

# SLOVENSKI STANDARD

## SIST EN 15609:2009

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

Flüssiggas-(LPG-)Geräte und Ausrüstungsteile - Flüssiggas-(LPG-)Antriebssysteme für Boote, Yachten und andere Wasserfahrzeuge - Anforderungen an die Installation

Equipements pour gaz de pétrole liquéfié et leurs accessoires - Systemes de propulsion GPL des bateaux, yachts et autres navires - Exigences d'installation

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### ICS:

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**LPG equipment and accessories - LPG propulsion systems for  
boats, yachts and other craft - Installation requirements**

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

Flüssiggas-(LPG-)Geräte und Ausrüstungsteile -  
Flüssiggas-(LPG-)Antriebssysteme für Boote, Yachten und  
andere Wasserfahrzeuge - Anforderungen an die  
Installation

This European Standard was approved by CEN on 25 October 2008.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

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

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## Foreword

This document (EN 15609:2008) has been prepared by Technical Committee CEN/TC 286 "Liquefied petroleum gas 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 May 2009, and conflicting national standards shall be withdrawn at the latest by May 2009.

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 94/25/EC.

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

Annexes A, B, C and D are normative.

Annexes E and F are informative.

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, 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 and United Kingdom.

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## Introduction

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

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 and does not absolve the user from legal obligations relating to health and safety at any stage.

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

This standard is based on EN 12979 [2].

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**EN 15609:2008 (E)****1 Scope**

This European Standard specifies the requirements for the LPG propulsion systems on craft with hull lengths less than or equal to 24 meters, see Directive 94/25.

**2 Normative references**

The following referenced documents are indispensable for the application 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 12816, *Transportable refillable steel and aluminium LPG cylinders – Disposal*

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 13109, *LPG tanks – Disposal*

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 14427, *Transportable refillable fully wrapped composite cylinders for Liquefied Petroleum Gases - Design and construction*

EN 28846, *Small craft - Electrical devices - Protection against ignition of surrounding flammable gases (ISO 8846:1990)*

EN 60529, *Degrees of protection provided by enclosures (IP-code) (IEC 60529:1989)*

EN ISO 898-1:1999, *Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs (ISO 898-1:1999)*

EN ISO 10133, *Small craft – Electrical systems – Extra-low-voltage d.c. installations (ISO 10133:2000)*

EN ISO 10239, *Small craft – Liquefied petroleum gas (LPG) systems (ISO 10239:2008)*

EN ISO 10240, *Small craft – Owner's manual (ISO 10240:2004)*

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

EN ISO 11591, *Small craft, engine-driven - Field of vision from helm position (ISO 11591:2000)*

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



EN ISO 13297, *Small craft – Electrical systems – Alternating current installations (ISO 13297:2000)*

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

##### **accessible**

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

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

#### 3.2

##### **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

#### 3.3

##### **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 recessed into the craft

#### 3.4

##### **cylinder**

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

#### 3.8

##### **filler valve**

valve system for liquid fill service

#### 3.9

##### **fixed container**

LPG tank permanently installed to the structure of the craft

#### 3.11

##### **gas detection**

detection of the presence of LPG outside its containment system

#### 3.13

##### **installer**

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

#### 3.15

##### **Liquefied Petroleum Gas (LPG)**

mixture of predominantly butane or propane with traces of other hydrocarbon gases classified in accordance with UN number 1965, hydrocarbon gases mixture, liquefied, NOS or UN number 1075, petroleum gases, liquefied

NOTE 1 In some countries, UN numbers 1011 and 1978 may also be designated LPG.

NOTE 2 For automotive LPG specification, see EN 589 [1].

**EN 15609:2008 (E)****3.17****permanently installed**

securely fastened so that tools have to be used for removal

**3.21****readily accessible**

capable of being reached for operation, inspection or maintenance without the removal of any craft structure or 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

**3.24****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

**3.25****venting tube**

duct that connects the gas-tight housing to the atmosphere outside of the craft

**4 Components****4.1 General provisions**

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 may come into contact under normal operating conditions, e.g. grease, lubricating oil, bilge solvents, fresh and sea water.

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**4.2 LPG container(s)****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 suitable for the marine environment.

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

- cylinders; and
- fixed containers

**4.2.2 Cylinders**

LPG cylinders may 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.

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

- EN 13110;
- EN 1442;
- EN 14140;

- EN 14427; or
- an equivalent standard

#### 4.2.3 Fixed container

##### 4.2.3.1 General

A fixed container shall comply with EN 12805, ISO 20826 or an equivalent standard.

##### 4.2.3.2 Components fitted to the fixed container

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

- a) 80 % stop valve
- b) filler valve
- c) level indicator
- d) pressure relief valve or pressure relief device
- e) remotely controlled service valve with excess flow valve

The container may be equipped with a:

- 1) gas-tight housing
- 2) power supply bushing for actuators/LPG fuel pump
- 3) LPG fuel pump inside the container
- 4) non-return valve

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

The filler valve shall incorporate a double non-return valve.

The non-return valve in the filler valve shall comply with Annex G of EN 12806.

#### 4.3 Fuel system 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:

- a) pressure regulator/vaporizer
- b) shut-off valve
- c) gas injection device or injector
- d) gas mixing unit
- e) gas dosage unit
- f) flexible fuel hoses and gas pipes

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- g) hydrostatic relief valve
- h) LPG filter unit
- i) pressure and/or temperature sensor
- j) service coupling
- k) electronic control unit
- l) fuel rail
- m) filler unit
- n) fuel pump

The materials of the vaporizer, which are in contact with the engine coolant, shall be compatible with this coolant. The vaporiser shall be designed to contain a coolant pressure of at least 200 kPa.

Additional equipment required for the effective operation of the engine, not covered by EN 12806, shall only be installed in parts of the LPG system where the pressure is less than 20 kPa.

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