

Overview of materials for Nylon 6, Film Grade

Categories: [Polymer](#); [Film](#); [Thermoplastic](#); [Nylon \(Polyamide PA\)](#); [Nylon 6 \(PA6\)](#); [Nylon 6, Film Grade](#)

Material Notes: This property data is a summary of similar materials in the MatWeb database for the category "Nylon 6, Film Grade". Each property range of values reported is minimum and maximum values of appropriate MatWeb entries. The comments report the average value, and number of data points used to calculate the average. The values are not necessarily typical of any specific grade, especially less common values and those that can be most affected by additives or processing methods.

Vendors: [Click here to view all available suppliers for this material.](#)

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Physical Properties	Metric	English	Comments
Density	1.04 - 1.38 g/cc	0.0376 - 0.0500 lb/in ³	Average value: 1.14 g/cc Grade Count:62
Water Absorption	1.60 - 10.0 %	1.60 - 10.0 %	Average value: 3.05 % Grade Count:12
Moisture Absorption at Equilibrium	2.70 - 3.00 %	2.70 - 3.00 %	Average value: 2.80 % Grade Count:3
Water Absorption at Saturation	5.50 - 9.50 %	5.50 - 9.50 %	Average value: 6.30 % Grade Count:5
Water Vapor Transmission	6.05 - 35.0 g/m ² /day	0.390 - 2.25 g/100 in ² /day	Average value: 31.1 g/m ² /day Grade Count:15
 Oxygen Transmission	2.60 - 465 g/m ² /day @Temperature 37.8 - 40.0 °C	0.167 - 29.9 g/100 in ² /day @Temperature 100 - 104 °F	Average value: 192 g/m ² /day Grade Count:13
Oxygen Transmission	1.00 - 40.3 cc-mm/m ² -24hr-atm	2.54 - 102 cc-mil/100 in ² -24hr-atm	Average value: 3.02 cc-mm/m ² -24hr-atm Grade Count:16
Oxygen Transmission Rate	0.230 - 192 cc/m ² /day	0.0148 - 12.4 cc/100 in ² /day	Average value: 27.2 cc/m ² /day Grade Count:20
Carbon Dioxide Transmission	15.0 - 72.8 cc-mm/m ² -24hr-atm	38.1 - 185 cc-mil/100 in ² -24hr-atm	Average value: 26.6 cc-mm/m ² -24hr-atm Grade Count:3
Viscosity	3.15 - 85.0 cP	3.15 - 85.0 cP	Average value: 10.3 cP Grade Count:5
 Viscosity	810 - 2.74e+6 cP @Temperature 260 - 260 °C	810 - 2.74e+6 cP @Temperature 500 - 500 °F	Average value: 470000 cP Grade Count:13
 Viscosity	40.0 - 5.00e+6 cP @Temperature 240 - 280 °C	40.0 - 5.00e+6 cP @Temperature 464 - 536 °F	Average value: 470000 cP Grade Count:13
	40.0 - 5.00e+6 cP @Shear Rate 0.100 - 10000 1/s	40.0 - 5.00e+6 cP @Shear Rate 0.100 - 10000 1/s	Average value: 470000 cP Grade Count:13
Viscosity Number	155 - 245 cm ³ /g	1.55 - 2.45 dI/g	Average value: 211 cm ³ /g Grade Count:19
Thickness	10.2 - 59.0 microns	0.400 - 2.32 mil	Average value: 30.7 microns Grade Count:35
Linear Mold Shrinkage	0.0140 cm/cm	0.0140 in/in	Average value: 0.0140 cm/cm Grade Count:5
Linear Mold Shrinkage, Transverse	0.0140 cm/cm	0.0140 in/in	Average value: 0.0140 cm/cm Grade Count:4
Melt Flow	25.0 - 50.0 g/10 min	25.0 - 50.0 g/10 min	Average value: 36.4 g/10 min Grade Count:7
Surface Tension	36.0 - 56.0 dynes/cm	36.0 - 56.0 dynes/cm	Average value: 52.9 dynes/cm Grade Count:17

