

What is PEEK MOD ESD90 black

PEEK MOD ESD90 black

PEEK, modified, electrostatically dissipative

PEEK MOD ESD90 black is a tribologically modified polyetheretherketone: carbon fibres increase stiffness and heat deflection temperature, the solid lubricants PTFE and graphite reduce friction and wear, and the dissipative setting discharges electrostatic charges in a controlled manner – the premium sliding material for bearings, bushings, valve and sealing elements up to 250 °C.

Properties

PEEK MOD ESD90 black is a semi-crystalline high-performance thermoplastic with a balanced combination of carbon fibre and solid lubricant content. This results in a higher tensile modulus than standard PEEK, a heat deflection temperature of 293 °C, a very low tendency to creep and low thermal expansion combined with excellent dry-running properties. The surface resistivity of 10^6 to $10^9 \Omega$ makes the material electrostatically dissipative (ESD) and thus suitable for semiconductor and electronics environments.

Like all PEEK grades, the material is flame retardant (UL 94 V0) and highly resistant to chemicals and radiation. The fillers reduce the elongation at break and are abrasive to tools; the colour is black due to the fillers.

Advantages

- Excellent sliding and wear properties, dry running possible
- Higher tensile modulus than standard PEEK, HDT 293 °C
- Very low tendency to creep and thermal expansion
- Electrostatically dissipative (10^6 – $10^9 \Omega$)

Disadvantages

- Low elongation at break, more brittle than unfilled PEEK
- Fillers are abrasive to tools
- Not generally declared for food contact (see FDA declaration)
- High material cost compared to engineering plastics

Processing

PEEK MOD ESD90 black 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.

Carbon-fibre-containing dust generated during machining must be extracted; do not heat PTFE-containing chips above 300 °C.

Typical Applications

PEEK MOD ESD90 black is used wherever highly loaded sliding elements must run without lubrication at high temperatures in ESD-protected environments – for example in the semiconductor industry, electronics, mechanical engineering, conveyor technology and aerospace.

- Plain bearings, bushings and thrust washers
- Valve, seal and piston rings
- Wafer handling and ESD components

Typical Properties

- Electrostatically dissipative (ESD)
- Higher tensile modulus than standard PEEK
- Excellent sliding and wear properties

Product Examples

- Plain bearings and bushings
- Valve and sealing elements
- ESD components

Typical Industries

- Semiconductor Industry
- Electronics
- Mechanical Engineering
- Aerospace

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.46
Water absorption	DIN EN ISO 62	%	0.20
Flammability (Thickness 3 mm / 6 mm)	UL 94		V0 / V0
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	75
Elongation at break	DIN EN ISO 527	%	4
Tensile modulus of elasticity	DIN EN ISO 527	MPa	4.900
Notched impact strength	DIN EN ISO 179	kJ / m ²	5.0
Ball indentation hardness	DIN EN ISO 2039-1	MPa	220
Shore hardness	DIN EN ISO 868	scale D	85
Thermal Properties			
Melting temperature	ISO 11357-3	°C	343
Thermal conductivity	DIN 52612-1	W / (m * K)	0.24
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	30
Service temperature, long term	Average	°C	-30 ... 250
Service temperature, short term (max.)	Average	°C	310
Heat deflection temperature	DIN EN ISO 75, Verf. A, HDT	°C	293