

SVENSK STANDARD

SS-EN 937:2016



Fastställt/Approved: 2016-05-30
Publicerad/Published: 2016-06-01
Utgåva/Edition: 3
Språk/Language: engelska/English
ICS: 13.060.20; 71.100.80

Processkemikalier för beredning av dricksvatten – Klor

Chemicals used for treatment of water intended for human consumption – Chlorine

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Denna standard ersätter SS-EN 937:2009, utgåva 2.

The European Standard EN 937:2016 has the status of a Swedish Standard. This document contains the official English version of EN 937:2016.

This standard supersedes the Swedish Standard SS-EN 937:2009, edition 2.

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EUROPEAN STANDARD

EN 937

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2016

ICS 71.100.80

Supersedes EN 937:2009

English Version

Chemicals used for treatment of water intended for human consumption - Chlorine

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Chlor

This European Standard was approved by CEN on 18 March 2016.

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.

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European foreword

This document (EN 937:2016) 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of an identical text or by endorsement, at the latest by November 2016 and conflicting national standards shall be withdrawn at the latest by November 2016.

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 937:2009.

Differences between this edition and EN 937:2009 are editorial in order to harmonize the text with other standards in this series:

- a) deletion of reference to Directive 67/548/EEC of 27th June 1967 in order to take into account the latest Regulation in force (see [2]);
- b) amendment of subclause 6.2 according to [2];
- c) deletion of reference to Directive 98/8/EC of 16 February 1998 in order to take into account the latest Regulation in force (see [3]).

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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.

This product is a biocide and needs to comply with the relevant legislation in force. In the European Union, at the time of publication, this legislation is Regulation (EU) No 528/2012 [3].

1 Scope

This European Standard is applicable to chlorine used for treatment of water intended for human consumption. It describes the characteristics of chlorine and specifies the requirements and the corresponding test methods for chlorine. 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 1552, *Liquid chlorine for industrial use - Method of sampling (for determining only the volumetric chlorine content)*

ISO 2120, *Liquid chlorine for industrial use - Determination of the content of chlorine by volume in the vaporized product*

ISO 2121, *Liquid chlorine for industrial use - Determination of water content - Gravimetric method*

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

3 Description

3.1 Identification

3.1.1 Chemical name

Chlorine.

3.1.2 Synonym or common name

Liquid chlorine.

3.1.3 Relative molecular mass

70,91.

3.1.4 Empirical formula

Cl₂.

3.1.5 Chemical formula

Cl₂.

3.1.6 CAS Registry Number ¹⁾

7782-50-5.

¹⁾ Chemical Abstracts Service Registry Number.

3.1.7 EINECS reference ²⁾

231-959-5.

3.2 Commercial form

Pressurized liquefied gas.

3.3 Physical properties

3.3.1 Appearance

Liquid chlorine is a clear, amber coloured liquid. Chlorine gas is greenish yellow, 2,5 times heavier than air. It has a suffocating and characteristic odour.

3.3.2 Density

Liquid: 1,409 g/ml at 20 °C.

Gas:

- 3,169 kg/m³ at 101.3 kPa at 0 °C;
- 2,945 kg/m³ at 101.3 kPa at 20 °C.

3.3.3 Solubility (in water)

7,26 g/l at 20 °C and 100 kPa.

3.3.4 Vapour pressure

669 kPa at 20 °C.

3.3.5 Boiling point at 100 kPa ³⁾

- 34 °C.

3.3.6 Liquefaction point

- 101 °C at 100 kPa.

3.3.7 Specific heat

Liquid: 920 J/(kg.K) at - 34 °C.

Gas: 475 J/(kg.K) at 0 °C.

3.3.8 Viscosity (dynamic)

Gas: $1\,333 \times 10^{-8}$ Pa.s at 20 °C.

Liquid: $4,78 \times 10^{-4}$ Pa.s at - 34 °C.

3.3.9 Critical temperature

144 °C.

²⁾ European Inventory of Existing Commercial Chemical Substances.

³⁾ 100 kPa = 1 bar.

3.3.10 Critical pressure

7 710,83 kPa.

3.3.11 Physical hardness

Not applicable.

3.4 Chemical properties

Chlorine is a very strong oxidizing agent and can react violently with some gases such as hydrogen. Almost all metals form chlorides in the presence of chlorine. Organic compounds including mineral oils and greases react very quickly with chlorine.

The standard redox potential of gaseous chlorine in neutral aqueous solution at 25 °C and 101.3 mbar is:



4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for chlorine 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 the product standard.

Limits have been given for impurities and chemicals 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 at least a volume fraction of 99,5 % chlorine.

4.3 Impurities and main by-products

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

Table 1 — Impurities

Impurities	Limit in mg/kg of product
Water (H ₂ O)	20
Nitrogen trichloride (NCl ₃)	20 ^a
^a Valid for containers with a net mass of max. 1 000 kg liquid chlorine. For tanks with a higher capacity the limit shall be lowered to 10 mg/kg due to safety concerns (see [4] for further details).	

NOTE 1 Other by-products consist of gases (nitrogen, oxygen, carbon dioxide, hydrogen) in variable proportions which are not relevant for the purposes described in this European Standard.