



Standard Test Method for Performance of Pressure and Kettle Fryers¹

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1. Scope

1.1 This test method evaluates the energy consumption and cooking performance of pressure and kettle fryers. The food service operator can use this evaluation to select a fryer and understand its energy efficiency and production capacity.

1.2 This test method is applicable to floor model natural gas and electric units with a 25 to 70-lb oil capacity.

1.3 The fryer can be evaluated with respect to the following:

1.3.1 Energy input rate (10.2),

1.3.2 Preheat energy and time (10.4),

1.3.3 Idle energy rate (10.5),

1.3.4 Pilot energy rate (10.6, if applicable),

1.3.5 Cooking energy rate and efficiency (10.9), and

1.3.6 Production capacity (10.9).

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 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 *ANSI Standard:*²

ANSI Z83.11 Gas Food Service Equipment

2.2 *AOAC Standard:*³

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

2.3 *ASHRAE Standard:*⁴

ASHRAE 2-1986 (RA90) Engineering Analysis of Experimental Data

¹ This test method is under the jurisdiction of ASTM Committee F-26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.06 on Productivity and Energy Protocol.

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² Available from the American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

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

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

3. Terminology

3.1 Definitions:

3.1.1 *kettle fryer, n*—an appliance with a deep cooking container containing oil or fat at such a depth that the cooking food is essentially supported by displacement of the cooking fluid rather than by the bottom of the vessel.

3.1.2 *pressure fryer, n*—an appliance with a deep kettle containing oil or fat and covered by a heavy, gasketed lid with a pressure valve; the appliance kettle operates between 10 and 12 psig.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *cold zone, n*—the volume in the fryer below the heating elements or heat exchanger surface designed to remain cooler than the cook zone.

3.2.2 *cooking energy, n*—total energy consumed by the fryer as it is used to cook breaded chicken product under heavy- and light-load conditions.

3.2.3 *cooking energy efficiency, n*—quantity of energy imparted to the chicken during the cooking process expressed as a percentage of the quantity of energy input to the fryer during the heavy- and light-load tests.

3.2.4 *cooking energy rate, n*—average rate of energy consumed by the fryer while cooking a heavy or light load of chicken.

3.2.5 *cook zone, n*—the volume of oil in which food is cooked.

3.2.6 *energy input rate, n*—peak rate at which a fryer consumes energy (Btu/h or kW), typically reflected during preheat.

3.2.7 *idle energy rate, n*—average rate of energy consumed (Btu/h or kW) by the fryer while holding or idling the frying medium at the thermostat(s) set point.

3.2.8 *pilot energy rate, n*—average rate of energy consumption (Btu/h) by a fryer's continuous pilot (if applicable).

3.2.9 *preheat energy, n*—amount of energy consumed (Btu or kWh) by the fryer while preheating the frying medium from ambient room temperature to the calibrated thermostat(s) set point.

3.2.10 *preheat rate, n*—the average rate ($^{\circ}\text{F}/\text{min}$) at which the frying medium temperature is heated from ambient temperature to the fryer's calibrated thermostat(s) set point.