

What is PEEK CM natural

PEEK CM natural

PEEK, special compound CM

PEEK CM natural is an unfilled polyetheretherketone compression moulded (CM) into sheets. The compression-moulded premium material is characterised by a very low level of residual stress and a tensile modulus that is higher than that of extruded PEEK – for components with maximum dimensional stability.

Properties

PEEK CM natural is a semi-crystalline high-performance thermoplastic. Compression moulding produces an isotropic, low-stress structure, so that even large-area, thin-walled or heavily milled components can be produced with low distortion. The material combines high stiffness and hardness with very good resistance to chemicals, hydrolysis and radiation, and is flame retardant (UL 94 V0) with low smoke density.

Compared to extruded PEEK natural, the elongation at break is lower; the material is stiffer and less tough. The low moisture absorption ensures stable dimensions even in humid environments.

Advantages

- Maximum dimensional stability, very low residual stress
- Increased tensile modulus compared to extruded PEEK
- Continuous service from -60 to 250 °C, flame retardant
- Very good resistance to chemicals, hydrolysis and radiation

Disadvantages

- Lower elongation at break and toughness than extruded PEEK
- High material cost compared to engineering plastics
- Not resistant to concentrated sulphuric acid and some halogenated hydrocarbons

Processing

PEEK CM natural can be machined using all conventional cutting methods; because of the high hardness, carbide tools with sharp cutting edges are recommended. Good cooling via chip removal remains important to avoid heat build-up and residual stresses in the part.

For tight tolerances and thick-walled parts, we recommend intermediate annealing to relieve machining stresses; thanks to the low moisture absorption, no conditioning is required.

The compression-moulded sheets are particularly suitable for large-area and delicate machining with low distortion.

Typical Applications

PEEK CM natural is used wherever extreme dimensional stability and heat deflection temperature are required – for example in aerospace, the semiconductor industry, mechanical engineering and medical technology.

- Precision and structural parts for aerospace
- Wafer handling and process components
- Large-area, low-distortion functional parts

Typical Properties

- Modified compound with adapted toughness profile
- Very high heat deflection temperature
- Maximum dimensional stability

Product Examples

- Precision and structural parts
- Wafer handling components
- Large-area functional parts

Typical Industries

- Aerospace
- Semiconductor Industry
- Mechanical Engineering
- Medical Technology

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.31
Water absorption	DIN EN ISO 62	%	0.2
Flammability (Thickness 3 mm / 6 mm)	UL 94		V0 / V0
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	70
Elongation at break	DIN EN ISO 527	%	2
Tensile modulus of elasticity	DIN EN ISO 527	MPa	4.100
Ball indentation hardness	DIN EN ISO 2039-1	MPa	250
Shore hardness	DIN EN ISO 868	scale D	88
Thermal Properties			
Melting temperature	ISO 11357-3	°C	343
Thermal conductivity	DIN 52612-1	W / (m * K)	0.25
Thermal capacity	DIN 52612	kJ / (kg * K)	1.34
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	50
Service temperature, long term	Average	°C	-60 ... 250
Service temperature, short term (max.)	Average	°C	310
Heat deflection temperature	DIN EN ISO 75, Verf. A, HDT	°C	152