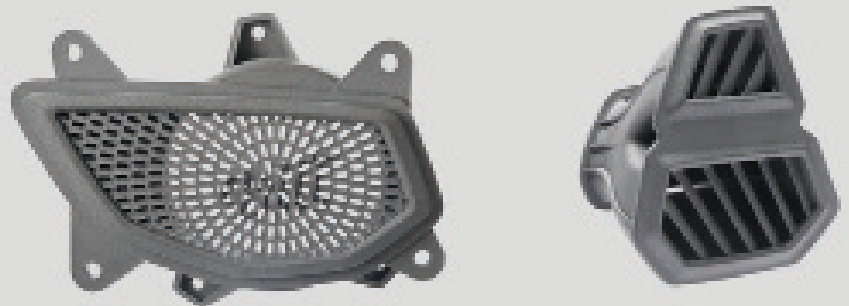


HP 3D High Reusability (HR) PP, enabled by Forward AM

with the HP Jet Fusion 5200 Series 3D Printing Solution



HP 3D High Reusability PP, enabled by Forward AM—ideal for producing chemical-resistant¹, weldable, low moisture absorption, functional parts

Chemical resistance¹, low moisture absorption

- Excellent chemical resistance and low moisture absorption ideal for piping or fluid systems, and containers¹
- Outstanding welding capabilities with other PP parts produced with traditional methods, like injection molding
- Versatile material ideal for a wide range of automotive, industrial, consumer goods, and medical² applications

Genuine, functional PP parts

- Get the same properties as many commonly used PPs with this genuine polypropylene material
- Accelerate your product development process using the same prototyping material as the final part
- Bio-compatibility—meets ISO 10993 and US FDA guidance for Intact Skin Surface Devices Statements²
- Meets strict automotive safety standards, including the Federal Motor Vehicle Safety Standard (FMVSS)³

Lowest cost HP 3D material for HP Multi Jet Fusion

- Our best value HP 3D material delivers consistent performance with up to 90% surplus powder reuse⁴
- Provides the optimal balance between performance and cost⁵
- Easy-to-process material enables high productivity and less waste⁶

General properties

	Value	Method
Powder melting point (DSC) (°C / °F)	138 / 280	ASTM D3418
Particle size (µm)	62	ASTM D3451
Bulk density of powder (g/cm ³ / lb/in ³)	0.34 / 0.012	ASTM 1895

Mechanical properties

This table shows the values that were obtained for HP 3D HR PP, enabled by Forward AM in the HP Jet Fusion 5200 Series 3D Printing Solution, with PP Balanced print profile and Type I tensile specimens, following the ASTM D638 standard. In this case, heat deflection temperature was characterized in a separate job configured for this purpose using a standard bar specimen according to the ASTM D648 standard^{i,ii,iii}

	Axis	Average value	Method
Tensile Strength (MPa) ^{iv,v}	XY	29	ASTM D638
	Z	29	
Tensile Modulus (MPa) ^{iv,v}	XY	1600	ASTM D638
	Z	1600	
Heat deflection temperature [@ 0.45 MPa, 66 psi] (°C) ^{vi}	XY	100	ASTMD648
	Z	100	
Heat deflection temperature [@ 1.82 MPa, 264 psi] (°C) ^{vi}	XY	60	ASTMD648
	Z	60	
Elongation at Yield (%) ^v	XY	9.5	ASTM D638
	Z	9.5	
Elongation at Break (%) ^v	XY	16	ASTM D638
	Z	13	
Impact strength (kJ/m ²) ^{vii}	XY	3.5	ASTMD256
	Z	3.0	
Density (g/cm ³)	XY	0.87	ASTMD792
	Z	0.87	

i. Based on internal testing and measured using the "HP Half_Commercial_Datasheet_Job". Results may vary with other jobs and geometries.
ii. Using HP 3D HR PP, enabled by Forward AM material, 20% refresh ratio, Balanced print profile, natural cooling, and measured after bead-blasting with glass beads (70-110 µm) at 5-6 bars.
iii. Following all HP-recommended printer setup and adjustment processes and printheads aligned using semi-automatic procedure.
iv. Tensile strength typical variation (95% of parts) falls within the 27-31 MPa range, while tensile modulus values remain within the 1400-1900 Mpa range.
v. Tensile test type I specimens measured with a pulling speed of 5 mm/min to comply with ASTM D638 test standards.
vi. Using a standard bar specimen measuring 5" x 1/2" x 1/4" in accordance with ASTM D648.
vii. Using the Izod test method A with notched @ 3.2 mm specimen according to the ASTM D256 standard.

