

# VICTREX XPI™ 174 Polymer

## General Information

### Product Description

VICTREX XPI™ 174 polymer is high-performance PolyEtherEtherKetone (PEEK) semi crystalline thermoplastic material and is supplied in granule feedstock format primarily for wire extrusion processing.

Winding wire insulation for electric motor applications requires good mechanical and electrical performance across a range of temperatures and potentially chemically aggressive environments. VICTREX XPI™ 174 polymer can meet many of these requirements such as (where specific properties are quantified in the below table);

- Long-term thermal stability in high electric field strength rotating machines
- Extruded coating provides superior electrical performance with reduced number of faults per wire length vs. enamelled equivalents
- Good ductility for demanding wire forming & resistance to thermal cycling / conductor expansion
- Excellent wear resistance
- Mechanical strength and dimensional stability
- Excellent chemical resistance to a broad range of ATF, oils and cooling fluids

## Material Properties

Physical	Nominal Value	Unit	Test Method
Density (Crystalline)	1.30	g/cm <sup>3</sup>	ISO 1183
Melt Mass-Flow Rate (MFR) (400°C/2.16 kg)	7.4	g/10 min	ISO 1133
Water Absorption (Saturation, 23°C)	0.45	%	ISO 62
Mechanical	Nominal Value	Unit	Test Method
Tensile Stress (Yield, 23°C)	96.0	MPa	ISO 527
Flexural Modulus			ISO 178
23°C	3600	MPa	
80°C	3100	MPa	
120°C	3000	MPa	
160°C	700	MPa	
Flexural Stress			ISO 178
Yield, 23°C	160	MPa	
Yield, 80°C	126	MPa	
Yield, 120°C	98.0	MPa	
Yield, 160°C	33.0	MPa	
Compressive Stress (23°C)	120	MPa	ISO 604
Thermal	Nominal Value	Unit	Test Method
Glass Transition Temperature (Onset)	143	°C	ISO 11357-2
Melting Temperature	343	°C	ISO 11357-3
Thermal Conductivity			ISO 22007-4
23°C <sup>1</sup>	0.29	W/m/K	
23°C <sup>2</sup>	0.32	W/m/K	

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Electrical	Nominal Value	Unit	Test Method
Volume Resistivity (23°C)	1.0E+16	ohms·cm	IEC 60093
Dielectric Constant (23°C, 1 kHz)	3.20		IEC 60250
Dissipation Factor (23°C, 1 MHz)	3.0E-3		IEC 60250
Breakdown Voltage <sup>3</sup>			ASTM D149
2000V/s in air, 6.4mm opposing electrodes : 23°C, 100.0 µm	16.6	kV	
2000V/s in air, 6.4mm opposing electrodes : 23°C, 150.0 µm	21.4	kV	
2000V/s in air, 6.4mm opposing electrodes : 23°C, 200.0 µm	25.4	kV	
500V/s in air, 6.4mm opposing electrodes : 23°C, 100.0 µm	15.7	kV	
500V/s in air, 6.4mm opposing electrodes : 23°C, 150.0 µm	19.9	kV	
500V/s in air, 6.4mm opposing electrodes : 23°C, 200.0 µm	23.0	kV	

## Typical Processing Information

Extrusion	Nominal Value	Unit
Drying Temperature	120 to 150	°C
Drying Time	3.0 to 5.0	hr
Suggested Max Moisture	< 0.020	%
Hopper Temperature	< 100	°C
Melt Temperature	365 to 385	°C
Die Temperature	> 390	°C

### Extrusion Notes

- Conductor Preheating: Usually between 100 and 200°C. >200°C also depending on wire requirements
- Melt Temperature in the Extrusion Processing Section refers to the extrusion barrel temperatures
- Melt Temperature Exiting the Die: Nominally 375°C

Important notes:

- 1) Processing conditions quoted in our datasheets are typical of those used in our processing laboratories.
- 2) Unless otherwise stated, mechanical, thermal and electrical properties are from injection moulded test coupons and may have been generated on similar products.
- 3) 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.

Detailed data available on our website [www.victrex.com](http://www.victrex.com) or upon request.

### Notes

<sup>1</sup> Average

<sup>2</sup> Along flow

<sup>3</sup> Electrical Properties of Equivalent Thickness (APTIV™) PEEK Films

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