



Designation: E2312 – 04

## Standard Practice for Tests of Cleanroom Materials<sup>1</sup>

This standard is issued under the fixed designation E2312; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This practice identifies test methods used to evaluate the properties of various materials and products used in cleanrooms and for cleanroom construction.

1.2 *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:<sup>2</sup>

- E595 Test Method for Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment
- E1216 Practice for Sampling for Particulate Contamination by Tape Lift
- E1234 Practice for Handling, Transporting, and Installing Nonvolatile Residue (NVR) Sample Plates Used in Environmentally Controlled Areas for Spacecraft
- E1235 Test Method for Gravimetric Determination of Nonvolatile Residue (NVR) in Environmentally Controlled Areas for Spacecraft
- E1549 Specification for ESD Controlled Garments Required in Cleanrooms and Controlled Environments for Spacecraft for Non-Hazardous and Hazardous Operations
- E1559 Test Method for Contamination Outgassing Characteristics of Spacecraft Materials
- E1560 Test Method for Gravimetric Determination of Nonvolatile Residue From Cleanroom Wipers
- E1731 Test Method for Gravimetric Determination of Nonvolatile Residue from Cleanroom Gloves
- E2088 Practice for Selecting, Preparing, Exposing, and Analyzing Witness Surfaces for Measuring Particle Deposition in Cleanrooms and Associated Controlled Environments

- E2090 Test Method for Size-Differentiated Counting of Particles and Fibers Released from Cleanroom Wipers Using Optical and Scanning Electron Microscopy
- E2217 Practice for Design and Construction of Aerospace Cleanrooms and Contamination Controlled Areas
- F25 Test Method for Sizing and Counting Airborne Particulate Contamination in Cleanrooms and Other Dust-Controlled Areas
- F51 Test Method for Sizing and Counting Particulate Contaminant In and On Clean Room Garments
- F739 Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact

#### 2.2 IEST Standards:<sup>3</sup>

- IEST RP-CC003 Garment System Considerations for Cleanrooms and Controlled Environments
- IEST RP-CC004 Evaluating Wiping Materials Used in Cleanrooms
- IEST RP-CC005 Gloves and Finger Cots Used in Cleanrooms and Other Controlled Environments
- IEST RP-CC020 Substrates and Forms for Documentation in Cleanrooms
- IEST RP-CC022 Electrostatic Charge in Cleanrooms and Other Controlled Environments

### 3. Terminology

#### 3.1 Definitions:

- 3.1.1 *ESD*—electrostatic discharge, the transfer of electrostatic charge between bodies that have different electric potential.
- 3.1.2 *fiber*—particle having an aspect (length-to-width) ratio of 10 or more.
- 3.1.3 *microorganism*—living organism of microscopic size capable of growth and reproduction. Examples include bacteria, yeasts, and molds.
- 3.1.4 *non-volatile residue (NVR)*—that quantity of molecular matter remaining after the filtration of a solvent containing contaminants and evaporation of the solvent at a specified temperature.
- 3.1.5 *outgassing*—evolution of volatile components from an item exposed to elevated temperature, normally in vacuum.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee E21 on Space Simulation and the Applications of Space Technology and is the direct responsibility of Subcommittee E21.05 on Contamination.

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<sup>2</sup> 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.

<sup>3</sup> Available from Institute of Environmental Sciences and Technology (IEST), 5005 Newport Dr., Suite 506, Rolling Meadows, IL 60008-3841.