

What is PSU natural

PSU natural

PSU, polysulfone

PSU natural is an amorphous, transparent high-performance thermoplastic with a glass transition temperature of 190 °C. It combines high heat deflection temperature and dimensional stability with good hydrolysis resistance – PSU can be steam sterilised – and a lower tendency to stress cracking than polycarbonate.

Properties

PSU natural offers a yield stress of 80 MPa and a tensile modulus of 2,600 MPa, largely retained over a wide temperature range up to the continuous service temperature of 160 °C. The material is resistant to hot water, steam, dilute acids and alkalis, microwave-safe, an excellent electrical insulator and self-extinguishing at 6 mm thickness (UL 94 V0). The yellowish transparency allows sight components.

As an amorphous material, PSU is sensitive to stress cracking in contact with ketones, esters and chlorinated hydrocarbons and has only limited UV resistance; the heat deflection temperature is below that of PES and PPSU.

Advantages

- High heat deflection temperature (HDT 175 °C), continuous service up to 160 °C
- Hydrolysis resistant, steam sterilisable, microwave-safe
- High dimensional stability, transparent
- Very good electrical insulating properties

Disadvantages

- Sensitive to stress cracking with some solvents
- Limited UV resistance
- Lower heat deflection temperature than PES and PPSU

Processing

PSU 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 the amorphous material – 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

PSU natural is used wherever components are exposed to hot water, steam or repeated sterilisation and must remain dimensionally stable and transparent – for example in medical technology, the electrical industry and food technology.

- Sterilisable components and instrument parts
- Sight glasses, filter housings and media-carrying components
- Insulating and functional parts for electrical engineering

Typical Properties

- High heat deflection temperature
- High transparency
- Good hydrolysis resistance, steam sterilisable
- High dimensional stability

Product Examples

- Sterilisable components
- Sight glasses and filter housings
- Insulating and functional parts

Typical Industries

- Medical Technology
- Electrical Industry
- Food Industry

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.24
Water absorption	DIN EN ISO 62	%	0.200
Flammability (Thickness 3 mm / 6 mm)	UL 94		HB / V0
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	80
Elongation at break	DIN EN ISO 527	%	15
Tensile modulus of elasticity	DIN EN ISO 527	MPa	2.600
Notched impact strength	DIN EN ISO 179	kJ / m ²	6.0
Ball indentation hardness	DIN EN ISO 2039-1	MPa	155
Shore hardness	DIN EN ISO 868	scale D	85
Thermal Properties			
Thermal conductivity	DIN 52612-1	W / (m * K)	0.26
Thermal capacity	DIN 52612	kJ / (kg * K)	1.10
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	55
Service temperature, long term	Average	°C	-50 ... 160
Service temperature, short term (max.)	Average	°C	180
Heat deflection temperature	DIN EN ISO 75, Verf. A, HDT	°C	175
Glass transition temperature	ISO 11357-2	°C	190
Electrical Properties			
Dielectric strength	IEC 60243-1	kV / mm	30