

# HP 3D High Reusability PA 12 Glass Beads

Stiff, low-cost, quality parts



3D data courtesy of NACAR

## Produce stiff, functional parts

- 40% glass bead filled thermoplastic material with both optimal mechanical properties and high reusability.<sup>1</sup>
- Provides dimensional stability along with repeatability.<sup>2</sup>
- Ideal for applications requiring high stiffness like enclosures and housings, fixtures and tooling.

## Quality at a low cost per part

- Produce at a low cost per part and reduce your total cost of ownership.<sup>3</sup>
- Less waste—reuse surplus powder batch after batch and get functional parts, no throwing away anymore.<sup>1</sup>
- Get consistent performance while achieving up to 70% surplus powder reusability.<sup>4</sup>
- Optimize cost and part quality—cost-efficient material with high surplus powder reusability.<sup>1</sup>

## 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.<sup>5</sup>
- Engineered to produce common glass bead applications with detail and dimensional accuracy.

For more information, please visit  
[hp.com/go/3DMaterials](https://hp.com/go/3DMaterials)

# Technical specifications<sup>6</sup>

| Category                             | Measurement   | Value  | Method                  |
|--------------------------------------|---|--|-------------------------|
| General properties                   | Powder melting point (DSC)  | 186° C/367° F                                    | ASTM D3418              |
|                                      | Particle size   | 58 µm  | ASTM D3451              |
|                                      | Bulk density of powder  | 0.48 g/cm <sup>3</sup> /0.017 lb/in <sup>3</sup> | ASTM D1895              |
|                                      | Density of parts  | 1.3 g/cm <sup>3</sup> /0.047 lb/in <sup>3</sup>  | ASTM D792               |
| Mechanical properties                | Tensile strength, max load <sup>7</sup> , XY, XZ, YX, YZ          | 30 MPa/4351 psi                                  | ASTM D638               |
|                                      | Tensile strength, max load <sup>7</sup> , ZX, XY                  | 30 MPa/4351 psi                                  | ASTM D638               |
|                                      | Tensile modulus <sup>7</sup> , XY, XZ, YX, YZ                     | 2500 MPa/363 ksi                                 | ASTM D638               |
|                                      | Tensile modulus <sup>7</sup> , ZX, XY                             | 2700 MPa/392 ksi                                 | ASTM D638               |
|                                      | Elongation at break <sup>7</sup> , XY, XZ, YX, YZ                 | 10%  | ASTM D638               |
|                                      | Elongation at break <sup>7</sup> , ZX, XY                         | 10%  | ASTM D638               |
|                                      | Flexural strength (@ 5%), <sup>8</sup> XY, XZ, YX, YZ             | 57.5 MPa/8340 psi                                | ASTM D790               |
|                                      | Flexural strength (@ 5%), <sup>8</sup> ZX, XY                     | 65 MPa/9427 psi                                  | ASTM D790               |
|                                      | Flexural modulus, <sup>8</sup> XY, XZ, YX, YZ                     | 2400 MPa/348 ksi                                 | ASTM D790               |
|                                      | Flexural modulus, <sup>8</sup> ZX, XY                             | 2700 MPa/392 ksi                                 | ASTM D790               |
|                                      | Izod impact notched (@ 3.2 mm, 23°C), XY, XZ, YX, YZ, ZX, ZY      | 3 KJ/m <sup>2</sup>                              | ASTM D256 Test Method A |
| Thermal properties                   | Shore Hardness D, XY, XZ, YX, YZ, ZX, ZY                          | 82   | ASTM D2240              |
|                                      | Heat deflection temperature (@ 0.45 MPa, 66 psi), XY, XZ, YX, YZ  | 174° C/345° F                                    | ASTM D648 Test Method A |
|                                      | Heat deflection temperature (@ 0.45 MPa, 66 psi), ZX, XY          | 175° C/347° F                                    | ASTM D648 Test Method A |
|                                      | Heat deflection temperature (@ 1.82 MPa, 264 psi), XY, XZ, YX, YZ | 114° C/237° F                                    | ASTM D648 Test Method A |
| Reusability                          | Heat deflection temperature (@ 1.82 MPa, 264 psi), ZX, XY         | 120° C/248° F                                    | ASTM D648 Test Method A |
|                                      | Minimum refresh ratio for stable performance                      | 30%  |                         |
| Recommended environmental conditions | Recommended relative humidity                                     | 50-70% RH  |                         |
| Certifications                       | UL 94, UL 746A, RoHS, <sup>9</sup> REACH, PAHs                    |  |                         |

