SLOVENSKI STANDARD
SIST EN 15609:2012

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Nadomešča:
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Oprema in pribor za utekočinjeni naftni plin (UNP) - Pogonski sistemi na utekočinjeni naftni plin (UNP) za čolne, jahte in druga plovila

LPG equipment and accessories - LPG propulsion systems for boats, yachts and other craft

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

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

Ta slovenski standard je istoveten z: **EN 15609:2012**

ICS:

23.020.20	Posode in vsebniki, montirani na vozila	Vessels and containers mounted on vehicles
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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ICS 47.020.20; 47.080

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English Version

LPG equipment and accessories - LPG propulsion systems for boats, yachts and other craft

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

This European Standard was approved by CEN on 16 March 2012.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Foreword

This document (EN 15609:2012) has been prepared by Technical Committee CEN/TC 286 “LPG equipment and accessories”, the secretariat of which is held by NSAI.

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of an identical text or by endorsement, at the latest by October 2012, and conflicting national standards shall be withdrawn at the latest by October 2012.

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

This document has been prepared under a mandate 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.

This document supersedes EN 15609:2008.

The main changes with respect to the previous edition include:

— the addition of Annexes E, G and H;

— expansion of requirements of the installer;

— removal of the specific requirements for the EN 13760 nozzle;

— components fitted to the cylinder;

— tightness test pressure increased to 10 bar;

— optional forced ventilation for the locker, 5.5.4; and

— gas detection requirements.

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard specifies requirements for the installation of equipment for the use of Liquefied Petroleum Gas (hereafter referred to as LPG) in the propulsion systems of small craft.

This European Standard calls for the use of substances and procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability: it does not absolve the user from their legal obligations relating to health and safety at any stage.

Protection of the environment is a key political issue in Europe and elsewhere. Protection of the environment in this document is understood in a very broad sense. The phrase is used, for example, in relation to the total life-cycle aspects of a product on the environment (including expenditure of energy) during all phases of its existence, from use, to scrapping, to recycling of materials, etc.

Annex I comprises an environmental checklist which highlights the clauses of this European Standard that address environmental aspects.

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

This European Standard is based on EN 12979 [3].

1 Scope

This European Standard specifies the requirements for LPG propulsion systems on craft with hull lengths less than or equal to 24 m, including those defined by Directive 94/25/EC.

This European Standard 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, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *Transportable refillable fully wrapped composite cylinders for Liquefied Petroleum Gases (LPG) — Design and Construction*

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

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

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

EN ISO 9094-2, *Small craft — Fire protection — Part 2: Craft with a hull length of over 15 m (ISO 9094-2)*

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

EN ISO 10239, *Small craft — Liquefied petroleum gas (LPG) systems (ISO 10239)*

EN ISO 10240, *Small craft — Owner's manual (ISO 10240)*

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

EN ISO 11591, *Small craft, engine-driven — Field of vision from helm position (ISO 11591)*

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.

3.1
liquefied petroleum gas
LPG
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

Note 1 to entry: For automotive LPG specification, see EN 589 [1].

3.2
LPG system
installation consisting of an arrangement of container(s), safety device(s), pressure regulator(s), vaporiser(s), connection(s), valve(s), piping, tubing, hose fitting(s) and devices intended to store, supply, monitor or control the flow of LPG up to and including the appliance and engine

Note 1 to entry: The cylinders are replaceable items and might not be supplied with the LPG system in the craft.

3.3
competent person
person who, due to a combination of appropriate qualifications, training, experience and resources, is able to make objective judgments on the subject

3.4
container
vessel used for the storage of LPG

3.5
cylinder
transportable, refillable container with a water capacity from 0,5 l up to and including 150 l

3.6
fixed container
LPG pressure vessel permanently installed to the structure of the craft

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
overfill 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

3.11
pressure relief device
component protecting the pressure vessel from bursting by venting the LPG content at a pre-set temperature

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
vaporiser
device intended to vaporise LPG from a liquid to a gaseous state

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
pressure regulator/vaporiser
single device incorporating both a pressure regulator and vaporiser

3.18
ventilation system
assembly of ducts and an electrical ventilator that is capable of extracting hydrocarbons from the inside of the craft and allowing the entrance of fresh air

3.19
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

3.20
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 craft

3.21
permanently installed
securely fastened so that tools have to be used for removal

3.22
accessible
capable of being reached for inspection, removal or maintenance without the removal of permanent craft structures

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

3.23
readily accessible
capable of being reached for operation, inspection or maintenance without the removal of any craft 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 craft structures in this sense.

3.24
installer

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

3.25

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

3.26
cockpit
area within the craft 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, open boats can effectively comprise a cockpit (which includes nearly all the boat), cockpit(s) can be situated anywhere in the boat and a cockpit can open aft to the sea.

3.27
venting tube
duct that connects the gas-tight housing to the atmosphere

3.28
shut-off valve
valve that provides a leak-tight seal which is operated either manually, remotely or is self-closing

3.29
gas detection
revealing of the presence of LPG due to exposure outside the LPG containment system

3.30
dual-fuel
engine designed to operate two separate fuel systems and to run either on LPG or an alternative fuel

3.31
inspection body
independent inspection and testing body approved by the competent authority

3.32
pressure vessel
assembly of the pressure-retaining envelope (including the openings and their closures) and non-pressure-retaining parts attached directly to it

4 Components

4.1 General provisions

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

4.2.1 General provisions

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 containers are identified:

— cylinders; and

— fixed containers.

4.2.2 Cylinders

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

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

a) EN 1442;

b) EN 13110;

c) EN 14140;

d) EN 14427; or

e) an equivalent standard.

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

4.2.2.4 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.

4.2.3.2 Components fitted to the fixed container

4.2.3.2.1 The container shall be equipped with the following components, which can be either separate or combined (e.g. multivalve):

a) overfill protection device,

b) filler valve,

c) contents gauge,

d) pressure relief valve or pressure relief device and

e) remotely controlled service valve with excess flow valve.

4.2.3.2.2 The container can be equipped with a:

a) gas-tight housing;

b) power supply bushing for actuators/LPG fuel pump;

c) LPG fuel pump inside the container; and

d) non-return valve.

4.2.3.2.3 All components fitted to the container shall comply with EN 12806.

4.2.3.2.4 The filler valve shall incorporate a double non-return valve which shall comply with Annex G of EN 12806:2003.

4.3 Fuel system components

4.3.1 Vaporiser

4.3.1.1 Vaporisers shall comply with EN 12806 and shall be suitable for use in the marine environment.

4.3.1.2 The materials of the vaporiser, which are in contact with the engine coolant, shall be compatible with the coolant and shall be designed to withstand a pressure of 2 bar of the heat exchange medium.

4.3.1.3 A suitable test procedure for metallic vaporisers is given in Annex E.

4.3.2 Other components

The following components of the fuel system, where used, shall comply with EN 12806 and shall be suitable for use in the marine environment: