



Standard Specification for Vegetable Peeling Machines, Electric¹

This standard is issued under the fixed designation F1371; 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 batch-type vegetable peeling machines.

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

D3951 Practice for Commercial Packaging

F760 Specification for Food Service Equipment Manuals

F1166 Practice for Human Engineering Design for Marine Systems, Equipment, and Facilities

2.2 NSF/ANSI Standard:³

NSF/ANSI 8 Commercial Powered Food Preparation Equipment

2.3 Underwriters Laboratories Standards:⁴

ANSI/UL 763 Motor Operated Commercial Food Preparing Machines

ANSI/UL 969 Marking and Labeling Systems

2.4 American Society of Sanitary Engineering Standard:⁵

ASSE 1001 Performance Requirements for Atmospheric Type Vacuum Breakers

2.5 ANSI Standard:⁶

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

2.6 Military Standards:⁷

MIL-STD-167/1 Mechanical Vibration of Shipboard Equipment (Type I-Environmental and Type II-Internally Excited)

MIL-STD-461 Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment

MIL-STD-1399/300 Interface Standard for Shipboard Systems, Section 300A, Electric Power, Alternating Current

3. Terminology

3.1 Definitions:

3.1.1 *vegetable peeling machine, n*—a machine consisting of the following: a cylinder having an abrasive or textured wall; an abrasive or textured disk with lobes; a peel trap (when waste disposer is not specified); a waste outlet; a water inlet and air-gap type sprayer; and a cylinder cover.

4. Classification

4.1 Vegetable peeling machines shall be of the styles and sizes:

4.1.1 Style 1—Counter Mounted:

4.1.1.1 Size A—15 lb (6.8 kg) of potatoes per charge.

4.1.2 Style 2—Floor Mounted:

4.1.2.1 Size A—15 lb (6.8 kg) of potatoes per charge.

4.1.2.2 Size B—30 lb (13.6 kg) of potatoes per charge.

4.1.2.3 Size C—50 lb (22.7 kg) of potatoes per charge.

¹ This specification is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.04 on Mechanical Preparation Equipment.

Current edition approved March 1, 2013. Published April 2013. Originally approved in 1992. Last previous edition approved in 2009 as F1371 – 04 (2009). DOI: 10.1520/F1371-13.

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.

³ Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140, <http://www.nsf.org>.

⁴ Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, <http://www.ul.com>.

⁵ Available from American Society of Sanitary Engineering, 901 Canterbury Rd., Suite A, Westlake, OH 44135.

⁶ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

5. Ordering Information

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

- 5.1.1 Title, number, and date of this specification;
- 5.1.2 Style and size arrangement required (see Section 4);
- 5.1.3 Whether a timer is required (see 6.12.4);
- 5.1.4 Electrical power supply characteristics (voltage, phase, and frequency) (see 6.12);
- 5.1.5 Whether a power supply cord is required (see 6.12.3);
- 5.1.6 Whether a disposer is required (see 6.11);
- 5.1.7 Quantity of peelers to be furnished;
- 5.1.8 Whether a service supply valve is required (see 6.13.2); and
- 5.1.9 Labeling requirements (if different from Section 14).

6. Physical Requirements

6.1 *Design and Manufacture*—The vegetable peeler shall be complete so that when connected to the specified source of power the unit can be used for its intended function. The vegetable peeler shall meet the then current applicable requirements of NSF/ANSI 8 and ANSI/UL 763.

6.1.1 *Compliance with NSF/ANSI 8*—Acceptable evidence of meeting the requirements of NSF/ANSI 8 shall be the NSF certification mark on the vegetable peeler and listing in the manufacturer's product listings on the NSF web site,³ a certified test report from a recognized independent testing laboratory acceptable to the user, or a certificate issued by NSF under its one time contract evaluation/certification service; and, where applicable, ASSE 1001.

6.1.2 *Compliance with ANSI/UL 763*—Acceptable evidence of meeting the requirements of ANSI/UL 763 shall be a UL Listing Mark on the vegetable peeler, or a certified test report from a recognized independent testing laboratory acceptable to the user.

