



Standard Test Method for Sizing and Counting Airborne Particulate Contamination in Cleanrooms and Other Dust-Controlled Areas¹

This standard is issued under the fixed designation F25/F25M; 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 test method covers counting and sizing airborne particulate matter 5 μm and larger (macroparticles). The sampling areas are specifically those with contamination levels typical of cleanrooms and dust-controlled areas.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with 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 requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

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

2.2 ISO Standard:

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

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.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

2.3 IEST Document:

IEST-G-CC1003 Measurement of Airborne Macroparticles (1999)⁴

2.4 SAE Document:

SAE Abstract ARP-743, Procedure for the Determination of Particulate Contamination of Air in Dust-Controlled Spaces by Particle Count Method, August 1962⁵

3. Terminology

3.1 Definitions:

3.1.1 airflow:

3.1.1.1 *unidirectional airflow*—air flow which has a singular direction of flow and may or may not contain uniform velocities of air flow along parallel lines.

NOTE 1—Formerly known as laminar airflow.

3.1.1.2 *non-unidirectional airflow*—air distribution where the supply air entering the room mixes with the internal air by means of induction.

3.1.2 *critical pressure*—for an orifice, with a constant upstream pressure, the downstream pressure at which the flow will not increase when the downstream pressure decreases.

3.1.3 *critical pressure ratio*—the ratio of the critical pressure of an orifice to the entrance pressure.

3.1.4 *customer*—organization, or the agent thereof, responsible for specifying the requirements of a cleanroom or clean zone.

3.1.5 *fiber*—particle having an aspect (length-to-width) ratio of 10 or more.

3.1.6 *macroparticle*—particle with an equivalent diameter greater than 5 μm .

⁴ Available from Institute of Environmental Sciences and Technology (IEST), Arlington Place One, 2340 S. Arlington Heights Rd., Suite 100, Arlington Heights, IL 60005-4516, <http://www.iest.org>.

⁵ Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.