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Gas cylinders — Specifications and testing of LPG cylinder valves — Manually operated

Bouteilles à gaz — Spécifications et essais pour valves de bouteilles de GPL — Fermeture manuelle

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 2, *Cylinder fittings,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 286, *Liquefied petroleum gas equipment and accessories,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 15995:2019) of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

— correction of Clause 8, list item c).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document covers the function of a LPG cylinder valve as a closure (defined by the UN Model Regulations[15]).

This document has been written so that it is suitable to be referenced in the UN Model Regulations.

Cylinder valves complying with this document can be expected to perform satisfactorily under normal service conditions.

When an LPG cylinder valve has been approved according to a previous version of this document, the body responsible for approving the same LPG cylinder valve to this new edition should consider which tests need to be performed.

In this document the unit bar is used, due to its universal use in the field of technical gases. It should, however, be noted that bar is not an SI unit, and that the corresponding SI unit for pressure is Pa (1 bar = 10^5 Pa = 10^5 N/m^2).

Pressure values given in this document are given as gauge pressure (pressure exceeding atmospheric pressure) unless noted otherwise.

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Gas cylinders — Specifications and testing of LPG cylinder valves — Manually operated

1 Scope

This document specifies the requirements for design, specification, type testing and production testing and inspection of dedicated LPG manually operated cylinder valves for use with and directly connected to transportable refillable LPG cylinders.

It also includes requirements for associated equipment for vapour and liquid service. Bursting discs and/or fusible plugs are not covered in this document.

Annex B identifies requirements for production testing and inspection.

This document excludes other LPG cylinder devices which are not an integral part of the dedicated manually operated cylinder valve.

This document does not apply to cylinder valves for fixed automotive installations and ball valves.

NOTE For self-closing LPG cylinder valves see ISO 14245. For cylinder valves for compressed, dissolved and other liquefied gases see ISO 10297,[2] ISO 17871[6] or ISO 17879[7].

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.

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

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

ISO 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 13341, *Gas cylinders — Fitting of valves to gas cylinders*

ISO 10286, *Gas cylinders — Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10286 and the following apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

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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

[SOURCE: ISO 10286:2015, 723, modified.]

3.2
cylinder valve
valve
primary shutoff device fitted to LPG cylinders, intended for liquid or vapour filling and withdrawal

Note 1 to entry: The valve includes the *valve body* (3.8), *valve stem* (3.14), *valve outlet* (3.15) and *valve operating mechanism* (3.22).

Note 2 to entry: The valve can also include additional devices, e.g. *eduction tube* (3.5), *liquid level indicator* (3.7), *fixed liquid level gauge* (3.6), *excess flow valve* (3.9), *non-return valve* (3.10), *sediment tube* (3.19), and *pressure relief valve* (3.30).

3.3
external leak tightness
leak tightness to atmosphere (leakage in and/or leakage out), when the valve is open

3.4
internal leak tightness
leak tightness across the valve seat (leakage in and/or leakage out), when the valve is closed

3.5
eduction 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
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 or surpassed

3.7
liquid level indicator
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* (3.14) and *valve outlet* (3.15) and, where applicable, the provision for other optional components

3.9
excess flow valve
valve comprising two or more components 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

3.10
non-return valve
automatic valve which allows gas/liquid to flow only in one direction

[SOURCE: ISO 10286:2015, 349, amended — liquid added.]

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3.11
dual valve
valve designed to allow separate vapour and liquid withdrawal from a cylinder in its normal operating position each port having its own valve operating mechanism

3.12
sealing element
element used to obtain *internal leak tightness* (3.4)

3.13
special valve
valve which is only used for cylinders up to and including 7,5 l water capacity, having a hand wheel diameter less than 30 mm and where the maximum section of gas passage is not more than 4 mm diameter

3.14
valve stem
section of the *valve body* (3.8), which connects to the cylinder

3.15
valve outlet
section of the *valve body* (3.8) to which a regulator or connector can be fitted for vapour or liquid withdrawal

Note 1 to entry: The valve outlet is also normally used for filling the cylinder.

3.16
type test
test or series of tests conducted to prove that the design meets the requirements of this document

3.17
cylinder opening
part of the cylinder to which the *valve stem* (3.14) connects

3.18
test pressure
pressure at which the valve or component is tested

3.19
sediment tube
device designed to reduce the risk of foreign matter, which can be in the cylinder, entering the valve

3.20
sealing cap
device which is intended to seal the external outlet connection of a valve

[SOURCE: ISO 10286:2015, 368]

3.21
sealing plug
device which is intended to seal the internal outlet connection of a valve

[SOURCE: ISO 10286:2015, 369]

3.22
valve operating mechanism
mechanism which closes and opens the valve orifice and which includes the internal and external sealing systems

[SOURCE: ISO 10286:2015, 328, modified — EXAMPLE deleted.]

Note 1 to entry: Normally the valve operating mechanism includes the hand wheel.

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3.23
operating torque
torque during opening or closing the valve, after the first half rotation of the hand wheel in opening the valve and before the last half rotation of the hand wheel in closing the valve

3.24
opening torque
initial torque required to open the valve from the closed position

3.25
closing torque
torque required to close the valve and obtain *internal leak tightness* (3.4)

3.26
valve protection cap
device securely fixed over the valve during handling, transport and storage and which is removed for access to the valve

[SOURCE: ISO 10286:2015, 360]

3.27
valve shroud
integral part of a cylinder which is permanently attached for valve protection during transportation, handling and storage

[SOURCE: ISO 10286:2015, 362]

3.28
valve guard
device securely fixed over the valve during handling transport and storage and which does not need to be removed for access to the valve

3.29
gross mass
total package mass of the heaviest cylinder on which the valve is intended to be fitted, including any permanently attached accessories and the maximum mass of the LPG content

3.30
pressure relief valve
pressure actuated valve held shut by a spring or other means and designed to relieve excessive pressure automatically by starting to open at the set pressure and reclosing after the pressure has fallen below the set pressure

3.31
nominal set pressure
predetermined pressure of the *pressure relief valve* (3.30) at which the valve is set to start to discharge

4 Design and specification

4.1 General

The valve shall be capable of withstanding:

a) operating pressures and test pressures;

b) operating temperatures and test temperature;

c) mechanical stresses during operation;

d) vibration during transport.

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