

Ultra-High Molecular Weight Polyethylene (UHMW-PE)

KEY FEATURES

- Excellent Abrasion Resistance
- Low Coefficient of Friction
- Wide Variety of Fillers Can Be Added
- Many Grades are FDA Approved
- Good Chemical Resistance
- Good Impact Strength

DESCRIPTION

Ultra-high molecular weight polyethylene (UHMW-PE) is defined as polyethylene with a molecular weight of 3.1 million or higher. It has outstanding abrasion resistance and an extremely low coefficient of friction. Impact strength is high and chemical resistance is excellent. UHMW-PE has a recommended service temperature of about 180°F. However UHMW-PE has a high coefficient of thermal expansion, which can cause it to dramatically change dimensions over temperature variations. There are many fillers that can be added to UHMW-PE to enhance its properties.

TYPICAL PROPERTY VALUES

Physical	Properties	Condition	Units	Value	ASTM Test
	Density		g/cm ³	0.93	D792
	Chemical Designation			UHMW-PE	
	Filler				

Mechanical	Properties	Condition	Units	Value	ASTM Test
	Tensile Modulus	@ 73 °F	PSI		D639
	Tensile Strength	@ 73 °F	PSI	5,800	D638
	Shear Strength	@ 73 °F	PSI	4,800	
	Elongation @ Yld	@ 73 °F	%		
	Elongation @ Brk	@ 73 °F	%	300	D638
	Flexural Modulus	@ 73 °F	PSI	88,000	D790
	Flexural Strength @ Brk	@ 73 °F	PSI	3,500	D790
	Compressive Modulus	@ 73 °F	PSI	80,000	D695
	Compressive Strength	@ 73 °F, 10% strain	PSI	3,000	D695
	Izod (Charpy) Impact Strength	@ 73 °F	ft-lbs/in	no break	D256
	Hardness, Shore D	@ 73 °F	M (R) Scale	D62 - D66	D785
Coefficient of Friction	Static				

Thermal	Properties	Condition	Units	Value	ASTM Test
	Heat Deflection Temperature	@ 66 PSI	°F	203	D648
	Heat Deflection Temperature	@ 264 PSI	°F	180	D648
	Max. Operating Temperature		°F	180	
	Thermal Expansion (CLTE)		in/in/°F	11*10 ⁻⁵	D696
	Specific Heat		BTU/lb-°F		
	Thermal Conductivity		BTU-in/hr-ft ² -°F	2.9	C177

Electrical	Properties	Condition	Units	Value	ASTM Test
	Surface Resistivity	@50% RH	ohms/square	>10 ¹⁵	D257
	Volume Resistivity		ohm-cm	≥10 ¹⁴	D257
	Dielectric Constant	50% RH		2.30-2.35	D150
	Dielectric Strength	@ 60 Hz, 73 °F	V/mil	2300	D149
	Dissipation Factor	@ 60 Hz, 73 °F		0.0005	D150

Other	Properties	Condition	Units	Value	ASTM Test
	Moisture Absorption	@ 24 hrs, 73 °F	%	<0.01	D570
	Food Grade			Y	

• The data stated above are typical values intended for reference and comparison purposes only.
• The data should not be used as a basis for design specifications or quality control.

• The information is provided as a guide to the best of our knowledge and given without obligation or liability.
• Testing under individual application circumstances is recommended