WARNING
Electrical Grounding Instructions
This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle. Do not cut or remove the grounding prong from this plug.

4.48.14
Baking and roasting ovens

Appliances provided with a flue deflector shall bear a Class II marking on which shall appear: "For installation under ventilation hood only." (See Clause 4.19.1.)

4.48.15
Fryers

A warning label(s) on Class IIIA marking material shall be located on the exterior of a fryer:

a) advising against operation of the fryer without the tipping restraint in place;
b) addressing the nature and consequences of the hazards associated with moving the fryer with liquid in the vessel and informing the user of how to avoid the hazard; and
c) fryers equipped with an oil circulating pump shall have a Class IIIA marking near the manual reset protection device for the pump, warning the operator of the possible unsafe condition that could result when resetting the device (see Clause 4.21.9).

4.48.16
Steam generators

Steam generators shall bear the statement, "Steam generator for use with food service equipment," on the name plate or on a separate plate of Class IIA marking material adjacent to the name plate.

4.48.17
Outdoor appliances, carts, and trailers

a) For a self-contained LP-gas supply system integral to the appliance, the following statement on a Class IIIA marking shall be in a prominent location "For Outdoor Use Only. If Stored Indoors, Detach and Leave Cylinder(s) Outdoors."
b) On Class IIIA marking, a statement that the LP-gas supply cylinder must be disconnected when the appliance is not in use.
c) For appliances that are for outdoor use only, a Class IIIA marking stating, "Do not locate this appliance under overhead unprotected combustible surfaces."
d) Appliances for connection to a self-contained LP-gas supply system shall bear the following marking on Class IIIA marking material:
"CAUTION: The gas pressure regulator provided with this appliance must be used. This regulator is set for an outlet pressure of ___ inches water column." (The outlet pressure specified by the manufacturer.)
e) Appliances for connection to a self-contained LP-gas supply system shall bear the following applicable statement on Class IIIA marking material located so as to be easily read:
    i) For an appliance provided with a No. 510 Cylinder Connection Device (see Clause 4.40.6-d) "The gas supply must be turned off at the LP-gas supply cylinder when this appliance is not in use."
    ii) For an appliance provided with a No. 600 Cylinder Connection Device (see Clause 4.40.6-c): "The LP-gas supply cylinder must be disconnected when this appliance is not in use."

f) Appliances for connection to a self-contained LP-gas supply system utilizing a No. 600 Cylinder Connection Device shall bear a Class IIIA marking specifying that only cylinders marked “propane” shall be used.

g) An open top appliance having an attached top cover that is not intended to be closed when the appliance is in operation, shall bear a Class IIIA marking specifying that the top cover must be open when main burner(s) is in operation.

h) A remote gas system shall have a Class IIIA label, which includes the following:
   i) The system is only to be used with the appliance that was supplied with it. The manufacturer’s name, address, and model number of the appliance shall be included.
   ii) The part number of the holder shall be stated.
   iii) Instructions specifying where the holder should be placed or not placed with respect to the appliance and general work area.
   iv) Instructions specifying how to restrain the holder, when required, and how to do so.

i) Carts or trailers sold with removable appliances shall have additional Class IIIA marking on the cart that provides the following information:
   i) Manufacturer’s name and address.
   ii) Model number of the cart or trailer.
   iii) The maximum BTU/HR input of all appliances to be installed on the unit.
   iv) The maximum number of gas cylinders the unit may carry.
   v) A unit containing LP-gas cylinder(s) and intended to be transported over city streets or highways shall be identified with a weather-resistant diamond shaped label located on a vertical or near vertical surface at the rear of the unit so that it is clearly visible. The label shall be approximately 4 $^{3}/_{4}$ in (121 mm) in length by 3 $^{1}/_{4}$ in (83 mm) in height. The marking shall consist of a border and letters “PROPANE” [1 in (25.4 mm) high centered in the diamond] of silver or white reflective luminous material on a black background (see Figure 3. Example of Vehicle Identification Marking)
   vi) The delivery pressure utilized within the unit for distribution to the appliances.

j) A marking that states where the fire extinguisher is stored if it is hidden from view. This label shall utilize 1 in (25.4 mm) high or larger red letters on a white background.

k) If the unit incorporates copper tubing for gas conduit, it shall also incorporate a statement “Not to be used, or converted for use, on natural gas.”

