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Polnilne postaje za oskrbo z zemeljskim plinom - Postaje za oskrbo vozil s stisnjenim zemeljskim plinom (ISO/DIS 16923:2024)

Natural gas fuelling stations - CNG stations for fuelling vehicles (ISO/DIS 16923:2024)

Gasfüllanlagen - CNG Füllanlagen zur Betankung von Fahrzeugen (ISO/DIS 16923:2024)

Stations-service de gaz naturel - Stations GNC pour le ravitaillement de véhicules (ISO/DIS 16923:2024)

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Natural gas fuelling stations — CNG stations for fuelling vehicles

Stations-service de gaz naturel — Stations GNC pour le ravitaillement de véhicules

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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).

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For an explanation on 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.

The committee responsible for this document is ISO/PC 340, *Natural gas fuelling stations*.

Natural gas fuelling stations — CNG stations for fuelling vehicles

1 Scope

This document covers the design, construction, operation, inspection and maintenance of stations for fuelling compressed natural gas (CNG) to vehicles, including equipment, safety and control devices.

This document also applies to portions of a fuelling station where natural gas is in a gaseous state and dispensing CNG derived from liquefied natural gas (LCNG) according to ISO 16924.

This document applies to fuelling stations supplied with natural gas as defined in local applicable gas composition regulations or ISO 13686. It also applies to other gases meeting these requirements including biomethane, upgraded coal-bed methane (CBM) and gas supplies coming from LNG vaporization (on-site or off-site).

This document includes all equipment for downstream gas supply connection (i.e. point of separation between the CNG fuelling station piping and the pipeline network). Fuelling station nozzles are not defined in this document.

This document covers fuelling stations with the following characteristics:

— slow fill;

— fast fill;

— private access;

— public access (self-service or assisted);

— fuelling stations with fixed storage;

— fuelling stations with mobile storage (daughter station);

— multi-fuel stations.

This document is not applicable to domestic CNG fuelling devices without buffer storage.

NOTE This document is based on the condition that the gas entering the fuelling station is odorized. For unodorized gas fuelling stations, additional safety requirements are included in Clause 10.

2 Normative references

The following documents are referred to in 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 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

ISO 4126-1, *Safety devices for protection against excessive pressure — Part 1: Safety valves*

ISO 8580, *Rubber and plastics hoses — Determination of ultra-violet resistance under static conditions*

ISO 9809-1, *Gas cylinders — Design, construction and testing of refillable seamless steel gas cylinders and tubes — Part 1: Quenched and tempered steel cylinders and tubes with tensile strength less than 1 100 MPa*

ISO 9809-2, *Gas cylinders — Design, construction and testing of refillable seamless steel gas cylinders and tubes — Part 2: Quenched and tempered steel cylinders and tubes with tensile strength greater than or equal to 1 100 MPa*

ISO 11119-1, *Gas cylinders — Design, construction and testing of refillable composite gas cylinders and tubes — Part 1: Hoop wrapped fibre reinforced composite gas cylinders and tubes up to 450 l*

ISO 11119-2, *Gas cylinders — Design, construction and testing of refillable composite gas cylinders and tubes — Part 2: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450 l with load-sharing metal liners*

ISO 11119-3, *Gas cylinders — Design, construction and testing of refillable composite gas cylinders and tubes — Part 3: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450 l with non-load-sharing metallic or non-metallic liners or without liners*

ISO 11439, *Gas cylinders — High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles*

ISO 11925-3, *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame — Part 3: Multi-source test*

ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13847, *Petroleum and natural gas industries — Pipeline transportation systems — Welding of pipelines*

ISO 14120, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

ISO 15500-2, *Road vehicles — Compressed natural gas (CNG) fuel system components — Part 2: Performance and general test methods*

ISO 15500-17, *Road vehicles — Compressed natural gas (CNG) fuel system components — Part 17: Flexible fuel line*

ISO 15589-1, *Petroleum, petrochemical and natural gas industries — Cathodic protection of pipeline systems — Part 1: On-land pipelines*

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

ISO 23684, *Road vehicles — Technical personnel dealing with natural gas vehicles (NGVs) — Training and qualification*

ISO 20607, *Safety of machinery — Instruction handbook — General drafting principles*

ISO 24671, *Road vehicles — Qualification and certification of technical personnel dealing with natural gas vehicles (NGVs)*

IEC 31010, *Risk management — Risk assessment techniques*

IEC 60079-0, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements*

IEC 60079-10-1, *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres*

IEC 60079-11, *Explosive atmospheres — Part 11: Equipment Protection by Intrinsic Safety "i"*

IEC 60079-14, *Electrical apparatus for explosive gas atmospheres — Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 60079-25, *Explosive atmospheres — Part 25: Intrinsically safe electrical systems*

IEC 60079-29-1, *Explosive atmospheres - Part 29-1: Gas detectors - Performance requirements of detectors for fammable gases*

IEC 60079-29-4, *Explosive atmospheres - Part 29-4: Gas detectors - Performance requirements of open path detectors for fammable gases*

IEC 60079-32, *Explosive atmospheres - Part 32-1: Electrostatic hazards, guidance*

ISO 80079-36, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements*

IEC 60204-1, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 62305 (series), *Protection against lightning*

IEC 62443 (series), *Industrial communication networks – network and system security*

EN 16723-2, *Natural gas and biomethane for use in transport and biomethane for injection in the natural gas network -part 2 – Automotive fuels specification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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

3.1
assembly
sub-system of fuelling stations comprising several components

3.2
auto-extinguishing
feature of a material that ceases combustion upon removal of flame or ignition source

3.3
biomethane
methane rich gas derived from biogas or from gasification of biomass by upgrading with the properties similar to natural gas

[SOURCE: ISO 14532:2014, 2.1.1.15]

3.4
bonding
equipotential zone where potentially live exposed metallic parts are electrically connected with at least one point connected to ground/earth

3.5
breakaway device
a coupling which separates at a predetermined section to protect the fuelling station from damage by vehicles driving away while still connected to the station.

