Designation: F 1024 – 99

Standard Specification for Dispensers, Rehydrated Mashed Potato[1]

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1. Scope

1.1 This specification covers counter-model, self-contained hot rehydrated mashed potato dispensers.

1.2 The dispenser delivered under this specification shall be the manufacturer's standard product. Each dispenser model furnished by a particular manufacturer under this specification, including parts and assemblies thereof, shall be new and interchangeable.

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

1.4 The following safety hazards caveat pertains only to the test method portion, Section 11, 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:*

F 760 Specification for Food Service Equipment Manuals[2]

2.2 *National Safe Transit Association Standard:*

NSTA Pre-Shipment Test Procedures[3]

2.3 *ANSI/National Sanitation Foundation Standards:*

ANSI/NSF No. 18 Manual Food and Beverage Dispensing Equipment[4]

ANSI/NSF No. 51 Plastic Materials and Components Used in Food Equipment[4]

2.4 *ANSI/Underwriters Laboratory Standard:*

ANSI/UL Standard No. 197 Commercial Electric Cooking Appliances[5]

2.5 *American National Standards Institute Standard:*

ANSI Z1.4 Sampling Procedures and Tables for Inspection by Attributes[6]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *agglomerated, n*—a small cluster of individual particles of dehydrated potato product.

3.1.2 *granule, n*—individual fine particles of dehydrated potato product.

3.1.3 *mashed potato dispenser, n*—a commercial appliance designed to deliver whipped or mashed potato food.

3.1.4 *throw, n*—a quantity of potato powder ingredient that is augered, pumped, or dispensed into water and makes up the basic solids of a finished food.

4. Classification

4.1 *General*—The mashed potato dispensers shall be of the types, styles, sizes, and electrical ratings described in 4.2-4.5.

4.2 *Types*:

4.2.1 *Type I*—Dispenser that mixes dehydrated granule potato ingredient with hot water to produce a whipped food.

4.2.2 *Type II*—Dispenser that mixes dehydrated agglomerated potato ingredient with hot water to produce whipped food.

4.3 *Styles*:

4.3.1 *Style A*—Plumbed in, connected to water line.

4.3.2 *Style B*—Portable (nonplumbed), equipped with manually filled water reservoir.

4.4 *Sizes*:

4.4.1 *Size 1*—Hot water tank with a capacity of up to and including 1 gal (3.7 L).

4.4.2 *Size 2*—Hot water tank with a capacity of more than 1 and up to and including 2 gal (7.56 L).

4.4.3 *Size 3*—Hot water tank with a capacity of more than 2 gal (7.56 L).

4.5 *Electrical Rating*:

4.5.1 Nominal 115 V, single phase, 60 Hz.

4.5.2 Nominal 230 V, single phase, 60 Hz.

5. Ordering Information

5.1 Procurement documents should specify the following information:

5.1.1 Title, designation, and year date of this specification,

5.1.2 Type, style, and size of dispenser (see Section 4),

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

[3] Available from National Safe Transit Association, 6022 West Touhy Ave., Chicago, IL 60648.

[4] Available from National Sanitation Foundation, 3475 Plymouth Rd., Ann Arbor, MI 48105.

[5] Available from the Underwriters Laboratories Inc., 1655 Scott Blvd., Santa Clara, CA 95050; 333 Pfingsten Rd., Northbrook, IL 60062; 1285 Walt Whitman Rd., Melville, Long Island, NY 11746; or 2602 Tampa East Blvd., Tampa, FL 33619.

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

5.1.3 Description of product intended to be dispensed,
5.1.4 Electrical requirements (see Section 4), and
5.1.5 Special requirements.

6. Materials

6.1 Materials not definitely specified shall be of the quality normally used by the manufacturer for mashed potato dispensers, providing the completed items comply with all provisions of the standard.

7. Design and Manufacture

7.1 *General*—The dispenser shall comply with the requirements of NSF No. 18, NSF No. 51, and UL Standard 197. Evidence of compliance with NSF No. 18, NSF No. 51, and UL 197 is as follows:

7.1.1 *NSF*—Listing of the dispenser in the current edition of the NSF "Listing of Food Service Equipment" and display of the NSF seal on the finished dispenser.

7.1.2 *UL*—Acceptable evidence of meeting the requirements of UL 197 shall be the UL label, or listing mark, indicating that the dispenser has been tested and conforms to the requirements of UL 197.

7.2 *Dimensions*—The size of the dispenser will be expressed in inches (or centimetres). The width dimension shall not exceed 12 in. (30.5 cm).

7.3 *Operator Controls*—The dispenser shall be provided with at least two switches located at the front of the unit. One switch will provide for a timed portion of hot whipped or mashed potatoes. The other switch will provide for a continuous flow of hot water only.

7.4 *Concentrate Hopper*—The volume of the hopper shall be expressed in cubic centimetres.

