



Standard Guide for Tiered Approach to Detection and Characterization of Silver Nanomaterials in Textiles¹

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1. Scope

1.1 This guide covers the use of a tiered approach for detection and characterization of silver nanomaterials in consumer textile products made of any combination of natural or manufactured fibers.

1.2 This guide covers, but is not limited to, fabrics and parts (for example, thread, batting) used during the manufacture of textiles and production of consumer textile products that may contain silver-based nanomaterials. It does not apply to analysis of silver nanomaterials in non-consumer textile product matrices nor does it cover thin film silver coatings with only one dimension in the nanoscale.

1.3 This guide is intended to serve as a resource for manufacturers, producers, analysts, policymakers, regulators, and others with an interest in textiles.

1.4 This guide is presented in the specific context of measurement of silver nanomaterials; however, the structured approach described herein is applicable to other nanomaterials used to treat consumer textile products.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D123 Terminology Relating to Textiles

D6413 Test Method for Flame Resistance of Textiles (Vertical Test)

2.2 AATCC Standards:³

AATCC 135 Dimensional Changes of Fabrics after Home Laundering

2.3 ISO Standards:⁴

ISO 10136-1 Glass and Glassware—Analysis of Extract Solutions—Part 1: Determination of Silicon Dioxide by Molecular Absorption Spectrometry

ISO 16140 Microbiology of Food and Animal Feeding Stuffs—Protocol for the Validation of Alternative Methods

ISO/IEC Guide 99 International Vocabulary of Metrology—Basic and General Concepts and Associated Terms (VIM)

ISO/DTR 18196 Nanotechnologies—Measurement Technique Matrix for the Characterization of Nano-Objects

ISO/TS 80004-1 Nanotechnologies—Vocabulary—Part 1: Core Terms

2.4 U.S. Code of Federal Regulations:⁵

16 CFR Parts 1615 and 1616 Standards for the Flammability of Children's Sleepwear

3. Terminology

3.1 *Definitions*—For additional definitions related to textiles, see Terminology **D123**; for additional definitions related to nanotechnology, see ISO/TS 80004-1; and for additional definitions related to measurements, see ISO/IEC Guide 99.

3.1.1 *analyte, n*—element or constituent to be determined.

ISO 10136-1

3.1.2 *consumer textile product, n*—textile product intended to satisfy human wants and needs.

D123

3.1.3 *manufactured fiber, n*—class name for various genera of filament, tow, or staple produced from fiber-forming substances that may be: (1) polymers synthesized from chemical

¹ This guide is under the jurisdiction of ASTM Committee E56 on Nanotechnology and is the direct responsibility of Subcommittee E56.06 on Nano-Enabled Consumer Products.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American Association of Textile Chemists and Colorists (AATCC), P.O. Box 12215, Research Triangle Park, NC 27709-2215, <http://www.aatcc.org>.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁵ Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, <http://www.access.gpo.gov>.