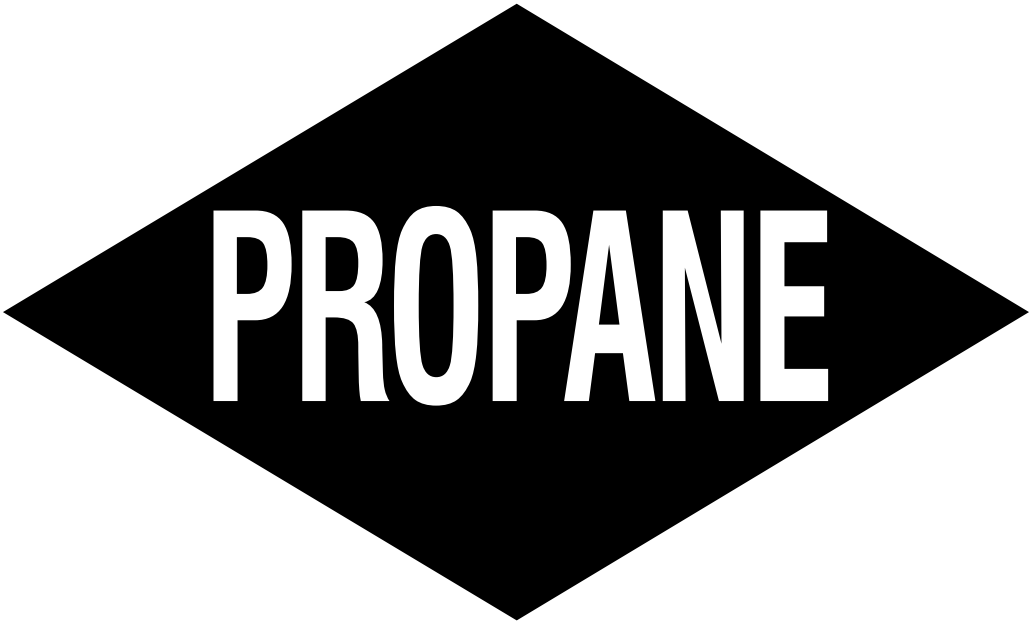
l) A Class IIIA marking on an appliance incorporating non-permanent fuel systems not to allow dirt or foreign material to get into the POL connection when it is not attached to the fuel supply system.

m) A Class IIIA marking to keep leaves, grass, and other combustible material from the area below the appliance.

n) A Class IIIA marking stating the minimum operational temperature of the appliance shall be provided. (See Clause 5.14, Wall, floor, and component temperatures.)

o) Products that utilize non-metallic flexible gas hose rated more than 140°F (60 °C) shall have a Class IV marking with the following:
   “WARNING: To reduce the risk of fire, only listed flexible non-metallic gas hose suitable for ___°F (___°C) or more shall be used as a replacement for the same temperature hose.”
   The Class IV marking shall remain on the hose after installation.

Figure 3
Example Of Vehicle Identification Marking
(See Clause 4.48.17.)



4.48.18
Clearance marking

Appliance installation clearances, as applicable, shall be clearly marked on the name plate, or on a separate Class II marking adjacent thereto, as follows:

a) If clearances for combustible and noncombustible construction are all the same, it shall be so indicated.

b) If clearances are not all the same or if the appliance is for installation in noncombustible locations only, the applicable portions of the following chart shall be used:

	Clearances	
	Combustible construction	**Noncombustible construction**
Back	___	___
Right Side	___	___
Left Side	___	___

For a tableside cooking appliance, the clearances below and above the cook top surface shall be shown, along with the clearance to the horizontal surfaces above the cook top. It shall also indicate: “Suitable for installation on combustion surfaces.”

In addition, for other than a tableside cooking appliance, one of the following shall be marked, as applicable: “Suitable for installation on combustible floors”; “For use only on noncombustible floors”; or “For use in noncombustible locations only.”

The lettering used shall be in boldfaced uppercase letter height of 0.100 in (2.54 mm).* With a minimum vertical spacing between lines of 0.066 in (1.67 mm).†

* *This letter height corresponds to 10-point type.*
† *This spacing corresponds to 2-point leaded.*

4.48.19

An appliance provided with a draft hood and complying with Clause 5.15 [(Optional) flue gas temperature] shall bear a Class II marking on which shall appear: "Suitable for connection to Type B Gas Vent when used with the draft hood provided."

