VICTREX AM™ 450 FIL

General Information

Product Description

High performance thermoplastic material, PolyEtherEtherKetone (PEEK), semi crystalline, filament for Additive Manufacture by filament fusion and other melt extrusion 3D printing processes. Colour natural/beige.

Additive manufacturing processing. Filament Fusion printed parts. For use in high temperature applications and chemically aggressive environments. Low outgassing, suitable for sterilisation. Not suitable for medical implant applications. Product supplied vacuum packed with desiccant and dry when produced. Drying before use is recommended. This product is based on VICTREX 450G™ Polymer.

Material Properties

Physical	Nominal Value	Unit	Test Method
Density (Crystalline)	1.30	g/cm³	ISO 1183
Water Absorption (Saturation, 23°C)	0.45	%	ISO 62
Water Absorption - Saturation (100°C)	0.55	%	ISO 62
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Modulus			ISO 527-1
23°C, Injection Molded	4000	MPa	
XY Orientation : 23°C, Filament Extrusion	3000 to 4000	MPa	
ZX Orientation : 23°C, Filament Extrusion	2000 to 4000	MPa	
Tensile Stress			ISO 527-2
Yield, 23°C, Injection Molded	98.0	MPa	
XY Orientation : Yield, 23°C, Filament Extrusion	60.0 to 80.0	MPa	
ZX Orientation : Yield, 23°C, Filament Extrusion	20.0 to 85.0	MPa	
Tensile Strain			ISO 527-2
Break, 23°C, Injection Molded	45	%	
XY Orientation : Break, 23°C, Filament Extrusion	2.0 to 95	%	
ZX Orientation : Break, 23°C, Filament Extrusion	1.0 to 10	%	
Flexural Modulus (23°C, Injection Molded)	3800	MPa	ISO 178
Flexural Stress			ISO 178
3.5% Strain, 23°C, Injection Molded	125	MPa	
125°C, Injection Molded	85.0	MPa	
175°C, Injection Molded	19.0	MPa	
275°C, Injection Molded	12.5	MPa	
Compressive Stress			ISO 604
23°C, Injection Molded	125	MPa	
120°C, Injection Molded	70.0	MPa	
Impact	**Nominal Value**	**Unit**	**Test Method**
Charpy Notched Impact Strength			ISO 179/1eA
23°C, Injection Molded	6.0	kJ/m²	
Charpy Unnotched Impact Strength			ISO 179/1U
23°C, Injection Molded	No Break		
Notched Izod Impact Strength (23°C, Injection Molded)	7.0	kJ/m²	ISO 180/A
Unnotched Izod Impact Strength			ISO 180
23°C, Injection Molded	No Break		
Hardness	**Nominal Value**	**Unit**	**Test Method**
Shore Hardness (Shore D, 23°C)	84.5		ISO 868

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Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			ISO 75-2/Af
1.8 MPa, Unannealed	152	°C	
Glass Transition Temperature			ISO 11357-2
Onset	143	°C	
Midpoint	150	°C	
Melting Temperature	343	°C	ISO 11357-3
Thermal Conductivity			ISO 22007-4
23°C [1]	0.29	W/m/K	
23°C [2]	0.32	W/m/K	
RTI Elec	260	°C	UL 746B
RTI Imp	180	°C	UL 746B
RTI Str	240	°C	UL 746B

Electrical	Nominal Value	Unit	Test Method
Volume Resistivity (23°C)	1.0E+16	ohms·cm	IEC 60093
Dielectric Strength (2.00 mm)	23.0	kV/mm	IEC 60243-1
Dielectric Constant (23°C, 1 kHz)	3.10		IEC 60250
Dissipation Factor (23°C, 1 MHz)	4.0E-3		IEC 60250
Comparative Tracking Index	150	V	IEC 60112

Flammability	Nominal Value	Unit	Test Method
Glow Wire Flammability Index (2.0 mm)	960	°C	IEC 60695-2-12

Fill Analysis	Nominal Value	Unit	Test Method
Melt Viscosity (400°C, 1000 sec^-1)	350	Pa·s	ISO 11443

Additional Information

Diameter (3 axis laster micrometer): 1.75 mm
Linear density (Victrex test method VSH-STM-01): 31,000 g/10000 m

Packaging:

- Spool Dimensions: 200mm diameter; 70mm width
- Spool Material: Heat-resistant Polycarbonate
- Nominal Weights: 1kg
- Nominal Lengths: 322m

Typical Processing Information

Extrusion	Nominal Value	Unit
Drying Temperature	120	°C
Drying Time	5.0	hr
Suggested Max Moisture	< 0.020	%
Melt Temperature	340 to 450	°C

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Extrusion Notes

Chamber/Build-Space Temperature: Not less than 150°C
Bed Temperature: >150°C

Best results may be expected from elevated build-space temperatures and are machine specific. Results vary widely from machine to machine.

Important notes:
i. Example values only, not product specification.
ii. Limited data of material properties via filament extrusion, values sourced in dedicated technical literature
iii. 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, equipment configuration, extrusion deposition strategy and processing conditions. Properties may also differ for along flow and across flow directions and from different printers technologies and manufacturers.

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

Notes

[1] Average

[2] Along flow

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