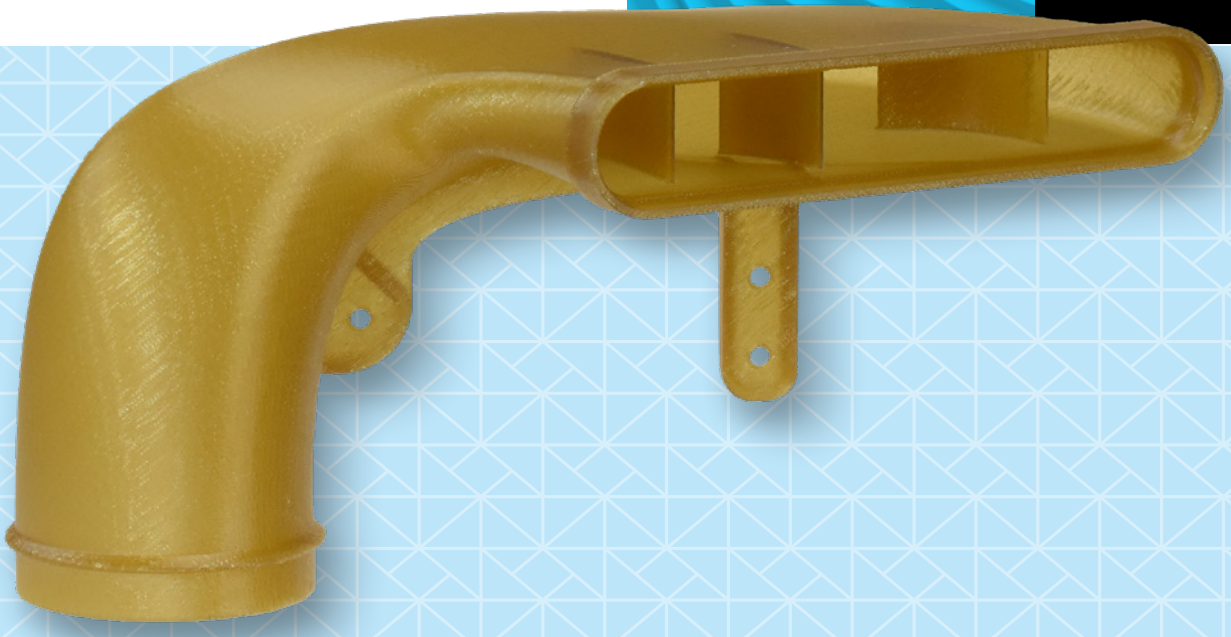
stratasys

MATERIAL DATA SHEET
FDM

Antero 800NA

FDM Thermoplastic Filament

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes.



Overview

Antero® 800NA is a PEKK-based FDM® thermoplastic with excellent mechanical properties that include high strength, high heat resistance, toughness and wear-resistance. These superior qualities make it a lighter alternative to aluminum and steel in certain use cases.

Chemical resistance and minimal outgassing provide suitability for aerospace applications where prototypes and parts are exposed to jet fuel, oil, and hydraulic fluid. Other uses include industrial applications where high strength and chemical resistance are needed.

3D printing with Antero 800NA FDM filament avoids the waste associated with subtractive manufacturing of high-cost bulk PEKK material.

Antero 800NA CG (Certified Grade) meets more stringent test criteria and possesses documented traceability from filament back to raw material lot number. Included documentation:

- Certificate of Analysis — for both raw material and filament are supplied, documenting test results and identification to match filament manufacturing lot number to raw material batch number.
- Certificate of Conformance — confirms that the material is manufactured in compliance to approved Stratasys® and industry specifications.

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Ordering Information

Table 1: Printer and Support Material Compatibility

Printer	Model Tip	Layer Height	Support Material	Support Tip
Fortus 450mc™	T20D	0.25 mm (0.010 in.)	SUP8000B™ (breakaway)	T16
	T20F[1]			
F900®	T20D	0.25 mm (0.010 in.)	SUP8000B (breakaway)	T16
	T20F[1]			
F3000®	N500SAC	0.25 mm (0.010 in.)	SUP8000B (breakaway)	N410SA

[1] The T20F improves mechanical performance and is the recommended tip.

Build Sheet

Fortus High Temperature Build Sheets

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

F3300 High Temperature Build Sheets

- 0.51 x 660 x 711 mm (0.02 x 26 x 28 in.)

