

SLOVENSKI STANDARD
oSIST prEN 13175:2010
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Oprema in pribor za utekočinjeni naftni plin (UNP) - Zahteve in preskušanje ventilov in priključkov za posode za utekočinjeni naftni plin (UNP)

LPG Equipment and accessories - Specification and testing for Liquefied Petroleum Gas (LPG) tank valves and fittings

Flüssiggas-Geräte und -Ausrüstungsteile - Spezifikation und Prüfung von Ventilen und Ausrüstungsteilen von Behältern für Flüssiggas (LPG)

Equipements pour GPL et leurs accessoires - Spécifications et essais des équipements et accessoires des réservoirs pour gaz de pétrole liquéfié (GPL)

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LPG Equipment and accessories - Specification and testing for Liquefied Petroleum Gas (LPG) tank valves and fittings

Equipements pour GPL et leurs accessoires -
Spécifications et essais des équipements et accessoires
des réservoirs pour gaz de pétrole liquéfié (GPL)

Flüssiggas-Geräte und -Ausrüstungsteile - Spezifikation
und Prüfung von Ventilen und Ausrüstungsteilen von
Behältern für Flüssiggas (LPG)

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

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Foreword

This document (prEN 13175:2010) has been prepared by Technical Committee CEN/TC 286 "Liquefied petroleum gas 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 13175:2003+A2:2007.

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 97/23/EC.

For relationship with EU Directive 97/23/EC, see informative Annex ZA, which is an integral part of this document.

The major changes to this revision include:

- The inclusion of aluminium alloys and zinc alloys
- Additional requirements for brass materials
- Change in requirements for non-metallic components, lubricants, sealants and adhesives
- The insertion of auto-stop filler valve, dry disconnect couplings requirements and the deletion of plug and cap requirements.
- Additional requirements for periodic testing of 3/4" x 6 ACME threaded connections in Annex C
- Introduction of Annex D, dry disconnect couplings
- Introduction of the Annex F, Environmental checklist

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Introduction

This European Standard calls for the use of substances and procedures that may be injurious to health and/or the environment if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations at any stage.

Protection of the environment is a key political issue in Europe and elsewhere. Protection of the environment is taken in a very broad sense. What is meant is the total life cycle aspects of, e.g. a product on the environment, including expenditure of energy and during all phases from mining of raw materials, fabrication, packaging, distribution, use, scrapping, recycling of materials, etc.

NOTE Annex F indicates which clauses in this standard address environmental issues.

Provisions have to be restricted to a general guidance. Limit values are specified in national laws.

It is recommended that manufacturers develop an environmental management policy. For guidance see ISO 14000 series

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.

All pressures are gauge pressures unless otherwise stated.

NOTE This standard requires measurement of material properties, dimensions and pressures. All such measurements are subject to a degree of uncertainty due to tolerances in measuring equipment etc. It may be beneficial to refer to the leaflet "measurement uncertainty leaflet (SP INFO 2000 27 uncertainty pdf)",

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prEN 13175:2010 (E)**1 Scope**

This European Standard specifies minimum requirements for the design and testing of valves, including appropriate fittings, which are connected to mobile or static LPG tanks above 150 l water capacity. Pressure relief valves and their ancillary equipment, contents gauges and automotive LPG components are outside the scope of this European Standard.

This European Standard does not apply to refineries or other process plants.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 549, *Rubber materials for seals and diaphragms for gas appliances and gas equipment.*

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

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 837-1, *Pressure gauges - Part 1: Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing.*

EN 1092-1, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges.*

EN 1267, *Valves - Test of flow resistance using water as test fluid.*

EN 1503-1, *Valves - Materials for bodies, bonnets and covers - Part 1: Steels specified in European Standards.*

EN 1503-2, *Valves - Materials for bodies, bonnets and covers - Part 2: Steels other than those specified in European Standards.*

EN 1503-3, *Valves - Materials for bodies, bonnets and covers - Part 3: Cast Irons specified in European Standards.*

EN 1503-4, *Valves - Materials for bodies, bonnets and covers - Part 4: Copper alloys specified in European Standards.*

EN 563, *Founding - Spheroidal graphite cast irons.*

EN 983, *Industrial valves - Steel ball valves.*

EN 10270-3, *Steel wire for mechanical springs - Part 3: Stainless spring steel wire.*

EN 12164, *Copper and copper alloys - Rod for free machining purposes.*

EN 12165, *Copper and copper alloys - Wrought and unwrought forging stock*

prEN 12360, *Industrial valves – Copper alloy globe valves.*

EN 12420, *Copper and copper alloys – Forgings.*

EN 12516-1, *Industrial valves – Shell design strength – Part 1: Tabulation method for steel valves.*

