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An American National Standard

Standard Specification for Heavy-Duty Ranges, Gas and Electric[1]

This standard is issued under the fixed designation F2521; 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 heavy-duty ranges that use gas or electrical heat sources, or both, for cooking food in the commercial and institutional food service establishments.

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

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

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

F1275 Test Method for Performance of Griddles

F1496 Test Method for Performance of Convection Ovens

F1521 Test Methods for Performance of Range Tops

2.2 *ANSI Standards:*[3]

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/CSA 6.9 Quick-Disconnect Devices for Use With Gas Fuel Appliances

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

ANSI Z83.11/CGA-1.8 Gas Food Service Equipment

2.3 *NSF Standard:*[4]

NSF/ANSI 4 Commercial Cooking, Rethermalization and Powered Hot Food Holding and Transport Equipment

2.4 *NFPA Standard:*[5]

NFPA 70/ANSI Z223 National Electrical Code

NFPA 54/ANSI Z223 National Fuel Gas Code

2.5 *UL Standard:*[6]

UL/ANSI 197 Commercial Electrical Cooking Appliances

2.6 *Military Standards:*[7]

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 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 *broiler, n*—open cast iron or steel grate on which food is laid, allowing highly directional intense heat under the grate to cook the food. Another type is an overfired heat source, using highly directional intense heat over the food.

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

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

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

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

[7] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, or from Acquisition Streamlining and Standardization Information System (ASSIST) located at http://dsp.dla.mil.

3.1.2 *convection oven, n—as used in this specification*, a device that combines the function of circulating hot convection air in an enclosed cavity by means of a fan or blower, which is operated by an electric motor, for the purpose of baking or roasting food.

3.1.3 *cook-top electric element, n*—open coil electrical elements supported to withstand the weight of filled cooking utensils in direct contact with the burners.

3.1.4 *French top, n*—sheathed electric burner with permanent cover over entire heating element; round and sealed to the range top to resist drips and splash.

3.1.5 *griddle, n*—device for cooking food by direct contact with a hot surface.

3.1.6 *heavy-duty range, n*—appliance used for pot or pan surface cooking, griddling, frying, broiling, steaming, baking, roasting, and reheating food products with a standard oven or convection oven. It is of the most durable construction, varying in size, offers increased heat input than medium (restaurant) or specialty ranges. Typical industry widths are 32 in. (812 mm), 34 in. (863 mm), and 36 in. (914 mm) for gas range tops and for electric ranges. The top cooking surface can be ⅓, ⅔, or full top options of any style noted. For purposes of convenience, nominal dimensions for each width will be used in this specification.

3.1.7 *hot top, n*—flat cast iron surface sometimes called a "boiling plate" or "uniform heat top" with heat transferred from gas burners or electric heating elements under the cooking surface where pots are set to warm or keep hot food contained in the utensil.

3.1.8 *open top gas burner, n*—also called grate top; has a cast iron or steel burner top that supports the pot above the gas burner.

3.1.9 *standard oven, n—as used in this specification*, a space where food is baked or roasted without recirculating air.

4. Classification

4.1 *Type:*
4.1.1 *Type I*—Electric range top with electric oven.
4.1.2 *Type I*—Electric range top with gas-fired oven.
4.1.3 *Type I*—Electric range top with storage base.
4.1.4 *Type II*—Gas-fired range top with gas-fired oven.
4.1.5 *Type II*—Gas-fired range top with electric oven.
4.1.6 *Type II*—Gas-fired range top with storage base.

Type I Style, Electric Ranges—Dimensions

4.2 *Widths:*[8]
4.2.1 32 in. (812 mm)
4.2.2 34 in. (863 mm)
4.2.3 36 in. (914 mm)
4.2.4 *Heights*—Typically 37 in. (939 mm) from floor to work surface.
4.2.5 *Depth*—Typically 37 in. (939 mm) to 41 in. (1040 mm).

4.3 *Electrical Class:*
4.3.1 *Class 1*—208 V, 60 Hz, 1 phase.
4.3.2 *Class 2*—208 V, 60 Hz, 3 phase.
4.3.3 *Class 3*—240 V, 60 Hz, 1 phase.
4.3.4 *Class 4*—240 V, 60 Hz, 3 phase.
4.3.5 *Class 5*—480 V, 60 Hz, 3 phase.
4.3.6 *Class 6*—120 V, 60 Hz, 1 phase.
4.3.7 *Class 7*—230 V, 50 Hz, 1 phase.
4.3.8 *Class 8*—400 V, 50 Hz, 3 phase.
4.3.9 *Class 9*—440 V, 60 Hz, 3 phase (shipboard use).

4.4 *Cook Top Options*
4.4.1 *Electric Griddles:*
4.4.1.1 ⅓ top cover rated nominal 5 kW, ⅔ other top options.
4.4.1.2 ½ top cover rated nominal 10 kW, ½ other top options.
4.4.1.3 Full top cover rated nominal 10 to 15 kW (Fig. A1.24).
4.4.1.4 ⅔ top cover rated nominal 10 kW (Fig. A1.25).
4.4.2 *Electric Hot Tops (also known as Boiling Tops, Uniform Heat Tops)*—Specify with or without thermostat.
4.4.2.1 ⅓ top cover rated nominal 5 kW, ⅔ other top options.
4.4.2.2 ½ top cover rated nominal 10 kW, ½ other top options.
4.4.2.3 Full top cover rated nominal 10 to 15 kW (Fig. A1.21).
4.4.2.4 ⅔ top cover rated nominal 10 kW (Fig. A1.22).
4.4.3 *Open Top Electric Element Burner:*
4.4.3.1 9½-in. (241-mm) diameter closed element (French top) full cook top rated nominal kW each (Fig. A1.23).
4.4.3.2 9½-in. (241-mm) diameter open element cook top rated at nominal kW.
4.4.4 *Additional Electric Range Cook Top Options for Electric Ranges*—Any combination of top cook devices in ⅓, ½, ⅔, or full top coverage.
4.4.4.1 Three hot tops with or without thermostat.
4.4.4.2 Two hot tops and two 9-in. (229 mm) diameter French style electric burners.
4.4.4.3 Two hot tops and two 9-in. (229 mm) diameter open top element burners.
4.4.4.4 Six 9-in. (229 mm) diameter French stle electric element burners.
4.4.4.5 Six 9-in. (229 mm) diameter open top element burners.
4.4.4.6 ⅓, ½, ⅔, or full top coverage with griddle.
4.4.4.7 ⅓ griddle, 4-top cook elements or hot tops.
4.4.4.8 ½ griddle 2-top cook elements or hot tops

NOTE 1—All open top burners, French top burners, hot tops and griddles may have temperature controls.

4.4.4.9 With or without electric or gas oven (see 4.5 and 4.11).

4.5 *Electric Ovens:*
4.5.1 *Electric Standard Oven*—7.0 kW or greater.
4.5.2 *Electric Convection Oven*—7.0 kW or greater.

[8] Tops can be either a full top of one type of cook top such as a griddle or divided in sections with one or two or three cook top styles. Depending on range width, a full top and two sections for 32 and 34-in. (813 and 864-mm) widths and one, two, or three sections on 36-in. (914-mm) range tops.