



Standard Specification for Underfired Broilers¹

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1. Scope

1.1 This specification covers underfired broilers which utilize gas or electrical heat sources for cooking food in 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 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
 - F1695 Test Method for Performance of Underfired Broilers
- ### 2.2 ANSI Standards:³
- NSF/ANSI 4 Commercial Cooking, Rethermalization, and Powered Hot Food Holding and Transport Equipment
 - ANSI/UL 197 Commercial Electric Cooking Appliances
 - ANSI B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)
 - ANSI Z1.4 Sampling Procedures and Tables for Inspection and Attributes
 - ANSI Z21.41 Quick-Disconnect Devices For Use With Gas Fuel Appliances
 - ANSI Z21.69 Connectors for Moveable Gas Appliances
 - ANSI Z83.11 Gas Food Service 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, <http://www.ansi.org>.

2.3 Military Standards:⁴

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

2.4 Other Standards:⁵

CAN/CSA-B339 Cylinders, Spheres and Tubes for the Transportation of Dangerous Goods

3. Terminology

3.1 Definitions:

3.1.1 *underfired broiler, n*—as used in this specification, is a device for cooking food consisting of a grate and a high temperature heat source beneath the grate to cook food resting on the grate.

4. Classification

4.1 Broilers covered by this specification are classified by type, style, fuel class, and size.

4.2 Type:

4.2.1 *Type 1*—For counter top use.

4.2.2 *Type 2*—OEM stand mounted.

4.2.2.1 *Type 2A*—Stand with plain legs.

4.2.2.2 *Type 2B*—Stand with casters.

4.2.2.3 *Type 2C*—Stand with bolt-down legs.

4.2.3 *Type 3*—For flush installation (drop-in type)

4.3 Style (Radiant System):

4.3.1 *Style 1*—Ceramic briquettes, lava rock or other loose substances for radiant surface.

4.3.2 *Style 2*—Metal radiant surface.

4.3.3 *Style 3*—Glass radiant surface.

4.3.4 *Style 4*—None.

4.3.5 *Style 5*—Combination (any of the above styles together).

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

⁵ Available from Canadian Standards Association (CSA), 5060 Spectrum Way, Mississauga, ON L4W 5N6, Canada, <http://www.csa.ca>.

4.4 Class:

4.4.1 Electric:

- 4.4.1.1 Class 1—208V, 60 Hz, 1 phase.
- 4.4.1.2 Class 2—208V, 60 Hz, 3 phase.
- 4.4.1.3 Class 3—240V, 60 Hz, 1 phase.
- 4.4.1.4 Class 4—240V, 60 Hz, 3 phase.
- 4.4.1.5 Class 5—440V, 60 Hz, 3 phase.
- 4.4.1.6 Class 6—480V, 60 Hz, 3 phase.
- 4.4.1.7 Class 7—230V, 50 Hz, 1 phase.
- 4.4.1.8 Class 8—400V, 50 Hz, 1 phase.

4.4.2 Gas:

- 4.4.2.1 Class 8—Natural Gas.
- 4.4.2.2 Class 9—LP Gas.

(1) Class 9A—Fixed LP fuel applications.

(2) Class 9B—Self-contained LP fuel applications.

4.4.2.3 Class 10—Other Gases (specify gas composition, heating value and specific gravity).

4.4.3 Solid Fuel:

- 4.4.3.1 Class 11—Solid Fuel without Gas Assist.
- 4.4.3.2 Class 12—Solid Fuel with Gas Assist.

4.5 Size (Overall Width):

- 4.5.1 18 in. (457 mm) nominal.
- 4.5.2 24 in. (610 mm) nominal.
- 4.5.3 36 in. (914 mm) nominal.
- 4.5.4 48 in. (1219 mm) nominal.
- 4.5.5 60 in. (1524 mm) nominal.
- 4.5.6 72 in. (1829 mm) nominal.

4.5.7 This specification does not purport to address all of the sizes, which may be available, but it is an overview of the most common sizes used in the industry today. Sizes not listed above may be designated using their nominal width.

5. Ordering Information

5.1 An order for a broiler(s) under this specification shall specify 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 Style,
- 5.1.5 Class, and
- 5.1.6 Size.

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

5.2.1 When federal/military procurement(s) is involved, refer to the supplementary requirements.

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

5.2.3 Specify special requirements, such as inspections, accessories, additional nameplate data, and modifications.

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

5.2.5 When specified with a quick-disconnect gas supply, an approved quick disconnect (socket and plug) conforming to

ANSI Z21.41 and a flexible connector conforming to AN-SIZ21.69 shall be provided with the broiler.

5.2.6 When connected to a self-contained gas fuel source, cylinder configuration (size, orientation, and number) should be specified along with the type of cylinder connection device.

5.2.7 For a product for outdoor use only and if the purchase is for a LP self contained appliance, the specifications should state: The broiler must be listed under Z81.11 for use with a self-contained LP system and the broiler shall furnished with all necessary LP connection components in accordance with ANSI Z83.11, Part I Construction subsection titled "Self Contained LP-Gas Supply Systems." These components shall be those recognized for use on the broiler under the broiler's listing to ANSI Z83.11.

5.2.8 As a part of a LP self contained system, if quoted that the self contained LP tank shall be provided with the broiler, the specifications shall state:

5.2.8.1 The LP tank shall be constructed and marked in accordance with the specifications for propane cylinders of the U.S. Department of Transportation (DOT) or the specification for LP-gas cylinders of the National Standard of Canada, CAN/CSA-B339, or both.

