BS EN 15514:2014

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Chemicals used for treatment of swimming pool water — Hydrochloric acid

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National foreword

This British Standard is the UK implementation of EN 15514:2014. It supersedes BS EN 15514:2007 which is withdrawn.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.

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Chemicals used for treatment of swimming pool water - Hydrochloric acid

Produits chimiques utilisés pour le traitement de l'eau des piscines - Acide chlorhydrique

Produkte zur Aufbereitung von Schwimm- und Badebeckenwasser - Salzsäure

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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 15514:2014) 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of an identical text or by endorsement, at the latest by November 2014 and conflicting national standards shall be withdrawn at the latest by November 2014.

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This document supersedes EN 15514:2007.

The significant technical difference between this edition and EN 15514:2007 is as follows:

— updating of 6.2 in line with current legislation.

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Introduction

In respect of potential adverse effects on the quality of swimming pool water, 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 hydrochloric acid used for the treatment of swimming pool water. It describes the characteristics of hydrochloric acid and specifies the requirements and the corresponding test methods for hydrochloric acid. It gives information on its use in swimming pool water treatment. It also determines the rules relating to safe handling and use of hydrochloric acid (see Annex B).

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 939, *Chemicals used for treatment of water intended for human consumption - Hydrochloric acid*

3 Description

3.1 Identification

3.1.1 Chemical name

Hydrochloric acid.

3.1.2 Synonym or common names

Muriatic acid, hydrogen chloride.

3.1.3 Relative molecular mass

36,46.

3.1.4 Empirical formula

HCl.

3.1.5 Chemical formula

HCl.

3.1.6 CAS Registry Number[1)]

7647-01-0.

3.1.7 EINECS reference[2)]

231-595-7.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3.2 Commercial forms

The product is supplied as aqueous solutions of hydrochloric acid with mass fraction of 25 % to 38 % (concentrated acid).

Dilutions of these solutions are also available.

3.3 Physical properties

3.3.1 Appearance

The solution is colourless to yellow and slightly fuming to strongly fuming, depending on concentration.

3.3.2 Density

The density is between 1,135 g/ml and 1,185 g/ml at 20 °C, depending on concentration.

3.3.3 Solubility

The product is miscible with water in any proportion.

3.3.4 Vapour pressure

The vapour pressure for HCl at mass fraction 30 % depending on temperature is given in Table 1.

Table 1 — Vapour pressure of hydrochloric acid solutions

Temperature °C	**p_{total}** kPa	**p_{HCl}** kPa	**p_{H_2O}** kPa
20	2,13	1,41	0,72
50	13,73	9,46	4,27

3.3.5 Boiling point at 100 kPa

The boiling point of HCl depending on concentration is given in Table 2.

Table 2 — Boiling point of hydrochloric acid solutions

Concentration Mass fraction in %	**Boiling point at 100 kPa** [a] °C
25	104
30	90
38	50,5
[a] 100 kPa = 1 bar.	

3.3.6 Melting or freezing point

The melting or freezing point of HCl depending on concentration is given in Table 3.

Table 3 — Melting or freezing point

Concentration Mass fraction in %	Melting or freezing point °C
38	- 27
25	- 75

3.3.7 Specific heat

3,14 kJ/(kg · K) at 18 °C for HCl at mass fraction 16,83 %.

3.3.8 Viscosity (dynamic)

The viscosity of a HCl at mass fraction 30 %, solution at 15 °C, is 1,9 mPa.s.

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 solution of hydrochloric acid is a strong mineral acid.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for hydrochloric acid used for the treatment of swimming pool water. 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 swimming pool water, 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 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

As concentrated acid the concentration of HCl solution shall be at least at mass fraction of 25 %.

More diluted solutions are commercially available, the concentration of hydrochloric acid shall be equal to or greater than the manufacturer specified value.

4.3 Impurities and main by-products

The product shall conform to the requirements specified in Table 4.

Table 4 — Impurities

Impurity		Limit in mg/kg of HCl mass fraction 100 %
Iron (Fe)	max.	170
Halogenated organic compounds (expressed as Cl)	max.	17

4.4 Chemical parameters

The product shall conform to the requirements specified in Table 5.

Table 5 — Chemical parameters

Parameter		Limit in mg/kg of HCl mass fraction 100 %	
		Type 1	Type 2
Arsenic (As)	max.	3	10
Cadmium (Cd)	max.	1	5
Chromium (Cr)	max.	3	10
Mercury (Hg)	max.	0,5	3
Nickel (Ni)	max.	3	10
Lead (Pb)	max.	3	20
Antimony (Sb)	max.	1	10
Selenium (Se)	max.	5	10
NOTE Pesticides and polycyclic aromatic hydrocarbons are not relevant in HCl. Cyanide which does not exist in a very acidic media, such as hydrochloric acid, is not a relevant chemical parameter. For parametric values of hydrochloric acid on trace metal content in drinking water, see [1].			

