



Designation: F2608 – 15 (Reapproved 2022)

Standard Test Method for Determining the Change in Room Air Particulate Counts as a Result of the Vacuum Cleaning Process¹

This standard is issued under the fixed designation F2608; 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 provides a laboratory test for the measurement of particulate generated as a direct result of the vacuuming process.

1.2 This test method is applicable to all residential/commercial uprights, canisters, stickvacs, central vacuum systems, and combination cleaners.

1.3 This test method applies to test dust removal from floor coverings not the removal of surface litter and debris.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.5 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

F555 Test Method for Motor Life Evaluation of an Upright Vacuum Cleaner

F608 Test Method for Evaluation of Carpet Embedded Dirt Removal Effectiveness of Household/Commercial Vacuum Cleaners

F655 Specification for Test Carpets and Pads for Vacuum Cleaner Testing

F884 Test Method for Motor Life Evaluation of a Built-In (Central Vacuum) Vacuum Cleaner

F922 Test Method for Motor Life Evaluation of an Electric Motorized Nozzle

F1038 Test Method for Motor Life Evaluation of a Canister, Hand-held, Stick, and Utility Type Vacuum Cleaner Without a Driven Agitator

F1334 Test Method for Determining A-Weighted Sound Power Level of Vacuum Cleaners

F1409 Test Method for Straight Line Movement of Vacuum Cleaners While Cleaning Carpets

2.2 AHAM Standard:

ANSI/AHAM AC-1-2006 Test Method for Performance of Portable Household Electric Room Air Cleaners³

2.3 Other References:

IEC 60312 Vacuum Cleaners for Household Use—Methods for Measuring the Performance

Standard Laboratory Practice for Quantifying Respirable Particulate Emissions Generated by Residential/Commercial Vacuums and Central Vacuum Systems, Carpet and Rug Institute, 12/4/02

3. Terminology

3.1 Definitions:

3.1.1 *model, n*—designation of a group of vacuum cleaners having identical mechanical and electrical construction with only cosmetic or nonfunctional differences.

3.1.2 *population, n*—total of all units of a particular model vacuum cleaner being tested.

3.1.3 *repeatability limit, n*—value below which the absolute difference between two individual test results obtained under the repeatability condition may be expected to occur with a probability of approximately 0.95 (95 %).

3.1.4 *test run, n*—definitive procedure that produces a singular measured result.

3.1.5 *unit, n*—single vacuum cleaner of the model being tested.

¹ This test method is under the jurisdiction of ASTM Committee F11 on Vacuum Cleaners and is the direct responsibility of Subcommittee F11.23 on Filtration.

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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 the Association of Home Appliance Manufacturers, 19th St. NW, Suite 402, Washington, DC 20036.

4. Significance and Use

4.1 In this test method, the amount of particulate generated into the air by operating a vacuum cleaner over a specific floor covering that is contaminated with dust will be determined. Particles from the motor, floor covering, and the test dust will all be measured. The amount of dust generated in the laboratory practice will differ from that in residential/commercial installations because of variations in floor coverings, soil and other solid particulate compositions, the vacuuming process used by individual operators, the air exchange rate of heating, ventilation, and air conditioning (HVAC) systems, and other factors.

4.2 To provide a uniform basis for measuring the performance in 4.1, a standardized test chamber, equipment, floor covering material, and dust particulate are used in this test method.

4.3 Due to the large range of generated particle counts observed among products in the vacuum cleaner industry at the present time, the test results of the maximum particle counts generated under this test method are expressed in Log₁₀ equivalents for evaluation and comparison of product performance.

5. Apparatus

5.1 An air-conditioned laboratory at $21 \pm 1.5^\circ\text{C}$ ($70 \pm 5^\circ\text{F}$) and 50 % relative humidity $\pm 5\%$ is to be used for sample preparation.

5.2 *Environmentally Controlled Test Chamber (per ANSI/AHAM AC-1-2006):*

5.2.1 *Chamber Size*—Nominal dimensions of 3.2 by 3.7 by 2.4 m (10.5 by 12 by 8 ft) up to a 20 % difference in volume is permitted.

