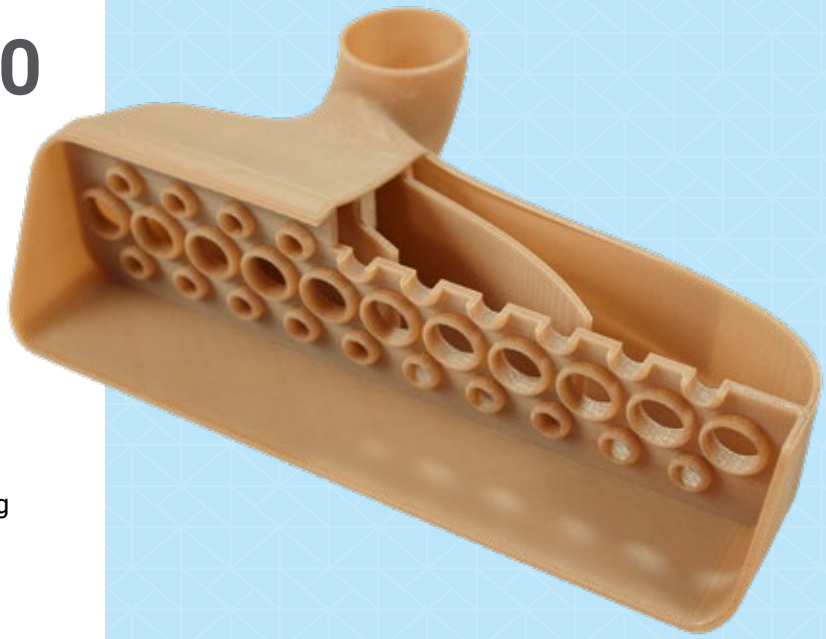
MATERIAL DATA SHEET
FDM

VICTREX AM™ 200

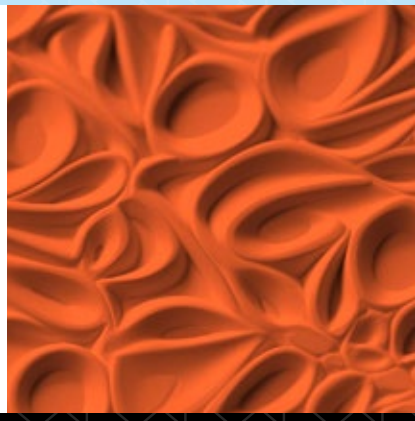


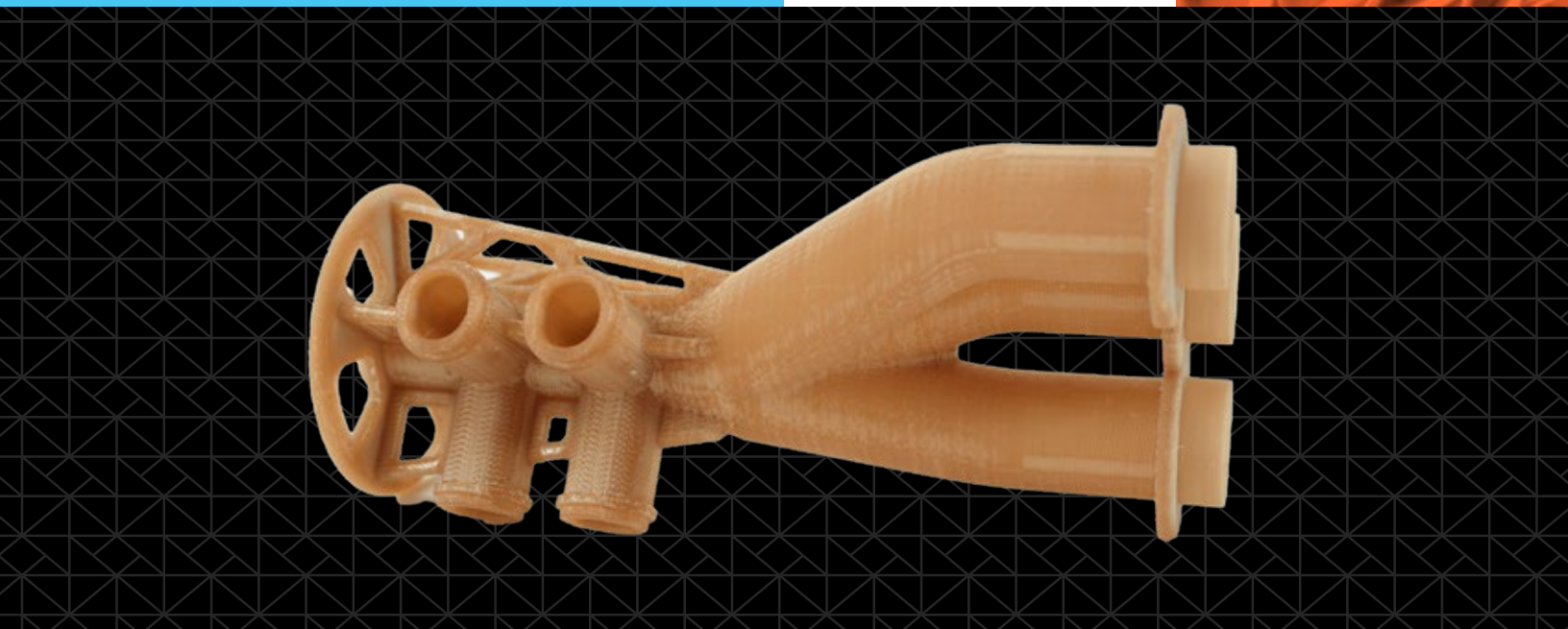
FDM™ Thermoplastic Filament

Overview

VICTREX AM™ 200 is based on LMPAEK™ technology and is part of the PEEK family in the PAEK polymer group. Designed specifically for additive manufacturing, it offers the benefits of a polyaryletherketone (PAEK) material while addressing challenges associated during 3D printing this group of polymers that includes PEEK and PEKK. VICTREX AM 200 is formulated to provide dimensional stability and optimal interlayer bonding (Z-strength).

The information presented are typical values intended for reference and comparison purposes only. They should no be used for design specifications or quality control purposes.





Contents

Ordering Information

Table 1. Printer and Support Material Compatibility

Part Number	Model Tip	Layer Height	Support Material	Support Tip
Fortus 450mc™	T20F	0.254 mm (0.010 in)	SR-100 (soluble)	T12SR100
			SUP8000B (breakaway)	T16
F900®	T20F	0.254 mm (0.010 in)	SR-100 (soluble)	T12SR100