An appliance provided with a draft hood and not complying with Clause 5.15 and an appliance provided with a flue collar shall bear a Class II marking on which shall appear: "Not suitable for connection to Type B Gas Vent."

4.48.20

Electrical diagrams

Electrical diagrams of all circuits within the appliance shall be attached to the appliance on a Class IV marking in a location where they are accessible during servicing of the electrical components. Millivoltage circuits connected to only a single component need not comply with this provision. Some means of color, letter, or number coding shall be used in the diagram so as to identify each circuit, and the actual wiring of the appliance shall be colored, or marked as shown in the diagram.

a) Electrical diagrams shall conform to the Standard for *Electrical and Electronics Diagrams, ANSI Y14.15*. See Annex F for reference to pertinent provisions of ANSI Y14.15. The wire color designations specified under 15-3.11 of ANSI Y14.15 are shown in Annex G.
b) Unidentified graphical symbols used for electrical diagrams shall conform to the Standard for *Graphic Symbols for Electrical and Electronics Diagrams, ANSI/IEEE 315*. See Annex H for preferred symbols of commonly used items, as extracted from the above standard. Abbreviations for identified items shall be as shown in Annex H.
c) The electrical diagram specified in "-a" shall be a connection diagram (see Clause 3, Definitions) to aid in locating components for field service. When necessary for clarification, a cycle chart or printed sequence of switching action shall accompany the connection diagram.
d) It is recommended that a schematic diagram of the ladder form (see Clause 3, Definitions) also be provided.

4.48.21

An appliance having provision for permanent connection to multiple power supplies shall bear a Class III marking located on each cover that gives access to live parts which may be connected to different circuits. This marking shall display the following statement:

"CAUTION - This appliance has more than one power supply connection point. Disconnect all power supplies before servicing."

4.48.22

An appliance rated more than 15 amperes and having an attachment plug rated less than 125 percent of the current rating of the appliance shall be marked:

"For use on individual branch circuits only: or the equivalent."

5 Performance

5.1 General

5.1.1

This Standard covers commercial food service equipment:

a) for use with natural gas;
b) for use with manufactured gas;
c) for use with mixed gas;
d) for use with propane gas;
e) for use with liquefied petroleum gases;
f) for a tableside cooking appliance only, for use with butane gas;
g) for use with LP gas-air mixtures; and
h) for use with either natural, manufactured, or mixed gas and convertible (see Clause 3, Definitions) for use with either propane gas or liquefied petroleum gases.

5.1.2

An appliance submitted for examination under this Standard shall be tested with the type(s) of gas selected by the manufacturer.

5.1.3

An appliance submitted for examination under this Standard shall be accompanied by at least one copy of all installation, operating, and servicing instructions furnished with such an appliance when sold by the manufacturer.

5.1.4

Components such as vent hoods, grease extractors, and fire extinguisher systems, which are supplied as a part of the appliance, shall comply with nationally recognized standards. (See Clause 2, Reference publications.) There shall be no evidence during any of the tests conducted that the appliance operation interferes with components or that the components interfere with appliance operation.

5.1.5

A vent limiter, when provided on a gas appliance pressure regulator, shall be in place during all performance tests.

5.1.6

Tests specified under Clauses 5.6, Pilot operating characteristics, 5.7, Automatic ignition systems, 5.8, Ignition systems, and Clause 5.12.3 shall be conducted at the pilot location tolerances specified by the manufacturer.

5.1.7

Unless otherwise specified herein, an appliance tested for compliance with this Standard shall not be connected to a vent pipe but shall depend for venting of the flue gases solely on the provisions incorporated within it. When a draft hood is provided with an appliance, it shall be attached during the conduct of the tests specified herein as it would be in service.

5.1.8

Room temperature, when specified, shall be determined by means of four 24 AWG (0.20 mm^2) iron-constantan bead-type thermocouples, the junctions of which are shielded from radiation. These thermocouple junctions shall be located so that room air temperature can be measured at points approximately 24 in (610 mm) away from the intersection of the horizontal and vertical midpoints of each of the four sides of the appliance or test enclosure. The thermocouple leads shall be connected to a temperature indicating or recording device, and room temperature shall be the average of the four individual temperature readings.

