

STN	Kvapalný vodík Plniaci protokol pozemných vozidiel	STN ISO 13984 30 2345
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Liquid hydrogen
Land vehicle fuelling protocol

Hydrogène liquide
Protocole des systèmes de remplissage pour véhicules terrestres

Táto slovenská technická norma obsahuje anglickú verziu medzinárodnej normy ISO 13984: 2026 a má postavenie oficiálnej verzie.

This standard includes the English version of the International standard ISO 13984: 2026 and has the status of the official versions.

143098

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2026
Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

Anotácia

Tento dokument špecifikuje plniace protokoly pre kvapalný vodík (LH2) a definuje minimálne požiadavky na návrh, inštaláciu a prevádzku pre bezpečný, rýchly, efektívny a interoperabilný prenos vodíka z plniacej stanice do palivového systému vozidla.

Tento dokument sa vzťahuje na pozemné vozidlá všetkých typov vybavené systémom skladovania kvapalného vodíka v súlade s ISO 13985. Protokoly opísané v tomto dokumente sú v súčasnosti obmedzené na vozidlá s celkovým vnútorným objemom systému skladovania rovným alebo v rozmedzí 0,6 m³ až 4 m³. Požiadavky uvedené v tomto dokumente sú uplatniteľné aj na ďalšie aplikácie vodíka, avšak ďalšie špecifické požiadavky, ktoré môžu byť potrebné pre bezpečnú prevádzku takéhoto plnenia, nie sú v tomto dokumente uvedené.

Tento dokument špecifikuje požiadavky na systémy plnenia a výdaja kvapalného vodíka, rozhranie medzi plniacou stanicou a vozidlom a systém skladovania vozidla s cieľom minimalizovať riziko požiaru, výbuchu alebo akýchkoľvek iných nepriaznivých účinkov vodíka na prijateľnú úroveň, najmä počas a po procese plnenia.

Národný predhovor

Normatívne referenčné dokumenty

Na nasledujúce dokumenty sa odkazuje v texte takým spôsobom, že časť ich obsahu alebo celý obsah predstavuje požiadavky tohto dokumentu. Pri datovaných odkazoch sa používa len citované vydanie. Pri nedatovaných odkazoch sa používa najnovšie vydanie citovaného dokumentu (vrátane akýchkoľvek zmien).

POZNÁMKA 1. – Ak bola medzinárodná publikácia zmenená spoločnými modifikáciami, čo je indikované označením (mod), použije sa príslušná EN/HD.

POZNÁMKA 2. – Aktuálne informácie o platných a zrušených STN a TNI možno získať na webovom sídle www.unms.sk.

ISO 7369 prijatá ako STN EN ISO 7369 Potrubie. Kovové hadice a hadicové zostavy. Slovník (ISO 7369) (02 8301)

ISO 10286 prijatá ako STN EN ISO 10286 Fľaše na plyny. Slovník (ISO 10286) (69 0008)

ISO 10893-4 prijatá ako STN EN ISO 10893-4 Nedeštruktívne skúšanie ocelových rúr. Časť 4: Kapilárna skúška bezšvových a zvarovaných ocelových rúr farebnou kvapalinou na zisťovanie povrchových chýb (ISO 10893-4) (01 5061)

ISO 10893-6 prijatá ako STN EN ISO 10893-6 Nedeštruktívne skúšanie ocelových rúr. Časť 6: Rádio-grafické skúšanie zvarových spojov zvarovaných ocelových rúr na zisťovanie nedokonalostí (ISO 10893-6) (01 5061)

ISO 10893-7 prijatá ako STN EN ISO 10893-7 Nedeštruktívne skúšanie ocelových rúr. Časť 7: Digitálne rádiografické skúšanie zvarových spojov zvarovaných ocelových rúr na zisťovanie nedokonalostí (ISO 10893-7) (01 5061)

ISO 10893-8 prijatá ako STN EN ISO 10893-8 Nedeštruktívne skúšanie ocelových rúr. Časť 8: Automatizované ultrazvukové skúšanie bezšvových a zvarovaných ocelových rúr na zisťovanie dvojitosť (ISO 10893-8) (01 5061)

ISO 10893-10 prijatá ako STN EN ISO 10893-10 Nedeštruktívne skúšanie ocelových rúr. Časť 10: Automatizované ultrazvukové skúšanie po celom obvode bezšvových a zvarovaných ocelových rúr (okrem rúr zvarovaných elektrickým oblúkom pod tavivom) na zisťovanie pozdĺžnych a/alebo priečných nedokonalostí (ISO 10893-10) (01 5061)

ISO 11484 dosiaľ neprijatá

ISO/DIS 13985: 2025 dosiaľ neprijatá

ISO 14687 dosiaľ neprijatá

súbor ISO 17636 prijatý ako súbor STN EN ISO 17636 Nedeštruktívne skúšanie zvarov. Rádiografické skúšanie (05 1150)

ISO 19880-1:2020 prijatá ako STN ISO 19880-1: 2024 Plynny vodík. Plniace stanice. Časť 1: Všeobecné požiadavky (30 2340)

ISO 21013-1 dosiaľ neprijatá

ISO 21013-2 dosiaľ neprijatá

ISO 21013-3 prijatá ako STN EN ISO 21013-3 Kryogénne nádoby. Príslušenstvo na uvoľňovanie tlaku v kryogénnych systémoch. Časť 3: Určovanie veľkosti a kapacity (ISO 21013-3) (69 8873)

