Gas cylinders - Cylinder bundles - Design, manufacture, testing and inspection (ISO 10961:2019)

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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 10961:2019 sisaldab Euroopa standardi EN ISO 10961:2019 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 10961:2019 consists of the English text of the European standard EN ISO 10961:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 04.12.2019.	Date of Availability of the European standard is 04.12.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Gas cylinders - Cylinder bundles - Design, manufacture, testing and inspection (ISO 10961:2019)

Bouteilles à gaz - Cadres de bouteilles - Conception, fabrication, essais et inspection (ISO 10961:2019)

Gasflaschen - Flaschenbündel - Auslegung, Herstellung, Prüfung und Inspektion (ISO 10961:2019)

This European Standard was approved by CEN on 12 November 2019.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 10961:2019) has been prepared by Technical Committee ISO/TC 58 "Gas cylinders" in collaboration with Technical Committee CEN/TC 23 “Transportable gas cylinders” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2020, and conflicting national standards shall be withdrawn at the latest by June 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 10961:2012.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 10961:2019 has been approved by CEN as EN ISO 10961:2019 without any modification.

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

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 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements of gas cylinders*.

This third edition cancels and replaces the second edition (ISO 10961:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the terminology was brought in line with ISO 10286, as far as possible,

— storage was added throughout the document as a possible use case,

— the descriptions of the drop tests were clarified,

— the descriptions of the leak tests were clarified,

— a new figure was added showing the angle for the vertical drop test,

— the rotating drop test has been differentiated by whether the bundle is fitted with cylinders vertically or horizontally,

— the additional requirements for acetylene cylinder bundles were clarified,

— the information for the bundle identification for filling was moved to Annex C.

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 https://www.iso.org/members.html.

Introduction

For some applications, the contents of an individual gas cylinder might not satisfy the gas demand, in which case assemblies of cylinders can be used to supply larger volumes of gas in a single unit. The single unit, which contains a number of cylinders, is known as a cylinder bundle.

Such a cylinder bundle is a portable assembly, designed to be routinely lifted, that consists of a frame and two or more cylinders connected to a manifold by cylinder valves or fittings so that the cylinders can be filled, transported and emptied without disassembly.

A cylinder bundle can be subjected to rough handling in the course of normal operations.

There are types of gas cylinder assemblies that use cylinder bundle components but are designed to be disassembled at each filling to enable the cylinders to be filled individually. Although these assemblies do not conform to the basic definition of a cylinder bundle, they are commonly referred to as bundles. Their special requirements are provided in Annex A.

Acetylene cylinder bundles are often filled without disassembly. The confirmation of solvent content can be achieved with or without disassembling the bundle. Replenishing of solvent is usually done after a defined number of fillings. Their special requirements are provided in Annex B.

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”, but this practice is deprecated (see ISO 80000-4).

This document has been written so that it is suitable to be referenced in the UN *Model Regulations*[1].

Gas cylinders — Cylinder bundles — Design, manufacture, testing and inspection

1 Scope

This document specifies the requirements for the design, construction, testing and initial inspection of a transportable cylinder bundle.

It is applicable to cylinder bundles containing cylinders containing compressed gas, liquefied gas and mixtures thereof. It is also applicable to cylinder bundles for acetylene. Additional requirements for acetylene cylinder bundles containing acetylene in a solvent are provided in Annex B. This document does not, however, cover acetylene cylinder bundles with solvent-free acetylene cylinders.

This document specifies the additional requirements that apply when individual cylinders are assembled into a bundle. Unless otherwise stated, individual cylinders within a cylinder bundle conform to applicable standards for single cylinders.

This document is intended primarily for industrial gases other than liquefied petroleum gas (LPG), but it can also be used for LPG.

This document does not apply to packages in which cylinders are manifolded together in a frame that is designed to be fixed permanently to a road vehicle, to a railway wagon or to the ground as a customer storage vessel. It also does not apply to cylinder bundles that are designed for use in extreme environmental or operational conditions (e.g. offshore cylinder bundles) when additional and extraordinary requirements are imposed to maintain safety standards, reliability and performance.

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 3807, *Gas cylinders — Acetylene cylinders — Basic requirements and type testing*

ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

ISO 10297, *Gas cylinders — Cylinder valves — Specification and type testing*

ISO 10286:2015, *Gas cylinders — Terminology*

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

ISO 11114-2, *Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-metallic materials*

ISO 13585, *Brazing — Qualification test of brazers and brazing operators*

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

ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules*

ISO 15615:2013, *Gas welding equipment — Acetylene manifold systems for welding, cutting and allied processes — Safety requirements in high-pressure devices*

ISO 16964, *Gas cylinders — Flexible hoses assemblies — Specification and testing*

EN 13134, *Brazing — Procedure approval*

3 Terms and definitions

For the purposes of this document, the terms and definitions 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
cylinder bundle
bundle of cylinders
assembly of cylinders that are fastened together and interconnected by a manifold and transported as a unit having a total water capacity not exceeding 3 000 l

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

Note 2 to entry: Bundles intended for the transport of toxic gases shall be limited to 1 000 l total water capacity.

[SOURCE: ISO 10286:2015, 204, modified — preferred term and admitted term reversed, "which are" deleted and requirement for toxic gases moved into Note 2 to entry]

3.2
frame
structural and non-structural members of a bundle that combine all other components together, whilst providing protection for the bundle's cylinders, *valves* (3.3) and *manifold* (3.5) and which enable the bundle to be transported

[SOURCE: ISO 10286:2015, 264]

3.3
cylinder valve
valve that is fitted into a cylinder and to which a *manifold* (3.5) is connected in a *bundle* (3.1)

3.4
cylinder fitting
component with no gas shut-off capability that serves as a method for connecting a bundle's *manifold* (3.5) to its individual cylinders when *cylinder valves* (3.3) are not fitted to the cylinders

3.5
manifold
piping system for connecting pressure receptacle(s) valves or *fittings* (3.4) to the *main valve(s)* (3.6) or the *main connection(s)* (3.7)

[SOURCE: ISO 10286:2015, 265]

3.6
main valve
valve which is fitted to the *manifold* (3.5) of a *bundle* (3.1), isolating it from the *main connection(s)* (3.7)

[SOURCE: ISO 10286:2015, 267, modified — battery vehicle/battery wagon/MEGC deleted]

3.7
main connection
means of making a gas connection to a *bundle* (3.1)

[SOURCE: ISO 10286:2015, 266, modified — battery vehicle/MEGC deleted]