Note 1 to entry: Each separated section contains a self-closing shut-off valve which seals automatically.

3.6
buffer storage
one or more suitable pressure vessels designed for the purpose of storing compressed natural gas

3.7
building
structures, usually enclosed by walls and a roof, constructed to provide support or shelter for an intended occupancy

3.8
bundle tube
bundles of small diameter stainless steel tubes contained within a Polyethylene sheath

3.9
burst pressure
p_b pressure that causes failure and consequential fluid loss through the component envelope

3.10
canopy
roof, overhead shelter, or hood, that affords a degree of weather protection

3.11
CNG fuelling station
facility at which compressed natural gas is dispensed to vehicles

3.12
competent person
person having the ability, appropriate training, knowledge and experience, to supervise or carry out the work being undertaken in a safe and proper manner with documented proof of appropriate training

3.13
compressed natural gas CNG
natural gas which has been compressed and stored for use as a vehicle fuel

[SOURCE: ISO 15500-1:2000, 3.2]

3.14
compressor
machine that increases the pressure of gas

3.15
conduit
casing, tubing or liner, either metallic or non-metallic

[SOURCE: ISO 14310:2008, 3.6]

3.16
cylinder
pressure vessel used for the storage of compressed natural gas

3.17
cylinder working pressure
settled pressure of a fully filled cylinder at a uniform temperature of 15 °C

3.18
dispenser
equipment through which the fuel is supplied to the vehicle

Note 1 to entry: This equipment can include metering.

3.19
Dryer
equipment which decreases the water vapour content (moisture) of natural gas

3.20
enclosure
structure, not being a building or canopy, that encloses a component of the fuelling station

EXAMPLE Housing, container and machine cabinet.

3.21
explosive gas atmosphere
mixture of substances with air, under atmospheric conditions, in the form of gases, vapours, mists or dusts in which, after ignition has occurred, combustion spreads to the entire unburned mixture

[SOURCE: IEC 61340–4-4:2014, 11, 3.4]

3.22
fail-safe
design feature that ensures that safe conditions are maintained in the event of a malfunction of a control device or an interruption of a supply source

3.23
fast fill
fuelling operation which has a designed flow rate greater than 100 m^3(N)/h per nozzle

3.24
field piping
piping installed for interconnection between equipment at the site

3.25
fire resistant
property that prevents or retards the passage of excessive heat, hot gases or flames under specified conditions

3.26
fire wall
wall, or separating partition erected to reduce the effects of radiated heat

3.27
fuelling
transfer of fuel from dispenser to the vehicle

3.28
fuelling pressure
pressure at which the fuel is delivered to the vehicle

3.29
fuelling station
facility at which vehicles fuels are dispensed

3.30
grounding
electrical connection of potentially live exposed metallic parts to earth

3.31
hazardous area
area in which an explosive gas atmosphere is present, or can be expected to be present, in quantities such as to require special precautions for the construction, installation and use of apparatus to prevent ignition

[SOURCE: IEC 60079–10–1:2008, 3.3]

3.32
hose
pipeline of flexible material with end fittings attached

3.32.1
vent hose
pipeline of flexible material through which natural gas is vented from the fuelling connection at a vehicle

3.31.2
hose assembly
hose or hoses with ancillary components, such as bend restrictors, breakaways and nozzles, attached

3.33
intrinsically safe circuit
circuit in which any spark or thermal effect is incapable of causing ignition of a mixture of flammable or combustible material in air under specified test conditions

3.34
lower explosive limit
LEL
volume concentration of flammable gas or vapour in air, below which the mixture is not flammable

[SOURCE: ISO 19372:2015, 3.7, modified — “explosive” has been changed to “flammable”.]

3.35
maximum allowable operating pressure
MAOP
maximum pressure that the component or system is subjected to during normal operation

Note 1 to entry: MAOP is typically not greater than 90 % of the maximum allowable working pressure of the component or system.

3.36
maximum allowable working pressure
MAWP
maximum pressure to which a component or system is designed to be subjected and which is the basis for determining the strength of the component or system

[SOURCE: ISO 12991:2012, 3.10, modified — “or system” has been added and “under consideration” has been removed.]

3.36.1
mobile storage
multi-cylinder or tank fixture mounted on a vehicle or trailer and used for the transportation of natural gas to CNG fuelling stations

3.37
multi-fuel dispenser
dispenser delivering CNG and other fuels (liquid or gaseous)

3.38
multi-fuel station
fuelling station that can fuel natural gas as well as other fuels, for example diesel, petrol, LPG

3.39
natural gas
complex gaseous mixture of hydrocarbons, primarily methane, but generally includes ethane, propane and higher hydrocarbons, and some non-combustible gases such as nitrogen and carbon dioxide

Note 1 to entry: Natural gas can also contain components or containments such as sulfur compounds and/or other chemical species.

[SOURCE: ISO 14532:2014, 2.1.1.1]