			SUP8000B (breakaway)	T16

Build Sheet

High Temperature

- 0.51 x 406 x 470 mm (0.02 x 16 x 18.5 in.)
- 0.51 x 660 x 965 mm (0.02 x 26 x 38 in.)

System Requirements[1]

Fortus 450mc

- Hardened machine upgrade
- Hardened Fortus 450mc head
- All Materials License or equivalent (included if new system)

F900

- F900 – purchased F900 or upgrade from Gen 1 or Gen 2 system to F900 (Gen 3).
- Hardened F900 head
- Validated Materials License

Table 2. VICTREX AM 200 Ordering Information

Part Number	Description
Filament Canisters	
355-70030	VICTREX AM™ 200 model material, 92.3 cu in. - Plus
355-03120	SR-100 Soluble Support, 92.3 cu in. - Plus
355-03260	SUP8000B, 92.3 cu in. – Plus
Printer Consumables	
511-10740-S	T20F tip
511-10100	T12SR100 tip (SR-100 support)
511-10401	T16 tip (SUP8000B support)
325-00275-S	High temperature build sheet, 0.02 x 16 x 18.5 in. (0.51 x 406 x 470 mm)
325-00475-S	High temperature build sheet, 0.02 x 26 x 38 in. (0.51 x 660 x 965 mm)
Print Heads	
821726-XXXX	Hardened Fortus 450mc head[2]
325-63500	Hardened F900 head[3]

[1] Contact your Stratasys representative for ordering information.

