ANSI LC 1-2018 • CSA 6.26-2018

CSA Group

Fuel gas piping systems using corrugated stainless steel tubing

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Revision History

ANSI LC 1-2018 • CSA 6.26-2018, Fuel gas piping systems using corrugated stainless steel tubing

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Fuel gas piping systems using corrugated stainless steel tubing

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International Gas Advisory Council

CSA Group

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Preface

This is the fifth edition of ANSI LC 1 • CSA 6.26, *Fuel gas piping systems using corrugated stainless steel tubing*. It supersedes the previous editions published in 2016, 2014, 2005, and 1997.

This Standard was prepared by the LC1/CSA Joint Technical Sub-Committee on Standards for Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing under the jurisdiction of the Technical Committee on Gas Appliances and Related Accessories, the Z21/83 Technical Committee on Performance and Installation of Gas Burning Appliances and Related Accessories, and the Strategic Steering Committee on Standards for Fuel Burning Appliances, and has been formally approved by the Technical Committee(s), American National Standards Institute, and the Interprovincial Gas Advisory Council.

Interpretations: The Strategic Steering Committee on Standards for Fuel Burning Appliances has provided the following direction for the interpretation of standards under its jurisdiction: "The literal text shall be used in judging compliance of products with the safety requirements of this Standard. When the literal text cannot be applied to the product, such as for new materials or construction, and when a relevant committee interpretation has not already been published, CSA's procedures for interpretation shall be followed to determine the intended safety principle."

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3) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
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History of the development of ANSI LC 1-2018 • CSA 6.26-2018

Note: *This history is informative and is not part of the standard.*

In 1983, the Gas Research Institute (GRI) initiated its "Residential/Commercial Piping Program." This research and development effort was aimed at identifying and developing innovative building piping systems and materials as a viable alternative to conventional rigid black iron piping.

One of the most promising concepts that emerged from the GRI project was a piping system using semi-flexible, corrugated stainless steel tubing in conjunction with elevated gas pressures (up to 5 psig). This system offered several advantages over rigid black iron piping systems, including ease and speed of installation, elimination of the need for precise on-site measuring, cutting and threading of piping sections, and elimination of the need for certain fittings such as elbows, tees and couplings. A disadvantage was increased flow resistance imposed by the tubing corrugations and smaller internal diameters. This resulted in the requirement for higher system pressures and an additional gas pressure regulator upstream of equipment requiring lower supply pressures.

In November 1986, Foster-Miller Inc., a GRI contractor assigned to the piping system project, requested the American Gas Association (A.G.A.) Laboratories to develop construction and performance criteria for use as the basis for a third party certification program for corrugated stainless steel piping systems. This work was undertaken and, on September 8, 1987, the "A.G.A. Requirements For Natural Gas Piping Systems Using Corrugated Stainless Steel Conduit," No. 1-87 was published.

A.G.A. 1-87 was developed with input from Foster-Miller Inc. who had conducted numerous testing programs and gained considerable experience with these types of piping systems as part of the GRI project. Information was also drawn from existing ANSI standards, such as Z21.24, which cover similar types of products. Safety issues, such as potential damage to the tubing caused by bending, stretching, torquing, crushing or impacting, and accidental puncturing of concealed tubing, were given prime consideration in developing the construction and performance criteria contained in this document. Emphasis also was placed on comprehensive instructions to guide the installer through proper step-by-step installation and check-out procedures.

A.G.A. 1-87 was referenced in the fourth edition of the *National Fuel Gas Code, ANSI Z223.1*, as a recognized document for testing and listing corrugated stainless steel gas piping systems.

As interest in using these piping systems increased, there was some reluctance by local code authorities to accept systems not covered by a nationally recognized safety standard. Consequently, the A.G.A. Laboratories, in August 1989, applied to the American National Standards Institute (ANSI) for recognition as an approved sponsor under the canvass method for developing ANSI standards. On December 8, 1989, the A.G.A. Laboratories was approved by ANSI as a canvass sponsor. Consequently, A.G.A. 1-87 was retitled as proposed "American National Standard for Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing, AGA LC 1, and was distributed to all known interested parties for comment in accordance with the ANSI procedures for standards development under the canvass method.

The first edition of the Standard for Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing was approved by the American National Standards Institute, Inc., on January 25, 1991.

With the onset of the Free Trade Agreement between the United States and Canada on January 2, 1988, significant attention was given to the harmonization of the United States and Canadian safety standards addressing gas-fired equipment for residential, commercial and industrial applications. It was believed that the elimination of the differences between the standards would remove potential trade barriers

and provide an atmosphere in which North American manufacturers could market more freely in the United States and Canada. The harmonization of these standards was also seen as a step toward harmonization with international standards. Joint subcommittees were established to facilitate the standards harmonization process between the United States and Canada.

The harmonized draft standard was based on coverage from the first edition of ANSI/AGA LC 1-1991, and Addenda, LC 1a-1993, and LC 1b-1994.

