

Technical Data Sheet Polyamide 6 – flame retardant (FR)

PA 6 FR black

PA 6 FR – halogen- and phosphorus-free flame-retardant system, certified to EN 45545-2, coloured black throughout

Typical Properties

- Halogen- and phosphorus-free
- Flame retardant
- Self-extinguishing
- High hardness
- High strength
- Good sliding properties
- Good abrasion and wear resistance
- Good machinability
- Good dimensional stability
- Certified to EN 45545-2

Typical Industries

- Railway technology and rail vehicles
- Automotive engineering
- Semiconductor industry
- Factory equipment

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.17
Water absorption	DIN EN ISO 62	%	3.0
Flammability (thickness 3 mm / 6 mm)	UL 94		V0 / V0
Colour			black
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	82
Elongation at break	DIN EN ISO 527	%	3
Tensile modulus of elasticity	DIN EN ISO 527	MPa	3800
Shore hardness	DIN EN ISO 868	scale D	83
Thermal Properties			
Melting temperature	ISO 11357-3	°C	222
Thermal capacity	DIN 52612	kJ / (kg * K)	1.70
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	90
Service temperature, long term	Average	°C	-20 ... 85
Service temperature, short term (max.)	Average	°C	160

	Test Method	Unit	Value
Heat deflection temperature	DIN EN ISO 75, method A, HDT	°C	65
Electrical Properties			
Volume resistivity	DIN EN 62631-3-1	$\Omega \cdot \text{cm}$	10^{13}
Surface resistivity	DIN EN 62631-3-2	Ω	10^{16}

The values stated apply to the PA 6 FR grade; colouring does not significantly change the mechanical and thermal properties. The electrical properties were measured on natural, dry material – with black-coloured or moist material the electrical properties may change significantly; for electrically critical applications please contact us. Moisture absorption changes the mechanical properties of polyamides: the material becomes tougher and more impact resistant, the tensile modulus decreases. Depending on the ambient atmosphere, temperature and exposure time, only a certain surface layer is affected by these changes; in thick-walled parts the core area remains unchanged. The short-term maximum application temperature only applies to applications with very low mechanical stress over a few hours. The long-term maximum application temperature is based on the thermal ageing of plastics by oxidation, resulting in a decrease of the mechanical properties. The temperatures stated cause a 50 % loss of the tensile strength (measured at room temperature) compared with the original value after an exposure of at least 5,000 hours. The minimum application temperature is mainly determined by possible impact or shock loads in service; the values stated refer to a low degree of impact stress. PA 6 FR contains a flame-retardant system and is not intended for food contact. The values stated are average values; they serve as information about our products and as an aid to material selection. They are not a legally binding assurance of specific properties or of suitability for a particular purpose. As the properties also depend on the dimensions of the semi-finished product and on the degree of crystallinity (e.g. nucleation by pigments), the actual property values of a specific product may deviate slightly from the data given.