

## TECHNICAL DATA SHEET

### Torlon® (PAI) (polyamide-imide)

Torlon® is an ideal material for applications where extreme strength, stiffness, stability and wear-resistance are required. Torlon® polyamide-imide is recognized as the highest performance thermoplastic that is still melt processible and can withstand a 500°F continuous service temperature. Torlon® offers unmatched strength at elevated temperatures. It is stronger at 400°F than other engineering resins at room temperature. Torlon's® exceptional properties are the result of being transformed from a thermoplastic to a cross-linked thermoset during the extended curing process. Glass-reinforced and carbon fiber reinforced grades offer even greater stiffness plus enhanced thermal expansion properties.

#### TORLON® GRADES

##### Torlon® 4203 (Electrical Grade)

Torlon® 4203 extruded PAI offers excellent compressive strength and the highest elongation of the Torlon® grades. It also provides electrical insulation and exceptional impact strength. This grade is commonly used for electrical connectors and insulators due to its high dielectric strength.

##### Torlon® 4301 (Bearing Grade)

Torlon® 4301 extruded PAI is primarily used for wear and friction parts. It offers a very low expansion rate, low coefficient of friction and exhibits little or no slip-stick in use. Torlon® 4301's flexural modulus of 1,000,000 psi is higher than most other advanced engineering plastics. This grade excels in severe service wear applications such as non-lubricated bearings, seals, bearing cages and reciprocating compressor parts.

##### Torlon® 5530 (Glass-Reinforced Grade)

Torlon® 5530 is 30% glass reinforced, compression molded PAI. It is ideal for higher load structural or electronic applications. This grade is similar in composition to Torlon® 5030 PAI (injection molded). It is selected for larger shapes or when the greatest degree of dimensional control is required. Applications include burn-in sockets, gears, valve plates, impellers, rotors, terminal strips, and insulators.

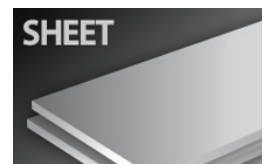
#### Benefits

- Exceptional long-term strength and stiffness
- Outstanding wear resistance
- Superior toughness from cryogenic up to 275°C
- Resistant to strong acids and most organics
- Inherent flame resistance
- Low CLTE

#### Applications

- Aircraft hardware and fasteners
- Mechanical and structural components
- Transmission and powertrain components
- Coatings, composites, additives
- Electric motor components
- Semiconductor fabrication and testing
- Oil and gas exploration and recovery equipment
- Bearing retainers
- Gears
- Bushings
- Seals
- Thrust washers

#### SHAPES AVAILABLE



#### SEE NEXT PAGE FOR ADDITIONAL INFORMATION

TORLON is a registered trademark of Solvay Advanced Polymers. DURATRON is a registered trademark of Quadrant Engineering Plastic Products.

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.



<b>TYPICAL PROPERTIES of TORLON® PAI</b>				
<b>ASTM or UL test</b>	<b>Property</b>	<b>Torlon® 4203 Elect. Grade</b>	<b>Torlon® 4301 Bearing Grade</b>	<b>Torlon® 5530 Glass-Filled</b>
<b>PHYSICAL</b>				
D792	Density (lb/in <sup>3</sup> ) (g/cm <sup>3</sup> )	0.051 1.41	0.052 1.45	0.059 1.61
D570	Water Absorption, 24 hrs (%)	0.4	0.4	0.3
<b>MECHANICAL</b>				
D638	Tensile Strength (psi)	18,000	12,000	15,000
D638	Tensile Modulus (psi)	600,000	800,000	900,000
D638	Tensile Elongation at Break (%)	10	3	3
D790	Flexural Strength (psi)	24,000	23,000	20,000
D790	Flexural Modulus (psi)	600,000	800,000	900,000
D695	Compressive Strength (psi)	24,000	22,000	27,000
D695	Compressive Modulus (psi)	700,000	950,000	600,000
D785	Hardness, Rockwell	E80(M120)	E70(M106)	E85(M125)
D256	IZOD Notched Impact (ft-lb/in)	2.0	0.8	0.7
<b>THERMAL</b>				
D696	Coefficient of Linear Thermal Expansion (x 10 <sup>-5</sup> in./in./°F)	1.7	1.4	2.6
D648	Heat Deflection Temp (°F / °C) at 264 psi	532 / 278	534 / 279	520 / 271
D3418	Glass Transition Temp (°F / °C)	527 / 275	527 / 275	527 / 275
-	Max Operating Temp (°F / °C)	500 / 260	500 / 260	500 / 260
C177	Thermal Conductivity (BTU-in/ft <sup>2</sup> -hr-°F) (x 10 <sup>-4</sup> cal/cm-sec-°C)	1.80 6.20	3.70 12.8	2.50 8.61
UL94	Flammability Rating	V-0	V-0	V-0
<b>ELECTRICAL</b>				
D149	Dielectric Strength (V/mil) short time, 1/8" thick	580	-	700
D150	Dielectric Constant at 1 MHz	4.2	6.0	6.3
D150	Dissipation Factor at 1 MHz	0.026	0.037	0.022
D257	Volume Resistivity (ohm-cm)at 50% RH	> 10 <sup>16</sup>	> 10 <sup>13</sup>	> 10 <sup>13</sup>

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