

**SLOVENSKI STANDARD**  
**oSIST prEN ISO 10961:2019**  
**01-januar-2019**

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**Plinske jeklenke - Snopi jeklenk - Konstruiranje, proizvodnja, preskušanje in kontrola (ISO/DIS 10961:2018)**

Gas cylinders - Cylinder bundles - Design, manufacture, testing and inspection (ISO/DIS 10961:2018)

Gasflaschen - Flaschenbündel - Auslegung, Herstellung, Prüfung und Inspektion (ISO/DIS 10961:2018)

Bouteilles à gaz - Cadres de bouteilles - Conception, fabrication, essais et inspection (ISO/DIS 10961:2018)

**Ta slovenski standard je istoveten z: prEN ISO 10961**

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23.020.35

Plinske jeklenke

Gas cylinders

**oSIST prEN ISO 10961:2019**

**en,fr,de**



# DRAFT INTERNATIONAL STANDARD

## ISO/DIS 10961

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

*Bouteilles à gaz — Cadres de bouteilles — Conception, fabrication, essais et inspection*

ICS: 23.020.35

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## ISO/DIS 10961:2018(E)

## 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 Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements of gas cylinders*.

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>.

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 document was editorially updated.

## 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 or tubes, 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 or tubes connected to a manifold by cylinder valves or fittings so that the cylinders or tubes 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.

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*.<sup>[1]</sup>

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# 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 or tubes not exceeding a water capacity of 450 l containing compressed gas, liquefied gas and mixtures thereof. 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.

Unless otherwise stated, individual cylinders or tubes not exceeding a water capacity of 450 l within a cylinder bundle will have to conform to applicable standards for single cylinders or tubes not exceeding a water capacity of 450 l. This document specifies the additional requirements that apply when individual cylinders or tubes not exceeding a water capacity of 450 l are assembled into a bundle.

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

This document does not apply to packages in which cylinders or tubes not exceeding a water capacity of 450 l 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.

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 7225, *Gas cylinders — Precautionary labels*

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

ISO 13769, *Gas cylinders — Stamp marking*

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

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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 bundle of cylinders cylinder bundle

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 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 amended — “which are” deleted]

#### 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

pipng 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, amended — 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, amended — battery vehicle/MEGC deleted]

### 3.8 tare

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

Note 1 to entry: Additional information regarding tare for acetylene cylinder bundles is provided in [B.2](#).

### 3.9 maximum gross weight

sum of the tare of the *bundle* ([3.1](#)) and the maximum permissible filling weight

Note 1 to entry: Maximum gross weight is to be understood as "maximum gross mass" as per regional transport regulations.

[SOURCE: ISO 10286:2015, 743, amended — note added]

### 3.10 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]

### 3.11 liquefied gas

gas, which, when packaged for transport, 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, which is a gas with a critical temperature between  $-50\text{ }^{\circ}\text{C}$  and  $+65\text{ }^{\circ}\text{C}$ ; and— low pressure liquefied gas, which is a gas with a critical temperature above  $+65\text{ }^{\circ}\text{C}$ .

[SOURCE: ISO 10286:2015, 706 + 707 + 708]

### 3.12 test pressure

required pressure applied during a pressure test

Note 1 to entry: In some cases, the test pressure of the bundle can be different from the test pressure of the cylinders in the bundle.

[SOURCE: ISO 10286:2015, 729, amended — note added]

### 3.13 burst pressure

highest pressure reached in a cylinder during a burst test

Note 1 to entry: The burst pressure also applies to approved hoses and manifolds.

[SOURCE: ISO 10286:2015, 732, amended — note added]

### 3.14 working pressure

<compressed gas> settled pressure of a compressed gas at a uniform reference temperature of  $15\text{ }^{\circ}\text{C}$  in a full cylinder bundle

Note 1 to entry: In North America service pressure is often used to indicate a similar condition, usually at  $21,1\text{ }^{\circ}\text{C}$  ( $70\text{ }^{\circ}\text{F}$ ).

Note 2 to entry: In East Asia service pressure is often used to indicate a similar condition, usually at  $35\text{ }^{\circ}\text{C}$ .

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[SOURCE: ISO 10286:2015, 736, amended — “in a full gas cylinder” substituted with “in a full cylinder bundle”]

**3.15****maximum filling weight**

product of the minimum guaranteed water capacity of the pressure receptacle and the filling ratio of the gas contained

Note 1 to entry: For liquefied gas.

[SOURCE: ISO 10286:2015, 740]

**3.16****toxic gas**

gas which is known to be so toxic or corrosive to humans to pose a health hazard or which is presumed to be toxic or corrosive to humans because it has a LC<sub>50</sub> value for acute toxicity equal to or less than 5 000 ml/m<sup>3</sup> (ppm)

Note 1 to entry: Other risks such as tissue corrosiveness are sometimes associated.

[SOURCE: ISO 10286:2015, 716]

**3.17****filling pressure**

pressure to which a cylinder bundle is filled at the time of filling

Note 1 to entry: It varies according to the gas temperature in the cylinder, which is dependent on the charging parameters and the ambient conditions. It is normally higher than the working pressure (because of the heat of compression) and always less than the test pressure.

[SOURCE: ISO 10286:2015, 734, amended — “cylinder” substituted with “cylinder bundle”]

**3.18****bundle manufacturer**

entity that assembles the various components of the bundle into its final configuration

**3.19****inspection body**

independent inspection and testing body approved by the competent authority

[SOURCE: ISO 10286:2015, 621]

**3.20****competent authority**

any body or authority designated or otherwise recognized as such for any purpose in each country by its government

Note 1 to entry: “Competent body” is not to be used; UN *Model Regulations* only use “competent authority” and “inspection body.”

[SOURCE: ISO 10286:2015, 620]

**3.21****saturation gas**

<acetylene> amount of acetylene needed to saturate the solvent at atmospheric pressure and a temperature of 15 °C