



**Summary of Substantive Changes  
between the 2015 and the 2017 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 September 10, 2018**

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

- Clarified that some requirements are specific to water heaters with injection burners (see Sections 4.5, 4.7 and 4.30).
- Changed the requirement for Non-metallic dip tubes, from compliance with NSF 14 to compliance with ANSI Z21.98/CSA 4.10 (see Section 4.13.2).
- Revised the marking requirements indicating a water heaters maximum operating temperature (See Section 4.31).

Section 2, Reference publications: The following standards were added, revised or deleted as follows:

**CSA Group**

**Note:** CGA Standards, Recommended Practices, and Codes are published by CSA Group.

CSA 6.6-M78 (~~R2012~~) (R2016) Gas Appliance Thermostats

ANSI Z21.15-2009(R2014) • CSA 9.1-2009(R2014) Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves

ANSI Z21.18-2007(~~R2012~~R2016) • CSA 6.3-2007(~~R2012~~R2016) Gas Appliance Pressure Regulators

ANSI Z21.20-2005(~~R2012~~R2016), Addenda Z21.20a-2008(~~R2012~~R2016) Automatic Gas Ignition Systems and Components

ANSI Z21.21-~~2012~~2015 • CSA 6.5-~~2012~~2015 Automatic Valves for Gas Appliances

ANSI Z21.22-~~1999~~(R2008) 2015 • CSA 4.4-~~M99~~(R2008) 2015, Addenda Z21.22a-2000 (R2008) • ~~CSA 4.4a-2000~~ Relief Valves for Hot Water Supply Systems

ANSI Z21.23-2010(R2015) Gas Appliance Thermostats

ANSI Z21.66-~~1996~~(R2012)2015 • CSA 6.14-~~1996~~(R2012)2015 Automatic Vent Damper Devices for Use with Gas-Fired Appliances

ANSI Z21.78-2005(~~R2010~~R2015) • CSA 6.20-2005(~~R2010~~R2015), and Addenda ANSI Z21.78a-

2007(~~R2010~~R2015) • CSA 6.20a-2007(~~R2010~~R2015) and ANSI Z21.78b-2008(~~R2010~~R2015) • CSA 6.20b-2008(~~R2010~~R2015) Combination Gas Controls for Gas Appliances

ANSI Z21.87-2007(~~R2012~~R2016) • CSA 4.6-2007(~~R2012~~R2016) Automatic Gas Shutoff Devices for Hot Water Supply Systems

**ASME International**

ANSI/ASME B1.20.1-~~1983~~(R2006)2013 Pipe threads, General Purpose (Inch)

ANSI/ASME B18.2.2-~~2010~~2015 Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)

ASME B36.10M-~~2004~~(R2010)2015 Welded and Seamless Wrought Steel Pipe



**ASTM International**

ASTM B499-2009(R2014) Standard Test Method for Measurement of Coating Thickness by the Magnetic Method: Nonmagnetic Coatings on Magnetic Basis Metals

ASTM B504-1990(R2011) Standard Test Method for Measurement of Thickness of Metallic Coatings by the Coulometric Method

ASTM D2661-1114 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings

**UL (Underwriters Laboratories Inc.)**

~~ANSI/UL 275-2013 Automotive Glass Tube Fuses~~

Section 4.5, Burners; Revised the requirements to permit satisfactory visual observation of main burner flames to emphasize injection burners as follows:

**4.5.8**

For water heaters with an injection burner(s) or when the instructions provided with the appliance specify visual observation of the main burner flame for adjustment, ~~Provision shall be made to permit satisfactory visual observation (direct or indirect) of main burner flames and pilot(s) during adjustment and under operating conditions with the combustion chamber door in place.~~

**4.5.9**

When a direct vent water heater has flame observation ports ~~of direct vent water heaters,~~ they shall be constructed of heat-resistant material and, unless located within the cabinet casing, shall be protected from mechanical damage. Glass, if used, shall be framed and of not less than 1/8 in (3.2 mm) thickness.

