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BSI Standards Publication

Chemicals used for treatment of water for swimming pools — Sodium hydrogen sulfate

National foreword

This British Standard is the UK implementation of EN 16038:2012.

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.

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Chemicals used for treatment of water for swimming pools - Sodium hydrogen sulfate

Produits chimiques utilisés pour le traitement de l'eau des piscines - Hydrogénosulfate de sodium

Produkte zur Aufbereitung von Schwimm- und Badebeckenwasser - Natriumhydrogensulfat

This European Standard was approved by CEN on 24 May 2012.

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

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Foreword

This document (EN 16038:2012) 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of an identical text or by endorsement, at the latest by January 2013, and conflicting national standards shall be withdrawn at the latest by January 2013.

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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 to sodium hydrogen sulfate used for treatment of swimming pool water. It describes the characteristics of sodium hydrogen sulfate and specifies the requirements and the corresponding test methods for sodium hydrogen sulfate. It gives information on its use in water treatment for swimming pools.

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 16037, *Chemicals used for treatment of water intended for human consumption — Sodium hydrogen sulfate.*

3 Description

3.1 Identification

3.1.1 Chemical name

Sodium hydrogen sulfate.

3.1.2 Synonym or common name

Sodium bisulfate.

3.1.3 Relative molecular mass

120,06 g/mol.

3.1.4 Empirical formula

$NaHSO_4$.

3.1.5 CAS-Registry-Number[1)]

7681-38-1.

3.1.6 EINECS-Number[2)]

231-665-7.

3.2 Commercial form

Powder or beads, free flowing.

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1) Chemical Abtracts Service Registry Number.
2) European Inventory of Existing Commercial Chemical Substances.

3.3 Physical properties

3.3.1 Appearance and odour

White to slightly yellow, odourless.

3.3.2 Density

The bulk density of the product is approximately between 1 400 kg/m^3 and 1 450 kg/m^3.

3.3.3 Solubility in water

Approximately 1 080 g/l at 25 °C.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point

Not applicable.

3.3.6 Melting point at 100 kPa[3)]

Approximately 180 °C.

Note 1 to entry: The product decomposes at higher temperatures to sodium disulfate and water.

3.3.7 Specific heat

Not applicable.

3.3.8 Viscosity (dynamic)

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

Sodium hydrogen sulfate is hygroscopic.

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3) 100 kPa = 1 bar.

Aqueous solutions of the product exhibit an acid reaction and are corrosive to metals:

— acid constant pK_S = 1,99;

— a solution with a mass fraction of 20 % has a pH value between 1 and 1,2 at 25 °C.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for sodium hydrogen sulfate 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 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 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 commercial product shall contain a mass fraction of sodium hydrogen sulfate greater than 92 %.

4.3 Impurities and by-products

The content of impurities and by-products shall be in accordance with Table 1.

Table 1 — Impurities and by-products

Parameter		Limit in % (mass fraction)
Sodium Sulfate	max.	8
Water	max.	0,8
Water insoluble substances	max.	0,05
Iron	max.	0,01

4.4 Chemical Parameters

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

Table 2 — Chemical parameters

Parameter		Limit in mg/kg $NaHSO_4$
Arsenic (As)	max.	0,1
Cadmium (Cd)	max.	0,1
Chromium (Cr)	max.	1
Mercury (Hg)	max.	0,1
Nickel (Ni)	max.	1
Lead (Pb)	max.	1
Antimony (Sb)	max.	1
Selenium (Se)	max.	1
NOTE Pesticides, polycyclic aromatic hydrocarbons and halogenated organic substances are not by-products of the manufacturing process.		

5 Test methods

The sampling and the analytical methods are those described in EN 16037.

6 Labelling – Transportation – Storage

6.1 Means of delivery

Sodium hydrogen sulfate shall be delivered in polyethylene bags, with net contents of 1 kg to 25 kg, or in flexible bulk containers, with net contents of a maximum of 1 000 kg.

