



Designation: E 1560 – 95^{€1}

Standard Test Method for Gravimetric Determination of Nonvolatile Residue From Cleanroom Wipers¹

This standard is issued under the fixed designation E 1560; 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 (€) indicates an editorial change since the last revision or reapproval.

€¹ NOTE—In compliance with Part H of the *Form & Style Manual*, the “M” designation was editorially removed in February 2001.

1. Scope

1.1 This test method covers the determination of solvent extractable nonvolatile residue (NVR) from wipers used in assembly, cleaning, or testing of spacecraft, but not from those used for analytical surface sampling of hardware.

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

1.3 The NVR of interest is that which can be extracted from cleanroom wipers using a specified solvent that has been selected for its extractive qualities. Alternative solvents may be selected, but since their use may result in different values being generated, they must be identified in the procedure data sheet.

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:

D 1193 Specification for Reagent Water²

F 24 Test Method for Measuring and Counting Particulate Contamination on Surfaces³

F 50 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 Particles⁴

2.2 Military Standards:

Air Force T.O. 00-25-203 Contamination Control of Aerospace Facilities, U.S. Air Force⁵

Mil-F-51068F Filters, Particulate (High Efficiency, Fire Resistant)^{5,6}

Mil-P-27401 Propellant, Pressurizing Agent, Nitrogen⁵

Mil Std 105D Sampling Procedures and Tables for Inspection by Attributes⁵

Mil-Std-1246B Product Cleanliness Levels and Contamination Control Program⁵

2.3 Federal Standards:

Fed Spec. O-E-00760 Ethyl Alcohol⁵

Fed Spec. O-T-620 1,1,1-Trichloroethane, Technical, Inhibited (Methyl Chloroform)⁵

Fed. Std. 209E Airborne Particulate Classes for Cleanrooms and Clean Zones⁵

2.4 Other Documents:

Industrial Ventilation, A Manual of Recommended Practice, Latest Edition⁷

3. Terminology

3.1 Definitions:

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

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

3.1.3 *environmentally controlled area*—cleanrooms, clean facilities, controlled work areas, and other enclosures that are designed to protect hardware from contamination. Cleanliness is achieved by controlling airborne particulate matter, temperature, relative humidity, materials, garments, and personnel activities. Guidelines for controlled areas can be found in Table 3-1 of Air Force T.O. 00-25-203.

3.1.4 *high efficiency particulate air (HEPA)*—a term describing filters having an efficiency of 99.97 % for removal of 0.3-µm and larger particles. For this application, filters shall meet the requirements of 2.3 and 6.1 of this test method.

3.1.5 *molecular contaminant (nonparticulate)*—may be in a

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² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 10.05.

⁴ *Annual Book of ASTM Standards*, Vol 15.03.

⁵ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁶ The use of Di Octyl Phthalate (DOP) in leak testing of filters or filter installation is not acceptable.

⁷ Available from Committee on Industrial Ventilation, American Conference of Governmental and Industrial Hygienists, P.O. Box 16153, Lansing, MI 48901.