EN 12516-2, *Industrial valves – Shell design strength – Part 2: Calculation method for steel valves.*

EN 12516-3, *Valves – Shell design strength – Part 3: Experimental method.*


CEN/TS 13547, *Industrial valves – Copper alloy ball valves.*

EN 13709, *Industrial valves – Steel globe and globe stop and check valves.*

EN 13789 *Industrial valves – Cast iron globe valves.*

EN 13799, *LPG equipment and accessories - Contents gauges for LPG tanks*

EN 13906, *Cylindrical helical springs made from round wire and bar – Calculation and design.*

EN 15202, *LPG equipment and accessories - Essential operational dimensions for LPG cylinder valve outlet and associated equipment connections* 

EN 50014, *Electrical apparatus for potentially explosive atmospheres – General requirements.*

EN ISO 11114-1, *Transportable gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 1: Metallic materials (ISO 11114-1:1997)*

EN ISO 11114-2, *Transportable gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 2: Non-metallic materials (ISO 11114-2:2000)*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions, tolerances and designation.*

ISO 301, *Zinc alloy ingots intended for castings*

ISO 2859-1, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection.*

ISO 6957, *Copper alloys – Ammonia test for stress corrosion resistance.*

ANSI/ASME B1.20.1 – 1983, *Pipe threads, general purpose (inch) issued by American National Standards Institute on 1983.*

ASME B1.5 – 1990, *ACME Screw Threads issued by American Society of Mechanical Engineers on 1990.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

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

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

- 3.2 self closing valve**
normally closed valve that provides a leak tight seal and opens by the engagement of a special connector or by fluid passing through it. It closes automatically upon removal of the connector or by stopping the fluid flow
- 3.3 sealing element**
element used to provide internal leak tightness
- 3.4 maximum allowable pressure**
maximum pressure for which the equipment is designed
- 3.5 internal leak tightness**
resistance to leakage across the valve seal or other internal sealing components when the valve is closed
- 3.6 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
- 3.7 non return valve**
valve designed to close automatically to restrict reverse flow
- 3.8 residual flow**
allowable flow past the seat of an excess flow valve or a non return valve, when the valve is in the closed position
- 3.9 shut-off valve**
valve to provide a leak-tight seal which is operated either manually, remotely or is self-closing
- 3.10 filler valve**
valve system for liquid fill service
- 3.11 occasional liquid withdrawal valve**
normally blanked valve, used for occasional liquid withdrawal which is designed to be opened by the engagement of a special connector valve
- 3.12 internal valve**
valve which has its seal within the profile of the tank
- 3.13 vapour equalising valve**
valve which permits vapour to flow in either direction in order to equalise vapour pressure between tanks during liquid transfer, and which incorporates an excess flow valve and a self closing valve opened by a special connector valve.

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3.14**multipurpose valve**

valve which incorporates two or more service functions and which meets the combined requirements of the individual functions

3.15**breakaway coupling**

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

3.16**test pressure**

pressure at which the valve, fitting or component is tested

NOTE All pressures are gauge pressures unless otherwise stated.

3.17**plug**

component which seals a female connection

3.18**cap**

component which seals a male connection

3.19**fitting**

pressure containing component fitted to an LPG pressure system

3.20**STP**

Standard Temperature and Pressure [15,6 °C (288,7 K), 1,013 bar absolute (0,101 3 MPa absolute)]

3.21**service valve**

valve for fluid off take which is manually operated to provide a leak-tight seal

3.22**filler valve with overfill protection device (OPD):**

filler valve designed to automatically reduce the filling rate to a minimal flow when the tank level reaches a predetermined amount.

4 Operating conditions

Valves and fittings designed in accordance with this standard shall be suitable for the following conditions:

- a minimum operating temperature of -20 °C. In service, temperatures below this can be encountered during short periods, for example, when filling;
- for some parts of Europe and certain applications, temperatures lower than -20 °C can be encountered, for these conditions the requirements of Annex B shall be met;
- the maximum operating temperature is 65 °C. The maximum allowable pressure for valves or fittings is 25 bar;
- the minimum pressure to which a valve or fitting is normally exposed is 0 bar. Vacuum conditions on the valve, arising from butane at low temperature or evacuation of the tank may expose the valve or fitting to a vacuum of 50 mbar absolute.

prEN 13175:2010 (E)**5 Materials****5.1 Environmental**

The manufacturer shall endeavour to acquire materials and components from suppliers who have a declared environmental policy, see EN ISO 14021, EN ISO 14024 and ISO 14025.

