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An American National Standard

Standard Specification for Heat Sanitizing Commercial Pot, Pan, and Utensil Stationary ~~Rack Type Washing Machines, Stationary Rack, Water- Driven Rotary Spray Type~~¹

This standard is issued under the fixed designation F1114; 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 specification covers manually fed, spray-type stationary rack, automatically controlled, water-driven rotary spray commercial pot, pan, and utensil washing machines, herein referred to as “the washer.”

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 9, 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
- A276 Specification for Stainless Steel Bars and Shapes
- A436 Specification for Austenitic Gray Iron Castings
- A554 Specification for Welded Stainless Steel Mechanical Tubing
- A582/A582M Specification for Free-Machining Stainless Steel Bars
- B127 Specification for Nickel-Copper Alloy Plate, Sheet, and Strip
- D3951 Practice for Commercial Packaging
- F760 Specification for Food Service Equipment Manuals
- F1021 Specification for Feeders, Detergent, Rinse Agent, and Sanitizing Agent for Commercial Dishwashing and Glasswashing Machines
- F1696 Test Method for Energy Performance of Stationary-Rack, Door-Type Commercial Dishwashing Machines

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.

2.2 *Federal Regulation:*³

29 CFR Part 1910 OSHA Regulations on Safety

2.3 *NSF International Standards:*⁴

NSF/ANSI 3 Commercial Warewashing Equipment

NSF/ANSI 5 Commercial Hot Water Generating Equipment

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

NSF Listings—Food Equipment

2.4 *Underwriters Laboratories Standard:*⁵

UL 921 Commercial Dishwashers

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *commercial pot, pan, and utensil washing machines*—machines that uniformly wash, rinse, and heat-sanitize food preparation utensils. The machines are capable of removing physical soil from properly racked and pre-scraped items, and sanitizing multiple pots, pans, and utensils.

4. Classification

4.1 *General*—The washers shall be of the types, styles, sizes, and classes specified as follows:

4.2 *Types:*

4.2.1 *Type I*—One rack (up to a nominal capacity of 25 racks/h).

4.2.1.1 *Style A*—Two doors (pass-through).

4.2.1.2 *Style B*—One door (front-loading).

4.2.1.3 *Style C*—One or two doors (corner).

4.2.1.4 *Style D*—Three doors (pass-through with front clean-out door).

4.2.2 *Type II*—Two rack (up to a nominal capacity of 46 racks/h).

4.2.2.1 *Style A*—Two doors (pass-through).

4.2.2.2 *Style B*—Three doors (pass-through with clean-out).

4.3 *Classes:*

4.3.1 *Class 1*—Steam heated.

4.3.1.1 *Mode A*—Injector.

4.3.1.2 *Mode B*—Heat exchange coil.

4.3.2 *Class 2*—Electric heat.

4.3.3 *Class 3*—Gas heat.

4.3.3.1 Natural gas.

4.3.3.2 LP gas.

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

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

⁵ Available from Underwriters Laboratories (UL), 333 Pfingsten Rd., Northbrook, IL 60062.

5. Ordering Information

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

5.1.1 Title, designation, and date of this specification.

5.1.2 Type, style, class, and mode of machine required (see Section 4).

5.1.3 Noise level requirements, if other than specified (see 8.2).

5.1.4 Whether a service-supply valve is required (see 7.5).

5.1.5 When a standard 40°F (22°C) temperature rise steam or electric booster is required. If the required temperature rise is more than 40°F (22°C) (see 7.14), it should be specified.

5.1.6 Electrical power supply characteristics (current, voltage, phase, frequency).

5.1.7 Whether a detergent feeder is required (see 7.15).

5.1.8 Accessory equipment, spare, and maintenance parts required, and selected options.

5.1.9 Treatment and painting if other than specified (see 7.18).

5.1.10 When energy consumption profiles, water consumption profiles, or productivity profiles are desired (see 9.3).

5.1.11 Manufacturer's certification, when required (see Section 10).

6. Materials

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 machines shall meet the material requirements of NSF/ANSI 3 where applicable.

6.1.2 *Corrosion-Resistant Steel*—Corrosion-resisting steel shall conform to the requirements of any 300 series stainless steel specified in Specifications **A240/A240M**, **A276**, **A554**, and **A582/A582M**.

