



Standard Test Method for Performance of Self-Contained Soft Serve and Shake Freezers¹

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1. Scope

1.1 This test method evaluates the energy consumption and performance of soft serve ice cream and shake freezers. The food service operator can use this test to evaluate and select an appropriate soft serve or shake freezer and understand its energy consumption and production capabilities.

1.2 This test method applies to the following types of soft serve and shake freezers: (any of which may or may not have a reservoir for liquid mix). Included in these test methods are conventional and heat-treatment freezers. The unit may include separate refrigeration systems for the frozen product and fresh mix and may be either air-cooled or water-cooled.

1.3 The soft serve/shake freezers will be tested for the following (where applicable):

- 1.3.1 Maximum power input, or maximum current draw,
- 1.3.2 Initial freeze-down energy consumption and duration,
- 1.3.3 Heavy-use energy consumption,
- 1.3.4 Production capacity,
- 1.3.5 Overrun,
- 1.3.6 Impact performance,
- 1.3.7 Idle energy rate, and
- 1.3.8 Heat treat cycle energy consumption (if applicable).

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 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.*

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. Referenced Documents

2.1 *ASTM Standards*:²

F1604 Specification for Freezers, Ice Cream, Soft Serve, Shake

2.2 *Code of Federal Regulations*:³

21 CFR 135.110 Ice cream and frozen custard

2.3 *NSF/ANSI Standard*:⁴

NSF/ANSI 6 Dispensing freezers

2.4 *ASHRAE Guideline*:⁵

ASHRAE Guideline 2 - 2005 (RA90) Engineering Analysis of Experimental Data

3. Terminology

3.1 *Definitions*:

3.1.1 *air cooled, n*—a freezer which uses air passing over a main condenser in the freezer cylinder refrigeration system.

3.1.2 *combination, n*—a freezer employing two main compressors and two main condensers with one or two condenser fan motors and two separate freezer doors (that is, one for soft serve and another for shake), designed to dispense shake and soft serve product in the same footprint.

3.1.3 *freeze-down energy, n*—amount of energy consumed (kWh) by the soft serve or shake freezer while cooling the product to a servable temperature.

3.1.4 *freeze-down time, n*—time required for the soft serve or shake freezer while cooling the product to a servable temperature.

3.1.5 *heat treat-cool phase, n*—portion of the heat treat cycle which involves cooling the product from $\geq 150^{\circ}\text{F}$ ($\geq 65^{\circ}\text{C}$) to $\leq 41^{\circ}\text{F}$ ($\leq 5^{\circ}\text{C}$) within a period of 120 min or less.

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 U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁵ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329, <http://www.ashrae.org>.