

Chemicals used for treatment of swimming pool water — Calcium hypochlorite

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National foreword

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Produkte zur Aufbereitung von Schwimm-und Badebeckenwasser - Calciumhypochlorit

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Foreword

This document (EN 15796:2010) 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of an identical text or by endorsement, at the latest by July 2010, and conflicting national standards shall be withdrawn at the latest by July 2010.

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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 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.

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 European Standard is subject to regulation or control by National Authorities.

1 Scope

This European Standard is applicable to calcium hypochlorite used directly, or for the production of formulations, for treatment of water for swimming pools. It describes the characteristics of calcium hypochlorite and specifies the requirements and the corresponding test methods for calcium hypochlorite. It gives information on its use in swimming pool water treatment. It also determines the rules relating to safe handling and use of calcium hypochlorite (see Annex B).

2 Normative reference

The following referenced document is indispensable for the application 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 900, *Chemicals used for treatment of water intended for human consumption — Calcium hypochlorite*

3 Description

For the identification, the commercial form, the physical properties and the chemical properties see the relevant subclauses of EN 900.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for calcium hypochlorite used for the treatment of water for swimming pools. 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.

NOTE Users of the product should check national regulations in order to clarify whether it is of appropriate purity for treatment of water for swimming pools, taking into account water quality, required dosage, and contents of other impurities and additives used in the product not stated in the 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 other impurities, by-products or additives being present, this shall be notified to the user.

4.2 Composition of commercial product

Calcium hypochlorite is available in powder, granular or tablet form with a minimum concentration of mass fraction 65,5 % calcium hypochlorite ($\text{Ca}(\text{ClO})_2$) (equivalent to an available active chlorine content in mass fraction of at least 65 %) at the time of delivery by the producer. The concentration of calcium hypochlorite shall be equal to or greater than the value specified by the manufacturer.

Dissolution quality, calculated as available chlorine which is obtainable within 1 min after dissolution in water, shall not be less than a mass fraction of 45,5 %.

4.3 Impurities and main by-products

The content of impurities and water-insoluble matter shall conform to the requirements specified in EN 900.

4.4 Chemical parameters

The contents of arsenic, cadmium, chromium, mercury, nickel, lead, antimony, selenium and bromate for each type of product shall conform to the requirements specified in EN 900.

5 Test methods

The methods for sampling and analysis are those specified in EN 900.

6 Labelling - Transportation - Storage

6.1 Means of delivery

Calcium hypochlorite shall be delivered in plastics-coated steel drums or polyethylene bottles.

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 Risk and safety labelling according to the EU Directives¹⁾

The following labelling requirements shall apply to calcium hypochlorite dry at the date of the publication of this standard.

a) Symbols and indications of danger:

- 1) O: Oxidizing;
- 2) C: Corrosive;
- 3) N: Dangerous for the environment;

b) Nature of special risks attributed to dangerous substances:

- 1) R 8: Contact with combustible material may cause fire;
- 2) R22: Harmful if swallowed;
- 3) R 31: Contact with acids liberates toxic gas;
- 4) R 34: Causes burns;
- 5) R 50: Very toxic to aquatic organisms;

c) Safety advice concerning dangerous substances:

- 1) S1/2: Keep locked up and out of the reach of children;
- 2) S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice;
- 3) S 36/37/39: Wear suitable protective clothing, gloves and eye/face protection;

1) See Bibliography, [1].

- 4) S 45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible);
- 5) S 61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

6.3 Transportation regulations and labelling

The following classification requirements shall apply to calcium hypochlorite dry at the date of the publication of this standard.

Calcium hypochlorite is listed as UN Number²⁾

- 1748 for granular, calcium hypochlorite mixture, dry;
- 1748 for tablets, calcium hypochlorite mixture, dry;

(The above products contain more than 39 % mass fraction available chlorine.)

- 2880 for granular, calcium hypochlorite, hydrated or calcium hypochlorite, hydrated mixture;
- 2880 for tablets, calcium hypochlorite, hydrated or calcium hypochlorite, hydrated mixture.

(The above products contain a minimum of 5,5 % mass fraction water but not more than 16 % mass fraction water.)

RID³⁾ ADR⁴⁾: class 5.1, classification code O2; packing group II (powder and granular) and packing group III (tablets).