6.1.3 *Corrosion-Resistant Material*—Corrosion-resisting material is material other than corrosion-resistant steel that is equivalent to use in the washer application.

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

7. Design and Construction

7.1 The machines shall meet the design and construction requirements for NSF/ANSI 3 where applicable.

7.2 The washing machines shall be complete so that when connected to the specified source of power, water supply, heating means (steam or electric), drainage and detergent feeder, as applicable, the unit can be used for its intended function. Machines shall be rigid and quiet in operation (see 8.2). Parts requiring adjustment or service, or both, shall be readily accessible. The machine shall wash pots, pans, and utensils by means of a water and detergent solution pumped from a tank, and shall final rinse the pots, pans, and utensils 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-resistant steel not less than 0.070-in. (0.178-cm) thick or with other equivalent corrosion-resisting material. They shall have an inside working height, including the door height of not less than 27 in. (686 mm) above the track.

7.3 *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.

7.4 *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. (5.08 cm) above the maximum flood level rim, or an effective air gap or vacuum breaker shall be installed to prevent backflow in accordance with NSF/ANSI 3. The drain and other plumbing connections shall be standard pipe or tubing connections. Drainage piping shall be corrosion-resisting material, or suitable heat-resisting plastic material. Drains may be joined into a single trunk line requiring only one connection or arranged to permit individual connections to the waste line.

7.5 *Valves*—Steam valves shall be corrosion-resisting material designed for steam applications and for a saturated steam working pressure of 50 psi (344.6 kPa). When specified (see 5.1.4), a separately packed service supply valve shall be provided for closing the supply of water to the machine. A suitable closure or drain valve shall be furnished when not supplied with a pumped drain system. A permanent identification on the machine shall show “open” and “closed” positions on the manual drain. Fresh water rinse valves shall be reliable, fully automatic, and suitable for 210°F (98.9°C) water. The manually operated valves, when used, shall be identified.

7.6 *Spray Assemblies*—All spray nozzles and spray arm manifolds shall be of corrosion-resisting materials. All spray assemblies shall be removable without the use of tools and shall be easy to clean.

7.7 *Tank*—The tank shall be constructed of not less than 0.070-in. (1.78-mm) corrosion-resistant steel, or other corrosion-resisting material. Single rack (Type I) machines shall have a minimum capacity of 22 gal (83.2 L). Double-rack (Type II) machines shall have a minimum capacity of 52 gal (196.8 L).

7.8 *Overflow*—The washer shall have a readily accessible overflow drain in the tank. The overflow unit, or the overflow cover, when provided, shall be removable for cleaning.

7.9 *Scrap Trays (Strainers)*—Scrap trays of corrosion-resistant steel, not less than 0.044-in. (1.12-mm) thick, or other corrosion-resisting material shall be provided to prevent insoluble matter and large pieces of food residue from passing into the tank. The ledges on which the scrap trays rest shall be so designed that surfaces beneath the ledges are easily accessible for cleaning when the trays are removed. Any opening around the perimeter of the tank where the scrap trays are installed shall be held to a minimum and in no case shall the space be more than $\frac{3}{8}$ in. (9.53 mm).

7.10 *Access Door(s)*—Door and door frames shall be constructed of not less than 0.060-in. (1.52-mm) corrosion-resistant steel, or other corrosion-resisting material, and shall be rigid or stiffened as necessary. Loading and unloading door(s) shall be counterbalanced and, when in the open position, shall electrically interlock the machine so that it cannot operate. Opening the door during operation shall automatically stop the machine. Door catch(s) shall be provided on inspection door(s) not counterbalanced. Door(s) shall be splash-proof and their exposed edges shall be smooth and formed to prevent canting or warping.

7.11 *Legs (Feet)*—The washer shall be rigidly constructed and have four or more legs (feet) made of corrosion-resistant steel, or other corrosion-resisting material. Legs shall be adjustable so that the height of the track may be varied from 34 to 35 in. (864 to 889 mm) above the floor.

7.12 *Pump and Motor Assemblies:*

7.12.1 *Assemblies*—The pump motor shall be mounted on the tank or on a rigid steel base. Rotary seals shall be provided for pump shafts and shall be removable for servicing.