5.1.9

When a thermocouple is specified for the measurement of air, flue, or vent gas temperatures, a thermocouple or an equivalent temperature measuring device complying with the *Performance Test Codes, Supplement on Instruments and Apparatus, Part 3, Temperature Measurement, ASME PTC 19.3*, shall be used.

5.1.10

For test purposes only, an appliance marked in accordance with Clause 4.48.8, to the effect that the appliance manifold must be connected to a gas appliance pressure regulator, shall be submitted for examination furnished with a suitable gas appliance pressure regulator for attachment to the inlet of the appliance manifold.

5.1.11

Appliances designed to be combined shall be tested in the various combinations offered by the manufacturer.

5.1.12

Outdoor appliances, carts, or trailers

For commercial outdoor cooking appliances, carts, or trailers for use with a flexible hose or tubing, the tests called for in this Standard shall be conducted with the hose and/or tubing attached. Additionally, the regulators for the self-contained system shall also be provided for examination as to suitability. The supply pressure to the inlet of the hose or tubing shall be the same as will be supplied in actual usage.

5.1.13

An appliance provided with a power burner or mechanical draft which also incorporates automatic step-rate or automatic modulating controls, that provide ignition and operation at ratings less than the full input rate, shall also be tested at the minimum test input rate (see Clause 5.3.5) under Clauses 5.4.1,5.4.2, 5.5.1-a, 5.5.2, 5.5.3, 5.5.5, 5.5.7, 5.7.3, 5.7.4, and Clause 5.7.12.

An appliance provided with a power burner or mechanical draft which also incorporates automatic step-rate or automatic modulating controls, which act to reduce the input rating after ignition of the main burner gas, shall also be tested at the minimum input rate (see Clause 5.3.5) under Clauses 5.4.1, 5.4.2, 5.5.1-b, 5.5.3, 5.5.5, and Clause 5.5.7 “-b”, ”-c”, and “-d”.

5.2 Test gases

In conducting the performance tests specified herein, gases with characteristics approximately as shown in Table 5, Characteristics of test gases, shall be used.

a) An appliance for use with natural gas shall have the tests specified herein conducted with Test Gas A. Additional tests shall be conducted with Test Gas G at normal inlet test pressure with

no change whatever in the natural gas adjustments and shall comprise those tests specified in Clauses 5.5.1,5.5.2, 5.5.5, 5.6.1, 5.6.2, 5.6.5, 5.8, Ignition systems, or Clauses 5.7.3 or Clauses 5.7.16, 5.7.4 or Clauses 5.7.12, 5.7.5, and 5.7.6. Compliance with these supplemental tests does not imply that the appliance has been examined under this Standard for use with LP gas-air mixtures.

b) An appliance for use with manufactured gas shall have the tests specified herein conducted with Test Gas B.

c) An appliance for use with mixed gas shall have the tests specified herein conducted with Test Gas C.

d) An appliance for use with natural, manufactured, and mixed gases shall be tested with Test Gases A and G, as specified in Clause 5.2-a, and Test Gas B.
The tests specified in Clauses 5.4.1, 5.5, Burner operating characteristics, 5.6, Pilot operating characteristics, and Clause 5.7, Automatic gas ignition systems or Clause 5.8, Ignition systems, shall also be conducted with Test Gas C:
   i) when the appliance is equipped with different burners for natural and manufactured gas; or
   ii) when a third burner is supplied specifically for use with mixed gas. In the former case, the burner equipment employed for the mixed gas tests shall be that specified by the manufacturer.

e) An appliance for liquefied petroleum gases shall be tested with Test Gas D only, except when the appliance is equipped with separate burners or other equipment for propane and butane gases, in which case tests on the butane equipment shall be conducted with Test Gas D and on the propane equipment with Test Gas E.

f) When the appliance is for use with propane gas only, tests shall be conducted with Test Gas E only.

g) An appliance for use with LP gas-air mixtures shall have the tests specified herein conducted with Test Gas H. The tests specified in Clause 5.4.1, 5.5, Burner operating characteristics, 5.6, Pilot operating characteristics, 5.8, Ignition systems, or Clause 5.7.3 or Clause 5.7.16, 5.7.4 or Clauses 5.7.12,5.7.9 or Clause 5.7.11, and Clause 5.7.15 shall also be conducted with Test Gas F without change in the appliance except for main burner and pilot orifices and air shutter adjustment.

