

PEEK-CA30

30% Carbon Fiber Reinforced Polyetheretherketone

Material Overview

PEEK-CA30 is a 30% carbon fiber reinforced polyetheretherketone grade that exhibits even higher stiffness, mechanical strength, and creep resistance than glass-filled PEEK. Carbon fiber reinforcement dramatically reduces thermal expansion and provides 3.5 times higher thermal conductivity than unfilled PEEK, enabling faster heat dissipation from bearing surfaces and improved bearing life.

Material Composition

Component	Percentage	Function
PEEK Base Resin	70%	Matrix material
Carbon Fiber	30%	High-performance reinforcement

Mechanical Properties

Property	Value	Test Method
Density	1.40-1.44 g/cm ³	ISO 1183
Tensile Strength	200+ MPa (29,000 psi)	ISO 527
Tensile Modulus	18,000-21,000 MPa	ISO 527
Elongation at Break	1.5-2%	ISO 527
Flexural Strength	290-330 MPa	ISO 178
Flexural Modulus	17,000-19,000 MPa (19 GPa)	ISO 178
Compressive Strength	200+ MPa	ISO 604

Impact Strength (Notched)	5-6 kJ/m ²	ISO 179
Hardness	M102-105 Rockwell	ISO 2039-2
Water Absorption (24h)	0.02-0.04%	ISO 62

Thermal Properties

Property	Value	Test Method
Melting Temperature	340°C (644°F)	ISO 11357
Glass Transition Temperature	143°C (289°F)	ISO 11357
Continuous Service Temperature	250°C (480°F)	-
Short-term Max Temperature	310°C (590°F)	-
Heat Deflection Temperature	315°C (600°F)	ISO 75 (1.8 MPa)
Thermal Conductivity	0.92 W/(m·K)	ISO 8302
Coefficient of Linear Expansion	10-15 x 10 ⁻⁵ /°C	ISO 11359
Flammability Rating	V-0	UL 94

Comparison: PEEK-CA30 vs PEEK-GF30

Property	PEEK-CA30	PEEK-GF30
Tensile Strength	200+ MPa (+25%)	160 MPa
Tensile Modulus	21,000 MPa (+90%)	11,000 MPa
Thermal Conductivity	0.92 W/(m·K) (3.5x)	0.30 W/(m·K)
Thermal Expansion	10-15 x 10 ⁻⁵ /°C	22 x 10 ⁻⁵ /°C
Density	1.44 g/cm ³	1.55 g/cm ³

Wear Resistance	Superior	Good
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Key Features & Benefits

- Highest stiffness and mechanical strength of PEEK grades
- 3.5x higher thermal conductivity than unfilled PEEK
- Significantly reduced thermal expansion
- Superior creep resistance at elevated temperatures
- Excellent wear and abrasion resistance
- Optimum load-carrying capability
- Extended part life in bearing applications
- Rapid heat dissipation from bearing surfaces
- Outstanding chemical and hydrolysis resistance
- Excellent high energy radiation resistance
- Low moisture absorption
- Inherent low flammability with very low smoke emission

Typical Applications

- High-performance bearings and rollers
- Pump wear rings
- Valve seats
- Gears requiring high strength
- Aerospace structural components
- Semiconductor processing equipment
- Medical device components
- Automotive powertrain components
- Oil & gas equipment
- Large structural parts requiring high strength and stiffness