SLOVENSKI STANDARD
SIST EN 1949:2022

01-april-2022

Nadomešča:
SIST EN 1949:2011+A1:2013

Specifikacija za vgradnjo sistemov na utekočinjeni naftni plin (UNP) v bivalna vozila za prosti čas in druga bivalna vozila

Specification for the installation of LPG systems for habitation purposes in leisure accommodation vehicles and accommodation purposes in other vehicles

Festlegungen für die Installation von Flüssiggasanlagen in bewohnbaren Freizeitfahrzeugen und zu Wohnzwecken in anderen Fahrzeugen

Spécifications relatives aux installations des systèmes GPL pour les besoins domestiques dans les véhicules habitables de loisirs et dans les autres véhicules

Ta slovenski standard je istoveten z: **EN 1949:2021**

ICS:

43.100	Osebni avtomobili. Bivalne prikolice in lahke prikolice	Passenger cars. Caravans and light trailers
75.160.30	Plinska goriva	Gaseous fuels

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EUROPEAN STANDARD

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English Version

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This European Standard was approved by CEN on 23 August 2021.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 1949:2021) has been prepared by Technical Committee CEN/TC 181 “Appliances and leisure vehicle installations using liquefied petroleum gas and appliances using natural gas for outdoor use”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2023.

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 supersedes EN 1949:2011+A1:2013.

The following main technical changes have been made compared to EN 1949:2011+A1:2013:

a) definition for LPG tank compartment has been added;

b) declaration of conformity is now mandatory;

c) several clauses have been separated to clearly state the requirements for road vehicles and caravan holiday homes;

d) requirements for LPG cylinder compartment with internal access has been amended;

e) requirements for LPG tank compartment have been added;

f) requirements for electric installations inside LPG cylinder/tank compartments have been extended;

g) requirements for slide outs have been added;

h) requirements for LPG tanks and LPG tank installations have been extended;

i) Annex A for national regulation concerning the maximum flow rate of pressure regulating devices for caravan holiday homes has been added;

j) Annex B (old) has been deleted;

k) former Annex A became Annex B;

l) Annex C has been updated.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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.

1 Scope

This document specifies the requirements for the installation of liquefied petroleum gas systems for habitation purposes in leisure accommodation vehicles and for accommodation purposes in other vehicles.

It details health and safety requirements on:

— the selection of materials;

— components and appliances;

— design considerations;

— tightness testing of installations;

— the contents of the user's handbook.

This document only covers installations supplied with 3rd family gases (LPG).

It does not cover:

— water connections or electrical power supplies to the appliance(s);

— portable appliances, incorporating their own LPG supply;

— the installation of LPG appliances to be used for commercial purposes;

— LPG installations on boats;

— LPG supply equipment and LPG appliances separate from and external to the body of the vehicle.

This document covers LPG tanks fulfilling the requirements of the Pressure Equipment Directive (2014/68/EU).

Attention is drawn to the Pressure Equipment Directive (2014/68/EU) for any parts of the installation operating above 0,5 bar.

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 331:2015, *Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings*

EN 624, *Specification for dedicated LPG appliances - Room sealed LPG space heating equipment for installation in vehicles and boats*

EN 732, *Specifications for dedicated liquefied petroleum gas appliances - Absorption refrigerators*

EN 751-2, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 2: Non-hardening jointing compounds*

EN 751-3, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 3: Unsintered PTFE tapes*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1254-1, *Copper and copper alloys - Plumbing fittings - Part 1: Capillary fittings for soldering or brazing to copper tubes*

EN 1254-2, *Copper and copper alloys - Plumbing fittings - Part 2: Compression fittings for use with copper tubes*

EN 1254-4, *Copper and copper alloys - Plumbing fittings - Part 4: Threaded fittings*

EN 10226-1, *Pipe threads where pressure tight joints are made on the threads - Part 1: Taper external threads and parallel internal threads - Dimensions, tolerances and designation*

EN 10305-1, *Steel tubes for precision applications - Technical delivery conditions - Part 1: Seamless cold drawn tubes*

EN 10305-2, *Steel tubes for precision applications - Technical delivery conditions - Part 2: Welded cold drawn tubes*

EN 10305-3, *Steel tubes for precision applications - Technical delivery conditions - Part 3: Welded cold sized tubes*

EN 10305-4, *Steel tubes for precision applications - Technical delivery conditions - Part 4: Seamless cold drawn tubes for hydraulic and pneumatic power systems*

