



# SLOVENSKI STANDARD

## SIST EN 12123:2013

01-april-2013

Nadomešča:  
SIST EN 12123:2005

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### Kemikalije, ki se uporabljajo za pripravo pitne vode - Amonijev sulfat

Chemicals used for treatment of water intended for human consumption - Ammonium sulfate

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Ammoniumsulfat

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Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Sulfate d'ammonium

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**Ta slovenski standard je istoveten z: EN 12123:2012**

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#### **ICS:**

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

**SIST EN 12123:2013**

**en,fr,de**

EUROPEAN STANDARD

EN 12123

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## Chemicals used for treatment of water intended for human consumption - Ammonium sulfate

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Sulfate d'ammonium

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Ammoniumsulfat

This European Standard was approved by CEN on 23 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 12123:2012) 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 12123:2005.

Significant technical differences between this edition and EN 12123:2005 are as follows:

- 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 ammonium sulfate used for treatment of water intended for human consumption. It describes the characteristics and specifies the requirements of ammonium sulfate and refers to the corresponding analytical methods. It gives information on its use in water treatment.

## 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)*

ISO 760, *Determination of water — Karl Fischer method (General method)*

ISO 2992, *Ammonium sulphate for industrial use — Determination of iron content — 2,2'-bipyridyl photometric method*

ISO 2993, *Ammonium sulphate for industrial use — Determination of free acidity — Titrimetric method*

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

ISO 3332, *Ammonium sulphate for industrial use — Determination of ammoniacal nitrogen content — Titrimetric method after distillation* (standards.iteh.ai)

ISO 5993, *Sodium hydroxide for industrial use — Determination of mercury content — Flameless atomic absorption spectrometric method*

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

ISO 6353-1, *Reagents for chemical analysis — Part 1: General test methods*

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

Ammonium sulfate.

#### 3.1.2 Synonym or common name

Ammonium sulfate.

#### 3.1.3 Relative molecular mass

132,14.

**EN 12123:2012 (E)****3.1.4 Empirical formula**

$(\text{NH}_4)_2\text{SO}_4$ .

**3.1.5 Chemical formula**

$(\text{NH}_4)_2\text{SO}_4$ .

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

7783-20-2.

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

213-984-1.

**3.2 Commercial form**

The product is a powder.

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

The product is a white, fine crystalline powder.

**3.3.2 Density**

The density of the product is 1,8 g/cm<sup>3</sup> at 20 °C. [SIST EN 12123:2013](#)

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**3.3.3 Solubility in water**

The solubility of the product in water is 767 g/l at 25 °C.

**3.3.4 Vapour pressure**

Not applicable.

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

Not applicable.

**3.3.6 Crystallisation point**

The product decomposes above 235 °C.

**3.3.7 Specific heat**

Not known.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

### 3.3.8 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

Ammonium sulfate easily dissolves in water. A saturated solution (706 g/l at 0 °C) has a pH value of approximately 6.

Upon heating with chlorates, nitrates or nitrites it reacts violently.

Above 235 °C the product decomposes with formation of ammonia vapour, sulfur oxides.

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## 4 Purity criteria

### 4.1 General

[SIST EN 12123:2013](https://standards.iteh.ai/catalog/standards/sist/348078fb-46fc-4517-b5a8-134170224000/sist-en-12123-2013)

This document specifies the minimum purity requirements for ammonium sulfate 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.

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 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 content of ammonium sulfate shall not be less than a mass fraction of 99% corresponding to a mass fraction of 21 % of ammoniacal nitrogen.

### 4.3 Impurities and main by-products

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



Table 1 — Impurities

Impurity		Limit in mg/kg of the product
Sulfuric acid (free) H <sub>2</sub> SO <sub>4</sub>	max	200
Water	max	300
Iron (Fe)	max	10

#### 4.4 Chemical parameters

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

Table 2 — Chemical parameters

Parameter		Limit mg/kg of commercial product
Antimony (Sb)	max	1
Arsenic (As)	max	5
Cadmium (Cd)	max	0,5
Chromium (Cr)	max	5
Lead (Pb)	max	5
Mercury (Hg)	max	0,1
Nickel (Ni)	max	5
Selenium (Se)	max	2

NOTE Pesticides and polycyclic aromatic hydrocarbons and cyanides (CN<sup>-</sup>) are not relevant in ammonium sulfate because the raw materials used in the manufacturing are free of them. For parametric values of ammonium sulfate on trace metal content in drinking water, see [1].

## 5 Test methods

### 5.1 Sampling

Observe the general recommendations of ISO 3165 and take account of ISO 6206. Prepare the laboratory sample(s) required by the relevant procedure described in ISO 8213.

### 5.2 Analyses

#### 5.2.1 Main product

The content of ammoniacal nitrogen ( $C_1$ ), expressed as mass fraction in %, shall be determined in accordance with ISO 3332 (titrimetric method after distillation). The content of ammonium sulfate ((NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>) ( $C_2$ ), expressed as mass fraction in %, is calculated from the formula:

$$C_2 = C_1 \times 4,72 \quad (1)$$