



**SLOVENSKI STANDARD**  
**SIST EN 887:2002**

**01-december-2002**

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**Kemikalije, ki se uporabljajo za pripravo pitne vode – Aluminijev železov (III) sulfat**

Chemicals used for treatment of water intended for human consumption - Aluminium iron (III) sulfate

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Aluminium-Eisen(III)-sulfat

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Sulfate d'aluminium et de fer(III)

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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 887:2002**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 887**

October 2001

ICS 71.100.80

English version

## Chemicals used for treatment of water intended for human consumption - Aluminium iron(III) sulfate

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Sulfate d'aluminium et de fer(III)

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Aluminium-Eisen(III)-sulfat

This European Standard was approved by CEN on 29 September 2001.

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 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 Management Centre 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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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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 April 2002, and conflicting national standards shall be withdrawn at the latest by April 2002.

This European Standard refers to the EU Directive 80/778/EEC (see [1]) of 15 July 1980, however it will be revised in future in order to take account of the new EU Directive 98/83/EEC (see [3]).

Annex A is informative.

Annex B is normative.

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 :

- a) 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 ;
- 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.

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## 1 Scope

This European Standard is applicable to aluminium iron(III) sulfate used for treatment of water intended for human consumption. It describes the characteristics of aluminium iron(III) sulfate and specifies the requirements for aluminium iron(III) sulfate and refers to the corresponding analytical methods. It also gives information on its use in water treatment.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places 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 (including amendments).

EN 1302, *Chemicals used for treatment of water intended for human consumption – Aluminium-based coagulants - Analytical methods.*

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.*

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## 3 Description

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### 3.1 Identification

#### 3.1.1 Chemical name

Aluminium iron(III) sulfate.

#### 3.1.2 Synonym or common name

Aluminium and iron sulfate.

#### 3.1.3 Relative molecular mass

Variable (see 3.1.4).

#### 3.1.4 Empirical formula

$(Al_x Fe_{1-x})_2 (SO_4)_3$  where  $x$  is 0,70 to 0,95.

#### 3.1.5 Chemical formula

$xAl_2(SO_4)_3 \cdot (1 - x) Fe_2(SO_4)_3 \cdot n H_2O$  where  $n$  is variable and  $x$  varies from 0,70 to 0,95.

**EN 887:2001 (E)****3.1.6 CAS Registry Number <sup>1)</sup>**

The following is a list of CAS Registry Numbers for the components:

$\text{Al}_2(\text{SO}_4)_3$  : 10043-01-3;

$\text{Fe}_2(\text{SO}_4)_3$  : 10028-22-5.

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

The following is a list of EINECS reference numbers for the components:

$\text{Al}_2(\text{SO}_4)_3$  : 233-135-0;

$\text{Fe}_2(\text{SO}_4)_3$  : 233-072-9.

**3.2 Commercial forms**

Aluminium iron(III) sulfate is available in solid hydrated forms, with different particle sizes (slabs, kibbled, ground, granulated), and as aqueous solutions.

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

The product is a yellow to brown solid or liquid.

**3.3.2 Density**

The density of aluminium iron(III) sulfate solution varies depending on the composition.

For example :

— 1,330 g/ml for (36 g Al + 15 g Fe) per kilogram of solution at 15 °C.

The bulk density (loose) of granulated solid product is approximately 0,9 g/cm<sup>3</sup>.

**3.3.3 Solubility in water**

The solubility of aluminium iron(III) sulfate varies depending on the content of iron.

For example :

— for a solid form containing 72 g of aluminium and 30 g of iron per kilogram of product, at 0 °C the solubility is :

- Al 36 g/kg of solution ;
- Fe 15 g/kg of solution.

**3.3.4 Vapour pressure at 20 °C**

Not known.

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

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



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

120 °C for a saturated solution.

**3.3.6 Crystallization point**

The crystallization point of aluminium iron(III) sulfate varies, depending on the composition.

For example :

— 13 °C for composition (36 g Al + 15 g Fe) per kilogram of product.

**3.3.7 Specific heat**

Not known.

**3.3.8 Viscosity (dynamic)**

The viscosity of aluminium iron(III) sulfate solution varies greatly, depending on the composition and content of insoluble matters.

For a typical commercially available solution with a composition of (36 g Al + 15 g Fe) per kilogram of solution, the viscosity is given in Table 1.

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**Table 1 — Viscosity**  
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Temperature (°C)	Viscosity (mPa·s)
5	62
0	49
10	29

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**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**

Aluminium iron(III) sulfate is a slightly acidic hydrated salt or solution. Very dilute solutions hydrolyze and form a precipitate of aluminium hydroxide and iron hydroxide.

NOTE The solubility of aluminium and the solubility of iron depend on the pH value and the product should be used within an appropriate pH range.

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