

**Quadrant EPP Proteus® HDPE - High Density Polyethylene**
**Categories:** Polymer; Thermoplastic; Polyethylene (PE); HDPE; High Density Polyethylene (HDPE), Injection Molded

Physical Properties	Metric	English	Comments
Specific Gravity	0.960 g/cc	0.960 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	70	70	ASTM D2240
Tensile Strength	31.7 MPa	4600 psi	ASTM D638
Elongation at Break	400 %	400 %	ASTM D638
Tensile Modulus	1.38 GPa	200 ksi	ASTM D638
Flexural Strength	31.7 MPa	4600 psi	ASTM D790
Flexural Modulus	1.20 GPa	174 ksi	ASTM D790
Compressive Strength	31.7 MPa	4600 psi	10% Def.; ASTM D695
Compressive Modulus	0.689 GPa	100 ksi	ASTM D695
Izod Impact, Notched	0.694 J/cm	1.30 ft-lb/in	ASTM D256 Type A
Coefficient of Friction, Dynamic	0.20	0.20	Dry vs. Steel; QTM55007
Electrical Properties	Metric	English	Comments
Surface Resistivity per Square	>= 1.00e+15 ohm	>= 1.00e+15 ohm	ASTM D257
Thermal Properties	Metric	English	Comments
CTE, linear	110 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ <small>@Temperature -40.0 - 149 °C</small>	61.0 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$ <small>@Temperature -40.0 - 300 °F</small>	ASTM E831
Melting Point	127 °C	260 °F	Crystalline, Peak; ASTM D3418
Maximum Service Temperature, Air	82.2 °C	180 °F	Long Term
Deflection Temperature at 1.8 MPa (264 psi)	80.0 °C	176 °F	ASTM D648
Flammability, UL94	HB	HB	1/8 inch (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)	Acceptable	Acceptable	
Acids, Weak	Acceptable	Acceptable	
Alcohols	Acceptable	Acceptable	
Alkalies, Strong (pH 11-14)	Acceptable	Acceptable	
Alkalies, Weak	Acceptable	Acceptable	
Chlorinated Solvents	Unacceptable	Unacceptable	
Conductive / Static Dissipative	No	No	
Continuous Sunlight	Limited	Limited	
Hot Water / Steam	Limited	Limited	
Hydrocarbons - Aliphatic	Unacceptable	Unacceptable	
Hydrocarbons - Aromatic	Unacceptable	Unacceptable	
Inorganic Salt Solutions	Acceptable	Acceptable	
Ketones, Esters	Unacceptable	Unacceptable	
Descriptive Properties			
Machinability		3	1-10, 1=Easier to Machine