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

| Material designation | IEC 60893-3-1 | 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 S | - | XXX | Paper | Phenol | | 120 | 130 | 145 |
| Etronit IV C | - | XXX | Paper | Phenol | | 120 | 130 | 145 |
| Etronit B 67 | PF CP 23 | XX | Paper | Phenol | | 120 | 140 | 160 |
| Etronit B 66 | PF CP 22 | XX | Paper | Phenol | | 120 | 130 | 150 |
| Etronit B 65 | PF CP 21 | XX | Paper | Phenol | | 130 | 140 | 160 |
| Etronit 201 M | - | - | Paper | Phenol | | 130 | 140 | 160 |
| Etronax MMMF | PF CC 24 | - | Cotton fabric | Phenol | | 120 | 170 | 150 |
| Etronax MMF | PF CC 21 | L | Cotton fabric | Phenol | | 100 | 170 | 130 |
| Etronax MFP G | - | - | Cotton/synthetic fabric | Phenol | | 120 | 160 | 150 |
| Etronax MF G | - | - | Cotton fabric | Phenol | | 100 | 180 | 140 |
| Etronax MF | PF CC 22 | C | Cotton fabric | Phenol | | 90 | 170 | 130 |
| Etronax DN | - | - | Synthetic fabric | Phenol | | 85 | 140 | 180 |
| 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 M | MF GC 21 | G - 5 | Glass fabric | Melamine | | 300 | 180 | 250 |
| G-Etronax PI | - | - | Glass fabric | Polyimide | | 380 | 300 | 460 |
| G-Etronax SI | SI GC 21 | G - 7 | Glass fabric | Silicone | | 120 | 65 | 150 |

**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 + 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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Test method: IEC/EN 61212-2
Norm
Thickness of sample
Conditioning: IEC 60212

| Material designation | IEC 60893-3-1 | 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 | 6.4 |
| | | | | | | IEC 61212-2 | | IEC 60250 | | IEC 60250 | | IEC 60167 | 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 S | - | XXX | Paper | Phenol | ● | 6.7 | 25 | 0.03 | 0.03 | 5 | 5 | 200 | |
| Etronit IV C | - | XXX | Paper | Phenol | ● | 6.7 | 25 | 0.03 | 0.03 | 5 | 5 | 200 | |
| Etronit B 67 | PF CP 23 | XX | Paper | Phenol | ● | 8.3 | 35 | 0.04 | - | 5 | - | 100 | |
| Etronit B 66 | PF CP 22 | XX | Paper | Phenol | ● | 10 (5) | 50 (5) | 0.04 | - | 5 | - | 10 | |
| Etronit B 65 | PF CP 21 | XX | Paper | Phenol | ● | 8.3 | 25 | 0.04 | - | 5 | - | 10 | |
| Etronit 201 M | - | - | Paper | Phenol | ● | - | 1 | - | - | - | - | 5 | |
| Etronax MMMF | PF CC 24 | - | Cotton fabric | Phenol | ● | 4 | 20 | - | - | - | - | 50 | |
| Etronax MMF | PF CC 21 | L | Cotton fabric | Phenol | ● | 3 | 20 | - | - | - | - | 200 | |
| Etronax MFP G | - | - | Cotton/synthetic fabric | Phenol | ● | - | - | - | - | - | - | - | |
| Etronax MF G | - | - | Cotton fabric | Phenol | ● | - | - | - | - | - | - | - | |
| Etronax MF | PF CC 22 | C | Cotton fabric | Phenol | ● | 2 | 15 | - | - | - | - | 100 | |
| Etronax DN | - | - | Synthetic fabric | Phenol | ● | 3 | 40 | 0.04 | - | 4 | - | 5000 | |
| G-Etronax B | PF GC 21 | G - 3 | Glass fabric | Phenol | ● | 8 | 50 | 0.03 | 0.04 | 5 | 5 | 1000 | 100 (F) |
| G-Etronax EP 10 | EP GC 21 | G - 10 | Glass fabric | Epoxy | ○ | 11 | 60 | 0.01 | 0.01 | 4.5 | 4.5 | 10000 | 200 (F) |
| G-Etronax EP 11 | EP GC 22 | G - 11 | Glass fabric | Epoxy | ○ | 11 | 60 | 0.01 | 0.01 | 4.5 | 4.5 | 10000 | 200 (F) |
| G-Etronax EP 22 | EP GC 22 | G - 11 | Glass fabric | Epoxy | ○ | 11 | 60 | 0.01 | 0.01 | 4.5 | 4.5 | 10000 | 200 (F) |
| G-Etronax EP 311 HC | | FR-5 | Glass fabric | Epoxy | ○ | 11 | 60 | 0.01 | 0.01 | 4.5 | 4.5 | 10000 | 600 (F) |
| G-Etronax EP FR | EP GC 23 | FR - 4 | Glass fabric | Epoxy | ○ | 10 | 50 | 0.01 | 0.01 | 4.5 | 4.5 | 10000 | 200 (F) |
| G-Etronax M | MF GC 21 | G - 5 | Glass fabric | Melamine | ○ | 3.3 | 30 | 0.02 | 0.01 | 6 | 6 | 100 | 600 (F) |
| G-Etronax PI | - | - | Glass fabric | Polyimide | ● | 10 | 70 | 0.01 | - | 4 | - | 1000 | 250 (F) |
| G-Etronax SI | SI GC 21 | G - 7 | Glass fabric | Silicone | ○ | 6.7 | 40 | 0.006 | 0.006 | 4 | 4 | 5000 | 400 (F) |

