

Nylon/Polyamide (PA)

TYPICAL PROPERTIES OF NYLONS (DRY, AS MOLDED)

ASTM or UL Test	Property	TYPE			
		6/6	6	6/12	11
PHYSICAL					
D792	Specific gravity	1.14	1.13	1.06	1.04
D792	Specific volume (in ³ /lb)	24.2	24.5	25.9	26.6
D570	Water absorption, 24 h, 1/8-in thk (%)	1.2	1.6	0.25	0.4
MECHANICAL					
D638	Tensile strength (psi)	12,000	11,800	8,800	8,500
D638	Elongation (%)	60	150	150	120
D638	Tensile modulus (10 ⁵ psi)	4.2	3.8	2.9	1.8
D790	Flexural modulus (10 ⁵ psi)	4.1	4.0	2.9	1.5
D256	Impact strength, Izod (ft-lb/in of notch)	1.0	1.0	1.0	3.3
D785	Hardness, Rockwell R	121	119	114	—
THERMAL					
C177	Thermal conductivity (Btu-in/hr-ft ² -°F)	1.7	1.7	1.5	—
D696	Coefficient of thermal expansion (10 ⁻⁵ in/in-°F)	4.0	4.5	5.0	5.1
D648	Deflection temperature (°F)				
	At 264 psi	194	152	194	118
	At 66 psi	455	365	356	154
UL 94	Flammability rating, 1/8 in	V-2	V-2	V-2	—
ELECTRICAL					
D149	Dielectric strength (V/mil)				
	Short time, 1/8-in thk	600	400	400	425
D150	Dielectric constant				
	At 1 kHz	3.9	3.7	4.0	3.3
D150	Dissipation factor				
	At 1 kHz	0.02	0.02	0.02	0.03
D257	Volume resistivity (ohm-cm)				
	At 73°F, 50% RH	10 ¹⁵	10 ¹⁵	10 ¹⁵	2×10 ¹³
D495	Arc resistance (s)	116	—	121	—

*0.040-in thick specimen.

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TYPICAL PROPERTIES OF NYLONS (DRY, AS MOLDED)

ISO or UL Test	Property	----- TYPE -----			
		6/6	6	6/12	11
PHYSICAL					
ISO1183	Specific gravity	1.14	1.13	1.06	1.04
ISO1183	Specific volume (cm ³ /g)	0.871	0.882	0.932	0.957
ISO62	Water absorption, 24 h, 3 mm thk (%)	1.2	1.6	0.25	0.4
MECHANICAL					
ISO527	Tensile strength (MPa)	82.74	81.36	60.67	58.61
ISO527	Elongation (%)	60	150	150	120
ISO527	Tensile modulus (10 ³ MPa)	2.89	2.62	1.99	1.24
ISO178	Flexural modulus (10 ³ MPa)	2.83	2.75	1.99	1.03
ISO180	Notched izod impact strength (J/m)	53	53	53	176
ISO2039	Hardness, Rockwell R	121	119	114	—
THERMAL					
ASTM C177	Thermal conductivity (Btu-in/hr-ft ² -°F)	1.7	1.7	1.5	—
ISO11359	Coefficient of thermal expansion (10 ⁻⁴ m/m °C)	0.72	0.81	0.90	0.92
ISO75	Deflection temperature (°C)				
	At 1.80 MPa	90	67	90	48
	At 0.45 MPa	235	185	185	68
UL 94	Flammability rating, 3 mm	V-2	V-2	V-2	—
ELECTRICAL					
IEC243	Dielectric strength (kV/mm)				
	Short time, 3 mm thk	23.6	15.75	15.75	16.73
IEC250	Dielectric constant				
	At 1 kHz	3.9	3.7	4.0	3.3
IEC250	Dissipation factor				
	At 1 kHz	0.02	0.02	0.02	0.03
IEC93	Volume resistivity (ohm-cm)				
	At 23°C, 50% RH	10 ¹⁵	10 ¹⁵	10 ¹⁵	2×10 ¹³
ASTM D495	Arc resistance (s)	116	—	121	—

*0.10-mm thick specimen.