



SLOVENSKI STANDARD

oSIST prEN 15609:2020

01-maj-2020

Oprema in pribor za utekočinjeni naftni plin (UNP) - Pogonski sistemi na UNP za čolne, jahte in druga vodna plovila - Zahteve za vgradnjo

LPG equipment and accessories - LPG propulsion systems for boats, yachts and other watercraft - Installation requirements

Flüssiggas (LPG) Geräte und Ausrüstungsteile - Flüssiggas (LPG) Antriebssysteme für Boote, Yachten und andere Wasserfahrzeuge

Equipements pour gaz de pétrole liquéfié et leurs accessoires - Systèmes de propulsion GPL des bateaux, yachts et autres navires

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ICS:

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47.020.01	Splošni standardi v zvezi z ladjedelništvom in konstrukcijami na morju	General standards related to shipbuilding and marine structures

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EUROPEAN STANDARD
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LPG equipment and accessories - LPG propulsion systems for boats, yachts and other watercraft - Installation requirements

Equipements pour gaz de pétrole liquéfié et leurs
accessoires - Systèmes de propulsion GPL des bateaux,
yachts et autres navires

Flüssiggas (LPG) Geräte und Ausrüstungsteile -
Flüssiggas (LPG) Antriebssysteme für Boote, Jachten
und andere Wasserfahrzeuge

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 286.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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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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prEN 15609:2020 (E)**European foreword**

This document (prEN 15609:2020) has been prepared by Technical Committee CEN/TC 286 “LPG equipment and accessories”, the secretariat of which is held by NSAI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15609:2012.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

The main changes with respect to the previous edition include:

- addition of Annex Z.A, Relationship between this document and the Essential Requirements of EU Directive 2013/53/EU;
- Outboard engines;
- Hybrid systems with LPG genset for recreational watercrafts;
- Updated text to paragraphs 3.3.3, 5.1.2.1, 5.2, 5.3.5, 5.5.1.3, 5.5.3.4, 5.5.5.3

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Introduction

This document specifies requirements for the installation of equipment for the use of Liquefied Petroleum Gas (LPG) in the propulsion systems of small watercraft.

This document calls for the use of substances and procedures that can be injurious to health if adequate precautions are not taken.

Protection of the environment is a key political issue in Europe and elsewhere, for TC 286 this is covered in CEN/TS 16765 [2] LPG equipment and accessories - Environmental considerations for CEN/TC 286 standards, and this Technical Specification should be read in conjunction with this standard.

It has been assumed in the drafting of this document that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This document is based on EN 12979 [3].

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prEN 15609:2020 (E)**1 Scope**

This document specifies the requirements for LPG propulsion systems on watercraft with hull lengths less than or equal to 24 m.

This document does not cover appliances with directly attached gas cylinders, such as portable self-contained camping stoves and portable gas lamps.

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 1442, *LPG equipment and accessories - Transportable refillable welded steel cylinders for LPG - Design and construction*

EN 12805, *Automotive LPG components - Containers*

EN 12806:2003, *Automotive liquefied petroleum gas components - Other than containers*

EN 12864, *Low-pressure, non adjustable regulators having a maximum outlet pressure of less than or equal to 200 mbar, with a capacity of less than or equal to 4 kg/h, and their associated safety devices for butane, propane or their mixtures*

EN 13110, *Transportable refillable welded aluminium cylinders for liquefied petroleum gas (LPG) — Design and construction*

EN 14140, *LPG equipment and accessories - Transportable refillable welded steel cylinders for LPG - Alternative design and construction*

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

EN 14427, *LPG equipment and accessories - Transportable refillable fully wrapped composite cylinders for LPG - Design and construction*

EN 28846, *Small craft — Electrical devices — Protection against ignition of surrounding flammable gases (ISO 8846)*

EN 3-7, *Portable fire extinguishers - Part 7: Characteristics, performance requirements and test methods*

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

EN ISO 898-1:2009, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread (ISO 898-1:2009)*

