

What is PPSU MG bone

PPSU MG bone

PPSU, medical grade (bone)

PPSU MG bone is an amorphous high-performance thermoplastic based on polyphenylsulfone in medical grade (MG), developed for surgical instruments, sterilisation trays and components of medical devices. It combines exceptional toughness with a glass transition temperature of 220 °C and the highest resistance to repeated steam sterilisation. The bone colouring serves for colour coding and identification of instruments.

Properties

PPSU MG bone withstands more than 1,000 autoclave cycles without significant loss of properties and is resistant to hot water, steam, common disinfectants and cleaning agents as well as many acids and alkalis. With a notched impact strength of 10 kJ/m², an elongation at break of 30 % and a yield stress of 77 MPa, it is the toughest material of the sulfone family; the continuous service temperature is 180 °C, the material is inherently flame retardant (UL 94 V0) and is supplied with batch traceability.

As an amorphous material, PPSU is sensitive to stress cracking in contact with ketones, esters and chlorinated hydrocarbons; moisture absorption is moderate at 0.6 %. According to the resin manufacturer, the material is not intended for implants that remain in the body for more than 24 hours.

Advantages

- Medical grade, batch traceable
- Very high toughness, continuous service up to 180 °C
- Resistant to more than 1,000 steam sterilisation cycles
- Inherently flame retardant (UL 94 V0), colour codable

Disadvantages

- Sensitive to stress cracking with some solvents
- Not intended for long-term implants (> 24 h)
- Not generally declared for food contact (see FDA declaration)

Processing

PPSU MG bone 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

PPSU MG bone is used wherever components are sterilised repeatedly and must remain tough, dimensionally stable and clearly identifiable by colour – for example in medical technology, dental technology and laboratory technology.

- Handles and housings of surgical instruments
- Sterilisation trays, holders and basket inserts
- Components of medical and laboratory devices

Typical Properties

- Medical grade
- Very high toughness
- High resistance to steam sterilisation

Product Examples

- Instrument handles and housings
- Sterilisation trays
- Device components

Typical Industries

- Medical Technology
- Dental Technology
- Laboratory Technology

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.29
Water absorption	DIN EN ISO 62	%	0.600
Flammability (Thickness 3 mm / 6 mm)	UL 94		V0 / V0
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	77
Elongation at break	DIN EN ISO 527	%	30
Tensile modulus of elasticity	DIN EN ISO 527	MPa	2.500
Notched impact strength	DIN EN ISO 179	kJ / m ²	10.0
Thermal Properties			
Thermal conductivity	DIN 52612-1	W / (m * K)	0.35
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	55
Service temperature, long term	Average	°C	-50 ... 180
Service temperature, short term (max.)	Average	°C	210
Heat deflection temperature	DIN EN ISO 75, Verf. A, HDT	°C	205
Glass transition temperature	ISO 11357-2	°C	220