

PEEK Polyetheretherketone, unfilled, extruded (ASTM Data)
Categories: Polymer; Thermoplastic; Polyketone; Polyetheretherketone (PEEK); Polyetheretherketone, PEEK, Unreinforced

Material Notes: 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.

Physical Properties	Metric	English	Comments
Specific Gravity	1.31 g/cc	1.31 g/cc	ASTM D792
Water Absorption	0.10 %	0.10 %	Immersion, 24hr; ASTM D570(2)
Water Absorption at Saturation	0.50 %	0.50 %	Immersion; ASTM D570(2)

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell M	100	100	ASTM D785
Hardness, Rockwell R	126	126	ASTM D785
Hardness, Shore D	85	85	ASTM D2240
Tensile Strength	110 MPa	16000 psi	ASTM D638
Elongation at Break	40 %	40 %	ASTM D638
Tensile Modulus	4.34 GPa	630 ksi	ASTM D638
Flexural Yield Strength	172 MPa	25000 psi	ASTM D790
Flexural Modulus	4.14 GPa	600 ksi	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
Izod Impact, Notched	0.320 J/cm	0.600 ft-lb/in	ASTM D256 Type A
Coefficient of Friction	0.32	0.32	Dry vs. Steel; QTM55007
K (wear) Factor	755 x 10 ⁻⁸ mm ³ /N-M	375 x 10 ⁻¹⁰ in ³ -min/ft-lb-hr	QTM 55010
Limiting Pressure Velocity	0.298 MPa-m/sec	8500 psi-ft/min	4:1 safety factor; QTM 55007

Electrical Properties	Metric	English	Comments
Surface Resistivity per Square	>= 1.00e+13 ohm	>= 1.00e+13 ohm	EOS/ESD S11.11
Dielectric Constant	3.3	3.3	ASTM D150
	@Frequency 1e+6 Hz	@Frequency 1e+6 Hz	
Dielectric Strength	18.9 kV/mm	480 kV/in	Short Term; ASTM D149
Dissipation Factor	0.0030	0.0030	ASTM D150
	@Frequency 1e+6 Hz	@Frequency 1e+6 Hz	

Thermal Properties	Metric	English	Comments
CTE, linear	46.8 µm/m-°C	26.0 µin/in-°F	ASTM E831
	@Temperature -40.0 - 149 °C	@Temperature -40.0 - 300 °F	
Thermal Conductivity	0.252 W/m-K	1.75 BTU-in/hr-ft ² -°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 (Estimated Rating)

Compliance Properties	Metric	English	Comments
3A-Dairy	Yes	Yes	
Canada AG	No	No	
FDA	Yes	Yes	Natural Only
NSF	No	No	
USDA	Yes	Yes	
USP Class VI	No	No	

Chemical Resistance Properties	Metric	English	Comments
Acids, Strong (pH 1-3)	Limited	Limited	
Acids, Weak	Acceptable	Acceptable	
Alcohols	Acceptable	Acceptable	
Alkalies, Strong (pH 11-14)	Acceptable	Acceptable	