h) An appliance for use with either natural, manufactured, or mixed gas convertible for use with butane/propane gases shall be tested with Test Gases A and G, B, or C as specified in Clause 5.2 "-a", "-b", or "-c" and Test Gases D and E as specified in Clause 5.2-e.

i) When use with more than one type of gas is desired, the tests specified in Clause 5.9, Manual gas valves, through Clause 5.18, Mechanical draft venting, need be conducted with only one test gas provided there are no changes in the appliance or input rating for different gases which, in the opinion of the testing agency, would affect the results of these tests.

Tableside cooking appliance

j) A tableside cooking appliance for use only with a specially designed cylinder available only from the manufacturer of the appliance, and which is filled with a specific mixture of butane gases, shall be tested with the specific gas as specified and supplied by the manufacturer.

Table 5
Characteristics of test gases
(See Clause 5.2.)

	Heating value		Sp Gr
	Btu/ft³	MJ/m³	Air = 1.0
Gas A (Natural)	1075	40.1	0.65
Gas B (Manufactured)	535	19.9	0.38
Gas C (Mixed)	800	29.8	0.50
Gas D (n-Butane)	3200	119.2	2.00
Gas E (Propane HD-5)	2500	93.1	1.55
Gas F (Propane-Air)	700	26.1	1.16
Gas G (Butane-Air)	1400	52.2	1.42
Gas H (Propane-Air)	1400	52.2	1.30

5.3 Test pressures and burner adjustments

5.3.1
Unless otherwise stated, each test specified herein shall consist of a series of three tests: one at normal inlet test pressure, one at reduced inlet test pressure, and one at increased inlet test pressure as shown in Table 6, Inlet test pressures.

When an appliance pressure regulator is provided and the manifold pressure at increased inlet test pressure is not greater than the manifold pressure at normal inlet test pressure, the tests at the increased inlet test pressure need not be applied. However, tests at normal inlet test pressure shall be conducted whenever tests at increased inlet test pressure are specified.

Table 6
Inlet test pressures
(See Clauses 5.3.1 and 5.3.5.)

Test pressure — inches water column (kPa)			
Test gas	Reduced	Normal	Increased
A	3.5 (0.87)	7.0 (1.74)	10.5 (2.61)
B	3.0 (0.75)	6.0 (1.49)	9.0 (2.24)
C	3.0 (0.75)	6.0 (1.49)	9.0 (2.24)
D	8.0 (1.99)	11.0 (2.74)	13.0 (3.23)
E	8.0 (1.99)	11.0 (2.74)	13.0 (3.23)
F	3.0 (0.75)	6.0 (1.49)	9.0 (2.24)
G	3.5 (0.87)	7.0 (1.74)	10.5 (2.61)
H	3.0 (0.75)	6.0 (1.49)	9.0)2.24)

5.3.2

When the appliance is equipped with a gas appliance pressure regulator, the inlet test pressures specified in Clause 5.3.1 hall be the pressure at the inlet of the regulator. The outlet pressure shall be adjusted so that the manifold pressure is approximately that marked on the name plate.

5.3.3

Burners shall be adjusted to their Btu ratings at normal inlet test pressure, unless otherwise specified herein. When operated for 15 minutes, starting with all parts of the appliance at room temperature, the burner adjustments shall be within ± 5 percent of the manufacturer's hourly Btu input rating.*

Primary air shall be set to give a good flame at this adjustment, and neither burner ratings nor primary air adjustments shall be changed during a series of tests with any one test gas.

* *Test laboratories should make necessary input adjustments by manifold pressure adjustment and orifice sizing, if necessary, to ensure that the input is as close to the input rating as practicable [The manifold pressure shall be within ± 0.3 in wc (± 74.7 kPa) of the manufacturer's specified manifold pressure.]*

5.3.4

For testing purposes of an appliance provided with a power burner or mechanical draft that also incorporates automatic step-rate or automatic modulating controls, the minimum input rate shall be the minimum stable flame or no lower than 87 percent of the minimum input rating specified by the manufacturer.

