

VICTREX AM™ 200 FIL

General Information

Product Description

High performance thermoplastic material, PolyArylEtherKetone (PAEK), 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, to achieve improved printed part strength and printability compared to PEEK polymer on most machines. For use in higher 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.

Material Properties

Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			ISO 527-1
XY Orientation : 23°C ¹	2300 to 2900	MPa	
XY Orientation : 23°C ²	2900 to 3700	MPa	
YZ Orientation : 23°C ¹	2200 to 2600	MPa	
YZ Orientation : 23°C ²	2100 to 2900	MPa	
ZX Orientation : 23°C ¹	2100 to 2300	MPa	
ZX Orientation : 23°C ²	2600 to 2800	MPa	
Tensile Stress			ISO 527-2
XY Orientation : Yield, 23°C ¹	45.0 to 57.0	MPa	
XY Orientation : Yield, 23°C ²	58.0 to 70.0	MPa	
YZ Orientation : Yield, 23°C ¹	56.0 to 58.0	MPa	
YZ Orientation : Yield, 23°C ²	65.0 to 73.0	MPa	
ZX Orientation : Yield, 23°C ¹	34.0 to 44.0	MPa	
ZX Orientation : Yield, 23°C ²	36.0 to 50.0	MPa	
Tensile Strain			ISO 527-2
XY Orientation : Break, 23°C ¹	15 to 33	%	
XY Orientation : Break, 23°C ²	14 to 16	%	
YZ Orientation : Break, 23°C ¹	15 to 19	%	
YZ Orientation : Break, 23°C ²	13 to 19	%	
ZX Orientation : Break, 23°C ¹	5.0 to 7.0	%	
ZX Orientation : Break, 23°C ²	4.0 to 6.0	%	
Thermal	Nominal Value	Unit	Test Method
Glass Transition Temperature			ISO 11357-2
Onset	151	°C	
Midpoint	154	°C	
Melting Temperature	303	°C	ISO 11357-3
Peak Crystallization Temperature	249	°C	ISO 11357-3
Fill Analysis	Nominal Value	Unit	Test Method
Melt Viscosity (400°C, 1000 sec ⁻¹)	245	Pa·s	ISO 11443

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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; 55mm centre bore
- Spool Material: Heat-resistant Polycarbonate
- Nominal Weights: 1kg, 0.5 kg respectively
- Nominal Lengths: 322m, 161m respectively

Typical Processing Information

Extrusion	Nominal Value	Unit
Drying Temperature	120	°C
Drying Time	5.0	hr
Suggested Max Moisture	< 0.020	%
Melt Temperature	380 to 400	°C

Extrusion Notes

Chamber/Build-Space Temperature:

- Printing directly semi-crystalline: Above 150°C (see note below)
- Printing amorphous: Below 150°C (see note below)

Bed Temperature:

- 20-40°C above chamber temperature, keeping below 150°C for amorphous print.

Annealing conditions:

- Slow heating rate (3°C/min ramp rate). 170-180°C, 2-4 hours. Optimization may be required.

Best results may be expected from elevated build-space temperatures and are machine specific. This datasheet represents properties that may be expected from build-space temperatures between 50-120°C on ISO 527-2 1A samples. Samples have been successfully produced on <120°C build-space temperatures, however higher performance may be expected from machines with >120°C build space temperatures. Results vary widely from machine to machine.

Annealing may be required to generate semi-crystalline parts, depending on the machine and process conditions used in printing. Semi-crystalline parts can be made in some machines by using chamber temperatures >150°C, however in other machines the best results may be achieved by printing parts with reduced crystallinity and subsequently annealing. Annealing temperatures between 170-180°C are recommended. Parts may deform if higher annealing temperatures are used. Depending on the print parameters, annealing conditions may require adjustment for best results.

Important notes:

- Example values only. Not product specification.
- Printing condition details: ISO 527-2 type 1A specimens printed on a 3D Gence F340 printer. Layer height: 0.15mm. Nozzle diameter: 0.4 mm. Nozzle temperature 380°C. Chamber temperature: 60°C. Bed temperature: 100°C. Infill: 100%. Raster angle: $\pm 45^\circ$. Contour speed: 20 mm/s. Hatch speed: 30 mm/s. ZX samples built with breakway support structure – details available on request.
- 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 Amorphous As Printed

² Semicrystalline Annealed at 170°C 2hrs

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