
**Gas cylinders — Cylinder bundles —
Periodic inspection and testing**

*Bouteilles à gaz — Cadres de bouteilles — Contrôles et essais
périodiques*

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Published in Switzerland

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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).

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. (standards.iteh.ai)

This document was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements for gas cylinders*.
ISO 20475:2018
<https://standards.iteh.ai/catalog/standards/sist/d83a6294-758e-4c61-a543-0f8ec202d6c9/iso-20475-2018>

Introduction

The principal aim of a periodic inspection and testing procedure is that, at the completion of the test, the cylinder bundles may be reintroduced into service for a further period of time.

Periodic inspection and testing of cylinder bundles is carried out in conjunction with the retest period of the cylinders within the bundle in order to comply with national and regional transport regulations.

If there are any doubts, inspectors should consult the bundle/cylinder's manufacturer so that the manufacturer's current recommendations are taken into account.

This document is intended to be used under a variety of national regulatory regimes, but has been written so that it is suitable for the application of the UN Model Regulations^[10].

In International Standards, weight is equivalent to a force, expressed in Newton. However, in common parlance (as used in terms defined in this document), the word "weight" continues to be used to mean mass, although this practice is deprecated (see ISO 80000-4).

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Gas cylinders — Cylinder bundles — Periodic inspection and testing

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

1 Scope

This document specifies the requirements for the periodic inspection and testing of cylinder bundles containing compressed, liquefied and dissolved gas.

NOTE Additional requirements for acetylene cylinder bundles are provided in [Annex A](#).

This document also establishes general principles for the maintenance of cylinder bundles.

This document is not applicable to acetylene bundles with solvent-free acetylene cylinders.

This document excludes the requirements for cylinder bundles when they are a part of a battery vehicle. For some specific applications, e.g. offshore, additional requirements can apply.

2 Normative references (standards.iteh.ai)

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 10286, *Gas cylinders — Terminology*

ISO 10460, *Gas cylinders — Welded carbon-steel gas cylinders — Periodic inspection and testing*

ISO 10462, *Gas cylinders — Acetylene cylinders — Periodic inspection and maintenance*

ISO 10961, *Gas cylinders — Cylinder bundles — Design, manufacture, testing and inspection*

ISO 11372, *Gas cylinders — Acetylene cylinders — Filling conditions and filling inspection*

ISO 11623, *Gas cylinders — Composite construction — Periodic inspection and testing*

ISO 14113, *Gas welding equipment — Rubber and plastics hose and hose assemblies for use with industrial gases up to 450 bar (45 MPa)*

ISO 15996, *Gas cylinders — Residual pressure valves — Specification and type testing of cylinder valves incorporating residual pressure devices*

ISO 18119¹⁾, *Gas cylinders — Seamless steel and seamless aluminium-alloy gas cylinders and tubes — Periodic inspection and testing*

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.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10286 and the following 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 <https://www.iso.org/obp>

3.1 compressed gas

gas, which, when packaged under pressure for transport, is entirely gaseous at $-50\text{ }^{\circ}\text{C}$

Note 1 to entry: This category includes all gases with a critical temperature less than or equal to $-50\text{ }^{\circ}\text{C}$.

[SOURCE: ISO 10286:2015, 705]

3.2 liquefied gas

gas, which, when packaged under pressure, is partially liquid (or solid) at temperatures above $-50\text{ }^{\circ}\text{C}$

Note 1 to entry: A distinction is made between:

- high pressure liquefied gas, a gas with a critical temperature between $-50\text{ }^{\circ}\text{C}$ and $+65\text{ }^{\circ}\text{C}$;
- low pressure liquefied gas, a gas with a critical temperature above $+65\text{ }^{\circ}\text{C}$.

[SOURCE: ISO 10286:2015, 706, modified — Note 1 to entry has been added.]

3.3 dissolved gas (under pressure)

gas, which when packaged under pressure for transport, is dissolved in a liquid phase solvent

[SOURCE: ISO 10286:2015, 709]

3.4 main valve

valve which is fitted to the *manifold* (3.11) of a *bundle* (3.5), isolating it from the *main connection(s)* (3.12)

[SOURCE: ISO 10286:2015, 267, modified — “battery vehicle/battery wagon/MEGC” has been deleted.]

3.5 bundle of cylinders cylinder bundle

assembly of *cylinders* (3.7) that are fastened together and which are interconnected by a *manifold* (3.11) and transported as a unit having a total water capacity not exceeding 3 000 l except that bundles intended for the transport of toxic gases shall be limited to 1 000 l total water capacity

Note 1 to entry: In ISO/TC 58 standards, the term “bundle” is frequently used for simplification.

[SOURCE: ISO 10286:2015, 204]

3.6 frame

structural and non-structural members of a *bundle* (3.5) that combine all other components together, while providing protection for the bundle's *cylinders* (3.7), valves and *manifold* (3.11) and which enable the bundle to be transported

[SOURCE: ISO 10286:2015, 264]

3.7**gas cylinder
cylinder**

transportable pressure receptacle of a water capacity not exceeding 150 l

Note 1 to entry: In ISO/TC 58 standards, the term “gas cylinder” is frequently used for clarification.

[SOURCE: ISO 10286:2015, 201]

3.8**cylinder valve**

valve that is fitted into a cylinder and to which a *manifold* (3.11) is connected in a *bundle* (3.5)

3.9**cylinder fitting**

component with no gas shut-off capability that serves as a method for connecting a bundle's *manifold* (3.11) to its individual cylinders when *cylinder valves* (3.8) are not fitted to the cylinders

3.10**fitting**

connecting piece, of one or more parts having no shut-off function

3.11**manifold**

pipng system for connecting pressure receptacle(s) valves or *cylinder fittings* (3.9) to the *main valve(s)* (3.4) or the *main connection(s)* (3.12)

[SOURCE: ISO 10286:2015, 265]

3.12**main connection**

means of making a gas connection to a *bundle* (3.5)

[SOURCE: ISO 10286:2015, 266, modified — “battery vehicle/MEGC” has been deleted.]

3.13**tare**

<general> weight of the pressure receptacle when empty, including accessories fitted as presented for filling

[SOURCE: ISO 10286:2015, 745]

3.14**maximum gross weight**

<cylinder bundle> sum of the *tare* (3.13) of the *bundle* (3.5) and the maximum permissible filling weight

Note 1 to entry: To be understood as “maximum gross mass” as per regional transport regulations.

[SOURCE: ISO 10286:2015, 743, modified — Note 1 to entry has been added.]

3.15**test pressure**

required pressure applied during a pressure test

3.16**working pressure**

<compressed gas> settled pressure of a *compressed gas* (3.1) at a uniform temperature of 288 °K (15 °C) in a full *bundle* (3.5)

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