Designation: F 1696 – 96 (Reapproved 2003)

An American National Standard

Standard Test Method for Energy Performance of Single-Rack Hot Water Sanitizing, Door-Type Commercial Dishwashing Machines[1]

This standard is issued under the fixed designation F 1696; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the evaluation of the energy consumption of single-rack, hot water sanitizing, door-type commercial dishwashers (hereafter referred to as dishwashers). This includes under the counter single rack, hot water sanitizing, door type commercial dishwashing machines. This test method excludes single temperature door-type machines. Dishwasher tank heaters are evaluated separately from the booster heater. Dishwashers may have a remote or self-contained booster heater. This test method does not address cleaning or sanitizing performance.

1.2 The following procedures are included in this test method:

1.2.1 *Procedures to Confirm Dishwasher is Operating Properly Prior to Performance Testing*:

1.2.1.1 Maximum energy input rate of the tank heaters (see 10.2).

1.2.1.2 Maximum energy input rate of the booster heater, if applicable (see 10.3).

1.2.1.3 Water consumption calibration (see 10.4).

1.2.1.4 Booster temperature calibration, if applicable (see 10.5).

1.2.1.5 Wash tank temperature calibration (see 10.6).

1.2.2 *Energy Usage and Cycle Rate Performance Tests*:

1.2.2.1 Washing energy test (10.7).

1.2.2.2 Tank heater idle energy rate (door(s) open and door(s) closed) (see 10.8).

1.2.2.3 Booster idle energy rate, if provided (see 10.9).

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 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 857 Specification for Hot Water Sanitizing Commercial Dishwashing Machines, Stationary Rack Type[2]

2.2 *NSF Standards:*[3]

NSF, Listings Food Equipment and Related Products, Components and Materials

Standard Number 3 Commercial Spray-Type Dishwashing Machines

2.3 *ASHRAE Document:*[4]

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

3. Terminology

3.1 *Definitions:*

3.1.1 *booster heater*, *n*—water heater for taking supply hot water (typically 140°F) up to 180°F for sanitizing rinse; the booster heater may be separate from dishwasher or integral.

3.1.2 *dishload*, *n*—a peg type, polypropylene dishrack of a specified weight, loaded with ten 9-in. plates of a specified weight, used to put a thermal load on the dishwasher during the washing energy test.

3.1.3 *dishwasher*, *n—for this test method*, a heat-sanitizing commercial, single rack, door-type dishwasher.

3.1.4 *uncertainty*, *n*—measure of systematic and precision errors in specified instrumentation or measure of repeatability of a reported test result.

4. Summary of Test Method

4.1 The maximum energy input rate of the tank heater and the booster heater is determined to check whether the dishwasher is operating at the manufacturer's rated input. If the measured input rate is not within 5 % of the rated input, all further testing ceases and the manufacturer is contacted. The manufacturer may make appropriate changes or adjustments to the dishwasher.

[1] This test method is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.01 on Cleaning and Sanitation Equipment.

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[2] *Annual Book of ASTM Standards*, Vol 15.08.

[3] Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140.

[4] Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329.

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