

What is EP GC 306

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EP GC 306 acc. to EN 60893 – epoxy/glass-fabric laminate with significantly increased tracking resistance (CTI $\geq$ 600)

EP GC 306 is a glass-fabric reinforced epoxy resin laminate to EN 60893 whose resin system is specifically designed for a significantly increased tracking resistance (CTI $\geq$ 600 instead of the usual CTI 200-250) while retaining very good basic mechanical values.

CLASSIFICATION AND BASIC CHARACTER

EP GC 306 belongs to the family of glass-fabric laminates (industrial laminates): layers of glass fabric are impregnated with epoxy resin and pressed under heat and pressure into sheets, rods or tubes. A reliable assignment to a DIN 7735 Hgw short designation is not established for this grade; EP GC 306 is therefore listed here exclusively under its EN 60893 designation. The colour is manufacturer-dependent; standard colours are available.

SIGNIFICANTLY INCREASED TRACKING RESISTANCE – THE CTI 600 CLASS

The decisive difference to the common epoxy/glass-fabric grades lies in the tracking resistance: while standard grades reach a CTI value (Comparative Tracking Index, IEC 60112) of around 200-250, EP GC 306 reaches at least 600. This places the material in a significantly higher insulating-material group (relevant, among other things, for creepage-distance dimensioning acc. to IEC 60664). In addition, a Proof Tracking Index (PTI) of at least 500 V is achieved. This property makes the material particularly interesting for applications in which moisture, contamination or conductive dust could promote tracking.

HOW EP GC 306 IS MADE AND MACHINED

EP GC 306 is produced by pressing epoxy-impregnated glass fabric layers into sheets, rods or tubes. From these semi-finished products we machine precision parts – sawing, milling, drilling and turning are carried out with sharp, carbide-tipped or diamond-coated tools, with increased tool wear from the glass fabric to be expected. Adequate dust extraction must be ensured during machining (resin/glass-fibre dust).

MECHANICAL, ELECTRICAL AND THERMAL PROPERTIES

EP GC 306 achieves a flexural strength of at least 340 MPa and a tensile strength of at least 300 MPa, with a flexural modulus of at least 22,000 MPa and a density of 1.8-2.0 g/cm³. Electrically, the material offers an electric strength of at least 10.2 kV/mm ($\perp$) resp. 45 kV ($\parallel$), an insulation resistance of at least 50,000 M Ω , and its namesake tracking resistance of CTI $\geq$ 600. The temperature index acc. to IEC 60216 is at least 155.

WHEN EP GC 306 IS THE RIGHT CHOICE

EP GC 306 is worthwhile whenever a particularly high tracking resistance is required – for example:

- Electrical engineering and switchgear construction with elevated tracking-resistance requirement (insulating material group I acc. to IEC 60664)
- Power electronics and converter engineering
- Applications in humid, contaminated or dust-laden environments
- Transformer and apparatus manufacturing with elevated insulation requirements
- Components where standard grades (CTI 200-250) do not meet the insulation coordination requirement

WHEN EP GC 306 IS NOT THE RIGHT CHOICE

Equally important are the limits of the material:

- Direct food contact – EP GC 306 is not declared for this
- Pure cost optimisation without an elevated tracking-resistance requirement – the standard grades of the epoxy/glass-fabric series (e.g. EP GC 202/203) are sufficient here
- Forming or welding – not possible as a thermoset (machining only)
- Skin-sensitive applications without protective measures during machining (glass-fibre dust)
- Applications where a reliably documented DIN 7735 Hgw assignment is required – this is not reliably established for this grade

WHAT DOES EP GC 306 COST?

Due to the special resin formulation designed for high tracking resistance, EP GC 306 is priced above the standard grades of the epoxy/glass-fabric series. The component price is determined mainly by sheet thickness, dimensions, material utilisation (offcut), machining effort and batch size. We are glad to provide binding prices on request based on your drawing.

