



Insulation materials and properties

FELTEN Wire & Cable Solutions

Materials and properties



Material	Chemical Description	VDE Clas- sification	Thermal Properties					Resistance							Physical Properties				Electric Properties			Flammability					Density g/cm ³
			Continuous Operating Temperature for 20.000 hrs		Continuous Operating Temperature for 3000 hrs	Thermal Overload Capacity	Melt/Flow Temperature	Cold Winding Test	Oil	Acid / Alkali	Chemicals	Ozone	UV	Water Absorption	Shore / Hardness	Tensile Strength	Elongation at break	Corrosive Resistance	Sp Volume Resistance	Dielectric Strength	Relative Permittivity	LOI	Flame retardant	Low Smoke Density	Corrosive Gases	Halogen Free	
			from °C	to °C	°C	20 h	°C																				
Fluoropolymer																											
PTFE	Polytetrafluorethylen	5Y	-190	260	300	310	327	-90	++	++	++	++	++	0.01	D55 - D65	>20	>200	++	>10 ¹⁸	>20	2.0	95	++	yes	--	no	2.10 - 2.30
PFA	Tetrafluorethylen-Perfluorpropylvinylether	51Y	-190	250	250	280	300 - 310	-90	++	++	++	++	++	0.01	D55 - D60	>15	>200	+	>10 ¹⁶	>25	2.1	95	++	yes	--	no	2.12 - 2.17
MFA	Tetrafluorethylen-Perfluormethylvinylether	N.a.	-100	230	250	270	280 - 290	-90	++	++	++	++	++	0.01	D55 - D60	>20	>200	+	>10 ¹⁶	>25	2.1	95	++	yes	--	no	2.12 - 2.17
FEP	Tetrafluorethylen-Hexafluorpropylen	6Y	-100	205	230	260	265 - 270	-80	++	++	++	++	++	0.01	D55 - D60	>20	>200	+	>10 ¹⁸	>25	2.1	95	++	yes	--	no	2.00 - 2.30
ETFE	Ethylen-Tetrafluorethylen	7Y	-100	135	180	200	235 - 270	-65	++	++	++	++	++	0.02	D70 - D75	>25	>150	++	>10 ¹⁵	>30	2.6	>30	++	yes	--	no	1.60 - 1.80
ECTFE	Ethylen-Chlorotrifluorethylen	71Y	-100	125	150	160	250 - 280	-65	++	++	++	++	++	0.10	D70 - D75	>25	>150	++	>10 ¹⁴	>30	2.5	>50	++	yes	--	no	1.67 - 1.69
PVDF	Polyvinylidenfluorid	10Y	-100	135	135 - 145	160	160 - 190	-65	++	++	++	++	++	0.02	D75 - D80	>25	>100	++	>10 ¹⁴	>25	>8.0	>30	++	yes	--	no	1.70 - 1.90
Silicone																											
SIR	Silicone-Rubber	2G	-60	180	230	>300	cross-linked	-80	-/+	-/+	+	+	++	1.00	A40 - A90	6 - 15	>250	+	>10 ¹⁵	18 - 36	>2.7	25 - 35	++	yes	++	yes	1.20 - 1.30
Thermoplastics																											
LDPE	Low Density Polyethylen	2Y	-50	70	90	100	115 - 125	-50	-/+	++	+	+	-	<0.01	D45	10 - 20	>400	+	>10 ¹⁸	>70	2.3	<17	-	yes	++	yes	0.92 - 0.94
HDPE	High Density Polyethylen	2Y	-50	90	150	115	115 - 125	-50	-/+	++	+	+	-	<0.01	D64	15 - 30	>400	-/+	>10 ¹⁸	>80	2.4	<17	-	yes	++	yes	0.94 - 0.96
PA	Polyamid	4Y	-40	105	125	150	230 - 260	-30	++	-/+	+	+	-/+	1.00 - 1.50	D75 - D80	50 - 60	>50	++	10 ¹³	>30	3.5 - 4.5	28	+	yes	++	yes	1.14
