



Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel¹

This standard is issued under the fixed designation E2515; 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 is applicable for the determination of particulate matter emissions from solid-fuel-burning appliances including woodstoves, pellet-burning appliances, factory-built fireplaces, masonry fireplaces, masonry heaters, indoor furnaces, and indoor and outdoor hydronic heaters within a laboratory environment.

1.2 Analytes will be a particulate matter (PM) with no CAS number assigned. For data quality objectives, see [Appendix X1](#).

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered standard.

1.4 *This test method 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

[D2986 Practice for Evaluation of Air Assay Media by the Monodisperse DOP \(Diocetyl Phthalate\) Smoke Test \(Withdrawn 2004\)](#)³

[E2558 Test Method for Determining Particulate Matter Emissions from Fires in Wood-Burning Fireplaces](#)

[E2618 Test Method for Measurement of Particulate Emissions and Heating Efficiency of Solid Fuel-Fired Hydronic Heating Appliances](#)

¹ This test method is under the jurisdiction of ASTM Committee [E06](#) on Performance of Buildings and is the direct responsibility of Subcommittee [E06.54](#) on Solid Fuel Burning Appliances.

Current edition approved Nov. 1, 2011. Published December 2011. Originally approved in 2007. Last previous edition approved in 2010 as E2515 – 10. DOI: 10.1520/E2515-11.

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 last approved version of this historical standard is referenced on www.astm.org.

[E2779 Test Method for Determining Particulate Matter Emissions from Pellet Heaters](#)

[E2780 Test Method for Determining Particulate Matter Emissions from Wood Heaters](#)

[E2817 Test Method for Test Fueling Masonry Heaters](#)

2.2 *AISI Documents:*⁴

[AISI 316 Stainless Steel](#)

2.3 *NIST Documents:*⁵

[NIST Monograph 175 Standard Limits of Error](#)

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *laboratory environment*—the area or room that is used for the storage, weighing, assembly, disassembly, and desiccation of filters and related equipment (sample recovery and analysis).

3.1.2 *particulate matter (PM)*—all gas-borne matter resulting from combustion of solid fuel, as specified in the appliance operation test method, that is collected and retained by the specified filter and probe system under the conditions of the test.

3.1.3 *test facility*—the area in which the tested appliance is installed, operated, and sampled for emissions.

4. Summary of Test Method

4.1 The total flue-gas exhaust from a solid fuel burning appliance is collected along with ambient dilution air with a collection hood. Duplicate sampling trains are used to extract gas samples from the dilution tunnel for determination of particulate matter concentrations. Each sample train has two glass fiber filters in series. The samples are withdrawn at a consistently proportional rate from sampling points located at the centroid of a sampling tunnel. During sampling, the filters are maintained at a temperature less than 32°C (90°F). The mass of the sampled particulate matter is determined gravimetrically after the removal of uncombined water. The total particulate matter mass collected on the filters and in the probe

⁴ Available from American Iron and Steel Institute (AISI), 1140 Connecticut Ave., NW, Suite 705, Washington, DC 20036, <http://www.steel.org>.

⁵ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, <http://www.nist.gov>.