



**Summary of Substantive Changes  
between  
the 2018 and 2019 editions of  
ANSI LC 1 • CSA 6.26 “Fuel gas piping systems using corrugated  
stainless steel tubing”**

**Presented to the IAPMO Standards Review Committee on April 20, 2020**

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

- Added a requirement for CSST installers to be qualified to the manufacturer’s training program (see Section 4.7)
- Addition of Annex B for installer training (see Annex B)
- Reference standards were added, deleted or updated to current editions (see Section 2).
- Added requirements for French language marking when applicable and added requirements to include marking for “CSST” factory coils (see Sections 4.8, and Section 7).

Section 1, Scope: Added note for clarifying the use of metric units as follows:

**1.11**

*If a value for measurement as given in this Standard is followed by an equivalent value in other units, the first stated value is to be regarded as the specification.*

*Note: This Standard contains SI (metric) units corresponding to the yard/pound quantities, the purpose being to allow this Standard to be used in SI (metric) units. IEEE/ASTM SI 10, American National Standard for Metric Practice, or ISO 80000-1, Quantities and units — Part 1: General, is used as a guide in making metric conversion from yard/pound quantities. If a value for a measurement and a corresponding value in other units are both specified as a quoted marking requirement, the first stated unit, or both, are to be provided. Given corresponding values might be approximate.*

**1.12**

*Clause 7 contains provisions that are unique to Canada.*

**1.13**

*Clause 2 contains a list of standards specifically referenced in this Standard.*

Section 2, Reference publications: Reference standards were added, deleted or updated as follows:

**CSA Group**

*ANSI Z21.15-2009 (R2014) • CSA 9.1-2009 (R2014), ANSI Z21.15a-2012 (R2014) • CSA 9.1a-2012 (R2014);  
and ANSI Z21.15b-2013 (R2014) • CSA 9.1b-2013 (R2014)*

*Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves*

*ANSI Z21.18-2007 (R2016) • CSA 6.3-2007 (R2016)*

*Gas Appliance Pressure Regulators*

*ANSI Z21.80-2011 (R2016) • CSA 6.22-2011 (R2016)*

*Line Pressure Regulators*

*CSA 3.11-15*



~~Lever Operated Pressure Lubricated Plug Type Gas Shut-Off Valves~~  
~~CSA 3.16-15~~

~~Lever Operated Non-Lubricated Gas Shut-Off Valves~~

~~CGA CR91-2002~~

~~Manually Operated Gas Valves for Use On Piping~~

~~CSA C22.1-15 [18](#)~~

~~Canadian Electrical Code, Part I~~

~~CSA America, Inc., Requirement 3-88~~

~~Manually Operated Gas Valves for Use in House Piping Systems~~

### **ASTM International**

~~ASTM B117-11 [18](#)~~

~~Standard Practice for Operating Salt Spray (Fog) Apparatus~~

~~ASTM E84-15a [19a](#)~~

~~Standard Test Method for Surface Burning Characteristics of Building Materials~~

### **ASME International**

~~ANSI/ASME B1.20.1-2013 [\(R2018\)](#)~~

~~Pipe Threads, General Purpose (Inch)~~

~~ANSI/ASME B16.33-2012~~

~~Manually Operated Metallic Gas Valves for use in Gas Piping Systems up to 125 psig~~

### **[IAPMO \(International Association of Plumbing and Mechanical Officials\)](#)**

[IAPMO/ANSI UPC 1-2018](#)

[Uniform Plumbing Code](#)

### **International Code Council**

~~ICC/ANSI 2.0-[1998](#)~~

~~Manufactured Housing Construction and Safety~~

### **[IEEE \(Institute of Electrical and Electronics Engineers\)/ASTM International](#)**

[IEEE/ASTM SI 10-2016](#)

[American National Standard for Metric Practice](#)

### **[ISO \(International Organization for Standardization\)](#)**

[80000-1:2009](#)

[Quantities and units — Part 1: General](#)

### **National Fire Protection Association**

~~NFPA 501A-2017/[ANSI A225.1-2017](#)~~

~~Standard for Fire Safety Criteria for Manufactured Home Installations, Sites, and Communities~~

### **Underwriters Laboratories of Canada**

~~CAN/ULC-S102-[1988](#) [2018](#)~~

~~Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies~~



Section 4, Construction: Editorially revised language for clarification as follows:

#### 4.1.3

The manufacturer shall ~~furnish~~ provide evidence acceptable to the testing agency concerning the composition of the materials used in all components of the piping system.

**Exception Note:** Such evidence is not required for listed components such as gas pressure regulators, manual gas valves, and quick-disconnect devices.

#### 4.2 General

##### 4.2.1

The construction of parts not specifically covered by this Standard shall be in accordance with ~~reasonable~~ industry-accepted concepts of safety, substantiality, and durability.

Section 4.7, Instructions: Added a requirement for CSST installers to be qualified to the manufacturer's training program as follows:

#### 4.7 Instructions

Complete detailed instructions, including appropriate illustrations, necessary for proper sizing, installation, inspection, and repair of the piping system shall be provided by the manufacturer. These instructions shall be included in a printed design and installation manual to be provided with the piping system. The manual shall include instructions on all topics and in the exact prescribed format shown in Annex A.

~~Included in~~ The instructions shall be include the following (or equivalent) statements to the effect that and the following requirements:

a) The CSST installer shall be qualified to the manufacturer's training program (see Annex B).

.....

