



**CSA
Group**

CSA/ANSI LNG 3.1-2018
(ISO 12614-1:2014, MOD)
National Standard of Canada



CSA/ANSI LNG 3.1-2018
**Road vehicles — Liquefied natural gas (LNG) fuel
system components — Part 1: General requirements
and definitions**
(ISO 12614-1:2014, MOD)



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CSA/ANSI LNG 3.1-2018

Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions (ISO 12614-1:2014, MOD)

Prepared by
International Organization for Standardization



Reviewed by



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CSA/ANSI LNG 3.1-2018

Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions (ISO 12614-1:2014, MOD)

CSA Preface

This is the first edition of CSA/ANSI LNG 3.1, *Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions*, which is an adoption, with North American deviations, of the identically titled ISO (International Organization for Standardization) Standard 12614-1 (first edition, 2014-07-01). At the time of publication, ISO 12614-1:2014 is available from ISO in English only. CSA Group will publish the French version when it becomes available from ISO.

For brevity, this Standard will be referred to as “CSA/ANSI LNG 3.1” throughout.

The North American deviations are intended to

- a) correct inaccuracies; and
- b) replace references to ISO and IEC Standards with references to U.S. and CSA Group Standards, where applicable.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was reviewed for North American adoption by the CSA Subcommittee on Liquefied Natural Gas Vehicle Fueling Connection Devices, LNG 1, under the jurisdiction of the CSA Technical Committee on Natural Gas Transportation and the CSA Strategic Steering Committee on Transportation. It has been formally approved by the Technical Committee and by the Interprovincial Gas Advisory Council.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group. This Standard was approved by the American National Standards Institute (ANSI) as an American National Standard on June 1, 2018.

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Inquiries regarding this American National Standard/National Standard of Canada should be addressed to

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- a) *Standard designation (number);*
- b) *relevant clause, table, and/or figure number;*
- c) *wording of the proposed change; and*
- d) *rationale for the change.*

CSA Group acknowledges that the adoption of this Standard was made possible, in part, by the financial support of



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North American deviations

The following deviations are intended to meet local product requirements and to align with energy efficiency requirements of relevant Canadian regulators.

1 Scope

[Add the following note]

NOTE 3A For North American application, all references to working pressure are considered to be equivalent to maximum allowable working pressure (MAWP).

2 Normative references

[Add the following]

Where reference is made to CSA Group publications, such reference shall be considered to refer to the latest edition and all amendments published to that edition. This Standard refers to the following publications, and the years shown indicate the latest editions available at the time of printing:

CSA Group

ANSI NGV 3.1-2014/CSA 12.3-2014

Fuel system components for compressed natural gas powered vehicles

The following National Standard of Canada, published by CSA Group, is an adoption of an ISO Standard. The requirements of this CSA Group Standard shall take precedence over the International Standard on which it is based. Any reference within CSA/ANSI NGV 3.1 to the International Standard shall be replaced by a reference to the equivalent Canadian Standard. Any reference to International Standards that are adopted as National Standards of Canada subsequent to the publication of CSA/ANSI LNG 3.1 shall be replaced by the relevant National Standard of Canada.

CSA/ANSI LNG 3.18-2018

Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 18: Gas temperature sensor

[Replaces ISO 12614-1:2011]

SAE International

J1113 (Cancelled August 1987)

Electromagnetic Susceptibility Measurement Procedures for Vehicle Components (Except Aircraft)

J1292 (2010)

Automobile and Motor Coach Wiring

J1455 (2017)

Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications

3 Terms and definitions

3.20

[Delete this definition]

3.37

[Replace this definition with the following]

automatic valve

a valve for controlling flow of gas that is not manually operated

3.40

pressure relief valve

[Replace this definition with the following]

a reclosing device that opens to relieve pressure at a pre-determined upstream pressure

[Add the following definitions]

3.42A

fuel

for the purpose of this Standard, liquefied natural gas (LNG)

3.42B

LNG system

for an example of one type of LNG system, see Annex A

4 Construction and assembly

4.1

[Delete this Clause]

4.4.1

[Replace this Clause with the following]

Components, which are not intended to be used at temperatures less than $-40\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$), shall be designed and specified in accordance with ISO 15500 or ANSI NGV 3.1/CSA 12.3, with the exception of the gas temperature sensor, which shall comply with CSA/ANSI LNG 3.18.

