Designation: F 1202 – 97

Standard Specification for Washing Machines, Heat Sanitizing, Commercial, Pot, Pan, and Utensil Vertically Oscillating Arm Type[1]

This standard is issued under the fixed designation F 1202; 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, motor-driven vertically oscillating arm type, automatically controlled, commercial pot, pan, and utensil washing machines, hereinafter referred to as "the washer."

1.2 The following precautionary statement 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]

2. Referenced Documents

2.1 *ASTM Standards:*

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 Steel Bars and Shapes[4]

A 436 Specification for Austenitic Gray Iron Castings[5]

A 554 Specification for Welded Stainless Steel Mechanical Tubing[3]

B 43 Specification for Seamless Red Brass Pipe, Standard Sizes[6]

B 75 Specification for Seamless Copper Tube[6]

B 127 Specification for Nickel-Copper Alloy (UNS NO4400) Plate, Sheet, and Strip[7]

D 3951 Practice for Commercial Packaging[8]

F 760 Specification for Food Service Equipment Manuals[9]

F 1021 Specification for Feeders, Detergent, Rinse Agent, and Sanitizing Agent for Commercial Dishwashing and Glasswashing Machines[9]

2.2 *Federal Regulation:*[10]

OSHA Title 29

2.3 *American National Standards:*[11]

ANSI SI.4 Specification for Sound Level Meters

ANSI SI.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-I Motors and Generators

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

NFPA No. 70 National Electrical Code

2.6 *National Sanitation Foundation Standards:*[14]

NSF No. 5 Commercial Hot Water Generating Equipment

NSF No. 14 Plastic Piping System Components and Related Materials

NSF No. 26 Spray Type Pot, Pan and Utensil Washing Machines

NSF No. 29 Detergent/Chemical Feeders for Commercial Spray-Type Dishwashing Machines

NSF No. 51 Plastic Materials and Components Used in Food Equipment

NSF Criteria C-2 Special Equipment and/or Devices

NSF Food Service Equipment Listing

2.7 *Underwriters Laboratories Standard:*[15]

UL 921 Commercial Electric Dishwashers

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

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[1] This specification is under the jurisdiction of Committee F-26 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] *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 02.01.

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

[8] *Annual Book of ASTM Standards*, Vol 15.09.

[9] *Annual Book of ASTM Standards*, Vol 15.07.

[10] Available from the Superintendent of Documents, Government Printing Office, Washington, DC 20401.

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

[12] Available from National Electrical Manufacturers Association, 2101 L St. N.W., Washington, DC 20037.

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

[14] Available from NSF International, P.O. Box 130140, Ann Arbor, MI 48113-0410.

[15] Available from Underwriters Laboratories, Inc., 333 Pfingsten Rd., 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

3. Terminology

3.1 *Definition:*

3.1.1 *commercial pot, pan and utensil washing machines*—machines that uniformly wash, rinse, and heat sanitize food preparation utensils. The machines shall be capable of removing physical soil and sanitizing multiple pots, pans, and utensils from properly racked and pre-scraped items. The machines may 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*—The washer shall be of the following types, styles, sizes, and classes as specified.

4.2 *Types*:

4.2.1 Type I—One rack capacity.

4.2.1.1 *Style A*—One door (front-loading).

4.2.1.2 *Style B*—Three doors (pass-through with front load door).

4.3 *Tank Heat*:

4.3.1 *Class A*—Injection.

4.3.2 *Class B*—Heat Exchange Coil.

4.3.3 *Style 2*—Electric Heat.

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 type, style, and class of machine required.

5.1.2 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 7.13), it should be specified.

5.1.3 Electrical power supply characteristics (voltage, phase, frequency) (see Section 7.11.3).

5.1.4 A detergent feeder, if required (see 7.14).

5.1.5 Accessory equipment, spare and maintenance parts required, as specified in order.

5.1.6 Treatment and painting, if other than specified (see 7.17).

5.1.7 When energy consumption profiles, water consumption profiles, or productivity profiles are desired.

5.1.8 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 pot, pan, and utensil washing machines shall meet the material, design, and construction requirements of NSF No. 26 or Criteria C-2.

6.1.2 *Corrosion-Resistant Steel*—Corrosion-resistant steel shall conform to the requirements of any 300 series stainless steel specified in 2.1 (see Specification A 167).

6.1.3 *Corrosion-Resisting Material*—Corrosion-resisting material is other than corrosion-resistant steel that is equivalent in the pot, pan, and utensil washer 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 pot, pan, and utensil machine rinse system shall conform to NSF No. 14 and NSF No. 51.

7. Design and Construction

7.1 The washer shall be complete so that when connected to the specified source of power, water supply, heating means (steam or electric), drainage, detergent and rinse agent feeder as applicable, the unit can be used for its intended function. Machines shall be rigid and quiet in operation. 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 at 15 to 25-psi incoming pressure. 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 solenoids, 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 or other corrosion-resisting material not less than 0.109. They shall have an inside working height including the door height of not less than 30 in. (76.2 cm).

7.2 *Piping, Tubing, Fittings, and Valves (Installation)*—Connections shall be readily accessible to facilitate installation and maintenance (see Specifications B 43, B 75, A 554, and A 120).

7.3 *Piping and Fittings*—Water, steam piping, and fittings shall be of corrosion-resisting material, or suitable heat-resisting plastic material.

7.3.1 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 vacuum breaker shall be installed to prevent backflow. Backflow protection shall be in accordance with ASSE 1001. The drain and other plumbing connections shall be standard pipe or tubing connections. Drains may be joined into a single trunk line requiring only one connection or arranged to permit individual connections to the waste line.

