

What is PF CC 204

PF CC 204

PF CC 204 acc. EN 60893 (Hgw 2083.5 acc. DIN 7735) – fine-cotton-fabric phenolic laminate, high tensile strength

PF CC 204 (Hgw 2083.5 acc. DIN 7735) is a fine-cotton-fabric-reinforced phenolic laminate. Compared with the standard cotton fabric grade, the finer fabric reinforcement provides higher tensile strength and reduced water absorption at comparable electrical insulation performance.

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 204 (Hgw 2083.5), the reinforcing material is a fine cotton fabric and the bonding resin is a phenol-formaldehyde resin. The finer fabric lies denser and more evenly than a standard fabric and gives the material higher tensile strength combined with reduced water absorption. 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 204 (Hgw 2083.5) is the fine-fabric-based development of PF CC 202 (Hgw 2082.5): compared with the standard cotton fabric grade, PF CC 204 achieves significantly higher tensile strength (130 instead of 100 MPa typical) and lower water absorption, at comparable electrical insulation performance and limiting temperature. For applications with particularly high mechanical tensile loading or increased moisture requirements, PF CC 204 is the targeted choice within the cotton fabric series.

HOW PF CC 204 IS MANUFACTURED AND PROCESSED

PF CC 204 (Hgw 2083.5) is produced by pressing phenolic-resin-impregnated fine 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 204 (Hgw 2083.5) achieves typical values of 170 MPa flexural strength, 130 MPa tensile strength and 190 MPa compressive strength, with a modulus of elasticity of around $8 \cdot 10^3$ MPa and a typical density of 1.36 g/cm^3 . Electrically, the material offers an electric strength of up to 30 kV (parallel) or 15 kV (perpendicular) and a comparative tracking index of CTI 100-160. The limiting temperature for continuous use is 110 °C (thermal class E); water absorption is reduced compared with PF CC 202.

WHEN PF CC 204 IS THE RIGHT CHOICE

- Components with particularly high mechanical tensile loading
- Applications with increased moisture requirements (reduced water absorption)
- High-voltage-resistant insulating and partition parts in switchgear construction
- Insulating parts in transformer and motor manufacturing under high mechanical stress

WHEN PF CC 204 IS NOT THE RIGHT CHOICE

- Direct food contact – PF CC 204 is not declared suitable for this
- Economical standard applications without increased tensile-strength or moisture requirements – PF CC 202 (Hgw 2082.5) is sufficient here
- Applications without a high-voltage requirement – a simpler phenolic paper laminate is sufficient here
- Continuous use above approx. 110 °C or permanently wet environments

WHAT DOES PF CC 204 COST?

Due to the fine fabric reinforcement, PF CC 204 is priced above the standard cotton fabric grade PF CC 202. 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 204 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-tensile-strength, 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 tensile strength
- Reduced water absorption compared with standard cotton fabric
- High-voltage resistant
- Thermoset, dimensionally stable

Disadvantages

- Not declared suitable for direct food contact
- More expensive than the standard cotton fabric grade PF CC 202
- Continuous use limited to approx. 110 °C
- Fabric reinforcement still absorbs some moisture, though reduced

Typical Properties

- Fine-cotton-fabric-reinforced phenolic laminate
- High tensile strength
- Reduced water absorption
- High-voltage resistant
- Thermoset laminate (dimensionally stable)
- Colour brown

Product Examples

- Tension-loaded insulating and structural parts
- Insulating and partition parts for high-voltage applications
- Components in transformer and motor manufacturing
- Mechanically highly 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	170 (DIN 7735: 130)
Tensile strength	DIN 53455	MPa	130 (DIN 7735: 80)

	Test Method	Unit	Value
Compressive strength	DIN 53454	MPa	190 (DIN 7735: 150)
Electrical			
Electric strength $\parallel$ / $\perp$	DIN 53483	kV	30 / 15 (DIN 7735: 25 / 5)
Comparative tracking index (CTI)	IEC 112		100-160
General			
Density		g / cm ³	1.3-1.4 (typically 1.36)
Limiting temperature	VDE 0304	°C	110
Colour			brown

PF CC 204 (Hgw 2083.5 acc. DIN 7735) is a fabric laminate (phenolic resin/fine cotton fabric) according to EN 60893 with high tensile strength. 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 204 is not declared suitable for direct food contact.