

# Antero 800NA

[Antero™ 800NA](#) is a PEKK-based [FDM®](#) thermoplastic. It combines FDM's design freedom and ease of use with the excellent strength, toughness and wear-resistant properties of PEKK material.

Antero 800NA exhibits high heat resistance, chemical resistance, low outgassing and dimensional stability, particularly in large parts.

Appropriate applications include aircraft components exposed to jet fuel, oil and hydraulic fluid, spacecraft parts that demand low outgassing and chemical-resistant industrial parts. Using Antero 800NA with FDM technology avoids the waste associated with subtractive manufacturing of high-cost bulk PEKK material.

Antero 800NA is available on [Fortus 450mc™](#) and [F900™ 3D Printers](#) and is compatible with breakaway support material SUP8000B™.

## Mechanical Properties

Fortus 450mc	Test Method	XZ Orientation	ZX Orientation
Tensile Strength, Yield (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	93.1 ± 0.4 MPa (13,504 ± 57 psi)	45.9 ± 5.3 MPa (6,650 ± 765 psi)
Tensile Strength, Ultimate (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	93.1 ± 0.4 MPa (13,504 ± 57 psi)	45.9 ± 5.3 MPa (6,650 ± 765 psi)
Tensile Modulus (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	3.1 ± 0.3 GPa (448.9 ± 39.5 ksi)	3.5 ± 0.7 GPa (505.3 ± 108.2 ksi)
Elongation at Break (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	6.40 ± 1.05% <sup>1</sup>	1.22 ± 0.28% <sup>1</sup>
Elongation at Yield (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	4.31 ± 0.58%	1.11 ± 0.53% <sup>2</sup>
Flexural Strength (Method 1, 0.05 in./min)	ASTM D790	142 ± 3 MPa (20,548 ± 477 psi)	64 ± 10 MPa (9,349 ± 1,514 psi)
Flexural Modulus (Method 1, 0.05 in./min)	ASTM D790	3.1 ± 0.1 GPa (445.6 ± 10.8 ksi)	2.7 ± 0.1 GPa (388.7 ± 13.0 ksi)
Flexural Strain at Break (Method 1, 0.05 in./min)	ASTM D790	No break	2.41 ± 0.39% <sup>3</sup>
Notched Impact (Method A, 23 °C)	ASTM D256	37 ± 6 J/m (0.69 ± 0.12 ft-lb/in)	27 ± 5 J/m (0.51 ± 0.09 ft-lb/in)
Unnotched Impact (Method A, 23 °C)	ASTM D256	1,826 ± 1,254 J/m (34.2 ± 23.5 ft-lb/in)	75 ± 28 J/m (1.40 ± 0.52 ft-lb/in)
Compressive Strength, Yield (Method 1, 0.05 in./min)	ASTM D695	100 ± 2 MPa (14,572 ± 317 psi)	101 ± 3 MPa (14,595 ± 439 psi)
Compressive Strength, Ultimate (Method 1, 0.05 in./min)	ASTM D695	100 ± 2 MPa (14,572 ± 317 psi)	101 ± 3 MPa (14,595 ± 439 psi)
Compressive Modulus (Method 1, 0.05 in./min)	ASTM D695	2.45 ± 0.01 GPa (355.6 ± 1.6 ksi)	2.3 ± 0.1 GPa (336.3 ± 12.1 ksi)

<sup>1</sup> 5/30 bars did not break; elongation at end of the test for those 5 bars was used in the calculation

<sup>2</sup> 8/30 bars did not yield per the MTS machine, average calculated with 22 samples

<sup>3</sup> 11/30 bars did not break, average calculated with 19 samples

# Antero 800NA

Stratasys F900	Test Method	XZ Orientation	ZX Orientation
Tensile Strength, Yield (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	90.6 ± 3.0 MPa (13,138 ± 438 psi)	57.0 ± 5.0 MPa (8,265 ± 718 psi)
Tensile Strength, Ultimate (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	90.6 ± 3.0 MP (13,138 ± 438 psi)	57.0 ± 5.0 MPa (8,265 ± 718 psi)
Tensile Modulus (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	2.92 ± 0.10 GPa (423.8 ± 15.1 ksi)	2.86 ± 0.18 GPa (415.4 ± 26.3 ksi)
Elongation at Break (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	6.08 ± 1.31% <sup>1</sup>	1.87 ± 0.30%
Elongation at Yield (Type 1, 0.125 in., 0.2 in./min)	ASTM D638	4.26 ± 0.32%	1.78 ± 0.45% <sup>2</sup>
Flexural Strength (Method 1, 0.05 in./min)	ASTM D790	140.0 ± 3.9 MPa (25,299 ± 569 psi)	87.9 ± 14.4 MPa (12,743 ± 2,083 psi)
Flexural Modulus (Method 1, 0.05 in./min)	ASTM D790	3.07 ± 0.06 GPa (445.2 ± 9.1 ksi)	2.73 ± 0.08 GPa (395.8 ± 12.2 ksi)
Flexural Strain at Break (Method 1, 0.05 in./min)	ASTM D790	4.55 ± 0.37% <sup>3</sup>	3.3 ± 1.90% <sup>4</sup>
Notched Impact (Method A, 23 °C)	ASTM D256	44 ± 4 J/m (0.83 ± 0.07 ft-lb/in)	33 ± 9 J/m (0.61 ± 0.16 ft-lb/in)
Unnotched Impact (Method A, 23 °C)	ASTM D256	1,553 ± 464 J/m (29.1 ± 8.7 ft-lb/in)	153 ± 40 J/m (2.86 ± 0.74 ft-lb/in)
Compressive Strength, Yield (Method 1, 0.05 in./min)	ASTM D695	97.5 ± 3.1 MPa (14,135 ± 445 psi)	93.5 ± 2.9 MPa (13,559 ± 417 psi)
Compressive Strength, Ultimate (Method 1, 0.05 in./min)	ASTM D695	97.5 ± 3.1 MPa (14,135 ± 445 psi)	93.5 ± 2.9 MPa (13,559 ± 417 psi)
Compressive Modulus (Method 1, 0.05 in./min)	ASTM D695	2.36 ± 0.05 GPa (341.5 ± 7.5 ksi)	2.18 ± 0.06 GPa (316.7 ± 9.2 ksi)

