



SLOVENSKI STANDARD
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Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev heksafluorosilikat

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhexafluorsilikat

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

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EUROPEAN STANDARD

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

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

Produkte zur Aufbereitung von Wasser für den
menschlichen Gebrauch - Natriumhexafluorsilikat

This European Standard was approved by CEN on 27 March 2022.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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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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European foreword

This document (EN 12174:2022) 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of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by November 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12174:2013.

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

- a) Modification of 7.3 on transportation regulations and labelling, adding the sentence “The user shall be aware of the incompatibilities between transported products.”;
- b) Modification of 7.4 on marking. The requirements of marking are also applied to the accompanying documents.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 12174:2022 (E)**Introduction**

In respect of 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 (see Annex A).

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SIST EN 12174:2022

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1 Scope

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3696:1995, *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 4281, *Sodium hexafluorosilicate for industrial use — Determination of free acidity and total hexafluorosilicate content — Titrimetric method*

ISO 4793, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation*

ISO 5444, *Sodium fluorosilicate for industrial use — Determination of loss in mass at 105 degrees C*

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*

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 <https://www.electropedia.org/>

4 Description

4.1 Identification

4.1.1 Chemical name

Disodium hexafluorosilicate.

4.1.2 Synonym or commons name

Sodium silicofluoride, sodium hexafluorosilicate.

EN 12174:2022 (E)**4.1.3 Relative molecular mass**

188,055.

4.1.4 Empirical formula

Na₂SiF₆.

4.1.5 Chemical formula

Na₂SiF₆.

4.1.6 CAS-Registry Number ¹

16893-85-9.

4.1.7 EINECS reference ²

240-934-8.

4.2 Commercial form

The product is a crystalline powder.

4.3 Physical properties**4.3.1 Appearance and odour**

The product is a colourless, odourless fine crystalline powder.

4.3.2 Density

The particle density of the crystals is 2,8 g/cm³ at 20 °C.

The bulk density of the product is approximately 1,5 g/cm³ at 20 °C.

4.3.3 Solubility

The solubility of the product in water is 7 g/l at 20 °C.

4.3.4 Vapour pressure

Not applicable.

4.3.5 Boiling point at 100 kPa ³

Not applicable.

4.3.6 Crystallization point

The product melts above 500 °C.

4.3.7 Specific heat

Not known.

¹ Chemical Abstracts Service Registry Number.

² European Inventory of Existing Commercial Chemical Substances.

³ 100 kPa = 1 bar.

4.3.8 Viscosity dynamic

Not applicable.

4.3.9 Critical temperature

Not applicable.

4.3.10 Critical pressure

Not applicable.

4.3.11 Physical hardness

Not applicable.

4.4 Chemical properties

The pH value of a saturated aqueous solution (7 g/l) of sodium hexafluorosilicate is approximately 10.

Sodium hexafluorosilicate reacts with acids to form hydrofluoric acid. For additional information on sodium hexafluorosilicate, see Annex A.

5 Purity criteria

5.1 General

This document specifies the minimum purity requirements for sodium hexafluorosilicate 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.

The national regulations allow users to clarify whether the product is of appropriate purity for the 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 and not stated in this document.

Limits have been given for impurities and chemicals 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 impurities, by-products or additives being present, this shall be notified to the user.

5.2 Composition of commercial product

The content of sodium hexafluorosilicate shall not be less than a mass fraction of 98 % (Na_2SiF_6).

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

5.3 Impurities and main by-products

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

Table 1 — Impurities

Impurity		Limit
		in mass fraction in % of commercial product
Water – insoluble matter	max.	0,5
Moisture	max.	0,3

5.4 Chemical parameters

The product shall conform to the requirements specified in Table 2.

Table 2 — Chemical parameters

Parameter		Limit
		mg/kg of commercial product
Antimony (Sb)	max.	80
Arsenic (As)	max.	400
Cadmium (Cd)	max.	40
Chromium (Cr)	max.	400
Lead (Pb)	max.	400
Mercury (Hg)	max.	10
Nickel (Ni)	max.	400
Selenium (Se)	max.	80
NOTE Other chemical parameters and indicator parameters are not relevant in sodium hexafluorosilicate because the raw materials used in the manufacturing process are free of them. For parametric values of sodium hexafluorosilicate on trace metal content in drinking water, see [1].		

6 Test methods

6.1 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.

NOTE Sodium hexafluorosilicate presents a toxic hazard through inhalation of dust (see B.1).

6.2 Analyses

6.2.1 Main product

The sodium hexafluorosilicate content shall be determined in accordance with ISO 4281.

This document includes the determination of free acid.

6.2.2 Impurities

6.2.2.1 Insoluble matters

6.2.2.1.1 Procedure

Weigh and transfer to a beaker 2 g of the sample, which has previously been dried at 105 °C to constant mass.

Dissolve in 500 ml of hot water. Generally, 15 min to 30 min is sufficient time.

Filter through a tared Gooch crucible or a tared fritted-glass filter of medium porosity (porosity P 16 according to ISO 4793). Wash with at least six separate 25 ml portions of boiling water, allowing the crucible to drain between washings. Dry the crucible or filter at 105 °C to constant mass.

6.2.2.1.2 Expression of results

The content of insoluble matters, W_1 , expressed as mass fraction in % is given by the following formula:

$$C_1 = \frac{m_1 \times 100}{m_2} \quad (1)$$

where

m_1 is the mass, in grams, of the filter residue;

m_2 is the mass, in grams, of the test portion.

6.2.2.2 Moisture content

The content of moisture shall be determined in accordance with ISO 5444.

6.2.3 Chemical parameters

6.2.3.1 General

The content of chemical parameters shall be determined using the procedures specified in Table 3.