System Requirements

Fortus 450mc

- Hardened machine upgrade
- Hardened Fortus 450mc head
- Antero 800NA material license (included if new system)

F900

- Hardened F900 head
- Antero 800NA material license

F3000

- F3000 Series Extruder Drive
- Standard Hot Ends
- No material licenses required

Table 2: Antero 800NA Ordering Information

Part Number	Description	System Compatibility
Filament Consumables		
Fortus Plus Canister (black snout)		
355-02500	Antero 800NA, 92.3 cu. in. – Plus	Fortus 450mc, F900
355-03260	SUP8000B, 92.3 cu. in. – Plus	
F3000 Series Spools		
363-00600	MTRL, F3000 Series, (M), Antero 800NA CG, 4100CC	F3300
363-00730	MTRL, F3000 Series, (S), SUP8000B, 4100CC	
Printer Consumables		
Fortus		
511-10730-S	T20D tip	Fortus 450mc, F900
511-10740-S	T20F tip	
511-10401	T16 tip	
325-00275-S	High Temperature build sheet, 0.02 x 16 x 18.5 in. (0.51 x 406 x 470 mm), 20 pack	
325-00475-S	High Temperature build sheet, 0.02 x 26 x 38 in. (0.51 x 660 x 965 mm), 10 pack	F900
F3000 Series		
533-00523-S	FDM, N500SAC Hot End (0.25 mm/0.010 in. layer height)	F3300
533-00421	FDM, N410SA Support Hot End (0.25 mm/0.010 in. layer height)	
363-30200-S	F3300 Sheet Bundle, high temp, 0.02 x 26 x 28 in., 10 pack	
Print Heads		
Fortus		
821726-XXXX	Hardened Fortus 450mc head (blue handle)	Fortus 450mc
380-30400-S	OpenAM Hardened Fortus 450mc head (blue handle, additional sticker)	
325-63500	Hardened F900 head (folded sheet metal handle)	F900
380-63500-S	OpenAM Hardened F900 head (folded sheet metal handle, additional sticker)	
F3000 Series		
533-10000-S	F3000 Series Extruder Drive	F3300

Legal Disclaimer

Important Information Regarding Material Property Data

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. End-use material performance can be impacted (+/-) by, but not limited to, part design, end use conditions, test conditions, etc. Actual values will vary with build conditions. Product specifications are subject to change without notice.

This document provides technical performance information and is not a substitute for the applicable Safety Data Sheet, processing instructions, or other product safety information. Before use, each user must review the applicable safety information and independently test and validate the material and finished part under the intended processing, operating, and end-use conditions.

Physical Properties

Values are measured as molded and printed. XY and XZ orientations were tested. For full details refer to the Stratasys Materials Test Procedure. DSC and TMA curves can be found in the Appendix.

Table 3: Antero 800NA Physical Properties

Physical Properties - Printed			
Property	Test Method	Typical Values XY	Typical Values XZ
HDT at 66 psi	ASTM D648 Method B	158 °C (316 °F)	158 °C (316 °F)
HDT at 264 psi	ASTM D648 Method B	157 °C (315 °F)	156 °C (313 °F)
Mean CTE	ASTM E831 (40 °C to 140 °C)	36.11 µm/[m*°C] (20.06 µin/[in*°F])	50.20 µm/[m*°C] (27.89 µin/[in*°F])
Physical Properties - Non Printed			
Property	Test Method	Molded Plaques	
HDT at 66 psi	ASTM D648 Method B	151 °C (304 °F)	
HDT at 264 psi	ASTM D648 Method B	147 °C (297 °F)	
Tg	ASTM D7426 Inflection Point	156 °C (313 °F)	
Melt Point	ASTM D7426 Peak Heat	300 °C (572 °F)	
Volume Resistivity	ASTM D257	> $1.4*10^{14}$ Ω*cm	
Dielectric Constant	ASTM D150 1 kHz test condition	3.32	
Dissipation Factor	ASTM D150 1 kHz test condition	0.003	
Thermal Conductivity	ASTM E1952 at 0 °C	0.2988 W/m*K (0.1727 BTU/[hr*ft*°F])	
	ASTM E1952 at 30 °C	0.3011 W/m*K (0.1740 BTU/[hr*ft*°F])	
	ASTM E1952 at 60 °C	0.3054 W/m*K (0.1765 BTU/[hr*ft*°F])	
	ASTM E1952 at 90 °C	0.3088 W/m*K (0.1785 BTU/[hr*ft*°F])	

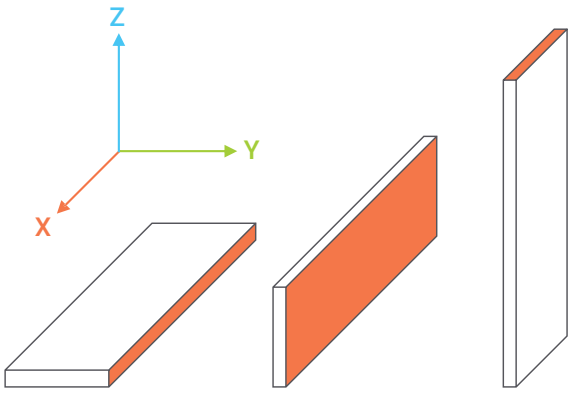
Property	Test Method	Molded Plaques
Thermal Diffusivity	ASTM E1952 at 0 °C	0.193 mm^2/s ($2.99*10^{-4}$ in^2/s)
	ASTM E1952 at 30 °C	0.174 mm^2/s ($2.70*10^{-4}$ in^2/s)
	ASTM E1952 at 60 °C	0.162 mm^2/s ($2.51*10^{-4}$ in^2/s)
	ASTM E1952 at 90 °C	0.152 mm^2/s ($2.36*10^{-4}$ in^2/s)
Specific Gravity	ASTM D792 at 23 °C	1.28

