Technical Data Sheet

genPHA™ 3DFP01

FDM Filament Grade

genPHA™ 3DFP01 is a biodegradable semi-crystalline polyhydroxyalkanoate thermoplastic produced from microorganisms by fermentation of renewable carbohydrate feedstocks. **genPHA™ 3DFP01** is 100% biobased, biocompatible, and marine biodegradable and can be used as an alternative to other biopolymers such as Polylactic Acid (PLA) and petroleum-based thermoplastics such as PETG in FDM applications.

Features:

- Good processability and stable mass flow for FDM 3D Printing.
- Contains non-petrol chemical base nucleating agent.
- Suitable for a wide range of FDM processes.
- While genPHA™ is not suitable for food contact, it is phthalate-free, BPA-free, and CPSIA complaint.
- Contains no chemicals listed under California's Proposition 65.

Properties	Test Method	Value
Density	ASTM D1238	1.21 g/cm^3
MFR (190 ˚C, 2.16 kg)	ASTM D1238	8-12 g/10 min
Tensile Strength	ASTM D638	25 MPa
Elongation at Yield	ASTM D638	3~8 %
Max Braking Force	ASTM D638	490 N
Melting Point	ASTM D3418-21	171 °C
Glass Transition	ASTM D3418-21	-10°C to 5°C
Crystallization Temperature	ASTM D3418-21	110 °C
Thermal Degradation Temperature	ASTM E1131	255 °C

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Pellet Storage and Drying

genPHA™ should be stored under cool dry conditions to minimize moisture ingress. Storage temperatures should not exceed 50ºC. Resin containers and bags should remain sealed until ready for use. If the resin is to be used in Direct Pellet Extruders and the container is open for extended periods of time, the resin can be dried if required for a minimum of 6 hours at 65 °C. This is not necessary for FDM 3D printing, and no negative effect have been observed in “dry” vs. “wet” filament processing.

Pellet drying conditions should not exceed 75ºC to prevent clumping, melting, or pellet bridging.

genPHA™ should be dried to a maximum of 1000ppm of moisture before processing. A moisture of under 1000ppm will not adversely affect the resin.

1. Processing and Purge Conditions

Drying Temperature	65 °C for a minimum of 6 hrs
Barrel Temperature	155-175 °C
Pressure	12,000-14000 PSI
Water Bath Temperature	50 - 55 °C
Run Rate	6 to 12 kg / hour

Temperatures significantly above the melt temperature should be avoided to minimize the risk of filament degradation. Be sure to avoid extended resting time in the extruder assembly.

Purge or transitioning to other materials that have a similar melt flow and processing temperature; such as PLA. Purge until impurities (colorants and decomposition products) are cleansed from the extruder. It is not necessary to purge the extruder empty for FDM but recommended for Direct Pellet Extrusion.