## Ordering information

|                            | HP 3D High Reusability PA 12 Glass Beads      | HP 3D High Reusability PA 12 Glass Beads      | HP 3D High Reusability PA 12 Glass Beads Production Material | HP 3D High Reusability PA 12 Glass Beads <sup>10, 11, 12, 13</sup> |
|----------------------------|---|---|--|--|
| Product Number             | V1R11A  | V1R22A  | V1R35A   | V1R23A   |
| Weight                     | 15 kg/33.1 lb                                 | 150 kg/330.7 lb                               | 150 kg/330.7 lb  | 700 kg/1543.2 lb   |
| Capacity                   | 30L <sup>14</sup>                             | 300L <sup>14</sup>                            | 300L <sup>14</sup>   | 1400L <sup>14</sup>  |
| Dimensions (xyz)           | 600 x 333 x 302 mm (23.6 x 13.1 x 11.9 in)    | 800 x 600 x 1205 mm (31.5 x 23.6 x 47.4 in)   | 800 x 600 x 1205 mm (31.5 x 23.6 x 47.4 in)                  | 1143 x 1143 x 1500 mm (45 x 45 x 59 in)                            |
| Printer compatibility      | HP Jet Fusion 3D 4210/4200 Printing Solutions | HP Jet Fusion 3D 4210/4200 Printing Solutions | HP Jet Fusion 3D 4210 Printing Solution                      | HP Jet Fusion 3D 4210 Printing Solution                            |
| Fast cooling compatibility | Compatible                                    | Compatible                                    | Compatible   | Compatible   |

### Eco Highlights

- Powders and agents are not classified as hazardous<sup>15</sup>
- Cleaner, more comfortable workplace—enclosed printing system, and automatic powder management<sup>16</sup>
- Minimizes waste due to high reusability of powder<sup>17</sup>

Find out more about HP sustainable solutions at [hp.com/ecosolutions](http://hp.com/ecosolutions)

Dynamic security enabled printer. Only intended to be used with cartridges using an HP original chip. Cartridges using a non-HP chip may not work, and those that work today may not work in the future. More at: [hp.com/go/learnaboutsplies](http://hp.com/go/learnaboutsplies)

Learn more at [hp.com/go/3DMaterials](http://hp.com/go/3DMaterials)

1. 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.

2. Testing according to ASTM D638, ASTM D256, and ASTM D648 using HDT at different loads with a 3D scanner for dimensional stability. Testing monitored using statistical process controls.

3. 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.

4. HP Jet Fusion 3D Printing Solutions using HP 3D High Reusability PA 12 Glass Beads provide up to 70% 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 reusability). Parts are then made from each generation and tested for mechanical properties and accuracy.

5. Compared to selective laser sintering (SLS) technology. Based on running a scan on the 3D printing part to measure and compare with the original STL file (using GOM software). For testing, material is aged in real printing conditions and powder is tracked by generations (worst case for reusability). Parts are then made from each generation and tested for mechanical properties and accuracy.

6. The following technical information should be considered representative of averages or typical values and should not be used for specification purposes. These values refer to a balanced print mode with FW TATDAG\_15\_18\_11.69. Orientations defined according to ASTM F2971.

7. Test results realized under the ASTM D638 with a test rate of 1 mm/min for Z type test and a test rate of 10 mm/min for XY type test, specimens type V.

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

9. RoHS certification for EU, Bosnia-Herzegovina, China, India, Japan, Jordan, Korea, Serbia, Singapore, Turkey, Ukraine, Vietnam.

10. Additional material management equipment is required.

11. This SKU is only available for the HP Jet Fusion 3D 4210B Printing Solution.

12. This product number is sold directly by HP.

13. Available during the second half of 2019.

14. Liters refers to the materials container size and not the actual materials volume. Materials are measured in kilograms.

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. HP Jet Fusion 3D Printing Solutions using HP 3D High Reusability PA 12 Glass Beads material provide up to 70% post-production surplus powder reusability, producing functional parts batch after batch.