[2] The hardened Fortus 450mc head is easily identified by a blue handle.

[3] The hardened F900 head is easily identified by a folded sheet metal handle.

Physical Properties

Table 3. VICTREX AM 200 Physical Properties

Property	Test Method	Typical Values XY	Typical Values XZ/ZX
Melting Point	ISO 11357	303 ˚C (577 ˚F)	
Glass Transition (Tg) - Onset	ISO 11357	151 ˚C (304 ˚F)	
Glass Transition (Tg) - Midpoint	ISO 11357	154 ˚C (309 ˚F)	
Crystallization Point	ISO 11357	249 ˚C (480 ˚F)	

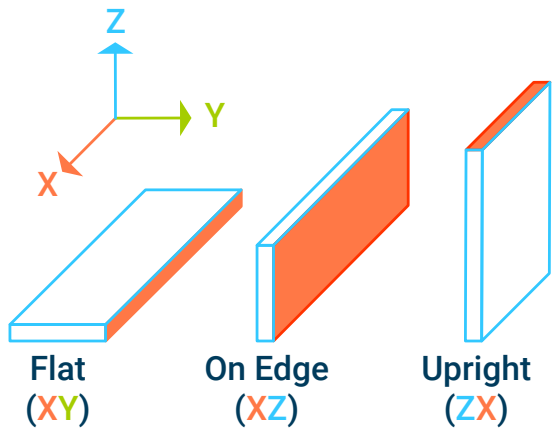
* Data provided by Victrex.

Mechanical Properties

VICTREX AM 200 samples were printed with a 0.254 mm (0.010 in.) layer height on the Fortus 450mc and F900 with a T20F tip. For the full test procedure please see the Stratasys Materials Test Procedure.

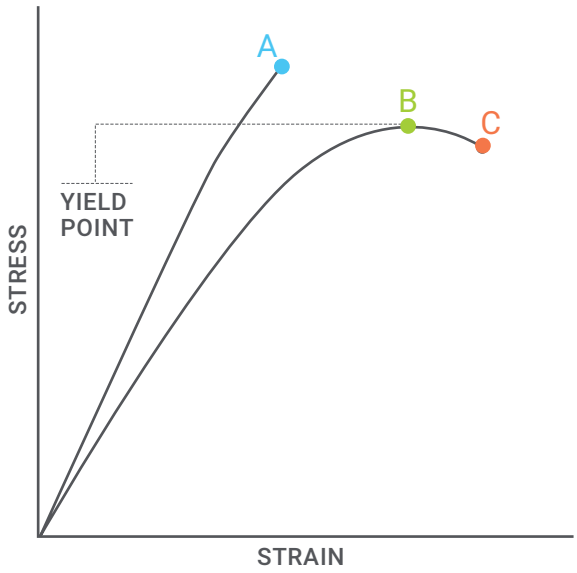
Print Orientation

Parts created using FDM are anisotropic as a result of the printing process. Below is a reference of the different orientations used to characterize the material.



Tensile Curves

Due to the anisotropic nature of FDM, tensile curves look different depending on orientation. Below is a guide of the two types of curves seen when printing tensile samples and what reported values mean.



A = Tensile at break, elongation at break (no yield point)

B = Tensile at yield, elongation at yield

C = Tensile at break, elongation at break

Table 4. VICTREX AM 200 Mechanical Properties – F900 w/SR-100 Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	64.8 (1.1)	54.3 (6.6)
	psi	9400 (160)	7870 (960)
Elongation @ Yield	%	4.9 (0.071)	3.3 (0.9)
Strength @ Break[2]	MPa	36.8 (6.7)	52.4 (6)
	psi	5330 (970)	7590 (870)
Elongation @ Break	%	55 (39)	3.2 (0.94)
Modulus (Elastic)	GPa	2.29 (0.015)	2.26 (0.042)
	ksi	332 (2.1)	327 (6)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	98.7 (3)	83.8 (6.7)
	psi	14300 (440)	12200 (970)
Strain @ Break	%	No break	3.7 (0.83)
Modulus	GPa	2.49 (0.066)	2.15 (0.1)
	ksi	361 (9.5)	311 (15)
Impact Properties: ASTM D256, ASTM D4812			
Notched	J/m	1500 (680)	61.8 (17)
	ft*lb/in	28.1 (13)	1.16 (0.31)
Unnotched	J/m	4490 (1200)	189 (39)
	ft*lb/in	84.2 (22)	3.53 (0.72)

[1] Values in parenthesis are standard deviations.

