



Standard Specification for Convection Oven Gas or Electric¹

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1. Scope

1.1 This specification covers forced air convection ovens for baking, roasting or rethermalizing which utilize gas or electrical heat sources, or both for cooking food in the commercial and institutional food service establishments. The units may have water and drain connections for adding moisture but do not have a dedicated steam only mode.

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
- F1496 Test Method for Performance of Convection Ovens

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.

2.2 ANSI Standards:³

- ANSI/NSF 2 Food Equipment
- ANSI/NSF 4 Commercial Cooking, Rethermalization and Powered Hot Food Holding and Transport Equipment
- ANSI Z223/NFPA 70 National Electrical Code
- ANSI/UL 197 Commercial Electrical Cooking Appliances
- ANSI B1.1 Unified in. Screw Threads (UN and UNR Thread Form)
- ANSI Z21.41 Quick-Disconnect Devices for Use With
- ANSI Z21.45 Flexible Connectors of Other Than All-Metal Construction for Gas Appliances
- ANSI Z83.11 Gas Food Service Equipment
- ANSI Z1.4 Sampling Procedures and Tables for Inspection and Attributes
- ANSI/NFPA 54 National Fuel Gas Code

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

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *capacity*—the capacity of a convection oven is determined by the number of bake or sheet pans that it is designed to hold during cooking. For capacity classification, the minimum vertical clearance between each row of pans shall be 1 in. (25 mm).

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

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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

3.1.3 *moisture addition feature*—a convection oven that may have water and drain connections and is capable of adding moisture but does not have a dedicated steam only mode.

3.1.4 *oven cavity*—space within the convection oven in which food products are heated or cooked.

3.1.5 *pans*—containers used to hold the food product in the oven cavity.

3.1.5.1 *full size*—bake or sheet pan is nominally 18 by 26 by 1 in. (457 by 660 by 25 mm).

3.1.5.2 *half size*—bake or sheet pan is nominally 18 by 13 by 1 in. (457 by 330 by 25 mm).

4. Classification

4.1 Convection ovens covered by this specification are classified by type, style, size, class, grade, group, and mode. The capacity of the convection oven is determined by the number of pans to be used for the heavy-load cooking-energy efficiency test. Place the top oven rack so that it is a minimum of 2.75 in. (70 mm) from the top of the cavity. Place the bottom oven rack so that it is a minimum of 1-in. (25 mm) from the bottom of the cavity. Place the remaining oven racks in the oven such that adjacent racks are no closer than 2.75 in. (70 mm) from each other. Racks should be spaced as evenly as possible throughout the cavity. Count the number of racks. This is the maximum pan load for the heavy-load cooking tests.

4.1.1 *Type*:

4.1.1.1 *Type I*—Table or Counter top units.

4.1.1.2 *Type II*—Table or Counter top units stacked 2 high.

4.1.1.3 *Type III*—Floor Installed or Roll-In units.

4.1.2 *Style*:

4.1.2.1 *Style 1*—Electric Heated Convection Oven.

4.1.2.2 *Style 2*—Gas Fired Convection Oven.

4.1.3 *Size*:

4.1.3.1 *Size i*—Half Size.

4.1.3.2 *Size ii*—Full Size.

4.1.4 *Class*:

4.1.4.1 *Class a*—208 volts, 60 hertz, 1 phase.

4.1.4.2 *Class b*—208 volts, 60 hertz, 3 phase.

4.1.4.3 *Class c*—240 volts, 60 hertz, 1 phase.

4.1.4.4 *Class d*—240 volts, 60 hertz, 3 phase.

4.1.4.5 *Class e*—480 volts, 60 hertz, 3 phase.

4.1.4.6 *Class f*—120 volts, 60 hertz, 1 phase.

4.1.4.7 *Class g*—220 volts, 60 hertz, 3 phase.

4.1.4.8 *Class h*—230 volts, 50 hertz, 1 phase.

4.1.4.9 *Class i*—230 volts, 50 hertz, 3 phase.

4.1.4.10 *Class j*—400 volts, 50 hertz, 3 phase.

4.1.4.11 *Class k*—440 volts, 60 hertz, 3 phase (shipboard use).

4.1.5 *Grade*:

4.1.5.1 *Grade A*—Standard Depth.

4.1.5.2 *Grade B*—Extended Depth.

4.1.6 *Group*:

4.1.6.1 *Group a*—Minimum 3 half size bake sheets (for Type I, Grade A, Size i),

4.1.6.2 *Group b*—Minimum 6 half size bake sheets (for Type II, Grade A, Size i),

4.1.6.3 *Group c*—Minimum 5 full size bake sheets (for Type I, Grade A and B, Size ii),

4.1.6.4 *Group d*—Minimum 10 full size bake sheets (for Type II, Grade A and B, Size ii), and

4.1.6.5 *Group e*—Minimum 16 full size bake sheets (for Type III, Grade A, Size ii).

4.1.7 *Mode*:

4.1.7.1 *Mode 1*—With moisture addition.

4.1.7.2 *Mode 2*—Without moisture addition.

5. Ordering Information

5.1 An order for a convection oven(s) under this specification shall specify:

5.1.1 ASTM specification number and date of issue.

5.1.2 Quantity to be furnished.

5.1.3 Type.

5.1.4 Style—If Style 2, specify gas type (see 5.2.2).

5.1.5 Size.

5.1.6 Class.

5.1.7 Grade.

5.1.8 Group.

5.1.9 Mode.

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 or other (specify heating value in BTU/ft³ specific density and constituents).

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

5.2.4 *Fan Speed*—single speed or multiple speeds.

5.2.5 A cool down switch to manually override the fan shut-off referenced in 7.5.6.

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

5.2.7 *Interior Finish*—porcelain enamel or stainless steel.

5.2.8 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 convection oven.

5.2.9 When other than manufacturer's standard, commercial, domestic packaging is required, specify packaging requirements (13.1).

5.2.10 When specified:

5.2.10.1 A certification to ensure that samples representing each lot have been either tested or inspected as directed and the requirements have been met.

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

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

5.2.12 When specified, controls shall be waterproof.

5.2.13 When a drain is required for Mode 1 (4.1.7.1).