PEEK – Polyetheretherketone

Facts:

PEEK, Polyetheretherketone is a semi-crystalline thermoplastic with excellent mechanical and chemical resistance properties that are retained at high temperatures.

PEEK has excellent strength, stiffness and dimensional stability, compatible with high temperature and harsh environments and is ideal for metal replacement.

PEEK also has a low coefficient of friction and high wear resistance without lubrication and is resistant to common solvents including acids, salts and oil. The addition of carbon fibre can increase the HDT to over 300ºC

PEEK is one of the few plastics that is compatible with ultra-high vacuum applications and is considered an advanced biomaterial used in medical implants.

Applications:

Because of its robustness, PEEK is used to fabricate items used in demanding applications, including bearings, piston parts, pumps, compressor valves and cable insulation. PEEK is used extensively in the medical, aerospace, defence and automotive industries.

victrex®

HIGH PERFORMANCE PEEK™ POLYMERS

VICTREX® PEEK™ 450GL30

Product Description:

High performance thermoplastic material, 30% glass fibre reinforced **P**oly**E**ther**E**ther**K**etone (PEEK), semi crystalline, granules for injection moulding and extrusion, standard viscosity, FDA food contact compliant, colour natural/beige.

Typical Application Areas:

Applications for higher strength in a static system. Low coefficient of thermal expansion. Chemically resistant to aggressive environments, suitable for sterilization for medical and food contact applications.

Material Properties

	CONDITIONS	TEST METHOD	UNITS	TYPICAL VALUE
Mechanical Data				
Tensile Strength	Break, 23℃	ISO 527	MPa	180
	Break, 125℃			115
	Break, 175℃			60
	Break, 275℃			35
Tensile Elongation	Break, 23℃	ISO 527	%	2.7
Tensile Modulus	23℃	ISO 527	GPa	11.8
Flexural Strength	23℃	ISO 178	MPa	270
	125℃			190
	175℃			80
	275℃			50
Flexural Modulus	23℃	ISO 178	GPa	11.3
Compressive Strength	23℃	ISO 604	MPa	250
	120℃			160
	200℃			55
Charpy Impact Strength	Notched, 23℃	ISO 179/1eA	kJ m^{-2}	8.0
	Unnotched, 23℃	ISO 179/1U		55
Izod Impact Strength	Notched, 23℃	ISO 180/A	kJ m^{-2}	10
	Unnotched, 23℃	ISO 180/U		60
Thermal Data				
Melting Point		ISO 11357	℃	343
Glass Transition (Tg)	Onset	ISO 11357	℃	143
Specific Heat Capacity	23ºC	DSC	kJ kg^{-1} $℃^{-1}$	1.7
Coefficient of Thermal Expansion	Along flow below Tg	ISO 11359	ppm $℃^{-1}$	18
	Average below Tg			45
	Along flow above Tg			18
	Average above Tg			110
Heat Deflection Temperature	1.8 MPa	ISO 75-f	℃	328
Thermal Conductivity	23ºC	ISO/CD 22007-4	W m^{-1} $℃^{-1}$	0.30
Relative Thermal Index	Electrical	UL 746B	℃	240
	Mechanical w/o impact			240
	Mechanical w/impact			220

Flow				
Melt Viscosity	400℃	ISO 11443	Pa.s	560

Miscellaneous				
Density	Crystalline	ISO 1183	g cm^{-3}	1.51
Shore D hardness	23℃	ISO 868		89
Water Absorption (3.2mm thick Tensile bar)	24h, 23℃	ISO 62-1	%	0.04
(by immersion)	Equilibrium, 23℃			0.3

Electrical Properties				
Dielectric Strength	2.5mm thickness	IEC 60243-1	kV mm^{-1}	20
Loss Tangent	23℃, 1 MHz	IEC 60250	n/a	0.005
Dielectric Constant	23℃, 1 kHz	IEC 60250	n/a	3.2
Volume Resistivity		IEC 60093	Ωcm	10^{16}

Fire Smoke Toxicity				
Flammability Rating		UL94	n/a	V-0 @ 0.5 mm
Glow Wire Test	2mm thickness	IEC 60695-2-12	ºC	960

Recommended Processing Conditions	
Drying Temperature / Time	150℃ / 3h or 120℃ / 5h
Temperature settings	360 / 370 / 375 / 380 / 385℃ (Nozzle)
Hopper Temperature	Not greater than 100℃
Mould Temperature	180℃ - 200℃ (max 250℃)
Runner	Die / nozzle >3mm, manifold >3.5mm
Gate	>2mm or 0.5 x part thickness

Mould Shrinkage and Spiral Flow					
Spiral Flow	385℃ nozzle, 190℃ tool	1mm thick section	Victrex	mm	85
		3mm thick section			410
Mould Shrinkage	385℃ nozzle, 190℃ tool	Along flow	ISO 294-4	%	0.3
		Across flow			0.9

Detailed data available on our website www.victrex.com or upon request

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