FUSED DEPOSITION MODELING

Antero 800NA PEKK

Aerospace-Grade Thermoplastic with Exceptional Chemical Resistance & Low Outgassing



Antero 800NA is a PEKK-based FDM thermoplastic that combines high strength, heat resistance, and superior chemical resistance with ultra-low outgassing properties. Designed for the most demanding aerospace and industrial applications, it provides exceptional performance in environments exposed to jet fuel, hydraulic fluids, and extreme temperatures. Its excellent mechanical properties make it a lighter-weight alternative to metal components while maintaining the dimensional stability and chemical resistance required for critical applications.

BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
914 × 610 × 914 mm	**2-4 business days**	**0.254 mm**	**±0.25 mm or ±0.3%, whichever is greater**

MECHANICAL PROPERTIES

Antero 800NA PEKK delivers dependable strength and stiffness for aircraft ducting, structural brackets and spacecraft housings, helping teams move from prototype to production with confidence. Its compressive strength is almost identical in both build directions, so it carries clamping and bearing loads well in any orientation.

FDM parts are strongest along the build plane. XZ values describe parts printed on edge and ZX values parts printed upright, so orient the main load path along the layers. Printed on edge, Antero bends without breaking in flexural testing, while upright parts are slightly stiffer in tension but far less ductile.

PROPERTY	VALUE	TEST STANDARD
Tensile Strength, Yield (XZ)	**86.7 MPa**	ASTM D638
Tensile Strength, Yield (ZX)	**59.4 MPa**	ASTM D638
Tensile Strength, Break (XZ)	**73.0 MPa**	ASTM D638
Tensile Strength, Break (ZX)	**59.7 MPa**	ASTM D638
Tensile Modulus (XZ)	**2,640 MPa**	ASTM D638
Tensile Modulus (ZX)	**2,770 MPa**	ASTM D638
Elongation at Yield (XZ)	**4.7 %**	ASTM D638
Elongation at Yield (ZX)	**2.3 %**	ASTM D638
Elongation at Break (XZ)	**6.1 %**	ASTM D638
Elongation at Break (ZX)	**2.3 %**	ASTM D638
Flexural Strength @ 5% Strain (XZ)	**136 MPa**	ASTM D790, Procedure A
Flexural Strength at Break (XZ)	**No break**	ASTM D790, Procedure A
Flexural Strength at Break (ZX)	**106 MPa**	ASTM D790, Procedure A
Flexural Strain at Break (ZX)	**4.1 %**	ASTM D790, Procedure A
Flexural Modulus (XZ)	**3,200 MPa**	ASTM D790, Procedure A

Flexural Modulus (ZX)	**2,650 MPa**	ASTM D790, Procedure A
Compressive Strength, Yield (XZ)	**95.8 MPa**	ASTM D695
Compressive Strength, Yield (ZX)	**95.4 MPa**	ASTM D695
Compressive Modulus (XZ)	**2,260 MPa**	ASTM D695
Compressive Modulus (ZX)	**2,300 MPa**	ASTM D695
Izod Impact, Notched (XZ)	**41.1 J/m**	ASTM D256
Izod Impact, Notched (ZX)	**33.3 J/m**	ASTM D256
Impact Strength, Unnotched (XZ)	**1,730 J/m**	ASTM D4812
Impact Strength, Unnotched (ZX)	**203 J/m**	ASTM D4812

THERMAL PROPERTIES

Antero 800NA is a semi-crystalline PEKK. Its heat deflection temperature sits at its glass transition and barely changes between light and heavy loads or between flat and upright parts, so treat the glass transition as the practical ceiling for loaded parts. Stratasys also tested upright parts from well below freezing to above 130 °C; they are stronger in the cold and keep most of their strength when hot, which helps size engine-bay and space hardware that cycles through both.

Thermal expansion is listed by build direction; use the matching value when sizing clearances against metal parts.

PROPERTY	VALUE	TEST STANDARD
HDT @ 0.45 MPa (XY / XZ, ZX)	**158 / 158 °C**	ASTM D648, Method B
HDT @ 1.82 MPa (XY / XZ, ZX)	**157 / 156 °C**	ASTM D648, Method B
Glass Transition Temperature (Tg)	**156 °C**	ASTM D7426 (inflection point)
Melting Point	**300 °C**	ASTM D7426 (peak)
Mean CTE (XY, 40–140 °C)	**36.11 ×10^{-6}/K**	ASTM E831
Mean CTE (XZ / ZX, 40–140 °C)	**50.20 ×10^{-6}/K**	ASTM E831
Thermal Conductivity @ 0 °C	**0.2988 W/m·K**	ASTM E1952
Thermal Conductivity @ 90 °C	**0.3088 W/m·K**	ASTM E1952
Thermal Diffusivity @ 0 °C	**0.193 mm^2/s**	ASTM E1952
Thermal Diffusivity @ 90 °C	**0.152 mm^2/s**	ASTM E1952
Tensile Strength at Break Retained @ −54 °C (ZX)	**113 %**	ASTM D638 (Stratasys)
Tensile Strength at Break Retained @ 104 °C (ZX)	**82 %**	ASTM D638 (Stratasys)
Tensile Strength at Break Retained @ 132 °C (ZX)	**63 %**	ASTM D638 (Stratasys)

PHYSICAL PROPERTIES

Antero is light for a high-performance polymer. Most of the little mass it loses in vacuum outgassing tests is absorbed water, which it regains in air.

