SLOVENSKI STANDARD
oSIST prEN 14129:2021

01-marec-2021

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

Ta slovenski standard je istoveten z: **prEN 14129**

ICS:

23.020.32	Tlačne posode	Pressure vessels
23.060.40	Tlačni regulatorji	Pressure regulators

oSIST prEN 14129:2021 **en,fr,de**

EUROPEAN STANDARD

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ICS

Will supersede EN 14129:2014

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

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

Flüssiggas-Geräte und Ausrüstungsteile - Druckentlastungsventile für Behälter 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.

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

Contents

European foreword

This document (prEN 14129:2021) has been prepared by Technical Committee CEN/TC 286 “LPG equipmwnt and accessories”, the secretariat of which is held by NSAI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14129:2014.

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.

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.

The main changes with respect to the previous edition include:

— Addition of normative references;

— Revision of 5.1, 5.2, 5.3, 6.4, 7.1, 7.11.3; and

— Revision of Annex ZA.

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].

1 Scope

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

— static LPG pressure vessels,

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

— LPG pressure vessels on road tankers, rail tankers, tank-containers or demountable tanks.

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 pressure relief valve accessories such as isolating devices, changeover manifolds and vent pipes are specified in EN 14071:2015+A1:2019.

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

EN 12252 [3] identifies the requirements for the pressure relief valve 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 pressure relief valves 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, *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 751-3:1996[1)], *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 3: Unsintered PTFE tapes*

EN 837-1:1996[2)], *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*

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1) Document impacted by AC:1997.

2) 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 13445-2:2014/A3:2018, *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 14071:2015+A1:2019, *LPG equipment and accessories - Pressure relief valves for LPG pressure vessels - Ancillary equipment*

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 11114-2:2013, *Gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 2: Non-metallic materials (ISO 11114-2:2013)*

ISO 7-1:1994[3)], *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

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) Document impacted by Cor 1:2007.

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

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
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
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: 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
reseat 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 valve is designed, as specified by the manufacturer

3.18
pop action
rapid opening of the valve sealing element to achieve full lift, 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 reseat pressures, usually expressed as a percentage of the nominal set pressure

3.21
discharge capacity
capacity at the flow rating pressure of a pressure relief valve expressed in m^3/min of free air at STP

3.22
nominal discharge capacity
minimum discharge capacity at the flow rating pressure expressed in m3/min of free air at STP rounded down to one decimal place

3.23
sealing element
non-metallic resilient component which effects a seal by contact with the pressure relief valve seat

3.24
valve seat
normally raised area of the pressure relief valve body on to which the sealing element effects the seal

3.25
pressure relief valve isolating device
device fitted between the storage pressure vessel and an external pressure relief valve (including pilot operated), which permits replacement of the pressure relief valve without depressurising the pressure vessel

3.26
changeover manifold
device fitted to a storage vessel permitting two or more pressure relief valves to be fitted, only one of which can be isolated at a time, which permits replacement of the isolated pressure relief valve without depressurising the vessel

3.27
leak tightness
resistance to leakage to atmosphere across the valve seat or any other pressure containing component when the valve is closed

3.28
Standard Temperature and Pressure
STP
15,6 °C (288,7 K), 1,013 bar absolute (0,1013 MPa absolute)

4 Operating conditions

4.1 The pressure relief valve shall be suitable for a minimum operating temperature of - 20 °C, the temperature to which the valve is expected to be exposed during normal use. Temperatures below this may be encountered during short periods, for example, during discharge.

4.2 In some parts of Europe, and for certain applications, lower minimum operating temperatures are encountered. When equipment is designed for a temperature lower than −20 °C, the pressure relief valve shall meet the requirements of Annex B.