Torlon® 4301

Material Notes: Torlon 4301 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. This grade excels in severe service wear applications such as non-lubricated bearings, seals and bearing cages.

Torlon is the highest performing melt processable plastic. It has superior resistance to elevated temperatures. It is capable of performing under severe stress conditions at continuous temperatures to 500°F (260°C). Parts machined from Torlon stock shapes provide greater compressive strength and higher impact resistance than most advanced engineering plastics. Its extremely low coefficient of linear thermal expansion and high creep resistance deliver excellent dimensional stability over its entire use range. Torlon is an amorphous material with a Tg (glass transition temperature) of 537°F (280°C).

Physical Properties	Metric	English	Comments
Specific Gravity	1.45 g/cc	0.0524 lb/in³	ASTM D792
Water Absorption	0.400 %	0.400 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	1.50 %	1.50 %	Immersion; ASTM D570(2)

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell E	70.0	70.0	ASTM D785
Hardness, Rockwell M	106	106	ASTM D785
Tensile Strength, Ultimate	103 MPa	15000 psi	ASTM D638
Elongation at Break	3.00 %	3.00 %	ASTM D638
Tensile Modulus	6.21 GPa	900 ksi	ASTM D638
Flexural Modulus	5.52 GPa	800 ksi	ASTM D790
Flexural Yield Strength	159 MPa	23000 psi	ASTM D790
Compressive Strength	152 MPa	22000 psi	10% Def.; ASTM D695
Compressive Modulus	6.55 GPa	950 ksi	ASTM D695
Shear Strength	113 MPa	16400 psi	ASTM D732
Coefficient of Friction	0.200	0.200	Dry vs. Steel; QTM55007

K (wear) Factor	20.1 x 10^{-8} mm^3/N-M	10.0 x 10^{-10} in^3-min/ft-lb-hr	QTM 55010
Limiting Pressure Velocity	0.788 MPa-m/sec	22500 psi-ft/min	4:1 safety factor; QTM 55007
Izod Impact, Notched	0.427 J/cm	0.800 ft-lb/in	ASTM D256 Type A

Electrical Properties	**Metric**	**English**	**Comments**
Surface Resistivity per Square	>= 1.00e+13 ohm	>= 1.00e+13 ohm	EOS/ESD S11.11
Dielectric Constant	6.00	6.00	1MHz; ASTM D150
Dissipation Factor	0.0370	0.0370	1MHz; ASTM D150

Thermal Properties	**Metric**	**English**	**Comments**
CTE, linear 68°F	25.2 µm/m-°C	14.0 µin/in-°F	(-40°F to 300°F); ASTM E831
Thermal Conductivity	0.533 W/m-K	3.70 BTU-in/hr-ft^2-°F	ASTM F433
Maximum Service Temperature, Air	260 °C	500 °F	Long Term
Deflection Temperature at 1.8 MPa (264 psi)	279 °C	534 °F	ASTM D648
Glass Temperature	275 °C	527 °F	ASTM D3418
Flammability, UL94	V-0	V-0	1/8 inch (Estimated Rating)

Descriptive Properties		
Compliance - FDA	Not Compliant	
Machinability	5	1-10, 1=Easier to Machine
Service in Alcohols	Acceptable	
Service in Aliphatic Hydrocarbons	Acceptable	
Service in Aromatic Hydrocarbons	Acceptable	
Service in Chlorinated Solvents	Acceptable	
Service in Ethers	Acceptable	
Service in Ketones	Acceptable	
Service in Strong Acids	Limited	
Service in Strong Alkalies	Unacceptable	
Service in Sunlight	Acceptable	
Service in Weak Acids	Acceptable	
Service in Weak Alkalies	Limited	