TECAPEEK™ (Polyetheretherketone)

TECAPEEK™ is a unique semi-crystalline, high temperature engineering thermoplastic, is an excellent material for a wide spectrum of applications where thermal, chemical, and combustion properties are critical to performance. Especially significant, in this regard, is TECAPEEK™'s ability to retain its flexural and tensile properties at very high temperatures– in excess of 250°C (482°F). The addition of glass fiber or carbon fiber reinforcements enhances the mechanical and thermal properties of the basic TECAPEEK™ material.

- Excellent flexural, impact, and tensile characteristics
- Very high continuous working temperature
- Very high heat distortion temperature - For unreinforced TECAPEEK™, the HDT is 160°C (320°F). The addition of 30% reinforcement results in a dramatic increase to 315°C (599°F).
- Exceptional chemical resistance - TECAPEEK™ is insoluble in all common solvents.
- A superior dielectric at high temperatures and frequencies
- Good radiation resistance - TECAPEEK™ exhibits superior resistance to high doses of gamma radiation.
- Outstanding wear and abrasion resistance
- Low smoke and toxic gas emissions
- Excellent hydrolysis resistance - TECAPEEK™ has an excellent resistance to hydrolysis in boiling water and superheated steam (sterilization/auto clavability) at temperatures in excess of 250°C (482°F).

TECAPEEK™s exceptional property profile enables it to be utilized in many of the most critical areas in general industry, as well as in the automotive, marine, nuclear, oil well, electronics, medical and aerospace fields.

Primary Specification (Resin) (Typical)
TECAPEEK®: MIL-P-46183, Type I
TECAPEEK® GF30: MIL-P-46183, Type II Class 3 (Except Elong.)

Shapes Specification (Typical)
ASTM-D-6262 S-PAEK0111
ASTM-D-6262 S-PAEK0122

Properties	ASTM Test Method	Units	TECAPEEK™	TECAPEEK™ GF30 30% Glass Reinforced	TECAPEEK™ CF30 30% Carbon Reinforced	TECAPEEK™ PVX
Physical						
Density	D792	lbs/in^3	0.0477	0.0538	0.0520	-
Specific Gravity	D792	g/cc	-	-	-	1.48
Water Absorption, @ 24 hours @Equilibrium	D570 D570	% %	0.03 0.45	0.11 -	0.06 -	- -
Mechanical						
Tensile Strength @ Yield, 73°F	D638	psi	16,000	22,800	30,200	17,300
Tensile Modulus	D639	psi	650,000	1,406,800	1,885,400	-
Elongation @ Break, 73°F	D638	%	4.9	-	-	-
Elongation, Ultimate, 73°F	D638	%	>30.0	2.2	1.3	2.5
Flexural Strength, 73°F	D790	psi	26,000	33,800	46,100	30,000
Flexural Modulus, 73°F	D790	psi	600,000	1,495,200	1,885,400	1,400,000
Compressive Strength, 73°F	D695	psi	17,500	31,200	34,800	22,000
Shear Strength, Ultimate, 73°F	D3846	psi	7,600	14,100	14,100	-
Izod Impact Strength, 73°F	D256	ft-lbs/in	0.90	1.8	1.6	3.25
Rockwell Hardness, 73°F	D785	-	M100	M103	M107	-
Limiting PV @ 68°F 1200 in/min	-	(psi) (ft/min)	170,000	-	385,000	-
Wear Factor Against Steel, 40 psi, 50 fpm	D3702	in^3 /hr*1/PV	-	-	-	
Coefficient of Friction, @ 68°F 1200 in/min, 155 lbs Load	D1894-95	µ	0.18	-	0.22	.19-.21

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Properties	ASTM Test Method	Units	TECAPEEK™	TECAPEEK™ GF30 30% Glass Reinforced	TECAPEEK™ CF30 30% Carbon Reinforced	TECAPEEK™ PVX
Thermal						
Heat Deflection Temperature @ 264 psi, ¼"	D648	°F	320	600	600	530
Maximum Continuous Use Temperature	-	°F	480	482	482	500
Melting Point	-	°F	633	633	633	633
Coefficient of Linear Thermal Expansion	D696	in/in/°F	2.7×10^{-5}	1.2×10^{-5}	0.8×10^{-5}	3.11×10^{-6}
Thermal Conductivity	C177	Btu-in/hr-ft^2-°F	2.01	3.0	6.37	-
Flammability	UL94	-	V-0	V-0	V-0	-
Electrical						
Volume Resistivity	D257	ohm-cm	4.9×10^{16}	-	-	-
Dielectric Strength	D149	V/mil	630	-	-	-

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