<sup>1</sup> 3/30 bars did not break; elongation at end of test for those 3 bars was used in the calculation

<sup>2</sup> 4/30 bars did not yield per the MTS machine, average calculated with 26 samples

<sup>3</sup> 27/30 bars did not break; average calculated with 3 samples

<sup>4</sup> 6/30 bars did not break; average calculated with 24 samples

# Antero 800NA

Thermal Properties	Test Method	Value
Heat Deflection (HDT) @ 66 psi	ASTM D648	150 °C (302 °F)
Heat Deflection (HDT) @ 264 psi	ASTM D648	147 °C (296.6 °F)
Glass Transition Temperature (Tg)	ASTM D7426-08	149 °C (300.2 °F)
Coefficient of Thermal Expansion (X)	ASTM E831	39.23 $\mu\text{m}/(\text{m}\cdot^{\circ}\text{C})$ (21.79 $\mu\text{in}/(\text{in}\cdot^{\circ}\text{F})$ )
Coefficient of Thermal Expansion (Y)	ASTM E831	53.14 $\mu\text{m}/(\text{m}\cdot^{\circ}\text{C})$ (29.52 $\mu\text{in}/(\text{in}\cdot^{\circ}\text{F})$ )
Coefficient of Thermal Expansion (Z)	ASTM E831	50.52 $\mu\text{m}/(\text{m}\cdot^{\circ}\text{C})$ (28.06 $\mu\text{in}/(\text{in}\cdot^{\circ}\text{F})$ )

Electrical Properties	Test Method	Value Range	
		XY	ZX
Volume Resistivity	ASTM D257	$> 5.4 \times 10^{14} \Omega\text{-cm}$	$> 5.4 \times 10^{14} \Omega\text{-cm}$
Dielectric Constant	ASTM D150-98	3.23	3.32
Dissipation Factor	ASTM D150-98	0.004	0.003

Outgassing	Test Method	Value
Total Mass Loss (TML)	ASTM E595	0.27%
Collected Volatile Condensable Material (CVCM)	ASTM E595	0.01%
Water Vapor Recovered (WVR)	ASTM E595	0.15%

Burn Testing	Test Method	Value
Horizontal Burn (15 sec)	14 CFR/FAR 25.853	Passed
Vertical 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
Fire Protection of Railway Vehicles <sup>1</sup>	EN-45545-2, R1	Certified, H1/H2/H3

<sup>1</sup> Stratasys F900 only

# Antero 800NA

Other Testing	Test Method	Value
Specific Gravity	ASTM D792	1.28
Chemical Compatibility	MIL-STD-810G; Method 504.1	No visible damage

System Availability	Layer Thickness Capability	Support Structure	Available Colors
Fortus 450mc	0.010 inch (0.254 mm)	SUP8000B (breakaway)	■ Natural
F900	0.010 inch (0.254 mm)	SUP8000B (breakaway)	■ Natural

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. All values after “±” are standard deviations. 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. Tested parts were built on Fortus 450mc @ 0.010” (0.254 mm) slice. Fluids tested include Skydrol 500B-4, MEK (methyl ethyl ketone), Toluene, Dichloromethane (DCM), Ethyl Acetate, and Jet-A aviation fuel. Product specifications are subject to change without notice.

Ten samples were built on three different machines, resulting in 30 samples total used in each mechanical test in both the XZ and ZX orientations.

The performance characteristics of these materials may vary according to application, operating conditions or end use. Each user is responsible for determining that the Stratasys material is safe, lawful and technically suitable for the intended application, as well as for identifying the proper disposal (or recycling) method consistent with applicable environmental laws and regulations. Stratasys makes no warranties of any kind, express or implied, including, but not limited to, the warranties of merchantability, fitness for a particular use or warranty against patent infringement.

For further details, please see our Chemical Resistance of Antero 800NA white paper.



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