International Standard

ISO 15995

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

AMENDMENT 1

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

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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).

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

AMENDMENT 1

Normative references

Add the following normative reference:

MIL-STD-810G:2008, *Department of Defence Test Method Standard, Environmental Engineering Considerations and Laboratory Tests*

4.2

Add the following new subclause:

4.2.5 Adhesives

Where used, adhesives shall be proven compatible with LPG in accordance with recognized international, regional or national standards.

4.3.1, last paragraph

Replace paragraph with the following:

All valves shall close when turned clockwise and open when turned anti-clockwise. The hand wheel shall be visibly marked with a portion(s) of circle terminating by an arrow for each direction. One arrow shall be marked with “–" or "close” (closure) and the other arrow with “+” or "open" (opening) to indicate the result of the rotation.

4.3.3, first sentence

Replace sentence with the following:

Valve inlet connections shall conform to an international, regional or national standard or proprietary designs that have been qualified to an acceptable industry standard.

4.3.3, NOTE

Replace NOTE with the following:

NOTE 1 Valve inlet connection standards are, for example, ISO 11363-1 and ISO 15245-1.

NOTE 2 Qualification procedures for proprietary valve inlet connection designs are, for example, given in ISO 10692-2.

4.3.3, third paragraph

Replace the reference "Table 3" with "Table 4".

4.3.4, first sentence

Replace sentence with the following:

Valve outlet connections shall conform to an international, regional or national standard or proprietary designs that have been qualified to an acceptable industry standard.

4.3.4, NOTE

Replace NOTE with the following:

NOTE 1 Valve outlet connection standards are, for example, ISO 5145 and EN 15202.

NOTE 2 Qualification procedures for proprietary valve outlet connection designs are, for example, given in CGA V-1.

4.4.1

Add the following paragraph at the end of the subclause:

Where threaded joints are used within the valve, an anaerobic sealant may be used if proven compatible with LPG in accordance with recognized international, regional (e.g. EN 751-1) or national standards.

4.4.4

Add the following indents to the end of the list:

d) There shall be sufficient thread engagement between the vent screw and the fixed liquid level gauge to allow metal to metal contact in the event of absence of the seal.

e) The dip tube shall be securely fitted to the valve to ensure that it does not disassemble during installation or operation.

EXAMPLE Using adhesive, press fitting or any other mechanical means.

4.4.9

Add the following paragraph at the end of the subclause:

The sediment tube shall be securely fitted to the valve to ensure that it does not disassemble during installation or operation.

EXAMPLE Using adhesive, press fitting or any other mechanical means.

5.1

Delete subclause numbering "5.1.1" and retain text as normal style.

5.1, third paragraph

Replace the reference "Table 1" with "Table 2".

5.1

Add the following text as new fifth paragraph:

For valves designed to incorporate pressure relief valves, their ports shall be plugged or sealed, or their setting shall be adjusted to allow applying the test pressure without activating the pressure relief valve.

5.1.2

Delete subclause numbering "5.1.2" and replace paragraph and list with the following text and Table 1:

Changes or variations to the valve configuration which can adversely affect valve performance shall require additional inspection and tests in accordance with Table 1, using the number of test samples quoted in Table 2.

Table 1 — Inspections and tests required after changes or variations to the valve configuration