[2] The XZ samples yield significantly before breaking, resulting in a lower value than the ZX samples. This is shown in the Tensile Curves image on page 4.

Table 5. VICTREX AM 200 Mechanical Properties – F900 w/SUP8000B Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	60.7 (2.1)	48.9 (7.3)
	psi	8800 (310)	7090 (1100)
Elongation @ Yield	%	4.8 (0.086)	2.68 (0.83)
Strength @ Break[2]	MPa	41.9 (4.5)	48.5 (6.5)
	psi	6070 (650)	7040 (940)
Elongation @ Break	%	8.3 (1.9)	3 (0.86)
Modulus (Elastic)	GPa	2.16 (0.051)	2.18 (0.033)
	ksi	313 (7.4)	316 (4.8)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	96 (0.71)	65.3 (17)
	psi	13900 (100)	9470 (2400)
Strain @ Break	%	No break	2.3 (0.22)
Modulus	GPa	2.4 (0.022)	2.11 (0.12)
	ksi	347 (3.2)	306 (18)
Impact Properties: ASTM D256, ASTM D5412			
Notched	J/m	1380 (580)	45.4 (6.4)
	ft*lb/in	25.8 (11)	0.851 (0.12)
Unnotched	J/m	3970 (580)	520 (66)
	ft*lb/in	74.4 (11)	9.75 (1.2)

[1] Values in parenthesis are standard deviations.

[2] The XZ samples yield significantly before breaking, resulting in a lower value than the ZX samples. This is shown in the Tensile Curves image on page 4.

Table 6. VICTREX AM 200 Mechanical Properties – Fortus 450mc w/SR-100 Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	67.5 (0.3)	50.4 (2.9)
	psi	9800 (43)	7300 (420)
Elongation @ Yield	%	5 (0.055)	3.4 (0.35)
Strength @ Break[2]	MPa	17 (8.9)	49 (2.5)
	psi	2460 (1300)	7110 (360)
Elongation @ Break	%	48 (29)	3.3 (0.38)
Modulus (Elastic)	GPa	2.29 (0.015)	2.06 (0.023)
	ksi	332 (2.1)	299 (3.3)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	99.3 (0.46)	69.8 (8.9)
	psi	14400 (67)	10100 (1300)
Strain @ Break	%	No break	3.8 (1)
Modulus	GPa	2.42 (0.017)	1.93 (0.14)
	ksi	351 (2.5)	279 (20)
Impact Properties: ASTM D256, ASTM D5412			
Notched	J/m	1530 (910)	30.2 (5.2)
	ft*lb/in	28.7 (17)	0.567 (0.097)
Unnotched	J/m	4740 (670)	86.8 (24)
	ft*lb/in	88.9 (13)	1.63 (0.44)

[1] Values in parenthesis are standard deviations.

[2] The XZ samples yield significantly before breaking, resulting in a lower value than the ZX samples. This is shown in the Tensile Curves image on page 4.

Table 7. VICTREX AM 200 Mechanical Properties – Fortus 450mc w/SUP8000B Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	68.7 (0.71)	48.6 (2.2)
	psi	9970 (100)	7050 (320)
Elongation @ Yield	%	5.3 (0.045)	3.1 (0.27)
Strength @ Break[2]	MPa	15.1 (1)	47.3 (2.8)
	psi	2190 (150)	6860 (410)
Elongation @ Break	%	84 (3.2)	3 (0.29)
Modulus (Elastic)	GPa	2.29 (0.02)	2.1 (0.023)
	ksi	332 (2.9)	305 (3.3)
Flexural Properties: ASTM D790, Procedure A			
Strength @ Break	MPa	98.8 (0.86)	71.5 (6.5)
	psi	14300 (130)	10400 (940)
Strain @ Break	%	No break	3.9 (1.2)
Modulus	GPa	2.44 (0.025)	1.92 (0.15)
	ksi	354 (3.7)	278 (22)
Impact Properties: ASTM D256, ASTM D4812			
Notched	J/m	1730 (850)	49.8 (17)
	ft*lb/in	32.3 (16)	0.933 (0.31)
Unnotched	J/m	4250 (520)	84.6 (23)
	ft*lb/in	79.7 (9.7)	1.58 (0.43)

