



Standard Practice for Handling, Transporting, and Installing Nonvolatile Residue (NVR) Sample Plates Used in Environmentally Controlled Areas for Spacecraft¹

This standard is issued under the fixed designation E1234; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the handling, transporting, and installing of sample plates used for the gravimetric determination of nonvolatile residue (NVR) within and between facilities.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 *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

E1235 Test Method for Gravimetric Determination of Nonvolatile Residue (NVR) in Environmentally Controlled Areas for Spacecraft

2.2 *ISO Standards:*

14644-1, Cleanrooms and Associated Controlled Environments—Part 1: Classification of Air Cleanliness³

14644-2, Cleanrooms and Associated Controlled Environments—Part 2: Specifications for Testing and Monitoring to Prove Continued Compliance with ISO 14644-1³

2.3 *U.S. Federal Standard:*

FED-STD-209E Airborne Particulate Cleanliness Classes in Cleanrooms and Clean Zones⁴

¹ This practice is under the jurisdiction of ASTM Committee E21 on Space Simulation and Applications of Space Technology and is the 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.

³ Available from Institute of Environmental Sciences and Technology, 940 E. Northwest Highway, Mount Prospect, IL 60056.

⁴ Available from Institute of Environmental Sciences and Technology, 940 E. Northwest Highway, Mount Prospect, IL 60056, and U.S. government sources.

2.4 *Institute of Environmental Sciences and Technology:*

IEST-RP-CC001.3, HEPA and ULPA Filters⁵

IEST-RP-CC007.1, Testing ULPA Filters³

IEST-RP-CC034.1, HEPA and ULPA Filter Leak Tests³

IEST-STD-CC1246, Product Cleanliness Levels and Contamination Control Program³

2.5 *American National Standards Institute:*

ANSI/ASME B46.1-2009, Surface Texture (Surface Roughness, Waviness, and Lay)⁵

3. Terminology

3.1 *Definitions:*

3.1.1 *ISO Class N (airborne particulate cleanliness class), n*—level of airborne particulate concentrations as defined in ISO 14644-1 and 14644-2, where 10^N is the maximum allowable concentrations (particles per cubic metre).

3.1.1.1 *Discussion*—The considered particle sizes (lower threshold values) applicable for classification with ISO 14644-1 are limited to the range from 0.1 through 5 μm . Particles larger than 5 μm (macroparticles) may be expressed in accordance with Annex E of ISO 14644-1.

3.1.2 *FS209, n*—the level of cleanliness specified by the maximum allowable number of particles per cubic foot of air as defined in FED-STD-209E.

3.1.2.1 *Discussion*—This is provided for information and to facilitate the transition to the use of the ISO classification standard (ISO 14644-1).

3.1.3 *clean area, n*—a general term that includes cleanrooms, controlled areas, good housekeeping areas, and other areas that have contamination control by physical design and specified operating procedures.

3.1.4 *clean zone, n*—a defined space in which the contamination is controlled to meet specified cleanliness levels.

3.1.5 *contaminant, n*—unwanted molecular and particulate matter that could affect or degrade the performance of the components upon which they reside.

3.1.6 *contamination, n*—a process of contaminating.

⁵ Available from American Society of Mechanical Engineers, United Engineering Center, 345 E. 47th St., New York, NY 10017.