BS EN 15073:2013

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Chemicals used for treatment of swimming pool water — Sodium dichloroisocyanurate, dihydrate

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National foreword

This British Standard is the UK implementation of EN 15073:2013. It supersedes BS EN 15073:2006+A1:2008 which is withdrawn.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 80016 0

ICS 13.060.25; 71.100.80

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2013.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15073

May 2013

ICS 71.100.80

Supersedes EN 15073:2006+A1:2008

English Version

Chemicals used for treatment of swimming pool water - Sodium dichloroisocyanurate, dihydrate

Produits chimiques utilisés pour le traitement de l'eau des piscines - Dichloroisocyanurate de sodium, dihydraté

Produkte zur Aufbereitung von Schwimm- und Badebeckenwasser - Natriumdichlorisocyanurat-Dihydrat

This European Standard was approved by CEN on 28 March 2013.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 15073:2013: E

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Foreword

This document (EN 15073:2013) 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of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

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 15073:2006+A1:2008.

Significant technical differences between this edition and EN 15073:2006+A1:2008 are as follows:

— Replacement of warning and safety precautions notes by labelling according to Regulation (EC) No 1272/2008.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

In respect of potential adverse effects on the quality of water intended for swimming pools caused by the product covered by this European Standard, the following statements apply:

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 1 Conformity with this European Standard does not confer or imply acceptance or approval of the products in any of the Member States of the EU or EFTA. The use of the products covered by this European Standard is subject to regulation or control by National Authorities.

NOTE 2 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 Directive 1998/8/EC [1].

1 Scope

This European Standard is applicable to sodium dichloroisocyanurate, dihydrate used directly or used to prepare commercial formulations for disinfecting swimming pool water. It describes the characteristics of sodium dichloroisocyanurate, dehydrate and specifies the requirements and the corresponding test methods for sodium dichloroisocyanurate, dihydrate. It gives information on its use for treating swimming pool water. It also determines the rules relating to safe handling and use (see Annex B).

2 Normative reference

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 12932:2008, *Chemicals used for treatment of water intended for human consumption — Chemicals for emergency use — Sodium dichloroisocyanurate, dihydrate*

3 Description

3.1 Identification

3.1.1 Chemical name

1-sodium, 3, 5-dichloro-1,3,5-triazine-2, 4, 6-trione dihydrate.

3.1.2 Synonym or common name

Sodium dichloroisocyanurate, dihydrate.

Troclosene sodium, dihydrate

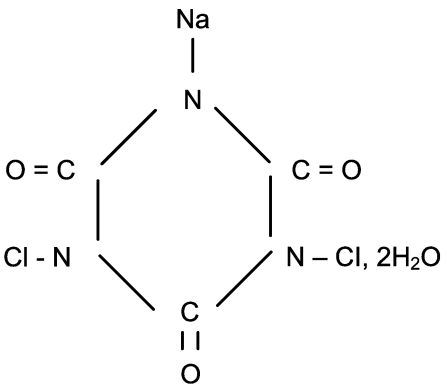
3.1.3 Relative molecular mass

256,02.

3.1.4 Empirical formula

$C_3N_3O_3Cl_2Na.2H_2O$.

3.1.5 Chemical formula



3.1.6 CAS Registry Number [1)]

51580-86-0.

3.1.7 EINECS reference [2)]

Not listed.

3.2 Commercial form

The product is available in various granular forms.

3.3 Physical properties

3.3.1 Appearance and odour

The product is a white granular solid with chlorinous odour.

3.3.2 Density

The bulk density of the product is approximately 0,9 g/cm^3.

3.3.3 Solubility in water

The solubility of the product in water is 291 g/l at 25 °C.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa [3)]

Not applicable, the product decomposes before fusion.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

3.3.6 Melting point

Not applicable.

3.3.7 Specific heat

(1,090 ± 0,040) kJ/kg.K at 20 °C.

3.3.8 Viscosity

Not applicable.

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

The product is a strong oxidant. It liberates chlorine by hydrolysis.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for dihydrate sodium dichloroisocyanurate 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, the user shall be notified and, when necessary, the 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 for swimming pools, taking into account raw water quality, required dosage, contents of other impurities and additives used in the product 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, the user shall be notified.

4.2 Composition of commercial product

The product shall contain at least a mass fraction of 55 % of available chlorine as calculated in accordance with the corresponding method given in EN 12932:2008, 5.2.1.

4.3 Impurities and main by-products

The water content shall be less than a mass fraction of 14 % of the product.

The sodium chloride content shall be less than a mass fraction of 0,05 % of the product.

4.4 Chemical parameters

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

Table 1 — Chemical parameters

Element		Limit mg/kg of product	
		Type 1	Type 2
Arsenic (As)	max.	10	10
Cadmium (Cd)	max.	1	1
Chromium (Cr)	max.	6	10
Mercury (Hg)	max.	0,02	0,02
Nickel (Ni)	max.	3	3
Lead (Pb)	max.	4	4
Antimony (Sb)	max.	5	5
Selenium (Se)	max.	1	1
NOTE Cyanide, which does not exist in a strong oxidising medium such as sodium dichloroisocyanurate, dihydrate, is not a relevant chemical parameter. Pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process. For parametric values of sodium dichloroisocyanurate on trace metal content in drinking water, see [2].			

5 Test methods

The sampling and the analytical methods are those described in EN 12932.

6 Labelling - Transportation - Storage

6.1 Means of delivery

The product shall be delivered in fibre, polyethylene drums or semi-bulk containers.

