



**International
Standard**

ISO 19880-5

**Gaseous hydrogen — Fuelling
stations —**

**Part 5:
Dispenser hoses and hose
assemblies**

*Carburant d'hydrogène gazeux — Stations de ravitaillement —
Partie 5: Flexibles et assemblages flexibles pour distributeurs*

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Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification	5
5 Materials and construction	6
5.1 General.....	6
5.2 Lining.....	6
5.3 Reinforcement.....	6
5.4 Cover.....	7
5.5 Static electricity dissipation.....	7
5.5.1 General.....	7
5.5.2 External surface.....	7
5.5.3 Internal surface.....	7
6 Dimensions and tolerances	7
7 Performance requirements and testing	7
7.1 General.....	7
7.2 Leakage test.....	8
7.2.1 General.....	8
7.2.2 Type tests - Method A.....	8
7.2.3 Routine tests - Method B.....	9
7.3 Hydrostatic strength.....	10
7.3.1 Proof pressure test.....	10
7.3.2 Ultimate strength.....	10
7.4 Electrical conductivity.....	10
7.5 Tensile test of hose assembly.....	10
7.5.1 General.....	10
7.5.2 Test method.....	11
7.6 Vertical load strength.....	11
7.6.1 General.....	11
7.6.2 Test method.....	11
7.7 Torsion strength.....	12
7.7.1 General.....	12
7.7.2 Test method.....	12
7.8 Pressure cycle test (Hydraulic-pressure impulse test).....	13
7.8.1 General.....	13
7.8.2 Apparatus.....	13
7.8.3 Test fluid.....	13
7.8.4 Test temperature.....	13
7.8.5 Test piece.....	13
7.8.6 Procedure.....	14
7.9 Hydrogen impulse test.....	15
7.10 Corrosion test.....	15
7.10.1 General.....	15
7.10.2 Test conditions.....	16
7.11 Minimum bend radius.....	16
7.12 Hose permeation.....	16
7.12.1 General.....	16
7.12.2 Test Method 1.....	16
7.12.3 Test Method 2.....	17
7.13 Ozone resistance.....	17

ISO 19880-5:2025(en)

7.14	Ultraviolet light and water exposure test	18
7.14.1	Applicability and verification	18
7.14.2	Test conditions	18
7.14.3	Length of exposure	18
7.15	Crush test	18
7.15.1	General	18
7.15.2	Test method	18
7.16	Abrasion resistance test	18
7.17	Marking material legibility	19
7.17.1	General	19
7.17.2	Test method	19
7.18	Electrical properties of lining material	19
7.18.1	General	19
7.18.2	Electric strength	19
7.18.3	Volume resistivity	19
7.18.4	Criteria of electric properties of lining materials	19
8	Marking	20
8.1	General	20
8.2	Hoses	21
8.3	Hose end fittings or couplings	21
8.4	Hose assemblies	21
9	Instruction manual	21
9.1	General	21
9.2	Selection	22
9.3	Installation	22
9.4	Inspection and maintenance	22
9.5	Safety precautions and usage	22
10	Test report	23
	Annex A (normative) Type tests and routine tests	24
	Annex B (informative) Production acceptance tests	25
	Annex C (normative) Hydrogen impulse test	26
	Bibliography	29

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 197, *Hydrogen technologies*.

This second edition cancels and replaces the first edition (ISO 19880-5:2019), which has been technically revised.

The main changes are as follows:

- [subclause 7.2.3](#) revised test gas and pass/fail criteria;
- [subclause 7.7.2](#) revised to add temperature tolerance;
- editorial changes.

A list of all parts in the ISO 19880 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies the implementation of performance-based testing for components of dispensing systems and fuelling stations that are based on proven engineering principles, research and the combined expertise of gas utilities, fuel providers, manufacturers, users, and others having specialized experience.

The successful commercialization of hydrogen vehicle technologies requires codes and standards pertaining to fuelling stations, vehicle fuel system components, and the global homologation of standards requirements for technologies with the same end use. Essentially this will allow manufacturers to achieve economies of scale by producing one product for use globally.

International harmonization contributes to reducing technical barriers and stimulates related markets. A series of documents that address hydrogen-fuelled vehicles and fuelling stations is being developed. These documents will provide internationally homologized minimum safety performance criteria at the component level, thus providing a foundation to build a safe “fuelling system”.

This document is based on ANSI/CSA HGV 4.2-2022.

