

## PEEK (Polyetheretherketone)

PEEK grades offer chemical and hydrolysis resistance similar to PPS, but can operate at higher temperatures. Unreinforced, extruded PEEK offers good wear resistance and can be used continuously to 480°F (250°C). It can also be used in hot water or steam without permanent loss in physical properties. For hostile environments, PEEK is a high strength alternative to fluoropolymers. PEEK carries a V-O flammability rating and exhibits very low smoke and toxic gas emission when exposed to flame.

<b>Physical Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Specific Gravity	1.31 g/cc	0.0473 lb/in <sup>3</sup>	ASTM D792
Water Absorption	0.1 %	0.1 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	0.5 %	0.5 %	Immersion; ASTM D570(2)
<b>Mechanical Properties</b>			
Hardness, Rockwell M	100	100	ASTM D785
Hardness, Rockwell R	126	126	ASTM D785
Hardness, Shore D	85	85	ASTM D2240
Tensile Strength, Ultimate	110 MPa	16000 psi	ASTM D638
Elongation at Break	40 %	40 %	ASTM D638
Tensile Modulus	4.34 GPa	630 ksi	ASTM D638
Flexural Modulus	4.14 GPa	600 ksi	ASTM D790
Flexural Yield Strength	172 MPa	25000 psi	ASTM D790
Compressive Strength	138 MPa	20000 psi	10% Def.; ASTM D695
Compressive Modulus	3.45 GPa	500 ksi	ASTM D695
Shear Strength	55.2 MPa	8000 psi	ASTM D732
Coefficient of Friction	0.4	0.4	Dry vs. Steel;

			QTM55007
K (wear) Factor	755 x 10 <sup>-8</sup> mm <sup>3</sup> /N-M	375 x 10 <sup>-10</sup> in <sup>3</sup> -min/ft-lb-hr	QTM 55010
Limiting Pressure Velocity	0.298 MPa-m/sec	8500 psi-ft/min	4:1 safety factor; QTM 55007
Izod Impact, Notched	0.534 J/cm	1 ft-lb/in	ASTM D256 Type A

### Electrical Properties

Surface Resistivity per Square	Min 1e+013 ohm	Min 1e+013 ohm	EOS/ESD S11.11
Dielectric Constant	3.3	3.3	1MHz; ASTM D150
Dielectric Strength	18.9 kV/mm	480 V/mil	Short Term; ASTM D149
Dissipation Factor	0.003	0.003	1MHz; ASTM D150

### Thermal Properties

CTE, linear 68°F	46.8 μm/m-°C	26 μin/in-°F	(-40°F to 300°F); ASTM E831
Thermal Conductivity	0.252 W/m-K	1.75 BTU-in/hr-ft <sup>2</sup> -°F	ASTM F433
Melting Point	340 °C	644 °F	Crystalline, Peak; ASTM D3418
Maximum Service Temperature, Air	249 °C	480 °F	Long Term
Deflection Temperature at 1.8 MPa (264 psi)	160 °C	320 °F	ASTM D648
Flammability, UL94	V-0	V-0	1/8 inch

### Descriptive Properties

Compliance - FDA	Compliant
Service in Alcohols	Acceptable

Service in Aliphatic Hydrocarbons	Acceptable
Service in Aromatic Hydrocarbons	Acceptable
Service in Chlorinated Solvents	Acceptable
Service in Ethers	Acceptable
Service in Ketones	Acceptable
Service in Strong Acids	Limited
Service in Strong Alkalies	Acceptable
Service in Sunlight	Limited
Service in Weak Acids	Acceptable
Service in Weak Alkalies	Acceptable