5.2 General

5.2.1 All materials in contact with LPG shall be physically and chemically compatible with LPG under all the normal operating conditions for which the contents gauge is intended.

5.2.2 Materials for gauge components shall be selected to give adequate strength in service. Consideration shall also be given to other modes of failure such as atmospheric corrosion, brass dezincification, stress corrosion, impact or material failure.

5.2.3 Alternative materials to those listed in 5.3 are not precluded, providing they comply with a standard or specification that ensures control of chemical and physical properties, and quality appropriate to the end use.

5.3 Metallic materials

5.3.1 Metallic materials for gauges shall be steel, stainless steel, copper alloys, aluminium alloys, zinc alloys, or other suitable materials.

5.3.2 For pressure containing components steel and stainless steels shall comply with EN 1503-1 or EN 1503-2, cast iron shall comply with EN 1503-3 and copper alloys shall comply with EN 1503-4.

5.3.3 Materials for steel flanges shall be in accordance with EN 1092-1.

5.3.4 Stainless steel for components shall contain not less than 16 % chromium and not less than 7 % nickel.

5.3.5 Springs shall be manufactured from stainless steel in accordance with EN 10270-3 or a material with an equivalent resistance to corrosion.

5.3.6 Hot stamped brass shall be non-porous and suitable for machining or other processing. Leaded brass shall be CW614N or CW617N in accordance with EN 12420 and EN 12165. Sand-cast brass shall not be used. Cold drawn brass rods shall only be used for machining after adequate testing for internal cracking, porosity or other inclusions and shall be heat treated if required. Components produced from stamping brass shall not exhibit cold shuts also known as folds, or surface defects.

5.3.7 Components manufactured from hot stamped brass or contents gauge bodies made of drawn brass or machined from brass rod shall be capable of withstanding, without cracking, the stress-cracking test.

5.3.8 Spheroidal graphite cast iron shall comply with EN 1563, with an elongation at fracture of more than 18 %. Other ductile irons or cast irons shall not be used.

5.3.9 ZnAl4 and ZnAl4Cu1 shall be in accordance with ISO 301.

5.3.10 Castings shall be free from inclusions and surface defects which could adversely affect the strength, leak tightness or performance of the contents gauge.

5.3.11 For guidance on the choice of metallic materials, see EN ISO 11114-1.

5.4 Non-metallic components

5.4.1 For guidance on the choice of non-metallic materials, see EN ISO 11114-2.

5.4.2 All non-metallic materials in contact with LPG shall not distort, harden or adhere to the body or seat face to such an extent as to impair the function of the valve.

All rubber materials shall also comply with the requirements of EN 549. The ozone test in EN 549 shall only be carried out where gaskets/seals are exposed to atmosphere.

5.4.3 The buoyancy of flotation devices shall not be affected by the LPG.

5.5 Lubricants, sealants and adhesives

Where used on threads and seals; lubricants, sealants, and adhesives shall be compatible with LPG and not interfere with the operation of the contents gauge. Sealants shall comply with EN 751 -1, EN 751-2 or EN 751-3.

6 Design – general requirements

6.1 General

6.1.1 All valves and fittings shall be capable of withstanding the tests specified in Table 1 where appropriate.

6.1.2 Moving parts shall have sufficient clearance to ensure freedom of movement under all normal conditions of service. Where necessary, means of guidance shall be provided to ensure correct seating or sealing.

6.1.3 All components vital to the function of a valve or fitting shall be secured to prevent disassembly during normal operation.

6.1.4 Valves and fittings shall be designed to ensure external and internal leak tightness, and its function shall not be affected, as a result of vibration during transportation.

6.1.5 The design shall take account of the use of dissimilar materials, e.g. electrochemical corrosion or material expansion.

6.1.6 Electrical equipment, when used in an integral part of a valve or fitting, shall meet the requirements of EN 50014 where appropriate.

6.1.7 Valves shall have their flow resistance determined using water as a test fluid

6.1.8 Possible stress corrosion shall be eliminated by either design or heat treatment.

NOTE The design should take account of the following:

- Minimising the use of raw materials
- Minimising the environmental impact of in-service maintenance and end of life disposal
- Efficient packaging of finished product

6.2 Seats and seals

6.2.1 Valves and fittings shall be so designed that they can be installed without damaging non-metallic seats or seals.

6.2.2 Sealing may be achieved by either elastomeric or other non-metallic material. When a metal to metal closure is used, the residual flow shall meet the requirements of 8.5.