

**Material overview for tubes**

Grønlandsvej 197 +45 7642 8200

DK-7100, Vejle - Denmark [ei@elektro-isola.dk](mailto:ei@elektro-isola.dk)

VAT no.: DK20429488 [www.elektro-isola.com](http://www.elektro-isola.com)

Test method: IEC/EN 61212-2

Norm

Sample dimension

Conditioning: IEC 60212

**Closest relevant standards**

Material designation	IEC 61212-3-1	NEMA	Reinforcement	Resin	Colour**
Etronax MF	PF CC 22	C	Cotton fabric	Phenol	●
Etronax MFP G	-	-	Cotton/synthetic fabric	Phenol	●
Etronax MF G	-	-	Cotton fabric	Phenol	●
Etronax MMMF	PF CC 24	-	Cotton fabric	Phenol	●
Etronax MMF	PF CC 21	L	Cotton fabric	Phenol	●
Etronit B 67	PF CP 23	XX	Paper	Phenol	●
Etronit B 66	PF CP 22	XX	Paper	Phenol	●
Etronit IV C	-	XXX	Paper	Phenol	●
Etronit B 65	PF CP 21	XX	Paper	Phenol	●
G-Etronax EP 311 HC		FR-5	Glass fabric	Epoxy	●
G-Etronax EP 11	EP GC 22	G - 11	Glass fabric	Epoxy	●
G-Etronax EP FR	EP GC 23	FR - 4	Glass fabric	Epoxy	●
G-Etronax SI	SI GC 21	G - 7	Glass fabric	Silicone	●
G-Etronax EP 22	EP GC 22	G - 11	Glass fabric	Epoxy	●
G-Etronax PI	-	-	Glass fabric	Polyimide	●
G-Etronax B	PF GC 21	G - 3	Glass fabric	Phenol	●
G-Etronax EP 10	EP GC 21	G - 10	Glass fabric	Epoxy	●

Mechanical properties		
Bending strength	Compressive strength	Cohesion between layers
5.1	5.2	5.3
ISO 178	ISO 604	IEC 61212-2
ID > 100 mm	-	ID < 100 mm
1	1	1
MPa	MPa	MPa
90	170	130
120	160	150
100	180	140
120	170	150
100	170	130
120	140	160
120	130	150
120	130	145
130	140	160
300	200	400
325 <sup>(D)</sup>	200	480
350	230	400
120	65	150
325 <sup>(D)</sup>	200	400
380	300	460
300	220	250
325	200	400

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04/06/2026

**Conditioning**

- 1: 24h/23°C/50%RH
- 2: 24h/23°C/50%RH + 1h/ in oil at 90°C
- 3: 96h/105°C + 1h/23°C/20%RH
- 4: 24h/50°C/<20% RH + 24h in water at 23°C
- 5: 96h/105°C + 1h/ in oil at 90°C

**Notes**

- A: ID > 8 mm and/or OD > 10 mm
- B: Wall thickness
- C: Halogen free
- D: 230 MPa measured at 150°C
- E: Wall thickness ≥ 4,0 mm
- F: Tested on sheet material

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Electrical properties							
Electrical strength in 90°C oil		Permittivity		Dissipation factor		Insulation resistance after submersion in water	Comparative tracking index [CTI]
Perpendicular	Parallel	50HZ	1MHz	50HZ	1MHz		
6.1.2.2	6.1.2.1	6.3		6.3		6.2	
IEC 61212-2		IEC 62631-2-1		IEC 62631-2-1		IEC 62631-3-3	IEC 60112
B) 3 mm	B) ≥ 3 mm	-		-		A)	-
2 kV/mm	2 kV/25 mm	3		3		4 MΩ	1 V
2	15	-	-	-	-	100	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
4	20	-	-	-	-	50	
3	20	-	-	-	-	200	
8.3	35	5	-	0.04	-	100	
10 <sup>(5)</sup>	50 <sup>(5)</sup>	5	-	0.04	-	10	
6.7	25	5	5	0.03	0.03	200	
8.3	25	5	-	0.04	-	10	
11	60	4.5	4.5	0.01	0.01	10000	600 <sup>(F)</sup>
11	60	4.5	4.5	0.01	0.01	10000	200 <sup>(F)</sup>
10	50	4.5	4.5	0.01	0.01	10000	200 <sup>(F)</sup>
6.7	40	4	4	0.006	0.006	5000	400 <sup>(F)</sup>
11	60	4.5	4.5	0.01	0.01	10000	200 <sup>(F)</sup>
10	70	4	-	0.01	-	1000	250 <sup>(F)</sup>
8	50	5	5	0.03	0.04	1000	100 <sup>(F)</sup>
11	60	4.5	4.5	0.01	0.01	10000	200 <sup>(F)</sup>

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Physical and thermal properties								
Temperature index 20,000 h (T.I.)	Fire class	Density	Water absorption	Smoke emission & toxicity	Oxygen Index (OI)	Smoke density (Ds max.)	Smoke density (Ds max.)	Toxicity (CIT <sub>NLP</sub> )
7.1	7.4	7.3	7.2	-	-	-	-	-
ISO 60216	IEC 60695-11-10	ISO 1183-A	ISO 62-1	EN 45545-2; R22, R23 & R24	EN ISO 4589-2	EN ISO 5659-2	EN ISO 5659-2	NF X 70-100-1/-2
B) ≥ 3 mm	-	All	-	-	-	-	-	-
-	-	1	4	-	-	-	-	-
°C	Thickness in mm /Category	g/cm <sup>3</sup>	mg	Thickness in mm /Classification	Thickness in mm /%	Thickness in mm /Value	Thickness in mm /Value	-
115 <sup>(F)</sup>		1.25	2					
100 <sup>(F)</sup>		1.3	5					
100 <sup>(F)</sup>		1.3	1.8					
115 <sup>(F)</sup>		1.3	2					
115 <sup>(F)</sup>		1.3	2.5					
120 <sup>(F)</sup>		1.25	3.5					
120 <sup>(F)</sup>		1.25	4.5					
120 <sup>(F)</sup>		1.25	2					
120 <sup>(F)</sup>		1.25	4.5					
180 <sup>(F)</sup>	≥ 3 / V-0 <sup>C</sup>	1.8	0.3	≥ 3 / HL1, HL2, HL3 <sup>(F)</sup>	3 / ≥ 32 <sup>(F)</sup>	25 / 1 <sup>(F)</sup>	1 / 106 <sup>(F)</sup>	0.06 <sup>(F)</sup>
180 <sup>(F)</sup>		1.8	0.2					
145 <sup>(F)</sup>	≥ 3 / V-0 <sup>(F)</sup>	1.85	0.3					
220 <sup>(F)</sup>	≥ 3 / V-0 <sup>(F)</sup>	1.8	0.2					
160 <sup>(F)</sup>		1.75	0.2					
190 <sup>(F)</sup>	≥ 4 / V-0 <sup>(F)</sup>	1.9	0.4					
155 <sup>(F)</sup>	≥ 3 / V-0 <sup>(F)</sup>	1.85	2					
140 <sup>(F)</sup>		1.75	0.2					

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