



SLOVENSKI STANDARD
oSIST prEN ISO 15615:2022

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Oprema za plamensko varjenje - Baterije acetilenskih jeklenk za varjenje, rezanje in sorodne postopke - Varnostne zahteve za visokotlačne naprave (ISO/DIS 15615:2022)

Gas welding equipment - Acetylene manifold systems for welding, cutting and allied processes - Safety requirements in high-pressure devices (ISO/DIS 15615:2022)

Gasschweißgeräte - Acetylenflaschen-Batterieanlagen für Schweißen, Schneiden und verwandte Prozesse - Sicherheitsanforderungen für Hochdruckeinrichtungen (ISO/DIS 15615.2:2022)

Matériel de soudage aux gaz - Centrales de détente pour la distribution d'acétylène pour le soudage, le coupage et les techniques connexes - Exigences de sécurité pour les dispositifs haute pression (ISO/DIS 15615:2022)

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Gas welding equipment — Acetylene manifold systems for welding, cutting and allied processes — Safety requirements in high-pressure devices

*Matériel de soudage aux gaz — Centrales de détente pour la distribution d'acétylène pour le soudage, le
coupage et les techniques connexes — Exigences de sécurité pour les dispositifs haute pression*

ICS: 25.160.30

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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 44, *Welding and allied processes*, Subcommittee SC 8, *Equipment for gas welding, cutting and allied processes*.

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.

This third edition cancels and replaces the second edition (ISO 15615:2002), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the manual quick-acting shut-off valve has been removed from the document because it is no longer state of the art;
- the remotely actuated shut-off valve has been removed from the document because it is no longer state of the art;
- in 3.8 the definition of change-over unit has been added;
- in 5.3.4 the test method for three-way valves have been precised;
- in 5.3.6 specific requirements for pressure gauges have been added;
- new subclause 6.4 has been added;
- in 6.7.2 tolerances have been added;
- in 6.7.3, a minimum value for vacuum has been added;
- in 6.8.2 other comparable test methods for leakage have been permitted;
- in 6.8.3 a minimum settling time of pressure has been added;
- in 8 the kind of device has been added to the marking.

Official interpretations of ISO/TC 44 documents, where they exist, are available from this page:
<https://committee.iso.org/sites/tc44/home/interpretation.html>.

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Gas welding equipment — Acetylene manifold systems for welding, cutting and allied processes — Safety requirements in high-pressure devices

1 Scope

This document establishes the general specifications, requirements and tests for devices located on the high-pressure side of acetylene manifold systems up to 25 bar (2,5 MPa) as defined in ISO 14114. It does not cover the high-pressure piping, high-pressure flexible hoses or the pressure regulator.

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 5171, *Gas welding equipment — Pressure gauges used in welding, cutting and allied processes*

ISO 9090, *Gas tightness of equipment for gas welding and allied processes*

ISO 9539, *Gas welding equipment — Materials for equipment used in gas welding, cutting and allied processes*

ISO 10297, *Gas cylinders — Cylinder valves — Specification and type testing*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15296:2017 and the following 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 <https://www.electropedia.org/>

3.1

non-return valve

device that prevents passage of gas in the direction opposite to the intended flow

[SOURCE: ISO 15296:2017, 3.4.2]

3.2

automatic quick-acting shut-off device

self-acting device that closes quickly, e.g. when triggered by an acetylene decomposition in the high-pressure manifold pipework

[SOURCE: ISO 15296:2017, 3.4.10, modified - “acetylene explosion” was replaced by “acetylene decomposition”]

3.3

automatic pressure-actuated shut-off valve

device which automatically stops the gas supply to the regulator when the downstream pressure rises above the maximum operating pressure

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3.4

three-way valve

device which can be manually or automatically actuated and allows gas flow from one side of the high-pressure manifold to enter the regulator while isolating flow from the other side

Note 1 to entry: Its position can be reversed so that gas flows from the other side while the first side is isolated. It prevents simultaneous flow from both sides.