NOTE 1—Mashed potato ingredient densities now vary from 0.2 to 1.0 g/cm^3. The blending technology also varies. The augering water flow rate and water temperature must be matched to the product dispensed. To assist in matching, the customer should advise the manufacturer of the dispenser of the brand of potato ingredient planned for use.

7.5 *Drip or Spillage Tray*—A drip tray having a cover for the container to rest upon shall be positioned for accessible and splash-free operation. The drip tray may have provisions for draining the splash and drippings into a drain. The tray cover may also have provisions for locating the container below the nozzle.

7.6 *Dispenser Base*:

7.6.1 The dispenser bases shall be provided with protectors to prevent damage to the surface on which it rests. The dispenser shall be fully assembled and ready for operation when connected to the electrical and water supplies in the manner specified in the operating or installation instructions.

7.6.2 An indicator light, visible at the dispenser front, shall be provided to show that the unit is energized.

8. Performance Requirements

8.1 *Finished Product*—The dispenser shall automatically combine either granule, Type I, or agglomerated, Type II, potato ingredient with hot water to provide a portion of hot, whipped or mashed potatoes while maintaining an ingredient throw consistency of ±5 %, when tested as specified in 11.5, and ±10 % when tested as specified in 11.8. The temperature of the water shall be maintained by a control to provide a hot whipped or mashed potato serving at the required temperature, ranging from 165 to 180°F (74 to 82°C). The required temperature shall be reached within 30 min after the dispenser is filled with 60 ± 2°F (16 ± 1°C) water and the dispenser is turned on. Refer to the test methods in Section 11.

8.2 *Water Heating*—The time to reach the required temperature shall be 30 min or less, as specified in 11.2.

8.3 *Energy Consumption*—By means of a kilowatt hour meter, the energy consumed to maintain the required temperature shall be recorded in kW/8-h period, starting with and including the water heating test of 11.2 as specified in 11.3.

8.4 *Water Flow*—There shall be 30 consecutive servings (water only), and each shall be within ±5 % of the desired serving setting as specified in 11.4.

8.5 *Ingredient Throw*—There shall be 30 consecutive servings (ingredient only) and each shall be within ±5 % of the desired setting as specified in 11.5.

8.6 *Peak Product Capacity*—The number of servings drawn prior to the product temperature falling below 165°F (74°C) shall be peak production rating as specified in 11.6.

8.7 *Sustained Product Capacity*—The dispenser shall deliver specified fluid-ounce servings at a controlled rate per minute as specified in 11.7.

8.8 *Humidity Test*—Ten servings of specified size shall be dispensed and verification obtained that each serving is within ±10 % of the desired setting as specified in 11.8.

9. Workmanship, Finish, and Appearance

9.1 *Workmanship*—All components and assemblies of the dispenser shall be free from dirt and other extraneous materials, burrs, slivers, rough die, tool and grind marks, dents, and cracks. Castings and molded parts, if used, shall be free of sand, fins, pits, blowholes, and sprues. External surfaces shall meet the UL Sharp Edge Test.

NOTE 2—Although 9.1 requires subjective judgements, its inclusion is considered important as a guide in evaluating and manufacturing equipment.

9.2 *Metal Fabrication*—Metal used in the fabrication of the dispensers shall be free from visually apparent defects. Forming and shearing shall not cause damage to the metal, and the metal shall be free from trimming marks.

9.3 *Welding*—Welds shall be smooth and free from cracks, burr holes, undercuts, or incomplete fusion, as determined by visual inspection. All scale and flux shall be removed from the finished weld areas.

9.4 *Fastening Devices*—Holes punched or drilled shall be free of burrs. Threaded fasteners shall not be broken, cracked, or stripped, and shall be drawn tight. Rivets, when used, shall fill the hole completely and the heads shall be in full contact with the surface of the member.

9.5 *Finish*—Dispenser finishes shall be free from discoloration and stains.

10. Sampling and Quality Assurance

10.1 *Sampling*—When specified in the contract or purchase order, sampling for inspection should be performed in accordance with ANSI Z1.4.

10.2 Measure and inspect the dispensers prepared for shipment for performance, safety, and appearance by a qualified quality audit program.

11. Test Methods

11.1 *General*—Prior to the performance of the test specified herein, operate the dispensers to be tested for a period of time recommended by the manufacturer for run-in and adjustment. Perform tests using a 70 ± 2°F (21 ± 1°C) ambient, a 70 ± 2°F (21 ± 1°C) potato ingredient temperature, and a 60 ± 2°F (15.5 ± 1°C) potable water supply at the manufacturer's recommended water pressure.

11.2 *Water Heating*:

11.2.1 *Significance and Use*—The purpose of this test is to ensure that the dispenser is capable of reaching a sufficient operating temperature in a given time period.

11.2.2 *Procedure*—Fill the water tank and turn on the power, as specified in the operating instructions.

11.3 *Energy Consumption*:

11.3.1 *Significance and Use*—The purpose of this test is to determine an energy consumption for the dispenser model being tested.

