SLOVENSKI STANDARD
oSIST prEN 16400:2012

01-julij-2012

Kemikalije, ki se uporabljajo za pripravo bazenske vode - Vodikov peroksid

Chemicals used for treatment of swimming pool - Hydrogen peroxide

Produkte zur Aufbereitung von Schwimm-und badebeckenwasser - Wasserstoffperoxid

Produits chimiques utilisés pour le traitement de l'eau des piscines - Peroxyde d'hydrogène

Ta slovenski standard je istoveten z: **prEN 16400**

ICS:

13.060.25	Voda za industrijsko uporabo	Water for industrial use
71.100.80	Kemikalije za čiščenje vode	Chemicals for purification of water

oSIST prEN 16400:2012 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 16400

March 2012

ICS

English Version

Chemicals used for treatment of swimming pool - Hydrogen peroxide

Produits chimiques utilisés pour le traitement de l'eau des piscines - Peroxyde d'hydrogène

Produkte zur Aufbereitung von Schwimm-und badebeckenwasser - Wasserstoffperoxid

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 164.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN 16400:2012: E

Contents

Page

Foreword

This document (prEN 16400:2012) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

Introduction

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

1) 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;

2) 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 document is applicable only to hydrogen peroxide and not to mixtures with other chemicals used for treatment of swimming pool water. It describes the characteristics of hydrogen peroxide and specifies the requirements and the corresponding test methods for hydrogen peroxide. It gives information on its use in swimming water treatment. It also determines the rules relating to safe handling and use (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.

ISO 9965 (AAS) Water quality - Determination of selenium - Atomic absorption spectrometric method (hydride technique)

EN ISO 11969 Water quality - Determination of arsenic - Atomic absorption spectrometric method (hydride technique)

EN 902, *Chemicals used for treatment of water intended for human consumption* - Hydrogen peroxide

3 Description

3.1 Identification

3.1.1 Chemical name

Hydrogen peroxide

3.1.2 Synonym or common name

None

3.1.3 Relative molecular mass

34,02

3.1.4 Empirical formula

H_2O_2

3.1.5 Chemical formula

H_2O_2

3.1.6 CAS Registry Number[1)]

7722-84-1

3.1.7 EINECS reference[2)]

231-765-0

3.2 Commercial form

The product is supplied as an aqueous solution

---

1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3.3 Physical properties

3.3.1 Appearance and odour

The product is colourless liquid, slightly pungent odour.

3.3.2 Density

The density of hydrogen peroxide is given in Table 1.

Table 1 - Density

Solution concentration Mass fraction in%	**Density** g/ml at 20 °C
20	1,075
30	1,114
35	1,132
50	1,195
60	1,241
70	1,289

3.3.3 Solubility in water

The product is miscible with water in all proportions.

3.3.4 Vapour pressure

The vapour pressure of hydrogen peroxide depending on concentration is given in Table 2.

Table 2 - Vapour pressure

Solution concentration Mass fraction in %	**Vapour pressure** kPa at 20 °C
20	2,0
30	1,8
35	1,7
50	1,3
60	1,1
70	0,8

3.3.5 Boiling point at 100 kPa[3)]

The boiling point of hydrogen peroxide depending on concentration is given in Table 3.

3) 100 kPa = 1 bar.

Table 3 - Boiling point

Solution concentration Mass fraction in %	**Boiling point** °C at 100 kPa
20	103
30	106
35	108
50	114
60	119
70	125

3.3.6 Crystallization point

The crystallisation point of hydrogen peroxide depending on concentration is given in Table 4.

Table 4 - Crystallization point

Solution concentration Mass fraction in %	**Crystallization point** °C
20	- 14,6
30	- 25,7
35	- 32,5
50	- 51
60	- 55
70	- 37

3.3.7 Specific heat

The specific heat of hydrogen peroxide depending on concentration is given in Table 5.

Table 5 - Specific heat

Solution concentration Mass fraction in %	**Specific heat** kJ/(kg.K)
20	3,82 at 20 °C
50	3,32 at 20 °C
100	2,63 at 25 °C

3.3.8 Viscosity, dynamic

The viscosity of hydrogen peroxide depending on concentration is given in table 6.

Table 6 - Viscosity

Solution concentration Mass fraction in %	**Viscosity** MPa.s at 20 °C
20	1,04
30	1,07
35	1,10
50	1,17
60	1,20
70	1,24
100	1,25

3.3.9 Critical temperature

The critical temperature of pure hydrogen peroxide is 457 °C.

3.3.10 Critical pressure

The critical pressure of pure hydrogen peroxide is 21,7 mPa.

3.3.11 Physical hardness

Not applicable.

3.4 Chemical properties

Hydrogen peroxide is a weak acid.

According to species in solution, it is an oxidizing agent (E° =1,776 V) or a reducing agent (E° = 0,682 V).
Oxidizing agent :

$H_2O_2 + 2H^+ + 2e^-$ -----> $2H_2O$

Reducing agent :

H_2O_2 -----> $O_2 + 2H^+ + 2e^-$

NOTE 1 It can be activated by ultraviolet light, ozone or metals to generate free radicals.

NOTE 2 Singlet oxygen can be obtained by reaction of hydrogen peroxide with hypochlorite.

NOTE 3 In swimming pool water treatment, hydrogen peroxide is commonly used at 35% mass fraction