**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 + 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
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Test method: IEC/EN 61212-2
Norm
Thickness of sample
Conditioning: IEC 60212

| Material designation | IEC 60893-3-1 | 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 | 7.2 | 7.3 | 7.2 | - | - | - | - | - |
| | | | | | | ISO 60216 | ISO 60895-11-10 | 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 S | - | XXX | Paper | Phenol | | 120 | | 1.25 | 2 | | | | | |
| Etronit IV C | - | XXX | Paper | Phenol | | 120 | | 1.25 | 2 | | | | | |
| Etronit B 67 | PF CP 23 | XX | Paper | Phenol | | 120 | | 1.25 | 3.5 | | | | | |
| Etronit B 66 | PF CP 22 | XX | Paper | Phenol | | 120 | | 1.25 | 4.5 | | | | | |
| Etronit B 65 | PF CP 21 | XX | Paper | Phenol | | 120 | | 1.25 | 4.5 | | | | | |
| Etronit 201 M | - | - | Paper | Phenol | | 120 | | 1.25 | 4.5 | | | | | |
| Etronax MMMF | PF CC 24 | - | Cotton fabric | Phenol | | 100 | | 1.3 | 2 | | | | | |
| Etronax MMF | PF CC 21 | L | Cotton fabric | Phenol | | 100 | | 1.3 | 2.5 | | | | | |
| Etronax MFP G | - | - | Cotton/synthetic fabric | Phenol | | 100 | | 1.3 | 5 | | | | | |
| Etronax MF G | - | - | Cotton fabric | Phenol | | 100 | | 1.3 | 1.8 | | | | | |
| Etronax MF | PF CC 22 | C | Cotton fabric | Phenol | | 100 | | 1.25 | 2 | | | | | |
| Etronax DN | - | - | Synthetic fabric | Phenol | | 130 | | 1.15 | 1 | | | | | |
| 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 M | MF GC 21 | G - 5 | Glass fabric | Melamine | | 130 | ≥ 3 / V-0 (F) | 1.8 | 1 | | | | | |
| G-Etronax PI | - | - | Glass fabric | Polyimide | | 200 | ≥ 4 / V-0 (F) | 1.9 | 0.4 | | | | | |
| G-Etronax SI | SI GC 21 | G - 7 | Glass fabric | Silicone | | 210 | ≥ 3 / V-0 (F) | 1.8 | 0.2 | | | | | |

**Conditioning**

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

**Notes**

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