



# SLOVENSKI STANDARD

## SIST EN 896:2005

01-september-2005

Nadomešča:  
SIST EN 896:2000

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### Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev hidroksid

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhydroxid

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

Ta slovenski standard je istoveten z: **EN 896:2005**

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#### ICS:

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

**SIST EN 896:2005** en

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 896**

June 2005

ICS 71.100.80

Supersedes EN 896:1998

English version

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumhydroxid

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.

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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## Foreword

This European Standard (EN 896:2005) 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 896:1998.

Significant technical differences between this edition and EN 896:1998 are as follows:

- a) deletion of the reference to EU Directive 80/778/EEC of July, 15 1980 in order to take into account the latest Directive in force (see [1]);
- b) replacement of ISO 5666-1 by EN 1483.

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

## 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 1483:1997, *Water quality – Determination of mercury*

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

ISO 979, *Sodium hydroxide for industrial use - Method of assay*

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

ISO 3196, *Sodium hydroxide for industrial use- Determination of carbonates content- Titrimetric method*

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*

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## 3 Description

### 3.1 Identification

#### 3.1.1 Chemical name

Sodium hydroxide.

#### 3.1.2 Synonym or common name

Caustic soda.

#### 3.1.3 Relative molecular mass

40,0.

#### 3.1.4 Empirical formula

NaOH.

#### 3.1.5 Chemical formula

NaOH.

**EN 896:2005 (E)****3.1.6 CAS Registry Number<sup>1)</sup>**

1310-73-2.

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

215-185-5.

**3.2 Commercial forms**

The product is available as flakes, pearls, solid, or as an aqueous solution of different concentrations.

**3.3 Physical properties****3.3.1 Appearance**

Solid: the product is white, deliquescent.

Liquid: the product is a clear solution, slightly turbid colourless solution, slightly viscous.

**3.3.2 Density**

Solid : the density of this product is 2,1 g/cm<sup>3</sup>.

The bulk density of pearls is 1,2 kg/dm<sup>3</sup>.

Liquid : the density of solution is 1,52 g/ml for a product concentration of mass fraction of 50 % at 20 °C.

**3.3.3 Solubility in water**

The product is highly soluble at all temperatures above 20 °C (partial crystallization occurs above concentration of mass fraction of 55 %, (see Figure 1).

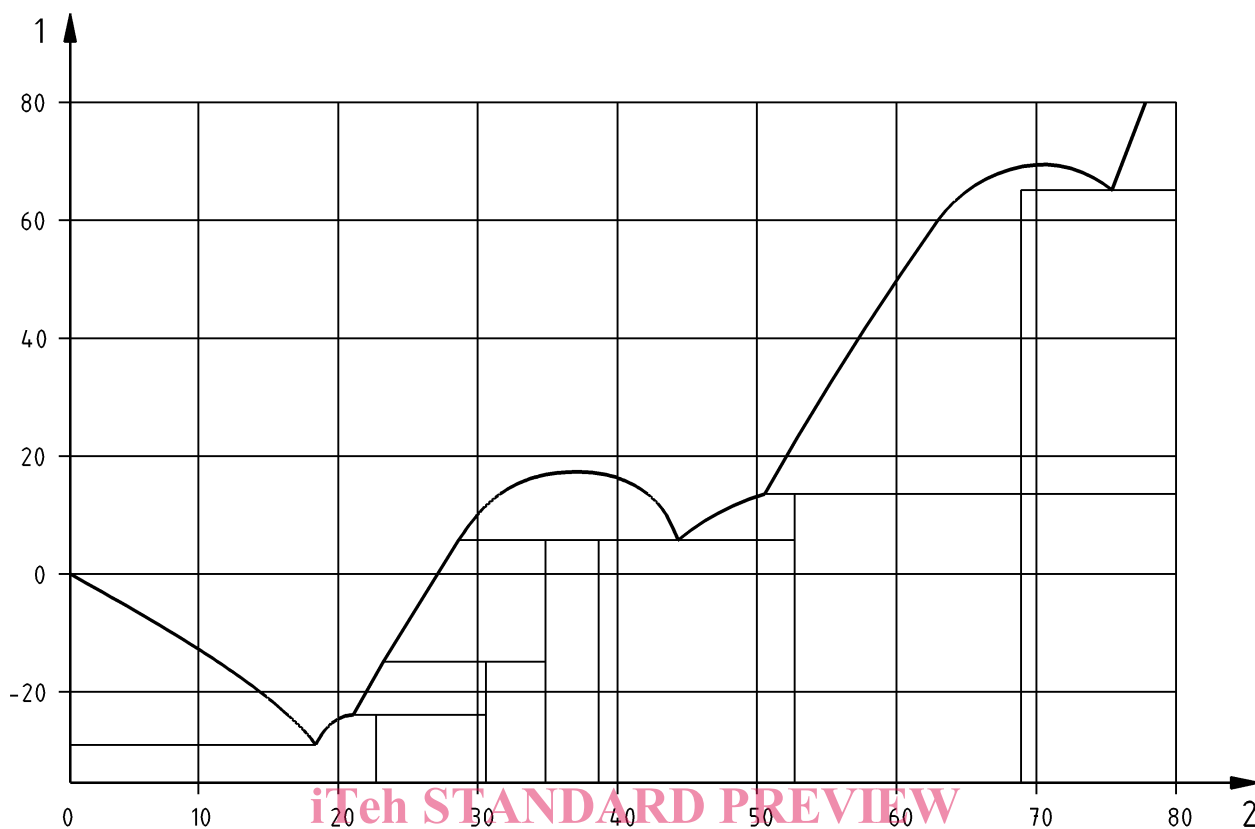
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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.



