



Standard Specification for Heat Sanitizing Commercial Pot, Pan, and Utensil Stationary Rack Type Water-Driven Rotary Spray¹

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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 and health practices and determine the applicability of regulatory limitations prior to use.*

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 (UNS N04400) Plate, Sheet, and Strip
- D3951 Practice for Commercial Packaging
- F760 Specification for Food Service Equipment Manuals

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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.

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

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).

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.

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.

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).

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.

8.2 *Noise Level*—The noise level of the washer only, when operating, exclusive of loading, unloading, and servicing, shall not exceed 80 dBA at loading and unloading stations, measured at 5 ft (1.52 m) above the floor and 2 ft (0.61 m) away from the machine.

9. Test Methods

9.1 *Operational*—The washer shall be thoroughly tested in accordance with manufacturer's instructions to determine compliance with requirements of NSF/ANSI 3 and UL 921.

9.2 *Leakage*—No leakage shall occur when tested at pressures up to 125 % of the manufacturer's recommended supply line pressure.

9.3 *Energy and Productivity*—See Test Method **F1696**.

10. Certification

10.1 Certification of compliance with the standards cited in this specification shall be provided to the purchaser if required in the purchase document.

10.2 *Listing*—Acceptable evidence of meeting the requirements of UL 921 shall be UL listing or UL label or a certification by an independent nationally recognized testing laboratory, acceptable to the user, to the UL standard.

10.3 *NSF Listing*—Acceptable evidence of meeting the requirements of NSF/ANSI 3 shall be the NSF Certification Mark on the finished machine and listing in the *NSF Certified Food Equipment* data base, or certification by an independent nationally recognized testing laboratory, acceptable to the user, to the NSF/ANSI standards. Certification specified under **8.1** will be accepted as evidence of compliance.

11. Product Marking

11.1 *Machine Identification*—Identification shall be permanently and legibly marked directly on the machine or on a corrosion-resistant material securely attached to the machine at the source of manufacture. Identification shall include the manufacturer's model, serial number, name, and trademark to be readily identifiable. In addition, information required by NSF/ANSI 3 and UL 921 shall be included on the machine on the data plate.

11.2 *Instruction Plate*—An instruction plate of corrosion-resisting material shall be attached to each machine at a height readily visible to the operator.

12. Machine Manuals

12.1 Manuals shall be in accordance with Specification **F760**.

13. Packaging and Packing Material

13.1 The machine should be packaged and packed in accordance with Practice **D3951**.

14. Quality Assurance

14.1 Unless otherwise specified in the contract or purchase order, the manufacturer is responsible for the performance of all requirements as specified in this specification.

15. Keywords

15.1 pot washer; prep washer; rack type water-driven rotary spray; utensil washer

SUPPLEMENTARY REQUIREMENTS

(Pot, Pan, and Utensil Washing Machines for Use on Naval Shipboard)

Where provisions of these supplementary requirements conflict with Specification F1114, these supplementary requirements shall prevail.

S1. First Article

S1.1 When specified the contractor shall furnish a complete pot, pan, and utensil washer, herein referred to as "washing machine," for First Article inspection and approval.

S1.2 When a First Article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor's current inventory. The First Article should consist of one washing

machine. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the First Article.

S1.3 If the manufacturer has successfully furnished the same article on a previous contract within the past three years, upon manufacturer's certification further inspection will not be required.

S2. Alternate Certification

S2.1 In lieu of the certification specified in 10.2, acceptable evidence of meeting the requirements of the standards will be a certified test report from a nationally recognized independent testing laboratory approved by the contracting officer or for NSF certification acceptable to the medical department of the service for which the washing machines are being acquired attesting that a washing machine identical in all respects to the units to be supplied under this specification has been examined and tested, and meets all requirements of the applicable standards. When authorized in writing by the contracting officer, such examination and tests for alternate certification may be conducted by the manufacturer at the manufacturer's plant when the cognizant inspection authority has determined that adequate facilities and instrumentation are available for conducting the required tests.

S3. Preparation for Delivery

S3.1 *Preservation, Packaging, and Packing*—As specified.

S3.1.1 *Preservation and Packing*—When specified, preservation and packing shall be in accordance with the requirements of washing machines with the level of preservation and packing as specified.

S3.2 *Marking*—In addition to any special marking required by the contract or order, packages and shipping containers shall be marked in accordance with MIL-STD-129.

S4. Ordering Data

S4.1 Purchasers should exercise any desired options offered herein and acquisition documents should specify the following:

S4.1.1 When a first article is required for inspection and approval.

S4.1.2 When safety and health requirements are different, specify and fully describe.

S4.1.3 Noise level requirements, if other than specified.

S4.1.4 Whether fungus resistance treatment is required.

S4.1.5 Whether electromagnetic interference suppression is required.

S5. Shipboard Operation

S5.1 The Navy has specific design criteria for shipboard operation to compensate for pitch and roll, conserve potable water for extended periods, provide on board spare parts, and use direct current electric supply on board some ships. The provisions for shipboard operation are indicated as follows:

S5.1.1 The washer shall be capable of satisfactory performance when inclined 15° from the horizontal in any direction. When electric heat is specified, a positive low water cutoff shall be provided. The cutoff shall be designed to prevent interruption of electric power to the washer during pitch and roll.

S5.1.1.1 *Inclined Operational Test*—Bolt the washer to a test platform with its base level. The washer shall then be operated with product for a 60 s cycle (30 s to reach each 15° incline) as the test platform is slowly inclined (rolled) 15° to each side of the vertical in each of two vertical planes at right angles to each other. This test shall be run for 15 cycles in each of the two vertical planes. Any nonconformance with specified requirements shall constitute failure of the test.

S5.1.2 Motors shall be totally enclosed.

S5.1.3 Controls shall be furnished packed separately for bulkhead mounting.

S5.1.4 The contractor shall submit a design for approval prior to furnishing the equipment unless approval has been granted within the last three years.

S5.1.5 A steam booster to furnish 80°F (27°C) temperature rise is required. Valves and regulators shall be accessible and regulated from the front of the washing machine.

S5.1.6 An electrically heated water temperature booster to furnish 80°F (27°C) temperature rise with controls is required. For Naval shipboard use, unless otherwise specified, electric power characteristics are 440 V, 3 wire balanced, 3 phase.

S5.1.7 A detergent dispenser is to be machine mounted or packed separate for bulkhead mounting.

S5.1.8 A complement of six pot racks total is required to include two bake sheet, two general utility, and two basket racks.

S5.1.9 Feet and legs shall be constructed of stainless steel. Feet shall be capable of being adequately and securely bolted to the deck. Feet, legs, and frame shall be adequately constructed to withstand a horizontal force equivalent to 20 times the acceleration due to gravity (20 g) without permanent distortion.

S5.1.10 Due to a limited supply of potable water on board ship, the final rinse consumption shall not exceed 200 gal/h (757 L/h).

S5.1.11 Control center may be furnished separate from the washer for mounting on the bulkhead.

S5.1.12 Manufacturer's publication shall include an approved drawing containing a complete layout of the washer, dimensions, weight, capacity, material listing, method of deck mounting, and a list of recommended spare and maintenance parts.

S5.1.13 Washing machines for shipboard use shall be designed and constructed so that all preventive and corrective maintenance actions, including required lubrication, can be performed from the front of the machine and shall not require demounting the machine. The maximum dimension including mounted control panel should be 58 in. (147 cm) long, 38 in. (96.5 cm) deep, and 84 in. (213 cm) high.

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