Mechanical Properties

Samples were printed with a 0.25 mm (0.010 in.) layer height on the Fortus 450mc and F900 with a T20F tip and the F3300 with an N500SAC hot end. For the full test procedure please see Stratasys Materials Test Procedure. For more information on compression testing and reporting please see the Refining Compressive Yield Stress Measurement for FDM Materials one pager.

Print Orientation

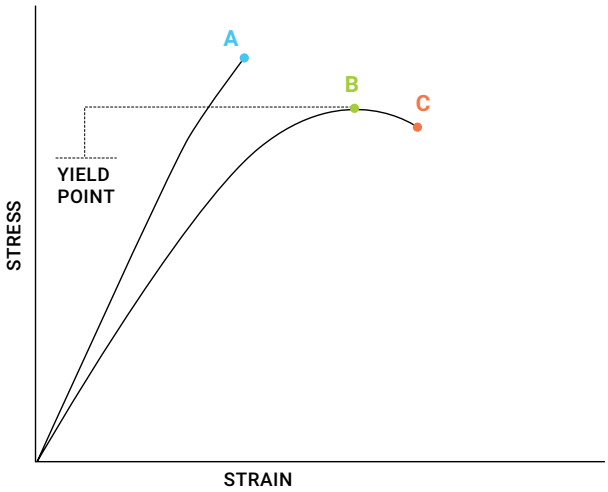
Parts created using FDM are anisotropic as a result of the printing process. Below is a reference of the different orientations used to characterize the material.



Flat (XY) On Edge (XZ) Upright (ZX)

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: Antero 800NA Mechanical Properties - Fortus 450mc - T20F Tip

0.25 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	90.0 (5.2)	50.1 (3.6)
	psi	13,000 (760)	7,270 (530)
Elongation at Yield	%	4.8	1.8
Strength at Break	MPa	73.0 (13)	49.4 (3.8)
	psi	10,600 (1,900)	7,170 (550)
Elongation at Break	%	6.4	1.8
Modulus (Elastic)	GPa	2.71 (0.05)	2.89 (0.05)
	ksi	393 (7.4)	419 (7.8)
Flexural Properties: ASTM D790, Procedure A			
Strength at Break	MPa	No break	96.6 (11)
	psi	No break	14,000 (1,700)
Strength at 5% Strain	MPa	137 (1.85)	-
	psi	19,900 (260)	-
Strain at Break	%	No break	3.6
Modulus	GPa	3.20 (0.02)	3.84 (0.07)
	ksi	464 (5.8)	411 (11)
Compression Properties: ASTM D695			
Peak Strength	MPa	98.4 (4.8)	102 (1.4)
	psi	14,300 (700)	14,800 (210)
Modulus	GPa	2.46 (0.03)	2.34 (0.15)
	ksi	357 (4.5)	340 (21)
Impact Properties: ASTM D256 (sample depth of 0.4 in.)			
Impact Resistance	J/m	40.0 (6.3)	30.1 (6.0)
	ft*lb/in.	0.749 (0.12)	0.564 (0.11)

[1] Values in parentheses are standard deviations.

Table 5: Antero 800NA Mechanical Properties - F900 - T20F Tip

0.25 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	86.7 (5.0)	59.4 (5.8)
	psi	12,600 (720)	8,600 (850)
Elongation at Yield	%	4.7	2.3
Strength at Break	MPa	73.0 (4.7)	59.7 (5.5)
	psi	10,600 (680)	8,650 (800)
Elongation at Break	%	6.1	2.3
Modulus (Elastic)	GPa	2.64 (0.05)	2.77 (0.04)
	ksi	383 (6.5)	402 (5.8)
Flexural Properties: ASTM D790, Procedure A			
Strength at Break	MPa	No break	106 (13)
	psi	No break	15,400 (1,900)
Strength at 5% Strain	MPa	136 (2.3)	-
	psi	19,800 (340)	-
Strain at Break	%	No break	4.1
Modulus	GPa	3.20 (0.04)	2.65 (0.03)
	ksi	463 (6.4)	385 (40)
Compression Properties: ASTM D695			
Peak Strength	MPa	95.8 (5.9)	95.4 (4.0)
	psi	13,800 (0.85)	13,800 (0.58)
Modulus	GPa	2.26 (0.25)	2.30 (0.18)
	ksi	327 (36)	333 (25)
Impact Properties: ASTM D256 (sample depth of 0.4 in.)			
Impact Resistance	J/m	41.1 (6.9)	33.3 (4.2)
	ft*lb/in.	0.770 (0.13)	0.623 (0.08)

[1]Values in parentheses are standard deviations.

