



Standard Test Method for Determining Particulate Matter Emissions from Fires in Wood-Burning Fireplaces¹

This standard is issued under the fixed designation E2558; 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 covers the fueling and operating protocol for determining particulate matter emissions from wood fires in low mass wood-burning fireplaces. The fueling and operating protocol for determining particulate matter emissions from masonry or other high mass fireplaces is covered in [Annex A1](#) of this test method.

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

1.3 *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

[E631 Terminology of Building Constructions](#)
[E2515 Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel](#)

2.2 NIST Document:³

[Monograph 175 Temperature-Electromotive Force Reference Functions and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90](#)

3. Terminology

3.1 *Definitions*—Terms used in this test method are defined in Terminology [E631](#).

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 July 15, 2013. Published August 2013. Originally approved in 2007. Last previous edition approved in 2009 as E2558 – 09. DOI: 10.1520/E2558-13.

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

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *base of fireplace, n*—the lowest part of the fireplace assembly that would normally be in contact with the floor of the dwelling or structure in which it is installed.

3.2.2 *Douglas fir, n*—untreated, standard, or better grade Douglas fir lumber with agency grade stamp: D. Fir or Douglas Fir.

3.2.3 *firebox, n*—the volume within the fireplace where logs are burned.

3.2.4 *first fuel crib, n*—the first fuel load (including fuel pieces and spacers to create air spaces) placed on the residual fuel from the kindling brands. The specific configuration is described in [9.3.5.1](#).

3.2.5 *fuel piece, n*— 2×4 or 4×4 wood pieces used to construct fuel cribs and referring to the nominal width and depth dimensions for commonly available dimensional lumber. The actual dimensions are $1\frac{1}{2} \times 3\frac{1}{2}$ in. (38×89 mm) and $3\frac{1}{2} \times 3\frac{1}{2}$ in. (89×89 mm).

3.2.6 *grate, n*—any device included with the fireplace or specified by the fireplace manufacturer for the purpose of elevating the fuel load above the hearth or for constraining fuel pieces from falling outside the intended burning area, or both. This includes basket grates and andirons.

3.2.7 *hearth, n*—the footprint of the fireplace firebox.

3.2.8 *kindling brands, n*—the initial fuel load or loads placed above crumpled newspaper to initiate combustion in the fireplace and to establish a charcoal bed that will become the ignition source for subsequent fuel loads. These are comprised of fuel strips separated by air spaces. The specific configuration is described in [9.3.4](#).

3.2.9 *low mass fireplace, n*—any fireplace and attached chimney that can be weighed (including the weight of the test fuel) on a platform scale that meets the requirements as specified in [7.3](#) and [8.2](#).

3.2.10 *nominal fuel length, n*—the Nominal Fuel Length (NFL) is one of five incremental nominal fuel piece lengths that simulates real-world firewood five piece lengths. These lengths are 16 in. (406 mm), 18 in. (457 mm), 20 in. (508 mm), 22 in. (559 mm), and 24 in. (610 mm). The NFL is used for both the kindling brands and fuel cribs.