NinjaTek *Technical Specifications*

NinjaTek™ PLA 3D Printing Filament

Rigid Eco-Friendly Polylactic Material for FDM Printers

PLA is made from renewable natural resources, making it the most environmentally friendly 3D printing material available. It also has one of the most appealing printing profiles allowing for printing at low temperatures and high speeds while maintaining a high level of detail and exceptional print quality. Our PLA complements its favorable material profile with more than 10% higher tensile strength than other leading brands.

General Properties	Test Method	Imperial	Metric
Specific Gravity	ASTM D792	1.25 g/cc	1.25 g/cc
Moisture Absorption - 24 hours	ASTM D570		
Mechanical Properties			
Tensile Strength, Yield	ASTM D638	7,800 psi	54 Mpa
Tensile Strength, Ultimate	ASTM D638	7,800 psi	54 Mpa
Tensile Modulus	ASTM D638	242,000 psi	1,669 Mpa
Elongation at Yield	ASTM D638	6%	6%
Elongation at Break	ASTM D638	6%	6%
Toughness (integrated stress-strain curve; calculated stress x strain)	ASTM D638	140 $in \cdot lbF/in^3$	1.0 $m*N/m^3$ x10^6
Hardness	ASTM D2240	75 Shore D	75 Shore D
Impact Strength (notched Izod, 23C)	ASTM D256	0.47 $ft.lbf/in^2$	1.0 kJ/m^2
Abrasion Resistance (mass loss, 10,000 cycles)	ASTM D4060	0.25 g	0.25 g
Thermal Properties			
Melting Point (via Differential Scanning Calorimeter)	DSC	311° F	155° C
Glass Transition (Tg)	DSC	140° F	60° C
Heat Deflection Temperature (HDT) @ 10.75psi/ 0.07 MPa	ASTM D648	147° F	64° C
Heat Deflection Temperature (HDT) @ 66psi/ 0.45 MPa	ASTM D648	140° F	60° C

NinjaTek filament is capable of being printed by a variety of printers in a variety of configurations. This specification sheet gives results as they pertain to the defined test standard and specimen details. Different slicing and/or printing configurations, test conditions, ambient environments, etc. may result in different results.

Impact Strength and Heat Deflection Temperature results were both provided by an accredited university testing laboratory. Specific Gravity and Hardness are innate characteristics of the material. Moisture Absorption, values associated with the Tensile Strength tests, Melting Point and Glass Transition data were prepared by Fenner Drives, Inc.

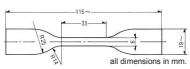
NinjaTek makes no warranties of any type, express or implied, including, but no liited to, the warranties of fitness for a particular application.

Test Specimen Details (by ASTM Test Number)
All printed specimens were created using the TAZ5 printer 0.75mm nozzle. For ASTM D638 tests, the extrusion multiplier is 1.05.

Specific Gravity (D792): Results determined by nature of material.

Moisture (D570): 30g of filament tested in moisture analyzer evaluated at 125°C until the mass change is < 0.005% over 1 minute.

Tensile (D638): Dogbone Style IV, 100% fill, diagonal line fill. Dimensions: 5mm thick. See drawing for other dimensions.



Hardness (D2240): Solid testing block.

Dimensions:
2"L x 2" H x 0.75" W

Impact (D256): Un-notched test specimen, notch added post print by testing facility.

Dimensions:
2.5 " L x 0.25" H x 0.5" W

Abrasion (D4060): Rectanglar block sized to fit tabor abrader.

Dimensions:
5" L x 0.5" H x 0.5" W

HDT (D648): Bar shape.

Dimensions:
7.5" L x 0.125" H x 0.5" W