



SLOVENSKI STANDARD

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Oprema in pribor za utekočinjeni naftni plin (UNP) - Varnostni ventili za tlačne posode za UNP

LPG Equipment and accessories - Pressure relief valves for LPG pressure vessels

Flüssiggas-Geräte und Ausrüstungsteile - Druckentlastungsventile für Behälter für Flüssiggas (LPG)

Équipements pour GPL et leurs accessoires - Soupapes de sûreté pour réservoirs de GPL

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LPG Equipment and accessories - Pressure relief valves for LPG pressure vessels

Équipements pour GPL et leurs accessoires - Soupapes
de sécurité pour réservoirs de GPL sous pression

Flüssiggas-Geräte und Ausrüstungsteile -
Druckentlastungsventile für Behälter für Flüssiggas
(LPG)

This European Standard was approved by CEN on 27 October 2024. This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 15 January 2025.

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

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EN 14129:2024 (E)

European foreword

This document (EN 14129:2024) 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of an identical text or by endorsement, at the latest by May 2025, and conflicting national standards shall be withdrawn at the latest by May 2025.

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 14129:2014.

The main changes with respect to the previous edition include:

- Scope amended to include transportable LPG welded steel pressure drums;
- Addition of normative references;
- Revision of 5.1, 5.2, 5.3, 6.4, 7.1, 7.6.1, 7.11.3; and
- Revision of Annex ZA.

This document has been submitted for reference in

- the RID [8] and/or
- the technical annexes of the ADR [9].

NOTE These regulations take precedence over any clause of this standard. It is emphasized that RID/ADR are being revised regularly at intervals of two years which may lead to temporary non-compliances with the clauses of this standard. 2025

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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

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, Türkiye and the United Kingdom.

Introduction

This document 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: it does not absolve the user from their legal obligations at any stage.

Protection of the environment is a key political issue in Europe and elsewhere. For CEN/TC 286 this is covered in CEN/TS 16765 [1] and this Technical Specification should be read in conjunction with this document. The Technical Specification provides guidance on the environmental aspects to be considered regarding equipment and accessories produced for the LPG industry and the following is addressed:

- a) design;
- b) manufacture;
- c) packaging;
- d) use and operation; and
- e) disposal.

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 the EN ISO 14000 series [7], [8] and [9].

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

All pressures are gauge pressures unless otherwise stated.

Valves designed in accordance with this standard are specifically for use in LPG applications. Valves manufactured in accordance EN ISO 4126-1 [4] may also be used in certain LPG applications.

NOTE This document 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 [12].

EN 14129:2024 (E)

1 Scope

This document specifies the requirements for the design and testing of spring loaded pressure relief valves (PRVs) and thermal expansion valves for use in:

- static LPG pressure vessels,

NOTE The pressure vessels can be situated above ground, underground or mounded.

- transportable LPG welded steel pressure drums,
- LPG pressure vessels on road tankers, rail tankers, tank-containers or demountable tanks.

This document does not address relief valves for LPG cylinders, which are identified in EN 13953.

This document does not address production testing.

Normative Annex B prescribes testing with conditioning at - 40 °C for valves for use under extreme low temperature conditions.

The requirements for PRV accessories such as isolating devices, changeover manifolds and vent pipes are specified in EN 14071:2024.

EN 14570 [2] identifies the requirements for the PRV capacities for static pressure vessels.

EN 12252 [3] identifies the requirements for the PRV capacities for road tankers.

Valves designed in accordance with this document are specifically for use in LPG applications. Valves manufactured in accordance with EN ISO 4126-1 [4] may also be used in certain LPG applications.

Terms used with LPG PRVs are described graphically in Annex A.

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 549:2019+A2:2024, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 751-1:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 1: Anaerobic jointing compounds*

EN 751-2:1996, *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 751-3:2022+A1:2023, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 3: Unsintered PTFE tapes and PTFE strings*

EN 837-1:1996,¹ *Pressure gauges - Part 1: Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing*

EN 1092-1:2018, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges*

¹ Document impacted by AC:1998.

