



THE GUND COMPANY

MANUFACTURERS & FABRICATORS OF ENGINEERED MATERIAL SOLUTIONS

PAI Series

Amorphous Imidized Plastic

PAI (Polyamide-imide) is a high-performance thermoplastic and part of the imide family (containing the O=C-N-C=O group). Other members of this family are PEI (Polyetherimide) and BMI/Poly-BMI (Bismaleimide). It offers exceptionally impressive strength under load at high temperatures, maintains rigidity, and resists deformation under static load over time with its superior compressive strength and creep resistance. PAI resists wear, chemicals, and high-energy radiation. Its extraordinary performance profile makes it ideal for applications in the most severe service environments. Tecapai™ is a commercial grade of PAI.

UNFILLED PAI

- Good electrical insulation properties
- Excellent dimensional stability
- High toughness and impact strength

APPLICATIONS

- Applications where large geometries are required such as dies or thermal insulators

GLASS REINFORCED PAI

- High rigidity, retention of stiffness, a low expansion rate, and outstanding load-carrying capabilities

APPLICATIONS

- Ideal for structural applications within the semiconductor, electronics, and aerospace industries

HIGH-TEMP. REINFORCED PAI

- High stiffness, strength, and creep resistance
- Available in larger geometries
- Exhibits superior dimensional stability up to 482°F / 250°C

APPLICATIONS

- Ideal for structural applications meant to support high static loads for extended periods – especially at high temperatures
- Favored solution for precision parts in the semiconductor and electronics industry

UNFILLED AE PAI

- Most superior impact strength of all PAI grades
- Highest elongation of all grades
- Intrinsic high-temperature resistance
- Exceptional machinability

APPLICATIONS

- Used in high-tech equipment precision parts including linkages and seal rings
- Aerospace where applications involve impact loading and abrasive wear

FRICTION MODIFIED PAI

- Very low expansion rate and coefficient of friction
- Exhibits little to no slip-stick in use
- Higher wear resistance compared to Unfilled AE

APPLICATIONS

- Non-lubricated bearings, seals, bearing cages, and reciprocating compressor parts

