



# SLOVENSKI STANDARD

## oSIST prEN 936:2021

01-april-2021

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### **Kemikalije, ki se uporabljajo za pripravo pitne vode - Ogljikov dioksid**

Chemicals used for treatment of water intended for human consumption - Carbon dioxide

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Kohlenstoffdioxid

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Dioxyde de carbone

**Ta slovenski standard je istoveten z: prEN 936**

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#### **ICS:**

13.060.20	Pitna voda	Drinking water
71.100.80	Kemikalije za čiščenje vode	Chemicals for purification of water

**oSIST prEN 936:2021**

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## Chemicals used for treatment of water intended for human consumption - Carbon dioxide

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Dioxyde de carbone

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Kohlenstoffdioxid

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 164.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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**prEN 936:2021 (E)****European foreword**

This document (prEN 936:2021) has been prepared by Technical Committee CEN/TC 164 “Water Supply”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 936:2013.

In comparison with the previous edition, the following technical modifications have been made:

- possible impurities are taken into account and partly changed in Table 2;
- update of the references quoted in the Bibliography;
- modification of 7.3 on transportation regulations and labelling, adding the sentence “The user shall be aware of the incompatibilities between transported products.”;
- modification of 7.4 on marking. The requirements of marking are also applied to the accompanying documents, and the regulation [6] is now quoted.

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## Introduction

In respect to the potential adverse effects on the quality of water intended for human consumption caused by the product covered by this document:

- a) this document provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;
- b) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

**NOTE** Conformity with this document does not confer or imply acceptance or approval of the product in any of the Member States of the EU or EFTA. The use of the product covered by this document is subject to regulation or control by National Authorities.

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**prEN 936:2021 (E)****1 Scope**

This document is applicable to carbon dioxide used for treatment of water intended for human consumption. It describes the characteristics of carbon dioxide and specifies the requirements and corresponding analytical methods for carbon dioxide. It also gives information on its use in water treatment.

**2 Normative references**

There are no normative references in this document.

**3 Terms and definitions**

No terms and definitions are listed in this document.

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

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

**4 Description****4.1 Identification****4.1.1 Chemical name**

Carbon dioxide.

**4.1.2 Synonym or common name**

Carbonic acid gas (carbonic anhydride).

**4.1.3 Relative molecular mass**

44,011.

**4.1.4 Empirical formula**

CO<sub>2</sub>.

**4.1.5 Chemical formula**

CO<sub>2</sub>.

**4.1.6 CAS Registry Number <sup>1)</sup>**

124-38-9.

**4.1.7 EINECS reference <sup>2)</sup>**

204-696-9.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.



## 4.2 Commercial form

The carbon dioxide is supplied as a pressurized liquefied or refrigerated pressurized gas.

NOTE The solid form is not usually used for the treatment of water intended for human consumption.

## 4.3 Physical properties

### 4.3.1 Appearance

The carbon dioxide is a colourless gas or liquid.

### 4.3.2 Density

The density of the gas at 0 °C and 101,3 kPa<sup>3)</sup> is 1,976 8 kg/m<sup>3</sup>, while the density of the liquid at 0 °C and 4 000 kPa is 933,318 kg/m<sup>3</sup>.

### 4.3.3 Solubility in water

The solubility of the gas in water is 1,72 g/l at 20 °C and 101,3 kPa.

### 4.3.4 Vapour pressure

The vapour pressure of the liquid is 5 733,0 kPa at 20 °C.

### 4.3.5 Boiling point at 100 kPa

See 4.3.6.

### 4.3.6 Melting point

The sublimation point of solid CO<sub>2</sub> is -78,9 °C and 101,3 kPa.

### 4.3.7 Specific heat

The specific heat of carbon dioxide is 0,827 kJ/kg x K at 0 °C and 100 kPa.

### 4.3.8 Viscosity (dynamic)

The viscosity of the liquid is  $147 \times 10^{-7}$  Pa x s at 20 °C.

### 4.3.9 Critical temperature

The critical temperature of the liquid is 31 °C.

### 4.3.10 Critical pressure

The critical pressure of the carbon dioxide is 7 383 kPa.

### 4.3.11 Physical hardness

Not applicable.

## 4.4 Chemical properties

The carbon dioxide CO<sub>2</sub> forms a weak acid when dissolved in water. It reacts in aqueous solution with alkali hydroxides to form carbonates and bicarbonates.

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3) 100 kPa = 1 bar.

## 5 Purity criteria

### 5.1 General

This document specifies the minimum purity requirements for carbon dioxide used for the treatment of water intended for human consumption. Limits are given for impurities commonly present in the product. Depending on the raw material and the manufacturing process, other impurities may be present and if so, the user and when necessary to relevant authorities, shall be notified.

Users of this product should check the national regulations in order to clarify whether it is of appropriate purity for treatment of water intended for human consumption, taking into account raw water quality, required dosage, contents of other impurities and additives used in the product not stated in the product standard.

Limits have been given for impurities and chemical parameters where these are likely to be present in significant quantities from the current production process and raw materials. If the production process or raw materials lead to significant quantities of further impurities or by-products being present, this shall be notified to the user.

### 5.2 Composition of commercial product

The products shall conform to the requirements specified in Table 1.

**Table 1 — Composition of commercial product**

Carbon dioxide, CO <sub>2</sub>	volume fraction ≥ 99,9 %
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NOTE The minimum requirements of the commercial product are defined in the EU Regulation 231/2012 of 9 March 2012 (see [5]).

### 5.3 By-products

The product tested in evaporated liquid phase shall conform to the requirements specified in Table 2 (see [3]).