

## PS-6PA Natural Unfilled Cast Nylon 6 (PA6)

**Material Notes:** PS-6PA Natural is an FDA-compliant grade used in applications requiring cast nylon but without any fillers.

**General Cast Nylon 6 Information:** Cast nylon 6, available in a variety of grades, offers a combination of good mechanical properties, excellent bearing and wear characteristics, and the large-size capabilities of the casting process. Its fatigue resistance, noise damping ability, corrosion resistance, and light weight make it ideal for metal replacement applications, such as bearings, gears, sheaves, and sprockets. At one-eighth the weight of bronze, Tecast is easier to handle and maintain than metals such as iron, aluminum, brass, and bronze, which it typically replaces in industrial wear applications. Other materials that Tecast commonly replaces because of its superior performance are laminated phenolics, elastomers, and wood. It has excellent wear and abrasion resistance, resulting in extended component life and lower maintenance cost. Its formulations are readily available in rod, plate, and tube. Nonstandard shapes, such as rings, discs, and blocks can be economically produced in small quantities with short lead times. Custom parts can be cast-size or near-net-shape with relatively inexpensive tooling.

**General Application Information:** Its unique combination of strength, wear resistance, toughness, machinability, and corrosion resistance makes cast nylon ideal for bearings, thrust washers, bushings, wear pads, sheaves, rollers, gears, sprockets, and wheels. It is commonly used in construction equipment, material handling systems, amusement park rides, pulp and paper processing equipment, steel mills and industrial equipment.

**Key Words:** PA6, Polyamide 6

Withstands severe environments, resist harsh chemicals, and perform well in extreme temperatures. Offers weight savings that have potential to drive lower cost systems.

Physical Properties	Metric	English	Comments
Density	1.15 - 1.16 g/cc	0.0416 - 0.0419 lb/in <sup>3</sup>	ASTM D792
Water Absorption	1.2 %	1.2 %	at 24 hours; ASTM D570

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell R	115	115	ASTM D785
Tensile Strength, Yield	68.9 MPa	10000 psi	ASTM D638
Elongation at Break	25 %	25 %	ASTM D638
Tensile Modulus	2.41 GPa	350 ksi	ASTM D638
Flexural Strength	86.2 MPa	12500 psi	ASTM D790
Flexural Modulus	2.41 GPa	350 ksi	ASTM D790
Izod Impact, Notched	0.320 J/cm	0.600 ft-lb/in	ASTM D256
Coefficient of Friction, Dynamic	0.26	0.26	40 psi, 50 fpm; ASTM D3702
K (wear) Factor	403 x 10 <sup>-8</sup> mm <sup>3</sup> /N-M	200 x 10 <sup>-10</sup> in <sup>3</sup> -min/ft-lb-hr	40 psi, 50 fpm; ASTM D3702

Electrical Properties	Metric	English	Comments
Volume Resistivity	1.00e+14 ohm-cm	1.00e+14 ohm-cm	ASTM D257
Dielectric Constant 	3.7	3.7	ASTM D150
	@Frequency 60 Hz	@Frequency 60 Hz	
	3.7	3.7	50% RH; ASTM D150

	@Frequency 60 Hz	@Frequency 60 Hz	
Dielectric Strength	19.7 kV/mm	500 kV/in	ASTM D149
Dissipation Factor	0.0020	0.0020	ASTM D150
	@Frequency 60 Hz	@Frequency 60 Hz	

<b>Thermal Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
CTE, linear	72.0 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ @Temperature 20.0 $^{\circ}\text{C}$	40.0 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$ @Temperature 68.0 $^{\circ}\text{F}$	ASTM D696
Specific Heat Capacity	1.67 J/g- $^{\circ}\text{C}$	0.400 BTU/lb- $^{\circ}\text{F}$	
Thermal Conductivity	0.241 W/m-K	1.67 BTU-in/hr-ft $^2\cdot^{\circ}\text{F}$	
Melting Point	220 $^{\circ}\text{C}$	428 $^{\circ}\text{F}$	ASTM D2133
Maximum Service Temperature, Air	93.3 $^{\circ}\text{C}$	200 $^{\circ}\text{F}$	Long Term; ASTM UL746B
	149 $^{\circ}\text{C}$	300 $^{\circ}\text{F}$	Intermittent
Deflection Temperature at 0.46 MPa (66 psi)	188 $^{\circ}\text{C}$	370 $^{\circ}\text{F}$	ASTM D648
Deflection Temperature at 1.8 MPa (264 psi)	93.3 $^{\circ}\text{C}$	200 $^{\circ}\text{F}$	ASTM D648
Flammability, UL94	HB	HB	

All specifications are deemed to be approximate values and may vary depending on the processing methods used and the specimen or test piece. Information presented herein cannot necessarily be applied to finished items or products. Suitability of materials for a specific field of application must be assessed by the party responsible for processing or the end-user.

All technical specifications presented herein are designed merely to provide assistance in terms of project planning. Under no circumstances do they constitute a guaranteed property or quality of the items presented. Data herein has been provided by the manufacturer of the material and or matweb.com