Polyesters, Thermoplastic

TYPICAL PROPERTIES OF THERMOPLASTIC POLYESTERS

ASTM or UL Test	Property	Unreinforced Resin	20 to 30% Glass Reinforced
	PHYSICAL		
D792	Specific gravity	1.31-1.43	1.49-1.56
D792	Specific volume (in^3/lb)	21.1-19.4	17.1-16.4
D570	Water absorption, 24 h, 1/8-in thk (%)	0.08-0.09	0.07
	MECHANICAL		
D638	Tensile strength (psi)	8,000	16,500-23,000
D638	Elongation (%)	5-300	1-3
D638	Tensile modulus (10^5 psi)	2.8	12-17
D790	Flexural strength (psi)	12,000-14,000	24,000-33,000
D790	Flexural modulus (10^5 psi)	2.8-4.0	11-14
D256	Impact strength, Izod (ft-lb/in of notch)	0.5	1.0-2.6
D671	Fatigue endurance limit, 10^7 cycles (psi)	2,850-3,500	4,000-5,000
D785	Hardness, Rockwell M	65-80	90-100
	THERMAL		
C177	Thermal conductivity (Btu-in/hr-ft^2-°F)	1.1-1.7	1.3-9.0
D696	Coefficient of thermal expansion (10^{-5} in/in-°F)	4.3-8.9	1.3-5.4
D648	Deflection temperature (°F)		
	At 264 psi	122-150	395-435
	At 66 psi	302-354	435-475
UL 94	Flammability rating	HB to V-O	HB to V-O and 5 V
	ELECTRICAL		
D149	Dielectric strength (V/mil)		
	Short time, 1/8-in thk	420-450	480-560
D150	Dielectric constant		
	At 1 kHz	3.2-3.4	3.6-3.7
D150	Dissipation factor		
	At 1 kHz	0.0014-0.0006	0.002-0.003
D257	Volume resistivity (ohm-cm)		
	At 73°F, 50% RH	10^{15}-10^{16}	5-10×10^{15}
D495	Arc resistance (s)	110-130	80-130
	FRICTIONAL		
—	Coefficient of friction		
	Self	0.12-0.20	0.12-0.22
	Against steel	0.10-0.23	0.12-0.13

Ref: Machine Design – 1985

TYPICAL PROPERTIES OF THERMOPLASTIC POLYESTERS

ISO or UL Test	Property	Unreinforced Resin	20 to 30% Glass Reinforced
	PHYSICAL		
ISO1183	Specific gravity	1.31-1.43	1.49-1.56
ISO1183	Specific volume (cm^3/g)	0.759-0.698	0.615-0.554
ISO62	Water absorption, 24 h, 3.1 mm thk (%)	0.08-0.09	0.07
	MECHANICAL		
ISO527	Tensile strength (MPa)	55.16	113.76-158.58
ISO527	Elongation (%)	5-300	1-3
ISO527	Tensile modulus (10^3 MPa)	1.93	8.3-11.7
ISO178	Flexural strength (MPa)	82.74-96.53	165.47-227.53
ISO178	Flexural modulus (10^3 MPa)	1.93-2.76	7.58-9.65
ISO180	Notched izod impact strength (J/m)	27	53-139
ASTM D671	Fatigue endurance limit, 10^7 cycles (bar)	196	275-344
ISO2039	Hardness, Rockwell M	65-80	90-100
	THERMAL		
ASTM C177	Thermal conductivity (W/mK)		
ISO11359	Coefficient of thermal expansion (10^{-4} m/m-°C)	0.77-1.60	0.23-0.97
ISO75	Deflection temperature (°C)		
	At 1.80 MPa	50-66	202-224
	At 0.45 MPa	150-179	224-246
UL 94	Flammability rating	HB to V-O	HB to V-O and 5 V
	ELECTRICAL		
IEC243	Dielectric strength (kV/mm)		
	Short time, 3.1 mm thk	16.5-17.7	18.9-22.0
IEC250	Dielectric constant		
	At 1 kHz	3.2-3.4	3.6-3.7
IEC250	Dissipation factor		
	At 1 kHz	0.0014-0.0006	0.002-0.003
IEC93	Volume resistivity (ohm-cm)		
	At 23°C, 50% RH	10^{15}-10^{16}	5-10×10^{15}
D495	Arc resistance (s)	110-130	80-130
	FRICTIONAL		
—	Coefficient of friction		
	Self	0.12-0.20	0.12-0.22
	Against steel	0.10-0.23	0.12-0.13

Ref: Machine Design – 1985