
Specifikacija in preskušanje ventilov za jeklenke za utekočinjeni naftni plin (UNP) - Samozaporni ventili

Specification and testing of LPG cylinder valves - Self closing

Spezifikation und Prüfung der LPG-Zylinderventile - Selbstschließend

Spécifications et essais pour valves de bouteilles de GPL - Fermeture automatique

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Specification and testing of LPG cylinder valves - Self closing

Spécifications et essais pour valves de bouteilles de GPL -
Fermeture automatiqueSpezifikation und Prüfung der LPG-Zylinderventile -
Selbstschließend

This European Standard was approved by CEN on 25 October 2001.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by June 2002, and conflicting national standards shall be withdrawn at the latest by June 2002.

This European Standard 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(s).

In this standard the annexes A and C are normative and the annex B is informative.

The standard has been submitted for reference into the RID and/or in the technical annexes of the ADR. Therefore the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or in the technical annexes of the ADR.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. (standards.iteh.ai)

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Introduction

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 execution of its provisions is entrusted to appropriately qualified and experienced people.

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1 Scope

This European Standard specifies the requirements for design, specification and type testing for self-closing cylinder valves specifically for use with LPG. It includes references to associated equipment for vapour or liquid service.

NOTE Annex B gives recommendations for production testing and inspection.

This European Standard applies to self-closing valves fitted to transportable refillable LPG cylinders from 0,5 l up to 150 l water capacity intended to convey LPG only.

This European Standard does not apply to fixed automotive installations.

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 629-1, *Transportable gas cylinders – 25E taper thread for connection of valves to gas cylinders – Part 1: Specification.*

EN ISO 11116, *Gas cylinders – 17E taper thread for connections of valves to gas cylinders – Part 1: Specifications.*

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

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

prEN 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 devices for butane, propane or their mixtures.*

prEN 13175, *Specifications and testing for Liquefied Petroleum Gas (LPG) tank valves.*

prEN 13953, *Pressure relief valves for transportable refillable cylinders for liquefied petroleum gas (LPG).*

3 Terms and definitions

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

3.1

LPG

mixture of light hydrocarbons, gaseous under standard atmospheric conditions, which can be liquefied by increased pressure or decreased temperature. The main components are propene, propane and butene isomers

3.2

cylinder valve

valve designed for use in one or more of the following applications: liquid filling, liquid service, vapour service, liquid level indication

EN 13152:2001 (E)**3.3****external tightness**

resistance to leakage through the valve body to or from the atmosphere

3.4**internal tightness**

resistance to leakage across the valve seat, or other internal sealing components, when the valve is closed

3.5**reduction tube**

tube fitted to the valve to allow withdrawal of liquid LPG with the cylinder in its normal operating position

3.6**fixed liquid level gauge**

control device, such as a dip tube in combination with a vent valve to verify that the predetermined maximum liquid level in a cylinder has been reached

3.7**liquid level indicator**

control device, such as a float gauge, permitting the gauging of the liquid level in the cylinder

3.8**valve body**

major valve component including valve stem and/or valve outlet and, where applicable, the provision for other optional components

3.9**excess flow device**

device designed to close or partially close when the flow of liquid or vapour 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

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3.10**non-return valve**

valve designed to close automatically to restrict reverse flow

3.11**vapour/liquid dual valve**

valve designed to allow vapour and liquid withdrawal from a cylinder in its normal operating position

3.12**sealing element**

element used to provide internal leak tightness

3.13**valve stem**

section of the valve body which connects to the cylinder

3.14**valve outlet**

section of the valve to which a regulator or connector can be fitted

3.15**type test**

test or series of tests conducted to prove that the design meets the requirements of this standard

3.16**cylinder opening**

part of the cylinder to which the valve stem connects

3.17**quick coupling connector**

system which enables an appliance or equipment to be connected to a cylinder valve without the use of tools

3.18**test pressure**

pressure at which the valve or component is tested in bar gauge

3.19**sediment tube**

device designed to reduce the risk of foreign matter, which may be in the cylinder, entering the valve

3.20**protection cap/dust cap**

device fitted to the valve outlet and intended for one or more of the following functions:

- to protect the outlet;
- to prevent the ingress of foreign matter;
- to indicate unauthorised manipulation.

