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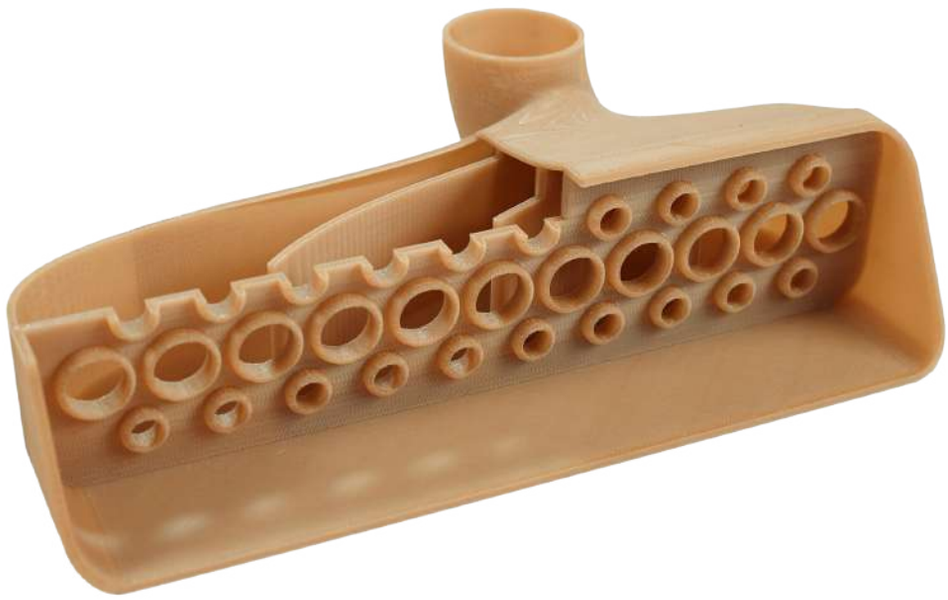

