



Standard Test Method for Performance of Upright Overfired Broilers¹

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1. Scope

1.1 This test method evaluates the energy consumption and cooking performance of overfired broilers. The food service operator can use this evaluation to select an overfired broiler and understand its performance and energy consumption.

1.2 This test method is applicable to gas and electric upright overfired broilers having input rates greater than 60,000 Btu/h (gas overfired broilers) or 10kW (electric overfired broilers).

1.3 The overfired broiler can be evaluated with respect to the following (where applicable):

- 1.3.1 Energy input rate (see 10.2),
- 1.3.2 Temperature uniformity of the broiler cavity (see 10.3),
- 1.3.3 Preheat energy consumption and time (see 10.4),
- 1.3.4 Pilot energy rate (if applicable) (see 10.5),
- 1.3.5 Idle energy rate (see 10.6), and
- 1.3.6 Cooking energy efficiency and production capacity (see 10.7).

1.4 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.

1.5 *This test method may involve hazardous materials, operations, and equipment. 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

A36/A36M Specification for Carbon Structural Steel

¹ This test method is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.06 on Productivity and Energy Protocol.

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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.

D3588 Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels

2.2 AOAC Document:

AOAC Official Action 950.46 Air Drying to Determine Moisture Content of Meat and Meat Products³

2.3 ASHRAE Standard:

ASHRAE Handbook of Fundamentals "Thermal and Related Properties of Food and Food Materials," Chapter 30, Table 1, 1989⁴

2.4 ANSI Standard:

ANSI Z83.11 Gas Food Service Equipment⁵

3. Terminology

3.1 Definitions:

3.1.1 *broiler cavity, n*—that portion of the overfired broiler in which food products are heated or cooked.

3.1.2 *cooking energy efficiency, n*—quantity of energy imparted to the specified food product, expressed as a percentage of energy consumed by the overfired broiler during the cooking event.

3.1.3 *cooking energy rate, n*—average rate of energy consumption (Btu/h or kW) during the cooking energy efficiency tests.

3.1.4 *grate, broiler grate, n*—the platform on which food is placed while cooking in an overfired broiler.

3.1.5 *idle energy rate, n*—the overfired broiler's rate of energy consumption (kW or Btu/h), when empty, required to maintain the broiler's operating temperature while not cooking.

3.1.6 *overfired broiler, n*—an appliance with a high temperature radiant heat source above a heavy duty, sliding grate for cooking food, characterized by an open front cooking cavity and having an input rate greater than 60 000 Btu/h or 10kW.

NOTE 1—The upright overfired broiler is distinguished from the salamander and the cheese melter by its heavy duty, stand-alone construction and high energy input rate (see Fig. 1).

³ Available from Association of Official Analytical Chemists, 1111 N. 19th Street, Arlington, VA 22209.

⁴ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.