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Chemicals used for treatment of swimming pool water — Sodium chloride used for electrochlorinator systems

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The UK participation in its preparation was entrusted to Technical Committee CII/59, Chemicals for drinking water treatment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Chemicals used for treatment of swimming pool water - Sodium chloride used for electrochlorinator systems

Produits chimiques utilisés pour le traitement de l'eau des piscines - Chlorure de sodium utilisé avec les systèmes d'électrochloration

Produkte zur Aufbereitung von Schwimm- und Badebeckenwasser - Natriumchlorid für den Einsatz in Anlagen zur elektrochemischen Erzeugung von Chlor

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Foreword

This document (EN 16401:2013) 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of an identical text or by endorsement, at the latest by April 2014, and conflicting national standards shall be withdrawn at the latest by April 2014.

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Introduction

In respect of potential adverse effects on the quality of water for swimming pools, 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.

1 Scope

This European Standard is applicable only to sodium chloride used in electrochlorinator systems and not to mixtures with other chemicals used for treatment of swimming pool water. It describes the characteristics of sodium chloride used in electrochlorinator systems and specifies the requirements and the corresponding test methods for sodium chloride used in electrochlorinator systems. It gives information on its use in swimming water treatment. It also determines the rules relating to safe handling and use (see Annex A).

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 973, *Chemicals used for treatment of water intended for human consumption - Sodium chloride for regeneration of ion exchangers*

3 Description

3.1 Identification

3.1.1 Chemical name

Sodium chloride.

3.1.2 Synonym or common name

Salt.

3.1.3 Relative molecular mass

58,45 for sodium chloride.

3.1.4 Empirical formula

NaCl.

3.1.5 Chemical formula

NaCl.

3.1.6 CAS Registry Number[1)]

7647-14-5 for sodium chloride.

3.1.7 EINECS Reference[2)]

231-598-3 for sodium chloride.

1) Chemical Abstract Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3.2 Commercial forms

These products are available as rock salt, sea salt or evaporated salt, and it is supplied as free-flowing crystals or their compacted forms.

3.3 Physical properties

3.3.1 Appearance

The product is white and crystalline.

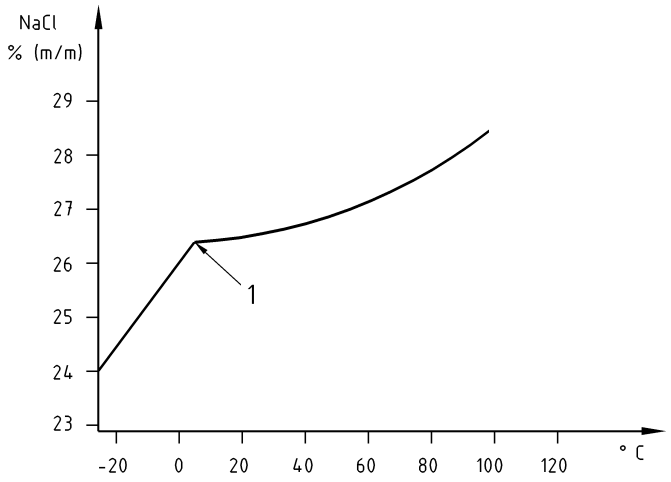
3.3.2 Density

The density of the solid crystal is 2,16 g/cm^3 at 20 °C.

The bulk density depends on the particle size distribution.

3.3.3 Solubility (in water)

The solubility of the product depends on the temperature as given in Figure 1.



Temperature °C	NaCl solution % (*m/m*)
- 10	25,0
0	26,34
10	26,35
20	26,43
30	26,56
40	26,71
50	26,89
60	27,09
70	27,30
80	27,53
90	27,80
100	28,12

Key

1 Transition point
$NaCl \rightarrow NaCl.2H_2O$

Figure 1 - Solubility curve for sodium chloride in water

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa[3)]

Not applicable.

3.3.6 Melting point

802 °C for sodium chloride.

3.3.7 Specific heat

Approximately 850 J/(kg·K) at 25 °C for the solid.

3.3.8 Viscosity (dynamic)

The viscosity of the saturated solution at 20 °C is approximately 1,9 mPa·s.

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

The hardness of solid salt is given as 2 to 2,5 on the Mohs' scale of hardness.

3.4 Chemical properties

Sodium chloride is stable, non-volatile and aqueous solutions have good electrical conductivity.

Sodium chloride is decomposed by a number of acids. It reacts with sulfuric acid, phosphoric acid and strong oxidizing agents. The reactions are often complex and require heat for completion.

