



MANUFACTURING CORPORATION

- Plastics Machining
- Spring Energized Seals
- Rotary Lip Seals

**Material Data Sheet**

Material: Torlon® 4XCF PAI Polyamide-Imide

Torlon® 4XCF(Extruded) is 30% carbon fiber-reinforced. It offers exceptional stiffness, nonabrasive wear performance and the lowest coefficient of thermal expansion Quadrant materials. 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 Torlon PAI's extremely low coefficient of linear thermal expansion and high creep resistance deliver excellent dimensional stability over its entire service range. Torlon is an amorphous material with a Tg (glass transition temperature) of 537°F (280°C). Torlon stock shapes are post-cured using procedures developed jointly by BP Amoco and Quadrant. This eliminates the need for additional curing by the end user in most situations.

Mechanical Properties	Test Method ASTM	Value	Units
Specific Gravity, 73°F	D792	1.47	
Tensile Strength, 73°F	D638	22,000	psi
Tensile Modulus of Elasticity, °F	D638	1,200,000	psi
Tensile Elongation ( at break), 73°F	D638	2.5	%
Flexural Strength, 73°F	D790		psi
Flexural Modulus of Elasticity, 73°F	D790		psi
Shear Strength, 73°F	D732		psi
Compressive Strength, 10% Deformation, 73°F	D695	37,000	psi
Compressive Modulus of Elasticity, 73°F	D695	1,000,000	psi
Hardness, Rockwell, Scale as noted, 73°F	D785	E91	
Hardness, Durometer, Shore "D" Scale, 73°F	D2240		
Izod Impact (notched), 73°F	D256 Type A	0.9	ft-lb/in of notch
Coefficient of Friction (Dry vs. Steel) Dynamic	QTM 55007	0.3	
Limiting PV (with 4:1 safety factor applied)	QTM 55007	14,000	ft.lbs./in. <sup>2</sup> min
Wear Factor "k" x 10 <sup>-10</sup>	QTM 55010	75	in. <sup>3</sup> -min/ft.lbs.hr
<b>Thermal Properties</b>			
Coefficient of Linear Thermal Expansion (-40°F to 300°F)	E-831 (TMA)	.5 x 10 <sup>-5</sup>	in/in./°F
Heat Deflection Temperature 264 psi	D648	540	°F
TG-Glass transition (amorphous)	D3418	527	°F
Melting Point (Crystalline) peak	D3418	N/A	°F
Continuous Service Temperature in Air (Max.) (1)		500	°F
Thermal Conductivity	F433	3.6	BTU-in/hr-ft <sup>2</sup> -°F
<b>Electrical Properties</b>			
Dielectric Strength, Short Term	D149		Volts/mil
Surface Resistivity	EOS/ESD S11.11		ohm/square
Dielectric Constant, 106 Hz	D150		
Dissipation Factor, 106 Hz	D150		
Flammability @ 3.1 mm (1/8 in.)	UL 94	V-0	
FDA Compliant		No	

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\*The values shown in these and the following charts are typical, average properties. Actual values may differ due to variations in resin formulations and processing methods. These values are obtained from sources believed to be reliable, including the resin manufactures, converters and other published sources. However, they should not be used for specification or design purposes. Above information is provided by Quadrant EPP.