EN ISO 9094:2015, *Small craft — Fire protection — Part 1: Craft with a hull length of up to and including 15 m*

EN ISO 10133, *Small craft - Electrical systems - Extra-low-voltage d.c. installations (ISO 10133:2012)*

EN ISO 10239, *Small craft - Liquefied petroleum gas (LPG) systems (ISO 10239:2014)*

EN ISO 10240, *Small craft - Owner's manual (ISO 10240:2019)*

EN ISO 11105, *Small craft - Ventilation of petrol engine and/or petrol tank compartments (ISO 11105:1997)*

EN ISO 11591, *Small craft - Field of vision from the steering position (ISO 11591:2019)*

EN ISO 12217 (all parts), *Small craft — Stability and buoyancy assessment and categorization*

EN ISO 13297, *Small craft - Electrical systems - Alternating current installations (ISO 13297)*

ISO 630, *Structural steels — Plates, wide flats, bars, sections and profiles*

ISO 20826, *Automotive LPG components — Containers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12806:2003 and the following 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 <http://www.electropedia.org/>

3.1

liquefied petroleum gas LPG

low pressure liquefied gas composed of one or more light hydrocarbons which are assigned to either UN 1011, UN 1075, UN 1965, UN 1969 or UN 1978 only, and which consist mainly of propane, propene, butane, butane isomers and butene with traces of other hydrocarbon gases

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Note 1 to entry: For automotive LPG specifications, see EN 589 [1]20

3.2

LPG system

assembly of components enabling a watercraft to use LPG in its propulsion system

3.3

outboard engine

engine used for propulsion of the watercraft that is mounted so that the engine is outside the hull of the watercraft

EXAMPLE long tail engines or other engines designed to be removable.

3.4

competent person

person which by combination of appropriate qualification, training, experience, and resources, is able to make objective judgments on the subject

3.5

pressure vessel

assembly of the pressure envelope (including the openings and their closures) and non-pressure-retaining parts attached directly to it

prEN 15609:2020 (E)**3.6****cylinder**

transportable pressure receptacle with a water capacity not exceeding 150 l

3.7**contents gauge**

device to indicate the liquid level or contents in a pressure vessel

3.8**pressure relief valve****PRV**

self-closing valve which automatically, without the assistance of any energy other than that of the vapour concerned, discharges vapour at a predetermined pressure, and operates with a pop action

3.9**overflow protection device****OPD**

device designed to automatically reduce the filling rate to a minimal flow when the fill level reaches a predetermined amount

Note 1 to entry: In marine applications, the predetermined amount is 80 % of the water capacity.

3.10**filler valve**

valve system for liquid fill service

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3.11**fusible plug**

component protecting the pressure vessel from bursting by venting the LPG content at a pre-set temperature

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3.12**excess flow valve**

valve designed to close automatically, with a small residual flow, when the fluid flow passing through it exceeds a predetermined value, and to re-open when the pressure differential across the valve has been restored below a certain value

3.13**non-return valve**

valve designed to close automatically to restrict reverse flow

3.14**fuel system**

installation required to supply LPG to the engine

3.15**pressure regulator****vaporiser**

device that vaporises LPG, reduces and/or regulates the outlet pressure to a pre-set value independent of variations of the inlet pressure and/or the flow rate

Note 1 to entry: The shut-off valve can be integrated in the vaporizer/regulator.

3.16**hydrostatic relief valve**

self-closing valve which automatically, without the assistance of any energy other than that of the fluid concerned, discharges fluid at a predetermined pressure

3.17**ventilation system**

assembly of ducts and an electrical ventilator that is capable of extracting hydrocarbons from the inside of the watercraft and allowing the entrance of fresh air

3.18**container housing**

ventilated enclosure intended solely for storage of one or more LPG containers, pressure regulators and safety devices, and located on the exterior of the boat where any leakage would flow overboard

3.19**container locker**

gas-tight (to the craft) enclosure with an overboard drain, where any leakage would flow overboard, intended solely for storage of one or more LPG containers in a cockpit or recess in the watercraft

3.20**permanently installed**

securely fastened so that tools have to be used for removal

3.21**accessible**

capable of being reached for inspection, removal or maintenance without the removal of permanent watercraft structures

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Note 1 to entry: Hatches are not regarded as permanent watercraft structures in this sense, even if tools such as wrenches or screwdrivers are needed to open them.