6.1.3 *Materials*—Materials used in the construction of vegetable peelers shall comply with the applicable requirements of NSF/ANSI 8. Materials used shall be free from defects that would adversely affect the performance or maintainability of individual components of the overall assembly.

6.2 *Cylinder or Hopper*—The cylinder or hopper shall be sheet aluminum or stainless steel, or cast iron. Machines intended for marine applications shall be furnished with a stainless steel cylinder. The inside surface of all cylinders shall be as described in 6.2.1-6.2.6. When silicon carbide or aluminum oxide is used, it shall cover the inside surface of the cylinder completely and uniformly. The silicon carbide or aluminum oxide shall still be intact, without looseness or bare spots.

- 6.2.1 Silicon carbide fused to the cylinder;
- 6.2.2 Silicon carbide bonded to the cylinder with a thermosetting resin, or epoxy adhesive;
- 6.2.3 A ribbed cylinder;
- 6.2.4 Silicon carbide bonded to the cylinder with an asphalt compound;
- 6.2.5 Aluminum oxide fused to the cylinder; and
- 6.2.6 Removable food-grade plastic cylinder liner with textured surface.

6.3 *Disk*—The disk shall be cast aluminum, formed stainless steel, or reinforced plastic. Each disk shall be removable through the top of the cylinder. The top surface of the disk shall have a cast-in textured surface or be covered completely and uniformly with silicon carbide or aluminum oxide.

6.3.1 Machines intended for marine application shall be furnished with a stainless steel or reinforced plastic disk.

6.4 *Vegetable Outlet*—The cylinder shall be provided with a vegetable discharge outlet consisting of a hinged metal door of stainless steel or aluminum, with a door latching mechanism and a stainless or aluminum vegetable guide or chute. The height of the outlet on Style 2 machines shall be not less than 37 in. (940 mm) and not more than 42 in. (1016 mm) above the floor. The door shall open and close easily and shall have a positive locking action. The inside surface of the hinged metal door shall line up with the inside surface of the cylinder wall when in the closed position. The door shall be equipped with a gasket or O-ring seal to prevent leakage, or there shall be a trough and drain arranged around or under the door, so that any seeping water is returned automatically to the waste outlet of the cylinder.

6.5 *Peel Trap*—The peel trap for the Style 2 machine shall be either integral with the machine or an independent unit, and it shall consist of a covered compartment with a removable wire mesh or perforated sheet metal basket. The basket shall be constructed of stainless steel. The Style 1 machine shall be furnished with a peel trap basket for attachment to the discharge hose. A peel trap is not required when a disposer is provided.

6.6 *Waste Outlet*—For Style 2 machines, a threaded noncorrosive metal outlet shall be located below the level of the disk for connection to a waste drain. The outlet shall drain the compartment beneath the disk completely. The outlet shall be at least 1.5-in. (38-mm) iron pipe size (IPS) for Size A and B machines and at least 2-in. (51-mm) IPS for Size C machines.

6.7 *Water Inlet and Sprayer*—A noncorrosive water sprayer shall be designed to spray, wash, and flush the inside of the cylinder and the vegetables during the peeling operation. The sprayer shall be designed to spray through an opening in the cover, or it shall be attached permanently to the top inside cylinder wall and shall be so positioned that it does not interfere with cylinder loading. The supply line to the spray head shall be at least 1/4-in. (6.35-mm) IPS or 3/8-in. (9-mm) tube.

6.8 *Cylinder Covering Ring*—The cylinder covering ring shall be cast aluminum, spun sheet aluminum, or fiberglass-reinforced plastic. The ring shall be either readily removable or hinged to the cylinder so as not to interfere with the removal of the disk. The ring shall prevent water from splashing out when the machine is peeling vegetables. The opening in the ring shall facilitate charging of the cylinder.

6.9 *Style 1, Counter Mounted*—The Style 1 machine shall be equipped with provisions for counter mounting.

6.10 *Style 2, Floor Mounted*—The supporting base shall be steel, aluminum, or stainless steel. The base shall provide a rigid and stable support for all machine components. The base

shall be equipped with adjustable legs, with provision for bolting the legs to the floor.

