FUSED DEPOSITION MODELING

ULTEM 1010 (Triton PEI 1010)

Highest Heat Resistance, Chemical Resistance & Tensile Strength of Any FDM Material



ULTEM 1010 is a high-performance polyetherimide resin with exceptional heat resistance, tensile strength, dimensional stability, and chemical resistance. Its thermal stability and mechanical properties make it an excellent choice for high-performance prototyping, tooling, and production parts that will be exposed to high temperatures. The availability of a certified grade expands its applications to include biocompatible and food contact applications. ULTEM 1010's versatility and reliability make it a preferred material for industries seeking robust solutions that can withstand demanding environments. Triton PEI 1010 is 3DXTECH's ULTEM 1010 PEI for Stratasys printers, for high-heat tooling, fixtures and parts. Its 217 °C glass transition temperature keeps parts performing at elevated temperatures, and it combines exceptional dimensional stability with inherent flame retardancy and good chemical resistance.

BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
914 × 610 × 914 mm	**2-4 business days**	**0.254-0.330 mm**	**±0.25 mm or ±0.3%, whichever is greater**

MECHANICAL PROPERTIES

Triton PEI 1010 brings the strength and stiffness of ULTEM 1010 PEI to high-heat tooling, fixtures and parts.

Triton PEI 1010 values come from flat (XY) samples printed on a Fortus 400mc at 0.33 mm layers with solid infill and tested to ISO standards, so they are not directly comparable with the ASTM values for Stratasys ULTEM 1010, which are measured on edge and upright.

PROPERTY	VALUE	TEST STANDARD
Tensile Strength at Break (XY)	**56 MPa**	ISO 527
Tensile Modulus (XY)	**2500 MPa**	ISO 527
Elongation at Break (XY)	**3 %**	ISO 527
Flexural Strength (XY)	**111 MPa**	ISO 178
Flexural Modulus (XY)	**2500 MPa**	ISO 178

THERMAL PROPERTIES

Glass transition is measured by DSC and heat deflection at 0.45 MPa on flat samples to ISO 75. The high glass transition temperature gives parts excellent properties at elevated temperatures.

Triton PEI 1010 is amorphous, so it has no melting point and softens gradually over a wide temperature range.

PROPERTY	VALUE	TEST STANDARD
Glass Transition Temperature	**217 °C**	DSC
HDT @ 0.45 MPa / 66 psi (XY)	**208 °C**	ISO 75

PHYSICAL PROPERTIES

Triton PEI 1010 is specified by its density, measured to ISO 1183 on printed samples, and its exceptional dimensional stability keeps critical features in tolerance.

PROPERTY	VALUE	TEST STANDARD
Density	**1.27 g/cm^3**	ISO 1183

ELECTRICAL PROPERTIES

The surface resistance of Triton PEI 1010 confirms it as an electrical insulator for housings and insulating features.

PROPERTY	VALUE	TEST STANDARD
Surface Resistance	**> 10^{13} Ω/sq**	IEC 60093

CHEMICAL PROPERTIES

Triton PEI 1010 has good chemical resistance. It has no chemical ratings of its own; the table shows the Stratasys ULTEM 1010 class ratings as a guide to the resin.

Chemical ratings are screening guidance; confirm them with application-specific testing before production release.

CHEMICAL	RATING
Petroleum fuels	**Excellent**
Aromatic hydrocarbons (e.g. benzene)	**Excellent**
Antifreeze / engine coolant	**Excellent**
Windshield washer fluid	**Excellent**
Weak bases (pH 8–10)	**Excellent**
Deionized water	**Excellent**
Aliphatic hydrocarbons (e.g. propane, butane)	**Good**
Motor oil	**Good**
Transmission fluid	**Good**
Brake fluid	**Good**
Petroleum greases	**Good**
Silicone greases and oils	**Good**
Alcohol / ethanol	**Good**
Esters	**Good**
Weak acids (pH 3–6)	**Good**
Strong bases (pH > 10)	**Good**
Strong acids (pH < 3)	**Limited**
Ketones (e.g. MEK, acetone)	**Limited**
Halogenated hydrocarbons (e.g. CFCs)	**Limited**
Phenols	**Poor**

MANUFACTURING

Colours & finishes	**Natural amber; support removal, machining, sanding, drilling, tapping and vapor polishing**