

What is PA6 GF25 black

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PA 6, glass-fibre reinforced 25 %

PA6 GF25 black is a polyamide 6 reinforced with 25 % glass fibres. The reinforcement significantly increases strength, stiffness and heat deflection temperature compared to unreinforced PA 6 and reduces creep and thermal expansion; compared to more highly filled grades, the material can be extruded in larger dimensions and remains tougher.

Properties

PA6 GF25 black achieves a yield stress of 96 MPa and a tensile modulus of 5,100 MPa with an impact strength that is high for a glass-fibre reinforced polyamide (Charpy unnotched 78 kJ/m²) and a continuous service temperature of 100 °C. The material is resistant to oils, greases and fuels, easy to machine and weldable and bondable; the thermal conductivity of 0.40 W/(m·K) helps to dissipate frictional heat in sliding applications.

Like all polyamides, the material absorbs moisture, which affects dimensions and stiffness; the glass fibres are abrasive to tools and make the properties direction-dependent. The material is black and not declared for food contact.

Advantages

- Very high strength and stiffness
- High dimensional stability, good heat deflection
- Resistant to oils, greases and fuels
- Easy to machine, weldable and bondable

Disadvantages

- Moisture absorption affects dimensions and stiffness
- Abrasive to tools, direction-dependent properties
- Not generally declared for food contact (see FDA declaration)

Processing

PA6 GF25 black can be machined using all conventional cutting methods; carbide tools are required because of the abrasive glass fibres; sharp cutting edges and good cooling via chip removal avoid heat build-up and residual stresses in the part.

For tight tolerances and thick-walled parts, we recommend intermediate annealing to relieve machining stresses; for tight fits, the moisture absorption of the polyamide must be taken into account.

Typical Applications

PA6 GF25 black is used wherever highly loadable, stiff and dimensionally stable structural parts are required – for example in mechanical engineering and the automotive industry.

- Gears, pinions and coupling parts
- Housings, brackets and consoles under permanent load
- Sliding and guide elements under high load

Typical Properties

- Very high strength and stiffness due to glass fibre reinforcement
- High dimensional stability
- Resistant to oils, greases and fuels

Product Examples

- Gears and coupling parts
- Housings and brackets
- Sliding and guide elements

Typical Industries

- Mechanical Engineering
- Automotive Industry

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.33
Water absorption (24 h)	DIN EN ISO 62	%	0.20
Water absorption (96 h)	DIN EN ISO 62	%	0.30
Flammability	UL 94		HB
Mechanical Properties			
Yield stress	DIN EN ISO 527-2	MPa	96
Yield strain	DIN EN ISO 527-2	%	9
Elongation at break	DIN EN ISO 527-2	%	11
Tensile modulus of elasticity	DIN EN ISO 527-2	MPa	5.100
Flexural strength	DIN EN ISO 178	MPa	143
Flexural modulus	DIN EN ISO 178	MPa	4.900
Compressive strength (2 % strain)	DIN EN ISO 604	MPa	42
Impact strength (Charpy, unnotched)	DIN EN ISO 179-1eU	kJ / m ²	78
Ball indentation hardness	ISO 2039-1	MPa	230
Thermal Properties			
Melting temperature	DIN EN ISO 11357	°C	217
Glass transition temperature	DIN EN ISO 11357	°C	49
Thermal conductivity	ISO 22007-4	W / (m * K)	0.40
Specific heat capacity	Average	kJ / (kg * K)	1.40
Coefficient of linear thermal expansion	DIN EN ISO 11359	10 ⁻⁶ / K	70
Service temperature, long term	Average	°C	100
Service temperature, short term (max.)	Average	°C	180
Electrical Properties			
Surface resistivity	DIN EN 62631-3-2	Ω	10 ¹⁴
Volume resistivity	DIN EN 62631-3-1	Ω · cm	10 ¹⁴