



# SLOVENSKI STANDARD

## SIST EN 897:2013

01-maj-2013

Nadomešča:  
SIST EN 897:2005

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumcarbonat

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

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**Ta slovenski standard je istoveten z: EN 897:2012**

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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  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 897**

November 2012

ICS 71.100.80

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English Version

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumcarbonat

This European Standard was approved by CEN on 16 September 2012.

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.

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

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## Foreword

This document (EN 897:2012) 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 May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

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

This document supersedes EN 897:2005.

Significant technical differences between this edition and EN 897:2005 are as follows:

- a) Modification of 6.2 on labelling, deletion of the reference to EU Directive 80/778/EEC of 15 July 1980 in order to take account of the latest Directive in force.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the 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 carbonate used for treatment of water intended for human consumption. It describes the characteristics and specifies the requirements and the corresponding test methods for sodium carbonate. 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 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 ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

EN ISO 12846:2012, *Water quality — Determination of mercury — Method using atomic absorption spectrometry (AAS) with and without enrichment (ISO 12846:2012)*

ISO 740, *Sodium carbonate for industrial use — Determination of total soluble alkalinity — Titrimetric method*

ISO 746, *Sodium carbonate for industrial use — Determination of matter insoluble in water at 50 degrees C*

ISO 2460, *Sodium hydrogen carbonate for industrial use — Determination of iron content — 1,10-Phenanthroline photometric method*

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

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

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

## 3 Description

### 3.1 Identification

#### 3.1.1 Chemical name

Sodium carbonate.

#### 3.1.2 Synonym or common name

Soda ash, anhydrous sodium carbonate, light soda ash, heavy soda ash.

#### 3.1.3 Relative molecular mass

105,99.

#### 3.1.4 Empirical formula

Na<sub>2</sub>CO<sub>3</sub>.

**EN 897:2012 (E)****3.1.5 Chemical formula**

Na<sub>2</sub>CO<sub>3</sub>.

**3.1.6 CAS Registry Number<sup>1)</sup>**

497-19-8.

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

207-838-8.

**3.2 Commercial forms**

The product is available as dry powder or fine granules and is described as light soda ash or heavy soda ash according to bulk density (see 3.3.2).

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

The product is a white powder or crystals, slightly hygroscopic.

**3.3.2 Density**

The density of this product is 2,53 g/cm<sup>3</sup>. (standards.iteh.ai)

The bulk density is:

ranging from 0,5 kg/dm<sup>3</sup> to 0,65 kg/dm<sup>3</sup> (light soda ash),  
ranging from 0,8 kg/dm<sup>3</sup> to 1,2 kg/dm<sup>3</sup> (heavy soda ash).

**3.3.3 Solubility in water**

The product is soluble at 212 g/l at 20 °C.

**3.3.4 Vapour pressure**

Not applicable.

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

Not applicable.

**3.3.6 Melting point**

851 °C.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.



### 3.3.7 Specific heat

1,043 J/(kg K).

### 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

The hardness of solid sodium carbonate is given as 1 to 2 on the Mohs' scale of hardness.

## 3.4 Chemical properties

Sodium carbonate reacts exothermically with acids with the formation of carbon dioxide.

Sodium carbonate is slightly hygroscopic and dissolution in water is an exothermic reaction.

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## 4 Purity criteria

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### 4.1 General

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This European Standard specifies the minimum purity requirements for sodium carbonate 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 99 % of Na<sub>2</sub>CO<sub>3</sub>.

### 4.3 Impurities and main by-products

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

The concentration limits refer to pure Na<sub>2</sub>CO<sub>3</sub>.

Table 1 — Impurities

Impurity		Limit in mg/kg of Na <sub>2</sub> CO <sub>3</sub>
Iron(II) <sup>1)</sup>	max.	20
Insoluble matters <sup>2)</sup>	max.	200
1) Iron(II) can cause organoleptic problems. 2) Indicate the presence of foreign matter.		

#### 4.4 Chemical parameters

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

Table 2 — Chemical parameters

Parameter		Limit in mg/kg of Na <sub>2</sub> CO <sub>3</sub>
Arsenic (As)	max.	2
Cadmium (Cd)	max.	2
Chromium (Cr)	max.	2
Mercury (Hg)	max.	0,1
Nickel (Ni)	max.	2
Lead (Pb)	max.	2
NOTE Antimony, selenium, cyanides, pesticides and polycyclic aromatic hydrocarbons are not relevant in sodium carbonate. For parametric values of sodium carbonate on trace metal content in drinking water, see [1].		

## 5 Test methods

### 5.1 Sampling

Prepare the laboratory sample (s) required by the relevant procedure described in ISO 8213, observe the recommendations of ISO 3165 and also take into account ISO 6206.

## 5.2 Analyses

### 5.2.1 Main product

The mass fraction in % of  $\text{Na}_2\text{CO}_3$  shall be determined by titration of the total alkalinity with a standard volumetric acid solution in accordance with ISO 740.

### 5.2.2 Impurities

#### 5.2.2.1 Iron

The iron content shall be determined by a spectrometric method with 1,10-phenanthroline in accordance with ISO 2460 replacing sodium bicarbonate by sodium carbonate.

#### 5.2.2.2 Insoluble matters

The mass fraction in % of the insoluble matter in water shall be determined at 50 °C in accordance with ISO 746.

### 5.2.3 Chemical parameters

#### 5.2.3.1 Principle

The elements arsenic, cadmium, chromium, lead and nickel are determined by inductively coupled plasma optical emission spectrometry. Mercury is determined by cold vapour atomic absorption spectrometry.

#### 5.2.3.2 Arsenic

The arsenic content shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

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#### 5.2.3.3 Cadmium

The cadmium content shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

#### 5.2.3.4 Chromium

The chromium content shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).

#### 5.2.3.5 Nickel

The nickel content shall be determined by inductively coupled plasma optical emission spectrometry (ICP/OES) (see B.1).