



Standard Practice for Collection of Floor Dust for Chemical Analysis¹

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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 the 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:

D 422 Test Method for Particle-Size Analysis of Soils²

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres³

E 1 Specification for ASTM Thermometers⁴

E 337 Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry-Bulb Temperatures)³

F 608 Test Method for Evaluation of Carpet-Embedded Dirt Removal Effectiveness of Household Vacuum Cleaners⁵

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology D 1356.

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,^{6,7,8} and Stamper, et al.⁹

4.2 Particulate matter is withdrawn from the carpet or bare floor by means of a flowing air stream passing through a sampling nozzle at a specific velocity and flow rate and separated mechanically by a cyclone. The cyclone collects efficiently particles approximately 5-μm mean aerodynamic diameter and larger. 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.¹⁰ 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.

⁶ Roberts, J. W., Budd, W. T., Ruby, M. G., Stamper, V. R., Camann, D. E., Fortman, R. C., Sheldon, L. S., and Lewis, R. G., "A Small High Volume Surface Sampler HVS3 for Pesticides, and Other Toxic Substances in House Dust," *Paper No. 91-150.2*, 84th Annual Meeting, Air & Waste Management Association, Vancouver, British Columbia, June 16–21, 1991.

⁷ Roberts, J. W., and Ruby, M. G., "Development of a High Volume Surface Sampler for Pesticides," *U.S. Environmental Protection Agency Report No. EPA 600/4-88/036*, Research Triangle Park, NC, January 1989.

⁸ Roberts, J. W., Han, W., and Ruby, M. G., "Evaluation of Dust Samplers for Bare Floors and Upholstery," Battelle Subcontract No. 46534(g21733808)-00 03EQ, EPA Prime Contract No. 68-00-0007, U.S. EPA, AREAL, Office of Research and Development, 1993.

⁹ Stamper, V. R., Roberts, J. W., and Ruby, M. G., "Development of a High Volume Small Surface Sampler for Pesticide and Toxics in House Dust," *Research Triangle Institute Report No. RTI/171-01/02F*, Research Triangle Park, NC, June 1990. Included in supporting data, which are on file at ASTM Headquarters. Request RR:D22-1010.

¹⁰ Willis, R. D., "SEM Characterization of House Dusts Collected by Conventional Vacuum and the HVS3 Sampler." Report to the U.S. EPA under Contract 68-D5-0049, Research Triangle Park, NC, ManTech Environmental Technology, Inc., 1995.

¹ This practice is under the jurisdiction of ASTM Committee D22 on Sampling and Analysis of Atmospheres and is the direct responsibility of Subcommittee D22.05 on Indoor Air.

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² *Annual Book of ASTM Standards*, Vol 04.08.

³ *Annual Book of ASTM Standards*, Vol 11.03.

⁴ *Annual Book of ASTM Standards*, Vol 14.03.

⁵ *Annual Book of ASTM Standards*, Vol 15.07.