

G-Etronax EP FR4 - Sheet

Components: Glass fabric - Epoxy
Colour*: 
Serial no.: 365
Version no.: V1.0-17/06/15

Closest relevant standards

IEC 60893: EP GC 204
DIN 7735: Hgw 2372.2
NEMA LI 1: FR 4&5

Mechanical properties	Test method	Thickness	Value	Unit	
Bending strength at RT	ISO 178	≥ 1,5 mm	450	MPa	*1
Bending strength at a high temperature	ISO 178	≥ 1,5 mm	170	MPa	*B
Modulus of elasticity	ISO 178	≥ 1,5 mm	22000	MPa	*1
Compressive strength	ISO 604	≥ 5 mm	550	MPa	*1
Izod impact strength, parallel with layers	ISO 180/2A	≥ 5 mm	65	Kj/m ²	*1
Shearing strength, parallel	ISO 60893-2	≥ 5 mm	55	MPa	*1
Tensile strength	ISO 527	≥ 1,6 mm	320	MPa	*1

Electrical properties	Test method	Thickness	Value	Unit	
Electrical strength in oil at 90°C, perpendicular	IEC 60243-1	3 mm	15	kV/mm	*2
Electrical strength in oil at 90°C, parallel	IEC 60243-1	≥ 3 mm	70	kV/25mm	*2
Permittivity 50 MHz	IEC 62631-2-1	≤ 3 mm	4.5		*3
Permittivity 1 MHz	IEC 62631-2-1	≤ 3 mm	4.5		*3
Dissipation factor 50 MHz	IEC 62631-2-1	≤ 3 mm	0.005		*3
Dissipation factor 1 MHz	IEC 62631-2-1	≤ 3 mm	0.008		*3
Insulation resistance after submersion in water	IEC 62631-3-3	All	500000	MΩ	*4
Comparative tracking index	IEC 60112	≥ 3 mm	200	CTI	*1

Conditioning

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

Notes

- 1h/130°C / measured at 130°C
- 1h/150°C / measured at 150°C
- Halogen free
- 1h/180°C / measured at 180°C
- 1h/200°C / measured at 200°C

The above values are average values resulting from extensive tests in our laboratories. ELEKTRO-ISOLA A/S disclaims any and all liability for the performance of our materials in applications outside our control. Elektro-Isola A/S reserves the right to modify the above data without notice or further information. Furthermore, we refer to our general disclaimer.

* Note that color and surface are indicative. As this is a technical product, colour and expression may vary according to dimensions, batches and machining. If you want further information or have special decorative needs, please feel free to contact us.

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Physical and thermal properties	Test method	Thickness	Value	Unit	
Temperature index 20,000 h (T.I.)	IEC 60216	≥ 3 mm	145	°C	-
Fire class	IEC 60695-11-10	≥ 0.2 mm	V-0	-	-
Density	ISO 1183-A	All	1.9	g/cm ³	-
Water absorption	ISO 62-1	50x50x3 mm	10	mg	-
Smoke emission & toxicity	EN 45545-2; R22, R23 & R24	-	-	-	-
Oxygen Index (OI)	EN ISO 4589-2	-	-	%	-
Smoke density (Ds max)	EN ISO 5659-2	-	-	-	-
Smoke density (Ds max)	EN ISO 5659-2	-	-	-	-
Toxicity (CIT _{NLP})	NF X70-100-1/-2	-	-	-	-

Characteristics and applications

This material is self-extinguishing. Particularly good electrical and mechanical properties at moderate temperatures. Retains good electrical properties, even at high humidity. Used in mechanical, electrical and electronic constructions. UL-94 V-0 approved – file No. E222199.

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 1h/130°C / measured at 130°C
- B 1h/150°C / measured at 150°C
- C Halogen free
- D 1h/180°C / measured at 180°C
- E 1h/200°C / measured at 200°C

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