ESSENTIUM

Essentium HTN
TECHNICAL DATA SHEET

ESSENTIUM HTN

Essentium HTN (high-temperature nylon) is a polyamide based chemistry that has improved mechanical and thermal properties compared to standard nylons. Additionally, it is an easy-to-print, low-warp material that boasts high toughness and wear resistantance. This material is a drop-in replacement for Acetal (Delrin®) and has best-in-class slow moisture absorption.

MECHANICAL PROPERTIES

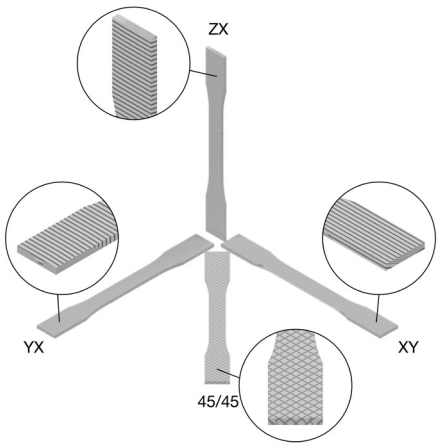
Metric	Test Method	Print Orientation			
		XY	45/45	YX	ZX
Ultimate Tensile Strength, MPa	ISO 527-2	76.9 (1.0)	69.8 (0.8)	41.2 (1.5)	69.7 (1.2)
Tensile Modulus, GPa	ISO 527-2	3.18 (0.31)	2.83 (0.16)	2.35 (0.56)	3.26 (0.13)
Strain at Break, %	ISO 527-2	7.3 (1.3)	7.7 (1.4)	2.8 (0.3)	2.8 (0.1)
Flexural Strength, MPa	ISO 178	129 (3.0)	111 (3.0)	111 (7.0)	124 (2.0)
Flexural Modulus, GPa	ISO 178	3.10 (0.11)	2.72 (0.16)	2.57 (0.26)	2.76 (0.11)
Notched Izod Impact Strength, kJ/m^2	ISO 180/A	3.4 (0.3)	5.0 (0.8)	5.0 (0.7)	4.0 (0.4)

Standard deviations listed in parentheses

MATERIAL PROPERTIES

Property	Method	Value
Specific Gravity[1], g/cm^3	ISO 1183	1.2
HDT B @ 0.45 MPa, ˚C	ISO 75	110
HDT A @ 1.8 MPa, ˚C	ISO 75	75
Continuous use temperature @20,000 hrs[1], ˚C	IEC 60216	120

1 Values taken from resin manufacturer TDS



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MATERIAL HANDLING AND DRYING

Essentium HTN is a slightly hygroscopic thermoplastic and will absorb moisture from humid air. Keep the material in the vacuum sealed packaging until you are ready to print with it. HTN filament should always be fed to the printer in a dry container and stored in a dry cabinet. If the material does absorb more than 400ppm moisture, it should be dried in a low dew point (< -40˚C) oven or vacuum oven at 130˚C for 6 – 8 hours.

RECOMMENDED HSE PRINT SETTINGS

0.4mm Hozzle			
Extrusion Width, mm	0.35 – 0.5	Hozzle Temperature, ˚C	280 – 440
Layer Height, mm	0.15 – 0.25	Bed Temperature, ˚C	80
Print Speed, mm/s	50 – 500	IR Temperature, ˚C	20 – 40
Infill, %	15 – 75	Fan Speed, %	10 – 30
0.8mm Hozzle			
Extrusion Width, mm	0.75 – 0.9	Hozzle Temperature, ˚C	270 – 455
Layer Height, mm	0.3 – 0.35	Bed Temperature, ˚C	80
Print Speed, mm/s	10 – 160	IR Temperature, ˚C	20 – 40
Infill, %	15 – 75	Fan Speed, %	10 – 30

RECOMMENDED FDM PRINT SETTINGS

Nozzle Temperature, ºC	270 – 290	Fan Speed, %	0 – 20
Bed Temperature, ºC	70 – 80	Bed Material	G-10/FR4 or Glass
Print Speed, mm/s	20 – 60	Bed Adhesion Method	Magigoo® PA or PVA glue
First Layer Speed, mm/s	15 – 20	Infill Density, %	<75

KEY FEATURES:

- Better heat deflection temperature and printability than ABS and standard Nylons
- High toughness and high strength
- Improved chemical and solvent resistance
- Wear resistance

APPLICATIONS INCLUDE:

- Jigs and fixtures
- Electrically insulating components
- Electronic housings
- Low-speed gears and moving parts

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