



THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

Polyimide (PI) Series

Polymer Structure Performance

PI (Polyimide) can be a thermoset composite (NEMA G-15) or thermoplastic. PI thermoplastic is comprised of extra long chain polymers held by strong intermolecular forces instead of cross-linked. It can be unfilled thermoplastic (Kapton™ tape or Vespel® sheet) or filled to improve and optimize properties. Vespel is normally used in aerospace, semiconductors, and transportation technology. It combines heat resistance, lubricity, dimensional stability, chemical resistance, and creep resistance. It can be used in extreme heat (up to 300°C) and hostile environmental conditions.

The Gund Company custom fabricates insulation materials to the exact specifications and drawings specified by our customers. We offer our customers the proper product for their specific application. A variety of dimensions and diameter sizes are available. Product colors vary according to material type.

PROPERTIES	ASTM*		TYPICAL VALUES					
	Test Method	Units	Unfilled	15% Graphite	40% Graphite	10% PTFE 15% Graphite	15% Moly	
PHYSICAL	Water Absorption: 24 hrs. @ 73°F	ASTM D570	%	0.24	0.19	0.14	0.21	0.23
	Water Absorption: 48 hrs. @ 73°F	ASTM D570	%	0.72	0.57	0.42	0.49	0.65
	Water Absorption: Saturation, 50% RH @ 73°F	ASTM D570	%	1.0 - 1.3	0.8 - 1.1			
	Specific Gravity @ 73°F	ASTM D792		1.43	1.51	1.65	1.55	1.60
	Poissons Ratio @ 73°F			0.41	0.41			
THERMAL	CLTE: From 73°F to 500°F	ASTM D696	µin./in.-°F	30.0	27.0	21.0	54.0	52.0
	CLTE: From -80°F to 73°F	ASTM D696	µin./in.-°F	25.0	19.0			
	Thermal Conductivity @ 104°F		W/m/°C	0.35	0.87	1.73	0.76	0.47
	Specific Heat		J/kg/°C					
	Deformation Under 14 MPa Load (122°F)	ASTM D621	%	0.14	0.10	0.08	0.13	0.12
	Heat Deflection Temperature (2 MPa)	ASTM D648	°C	360	360			
Flammability: Oxygen Index	ASTM D2863	%	53	49				
MECHANICAL	Ultimate Tensile Strength @ 73°F / 500°F	ASTM D1708	KSI	12.5 / 6.0	9.5 / 5.5	7.5 / 3.4	6.5 / 3.5	8.5 /
	Elongation @ Break @ 73°F / 500°F	ASTM D1708	%	7.5 / 6.0	4.5 / 3.0	3.0 / 2.0	3.5 / 3.0	4.0 /
	Flexural Strength @ 73°F / 500°F	ASTM D790	KSI	16.0 / 9.0	16.0 / 9.0	13.0 / 6.5	10.0 / 5.0	11.0 / 5.8
	Flexural Modulus @ 73°F / 500°F	ASTM D790	KSI	450 / 250	550 / 370	700 / 400	450 / 200	475 / 270
	Compressive Stress at 1% Strain @ 73°F	ASTM D695	KSI	3.6	4.2	4.6	3.0	5.0
	Compressive Stress at 10% Strain @ 73°F	ASTM D695	KSI	19.3	19.3	16.3	14.8	18.5
	Compressive Stress at 0.1% Offset @ 73°F	ASTM D695	KSI	7.4	6.6	6.0	5.4	
	Compressive Modulus, 73°F	ASTM D695	KSI	350	420	475	300	350
	Axial Fatigue at 10 ³ cycles 73°F / 500°F		KSI	8.10 / 3.8	6.7 / 3.3			
	Axial Fatigue at 10 ⁷ cycles 73°F / 500°F		KSI	6.1 / 2.4	4.7 / 2.4			
	Flexural Fatigue at 10 ³ cycles 73°F		KSI	9.5	9.5			
	Flexural Fatigue at 10 ⁷ cycles 73°F		KSI	6.5	6.5			
	Shear Strength @ 73°F	ASTM D732	KSI	13.0	11.2			
	IZOD Impact Strength @ 73°F - Notched	ASTM D256	J/m	42.7	42.7			
	IZOD Impact Strength @ 73°F - Unnotched	ASTM D256	J/m	747	320			
Friction Coefficient: In Vacuum / Static in Air			-- / 0.29	-- / 0.30	-- / 0.27	-- / 0.20	0.03 /	
Wear (K) Factor		m/s 10 ⁻¹⁰	17 - 85	6.3	4.2	4.9	17 - 23	
ELECTRICAL	Dielectric Constant at 10 ² Hz @ 73°F	ASTM D150		3.62	13.53			
	Dielectric Constant at 10 ⁶ Hz @ 73°F	ASTM D150		3.64	13.28			
	Dielectric Constant at 10 ⁸ Hz @ 73°F	ASTM D150		3.55	13.41			
	Dissipation Factor at 10 ² Hz @ 73°F	ASTM D150		0.0018	0.0053			
	Dissipation Factor at 10 ⁴ Hz @ 73°F	ASTM D150		0.0036	0.0067			
	Dissipation Factor at 10 ⁶ Hz @ 73°F	ASTM D150		0.0034	0.0106			
	Dielectric Strength Short Time 2 mm Thick @ 73°F	ASTM D149	MV/m	3.2	1.4			
	Volume Resistivity @ 73°F	ASTM D257	Ohm*m	10 ¹⁴ - 10 ¹⁵	10 ¹² - 10 ¹³			
	Surface Resistivity @ 73°F	ASTM D257	Ohm	10 ¹⁵ - 10 ¹⁶				

The data supplied are typical values. They are not to be considered specification values. All of the information, suggestions, and recommendations about these properties and uses of the products herein are based on tests and data believed to be accurate; however, the final determination regarding the suitability of any material described herein for the contemplated application, the manner of such use, and whether the use infringes any patents is the sole responsibility of the user. There is no warranty - expressed or implied - including, without limitation, warranties of merchantability or fitness for a particular purpose. Under no circumstances shall we be liable for incidental or consequential loss or damage.