



# SLOVENSKI STANDARD

## SIST EN 1405:1999

01-april-1999

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### Kemikalije, ki se uporabljajo za pripravo pitne vode – Natrijev alginat

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natrium-Alginat

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

Ta slovenski standard je istoveten z: <sup>SIST EN 1405:1999</sup> EN 1405:1998  
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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 1405:1999**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN 1405

April 1998

ICS 71.100.80

Descriptors: potable water, water treatment, chemical compounds, sodium alginates, description, physical properties, chemical properties, impurities, toxic substances, tests, labelling, storage, information, warning notices

English version

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

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natrium-Alginat

This European Standard was approved by CEN on 4 April 1998.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This European Standard 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 October 1998, and conflicting national standards shall be withdrawn at the latest by October 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland 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 standard :

- 1) This 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 ;
- 2) 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.

## 1 Scope

This European standard is applicable to sodium alginate used for treatment of water intended for human consumption. It describes the characteristics of sodium alginate and specifies the requirements and the corresponding test methods for sodium alginate .

Annex A gives some information on origin, use and handling of sodium alginate.

Annex B lists the bibliography.

## 2 Normative references

This European standard incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate place in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN ISO 3696	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 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 Description

### 3.1 Identification

#### 3.1.1 Chemical name

Sodium alginate

NOTE : Linear glycuronoglycan consisting mainly of (1-4) linked  $\beta$ -D-mannuronic acid units and (1-4) linked  $\alpha$ -L-guluronic acid units in pyranose ring form.

**3.1.2 Synonym or common name**

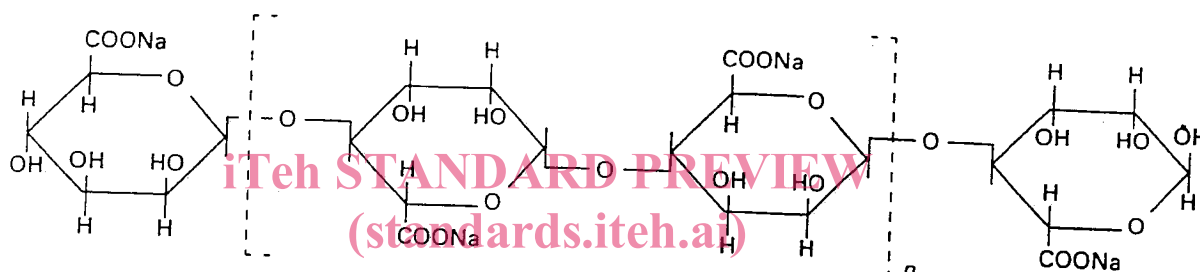
Algin.

**3.1.3 Relative molecular mass**

10 000 to 250 000 approximately.

**3.1.4 Empirical formula**

$(C_6O_6H_7Na)_n$

**3.1.5 Chemical formula**

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Sodium alginate (with D-mannuronic acid units)

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

9005-38-3.

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

The EINECS inventory lists alginic acid, but does not apply numbers to the salts of alginic acid. The EINECS number for alginic acid is 232-68-01.

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

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

### 3.2 Commercial form

Sodium alginate as specified in this standard is available as a solid containing a small amount of residual moisture.

### 3.3 Physical properties

#### 3.3.1 Appearance

The product is a white to pale yellowish-brown powder.

#### 3.3.2 Density

The bulk density of the product is typically in the range 0,7 g/cm<sup>3</sup> to 1,0 g/cm<sup>3</sup>.

#### 3.3.3 Solubility

The product is soluble in hot or cold water. Its solubility is limited only by viscosity, with a paste being formed at concentrations of approximately 50 g/l and above.

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#### 3.3.4 Vapour pressure (standards.iteh.ai)

Not applicable.

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#### 3.3.5 Boiling point at 100 kPa

Not applicable.

#### 3.3.6 Melting point

The product decomposes at approximately 200 °C.

#### 3.3.7 Specific heat

Not applicable.

#### 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

Not applicable.

## 3.4 Chemical properties

Sodium alginate is a non-hazardous material and not intrinsically reactive. However, in common with many other organic compounds, a strong exothermic reaction will occur if it is brought into contact in the dry state with a strong oxidizing agent or strong acid.

NOTE : In dilute solution there can be a reaction with, or destruction by, some of the disinfection and oxidizing agents used in water treatment.

## 4 Purity criteria

Limits have been given for impurities and toxic substances where these are likely to be present in significant quantities from the current production process and raw materials. If a change in the production process or raw materials leads to significant quantities of other impurities or by-products being present, this shall be notified to the user.