5.3.5

Outdoor appliances, carts, and trailers

On appliances for connection to a self-contained gas supply system, the self-contained fuel system, including the cylinder regulator, shall be disconnected and gases shall be supplied directly to the inlet of the appliance hose, tubing, or inlet connection. The delivery pressure at the inlet shall be either:

a) the pressure in Table 6, Inlet test pressure, for appliances with a single stage regulator; or
b) the pressure specified by the manufacturer for two stage regulation.

The appliance shall then be tested in the same manner prescribed for an appliance for connection to a fixed fuel piping system.

5.3.6

Tableside cooking appliances

The test pressures for test purposes shall be either:

a) the reduced, normal, and increased pressure conditions correspond approximately to the vapor pressure for commercial butane at 32°F (0 °C), 77°F (25 °C), and 100°F (38 °C) ambient temperatures, respectively. (See Clause 3, Definitions – Butane.) Technical Grade Butane is not utilized for this pressure determination or testing; or
b) at the test pressures resulting from exposure of the specified fuel container to the three ambient conditions specified in "-a" above, whichever is higher. See below for test procedures to determine the pressures corresponding to the three ambient conditions.

Method of Test

Prior to the tests of the tableside cooking appliance, two samples of each different fuel cylinder specified for use with the appliance shall be tested under controlled temperature conditions using air or

water immersion to determine the resulting pressure at each temperature specified-in "-a" above. For this test, a special fitting to connect the cylinder to the pressure gauge is required.

5.4 Combustion

5.4.1

An appliance shall not produce carbon monoxide in excess of 0.08 percent in an air-free sample of the flue gases when the appliance is tested in a room having a normal oxygen supply.

Method of Test

a) Units containing water or frying compounds shall be filled to the normal level as recommended in the manufacturer's printed instructions.

b) After adjustment, the gas shall be ignited at all burners and the appliance operated at normal test pressure for approximately 15 minutes before a sample of the flue gases is secured. In the event the thermostat or operating control operates before the 15 minute period, a sample of the flue gas shall be obtained prior to the control operating, or at any other time during full rate operation as specified by the manufacturer. Two samples of flue gases shall be secured, one with the appliance operating at the reduced inlet pressure and the other at the increased inlet test pressure. Samples shall be secured between the appliance and flue outlet at least 4 in (102 mm) below the draft hood. When this method of sampling is not practical, the procedure shall be left to the discretion of the testing agency. The flue samples shall be analyzed for carbon dioxide and carbon monoxide.

c) When construction of the appliance is such that incomplete combustion might be expected to result at normal inlet test pressure, samples of the flue gases at this pressure shall also be secured and analyzed.

d) On appliances provided with a power burner or mechanical draft, an additional sample of the flue gases shall be secured with appliance operating at normal inlet test pressure and with the supply voltage reduced to 85 percent of the appliance rating plate.

e) Each top burner section, oven burner section, broiler burner section, one section placed over another, when more than one section is vented into a common flue, or any other burner combination shall be tested separately. Additional tests as are necessary to determine compliance with this provision, shall be made at the discretion of the testing agency.

f) If a flue deflector is provided, the above tests shall be repeated at the increased inlet test pressure with the flue deflector installed as it would be in service. The carbon dioxide concentration in the flue products shall not vary more than 0.5 percent from the concentration determined with the draft hood in place.

g) Ranges and broilers shall comply with the following:

   i) Open top section shall be tested with a 13 in (330 mm) diameter (bottom) pan over each burner rated at 15,000 Btu/hr (4,396 W) or more; a $9^1/_2$ in (241 mm) diameter (bottom) pan over each burner rated between 12,000 and 15,000 Btu/hr (3 517 and 4 396 W); and a $7^1/_2$ in (191 mm) diameter (bottom) pan over each burner rated 12,000 Btu/hr (3 517 W) or less.
   A suitably designed hood shall be placed over the pans on the cooking top and after the burners have been in operation long enough to start the water boiling, but not less than 15 minutes, a sample of the flue gases at each test pressure shall be secured from the hood vent.
   In the event an oven or broiler, or both, is located below the cooking top, an additional combustion test at increased inlet test pressure shall be conducted on the top burners with the oven and broiler in operation. For this test, the oven and broiler burners and top burners shall be placed in operation at the same time.

