

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

	Properties	Condition	Units	Value	ASTM Test
Physical	Chemical Designation			UHMW-PE	
	Filler				
	Density		g/cm ³	0.93	D792
Mechanical	Tensile Modulus	@ 73 °F	PSI		D639
	Tensile Strength @ Yld	@ 73 °F	PSI	2,465	D638
	Tensile Strength @ Brk	@ 73 °F	PSI	5,800	
	Shear Strength	@ 73 °F	PSI	3,000	
	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			

TYPICAL PROPERTY VALUES

	Properties	Condition	Units	Value	ASTM Test
Thermal	Vicat Softening Point	VST/B/50	°F	176	D1525
	Melting Temperature		°F	275	D3418
	Heat Deflection Temperature	@ 66	°F	203	D648
	Heat Deflection Temperature	@ 264	°F	180	D648
	Max. Operating Temperature		°F	180	
	Thermal Expansion (CLTE)		in/in/°F	11x10 ⁻⁵	D696
	Specific Heat		BTU/lb-°F		
	Thermal Conductivity	@ 20 °C	BTU-in/hr-ft ² -°F	2.9	C177
Electrical	Surface Resistivity	@50% RH	ohms/square	>10 ¹⁵	D257
	Volume Resistivity		ohm-cm	≥10 ¹⁴	D257
	Dielectric Strength		V/mil	2300	D149
	Dielectric Constant	@ 1MHz		2.30-2.35	D150
	Dissipation Factor	@ 1kHz		0.0005	D150
Other	Moisture Absorption	@ 24 hrs, 73 °F	%	<0.01	D570
	Moisture Absorption	@ Saturation, 73 °F	%		
	Flammability	UL 94		HB	
	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.