



Standard Specification for Cooker, Steam¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers food cookers and food reheaters which use steam as the heat source. These units are also known as steamers, steam ovens, and steam cookers which utilize steam generated by gas, electric heat, or steam coil sources, or a combination thereof, in commercial and institutional food service establishments. This specification can be used for zero-pressure steam cookers, pressure steamers, and combination pressure/pressureless steamers and does not cover steam cooking equipment used by food processors who normally package the food that they cook.

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

1.3 *This standard may involve hazardous materials, operations, and equipment. 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

- A36/A36M Specification for Carbon Structural Steel
- A167 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
- A176 Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip
- A240/A240M Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- A268/A268M Specification for Seamless and Welded Ferritic and Martensitic Stainless Steel Tubing for General Service

A269 Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

A276 Specification for Stainless Steel Bars and Shapes
A366/A366M Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality³

A478 Specification for Chromium-Nickel Stainless Steel Weaving and Knitting Wire

A569/A569M Specification for Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Commercial Quality Sheet and Strip³

B108 Specification for Aluminum-Alloy Permanent Mold Castings

B209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate

D3951 Practice for Commercial Packaging

F760 Specification for Food Service Equipment Manuals

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

F1484 Test Methods for Performance of Steam Cookers

2.2 Underwriters Laboratories Standard:⁴

UL/ANSI 197 Commercial Electric Cooking Appliances

2.3 ANSI Standards:⁵

ANSI B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)

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

ANSI Z21.41 Quick-Disconnect Devices for Use With Gas Fuel Appliances

ANSI Z21.45 Flexible Connectors of Other Than All-Metal Construction for Gas Appliances

ANSI Z83.11 Gas Food Service Equipment

ANSI/NFPA 54 National Fuel Gas Code

ANSI Z223/NFPA 70 National Electrical Code⁶

2.4 NSF Standards:⁷

¹ This specification is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.02 on Cooking and Warming 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.

³ Withdrawn.

⁴ Available from Underwriters Laboratories (UL), Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁶ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269-9101.

⁷ Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140.

NSF/ANSI Standard No. 4 Commercial Cooking and Hot Food Storage Equipment

2.5 *ASME Documents*.⁸

ASME Boiler and Pressure Vessel Code, Section IV—Heating Boilers

2.6 *Military Standards*:

MIL-STD-167/1 Mechanical Vibration of Shipboard Equipment (Type 1—Environmental and Type 2—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 of Terms Specific to This Standard*:

3.1.1 *capacity*—the capacity of a steam cooker is determined by the number of steam table pans that it is designed to hold during cooking.

3.1.2 *pans*—containers used to hold the food product in the oven cavity. A full size steam table pan is nominally 12¾ by 20¾ by 2½ in. (324 by 527 by 64 mm).

3.1.3 *steam cooker*—as used in this specification, is a device with one or more food steaming compartments in which the energy in steam is transferred to the food by direct contact. The pressure occurring in the food compartment of these steamers during cooking ranges from 0 to 15 psig.

4. Classification

4.1 Steam cookers covered by this specification are classified by type, grade, class, size, style, and capacity:

4.2 *Type*:

4.2.1 *Type IA*—Table or countertop units with permanent water connection.

4.2.2 *Type IB*—Table or countertop units without water connection (connectionless steamer).

4.2.3 *Type II*—Floor mounted on an open stand.

4.2.4 *Type III*—Floor mounted on a cabinet base.

4.3 *Grade*:

4.3.1 *Grade A*—0 to 2.9 psig compartment pressure.

4.3.2 *Grade B*—3.0 to 9.9 psig compartment pressure.

4.3.3 *Grade C*—10.0 to 15 psig compartment pressure.

NOTE 1—These pressure values refer to the continuous pressure or the maximum pressure reached during a cooking cycle.

4.4 *Class*:

4.4.1 *Class 1*—208 V, 60 Hz, 1 phase.

4.4.2 *Class 2*—208 V, 60 Hz, 3 phase.

4.4.3 *Class 3*—240 V, 60 Hz, 1 phase.

4.4.4 *Class 4*—240 V, 60 Hz, 3 phase.

