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What is EP GM 203

EP GM 203

EP GM 203 acc. to EN 60893 – glass-mat reinforced epoxy resin hard laminate ("hartmatte"), limiting temperature 180 °C

EP GM 203 is a glass-mat reinforced hard laminate made of epoxy resin ("hartmatte"). It consists of epoxy resin reinforced with glass-fibre mats and combines high mechanical strength with good electrical insulation performance, at a limiting temperature of 180 °C that is unusually high for glass-mat hard laminates.

CLASSIFICATION AND BASIC CHARACTER

Glass-mat hard laminates ("hartmatten", GM) belong to the family of laminated sheet materials: glass-fibre mats are impregnated with a thermoset resin and pressed under heat and pressure into sheets or round bars. In EP GM 203 the reinforcing material is a glass-fibre mat, the binding resin an epoxy resin. Unlike thermoplastics, the cured thermoset does not melt but remains dimensionally stable, hard and mechanically resilient. The colour is characteristically yellow-brown.

EP GM 203 COMPARED WITH UP GM 203 (HM 2471)

Within the glass-mat hard laminate family, EP GM 203 differs from UP GM 203 (Hm 2471) in its binding resin: while UP GM 203 is based on unsaturated polyester resin and operates at a limiting temperature of 130 °C, EP GM 203 uses an epoxy resin – enabling a significantly higher limiting temperature of 180 °C and higher mechanical values (flexural strength, compressive strength, modulus of elasticity), albeit at a higher price. For general electrical insulation and structural applications up to 130 °C, UP GM 203 (Hm 2471) remains the more economical choice; where high continuous temperature and/or high mechanical load coincide, EP GM 203 is superior.

HOW EP GM 203 IS MANUFACTURED AND PROCESSED

EP GM 203 is produced by pressing epoxy-resin-impregnated glass-fibre mats into sheets or round bars. From these semi-finished products we machine precision parts – sawing, milling, drilling and turning produce clean, dimensionally accurate results with sharp, carbide-tipped or diamond-coated tools. Because of the abrasive glass-fibre content, increased tool wear should be expected and adequate dust extraction ensured.

MECHANICAL, ELECTRICAL AND THERMAL PROPERTIES

EP GM 203 achieves typical values of around 360 N/mm² flexural strength at room temperature (still around 100 N/mm² at 180 °C), a tensile strength around 250 N/mm² and a compressive strength (⊥ to laminations) around 600 N/mm², with a flexural modulus of elasticity around 20,000 N/mm² and a density of about 2.0 g/cm³. Electrically, the material offers an electric strength of about 60 kV (∥, 90 °C in oil) or 13 kV/mm (⊥, 90 °C) and a comparative tracking index of CTI 180. The limiting temperature for continuous use is 180 °C.

WHEN EP GM 203 IS THE RIGHT CHOICE

- Mechanically highly loaded insulating and structural parts at elevated continuous temperature (up to 180 °C)
- Insulating and separating parts in switchgear and transformer engineering with temperature requirements
- Components in electrical machine construction with simultaneous mechanical and thermal loading
- Support insulators and structural parts requiring high dimensional stability under heat
- Applications in aerospace and rail technology requiring high-temperature insulating parts

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WHEN EP GM 203 IS NOT THE RIGHT CHOICE

- Direct food contact – EP GM 203 is not declared for this
- Applications without particular temperature requirements up to 130 °C – UP GM 203 (Hm 2471) is more economical here
- Applications requiring very high tracking resistance – epoxy resin (CTI 180) is lower here than polyester or melamine resin grades (CTI 600)
- Wet/damp continuous environments without additional protection
- Applications requiring non-machining reshaping or weldability (thermoset)

WHAT DOES EP GM 203 COST?

EP GM 203 is priced at the upper end of the glass-mat hard laminates, as epoxy resin is more expensive than polyester resin. The component price is determined mainly 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

EP GM 203 machines well – sawing, milling, drilling and turning produce clean, dimensionally accurate results with sharp, carbide-tipped or diamond-coated tools. Because of the abrasive glass-fibre content, we use wear-resistant tools and ensure adequate dust extraction. This allows us to reliably manufacture highly loadable, high-temperature-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 mechanical strength, even at elevated temperature
- High limiting temperature (180 °C)
- Good electrical insulation performance
- Thermoset, dimensionally stable
- Good machinability

Disadvantages

- Not declared for direct food contact
- Higher price than polyester hard laminates (UP GM 203)
- Lower tracking resistance (CTI 180) than melamine resin grades (CTI 600)
- Abrasive glass-fibre content, increased tool wear
- Not reshapeable or weldable (thermoset)

Typical Properties

- Glass-mat reinforced epoxy resin hard laminate ("hartmatte")
- High mechanical strength, even at elevated temperature
- High limiting temperature (180 °C)
- Good electrical insulation performance
- Thermoset, dimensionally stable
- Colour yellow-brown

Product Examples

- Insulating and structural parts in switchgear and transformers
- Components in electrical machine construction with temperature requirements
- Support insulators and mounting parts
- High-temperature insulating parts in aerospace and rail technology
- Mechanically highly loaded insulating parts

Typical Industries

- Electrical engineering and switchgear construction
- Power supply and transformer engineering
- Mechanical and plant engineering
- Jig, fixture and tool making
- Aerospace and rail technology

	Test Method	Unit	Value
Mechanical			

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	Test Method	Unit	Value
Flexural strength 23°C	ISO 178	N/mm²	360
Tensile strength	ISO 527	N/mm²	250
Compressive strength ⊥	ISO 604	N/mm²	600
Modulus of elasticity ⊥	ISO 178	N/mm²	20000
Electrical			
Comparative tracking index CTI	IEC 60112		180
Electric strength ‖ (90°C, oil)	IEC 60243-1	kV	60
General			
Density	ISO 1183	g/cm³	2.0
Limit temperature	EN 60893	°C	180
Colour			yellow-brown

EP GM 203 is a glass-mat reinforced epoxy resin hard laminate to EN 60893. The values stated are typical, researched properties based on 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 depending on manufacturer and sheet thickness. EP GM 203 is not declared for direct food contact.

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