# EXT Titan Pellet Series

# PETG, Natural - Technical Data Sheet

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Original Instructions



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# 1 PETG, NATURAL

Polyethylene Terephthalate Glycol (PETG)

Materials Available for purchase:

- 68-0059 PETG, Natural

## 1.1 PETG, Natural - Product Description

Titan PETG, Natural is an engineered thermoplastic additive manufacturing polyester that delivers good chemical resistance, durability, and print-ability. The addition of the glycol (G) to the PET component which is found commonly in plastic bottles, increases the durability, strength, and contributes to the impact resistance of the compound. PETG has excellent dimensional stability for large and medium platform printing processes that use direct pellet extrusion, and great for industrial applications. PETG has excellent clarity and process-ability that makes an attractive solution for versatile end use applications.

## 1.2 PETG, Natural - Advantages

Easy print-ability, high transparency and gloss surface, high chemical resistance, great bed adhesion, durable, and high impact resistance.

- Chemical resistance, high print resolution, and repeatability.
- Durability and transparency

## 1.3 PETG, Natural- Storage and Use

PETG is hygroscopic; hence it will absorb moisture from the atmosphere which would potentially affect the print quality and mechanical properties of the printed part. For optimal results, the pellets should be dried for 4-6 hours in a pellet dryer at 65 $^{0}$C (149 $^{0}$F). Storage in bins, drums, or buckets is fine. Respirator or dust mask is required when handling large quantities of material (i.e., pouring into feed source).

## 1.4 PETG, Natural - Safety

Consult the SDS for the safety properties of the material. Molten material and hot surfaces can cause thermal burns. Therefore, wear personal protective equipment for the hands, eyes, and body.

## 1.5 PETG, Natural - Material Properties

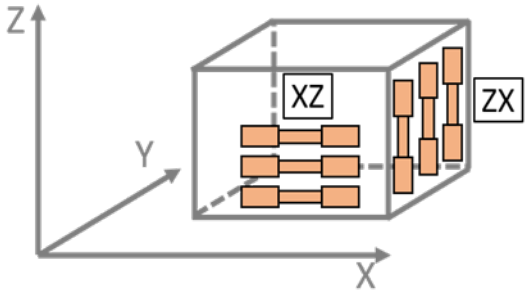
| MECHANICAL PROPERTIES- DRIED BEFORE PRINTING | | | |
|---|---|---|---|
| | In-Plane (XZ) | Out of plane (ZX) | Method |
| **Tensile Modulus (GPa)** | 2.50 | 2.30 | ASTM D638 |
| **Yield Strength (MPa)** | 64.71 | 56.23 | ASTM D638 |
| **Strength @Break (MPa)** | 32.05 | 16.21 | ASTM D638 |
| **Elongation @Break, %** | 4.73 | 4.15 | ASTM D638 |
| **Shrink factor during printing** | 0.4 | | |
| **Max moisture content for printing *** | <0.1% | | Moisture analyzer |
| HDT @0.455MPa | 70 °C | | ASTM 648 |

* The Max Moisture content is dependent on print geometry.

## 1.6 **PETG, Natural** - Print Orientation

All test samples were routed from 3D printing a single wall 12”x12”x12” cube was printed with a 2 mm nozzle, 3.3 mm extrusion width, 1 mm layer height and typical print speeds at nominal temperatures (melt temperature @220 °C +/- 2). The tensile strips were routed along XZ direction for in-plane specimens and along ZX for the out of plane specimens.

*Layer lines were not removed from the surface. The surface of the coupons was as printed.




## 1.7 PETG, Natural - Typical Print Parameters

| PARAMETER | TYPES |
|---|---|
| **Bed Material** | PC |
| **Adhesion Promoter** | ABS Cement, Nano Polymer Adhesive |
| **Purge/Buffer Material** | From High Temp: GF PC -> HDPE<br>From Low Temp: HDPE |

## 1.8 PETG, Natural - Disclaimer

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**3D Systems, Inc.** 333 Three D Systems Circle Rock Hill, SC 29730
www.3dsystems.com

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