EN 12979:2002, *Automotive LPG-systems - Installation requirements*

EN 14291, *Foam producing solutions for leak detection on gas installations*

EN 14800, *Corrugated safety metal hose assemblies for the connection of domestic appliances using gaseous fuels*

EN 15033, *Room sealed storage water heaters for the production of sanitary hot water using LPG for vehicles and boats*

EN 15266, *Stainless steel pliable corrugated tubing kits in buildings for gas with an operating pressure up to 0,5 bar*

EN 16129:2013, *Pressure regulators, automatic change-over devices, having a maximum regulated pressure of 4 bar, with a maximum capacity of 150 kg/h, associated safety devices and adaptors for butane, propane, and their mixtures*

EN 16436-2:2018, *Rubber and plastics hoses, tubing and assemblies for use with propane and butane and their mixtures in the vapour phase — Part 2: Assemblies*

EN ISO 1127, *Stainless steel tubes - Dimensions, tolerances and conventional masses per unit length (ISO 1127)*

EN ISO 8434-1, *Metallic tube connections for fluid power and general use - Part 1: 24° cone connectors (ISO 8434-1)*

ISO 8434-2, *Metallic tube connections for fluid power and general use — Part 2: 37 degree flared connectors*

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:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
leisure accommodation vehicle
unit of living accommodation for temporary or seasonal occupation that may meet requirements for construction and use of road vehicles

[SOURCE: EN 13878:2019, definition 3.19]

3.2
caravan
trailer leisure accommodation vehicle that meets requirements for construction and use of road vehicles

[SOURCE: EN 13878:2019, definition 3.5]

3.3
motor caravan
self-propelled leisure accommodation vehicle that meets requirements for construction and use of road vehicles. It contains at least seats and table, sleeping accommodation which may be converted from the seats, cooking facilities and storage facilities

[SOURCE: EN 13878:2019, definition 3.24]

3.4
caravan holiday home
transportable leisure accommodation vehicle that does not meet requirements for construction and use of road vehicles, that retains means for mobility and is for temporary or seasonal occupation

[SOURCE: EN 13878:2019, definition 3.6]

3.5
liquefied petroleum gas (LPG)
mixture of light hydrocarbons composed mainly of propane, butane and their isomers, gaseous under conditions of normal temperature and pressure

Note 1 to entry: LPG is maintained in its liquid state by increased pressure or lowered temperature.

Note 2 to entry: In some countries, UN numbers 1011 and 1978 may also be designated LPG.

3.6
LPG appliance
appliance that is designed for heating, cooking, lighting, refrigeration, hot water production or electricity production (fuel cell or generator), using LPG as its energy source

3.7
LPG system
assembly of an installation and its appliances

3.8
LPG installation
installation usually consisting of fuel container(s), pressure regulator(s), piping, hose assemblies and shut-off devices, providing liquefied petroleum gas in gaseous phase to appliances

3.9
pressure regulation system
system incorporating one or more regulators with or without change-over device to reduce the supply pressure of the LPG system to the required working pressure for the appliance(s)

3.10
regulator
device which maintains a regulated pressure within preset limits, whatever the upstream pressure, rate and temperature

[SOURCE: EN 16129:2013, definition 3.1.1]

3.11
changeover device
device which maintains the gas supply continuity by using gas from a “LPG cylinder”, a “LPG tank” or an external supply manually chosen by the user or automatically

3.12
room sealed appliance
appliance that has the combustion system, including the air inlet and products outlet, isolated from any internal area

3.13
open-flue appliance
appliance designed to be connected to a flue via a draught diverter, its combustion air being drawn from the room or internal space in which it is installed

3.14
closed-flue appliance
appliance where the flue is closed from a room or internal space due to the absence of a draught diverter, flue break and any draught break within the flue

3.15
flueless appliance
appliance that discharges its products of combustion into the compartment in which it is installed

3.16
flue
duct designed to convey the products of combustion to the exterior of a vehicle

3.17
flue terminal
part of the flue system through which the products of combustion are discharged to the outside (cowl)

3.18
shut-off valve
device to interrupt the flow of gas, having one inlet and one or more individually controlled outlets

3.19
liquefied petroleum gas cylinder
portable container for liquefied petroleum gas

Note 1 to entry: portable containers which are refilled outside the vehicle are considered as cylinders (see ADR 4.1.4, P200).