Dimensional capabilities

This table shows the dimensional tolerances obtained during the characterization for a target process capability of Cpk= 1.33 (4 sigma).

Tolerances for C _{pk} = 1.33 ^{i,ii,iii} (in mm)	Nominal dimension							
	0 - 30 mm		30 - 50 mm		50 - 80 mm		>80mm	
	XY	Z	XY	Z	XY	Z	XY	Z
With the default setting for HP Jet Fusion 5200 Series 3D Printing Solution	±0.30	±0.40	±0.40	±0.65	±0.45	±1.00	±70%	±1.55

i. Based on Internal testing and measured using the HP dimensional capability characterization job. Results may vary with other jobs and geometries.
ii. Using HP 3D HR PP enabled by Forward AM material, 20% refresh ratio, Balanced print profile, natural cooling, and measured after bead-blasting with glass beads 70-110 µm at 5-6 bars.
iii. Following all HP-recommended printer setup and adjustment processes and printheads aligned using semi-automatic procedure.



This table shows the dimensional tolerances if the process capability target is set to Cpk = 1.00 (3 sigma).

Tolerances for $C_{pk} = 1.00^{i,ii,iii}$ (in mm)	Nominal dimension							
	0 - 30 mm		30 - 50 mm		50 - 80 mm		>80mm	
	XY	Z	XY	Z	XY	Z	XY	Z
With the default setting for HP Jet Fusion 5200 Series 3D Printing Solution	±0.25	±0.30	±0.30	±0.50	±0.35	±0.80	±55%	±1.40
i. Based on internal testing and measured using the HP dimensional capability characterization job. Results may vary with other jobs and geometries. ii. Using HP 3D HR PP enabled by Forward AM material, 20% refresh ratio. Balanced print profile. natural cooling, and measured after bead-blasting with gloss beads 70-110 μm at 5-6 bars. iii. Following all HP-recommended printer setup and adjustment processes and printheads aligned using semi-automatic procedure.								

Ordering information*

Product number	Material
V1R29A	HP 3D HR PP enabled by Forward AM 1200 L/ 400 kg Material
V1R28A	HP 3D HR PP enabled by Forward AM 300L/100 kg Material
V1R37A	HP 3D HR PP enabled by Forward AM 300L/100 kg P Material

*Available for HP Jet Fusion 5200 Series 3D Printing Solutions and the HP Jet Fusion 5000 3D Printer.

Safety datasheet*

Product number	Link to Safety Datasheet
V1R29A	HP 3D HR PP enabled by Forward AM 1200 L/ 400 kg Material
V1R28A	HP 3D HR PP enabled by Forward AM 300L/100 kg Material
V1R37A	HP 3D HR PP enabled by Forward AM 300L/100 kg P Material

*The link provided refer to US English version of the Safety Datasheet.

Other country specific Safety Datasheets are available [here](#).
If you need more information please contact your HP AM representative.



1. For HP 3D High Reusability PP enabled by Forward AM, based on internal HP testing, May 2020, with tests for mechanical property retention, dimensional stability, and weight change after 7- and 30-day immersion with acids, bases, organic solvents, and aqueous solutions. Due to the material characteristics, extra tuning is required in part design and printing, compared to other rigid HP 3D Printing materials.
2. HP has completed preliminary biocompatibility testing of printed parts deemed representative of those that would most likely be used for commercial purposes. The intent of this testing is to initially characterize the suitability of printed parts for certain regulated market applications affiliated with the HP 3D HR PP material. For additional information, please contact your HP representative. Environmental Attributes and Regulatory Summary (EARS) document are available upon request. Please contact your HP representative to get the latest version.
3. This product is certified for Federal Motor Vehicle Safety Standard (FMVSS) 302 for Flammability of Interior Materials-Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses.
4. Based on internal HP testing, May 2020. HP Jet Fusion 3D Printing Solutions using HP 3D High Reusability PP, enabled by Forward AM, provide up to 90% powder reusability ratio, producing functional parts batch after batch. For testing, material is aged in real printing conditions and reclaimed powder is tracked by generations (worst case for reusability). Parts are then made from each subsequent generation and tested for mechanical properties and accuracy showing no degradation of properties up to three generations of use.
5. Compared to other materials in the HP 3D materials portfolio as of May, 2020.
6. Easier to process than standard HP 3D High Reusability PA 12, providing proper fusing along with good spreadability and compatibility due to its small particle size.

