

### Exceptional Engineering Plastic for Severe Applications

Service. Quality. Value.



A high quality and very high-performance engineering plastic material available in a range of grades and forms to suit many applications.

The chemical name is polyetheretherketone.

#### Product Attributes

Range of grades available

Uncommon balance of stiffness, tensile strength and impact strength.

Very high continuous service temperature.

Excellent chemical resistance.

Good electrical insulating properties over a broad temperature range.

Very high resistance to high-energy radiation.

Excellent dimensional stability under heat.

Low coefficient of thermal expansion.

Good resistance to creep. Low moisture absorption.

Outstanding sliding properties. (PEEK FC30)

High wear resistance.

Excellent abrasion resistance

Product sourced from long-standing manufacturer with ISO accreditation.

#### Customer Benefits

Correct grade selection for application is optimised.

Very good all-round product for diverse engineering applications.

A capability to operate in some of the most demanding conditions and applications – rarely found in a single material

Ideal for precision components needing tight tolerances.

Suitable for use in many industrial bearing and gear applications.

Consistent quality ensures uniform characteristics in machining and performance.

### Typical Applications

Mechanical engineering, automotive and general machinery construction - e.g. plain bearings, coil bodies, guide & clutch parts, gears, cams, rollers, slide bearings, seal rings and guide rails, pulleys, conveyor parts.

### Technical Description

Our range of PEEK includes the following grade options –

Grade	Modification	Purpose
PEEK 450G™	None. Colours natural & black	Component identification
PEEK GL30	Reinforced with 30% glass fibre.	Increased strength and stiffness.
PEEK FC30	Self-lubricating additives.	To provide increased bearing performance and life.
PEEK CA30	Reinforced with 30% carbon fibre.	Increased strength, stiffness and stability. Static dissipative.
PEEK MG	Biocompatibility tested grade. (USP class VI & DIN EN ISO 10993-5)	Facilitates approval for use in medical technology applications

### Machinability

The machinability of un-modified PEEK 450G™ is very good. The glass or carbon fibre reinforced grades will require tipped tooling. As with all plastic materials, experience has shown that extra care must be taken with larger diameters, especially in the colder months when plastic materials lose some of their toughness and so have less resistance to machining stresses. Full machining instructions can be supplied on request.

### Chemical Resistance

Smiths' PEEK material has good resistance to water and water vapour (un-filled material has excellent hydrolysis resistance), alcohols, esters, alkaline solutions, oils, fats and fuels. It is not resistant to sulphuric acid, nitric acid, halogens, MEK at raised temperatures.

### Product Availability \*

<b>Extruded round bar</b>	Natural colour made from 6mm to 150mm dia, black to 100mm. Modified grades – please call for quotation.
<b>Extruded sheet/plate</b>	Natural colour made from 6mm to 60mm thk. Modified grades – please call for quotation.
<b>Tubular bar</b>	Natural from 30 x 15mm dia to 95 x 50mm dia

\* Sizes not stocked are available on relatively short delivery time. 1, 2 or 3m lengths supplied or cut to customer requirements.

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	PEEK 450G™ natural or Black, un- modified	-GL30 (30% Glass)	-FC30 (bearing grade)	-CA30 (30% carbon fibre)	-MG (medical grade)	
<b>Mechanical Properties</b>						
Density at 20°C	1.31	1.51	1.46	1.40	1.31	g/cm <sup>3</sup>
Tensile strength @ yield	110	80	75	120	110	MPa
Elongation @ break	20	5	4	7	20	%
Tensile modulus of elasticity	4000	6550	4900	6500	4000	MPa
Flexural Strength	170	250	210	-	-	MPa
Impact Strength	No brk	40	27.5	-	-	kJ/m <sup>2</sup>
Notched Impact Strength	-	3	5	3	3	kJ/m <sup>2</sup>
Ball indentation hardness / Rockwell	230	250	220	310	230	N/mm <sup>2</sup>
Hardness (Shore D)	88	91	85	91	88	-
<b>Electrical Properties</b>						
Volume resistivity	≥10 <sup>16</sup>	≥10 <sup>13</sup>	10 <sup>6</sup>	10 <sup>5</sup>	-	Ohm cm
Surface resistivity	≥10 <sup>15</sup>	≥10 <sup>13</sup>	-	-	-	Ohm
Dielectric constant @ 1 MHz	3.2	3.2	-	-	-	-
Dielectric loss factor @ 1 MHz	0.001	0.001	-	-	-	-
Comparative tracking index (CTI)	-	175	-	-	-	-
Solution 'A'	-	-	-	-	-	-
Dielectric strength	20	20	-	-	-	Kv/mm
<b>Thermal Properties</b>						
Melting temperature	343	343	343	343	343	°C
Specific thermal capacity at 100°C	1.34	-	-	-	1.34	kJ/(kg · K)
Coefficient of thermal expansion (Ave. between 20 - 60 °C)	50	30	30	25	50	10 <sup>-6</sup> .K <sup>-1</sup>
Thermal conductivity at 20°C	0.25	0.43	0.24	-	0.25	W/(m · K)
Heat deflection temperature - method A, 1.8 MPa	152	315	293	315	152	°C
Service temperature – long term	-60 to +250	-20 to +250	-30 to +250	-20 to +250	-60 to +250	°C
- shorter (max)	+310	+310	+310	+310	+310	
<b>Other Physical Properties</b>						
Moisture absorption	0.20	0.14	0.15	0.14	0.20	%
Saturation in air @ 23°C and 50% RH						
Flammability according to UL94 (3mm/6mm thick)	V0/V0	V0/V0	V0/V0	V0/V0	V0/V0	-
Suitability to bonding	+	+	-	+	-	-
Physiological indifference according to FDA or EEC 90/128 - natural colour	=	-	-	+	-	-
Friction Co-efficient	0.34	0.42	0.11	-	-	DIN 53375
UV Stability	0	0	+	+	0	-

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## Technical Assistance

Our knowledgeable staff backed up by our resident team of qualified metallurgists and engineers, will be pleased to assist further on any technical topic.

### UK Service Centres:

Smiths Belfast **02895 908 897**  
 Smiths Biggleswade **01767 604 704**  
 Smiths Birmingham **0121 728 4940**  
 Smiths Bristol **0117 971 2800**  
 Smiths Chelmsford **01245 466 664**  
 Smiths Gateshead **0191 469 5428**  
 Smiths Horsham **01403 261 981**

Smiths Leeds **0113 307 5167**  
 Smiths Manchester **0161 794 8650**  
 Smiths Norwich **01603 789 878**  
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### Quality & Testing:



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