Table 6: Antero 800NA CG Mechanical Properties - F3300 - N500SAC Hot End

0.25 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	90.2 (1.5)	65.1 (4.2)
	psi	13,100 (220)	9,440 (610)
Elongation at Yield	%	5.1 (0.14)	2.7 (0.22)
Strength at Break[2]	MPa	56.4 (27)	65.2 (4.3)
	psi	8,180 (3,900)	9,460 (630)
Elongation at Break	%	7.1 (2.7)	2.7 (0.24)
Modulus (Elastic)	GPa	2.89 (0.041)	2.82 (0.04)
	ksi	419 (5.9)	408 (5.8)
Flexural Properties: ASTM D790, Procedure A			
Strength at Break	MPa	No break	106 (12)
	psi	No break	15,400 (1700)
Strength at 5% Strain	MPa	134 (3.6)	-
	psi	19,400 (530)	-
Strain at Break	%	No Break	4.1 (0.47)
Modulus	GPa	3.14 (0.11)	2.75 (0.11)
	ksi	455 (17)	399 (15)
Compression Properties: ASTM D695			
0.2% Offset Yield	MPa	55.2 (1.9)	65.1 (2.7)
	psi	8,010 (270)	9,440 (400)
1.0% Offset Yield	GPa	72.9 (2.3)	84.1 (1.1)
	ksi	10,600 (330)	12,200 (170)
Modulus	GPa	2.23 (0.046)	2.46 (0.83)
	ksi	323 (6.7)	357 (120)
Impact Properties: ASTM D256 (sample depth of 0.4 in.)			
Impact Resistance	J/m	42.3 (4.6)	30.3 (9.3)
	ft*lb/in.	0.793 (0.086)	0.567 (0.17)
Impact Strength	kJ/m^2	4.16 (0.45)	2.97 (0.91)
	$ft*lb/in^2$	1.98 (0.21)	1.41 (0.43)

[1] Values in parentheses 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 at the beginning of the Mechanical Properties section.

UV Aging

Antero 800NA coupons were built on the F900 using the T20F tip with 0.25 mm (0.010 in.) layer height. Antero 800NA was tested before and after UV exposure. Ten ASTM D638 upright (ZX) coupons were tested in tensile after UV exposure and an additional 10 ASTM D638 ZX coupons were the control (no UV Exposure). The UV exposed samples were cycled in the QUV chamber per ASTM G154 (Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Non-Metallic Materials) for 1,000 hours, alternating for 8 hours at 60 °C (140 °F) and 4 hours at 50 °C (122 °F) with humidity and condensation. The increase in stress at break is from the control samples. For more information see the Impact of UV Exposure on FDM Materials white paper.

Table 7: UV Aging of Antero 800NA - F900 - T20F Tip

Material	Conditioning	Yield Strength		Stress at Break		Elongation at Break	Increase in Stress at Break	Modulus	
		(psi)	(MPa)	(psi)	(MPa)	%	%	(ksi)	(GPa)
Antero 800NA	No UV Exposure	8,320	57.4	8,360	57.6	2.4	-	392	2.7
	UV Exposure	8,310	57.3	8,670	59.7	2.4	3.60	399	2.75

Performance at Temperature

Antero 800NA coupons were built on the F900 using the T20F tip with 0.25 mm (0.010 in.) layer height. Antero 800NA was tested at various temperatures. Ten ASTM D638 upright (ZX) coupons were tested in tensile. The percent change from the reported room temperature results are listed below. For more information see the Impact of Temperature on High-Performance FDM Materials white paper.

Table 8: Performance of Antero 800NA at Temperatures - F900 - T20F Tip

Material	Temperature (°F)	Temperature (°C)	Strength at Break	Elongation at Break	Modulus
Antero 800NA	-65	-54	113%	100%	124%
	-40	-40	118%	109%	119%
	120	49	110%	122%	108%
	180	82	103%	139%	110%
	220	104	82%	148%	104%
	270	132	63%	148%	101%

Chemical Resistance

Antero 800NA coupons were built on the Fortus 450mc using the T20D tip with 0.25 mm (0.010 in.) layer height. Antero 800NA was tested for resistance to chemical exposure per ASTM D543. Chemicals tested and percent change from control is listed below. The samples were annealed at 200 °C (392 °F) for three hours. For further details read the Antero 800NA Chemical Resistance White Paper.