Mechanical Properties	Metric	English	Comments
Ball Indentation Hardness	60.0 - 140 MPa	8700 - 20300 psi	Average value: 100 MPa Grade Count:4
Tensile Strength, Ultimate	48.0 - 112 MPa	6960 - 16200 psi	Average value: 86.3 MPa Grade Count:6
Film Tensile Strength at Yield, MD	31.0 - 51.0 MPa	4500 - 7400 psi	Average value: 35.8 MPa Grade Count:19
Film Tensile Strength at Yield, TD	37.2 - 82.7 MPa	5400 - 12000 psi	Average value: 65.6 MPa Grade Count:10
Tensile Strength, Yield	28.0 - 80.0 MPa	4060 - 11600 psi	Average value: 63.0 MPa Grade Count:19
Film Elongation at Break, MD	4.50 - 460 %	4.50 - 460 %	Average value: 223 % Grade Count:44
Film Elongation at Break, TD	3.50 - 480 %	3.50 - 480 %	Average value: 269 % Grade Count:23
Elongation at Break	3.50 - 400 %	3.50 - 400 %	Average value: 168 % Grade Count:20
Elongation at Yield	4.00 - 25.0 %	4.00 - 25.0 %	Average value: 9.27 % Grade Count:3
Modulus of Elasticity	0.100 - 4.00 GPa	14.5 - 580 ksi	Average value: 1.59 GPa Grade Count:27
Flexural Yield Strength	28.0 - 120 MPa	4060 - 17400 psi	Average value: 74.9 MPa Grade Count:14
Flexural Modulus	0.690 - 2.80 GPa	100 - 406 ksi	Average value: 2.22 GPa Grade Count:10
Secant Modulus	0.650 GPa	94.3 ksi	Average value: 0.650 GPa Grade Count:6
Secant Modulus, MD	0.285 - 4.69 GPa	41.3 - 680 ksi	Average value: 2.17 GPa Grade Count:22
Secant Modulus, TD	0.285 - 3.70 GPa	41.3 - 537 ksi	Average value: 2.17 GPa Grade Count:20
Izod Impact, Notched	0.450 - 10.7 J/cm	0.843 - 20.0 ft-lb/in	Average value: 3.69 J/cm Grade Count:4
Charpy Impact Unnotched	1000 J/cm ²	4760 ft-lb/in ²	Grade Count:5
 Charpy Impact, Notched	5.50 - 999.9 J/cm ² @Temperature -30.0 - -30.0 °C	26.2 - 4759 ft-lb/in ² @Temperature -22.0 - -22.0 °F	Average value: 5.50 J/cm ² Grade Count:1
Charpy Impact, Notched	0.500 - 5.00 J/cm ²	2.38 - 23.8 ft-lb/in ²	Average value: 1.16 J/cm ² Grade Count:7
 Charpy Impact, Notched	0.500 - 0.500 J/cm ² @Temperature -30.0 - -30.0 °C	2.38 - 2.38 ft-lb/in ² @Temperature -22.0 - -22.0 °F	Average value: 0.500 J/cm ² Grade Count:1
Coefficient of Friction	0.150 - 2.00	0.150 - 2.00	Average value: 0.618 Grade Count:36
Coefficient of Friction, Static	0.370 - 1.40	0.370 - 1.40	Average value: 1.15 Grade Count:16
Tear Strength Test	23.0 - 14000	23.0 - 14000	Average value: 916 Grade Count:36

Elmendorf Tear Strength MD	56.0 - 499 g	56.0 - 499 g	Average value: 167 g Grade Count:8
Elmendorf Tear Strength, MD	0.394 - 4.21 g/micron	10.0 - 107 g/mil	Average value: 1.86 g/micron Grade Count:4
Elmendorf Tear Strength, TD	1.57 - 7.87 g/micron	40.0 - 200 g/mil	Average value: 4.74 g/micron Grade Count:4
Film Tensile Strength at Break, MD	32.0 - 379 MPa	4640 - 55000 psi	Average value: 166 MPa Grade Count:44
Film Tensile Strength at Break, TD	29.0 - 303 MPa	4210 - 44000 psi	Average value: 126 MPa Grade Count:23

