



**CSA/ANSI HGV 3.1:22**  
National Standard of Canada  
American National Standard



# Fuel system components for compressed hydrogen gas powered vehicles



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***September 2022***

**Title:** *Fuel system components for compressed hydrogen gas powered vehicles*

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*Approved on September 20, 2022 by ANSI  
Published in September 2022 by CSA Group  
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*ICS 27.075  
ISBN 978-1-4883-4248-6*

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<b>S. Marxen</b>	CSA Group, Cleveland, Ohio, USA	<i>Project Manager</i>

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<b>S. Allan</b>	TesTneT Canada Inc., Langley, British Columbia, Canada	
<b>T. Amling</b>	Parker Hannifin Corporation, Tube Fittings Division, Columbus, Ohio, USA	
<b>R. Boyd</b>	Boyd Hydrogen LLC, Spring Lake Heights, New Jersey, USA	
<b>D. Byerly</b>	Hexagon Lincoln Inc., Lincoln, Nebraska, USA	
<b>W. Collins</b>	WPCSOL LLC, East Windsor, Connecticut, USA	
<b>M. Conrad</b>	Ford Motor Company, Dearborn, Michigan, USA	
<b>J. Coursen</b>	Luxfer Gas Controls, Pomona, California, USA	
<b>P. Dijkhof</b>	Kiwa Nederland B.V., Apeldoorn, Gelderland, Netherlands	
<b>J. E. Eihusen</b>	Hexagon Lincoln Inc., Lincoln, Nebraska, USA	
<b>K. Flint</b>	Oasis Engineering Ltd., Tauranga, Bay of Plenty, New Zealand	
<b>L. Gambone</b>	Nikola Motor Company, Phoenix, Arizona, USA	

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<b>A. Grab</b>	Nikola Motor Company, Phoenix, Arizona, USA
<b>C. Hayes</b>	Swagelok Company, Solon, Ohio, USA
<b>A. Holbert</b>	Hanwha Cimarron, Twinsburg, Ohio, USA
<b>D. Itoe</b>	CSA Group, Cleveland, Ohio, USA
<b>S. Johnston</b>	Ann Arbor, Michigan, USA
<b>J. F. Jordan</b>	Hexagon Agility, Cook, Minnesota, USA
<b>S. Katz</b>	S. Katz and Associates Inc., North Vancouver, British Columbia, Canada
<b>R. Martini</b>	Gastite, Division of Titeflex, Springfield, Massachusetts, USA
<b>S. Mathison</b>	FirstElement Fuel Inc., Irvine, California, USA
<b>G. Meadows</b>	Westport Fuel Systems Canada Inc., Cambridge, Ontario, Canada
<b>S. Quong</b>	Quong & Associates Inc., San Francisco, California, USA
<b>S. Rivalta</b>	Winkelmann Flowform Technology-Fuel Systems, Thousand Oaks, California, USA
<b>A. Ryan</b>	Toyota Motor Engineering & Manufacturing North America, Gardena, California, USA
<b>P. Sandsted</b>	NGVAmerica, Washington, DC, USA

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<b>T. Schmiedl</b>	SPIR STAR AG, Rimbach, Hessen, Germany
<b>C. Schmitt</b>	SPIR STAR AG, Rimbach, Hessen, Germany
<b>M. S. Sekura</b>	TÜV SÜD Product Service GmbH, Garching, Germany
<b>E. M. Steele</b>	Steele Consulting, Cypress, California, USA
<b>J. Taylor</b>	Comtech Energy, Winnipeg, Manitoba, Canada
<b>M. Treacy</b>	Powertech Labs Inc., Surrey, British Columbia, Canada
<b>M. Veenstra</b>	Ford Motor Company, Dearborn, Michigan, USA
<b>C. Webster</b>	TesTneT Canada Inc., Langley, British Columbia, Canada
<b>A. Weil</b>	Parker Hannifin Manufacturing GmbH & Co., KG Polymer Hose Division Europe, Lampertheim, Germany
<b>D. Wenger</b>	Wenger Engineering GmbH, Ulm, Germany
<b>B. Whittle</b>	Intertek, Edmonton, Alberta, Canada
<b>A. Willfort</b>	WEH Technologies Inc., Katy, Texas, USA
<b>E. Wolff-Klammer</b>	UL LLC, Northbrook, Illinois, USA
<b>L. Yang</b>	Toyota Motor Engineering & Manufacturing North America, Gardena, California, USA

