

What is PF CC 202

PF CC 202

PF CC 202 acc. EN 60893 (Hgw 2082.5 acc. DIN 7735) – high-voltage-resistant cotton fabric phenolic laminate

PF CC 202 (Hgw 2082.5 acc. DIN 7735) is a cotton-fabric-reinforced phenolic laminate for high-voltage-resistant applications. Compared with paper-reinforced phenolic laminates, the fabric reinforcement provides higher toughness and cleavage strength combined with good electrical insulation.

CLASSIFICATION AND BASIC CHARACTER

Fabric-based laminate (PF-CC) belongs to the family of industrial laminates: fabric webs are impregnated with a thermoset resin and pressed under heat and pressure into sheets, rods or tubes. In PF CC 202 (Hgw 2082.5), the reinforcing material is a cotton fabric and the bonding resin is a phenol-formaldehyde resin. Compared with paper-reinforced phenolic laminates, the fabric reinforcement gives the material higher toughness and cleavage strength. Unlike thermoplastics, the cured thermoset does not melt but remains dimensionally stable, hard and mechanically resilient. The colour is typically brown.

CLASSIFICATION WITHIN THE FABRIC-LAMINATE FAMILY

Within the fabric-laminate family according to DIN 7735 / EN 60893, PF CC 202 (Hgw 2082.5) belongs to the high-voltage-resistant cotton fabric grades: solid mechanical values combined with good electrical insulation at higher dielectric strength. The neighbouring grade PF CC 204 (Hgw 2083.5) is reinforced with fine cotton fabric, achieving higher tensile strength and reduced water absorption. For applications with classic high-voltage requirements and good toughness, PF CC 202 is the proven choice.

HOW PF CC 202 IS MANUFACTURED AND PROCESSED

PF CC 202 (Hgw 2082.5) is produced by pressing phenolic-resin-impregnated cotton fabric webs into sheets, rods or tubes. From these semi-finished products we machine precision parts – sawing, milling, drilling and turning can be carried out cleanly and accurately with sharp, carbide-tipped tools. Adequate dust extraction should be ensured during machining (resin/fabric dust).

MECHANICAL, ELECTRICAL AND THERMAL PROPERTIES

PF CC 202 (Hgw 2082.5) achieves typical values of 145 MPa flexural strength, 100 MPa tensile strength and 190 MPa compressive strength, with a modulus of elasticity of around $8 \cdot 10^3$ MPa and a density of 1.3-1.4 g/cm³. Electrically, the material offers an electric strength of up to 25 kV (parallel) or 12 kV (perpendicular) and a comparative tracking index of CTI 100-160. The limiting temperature for continuous use is 110 °C (thermal class E).

WHEN PF CC 202 IS THE RIGHT CHOICE

- High-voltage-resistant insulating and partition parts in switchgear construction
- Components with increased toughness and cleavage-strength requirements
- Insulating parts in transformer and motor manufacturing
- Mechanically resilient structural parts with an electrical insulation function

WHEN PF CC 202 IS NOT THE RIGHT CHOICE

- Direct food contact – PF CC 202 is not declared suitable for this
- Applications requiring particularly high tensile strength or particularly low water absorption – PF CC 204 (Hgw 2083.5) is the better choice here
- Economical standard applications without a high-voltage requirement – a simpler phenolic paper laminate is sufficient here
- Continuous use above approx. 110 °C or damp/wet environments (fabric reinforcement is hygroscopic)

WHAT DOES PF CC 202 COST?

Due to the fabric reinforcement, PF CC 202 is priced above comparable paper-reinforced phenolic laminates. Component price is mainly determined by sheet thickness or rod diameter, 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

PF CC 202 machines well – sawing, milling, drilling and turning can be carried out cleanly and accurately with sharp, carbide-tipped tools. We ensure adequate dust extraction during machining. This allows us to reliably manufacture high-voltage-resistant insulating and structural 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

- High-voltage resistant
- High toughness and cleavage strength from fabric reinforcement
- Good basic mechanical properties
- Thermoset, dimensionally stable

Disadvantages

- Not declared suitable for direct food contact
- Fabric reinforcement absorbs moisture
- Continuous use limited to approx. 110 °C
- More expensive than comparable paper-reinforced laminates

Typical Properties

- High-voltage resistant
- Cotton-fabric-reinforced phenolic laminate
- High toughness and cleavage strength
- Thermoset laminate (dimensionally stable)
- Good machinability
- Colour brown

Product Examples

- Insulating and partition parts for high-voltage applications
- Components in transformer and motor manufacturing
- Gears and sliding elements
- Mechanically resilient insulating parts

Typical Industries

- High-voltage switchgear engineering
- Electrical engineering and insulation technology
- Transformer and motor manufacturing
- Mechanical engineering
- Jig, fixture and tool making

	Test Method	Unit	Value
Mechanical			
Flexural strength	DIN 53452	MPa	145 (DIN 7735: 115)
Tensile strength	DIN 53455	MPa	100 (DIN 7735: 60)
Compressive strength	DIN 53454	MPa	190 (DIN 7735: 150)
Electrical			
Electric strength / ⊥	DIN 53481	kV	25 / 12 (DIN 7735: 20 / 5)

	Test Method	Unit	Value
Comparative tracking index (CTI)	IEC 112		100-160
General			
Density	DIN 53479	g / cm ³	1.3-1.4
Limiting temperature	VDE 0304 T.21	°C	110
Colour			brown

PF CC 202 (Hgw 2082.5 acc. DIN 7735) is a high-voltage-resistant fabric laminate (phenolic resin/cotton fabric) according to EN 60893. The stated values comprise the minimum requirement according to DIN 7735 as well as the typical measured value and are researched, commonly published figures for this product type; they serve as an aid to material selection and are not a legally binding warranty of specific properties. Actual values may vary slightly depending on manufacturer and sheet thickness. PF CC 202 is not declared suitable for direct food contact.

Liedtke
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