



Standard Test Method for Performance of Rapid Cook Ovens¹

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1. Scope

1.1 This test method evaluates the energy consumption and cooking performance of rapid cook ovens. The food service operator can use this evaluation to select a rapid cook oven and understand its energy consumption.

1.2 This test method is applicable to gas and electric rapid cook ovens.

1.3 The rapid cook oven can be evaluated with respect to the following (where applicable):

- 1.3.1 Energy input rate (see 10.2),
- 1.3.2 Preheat energy consumption and time (see 10.3),
- 1.3.3 Idle energy rate (see 10.4),
- 1.3.4 Pilot energy rate (if applicable) (see 10.5), and
- 1.3.5 Cooking energy efficiency, cooking-load energy efficiency and production capacity (see 10.6).

1.4 The values stated in inch-pound units are to be regarded as standard. The SI units given in parentheses are for information only.

1.5 *This test method may involve hazardous materials, operations, and equipment. 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 test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 3588 Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels²

2.2 ASHRAE Documents:

ASHRAE Handbook of Fundamentals “Thermal and Related Properties of Food and Food Materials,” Chapter 30, Table 1, 1989³

ASHRAE Guideline 2-1986 (RA90) Engineering Analysis of Experimental Data³

3. Terminology

3.1 Definitions:

3.1.1 *cooking energy efficiency, n*—quantity of energy imparted to the specified food product, expressed as a percentage of energy consumed by the rapid cook oven during the cooking event.

3.1.2 *cooking energy rate, n*—average rate of energy consumption (Btu/h or kW) during the cooking energy efficiency tests. Refers to all loading scenarios (heavy, medium, light).

3.1.3 *cooking-load energy efficiency, n*—quantity of energy imparted to the specified food product and the pot, pan, tray, or dish containing the food product, expressed as a percentage of energy consumed by the rapid cook oven during the cooking event.

3.1.4 *energy input rate, n*—peak rate at which a rapid cook oven consumes energy (Btu/h or kW).

3.1.5 *idle energy rate, n*—the rapid cook oven’s rate of energy consumption (Btu/h or kW), when empty, required to maintain its cavity temperature at the specified thermostat set point or to otherwise maintain the oven in a ready-to-cook condition.

3.1.6 *oven cavity, n*—that portion of the rapid cook oven in which food products are heated or cooked.

3.1.7 *pilot energy rate, n*—rate of energy consumption (Btu/h) by a rapid cook oven’s continuous pilot (if applicable).

3.1.8 *preheat energy, n*—amount of energy consumed (Btu or kWh), by the rapid cook oven while preheating its cavity from ambient temperature to the specified thermostat set point or while preheating any other component of the oven, for example, an integral heat exchanger, to a ready-to-cook condition.

3.1.9 *preheat time, n*—time (min.) required for the rapid cook oven cavity to preheat from ambient temperature to the specified thermostat set point or for the rapid cook oven to achieve a ready-to-cook condition.

3.1.10 *production capacity, n*—maximum rate (lb/h) at which an rapid cook oven can bring the specified food product to a specified “cooked” condition.

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 Annual Book of ASTM Standards, Vol 05.06

³ Available from American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329.