



**SLOVENSKI STANDARD**  
**SIST EN 12120:2000**  
**01-november-2000**

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**Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev hidrogen sulfit**

Chemicals used for treatment of water intended for human consumption - Sodium hydrogen sulfite

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhydrogensulfit

Produits chimiques utilisés pour le traitement de l'eau destinée a la consommation humaine - Hydrogénosulfite de sodium

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**ICS:**

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

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EUROPEAN STANDARD

EN 12120

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Descriptors: potable water, water treatment, chemical compounds, sodium bisulfite, description, physical properties, chemical properties, impurities, toxic substances, tests, marking, transportation, storage, labelling

English version

## Chemicals used for treatment of water intended for human consumption - Sodium hydrogen sulfite

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhydrogensulfit

This European Standard was approved by CEN on 5 September 1998.

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This European Standard exists 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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COMITÉ EUROPÉEN DE NORMALISATION  
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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 164 "Water supply", the secretariat of which 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of an identical text or by endorsement, at the latest by March 1999, and conflicting national standards shall be withdrawn at the latest by March 1999.

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

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## 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 is applicable to sodium hydrogen sulfite used for treatment of water intended for human consumption. It describes the characteristics of sodium hydrogen sulfite and specifies the requirements and the corresponding test methods for sodium hydrogen sulfite. It gives information on its use in water treatment.

## 2 Normative references

This 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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EN ISO 3696	Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)
ISO 418	Photography - Processing chemicals - Specifications for anhydrous sodium sulfite
ISO 3165	Sampling of chemical products for industrial use - Safety in sampling
ISO 5993	Sodium hydroxide for industrial use - Determination of mercury content - Flameless atomic absorption spectrometric method
ISO 6206	Chemical products for industrial use - Sampling - Vocabulary.
ISO 6353-1	Reagents for chemical analysis - Part 1 : General test methods
ISO 9280	Water quality - Determination of sulfate - Gravimetric method using barium chloride
ISO 9297	Water quality - Determination of chloride - Silver nitrate titration with chromate indicator (Mohr's method)

### 3 Description

#### 3.1 Identification

##### 3.1.1 Chemical name

Sodium hydrogen sulfite.

##### 3.1.2 Synonym or common name

Sodium bisulfite.

##### 3.1.3 Relative molecular mass

104,06.

##### 3.1.4 Empirical formula

NaHSO<sub>3</sub>.

##### 3.1.5 Chemical formula

NaHSO<sub>3</sub>.

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##### 3.1.6 CAS-Registry Number <sup>1)</sup>

7631-90-5.

##### 3.1.7 EINECS reference <sup>2)</sup>

231-548-4.

#### 3.2 Commercial form

Aqueous solution, usual concentration: approximately 40 % (m/m) NaHSO<sub>3</sub> corresponding to 520 g NaHSO<sub>3</sub> per litre.

<sup>1)</sup> Chemical Abstracts Service Registry Number.

<sup>2)</sup> European Inventory of Existing Commercial Chemical Substances.

### 3.3 Physical properties

#### 3.3.1 Appearance and odour

The product is a yellowish liquid with a slight odour of sulfur dioxide

#### 3.3.2 Density

The density of the product is 1,3 g/ml to 1,5 g/ml at 20°C.

#### 3.3.3 Solubility

The product is miscible with water.

#### 3.3.4 Vapour pressure

The vapour pressure of a 40% (*m/m*) solution of NaHSO<sub>3</sub> is 4 kPa<sup>3)</sup> at 20 °C.

#### 3.3.5 Boiling point at 100 kPa<sup>3)</sup>

The product decomposes at 100 °C.

#### 3.3.6 Crystallisation point

A 40% (*m/m*) solution of NaHSO<sub>3</sub> crystallizes at 2 °C.

#### 3.3.7 Specific heat

The specific heat of the product is 3,15 kJ/kg.K

#### 3.3.8 Viscosity, dynamic

The viscosity of a solution containing 40% (*m/m*) of NaHSO<sub>3</sub> is 4 mPa.s at 25 °C.

#### 3.3.9 Critical temperature

Not applicable.

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<sup>3)</sup> 100 kPa = 1 bar.



### 3.3.10 Critical pressure

Not applicable.

