



Designation: D4532 – 22

Standard Test Method for Respirable Dust in Workplace Atmospheres Using Cyclone Samplers¹

This standard is issued under the fixed designation D4532; 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 details for the determination of respirable dust concentration defined in terms of international convention in a range from 0.5 mg/m³ to 10 mg/m³ in workplace atmospheres, depending on sampling time. Specifics are given for sampling and analysis using any one of a number of commercially available cyclone samplers.

1.2 The limitations on the test method are a minimum weight of 0.1 mg of dust on the filter, and a maximum loading dependent on sampler type and time of sampling. The test method may be used at higher loadings if the flow rate can be maintained constant.

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

1.4 This test method contains notes that are explanatory and are not part of the mandatory requirements of the method.

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

¹ This test method is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.04 on Workplace Air Quality.

Current edition approved Nov. 15, 2022. Published January 2023. Originally approved in 1985. Last previous edition approved in 2015 as D4532 – 15. DOI: 10.1520/D4532-22.

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.

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

D3195 Practice for Rotameter Calibration

D5337 Practice for Flow Rate Adjustment of Personal Sampling Pumps

D6062 Guide for Personal Samplers of Health-Related Aerosol Fractions

D6552 Practice for Controlling and Characterizing Errors in Weighing Collected Aerosols

D7440 Practice for Characterizing Uncertainty in Air Quality Measurements

E1 Specification for ASTM Liquid-in-Glass Thermometers

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

2.2 *Other International Standards:*³

ISO GUM Guide to the Expression of Uncertainty in Measurement, ISO Guide 98

ISO 7708 Air Quality—Particle Size Fraction Definitions for Health-Related Sampling

ISO 13137 Workplace Atmospheres – Pumps for Personal Sampling of Chemical and Biological Agents – Requirements and Test Methods

ISO 15767 Workplace Atmospheres—Controlling and Characterizing Errors in Weighing Collected Aerosol

ISO 18158 Workplace Atmospheres - Terminology

EN 481 Workplace Atmospheres—Size Fraction Definitions for the Measurement of Airborne Particles in the Workplace

EN 13205 Workplace Atmospheres—Assessment of Performance of Instruments for Measurement of Airborne Particle Concentrations

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology D1356.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *respirable fraction*—mass fraction of total airborne particles which penetrate to the unciliated airways. (ISO 18158)

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