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What is HGW 2372.1

HGW 2372.1

Hgw 2372.1 – glass-fabric laminate with epoxy resin (FR-4), high-strength and flame-retardant

HGW 2372.1 (Hgw 2372.1 acc. to DIN 7735 / EP GC 202 acc. to EN 60893) is known worldwide primarily under the name "FR-4" – the standard material of the PCB industry. As a glass-fabric laminate with epoxy resin, HGW 2372.1 combines very high mechanical strength, low water absorption and self-extinguishing fire behaviour (UL 94 V-0).

Classification and basic character

HGW 2372.1 belongs to the family of glass-fabric laminates (industrial laminates): glass-fabric layers are impregnated with epoxy resin and pressed under heat and pressure into sheets, round bars or tubes. Compared with cotton-fabric laminates (Hgw 2081-2088), the combination of glass fabric and epoxy resin yields significantly higher strength, lower water absorption and better fire behaviour. The colour is characteristically light green.

FR-4 – the world standard of the PCB industry

HGW 2372.1 is chemically identical to the material known as "FR-4", which forms the base of almost every printed circuit board (PCB) worldwide. Besides electronics manufacturing, the material is also used as a standalone mechanical and electrical engineering material – wherever high strength, good electrical insulation and flame retardancy are required.

How HGW 2372.1 is manufactured and processed

HGW 2372.1 is produced by pressing epoxy-resin-impregnated glass-fabric layers into sheets, round bars or tubes. From these semi-finished products we machine precision parts – sawing, milling, drilling and turning produce clean results with sharp, carbide-tipped or diamond-coated tools, allowing for higher tool wear than with cotton-fabric laminates due to the glass fabric. Adequate dust extraction should be ensured during machining (resin/glass fibre dust).

Mechanical, electrical and thermal properties

HGW 2372.1 achieves typical values of around 500 MPa flexural strength, around 350 MPa tensile strength and around 330 MPa compressive strength, with a modulus of elasticity around 21,000 MPa and a density of 1.7-1.9 g/cm³. Electrically, the material offers tracking resistance of CTI 200-220 and very good dielectric strength. The limiting temperature for continuous use is 130 °C (thermal class B), and fire behaviour is self-extinguishing per UL 94 V-0.

When HGW 2372.1 is the right choice

HGW 2372.1 is worthwhile whenever high mechanical strength must be combined with good electrical insulation and flame retardancy – for example:

- PCB substrate and electronics manufacturing (FR-4)
- High-strength insulating and partition panels in medium-voltage switchgear technology
- Components requiring flame retardancy (UL 94 V-0), e.g. in aerospace and rail technology
- Mechanically highly loaded insulating parts in mechanical engineering
- Precision and test engineering requiring low water absorption

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When HGW 2372.1 is NOT the right choice

Equally important are the limits of the material:

- Direct food contact – HGW 2372.1 is not declared for this
- Pure cost optimisation without increased mechanical or electrical requirements – a cotton-fabric laminate such as Hgw 2082 is sufficient here
- Continuous use above approx. 130 °C – a silicone-resin laminate such as Hgw 2572 is more suitable here
- Reshaping or welding – not possible as a thermoset (machining only)
- Skin-sensitive applications without protective measures during machining (glass fibre dust)

What does HGW 2372.1 cost?

HGW 2372.1 is priced above cotton-fabric laminates, since glass fabric and epoxy resin require more material effort. The component price is determined mainly by sheet thickness, dimensions, material utilisation (offcuts), machining effort and batch size. We are happy to provide binding prices on request based on your drawing.

Machining at Liedtke

HGW 2372.1 machines well – sawing, milling, drilling and turning produce clean, dimensionally accurate results with sharp, carbide-tipped or diamond-coated tools, and we allow for the increased tool wear caused by the glass fabric. During machining we ensure adequate dust extraction. This allows us to reliably manufacture high-strength, flame-retardant insulating parts, 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

- Very high mechanical strength
- Low water absorption
- Flame-retardant (UL 94 V-0)
- Very good electrical insulation properties
- World-standard material (FR-4)

Disadvantages

- Not declared for direct food contact
- Higher tool wear during machining (glass fabric)
- Higher price than cotton-fabric laminates
- Continuous use limited to about 130 °C
- Tracking resistance (CTI 200-220) may be insufficient for very high medium-voltage requirements – check melamine-resin-bonded grades in that case

Practical tip: HGW 2372.1 is the right choice when high strength, low water absorption and flame retardancy are required – for example for PCB substrates or highly loaded insulating parts. If the strength of a cotton-fabric laminate is sufficient, Hgw 2082/2083 is the more economical choice; for very high temperature requirements, Hgw 2572 (silicone resin) is more suitable.

Typical Properties

- Very high mechanical strength
- Low water absorption
- Flame-retardant (UL 94 V-0)
- Very good electrical insulation properties
- Thermoset, dimensionally stable
- Colour light green

Product Examples

- PCB substrate (FR-4)
- High-strength insulating and partition panels
- Flame-retardant components (aerospace, rail)
- Mechanically highly loaded insulating parts
- Precision and test engineering components

Typical Industries

- PCB substrate and electronics manufacturing
- Electrical engineering and switchgear construction (medium voltage)
- Mechanical and plant engineering
- Aerospace and rail technology
- Test and measurement engineering

	Test Method	Unit	Value
Mechanical			
Flexural strength	DIN 53452	MPa	500
Tensile strength	DIN 53455	MPa	350
Compressive strength	DIN 53454	MPa	330
Modulus of elasticity	DIN 53452	MPa	21000
Electrical			
Tracking resistance CTI	IEC 60112		220
Electric strength ‖	DIN 53481	kV	75
General			
Density	DIN 53479	g / cm³	1.7-1.9
Limit temperature	VDE 0304, T.21	°C	130
Colour			light green

HGW 2372.1 (EP GC 202 acc. to EN 60893, widely known as "FR-4") is a glass-fabric laminate with epoxy resin per DIN 7735 / EN 60893. The values stated are typical properties, researched from common publicly available data sheet information for this product type; they serve as an aid to material selection and do not constitute a legally binding guarantee of specific properties. Actual values may vary somewhat depending on manufacturer and sheet thickness. HGW 2372.1 is not declared for direct food contact.

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