VICTREX FG™ 200 Series

Product Description

High performance Food Grade thermoplastic material, unreinforced, glass fiber and carbon fiber reinforced **P**oly**E**ther**E**ther**K**etone (PEEK), semi crystalline, granules for injection moulding and extrusion, colour natural/beige and black.

Regulatory

Food Contact compliance for EU 10/2011 (FG200 & FG220), FDA 21CFR 177.2415 (FG200, FG220, & FG240), China (FG200 & FG220) and South America (FG200 & FG220).
Drinking water compliance to WRAS (UK).

Typical Application Areas

The VICTREX FG™ 200 family of materials is intended for applications needing TOUGHNESS: ductility from sub-ambient to elevated temperatures along with long-term fatigue resistance and low coefficient of thermal expansion for metal replacement. Chemically resistant to aggressive environments, suitable for sterilisation for food contact applications.

MATERIAL PROPERTIES						
	CONDITIONS	TEST METHOD	UNITS	FG200	FG220	FG240
Mechanical Data						
Tensile Fatigue	23°C, 1E06 cycles		MPa	80 @2Hz	100 @5Hz	175 @5Hz
	120°C, 1E06 cycles		MPa		75 @5Hz	120 @5Hz
Izod Impact Strength	Notched, 23°C	ISO 180/A	kJ m^{-2}	9.5	8.0	10.5
	Unnotched, 23°C	ISO 180/U		No break	55	50
Tensile Strength	@yield, 23°C	ISO 527	MPa	95		
	@break, 23°C				185	265
Tensile Elongation	@break, 23°C	ISO 527	%	60	2.8	1.7
Flexural Strength	@3.5% yield, 23°C	ISO 178	MPa	120		
	@break, 23°C			155	275	380
	125°C			85	190	275
	175°C				80	130
	275°C				50	65
Flexural Modulus	23°C	ISO 178	GPa	3.6	11	24
Compressive Strength	23°C	ISO 604	MPa	120	250	320
	120°C			65	160	200
	200°C				55	70
Thermal Data						
Melting Point		ISO 11357	°C	343	343	343
Glass Transition (Tg)	Onset	ISO 11357	°C	143	143	143
	Midpoint			150	150	150
Coefficient of Thermal Expansion	Along flow below Tg	ISO 11359	ppm K^{-1}	45	18	5
	Average below Tg			65	45	40
	Along flow above Tg			125	18	6
	Average above Tg			160	110	100
Heat Deflection Temperature	1.8 MPa	ISO 75A-f	°C	152	328	334
Thermal Conductivity	Average, 23°C	ISO 22007-4	W m^{-1} K^{-1}	0.29	0.30	0.95
Miscellaneous						
Density	Crystalline	ISO 1183	g cm^{-3}	1.30	1.51	1.40
Shore D hardness	23°C	ISO 868		84	87.5	87.5
Water Absorption by immersion	Saturation, 23°C	ISO 62-1	%	0.45	0.3	0.3
	Saturation, 100°C			0.55	0.45	0.45

Electrical Properties						
Volume Resistivity	23°C	IEC 60093	Ω cm	10^{16}	10^{16}	10^{5}*
Dielectric Strength	2mm thickness	IEC 60243-1	kV mm^{-1}	23	25	-

*This property provided for informational purposes only – resistivity is not controlled

Typical Processing			
Conditions	**FG200**	**FG220**	**FG240**
Drying Temperature / Time	150°C / 3h or 120°C / 5h (residual moisture <0.02%)		
Temperature settings	375 / 380 / 385 / 390 / 395°C (Nozzle)	360 / 370 / 375 / 380 / 385°C (Nozzle)	375 / 380 / 385 / 390 / 395°C (Nozzle)
Hopper Temperature	Not greater than 100°C		
Mould Temperature	170°C - 200°C (max 250°C)	180°C - 200°C (max 250°C)	180°C - 210°C (max 250°C)
Runner	Die / nozzle >3mm, manifold >3.5mm		
Gate	>1mm or 0.5 x part thickness	>2mm or 0.5 x part thickness	

Mould Shrinkage + Spiral Flow						
Conditions		**Method**	**Units**	**FG200**	**FG220**	**FG240**
Nozzle Temperature			°C	395	385	395
Tool temperature			°C	180	190	200
Spiral Flow	1mm thick section	Victrex	mm	125	85	75
	3mm thick section		%	630	410	330
Mould Shrinkage	Along flow	ISO 294-4	%	0.9	0.3	0.1
	Across flow			1.3	0.9	0.5

Important notes:

1. Processing conditions quoted in our datasheets are typical of those used in our processing laboratories
   - *Data for mould shrinkage should be used for material comparison. Actual mould shrinkage values are highly dependent on part geometry, mould configuration, and processing conditions.*
   - *Mould shrinkage differs for along flow and across flow directions. "Along flow" direction is taken as the direction the molten material is travelling when it exits the gate and enters the mould.*
   - *Mould shrinkage is expressed as a percent change in dimension of a specimen in relation to mould dimensions.*
2. Data are generated in accordance with prevailing national, international and internal standards, and should be used for material comparison. Actual property values are highly dependent on part geometry, mould configuration and processing conditions. Properties may also differ for along flow and across flow directions.