ELEKTRO-ISOLA

Material overview for tubes

Grønlandsvej 197 +45 7642 8200
DK-7100, Vejle - Denmark ei@elektro-isola.dk
VAT no.: DK20429488 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**	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
Etronit IV C	-	XXX	Paper	Phenol		120	130	145
Etronit B 65	PF CP 21	XX	Paper	Phenol		130	140	160
Etronit B 66	PF CP 22	XX	Paper	Phenol		120	130	150
Etronit B 67	PF CP 23	XX	Paper	Phenol		120	140	160
Etronax DN	-	-	Synthetic fabric	Phenol		85	140	180
Etronax MF	PF CC 22	C	Cotton fabric	Phenol		90	170	130
Etronax MMF	PF CC 21	L	Cotton fabric	Phenol		100	170	130
Etronax MMMF	PF CC 24	-	Cotton fabric	Phenol		120	170	150
Etronax MF G	-	-	Cotton fabric	Phenol		100	180	140
Etronax MFP G	-	-	Cotton/synthetic fabric	Phenol		120	160	150
G-Etronax B	PF GC 21	G - 3	Glass fabric	Phenol		300	220	250
G-Etronax EP 10	EP GC 21	G - 10	Glass fabric	Epoxy		325	200	400
G-Etronax EP 11	EP GC 22	G - 11	Glass fabric	Epoxy		325 (D)	200	480
G-Etronax EP 22	EP GC 22	G - 11	Glass fabric	Epoxy		325 (D)	200	400
G-Etronax EP 311 HC		FR-5	Glass fabric	Epoxy		300	200	400
G-Etronax EP FR	EP GC 23	FR - 4	Glass fabric	Epoxy		350	230	400
G-Etronax PI	-	-	Glass fabric	Polyimide		380	300	460
G-Etronax SI	SI GC 21	G - 7	Glass fabric	Silicone		120	65	150

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25/04/2025

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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Norm
Thickness of sample
Conditioning: IEC 60212

Closest relevant standards

Material designation	IEC 61212-3-1	NEMA	Reinforcement	Resin	Colour**	Electrical properties							
						Electrical strength in 90°C oil		Permitivity		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	2	3		3		4	1
						kV/mm	kV/25 mm					MΩ	V
Etronit IV C	-	XXX	Paper	Phenol		6.7	25	5	5	0.03	0.03	200	
Etronit B 65	PF CP 21	XX	Paper	Phenol		8.3	25	5	-	0.04	-	10	
Etronit B 66	PF CP 22	XX	Paper	Phenol		10 (5)	50 (5)	5	-	0.04	-	10	
Etronit B 67	PF CP 23	XX	Paper	Phenol		8.3	35	5	-	0.04	-	100	
Etronax DN	-	-	Synthetic fabric	Phenol		3	40	4	-	0.04	-	5000	
Etronax MF	PF CC 22	C	Cotton fabric	Phenol		2	15	-	-	-	-	100	
Etronax MMF	PF CC 21	L	Cotton fabric	Phenol		3	20	-	-	-	-	200	
Etronax MMMF	PF CC 24	-	Cotton fabric	Phenol		4	20	-	-	-	-	50	
Etronax MF G	-	-	Cotton fabric	Phenol		-	-	-	-	-	-	-	
Etronax MFP G	-	-	Cotton/synthetic fabric	Phenol		-	-	-	-	-	-	-	
G-Etronax B	PF GC 21	G - 3	Glass fabric	Phenol		8	50	5	5	0.03	0.04	1000	100 (F)
G-Etronax EP 10	EP GC 21	G - 10	Glass fabric	Epoxy		11	60	4.5	4.5	0.01	0.01	10000	200 (F)
G-Etronax EP 11	EP GC 22	G - 11	Glass fabric	Epoxy		11	60	4.5	4.5	0.01	0.01	10000	200 (F)
G-Etronax EP 22	EP GC 22	G - 11	Glass fabric	Epoxy		11	60	4.5	4.5	0.01	0.01	10000	200 (F)
G-Etronax EP 311 HC		FR-5	Glass fabric	Epoxy		11	60	4.5	4.5	0.01	0.01	10000	600 (F)
G-Etronax EP FR	EP GC 23	FR - 4	Glass fabric	Epoxy		10	50	4.5	4.5	0.01	0.01	10000	200 (F)
G-Etronax PI	-	-	Glass fabric	Polyimide		10	70	4	-	0.01	-	1000	250 (F)
G-Etronax SI	SI GC 21	G - 7	Glass fabric	Silicone		6.7	40	4	4	0.006	0.006	5000	400 (F)

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5: 96h/105°C + 1h/ in oil at 90°C

Notes

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Thickness of sample

Conditioning: IEC 60212

Material designation	IEC 61212-3-1	NEMA	Reinforcement	Resin	Colour**	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_{NLP})
						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	-	-	3 mm	-	-	-
						-	-	1	4	-	-	-	-	-
						°C	Thickness in mm /Category	g/cm³	mg	Thickness in mm /Classification	%	Thickness in mm /Value	Thickness in mm /Value	-
Etronit IV C	-	XXX	Paper	Phenol		120		1.25	2					
Etronit B 65	PF CP 21	XX	Paper	Phenol		120		1.25	4.5					
Etronit B 66	PF CP 22	XX	Paper	Phenol		120		1.25	4.5					
Etronit B 67	PF CP 23	XX	Paper	Phenol		120		1.25	3.5					
Etronax DN	-	-	Synthetic fabric	Phenol		130		1.15	1					
Etronax MF	PF CC 22	C	Cotton fabric	Phenol		115		1.25	2					
Etronax MMF	PF CC 21	L	Cotton fabric	Phenol		115		1.3	2.5					
Etronax MMMF	PF CC 24	-	Cotton fabric	Phenol		115		1.3	2					
Etronax MF G	-	-	Cotton fabric	Phenol		100		1.3	1.8					
Etronax MFP G	-	-	Cotton/synthetic fabric	Phenol		100		1.3	5					
G-Etronax B	PF GC 21	G - 3	Glass fabric	Phenol		155	≥ 3 / V-0 (F)	1.85	2					
G-Etronax EP 10	EP GC 21	G - 10	Glass fabric	Epoxy		140		1.75	0.2					
G-Etronax EP 11	EP GC 22	G - 11	Glass fabric	Epoxy		180		1.8	0.2					
G-Etronax EP 22	EP GC 22	G - 11	Glass fabric	Epoxy		160		1.75	0.2					
G-Etronax EP 311 HC		FR-5	Glass fabric	Epoxy		180	≥ 3 / V-0 C	1.8	0.3	≥ 3 / HL3 (F)	≥ 32 (F)	25 / 1 (F)	1 / 106 (F)	0.06 (F)
G-Etronax EP FR	EP GC 23	FR - 4	Glass fabric	Epoxy		145	≥ 3 / V-0 (F)	1.85	0.3					
G-Etronax PI	-	-	Glass fabric	Polyimide		190	≥ 4 / V-0 (F)	1.9	0.4					
G-Etronax SI	SI GC 21	G - 7	Glass fabric	Silicone		220	≥ 3 / V-0 (F)	1.8	0.2					

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