6.11 *Disposer, Waste*—When specified (see 5.1.6), the Style 2, Size B and C vegetable peeling machines shall be furnished with a waste disposer. The disposer housing shall be stainless steel, suitable for mounting to a 3.5-in. (88.9-mm) inside diameter throat opening, equipped with a UL-Listed or Recognized *On-Off* switch. The disposer motor shall be as specified in 6.12.2. A tailpiece of noncorrosive material shall be provided for a 1.5-in. (38-mm) drain connection. The waste disposer shall operate smoothly, disposing of potato peelings without leakage.

6.12 *Electrical Devices:*

6.12.1 *Electrical Specifications*—Nominal electrical specifications are: 120/60/1, 208/60/1, 240/60/1, 208/60/3, 240/60/3, and 480/60/3.

6.12.2 *Motors*—Motors shall meet the requirements of ANSI/UL 763. The peeler motor, and, if equipped, disposer motor, shall be of the continuous duty type. The motor shall be not less than $\frac{1}{3}$, $\frac{3}{4}$, and 1 hp (248, 559, and 746 W) for Sizes A, B, and C machines, respectively. The disposer shall be $\frac{1}{2}$ hp (373 W) minimum, 115 V, 60 Hz, and 1 phase.

6.12.3 *Wiring*—The machine shall be completely wired. When specified (see 5.1.5), a power supply cord shall be furnished.

6.12.4 *Timer*—When specified (see 5.1.3), the vegetable peeling machine shall be provided with a timer. The timer shall be adjustable in increments from 15 s up to at least 4 min, with the increments marked permanently on a timer dial.

6.12.5 *Switch*—The switch and wiring shall be located for convenient use, and shall not be exposed to water splashage.

6.13 *Piping, Tubing, Fittings, and Valves (Installation)*—Connections shall be readily accessible to facilitate installation and maintenance. Whenever possible, piping, tubing, and valves shall be located on the exterior of the machine.

6.13.1 *Piping and Fittings*—Water fittings shall be of corrosion-resisting material. Fresh water supply to the hopper shall be discharged not lower than 1 in. (25.4 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. Drainage piping shall be either corrosion-resisting material or suitable heat-resisting plastic tubing with fittings.

6.13.2 *Valves*—Valves shall be of corrosion-resisting material. When specified, a separately packed service supply valve shall be provided for closing the supply of water (see 5.1.8).

7. Hazard Protection

7.1 The peeler shall meet the requirements of ANSI/UL 763.

7.2 *Switch Guard*—The on/off switch shall be guarded, or be designed in such a manner to prevent unplanned activation.

8. Performance Requirements

8.1 *Performance Standards Compliance*—When tested in accordance with Section 9, with the cylinder or hopper filled to

rated capacity, and within a period of 3 or 4 min, or one cycle of the timer (if equipped), potatoes shall be considered peeled satisfactorily when all of the outer and under skins, except the eyes and the skin on low spots, have been removed. At rated capacity, the machine shall be capable of peeling all sizes of new and old potatoes conforming to U.S. Grade No. 1 without flats and without greater than 15 % weight loss. Vegetable peeling machines shall not leak when tested in accordance with Section 9. The motor shall be capable of starting with a full cylinder or hopper and accelerating to rated speed. Vegetable peeling machines shall conform to the requirements of ANSI/UL 763 and NSF/ANSI 8.

9. Test Methods

9.1 *Operational Test*—Test each peeler for operation in accordance with the manufacturer's operating instructions.

9.2 Using the manufacturer's recommended quantity, load the vegetable peeling machine with clean, unpeeled potatoes. Desired peel quality shall be achieved with 4 min or one complete timer cycle. The machine drain system and outlet shall drain the compartment beneath the disk without leakage of waste water or peelings.

10. Sampling

10.1 When specified in the contract or purchase order, sampling for inspection shall be performed in accordance with ANSI Z1.4, which will supersede implied sampling requirements stated elsewhere in this specification.