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[4)]

At the date of publication of this standard, the following labelling requirements shall apply to sodium hydrogen sulfate:

4) See [1].

Hazard pictogram	
 **Figure 1** GHS05	– Signal word : **Danger** – Hazard statement H318: Causes serious eye damage NOTE Precautionary statements ('P statements') should be provided by the company being responsible for the marketing of the substance. They should be indicated on the packaging label and in the extended safety data sheet (eSDS) of the substance.

NOTE 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

At the date of publication of this standard, Sodium hydrogen sulfate is not listed as UN Number[5] and not classified by the manufacturers as a dangerous good according to the transport regulations RID[6], ADR[7], IMDG[8] and IATA[9].

6.4 Marking

The marking shall include the following:

— the name: “sodium hydrogen sulfate” and trade name;

— the net mass;

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

— the statement “This product conforms to EN 16038”.

5) United Nations Number.
6) Regulations concerning the 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 Code.
9) International Air Transport Association. Dangerous Goods Regulations.

6.5 Storage

6.5.1 General

Store the product in original packages or in tightly closed plastic containers in a cool and dry place. Do not use containers made of common construction metals (mild steel, stainless steel, zinc coated steel, etc.). Keep away from any sources of heat (avoid heat of > 60 °C to prevent agglomeration) or incompatible materials.

6.5.2 Long term stability

Stable when stored under conditions described in 6.5.1.

6.5.3 Storage incompatibilities

Avoid contact with alkaline substances (intense reaction). Avoid contact with common construction metals (corrosion, release of highly flammable hydrogen gas).

Avoid mixtures with hypochlorites and other compounds containing active chlorine (intense reaction, release of toxic chlorine gas).

Annex A
(informative)

General information on sodium hydrogen sulfate

A.1 Origin

A.1.1 Raw materials

Sodium hydrogen sulfate is usually manufactured from sulfuric acid and sodium chloride. It can be made from sulfuric acid and sodium sulfate, or from sulfuric acid and sodium hydroxide or from sulfuric acid and sodium carbonate.

A.1.2 Manufacturing process

The usual manufacturing process is the reaction of solid sodium chloride (salt) or sodium sulfate with equivalent amounts of concentrated sulfuric acid under heating according to the reaction formulae:

$$H_2SO_4 + NaCl \rightarrow NaHSO_4 + HCl \quad (A.1)$$

$$H_2SO_4 + Na_2SO_4 \rightarrow 2\ NaHSO_4 \quad (A.2)$$

A.2 Use

A.2.1 Function

It is used for adjustment of pH value.

A.2.2 Form in which it is used

The product is usually used as delivered, but it could also be used as an aqueous solution.

A.2.3 Treatment dose

The treatment dose depends of the pool water quality and the desired pH.

A.2.4 Means of application

The solid product is directly added into the pool water.

The aqueous solution of the product is usually applied using a metering pump.

A.2.5 Secondary effects

Not applicable.

A.2.6 Removal of excess product

Addition of alkaline agents (e.g. calcium carbonate) is used to neutralize the excess acidity.

Annex B
(normative)

General rules relating to safety

B.1 Rules for safe handling and use

The supplier shall provide current safety instructions.

B.2 Emergency procedures

B.2.1 First aid

Skin: wash thoroughly with plenty of water and soap.

Eyes: rinse immediately and thoroughly with plenty of water for at least 15 min and seek medical advice.

Inhalation: remove person to fresh air, if breathing is difficult seek medical help immediately.

Ingestion: give plenty of water to drink. Do not induce vomiting. Seek medical advice.

B.2.2 Spillage

Sweep up and collect in plastics containers (no metallic containers). Observe local waste disposal regulations. Rinse residues away with plenty of water. Clean contaminated tools with plenty of water.

B.2.3 Fire

Product itself does not burn. Cool endangered containers with water spray jet. Adapt extinguishing measure to the surrounding fire as foam, carbon dioxide, dry powder. Do not use water.

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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