Table 9: Antero 800NA Chemical Resistance Results - Fortus 450mc - T20D Tip

Change in Tensile Properties – 168 Hour Chemical Exposure (ASTM D543)					
	Reagent	Non-Annealed XZ	Non-Annealed ZX	Annealed XZ	Annealed ZX
Tensile Strength	Dichloromethane	-88%	-81%	-15%	1%
	Ethyl Acetate	-20%	-4%	-19%	-7%
	Jet A	-14%	-3%	11%	-1%
	Methyl Ethyl Ketone	-17%	-7%	-16%	-7%
	Skydrol	-5%	16%	19%	-9%
	Toluene	-17%	-11%	-14%	-9%
	30% Nitric Acid	-8%	6%	-7%	7%
	30% Sulfuric Acid	2%	0%	-4%	1%
	60% NaOH	2%	-5%	7%	1%
	Concentrated Ammonia	2%	-4%	2%	4%
% Elongation at Break	Dichloromethane	1,135%	2,264%	-11%	0%
	Ethyl Acetate	9%	-1%	3%	-5%
	Jet A	25%	-1%	45%	2%
	Methyl Ethyl Ketone	21%	-2%	16%	-2%
	Skydrol	24%	26%	48%	-7%
	Toluene	8%	-7%	12%	-7%
	30% Nitric Acid	-10%	8%	-12%	7%
	30% Sulfuric Acid	4%	-3%	-4%	4%
	60% NaOH	9%	-10%	8%	3%
	Concentrated Ammonia	10%	-9%	12%	11%
Tensile Modulus	Dichloromethane	-92%	-93%	-1%	-1%
	Ethyl Acetate	-3%	-4%	-3%	-1%
	Jet A	-3%	-3%	-4%	-3%
	Methyl Ethyl Ketone	-2%	-6%	-4%	-4%
	Skydrol	-3%	-4%	-1%	-4%
	Toluene	-1%	-4%	-3%	-3%
	30% Nitric Acid	0%	-6%	-2%	2%
	30% Sulfuric Acid	2%	0%	2%	-2%
	60% NaOH	-1%	7%	3%	0%
	Concentrated Ammonia	-1%	10%	0%	-8%

Flame, Smoke, and Toxicity

Antero 800NA was printed with a T20D tip on the Stratasys F900 and tested per 14 CFR 25.853, BSS 7238 and 7239, and AITM 2.0007B and 3.0005. The testing establishes that this material meets requirements for:

- 60s and 12s Vertical Burn
- 15s Horizontal Burn
- Toxic Gas Emission
- Heat Release Rate of Cabin Materials
- Smoke Density

Table 10: Antero 800NA Flame, Smoke, and Toxicity Test Results - F900 - T20D Tip

	Avg Time to Extinguish (seconds)	Avg Burned Length (inches)	Avg Burned Length (centimeters)	Drip Time to Extinguish (seconds)
12 Second Vertical Ignition per 14 CFR 25.853(a), Appendix F, Part I, Paragraph (a)(1)(ii)				
Antero 800NA - Flat Build XY	<1	1.23	3.12	0 (no drips)
Antero 800NA - Vertical - ZX	<1	1.11	2.82	0 (no drips)
60 Second Vertical Ignition per 14 CFR 25.853(a), Appendix F, Part I, Paragraph (a)(1)(i)				
Antero 800NA - Flat Build XY	1.1	2.45	6.22	0 (no drips)
Antero 800NA - Vertical - ZX	1.1	2.86	7.26	0 (no drips)

	Avg Time to Extinguish (seconds)	Avg Burned Length (inches)	Avg Burned Length (centimeters)	Burn Rate (inches/minute)
Antero 800NA - Flat Build XY	0	0	0	0
Antero 800NA - Vertical - ZX	0	0	0	0

	Test Mode	Average Ds (maximum) within 4 minutes, (^{4}Dmax)
Smoke Density per BSS 7238, Rev. C		
Antero 800NA - Flat Build XY	Flaming	2
Antero 800NA - Vertical - ZX	Flaming	2
Smoke Density per AITM 2.0007B, Issue 3		
Antero 800NA - Flat Build XY	Flaming	1
Antero 800NA - Vertical - ZX	Flaming	2
Antero 800NA - Flat Build XY	Non-flaming	1
Antero 800NA - Vertical - ZX	Non-flaming	1

	Test Mode	CO ppm	SO_2 ppm	NOx ppm	HCN ppm	HCl ppm	HF ppm
Toxic Gas Emission per BSS 7239, Rev. A							
Antero 800NA - Flat Build XY		0	1.3	0.5	1	0.2	64
Antero 800NA - Vertical - ZX		0	1.4	0.5	0	0.2	86
Toxic Gas Emission per AITM 3.0005, Issue 2							
Antero 800NA - Flat Build XY	Flaming	60	0	0.9	0.4	0	0
Antero 800NA - Vertical - ZX	Non-flaming	1	0	0	0	0	0
Antero 800NA - Flat Build XY	Flaming	50	0	1.3	0	0	0
Antero 800NA - Vertical - ZX	Non-flaming	1	0	0	0	0	0

	Peak HRR (kW/m²)	Time to Peak Heat Release (seconds)	2 Minute Total HRR (kW-min/m²)
Heat Release Rate of Cabin Materials per 14 CFR 25.853(d), Appendix F, Part IV			
Antero 800NA - Flat Build XY	48.4	150	15.5
Antero 800NA - Vertical - ZX	49.4	92	38.6

Outgassing

Table 11: Antero 800NA Outgassing (ASTM E595) - F900 - T20D Tip

Sample	TML (%)	CVCM (%)	WVR (%)
Antero 800NA	0.347	0.004	0.267

Antero 800NA Annealed

Annealing is a heat treatment process used to reduce internal stresses introduced during the FDM printing process. By heating the material to a controlled temperature below its melting point and holding it there for a set period, the polymer chains can relax and reorganize into a more stable, orderly structure. This change can improve certain physical and mechanical properties, such as tensile and flexural modulus, heat deflection temperature, and chemical resistance.