4.4.5 *Class 5*—480 V, 60 Hz, 1 phase.

4.4.6 *Class 6*—480 V, 60 Hz, 3 phase.

4.4.7 *Class 7*—120 V, 60 Hz, 1 phase.

4.4.8 *Class 8*—220 V, 60 Hz, 3 phase.

4.4.9 *Class 9*—230 V, 50 Hz, 1 phase.

4.4.10 *Class 10*—400 V, 50 Hz, 3 phase.

4.4.11 *Class 11*—440 V, 60 Hz, 3 phase (shipboard use).

4.5 *Size*:

4.5.1 *Size a*—One-compartment steamer.

4.5.2 *Size b*—Two-compartment steamer.

4.5.3 *Size c*—Three-compartment steamer.

4.6 *Style*:

4.6.1 The steam used in the food compartments must be made from potable water and can be supplied from a self-contained electric, gas-fired, or steam coil steam generator, or from an external potable steam source.

4.6.2 *Style i*—Directly connected to an external steam source.

4.6.3 *Style ii*—Self-contained steam coil steam generator.

4.6.4 *Style iii*—Self-contained gas-fired steam generator.

4.6.5 *Style iv*—Self-contained electric steam generator.

4.7 *Capacity*:

4.7.1 Maximum three full size pans.

4.7.2 Maximum five full size pans.

4.7.3 Maximum six full size pans.

4.7.4 Maximum ten full size pans.

4.7.5 Maximum 12 full size pans

4.7.6 Maximum 16 full size pans.

4.7.7 Maximum 18 full size pans.

4.7.8 Maximum 24 full size pans.

5. Ordering Information

5.1 An order for a steam cooker under this specification shall include the following information:

5.1.1 ASTM specification number and year of issue,

5.1.2 Quantity to be furnished,

5.1.3 Type,

5.1.4 Grade,

5.1.5 Class,

5.1.6 Size, <https://standards.ansi.org/astm-f1217-03>

5.1.7 Style, and

5.1.8 Capacity.

5.2 The following options should be reviewed and if any are desired they should be included in the order.

5.2.1 When Federal/Military procurement(s) is involved, refer to the supplement pages.

5.2.2 Type of gas, if applicable: natural, propane, other (specify dry gas energy content in Btu per cubic feet and specific gravity).

5.2.3 Electrical power supply connection if applicable; power cord with plug or conduit connection and size.

5.2.4 If required, the ability to cook frozen food without thawing it first.

5.2.5 When other than manufacturer's standard, commercial, domestic packaging is required, specify packaging requirements.

5.2.6 Specify special requirements, such as inspections, accessories, additional nameplate data, anchorable feet, etc.

5.2.7 If required, specify an automatic cold water steam condenser on the steam cooker's drain line.

5.2.8 When specified, a certification to ensure that samples representing each lot have been either tested or inspected as directed and the requirements have been met. When specified,

⁸ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990.

a copy of the certification or test results, or both, shall be furnished to the purchaser.

5.2.9 If Type 430 corrosion-resistant steel is not desired in 6.4.

5.2.10 *Type of Controls*—Electro-mechanical, solid state, or programmable/computer controlled.

5.2.11 When specified, a fan and baffle shall be provided in a steam cooking compartment:

5.2.11.1 Fan shall be operated by a single speed or two-speed motor.

5.2.11.2 Air baffle or fan guard may be provided to maintain uniformity of temperature within the cooking cavity.

5.2.11.3 When provided, the baffle or fan guard shall be removable for cleaning of fan or blower.

5.2.12 *Water Resistance*:

5.2.12.1 When specified, control components and electrical wiring shall be resistant to moisture and condensation due to steam from “blow-down” of boiler or accidental leakage.

5.2.12.2 When specified, all control components and exposed electrical wiring shall be resistant to cleaning by a water spray hose connected to domestic city water supply.

5.2.13 When specified, the steam cooker shall be provided with “Hold” or “Cook and Hold” feature.

5.2.14 When specified, with a quick-disconnect gas supply, an approved quick disconnect (socket and plug) conforming to **ANSI Z21.41**, and a flexible metal connector conforming to **ANSI Z21.45** and consisting of a male pipe thread fitting on one end and a union with female thread on the opposite end shall be provided with the steam cooker.