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### 4.1 Composition of commercial product

The product consists of sodium alginate, moisture and minor levels of inorganic salts (i.e. sodium chloride and sodium sulfate).

The following requirements shall apply to sodium alginate :

- sodium alginate content : minimum 80 percent by mass (% *m/m*) calculated with reference to the dried substance ;
- moisture content : less than 15 percent by mass (% *m/m*) ;
- ash : 18 percent by mass (% *m/m*) to 32 percent by mass (% *m/m*) on a dry basis ;
- pH : 4,8 to 8,8 as 1 percent by mass (% *m/m*) solution at 20 °C ;
- extraneous matter : there shall be no visible extraneous matter.

### 4.2 Impurities and main by-products

Based on the raw materials and manufacturing process (see A.1) there are no significant concentration of additional reactants or by-products which are relevant to the application of this product in drinking water treatment.

### 4.3 Toxic substances

NOTE : For the purpose of this standard, "toxic substances" are those defined in the EU Directive 80/778/EEC of 15 July 1980 (see B.1).

Toxic substances as defined above are not relevant at a reference dose of 0,5 mg/l.

## 5 Test methods

### 5.1 Sampling

Sampling shall be in accordance with ISO 8213 and the recommendations given in ISO 3165 and ISO 6206 shall be followed.

A representative sample of the solid product, of sufficient mass, shall be obtained immediately after manufacture or from a newly opened package(s). The sample shall be clearly labelled with product name/code, batch number, type of container(s) sampled and date sampled. Reference samples shall be retained for the storage life of the product as claimed by the manufacturer/supplier.

### 5.2 Analyses

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#### 5.2.1 General

Unless otherwise specified, all reagents shall be of recognised analytical grade. The water used shall conform to grade 2 specified in EN ISO 3696.

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#### 5.2.2 Main product

If additional requirements are agreed between the customer and manufacturer/ supplier, the latter shall provide the necessary methods if requested, so that the customer can carry out his own quality check.

A certificate of analysis shall be provided by the manufactured/supplier if requested.

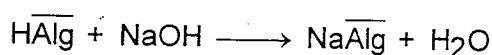
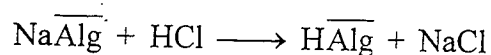
##### 5.2.2.1 Sodium alginate content

###### 5.2.2.1.1 General

This method is applicable to sodium alginates with alginate content in the range 50 % (m/m) to 100 % (m/m).

###### 5.2.2.1.2 Principle

The sodium alginate ( $\text{NaAlg}$ ) is converted to alginic acid by the action of dilute hydrochloric acid in the presence of propan-2-ol. The alginic acid formed is washed with a propan-2-ol/water mixture to remove excess hydrochloric acid. The alginic acid is then titrated with standard volumetric solution alkali. Propan-2-ol is present to prevent solubilisation of low molecular weight fractions of the sodium alginate.



### 5.2.2.1.3 Reagents

5.2.2.1.3.1 Propan-2-ol (isopropanol).

5.2.2.1.3.2 Hydrochloric acid,  $c(\text{HCl}) = 2 \text{ mol/l}$ .

5.2.2.1.3.3 Propan-2-ol diluted solution (50 + 50) ( $V_1 + V_2$ ) of propan-2-ol with HCl (5.2.2.1.3.2).

5.2.2.1.3.4 Propan-2-ol diluted solution (75 + 25) ( $V_1 + V_2$ ) of propan-2-ol with water.

5.2.2.1.3.5 Sodium hydroxide solution,  $c(\text{NaOH}) = 0,5 \text{ mol/l}$ .

5.2.2.1.3.6 Phenolphthalein indicator solution

### 5.2.2.1.4 Apparatus

5.2.2.1.4.1 Ordinary laboratory apparatus and glassware together with the following :

5.2.2.1.4.2 Filter crucible, pore size index P16 (diameter of pores 10  $\mu\text{m}$  to 16  $\mu\text{m}$ ), 35 ml capacity, clean and dry.

5.2.2.1.4.3 Vacuum pump or water vacuum pump.

5.2.2.1.4.4 Filter flask, 250 ml, fitted with rubber cone.

5.2.2.1.4.5 Stirrer, variable speed, with propeller paddle.

5.2.2.1.4.6 Burette, 25 ml, graduated in 0,1 ml divisions.

### 5.2.2.1.5 Procedure

**WARNING : Concentrated HCl : causes burns. Harmful vapour. Avoid contact with skin, eyes and clothing. Wear rubber gloves and eye protection when handling.**