

## What is PA 6 GF30 black

# PA 6 GF30 black

PA 6, glass-fibre reinforced 30 % (black)

PA 6 GF30 black is a polyamide 6 reinforced with 30 % glass fibres and coloured black. The glass-fibre reinforcement significantly increases stiffness and strength compared to unreinforced PA6, while reducing toughness and elongation at break.

## Properties

PA 6 GF30 black is a semi-crystalline, glass-fibre reinforced polyamide with high stiffness, high strength, and good dimensional stability. Compared to the natural-coloured grade, this black compound has a somewhat lower yield stress, a lower tensile modulus, and a lower notched impact strength.

Like all polyamides, PA 6 GF30 black absorbs moisture from the environment; this somewhat improves toughness and impact resistance, while stiffness and dimensional stability decrease slightly.

## Advantages

- High rigidity and strength through glass-fibre reinforcement
- Good dimensional stability
- Black coloured for easy visual identification

## Disadvantages

- Lower toughness and elongation at break than unreinforced PA6
- Moisture absorption up to 2.0 % in standard atmosphere, causing dimensional and property changes
- Not generally declared for food contact (see FDA declaration)

## Processing

PA 6 GF30 black can be machined using all conventional cutting methods; due to the abrasive effect of the glass fibres, carbide tools are recommended. Good cooling via chip removal remains important to avoid softening or smearing of the surface caused by heat build-up.

For tight tolerances, we take swelling and shrinkage behaviour into account and condition the semi-finished product where required.

## Typical Applications

PA 6 GF30 black is used wherever high stiffness and strength are required at low weight and a black colour is desired, for example in mechanical engineering.

- Highly loaded structural components
- Bearing and guide elements
- Components with high stiffness requirements

## Typical Properties

- High rigidity and strength
- Good dimensional stability
- Black coloured

## Product Examples

- Structural components
- Bearing and guide elements
- Rigid mouldings

## Typical Industries

- Mechanical Engineering

|                           | Test Method       | Unit                | Value |
|---------------------------|-------------------|---------------------|-------|
| <b>General Properties</b> |                   |                     |       |
| Density                   | DIN EN ISO 1183-1 | g / cm <sup>3</sup> | 1.35  |

|                                      | Test Method   | Unit | Value   |
|--------------------------------------|---------------|------|---------|
| Water absorption                     | DIN EN ISO 62 | %    | 2.00    |
| Flammability (Thickness 3 mm / 6 mm) | UL 94         |      | HB / HB |

### Mechanical Properties

|                               |                |                     |       |
|-------------------------------|----------------|---------------------|-------|
| Yield stress                  | DIN EN ISO 527 | MPa                 | 85    |
| Elongation at break           | DIN EN ISO 527 | %                   | 5     |
| Tensile modulus of elasticity | DIN EN ISO 527 | MPa                 | 4.500 |
| Notched impact strength       | DIN EN ISO 179 | kJ / m <sup>2</sup> | 4.0   |
| Shore hardness                | DIN EN ISO 868 | scale D             | 86    |

### Thermal Properties

|                                         |                             |                      |             |
|-----------------------------------------|-----------------------------|----------------------|-------------|
| Melting temperature                     | ISO 11357-3                 | °C                   | 220         |
| Thermal conductivity                    | DIN 52612-1                 | W / (m·K)            | 0.28        |
| Thermal capacity                        | DIN 52612                   | kJ / (kg·K)          | 1.50        |
| Coefficient of linear thermal expansion | DIN 53752                   | 10 <sup>-6</sup> / K | 60          |
| Service temperature, long term          | Average                     | °C                   | -30 ... 110 |
| Service temperature, short term (max.)  | Average                     | °C                   | 180         |
| Heat deflection temperature             | DIN EN ISO 75, Verf. A, HDT | °C                   | 140         |