TECHNICAL DATA SHEET

Nylon
(Polyamide)

The exceptional bearing and wear properties of Nylon make it one of the most widely used plastics in the world. Nylon is frequently used as a replacement for bronze, brass, aluminum, steel and other metals, as well as other plastics, wood, and rubber. Nylon (Polyamide) is the generic name for all long-chain fiber-forming polyamides with recurring amide groups. Polyamides (Nylon) comprise the largest family of engineering plastics with a very wide range of applications. The family of nylons consists of several different types. Nylon 6/6, nylon 6, nylon 6/10, nylon 6/12, nylon 11, nylon 12, and nylon 6-6/6 copolymer are the most common. Of these, nylon 6/6 and nylon 6 dominate the market. Nylons offer extremely good wear resistance, coupled with high tensile strength and modulus of elasticity. They also have high impact resistance, a high heat distortion temperature, and resist wear, abrasion, and vibration. In addition, nylons can withstand sustained contact with a wide variety of chemicals, alkalis, dilute acids or oxidizing agents.

Another important factor both economically and mechanically, is the relative light weight of nylon. Nylon is approximately 1/8 the weight of bronze, 1/7 the weight of cast iron, and 1/2 the weight of aluminum. This reduces both the inertial and static loads and eases the handling of large components during maintenance or replacement procedures.

Benefits
High tensile strength
Light weight
High modulus of elasticity
High impact resistance
Resistance wear, abrasion, and vibration
Chemical resistance to alkalis, dilute acids or oxidizing agents

Note- Nylon® is NOT moisture Resistant

Applications
Electrical connectors
Gear, slide, cams and bearings
Automotive
Sports & recreational equipment
Bearings
Rollers
Wheels & wear components
Semiconductor
Medical
Wear Pads
Noels
Bushings
Seals

SHAPES AVAILABLE

SEE NEXT PAGE FOR ADDITIONAL INFORMATION

NOTE: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control. Contact us for manufacturers’ complete material property datasheets. All values at 73°F (23°C) unless otherwise noted.
## TYPICAL PROPERTIES of EXTRUDED NYLONS

<table>
<thead>
<tr>
<th>ASTM or UL test</th>
<th>Property</th>
<th>Nylon 6/6 Unfilled</th>
<th>Nylatron GS Moly-Filled 6/6</th>
<th>Nylon 6/6 30% Glass</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D792</td>
<td>Density (lb/in³) (g/cm³)</td>
<td>0.042 / 1.15</td>
<td>0.042 / 1.16</td>
<td>0.049 / 1.35</td>
</tr>
<tr>
<td></td>
<td>Water Absorption, 24 hrs (%) Saturation (%)</td>
<td>0.3 / 7.0</td>
<td>0.3 / 7.0</td>
<td>0.7 / 5.4</td>
</tr>
<tr>
<td><strong>MECHANICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D638</td>
<td>Tensile Strength (psi)</td>
<td>11,500</td>
<td>12,500</td>
<td>27,000</td>
</tr>
<tr>
<td></td>
<td>Tensile Modulus (psi)</td>
<td>425,000</td>
<td>480,000</td>
<td>1,400,000</td>
</tr>
<tr>
<td>D638</td>
<td>Tensile Elongation at Break (%)</td>
<td>50</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>D790</td>
<td>Flexural Strength (psi)</td>
<td>15,000</td>
<td>17,000</td>
<td>39,000</td>
</tr>
<tr>
<td>D790</td>
<td>Flexural Modulus (psi)</td>
<td>450,000</td>
<td>460,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td>D695</td>
<td>Compressive Strength (psi)</td>
<td>12,500</td>
<td>16,000</td>
<td>-</td>
</tr>
<tr>
<td>D695</td>
<td>Compressive Modulus (psi)</td>
<td>420,000</td>
<td>420,000</td>
<td>-</td>
</tr>
<tr>
<td>D785</td>
<td>Hardness, Rockwell R</td>
<td>M85 / R115</td>
<td>M85 / R115</td>
<td>M101</td>
</tr>
<tr>
<td>D256</td>
<td>IZOD Notched Impact (ft-lb/in)</td>
<td>0.6</td>
<td>0.5</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>THERMAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D696</td>
<td>Coefficient of Linear Thermal Expansion (x 10⁻⁵ in./in./°F)</td>
<td>5.5</td>
<td>4.0</td>
<td>1.2</td>
</tr>
<tr>
<td>D648</td>
<td>Heat Deflection Temp (°F / °C) at 264 psi</td>
<td>200 / 93</td>
<td>200 / 93</td>
<td>482 / 250</td>
</tr>
<tr>
<td>D3418</td>
<td>Melting Temperature (°F / °C)</td>
<td>500 / 260</td>
<td>500 / 260</td>
<td>491 / 255</td>
</tr>
<tr>
<td></td>
<td>Max Operating Temp (°F / °C)</td>
<td>210 / 99</td>
<td>220 / 104</td>
<td>230 / 110</td>
</tr>
<tr>
<td>C177</td>
<td>Thermal Conductivity (BTU-in/ft²-hr-°F) (x 10⁻⁴ cal/cm-sec-°C)</td>
<td>1.7 / 5.9</td>
<td>1.7 / 5.9</td>
<td>1.7 / 5.9</td>
</tr>
<tr>
<td>UL94</td>
<td>Flammability Rating</td>
<td>V-2</td>
<td>V-2</td>
<td>HB</td>
</tr>
<tr>
<td><strong>ELECTRICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D149</td>
<td>Dielectric Strength (V/mil) short time, 1/8&quot; thick</td>
<td>400</td>
<td>350</td>
<td>530</td>
</tr>
<tr>
<td>D150</td>
<td>Dielectric Constant at 60 Hz</td>
<td>3.6</td>
<td>-</td>
<td>3.5</td>
</tr>
<tr>
<td>D150</td>
<td>Dissipation Factor at 60 Hz</td>
<td>0.02</td>
<td>-</td>
<td>0.02</td>
</tr>
<tr>
<td>D257</td>
<td>Volume Resistivity (ohm-cm) at 73°F, 50% RH</td>
<td>&gt; 10¹³</td>
<td>&gt; 10¹³</td>
<td>10¹⁵</td>
</tr>
</tbody>
</table>