11.3.2 *Procedure*—By means of a kilowatt hour meter, record the energy consumed to maintain the required temperature in kW/8-h period, starting with and including the water heating test of 11.2.

11.4 *Water Flow*:

11.4.1 *Significance and Use*—The purpose of this test is to ensure that the proper amount of water is deposited for a 2.5, 3.2, 4.0, or 16-fl. oz serving.

11.4.2 *Procedure*—With the tank filled and heated, and with the hopper removed or made inoperative, adjust the water flow rate for the rate of flow, and adjust the timer for the period of time required for a 2.5, 3.2, 4.0, or 16-fl. oz serving. After these adjustments, make 30 consecutive servings (water only).

11.5 *Ingredient Throw*:

11.5.1 *Significance and Use*—The purpose of this test is to ensure that the proper amount of ingredients is deposited for a 2.5, 3.2, 4.0, or 16-fl. oz serving.

11.5.2 *Procedure*—With the water flow made inoperative, add the proper ingredient (granule or agglomerated) and adjust the ingredient time for the specified fluid ounce serving. After this adjustment, make 30 consecutive servings (ingredient only).

11.6 *Peak Product Capacity*:

11.6.1 *Significance and Use*—The purpose of this test is to ensure that the dispenser will produce continuous servings in a specified time period.

11.6.2 *Procedure*—With the water and ingredient systems operating normally, draw continuously 2.5, 3.2, 4.0, or 16-fl. oz servings at a rate of six, five, four, or two per minute, respectively, until the product temperature drops below 165°F (74°C).

11.7 *Sustained Product Capacity*:

11.7.1 *Significance and Use*—The purpose of this test is to ensure that the dispenser will deliver a uniform product at a sustained rate.

11.7.2 *Procedure*—The dispenser shall deliver specified fluid ounce servings at a controlled rate per minute. Measure the temperature and texture of each serving. Increase or decrease the controlled rate per minute until the product temperature for three consecutive servings is sustained at 165°F (74°C). Report this sustained draw rate in fluid ounces per minute.

11.8 *Humidity Test*:

11.8.1 *Significance and Use*—The purpose of this test is to ensure that the dispenser will function properly in an environment of high humidity.

11.8.2 *Procedure*—Place the dispenser in an environmental chamber of 90 ± 2°F (32.2 ± 1°C) with 80 ± 5 % humidity. Connect the water supply and install a full hopper. Install a thermocouple in the hopper at the discharge area and stabilize for 18 h. Dispense ten servings of specified size and verify that each serving is within ±10 % of the desired setting. Dispense balance of ingredient at a rate of two 2.5 and 3.2-fl. oz, and one 4.0-fl. oz serving per minute. Use one serving per two minutes rate for 16-fl. oz size. Record hopper temperature and note hopper delivery during sustained draw.

12. Inspection

12.1 *End Item Testing*—Test one production item selected at random from each lot in accordance with applicable tests of Section 11. Record performance results in a permanent file with the information accessible to customers upon demand. Any subsequent change in design that would relate to performance shall require a new test record and evaluation of minimum requirements.

12.2 *Quality Conformance Inspection*—The manufacturing organization shall have an effective quality audit system.

12.3 *Component and Material Inspection*—Inspect incoming components and materials to the design parameters as specified in drawings or purchase documents, or both.

12.4 *Optional Inspection*—A representative sample of a dispenser may be furnished on a trial and evaluation basis for 90 days at the discretion of the manufacturer when the equipment or customer represents a new experience.

13. Certification

13.1 When specified in the purchase order or contract, the purchaser shall be furnished certification that samples representing each lot have been tested or inspected as directed in this specification and the requirements have been met. When specified in the purchase order or contract, a report shall be furnished on this testing and inspection.

14. Product Marking

14.1 Each dispenser shall be provided with an identification plate or adjacent plates securely affixed to the item. The plate(s) shall be located on an external surface. The plate(s) shall be molded, die-stamped, or etched on metal or indelibly stamped on pressure-sensitive labels secured by adhesive. The marking shall be durable and shall be plain, legible, and readily visible after the item is installed in the intended manner. The identification plate(s) information shall include:

14.1.1 Name, brand, or trademark of the manufacturer of such known character as to be readily traceable to the manufacturer,

14.1.2 Energy characteristics of the equipment,

14.1.3 Distinctive number, letter, or number and letter code which will identify an individual item or production lot of a limited group of items, and

14.1.4 Information required by UL 197, as applicable.

15. Manuals

15.1 Format and content of applicable manuals shall be as indicated in Specification F 760.

16. Packaging and Package Marking

16.1 The complete dispenser shall be packaged in accordance with the supplier's standard practice.

16.2 The packaging shall meet the requirements of NSTA Pre-Shipment Test Procedures.

16.3 The package shall be marked showing the name of the product, model number, serial number, and manufacturer's name.