
**Gas cylinders — Seamless steel and
aluminium-alloy gas cylinders —
Evaluation of existing gas cylinders
and consideration of their safe use in
other jurisdictions**

*Bouteilles à gaz — Bouteilles à gaz en acier et en alliages
d'aluminium, sans soudure — Évaluation des bouteilles à gaz
existantes et considérations relatives à leur utilisation en toute
sécurité dans d'autres juridictions*

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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	2
5 Requirements	3
5.1 Inspection body.....	3
5.2 Information to be provided.....	3
5.2.1 General.....	3
5.2.2 Basic information.....	3
5.2.3 Additional information.....	3
5.3 Verification of the information provided.....	3
5.4 Cylinders subject to restriction on use.....	4
5.5 Compatibility with intended gas service.....	4
5.6 Specific requirements for seamless steel cylinders used-in carbon monoxide service.....	4
5.7 Toxic gas service.....	4
5.8 Manufacturing certificate or equivalent.....	4
6 Acceptance by the inspector	4
6.1 General.....	4
6.1.1 Acceptance by documentary evidence.....	4
6.1.2 Alternative acceptance.....	5
6.1.3 Periodic inspection requirements.....	6
6.2 Final verification.....	6
7 Marks	6
8 Inspection report/certificate	6
Annex A (informative) Calculating minimum wall and base thicknesses using the mean diameter formula	7
Annex B (informative) Correlation between tensile strength and hardness	8
Bibliography	9

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 on 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 the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

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Introduction

In some circumstances, there may be a reason for seamless steel and seamless aluminium-alloy cylinders designed, approved and used to standards or specifications recognized in a given jurisdiction to be transferred for use in another jurisdiction (e.g. if a cylinder is no longer in service in the country of origin due to low service pressure).

In some jurisdictions, a procedure called reassessment of conformity exists such as that given in Directive 2010/35/EU on transportable pressure equipment (TPED) and [Annex A](#) of European standards such as EN 1968.

The objective of this document is to verify whether a cylinder manufactured in accordance with the specification of a given jurisdiction is acceptable for use in another country outside its original jurisdiction. This is accomplished through either verification of original manufacturing certification and information (when available) or through evaluation and testing of the cylinder in accordance with given criteria to determine that the cylinder is safe to be used in the new (receiving) jurisdiction.

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Gas cylinders — Seamless steel and aluminium-alloy gas cylinders — Evaluation of existing gas cylinders and consideration of their safe use in other jurisdictions

1 Scope

This document details the checks, inspections and tests to be performed in order to qualify and certify existing seamless steel and aluminium-alloy cylinders of water capacity less than 150 l used for the transport of gases, manufactured in a jurisdiction in accordance with its national regulations, for use in jurisdictions other than that of manufacture or first use.

NOTE For specific requirements regarding gas cylinders that have been used in toxic gas service, see 5.7.

This document does not address acetylene cylinders.

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 6406, *Gas cylinders — Seamless steel gas cylinders — Periodic inspection and testing*

ISO 7866, *Gas cylinders — Refillable seamless aluminium alloy gas cylinders — Design, construction and testing*

ISO 9809-1, *Gas cylinders — Refillable seamless steel gas cylinders — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa*

ISO 9809-2, *Gas cylinders — Refillable seamless steel gas cylinders — Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1 100 MPa*

ISO 9809-3, *Gas cylinders — Refillable seamless steel gas cylinders — Part 3: Normalized steel cylinders*

ISO 10461, *Gas cylinders — Seamless aluminium-alloy gas cylinders — Periodic inspection and testing*

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

ISO 11621:1997, *Gas cylinders — Procedures for change of gas service*

ISO 13769,¹⁾ *Gas cylinders — Stamp marking*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 <http://www.iso.org/obp>

1) To be published.

**3.1
jurisdiction**

country, region or group of countries or regions that have the same regulations for gas cylinders

**3.2
manufacturing certificate**

certificate of initial inspection and testing issued by an authorized body confirming that the cylinder complies with the applicable standards or specification at time of manufacture

**3.3
owner**

individual who, or organization that, owns the cylinder

**3.4
group of cylinders**

cylinders made of the same materials (steel or aluminium-alloy) defined by the production dates for a given period, during which the provisions of the applicable standards or specifications accepted by the competent authority have not changed in their technical content

**3.5
batch**

a number of cylinders from the same *group of cylinders* (3.4) that have similar characteristics such as same manufacturer, *working pressure* (3.6) and design standard

Note 1 to entry: For the purposes of this document, the term “batch” is not the same as a manufacturing batch.

**3.6
working pressure**

settled pressure of a compressed gas at a uniform reference temperature of 15 °C in a full gas cylinder

Note 1 to entry: In North America service pressure is often used to indicate a similar condition, usually at 21,1 °C (70 °F).

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4 Symbols and abbreviated terms

<i>a</i>	calculated minimum thickness of the cylindrical shell wall, in mm
<i>D</i>	nominal outside diameter of the cylinder, in mm
<i>P_h</i>	hydraulic test pressure, in bars
<i>R</i>	0,75 x <i>R_{m-min}</i> , for normalized or normalized and tempered cylinders, or 0,85 x <i>R_{m-min}</i> , for quenched and tempered cylinders
<i>R_{m-min}</i>	minimum value of the tensile strength guaranteed by the cylinder manufacturer, in N/mm ²
<i>R_{m-max}</i>	maximum value of the tensile strength guaranteed by the cylinder manufacturer, in N/mm ²
<i>HB-min</i>	minimum Brinell hardness of the cylinder
<i>HB-max</i>	maximum Brinell hardness of the cylinder
NOTE	If <i>R_{m-min}</i> is unknown, it should be calculated as shown in Annex B .

5 Requirements

5.1 Inspection body

The checks, inspections and tests outlined in this document shall be performed by an inspection body (hereafter referred to as “the inspector”) authorized to do so by the competent authority in the jurisdiction in which the cylinder is intended to be used.

5.2 Information to be provided

5.2.1 General

The owner shall provide the inspector with all the information necessary to identify the cylinders, i.e. the groups of cylinders and number presented for qualification to the inspector.

5.2.2 Basic information

For each cylinder or batch of cylinders (as applicable), the following information shall be made available to the inspector for documentation, subsequent measurements/calculations and final evaluation:

- a) name of manufacturer;
- b) serial number;
- c) identification of material of construction (e.g. AA6061, quenched and tempered chromium-molybdenum steel or normalized steel);
- d) date of manufacture or initial test date;
- e) regulation, standard or specification to which the cylinder was manufactured;
- f) date and inspection mark of last periodic inspection and test station symbol, if applicable (from stamp marking or the periodic inspection and test certificate);
- g) either test pressure and/or working pressure, as applicable;
- h) external diameter;
- i) necessary documentation to allow determination of acceptance for use by comparison with cylinders designed to a comparable ISO International Standard (see [6.1.1](#)).

5.2.3 Additional information

For each cylinder or batch of cylinders, the inspector shall be provided further information from the owner either by documentation or by performing measurements/calculations as applicable:

- a) minimum design wall thickness;
- b) minimum yield strength and/or minimum tensile strength;

NOTE An indication of the tensile strength can be assessed by means of hardness tests (see [6.1.2](#)).

- c) nominal water capacity; and
- d) valve to cylinder neck thread specification.

5.3 Verification of the information provided

The inspector shall verify that all necessary information is available to fully identify the cylinder and to allow verification as required in [Clause 6](#).