Designation: D5438 – 11

Standard Practice for Collection of Floor Dust for Chemical Analysis[1]

This standard is issued under the fixed designation D5438; 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 a procedure for the collection of a sample of dust from carpets and bare floors that can be analyzed for lead, pesticides, or other chemical compounds and elements.

1.2 This practice is applicable to a variety of carpeted and bare floor surfaces. It has been tested for level loop and plush pile carpets and bare wood floors, specifically.

1.3 This practice is not intended for the collection and evaluation of dust for the presence of asbestos fibers.

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

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

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D422 Test Method for Particle-Size Analysis of Soils

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

E1 Specification for ASTM Liquid-in-Glass Thermometers

E337 Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures)

E1137/E1137M Specification for Industrial Platinum Resistance Thermometers

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

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

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology D1356.

3.1.1 *carpet-embedded dust*—soil and other particulate matter, approximately 5-µm equivalent aerodynamic diameter and larger, embedded in carpet pile and normally removable by household vacuum cleaners.

3.1.2 *surface dust*—soil and other particulate matter, approximately 5-µm equivalent aerodynamic diameter and larger, adhering to floor surfaces and normally removable by household vacuum cleaners.

4. Summary of Practice

4.1 The sampling method described in this practice is taken from work published in Roberts, et al (**1-3**),[3] and Stamper, et al (**4**).

4.2 Particulate matter is withdrawn from the carpet or bare floor by means of vacuum-induced suction which draws through a sampling nozzle at a specific velocity and flow rate, and the particles are separated mechanically by a cyclone. The cyclone is designed to efficiently separate and collect particles approximately 5-µm mean aerodynamic diameter and larger. However, much smaller particles are also collected at unknown efficiencies. The sampling system allows for height, air flow, and suction adjustments to reproduce systematically a specific air velocity for the removal of particulate matter from carpeted and bare floor surfaces, so that these sampling conditions can be repeated.

NOTE 1—Side-by-side comparison of the HVS3 and a conventional upright vacuum cleaner revealed that both collected particles down to at least 0.2 µm and that the HVS3 was more efficient at collecting particles smaller than 20 µm than conventional vacuum cleaners (**5**). If desired, a fine-particle filter may be added downstream of the cyclone to collect 99.9 % of particles above 0.2 µm aerodynamic mean diameter.

4.3 The particulate matter in the air stream is collected in a catch bottle attached to the bottom of the collection cyclone.

[1] This practice is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.05 on Indoor Air.

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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] The boldface numbers in parentheses refer to the list of references at the end of this standard.

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