



**Summary of Substantive Changes
between the 2011 and the 2013 editions of
ANSI Z21.10.3/CSA 4.3 “Gas-fired water heaters, volume III,
storage water heaters with input ratings above
75,000 Btu per hour, circulating and instantaneous”**

Presented to the IAPMO Standards Review Committee on June 9, 2014

General: The changes to this standard might have an impact on currently listed products. The significant changes are:

- Removed mandatory use of Type T wire and 18 AWG (minimum) wire as long as the wires comply with the temperature requirements (see Section 4.27).
- Added a test method to cover appliances that incorporate combustion air intake openings in addition to the outdoor combustion air duct (see Section 5.21).
- Added a performance requirement limiting the entrance of water into electric enclosures (see Section 5.30).
- Added general construction requirements for non-metallic tubing for items unique to the United States (see Section 7.5).

Revised title as follows:

Gas fired water heaters, volume III, storage water heaters, with input ratings above 75,000 Btu per hour, circulating and instantaneous

Section 4.27 (formerly Section 1.28) Electrical equipment and wiring: Removed requirements specifying the use of Type T and minimum 18 AWG wire as follows:

Wiring to be done in the field between the water heater and devices not attached to it, or between separate devices which are field-installed and located, shall conform with ~~the temperature limitation for Type T wire [63°F (35°C) rise]~~ a wire temperature limitation of 63°F (35°C) rise when installed in accordance with the manufacturer's instructions.

Line-voltage wiring exterior to an appliance between the burner assembly and a temperature control, that can be done readily with ~~Type T~~ wire enclosed in approved conduit, or with approved metal-clad cable in accordance with this standard, need not be furnished by the manufacturer as part of the appliance if adequate instructions for installing such wiring are furnished with each appliance.

~~1.28.24.27.2~~

Electrical equipment and line-voltage and safety-circuit wiring supplied for use with and as a part of a water heater shall be of approved types and shall also be judged with respect to their suitability for the particular application, or shall be tested as an integral part of and with the appliance. All other low-voltage wiring shall be suitable for the application ~~and shall not be less than No. 18 AWG (0.82 mm²) with neoprene, thermoplastic or equally durable insulation with a minimum thickness of 0.012 in (0.305 mm).~~



~~1.28.14~~ [4.27.14](#)

~~1.28.15~~

~~Wiring shall be done with insulated conductors having voltage and temperature ratings consistent with their use. A conductor, other than an integral part of a component, shall be not smaller than No. 18 AWG (0.82 mm²).~~

~~1.28.16~~ [4.27.15](#)

Section 5.21 (formerly Section 2.21), Draft tests for water heaters equipped with power burners: Added a test method to cover appliances that incorporate combustion air intake openings in addition to the outdoor combustion air duct as follows:

The construction of a water heater equipped with a power burner or operating under forced or induced draft shall be such that its performance is not impaired by chimney drafts or ~~chimney stoppage obstructions in the exhaust venting system or outdoor air inlet~~. This provision...

~~2.21.1~~ [5.21.1](#)

With the ~~flue outlet or outlet of the draft diverting device, if one is provided,~~ [following blocked](#) to any degree up to and including...

Method of test

[a\)](#) The appliance shall be operated at...

[b\)](#) If the appliance incorporates combustion air intake openings in addition to the outdoor combustion air duct, these shall not be blocked during these tests.

The appliance shall be operated at normal test pressure and maximum vent length for at least 15 minutes. When the appliance incorporates a control to automatically shut off the main gas supply under blocked air inlet conditions, the area of the air inlet shall be gradually decreased to the lowest point at which the control will allow main gas flow including tolerances as specified by the manufacturer. The minimum operating point of the control shall be specified by the manufacturer. The minimum operating point of the control shall be recorded. A sample of the flue gases shall then be secured and analyzed as specified in Clause 5.4.1.

When the appliance does not incorporate a control to automatically shut off the main gas supply under blocked air inlet conditions, the area of the air inlet shall be completely closed off and a sample of the flue gases secured and analyzed as specified in Clause 5.4.1. In case of outage, the blocked condition shall be maintained for 3 minutes to allow for operation of safety devices, and then removed and observation made.

Section 5.30 (formerly Section 2.30), Rain tests: Revised the test procedure and added a performance requirement limiting the entrance of water into electric enclosures as follows:

~~2.30.1~~ [5.30.1](#)

Method of test



After adjustment of the spray head unit, the rain test apparatus shall be operated for a period of 15 minutes. The main burner(s) shall then be placed in operation and the rain test apparatus operated for an additional 15 minutes.

~~The above test procedure shall be repeated with the appliance located in any other position(s) with respect to the spray heads deemed necessary by the testing agency.~~

The appliance shall function normally during exposure to the simulated rainstorm. Upon completion of exposure to the simulated rainstorm, there shall be no evidence of damage or malfunctioning of any part of the appliance, nor detrimental accumulation of water in any part of the appliance. The test is not to result in the entrance of water into any electric enclosure above the lowest live part or in wetting live parts, except motor windings may be judged by the dielectric strength test provided the motor(s) is constructed, located or shielded so the windings are not directly exposed to water.

Section 7 (Formerly Section Exhibit D), Items unique to the United States: Added general construction requirements for non-metallic tubing as follows:

7.5 General construction and assembly

7.5.1

Non-metallic tubing used in a water heater providing a connection to a control component shall be suitable for the application and the temperatures to which exposed in service and shall not show evidence of deterioration when the water heater is tested as specified in Clause 5.16. If the non-metallic tubing is connected to the atmospheric side of a component that can introduce fuel gas into the tubing under a failure condition, the amount of gas released into the tubing shall not exceed a flow rate of 2.5 ft³/hr (19.6 cm³/s) for natural gas, and 1.0 ft³/hr (7.9 cm³/s) for propane gas.