



SLOVENSKI STANDARD

SIST EN 12121:2005

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Nadomešča:
SIST EN 12121:2000

Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev disulfit

Chemicals used for treatment of water intended for human consumption - Sodium disulfite

Produkt zue Aufbereitung von Wasser den menschlichen Gebrauch - Natriumdisulfit

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

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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 12121

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2005

ICS 71.100.80

Supersedes EN 12121:1998

English version

Chemicals used for treatment of water intended for human consumption - Sodium disulfite

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

Produkt zur Aufbereitung von Wasser den menschlichen Gebrauch - Natriumdisulfit

This European Standard was approved by CEN on 12 May 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. 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.

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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CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This European Standard (EN 12121:2005) 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 December 2005, and conflicting national standards shall be withdrawn at the latest by December 2005.

This document supersedes EN 12121:1998.

Significant technical differences between this edition and EN 12121:1998 are as follows:

- deletion of this reference to EU Directive 80/778/EEC of July, 15 1980 in order to take into account the latest Directive in force (see [1]).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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 European Standard :

- a) this European 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;
- 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 European Standard 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 European Standard is subject to regulation or control by National Authorities.

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1 Scope

This European Standard is applicable to sodium disulfite used for treatment of water intended for human consumption. It describes the characteristics of sodium disulfite and specifies the requirements and the corresponding test methods for sodium disulfite. It gives information on its use in water treatment. It also determines the rules relating to safe handling and use (see Annex B).

2 Normative references

The following referenced documents are indispensable for the application 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.

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*

ISO 3165, *Sampling of chemical products for industrial use - Safety in sampling*

ISO 3629, *Photography-Processing chemicals- Specifications for potassium metabisulfite*

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 8213, *Chemical products for industrial use - Sampling techniques - Solid chemical products in the form of particles varying from powders to coarse lumps*

ISO 9297, *Water quality- Determination of chloride- Silver nitrate titration with chromate indicator (Mohr's method)*

ISO 22743 (in preparation) *Water quality -- Determination of sulfates by continuous flow analysis (CFA)*

3 Description

3.1 Identification

3.1.1 Chemical name

Sodium disulfite.

3.1.2 Synonym or common names

Sodium metabisulfite, sodium pyrosulfite.

3.1.3 Relative molecular mass

190,10.

3.1.4 Empirical formula

$\text{Na}_2\text{S}_2\text{O}_5$.

EN 12121:2005 (E)**3.1.5 Chemical formula**

$\text{Na}_2\text{S}_2\text{O}_5$.

3.1.6 CAS-Registry Number¹⁾

7681-57-4.

3.1.7 EINECS reference²⁾

231-673-0.

3.2 Commercial form

The product is a crystalline powder.

3.3 Physical properties**3.3.1 Appearance and odour**

The product is a white, free-flowing fine crystalline powder with a slight odour of sulfur dioxide.

3.3.2 Density

The density of the product is 2,7 g/cm³ at 20 °C.

The bulk density is approximately 1,3 g/cm³ at 20 °C.

3.3.3 Solubility (in water)

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The solubility of the product in water is 540 g/l at 20 °C.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa³⁾

Not applicable.

3.3.6 Crystallisation point

The product decomposes above 150 °C.

3.3.7 Specific heat

Not known.

¹⁾ Chemical Abstracts Service Registry Number.

²⁾ European Inventory of Existing Commercial Chemical Substances.

³⁾ 100 kPa = 1 bar.

3.3.8 Viscosity dynamic

Not applicable.

3.3.9 Critical temperature

Not applicable.

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 saturated aqueous solution of sodium disulfite is between 4,5 and 5,0.

Sodium disulfite dissolves in water forming sodium hydrogen sulfite.

At elevated temperatures (> 150 °C) or on contact with acids sulfur dioxide is generated.

Sodium disulfite reacts violently with oxidizing agents : e.g. with sodium hypochlorite or hydrogen peroxide.

4 Purity criteria

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4.1 General

This European Standard specifies the minimum purity requirements for sodium disulfite 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, this shall be notified to the user and when necessary to relevant authorities.

NOTE 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 products not stated in this 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 leads to significant quantities of impurities, by-products or additives being present, this shall be notified to the user.

4.2 Composition of commercial product

The content of sodium disulfite shall not be less than a mass fraction of 95 % ($\text{Na}_2\text{S}_2\text{O}_5$).

The concentration of sodium disulfite shall be within ± 5 % of the manufacturer's declared value.

4.3 Impurities and main by-products

The sum of the content of sodium sulfate and sodium chloride shall not exceed a mass fraction of 5% of the commercial product.

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4.4 Chemical parameters

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

Table 1 — Chemical parameters

Parameter		Limit
		mg/kg of commercial product
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. Other chemical parameters and indicator parameters are not relevant in sodium disulfite because the raw materials used in the manufacturing process are free of them. For parametric values of sodium disulfite on trace metal content in drinking water, see [1].		

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5 Test methods

5.1 Sampling

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

Prepare the laboratory sample(s) required by the relevant procedure described in ISO 8213.

5.2 Analyses

5.2.1 General

All reagents shall be of a recognized analytical grade and the water used shall conform to grade 3 specified in EN ISO 3696.

5.2.2 Main product

5.2.2.1 General

The sodium disulfite content shall be determined by the method for potassium disulfite described in ISO 3629.

5.2.2.2 Principle

Sodium disulfite is oxidized with a fixed volume of iodine. The excess of added iodine is titrated with sodium thiosulfate. The determination includes other sulfites in addition to $\text{Na}_2\text{S}_2\text{O}_5$, therefore the second titration, as described in ISO 3629, is omitted for the purpose of this determination.

5.2.2.3 Calculation

The equation given in ISO 3629 for potassium disulfite has to be adapted for sodium disulfite.

The sodium disulfite content C_1 , expressed as a mass fraction in %, is given by the following equation:

$$C_1 = 4,76 \left(\frac{(100 \times c_3) - (V \times c_2)}{m} \right) \quad (1)$$

where:

- c_2 is the actual concentration, in moles per litre, of the sodium thiosulfate solution;
- c_3 is the actual concentration, in moles per litre, of the iodine solution;
- V is the volume, in millilitres, of the sodium thiosulfate solution used for the titration;
- m is the mass, in grams, of the test portion used for the titration;
- 4,76 is a conversion factor for the mass of sodium disulfite equivalent to 1 mole of iodine (i.e. 47,6) X the conversion factor for millilitres to litres (i.e. 0,001) X 100 (for percentage);
- 100 is the volume, in millilitres of iodine solution added for total oxidation.

5.2.3 Impurities

5.2.3.1 Sulfate

The sulfate content shall be determined in accordance with ISO 22743

5.2.3.2 Chloride

The chloride content shall be determined in accordance with ISO 9297.