



Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters¹

This standard is issued under the fixed designation E2780; 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 wood-burning room heaters and fireplace inserts as well as determining heat output and efficiency.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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 *Other Standards:*

ANSI/UL-103 Standard for Chimneys, Factory-Built, Residential Type and Building Heating Appliance

CSA B415.1 Performance Testing of Solid-Fuel-Burning Heating Appliances

3. Terminology

3.1 *Definitions*—Terms used in this test method are defined in Terminology E631.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *burn rate, n*—the rate at which test fuel is consumed in a wood heater. Measured in kilograms (lb) (dry basis) per hour.

3.2.2 *combustion air control, n*—an air control device that regulates air to the wood heater that is primarily intended promote pyrolysis of the fuel load.

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

3.2.4 *firebox, n*—the chamber in the wood heater in which the test fuel charge is placed and combusted.

3.2.5 *fuel piece, n*—2 × 4 or 4 × 4 wood pieces used to construct test fuel cribs and referring to the nominal width and depth dimensions for commonly available dimensional lumber. The actual dimensions are 38 × 89 mm (1½ × 3½ in.) and 89 × 89 mm (3½ × 3½ in.).

3.2.6 *fuel piece length, n*—the length of fuel pieces used to construct the test fuel crib measured in mm (in.).

3.2.7 *firebox height, n*—unless otherwise specified in the manufacturer's written instructions included with the heater, firebox height is the vertical distance extending above the loading door, if fuel could reasonably occupy that space, but not more than 2 inches above the top (peak height) of the loading door, to the floor of the firebox (i.e., below a permanent grate) if the grate allows a 1-inch diameter piece of wood to pass through the grate, or, if not, to the top of the grate. Firebox height is not necessarily uniform but must account for variations caused by internal baffles, air channels, or other permanent obstructions. A visible indicator or landmark within the firebox that will provide a clear indication to the heater user of the maximum height that fuel should be loaded, and is specifically referenced in the manufacturer's written instructions, may be used to determine firebox height for the purposes of calculating usable firebox volume.

3.2.8 *firebox length, n*—the longest horizontal fire chamber dimension where fuel pieces might reasonably be expected to be placed in accordance with the manufacturer's written instructions that is parallel to a wall of the chamber.

3.2.9 *firebox width, n*—the shortest horizontal fire chamber dimension where fuel pieces might reasonably be expected to be placed in accordance with the manufacturer's written instructions that is parallel to a wall of the chamber.

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 Oct. 1, 2010. Published December 2010. DOI: 10.1520/E2780-10.

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.