IMDG⁵⁾: class 5.1.

IATA⁶⁾: class 5.1.

6.4 Marking

The marking shall include the following:

- the name "calcium hypochlorite", trade name, grade and type;
- the net mass;
- the name and address of supplier and/or manufacturer;
- the statement "This product conforms to EN 15796".

-
- 2) United Nations Number.
 - 3) Regulations concerning International carriage of Dangerous goods by rail.
 - 4) European Agreement concerning the international carriage of Dangerous goods by Road.
 - 5) International Maritime transport of Dangerous Goods.
 - 6) International Air Transport Association.

6.5 Storage

6.5.1 General

The product shall be stored in airtight containers in a cool, dry and well-ventilated room.

6.5.2 Long term stability

a) Heat stability:

At temperatures above 177 °C, decomposition is rapid with evolution of oxygen and heat and thus increasing the risks of pressure build-up to blow off the lid or rupture the container.

Decomposition also occurs at temperatures maintained above about 50 °C for longer periods.

NOTE Decomposition products are calcium chloride (CaCl₂), oxygen (O₂) and chlorine (Cl₂).

b) Chemical stability:

Contamination can initiate a vigorous chemical reaction resulting in fire and/or explosion.

6.5.3 Storage incompatibilities

Keep away from acids, acidic salts, inflammable substances, organic compounds and moisture.

Annex A (informative)

General information on calcium hypochlorite

A.1 Origin

A.1.1 Raw materials

Calcium hypochlorite is manufactured from chlorine, calcium hydroxide and sodium hydroxide.

A.1.2 Manufacturing process

It is produced by drying a filter cake of neutral calcium hypochlorite dihydrate that is usually prepared from calcium hydroxide (hydrated lime) ($\text{Ca}(\text{OH})_2$), sodium hydroxide (caustic soda) (NaOH), and chlorine (Cl_2).

A.2 Use

A.2.1 Function

Its functions in swimming pool water treatment are disinfection, the removal of ammonium compounds, the oxidation of sulfides and the oxidation of iron (II) to iron (III).

A.2.2 Form in which it is used

It is used dissolved in water as a dosing solution usually at a mass fraction of 1 % to 4 %.

A.2.3 Treatment dose

The treatment dose depends on the composition of the swimming pool water. The dose should be controlled to achieve the minimum free residual concentration that gives satisfactory microbial quality.

A.2.4 Means of application

It is applied using a metering pump, from a dissolving tank.

A.2.5 Secondary effects

The secondary effects include the following:

- slight increase in pH;
- slight increase in the chloride content;
- odour and colour removal;
- oxidation of organic compounds;
- local precipitation of carbonate at injection point.

A.2.6 Removal of excess product

Excess active chlorine can be removed by utilizing a reducing agent such as sulfur dioxide gas or an aqueous solution of a sulfite compound.

Passing through activated carbon is also effective.

Annex B (normative)

General rules relating to safety

B.1 Rules for safe handling and use

The supplier shall provide current safety instructions.

WARNING — NEVER MIX THIS PRODUCT WITH ORGANIC CHLORINE (Trichloroisocyanuric Acid, Dichloroisocyanuric acid salt or any product containing them) WITHIN THE SAME CONTAINER.

B.2 Emergency procedures

B.2.1 First aid

In case of skin contact, rinse with copious amounts of water, remove contaminated clothing. In the event of eye or mucous membrane contact, rinse immediately with copious amounts of water and consult a doctor.

If swallowed, little information is available but corrosion and freeze burns shall be expected. Wash out the mouth with water and give 200 ml to 300 ml of water to drink

B.2.2 Spillage

Wear respiratory equipment. Collect and store in separate plastics container. Do not accumulate the spilt material, dispose of it via a rubbish bin or drains. Disposal shall be carried out in accordance with the local regulations.

B.2.3 Fire

The material is not combustible, but due to the formation of oxygen as decomposition by-product it will support combustion. Use air-independent respiratory equipment for fire fighting. Use water to extinguish fire and to cool containers exposed to fire. Do not use dry chemical extinguishers containing ammonium compounds, e.g. monoammonium phosphate.

Bibliography

- [1] 67/548/EEC: Council Directive of 27 June 1967 on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and its amendments and adaptations

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