Samples were printed with 0.25 mm (0.010 in.) layer heights on the Fortus 450mc with a T20D tip. Samples were then annealed at 200 °C (392 °F) for three hours in a sand medium. For the full test procedure please see Stratasys Materials Test Procedure. For more information on compression testing and reporting please see the Refining Compressive Yield Stress Measurement for FDM Materials one pager. For further annealing details, read the Antero 800NA Chemical Resistance White Paper.

Table 12: Antero 800NA Annealed Physical Properties - Fortus 450mc - T20D

Property	Test Method	Typical Values		
		XY	XZ	ZX
HDT at 66 psi (printed)	ASTM D648 Method B	177 °C (350.6 °F)	170 °C (354.2 °F)	176 °C (348.8 °F)
HDT at 266 psi (printed)	ASTM D648 Method B	159 °C (318.2 °F)	159 °C (318.2 °F)	155 °C (311 °F)
Tg	ASTM D7426-08		151 °C (303.8 °F)	
Mean CTE (X)	ASTM E831		48.89 µm/[m*°C] (27.16 µin/[in*°F])	
Mean CTE (Y)	ASTM E831		46.61 µm/[m*°C] (25.89 µin/[in*°F])	
Mean CTE (Z)	ASTM E831		52.54 µm/[m*°C] (29.19 µin/[in*°F])	
Volume Resistivity	ASTM D257		> 1.4 x 10^{14} Ω	
Dielectric Constant	ASTM D150-98 1 kHz test condition	3.23	-	3.32
Dissipation Factor	ASTM D150-98 1 kHz test condition	0.004	-	0.003
Specific Gravity	ASTM D792		1.31	
Chemical Compatibility	MIL-STD-810G Method 504.1		No damage visible	

Table 13: Antero 800NA Annealed Mechanical Properties - Fortus 450mc - T20D tip

0.25 mm (0.010 in.) Layer Height		XZ Orientation[1]	ZX Orientation[1]
Tensile Properties: ASTM D638			
Yield Strength	MPa	No Yield	No Yield
	psi	No Yield	No Yield
Elongation at Yield	%	2.7 (0.64)	0.75 (0.27)
Strength at Break	MPa	88.8 (12)	36.7 (4.4)
	psi	12,900 (1,700)	5,330 (650)
Elongation at Break	%	2.6 (0.65)	0.83 (0.28)
Modulus (Elastic)	GPa	3.87 (0.34)	4.03 (1.4)
	ksi	561 (50)	585 (200)
Flexural Properties: ASTM D790, Procedure A			
Flex Strength	MPa	173 (4.9)	53.6 (8.2)
	psi	25,100 (700)	7,780 (1,200)
Strain at Break	%	No Break	1.8 (1.4)
Modulus	GPa	40.3 (0.11)	2.96 (0.12)
	ksi	5,840 (16)	429 (18)
Compression Properties: ASTM D695			
Peak Strength	MPa	108 (13)	106 (4.6)
	psi	15,700 (1,900)	15,300 (670)
Modulus	GPa	2.6 (0.22)	2.38 (0.046)
	ksi	378 (32)	346 (6.7)
Impact Properties: ASTM D256 (sample depth of 0.4 in.)			
Impact Resistance	J/m	27.2 (5.3)	16.6 (6.4)
	ft*lb/in	0.51 (0.1)	0.31 (0.12)

[1] Values in parentheses are standard deviations.

Table 14: Antero 800NA Annealed Outgassing - Fortus 450mc - T20D Tip

Sample	TML (%)	CVCM (%)	WVR (%)
Annealed Antero 800NA	0.27	0.006	0.152

Table 15: Antero 800NA Annealed Flammability Testing - Fortus 450mc - T20D Tip

Test	Method	Value
Horizontal Burn (15 sec)	14 CFR/FAR 25.853	Passed
Horizontal Burn (60 sec)	14 CFR/FAR 25.853	Passed
Vertical Burn (12 sec)	14 CFR/FAR 25.853	Passed
45° Ignition	14 CFR/FAR 25.853	Passed
Heat Release	14 CFR/FAR 25.853	Passed
NBS Smoke Density (flaming)	ASTM F814/E662	Passed
NBS Smoke Density (non-flaming)	ASTM F814/E662	Passed

Appendix

Figure 1: 2nd Heating Scan, DSC, for Antero 800NA

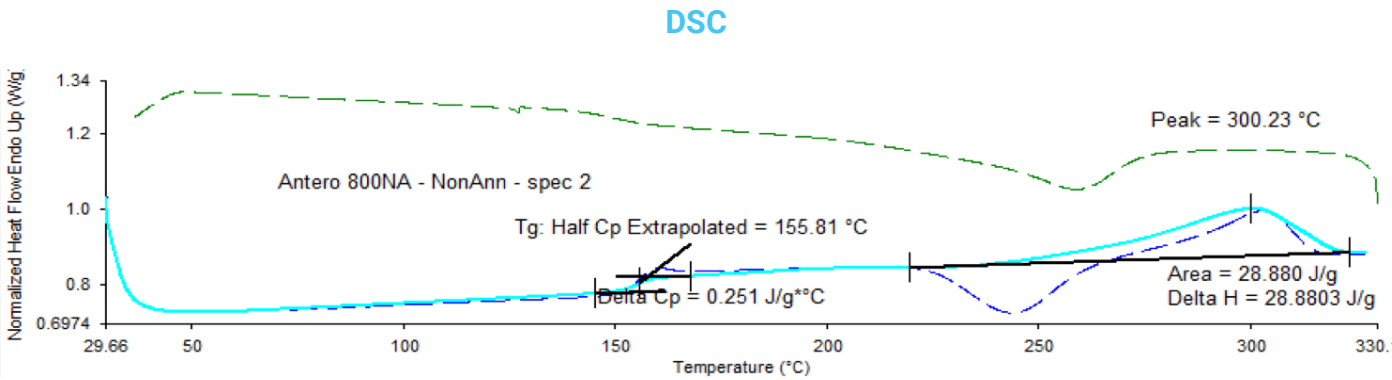


Figure 2: CTE for Antero 800NA Through the Layers