**M. Zilioli**

Cavagna Group Spa — Valves Operating Office,  
Maerba del Garda, Ponte San Marco Brescia, Italy

**I. Monner**

CSA Group,  
Calgary, Alberta, Canada

*Project Manager*

# Preface

This is the second edition of CSA/ANSI HGV 3.1, *Fuel system components for compressed hydrogen gas powered vehicles*. It supersedes the previous edition published in 2015.

The major changes to this edition include the following:

- a) adding requirements for flexible fuel lines, hoses, and hose assemblies for use as part of a vehicle's onboard fuel storage system or fuel delivery system; and
- b) harmonizing test procedures and values within the industry.

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of Natural Resources Canada.

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

This Standard was prepared by the Subcommittee on Onboard Vehicle Components for Hydrogen Gas Vehicles, under the jurisdiction of the Technical Committee on Hydrogen Transportation and the Strategic Steering Committee on Transportation, and has been formally approved by the Technical Committee.

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 has been approved by the American National Standards Institute (ANSI) as an American National Standard.

## Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *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.*
- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
- 4) *To submit a request for interpretation of this Standard, please send the following information to [inquiries@csagroup.org](mailto:inquiries@csagroup.org) and include “Request for interpretation” in the subject line:*
  - a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
  - b) *provide an explanation of circumstances surrounding the actual field condition; and*
  - c) *where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.*

*Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at [standardsactivities.csa.ca](http://standardsactivities.csa.ca).*
- 5) *This Standard is subject to review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to [inquiries@csagroup.org](mailto:inquiries@csagroup.org) and include “Proposal for change” in the subject line:*
  - 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/ANSI HGV 3.1:22

## Fuel system components for compressed hydrogen gas powered vehicles

### 1 Scope

#### 1.1 Inclusions

This Standard establishes requirements for newly produced compressed hydrogen gas fuel system components, as listed below, that are intended for use on hydrogen gas powered vehicles:

- a) check valves (see Clause [8](#));
- b) manual valves (see Clause [9](#));
- c) manual container valves (see Clause [10](#));
- d) automatic valves and automatic container valves (see Clause [11](#));
- e) hydrogen injectors (see Clause [12](#));
- f) pressure sensors, temperature sensors, and pressure gauges (see Clause [13](#));
- g) pressure regulators (see Clause [14](#));
- h) pressure relief valves (PRV) (see Clause [15](#));
- i) pressure relief devices (PRD) (see Clause [16](#));
- j) excess flow valves (see Clause [17](#));
- k) gastight housing and ventilation passages (see Clause [18](#));
- l) stainless steel rigid fuel lines (see Clause [19](#));
- m) flexible fuel lines, hoses, and assemblies (see Clause [20](#));
- n) filter assemblies (see Clause [21](#));
- o) fittings (see Clause [22](#));
- p) non-metallic, low-pressure rigid fuel lines (see Clause [23](#)); and
- q) discharge line closures (see Clause [24](#)).

**Note:** Other components not specifically covered here can be examined to meet the criteria of CSA/ANSI HGV 3.1 and tested according to the appropriate functional needs.

#### 1.2 Applicability

This Standard applies to devices that have a nominal working pressure of either 25MPa, 35MPa, 50MPa, or 70MPa, referred to in this Standard as the following pressure classes:

- a) "H25" — 25 MPa;
- b) "H35" — 35 MPa;
- c) "H50" — 50 MPa; and
- d) "H70" — 70 MPa.

This Standard also applies to components downstream of the first stage of pressure reduction with a maximum operating pressure designated by the manufacturer in MPa or kPa (psi).

#### 1.3 Exclusions

This Standard does not apply to the following:

- a) hydrogen gas fuel system components incorporated during the manufacture of motor vehicles originally manufactured in compliance with the Federal Motor Vehicle Safety Standards (FMVSS)