol, ester, ethers, ketones, aliphatic hydrocarbons, unleaded/petrol, motor oil, aromatic hydrocarbons, silicone, and DOT 3 brake fluid.

2. Tested 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.

1. Common cost criteria: using HP 3D High Reusability PA 12 material, and the powder reusability ratio recommended by manufacturer. HP Jet Fusion 3D 4200 Printing Solution average printing cost per part is half the average cost of comparable fused deposition modeling (FDM) and selective laser sintering (SLS) printer solutions from $100,000 to $300,000 USD. Cost criteria: printing 1 build chamber per day’s per week over 1 year of 30 cm³ parts at 10% packing density. HP Jet Fusion 3D 4210 Printing Solution average printing cost per part is 65% lower versus the average cost of comparable FDM and SLS printer solutions from $100,000 to $300,000 USD and is 50% lower versus the average cost of comparable SLS printer solutions for $300,000 to $450,000 USD. Cost criteria: printing 1.4 full build chambers of parts per day/5 days per week over 1 year of 30 cm³ parts at 10% packing density on fast print mode.

Eco Highlights

- Cleaners, more comfortable workplace—enclosed printing system, and automatic powder management
- Minimizes waste due to industry-leading reusability of powder

Find out more about HP sustainable solutions at hp.com/go/solutions

Eco Highlights

- Powders and agents are not classified as hazardous
- Cleaner, more comfortable workplace—enclosed printing system, and automatic powder management
- Minimizes waste due to industry-leading reusability of powder

Find out more about HP sustainable solutions at hp.com/go/solutions

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. Common cost criteria: using HP 3D High Reusability PA 12 material, and the powder reusability ratio recommended by manufacturer. HP Jet Fusion 3D 4210 Printing Solution average printing cost per part is half the average cost of comparable fused deposition modeling (FDM) and selective laser sintering (SLS) printer solutions from $100,000 to $300,000 USD. Cost criteria: printing 1 build chamber per day’s per week over 1 year of 30 cm³ parts at 10% packing density. HP Jet Fusion 3D 4210 Printing Solution average printing cost per part is 65% lower versus the average cost of comparable FDM and SLS printer solutions from $100,000 to $300,000 USD and is 50% lower versus the average cost of comparable SLS printer solutions for $300,000 to $450,000 USD. Cost criteria: printing 1.4 full build chambers of parts per day/5 days per week over 1 year of 30 cm³ parts at 10% packing density on fast print mode.

2. Tested with diluted alkalies, concentrated alkalies, chlorine salts, alcohol, ester, ethers, ketones, aliphatic hydrocarbons, unleaded/petrol, motor oil, aromatic hydrocarbons, silicone, and DOT 3 brake fluid.

3. Based on HP internal testing. Using current, HP 3D600 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder meet USP Class I-VI and US FDA’s guidance for Intact Skin Surface Devices. Tested according to USP Class I-VI including irritation, acute systemic toxicity, and implantation; cytotoxicity per ISO 10993-10, Biological evaluation of medical devices—Part 10: Tests for in vitro cytotoxicity and; sensitization per ISO 10993-11, Biological evaluation of medical devices—Part 11: 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 www.hp.com/go/biocompatibilityforIntactSkin/PA12.

4. Compared to selective laser sintering (SLS) and fused deposition modeling (FDM) technologies, HP Multi Jet Fusion technology can reduce the overall energy requirements needed to attain full fusing and reduce the system requirements for large, vacuum-sealed ovens. In addition, HP Multi Jet Fusion technology uses less heating power than SLS systems for better material properties and material reuse rates, minimizing waste.

5. Based on using recommended packing densities and compared to selective laser sintering (SLS) technology, offers excellent reusability without sacrificing mechanical performance. Tested according to ASTM D638, ASTM D256 Test Method A.

6. HP Jet Fusion 3D printing solutions using HP 3D High Reusability PA 12 provide 80% post-production surplus powder reusability, producing functional parts batch after batch. For testing, material is aged in real printing conditions and powder is tracked by generations (worst case for recyclability). Parts are then made from each generation and tested for mechanical properties and accuracy.

7. Compared to selective laser sintering (SLS) technology. Tested according to ASTM D638 and MFI test.

8. The following technical information should be considered representative of averages or typical values and should not be used for specification purposes. These values are with FW 007 and have been obtained from a sample of specimens printed in plots with 6% packing density. Separation between specimens in the plot was 10 mm. Modulus has been calculated using the slope of the regression line between 0.01% and 0.25% strain measured with an automatic extensometer during the entire test. Cross-section dimension measures using a micrometer with round ends. Conditioning according to ASTM D618 Procedure A.

9. Test results realized using the ASTM D638 with a test rate of 10 mm/min. Modulus has been calculated using the slope of the regression line between 0.01% and 0.25% strain measured with an automatic extensometer during the entire test. Cross-section dimension measures using a micrometer with round ends. Conditioning according to ASTM D618 Procedure A. Conducting 48 hours before printing and unpacking of the parts at 23°C/73°F and 50% RH.

10. Test results realized under the ASTM D638 with a test rate of 10 mm/min. Specimens type V.

11. Test results realized under the ASTM D790 Procedure 8 at a test rate of 13.55 mm/min.

12. Raw’s certification for EU, Bosnia-Herzegovina, China, India, Japan, Korea, Singapore, Turkey, Ukraine, Vietnam.

13. 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 www.hp.com/go/biocompatibilityforIntactSkin/PA12.

14. Recommended environmental conditions. Recommended relative humidity is 50-70% RH.

15. The HP powder and agents do not meet the criteria for classification as hazardous according to Regulation (EC) 1272/2008 as amended.

16. Compared to manual print retrieval process used by other powder-based technologies. The term “cleaner” does not refer to any indoor air quality requirements and/or consider related air quality regulations or testing that may be applicable.

17. Compared to PA 12 materials available as of June, 2017. HP Jet Fusion 3D printing solutions using HP 3D High Reusability PA 12 provide 80% post-production surplus powder reusability, producing functional parts batch after batch.