



Standard Test Methods for Performance of Steam Cookers¹

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1. Scope

1.1 These test methods evaluate the energy consumption and cooking performance of steam cookers. The food service operator can use this evaluation to select a steam cooker and understand its energy consumption.

1.2 These test methods are applicable to the following steam cookers: high-pressure, low-pressure, pressureless and vacuum steam cookers (Specification F1217 Grades A, B, C and D); convection and non-convection steam cookers; steam cookers with self-contained gas-fired, electric, or steam coil steam generators, and those connected directly to an external potable steam source (Specification F1217 Styles i, ii, iii, and iv). The steam cookers will be tested for the following (where applicable):

- 1.2.1 Maximum energy input rate (see 10.2).
- 1.2.2 Preheat energy consumption and duration (see 10.3).
- 1.2.3 Idle energy rate (see 10.5).
- 1.2.4 Pilot energy rate (see 10.6).
- 1.2.5 Frozen green pea cooking energy efficiency (see 10.8).
- 1.2.6 Frozen green pea production capacity (see 10.8).
- 1.2.7 Whole potato cooking energy efficiency (see 10.9).
- 1.2.8 Whole potato production capacity (see 10.9).
- 1.2.9 Water consumption (see 10.7, 10.9, and 10.10).
- 1.2.10 Condensate temperature (see 10.8 and 10.9).
- 1.2.11 Cooking uniformity (see 10.11).

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

1.4 *This standard may involve hazardous materials, operations, and equipment. It does not 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

D3588 Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels
F1217 Specification for Cooker, Steam

2.2 ASHRAE Documents:³

ASHRAE Handbook of Fundamentals Thermal and Related Properties of Food and Food Materials, Chapter 30, Table 1, 1989

ASHRAE Handbook of Fundamentals Thermodynamic Properties of Water at Saturation, Chapter 6, Table 2, 1989

2.3 Other Document:⁴

Development and Application of a Uniform Testing Procedure for Steam Cookers

3. Terminology

3.1 Definitions:

3.1.1 *boiler, n*—self-contained vessel, separate from the cooking cavity, wherein water is boiled to produce steam for the steam cooker. Also called a steam generator.

3.1.2 *condensate, n*—mixture of condensed steam and cooling water, exiting the steam cooker and directed to the floor drain.

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

3.1.4 *cooking energy rate, n*—average rate of energy consumption (kBtu/h or kW) during the cooking energy efficiency test. Refers to any loading scenario in the green pea or potato load tests.

3.1.5 *electric energy rate, n*—refers to rate of electric energy consumption (kW) by steam cookers whose primary fuel source is not electricity (for example, gas). Electric energy is

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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.

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

⁴ Available from the Food Service Technology Center, 12949 Alcosta Blvd., #101, San Ramon, CA 94583.