



SLOVENSKI STANDARD SIST EN 17278:2021

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Vozila na zemeljski plin - Polnilne naprave za vozila na zemeljski plin

Natural gas vehicles - Vehicle fuelling appliances

Erdgasfahrzeuge - Fahrzeugbetankungsgeräte

Véhicules fonctionnant au gaz naturel - Bornes de distribution de carburant véhicules

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Natural gas vehicles - Vehicle fuelling appliances

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Erdgasfahrzeuge - Fahrzeugbetankungsgeräte

This European Standard was approved by CEN on 2 May 2021.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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EN 17278:2021 (E)**European foreword**

This document (EN 17278:2021) has been prepared by Technical Committee CEN/TC 326 “Natural gas vehicles - Fuelling and operation”, the secretariat of which is held by TSE.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2021, and conflicting national standards shall be withdrawn at the latest by December 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under mandate M/071 given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the European Directive 2014/68/EU.

For relationship with European Directive 2014/68/EU, see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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1 Scope

This document covers the design and manufacturing, installation and testing, operation and maintenance for vehicle fuelling appliances (VFAs) – the assemblies of the pressure equipment with

- maximum compressor flow rate 20 scm/h,
- maximum fuelling pressure 200 bar at 15°C,

intended for the non-commercial fuelling of natural gas vehicles (NGVs) with compressed natural gas (CNG).

This document is applicable to VFAs supplied with natural gas as defined in local applicable gas composition regulations or EN 16723-2, or with other gases meeting these requirements including biomethane, upgraded coal-bed methane (CBM) and gas from liquefied natural gas (LNG) vaporizer (on-site or off-site).

In case of combination of the certified VFA assembly with additional equipment, such as external storage and/or dispenser, EN ISO 16923 applies to the new assembly - the certified VFA assembly with added external equipment.

In case of combinations of interconnected VFA assemblies, EN ISO 16923 applies to the whole new assembly of the certified VFA assemblies.

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.

EN 60204-1:2018, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*

EN 60079-10-1:2015, *Explosive atmospheres - Part 10-1: Classification of areas - Explosive gas atmospheres*

EN 60079-29-2:2015, *Explosive atmospheres - Part 29-2: Gas detectors - Selection, installation, use and maintenance of detectors for flammable gases and oxygen*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code)*

EN 13445-3:2014, *Unfired pressure vessels - Part 3: Design*

EN 13480-3:2017, *Metallic industrial piping - Part 3: Design and calculation*

EN 16723-2:2017, *Natural gas and biomethane for use in transport and biomethane for injection in the natural gas network - Part 2: Automotive fuels specification*

EN ISO 4126-1:2013,¹ *Safety devices for protection against excessive pressure - Part 1: Safety valves (ISO 4126-1:2013)*

EN ISO 4126-3:2006, *Safety devices for protection against excessive pressure — Part 3: Safety valves and bursting disc safety devices in combination*

¹ As impacted by amendments EN ISO 4126-1:2013/A1:2016 and EN ISO 4126-1:2013/A2:2019.

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EN ISO 9809-1:2019, *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 9809-1:2019)*

EN ISO 9809-2:2019, *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 9809-2:2019)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2015, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 14469:2017, *Road vehicles - Compressed natural gas (CNG) refuelling connector (ISO 14469:2017)*

EN ISO 15609-1:2019, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1:2019)*

EN ISO 16923:2018, *Natural gas fuelling stations - CNG stations for fuelling vehicles (ISO 16923:2016)*

EN ISO 30013:2011, *Rubber and plastics hoses - Methods of exposure to laboratory light sources - Determination of changes in colour, appearance and other physical properties (ISO 30013:2011)*

EN IEC 31010:2019, *Risk management - Risk assessment techniques*

EN IEC 60079-0:2018, *Explosive atmospheres - Part 0: Equipment - General requirements*

ISO 18119:2018, *Gas cylinders — Seamless steel and seamless aluminium-alloy gas cylinders and tubes — Periodic inspection and testing*

ISO 11119-1:2012, *Gas cylinders — Refillable composite gas cylinders and tubes — Design, construction and testing — Part 1: Hoop wrapped fibre reinforced composite gas cylinders and tubes up to 450 l*

ISO 11119-2:2012, *Gas cylinders — Refillable composite gas cylinders and tubes — Design, construction and testing — Part 2: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450 l with load-sharing metal liners*

ISO 11119-3:2013, *Gas cylinders — Refillable composite gas cylinders and tubes — Design, construction and testing — Part 3: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450L with non-load-sharing metallic or non-metallic liners*

ISO 11119-4:2016, *Gas cylinders — Refillable composite gas cylinders — Design, construction and testing — Part 4: Fully wrapped fibre reinforced composite gas cylinders up to 150 l with load-sharing welded metallic liners*

ISO 31000:2018, *Risk management — Guidelines*

ISO 15501-2:2016, *Road vehicles — Compressed natural gas (CNG) fuel systems — Part 2: Test methods*

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

3.1

automatic restart

system designed to initiate a fuelling sequence without a physical action by a person at the appliance

3.2

biomethane

gas comprising principally methane, obtained from either upgrading of biogas or methanation of bio-syngas

