

Mitsubishi Chemical Advanced Materials Semitron® CMP LL5 Polyester (ASTM Product Data Sheet)
Categories: Polymer; Thermoplastic; Polyester, TP

Material Notes: Enhanced semi-crystalline polyester product for extended service in CMP retaining rings. Superior performance, especially in oxide processes, and cost effective relative to standard ring materials. Recommended for use in reinforced designs.

- 1 Long life material - up to 5x PPS
- 1 Ideal for CMP applications up to 140°F (60°C)
- 1 Best performance in oxide chemistries - up to 8x PPS

Quadrant Engineering Plastic Products is now Mitsubishi Chemical Advanced Materials.

Physical Properties	Metric	English	Comments
Specific Gravity	1.44 g/cc	1.44 g/cc	ASTM D792
Water Absorption	0.060 %	0.060 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	0.47 %	0.47 %	ASTM D 570(2)
Outgassing - Total Mass Loss	0.15 %	0.15 %	ASTM E595
Collected Volatile Condensable Material	0.00 %	0.00 %	

Chemical Properties	Metric	English	Comments
Ionic Impurities - Na (Sodium)	18 ppm	18 ppm	ICP/MS
Ionic Impurities - K (Potassium)	1.1 ppm	1.1 ppm	ICP/MS
Ionic Impurities - Fe (Iron)	1.6 ppm	1.6 ppm	ICP/MS

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell M	94	94	ASTM D785
Tensile Strength	72.4 MPa	10500 psi	ASTM D638
Elongation at Break	5.0 %	5.0 %	ASTM D638
Tensile Modulus	3.45 GPa	500 ksi	ASTM D638
Flexural Strength	96.5 MPa	14000 psi	ASTM D790
Flexural Modulus	2.48 GPa	360 ksi	ASTM D790
Compressive Strength	105 MPa	15300 psi	10% Def.; ASTM D695
Compressive Modulus	2.76 GPa	400 ksi	ASTM D695
Shear Strength	58.6 MPa	8500 psi	ASTM D732
Izod Impact, Notched	0.21 J/cm	0.40 ft-lb/in	ASTM D256
Coefficient of Friction, Dynamic	0.19	0.19	dry vs. steel; QTM55007
K (wear) Factor	70.5 x 10 ⁻⁸ mm ³ /N-M	35.0 x 10 ⁻¹⁰ in ³ -min/ft-lb-hr	QTM 55010
Limiting Pressure Velocity	0.210 MPa-m/sec	6000 psi-ft/min	4:1 safety factor applied; QTM 55010

Electrical Properties	Metric	English	Comments
Surface Resistivity per Square	>= 1.00e+13 ohm	>= 1.00e+13 ohm	ASTM D257
Dielectric Constant	3.6 @Frequency 1e+6 Hz	3.6 @Frequency 1e+6 Hz	EOS/ESD S11.11
Dissipation Factor	0.0020 @Frequency 1e+6 Hz	0.0020 @Frequency 1e+6 Hz	ASTM D150

Thermal Properties	Metric	English	Comments
CTE, linear	81.0 µm/m-°C @Temperature -40.0 - 300 °C	45.0 µin/in-°F @Temperature -40.0 - 572 °F	ASTM E831
Thermal Conductivity	0.274 W/m-K	1.90 BTU-in/hr-ft ² -°F	
Melting Point	255 °C	491 °F	ASTM D3418
Maximum Service Temperature, Air	98.9 °C	210 °F	Continuous
Deflection Temperature at 1.8 MPa (264 psi)	82.2 °C	180 °F	ASTM D648
Flammability, UL94	HB @Thickness 3.17 mm	HB @Thickness 0.125 in	

Chemical Resistance Properties	Metric	English	Comments
Conductive / Static Dissipative	No	No	