11. Inspection

11.1 *End-Item Testing*—When specified in the contract or purchase order, one production item, selected at random from each lot, shall be tested by the manufacturer in accordance with the applicable subsections of Section 9. Performance results shall be recorded in a permanent file and the information shall be available to the customer upon demand. Any subsequent change in design that would relate to performance shall require a new test record.

11.2 *Quality Conformance Inspection*—The manufacturer shall have an effective quality audit inspection.

11.3 *Component and Material Inspection*—Incoming components and materials shall be inspected by the manufacturer to the design parameters as specified on drawings or purchase documents, or both.

12. Rejection and Rehearing

12.1 *Rejection*—During inspection, any failure to perform in accordance with the requirements of this specification is cause for rejection of the lot.

12.2 *Rehearing*—The supplier will be given a rehearing on the remainder of the lot by inspection of additional peeler(s). Acceptance of the peeler that failed inspection is at the discretion of the purchaser.

13. Manuals

13.1 Unless otherwise specified, manuals shall be in accordance with Specification F760.

14. Product Marking

14.1 *Identification*—Each vegetable peeling machine shall be provided with an identification plate or adjacent plates securely affixed to the item. The plate(s) shall be molded, die-stamped, etched on metal, or an ANSI/UL recognized label material. Markings shall be durable and should be plain, legible, and readily visible after the item is installed in the intended manner. The identification plates shall include the name, brand, or trademark of the manufacturer, and shall state the electrical characteristics of the equipment. The plate(s) shall also bear a distinctive number, letter, or number and letter code that will identify an individual item or production lot to a limited group of items. In addition, such information required by UL and NSF shall appear on the plate(s). The plates shall be located on an external surface.

15. Packaging and Package Marking

15.1 *Preservation and Marking*—Unless otherwise specified, the complete vegetable peeling machine shall be packaged and marked in accordance with Practice **D3951**.

15.2 *Unit Packing*—One machine shall be packed to a shipping container. All removable components such as abrasive disk, cover, peel trap, and hopper shall be secured in a manner as to prevent movement and damage during transit. Components shall be packed in the same shipping container as the vegetable peeling machine.

15.3 *Package Marking*—The package shall be prominently marked on at least one side showing the name of the product, model number, serial number, and manufacturer's name.

16. Quality Assurance

16.1 Unless otherwise specified in the contract or purchase order, the manufacturer is responsible for the performance of all requirements as specified in this specification. Except as otherwise specified in the contract or order, the manufacturer may use his own or any other facility suitable for the testing of the machine requirements specified herein.

17. Keywords

17.1 abrasive compound; cylinder; disk; peel trap; silicone carbide; vegetable peeler

SUPPLEMENTARY REQUIREMENTS

FEDERAL AND MILITARY PROCUREMENT

S1. The following supplemental requirements shall apply only to Federal and Military procurements. Where provisions of this supplement conflict with the main body of this specification, this supplement will prevail.

S2. Manual

S2.1 A manual complying with Specification **F760** and its supplement shall be provided.

S3. First Article Inspection

S3.1 When required, the first article inspection shall be performed on one unit. The first article may be either a first production item or a standard production item from the supplier's current inventory, provided the item meets the requirements of the standard and is representative of the design, construction, and manufacturing techniques applicable to the remaining items to be furnished under the contract.

S4. Label Plates

S4.1 Vegetable peeling machines shall be provided with data-name plates and instruction plates.

S4.2 *Data-Name Plates*—In addition to the manufacturer's data plate, machines shall be provided with data-name plates readily visible to the operator during normal operating use and so as to not adversely affect the life and utility of the unit. Plates shall be attached to the front of the unit in such a manner as to meet the applicable NSF International sanitary requirements for this equipment. The plate shall contain the following information, which shall be stamped, engraved, or applied by photosensitive means: National Stock Number and Government Approved Manual Number.

S4.3 *Instruction Plate*—An instruction plate shall be made of corrosion-resisting metal or an ANSI/UL 969 Recognized label material and shall be attached to the front of the vegetable peeling machine. The instruction plate shall bear instructions for startup, operation, and shutdown.

