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**Road vehicles — Compressed gaseous  
hydrogen (CGH<sub>2</sub>) and hydrogen/  
natural gas blends fuel system  
components —**

Part 12:

**Gas-tight housing and ventilation hoses**

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*Véhicules routiers — Composants des circuits d'alimentation pour  
hydrogène gazeux comprimé (CGH<sub>2</sub>) et mélanges de gaz naturel et  
hydrogène —*

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## 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](http://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](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html). (standards.itech.ai)

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A list of all parts in the ISO 12619 series can be found on the ISO website.

# Road vehicles — Compressed gaseous hydrogen (CGH<sub>2</sub>) and hydrogen/natural gas blends fuel system components —

## Part 12: Gas-tight housing and ventilation hoses

### 1 Scope

This document specifies tests and requirements for the gas-tight housing and ventilation hose, a compressed gaseous hydrogen (CGH<sub>2</sub>) and hydrogen/natural gas blend fuel system component intended for use on the types of motor vehicles defined in ISO 3833.

It is applicable to vehicles using CGH<sub>2</sub> in accordance with ISO 14687-1 or ISO 14687-2 and hydrogen/natural gas blend using natural gas in accordance with ISO 15403-1 and ISO/TR 15403-2. It is not applicable to the following:

- a) liquefied hydrogen (LH<sub>2</sub>) fuel system components;
- b) fuel containers;
- c) stationary gas engines;
- d) container mounting hardware; [ISO 12619-12:2017](https://standards.iteh.ai/catalog/standards/sist/3bd20606-9664-4a06-b97-f488b40f3254/iso-12619-12-2017)
- e) electronic fuel management; <https://standards.iteh.ai/catalog/standards/sist/3bd20606-9664-4a06-b97-f488b40f3254/iso-12619-12-2017>
- f) refuelling receptacles;
- g) fuel cell vehicles.

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

NOTE 2 All references to pressure in this document are considered gauge pressures unless otherwise specified.

### 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 12619-1, *Road vehicles — Compressed gaseous hydrogen (CGH<sub>2</sub>) and hydrogen/natural gas blend fuel system components — Part 1: General requirements and definitions*

ISO 12619-2, *Road vehicles — Compressed gaseous hydrogen (CGH<sub>2</sub>) and hydrogen/natural gas blend fuel system components — Part 2: Performance and general test methods*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12619-1 apply.

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

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

### 4 Marking

Marking of the component shall provide sufficient information to allow the following to be traced:

- a) the manufacturer's or agent's name, trademark or symbol;
- b) the model designation (part number);
- c) the temperature range.

The following additional markings are recommended:

- the direction of flow (when necessary for correct installation);
- the type of fuel;
- the electrical ratings (if applicable);
- the symbol of the certification agency;
- the type approval number;
- the serial number or date code;
- a reference to this document, i.e. ISO 12619-12:2017.

NOTE This information can be provided by a suitable identification code on at least one part of the component when it consists of more than one part.

### 5 Construction and assembly

The gas-tight housing and ventilation hose shall comply with the applicable provisions of ISO 12619-1 and ISO 12619-2 and with the tests specified in [Clause 6](#).

The gas-tight housing and ventilation hose are intended to contain and vent to a safe place permeation gas and small leaks from the primary pressure retaining components.

The gas-tight housing shall be assembled in such a way that the function of the pressure relief device or devices (PRD) will not be affected.

### 6 Tests

#### 6.1 Applicability

The tests required to be carried out are indicated in [Table 1](#).

**Table 1 — Applicable tests**

Test	Applicable	Test procedure as required by ISO 12619-2	Specific test requirements of this document
Leakage	X	X	X (see 6.2)
Excess torque resistance	X <sup>a</sup>	X	—
Bending moment	—	—	—
Continued operation	—	—	—
Corrosion resistance	X <sup>b</sup>	X	—
Oxygen ageing	X	X	—
Ozone ageing	X	X	—
Heat Ageing	X	X	—
Automotive fluids	X	X	—
Electrical over-voltages	—	—	—
Non-metallic synthetic immersion	X	X	—
Vibration resistance	X <sup>a</sup>	X	—
Brass material compatibility	—	—	—
Pull-off	X	—	X (see 6.3)
<sup>a</sup> Applicable only to rigid components. <sup>b</sup> Applicable to metallic parts or components.			

## 6.2 Leakage

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Test the gas-tight housing according to the procedure for leakage specified in ISO 12619-2 at the temperatures and pressures given in Table 2.

**Table 2 — Test temperatures and pressures**

Temperature °C	Pressure MPa
-40 or -20 (as applicable)	0,05
20	0,05
85	0,05

### 6.2.1 External leakage

This external leakage test is intended for ventilation hoses and gas-tight housings. Ventilation hoses and gas-tight housings shall be leak-tight when tested at the pressures and temperatures given in Table 2. Atmospheric passages and other connections shall be connected or plugged as recommended by the manufacturer for normal service.

### 6.2.2 External leakage — Pressure retaining ventilation passages

**6.2.2.1** This external leakage test is intended for ventilation passages of pressure-retaining components. Ventilation passages of pressure-retaining components shall meet the requirements of the following tests.

**6.2.2.2** Plug the ventilation passage outlets and pressurize the ventilation passages to the maximum pressure the vent passage is expected to be exposed to in service as specified by the manufacturer. The component shall be leak-tight other than through the intended vent passage.

**6.2.23** Allow the vent passage to vent normally. Remove or damage the worst case high pressure sealing component and pressurize the relevant high pressure portions of the component to a high enough pressure to create 0,5 g/s nitrogen leak, but not more than service pressure. The component shall be leak-tight other than through the intended vent passage.

### **6.2.3 Venting ability and pressure retention**

The venting ability and pressure retention test is intended for gas-tight housings and ventilation hoses. Install the component as recommended by the manufacturer for normal service, including typical components between the high pressure component and the final atmosphere port. Apply a 0,5 g/s nitrogen or dry air source to the interior or inlet of the component to simulate a pressure-retaining component leak.

The gas-tight housing or ventilation hose shall not retain more than 50 kPa pressure during leakage of the high pressure component.

### **6.3 Pull-off**

Test the ventilation hose, attached by a suitable connection device to the gas-tight housing and to any other connecting point used, according to the following procedure and acceptance criterion.

Place the test specimen in an appropriate test fixture, then statically apply a tensile load along the ventilation hose axis at a maximum rate of 100 N/min until the ventilation hose separates from its connecting points.

The force required to pull the ventilation hose apart from its connecting points shall be not less than 100 N.

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