[1] Values in parenthesis are standard deviations.

[2] The XZ samples yield significantly before breaking, resulting in a lower value than the ZX samples. This is shown in the Tensile Curves image on page 4.

Mechanical Properties – Annealed

Samples were printed with a 0.254 mm (0.010 in.) layer height on the Fortus 450mc and F900 with a T20F tip. Samples were then annealed in sand for two hours at 170 ˚C (338 ˚F) and allowed to cool naturally to room temperature. For the full test procedure please see Stratasys Materials Test Procedure.

Table 8. Annealed VICTREX AM 200 Mechanical Properties – F900 w/SR-100 Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	78 (1.2)	39.7 (3.7)
	psi	11300 (180)	5760 (530)
Elongation @ Yield	%	5.5 (0.11)	1.7 (0.18)
Strength @ Break	MPa	58.6 (7.2)	41.4 (3.7)
	psi	8500 (1000)	6000 (540)
Elongation @ Break	%	15 (8.6)	1.8 (0.18)
Modulus (Elastic)	GPa	2.67 (0.045)	2.62 (0.072)
	ksi	388 (6.5)	379 (10)

[1] Values in parenthesis are standard deviations.

Table 9. Annealed VICTREX AM 200 Mechanical Properties – F900 w/SUP8000B Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	76.7 (1.5)	33.2 (8)
	psi	11100 (220)	4810 (1200)
Elongation @ Yield	%	5.1 (0.1)	1.4 (0.37)
Strength @ Break	MPa	66.7 (2.3)	33.6 (7.6)
	psi	9670 (330)	4880 (1100)
Elongation @ Break	%	8.6 (1.5)	1.5 (0.35)
Modulus (Elastic)	GPa	2.62 (0.044)	2.57 (0.069)
	ksi	380 (6.4)	373 (10)

[1] Values in parenthesis are standard deviations.

Table 10. Annealed VICTREX AM 200 Mechanical Properties – Fortus 450mc w/SR-100 Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	74.7 (1.5)	32.6 (1.9)
	psi	10800 (220)	4720 (280)
Elongation @ Yield	%	5.5 (0.098)	1.5 (0.12)
Strength @ Break[2]	MPa	28 (9.6)	32.5 (1.7)
	psi	4070 (1400)	4710 (250)
Elongation @ Break	%	73 (27)	1.5 (0.12)
Modulus (Elastic)	GPa	2.57 (0.066)	2.5 (0.051)
	ksi	373 (9.6)	362 (7.4)

[1] Values in parenthesis are standard deviations.

[2] The XZ samples yield significantly before breaking, resulting in a lower value than the ZX samples. This is shown in the Tensile Curves image on page 4.

Table 11. Annealed VICTREX AM 200 Mechanical Properties – Fortus 450mc w/SUP8000B Support

		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	75.1 (0.6)	26.9 (2)
	psi	10900 (88)	3900 (290)
Elongation @ Yield	%	5.3 (0.099)	1.3 (0.12)
Strength @ Break[2]	MPa	17.1 (11)	26 (2.9)
	psi	2480 (1600)	3770 (430)
Elongation @ Break	%	25 (4.2)	1.2 (0.14)
Modulus (Elastic)	GPa	2.68 (0.089)	2.36 (0.084)
	ksi	389 (13)	343 (12)

[1] Values in parenthesis are standard deviations.

[2] The XZ samples yield significantly before breaking, resulting in a lower value than the ZX samples. This is shown in the Tensile Curves image on page 4.