7.12.2 *Pump*—Pump casings shall be cast iron (see Specification A436) or corrosion-resisting material and shall have a removable cover or inspection plate, or be of such a design as to permit ease of accessibility for inspection and removal of foreign items from the impeller and interior. The shaft shall be of corrosion-resistant steel, properly aligned and supported. The impeller shall be corrosion-resisting material or cast iron and shall be in dynamic balance. The pump shall have at least two ball or roller bearings, except that when the pump and motor are mounted on the same shaft, at least two ball or roller bearings shall be provided for the motor and pump. The pump suction intake shall be provided with a corrosion-resistant strainer or shroud.

7.13 *Heating*—Class 1, 2, and 3 washers shall be capable of maintaining required temperature levels in the tank.

7.13.1 Class 1, Mode A and B washers shall be suitable for operation with a steam supply flow pressure of from 20 to 35 psi (137.8 to 241.3 kPa). Temperature regulators (thermostats) shall be provided for maintaining the proper water temperature in the tank. Low water protection shall be provided. Steam heat will be provided by tube type heat exchangers or steam injectors, or a combination of both. The minimum and maximum operating pressure shall be specified by the manufacturer.

7.13.2 Class 2 machines shall be equipped with electric heater elements and sheaths of 300 series corrosion-resistant steel or other corrosion-resisting material. They shall be provided with temperature regulators (thermostats) for maintaining the proper water temperature in the tank. Low water protection shall be provided.

7.13.3 Class 3 machines shall be equipped with a gas burner assembly including safety pilots (or equivalent), shut-off valves, and flue suitable for operation with type of gas specified. They shall be provided with temperature regulators for maintaining the proper water temperature in the tank. Low water protection shall be provided.

7.14 *Final Rinse Booster*—Final rinse booster will not be furnished as a part of the machine unless specified.

7.14.1 *Steam Booster*—When specified, the washer shall be provided with an adjustable automatic steam booster to raise the temperature of the final rinse water from 140°F (60°C) to at least 180°F (82°C). The steam booster shall automatically maintain the required final rinse water temperature without producing steam within either the steam booster or the water supply piping from the steam booster to the machine. The steam booster may be securely mounted as an integral part of the washer in a position that does not interfere with operation and permits attachment of tables or counters. Otherwise, the steam booster may be furnished separately mounted on its own legs and equipped with suitable fittings for connection into the final rinse water lines. Required valves and the temperature regulator shall be accessible and adjustable. Valve and pipe unions may be installed on the steam booster where required. The final rinse water temperature may be controlled by an automatic thermostat controlling the input of steam to the steam booster.

7.14.2 *Electric Booster*—When specified, the washer shall be provided with an electric booster having all necessary controls for automatic operation to raise and maintain the temperature of the final rinse water from 140°F (60°C) to at least 180°F (82°C). The booster shall be designed to operate with the electric power characteristics specified. The electric booster may be securely mounted as an integral part of the machine in a position that does not interfere with operation and permits attachment of tables or counters. Otherwise, the electric booster may be furnished separately, mounted on its own legs, and equipped with suitable fittings for connection into the final rinse water lines. Required valves and the temperature regulator shall be accessible and adjustable.

7.15 *Detergent Feeder*—When specified, an electric or electronic automatic detergent feeder conforming to NSF/ANSI 29 and Specification F1021 shall be separately packed with the washer. The reservoir of the feeder shall be capable of holding a supply of nonfoaming detergent adequate in normal pot washing operation for one meal period.

7.16 *Controls*—All control equipment shall be capable of operation in an ambient temperature of 115°F (46°C); conform to UL 921.

7.17 *Lubrication Requirement*—Means for effective and adequate lubrication shall be provided when required. Lubricating points shall be readily accessible and the washer shall be lubricated with the proper amount of lubricant prior to delivery.

7.18 *Treatment and Painting Requirements:*

7.18.1 Unless otherwise specified, the washer shall be treated and painted in accordance with the manufacturer's standard practice. All surfaces of the machine, other than corrosion-resisting materials, shall be protected against corrosion in the use environment and shall present a neat appearance.

8. Performance Requirements

8.1 *Performance Standards Compliance*—The washer shall conform to the requirements of OSHA, UL 921, and NSF/ANSI 3. Detergent feeders, when specified, shall comply with NSF/ANSI 29 and Specification F1021. Electric and gas booster heaters, when specified, shall conform to NSF/ANSI 5.