*MATERIAL*

# VICTREX AM™200

## OVERVIEW

For more information or advice: theD2Mco.com/contact-us info@theD2Mco.com

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**MATERIAL DATA SHEET**
FDM

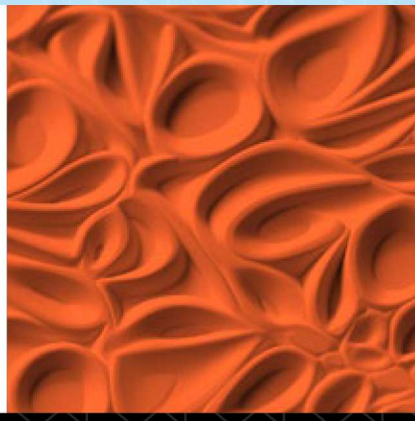
# VICTREX AM™ 200

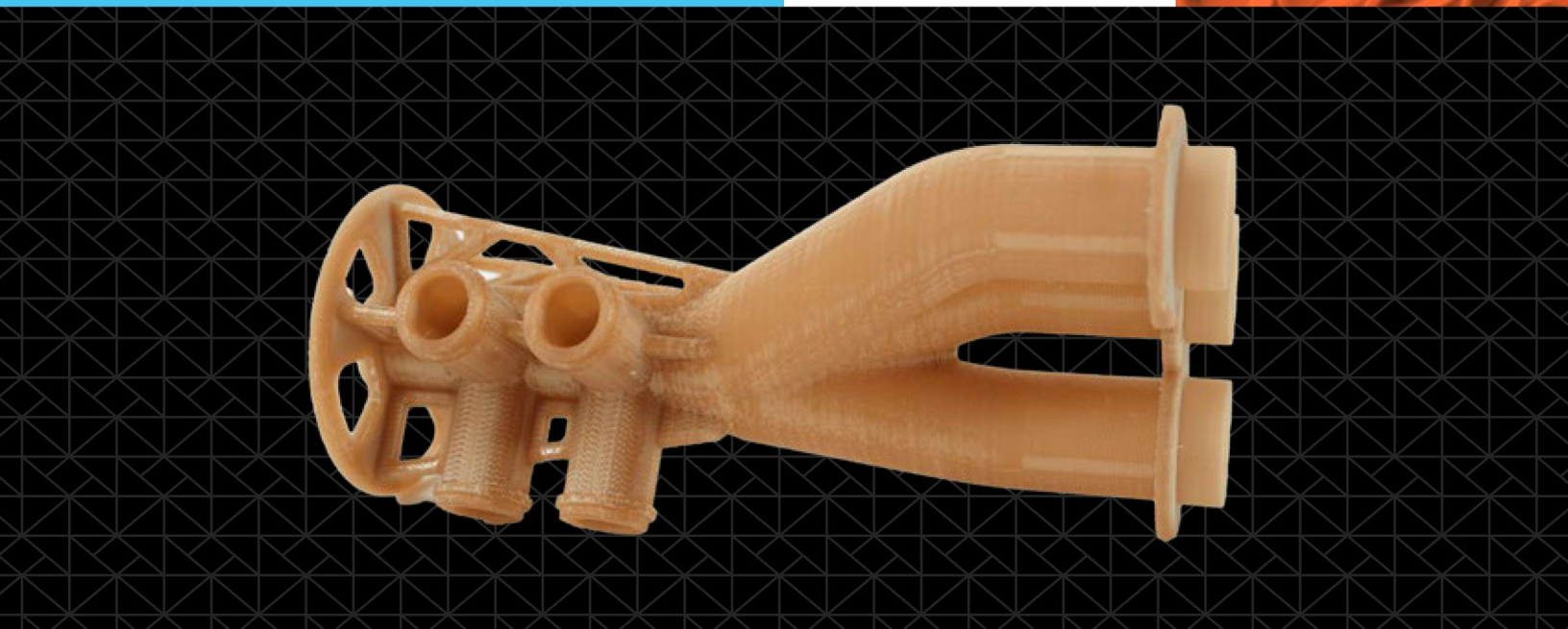
## FDM™ Thermoplastic Filament

### 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) | |

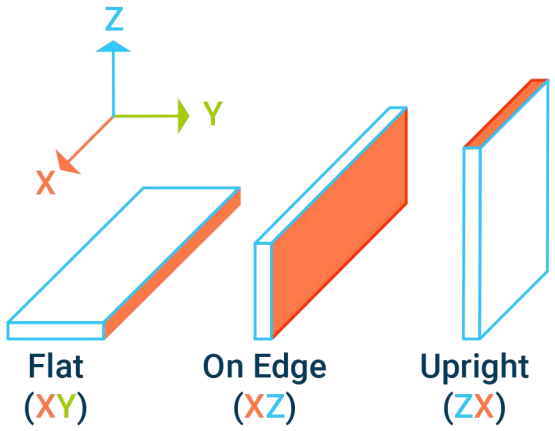
* Data provided by Victrex.

# 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.

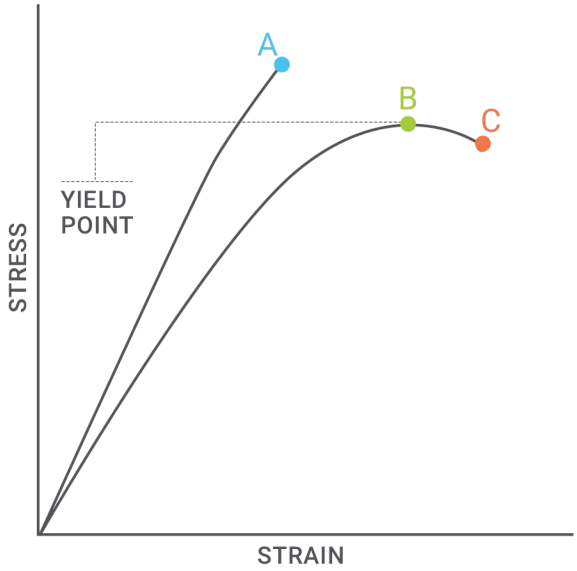
## Print Orientation

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.