



Document No.: NMS 840/1 Rev A, January 16<sup>th</sup>, 2026

NCAMP Material Specification

*This specification is generated and maintained in accordance with NCAMP  
Standard Operating Procedures, NSP 100*

Stratasys Inc. Antero(R) 840CN03 Resin, Type 1

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Reviewed by:

**Distribution Statement A.** Approved for public release; distribution is unlimited.

**REVISIONS:**

Rev	By	Date	Pages Revised or Added
-	Royal Lovingfoss	MM/DD/YEAR	Document Initial Release
Rev A	Royal Lovingfoss and Jonathan John	1/16/2026	Pg. 3-6, table 2,3, 4 and 5 updated footnotes. Pg. 6, Table 5, Updated spec limits

**1. SCOPE:**

**1.1 Form:**

This detailed specification along with the base specification NMS 840 establishes the requirements for the manufacturing of Antero(R) 840CN03 Fused Deposition Modeling (FDM) filament. The filament is produced using an extrusion process.

This detailed specification follows the section and table numbering scheme of the base specification. It contains additional or superseding requirements. The base specification shall govern where no additional requirement is specified; in such cases, the applicable sections are omitted from this detail specification.

**2. Type:** All products qualified to this detail specification have the following classification: Type 1, Antero(R) 840CN03

**8. Technical Requirements:**

**8.1 In-Process Canister Requirements:**

TABLE 2 – In-Process Canister Requirements (Type 1)<sup>(1)</sup>

<b>Property</b>	<b>Test Method</b>	<b>Number of Replicates</b>	<b>Requirements<sup>(2)</sup></b>
Moisture	ASTM D7191	First, middle (roughly) and end per batch	≤ 0.04%, ind
Melt Flow	ASTM D1238 <sup>(3)</sup>	First, middle (roughly) and end per batch	0.2 to 2 g/10min, ind

<sup>(1)</sup> The testing defined in this section is the responsibilities of the manufacturer and need not to be repeated by the purchaser.

<sup>(2)</sup> “ind” refers to individual measurements

<sup>(3)</sup> Melt flow test conditions are loading including plunger weight at 1.2kg load and temperature of 380°C.

**8.2 Filament Physical Properties:**

TABLE 3 – Filament Physical Properties (Type 1)

Property	Number of Replicates	Requirements <sup>(1)</sup>
Pull Force	One of the first three canisters in the batch	≤ 1.75 lbs, ind <sup>(2)</sup>
Diameter <sup>(4)</sup>	'Continuously'	0.0675 to 0.0739 inch, ind <sup>(3)</sup>
		0.07070 ± 0.00040 inch, avg <sup>(3)</sup>
Ovality <sup>(4)</sup>	'Continuously'	0.0028 inch (max), ind

(1) “ind” refers to individual measurements. “avg” refers to the average measurements. “max” refers to maximum measurement.

(2) Pull force spikes up to 3.75 lbs with SSYS 106194-0000 Stratasys proprietary test method are acceptable provided it meets one of the following criteria:

- (a) Length of spike above 1.75 lbs does not exceed 3 feet.
- (b) Length of spike above 2.75 lbs does not exceed 1 ft.

This testing is the responsibilities of the manufacturer and need not to be repeated by the purchaser.

(3) Diameter exception due to local flaw is permitted if it is within 0.0739 inch (max) diameter x 0.60 inch length. The diameters of the flaw areas must be included in the diameter average calculation and additionally, it must meet the requirement that 99.73% of diameter readings fall within the given range 0.0679 to 0.0735 inch.

(4) Manufacturer is to measure ‘continuously’ on one spool once it is cooled and packaged. This testing is the responsibilities of the manufacturer and need not to be repeated by the purchaser.

**8.3 As-printed Specimen Physical Properties:**

TABLE 4 – As-printed Specimen Physical Properties (Type 1)

<b>Property</b>	<b>Test Method</b>	<b>Requirements<sup>(1)</sup></b>
Thickness	ASTM D3171 or applicable mechanical test method	0.1172 to 0.1402 inch, avg <sup>(2)</sup>
Surface Resistivity	ASTM D257	10E4-10E9 Ω/sq

(1) “ind” refers to individual measurements. “avg” refers to the average measurements. Limits computed at  $\alpha=0.01$ .

(2) Computed from actual qualification printed specimens thicknesses. A minimum of 3 thickness measurements across the specimen width and length from each specimen listed in Table 4 using spherical faced micrometer or equivalent.

**8.4 As-printed Specimen Mechanical Properties:**

TABLE 5 – As-printed Specimen Mechanical Properties (Type 1)

Property	Test Method	Requirements <sup>(1)</sup>
Tension Strength and Modulus Room Temperature, Ambient Orientation: XZ	ASTM D638 Type 1 or Type DF <sup>(2)</sup>	Strength: Min. Ind. ≥ 10.76 ksi Strength: Average ≥ 12.47 ksi Modulus: 0.4469 to 0.5231 Msi, avg
Tension Strength and Modulus Room Temperature, Ambient Orientation: ZX	ASTM D638 Type 1 or Type DF <sup>(2)</sup>	Strength: Min. Ind. ≥ 5.101 ksi Strength: Average ≥ 6.800 ksi Modulus: 0.4014 to 0.4698 Msi, avg

<sup>(1)</sup> “ind” refers to individual measurements. “avg” refers to the average of 5 specimens.

<sup>(2)</sup> Type dual flare (DF) is an alternative dog-bone geometry covered under ASTM WORK ITEM 71391

To be conducted by Purchaser: A set of 5 specimens is required from each a resin batch that may be used to produce multiple filament lots by the manufacturer.

Limits computed at  $\alpha=0.01$  and modified CV. Specimens should be printed on the five different build platform location.

**QUALIFIED PRODUCTS LIST**

Supplier Product Designation	Supplier Name and Production Location	Date Qualified	Specification Callout <sup>(1)</sup>
Antero(R) 840CN03	Supplier Name: Stratasys Inc.  Production Location: Stratasys 6855 Shady Oak Rd. Eden Prairie Minnesota 55344	02/05/2026	NMS 840/1  Classification callout is optional because Type 1 is the only classification allowed in this QPL.

<sup>(1)</sup> In accordance with NCAMP Standard Operating Procedures, NSP 100, this QPL shall not contain alternate materials/products. Additional production location may be included in the QPL only after successful equivalency demonstration and approval per NCAMP Process Control Document (PCD) Preparation and Maintenance Guide, NRP 101.

<sup>(1)</sup> The proper specification callout for material procurement purpose is “NMS 840/1.” This specification is developed based on the material properties that are available publicly. The purchaser may specify additional requirements beyond those specified in this specification, especially when the purchaser has generated additional material properties beyond those available publicly or when the application requires additional requirements. The additional requirements are subject to supplier review and approval.