



SLOVENSKI STANDARD
oSIST prEN ISO 10298:2020
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Plinske jeklenke - Plini in zmesi plinov - Določevanje strupenosti za izbiro izhodnega priključka ventila na jeklenki (ISO 10298:2018)

Gas cylinders - Gases and gas mixtures - Determination of toxicity for the selection of cylinder valve outlets (ISO 10298:2018)

Gasflaschen - Gase und Gasgemische - Bestimmung der Toxizität zur Auswahl von Ventilausgängen (ISO 10298:2018)

Bouteilles à gaz - Gaz et mélanges de gaz - Détermination de la toxicité pour le choix des raccords de sortie de robinets (ISO 10298:2018)

Ta slovenski standard je istoveten z: prEN ISO 10298

[SIST EN ISO 10298:2020](#)

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ICS:

23.020.35 Plinske jeklenke Gas cylinders

oSIST prEN ISO 10298:2020 **en,fr,de**

INTERNATIONAL
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Third edition
2018-02

Gas cylinders — Gases and gas mixtures — Determination of toxicity for the selection of cylinder valve outlets

Bouteilles à gaz — Gaz et mélanges de gaz — Détermination de la toxicité pour le choix des raccords de sortie de robinets

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ISO 10298:2018(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).

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.

This document was prepared by ISO/TC 58 *Gas cylinders*, SC 2, *Cylinder fittings*.

This third edition cancels and replaces the second edition (ISO 10298:2010), which has been technically revised.

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

- The Scope and Clause 4 have been clarified.
- The terms and definitions in Clause 3 have been changed and, in particular, the reference to FTSC codes (that were in ISO 5145) was changed to ISO 14456.
- Some LC50 values have been updated.

Introduction

ISO 5145 specifies the dimensions of different valve outlets for different compatible gas groups. These compatible gas groups are determined according to practical criteria defined in ISO 14456.

These criteria are based on certain physical, chemical, toxic and corrosive properties of the gases. In particular, the tissue corrosiveness is considered in this document.

The aim of this document is to assign for each gas a classification category that takes into account the toxicity by inhalation of the gas. For gas mixtures containing toxic components a calculation based on the method specified in the GHS is proposed.

Since the publication of the first edition of ISO 10298, this International Standard has been used for other purposes than the selection of cylinder valve outlets, e.g. providing toxicity data for the classification of gas and gas mixtures according to the international transport regulations and according to the classification of dangerous substances regulations, which since 2003 is under the umbrella of the Globally Harmonized System (GHS).

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Gas cylinders — Gases and gas mixtures — Determination of toxicity for the selection of cylinder valve outlets

1 Scope

This document lists the best available acute-toxicity data of gases taken from a search of the current literature to allow the classification of gases and gas mixtures for toxicity by inhalation.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online Browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

lethal concentration 50

LC₅₀

concentration of a substance in air exposure to which, for a specified length of time, it is expected to cause the death of 50 % of the entire defined experimental animal population after a defined time period

Note 1 to entry: See [Annex A](#) for the selection of this LC₅₀ value.

3.2

toxicity level

level of toxicity of gases and gas mixtures

Note 1 to entry: In ISO 14456, the toxicity level is divided into three groups:

- Subdivision 1: non toxic [$LC_{50} > 5\,000$ ppm (volume fraction)]
- Subdivision 2: toxic [200 ppm (volume fraction) $< LC_{50} \leq 5\,000$ ppm (volume fraction)]
- Subdivision 3: very toxic [$LC_{50} \leq 200$ ppm (volume fraction)]

These subdivisions are sometimes used in transport regulations.

where

LC₅₀ values correspond to 1 h exposure to gas;

ppm (volume fraction) indicates parts per million, by volume.

Note 2 to entry: In the GHS, the inhalation toxicity levels are:

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Category 1: Fatal if inhaled	0 ppm < LC ₅₀ ≤ 100 ppm (volume fraction)
Category 2: Fatal if inhaled	100 ppm (volume fraction) < LC ₅₀ ≤ 500 ppm (volume fraction)
Category 3: Toxic if inhaled	500 ppm (volume fraction) < LC ₅₀ ≤ 2 500 ppm (volume fraction)
Category 4: Harmful if inhaled	2 500 ppm (volume fraction) < LC ₅₀ ≤ 20 000 ppm (volume fraction)

Note 3 to entry: In GHS, the LC₅₀ values correspond to 4 hours exposure. Consequently, the LC₅₀ values given in [Annex B](#) (see [4.2.2](#)) need to be divided by 2 (i.e. $\sqrt{4/1}$). The reasoning behind the division by 2 is given in [A.2](#).

3.3 lethal dose 50

LD₅₀

amount of a material, given all at once, which causes the death of 50 % of a group of test animals

3.4 lethal concentration low value

LC_{LO}

lowest concentration of a substance in air, other than the LC₅₀, which was reported in the original reference paper as having caused death in humans or animals

4 Determination of toxicity

4.1 General

Toxicity may be determined through a test method ([4.2](#)) for gas mixtures where the data for the components exist, or through a calculation method ([4.3](#)).

For reasons of animal welfare, inhalation toxicity tests geared only for the classification of gas mixtures should be avoided if the toxicity of each of the components is available. In this case, toxicity is determined in accordance with [4.3](#).

4.2 Test method

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4.2.1 Test procedure

When new toxicity data are being considered for inclusion in this document, an internationally recognized test method such as OECD TG 403([43](#)) should be used.

NOTE For this document, LC₅₀ is equivalent to 1 h exposure to albino rats.

4.2.2 Results for pure gases

The toxicity of pure gases is listed in [Annex B](#), in which LC₅₀ values correspond to 1 h exposure. Some of these values have been estimated in accordance with [Annex A](#).

4.3 Calculation method

The LC₅₀ value of a gas mixture is calculated using [Formula 1](#):

$$LC_{50i} = \frac{1}{\sum_i \frac{C_i}{LC_{50i}}} \quad (1)$$

where

C_i is the mole fraction of the i th toxic component present in the gas mixture;

LC_{50i} is the lethal concentration of the i th toxic component [LC₅₀ < 5 000 ppm (by volume)].