Section 4.8, Marking: Added a requirements for French language marking when applicable and added requirements to include marking for "CSST" factory coils as follows

#### 4.8.2

Tubing shall bear the following permanent markings:

a) rated pressure of 5 lb/in<sup>2</sup> or 25 lb/in<sup>2</sup> (34.5 kPa or 172.5 kPa);

b) the equivalent hydraulic diameter (EHD) (see Clause 5.10.3);

c) the words "FUEL GAS"\*;

\*The equivalent French wording is "GAZ COMBUSTIBLE".

d) the words "Arc-resistant"\* or acronym "AR" for CSST design-certified to the requirements in Clause 5.16; and

\*The equivalent French wording is "Résistant à l'arc".

e) identification with the following marking:

"CSA/ANSI LC 1 • CSA 6.26(:year)".

#### 4.8.4

Each factory coil of CSST shall bear a marking stating that the CSST must be installed by a manufacturer's qualified installer.



#### **4.9 Installer training**

~~The manufacturer shall establish and maintain an installer training program and a database of installers who have completed the manufacturer's training requirements. An identification card shall be supplied to each installer who has completed the manufacturer's training requirements, and a record of the installer's contact data shall be maintained in the database. The identification card shall include the following information:~~

- ~~a) CSST manufacturer's name and telephone number;~~
- ~~b) CSST product(s)/brand(s) covered by training;~~
- ~~c) unique serial number for the identification card (recorded in database);~~
- ~~d) installer's name and the date of training or card issuance (recorded in database); and~~
- ~~e) statement that the named installer has completed the manufacturer's training program to install —[insert manufacturer's name or brand] CSST.~~

Section 5.4.3, Torsion:

#### **5.4.25.4.3 Torsion**

##### **5.4.3.1.2 Method of test**

A section of tubing whose length is 69 times its actual internal diameter shall be used for this test. Connections to the tubing shall be made using appropriate fittings and according to the manufacturer's installation instructions.

One end of the tubing shall be securely attached to a rigid frame and the tubing loaded in tension. The load in pounds shall be 50 times the actual internal diameter of the tubing in inches.

For example, for tubing with an actual internal diameter of 0.59 in (15 mm), the length of the test specimen would be 40.7 in ( $69 \times 0.59 = 40.7$ ) [1033 mm ( $1752.6 \times 0.59 = 1033$ )], and the test load would be 29.5 lb ( $50 \times 0.59 = 29.5$ ) [64.9 kg ( $110 \times 0.59 = 64.9$ )].

Section 5.16.4, Resistance to installation damage:

#### **5.16.4.1 General**

Tubing and jacket assemblies shall withstand damage from friction/wear in a simulated drag-zone installation without excessive damage to the jacket in accordance with Clause 5.16.4.2.

Upon completion of the pull test, the tubing and jacket shall be inspected for physical damage. Any tearing or ripping of the jacket exposing the underlying stainless steel tubing indicates non-compliance with this requirement.

#### **5.16.4.2 Method of test**

.....

~~Upon completion of the pull test, the tubing and jacket shall be inspected for physical damage. Any tearing or ripping of the jacket exposing the underlying stainless steel tubing indicates non-compliance with this requirement.~~



Section 7, Items unique to Canada: New marking requirements were added as follows:

**7.1**

*All markings and instructions required by this Standard shall be provided in a form that is easily understood in both the English and French languages.*

| <b>Clause number</b> | <b>English</b>       | <b>French</b>            |  |
|----------------------|----------------------|--------------------------|--|
| <b>4.8.2c)</b>       | FUEL GAS             | GAZ COMBUSTIBLE          |  |
| <u>4.8.2d)</u>       | <u>Arc-resistant</u> | <u>Résistant à l'arc</u> |  |

Table 1a, Minimum capacity of CSST in cubic feet per hour for gas pressure of 0.5 psig and a pressure drop of 0.5 in WC (based on 0.60 specific gravity gas)\*:Also revised in Table 1b and Table 1c.

*\*Table includes losses for four 90° bends and two end fittings. Tubing runs with larger numbers of bends and/or fittings shall be increased by an equivalent length of tubing according to the following equation:*

$$L = 1.3n$$

where

*L = additional length (ft) of tubing*

*n = the number of additional fittings and/or bends*

*† ~~EHD — Equivalent Hydraulic Diameter — A measure of the relative hydraulic efficiency between different tubing sizes.~~ The greater the value of EHD, the greater the gas capacity of the tubing.*

**Note:** *For use only by testing laboratory to validate assigned EHD value.*

Figure 3, Experimental set-up for capacity measurements of test data: Additional Legend definitions added to Figure.

Figure 7, Illustration bending: Figure 7a - Step one and 7b -Step two have been combined into one figure. No additional changes have been made to these figures.

Annex A (normative), Minimum design and installation manual requirements: Annex A is now considered normative and is a mandatory part of this standard. The following has been added:

**A.1**

*A printed design and installation manual shall be provided with the piping system (see Clause 4.7). The manual shall include instructions on all topics and in the exact prescribed format shown below:*



Annex B (normative), Installer training: New Annex for installer training was added as follow

Note: This Annex is a mandatory part of this Standard.

**B.1**

The manufacturer shall establish and maintain an installer training program and a database of installers who have completed the manufacturer's training requirements. An identification card shall be supplied to each installer who has completed the manufacturer's training requirements, and a record of the installer's contact data shall be maintained in the database. The identification card shall include the following information:

- a) CSST manufacturer's name and telephone number;
- b) CSST product(s)/brand(s) covered by the training;
- c) unique serial number for the identification card (recorded in the database);
- d) installer's name and the date of training or card issuance (recorded in the database); and
- e) statement that the named installer has completed the manufacturer's training program to install [insert manufacturer's name or brand] CSST.