7.4 *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). The drain valve shall be permanently marked to show "open" and "closed" positions and shall be lever-operated or wheel-operated, ruggedly designed for foot or hand operation except when drain valve closure is automatic. Fresh water rinse valves shall be reliable and fully automatic and suitable for 210°F (98.9°C) water. The manually operated valves, when used, shall be identified. When specified, a water pressure reducing valve shall be provided for reducing water pressure to 15 to 25 psi (see ANSI SI.4 and SI.13).

7.5 *Spray Assemblies*—All spray nozzles and spray arm manifolds shall be of corrosion-resisting materials. The main spray arm assembly shall include separate wash and rinse pipes. The assembly shall be directly connected by means of a rod-cam device. The assembly shall oscillate thereby moving the spray arms vertically between racked ware. A secondary

spray assembly consisting of water-driven rotary sprays shall be installed under the work rack.

7.6 *Tank and Housing*—The tank and housing shall be constructed of not less than 0.109-in. corrosion-resistant steel. Fiberglass or foam insulation of not less than 1 in. shall be installed around the tank and housing and enclosed in corrosion-resistant steel of not less than 0.038 in.

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

7.8 *Scrap Trays (Strainers)*—Scrap trays of corrosion-resistant steel, not less than 0.044 in. 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 should be more than ⅜ in. (0.953 cm).

7.9 *Access Door(s)*—Door and door frames shall be constructed of not less than 0.060-in. corrosion-resistant steel, or other corrosion-resisting material, and shall be rigid and stiffened as necessary. Loading and unloading door(s) shall be counter-balanced 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(s) shall be splash-proof and their exposed edges shall be smooth and formed to prevent canting or warping.

7.10 *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. (863.6 to 899 mm) above the floor.

7.11 *Pump and Motor Assemblies*:

7.11.1 *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.

7.11.2 *Pump*—Pump casings shall be cast iron or corrosion-resisting material and shall be of such a design as to permit ease of accessibility for inspection and removal of foreign items from the impeller and interior (see Specification A 436). The pump shall either be self-draining or equipped with means for draining. The shaft shall be of corrosion-resistant steel, properly aligned and supported (see Specificaiton A 276). The impeller shall be corrosion-resisting material or iron alloy 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.

7.11.3 *Motor*—The wash spray assembly shall be motor driven (see NEMA ICS, NEMA MG-1, and NEPA No. 70). The drive shall be outfitted with a safety slip clutch.

7.12 *Heating*—Style 1 and 2 machines shall be capable of maintaining required temperature levels in the tank.

7.12.1 *Style 1*—Style 1 machines shall be suitable for operation with a steam supply flow pressure of from 10 to 15 psi (68.9 to 103.4 kPa). Temperature regulators (thermostats) shall be provided for maintaining the proper water temperature in the tank. Check valves or vacuum breakers must be used on all injector-type heating units to prevent back siphoning.

7.12.2 *Style 2*—Style 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 *Final Rinse Booster*—Final rinse booster heater will not be furnished as a part of the washer unless specified.

7.13.1 *Steam Booster*—When specified, meeting NSF Std. No. 5 (see 5.1.3), 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 (82.22°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 machine in a position that does not interfere with operation and permits attachment of tables or counters. 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. Valve and pipe unions shall be installed on the steam booster where the steam and water lines enter the unit. The final rinse water temperature shall be controlled by an automatic thermostat controlling the input of steam to the steam booster.

7.13.2 *Electric Booster*—When specified, meeting NSF Std. No. 5 (see 5.1.3), 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 (82.22°C) during the rinse cycle. 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. 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 from the front of the machine.

7.14 *Detergent Feeder*—When specified (see 5.1.5), an electric or electronic automatic detergent feeder conforming to NSF No. 29 (see also Specification F 1021) shall be separately packed with the washer. The reservoir of the feeder shall be capable of holding a supply of pot and pan washing detergent adequate in normal pot and pan washing operation for one meal period.

7.15 *Controls*—All control equipment shall conform to UL 921 and be capable of operation in ambient room temperature of 115 ± 9°F (46 ± 5°C).

7.16 Means for effective and adequate lubrication shall be provided when required. Lubricating points shall be readily accessible, and the machine shall be lubricated with the proper

amount of lubricant prior to delivery.

7.17 Unless otherwise specified (see 5.1.7), 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 Title 29, UL 921, and NSF 26 or Criteria C-2. Detergent and rinse agent feeders, when specified, shall comply with NSF No. 29. Electric booster heaters, when specified, shall conform to NSF No. 5.

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

9. Test Methods

9.1 *Operational*—Each washer shall be thoroughly tested in accordance with manufacturer's instructions to determine compliance with requirements of NSF No. 26 or Criteria C-2 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*—A new standard is to be developed for energy consumption, water consumption, and productivity profiles.

10. Certification

10.1 When specified in the purchase order or contract, the purchaser shall be furnished certification that samples representing each lot have been either tested or inspected as directed in this specification and the requirements have been met. When specified in the purchase order or contract, a report of the test results shall be furnished.

10.2 *Listing*—Acceptable evidence of meeting the requirements of UL 921 shall be UL Listing or UL Label or a certified test report from a recognized independent testing laboratory acceptable to the user.

10.3 *NSF Listing*—Acceptable evidence of meeting the requirements of NSF No. 26 or Criteria C-2 shall be the NSF Seal or Logo on the finished machine and listing in the NSF Official Listing of Food Service Equipment, or a certified test report from a recognized independent testing laboratory acceptable to the user. 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-resisting 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 No. 26 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. Manuals

12.1 Manuals shall be in accordance with Specification F 760.

13. Packaging and Packing Material

13.1 The washer should be packaged and packed in accordance with Practice D 3951.

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 oscillating arm; pot washer; utensil washer