### 3.3.11 Physical hardness

Not applicable.

## 3.4 Chemical properties

The solution is weakly acid. The pH value of a commercial solution of 40 % (m/m) is between 4,5 and 5,0.

NaHSO<sub>3</sub> exists in solution only ; if the solution is evaporated the salt which is formed is sodium disulfite.

At elevated temperatures (> 100 °C) sulfur dioxide is generated.

Sodium hydrogen sulfite reacts violently with oxidizing agents ; e.g. with sodium hypochlorite or hydrogen peroxide.

## 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 commercial product has a mass concentration of NaHSO<sub>3</sub> of approximately 520 g/l, which relates to a content of 40 % (m/m) NaHSO<sub>3</sub>, corresponding to 25 % (m/m) SO<sub>2</sub>.

The product shall contain the stated content of NaHSO<sub>3</sub> within ± 5 % (m/m)

### 4.2 Impurities and main by-products

The sum of the content of sodium sulfate and sodium chloride shall not exceed 5% (m/m) of the commercial product, i.e. solution of 40 % (m/m) NaHSO<sub>3</sub>.

### 4.3 Toxic substances

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

The content of toxic substances shall conform to the requirements specified in table 1.

**Table 1 : Toxic substances**

Parameter		Limit mg/kg of commercial product 40 % (m/m) NaHSO <sub>3</sub>
Antimony (Sb)	max.	1
Arsenic (As)	max.	1
Cadmium (Cd)	max.	1
Chromium (Cr)	max.	1
Lead (Pb)	max.	5
Mercury (Hg)	max.	1
Nickel (Ni)	max.	1
Selenium (Se)	max.	1
NOTE : Pesticides and polycyclic aromatic hydrocarbons and cyanides -as listed in EU Directive 80/778/EEC are not relevant in sodium hydrogen sulfite because the raw materials used in the manufacturing are free of them		

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## 5 Test methods

### 5.1 Sampling

Observe the general recommendations of ISO 3165 and take account of ISO 6206.

#### 5.1.1 Sampling from drums and bottles

##### 5.1.1.1 General

**5.1.1.1.1** Mix the contents of the container to be sampled by shaking the container, by rolling it or by rocking it from side to side, taking care not to damage the container or spill any of the liquid.

**5.1.1.1.2** If the design of the container is such (for example, a narrow-necked bottle) that it is impracticable to use a sampling implement, take a sample by pouring after the contents have been thoroughly mixed. Otherwise, proceed as described in 5.1.1.1.3.

**5.1.1.1.3** Examine the surface of the liquid. If there are signs of surface contamination, take samples from the surface as described in 5.1.1.2 ; otherwise, take samples as described in 5.1.1.3.

#### **5.1.1.2 Surface sampling**

Take a sample using a suitable ladle. Lower the ladle into the liquid until the rim is just below the surface, so that the surface layer runs into it. Withdraw the ladle just before it fills completely and allow any liquid adhering to the ladle to drain off. If necessary, repeat this operation so that, when the other selected containers have been sampled in a similar manner, the total volume of sample required for subsequent analysis is obtained.

#### **5.1.1.3 Bottom sampling**

Take a sample using an open sampling tube, or a bottom-valve sampling tube, suited to the size of container and the viscosity of the liquid.

When using an open sampling tube, close it at the top and then lower the bottom end to the bottom of the container. Open the tube and move it rapidly so that the bottom of the tube traverses the bottom of the container before the tube is filled. Close the tube, withdraw it from the container and allow any liquid adhering to the outside of the tube to drain off.

When using a bottom-valve sampling tube, close the valve before lowering the tube into the container and then proceed in a similar manner to that when using an open sampling tube.

#### **5.1.2 Sampling from tanks and tankers**

From each access point, take samples as follows :

- a) from the surface of the liquid, using a ladle as described in 5.1.1.2 ;
- b) from the bottom of the tank or tanker, using a sampling tube as described in 5.1.1.3 or using a specially designed bottom-sampling apparatus ;
- c) from one or more positions, depending on the overall depth, between the bottom and the surface using a weighted sampling can.

#### **5.2 Analyses**

All reagents shall be of a recognized analytical grade and the water used shall conform to the appropriate grade specified in EN ISO 3696.