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**Gas cylinders — Seamless steel  
and seamless aluminium-alloy gas  
cylinders and tubes — Periodic  
inspection and testing**

*Bouteilles à gaz — Bouteilles et tubes à gaz en acier et en alliages  
d'aluminium, sans soudure — Contrôles et essais périodiques*

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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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# Contents

	Page
<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Abbreviated terms and symbols</b> .....	<b>2</b>
<b>5 Intervals between periodic inspections and tests</b> .....	<b>3</b>
<b>6 List of procedures for periodic inspections and tests</b> .....	<b>3</b>
<b>7 Identification of cylinder and preparation for inspection and tests</b> .....	<b>4</b>
<b>8 Depressurization and de-valving procedures</b> .....	<b>4</b>
8.1 General.....	4
8.2 Cylinders requiring de-valving.....	5
8.3 Cylinders not requiring de-valving.....	5
8.4 Cylinders requiring shot blasting.....	5
<b>9 External visual inspection</b> .....	<b>5</b>
9.1 Preparation.....	5
9.2 Inspection procedure.....	6
<b>10 Inspection of cylinder neck</b> .....	<b>6</b>
10.1 Cylinder-to-valve threads.....	6
10.2 Other neck surfaces.....	9
10.3 Damaged internal neck threads.....	9
10.4 Neckring and collar attachment.....	9
<b>11 Check of internal condition</b> .....	<b>9</b>
11.1 General.....	9
11.2 Internal visual inspection.....	10
11.2.1 Preparation.....	10
11.2.2 Inspection requirements.....	10
11.2.3 Cylinders with footrings.....	11
11.2.4 Cylinders with internal coatings.....	11
<b>12 Supplementary tests</b> .....	<b>11</b>
12.1 General.....	11
12.2 Additional test for seamless aluminium-alloy cylinders possibly subjected to heat damage.....	11
12.3 Hammer test on cylinders with footrings.....	12
<b>13 Cylinder repairs</b> .....	<b>12</b>
<b>14 Pressure test or UT</b> .....	<b>12</b>
14.1 General.....	12
14.2 Proof pressure test.....	13
14.2.1 General.....	13
14.2.2 Test equipment.....	13
14.2.3 Test criteria.....	13
14.2.4 Acceptance criteria.....	14
14.3 Hydraulic volumetric expansion test.....	14
14.4 UT.....	14
14.4.1 General.....	14
14.4.2 Requirements.....	14
14.4.3 Calibration.....	19
14.4.4 Performing the examination.....	23

14.4.5	Interpretation of results.....	24
14.4.6	Records.....	25
<b>15</b>	<b>Inspection of valve and other accessories.....</b>	<b>25</b>
<b>16</b>	<b>Replacement of cylinder parts.....</b>	<b>26</b>
<b>17</b>	<b>Final operations.....</b>	<b>26</b>
17.1	Drying, cleaning and painting.....	26
17.1.1	Drying and cleaning.....	26
17.1.2	Painting and coating.....	26
17.2	Re-valving of the cylinder.....	27
17.3	Check of cylinder tare.....	27
17.4	Retest marking.....	28
17.4.1	General.....	28
17.4.2	Stamping.....	28
17.5	Reference to next periodic inspection and test date.....	28
17.6	Identification of contents.....	28
17.7	Records.....	28
<b>18</b>	<b>Rejection and rendering cylinder unserviceable.....</b>	<b>29</b>
18.1	General.....	29
18.2	Cylinders with a valve attached.....	29
18.3	Cylinders with no valves attached.....	29
<b>Annex A (informative) Periodic inspection and test periods.....</b>		<b>30</b>
<b>Annex B (normative) Description, evaluation of defects and conditions for rejection of seamless steel and seamless aluminium-alloy cylinders at the time of periodic inspection.....</b>		<b>31</b>
<b>Annex C (informative) List of gases corrosive to cylinder material.....</b>		<b>43</b>
<b>Annex D (informative) Volumetric expansion testing of cylinders.....</b>		<b>44</b>
<b>Annex E (informative) Test date rings for cylinders.....</b>		<b>52</b>
<b>Annex F (informative) Cleaning of seamless aluminium-alloy cylinders.....</b>		<b>53</b>
<b>Bibliography.....</b>		<b>54</b>

## 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](http://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](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

This document was prepared by ISO/TC 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements for gas cylinders*.

This first edition cancels and replaces ISO 6406:2005 and ISO 10461:2005, which have been technically revised. It also incorporates the Amendment [ISO 10461:2005/Amd 1:2006](http://www.iso.org/iso/10461-2005/Amd_1:2006).

The main changes are:

- a section has been added for symbols used in the document;
- a detailed account of steps to be taken if the actual cylinder wall thickness is less than the minimum design wall thickness has been added;
- a clearer way to ultrasonically test cylinders with a built-in footing, especially for seamless steel cylinders with a convex base, has been added;
- improved guidelines have been added for dealing with the effects of heating of seamless aluminium-alloy cylinders.

## Introduction

This document provides information and procedures for the periodic inspection and testing of seamless steel and seamless aluminium-alloy cylinders and the condition of the test equipment. The principal aim of periodic inspection and testing is that at the completion of the test the cylinders have been requalified and are suitable to be reintroduced into service for a further period of time.

This document requires that well-trained and competent personnel undertake the work as described in this document, who consult the cylinder's manufacturer if there are doubts about aspects of the document, so that the cylinder manufacturer's current recommendations are taken into account.

This document has been written so that it is suitable to be referenced in the UN *Model Regulations*<sup>[23]</sup>.

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# Gas cylinders — Seamless steel and seamless aluminium-alloy gas cylinders and tubes — Periodic inspection and testing

**CAUTION** — Some of the tests specified in this document involve the use of processes that could lead to a hazardous situation.

## 1 Scope

This document specifies the requirements for periodic inspection and testing to verify the integrity of cylinders and tubes to be re-introduced into service for a further period of time.

This document is applicable to seamless steel and seamless aluminium-alloy transportable gas cylinders (single or those that comprise a bundle) intended for compressed and liquefied gases under pressure, of water capacity from 0,5 l up to 150 l and to seamless steel and seamless aluminium-alloy transportable gas tubes (single or those that comprise a bundle) intended for compressed and liquefied gases under pressure, of water capacity greater than 150 l. It also applies, as far as practical, to cylinders of less than 0,5 l water capacity.

This document does not apply to the periodic inspection and maintenance of acetylene cylinders or to the periodic inspection and testing of composite cylinders.

**NOTE** Unless noted by exception, the use of the word “cylinder” in this document refers to both cylinders and tubes.

## 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 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

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

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

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

ISO 10286, *Gas cylinders — Terminology*

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

ISO 13769<sup>1)</sup>, *Gas cylinders — Stamp marking*

ISO 22434, *Transportable gas cylinders — Inspection and maintenance of cylinder valves*

ISO 25760, *Gas cylinders — Operational procedures for the safe removal of valves from gas cylinders*

1) To be published. Stage at the time of publication: ISO/FDIS 13769:2018.