5.2.2 *Framework*—Standard 5.1 by 10.2 cm (2 by 4 in.) or equivalent construction sealed to the floor line with caulking compound.

5.2.3 *Walls*—Any hard, cleanable surface, such as wallboard (sealed with a washable latex semi-gloss paint) or stainless steel. Seal with caulking compound.

5.2.4 *Flooring*—Any hard, seamless cleanable surface such as seamless full-width vinyl, stainless steel, or sealed concrete.

5.2.5 *Filtration*—HEPA filtration ($>99.97\%$ at $0.3\ \mu\text{m}$, $0.5\ \text{m}^3/\text{s}$ ($1000\ \text{ft}^3/\text{min}$) minimum).

5.2.6 *Motor and Blower for Conditioning Loop*— $0.35\text{-m}^3/\text{s}$ ($750\text{-ft}^3/\text{min}$) fan.

5.2.7 *Relative Humidity*— $50 \pm 5\%$.

5.2.8 *Temperature*— $21 \pm 1.5^\circ\text{C}$ ($70 \pm 5^\circ\text{F}$).

5.2.9 *Chamber Sealing*—Chamber sealing shall be verified as follows: Particulate level in the sealed room shall not rise above 1000 particles/ ft^3 at $\geq 0.3\ \mu\text{m}$ after 20 min of HEPA off, with the room static.

5.3 Real-time aerosol particle counter in the range of 0.3 to $5\ \mu\text{m}$. A laser photometer may be used, in addition to the particle counter, with a range of 0.1 to $1000\ \mu\text{g}/\text{m}^3$.

5.4 Particulate sampling pickoff probe shall be $152.4 \pm 12.7\ \text{cm}$ ($60 \pm 5\ \text{in.}$) above the test carpet, facing up, on centerline of carpet.

5.5 *Weighing Scale (for Weighing Test Dirt)*, accurate to 0.01 g (0.000353 oz) and having a weighing capacity of at least 100 g (3.53 oz) for weighing the dust for embedding.

5.6 *Dirt Embedment Tool*—Roller may be locked or unlocked (see Fig. 1).

5.7 *Dirt Dispenser*—Dispensing system that provides the operator with a method to distribute the test dirt uniformly on the carpet test area.

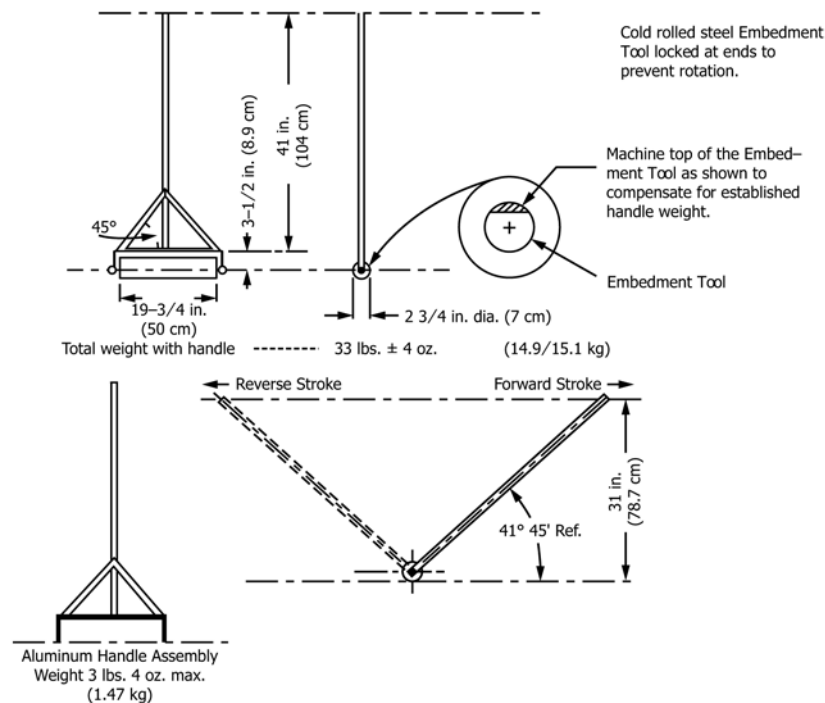


FIG. 1 Dirt Embedment Tool