	Inspection	Hydraulic pressure including subsequent external and internal leak tightness	Valve stem including subsequent external and internal leak tightness	Hand wheel fire exposure	Impact including subsequent internal leak tightness	Excessive torque tests including subsequent internal/external leak tightness	External and internal leak tightness at room temperature	Endurance – Part 1 and Part 2	External and internal leak tightness at low, high and room temperature	Examination of disassembled valves	Excess flow valve	Non-return valve	Vibration including subsequent external and internal leak tightness
Changes of the material of the valve body	Repetition of any tests to be decided on a case by case basis depending on changes of chemical composition and mechanical properties.												
Changes of the material of the handwheel				x		x		x	x	x			
Change of the handwheel diameter of a regular valve design	No tests required.												
Increase of the handwheel diameter of a special valve design in accordance with Annex A						x							
Change of configuration from special valve design to regular valve design						x		x	x	x			
Changes of the basic design dimensions of the internal valve components [e.g. spindle diameter, spindle thread pitch, seat diameter, dimension of o-ring(s)]	Repetition of a test to be decided on a case by case basis, depending on the change.												
Changes of metallic material of the valve operating mechanism components (e.g. spindle, springs)	Repetition of a test to be decided on a case by case basis, depending on the change.												
Change of non-metallic material with regard to composition or hardness of internal valve components [e.g. seals, o-ring(s) and lubricants]	x	x		x	x	x	x	x	x	x			
Changes of the thread and/or any dimensions of the valve inlet connection		x [a]	x [a]		x [a]								
Changes of the thread and/or any dimension of the valve outlet connection		x [b]											

[a] Repetition of a test to be decided on a case by case basis, depending on the change.

[b] Repetition of a test to be decided on a case by case basis, depending on the change but in open position only.

[c] If the strength of the inlet connection in shear and/or torsion is reduced.

[d] Only with the valve operating mechanism in the open position and the outlet not plugged.

[e] To be decided on a case by case basis depending on the configuration.

Table 1 *(continued)*

	Inspection	Hydraulic pressure including subsequent external and internal leak tightness	Valve stem including subsequent external and internal leak tightness	Hand wheel fire exposure	Impact including subsequent internal leak tightness	Excessive torque tests including subsequent internal/external leak tightness	External and internal leak tightness at room temperature	Endurance – Part 1 and Part 2	External and internal leak tightness at low, high and room temperature	Examination of disassembled valves	Excess flow valve	Non-return valve	Vibration including subsequent external and internal leak tightness
Design changes of previously tested optional components, excluding decreases of overall length													x [a]
Addition of a pressure relief valve	x	x	x [c]		x								
Addition of an eduction tube	x		x [c]										x
Addition of a fixed liquid level gauge	x	x	x [c]		x				x				x
Addition of an excess flow valve	x		x [c]		x [c]						x		x
Addition of a non-return-valve	x	x [d]	x [c]									x	
Addition of a liquid level indicator	x	x [a]	x [c]		x				x [e]				x
Addition of a sealing cap/plug	No tests required.												
Addition of a sediment tube	x		x [c]										x
Removal of an optional component	x [e]												

[a] Repetition of a test to be decided on a case by case basis, depending on the change.

[b] Repetition of a test to be decided on a case by case basis, depending on the change but in open position only.

[c] If the strength of the inlet connection in shear and/or torsion is reduced.

[d] Only with the valve operating mechanism in the open position and the outlet not plugged.

[e] To be decided on a case by case basis depending on the configuration.

5.2, second paragraph

Replace paragraph with the following:

Additional test samples can be required for changes or variations to the valve configuration in accordance with 5.1.

5.2, third, fourth and fifth paragraph

Delete third, fourth and fifth paragraph.

5.3

Replace the reference "Table 1" with "Table 2" and renumber “Table 1” as “Table 2”.

5.3, Table 1, Test 8

Replace text in column 2 with "Internal leak tightness and leakage through the valve body".

5.3, Table 1, Test 22

Replace text in column 2 with "External and internal leak tightness".

5.4

Add the following text at the end of the third paragraph:

The valve drawings shall be examined to determine that there is metal to metal contact between the vent screw and the fixed liquid level gauge, when fitted, with the sealing element removed.

5.5.1

Replace text of indent c) with "The test pressure shall be at a minimum of 45 bar."

5.5.2

Replace the reference "Table 1" with "Table 2".

5.6.1.1, indent b)

Replace the reference "Table 1" with "Table 2".