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## TYPICAL PROPERTIES of CAST NYLONS

<table>
<thead>
<tr>
<th>ASTM or UL test</th>
<th>Property</th>
<th>Nylon 6 MC907,901 Unfilled</th>
<th>Nyloil Oil-Filled</th>
<th>Nylatron GSM Moly-Filled</th>
<th>Nylatron Blue Moly &amp; Oil</th>
<th>Nylatron NSM Solid-Lube</th>
</tr>
</thead>
<tbody>
<tr>
<td>D792</td>
<td>Density (lb/in³) (g/cm³)</td>
<td>0.042 1.15</td>
<td>0.042 1.16</td>
<td>0.042 1.16</td>
<td>0.042 1.15</td>
<td>0.042 1.15</td>
</tr>
<tr>
<td>D570</td>
<td>Water Absorption, 24 hrs (%)</td>
<td>0.3 7.0</td>
<td>0.5 2.5</td>
<td>0.3 7.0</td>
<td>0.22 -</td>
<td>0.25 7.0</td>
</tr>
</tbody>
</table>

### PHYSICAL

| D638 | Tensile Strength (psi) | 12,000 | 10,000 | 10,500 | 10,000 | 11,000 |
| D638 | Tensile Modulus (psi) | 400,000 | 425,000 | 400,000 | 500,000 | 410,000 |
| D638 | Tensile Elongation at Break (%) | 20 | 50 | 30 | 35 | 20 |
| D790 | Flexural Strength (psi) | 16,000 | 15,000 | 16,000 | 15,000 | 16,000 |
| D790 | Flexural Modulus (psi) | 500,000 | 425,000 | 400,000 | 425,000 | 400,000 |
| D695 | Compressive Strength (psi) | 15,000 | 13,000 | 14,000 | 13,000 | 14,000 |
| D695 | Compressive Modulus (psi) | 400,000 | 325,000 | 400,000 | 425,000 | 400,000 |
| D785 | Hardness, Rockwell R | R115 | R110 | R110 | R117 | R110 |
| D256 | IZOD Notched Impact (ft-lb/in) | 0.4 | 1.6 | 0.5 | 0.9 | 0.5 |

### THERMAL

| D696 | Coefficient of Linear Thermal Expansion (x 10⁻⁵ in./in./°F) | 3.5 | 3.5 | 3.5 | 5.9 | 5.0 |
| D648 | Heat Deflection Temp (°F / °C) at 264 psi | 200 / 93 | 350 / 177 | 200 / 93 | - | 200 / 93 |
| D3418 | Melting Temperature (°F / °C) | 420 / 215 | 450 / 232 | 420 / 215 | 420 / 215 | 420 / 215 |
| - | Max Operating Temp (°F / °C) | 200 / 93 | 230 / 110 | 200 / 93 | 200 / 93 | 200 / 93 |
| C177 | Thermal Conductivity (BTU-in/ft²-hr-°F) (x 10⁻⁴ cal/cm-sec-°C) | - | - | - | - | - |
| UL94 | Flammability Rating | HB | - | HB | - | HB |

### ELECTRICAL

| D149 | Dielectric Strength (V/mil) short time, 1/8" thick | 500 | 550 | 400 | - | 400 |
| D150 | Dielectric Constant at 60 Hz | 3.7 | 3.7 | 3.7 | - | - |
| D150 | Dissipation Factor at 60 Hz | - | - | - | - | - |
| D257 | Volume Resistivity (ohm-cm) at 73°F, 50% RH | > 10¹³ | - | > 10¹³ | > 10¹³ | > 10¹³ |

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