



# SLOVENSKI STANDARD

## SIST EN 1019:1999

01-april-1999

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### Kemikalije, ki se uporabljajo za pripravo pitne vode – Žveplov dioksid

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Schwefeldioxid

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

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#### **ICS:**

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

**SIST EN 1019:1999**

**en**

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EUROPEAN STANDARD

EN 1019

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 1995

ICS 13.060.30

Descriptors: potable water, water treatment, chemical compounds, sulphur dioxide, description, physical properties, chemical properties, impurities, toxic substances, tests, labelling, storage

English version

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

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Produits chimiques utilisés pour le traitement  
de l'eau destinée à la consommation humaine  
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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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# CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 164 "Water supply" of which the secretariat is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 1996, and conflicting national standards shall be withdrawn at the latest by April 1996.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 0 Introduction

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

- 1) this standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA ;
- 2) 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.

## 1 Scope

This European standard specifies requirements and the corresponding test methods for sulfur dioxide used for treatment of water intended for human consumption.

## 2 Normative references

This present European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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ISO 760	Determination of water - Karl Fischer method (General method)
ISO 3165	Sampling of chemical products for industrial use - Safety in sampling
ISO 3696	Water for analytical laboratory use -Specification and test methods

## 3 Description

### 3.1 Identification

3.1.1 Chemical name	sulfur dioxide
3.1.2 Synonym or common names	sulfurous acid anhydride
3.1.3 Relative molecular mass	64
3.1.4 Empirical formula	SO <sub>2</sub>

3.1.5 Chemical formula	SO <sub>2</sub>
3.1.6 CAS Registry Number <sup>1)</sup>	7446-09-5
3.1.7 EINECS reference <sup>2)</sup>	231-195-2

### 3.2 Commercial forms

The product is supplied as a liquefied gas

### 3.3 Physical properties

#### 3.3.1 Appearance

At ambient temperature and normal pressure, sulfur dioxide is a colourless gas with a pungent characteristic odour.

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#### 3.3.2 Density

Liquid density : 1,4 g/cm<sup>3</sup> at 10 °C.

Vapour density : 2,7 g/l at 0 °C.

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3.3.3 Solubility in water	110 g/l at 20 °C
3.3.4 Vapour pressure	320 kPa at 20 °C
3.3.5 Boiling point at 100 kPa <sup>3)</sup>	- 9,4 °C
3.3.6 Melting point	- 75,5 °C
3.3.7 Specific heat	liquid : 1,337 J/(g·K) at 0 °C

1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

**3.3.8 Viscosity (dynamic)**Gas :  $11,40 \times 10^{-3}$  mPa·s at 20 °C.

Liquid : 0,76 mPa·s at - 50 °C.

**3.3.9 Critical temperature** 157,5 °C**3.3.10 Critical pressure** 7 780 kPa**3.3.11 Physical hardness** not applicable**3.4 Chemical properties**

Sulfur dioxide is an acidic gas and a reducing agent. The pH value of an aqueous solution is about 1,5. Sulfur dioxide reacts violently with oxidizing agents, e.g. peroxides, permanganates.

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**4 Purity criteria**

Limits have been given for impurities and toxic substances where these are likely to be present in significant quantities from the current production process and raw materials. If a change in the production process or raw materials leads to significant quantities of other impurities or by products being present, this shall be notified to the user.

**4.1 Composition of commercial product**

The liquid product shall contain not less than 99,9 percent by mass (% (*m/m*)) of sulfur dioxide.

**4.2 Impurities and main by-products**

The product shall conform to the requirements specified in table 1.

**Table 1 : Impurities**

Impurity		Limit in % ( <i>m/m</i> )
Water (H <sub>2</sub> O)	max.	0,01
Sulfuric acid (H <sub>2</sub> SO <sub>4</sub> )	max.	0,005



### 4.3 Toxic substances

NOTE 1 : For the purpose of this standard, "toxic substances" are those defined in the EEC Directive 80/778/EEC of July 15, 1980.

NOTE 2 : The inorganic toxic substances (in accordance with EEC Directive 80/778) are not found in liquid sulfur dioxide. Pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process.

## 5 Test methods

### 5.1 Sampling

Sampling shall be carried out by an expert ; handling of liquid sulfur dioxide is very dangerous and could lead to serious emissions.

Observe the recommendations of ISO 3165.

### 5.2 Analyses

Unless otherwise stated, the reagents shall be of a recognized analytical grade and the water used shall comply with grade three of ISO 3696.

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#### 5.2.1 Determination of water content

Principle : Determination by Karl Fischer method in accordance with ISO 760.

#### 5.2.2 Determination of sulfuric acid content

##### 5.2.2.1 Principle

A measured volume of the laboratory sample is evaporated in a stream of dry nitrogen and the residual sulfuric acid titrated with standard alkali solution.

NOTE : The method will determine sulfuric acid originally present in the sample but will exclude any which might be formed by reaction of water with any sulfur trioxide present.

**WARNING** : Liquid sulfur dioxide boils at - 10 °C giving off an irritating toxic gas. Since the liquid is contained in vulnerable glass apparatus great care is necessary in handling. Goggles and rubber gloves should be worn and the test should be carried out in a fume cupboard.

##### 5.2.2.2 Reagents

5.2.2.2.1 Sodium hydroxide solution,  $c(\text{NaOH}) = 0,1 \text{ mol/l}$ .