

■ UHMW-PE (Ultra-High Molecular Weight Polyethylene)

Property	ASTM Test Method	UHMW-NA UHMW-B UHMW-G	UHMW-ASB	UHMW-ASN	UHMW-SA
Specific Gravity	D792	0.94	0.96	0.98	0.97
Tensile Strength [MPa]	D638	37	28	28	23
Tensile Elongation [%]	D638	365	250	315	150
Young's Modulus [10^3 MPa]	D638	0.5	0.6	0.4	0.8
Compressive Strength at 5% strain [MPa]	D695	19	19	15	—
Flexural Strength [MPa]	D790	26	25	15	—
Izod Notched Impact Strength (1/2in×1/2in notched, 23°C) [J/m]	D256	non-break	non-break	non-break	180
Rockwell Hardness	D785	—	—	—	—
Thermal Conductivity [W/(m·K)]	C177	0.38	0.44	0.38	—
Specific Heat [J/(kg·K)]	—	2,300	2,200	2,300	—
Coefficient of Linear Expansion [$10^{-5}/^{\circ}\text{C}$]	D696	20.0	19.0	19.0	—
Continuous Use Temperature [$^{\circ}\text{C}$]	—	80	80	80	80
Deflection Temperature [$^{\circ}\text{C}$]	D648	0.451MPa	96	98	78
		1.813MPa	—	—	—
Volume Resistivity (23°C 50% RH) [$\Omega\cdot\text{m}$]	D257	$>10^{11}$	10^2	10^9	$10^8\sim10^{10}$
Dielectric Strength [kV/mm]	D149	shorttime 3.2mm thickness step	—	—	—
		3.2mm thickness	—	—	—
Dielectric Constant	D150	60Hz	2.3	2.3	2.3
		10^3 Hz	—	—	—
		10^6 Hz	—	—	—
Dissipation Factor	D150	60Hz	$1\sim2\times10^{-4}$	$1\sim2\times10^{-4}$	$1\sim2\times10^{-4}$
		10^3 Hz	$1\sim2\times10^{-4}$	$1\sim2\times10^{-4}$	$1\sim2\times10^{-4}$
		10^6 Hz	$1\sim2\times10^{-4}$	$1\sim2\times10^{-4}$	$1\sim2\times10^{-4}$
Arc resistance [sec]	D495	—	—	—	—
Water Absorption (24 hours 3.2mm Thickness) [%]	D570	<0.01	<0.01	<0.01	—
Flammability or Rate of Burning	D635/ UL94	—	—	—	—
sunlight resistances (color change)	—	slightly discolor	slightly discolor	slightly discolor	slightly discolor
Weak acid resistances	D543	resist	resist	resist	resist
Strong acid resistances	D543	non resistance	non resistance	non resistance	non resistance
Weak alkali resistances	D543	resist	resist	resist	resist
Strong alkali resistances	D543	resist	resist	resist	resist
Organic solvent resistances	D543	resist(under 80 degrees Celsius)	resist(under 80 degrees Celsius)	resist(under 80 degrees Celsius)	resist(under 80 degrees Celsius)
Transparency	—	opaque	opaque	opaque	opaque
Sand slurry Wear (SS400 =100)	(Original)	15	12	17	—
Thrust Wear (by S45C P=1,960kPa V=0.25m/sec [$\times 10^{-6}\text{cm}^3/(P\cdot V\cdot h)$])	(Original)	4.6	3.7	4.9	—
Allowable PV [kPa·m/sec]	(Original)	1000	1000	1000	2000

The material properties in above table are only for reference, measured by each test methods, and do not guarantee minimum value. And these properties might be changed without notice, so it is recommended to refer the data in the newest catalogues.