EN 1563:2018, *Founding - Spheroidal graphite cast irons*

EN 10204:2004, *Metallic products - Types of inspection documents*

EN 12164:2016, *Copper and copper alloys - Rod for free machining purposes*

EN 12165:2016, *Copper and copper alloys - Wrought and unwrought forging stock*

EN 12420:2014, *Copper and copper alloys - Forgings*

EN 12516-1:2014+A1:2018, *Industrial valves - Shell design strength - Part 1: Tabulation method for steel valve shells*

EN 12516-4:2014+A1:2018, *Industrial valves - Shell design strength - Part 4: Calculation method for valve shells manufactured in metallic materials other than steel*

EN 13445-2:2021+A1:2023, *Unfired pressure vessels - Part 2: Materials*

EN 13906-1:2013, *Cylindrical helical springs made from round wire and bar - Calculation and design - Part 1 : Compression springs*

EN 14071:2024, *LPG equipment and accessories - Pressure relief valves for LPG pressure vessels - Ancillary equipment*

EN ISO 9227:2022, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2022)*

EN ISO 11114-1:2020, *Gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 1: Metallic materials (ISO 11114-1:2020)*

EN ISO 11114-2:2021, *Gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 2: Non-metallic materials (ISO 11114-2:2021)*

ISO 6957:1988, *Copper alloys — Ammonia test for stress corrosion resistance*

ANSI/ASME B1.20.1-1983, *Pipe Threads, General Purpose (Inch)*

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 <http://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 UN 1011, UN 1075, UN 1965, UN 1969 or UN 1978 only and which consists mainly of propane, propene, butane, butane isomers, butene with traces of other hydrocarbon gases

EN 14129:2024 (E)**3.2****pressure vessel**

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

3.3**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

3.4**hydrostatic relief valve****thermal expansion 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

3.5**spring loaded pressure relief valve**

valve in which the loading due to the vapour pressure underneath the sealing element is opposed only by the force of a spring

3.6**external pressure relief valve**

pressure relief valve which when fitted to the LPG pressure vessel has the spring external to the pressure envelope

Note 1 to entry: See Figure 1.

3.7**pilot operated pressure relief valve**

external pressure relief valve where the pressure setting is separate from the discharge function

Note 1 to entry: See Figure 2.

3.8**internal pressure relief valve**

pressure relief valve which when fitted to the LPG pressure vessel has the spring internal to the pressure envelope

3.9**semi-Internal pressure relief valve**

pressure relief valve which when fitted has the spring inside the pressure envelope and which has some of the working parts and the wrenching section outside the pressure envelope

Note 1 to entry: See Figure 3.

3.10**fully internal pressure relief valve**

pressure relief valve which, when fitted, has the spring, all working parts and the wrenching section inside the pressure envelope

Note 1 to entry: See Figure 4.

3.11

nominal set pressure

predetermined pressure of the pressure relief valve at which the valve is set to start to discharge

Note 1 to entry: For LPG pressure vessels on road tankers, rail tankers, tank-containers or demountable tanks, in accordance with RID [8] and ADR [9] require a capability of automatic opening under a pressure between 0,9 times and 1,0 times the test pressure of the pressure vessel to which they are fitted.

3.12

start to discharge pressure

inlet pressure at which a steady stream of bubbles appear at the outlet of a pressure relief valve through a water seal of not more than 50 mm water column, or other equivalent method

3.13

overpressure

pressure increase between the nominal set pressure and the flow rating pressure, usually expressed as a percentage of nominal set pressure

3.14

reseal pressure

inlet pressure at which leakage ceases through a water seal of not more than 50 mm water column on the outlet of the valve, after the valve has been subjected to a pressure equal to or above the start to discharge pressure but below the "pop" pressure

3.15

reseal pressure

inlet pressure at which the sealing element effects a seal with the valve seat after the valve has been subjected to pop action

3.16

flow rating pressure

inlet pressure at which the discharge capacity is measured

3.17

maximum allowable pressure

PS

maximum pressure for which the equipment is designed

Note 1 to entry: All pressures are gauge pressures unless otherwise stated.

3.18

pop action

rapid opening of the pressure relief valve sealing element so that the pressure relief valve is fully open, resulting from an increase of inlet pressure creating a sudden increase in force and compression of the spring

3.19

pop pressure

pressure at which pop action occurs

3.20

blowdown

difference between start to discharge and reseal pressures, usually expressed as a percentage of the nominal set pressure