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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

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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).

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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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding and allied processes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 15615:2013), which has been technically revised.

The main changes are as follows:

— the manual quick-acting shut-off valve has been removed because it is no longer state of the art;

— the remotely actuated shut-off valve has been removed because it is no longer state of the art;

— in 3.8 the definition of change-over unit has been added;

— in 5.2.6 a requirement has been added;

— in 5.3.4 the additional requirements for three-way valves have been clarified;

— in 5.3.6 specific requirements for pressure gauges have been added;

— new subclause 6.4 on external gas leakage test has been added;

— in 6.7.2 tolerances have been added;

— in 6.7.3 a minimum value for vacuum has been added;

— in 6.7.4.4 the test conditions for three-way valves have been clarified;

— 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;

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— in Clause 8 the kind of device has been added to the marking.

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. 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 2,5 MPa (25 bar)[1)] as defined in ISO 14114. It does not apply to high-pressure piping, high-pressure flexible hoses or pressure regulators.

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*

ISO 15296:2017, *Gas welding equipment — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15296 and the following apply.

ISO and IEC maintain terminology 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, for example when triggered by an acetylene decomposition in the high-pressure manifold pipework

[SOURCE: ISO 15296:2017, 3.4.10, modified — Definition revised.]

1) 1 bar = 0,1 MPa = 10^5 Pa; 1 MPa = 1 N/mm^2.

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3.3
automatic pressure-actuated shut-off valve
device that automatically stops the gas supply to the regulator when the downstream pressure rises above the maximum operating pressure

Note 1 to entry: The terms “upstream”, “upstream side”, “downstream” and “downstream side” in this document refer to the intended direction of gas flow in the device.

3.4
three-way valve
device that can be manually or automatically actuated and allows gas flow from one side or the other, but not both sides, of the high-pressure manifold to enter the regulator while isolating flow from the other side

3.5
stop valve
device that prevents 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 that shows the actual pressure of the assembly (digital or analogue readouts), for example 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 its bank of cylinders or bundles by means of a pressure-actuated switching mechanism without interrupting the supply

[SOURCE: ISO 14114:2017, 3.7, modified — Definition revised and note to entry deleted.]

4 Design

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 rate figures in this document shall be specified and measured under normal conditions [0,101 3 MPa (1,013 bar), 23 °C].

5.2 General requirements

5.2.1 Materials

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

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