

What is ABS natural

ABS natural

ABS, acrylonitrile butadiene styrene

ABS natural is an amorphous standard engineering thermoplastic based on acrylonitrile butadiene styrene copolymer. The combination of a stiff styrene-acrylonitrile matrix and an embedded butadiene rubber phase results in a material with high impact strength, good stiffness and excellent surface quality – at economical cost.

Properties

ABS natural combines a yield stress of 38 MPa and a tensile modulus of 2,000 MPa with a notched impact strength of 25 kJ/m², largely retained even at low temperatures down to -40 °C. The material can be machined, drilled and thread-cut very well, bonds well with solvent and two-component adhesives, can be printed, painted and electroplated; the low moisture absorption ensures stable dimensions and the electrical insulating properties are good.

ABS can only be used continuously up to 80 °C, is not resistant to ketones, esters, aromatic and chlorinated hydrocarbons or concentrated acids, and without stabilisation has only limited weathering and UV resistance (yellowing, embrittlement). It is normally flammable (UL 94 HB) and not declared for food contact.

Advantages

- High impact strength, even at low temperatures
- Very good machinability, easy to bond, print and paint
- Good stiffness and dimensional stability, good surface quality
- Economical standard plastic

Disadvantages

- Continuous service temperature only 80 °C
- Not resistant to ketones, esters and aromatic solvents
- Limited UV and weathering resistance, normally flammable
- Not generally declared for food contact (see FDA declaration)

Processing

ABS natural can be machined well using all conventional cutting methods; sharp tools and good cooling via chip removal avoid heat build-up and stress cracking. Cooling lubricants must be compatible with ABS – ketones, esters and aromatic solvents must be avoided – if in doubt, machine dry or with compressed air.

For tight tolerances and thick-walled parts, we recommend intermediate annealing to relieve machining stresses.

Typical Applications

ABS natural is used wherever impact-resistant, dimensionally stable and visually appealing parts are to be produced economically at moderate temperatures – for example in mechanical and jig construction, in the electrical industry and in the consumer goods industry.

- Housings, covers and panels
- Prototypes, models and fixture parts
- Brackets, handles and control elements

Typical Properties

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- Good machinability
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Product Examples

- Housings and panels
- Prototypes and fixture parts
- Handles and control elements

Typical Industries

- Mechanical Engineering
- Consumer Goods Industry
- Electrical Industry

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.04
Water absorption	DIN EN ISO 62	%	0.30
Flammability (Thickness 3 mm / 6 mm)	UL 94		HB / HB
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	38
Elongation at break	DIN EN ISO 527	%	50
Tensile modulus of elasticity	DIN EN ISO 527	MPa	2.000
Notched impact strength	DIN EN ISO 179	kJ / m ²	25.0
Ball indentation hardness	DIN EN ISO 2039-1	MPa	90
Shore hardness	DIN EN ISO 868	scale D	74
Thermal Properties			
Thermal conductivity	DIN 52612-1	W / (m * K)	0.17
Thermal capacity	DIN 52612	kJ / (kg * K)	1.20
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	90
Service temperature, long term	Average	°C	-40 ... 80
Service temperature, short term (max.)	Average	°C	100
Electrical Properties			
Dielectric constant	IEC 60250		3.1
Dissipation factor	IEC 60250		0.015
Volume resistivity	DIN EN 62631-3-1	Ω · cm	10 ¹⁵
Surface resistivity	DIN EN 62631-3-2	Ω	10 ¹⁴