



Standard Specification for Heat-Sanitizing Commercial Dishwashing Machines, Multiple Tank, Conveyor Rack Type¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This specification covers multiple tank automatic rack-type commercial dishwashing machines, including continuous type, oval shaped, with horizontal table conveyor systems.

1.2 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.

1.3 The following safety hazards caveat pertains only to the test methods portion, Section 12, of this specification: *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

A240/A240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

B127 Specification for Nickel-Copper Alloy Plate, Sheet, and Strip

F760 Specification for Food Service Equipment Manuals

F861 Specification for Commercial Dishwashing Racks

¹ This specification 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 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.

F1920 Test Method for Performance of Rack Conveyor Commercial Dishwashing Machines

2.2 Federal Regulation:

OSHA Title 29³

2.3 NSF International Standards:⁴

NSF/ANSI 3 Commercial Warewashing Equipment

NSF/ANSI 5 Commercial Hot Water Generating Equipment

NSF/ANSI 14 Plastic Piping System Components and Related Materials

NSF/ANSI 29 Detergent/Chemical Feeders for Commercial Spray-Type Dishwashing Machines

NSF/ANSI 51 Food Equipment Materials

2.4 Underwriters Laboratories Standard:⁵

UL 921 Commercial Electric Dishwashers

2.5 ASSE International Standards:⁶

ASSE 1004 Dishwashers

2.6 Military Standard:⁷

MIL-STD-129 Marking for Shipment and Storage

3. Terminology

3.1 Definitions:

3.1.1 *commercial dishwashing machines*—machines that uniformly wash, rinse, and heat sanitize eating and drinking utensils.

3.1.1.1 *Discussion*—The machines shall be capable of removing physical soil from properly racked and pre-scraped items and sanitizing multiple-use eating and drinking utensils. These machines shall automatically convey racks of soiled dishes through the treatment stages of the machine, conveying them out at the clean end of the machine. The dishwashing machines shall consist of the following principal parts: legs, wash chamber, rinse chamber, tanks, doors, spray assemblies, pumps, motors, controls, piping, valves, conveying

³ *Code of Federal Regulations*, Chapter XVII, Part 1910 available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

⁴ Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140.

⁵ Available from UL LLC, 333 Pfingsten Rd., Northbrook, IL 60062.

⁶ Available from ASSE International, 18927 Hickory Creek Drive, Suite 220, Mokena, IL 60448.

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

mechanisms, heating equipment, and accessories. For continuous oval conveyor type, when assembled, the conveyor table shall form an oval-shaped dishrack handling system. The dishwashing machines shall include horizontal conveyor tables.

4. Classification

4.1 *General*—Dishwashing machines shall be of the following categories, types, styles, classes, sizes, capacity groups, and arrangements as specified in 4.2 – 4.8.

4.2 *Category*:

4.2.1 *Category A*—Base machine. This model is not provided with a continuous oval conveyor.

4.2.2 *Category B*—Continuous oval conveyor. This model is provided with a continuous horizontal oval conveyor for loading and unloading racks.

4.3 *Types*:

4.3.1 *Type I*—This machine shall be designed and supplied to accept the feeding of soiled tableware from the right side, when facing the front of the machine.

4.3.2 *Type II*—This machine shall be designed and supplied to accept the feeding of soiled tableware from the left side, when facing the front of the machine.

4.4 *Styles and Classes*:

4.4.1 *Style 1* Steam Heated—Low-pressure steam (20 to 35 psi) (137.9 to 241.3 kPa) flowing pressure at point of machine connection.

4.4.1.1 *Class A*—Injectors.

4.4.1.2 *Class B*—Heat exchange coils.

4.4.2 *Style 2* Electrically heated.

4.4.3 *Style 3* Gas-heated.

4.4.3.1 *Class C*—Natural Gas.

4.4.3.2 *Class D*—LP Gas.

4.5 *Style 4* Pre-Wash Unit—The dishwashing machine shall have a pump recirculated prewash unit. The automatic prewash unit shall be fitted to, or be a part of the dishwashing machine.

4.6 *Size and Capacity*,

4.6.1 *Group A*—19¾ by 19¾-in. (501.6 by 501.6 mm) (nominal) racks at 100 per hour minimum.

4.6.2 *Group B*—19¾ by 19¾-in. (501.6 by 501.6 mm) (nominal) racks at 234 per hour minimum.

4.6.3 *Group C*—19¾ by 19¾-in. (501.6 by 501.6 mm) (nominal) racks at 330 per hour minimum.

4.7 *Arrangement – for continuous oval conveyor Category B models*:

4.7.1 *Arrangement A*—With tray rail and table-mounted garbage disposal machine or pulper.

4.7.2 *Arrangement B*—With food waste trough instead of tray rail; garbage disposal machine or pulper in center of trough.

4.7.3 *Arrangement C*—Same as Arrangement A, except disposal or pulper unit not furnished; food discharged to garbage can at disposal location.

4.7.4 *Arrangement D*—Same as Arrangement B, except disposal or pulper unit not furnished; food discharged to garbage can at disposal location.

4.8 All dishwashing machines of the same classification, model, or material list designation furnished with similar options under a specific purchase order shall be identical to the extent necessary to ensure interchangeability of component parts, assemblies, accessories, and spare parts.

5. Ordering Information

5.1 Purchasers should select the preferred options permitted in this specification and include the following information in the procurement document:

5.1.1 Title, number, and date of this specification,

5.1.2 Category, type, style, class, group, and arrangement machine required (see 4.1),

5.1.3 Noise level requirements, if other than specified (see 11.2),

5.1.4 When a service-supply valve is required (see 7.5),

5.1.5 When a standard 40°F (22°C) temperature rise steam, electric, or gas booster is required, or stipulate if the required temperature rise is more than 40°F (22°C) (see 7.14),

5.1.6 Electrical power supply characteristic (current, voltage, phase, frequency) (see Section 8),

5.1.7 When a detergent feeder is required (see 7.15),

5.1.8 When a rinse agent feeder is required (see 7.16),

5.1.9 Accessory equipment, such as end cowls with vent opening, or spare and maintenance parts required, as suggested by the manufacturer,

5.1.10 Treatment and painting if other than specified (see Section 10),

5.1.11 When energy consumption profiles, water consumption profiles, or productivity profiles are desired (see 12.3), and

5.1.12 Manufacturer's certification, when required (see Section 13).

5.1.13 Whether a flatware soak sink is required (see 7.18).

6. Materials and Design

6.1 All materials shall be specified as follows:

6.1.1 Materials used shall be free from defects that would adversely affect the performance or maintainability of individual components of the overall assembly. The dishwashing machines shall meet the material design and construction requirements of NSF/ANSI 3, where applicable.

6.1.2 *Corrosion-Resistant Steel*—Corrosion resistant steel shall conform to the requirements of any 200, 300, or 400 series stainless steel specified in 2.1.

6.1.3 *Corrosion-Resisting Material*—Corrosion-resisting material is other than corrosion-resistant steel that is equivalent in the dishwasher application.

6.1.4 *Nickel-Copper Alloy*—Nickel-copper alloys shall conform to the requirements of Specification B127.

6.1.5 *Plastics*—All plastic materials and components used in the dishwashing machine rinse system shall conform to NSF/ANSI 14 or NSF/ANSI 51.

7. Construction Requirements

7.1 The dishwashing machine shall be complete so that when connected to the specified source of power, water supply, heating means (steam, electric, or gas), and drainage, detergent and rinse agent feeder as applicable, the unit can be used for its