



ANSI/CSA HGV 4.2-2013
(reaffirmed 2019)

**Standard for hoses for compressed
hydrogen fuel stations, dispensers and
vehicle fuel systems**



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AMERICAN NATIONAL STANDARD
ANSI/CSA HGV 4.2-2013

First Edition - 2013

This Standard is based on the Temporary Interim Requirement for
Hoses for compressed hydrogen fuel stations,
dispensers and vehicle fuel systems
CSA America HGV 4.2-2009

APPROVED



March 14, 2013
American National Standards Institute, Inc.

Standard Developer

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***American National Standards Institute, Inc.
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Preface

This publication represents a standard for safe operation, substantial and durable construction and performance testing of gaseous hydrogen hose and hose assemblies which are used as a part of the dispensing station to connect the dispenser to the refueling nozzle; used as part of a vehicle on-board fuel system; or used as vent lines which carry gas to a safe location for either vehicles or dispensing systems.

This standard is based on engineering principles, research and the combined expertise of manufacturers, users, and others having specialized experience.

Nothing in this standard is to be considered in any way as indicating a measure of quality beyond compliance with the provisions it contains. It is designed to allow compliance of products which may exceed that specified in the provisions herein. In its preparation, full recognition has been given to possibilities of improvement through ingenuity of design. This standard is subject to revision as further experience and investigation may show it is necessary and desirable.

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EFFECTIVE DATE: An organization using this standard for product evaluation as a part of its certification program will normally establish the date by which all products certified by that organization should comply with this standard

History Of Development Of ANSI HGV 4.2

(This history is informative and is not part of the standard.)

NOTE: This is the first edition of ANSI/CSA America HGV 4.2.

In September 2002, CSA met with the U.S. Department of Energy, Renewable Fuels Group in Washington, D.C. to discuss standards development opportunities in the hydrogen technology area. During this meeting, DOE requested that CSA provide a proposal relating to the development of hydrogen technology standards and codes in the United States.

Industry recognized that an important consideration in the successful commercialization of hydrogen gas as a vehicle fuel was the issue of codes and standards, pertaining to both fueling stations and vehicle fuel system components. CSA undertook the goal of establishing a program for the development of an organized family of coordinated standards that addresses hydrogen gas vehicles and fueling stations.

Industry and CSA recognized there was no standard that addressed safety requirements for hoses for compressed hydrogen fuel stations, dispensers and vehicle fuel systems. The development of such a standard was necessary based on industry needs and feedback:

- (1) There were no standards available for hydrogen hoses with applications at the 700 bar pressure levels.
- (2) Automotive OEMs driving the application of hydrogen as a fuel for vehicles expressed concern over solutions in demonstration projects in the field.

The focus of the hydrogen hose standard established performance based requirements for the construction and performance of newly manufactured hydrogen hose and hose assemblies which are used as a part of the dispensing station to connect the dispenser to the refueling nozzle; used as part of a vehicle on-board fuel system; or used as vent lines which carry gas to a safe location for either vehicles or dispensing systems.

CSA has positioned itself as a leader in the fuel cell, hydrogen and natural gas sectors as a Standards Developing Organization (SDO). CSA is aggressively updating and developing national standards, and is playing a major role in the promulgation of US technologies nationally. As US TAG Administrator to IEC TC 105 for Fuel Cell Technologies and as US TAG members of ISO TC 197 and ISO TC 22 / SC 25, CSA is facilitating US technology internationally. CSA organized committees to address technical issues in the development of standards which would affect future expansion of the hydrogen industry.

The HGV 4.2 hydrogen hose and hose assembly standard was processed as an American National Standard in accordance with procedures of the American National Standards Institute (ANSI).

This is the first edition of the HGV 4.2 hydrogen hose and hose assembly standard, and was approved by the American National Standards Institute, Inc. on March 14, 2013.

Previous editions of this standard are as follows:

CSA America HGV 4.2-2009 TIR.

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NOTE

This standard contains American equivalents to the SI (Metric) quantities, the purpose being to allow the standard to be used both units. (Standard for use of the International System of Units (SI): The Modern Metric System, IEEE/ASTM SI 10 or Metric Practice Guide, CAN/CSA Z234.1 are used as a guide in making conversions.) If a value for a measurement and an equivalent value in other units, the first stated is to be regarded as the requirement. The given equivalent value may be approximate. If a value for a measurement and an equivalent value in other units, are both specified as a quoted marking requirement, the first stated unit, or both shall be provided.

ANSI/CSA HGV 4.2-2013

Hoses for compressed hydrogen fuel stations, dispensers and vehicle fuel systems

Part I: Construction

1.1 Scope

1.1.1

This standard contains safety requirements for material, design, manufacture and testing of gaseous hydrogen hose and hose assemblies. This standard applies to newly manufactured hose and hose assemblies for:

- connecting the dispenser to the fueling nozzle, high pressure (class A)
- used as part of a vehicle on-board fuel storage system, high pressure (class B)
- used as part of a vehicle low pressure fuel delivery system, (class C)
- flexible hoses used on hydrogen fuel station equipment (class D)

Note: Class D hoses include all station side hydrogen hoses where flexibility is necessary and acceptable to the certification agency

The requirements of this standard may be superseded by an application specific standard.

1.1.2

All dimensions used in this standard are in metric units [International System of Units (SI)], unless otherwise specified. If a value for a measurement, as given in this standard, is followed by an equivalent value in other units, the first stated is to be regarded as the specification.

1.1.3

All references to pressure throughout this document are to be considered gauge pressures unless otherwise specified.

1.1.4

For clarification of which clause applies to which type of flexible hose see Appendix A, Applications Summary (Hose/Assembly).

1.1.5

Exhibit A contains a list of standards specifically referenced in this standard, and sources from which these reference standards may be obtained.