

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/cm ³	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/m ²	
Charpy Unnotched Impact Strength			ISO 179/1U
23°C, Injection Molded	No Break		
Notched Izod Impact Strength (23°C, Injection Molded)	7.0	kJ/m ²	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

VICTREX AM™ 450 FIL

Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load 1.8 MPa, Unannealed	152	°C	ISO 75-2/Af
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 laser 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

VICTREX AM™ 450 FIL

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

Revision Date: 2024

This information is provided "as is". It is not intended to amount to advice. Use of the product is at the customer's/user's risk. It is the customer's/user's responsibility to thoroughly test the product in each specific application to determine its performance, efficacy and safety for each end-use product, device or other application and compliance with applicable laws, regulations and standards. Mention of a product is no guarantee of availability. Victrex reserves the right to modify products, data sheets, specifications and packaging. **Victrex makes no warranties, express or implied (including, without limitation, any warranty of fitness for a particular purpose or of intellectual property non-infringement) and will not be liable for any loss or damage of any nature (however arising) in connection with customer's/user's use or reliance on this information, except for any liability which cannot be excluded or limited by law.** This document may be modified or retracted at any time without notice to the customer/user.

Victrex Manufacturing Limited (or another member of the Victrex group) is the owner or the licensee of all intellectual property rights in and to this document including the following trademarks, VICTREX, INVIBIO, JUVORA, APTIV, 450G, PEEK-OPTIMA, SHAPING FUTURE PERFORMANCE, LMPAEK, TRIANGLE (Device). All rights are protected by intellectual property rights including copyright under relevant national and international intellectual property laws and treaties. All rights reserved. Copyright © Victrex Manufacturing Limited 2023.