

# PA 4500 Filament

PA 4500 Filament is a low warp, neat nylon copolymer that has good lay flat/low warp properties, excellent appearance, strength in both XY and XZ directions, toughness, and can be printed at lower temps (240-260° C).

Applications for this material include component production of less than 20,000 per year with complex geometries that require good wear properties and appearance but also strength and durability, such as slides, screen printing pallets, automation sleds, adaptors for fluid and materials handling, end-of-arm tooling (EOAT), masking covers, die cast models and patterns, clips, covers, housings, and gears.

## ADVANTAGES

Along with easier printability, PA 4500 filament also delivers better appearance, over 100% elongation at break and better overall strength compared to other commercial PA's and products like PETg and PLA.

## STORAGE AND USE

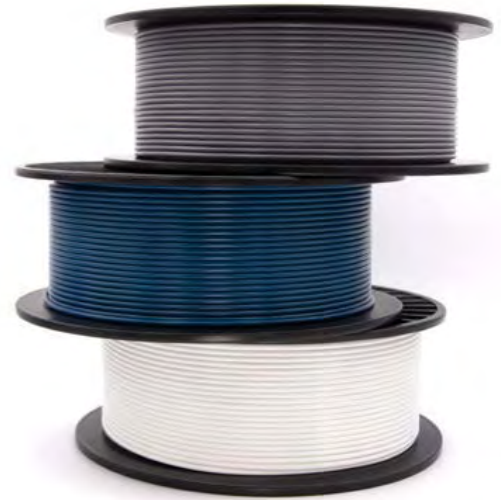
PA 4500 is highly hygroscopic, meaning it will quickly absorb and retain moisture from the atmosphere, affecting visual quality and mechanical properties. For best results, print and store filament in a dry environment. If necessary, dry filament in an oven at up to 75 °C (165 °F) for 6 - 12 hours.

## PROPERTIES

### MECHANICAL PROPERTIES - DRY AS PRINTED<sup>1</sup>

	Test Condition	Typical Value	Method
Tensile Modulus (MPa)	XY coupons, Ambient	1930	ASTM D638, Type I
Tensile Elongation at Break (%)	XY coupons, Ambient	>100	ASTM D638, Type I
Ultimate Tensile Strength (MPa)	XY coupons, Ambient	56.0	ASTM D638, Type I
Flexural Modulus (MPa)	XY coupons, Ambient	1440	ASTM D790
Flexural Strength (MPa)	XY coupons, Ambient	56.9	ASTM D790
Flexural Strain (%)	XY coupons, Ambient	>5	ASTM D790
Izod Impact, Notched (J/m)	XY coupons, Ambient	61.5	ASTM D256
Izod Impact, Un-notched (J/m)	XY coupons, Ambient	830	ASTM D256

<sup>1</sup>Testing conducted on bars printed at 260°C and tested at <0.20 wt% moisture. Typical values are for reference only.



**MECHANICAL PROPERTIES - MOISTURE CONDITIONED<sup>2</sup>**

	Test Condition	Typical Value	Method
Tensile Modulus (GPa)	XY coupons, Ambient	1050	ASTM D638, Type I
Tensile Yield Strength (Mpa)	XY coupons, Ambient	30.8	ASTM D638, Type I
Tensile Elongation at Break (%)	XY coupons, Ambient	>500	ASTM D638, Type I
Ultimate Tensile Strength (MPa)	XY coupons, Ambient	41.6	ASTM D638, Type I
Flexural Modulus (MPa)	XY coupons, Ambient	497	ASTM D790
Flexural Strength (MPa)	XY coupons, Ambient	20.4	ASTM D790
Flexural Strain (%)	XY coupons, Ambient	>5	ASTM D790
Izod Impact, Notched (J/m)	XY coupons, Ambient	282	ASTM D256
Izod Impact, Un-notched (J/m)	XY coupons, Ambient	1714	ASTM D256

<sup>2</sup>Testing conducted on bars printed at 260 °C and conditioned for 14 days at 23°C and 50% RH. Typical values are for reference only.

**THERMAL PROPERTIES**

	Test Condition	Typical Value	Method
Heat Deflection Temperature (°C)	0.455 Mpa	62	DMA
Melt Temperature, Peak (°C)	20°C/min ramp	190	DSC

<sup>1</sup>Testing conducted on bars printed in XY orientation at 250°C and tested dry. Typical values are for reference only.

**OTHER PHYSICAL PROPERTIES**

	Test Condition	Typical Value	Method
Density (g/cm <sup>3</sup> )	Ambient	1.10	ASTM D792

**DIMENSIONAL PROPERTIES**

	Test Condition	Typical Value	Method
Diameter: Mean, Indiv. Axis (mm)	In-line, 100% inspection	1.75±0.05 2.85±0.05	Laser Micrometer

**Disclaimer:** The information in this technical data sheet, including material properties, are obtained from testing representative samples under carefully controlled conditions and are provided for reference only. Material properties may be impacted by storage, handling, processing equipment/parameters, and product design, among other factors. The information is not a substitute for user testing to determine fitness for any specific use and the user is responsible for ensuring safe and lawful use of the product.

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