Reference Information supplied by our sources: PEEK is a trademark of Victrex USA, Inc.

PEEK

GENERAL PROPERTIES

PEEK is an abbreviation for PolyEtherEther-Ketone, a high performance engineering thermoplastic. PEEK grades offer chemical and water resistance similar to PPS (PolyPhenylene Sulfide), but can operate at higher temperatures. PEEK can be used continuously to 480°F (250°C) and 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-0 flammability rating and exhibits very low smoke and toxic gas emission when exposed to flame. And unfilled PEEK is approved by the FDA for food contact applications (since 1998).

FEATURES

• Excellent chemical resistance • Very low moisture absorption • Inherently good wear and abrasion resistance • Unaffected by continuous exposure to hot water or steam

PEEK GRADES

PEEK (Unfilled)

This general purpose grade is unreinforced and offers the highest elongation and toughness of all PEEK grades. Unfilled PEEK is available in sheet and rod forms in natural (a very light brown or tan) color (see photo above) and is also available in black. Black PEEK is ideal for instrument components where aesthetics are important, as well as for seal components where ductility and inertness are important. All unfilled PEEK grades comply with FDA regulation 21 CFR 177.2415 for repeated food contact.

PEEK (30% Glass Filled)

The addition of glass fibers significantly reduces the expansion rate and increases the flexural modulus of PEEK. This grade is ideal for structural applications that require improved strength, stiffness, or stability, especially at temperatures above 300°F (150°C). Glass-filled PEEK is light brown or tan in color.

PEEK (30% Carbon Filled)

The addition of carbon fibers enhances the compressive strength and stiffness of PEEK, and dramatically lowers its expansion rate. It offers designers optimum wear resistance and load carrying capability in a PEEK-based product. This grade provides 3½ times higher thermal conductivity than unreinforced PEEK -- dissipating heat from the bearing surface faster. Carbon-filled PEEK is black in color.

PEEK (Bearing Grade, Ketron HPV)

This grade of PEEK, containing carbon fiber reinforced with graphite and PTFE lubricants, offers the lowest coefficient of friction and the best machinability for all PEEK grades. Bearing grade PEEK has an excellent combination of low friction, low wear, high limiting PV, low mating part wear, and easy machining. Bearing grade PEEK is black or dark grey in color.

TYPICAL PROPERTIES of EXTRUDED PEEK (compression molded and injection molded versions also available) updated 19May2008					
ASTM or UL test	**Property**	**Unfilled**	**30% Glass Fibers**	**30% Carbon Fibers**	**Bearing Grade**
	PHYSICAL				
D792	Density (lb/in³) (g/cm³)	0.047 1.31	0.056 1.54	0.051 1.41	0.052 1.44
D570	Water Absorption, 24 hrs (%)	0.10	0.10	0.06	0.05
	MECHANICAL				
D638	Tensile Strength (psi)	16,000	15,000	19,000	11,000
D638	Tensile Modulus (psi)	500,000	900,000	1,100,000	850,000
D638	Tensile Elongation at Break (%)	20	3	5	2
D790	Flexural Strength (psi)	25,000	28,000	25,750	27,500
D790	Flexural Modulus (psi)	600,000	1,000,000	1,250,000	1,100,000
D695	Compressive Strength (psi)	20,000	26,000	29,000	26,700
D695	Compressive Modulus (psi)	500,000	1,000,000	-	1,000,000
D785	Hardness, Rockwell	M100 (R126)	M103	M102	M85
D256	IZOD Impact Notched (ft-lb/in)	1.0	1.4	1.0	0.7
	THERMAL				
D696	Coefficient of Linear Thermal Expansion (x 10^{-5} in./in./°F)	2.6	1.2	1.0	1.7
D648	Heat Deflection Temp (°F / °C) at 264 psi	320 / 160	600 / 315	550 / 288	383 / 195
D3418	Melting Temp (°F / °C)	644 / 340	644 / 340	644 / 340	-
-	Max Operating Temp (°F / °C)	480 / 249	480 / 249	500 / 260	482 / 250
C177	Thermal Conductivity (BTU-in/ft²-hr-°F) (x 10^{-4} cal/cm-sec-°C)	1.75 6.03	2.98 10.3	6.4 22.0	1.7 5.9
UL94	Flammability Rating	V-0	V-0	V-0	V-0
	ELECTRICAL				
D149	Dielectric Strength (V/mil) short time, 1/8" thick	480	500	32	-
D150	Dielectric Constant at 1 MHz	3.30	3.70	-	-
D150	Dissipation Factor at 1 MHz	0.003	-	-	-
D257	Volume Resistivity (ohm-cm) at 50% RH	4.9 x 10^{16}	5 x 10^{16}	10^{5}	10^{3}

NOTE: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control. Contact us for manufacturers' complete material property datasheets.

All values at 73°F (23°C) unless otherwise noted.