[SOURCE: EN 13878:2019, definition 3.21]

3.20
LPG cylinder compartment
space specially constructed to accommodate liquefied petroleum gas cylinder(s)

3.21
flame supervision device
device that has a sensing element, activated by the presence or absence of a flame, that causes the inlet of the LPG supply to a burner to be opened or closed

3.22
pilot
small burner that provides a continuously burning flame to ignite a main burner when required

3.23
tightness
absence of leakage greater than the specified limit

3.24
hard soldering
soldering for which the lowest temperature of the melting range, after application, is not less than 450 °C

3.25
fixed ventilation
permanent measures that ensure the minimum provision of fresh air

3.26
free area of ventilation
total area of the apertures in a ventilator or grill

3.27
ventilator
device that allows the passage of air for the ventilation of a compartment

3.28
hose assembly
length of hose with suitably attached end fittings

[SOURCE EN ISO 14113:2013, definition 3.5]

3.29
low pressure hose assembly
hose assembly, LPG resistant, for use at working pressure

3.30
high pressure hose assembly
hose assembly, LPG resistant, for use at high pressure, normally supply pressure

3.31
users handbook
document that provides information to the user of a leisure accommodation vehicle on its operation, maintenance, repair etc.

3.32
working pressure
pressure at the inlet of a LPG appliance while it is in operation

3.33
readily accessible
item capable of being reached quickly and safely for effective use under emergency conditions without the use of tools

Note 1 to entry: The key of a lock is not regarded as a tool.

3.34
accessible
item capable of being reached for inspection, removal or maintenance with or without the use of tools

3.35
safety closing device
device which automatically interrupts the flow of gas due to an accidental disconnection of a hose assembly or pipe installed downstream of the safety closing device

3.36
LPG tank
fixed container which can be refilled whilst in position on a vehicle and suitable for the storage of LPG

Note 1 to entry: This may supply LPG for gas appliances only.

3.37
underfloor flue
flue which discharges all or parts of the products of combustion into the space lying beneath and within the plan view of the vehicle

3.38
leak detection device
device capable of indicating any downstream leakage

3.39
LPG tank compartment
space specially constructed to accommodate LPG tank(s)

3.40
Extra low voltage
ELV
voltage not exceeding 50 V a.c. or 120 V ripple free d.c. between conductors or to earth, but usually of a nominal 12 V in leisure accommodation vehicles

[SOURCE EN 13878:2019, definition 3.14]

3.41
slide out
structural element, that can be moved to increase the habitational area of a road vehicle

4 General Requirements

4.1 General

The manufacturer or installer of an LPG system shall issue a declaration of conformity for each leisure accommodation vehicle or other vehicle stating the compliance with EN 1949, including the test result of 4.3.2, it should include the information shown in Annex C and if applicable, national regulations.

For road vehicles, a label according to Figure 1, stating that all LPG appliances shall be turned off before refilling (LPG, petrol, diesel or other fuels), shall be affixed inside the vehicle where it can be easily and readily seen.

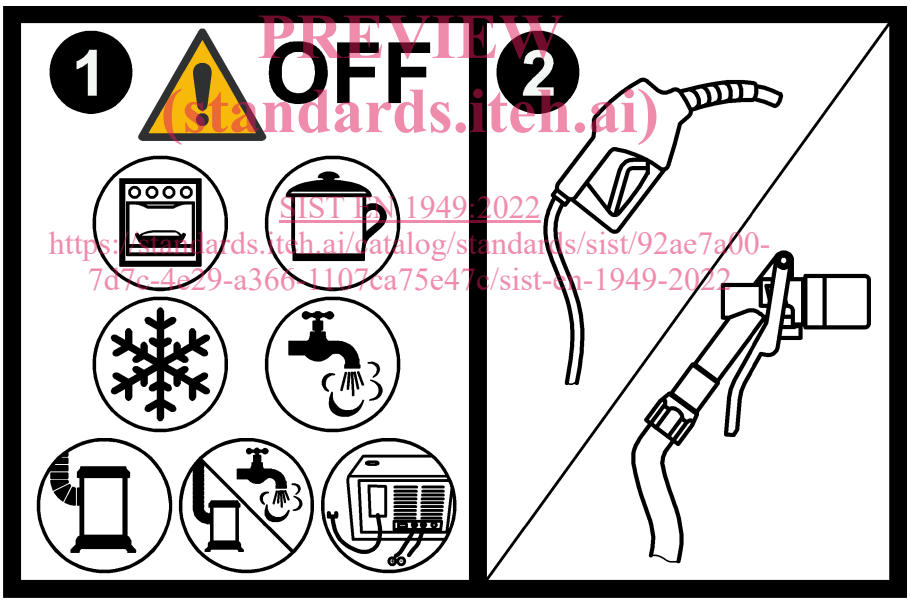

Figure 1 — Label stating to turn off all appliances in case of refilling

4.2 Dynamic loads

The LPG system shall be designed to withstand the dynamic loads during normal operation including movement of the vehicle.

