Insulations

Comparative Properties of Insulations

Property Considered	Cellular Polyethylene	Polyethylene	Nylon	Polypropylene	Polyurethane	PVC	FEP
Acid Resistance	G to E	G to E	P to F	E	F	G to E	E
Abrasion Resistance	G	F to G	E	F to G	O	F to G	G to E
Alcohol Resistance	E	E	P	E	P	G	E
Alkali Resistance	G to E	G to E	E	E	F	G	E
Benzol (Aromatic Hydrocarbons) Resistance	P	P	G	P to F	P	P to F	E
Degreaser Solvents (Halogenated Hydrocarbons)	P	P	G	P	P	P to F	E
Electrical Properties	E	E	F	E	P to F	F to G	E
Flame Resistance	P	P	P	P	P	E	O
Gasoline, Kerosene (Aliphatic Hydrocarbons) Resistance	P to F	P to F	G	P to F	F	P	E
Heat Resistance	G to E	G	E	E	G	G to E	O
Low Temperature Flexibility	E	G to E	G	P	G	P to G	O
Nuclear Radiation Resistance	G	G	P to F	F	G	P to G	O
Oil Resistance	G to E	G to E	E	E	E	P	O
Oxidation Resistance	E	E	E	E	E	E	O
Ozone Resistance	E	E	E	E	E	E	E
Water Resistance	E	E	P to F	E	P	E	E
Weather – Sun Resistance	E	E	E	E	F to G	G to E	O

P = Poor F = Fair G = Good E = Excellent O = Outstanding
Above ratings are based on average performance of compounds. Any specific property can often be improved by the use of selective compounding.

Current Carrying Capacity of Insulated Copper Conductors

Amps	PE, Polyurethane PVC (Semi-Rigid)	Polypropylene PVC	Nylon PVC	PVDF PE (X-linked) Thermoplastic Elastomers	FEP
	Temperature Rating				
Size AWG	80°C	90°C	105°C	125°C	200°C
30	2	3	3	3	4
28	3	4	4	5	6
26	4	6	5	6	7
24	6	7	7	8	10
22	8	9	10	11	13
20	10	12	13	14	17
18	15	17	18	20	24
16	19	22	24	26	32
14	27	30	33	40	45
12	36	40	45	50	55
10	47	55	58	70	75
8	65	70	75	90	100
6	95	100	105	125	135
4	125	135	145	170	180
2	170	180	200	225	240

Single Conductor in Free Air 30° Ambient Temp.

Dielectric Constants of Insulations

Insulation Materials	Nominal
PVDF	6.4
Nylon	4.0
Polyester	2.80
Polyethylene (Cellular)	1.50
Polyethylene (High Density)	2.34
Polyethylene (Low Density)	2.28
Polypropylene	2.24
Polyvinyl Chloride (Semi-Rigid)	4.3
Teflon FEP	2.15
Teflon TFE	2.15
Tefzel, Halar	2.6
FEP (Cellular)	1.5