

What is PA 66 natural

PA 66 natural

PA 66

PA 66 natural is a semi-crystalline polyamide with higher strength, hardness and heat deflection temperature than PA 6 and slightly lower moisture absorption. It is characterised by high abrasion resistance, good sliding properties and a high continuous service temperature.

Properties

PA 66 natural has high tensile strength and hardness as well as high abrasion resistance with good sliding properties. Compared to PA 6, the melting point (260 °C), stiffness and continuous service temperature are higher and moisture absorption is slightly lower. The material can be machined and welded very well.

Like all polyamides, PA 66 natural absorbs moisture from the environment (up to approx. 2.8 % in standard atmosphere); this makes the material tougher and more impact-resistant, while stiffness and dimensional stability decrease somewhat.

Advantages

- Higher stiffness, hardness and heat deflection temperature than PA 6
- High abrasion resistance, good sliding properties
- High continuous service temperature
- Very good machinability and weldability

Disadvantages

- Moisture absorption up to approx. 2.8 % in standard atmosphere, causing dimensional and property changes
- Lower toughness than PA 6, more notch-sensitive
- Not resistant to strong acids and permanently hot water (hydrolysis)

Processing

PA 66 natural can be machined using all conventional cutting methods; HSS or carbide tools are sufficient. 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.

In welding and bonding, PA 66 behaves like PA 6; for bonded joints, two-component epoxy or polyurethane adhesives are recommended after surface pretreatment.

Typical Applications

PA 66 natural is used wherever high strength, wear resistance and temperature resistance are required – for example in mechanical and vehicle engineering and in the electrical industry.

- Plain bearings, gears and rollers
- Guide and wear elements
- Insulating and structural parts

Typical Properties

- Higher stiffness and heat deflection temperature than PA 6
- Good wear resistance
- Good machinability

Product Examples

- Plain bearings and gears
- Guide and wear elements
- Insulating and structural parts

Typical Industries

- Mechanical Engineering
- Vehicle Construction
- Electrical Industry

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.15
Water absorption	DIN EN ISO 62	%	2.80
Flammability (Thickness 3 mm / 6 mm)	UL 94		HB / V2
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	85
Elongation at break	DIN EN ISO 527	%	50
Tensile modulus of elasticity	DIN EN ISO 527	MPa	3.300
Notched impact strength	DIN EN ISO 179	kJ / m ²	>3.0
Ball indentation hardness	DIN EN ISO 2039-1	MPa	180
Shore hardness	DIN EN ISO 868	scale D	83
Thermal Properties			
Melting temperature	ISO 11357-3	°C	260
Thermal conductivity	DIN 52612-1	W / (m * K)	0.23
Thermal capacity	DIN 52612	kJ / (kg * K)	1.70
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	80
Service temperature, long term	Average	°C	-30 ... 95
Service temperature, short term (max.)	Average	°C	170
Heat deflection temperature	DIN EN ISO 75, Verf. A, HDT	°C	100