5 Test methods

The methods for sampling and analysis are those specified in EN 939.

6 Labelling - Transportation - Storage

6.1 Means of delivery

The product shall be delivered in vessels used solely for that purpose of capacity appropriate to the application (varying from 25 kg carboys to 25 t bulk containers).

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[3)]

The following labelling requirements apply to hydrochloric acid at the date of the publication of this European Standard.

a) GHS 05

b) GHS 07

- Signal word :

Danger.

- Hazard statement:

H 314 Causes severe skin burns and eye damages.

H 335 May cause respiratory irritation.

H 312 Harmful if contact with skin.

H 302 Harmful if swallowed.

H 290 May be corrosive to metals.

Figure 1 — Hazard Pictograms

The legislation [2], 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

Hydrochloric acid is listed as UN Number [4)] 1789.

RID [5)] ADR [6)]: class 8, classification code C1, packing group II or III.

IMDG[7)]: class 8, packing group II or III.

IATA [8)]: class 8

6.4 Marking

The marking shall include the following:

— name "hydrochloric acid" and trade name;

— net mass;

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3) See [2].

4) United Nations Number.

5) Regulations concerning International carriage of Dangerous goods by rail.

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

7) International Maritime transport of Dangerous Goods.

8) International Air Transport Association.

— name and address of supplier and/or manufacturer;

— statement "this product conforms to EN 15514" and type.

6.5 Storage

6.5.1 General

The product shall be stored in tightly-closed containers made of rubber-lined steel, polyvinyl chloride, polyethylene, polypropylene, glass, stoneware or polytetrafluorethylene, or glass-reinforced plastics providing the resin is not attacked by hydrochloric acid in a cool, well ventilated place. For more details about use, see Annex A.

6.5.2 Long term stability

The product is stable.

6.5.3 Storage incompatibilities

The product and its vapour shall not be allowed to come into contact with metals, with which it reacts, in most cases, to produce hydrogen which forms explosive mixtures with air. Also, the product shall not be allowed to come into contact with bases, alkalis, sulfites and any oxychlorine compounds.

Annex A
(informative)

General information on hydrochloric acid

A.1 Origin

A.1.1 Raw materials

Hydrochloric acid is manufactured from the following:

— chlorine and hydrogen;

— chlorine and organic compounds;

— alkali chlorid and sulfuric acid.

A.1.2 Manufacturing process

It is produced from:

— chlorine and hydrogen by dissolving the hydrochloric acid gas thus formed in demineralised water;

— organic reactions of organic compounds with chlorine;

— chlorides and acids.

A.2 Use

A.2.1 Function

In the treatment of water for swimming pools, hydrochloric acid is used to adjust the pH value.

A.2.2 Form in which the product is used

It is used in aqueous solution, as delivered or diluted with water.

A.2.3 Treatment dose

The treatment dose depends on the pH value and the alkalinity of the untreated water and on the type of water treatment.

A.2.4 Means of application

It is applied using a metering-pump.

A.2.5 Secondary effect

The secondary effect is an increase in the chloride content.

A.2.6 Removal of excess product

The excess product can be removed by neutralisation.

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

In case of contact with skin remove victim form source of contamination. Promptly flush contaminated skin with water. Promptly remove clothing if soaked through and flush skin with water. Seek medical advice immediately.

In case of contact of eyes promptly wash with lots of water while lifting eye lids. Seek medical advice immediately. Continue to rinse.

In case of inhalation move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Keep the affected person warm and at rest. Seek medical advice immediately.

In case of ingestion never make an unconscious person vomit or drink fluids. Even if conscious do not include vomiting. Seek medical advice immediately. Let victim drink lots of water to dilute chemical.

The effects can be delayed and the affected person should be kept under observation.

B.2.2 Spillage

Take the following actions with any spillages:

a) wear respiratory equipment and protective clothing;

b) stop any leak if this can be done without any danger. Avoid any contact with the spilt material;

c) neutralise the spilt materials with sodium carbonate or sodium hydrogen carbonate non-combustible or other non-combustible basic chemicals;

d) flush the area with water and then collect it in suitable containers;

e) inform the appropriate authorities if a major spillage occurs.

B.2.3 Fire

Extinguishing media: use extinguisher to suit cause of fire. Hydrochloric acid is non-flammable, but can develop corrosive fumes if heated. Hydrochloric acid reacts with many metals generating hydrogen which forms explosive mixtures with air.

Bibliography

[1] 98/83/EC: Council Directive of 3rd November 1998 on the quality of water intended for human consumption

[2] 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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BSI Group Headquarters

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