After 1,000 hours of accelerated UV exposure, upright parts kept their full strength at break, so the material holds up on exposed hardware.

PROPERTY	VALUE	TEST STANDARD
Specific Gravity	**1.28**	ASTM D792
Outgassing, Total Mass Loss (TML)	**0.347 %**	ASTM E595
Outgassing, Collected Volatile Condensable Materials (CVCM)	**0.004 %**	ASTM E595
Outgassing, Water Vapour Regained (WVR)	**0.267 %**	ASTM E595
Stress at Break Change after 1,000 h UV (ZX)	**+3.6 %**	ASTM G154 / ASTM D638

ELECTRICAL PROPERTIES

Antero insulates well, with high volume resistivity and a low dissipation factor, suiting electrical connectors, housings and insulating fixtures, including high-temperature PCB fixtures, in aircraft and industrial systems.

Stratasys publishes dielectric values at 1 kHz; confirm high-frequency behaviour for RF and microwave parts with application testing.

PROPERTY	VALUE	TEST STANDARD
Volume Resistivity	**> 1.4×10^{14} Ω·cm**	ASTM D257
Dielectric Constant @ 1 kHz	**3.32**	ASTM D150
Dissipation Factor @ 1 kHz	**0.003**	ASTM D150

CHEMICAL PROPERTIES

Stratasys immersed Antero test parts printed on a Fortus 450mc for 168 hours to ASTM D543 and measured the change in tensile properties. Acids, bases and Skydrol 500B-4 hydraulic fluid had little effect on strength. Jet A and solvents such as toluene, MEK and ethyl acetate weakened parts printed on edge by up to a fifth and upright parts by less, and Stratasys describes resistance to these aviation fuels, fluids and solvents as good to excellent before annealing. Only dichloromethane attacks parts as printed; with that exception, tensile modulus changed by 10% or less for every reagent.

Annealing at 200 °C for three hours raises resistance further: annealed parts held up in dichloromethane, which swells and weakens parts as printed. Under strain, annealing makes upright parts more brittle, so it suits unloaded, solvent-exposed parts best. Chemical ratings are screening guidance; confirm them with application-specific testing before production release.

CHEMICAL	AS PRINTED (XZ / ZX)	ANNEALED (XZ / ZX)
Jet A	**−14% / −3%**	**+11% / −1%**
Skydrol 500B-4	**−5% / +16%**	**+19% / −9%**
Nitric acid 30%	**−8% / +6%**	**−7% / +7%**
Sulfuric acid 30%	**+2% / 0%**	**−4% / +1%**
Sodium hydroxide 60%	**+2% / −5%**	**+7% / +1%**
Concentrated ammonia	**+2% / −4%**	**+2% / +4%**
Toluene	**−17% / −11%**	**−14% / −9%**
Ethyl acetate	**−20% / −4%**	**−19% / −7%**

Methyl ethyl ketone	**−17% / −7%**	**−16% / −7%**
Dichloromethane	**−88% / −81%**	**−15% / +1%**

COMPLIANCE

In Stratasys testing, Antero 800NA meets the FAR 25.853 vertical burn, horizontal burn and heat-release requirements for aircraft cabins and the Boeing BSS 7238 / 7239 and Airbus AITM smoke density and toxic gas tests, so teams can start interior qualification from supplier data.

Stratasys also tested outgassing to ASTM E595 for spacecraft and vacuum hardware.

STANDARD	STATUS
14 CFR 25.853 (FAR 25.853) Meets 12 s and 60 s vertical burn, 15 s horizontal burn and cabin heat-release requirements in Stratasys testing	Stratasys tested
BSS 7238 & 7239 Boeing smoke density and toxic gas emission tests, meeting requirements in Stratasys testing	Stratasys tested
AITM 2.0007B & 3.0005 Airbus smoke density and toxic gas emission tests, meeting requirements in Stratasys testing	Stratasys tested
ASTM E595 (Outgassing) TML 0.347%, CVCM 0.004%, within the common 1.0% TML and 0.10% CVCM screening limits for space use	Stratasys tested

MANUFACTURING

Colours & finishes	**Natural colour; support removal, annealing for chemical resistance, machining, sanding, drilling and tapping**