



SLOVENSKI STANDARD
oSIST prEN 14071:2021

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

LPG equipment and accessories - Pressure relief valves for LPG pressure vessels - Ancillary equipment

Flüssiggas-Geräte und Ausrüstungsteile - Druckentlastungsventile für Druckbehälter für Flüssiggas (LPG) - Zusatzausrüstung

Équipements pour GPL et leurs accessoires - Soupapes de sécurité des réservoirs de gaz de pétrole liquéfié (GPL) - Équipement auxiliaire

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23.060.40	Tlačni regulatorji	Pressure regulators

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EUROPEAN STANDARD
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Will supersede EN 14071:2015+A1:2019

English Version

LPG equipment and accessories - Pressure relief valves for LPG pressure vessels - Ancillary equipment

Équipements pour GPL et leurs accessoires - Soupapes
de sécurité des réservoirs de gaz de pétrole liquéfié
(GPL) - Équipement auxiliaire

Flüssiggas-Geräte und Ausrüstungsteile -
Druckentlastungsventile für Druckbehälter für
Flüssiggas (LPG) - Zusatzausrüstung

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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prEN 14071:2021 (E)**European foreword**

This document (prEN 14071:2021) has been prepared by Technical Committee CEN/TC 286 “LPG equipment and accessories”, the secretariat of which is held by NSAI.

This document is currently submitted to the CEN Enquiry.

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 will supersede EN 14071:2015+A1:2019.

The major changes in comparison to the previous edition include:

- Revision of 5.2 Metallic materials;
- Revision to the resistance of the isolating mechanism test;
- Revision of the Kd value for M 36;
- Revision of Annex ZA.

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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.

It is recommended that manufacturers develop an environmental management policy. For guidance, see the EN ISO 14000 series [1], [2] and [3].

Protection of the environment is a key political issue in Europe and elsewhere. For TC 286 this is covered in CEN/TS 16765 [4] LPG equipment and accessories - Environmental considerations for CEN/TC 286 standards, 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.

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.

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 [5].

prEN 14071:2021 (E)**1 Scope**

This document specifies the design, testing and inspection requirements for pressure relief valve isolating devices, valve manifolds, vent pipes and system assemblies which are, where necessary, used with pressure relief valves for use in static pressure vessels for Liquefied Petroleum Gas (LPG) service.

This document addresses both prototype testing and production testing of isolating devices and PRV manifolds.

Pressure relief valves for LPG pressure vessels are specified in EN 14129:2014.

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, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water - Part 3: Unsintered PTFE tapes*

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

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 13480-3:2017¹⁾, *Metallic industrial piping - Part 3: Design and calculation*

EN 13445-2:2014²⁾, *Unfired pressure vessels - Part 2: Materials*

1) As impacted by EN 13480-3:2017/A2:2020 and EN 13480-3:2017/A3:2020.

2) As impacted by EN 13445-2:2014/A1:2016, EN 13445-2:2014/A2:2018 and EN 13445-2:2014/A3:2018.

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

EN 14129:2014, *LPG Equipment and accessories - Pressure relief valves for LPG pressure vessels*

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

ASME B1.20.1:2013, *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 <https://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

3.2

pressure vessel

assembly of the pressure 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

Note 1 to entry: This is known as a “safety valve” in ADR.

3.4

pressure relief valve system

PRV system

pressure relief valve(s) for use on the pressure vessel complete with isolating device or PRV manifold, and vent pipe where appropriate

3.5

pressure relief valve isolating device

device fitted between the storage tank and the external pressure relief valve, which permits the replacement of the pressure relief valve without de-pressuring the pressure vessel

3.6

coefficient of discharge

Kd

ratio of the actual measured flow capacity divided by the calculated theoretical capacity for the same fluid at the same operating conditions

prEN 14071:2021 (E)**3.7****pressure relief valve manifold****PRV 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 depressurizing the vessel

3.8**discharge capacity**

capacity at the flow rating pressure of a pressure relief valve expressed in cubic metres per minute of free air at STP

3.9**vent pipe**

open-ended pipe, fitted with a protection cap and attached to the pressure relief valve outlet, to direct discharged fluid away from the protected pressure vessel surface

3.10**design signal flow**

limited flow of LPG intended to equalise pressures so that a replacement PRV can be properly fitted to an isolating device; indicate the effectiveness of the internal shut off in an isolating device before the PRV is completely removed; and produce an acoustic signal

3.11**Standard Temperature and Pressure****STP**

15,6 °C (288,7 K), 1,013 bar absolute (0,1013 MPa absolute)

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3.12**flow rating pressure**

inlet pressure at which the discharge capacity is measured

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3.13**lift**

actual travel of the sealing disc away from the closed position

3.14**sealing element**

non-metallic resilient component which effects a seal by contact with the valve seat

3.15**valve seat**

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

3.16**maximum allowable pressure****PS**

maximum pressure for which the equipment is designed

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

3.17

nominal diameter

DN

numerical designation of the size of a component, which is a convenient round number, approximately equal to the manufacturing dimensions in millimetres (mm)

3.18

external leak tightness

resistance to leakage through the fitting to or from the atmosphere

4 Operating conditions

4.1 Equipment designed in accordance with this document shall be suitable for:

- minimum operating temperature of -20 °C ;
- maximum operating temperature of 65 °C ;
- maximum allowable pressure of 25 bar; and
- minimum pressure of 50 mbar absolute.

4.2 For some parts of Europe and certain applications, temperatures lower than -20 °C can be encountered. For these conditions, a temperature rating of -40 °C shall apply.

NOTE 1 In service, temperatures below this can be encountered during short periods, for example, during discharge.

NOTE 2 Vacuum conditions on the isolating device or PRV manifold, arising from butane at low temperature or evacuation of the pressure vessel can expose the valve or fitting to a vacuum of 50 mbar absolute.

5 Materials

5.1 General

5.1.1 All materials in contact with LPG shall be physically and chemically compatible with LPG under all normal operating conditions for which the device is intended to be used.

5.1.2 Material for components shall be selected for adequate strength in service. The material shall resist atmospheric corrosion, brass dezincification, stress corrosion, impact and material failure. Where stress corrosion could be present in a material, stress relieving heat treatment shall be carried out where necessary.

5.1.3 The components exposed to atmosphere shall be manufactured from corrosion resistant materials or suitably protected against corrosion.

NOTE Alternative materials to those listed in 5.2 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.

5.2 Metallic materials

5.2.1 Equipment shall be made from steel, stainless steel, copper alloys or other suitable materials.