4.3 Tightness

4.3.1 Requirements

Each vehicle manufacturer's LPG system up to the user operated controls of the appliances (taps) shall fulfil the following tightness requirements when tested at a test pressure of 150 mbar with air. A detectable pressure loss of at most 5 mbar is permissible. If the volume of the LPG system is below 700 cm^3, a test volume shall be added so that the test volume is at least 700 cm^3.

4.3.2 Test

The test is carried out with air using the connection point for test equipment described in 7.2.1.1 and the following procedure. In preparation for the test, the taps of the appliances shall be closed but the shut off valves be left open. The LPG system is then pressurized to 150 mbar and closed. The measurement of the pressure drop is carried out after a period of 5 minutes to allow for temperature and pressure stabilization. If the pressure is not stable, additional time shall be necessary or other action needs to be taken before the pressure is recorded. After another 5 minutes the remaining pressure is compared to the first pressure.

During the test period the LPG pressure source should be turned off.

All parts of the LPG system operating at pressures above working pressure are tested with an appropriate leak detection solution according to EN 14291 at operational pressure. No leakage shall be observed within 30 s.

All parts, which are dismantled during the pressure test, shall be tested with an appropriate leak detection solution according to EN 14291 at operational pressure after reassembling. No leakage shall be observed within 30 s.

4.4 Second LPG system

4.4.1 Road vehicles

Only if an LPG power generator is installed and the total LPG consumption including the appliances exceeds 1,5 kg/h it is allowed to install one additional LPG system.

For tightness test, see 4.3.

There shall be no connection between the both LPG systems.

The LPG containers for both LPG systems may be installed in the same compartment (see 5.1 and 6).

If there are two separate compartments, there shall be a warning sign inside both compartments, which indicates that there is a second LPG system. Inside the compartment it shall be clearly indicated by a label which appliances are supplied by each LPG system. Where the LPG tank(s) is/are not fitted within a compartment, these labels shall be fitted visibly on the LPG tank(s).

If there is a second LPG system, a second manufacture's declaration of conformity is mandatory.

4.4.2 Caravan holiday home

A second LPG system is not allowed.

5 LPG cylinder housing

5.1 LPG Cylinder compartment

5.1.1 General

For road vehicles, LPG cylinders shall be installed in LPG cylinder compartments or LPG tank compartments (see Clause 6), except when they are installed according to 5.2 or when they are used in the conditions of 7.7.

For caravan holiday homes, cylinders are not required to be installed in cylinder compartments, but if a cylinder compartment is used it shall fulfil the following appropriate requirements.

With the exception of 5.1.7, cylinder compartments shall be sealed against the accommodation space and shall have external access only.

5.1.2 Requirements for the construction of cylinder compartments

5.1.2.1 General

The cylinder compartment shall be designed so that:

a) access to any connections, changeover devices and pressure regulation systems is not obstructed;

b) the replacement of LPG cylinders can be made without disturbing the installation or ancillary equipment;

c) it is possible for any LPG cylinder securing device to be opened and closed without the use of tools;

d) it can accommodate LPG cylinder(s) of sufficient capacity to supply the total installed appliance consumption.

A label shall be placed with a pictogram of a LPG cylinder and a sign “read instructions”, see Figure 2, in the vicinity of the LPG cylinder(s).

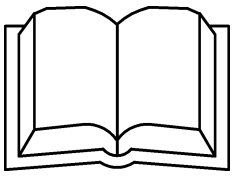

Figure 2 — Sign “read instructions”

5.1.2.2 Road vehicles

In addition to 5.1.2.1 each LPG cylinder shall be secured rigidly in an upright position with the valve uppermost to operate only in the gaseous phase and to prevent inadvertent movement when the vehicle is in motion. In order to ensure the location of each LPG cylinder there shall be securing or fixing means, one at high level and one at low level.

A pull-out tray for the placement of the LPG cylinder(s) is permitted inside the LPG cylinder compartment to facilitate the exchange of LPG cylinders.

5.1.2.3 Caravan holiday homes

In addition to 5.1.2.1 each LPG cylinder shall be in an upright position with the valve uppermost to operate only in the gaseous phase.