5.2.15 When specified, additional accessories such as: wire shelves, casters, oven stand, legs, wash-down hose assembly, and faucets shall be provided.

6. Materials

6.1 *General*:

6.1.1 Steam cookers shall conform to the documents listed in 2.1 and 2.3.

6.1.2 Materials used shall be free from defects, which would affect the performance or maintainability of individual components, or of the overall assembly.

6.1.3 Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice.

6.1.4 Use of used or rebuilt products is not allowed under this specification.

6.2 *Door*—The door shall be constructed of Types 302 or 304 corrosion-resistant steel conforming to Specifications **A167**, or **A240/A240M**. Aluminum alloy Types 356 or 319 conforming to Specification **B108** or Type 6061 aluminum alloy conforming to Specification **B209** may also be used alone or in combination with the corrosion-resisting steels described.

6.3 *Food Cooking Compartment*—Compartment shall be constructed of Types 302, 304, or 316 corrosion-resistant steel conforming to Specifications **A167** or **A240/A240M**, or aluminum alloy Type 3003-0 conforming to Specification **B209**. Pan racks shall be fabricated from Types 302, 304, or 316 corrosion-resistant steel conforming to Specifications **A276** or **A478**.

6.4 *Exterior*—Unless otherwise specified, material shall be Types 302, 304, 316, or 430 corrosion-resistant stainless steel

conforming to Specification **A240/A240M** or to Specifications **A167** or **A176** as applicable, and thickness shall be 20 gage minimum (0.0375 in. U.S. revised standard gage).

6.5 *Hardware and Fittings*—Unless otherwise specified, all hardware and fittings shall be corrosion-resistant or suitably processed to resist corrosion in accordance with the manufacturer’s standard practice.

6.6 *Threaded Parts*—All threaded parts shall conform to **ANSI B1.1**.

7. Design and Construction

7.1 *General*:

7.1.1 Steam cookers shall conform to UL/ANSI No. 197, **ANSI Z83.11**, NSF/ANSI No. 4, and ANSI Z223/NFPA 70, as applicable.

7.1.2 Steam cooker shall be delivered assembled and ready for connection to steam, water, or gas piping, and electrical supply, as applicable.

7.1.3 Steam cookers are to be equipped with a suitable drain and steam exhaust termination.

7.1.4 All supply and drain connections shall be designed so that the steamer may be connected while maintaining a flush rear or side surface.

7.1.5 Cooking shall be accomplished by direct action of steam at the pressure specified under type designation.

7.1.6 Steamers shall be vented to remove substantially all the air from the steam chamber prior to the cooking process.

7.1.7 *Door*—Steamers with a pressurized cooking compartment shall have the door and the door latch designed to prevent opening until the steam supply is shut off and the remaining pressure in the compartment is released.

7.1.8 *Food Cooking Compartment*:

7.1.8.1 Each compartment shall have removable pan racks for supporting the appropriate number of steam table pans.

7.1.8.2 Pan racks shall be capable of supporting, without permanent deformation, a load of 15 lb per square foot in each pan.

7.1.8.3 Pan rack design shall permit easy loading and unloading of the pans (empty or loaded, hot or cold) by sliding (see 8.1).

7.1.8.4 When specified, the pan support racks in the compartment shall be suitable for supporting the maximum number of 1 in. or 4 in. high 12¾- by 20¾-in. stainless steel pans.

7.1.8.5 When specified applicable, the cooking compartment shall be designed, manufactured, inspected, and tested per the ASME Pressure Vessel Code, Section VIII—Division 1.

7.1.9 *Controls and Indicators*:

7.1.9.1 Each steamer shall have an indicator which shows that the device is energized.

7.1.9.2 When the cooking compartment pressure is 1 psig or greater, a compartment pressure indicator shall be provided.

7.1.9.3 Each cooking compartment shall be provided with a 60-min (minimum) timer which will give an audible signal at the end of a cooking cycle. When the timer is activated it will start the steam supply to the compartment and shut off the steam when the selected cooking cycle time has elapsed.

7.2 *Design and Construction of the Steam Source*: