

### ESSENTIUM HTN-Z

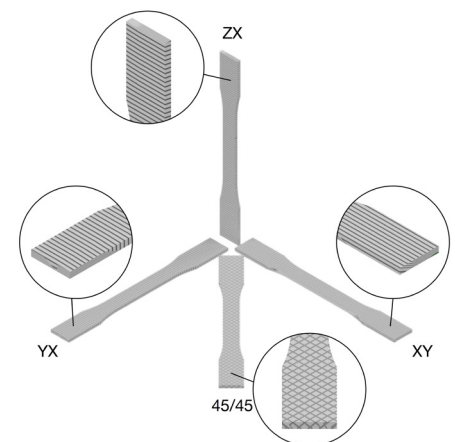
Essentium HTN-Z (high-temperature nylon) is the ESD-safe version in our HTN line of materials. This material is designed for use in medium-duty electronics manufacturing. The HTN line has improved mechanical and thermal properties compared to standard nylons. Additionally, it is an easy-to-print, low-warp material that boasts high toughness and wear resistance. This material is a drop-in replacement for ESD-safe 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	72.8 (0.4)	63.3 (4.6)	63.1 (1.6)	56.7 (1.1)
Tensile Modulus, GPa	ISO 527-2	3.45 (0.44)	3.49 (0.13)	3.23 (0.14)	2.86 (0.03)
Strain at Break, %	ISO 527-2	120 (25)	2.3 (0.3)	4.1 (0.1)	3.1 (0.5)
Flexural Strength, MPa	ISO 178	134 (2)	121 (3)	90.0 (6.6)	97.6 (0.8)
Flexural Modulus, GPa	ISO 178	3.73 (0.24)	2.93 (0.03)	2.77 (0.19)	2.29 (0.13)
Izod Impact Strength, Notched kJ/m <sup>2</sup>	ISO 180	3.6 (0.5)	3.8 (0.8)	4.6 (0.4)	3.4 (0.5)

Standard deviations listed in parentheses

MATERIAL PROPERTIES		
Property	Method	Value
Specific Gravity <sup>1</sup> , g/cm <sup>3</sup>	ISO 1183	1.2

<sup>1</sup> Values taken from resin manufacturer TDS



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### MATERIAL HANDLING AND DRYING

Essentium HTN-Z 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	260 – 420
Layer Height, mm	0.15 – 0.25	Bed Temperature, °C	70 – 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 – 450
Layer Height, mm	0.3 – 0.35	Bed Temperature, °C	70 – 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, °C	270 – 290	Fan Speed, %	0 – 20
Bed Temperature, °C	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:

- ESD-safe
- Solvent resistance
- Good temperature resistance
- Higher strength than PCTG, ABS, and Nylons

### APPLICATIONS INCLUDE:

- Assembly aids for electronics
- ESD-safe fixtures
- ESD-safe electrical housings
- Part trays for electronics manufacturing

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### ELECTRICAL PROPERTIES

Measurement position	Resistance, $\Omega$
	200 mm/s @ 345°C
1	3.54e6
2	1.66e6
3	3.74e3
4	7.60e3
5	3.40e4
6	2.52e5