Under certain conditions, a sodium chloride solution can cause corrosion of metallic surfaces.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for sodium chloride for swimming-pool chlorine generators. 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.

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.

3) 100 kPa = 1 bar.

4.2 Composition of commercial product

The content of sodium chloride in the dry product shall not be less than:

— grade A: mass fraction 99,4 % of dry NaCl;

— grade B: mass fraction 98,5 % of dry NaCl.

NOTE An anticaking agent, sodium or potassium hexacyanoferrate[4)], is not allowed (for the determination of hexacyanoferrate ion $[Fe(CN)_6]^{-4}$ see EN 973).

4.3 Impurities and main by-products

The product shall conform to the requirements specified in Table 1 and Table 2.

Table 1 — Impurities

Impurity	**Limit** **Mass fraction % of NaCl content**		
Water-insoluble matter		Grade A	Grade B
	max.	0,05	0,35

Table 2 — Moisture content

Impurity	**Limit** **Mass fraction % of NaCl content**		
Moisture content		Dry salt	Undried salt
	max.	0,6	5

4.4 Chemical parameters

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

4) E number 535 or 536.

Table 3 — Chemical parameters

Parameter		Limits in mg/kg of commercial product
Calcium (Ca) + Magnesium (Mg)	max.	1 000
Arsenic (As)	max.	13
Cadmium (Cd)	max.	1,3
Chromium (Cr)	max.	13
Mercury (Hg)	max.	0,26
Nickel (Ni)	max.	13
Lead (Pb)	max.	13
Antimony (Sb)	max.	2,6
Selenium (Se)	max.	2,6
Copper (Cu)	max.	2
Manganese (Mn)	max.	2
Iron (Fe)	max.	2
Bromine (Br)	max.	250

5 Test methods

The sampling and the analytical methods are those described in EN 973.

6 Labelling - Transportation - Storage

6.1 Means of delivery

Sodium chloride shall be delivered in water resistant bags.

In order that the purity of the product is not affected, the means of delivery shall not have been used previously for any different product or it shall have been specially cleaned and prepared before use.

6.2 Labelling according to the EU legislation[5)]

At the date of the publication of this European Standard no labelling requirements apply to sodium chloride.

The regulation [1], and its amendments for the purposes of its adaptation to technical and scientific progress contains a list of substances classified by the EU. Substances not listed in this regulation should be classified on the basis of their intrinsic properties according to the criteria in the regulation by the person responsible for the marketing of the substance.

6.3 Transportation regulations and labelling

Sodium chloride is not classified as a dangerous product for road, rail, sea and air transportation.

5) See [1].

6.4 Marking

The marking shall include the following:

— name “sodium chloride”, trade name, grade;

— net mass;

— name and address of the supplier and/or manufacturer;

— statement “this product conforms to EN 16401”.

6.5 Storage

6.5.1 Long term stability

Product is stable when stored in containers in a cool and dry place.

6.5.2 Storage incompatibilities

The product shall be kept away from acids, alkaloidal, heavy metal salts and oxidizers.

Annex A
(informative)
General information on sodium chloride

A.1 Origin

Rock salt: Salt produced by mining salt deposits of different geological formations derived from ancient seas.

Sea salt: Salt produced by sea water evaporation via the action of sun and wind.

Evaporated salt: Salt produced by evaporating water from a salt solution in a special evaporator leading to the recrystallization of the salt.

A.2 Use

A.2.1 Function

Salt to be used to produce active chlorine (Cl_2 or NaClO) by electrolysis of the brine for disinfection of the water.

A.2.2 Form in which it is used

It is used in the form of an aqueous solution, at a concentration given by the equipment supplier.

A.2.3 Consumption of salt for electrochlorination

The consumption is variable and depends on the applied technique, and is typically in the range of 1,7 kg to 3 kg of NaCl per kilogram of chlorine.

A.2.4 Means of application

To be documented by the equipment supplier.

A.2.5 Secondary effects

Increase of the chloride content.

A.2.6 Removal of excess product

Not applicable.

A.3 General rules relating to safety

No particular precaution is necessary.

A.3.1 Rules for safe handling and use

The supplier will provide current safety instructions.

A.3.2 Emergency procedures

A.3.2.1 First aid

If sodium chloride is in contact with the eyes or the skin, it is recommended to rinse with plenty of water.

A.3.2.2 Spillage

The product should be collected, then the area should be rinsed with plenty of water.

A.3.2.3 Fire

The product is not combustible.

Bibliography

[1] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (REACH)

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