

TYPICAL PROPERTIES OF POLYIMIDES (PI)

ASTM Test	Property	SHAPES		MOLDINGS		
		Unfilled	Filler			Laminates
			Glass Fiber	25% Graphite Powder	15% Graphite Powder	
PHYSICAL						
D792	Specific gravity	1.34	1.9	1.45	1.51	1.95
D792	Specific volume (in ³ /lb)	—	14.5	19.0	18.3	14.1
D570	Water absorption, 24 h, 1/8-in thk (%)	0.62	0.2	0.6	0.2	0.3
MECHANICAL						
D638	Tensile strength (psi)					
	At 70°F	20,300	27,000	5,700	9,500	50,000
	At 480°F	16,000	23,000	3,600	5,500	35,000
D638	Elongation (%)	9	<1	<1	4.5	<1
D790	Flexural strength (psi)					
	At 70°F	29,700	50,000	12,800	16,000	70,000
	At 480°F	24,000	36,000	9,200	9,000	50,000
D790	Flexural modulus (10 ⁵ psi)					
	At 70°F	58.0	32.5	9	5.5	40
	At 480°F	44.0	24.2	7.5	3.7	32
D256	Impact strength, Izod (ft-lb/in of notch)	0.6	17	0.25	0.8	13
D785	Hardness, Rockwell M	120	120	110	88	—
THERMAL						
C177	Thermal conductivity (Btu-in/hr-ft ² -°F)	—	3.48	11.3	6.0	2.2
D696	Coefficient of thermal expansion (10 ⁻⁶ in/in-°C)	2.8	1.4	3.4	4.7	1
D648	Deflection temperature (°F)					
	At 264 psi	600	660	550	680	660
ELECTRICAL						
D149	Dielectric strength (V/mil)					
	Short time, 1/8-in thk	500	500	—	250	625
D150	Dielectric constant					
	At 1 kHz	—	4.7	—	13.3	4.5
D150	Dissipation factor					
	At 1 kHz	—	0.003	—	0.006	0.015
D257	Volume resistivity (ohm-cm)					
	At 73°F, 50% RH	10 ¹⁸	5×10 ¹⁵	—	10 ¹⁴	6×10 ¹⁴
D495	Arc resistance (s)					
			180	—	—	180
FRICTIONAL						
—	Coefficient of friction					
	Against steel, PV=10,000	—	—	0.24	0.24	—

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ISO Test	Property	SHAPES		MOLDINGS		
		Unfilled	Filler			
			Glass Fiber	25% Graphite Powder	15% Graphite Powder	Laminates
PHYSICAL						
ISO1183	Specific gravity	1.34	1.9	1.45	1.51	1.95
ISO1183	Specific volume (cm ³ /g)	—	0.524	0.684	0.659	0.507
ISO62	Water absorption, 24 h, 3.1 mm thk (%)	0.62	0.2	0.6	0.2	0.3
MECHANICAL						
ISO527	Tensile strength (MPa)					
	At 21°C	72-86	186	39.3	62-65.5	344.7
	At 250°C	36-42	158.6	24.8	30-37.9	241.3
ISO527	Elongation (%)	7.5	<1	<1	4.5-5.5	<1
ISO178	Flexural strength (MPa)					
	At 21°C	82-110	344.7	88.2	82-110.3	482.6
	At 250°C	44-62	248.2	63.4	48-62.1	344.7
ISO178	Flexural modulus (10 ³ MPa)					
	At 21°C	2.4-3.1	22.1	6.2	3.1-3.8	27.6
	At 250°C	1.4-1.7	16.5	5.2	1.7-2.5	22.1
ISO180	Notched Izod impact strength (J/m)	42	907	13	43	694
ISO2039	Hardness, Rockwell M	120	120	110	88	—
THERMAL						
ISO8302	Thermal conductivity (W/(mK))	0.29	0.35	—	0.46-0.87	—
ISO11359	Coefficient of thermal expansion (10 ⁻⁴ m/m-°C)	0.50	0.25	0.61	0.27-0.38	0.18
ISO75	Deflection temperature (°C)					
	At 1.80 MPa	316	349	288	360	349
ELECTRICAL						
IEC243	Dielectric strength (kV/mm)					
	Short time, 3.1 mm thk	19.7	19.7	—	9.8	24.6
IEC250	Dielectric constant					
	At 1 kHz	3.63	4.7	—	13.3	4.5
IEC250	Dissipation factor					
	At 1 kHz	0.003	0.003	—	0.006	0.015
IEC93	Volume resistivity (ohm-cm)					
	At 21°C, 50% RH	10 ¹⁸	5×10 ¹⁵	—	10 ¹² -10 ¹⁴	6×10 ¹⁴
ASTM D495	Arc resistance (s)		180	—	—	180
FRICTIONAL						
—	Coefficient of friction					
	Against steel, PV=10,000	—	—	0.24	0.24	—