

What is PA66 CF20

PA66 CF20 black

Polyamide 66, carbon fibre reinforced 20% (PA66 CF20)

Polyamide 66 (PA66) is a semi-crystalline engineering plastic with high strength, good wear resistance and high heat deflection temperature. Reinforced with approximately 20% short carbon fibres, the material gains significantly in stiffness and dimensional stability, while remaining lighter than comparable glass-fibre-reinforced grades. Liedtke supplies PA66 CF20 as a black semi-finished product for machining.

Material Character

PA66 CF20 is based on polyamide 66 reinforced with short carbon fibres. The fibres significantly increase stiffness, tensile strength and creep resistance compared with unreinforced PA66, while giving a lower density than comparable glass-fibre-reinforced grades such as PA66 GF30.

Compared with glass-fibre filling, carbon fibre is less abrasive against mating surfaces and improves sliding properties, while the significantly higher thermal conductivity of the carbon fibres dissipates frictional heat more quickly – an advantage in dynamically loaded, tribological applications.

With around 20% fibre content, the material offers a balanced ratio of stiffness and toughness. More highly filled grades are stiffer but more brittle; PA66 CF20 is therefore suitable for components that require high dimensional stability alongside some residual tolerance to impact loading.

Advantages and Limitations

Advantages

- Very high stiffness at comparatively low density
- Good wear and sliding properties, less abrasive than glass-fibre-reinforced grades
- High thermal conductivity for fast heat dissipation
- High dimensional stability and low thermal expansion in the fibre direction
- Good weldability and bondability

Disadvantages

- Moisture absorption typical of polyamides, though lower than unreinforced PA66
- Carbon fibre dust generated during machining requires extraction and respiratory protection
- Limited electrical insulation capability due to the conductive carbon fibres
- Not intended for food contact

Processing

PA66 CF20 can be readily machined with conventional machine tools, such as milling, turning and drilling. Before machining, the semi-finished product should be at room temperature and/or stored for at least 24 hours under normal ambient conditions so that internal stresses in the material are relieved.

Machining generates abrasive carbon fibre dust, which should be captured with suitable extraction; carbide- or diamond-coated tools extend tool life against the abrasive fibre material.

Typical Properties

- Very high stiffness
- Good wear resistance
- High heat deflection temperature
- High thermal conductivity for a thermoplastic

Product Examples

- Heavily loaded bearing and sliding elements
- Gears and transmission components
- Structural components in vehicle construction

Typical Industries

- Mechanical and plant engineering
- Automotive industry

- High dimensional stability
- Precision components with tight tolerances

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.23
Water absorption (24 h / 96 h, 23 °C)	DIN EN ISO 62	%	0.1 / 0.3
Flammability	DIN IEC 60695-11-10		HB (UL 94)
Mechanical Properties			
Tensile strength	DIN EN ISO 527-2	MPa	104
Elongation at break	DIN EN ISO 527-2	%	13
Tensile modulus	DIN EN ISO 527-2	MPa	5100
Flexural strength	DIN EN ISO 178	MPa	135
Impact strength (Charpy, unnotched)	DIN EN ISO 179-1eU	kJ / m ²	116
Shore hardness	DIN EN ISO 868	scale D	83
Thermal Properties			
Glass transition temperature	DIN EN ISO 11357	°C	48
Melting temperature	DIN EN ISO 11357	°C	251
Thermal conductivity	ISO 22007-4:2008	W / (m * K)	0.72
Service temperature, long term	Average	°C	100
Service temperature, short term (max.)	Average	°C	170
Electrical Properties			
Surface resistivity	DIN EN 61340-2-3	Ω	10 ⁴ ... 10 ¹²
Volume resistivity	DIN EN 61340-2-3	Ω * cm	10 ³ ... 10 ¹²

The stated values are average values, confirmed by continuous statistical testing and in line with the requirements of DIN EN 15860. They serve as information for material selection and do not constitute a legally binding assurance of specific properties.