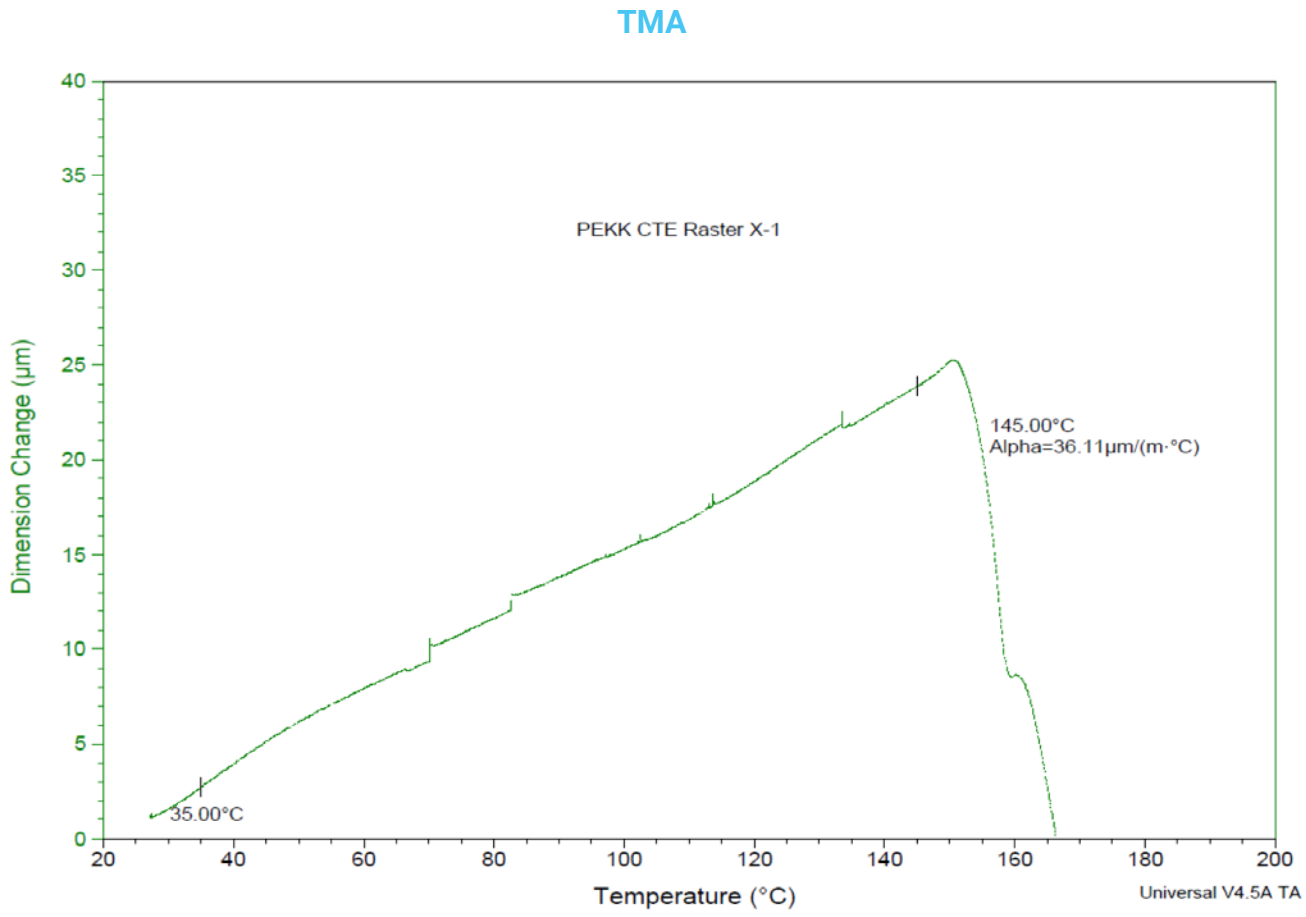
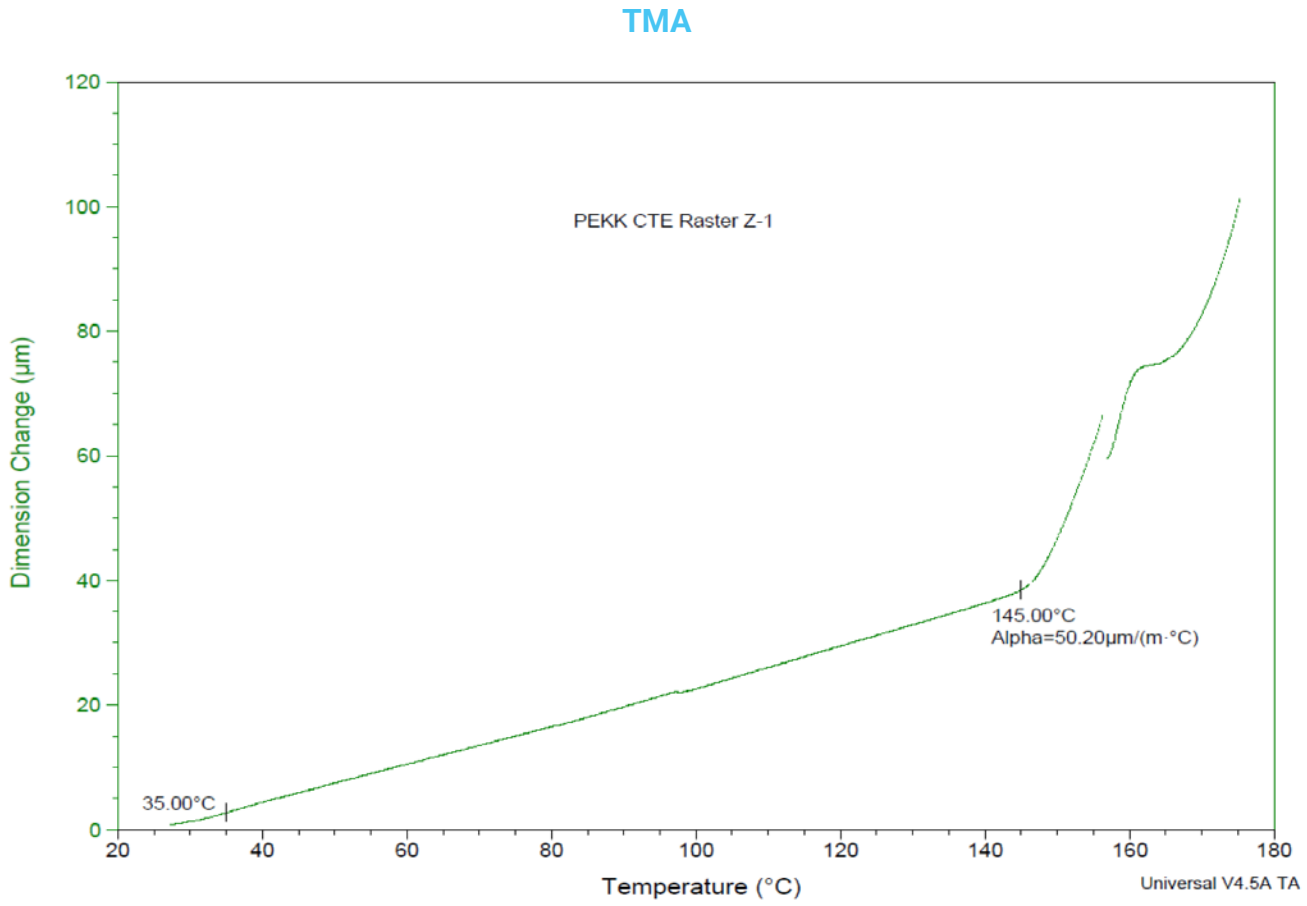


Figure 3: CTE for Antero 800NA in Plane to the Layers



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