

What is PA6 GF15 black

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PA 6 GF15, thermoforming grade

PA6 GF15 black is a 15 % glass-fibre reinforced, impact-modified polyamide 6 developed as extruded sheet specifically for thermoforming (vacuum forming). It combines the high strength, creep resistance and dimensional stability of a reinforced polyamide with very good formability – for large, thin-walled mouldings that could otherwise only be produced economically by injection moulding.

Properties

PA6 GF15 black achieves a yield stress of 105 MPa, a tensile modulus of 5,400 MPa and a heat deflection temperature of 190 °C at a notched impact strength of 12 kJ/m². The glass fibres keep creep low even under permanent load and give the mouldings high stiffness; the material is resistant to oils, greases and fuels – considerably better than PC, ABS or polyolefins – UV-stabilised, easy to machine and bondable.

Like all polyamides, the material absorbs moisture (up to 2.5 %), which affects dimensions and stiffness; sheets must be dried before thermoforming. The glass fibres limit elongation at break (3 %) and are abrasive to tools. The material is black and not declared for food contact.

Advantages

- Very good thermoformability for large mouldings
- High strength, creep resistance and dimensional stability
- Heat deflection temperature 190 °C, resistant to oils and fuels
- Easy to machine and bond, UV-stabilised

Disadvantages

- Moisture absorption affects dimensions and stiffness
- Low elongation at break, abrasive to tools
- Not generally declared for food contact (see FDA declaration)

Processing

PA6 GF15 black is formed as sheet in the vacuum thermoforming process; the sheets must be dried beforehand, and forming temperature and holding time depend on sheet thickness and tooling. The mouldings can then be trimmed and machined using all conventional cutting methods; carbide tools are recommended because of the abrasive glass fibres.

Good cooling via chip removal avoids heat build-up; bonding is readily possible with suitable adhesives after surface pretreatment.

Typical Applications

PA6 GF15 black is used wherever large, stiff and impact-resistant mouldings are required in small and medium quantities – for example in vehicle and commercial vehicle construction, in mechanical engineering and in container construction.

- Panels, covers and housing parts for vehicles and machines
- Thermoformed containers, trays and tubs
- Load-bearing mouldings in contact with oil and fuel

Typical Properties

- Very good thermoformability
- High creep resistance and dimensional stability
- Very good machinability
- Good bonding properties

Product Examples

- Panels and covers
- Containers, tubs and trays
- Load-bearing mouldings

Typical Industries

- Automotive Industry
- Mechanical Engineering
- Container Construction

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.22
Water absorption	DIN EN ISO 62	%	2.50
Flammability (Thickness 3 mm / 6 mm)	UL 94		HB / HB
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	105
Elongation at break	DIN EN ISO 527	%	3
Tensile modulus of elasticity	DIN EN ISO 527	MPa	5.400
Notched impact strength	DIN EN ISO 179	kJ / m ²	12.0
Ball indentation hardness	DIN EN ISO 2039-1	MPa	200
Shore hardness	DIN EN ISO 868	scale D	83
Thermal Properties			
Melting temperature	ISO 11357-3	°C	220
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	70
Service temperature, long term	Average	°C	-20 ... 140
Service temperature, short term (max.)	Average	°C	180
Heat deflection temperature	DIN EN ISO 75, Verf. A, HDT	°C	190