

## Insulation Materials Properties Chart

### Properties thru PP Foamed

Properties	ASTM Method	PVC	Semi-Rigid PVC	Polyethylene	Polyethylene Foamed	PP	PP Foamed
Specific Gravity	D-792-66	1.16-1.70	1.38	0.91-1.26	0.50-0.60	0.890-0.905	0.50-0.60
Tensile Strength, psi	D-638-7.2	500-4500	4000	1500-2200	550	2900-4500	260
Elongation	D-412	40-400	250	180-600	175	700	100
Volume Resistivity, ohm-cm	D-257-6	10 <sup>4</sup> -10 <sup>6</sup>	10 <sup>15</sup>	10 <sup>15</sup> +	-	1.5x10 <sup>15</sup> 2.8x10 <sup>15</sup>	-
Dielectric Strength, volts/mil	D-149-64	250-500	400	230-1420	300	450-850	300
Dielectric Constant, @ 60 Hz	D-150-70	3.2-9.0	3.8	2.23-2.50	1.69	2.25	1.69
Dielectric Constant, @ 1 kHz	D-150-70	3.0-8.0	3.8	2.27-2.50	1.69	2.25	1.69
Power Factor (Dissipation) @ 60 Hz.		0.007-0.15	-	0.003-0.044	0.0015	0.0054-0.0070	0.004
Power Factor (Dissipation) @ 1 kHz.		0.009-0.16	-	0.00048-0.00049	0.00025	0.0036-0.0050	0.0035
Abrasion Resistance		Good	Excellent	Good	Poor	Fair	Poor
Heat Resistance		Good	Good	Good	Poor	Good	Poor
Weatherability		Good	Good	Excellent	Poor	Excellent	Poor
Flame Retardancy		Excellent	Good	Poor	Poor	Poor	Poor
Water Resistance		Good	Good	Excellent	Poor	Excellent	Poor
Acid Resistance		Good	Good	Good	Fair	Excellent	Poor
Alkali Resistance		Excellent	Excellent	Good	Fair	Excellent	Fair
Aliphatic Hydro Resistance		Good	Good	Poor	Fair	Fair	Poor
Aromatic Hydro Resistance		Poor	Poor	Poor	Fair	Fair	Poor

### Properties thru SBR

Properties	ASTM Method	Polyurethane	Hytrel	Nylon	Surlyn	TPR	Thermoset	
							Neoprene	SBR
Specific Gravity	D-792-66	1.05-1.25	1.25	1.09	0.95	0.89-1.28	1.23-1.65	0.94
Tensile Strength, psi	D-638-7.2	5000+	6000	6000	4000	1300-2300	1200-2700	3000+
Elongation	D-412	540-750	500	500	450	500-750	300-700	450+
Volume Resistivity, ohm-cm	D-257-6	2x10 <sup>14</sup> 11x10 <sup>14</sup>	10 <sup>11</sup>	10 <sup>13</sup>	-	5x10 <sup>16</sup>	10 <sup>11</sup> - 10 <sup>13</sup>	3x10 <sup>16</sup>
Dielectric Strength, volts/mil	D-149-64	330-630	460	475	485	500-900	600	420-520
Dielectric Constant, @ 60 Hz	D-150-70	5.4-7.6	4.0	4.7	2.36	2.22-2.46	-	2.5-3.4
Dielectric Constant, @ 1 kHz	D-150-70	5.6-7.6	3.9	4.5	2.36	-	5.0-7.0	2.9
Power Factor (Dissipation) @ 60 Hz.		0.015-0.046	0.016	0.04	0.0016	-	-	0.002-0.003
Power Factor (Dissipation) @ 1 kHz.		0.043-0.060	0.019	0.04	0.0019		3.5	0.0032
Abrasion Resistance		Excellent	Excellent	Excellent	Excellent	Good	Excellent	Good
Heat Resistance		Good	Good	Good	Good	Good	Good	Excellent
Weatherability		Good	Excellent	Good	Excellent	Good	Good	Good
Flame Retardancy		Fair	Poor	Poor	Poor	Good	Good	Excellent
Water Resistance		Good	Good	Fair	Excellent	Good	Excellent	Good
Acid Resistance		Fair	Good	Good	Good	Good	Good	Excellent
Alkali Resistance		Fair	Good	Good	Good	Good	Good	Excellent
Aliphatic Hydro Resistance		Fair	Good	Good	Good	Good	Good	Excellent
Aromatic Hydro Resistance		Fair	Good	Good	Good	Good	Fair	Excellent

### Properties thru TFE

Properties	ASTM Method	KYNAR	HALAR	Foam Halar 47% air	Solef 11010	PTFE			
						PFA	FEP	Foam FEP 49% air	TFE
Specific Gravity	D-792-66	1.75-1.78	1.68	0.90	1.77	2.12-2.17	2.12-2.17	~1.1	2.13-2.20
Tensile Strength, psi	D-638-7.2	5200-7500	6000-7000	~2500	6000	4000-4300	2700-3100	~1000	1000-3500
Elongation	D-412	500	200-300	~20	300-400	300	250-330	~100	275
Volume Resistivity, ohm-cm	D-257-6	2x10 <sup>14</sup>	10 <sup>15</sup>	<10 <sup>16</sup>	6x10 <sup>14</sup>	10 <sup>15+</sup>	2x10 <sup>18</sup>	***	10 <sup>18+</sup>
Dielectric Strength, volts/mil	D-149-64	260	500	100	~1000	500	500-600	100	500
Dielectric Constant, @ 60 Hz	D-150-70	8.40	2.6	1.85	10.0	2.1	2.1	1.5	2.0-2.1
Dielectric Constant, @ 1 kHz	D-150-70	7.5	2.53	1.80	-	2.1	2.1	1.5	2.0-2.1
Power Factor (Dissipation) @ 60 Hz.		0.049	<5x10 <sup>-4</sup>	3x10 <sup>-4</sup>	58x10 <sup>-3</sup>	0.000027	0.0002	***	0.0004
Power Factor (Dissipation) @ 1 kHz.		0.019	<1.5x10 <sup>-2</sup>	<0.8x10 <sup>-2</sup>	-	0.000020	0.0007	***	0.0001
Abrasion Resistance		Good	Excellent	Good	Excellent	Fair	Good	Fair	Fair
Heat Resistance		Excellent	Excellent	Very Good	Very Good	Excellent	Excellent	Good	Excellent
Weatherability		Good	Excellent	Very Good	Very Good	Good	Good	Excellent	Excellent
Flame Retardancy		Excellent	Excellent	Good	Very Good	Excellent	Excellent	Good	Excellent
Water Resistance		Good	Excellent	Good	Very Good	Excellent	Good	Good	Excellent
Acid Resistance		Excellent	Excellent	Good	Very Good	Excellent	Excellent	Good	Excellent
Alkali Resistance		Excellent	Excellent	Good	Very Good	Excellent	Excellent	Good	Excellent
Aliphatic Hydro Resistance		Excellent	Excellent	Good	Very Good	Excellent	Excellent	Good	Excellent
Aromatic Hydro Resistance		Excellent	Excellent	Good	Very Good	Excellent	Excellent	Good	Excellent

\*KYNAR is a registered trademark of ELF Atochem North America, Inc.

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\*\*\*Variation depends on level expansions