



ANSI Z21.1b-2012

**Addenda to the Twenty-Ninth Edition of
ANSI Z21.1-2010 and Addenda Z21.1a-2011
Household cooking gas appliances**



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Preface

The standards set forth herein apply to the twenty-ninth edition of the Standard for Household Cooking Gas Appliances, ANSI Z21.1-2010 and Addenda Z21.1a-2011, and supersede corresponding standards therein. Following their preparation by the supervising Technical Advisory Group, they were accepted by the American National Standards Institute (ANSI) and the Interprovincial Gas Advisory Council (IGAC), and subsequently approved.

NOTE: Changes, other than editorial, are denoted by a vertical line in the margin.



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Standard Developer

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Addenda to the Standard for Household cooking gas appliances

Part II: Performance

2.4 Combustion*

2.4.1

An appliance shall not produce a concentration of 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 approximately a normal oxygen supply.

During combustion tests of a built-in unit, all cracks related to installation (other than designed air openings) shall be sealed.

For ranges or cooktops intended for use in conjunction with a ventilation system with provisions to direct air in a downward direction combustion testing shall be performed on any enclosed compartment (oven or broiler), specialty top section burners which operate automatically such as thermostatically controlled griddles, open top broilers, or any other burner hidden from view of the operator. After the burners have been in operation for 5 minutes under Test Conditions 2 and 3 in Table X, Gas Pressure and Input Conditions for Use in the Various Performance Tests, samples of the flues gases shall be procured and analyzed for CO and CO₂. During these tests no test pots shall be placed on the open top burners and no 75 percent coverage plate shall be used over the open top broiler.

For ranges incorporating a pyrolytic self clean feature and intended for use in conjunction with a ventilation system with provisions to direct air in a downward direction, an additional series of tests as noted above shall be conducted with the oven operating at the manufacturer's specified self clean temperature.

Method of Test

Burners shall be adjusted as specified in 2.3.5. Thermostats shall be set at their maximum open position after they have been adjusted as specified in 2.11, Thermostats.

- a. For top burners a flat-bottom utensil as shown in Figure 7, Range Top Burner Test Utensil, containing 5 lb of water (2.3 kg) (± 1 percent) at approximately room temperature shall be placed over each top burner. Burners that are elongated in shape or intended for use with elongated pans shall be tested with the test pot defined for 2.17, Evaluation of Clothing Ignition Potential containing 5 lb of water (2.3 kg) (± 1 percent) at approximately room temperature. A means shall be used with a mechanism to evacuate the steam vapor from the collection hood.

* For additional information on the Specified 800 ppm CO allowable, please refer to Gas Research Institute (GRI) Topical Report, GRI-96/0270, "Critique of ANSI Z21.1 Standard for CO Emissions from Gas-Fired Ovens and Ranges."

A suitably designed hood shall then be placed on the cooking top. Oven burners, broiler burners and any other gas-fired and electrical cooking sections, capable of simultaneous operation, if incorporated in the appliance, shall be placed in operation simultaneously with the top burners and shall be operated during the time the samples of flue gases from the top burners are being secured. After the top burners have been in operation for 5 minutes under Test Conditions 2 and 3 in Table X, Gas Pressure and Input Conditions for Use in the Various Performance Tests, samples of the flue gases shall be secured from the hood vent and analyzed for carbon monoxide and carbon dioxide.

- b. Wok burner(s) shall be tested with the maximum size wok pan(s) possible to be installed or the manufacturer's specified maximum size wok pan(s). The wok pan(s) shall be filled to 80 percent capacity with water at approximately room temperature. A suitable designed combustion hood, if available, with adjustable legs shall then be placed on the cooking top over the wok(s) burner and if applicable adjacent burner. Oven burners, broiler burners and any other gas fired and electrical cooking sections, capable of simultaneous operation, if incorporated in the appliance, shall be placed in operation simultaneously with wok burner(s) and shall be operated during the time the samples of flue gases from the wok burner are being secured. After the wok burner(s) have been in operation for 5 minutes under test conditions 2 and 3 in Table X, Gas Pressure And Input Conditions For Use In The Various Performance Tests, samples of the flue gases shall be secured from the hood, if used, or around the wok pan and analyzed for carbon monoxide and carbon dioxide.
- c. An additional test under Test Condition 3 in Table X, Gas Pressure And Input Conditions For Use In The Various Performance Tests, shall be conducted on top burners. During this test, other burners shall not be in operation. On appliances for use with natural, manufactured and mixed gases, or natural and mixed gases, this test need be conducted with test Gas A only. On appliances for use with LP-gas, this test need be conducted with test Gas E only. (See 2.2-e.)

Two adjacent top burners shall be covered as symmetrically as possible with cast-iron griddle plates $9\frac{1}{2}$ in (241 mm) in diameter having the bottom recessed $\frac{3}{16}$ in (4.8 mm) with approximately a $\frac{1}{8}$ in (2 mm) wide lip. (See Figure 9, Griddle Plate Used in Combustion Test.) When a burner having an input rating of 12,000 Btu/hr (3 517 W) or more is provided, it shall be one of those covered by the griddle plates. A $7\frac{1}{2}$ in (191 mm) diameter (bottom) water-filled utensil shall be placed on each of the griddle plates and over each of the remaining top burners.

A combustion hood, provided with adjustable legs, shall be placed on the cooking top so it covers the utensils placed over all of the top burners. When there are 6 top burners or 2 pairs of burners on a divided top unit, more than one combustion hood may be used. With the edge of the combustion hood(s) located at least 5 in (127 mm) above the cooking surface, the flames shall be observed. The hood(s) shall then be lowered in small increments, preferably $\frac{1}{2}$ in (12.7 mm), while constant observation of the flames is maintained. As soon as any noticeable change in the character of the flames occurs, the hood shall be raised $\frac{1}{2}$ in (12.7 mm). With the hood at this height, a sample of the flue gases shall be secured from the outlet of the hood and analyzed for carbon dioxide. The outlet area of the hood may be gradually reduced to obtain as high a carbon dioxide percentage as possible without altering the flame characteristics.

After the top burners have been in operation for 5 minutes, a sample of the flue gases shall be secured from the hood vent and analyzed for carbon monoxide and carbon dioxide, and when more than one hood is used, an averaging sample from the hood vents shall be secured and analyzed.

Additional tests shall be conducted when deemed necessary with the plates covering other combinations of any two adjacent burners.

- d. When the construction of the utensil supports is such that they can be positioned so as to cause the burner flames to impinge on the utensil support bars, the top burner tests shall be conducted with the utensil supports in that position.