



Designation: F 1920 – 98

An American National Standard

Standard Test Method for Energy Performance of Rack Conveyor, Hot Water Sanitizing, Commercial Dishwashing Machines¹

This standard is issued under the fixed designation F 1920; 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 evaluates the energy consumption of rack conveyor, hot water sanitizing, commercial dishwashing machines, hereafter referred to as dishwashers. It excludes rack conveyor, chemical sanitizing, commercial dishwashing machines, and dishwashers with multiple tanks and prewashing sections. This test method also excludes single temperature rack conveyor dishwashing machines. Dishwasher tank heaters are evaluated separately from the booster heaters. Dishwashers may have remote or self-contained booster heater. This procedure 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 (10.2).

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

1.2.1.3 Final sanitizing rinse water consumption calibration (10.4).

1.2.1.4 Booster temperature calibration, if applicable (10.5).

1.2.1.5 Wash tank temperature calibration (10.6).

1.2.1.6 Wash tank pump and conveyor motor calibration (10.7).

1.2.2 *Energy Usage and Cycle Rate Performance Tests:*

1.2.2.1 Washing energy performance test (10.8).

1.2.2.2 Tank heater idle energy rate (10.9).

1.2.2.3 Booster idle energy rate, if provided (10.10).

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:*

D 3588 Method of Calculating Calorific Value and Specific Gravity (Relative Density) of Gaseous Fuels²

F 858 Specification for Heat Sanitizing Commercial Dishwashing Machines, Single Conveyor Rack Type³

F 861 Specification for Commercial Dishwashing Racks³

2.2 *NSF Standards:*

ANSI/NSF 3–1996 Commercial Spray-Type Dishwashing and Glasswashing Machines⁴

NSF, Listings-Food Equipment and Related Products, Components and Materials⁴

2.3 *ASHRAE Standard:*

ASHRAE Guideline 2–1986 (RA90) Engineering Analysis of Experimental Data⁵

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

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 *cycle rate, n*—maximum production rate of a dishwasher when washing dishloads in accordance with the Cycle Rate Performance test.

3.1.3 *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.

3.1.4 *dishwasher, n*—for this test method, dishwasher is defined as a rack conveyor, hot-water sanitizing, commercial dishwashing machine.

3.1.5 *empty dish rack, n*—a dish rack without any dishware placed in the dish rack. Two empty dish racks are run through the dishwasher prior to washing the first dishload to condition the dishwasher for testing as specified in the Washing Energy Test (see 10.8).

² *Annual Book of ASTM Standards*, Vol 05.05.

³ *Annual Book of ASTM Standards*, 15.07.

⁴ NSF International, P.O. Box 130140, Ann Arbor, MI 48113–0140.

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

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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