MITSUBISHI CHEMICAL ADVANCED MATERIALS

Mitsubishi Chemical Advanced Materials Semitron® ESd 480 PEEK, static dissipative, (ASTM Product Data Sheet)

Categories: Polymer; Thermoplastic; Polyketone; Polyetheretherketone (PEEK); Polyetheretherketone, PEEK, Unreinforced

Material Notes: This PEEK based static dissipative material provides a dissipative range of 10E+6 - 10E+9 ohms/sq. Semitron® ESd 480 is very dimensionally stable, making it ideal for critical test fixture applications. Its exceptional chemical resistance makes it well suited for use in wafer handling and other structural applications in wet process tools where static dissipation is important. Like all Quadrant Semitron® ESd materials, Semitron ESd480 is not subject to dielectric breakdown.

Quadrant Engineering Plastic Products is now Mitsubishi Chemical Advanced Materials.

Physical Properties	Metric	English	Comments
Specific Gravity	1.47 g/cc	1.47 g/cc	ASTM D792
Water Absorption	0.18 %	0.18 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	1.65 %	1.65 %	Immersion; ASTM D570(2)

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell M	107	107	ASTM D785
Hardness, Rockwell R	122	122	ASTM D785
Tensile Strength	100 MPa	14500 psi	ASTM D638
Tensile Strength at 150°C (300°F)	13.8 MPa	2000 psi	ASTM D638
Tensile Strength at 65°C (150°F)	82.7 MPa	12000 psi	ASTM D638
Elongation at Break	1.5 %	1.5 %	ASTM D638
Tensile Modulus	6.48 GPa	940 ksi	ASTM D638
Flexural Strength	145 MPa	21000 psi	ASTM D790
Flexural Modulus	6.89 GPa	1000 ksi	ASTM D790
Compressive Strength	183 MPa	26500 psi	10% Def.; ASTM D695
Compressive Modulus	3.93 GPa	570 ksi	ASTM D695
Izod Impact, Notched	0.534 J/cm	1.00 ft-lb/in	ASTM D256 Type A
Coefficient of Friction, Dynamic	0.20	0.20	Dry vs. Steel; QTM55007
K (wear) Factor	403 x 10^{-8} mm³/N-M	200 x 10^{-10} in³-min/ft-lb-hr	QTM 55010
Limiting Pressure Velocity	1.26 MPa-m/sec	36000 psi-ft/min	4:1 safety factor; QTM 55007

Electrical Properties	Metric	English	Comments
Surface Resistivity per Square	1.00e+6 - 1.00e+9 ohm	1.00e+6 - 1.00e+9 ohm	EOS/ESD S11.11
Dielectric Constant	10.9 @Frequency 1e+6 Hz	10.9 @Frequency 1e+6 Hz	ASTM D150
Dissipation Factor	0.518 @Frequency 1e+6 Hz	0.518 @Frequency 1e+6 Hz	ASTM D150

Thermal Properties	Metric	English	Comments
CTE, linear	30.6 µm/m-°C @Temperature -40.0 - 149 °C	17.0 µin/in-°F @Temperature -40.0 - 300 °F	ASTM E831
Melting Point	340 °C	644 °F	Crystalline, Peak; ASTM D3418
Maximum Service Temperature, Air	246 °C	475 °F	Long Term
Deflection Temperature at 1.8 MPa (264 psi)	260 °C	500 °F	ASTM D648
Flammability, UL94	V-0 @Thickness 3.17 mm	V-0 @Thickness 0.125 in	Estimated Rating

Compliance Properties	Metric	English	Comments
3A-Dairy	No	No	
Canada AG	No	No	
FDA	No	No	
NSF	No	No	
USDA	No	No	
USP Class VI	No	No	

Chemical Resistance Properties	Metric	English	Comments
Acids, Strong (pH 1-3)	Limited	Limited	
Acids, Weak	Acceptable	Acceptable	
Alcohols	Acceptable	Acceptable	
Alkalies, Strong (pH 11-14)	Acceptable	Acceptable	
Alkalies, Weak	Acceptable	Acceptable	
Chlorinated Solvents	Acceptable	Acceptable	
Conductive / Static Dissipative	Yes	Yes	

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Continuous Sunlight	Acceptable	Acceptable	
Hot Water / Steam	Acceptable	Acceptable	
Hydrocarbons - Aliphatic	Acceptable	Acceptable	
Hydrocarbons - Aromatic	Acceptable	Acceptable	
Inorganic Salt Solutions	Acceptable	Acceptable	
Ketones, Esters	Acceptable	Acceptable	

Descriptive Properties			
Machinability		4	1-10, 1=Easier to Machine