3.21**sealing cap**

device fitted to, or integral with, the outlet of the cylinder valve to provide secondary closure

3.22**valve operating mechanism**

mechanism that opens the valve when, or after, a regulator or connector is fitted and closes automatically when, or before, a regulator or connector is disconnected

3.23**sealing mechanism**

mechanism to obtain internal leak tightness

4 Design and specification

4.1 General

4.1.1 The valve operation shall not be adversely affected by a change in cylinder pressure.

4.1.2 The valve shall be capable of withstanding:

- mechanical stresses, including dynamic loads such as pressure shocks, cyclic changes or transport vibrations;
- operating temperatures.

4.1.3 There shall be valve external and internal tightness for the full range of pressure and temperature conditions.

4.2 Materials

4.2.1 General

Materials in contact with LPG shall be physically and chemically compatible with LPG under all operating conditions for which the valve is designed.

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In selecting an appropriate material for valve components, it is important to select not only for adequate strength in service, but also to give consideration to other modes of failure due to atmospheric corrosion, brass dezincification, stress corrosion, shock loads, and material failure.

4.2.2 Operating temperatures

Materials used shall be suitable for the temperatures for which the valve is designed.

The minimum operating temperature to which the valve is expected to be exposed during normal use is minus 20 °C. In service, temperatures below this may be encountered during short periods, for example, during filling. Where necessary, e.g. in some parts of Europe and for certain applications, lower minimum operating temperatures shall be used. When equipment is designed for a temperature of minus 40 °C, it shall also meet the requirements of annex C.

The maximum operating temperature to which the valve is expected to be exposed during normal operation is 60 °C. In service, this temperature may be exceeded for short periods.

4.2.3 Copper alloys

Valve bodies made from copper alloys shall be manufactured from materials in accordance with EN 12164, EN 12165, or from alloys of equivalent properties.

4.2.4 Non-metallic materials

Non-metallic materials in contact with LPG shall be compatible with LPG and shall not distort, harden or adhere to the body or seat face to such an extent as to impair the function of the valve, and shall also comply with the appropriate requirements of EN 549. (standards.iteh.ai)

Elastomeric materials in contact with LPG shall meet the specific requirements of EN 549 for resistance to:

- gas (pentane test); <https://standards.iteh.ai/catalog/standards/sist/8d74adf4-7356-4958-8b0a-2107cf82563f/sist-en-13152-2002>
- lubricants;
- ageing;
- low temperature;
- high temperature;
- compression;
- ozone (where the material is exposed to the atmosphere).

4.3 Essential components**4.3.1 Valve operating mechanism**

The valve operating mechanism shall be designed in such a way that it remains captive and achieves direct contact with the valve body in the absence of the sealing element.

The valve shall be designed in such a way that the travel distance of the valve operating mechanism cannot be modified.

4.3.2 Valve body

If the valve body is made of more than one part, precautions shall be taken to ensure that there can be no unintentional dismantling. Disassembly shall require specialised equipment.

4.3.3 Sealing mechanism

The sealing mechanism shall ensure internal leak tightness. This can be achieved with one or more sealing elements, one of which shall be spring loaded to ensure closure when the valve is not activated.

The sealing mechanism may also include a sealing cap.

4.3.4 Valve stem

The connection between the valve and the LPG cylinder shall be a threaded sealing system conforming to EN 629-1, EN ISO 11116 or any other connection system that provides an equivalent level of safety.

The threaded connection dimension shall be defined as the valve stem, major diameter (large end), see Figure A.1.

4.3.5 Valve outlet

The connection between the valve and the equipment shall be by means of a quick coupling or a threaded connector.

In the case of a vapour/liquid dual valve, the following requirements shall apply:

- the valve shall have separate vapour and liquid outlet connections. The wall thickness between the passageways through the valve body shall not be less than 1 mm.
- the liquid outlet shall be a different design to that of the vapour outlet. Clear identification shall be provided to distinguish between the liquid and vapour outlets.
- it shall not be possible to obtain a flow from the liquid outlet before a leak tight connection has been made.

4.4 Optional components

4.4.1 Pressure relief valve

A pressure relief valve shall be designed to operate in the vapour phase. Pressure relief valves for LPG cylinders shall fulfil the requirements of prEN 13953.

4.4.2 Eduction tube

The eduction tube shall be securely fitted to the valve.

NOTE When a valve with an eduction tube is fitted to a cylinder, its presence and orientation should be clearly identified.

4.4.3 Excess flow device

Excess flow devices shall meet the requirements of prEN 13175.

NOTE Excess flow devices should be designed so that their function does not interfere with the operation of a pressure relief valve, if fitted.

4.4.4 Non-return valve

Non-return valves shall be designed so that, when closed, the reverse flow past the seat shall not exceed that of an opening of 1,77 mm² cross sectional area.