Section 4.7, Primary air adjustment means: Clarified that the following primary air adjustment means are specific to injection burners:

**4.7.2**

Primary air adjustment means, when provided on main injection burners, shall be designed so as to give a yellow-tipped flame when adjusted for minimum primary air.

Section 4.13, Dip tubes: Changed the requirements for Non-metallic dip tubes as follows:

**4.13.2**

~~Non-metallic dip tubes shall be accompanied by evidence acceptable to the testing agency that the material is suitable for the service, particularly with respect to toxicity, solubility, brittleness, temperature limits, etc~~ comply with the Standard for Non-metallic dip tubes for use in water heaters, ANSI Z21.98 • CSA 4.10.

~~Evidence of current certification under Standard NSF 14, Plastics Piping System Components and Related Materials, with appropriate end use shall be deemed acceptable.~~



Section 4.30, Instructions: Updated the maintenance instruction requirements for visual observation of main burner flames including an emphasize on injection burners as follows

**4.30.2**

*Each water heater shall be accompanied by clear, concise printed instructions and diagrams, stated in terms clearly understandable to the consumer and adequate for the proper field assembly, installation, maintenance, safe use, and operation of the appliance.*

...  
...

*Instructions shall bear the seal or symbol of the testing agency.*

*The instructions shall include:*

*a) Assembly instructions for field-installed parts and components, including all controls and accessories (when applicable).*

*b) Installation instructions indicating:*

...  
...

*c) Maintenance instructions (including recommended frequency guidelines) suggesting:*

*i) lubrication of moving parts (when applicable), including type and amount of lubricant.*

*ii) periodic examination of venting systems;*

*iii) information covering the cleaning of the burner(s);*

*iv) periodic visual check of pilot and burner flames by comparison with pictorial sketches or drawings [for water heaters with an injection burner\(s\) and when the instructions provided with the appliance specifies visual observation of the main burner flame for adjustment;](#)*

*v) keeping appliance area clear and free from combustible materials, gasoline, and other flammable vapors and liquids;*

*vi) not obstructing the flow of combustion and ventilation air;*

*vii) if the water heater manufacturer's instructions recommend manual operation of the relief valve, the instructions shall also provide information to the user regarding precautions that must be taken prior to operating the relief valve to avoid contact with hot water coming out of the relief valve and to prevent water damage; and*

*viii) if a relief valve discharges periodically, this may be due to thermal expansion in a closed water supply system. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the relief valve.*

*d) Lighting and shutdown instructions as specified in Clauses 4.31.5 and 4.31.8, including sketches or diagrams.*

*e) If a thermostat is provided that can be adjusted without the use of tools, thermostat information to the effect that:*

Section 4.31, Marking: Revised the marking requirements indicating a water heaters maximum operating temperature as follows:

**4.31.16**

*Unless the thermostat dial has temperature markings, water heaters, with the exception of booster water heaters, intended to deliver outlet water at a temperature in excess of 160 °F (71 °C) shall have a Class IIIA marking as follows: "[Designed](#) for operation at outlet water temperature(s) not in excess of ~~180 °F (82 °C)~~, or "~~For operation at outlet water temperature(s) not in excess of 190 °F (88 °C)~~        °F (       °C)," where the marked temperature represents the maximum setting of the water heater's [thermostat.](#)*



Section 8, Items unique to Canada: Included additional referenced standards for compliance of pilot burners and safety shutoff devices as follows:

**8.7 Pilot burners and safety shutoff devices**

*In Canada, pilot burners and safety shutoff devices utilizing low, extra low, or high voltages, shall conform to the applicable construction and performance provisions of the current edition of CSA C22.2 No. 199, Combustion Safety Controls and Solid State Igniters for Gas and Oil Burning Equipment, [ANSI Z21.20](#) • [CSA C22.2 No. 60730-2-5, Automatic electrical controls for household and similar use — Part 2-5: Particular requirements for automatic electrical burner or UL 60730-2-5, Automatic electrical controls for household and similar use — Part 2-5: Particular requirements for automatic electrical burner](#) .*