To ensure the purity of the product, the means of delivery shall not have previously been used for any different product or it shall have been specially cleaned and prepared before use.

6.2 Labelling according to the EU legislation [4)]

The following labelling requirements shall apply to sodium dichloroisocyanurate dihydrate at the date of the publication of this European Standard.

4) See [3].

Pictograms

– Signal word :

Danger

– Hazard statement:

H 302 Harmful if swallowed

H400 Very toxic to aquatic life

Figure 1 – GHS 07

Figure 2 – GHS 09

The regulation [3], 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 dichloroisocyanurate, dihydrate acid is listed as UN Number [5] 3077 and is classified as dangerous goods.

— RID [6] : class 9, classification code M7; packing group III;

— ADR [7] : class 9, classification code M7; packing group III;

— IMDG [8] : class 9;

— IATA [9] : class 9.

6.4 Marking

The marking shall include the following:

— name “sodium dichloroisocyanurate, dihydrate”, trade name and type;

— net mass;

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

— statement "this product conforms to EN 15073".

6.5 Storage

6.5.1 General

The product shall be stored in original package, firmly closed in a cool and dry place, away from any sources of heat or incompatible materials.

6.5.2 Long term stability

When stored in above conditions, the product is stable for at least three years.

5) United Nations Number.

6) International carriage of Dangerous goods by rail.

7) European Agreement concerning the international carriage of Dangerous goods by Road.

8) International maritime transport of Dangerous Goods.

9) International Air Transport Association.

6.5.3 Storage incompatibilities

Store the product on its own if possible. Keep it away from:

— strong acids;

— water;

— nitrogenated products;

— organic solvents;

— hydrocarbons;

— peroxides;

— hypochlorites;

— oils, greases and organic materials;

— ammonium salts;

— basic products.

Annex A
(informative)

General information on sodium dichloroisocyanurate, dihydrate

A.1 Origin

A.1.1 Raw materials

Sodium dichloroisocyanurate, dihydrate is manufactured from isocyanuric acid $(CNOH)_3$, sodium hydroxide (NaOH) and chlorine (Cl_2).

A.1.2 Manufacturing process

Sodium dichloroisocyanurate, dihydrate is produced by chlorination of disodium cyanurate ($Na_2H(NCO)_3$) using chlorine (Cl_2) and neutralisation with sodium hydroxide (NaOH).

Disodium cyanurate is obtained by the action of sodium hydroxide on isocyanuric acid.

A.2 Use

A.2.1 Function

The product is used as a disinfectant of swimming pool water. It is an indirect source of free chlorine (HOCl) when dissolved in water, via an organic carrier substance (sodium cyanurate, $C_3N_3O_3H_2Na$):

$$C_3N_3O_3Cl_2Na + 2H_2O \text{ - > } C_3N_3O_3H_2Na + 2HOCl \quad (A.1)$$

As the disinfectant (HOCl) is used up, more chlorine atoms are released from sodium dichloroisocyanurate to form hypochlorous acid. This results in an enrichment of sodium isocyanurate in the pool water, which cannot be removed by the water treatment process. Only dilution with fresh water keeps the sodium isocyanurate concentration at a satisfactory level. If the sodium isocyanurate concentration becomes too high, unsatisfactory disinfection can result. The automatic amperometric monitoring of free chlorine residual is negatively affected by sodium isocyanurate.

A.2.2 Form in which it is used

The product is used in tablet and granular form.

A.2.3 Treatment dose

The treatment dose is subject to national regulations, depending on the required free chlorine concentration in the swimming pool water.

In order to have 2,5 mg/l free chlorine concentration, one should add 4,47g/m^3 of sodium dichloroisocyanurate, dihydrate.

A.2.4 Means of application

The product is dissolved either directly or using a dissolution device.

A.2.5 Secondary effects

Secondary effects include the following:

— build-up of cyanuric acid concentration;

— oxidation of iron, of manganese and ammonium compounds;

— slight increase of "Kjeldahl" nitrogen;

— slight increase in the chloride content;

— odour and colour removal;

— chlorination of organic compounds leading to formation of halogenated by-products (e.g. trihalomethanes).

A.2.6 Removal of excess product

Removal of excess product is achieved (dechlorination of excess product) by using an aqueous solution of sodium hyposulfite (thiosulfate), sodium sulfite or sodium hydrogenosulfite. 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 INORGANIC CHLORINE (sodium hypochlorite or calcium hypochlorite or any product containing them) IN THE SAME CONTAINER.

B.2 Emergency procedures

B.2.1 First aid

In case of contact with the skin, remove any excess product; rinse immediately with cold water and remove the contaminated clothes.

In case of contact with eyes or mucous membranes, rinse immediately and thoroughly with water and seek medical advice immediately.

In case of inhalation, place the affected person at rest away from the polluted area; place them in reclined position and seek medical advice immediately.

In case of ingestion, gently clean the mouth with a clean linen and, if the person is conscious, give them a large quantity of water to drink. Place the person in a safe position; in case of loss of consciousness, do not induce vomiting and seek medical advice immediately.

B.2.2 Spillage

Collect and store in separate containers. Do not accumulate the spilled material and do not dispose of it via a rubbish bin or drain. 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 a 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. mono-ammonium phosphate.

Bibliography

[1] Directive 98/8/EC of the European Parliament and of the Council of 16th February 1998 concerning the placing of biocidal products on the market

[2] 98/83/EC Council Directive of 3rd November 1998 on the quality of water intended for human consumption

[3] 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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