

Mitsubishi Chemical Advanced Materials TIVAR® Oil Filled UHMW-PE FDA/USDA (ASTM Product Data Sheet)
Categories: Polymer; Thermoplastic; Polyethylene (PE); High Density (HDPE); High Density Polyethylene (HDPE), UHMW PE Ultra High Molecular Weight

Material Notes: Quadrant Engineering Plastic Products is now Mitsubishi Chemical Advanced Materials.

Physical Properties	Metric	English	Comments
Specific Gravity	0.935 g/cc	0.935 g/cc	ASTM D792
Water Absorption	<= 0.010 %	<= 0.010 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	<= 0.010 %	<= 0.010 %	Immersion; ASTM D570(2)

Mechanical Properties	Metric	English	Comments
Hardness, Shore D	64	64	ASTM D2240
Tensile Strength	44.8 MPa	6500 psi	ASTM D638
Tensile Strength at 65°C (150°F)	2.76 MPa	400 psi	ASTM D638
Elongation at Break	280 %	280 %	ASTM D638
Tensile Modulus	0.300 GPa	43.5 ksi	ASTM D638
Flexural Strength	17.2 MPa	2500 psi	ASTM D790
Flexural Modulus	0.400 GPa	58.0 ksi	ASTM D790
Compressive Strength	18.6 MPa	2700 psi	10% Def.; ASTM D695
Compressive Modulus	0.290 GPa	42.0 ksi	ASTM D695
Izod Impact, Notched	NB	NB	ASTM D256 Type A
Coefficient of Friction, Dynamic	0.14	0.14	Dry vs. Steel; QTM55007
Sand Slurry	13	13	1018 Steel = 100
Limiting Pressure Velocity	0.140 MPa-m/sec	4000 psi-ft/min	4:1 safety factor; QTM 55007

Electrical Properties	Metric	English	Comments
Surface Resistivity per Square	>= 1.00e+15 ohm	>= 1.00e+15 ohm	ASTM D257
Dielectric Constant	2.3 @Frequency 1e+6 Hz	2.3 @Frequency 1e+6 Hz	ASTM D150
Dielectric Strength	90.6 kV/mm	2300 kV/in	Short Term; ASTM D149
Dissipation Factor	0.00050 @Frequency 1e+6 Hz	0.00050 @Frequency 1e+6 Hz	ASTM D150

Thermal Properties	Metric	English	Comments
CTE, linear	198 µm/m-°C @Temperature -40.0 - 149 °C	110 µin/in-°F @Temperature -40.0 - 300 °F	ASTM E831
Thermal Conductivity	0.409 W/m-K	2.84 BTU-in/hr-ft²-°F	
Melting Point	135 °C	275 °F	Crystalline, Peak; ASTM D3418
Maximum Service Temperature, Air	82.2 °C	180 °F	Long Term
Deflection Temperature at 1.8 MPa (264 psi)	46.7 °C	116 °F	ASTM D648
Flammability, UL94	HB @Thickness 3.17 mm	HB @Thickness 0.125 in	Estimated Rating

Compliance Properties	Metric	English	Comments
3A-Dairy	No	No	
Canada AG	No	No	
FDA	Yes	Yes	
NSF	No	No	
USDA	Yes	Yes	
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	No	No	
Continuous Sunlight	Limited	Limited	
Hot Water / Steam	Limited	Limited	
Hydrocarbons - Aliphatic	Acceptable	Acceptable	
Hydrocarbons - Aromatic	Unacceptable	Unacceptable	

Inorganic Salt Solutions	Acceptable	Acceptable
Ketones, Esters	Limited	Limited
Descriptive Properties		
Color	Brown / Gray	
Machinability	3	1-10, 1=Easier to Machine



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