3.22**readily accessible**

capable of being reached for operation, inspection or maintenance without the removal of any watercraft structure, the use of any tools or the removal of any item of portable equipment stowed in places intended for storage of portable equipment such as lockers, drawers or shelves

Note 1 to entry: Hatches are not regarded as permanent watercraft structures in this sense.

3.23**installer**

person or organisation who, due to qualifications, training, experience and resources, can assume technical responsibility for the installation of the LPG propulsion system

3.24**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

prEN 15609:2020 (E)**3.25****cockpit**

area within the watercraft that can retain water, however briefly, due to rain, waves, boat heeling, etc

Note 1 to entry: Cockpits are normally designed for the accommodation of people but, for the purpose of this European Standard, the term “cockpit” is used either for a proper cockpit or for any other type of recess. This means that bulwarks can create a large cockpit, cockpit(s) can be situated anywhere in the boat and a cockpit can open aft to the sea. Open boats can effectively comprise the whole watercraft is a deck.

3.26**venting tube**

duct that connects the gas-tight housing to the atmosphere

3.27**shut-off valve**

valve that provides a leak-tight seal which is operated either manually, remotely or is self-closing

3.28**gas detection**

revealing of the presence of LPG due to exposure outside the LPG containment system

3.29**bi-fuel**

engine designed to operate two separate fuel systems and to run either on LPG or an alternative fuel

3.30**inspection body**

independent inspection and testing body approved by the competent authority

3.31**pressure vessel**

assembly of the pressure-retaining envelope (including the openings and their closures) and non-pressure-retaining parts attached directly to it

3.32**liquid LPG injection system**

fuel system that feeds the engine by injecting liquid LPG directly into the intake manifold or directly in the combustion chamber, where it vaporises, and not use a reducer/vaporizer device

3.33**quick-connector**

coupling used to provide a fast, make-or-break connection of fluid

Note 1 to entry: in the case of LPG, pressurized - transfer lines

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4 Components

4.1 Overview

The LPG system shall be designed by a competent person.

Individual components of the system, and the system as a whole, shall be designed to withstand the combined conditions of pressure, vibration, shocks, corrosion and movement encountered under normal operation.

All materials used in LPG systems shall be compatible with LPG and with other liquids or compounds with which it might come into contact under normal operating conditions, e.g. grease, lubricating oil, bilge solvents, fresh water and sea water.

Efforts should be made to prevent grease, lubricating oil, bilge solvents and other chemicals from contaminating the marine environment.

4.2 LPG containers/cylinders

4.2.1 General

The LPG container(s) shall be protected from corrosion in the marine environment by an adequate surface treatment system, or be constructed from materials suited to the marine environment.

For the purpose of this standard, two types of LPG pressure vessels are identified:

- cylinders; and
- fixed containers.

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4.2.2 Cylinders

LPG cylinders can be used in the liquid or gas/vapour phase to fuel the engine of a watercraft depending on the choice of technology and the required power.

The cylinders used on watercraft shall comply with one of the following:

- a) EN 1442;
- b) EN 13110;
- c) EN 14140;
- d) EN 14427; or
- e) an equivalent standard.

The quantity of LPG fuel on board shall be indicated by the use of cylinders fitted with contents gauges or by the provision of additional reserve cylinder(s).

A PRV shall be fitted to any cylinder greater than 17 l water capacity.

4.2.3 Fixed container

4.2.3.1 General

Fixed containers shall comply with EN 12805, ISO 20826 or an equivalent standard.

Consideration should be given to the potential of liquid movement within the fixed container and measures put in place. e.g. appropriate design by installing a number of baffles inside.