PP	Polypropylen	9Y	-40	90	110	140	130 - 145	-40	+	+	+	+	-/+	0.10	D65 - D70	>30	>400	+	>10 ¹⁶	>80	2.3	18	-	yes	++	yes	0.91
PVC	Polyvinylchlorid	Y	-40	80	120	140	140 - 160	-40	++	+	-/+	++	-/+	0.40	A50 - D50	>10	>200	+	>10 ¹⁰	>20	4.0 - 5.0	>20	++	no	--	no	1.35 - 1.50
Thermoplastic Elastomers																											
TPE-U	Thermoplastic Polyetherurethan Elastomer	11Y	-60	80	125	150	180 - 205	-50	++	++	+	+	+	0.80 - 1.50	A80 - D75	>30	>400	++	>10 ⁹	>10	5.5 - 8.0	<30	-/+	N.a.	++	yes	1.12 - 1.21
TPE-E	Thermoplastic Polyester Elastomer	13Y o. 12Y	-70	115	150	160	180 - 230	-50	++	-	++	+	++	0.60 - 1.20	D40 - D78	>20	>300	++	>10 ⁹	>10	3.5 - 5.0	<29	-/+	yes	++	yes	1.00 - 1.20
TPE-S	Thermoplastic Polystyrol Elastomer	17Y	-75	115	125	140 - 150	>150	-40	+	+	+	+	+	1.00 - 2.00	A30 - D50	>15	>200	+	>10 ¹⁰	>10	3.0 - 4.0	22 - 27	-/+	yes	+	yes	1.10 - 1.30
TPE-O	Thermoplastic Polyolefin Elastomer	18Y	-40	90	120	130 - 150	>135	-40	-	++	+	+	+	1.50	A50 - D40	>10	>300	+	>10 ¹⁴	>20	3.0	22 - 27	-/+	yes	+	yes	1.20 - 1.40
TPE-V	Thermoplastic Polyolefin Elastomer	N.a.	-60	110	130	150	155 - 230	-40	+	++	+	++	++	2.00	A35 - D50	4-26	>400	+	N.a.	>30	2.3	19 ¹⁾ // 26 ²⁾	- ¹⁾ // + ²⁾	no	- ¹⁾ // + ²⁾	yes ¹⁾ // n ^{o2)}	0.91 ¹⁾ // 1.24 ²⁾
Elastomers																											
EPDM	Ethylen-Propylen-Terpolymer	3G	-40	90	100	150	cross-linked	-40	--	++	+	+	++	0.02	A60 - D90	7 - 15	>200	+	>10 ¹⁵	30	3.0 - 4.0	30	-/+	yes	+	yes	1.30 - 1.40
EPR	Ethylen-Propylen-Rubber	3G	-40	90	100	160	cross-linked	-65	--	++	+	++	+	0.20	A60 - D85	7 - 10	>200	+	10 ¹³ - 10 ¹⁵	30	3.0 - 5.0	>20	-/+	yes	+	yes	1.30 - 1.40
EVM	Ethylen-Vinylacetat-Rubber	4G	-40	120	150	180	cross-linked	-50	+	+	+	+	+	0.10	>A70	>10	>200	+	10 ¹² - 10 ¹⁴	>20	4.0 - 7.0	>20	-/+	yes	+	yes	1.30 - 1.45
CR	Chloropren-Rubber	5G	-40	90	120	140	cross-linked	-40	+	+	+	+	+	1.00	A55 - D70	>10	>250	+	10 ¹⁰ - 10 ¹¹	20	6.0 - 9.0	30 - 34	++	no	--	no	1.40 - 1.45
FKM/FPM	Fluorubber	N.a.	-20	180	200	260	cross-linked	-20	++	++	++	++	++	>0.20	A60 - D40	5 - 13	200	+	10 ¹⁰ - 10 ¹⁴	>20	6.0 - 9.0	40	++	yes	--	no	1.90 - 2.25
Special Thermoplastics																											
PI	Polyimid	8Y	-190	220	260	400	no	-70	-/+	-	+	+	++	>0.25	D80 - D90	>70	>70	++	>10 ¹⁷	>10 ¹⁷	3.5	40 - 50	++	yes	+	yes	1.45
PEEK	Polyetheretherketon	20Y	-65	230	250	300	340	-50	++	++	+	++	+	0.50	>D80	>20	>60	++	>10 ¹⁶	>10 ¹⁶	3.2	35	++	yes	+	yes	1.32
PEI	Polyetherimid	N.a.	-40	150	170	190	>220	-25	+	-/+	+	+	+	>0.25	D80 - D85	>95	>60	+	>10 ¹⁵	>10 ¹⁵	3.2 - 3.5	>45	+	yes	+	yes	1.27
PEIC	Siloxane Polyetherimide Copolymer	21Y	-40	120	150	160	>170	-20	+	-	+	+	+	N.a.	D60 - D70	>30	>100	+	>10 ¹⁴	>10 ¹⁴	2.8	46	+	yes	+	yes	1.18