Designation: F 857 – 02

Standard Specification for Hot Water Sanitizing Commercial Dishwashing Machines, Stationary Rack Type[1]

This standard is issued under the fixed designation F 857; 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.

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

1. Scope

1.1 This specification covers manually fed, spray-type, stationary rack, automatically controlled, commercial dishwashing machines.

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

2. Referenced Documents

2.1 *ASTM Standards:*

A 29 Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for[2]

A 120 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated (Galvanized) Welded and Seamless, for Ordinary Uses[3]

A 167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip[4]

A 276 Specification for Stainless and Heat-Resisting Steel Bars and Shapes[2]

A 436 Specification for Austenitic Gray Iron Castings[5]

A 554 Specification for Welded Stainless Steel Mechanical Tubing[6]

A 582/A 582M Specification for Free-Machining Stainless Steel Bars, Hot-Rolled or Cold-Finished[4]

B 43 Specification for Seamless Red Brass Pipe, Standard Sizes[7]

B 75 Specification for Seamless Copper Tube[7]

B 127 Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip[8]

F 760 Specification for Food Service Equipment Manuals[9]

F 861 Specification for Commercial Dishwashing Racks[9]

2.2 *Federal Regulations:*

OSHA Title 29[10]

2.3 *American National Standards:*[11]

ANSI S1.4 Specification for Sound Level Meters

ANSI S1.13 Methods for the Measurement of Sound Pressure Levels

2.4 *National Electrical Manufacturers Association Standards:*[12]

NEMA ICS Industrial Controls and Systems

NEMA MG-1 Motors and Generators

2.5 *National Fire Protection Association Standards:*[13]

NFPA No. 70 National Electrical Code

2.6 *NSF International Standards, Criteria, and Listings:*[14]

NSF/ANSI 3 Spray Type Dishwashing Machines

NSF 5 Commercial Hot Water Generating Equipment

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

NSF/ANSI 51 Plastic Materials and Components Used in Food Equipment

NSF Criteria C-2 Special Equipment and/or Devices

NSF Food Equipment and Related Products, Components, and Materials

2.7 *Underwriters Laboratories Standard:*[15]

UL 921 Commercial Electric Dishwashers

2.8 *American Society of Sanitary Engineering Standards:*[16]

[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] *Annual Book of ASTM Standards*, Vol 01.05.

[3] Discontinued, see 1986 *Annual Book of ASTM Standards*, Vol 01.01.

[4] *Annual Book of ASTM Standards*, Vol 01.03.

[5] *Annual Book of ASTM Standards*, Vol 01.02.

[6] *Annual Book of ASTM Standards*, Vol 01.01.

[7] *Annual Book of ASTM Standards*, Vol 02.01.

[8] *Annual Book of ASTM Standards*, Vol 02.04.

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

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

[11] Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

[12] Available from National Electrical Manufacturers Assn., 2101 "L" Street, N.W., Washington, DC 20037.

[13] Available from National Fire Protection Assn., Batterymarch Park, Quincy, MA 02269.

[14] Available from NSF International, 789 N. Dixboro Rd., Ann Arbor, MI 48105-9723.

[15] Available from Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062.

[16] Available from American Society of Sanitary Engineering, P. O. Box 9712 Bay Village, OH 44140.

ASSE 1001 Pipe Applied Atmospheric Vacuum Breakers
ASSE 1004 Dishwashers

3. Terminology

3.1 *Definition:*

3.1.1 *commercial dishwashing machines*—machines that uniformly wash, rinse, and sanitize eating and drinking utensils. The machines shall be capable of removing physical soil from properly racked and pre-scraped items and sanitizing multiple-use eating and drinking utensils. The dishwashing machines shall consist of the following principal parts: legs, wash chamber hood, tank, doors, spray assemblies, pumps, motors, controls, piping, valves, heating equipment, and accessories.

4. Classification

4.1 *General*—Dishwashing machines shall be of the following types, styles, classes, size, and capacity group as specified.

4.2 *Types*:

4.2.1 *Type I* (Straight-Through Model)—This machine is used in line with table on each side.

4.2.2 *Type II* (Corner Model)—This machine is used in corner placement forming a 90° side.

4.3 *Styles and Classes*:

4.3.1 *Style 1* (Steam Heated)—Low pressure steam 10 to 15 psi (68.9 to 103.4 kPa) flowing pressure at point of machine connection.

4.3.1.1 *Class A*—Injector.

4.3.1.2 *Class B*—Heat exchange coil.

4.3.2 *Style 2* (Electrically heated).

4.3.3 *Style 3* (Gas-heated):

4.3.3.1 *Class C*—Natural Gas.

4.3.3.2 *Class D*—LP Gas.

4.4 *Size and Capacity*, 19¾ by 19¾ in. (nominal) racks at minimum of 50 racks per hour. (See Specification F 861).

4.5 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 standard;

5.1.2 Type, style, class, and size 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 7.4);

5.1.5 When a standard 40°F (22°C) temperature rise steam, or electric, or gas booster is required, or stipulate if the required temperature rise is more than 40°F (22°C) (see 7.13);

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

5.1.7 When a detergent feeder is required (see 7.14);

5.1.8 When a rinse agent feeder is required (see 7.15);

5.1.9 Accessory equipment, spare and maintenance parts required, as suggested by 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).

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 and Criteria C-2, where applicable.

6.1.2 *Corrosion-Resistant Steel*—Corrosion-resistant steel shall conform to the requirements of any 300 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 B 127.

6.1.5 *Plastics*—All plastic materials and components used in the dishmachine rinse system shall conform to NSF/ANSI 3 or 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), drainage, detergent, and rinse agent feeder as applicable, the unit can be used for its intended function. Dishwashers shall be rigid, quiet in operation, free from objectionable vibration, and so constructed as to prevent objectionable splashing of water or overflow of water to the outside of the machine. Parts requiring adjustment shall be readily accessible. Parts requiring service shall be accessible. The machine shall wash dishes by means of a water and detergent solution pumped from a tank, and shall final rinse the dishes with fresh water from an outside source. Provisions shall be made to fill the wash tank either directly from the regular hot water supply with a hand valve or through the booster or solenoid, or both. The wash, dwell, and rinse cycles shall be automatically controlled. A light shall be provided to indicate when the machine is in operation. Machines shall be provided with tracks of corrosion-resisting steel not less than 0.070 in. thick, or other suitable corrosion-resisting material. Dishwashers shall have an inside working height, including the door opening (or clearance) of not less than 16 in.

7.2 *Piping, Tubing, Fittings, and Valves (Installation)*—Connections shall be readily accessible to facilitate installation and maintenance. Piping, tubing, and valves shall be located, whenever possible, on the exterior of the machine. See Specification A 29, A 120, A 167, A 276, A 554, B 43, and B 75.

7.3 *Piping and Fittings*—Water, steam piping, and fittings shall be of corrosion-resisting material. Fresh water supply to the tank shall be discharged not lower than 2 in. (50.8 mm) above the maximum flood level rim, or an effective air gap or