[SOURCE: EN 16723-2:2017, 3.3]

3.3

breakaway device

coupling which separates at a predetermined section when required and each separated section contains a self-closing shut-off valve which seals automatically

[SOURCE: EN ISO 16923:2018, 3.5] (standards.iteh.ai)

3.4

burst pressure

pressure which causes failure and consequential fluid loss through the component envelope

[SOURCE: EN ISO 16923:2018, 3.8]

3.5

compressed natural gas

natural gas used as a fuel for automotive vehicles typically compressed up to 20000 kPa in the gaseous phase

[SOURCE: EN 16723-2:2017, 3.5]

3.6

compressor

system that is inherent to the VFA, which increases the pressure of gas from a lower to a higher level

3.7

cylinder

pressure vessel designed to store CNG

EN 17278:2021 (E)**3.8****domestic area**

area or building primarily used as a permanent place of residence, where the VFA(s) installed may not be used by the owner/operator for commercial purposes nor made available to other employees or associates of the owner/operator as a commercial resource

EXAMPLE A yard or a garage of a private house.

3.9**dryer**

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

[SOURCE: EN ISO 16923:2018, 3.18]

3.10**enclosure**

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

EXAMPLE Housing, container and machine cabinet.

[SOURCE: EN ISO 16923:2018, 3.19]

3.11**examiner**

person who has been appointed to verify compliance with the applicable standard

Note 1 to entry: In certain cases, an external independent examiner can be required.

3.12**fuelling pressure discharge system**

system that is inherent to the VFA, which is designed to reduce the pressure of CNG in the fuelling nozzle to allow safe disconnection from the NGV

3.13**fuel delivery system**

system that is inherent to the VFA, which is intended for CNG delivery from the VFA to the vehicle, including a fuelling hose, a fuelling nozzle and a break-away device

3.14**gas containment system**

system that is inherent to the VFA, which comprises at least one cylinder and its associated safety devices

3.15**hose**

pipeline of flexible material with end fittings attached

[SOURCE: EN ISO 16923:2018, 3.31]

3.16**leakage**

unintended escape of any fluid (gas, liquid)

3.17**locking system**

system that is inherent to the VFA, which is designed to block the activation of VFA functions for unauthorized access

3.18**maximum allowable operating pressure**

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.

[SOURCE: EN ISO 16923:2018, 3.31]

3.19**maximum allowable working pressure**

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: EN ISO 16923:2018, 3.32]

3.20**natural gas**

complex gaseous mixture of hydrocarbons, primary 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 sulphur compounds and/or other chemical species.

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[SOURCE: EN 16723-2:2017, 3.12] <https://standards.iteh.ai/catalog/standards/sist/a7db9339-c633-4c49-a0ab-1b3227e29133/sist-en-17278-2021>

3.21**non-domestic area**

area or building not primarily used as a permanent place of residence, where the VFA(s) installed may be used by the owner/operator for commercial purposes and made available to other employees or associates of the owner/operator as a commercial resource

EXAMPLE A plot of land, a workshop or a garage of a small commercial entity.

3.22**non-commercial fuelling**

fuelling for own needs, not for the retail of CNG

3.23**occupied space**

enclosed space intended to be occupied by people for extended periods of time, e.g., houses, apartments, hospitals and offices

3.24**periodic inspection**

thorough examination by a qualified person, due to official requirements and/or manufacturer's prescription of which records are made to provide the basis for a continuing evaluation

EN 17278:2021 (E)**3.25****qualified person**

person whose competence and knowledge have been obtained by education, training and/or relevant practical experience

Note 1 to entry: In order to demonstrate the level of competence and knowledge, a qualification test may be required.

[SOURCE: EN ISO 3834-1:2005, 3.2]

3.26**temperature compensation system**

system or device intended to limit the maximum fuelling pressure

3.27**user**

person who operates the VFA

3.28**vehicle fuelling appliance**

appliance, being manufactured, tested and CE marked as a single appliance, intended for non-commercial fuelling of NGVs with CNG enabling the fuelling directly into NGV's onboard fuel tank(s)

4 Abbreviations**iTeh STANDARD PREVIEW****(standards.iteh.ai)**

CNG	compressed natural gas
MAWP	maximum allowable working pressure
NGV	natural gas vehicle
PRD	pressure relief device
TPRD	temperature pressure relief device
VFA	vehicle fuelling appliance

5 Risk management

Risk assessment shall include design, construction, operation and maintenance of the VFA. The risk assessment process shall be used to evaluate the consequences of hazardous events and to determine appropriate means of risk reduction and/or mitigation of consequences.

The VFA shall be designed to minimize risk to users, servicing personnel, properties, and environment.

The manufacturer shall follow the guidelines from suitable standards, e.g.: EN ISO 12100, EN IEC 31010:2019, ISO 31000:2018 and EN ISO 13849-1. Measures to reduce fire and explosion risks shall be applied, including but not limited to:

- prevention of the formation of a flammable or explosive mixture (gas leakages);
- prevention of static charge build-up;
- avoidance of ignition sources;
- mitigation of the effects of a fire or explosion.