

Cheetah™ 3D Printing Filament

Flexible Polyurethane Material for FDM Printers

Cheetah™ flexible filament is the fastest and easiest to print flexible filament on the market. The focus in development of this material was on optimizing the user experience. The result is a filament that is printable across all types of desktop 3D printers at ABS and PLA speeds, many times twice the speed of other flexible materials on the market.

| General Properties | Test Method | Imperial | Metric |
|--------------------------------|-------------|-----------|-----------|
| Specific Gravity | ASTM D792 | 1.22 g/cc | 1.22 g/cc |
| Moisture Absorption - 24 hours | ASTM D570 | 0.18 % | 0.18 % |

| Mechanical Properties | Test Method | Imperial | Metric |
|--|-------------|-------------------------------|--|
| Tensile Strength, Yield | ASTM D638 | 1,250 psi | 9 Mpa |
| Tensile Strength, Ultimate | ASTM D638 | 5,650 psi | 39 Mpa |
| Tensile Modulus | ASTM D638 | 3,800 psi | 26 Mpa |
| Elongation at Yield | ASTM D638 | 55% | 55% |
| Elongation at Break | ASTM D638 | 580% | 580% |
| Toughness (integrated stress-strain curve; calculated stress x strain) | ASTM D638 | 17,000 in·lbF/in ³ | 117.2 m ³ N/m ³ x10 ⁶ |
| Hardness | ASTM D2240 | 95 Shore A | 95 Shore A |
| Impact Strength (notched Izod, 23C) | ASTM D256 | 9.1 ft.lbf/in ² | 19.1 kJ/m ² |
| Abrasion Resistance (mass loss, 10,000 cycles) | ASTM D4060 | 0.06 mg | 0.06 mg |

| Thermal Properties | Test Method | Imperial | Metric |
|--|-------------|----------|--------|
| Melting Point (via Differential Scanning Calorimeter) | DSC | 428° F | 220° C |
| Glass Transition (Tg) | DSC | -11° F | -24° C |
| Heat Deflection Temperature (HDT) @ 10.75psi/ 0.07 MPa | ASTM D648 | 165° F | 74° C |
| Heat Deflection Temperature (HDT) @ 66psi/ 0.45 MPa | ASTM D648 | 120° F | 49° 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 not limited to, the warranties of fitness for a particular application.

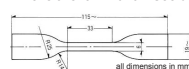
Test Specimen Details (by ASTM Test Number)

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.



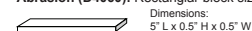
Hardness (D2240): Solid testing block.



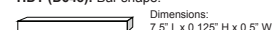
Impact (D256): Un-notched test specimen, notch added post print by testing facility.



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



HDT (D648): Bar shape.



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