SLOVENSKI STANDARD
SIST EN 888:2023

01-maj-2023

Nadomešča:
SIST EN 888:2005

Kemikalije, ki se uporabljajo za pripravo pitne vode - Železov (III) klorid

Chemicals used for treatment of water intended for human consumption - Iron (III) chloride

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

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

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Ta slovenski standard je istoveten z: **EN 888:2023**

ICS:

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

SIST EN 888:2023 **en,fr,de**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 888

February 2023

ICS 71.100.80

Supersedes EN 888:2004

English Version

Chemicals used for treatment of water intended for human consumption - Iron (III) chloride

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

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

This European Standard was approved by CEN on 25 December 2022.

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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.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 888:2023) 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of an identical text or by endorsement, at the latest by August 2023, and conflicting national standards shall be withdrawn at the latest by August 2023.

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

This document supersedes EN 888:2004.

EN 888:2023 includes the following significant technical changes with respect to EN 888:2004:

— removal of the analytical methods from this standard and addition of reference to EN 17215 as analytical method standard;

— update of the information of risk and safety labelling of the product to comply with the new regulations (see 7.2 and [2]);

— update of the information related to Drinking Water Directive.

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Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye 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 document:

a) this document 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 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 document is subject to regulation or control by National Authorities.

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1 Scope

This document is applicable to iron (III) chloride solution a) and iron (III) chloride hexahydrate b) used for treatment of water intended for human consumption. It describes the characteristics and specifies the requirements and the corresponding analytical methods for iron (III) chlorides a) and b) and gives information for their use in water treatment. It also determines the rules relating to safe handling and use of iron (III) chloride.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 17215, *Chemicals used for treatment of water intended for human consumption — Iron-based coagulants — Analytical methods*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at https://www.electropedia.org/

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4 Description

4.1 Identification

4.1.1 Chemical names

a) Iron (III) chloride solution.

b) Iron (III) chloride hexahydrate ($FeCl_3 \cdot 6\ H_2O$).

4.1.2 Synonym or common names

a) Ferric chloride, solution.

b) Ferric chloride, hexahydrate.

4.1.3 Relative molecular mass

a) 162,21 g/mol for $FeCl_3$.

b) 270,31 g/mol for $FeCl_3 \cdot 6\ H_2O$.

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4.1.4 Empirical formula

a) $FeCl_3$.

b) $FeCl_3 \cdot 6\ H_2O$.

4.1.5 Chemical formula

a) $FeCl_3$.

b) $FeCl_3 \cdot 6\ H_2O$.

4.1.6 CAS Registry Number[1)]

a) 7705-08-0.

b) 10025-77-1.

4.1.7 EINECS reference[2)]

231-729-4.

4.2 Commercial forms

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Iron (III) chloride a) is available as a solution.

Iron (III) chloride hexahydrate b) is available as crystalline granules.

4.3 Physical properties

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4.3.1 Appearance

Iron (III) chloride a) solutions are dark brown in colour.

Iron (III) chloride hexahydrate b) is an hygroscopic, yellow deliquescent crystalline granular material.

4.3.2 Density

The density of solutions of iron (III) chloride a) is approximately 1,43 g/cm^3 at 20 °C for a mass fraction of 40 % of $FeCl_3$.

The density of iron (III) chloride hexahydrate b) is approximately 1,8 g/cm^3 at 20 °C.

The bulk density of the products b) is approximately 1,0 kg/dm^3.

4.3.3 Solubility (in water)

The product a) is dilutable and b) is soluble (see A.3.2).

The solubility at 20 °C for the product b) is approximately up to a mass fraction of 47 % of $FeCl_3$.

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1) Chemical Abstracts Service Registry Number

2) European Inventory of Existing Commercial Chemical Substances

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4.3.4 Vapour pressure

Not applicable.

4.3.5 Boiling point at 100 kPa[3)]

For the product b) decomposition starts at 160 °C.

4.3.6 Melting and freezing point

For the product a) the freezing point depends on concentration.

For the product b) melting point is 37 °C.

The freezing point of an aqueous solution is lower than −15 °C.

4.3.7 Specific heat

For the product a) not applicable.

For the product b) not known.

4.3.8 Viscosity (dynamic)

For the product a) the viscosity is about 10 mPa·s for a solution of a mass fraction of 40 % of $FeCl_3$ at 20 °C.

For the product b) it is not applicable.

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4.3.9 Critical temperature

Not applicable.

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4.3.10 Critical pressure

Not applicable.

4.3.11 Physical hardness

Not applicable.

4.4 Chemical properties

The solutions of the liquid forms of iron (III) chloride a) and iron (III) chloride hexahydrate b) are acidic and corrosive. Very diluted solutions hydrolyse and form a precipitate of iron hydroxide.

5 Purity criteria

5.1 General

This document specifies the minimum purity requirements for iron (III) chloride 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 can be present and, if so, this shall be notified to the user and when necessary to relevant authorities.

3) 100 kPa = 1 bar

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NOTE Users of these products can check the national regulations in order to clarify whether it is of appropriate purity for treatment of water intended for human consumption, taking 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 lead to significant quantities of impurities, by-products or additives being present, this shall be notified to the user.

5.2 Composition of commercial product

The concentration of active matter in the product expressed as mass fraction in % of $FeCl_3$ or Fe (III) shall be within ±3 % of the manufacturer's declared values.

The products typically contain concentrations given in Table 1.

Table 1 — Concentration of active matter

Limit values in mass fraction in %

Commercial form	$FeCl_3$	Fe (III)
Solid a)	59	20,3
Solution b)	40	13,7

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These solutions typically contain 0 % to 1 % (mass fraction) free acid.

5.3 The grade of the product

The product shall conform to the requirements specified in Table 2.
The concentration limits refer to Fe (III).

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Table 2 — Limit values for the grades 1, 2 and 3

Limit values in mass fraction of Fe (III) content in %

Parameter		Limit		
		Grade 1	Grade 2	Grade 3
Manganese	max.	0,5	1	2
Iron (II) [a]	max.	2,5	2,5	2,5
Insoluble matters [b]	max.	0,2	0,2	0,2

[a] Fe (II) has a lower coagulant efficiency compared to Fe (III).
Also hydrolysis of Fe (II) starts at pH value 8, and therefore Fe (II) can remain into the water at lower pH values.

[b] An excess of insoluble matters indicates the presence of foreign matter. Iron as a component of the product will usually be removed in the treatment process.

5.4 The type of the product

The product shall conform to the requirements specified in Table 3.

The concentration limits are specified in milligrams per kilogram of Fe (III).