Electrical Properties	Metric	English	Comments
Electrical Resistivity	1.00e+12 - 1.00e+15 ohm-cm	1.00e+12 - 1.00e+15 ohm-cm	Average value: 4.10e+14 ohm-cm Grade Count:5
Surface Resistance	1.00e+13 - 1.00e+15 ohm	1.00e+13 - 1.00e+15 ohm	Average value: 4.50e+14 ohm Grade Count:5
Dielectric Strength	30.0 - 35.0 kV/mm	762 - 889 kV/in	Average value: 30.8 kV/mm Grade Count:5
Comparative Tracking Index	600 V	600 V	Average value: 600 V Grade Count:5

Thermal Properties	Metric	English	Comments
CTE, linear	80.0 - 100 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	44.4 - 55.6 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	Average value: 90.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ Grade Count:14
Specific Heat Capacity	1.55 - 2.55 J/g $\cdot^\circ\text{C}$	0.370 - 0.609 BTU/lb $\cdot^\circ\text{F}$	Average value: 1.91 J/g $\cdot^\circ\text{C}$ Grade Count:13
Melting Point	193 - 260 $^\circ\text{C}$	379 - 500 $^\circ\text{F}$	Average value: 220 $^\circ\text{C}$ Grade Count:25
Deflection Temperature at 0.46 MPa (66 psi)	51.0 - 161 $^\circ\text{C}$	124 - 322 $^\circ\text{F}$	Average value: 117 $^\circ\text{C}$ Grade Count:5
Deflection Temperature at 1.8 MPa (264 psi)	50.0 - 75.0 $^\circ\text{C}$	122 - 167 $^\circ\text{F}$	Average value: 57.3 $^\circ\text{C}$ Grade Count:10
Vicat Softening Point	70.0 - 195 $^\circ\text{C}$	158 - 383 $^\circ\text{F}$	Average value: 153 $^\circ\text{C}$ Grade Count:6
Minimum Service Temperature, Air	-60.0 $^\circ\text{C}$	-76.0 $^\circ\text{F}$	Average value: -60.0 $^\circ\text{C}$ Grade Count:4
Flammability, UL94	HB - V-2	HB - V-2	Grade Count:7
Glow Wire Test	750 $^\circ\text{C}$	1380 $^\circ\text{F}$	Average value: 750 $^\circ\text{C}$ Grade Count:4

Optical Properties	Metric	English	Comments
Haze	1.70 - 10.0 %	1.70 - 10.0 %	Average value: 5.00 % Grade Count:21
Gloss	80.0 - 180 %	80.0 - 180 %	Average value: 141 % Grade Count:11

Transmission, Visible	83.0 - 90.0 %	83.0 - 90.0 %	Average value: 86.3 % Grade Count:21
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Processing Properties	Metric	English	Comments
Processing Temperature	200 - 295 °C	392 - 563 °F	Average value: 252 °C Grade Count:21
Die Temperature	270 °C	518 °F	Average value: 270 °C Grade Count:13
Melt Temperature	230 - 290 °C	446 - 554 °F	Average value: 260 °C Grade Count:4
Mold Temperature	60.0 - 120 °C	140 - 248 °F	Average value: 90.0 °C Grade Count:4
Roll Temperature	80.0 - 110 °C	176 - 230 °F	Average value: 106 °C Grade Count:15
Drying Temperature	75.0 - 100 °C	167 - 212 °F	Average value: 87.5 °C Grade Count:4
Moisture Content	0.0600 - 0.100 %	0.0600 - 0.100 %	Average value: 0.0778 % Grade Count:9
Injection Pressure	80.0 - 130 MPa	11600 - 18900 psi	Average value: 105 MPa Grade Count:4

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error. We also ask that you refer to MatWeb's [terms of use](#) regarding this information. [Click here](#) to view all the property values for this datasheet as they were originally entered into MatWeb.