The harmonized draft standard was processed under the ANSI Canvass method with a final ballot on its acceptance as a proposed ANSI standard dated December 9, 1994.

The proposed first edition of ANSI/IAS LC 1 • CGA 6.26 standard was approved by the CGA Standards Advisory Committee on November 3, 1997, the Canadian Interprovincial Gas Advisory Council on September 18, 1997, and by the American National Standards Institute on October 28, 1996.

The first edition of the harmonized gas piping systems using corrugated stainless steel tubing standard was approved by the Standards Advisory Committee and the Standards Council of Canada on September 18, 1997, and by the American National Standards Institute, Inc., on October 28, 1996.

The second edition of the harmonized gas piping systems using corrugated stainless steel tubing standard was approved by the Standards Advisory Committee and the Standards Council of Canada on October 27, 2004, and by the American National Standards Institute, Inc., on March 9, 2005.

The third edition of the harmonized gas piping systems using corrugated stainless steel tubing standard, was approved by the Interprovincial Gas Advisory Council on March 20, 2014, and the American National Standards Institute, Inc. on September 17, 2013.

The fourth edition of the harmonized gas piping systems using corrugated stainless steel tubing standard, was approved by the Interprovincial Gas Advisory Council on March 27, 2016, and the American National Standards Institute, Inc. on March 10, 2016.

This, the fifth edition of the harmonized gas piping systems using corrugated stainless steel tubing standard, was approved by the Interprovincial Gas Advisory Council on January 9, 2018, and the American National Standards Institute, Inc. on January 24, 2018.

ANSI/IAS LC 1-1997 • CGA 6.26-M97
ANSI/IAS LC 1a-1999 • CGA 6.26a-M99
ANSI/IAS LC 1b-2001 • CGA 6.26b-2001
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ANSI LC 1-2016 • CSA 6.26-2016

The following identifies the designation and year of this edition of the standard:

ANSI LC 1-2018 • CSA 6.26-2018

Note: *This edition of ANSI LC 1 • CSA 6.26 incorporates changes to the 2016 edition. Changes, other than editorial, are denoted by a delta symbol in the margin.*

ANSI LC 1-2018 • CSA 6.26-2018
Fuel gas piping systems using corrugated stainless steel tubing

1 Scope

1.1

This Standard applies to fuel gas piping systems using corrugated stainless steel tubing (CSST), intended for installation in residential, commercial or industrial buildings, and including the following components as a minimum:

a) Corrugated stainless steel tubing (CSST);
b) Fittings for connection to the CSST; and
c) Striker plates (see Clause 3, Definitions) to protect the installed CSST from puncture threats.

Other components of piping systems covered by this Standard include gas manifolds, gas pressure regulators, manual gas valves, quick-disconnect devices and gas convenience outlets (see Clauses 4.3, Gas pressure regulators, 4.4, Manually operated gas valves and 4.5, Quick-disconnect devices and gas convenience outlets). If such additional components are required to complete the piping system installation, they are either provided as part of the piping system or specified in the manufacturer's installation instructions [see Clause 4.7-m)].

1.2

This Standard also applies to corrugated stainless steel piping systems in which portions of the piping are exposed to the outdoors as required to make connections to outdoor gas meters or to outdoor gas appliances, which are attached to, mounted on or located in close proximity to the building structure.

1.3

This Standard does not apply to CSST, whether coated or uncoated, intended for direct burial underground. Tubing is installed underground only when encased inside either an approved conduit or as part of an approved engineered system and in accordance with local codes and the manufacturer's instructions.

1.4

This Standard includes criteria to establish the suitability of concealed mechanical tube fittings for use with concealed gas piping (see Clause 3, Definitions).

1.5

This Standard also applies to corrugated stainless steel piping systems that are used in conjunction with other approved fuel gas piping materials.

1.6

This Standard applies to piping systems rated at either 5 psi (34.5 kPa) and intended for exposure to maximum actual operating pressures (see Clause 3, Definitions) not exceeding 6.5 psi (44.8 kPa), or rated at 25 psi (172.5 kPa) and intended for exposure to maximum actual operating pressures not

exceeding 30 psi (207 kPa). The manufacturer has the option to certify its system to either pressure rating.

1.7
This Standard applies to piping systems not exceeding a size of 2 in (50.8 mm), based on the nominal inside diameter of the tubing.

1.8
This Standard does not apply to gas connectors for appliances. These connectors are covered by the Standard for *Metal Connectors for Gas Appliances*, and the Standard for *Connectors for Movable Gas Appliances, ANSI Z21.24 • CSA 6.10* and *Z21.69 • CSA 6.16*, respectively.

1.9
This Standard does not apply to piping systems intended for use with propane in the liquid state.

1.10
All references to psi throughout this Standard are to be considered gauge pressure unless otherwise specified.

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.

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.

1.14
In this Standard, “shall” Is used to express a requirement, i.e. a provision that the use shall satisfy in order to comply with the Standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

2 Reference publications
This Standard refers to the following publications, and where such reference is made, it shall be to the latest edition listed below, including all amendments published thereto.