MACHINING AT LIEDTKE

EP GC 306 machines well – sawing, milling, drilling and turning are carried out cleanly and accurately with sharp, carbide-tipped or diamond-coated tools, and we allow for the increased tool wear caused by the glass fabric. We ensure adequate dust extraction during machining. This allows us to reliably manufacture high-insulation precision parts with particularly high tracking resistance – from single items to series production.

ADVANTAGES AND DISADVANTAGES AT A GLANCE

An honest assessment – and how the disadvantages can be mitigated in practice:

Advantages

- Significantly increased tracking resistance (CTI ≥ 600)
- Very good mechanical and dielectric properties
- Low water absorption
- Well suited to humid/contaminated environments

Disadvantages

- Not declared for direct food contact
- Higher price than standard grades without a CTI requirement
- Higher tool wear during machining (glass fabric)
- No reliably documented DIN 7735 Hgw assignment

Practical tip: EP GC 306 is the right choice when a tracking resistance of CTI ≥ 600 is required – for example for elevated insulation requirements acc. to IEC 60664 or in humid/contaminated environments. If CTI 200-250 is sufficient, the standard grades of the epoxy/glass-fabric series are the more economical choice.

Typical Properties

- Very good mechanical and dielectric properties
- Significantly increased tracking resistance (CTI ≥ 600)
- Very good electrical insulation properties
- Low water absorption
- Thermoset laminate (dimensionally stable)

Product Examples

- High-insulation components with a CTI requirement
- Power electronics components
- Transformer and switchgear parts
- Insulating parts in humid/contaminated environments
- Precision and test engineering components

Typical Industries

- Electrical engineering and switchgear construction (elevated tracking-resistance requirement)
- Power electronics and converter engineering
- Transformer and apparatus manufacturing
- Mechanical and plant engineering (highly stressed insulating parts)
- Jig, fixture and tool making

	Test Method	Unit	Value
Mechanical Properties			
Flexural strength	ISO 178	MPa	≥ 340
Flexural modulus of elasticity	ISO 178	MPa	≥ 22 · 10 ³
Tensile strength	ISO 527-4	MPa	≥ 300
Compressive strength (⊥)	ISO 604	MPa	≥ 350
Impact strength (Charpy/Izod)	ISO 179 / ISO 180	kJ / m ²	≥ 50
Shear strength ()	VDE 0318 Part 2	MPa	≥ 30
Electrical Properties			
Electric strength ⊥ (90 °C, oil bath, 3 mm)	IEC 60243-1	kV / mm	≥ 10.2
Electric strength (90 °C, oil bath)	IEC 60243-1	kV	≥ 45
Permittivity (50 Hz / 1 MHz)	IEC 60250		≤ 5.3
Dielectric dissipation factor (50 Hz / 1 MHz)	IEC 60250		≤ 0.04
Insulation resistance	IEC 60167	MΩ	≥ 50,000
Proof tracking index PTI	IEC 60112	V	≥ 500
Comparative tracking index CTI	IEC 60112	V	≥ 600
Thermal Properties			
Temperature index (thermal endurance)	IEC 60216		≥ 155
General Properties			
Density	ISO 1183	g / cm ³	1.8-2.0
Water absorption (10 mm thickness)	ISO 62	mg	≤ 34
Colour			manufacturer-dependent (standard colours available)

EP GC 306 (acc. to EN 60893) is an epoxy/glass-fabric laminate with significantly increased tracking resistance (CTI ≥ 600). A reliable DIN 7735 Hgw assignment is not established for this grade and is not claimed. The values stated are the minimum resp. maximum values required for this material type under EN 60893, researched from market-standard, publicly available data sheet information for this product type; they serve as an aid to material selection and are not a legally binding assurance of specific properties. Actual values may vary slightly depending on manufacturer and sheet thickness. EP GC 306 is not declared for direct food contact.