5.2.8.2 The LP tank connection shall be compatible with connection system components provided with broiler.

6. Materials and Manufacture

6.1 General:

6.1.1 Broilers shall conform to the applicable documents listed in Section 2.

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 *Hardware and Fittings*—Unless otherwise specified (see Section 5), all hardware and fittings shall be corrosion-resistant or suitably processed to resist corrosion in accordance with the manufacturer's standard practice.

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

7. Design and Construction

7.1 General:

7.1.1 Broilers and accessories shall conform to ANSI/UL 197 or ANSI Z83.11, as applicable, and NSF/ANSI 4, as applicable.

7.1.2 Broilers shall be delivered assembled, ready for connection to electricity or gas piping, or both, as applicable.

7.1.3 *Service Connections*—Provisions for service shall be provided in the back or bottom of the broiler. Types 1 and 2 shall be capable of being banked side by side.

7.1.4 *Electrical Characteristics*—All electric broilers shall be designed for operation on nominal voltage ratings, Hz and phases as specified by electrical class.

7.1.5 *Controls*—The temperature of each broiler section shall be controlled by a gas control valve, a temperature-regulating device or a thermostat. If valves and thermostats are located on the front panel, they shall be recessed or otherwise protected from inadvertent changes or damage.

7.1.6 *Heat Sources*—Broilers shall have heat sources arranged so that different areas of the broiler may be controlled independently. A minimum of one heat source shall be furnished for every two linear feet (610 mm) of the cook surface. Heat sources shall be readily accessible for repair or replacement. All internal wiring shall be free of stress or tension and, where required, shall be coated with high-heat resistant insulation to resist water or grease. Thermal insulation shall be fire resistant and suitable for the temperatures to which it is exposed.

7.1.7 *Broiler Stand Design and Construction*—Broiler stands for Type 2 broilers shall be of open type design, so constructed that they can be banked together in battery alignment without space between the tops or means shall be provided for covering the space. Means that are included to secure the broiler to the stand, shall allow removal of the broiler from the stand. Stands shall be as specified in 4.2.2, with plain legs, casters or bolt-down legs. Type 2B broiler stands shall be provided with a minimum of four casters. The front casters shall be provided with brakes.

8. Performance Requirements

8.1 When specified in the contract or purchase order, performance testing shall be performed in accordance with Test Method F1695.

9. Sampling and Quality Assurance

9.1 When specified in the contract or purchase order, sampling for inspection should be performed in accordance with the requirements specified in ANSI Z1.4.

10. Product Marking

10.1 Each broiler shall be provided with an identification plate in compliance with (1) ANSI Z83.11 (as applicable) or (2) ANSI/UL 197 and NSF/ANSI 4, or both.

11. Packaging and Package Marking

11.1 The broiler shall be packaged and packed in accordance with the manufacturer's standard commercial domestic packaging. The package shall be marked showing the name of the product, model number, serial number and manufacturer's name. When specified, packaging shall be in accordance with the requirements of Practice D3951.

12. Instruction Materials and Manuals

12.1 Each broiler shall be provided with installation and operators manuals. The manuals shall comply with Specification F760.

13. Keywords

13.1 broil; broiler; char broiler; char-broiler; cooking appliance; counter top mounted; drop-in type; food service equipment; grill; stand mounted; underfired broiler

SUPPLEMENTARY REQUIREMENTS

FEDERAL AND MILITARY PROCUREMENT

The supplemental requirements, which follow, apply to all Federal and Military procurements, except Naval Shipboard. Where provisions of this supplement conflict with the main body of the standard, this supplement shall prevail.

S1. Manual

S1.1 A manual complying with Specification F760 and its supplement shall be provided.

S2. First Article Inspection

S2.1 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 technique applicable to the remaining items to be furnished under the contract.

S3. Label Plates

S3.1 *Data-name Plates*—In addition to the manufacturer data plate, char broilers 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 National Sanitation Foundation sanitary requirements for this equipment. The plate shall contain the following information, which shall be stamped, engraved or applied by photosensitive means:

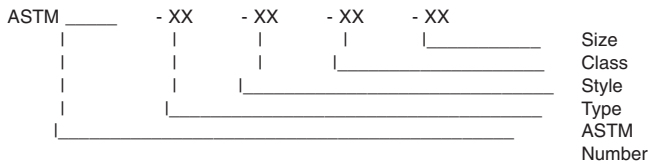
S3.1.1 National Stock Number (NSN).

S3.1.2 Government-approved manual number.

S3.2 *Instruction Plates*—An instruction plate shall be made of an ANSI/UL accepted label material and shall be attached to the front of the machine. The instruction plate shall bear instructions for start-up, operation, and shutdown.

S4. Part Identifying Number

S4.1 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 document are created as follows:



S4.2 The above is an examples of the PIN for an item in accordance with ASTM Standard F _____, type XX, style XX. Class XX and size XX.

S5. Human Factors Criteria

S5.1 Human factors engineering criteria, principles, and practices, as defined in Practice F1166, shall be used in the design of all cold food counters.

S6. Preservation, Packaging and Package Marking

S6.1 When other than 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.

S7. Manufacturer’s Certification

S7.1 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.

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