



SLOVENSKI STANDARD
oSIST prEN 15028:2020
01-julij-2020

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumchlorat

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Chlorate de sodium (standards.iteh.ai)

Ta slovenski standard je istoveten z: prEN 15028

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumchlorat

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

If this draft becomes a European Standard, 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.

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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

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European foreword

This document (prEN 15028:2020) 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 15028:2012.

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 must 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.

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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 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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1 Scope

This document is applicable to sodium chlorate used for treatment of water intended for human consumption. It describes the characteristics of sodium chlorate and specifies the requirements and the corresponding test methods for sodium chlorate. It gives information on its use in water treatment. It also determines the rules relating to safe handling and use of sodium chlorate (see normative Annex B) and gives the environmental, health and safety precautions within chemical laboratory (see normative Annex C).

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

EN ISO 11885, *Water quality - Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885)*

EN ISO 12846, *Water quality - Determination of mercury - Method using atomic absorption spectrometry (AAS) with and without enrichment (ISO 12846)*

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

ISO 6206, *Chemical products for industrial use - Sampling Vocabulary*

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:

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

4 Description

4.1 Identification

4.1.1 Chemical name

Sodium chlorate

4.1.2 Synonym or common names

None (for the processes related to treatment of drinking water)

NOTE Commercial names of formulations might exist. Purity needs to be checked in case of use for treatment of water.

prEN 15028:2020 (E)**4.1.3 Relative molecular mass**

106,45

4.1.4 Empirical formulaNaClO₃**4.1.5 Chemical formula**NaClO₃**4.1.6 CAS Registry Number ¹⁾**

7775-09-9

4.1.7 EINECS reference ²⁾

231-887-4

4.2 Commercial form

Sodium chlorate is commercially available in crystalline form or as a powder and as an aqueous solution.

4.3 Physical properties**4.3.1 Appearance and odour**

The product is a colourless solid as a powder or the product is a faint blue to colourless solution.

4.3.2 Density

The density of an aqueous solution of sodium chlorate is given in Table 1.

Table 1 — Density of sodium chlorate solution

Concentration of aqueous solution of sodium chlorate solution (Mass fraction in %)	Density (g/ml at 20 °C)
30	1,24
40	1,33
50	1,44

4.3.3 Solubility in water

The solubility of sodium chlorate in water is given in Table 2.

1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

Table 2 — Solubility of sodium chlorate

Temperature (°C)	Solubility (g/l)
10	650
20	700
40	780
60	880

4.3.4 Vapour pressure

Not applicable (thermal decomposition occurs at ≥ 400 °C)

4.3.5 Boiling point at 100 kPa ³⁾

The boiling point of aqueous solutions of sodium chlorate is given in Table 3.

Table 3 — Boiling point at 100 kPa of aqueous solutions of sodium chlorate

Concentration of aqueous solution of sodium chlorate (g NaClO ₃ /kg of saturated solution)	400	450	500	550	600	650	700
Boiling point (°C)	106	107	109	110	111	113	116

4.3.6 Crystallization

The crystallization point of aqueous solutions of sodium chlorate depending on concentration in water is given in Table 4.

Table 4 — Crystallization point of sodium chlorate aqueous solutions

Concentration of aqueous solution of sodium chlorate (mass fraction in %)	Crystallization point (°C)
40	-20
45	0
50	20
55	32
60	55

4.3.7 Melting point

The melting point (of the solid) is 248 °C; and the thermal decomposition is at ≥ 400 °C.

4.3.8 Viscosity (dynamic)

The relative viscosity of aqueous solutions of mass fraction of 40 % of sodium chlorate compared with water at the same temperature between 25 °C and 35 °C is 2,07.

³⁾ 100 kPa = 1 bar.

prEN 15028:2020 (E)**4.3.9 Critical temperature in aqueous solution**

Not applicable.

4.3.10 Critical pressure

Not applicable.

4.3.11 Physical hardness

Not applicable.

4.4 Chemical properties

The sodium chlorate is a strong oxidizing agent.

NOTE 1 When an acidic sodium chlorate solution is treated with a reducing agent (e.g. hydrogen peroxide (EN 902) or oxalic acid), chlorine dioxide can be formed.

NOTE 2 The formation of chlorine dioxide can also be obtained by acidification if the acid applied is capable of acting as a reducing agent in the current environment.

For the purpose of drinking water treatment, one should use acids of quality in accordance with existing standards for the purpose: hydrochloric acid (EN 939); sulfuric acid (EN 899); phosphoric acid (EN 974).

For additional information on sodium chlorate, see Annex A.

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5 Purity criteria**5.1 General**

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This document specifies the minimum purity requirements for sodium chlorate 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 be user and when necessary to relevant authorities.

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 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 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 sodium chlorate is commercially available as solid forms usually with a minimum dry mass fraction of 99 % of NaClO₃.

Commercial solutions if used for water treatment shall be certified to be made-up on the basis of the product with a dry mass fraction of 99 %. No additional substances like colorants shall be added to the basic product or to the solutions.

The content of sodium chlorate in commercially available solutions shall be within 3 % of the manufacturer's declared value.

5.3 Impurities and main by-products

NOTE Sodium chlorate in crystalline form contains normally a maximum mass fraction of 0,1 % of sodium chloride (as NaCl).

5.4 Chemical parameters

The product shall conform to the requirements specified in Table 5.

Table 5 — Chemical parameters

Parameter	Limit in sodium chlorate (mass fraction 100 %) (mg/kg)
Arsenic (As) max.	1
Cadmium (Cd) max.	1
Chromium (Cr) max.	5
Mercury (Hg) max.	1
Nickel (Ni) max.	1
Lead (Pb) max.	1
Antimony (Sb) max.	1
Selenium (Se) max.	1
NOTE Cyanide which does not exist in a strong oxidizing medium such as sodium chlorate is not a relevant chemical parameter. Pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process. For parametric values of sodium chlorate on trace metal content in drinking water, see [1].	

6 Test methods

6.1 Sampling

6.1.1 General

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

6.1.2 Solid

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

6.1.3 Liquid

6.1.3.1 Sampling from drums and bottles

6.1.3.1.1 General

6.1.3.1.1.1 Mix the contents of each 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.