



Standard Test Method for Gravimetric Determination of Nonvolatile Residue from Cleanroom Gloves¹

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1. Scope

1.1 This test method covers the determination of solvent extractable nonvolatile residue (NVR) from gloves used in cleanrooms where spacecraft are assembled, cleaned, or tested.

1.2 The NVR of interest is that which can be extracted from gloves using a specified solvent that has been selected for its extracting qualities, or because it is representative of solvents used in the particular facility. Alternative solvents may be used, but since their use may result in different values being generated, they must be identified in the procedure data sheet.

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

1.4 *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

D1193 Specification for Reagent Water

E2217 Practice for Design and Construction of Aerospace Cleanrooms and Contamination Controlled Areas

F50 Practice for Continuous Sizing and Counting of Airborne Particles in Dust-Controlled Areas and Clean Rooms Using Instruments Capable of Detecting Single Sub-Micrometre and Larger Particles

G120 Practice for Determination of Soluble Residual Contamination by Soxhlet Extraction

¹ This test method is under the jurisdiction of ASTM Committee E21 on Space Simulation and Applications of Space Technology and is the direct responsibility of Subcommittee E21.05 on Contamination.

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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.

2.2 Federal Standards³:

Fed Std 209E Airborne Particulate Cleanliness Classes in Cleanrooms and Clean Zones⁴

2.3 Other Documents:

IEST-RP-CC001 HEPA and ULPA Filters⁵

IEST-RP-CC005 Gloves and Finger Cots Used in Cleanrooms and Other Controlled Environments⁵

Industrial Ventilation, A Manual of Recommended Practice⁶

ISO 14644-1 Cleanrooms and Associated Controlled Environments, Classification of air cleanliness⁷

ISO 14644-2 Cleanrooms and Associated Controlled Environments, Specifications for testing and monitoring to prove continued compliance with ISO 14644-1⁷

3. Terminology

3.1 Definitions:

3.1.1 *contaminant*, *n*—unwanted molecular or particulate matter that could affect or degrade the performance of the components upon which they are deposited.

3.1.2 *contamination*, *n*—a process of contaminant transport or accretion, or both.

3.1.3 *environmentally controlled area*, *n*—cleanrooms, clean facilities, controlled work areas, and other enclosures that are designed to protect hardware from contamination. See *Industrial Ventilation, A Manual of Recommended Practice* for suggestions on facility operation. Cleanliness is achieved by controlling airborne particulate matter, temperature, relative humidity, materials, garments, and personnel activities. Guidelines for controlled areas can be found in Practice **E2217**.

³ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

⁴ Fed-Std-209E has been replaced by ISO 14644-1 and -2, but may continue to be used by mutual agreement.

⁵ Available from the Institute of Environmental Sciences and Technology, 2340 South Arlington Heights Road, Suite 100, Arlington Heights, IL 60005-4516, <http://www.iest.org>.

⁶ Available from Committee on Industrial Ventilation, American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Dr., Suite 600, Cincinnati, OH 45240. http://www.acgih.org/about/committees/c_indvnt.htm.

⁷ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.