



**SLOVENSKI STANDARD**  
**oSIST prEN 901:2024**  
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**Nadomešča:**  
**SIST EN 901:2013**

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhypochlorit

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

**Ta slovenski standard je istoveten z: prEN 901**

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhypochlorit

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## European foreword

This document (prEN 901:2023) 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 901:2013.

In comparison with the previous edition EN 901:2013, the following technical modifications have been made:

- a) modification of 6.3 on transportation regulations and labelling, adding the sentence “The user shall be aware of the incompatibilities between transported products.”;
- b) modification of 6.4 on marking, adding the note “at least the name and type of the product are clearly marked or displayed at viewing height on the means of delivery”.

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**prEN 901:2023 (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:

- c) this document provides no information regarding whether the product may be used without restriction in any of the Member States of the EU or EFTA;
- d) 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. Use of the product covered by this document is subject to regulation or control by National Authorities.

This product is a biocide and should comply with the relevant legislation in force. In the European Union, at the time of publication, this legislation is Directive 1998/8/EC [1].

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## 1 Scope

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

NOTE While this document is not applicable to sodium hypochlorite generated *in situ* (see bibliographic reference [6]), the limits for impurities and chemical parameters apply.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1233, *Water quality — Determination of chromium — Atomic absorption spectrometric methods*

EN ISO 3696:1995, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

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 8288:1986, *Water quality — Determination of cobalt, nickel, copper, zinc, cadmium and lead — Flame atomic absorption spectrometric methods*

## 3 Description

### 3.1 Identification

#### 3.1.1 Chemical name

Sodium hypochlorite. General information is given in Annex A.

#### 3.1.2 Synonym or common names

Liquid bleach, soda bleach, bleach lye.

#### 3.1.3 Relative molecular mass

74,44.

#### 3.1.4 Empirical formula

NaClO.

#### 3.1.5 Chemical formula

NaClO.

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

7681-52-9.

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

231-668-3.

## 3.2 Commercial form

The product is supplied as an aqueous solution with an available (active) chlorine concentration up to a mass fraction of 18 %.

## 3.3 Physical properties

### 3.3.1 Appearance and odour

The product is a clear yellowish-green solution with a faint chlorinous odour.

### 3.3.2 Density

The density of the product varies between 1,13 g/ml and 1,30 g/ml at 20 °C.

### 3.3.3 Solubility in water

The product is capable of being mixed with water in any proportion.

### 3.3.4 Vapour pressure

Approximately 2,5 kPa at 20 °C.

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

Not applicable.

### 3.3.6 Crystallization and freezing point

At about - 10 °C crystallization of NaOCl·6 H<sub>2</sub>O starts.

Freezing of the concentrated product takes place between - 20 °C and - 30 °C.

### 3.3.7 Specific heat

The specific heat is 3,48 kJ/(kg.K) for a solution with an available active chlorine concentration of mass fraction between 14 % and 15 %.

### 3.3.8 Viscosity (dynamic)

2,6 mPa.s at 20 °C.

### 3.3.9 Critical temperature

Not applicable.

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

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

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

### 3.3.10 Critical pressure

Not applicable.

### 3.3.11 Physical hardness

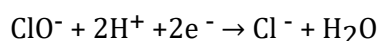
Not applicable.

## 3.4 Chemical properties

The product is an alkaline solution with a pH value greater than 11 at 20 °C.

It reacts with acids and acidic salts to form chlorine.

Vigorous reactions occur with reducing chemicals. It is a strong oxidant ( $E^{\circ}_{\text{Red}}$  for  $(\text{ClO}^-) = 0,89 \text{ V}$ ).



Environmental, health and safety precautions within chemical laboratories are described in Annex F.

## 4 Purity criteria

### 4.1 General

This document specifies the minimum purity requirements for sodium hypochlorite used for treating 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, the user, and when necessary the relevant authorities, shall be notified.

Users of the product should check the national regulations to clarify whether it is of appropriate purity for treating water intended for human consumption, taking into account raw water quality, required dosage, contents of other impurities and additives used in the product that are 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 the raw materials bring about the presence of significant amounts of impurities, by-products or additives, the user shall be notified.

### 4.2 Composition of commercial product

Sodium hypochlorite is available only in solutions with concentrations up to 18 % active chlorine at the time of delivery by the producer. Common concentrated products contain a minimum of 12 % active chlorine. Diluted solutions are also available.

The concentration of sodium hypochlorite shall be equal to or greater than the value specified by the manufacturer.

### 4.3 Impurities and main by-products

The product contains sodium chloride ( $\text{NaCl}$ ) in equimolar amounts at minimum, and a small portion of sodium hydroxide ( $\text{NaOH}$ ) which keeps the product alkaline. Thus, a little amount of sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) can be present, too.

The sodium chlorate ( $\text{NaClO}_3$ ) content shall not exceed a mass fraction of 5,4 % of available chlorine at the time of delivery by the producer. The product shall be visibly free from deposits or suspended matter.

NOTE Sodium chlorate is a by-product of the manufacturing process and can be formed during storage (see 6.5.1).

**prEN 901:2023 (E)****4.4 Chemical parameters**

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

**Table 1 — Chemical parameters**

Parameter		Limit in mg/kg of available chlorine	
		Type 1	Type 2
Arsenic (As)	max.	1	5
Antimony (Sb)	max.	20	25
Cadmium (Cd)	max.	2,5	5
Chromium (Cr)	max.	2,5	5
Lead (Pb)	max.	15	15
Mercury (Hg)	max.	3,5	5
Nickel (Ni)	max.	2,5	10
Selenium (Se)	max.	20	25
		Limit in g/kg of available chlorine	
Sodium bromate <sup>a</sup>	max.	2,5	5,0
<sup>a</sup> Sodium bromate is a by-product of the manufacturing process.			
NOTE Cyanide, which does not exist in a strong oxidising medium such as sodium hypochlorite, is not a relevant chemical parameter. Pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process. For parametric values of sodium hypochlorite on trace metal content in drinking water, see bibliographic reference [1].			

**5 Test methods****5.1 Sampling**

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

**5.2 Analysis****5.2.1 Determination of available chlorine content (main product)****5.2.1.1 General**

This method applies to all commercial products with available chlorine contents within the range of 70 g/l to 170 g/l.

NOTE It detects all oxidising agents being active in weak acidic solutions, i.e. hypochlorite/chlorine, iodate, and partially chloramines, Fe(III), etc. Bromate and chlorate are not covered under these conditions.

**5.2.1.2 Principle**

Sodium hypochlorite reacts with potassium iodide to release iodine in the presence of acetic acid. The iodine is titrated with sodium thiosulfate standard volumetric solution in the presence of starch indicator solution.