This document was developed based on five pressure classes of wire or textile reinforced hoses and hose assemblies suitable for use with gaseous hydrogen for hydrogen dispensing. This is based on technologies in use at the time of the development of the requirements.

In the future, other types and classes of hoses and hose assemblies will need to be evaluated to determine the suitability of requirements in this document.

This document applies to newly manufactured hoses and hose assemblies for connecting a dispenser to a high-pressure fuelling nozzle.

A nozzle vent hose is included in this document; however, the pressure rating may be lower than the nozzle rating, based on the nozzle and dispenser design.

For general hydrogen safety information, see ISO/TR 15916.

Gaseous hydrogen — Fuelling stations —

Part 5: Dispenser hoses and hose assemblies

1 Scope

This document specifies the requirements for wire or textile reinforced hoses and hose assemblies suitable for dispensing hydrogen up to 70 MPa nominal working pressure, in the operating temperature range of -40 °C to 65 °C.

This document specifies safety requirements for material, design, manufacture and testing of gaseous hydrogen hose and hose assemblies for hydrogen fuelling stations.

This document does not apply to the following hoses and hose assemblies:

- a) those used as part of a vehicle high pressure on-board fuel storage system;
- b) those used as part of a vehicle low pressure fuel delivery system; and
- c) flexible metal hoses.

NOTE 1 This document was developed primarily for hoses and hose assemblies for dispensing high-pressure hydrogen from refuelling dispensers to hydrogen vehicles. ISO 16964 addresses hoses used to deliver hydrogen from a transportable vessel (e.g. trailer) into a buffer storage of a station.

NOTE 2 Hose assemblies include a hose with connectors on each end (see [Figure 1](#)). Each connector has two basic functional elements that are addressed as described below.

- a) Coupling to hose. This function is defined by requirements and verified (along with the hose itself) by performance-based tests in this document.
- b) Fitting for transition and connection to the piping system or equipment. This function is addressed by reference to appropriate hydrogen equipment standards and piping codes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 4671, *Rubber and plastics hoses and hose assemblies — Methods of measurement of the dimensions of hoses and the lengths of hose assemblies*

ISO 6802, *Rubber or plastics hoses and hose assemblies — Hydraulic impulse test with flexing*

ISO 6803, *Rubber or plastics hoses and hose assemblies — Hydraulic-pressure impulse test without flexing*

ISO 7326:2016, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*

ISO 8031:2020, *Rubber and plastics hoses and hose assemblies — Determination of electrical resistance and conductivity*

ISO 19880-5:2025(en)

ISO 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary*

ISO 8331, *Rubber and plastics hoses and hose assemblies — Guidelines for selection, storage, use and maintenance*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 15649, *Petroleum and natural gas industries — Piping*

ISO 16964, *Gas cylinders — Flexible hoses assemblies — Specification and testing*

ISO 19880-1, *Gaseous hydrogen — Fuelling stations — Part 1: General requirements*

ISO 20485, *Non-destructive testing — Leak testing — Tracer gas method*

ISO 30013, *Rubber and plastics hoses — Methods of exposure to laboratory light sources — Determination of changes in colour, appearance and other physical properties*

IEC 60243-1, *Electric strength of insulating materials — Test methods — Part 1: Tests at power frequencies*

IEC 62631-3-1, *Dielectric and resistive properties of solid insulating materials — Part 3-1: Determination of resistive properties (DC methods) — Volume resistance and volume resistivity — General method*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 8330, ISO 19880-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

connector

mating parts that can be put together to form a "connection" which permits the transfer of fluids, electric power, or control signals

Note 1 to entry: *Fittings* (3.4) are a type of connector used in piping systems.

EXAMPLE Connectors commonly used in hydrogen systems are as follows:

- a) The fuelling nozzle "connector" mates with the receptacle "connector" on the vehicle to form the connection for transfer of compressed hydrogen between the dispenser and the vehicle, as defined in ISO 17268 for this specific application.
- b) The hose assemblies have connectors on each end that allow *coupling* (3.2) to the hoses and connection to the piping system (e.g. hose breakaway device or fuelling nozzle).
- c) Control systems often use electrical connectors to allow rapid and secure assembly or replacement.

3.2

connection fitting

connection part consisting of a fitting inserted into a hose and a mechanical joint

3.3

coupling

integrated structure of *nipple* (3.9) and socket with end portion of a hose crimped together

Note 1 to entry: See [Figure 1](#)