5.6.1.1, indent c)

Replace the reference "Table 2" with "Table 3".

5.6.1.1, Table 2

Replace Table 2 with the following table:

Table 3 — Test pressures

No.	Test pressure bar gauge
1	$0{,}1^{+0{,}4}_{-0{,}0}$
2	min. 30

5.6.2

Replace paragraph with the following:

The leak rate for the external and internal tightness shall not exceed 15 cm^3/h of air corrected to 15,6 °C and 1,013 bar, at pressures specified in Table 3 and temperatures specified in Table 2.

5.7.1

Replace indent b) with the following text:

b) A steel fitting reproducing the cylinder opening with matching threads shall be used.

5.7.1

Replace indent c) with the following text:

c) The threaded tapered valve stem shall be tightened to the torque settings as shown in Table 4 without using thread sealant. Lubricant may be used to assist the smooth torque.

5.7.1, indent c) NOTE

Replace the reference "Table 3" with "Table 4".

5.7.1, Table 3

Move Table to the end of the subclause and renumber as Table 4.

5.7.2

Add the following sentence at the end of second paragraph:

For parallel threads, a seal can be necessary to check the subsequent tightness.

5.8.1

Replace indent b) with the following:

b) The hand wheel shall be exposed for 1 min (+5/0 s) to a gas torch flame of approximately 150 mm length, without an additional air supply, such that the flame reaches a temperature of 800 °C to 1 000 °C.

5.9.1, first paragraph

Replace first paragraph with the following:

A valve, which is designed to be used only on cylinders protected by a valve protection cap, valve guard or valve shroud, shall be submitted to an impact test using a minimum impact energy of 40 J.

5.9.1, second paragraph

Replace second paragraph with the following:

A valve, which is not designed to be protected by a protection cap or shroud, shall be submitted to an impact test with an impact energy (in Joules) numerically equal to at least 3,6 times the gross mass in kilograms, with a relative tolerance of +5 %.

