



Standard Test Method for Performance of Large Open Vat Fryers¹

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1. Scope

1.1 This test method evaluates the energy consumption and cooking performance of large-vat open, deep fat 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 gas and electric fryers with 50 lbs and greater fat capacity and an 18-in. and larger vat size.

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

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 and frying medium temperature recovery time (10.9).

1.4 This test method is not intended to answer all performance criteria in the evaluation and selection of a fryer, such as the significance of a high energy input design on maintenance of temperature within the cooking zone of the fryer.

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

1.6 *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:

F 1361 Test Method for Performance of Open Deep Fat Fryers²

2.2 ANSI Document:³

ANSI Standard Z83.13, American National Standard for

Gas Food Service Equipment

2.3 AOAC Document:⁴

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

2.4 ASHRAE Document:⁵

ASHRAE Guideline 2—1986 (RA90), Engineering Analysis of Experimental Data

3. Terminology

3.1 Definitions:

3.1.1 *large vat fryer, n*—(hereafter referred to as fryer) an appliance designed for cooking large quantities of fish or chicken, in which oils are placed in the cooking vessel to such a depth that the cooking food is essentially supported by displacement of the cooking fluid rather than by the bottom of the vessel. Often referred to as chicken or fish fryers.

3.1.2 *test method, n*—a definitive procedure for the identification, measurement, and evaluation of one or more qualities, characteristics, or properties of a material, product, system, or service that produces a test result.

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 consumed by 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.

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 ASTM Annual Book of Standards, Vol. 15.08

³ Available from the American National Standards Institute, 1819 L Street, NW, Suite 600, Washington, DC 20036.

⁴ Available from the Association of Official Analytical Chemists, 1111 N. 19th Street, Arlington, VA 22209.

⁵ Available from the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329.