5 Electrical equipment and wiring

5.2

[Replace this Clause with the following]

Automotive grade wire and automotive-type (sealed mating) connectors shall be used. Wiring shall be protected from abrasion, corrosion, and mechanical damage, and shall meet the requirements of SAE J1292 or equivalent.

Note: For electronic equipment, SAE J1455 and SAE J1113 may provide guidance.

7 Marking

[Add the following clauses]

7.1A

Marking shall be permanent. Permanent adhesive labels are permissible, or markings may be etched, stamped, or moulded into the component.

7.1B

In the event that a component cannot accommodate all marking requirements listed in Clause 7, the manufacturer shall include missing marking information with the packaging of the component.

**Road vehicles — Liquefied natural gas
(LNG) fuel system components —**

**Part 1:
General requirements and definitions**

*Véhicules routiers — Équipements pour véhicules utilisant le gaz
naturel liquéfié (GNL) comme combustible —*

Partie 1: Exigences générales et définitions





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Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Construction and assembly	4
5 Electrical equipment and wiring	4
6 Instructions	5
7 Marking	5
Annex A (informative) Construction and assembly	6

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 25, *Vehicles using gaseous fuels*.

ISO 12614 consists of the following parts, under the general title *Road vehicles — Liquefied natural gas (LNG) fuel system components*:

- *Part 1: General requirements and definitions*
- *Part 2: Performance and general test methods*
- *Part 3: Check valve*
- *Part 4: Manual valve*
- *Part 5: Tank pressure gauge*
- *Part 6: Overpressure regulator*
- *Part 7: Pressure relief valve*
- *Part 8: Excess flow valve*
- *Part 9: Gas-tight housing and ventilation hose*
- *Part 10: Rigid fuel line in stainless steel*
- *Part 11: Fittings*
- *Part 12: Rigid fuel line in material other than stainless steel*
- *Part 13: Pressure control regulator*
- *Part 14: Differential pressure fuel content gauge*
- *Part 15: Capacitance fuel content gauge*

- *Part 16: Heat exchanger - vaporizer*
- *Part 17: Natural gas detector*
- *Part 18: Gas temperature sensor*

Road vehicles — Liquefied natural gas (LNG) fuel system components —

Part 1: General requirements and definitions

1 Scope

This part of ISO 12614 specifies general requirements and definitions of liquefied natural gas fuel system components, intended for use on the types of motor vehicles as defined in ISO 3833. It also provides general design principles and specifies requirements for instructions and marking.

This part of ISO 12614 is not applicable to the following:

- a) fuel containers;
- b) stationary gas engines;
- c) container mounting hardware;
- d) electronic fuel management;
- e) fuelling receptacles.

NOTE 1 It is recognized that miscellaneous components, not specifically covered herein can be examined to meet the criteria of this part of ISO 12614 and tested according to the appropriate functional tests.

NOTE 2 All references to pressure in this part of ISO 12614 are to be considered gauge pressures unless otherwise specified.

NOTE 3 This part of ISO 12614 is based upon a working pressure for natural gas as fuel of 1,6 MPa [16 bar¹]. Other working pressures can be accommodated by adjusting the pressure by the appropriate factor (ratio). For example, a 2 MPa (20 bar) working pressure system will require pressures to be multiplied by 1,25.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3833:1977, *Road vehicles — Types — Terms and definitions*

ISO 6722 (all parts), *Road vehicles — 60 V and 600 V single-core cables*

ISO 15500:2012, *Road vehicles — Compressed natural gas (CNG) fuel system components*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

burst pressure

pressure which causes failure and consequential fluid loss through the component envelope

1) 1 bar = 0,1 MPa = 105 Pa; 1 MPa = 1 N/mm².