

Nylon 101, Unfilled, Type 66 nylon, extruded

Material Notes:

Nylon 101 is an extruded form of polyamide, offering rigidity, strength, wear resistance, and heat resistance to 210°F. It is commonly used in both structural and general-purpose bearing and wear applications. This material is available in natural and black. The natural material is compliant with FDA, USDA, NST, and 3A-Dairy regulations.

Physical Properties	Metric	English	Comments
Density	1.15 g/cc	0.0415 lb/in ³	ASTM D792
Water Absorption	0.3 %	0.3 %	24 hour immersion; ASTM D570
Moisture Absorption at Equilibrium	0.9 %	0.9 %	Water Vapor Regained
Water Absorption at Saturation	7 %	7 %	Immersion; ASTM D570
Outgassing - Total Mass Loss	2.4 %	2.4 %	
Collected Volatile Condensable Material	0 %	0 %	
Mechanical Properties			
Hardness, Rockwell M	85	85	ASTM D785
Hardness, Rockwell R	115	115	ASTM D785
Hardness, Shore D	80	80	ASTM D2240
Tensile Strength, Ultimate	79.3 MPa	11500 psi	ASTM D638
Elongation at Break	50 %	50 %	ASTM D638
Tensile Modulus	2.93 GPa	425 ksi	ASTM D638
Flexural Modulus	3.1 GPa	450 ksi	ASTM D790
Flexural Yield Strength	103 MPa	15000 psi	ASTM D790
Compressive Yield Strength	86.2 MPa	12500 psi	10% Deflection; ASTM D695
Compressive Modulus	2.9 GPa	420 ksi	ASTM D695
Machinability	10 %	10 %	QEPP 10 to 100 scale
Shear Strength	68.9 MPa	10000 psi	ASTM D732
Coefficient of Friction	0.25	0.25	Dynamic; Dry vs. Steel; PTM55007
K (wear) Factor	80	80	10 ⁻¹⁰ in ³ -min/lb-ft-hr; PTM55007
Limiting Pressure Velocity	0.0946 MPa-m/sec	2700 psi-ft/min	PTM55007
Izod Impact, Notched	0.32 J/cm	0.6 ft-lb/in	ASTM D256A
Electrical Properties			
Surface Resistivity per Square	1e+013 ohm	1e+013 ohm	EOS/ESD S11.11
Dielectric Constant	3.6	3.6	1 MHz; ASTM D150(2)

Dielectric Strength	15.7 kV/mm	400 V/mil	Short Term; ASTM D149(2)
Dissipation Factor	0.02	0.02	1 MHz; ASTM D150(2)

Thermal Properties

CTE, linear 68°F	99 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	55 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	ASTM E831 (TMA)
Thermal Conductivity	0.245 W/m-K	1.7 BTU-in/hr-ft ² -°F	
Melting Point	260 °C	500 °F	ASTM D3418
Maximum Service Temperature, Air	98.9 °C	210 °F	Continuous Service Without Load
Deflection Temperature at 1.8 MPa (264 psi)	93.3 °C	200 °F	ASTM D648
Flammability, UL94	V-2	V-2	UL94

Descriptive Properties

Compliance - Canada AG	Not Compliant
Compliance - Dairy 3A	Compliant
Compliance - FDA	Compliant
Compliance - NSF	Compliant
Compliance - USDA	Compliant
Compliance - USP Class VI	Not Compliant
Service in Alcohols	Limited
Service in Aliphatic Hydrocarbons	Acceptable
Service in Aromatic Hydrocarbons	Acceptable
Service in Chlorinated Solvents	Limited
Service in Continuous Sunlight	Limited
Service in Ethers	Acceptable
Service in Inorganic Salt Solutions	Acceptable
Service in Ketones	Acceptable
Service in Steam	Limited
Service in Strong Acids	Unacceptable
Service in Strong Alkalies	Unacceptable
Service in Weak Acids	Limited
Service in Weak Alkalies	Limited