3.5

stop valve

device to prevent the flow of gas when closed

3.6

multifunctional safety device

device that incorporates two or more of the safety functions

[SOURCE: ISO 15296:2017, 3.4.8]

3.7

pressure gauge

device which shows the actual pressure of the assembly (digital or analogue readouts) (e.g. used in the high-pressure line of manifold systems)

3.8

change-over unit

device in a two-sided system allowing switching the supply of gas to the system from either of its bank of cylinders or bundles by means of a pressure actuated switching mechanism without interrupting supply

[SOURCE: ISO 14114:2017, 3.7, modified – “by means of a pressure actuated switching mechanism” has been added to the definition. The note to entry has been deleted.]

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4 Design

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Components within the devices should be designed to remain at the same electrostatic potential as the body of the device during operation. All metal components in contact with gas should be electrically continuous to prevent static electricity discharges.

5 Requirements

5.1 General

The general requirements (see [5.2](#)) apply to all the devices defined in [Clause 3](#). The multifunctional safety devices shall meet the general and additional requirements corresponding to each function.

All flow and leakage rates figures in this document shall be specified and measured under normal conditions (1 016 hPa, 20 °C).

5.2 General requirements

5.2.1 Materials

Materials used for devices shall be in accordance with ISO 9539.

5.2.2 External gas tightness

The general requirements on external gas tightness shall be in accordance with ISO 9090 at all times, before and after the tests. See [6.4](#) for test details.

5.2.3 Internal gas tightness

Where internal gas tightness is required in this document, the leakage rate shall not exceed 50 cm³/h for devices with a connection internal bore (diameter) less than 11 mm, or less than 0,41d² for larger diameters. See 6.5 for test details.

NOTE The expression 0,41d² gives the value of the flow in cm³/h, where *d* is the internal bore (diameter), in mm, of the largest connection in the device.

5.2.4 Internal gas tightness after decomposition test

Where internal gas tightness is required after acetylene decomposition, the leakage rate shall not exceed 50 l/h (see 6.5 for test details).

5.2.5 Pressure resistance

The housings of the devices shall withstand a pressure of 31,5 MPa (315 bar) for 5 min without any observed leakage. After pressurization, there shall be no visible permanent deformation (see 6.6 for test details).

5.2.6 Acetylene decomposition

After the device has been tested with decomposition at 2,5 MPa (25 bar) initial pressure in accordance with 6.7, there shall be no visible permanent deformation of the device. No escape of gas shall occur during the test. No part shall be ejected. Destruction of inner parts is permitted.

5.3 Additional requirements to be met by specific types of device

5.3.1 Non-return valve

Non-return valves shall not allow the reverse flow of gas greater than 150 cm³/h (0,15 l/h) when tested with a back pressure of 0,05 MPa (0,5 bar) and 2,5 MPa (25 bar) in accordance with 6.8.2, before and after the 2 000-cycle fatigue test carried out in accordance with 6.8.3.

These requirements do not apply to the non-return valve after it has been subjected to the acetylene decomposition test.

5.3.2 Automatic quick-acting shut-off device

Automatic quick-acting shut-off devices shall be triggered by an acetylene decomposition at 0,6 MPa (6 bar) and 2,5 MPa (25 bar). After tripping by acetylene decomposition, the internal gas leakage shall meet the requirements of 5.2.4.

5.3.3 Automatic pressure-actuated shut-off valve

Automatic pressure-actuated shut-off valves shall be triggered (stop gas flow on high-pressure side) at a pressure on the low-pressure signal port between 0,16 MPa and 0,20 MPa (1,6 bar and 2,0 bar) at both 0,1 MPa and 2,5 MPa (1 bar and 25 bar) on the high-pressure side. When triggered, the internal gas leakage shall meet the requirements of 5.2.3. See 6.10.2.1 (test 1) and 6.10.2.2 (test 2) for details.

The valve shall not be triggered when a pressure of 0,145 MPa to 0,150 MPa (1,45 bar to 1,50 bar) is held on the low-pressure signal port for 168 h. See 6.10.2.3 (test 3) for details.

Once actuated (closed), it shall not be possible for the valve to reset to an open condition without manual intervention.

In addition to the 31,5 MPa (315 bar) pressure resistance test on high-pressure chambers in 5.2.5, the internal chambers of the low-pressure signal port shall withstand a pressure of 6,0 MPa (60 bar)