S5. Part Identifying Number

S5.1 The following part identifying numbering procedure is for government purposes and does not constitute a requirement for the contractor. The PINs to be used for items acquired to this specification are created as follows:

ASTM F1371	-	XX	-	XX	
					Size
					Style
					ASTM Number

The above is an example of the PIN for an item in accordance with Specification F1371-13, Style XX, Size XX.

S6. Human Factors Criteria

S6.1 Human factors engineering criteria, principles, and practices, as defined in Practice **F1166**, shall be used in the design of all vegetable peeling machines.

S7. Preservation, Packaging, and Package Marking

S7.1 When other commercial practice or conformance to Practice **D3951** is desired, the preservation, packaging, and package marking requirements shall be stated in the purchase order or contract.

S8. Manufacturer's Certification

S8.1 If the manufacturer has successfully furnished the same equipment on a previous contract within the past three years, further inspection will not be required. The manufacturer shall certify in writing that the equipment to be furnished is the same as that previously furnished and approved, and that no major design changes have been made to the equipment.

S9. Naval Shipboard Requirements

S9.1 The following additional requirements apply when equipment is to be used for shipboard purposes:

S9.1.1 *Power Compatibility*—Unless otherwise specified (see 5.1), all types of vegetable peeling machines shall be compatible with 440 V, 60 Hz, 3 phase, 3-wire, ungrounded or 115 V, 60 Hz, single-phase, power sources for shipboard as specified in MIL-STD-1399/300.

S9.1.2 *Access*—Vegetable peeling machines for naval surface vessels shall pass through a 26-in. (660-mm) wide by 66-in. (1676-mm) shipboard hatch without major disassembly. Machines for submarines shall pass through a 25-in. (635-mm) diameter circular hatch without major disassembly. When establishing accessibility requirements, both physical and visual access must be provided along with access for any tools, test equipment, or replacement parts needed.

S9.1.3 *Mounting*—Where required, provisions shall be made to mount the vegetable peeling machine on a horizontal surface. The frame shall be provided with four drilled or threaded bosses or retaining nuts for this purpose. Four symmetrically spaced holes shall be provided, each having a 3/8-in. (9.5-mm) minimum bolt mounting size. Counter- or dresser-mounted vegetable peeling machines shall be provided with four Type 300 series stainless steel round legs, each a minimum 1 in. (25.4 mm) in diameter and 4 in. (102 mm) in height, for securing the unit to the dresser.

S9.1.4 *Environmental Suitability*—Vegetable peeling machines shall be capable of withstanding ship vibration and motion. Controls, switches, moving parts, and electrical cir-

cuits shall operate under shipboard conditions without malfunction, binding, excessive looseness, or damage (see S9.2.3).

S9.1.5 *Inclined Operation*—Vegetable peeling machines shall operate satisfactorily on surface ships when inclined at an angle of 15° each side of the vertical in each of two vertical planes at right angles to each other, with no spillage of fluid or product. For submarines, the angle of inclination shall be 30°.

S9.2 Quality Assurance Provision:

S9.2.1 *EMI Control Tests*—When specified, vegetable peeling machines shall be tested by the contractor for surface ships and submarines. The first article or initial production unit, as applicable, shall be tested. The contractor shall furnish written certification that the equipment meets the requirements of MIL-STD-461. Nonconformance with the requirements specified shall constitute failure of the test.

S9.2.2 *Inclined Operational Test*—The vegetable peeling machine shall be bolted to a test platform similar to shipboard installation and inclined at an angle of 15° (30° for submarines). The machine shall be filled to 75 % capacity with product, then operated for 60 s each at each side of the vertical in each of two vertical planes at right angles to each other. Any nonconformance with specified requirements of S9.1.5 shall constitute failure of this test.

S9.2.3 *Shipboard Environmental Test*—When specified, the vegetable peeling machine, under normal operating conditions, shall be tested in accordance with MIL-STD-167/1, Type I equipment. The vegetable peeling machine shall be secured to the test machine in the same manner that it will be secured on shipboard. Failure of the machine to perform its function during or after testing, or meeting the requirements of S9.1.4, shall constitute failure of this test. The Government reserves the right to witness all tests of vegetable peeling machines procured for Naval shipboard use, whether performed by the supplier or by an independent testing agency.

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