Torlon 4503 (Polyamide-imide)

High performance electrical grade PAI that that is commonly used in insulators and isolators is electrical applications.

General Information

Chemical Designation:

PA (Polyamide)

Fillers:

Proprietary

Color:

Tan/Light Brown

Specific Gravity:

1.45

Torlon 4503 is compression molded polyamide-imide offers exceptional properties for insulating components. It is similar in composition to Torlon 4203 which is the extruded grade of unfilled Torlon. When a component requires larger stock and cannot be extruded, 4503 is utilized. Torlon is known for its high temperature resistance, dimensional stability and machinability.

Machined with standard machining techniques, special care must be taken however to achieve close tolerances.

Annealing Torlon can be critical to the final properties of a component. Post-curing torlon removes all moisture in the part and must be done with care to reduce bubbling or warping the final components. Once post-cured, PAI components will have superior mechanical properties to uncured parts.

Technical Information

Specification	Test	Value	Units
Specific Gravity, 73°F	D792	1.4	
Tensile Strength @ Yield, 73°F	D638	18,000	psi
Tensile Modulus of Elasticity, 73°F	D638	500,000	psi
Tensile Elongation (at break), 73°F	D638	3	%
Flexural Strength, 73°F	D790	18,000	psi
Flexural Modulus of Elasticity	D790	560,000	psi
Shear Strength, 73°F	D732	16,400	psi
Compressive Strength - Ultimate			psi
Compressive Strength at 2% Deformation	D695	10,000	psi
Compressive Strength at 10% Deformation	D695	22,000	psi
Deformation Under Load			%
Compressive Modulus of Elasticity, 73°F	D695	950,000	
Compressive Strength to Laminate (Modulus)			psi
Compressive Strength to Laminate (Yield)			psi
Compressive Strength to Laminate (Ultimate)		10,000	psi
Hardness, Durometer (Shore "D" scale)	D2240		
Hardness, Rockwell (Scale as noted)	D785	M106	Rockwell M
Izod Impact, Notched @ 73°F	D256 Type A	.8	ft.lbs/in. of notch
Coefficient of Friction (Dry vs Steel) Static	PTM55007	.25	
Coefficient of Friction (Dry vs Steel) Dynamic	PTM55007	.2	
Maximum Static Bearing Load (P)	PTM55007	1,000	psi
Maximum Unlubricated No Load Bearing Velocity (V)	PTM55007	900	ft/minute
Maximum Limiting PV (Unlubricated)	PTM55007	50,000	psi x ft/min.
Wear Factor "K" x 10-10	PTM55010	300	Cubic in.-min/ft.lbs.hr
Sand Wheel Wear/Abrasion Test			UHMW=100
Minimum Mating Surface Hardness			Rockwell (Brinnell)
Coefficient of Linear Thermal Expansion	E-831(TMA)	1.4	in/in/°F x 10-5
Coefficient of Thermal Expansion // to Laminates	E-831(TMA)	1.4	in/in/°F x 10-5
Coefficient of Thermal Expansion l to Laminates	E-831(TMA)	1.4	in/in/°F x 10-5
Softening Point			°F
Heat Deflection Temperature 264 psi	D648	534	°F
Embrittlement Temperature			°F Min.
Continuous Service Temperature in Air		500	°F Max.
Short Term Service Temperature		500	°F Max.
Tg-Glass Transition (Amorphous)	D3418	527	°F
Melting Point (Crystalline Peak)	D3418	N/A	°F
Thermal Conductivity	F433	3.7	BTU-in/(hr/ft2°F)
Dielectric Strength Short Term	D149		Volts/mil
Volume Resistivity	D257		ohm/cm
Surface Resistivity	D257	>1013	ohm/cm
Dielectric Constant, 106 Hz	D150	5.4	
Dissipation Factor, 106 Hz	D150	.037	
Flammability @ 3.1mm(1/8 in.) UL94	UL94	V-O	
Arc Resistance			seconds
Water Absorption, Immersion 24 Hours	D570 (2)	.4	%
Water Absorption, Immersion Saturation	D570 (2)	1.5	%
Machinability Rating		3	1=easy, 10=difficult
Rod Diameter Availability (Off the Shelf)	1	3.0	inches
Sheet Thickness Availability (Off the Shelf)	.25	1.00	inches
Characteristics / Attributes	Excellent Bearing and Wear Properties, High Temp, Low Expansion Rate, Self-Lubricating		