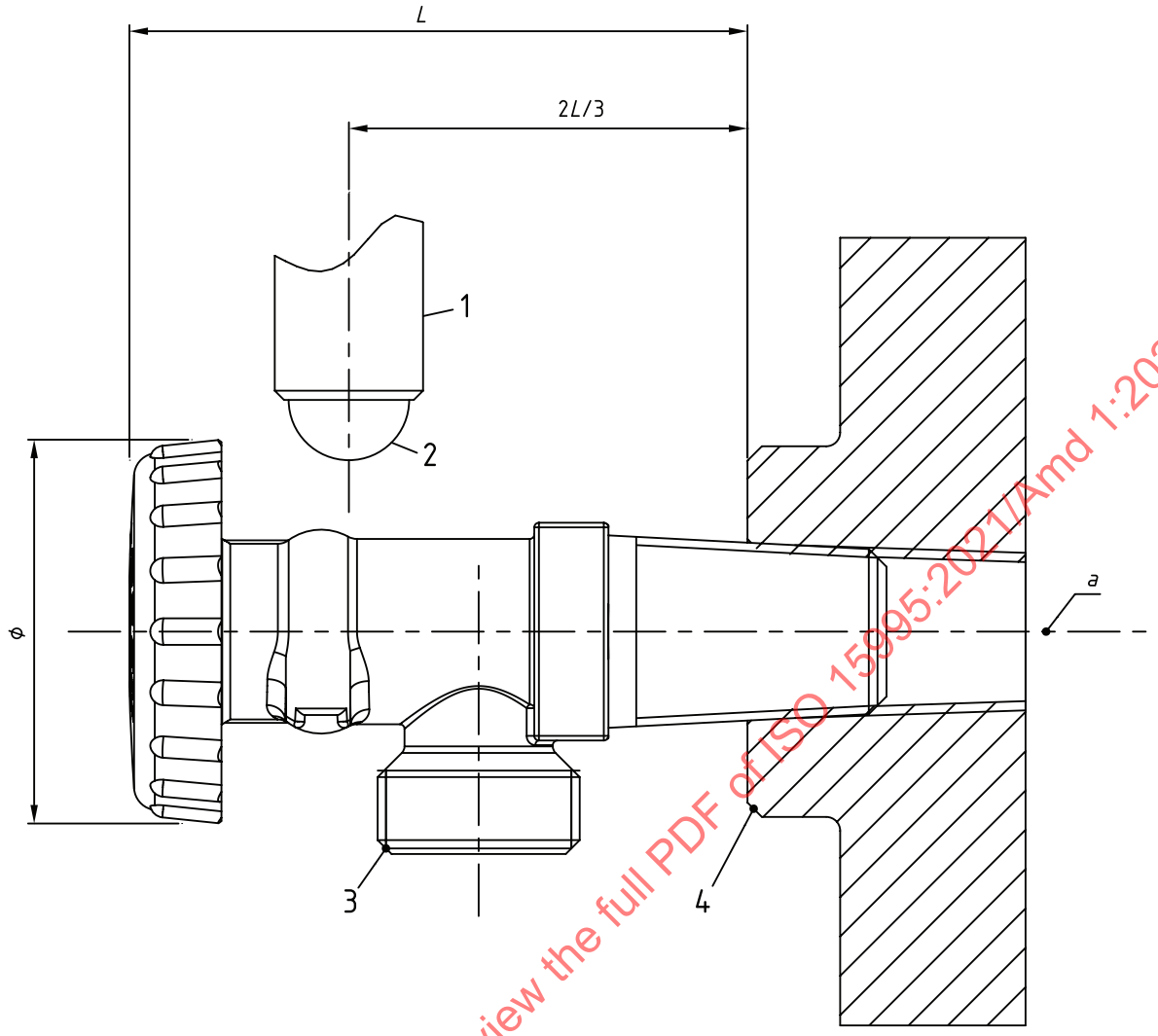
5.9.2, first paragraph

Replace first sentence with the following:

The test sample shall be tested in the closed condition (closed with a maximum of 3 Nm).

5.9.2, Figure 1

Replace Figure 1 with the following figure:



Key

1 plummet weight
2 13 mm diameter hardened steel ball
3 valve
4 fixture or cylinder
L overall length of exposed valve, including handwheel
Ø diameter of hand wheel
[a] Longitudinal axis of the valve.

Figure 1 — Impact test

5.9.3

Replace paragraph with the following three paragraphs:

The valve shall not crack or shear to such an extent that LPG would be released.

This shall be verified by:

a) performing an internal leak tightness test according to 5.6, where the closing torque, in accordance with 5.6.1.3 a), shall not exceed 6 Nm; and

b) checking that there is no leakage through the valve body.

For valves that have to be subjected to high impact values in excess of 200 J, due to the valve applications, the maximum closing toque in 5.9.3 a) may be increased up to 12 Nm, which can require tools to be used to close the valve.

5.10.1

Replace indent c) with the following:

c) The torque shall gradually be increased up to the minimum value of 20 Nm.

5.11.1

Replace indent c) with the following:

c) The torque shall gradually be increased up to the minimum value of 25 Nm.

5.12.1

Replace indent a) with the following:

a) The inlet pressure shall remain at a minimum of 12 bar.

5.12.1, last paragraph

Replace paragraph with the following:

The part 2 test shall consist of 3 000 openings/closings with a minimum load of 200 N applied vertically on the hand wheel for the duration of the test.

5.14.4, first paragraph

Replace paragraph with the following:

Each valve shall be subject to a strength test by the application of a minimum differential pressure of 30 bar to close the valve.

5.15.1

Replace indent c) with the following:

c) The pressure shall be a minimum of 12 bar and shall be applied from the upstream (cylinder) side of the non-return valve.

5.15.2, second paragraph

Replace reference "Table 2" with "Table 3".