IEC 60079-14 prijatá ako STN EN IEC 60079-14 Výbušné atmosféry. Časť 14: Návrh, výber a montáž elektrických zariadení, vrátane východiskovej prehliadky (33 2300)

Vypracovanie

Spracovateľ: Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, Bratislava

Technická komisia: TK 125 Vodíkové technológie

ISO 13984:2026(en)**Contents** ISO 13984-2: Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 2: Non-reclosable pressure-relief devices**Foreword** ISO 13984-3: Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 3: Sizing and capacity determination**Introduction****1 Scope** IEC 60079-14: Explosive atmospheres - Part 14: Electrical installations design, selection and erection

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ISO 13984:2026(en)**Foreword** *ISO 21912-2 Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 2: Non-reclosable pressure-relief devices*

ISO 21912-2 is an International Organization for Standardization (ISO) for 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).

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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 Technical Committee ISO/TC 197, *Hydrogen technologies*.

This second edition cancels and replaces the first edition (ISO 13984:1999), which has been technically revised.

The main changes are as follows:

- updated scope;
- updated normative references and definitions;
- alignment with common ISO 19880-1 requirements;
- technical requirements moved to annexes;
- introduction of fuelling process and protocol details;
- addition of supporting annexes.

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.

ISO 13984:2026(en)

Introduction
 ISO 13984-2:2026 Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 2: Non-reclosable pressure-relief devices

ISO 13984-2:2026 is a technical specification for pressure-relief accessories for cryogenic service. It covers the design, construction, testing and certification of pressure-relief devices for use on cryogenic vessels. The scope of this document is limited to pressure-relief devices for use on cryogenic vessels. The design and construction of the pressure-relief devices are also included. This is done to ensure:

a) the pressure-relief devices are designed and constructed in accordance with the requirements of ISO 13984-2:2026 and ISO 13985:2025.

b) the content of the previous edition of this document (ISO 13984:1999) has been reviewed and adapted when relevant.

This document has been prepared in coordination with the revision of ISO 13985¹⁾. The fuelling protocols described in this document and the liquid hydrogen storage systems built according to ISO 13985 are thus intended to work together.

1) Stage at the time of publication: ISO/DIS 13985:2025.

ISO 21013-2, *Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 2: Non-reclosable pressure-relief devices*

ISO 21013-3, *Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 3: Sizing and capacity determination*

Liquid hydrogen — Land vehicle fuelling protocol

IEC 60079-14, *Explosive atmospheres - Part 14: Electrical installations design, selection and erection*

1 Scope

This document specifies fuelling protocols for liquid hydrogen (LH₂), defining the minimum design, installation and operation requirements for a safe, as well as fast, efficient and interoperable hydrogen transfer from the fuelling station to the vehicle fuel system.

This document applies to land vehicles of all types equipped with a liquid hydrogen storage system in accordance with ISO 13985. The protocols described in this document are currently limited to vehicles with storage system total internal volume equal to or comprised between 0,6 m³ and 4 m³. The requirements specified in this document are also applicable to further hydrogen applications, however, further specific requirements that can be necessary for the safe operation of such fuelling are not addressed in this document.

This document specifies the requirements for liquid hydrogen fuelling and dispensing systems, fuelling station - vehicle interface and vehicle storage system in order to minimise the risk of fire, explosion or any other hydrogen adverse effects to an acceptable level, especially during and after the fuelling process.

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 7369, *Pipework — Metal hoses and hose assemblies — Vocabulary*

ISO 10286, *Gas cylinders — Vocabulary*

ISO 10893-4, *Non-destructive testing of steel tubes — Part 4: Liquid penetrant inspection of seamless and welded steel tubes for the detection of surface imperfections*

ISO 10893-6, *Non-destructive testing of steel tubes — Part 6: Radiographic testing of the weld seam of welded steel tubes for the detection of imperfections*

ISO 10893-7, *Non-destructive testing of steel tubes — Part 7: Digital radiographic testing of the weld seam of welded steel tubes for the detection of imperfections*

ISO 10893-8, *Non-destructive testing of steel tubes — Part 8: Automated ultrasonic testing of seamless and welded steel tubes for the detection of laminar imperfections*

ISO 10893-10, *Non-destructive testing of steel tubes — Part 10: Automated full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal and/or transverse imperfections*

ISO 11484, *Steel products — Employer's qualification system for non-destructive testing (NDT) personnel*

ISO/DIS 13985:2025, *Liquid hydrogen — Land vehicle fuel tanks*

ISO 14687, *Hydrogen fuel quality — Product specification*

ISO 17636 (all parts), *Non destructive testing of welds — Radiographic testing*

ISO 19880-1:2020, *Gaseous hydrogen — Fuelling stations — Part 1: General requirements*

ISO 21013-1, *Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 1: Reclosable pressure-relief valves*

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ISO 21013-2, *Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 2: Non-reclosable pressure-relief devices*

ISO 21013-3, *Cryogenic vessels – Pressure-relief accessories for cryogenic service — Part 3: Sizing and capacity determination*

IEC 60079-14, *Explosive atmospheres - Part 14: Electrical installations design, selection and erection*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN