

**T15: Properties of insulating and sheathing materials**

Only for the basic materials. Variations are possible depending on application/ design. See the relevant Catalogue page.

Material	Parameter			
	Abbreviation	VDE symbol	working temperature	dielectric constant (10 <sup>-3</sup> )
Bio-oil resistant material	Lapp type: P4/11	—	-40 +120	2.4
Polyvinylchloride	PVC	Y	-30 +70	4.0
Polyvinylchloride heat resistant	PVC	Y	-20 +90	3.5
High pressure Polyethylene	LDPE	2Y	-50 +70	2.3
Low Pressure Polyethylene	HDPE	2Y	-50 +100	2.3
Polyurethane	PUR	11Y	-40 +90/100	4.0 - 6.0
Polyamide	PA	4Y	-40 +80	3.5 - 7.0
Polybutylene terephthalate	PBTP	—	-60 +110	3.0 - 4.0
Polytetrafluorethylene	PTFE	5Y	-190 +260	2.1
Tetrafluorethylene Hexafluorpropylene Copolymere	FEP	6Y	-100 +200	2.1
Ethylene-tetrafluorethylene	ETFE	7Y	-100 +150	2.6
Perfluoralkoxy-polymer	PFA	—	-190 +260	2.1
Chloropren rubber	CR	5G	-40 +100	6.0 - 8.0
Silicone rubber	SI	2G	-60 +180	2.8 - 3.2
Ethylene vinyl acetate	EVA	4G	-30 +125	5 - 7
Ethylene propylen rubber	EPM/ EPDM	3G	-30 +120	3.2
Thermoplastic polyolefin elastomer	TPE-O	—	-40 +120	2.7 - 3.6
Thermoplastic polyester elastomer	TPE-E	12Y	-70 +125	3.7 - 5.1
Styrene triple block copolymer	TPE-S	—	-75 +105/140	2.2 - 2.6

Material	Parameter				
	Abbreviation	volume resistivity ( $\Omega \times \text{cm}$ )	tensile strength N/mm <sup>2</sup> MPa	Elongation %	Water absorption (20 °C) %
Bio-oil resistant material	Lapptype: P4/11	10 <sup>15</sup>	10 – 20	450 – 550	1 – 2
Polyvinylchloride	PVC	10 <sup>12</sup> – 10 <sup>15</sup>	10 – 25	150 – 300	0.4
Polyvinylchloride heat resistant	PVC	10 <sup>12</sup> – 10 <sup>15</sup>	10 – 25	150 – 300	0.4
High pressure Polyethylene	LDPE	10 <sup>17</sup>	20 – 30	500	0.1
Low Pressure Polyethylene	HDPE	10 <sup>17</sup>	30	800	0.1
Polyurethane	PUR	10 <sup>12</sup>	30 – 45	300 – 600	1.5
Polyamide	PA	10 <sup>14</sup>	50 – 180	200 – 300	1 – 2
Polybutylene terephthalate	PBTP	10 <sup>16</sup>	50 – 100	50 – 300	0.5
Polytetrafluorethylene	PTFE	10 <sup>18</sup>	14 – 40	240 – 400	0.01
Tetrafluorethylene Hexafluorpropylene Copolymer	FEP	10 <sup>18</sup>	20 – 25	250 – 350	0.01
Ethylene-tetrafluorethylene	ETFE	10 <sup>16</sup>	40 – 50	100 – 300	0.01
Perfluoroalkoxy-polymer	PFA	10 <sup>15</sup>	30	300	0.01
Chloropren rubber	CR	10 <sup>13</sup>	25	450	1
Silicone rubber	SI	10 <sup>15</sup>	5 – 10	200 – 350	1.0
Ethylene vinyl acetate	EVA	10 <sup>13</sup>	5	200	0.01
Ethylene propylen rubber	EPDM	10 <sup>14</sup>	5 – 25	200 – 450	0.02
Thermoplastic polyolefin elastomer	TPE-O	5 x 10 <sup>14</sup>	≥ 6	≥ 400	1.5
Thermoplastic polyester elastomer	TPE-E	10 <sup>12</sup>	3 – 25	280 – 650	0.3 – 0.6
Styrene triple block copolymer	TPE-S	10 <sup>16</sup>	9 – 25	500 – 700	1 – 2

Material	Weather resistance	Fuel resistance	Oil resistance	Flammability
Bio-oil resistant material	very good	good	Bio-oil resistant very good	flammable
Polyvinylchloride	moderate	moderate	good	self-extinguishing
Polyvinylchloride heat resistant	moderate	moderate	good	self-extinguishing
High pressure Polyethylene	good	poor	moderate	flammable
Low Pressure Polyethylene	moderate	poor	moderate	flammable
Polyurethane	very good	good	good	self-extinguishing*
Polyamide	good	moderate	good	flammable
Polybutylene terephthalate	good	good	good	flammable
Polytetrafluorethylene	very good	very good	very good	non-flammable
Tetrafluorethylene Hexafluorpropylene Copolymer	very good	very good	very good	non-flammable
Ethylene-tetrafluorethylene	very good	very good	very good	non-flammable
Perfluoroalkoxy-polymer	very good	very good	good	non-flammable
Chloropren rubber	very good	poor	good	self-extinguishing less
Silicone rubber	very good	poor	moderate	flammable
Ethylene vinyl acetate	good	poor	poor	flammable
Ethylene propylen rubber	good	poor	poor	flammable
Thermoplastic polyolefin elastomer	very good	moderate	moderate	flammable
Thermoplastic polyester elastomer	very good	good	very good	flammable
Styrene triple block copolymer	moderate	good	poor	flammable

\* only with additional flame retardener