

POLYETHYLENE

Polyethylenes are semi-crystalline materials with excellent chemical resistance, good fatigue and wear resistance, and a wide range of properties (due to differences in length of the polymer chain.) Polyethylenes are easy to distinguish from other plastics because they float in water. Polyethylenes provide good resistance to organic solvents, degreasing agents and electrolytic attack. They have a higher impact strength, but lower working temperatures and tensile strengths than polypropylene. They are light in weight, resistant to staining, and have low moisture absorption rates.

Low Density Polyethylene (LDPE)

This extruded material offers good corrosion resistance and low moisture permeability. It can be used in applications where corrosion resistance is important, but stiffness, high temperatures, and structural strength are not. A highly flexible product, LDPE is used widely in orthopaedic products, or where mobility without stress fatigue is desired. LDPE is also frequently used in consumer packaging, bags, bottles, and liners.

High Density Polyethylene (HDPE)

Representing the largest portion of the polyethylene applications, HDPE offers excellent impact resistance, light weight, low moisture absorption, and high tensile strength. HDPE is also non-toxic and non-staining and meets FDA and USDA certification for food processing.

Ultra High Molecular Weight Polyethylene (UHMW PE)

Light weight (1/8 the weight of mild steel), high in tensile strength, and as simple to machine as wood, UHMW PE is the ideal material for many wear parts in machinery and equipment as well as a superb lining in material handling systems and storage containers. UHMW PE is self-lubricating, shatter resistant, long-wearing, abrasion and corrosion resistant. It meets FDA and USDA acceptance for food and pharmaceutical equipment and is a good performer in applications up to 180 °F (82 °C) or when periodically cleaned with live steam or boiling water to sterilize.

TYPICAL PROPERTIES of POLYETHYLENE

ASTM or UL test	Property	LDPE	HDPE	UHMW
PHYSICAL				
D792	Density (lb/in ³)	0.033	0.035	0.034
	(g/cm ³)	0.92	0.95	0.93
D570	Water Absorption, 24 hrs (%)	<0.01	0	0
MECHANICAL				
D638	Tensile Strength (psi)	1,800-2,200	4,600	3,100
D638	Tensile Modulus (psi)	-	-	125,000
D638	Tensile Elongation at Yield (%)	600	900	-
D790	Flexural Strength (psi)	-	-	-
D790	Flexural Modulus (psi)	-	200,000	125,000
D695	Compressive Strength (psi)	-	-	2,000
D695	Compressive Modulus (psi)	-	-	-
D785	Hardness, Shore D	D41-D50	D69	D62-D66
D256	IZOD Notched Impact (ft-lb/in)	No Break	3	No Break
THERMAL				
D696	Coefficient of Linear Thermal Expansion (x 10 ⁻⁵ in./in./°F)	3	6	11
	Heat Deflection Temp (°F / °C)			
	at 66 psi	120 / 48	170 / 76	203 / 95
D648	at 264 psi	105 / 36	150 / 40	180 / 82
D3418	Approx. Melting Temperature (°F / °C)	230 / 110	260 / 125	280 / 138
-	Max Operating Temp (°F / °C)	160 / 71	180 / 82	180 / 82
	Thermal Conductivity (BTU-in/ft ² -hr-°F)	-	-	2.92
C177	(x 10 ⁻⁴ cal/cm-sec-°C)	-	-	10.06
UL94	Flammability Rating	n.r.	n.r.	H-B
ELECTRICAL				
D149	Dielectric Strength (V/mil) short time, 1/8" thick	460-700	450-500	900
D150	Dielectric Constant at 1 kHz	2.25-2.30	2.30-2.35	2.30-2.35
D150	Dissipation Factor at 1 kHz	0.0002	0.0002	0.0002
D257	Volume Resistivity (ohm-cm) at 50% RH	1015	1015	1018
D495	Arc Resistance (sec)	135-160	200-250	250-350

NOTE: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control. Contact us for manufacturers' complete material property datasheets. All values at 73°F (23°C) unless otherwise noted.