



Standard Test Method for Test Fueling Masonry Heaters¹

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1. Scope

1.1 This test method covers the fueling and operating protocol for determining particulate matter emissions from solid fuel biomass (cordwood or other densified, binder free biomass fuels) fires in masonry heaters. It may also be used to test other similar appliances (see 3.2.20).

1.2 This test method is applicable to the operation and fueling of masonry heaters during particulate emissions measurement test periods. The prescribed methods and procedures of these protocols are performed on masonry heaters installed and operated in accordance with the builder or manufacturer's specifications.

1.3 In conjunction with Test Method E2515, this test method provides a protocol for laboratory emissions testing of masonry heaters that is intended to simulate actual use in residential homes and other consumer applications. Since such actual use involves almost solely cordwood fueling, Annex A1, Cordwood Fuel, provides as close a simulation as is currently possible of consumer use, and is recommended for predicting actual consumer emissions performance. For regulatory and other potential uses in comparing relative emissions of various masonry heater products and designs, Annex A2, Cribwood Fueling, and Annex A3, Cribwood Fuel, Top-Down Burn, provide optional additional fueling protocols that substitute dimensional lumber cribs for the cordwood fuel. Data that establish the relationships between the emissions results generated by Annex A2 and Annex A3 and the emissions results generated by Annex A1 are not currently available.

1.4 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.

1.5 *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.*

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.

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2. Referenced Documents

2.1 ASTM Standards:²

E631 Terminology of Building Constructions

E1602 Guide for Construction of Solid Fuel Burning Masonry Heaters

E2515 Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel

2.2 Other Standards:

EN 15250 Slow Heat Release Appliances Fired By Solid Fuel-Requirements And Test Methods

EN 15544 One Off Kachelgrundfen/Putzgrundfen (Tiled/Mortared Stoves): Calculation Method

NIST Monograph 175 Standard Limits of Error³

US EPA Title 40 Code of Federal Regulations⁴

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 *ashpit loss, n*— the incomplete burned residue (charcoal) left with the ash after a test run is completed.

3.2.2 *burn rate, n*—the average rate at which test-fuel is consumed in a masonry heater during a test run. The burn rate excludes the inorganic salts and minerals (that is, “ash”) and incompletely burned residues (charcoal) remaining at the end of a test run; measured in mass of dry wood burned per hour (kg/hour, lb/hour).

3.2.3 *calibration error, n*—the difference between the gas concentration displayed by a gas analyzer and the known concentration of the calibration gas when the calibration gas is introduced directly to the analyzer.

3.2.4 *calibration (span) drift, n*—The difference between the expected instrument's response and the actual instrument's response when a calibration (span) gas is introduced to the

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>.

⁴ Available from United States Environmental Protection Agency (EPA), Ariel Rios Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20004, <http://www.epa.gov>.