**Key**

1-Temperature in ° C.

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2-NaOH concentration in mass fraction in %

**Figure 1-Solubility of sodium hydroxide**

**3.3.4 Vapour pressure**

Solution of concentration of mass fraction of 50 %

- 120 Pa at 20 °C;
- 450 Pa at 40 °C;
- 5 000 Pa at 80 °C.

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

145 °C for a solution of concentration of mass fraction of 50 %.

3) 100 kPa = 1 bar.

**EN 896:2005 (E)****3.3.6 Crystallization point**

+ 12 °C for a solution of concentration of mass fraction of 50 % (see Figure 1).

**3.3.7 Specific heat**

3 220 J/(kg K) at 20 °C for a solution of concentration of mass fraction of 50 %.

**3.3.8 Viscosity (dynamic)**

For a solution of concentration of mass fraction of 50 %:

- 100 Pa.s at 20 °C;
- 25 Pa.s at 40 °C;
- 5 Pa.s at 80 °C.

**3.3.9 Critical temperature**

Not applicable.

**3.3.10 Critical pressure**

Not applicable.

**3.3.11 Physical hardness**

Not applicable.

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**3.4 Chemical properties**

The solutions of sodium hydroxide are strongly alkaline.

Dilution of sodium hydroxide is very exothermic.

**4 Purity criteria****4.1 General**

This European Standard specifies the minimum purity requirements for sodium hydroxide 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 product shall contain not less than a mass fraction of 96 % of NaOH for the solid form. Typical concentration for solutions of sodium hydroxide is either a mass fraction of 50 % or 30 % , and shall be in any case within the manufacturer's stated tolerance.

## 4.3 Impurities and main by-products

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

The concentration limits refer to pure NaOH mass fraction of 100 %.

**Table 1 — Impurities**

Impurity		Limit in mass fraction in % of NaOH
Sodium chloride (NaCl) a)	max.	2,4
Sodium carbonate (Na <sub>2</sub> CO <sub>3</sub> ) b)	max.	0,4
Sodium chlorate (NaClO <sub>3</sub> ) c)	max.	0,7
a) Too high concentrations can cause problems with some ion exchange resins. b) Sodium carbonate is formed in contact with atmospheric carbon dioxide. c) The presence of any oxidizing agent in sodium hydroxide is to be avoided.		

## 4.4 Chemical parameters

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