
**Gas tightness of equipment for gas
welding and allied processes**

*Étanchéité aux gaz des appareils pour soudage aux gaz et techniques
connexes*

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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.

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

This second edition cancels and replaces the first edition (ISO 9090:1989), which has been technically revised. The main changes compared to the previous edition are as follows:

- the Scope has been clarified;
- [Clause 2](#) has been updated;
- a leakage requirement for unconnected female elements of a quick-action coupling has been added;
- the term “hose” has been replaced by “hose assembly” and the value for the leakage has been added;
- various types of blowpipes have been covered;
- in [6.2.1](#), b) the lower test pressure has been updated;
- the test methods for blowpipes have been moved to new [Annex B](#);
- hydrogen is not allowed anymore for leakage test; [Table A.1](#) has been updated accordingly.

Gas tightness of equipment for gas welding and allied processes

1 Scope

This document specifies the maximum external gas leakage rates which are acceptable for equipment used for welding, cutting and allied processes and provides the procedures of measurement.

It applies to individual components which are used in the gas supply to a blowpipe from the connecting point of the hose (outlet of the cylinder valve or connecting point to a gas supply plant). It does not apply to gas supply plant.

NOTE Specific requirements on the test method and conditions/procedure for measurement of the maximum external leakages can be given in individual standards, e.g. ISO 9012 for air-aspirated hand blowpipes. Concerning the method and the conditions to be applied, the individual standard takes precedence over this document. The maximum external leakages according to this document apply.

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 2503, *Gas welding equipment — Pressure regulators and pressure regulators with flow-metering devices for gas cylinders used in welding, cutting and allied processes up to 300 bar (30 MPa)*

ISO 15296, *Gas welding equipment — Vocabulary*

3 Terms and definitions

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

4 Expression of leakage

The maximum permissible external gas leakage rates, which are specified in this document, are total leakage rates for a complete component including inlet connections.

These rates shall be given in cubic centimetres per hour¹⁾ of the gas for which the equipment was designed, corrected to standard conditions²⁾ measured at room temperature.

NOTE Connections that are necessary only for the test are excluded.

1) $1 \text{ cm}^3/\text{h} = 0,28 \times 10^{-9} \text{ m}^3/\text{s}$.

2) Standards conditions: 23 °C, 1,013 bar (0,101 3 MPa).

5 Gas to be used for the tests

5.1 General

If the tests are carried out with a gas other than the gas for which the equipment is designed, appropriate corrections shall be made as specified in [Annex A](#).

5.2 Type tests

Devices to be used with helium and/or hydrogen shall be tested with helium.

Devices to be used with other gases shall be tested with dry oil free air or nitrogen.

5.3 Routine tests

Routine tests can be conducted with dry oil free air or nitrogen.

6 Test pressure

6.1 Regulators

Regulators shall be tested at pressure p_1 and p_2 as defined in ISO 2503.

6.2 Other equipment

6.2.1 Type tests

Other devices shall be tested at the following pressure:

- a) maximum working pressure as given by the manufacturer;
- b) 10 % of the maximum working pressure or 0,5 bar, whichever is lower.

6.2.2 Routine test

All devices shall be tested at one of the two pressures specified in [6.2.1](#), which gave the most unfavourable results during the type test.

7 Maximum permissible external gas leakage rates at the above defined pressures

7.1 Regulators

Regulator shall not have a total leakage rate greater than 10 cm³/h.

7.2 Blowpipes

Blowpipes shall not have a total external leakage rate greater than 8 cm³/h. The leakage rate through each valve shall not have a rate greater than 4 cm³/h. The test methods shall be as described in [Annex B](#).

These test methods enable total leakage and leakage through each valve to be tested. Under the 6 test conditions, respectively 3 for Welding/Heating blowpipes and 3 for Cutting blowpipes, defined in [Annex B](#) (plugged inlet and/or outlet, state of the valve and gas hose connected to an inlet as described), the leakage shall be limited to: 8 cm³/h as per [Figure B.1](#), [Figure B.2](#) and [Figure B.4](#), conditions and 4 cm³/h as per [Figure B.3](#), [Figure B.5](#) and [Figure B.6](#) conditions.