

What is PA 12 GF30 natural

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PA 12, glass-fibre reinforced 30 %

PA 12 GF30 natural is a polyamide 12 reinforced with 30 % glass fibres. The reinforcement gives the material significantly higher strength, stiffness and heat deflection temperature as well as improved dimensional stability – combined with the very low moisture absorption typical of PA 12. This makes it suitable for durable, highly stressed components.

Properties

PA 12 GF30 natural is a semi-crystalline polyamide with embedded short glass fibres. The fibres considerably increase stiffness, compressive strength and heat deflection temperature compared to unreinforced PA 12 and reduce thermal expansion. At the same time, the good damping properties of the polyamide are retained – the material absorbs noise and vibration and is highly abrasion-resistant.

Unlike PA 6 or PA 6 G, PA 12 absorbs very little moisture; dimensions and mechanical values therefore remain largely stable even in humid environments.

Advantages

- High stiffness and compressive strength
- High heat deflection temperature (HDT 140 °C)
- Very low moisture absorption, good dimensional stability
- Good noise and vibration damping, high abrasion resistance

Disadvantages

- Lower elongation at break and toughness than unreinforced PA 12
- Glass fibres are abrasive to tools and mating surfaces
- Not generally declared for food contact (see FDA declaration)

Processing

PA 12 GF30 natural can be machined using all conventional cutting methods. Because of the abrasive glass fibres, carbide tools are recommended; sharp cutting edges and good cooling via chip removal avoid softening or smearing of the surface caused by heat build-up.

Glass-fibre-containing dust generated during machining should be extracted. Thanks to the low moisture absorption, tight tolerances can be achieved without elaborate conditioning.

For sliding applications against soft mating surfaces, the abrasive effect of the glass fibres must be taken into account; for pure sliding components we recommend lubricant-modified grades where required.

Typical Applications

PA 12 GF30 natural is used wherever high stiffness, dimensional stability and heat deflection temperature are required together with low moisture absorption – for example in mechanical engineering and vehicle construction.

- Rigid housing and support parts
- Dimensionally stable guide and functional elements
- Highly stressed wear and structural parts

Typical Properties

- High stiffness and compressive strength
- High heat deflection temperature
- Very low moisture absorption

Product Examples

- Housing and support parts
- Guide and functional elements
- Wear and structural parts

Typical Industries

- Mechanical Engineering
- Vehicle Construction

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.25
Water absorption	DIN EN ISO 62	%	0.50
Flammability (Thickness 3 mm / 6 mm)	UL 94		HB / HB
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	60
Elongation at break	DIN EN ISO 527	%	10
Tensile modulus of elasticity	DIN EN ISO 527	MPa	4.000
Notched impact strength	DIN EN ISO 179	kJ / m ²	5.0
Ball indentation hardness	DIN EN ISO 2039-1	MPa	125
Shore hardness	DIN EN ISO 868	scale D	86
Thermal Properties			
Melting temperature	ISO 11357-3	°C	180
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 ⁻⁶ / 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, Method A, HDT	°C	140