ANSI/CSA HGV 4.1-2013
(reaffirmed 2019)

Standard for hydrogen dispensing systems

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American National Standard

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Standard for hydrogen dispensing systems

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Preface

This publication represents a standard for safe operation, substantial and durable construction and performance testing of the mechanical and electrical features of newly manufactured hydrogen gas dispensing systems for vehicles, intended primarily to dispense fuel directly into the vehicle fuel storage container.

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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History Of The Development Of ANSI/CSA HGV 4.1

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

NOTE: This is the first edition of ANSI/CSA America HGV 4.1.

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 hydrogen dispensing systems. The development of such a standard was necessary based on industry needs and feedback:

(1) There were no standards available for hydrogen dispenser 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 dispensing system standard established performance based requirements for the mechanical and electrical features and construction of newly manufactured systems that dispense hydrogen gas for vehicles, intended primarily to dispense fuel directly into the vehicle fuel storage container.

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 the 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 4.1 hydrogen dispensing systems 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 4.1 hydrogen dispensing systems standard, and was approved by the American National Standards Institute, Inc. on March 14, 2013.

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NOTE

This standard contains SI (Metric) equivalents to the yard/pound quantities, the purpose being to allow the standard to be used in SI (Metric) units. (Standard for use of the International System of Units (SI): The Modern Metric System, IEEE/ASTM SI I0 or Metric Practice Guide, CAN/CSA Z234.1 are used as a guide in making metric conversion from yard/pound quantities.) 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 4.1-2013
Hydrogen Dispensing Systems

Part I: Construction

1.1 Scope

1.1.1
This standard applies to:

a. The mechanical and electrical features of newly manufactured systems that dispense compressed hydrogen gas for vehicles (HGV) where such systems are intended primarily to dispense the fuel directly into the fuel storage container of the vehicle.

b. HGV dispensers that integrate in a single unit multiple dispensing functions (e.g., fuel metering, registering, control and management devices, vehicle fuel cylinder overfill and over pressure protection with listed hoses with nozzles).

c. The following service pressures are applicable, 25MPa, 35MPa, 50MPa, 70MPa:

Each dispenser may have the capability of independently fueling more than one vehicle simultaneously

1.1.2
HGV dispensers covered by this standard are intended for use with gas composition specified by the *Hydrogen Fuel Quality for Fuel Cell Vehicles, SAE J2719*.

1.1.3
This standard applies to dispensers that include fuel metering, registering, control and management devices, vehicle fuel cylinder overfill and vehicle fuel cylinder over pressure protection.

1.1.4
This standard does not apply to dispensers that are part of a modular fueling station with remote fuel metering, registering, control and management devices, vehicle fuel cylinder overfill and over pressure protection included in an integrated fueling station control system. For these applications refer to *CSA America HGV 4.9, Hydrogen Fueling Station Safety Guideline.*

1.1.5
Installation of a dispensing system is intended to be in accordance with the, *Hydrogen Motor Fuel Dispensing and Generating Facilities Standards, ICC 2006 International Fire Code, Section 2209*, or *Hydrogen Technologies Code, ANSI/NFPA 2*, as applicable, and the requirements of the authority having jurisdiction.

1.1.6
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

1.1.7
All references to pressure throughout this document are to be considered gauge pressures unless otherwise specified.