

# Properties of Insulation Materials

Properties	ASTM Method	PVC	Semi-Rigid PVC	Polyethylene	Foamed Polyethylene	Polypropylene	Foamed Polypropylene	Polyurethane
Specific Gravity	D-792	1.15 - 1.68	1.37	0.90 - 1.27	0.55 - 0.61	0.895 - 0.910	0.55 - 0.60	1.00 - 1.20
Tensile Strength, psi	D-638	1500 - 4400	3900	1500 - 2150	540	2800 - 4400	250	>4800
Elongation %	D-412	38 - 395	240	175 - 590	165	650	100	530 - 750
Volume Resistivity, Ω-cm	D-257	1013 - 1016	1014	>1014	1015	1.5 x 10 <sup>14</sup> 2.8 x 10 <sup>14</sup>	1014	2 x 10 <sup>12</sup> 11 x 10 <sup>12</sup>
Dielectric Strength, Volts/mil	D-149	240 - 490	390	220 - 1400	290	440 - 830	290	320 - 620
Dielectric Constant @ 1 kHz	D-150	3.7 - 8.1	2.9	2.28 - 2.55	1.7	2.2	1.7	5.7 - 7.7
Power Factor Dissipation @ 1 kHz	D-150	0.008 - 0.17	0.0038	0.00049	0.00035	0.0043	0.0034	0.043 - 0.060
Abrasion Resistance		Good	Excellent	Good	Poor	Poor	Poor	Excellent
Heat Resistance		Good	Good	Good	Poor	Good	Poor	Good
Weatherability		Good	Good	Excellent	Poor	Excellent	Poor	Good
Flame Retardancy		Excellent	Good	Poor	Poor	Poor	Poor	Fair
Water Resistance		Good	Good	Excellent	Poor	Excellent	Poor	Good
Acid Resistance		Good	Good	Good	Fair	Excellent	Fair	Fair
Alkali Resistance		Excellent	Excellent	Good	Fair	Excellent	Fair	Fair
Aliphatic Hydrocarbon Resistance		Good	Good	Poor	Fair	Fair	Poor	Fair
Aromatic Hydrocarbon Resistance		Poor	Poor	Poor	Fair	Fair	Poor	Poor

Properties	HYTREL®	Nylon	TPE	Thermoset Neoprene	SBR	KYNAR®	PFA	TEFLON® FEP	TPE
<b>Specific Gravity</b>	1.24	1.08	0.90 - 1.29	1.21 - 1.60	0.92	1.74 - 1.77	2.13 - 2.16	2.13 - 2.16	2.13 - 2.20
<b>Tensile Strength, psi</b>	6000	6000	1250 - 2200	1175 - 2600	>2800	5000 - 7400	4000 - 4200	2600 - 3000	1100 - 3300
<b>Elongation %</b>	490	500	490 - 730	290 - 680	>430	500	300	260 - 320	265
<b>Volume Resistivity, Ω-cm</b>	1010	1012	2 x 1016	1010 - 1012	3 x 1015	2 x 1012	>1014	2 x 1016	>1016
<b>Dielectric Strength, Volts/mil</b>	450	460	700	590	400 - 500	250	480	480 - 550	500
<b>Dielectric Constant @ 1 kHz</b>	3.8	4.6	2.8	4.9 - 7.1	3	7.6	2.2	2.2	2.2
<b>Power Factor Dissipation @ 1 kHz</b>	0.018	0.045	0.0018	3.6	0.0035	0.019	0.00003	0.0006	0.0002
<b>Abrasion Resistance</b>	Excellent	Excellent	Good	Excellent	Good	Good	Fair	Good	Fair
<b>Heat Resistance</b>	Good	Good	Good	Good	Fair	Excellent	Excellent	Excellent	Excellent
<b>Weatherability</b>	Excellent	Good	Good	Good	Fair	Good	Good	Good	Excellent
<b>Flame Retardancy</b>	Poor	Poor	Good	Good	Poor	Excellent	Excellent	Excellent	Excellent
<b>Water Resistance</b>	Good	Fair	Good	Excellent	Good	Good	Excellent	Good	Excellent
<b>Acid Resistance</b>	Good	Good	Good	Good	Fair	Excellent	Excellent	Excellent	Excellent
<b>Alkali Resistance</b>	Good	Good	Good	Good	Fair	Excellent	Excellent	Excellent	Excellent
<b>Aliphatic Hydrocarbon Resistance</b>	Good	Good	Good	Good	Poor	Excellent	Excellent	Excellent	Excellent
<b>Aromatic Hydrocarbon Resistance</b>	Good	Good	Good	Fair	Poor	Excellent	Excellent	Excellent	Excellent

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