ISO/IEC								ASTM							
PROPERTIES		Test Method	Units	Unfilled	Glass Reinforced	High-Temperature Reinforced	Unfilled AE	Friction Modified AE	Test Method	Units	Unfilled	Glass Reinforced	High-Temperature Reinforced	Unfilled AE	Friction Modified AE
PHYSICAL	Density	ISO 1183-1	g/cm³	1.41	-	1.61	1.41	1.45							
	Specific Gravity								ASTM D792		1.40	1.60	1.61	1.40	1.45
	Water Absorption: 24 hrs. in water at 73°F	ISO 62	%	0.35	-	0.26	0.35	0.30	ASTM D 570	%	0.35	0.30	0.30	0.40	0.40
	Water Absorption: Saturation in water at 73°F		%	4.40	-	3.20	4.40	3.80	ASTM D 570	%	1.70	1.50	1.50	1.70	1.50
	Wear Rate	ISO 7148-2	µm/km	5	-	-	5	1	QTM 55010	ln³·min/ft·lbs·hr·10 ⁻¹⁰	500	-	-	35	10
	Coefficient of Friction: Dynamic	ISO 7148-2		0.35 - 0.60	-	0.35 - 0.60	0.35 - 0.60	0.25 - 0.40	QTM 55007		0.3	-	0.2	0.4	0.2
	Limiting PV at 100 FPM		MPa·m/s	-	-	-	-	-	QTM 55007	ft·lbs/in²·min	4,000	-	20,000	12,000	40,000
	Limiting PV at 0.1 / 1 (m/s)		MPa·m/s	0.32 / 0.20	-	-	0.32 / 0.20	1.10 / 0.69							
THERMAL	Glass Transition Temperature (DMA- Tanδ)		°C	280	-	280	280	280	ASTM E 831 (TMA)	°F	527	527	527	527	527
	Thermal Conductivity at 23°C (73°F)		W/m·K	0.26	-	0.36	0.26	0.54		BTU·in/ft²·hr·°F	1.80	2.50	2.50	1.80	3.70
	CLTE (-40 to 150°C) (-40 to 300°F)									µin/in·°F	15	9	26	21	14
	CLTE (23 to 100°C) (73 to 210°F)		µm/m·°K	40	-	35	40	35							
	CLTE (23 to 150°C) (73 to 300°F)		µm/m·°K	40	-	35	40	35							
	CLTE (>150°C) (>300°F)		µm/m·°K	50	-	40	50	40							
	Heat Deflection Temperature (264 PSI)	ISO 75-1/-2	°C	280	-	280	280	280		°F	532	530	520	532	534
	Continuous Service Temperature in Air: 20 hrs.		°C	250	-	250	250	250		°F	500	500	500	500	500
	Min. Service Temperature		°C	-20	-	-20	-50	-20		°F	-	-	-	-	-
MECHANICAL	Flammability: UL94 (3 mm (1/8 in.))			V-0	V-0	V-0	V-0	V-0			V-0	V-0	V-0	V-0	V-0
	Flammability: Oxygen Index	ISO 4589-1/-2	%	44	-	50	45	45							
	Ultimate Tensile Strength	ISO 527-1/-2	MPa	150	-	125	150	110	ASTM D 638	PSI	16,000	23,000	11,500	20,000	15,000
	Tensile Strain at Yield	ISO 527-1/-2	%	9	-	-	9	-	ASTM D 638	%	13.10	-	-	10.10	6.60
	Tensile Strain at Break	ISO 527-1/-2	%	20	-	3	20	5	ASTM D 638	%	14.40	4.00	3.00	29.20	6.80
	Tensile Modulus of Elasticity	ISO 527-1/-2	MPa	4,200	-	6,400	4,200	5,500	ASTM D 638	KSI	500	1,000	900	600	900
	Shear Strength			124	-	-	110	113	ASTM D 732	PSI	18,000	-	-	16,000	16,400
	Compressive Stress: 1% nominal strain	ISO 604	MPa	34	-	55	34	39							
	Compressive Stress: 2% nominal strain	ISO 604	MPa	67	-	104	67	72							
	Compressive Stress: 5% nominal strain	ISO 604	MPa	135	-	190	135	130							
	Compressive Strength								ASTM D 695	PSI	22,000	40,000	27,000	24,000	22,000
	Charpy Impact Strength: Unnotched	ISO 179-1/1eU	kJ/m²	NB	-	30	NB	45							
	Charpy Impact Strength: Notched	ISO 179-1/1eA	kJ/m²	15	-	3.50	15	4							
	IZOD Impact Strength: Notched	ISO 180	kJ/m²	-	-	-	-	-	ASTM D 256	ft·lb/in	1.50	1	0.70	2	0.80
	Flexural Strength	ISO 178	MPa	178	-	170	178	155	ASTM D 790	PSI	18,000	30,000	20,000	24,000	23,000
ELECTRICAL	Flexural Modulus								ASTM D 790	KSI	600	980	900	600	800
	Rockwell Hardness: M Scale								ASTM D 785		119	-	125	120	106
	Dielectric Strength	IEC 60243-1	kV/mm	24	-	28	24	-	ASTM D 149	V/mil	600	700	700	580	-
	Volume Resistivity	IEC 62631-3-1	Ohm·cm	10 ¹³	-	10 ¹³	10 ¹³	10 ¹²	ASTM D 257	Ohm·cm	-	-	-	-	-
	Surface Resistivity								ANSI/ESD STM 11.11	Ohms/sq	10 ¹²	10 ¹²	10 ¹²	10 ¹⁵	10 ¹²
	Dielectric Constant at 1 MHz	IEC 62631-2-1		3.90	-	4.20	3.90	5.40	ASTM D 150		4.20	-	6.30	4.20	6
	Dissipation Factor at 1 MHz	IEC 62631-2-1		0.03	-	0.05	0.03	0.04	ASTM D 150		0.03		0.05	0.03	0.04

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.

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.