

**SLOVENSKI STANDARD**  
**oSIST prEN 16400:2012**  
**01-julij-2012**

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**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**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 16400**

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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

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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.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## 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.

**iTeh STANDARD PREVIEW**  
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SIST EN 16400:2014

<https://standards.iteh.ai/catalog/standards/sist/f8dd5939-0a5f-41c7-86b3-7802af99e86b/sist-en-16400-2014>

## 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.

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## 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 <https://standards.iteh.ai/catalog/standards/sist/f8dd5939-0a5f-41c7-86b3-7802af99e86b/sist-en-16400-2014>

#### 3.1.2 Synonym or common name

None

#### 3.1.3 Relative molecular mass

34,02

#### 3.1.4 Empirical formula

H<sub>2</sub>O<sub>2</sub>

#### 3.1.5 Chemical formula

H<sub>2</sub>O<sub>2</sub>

#### 3.1.6 CAS Registry Number<sup>1)</sup>

7722-84-1

#### 3.1.7 EINECS reference<sup>2)</sup>

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.

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## 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

<b>Solution concentration</b> Mass fraction in%	<b>Density</b> 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

<b>Solution concentration</b> Mass fraction in %	<b>Vapour pressure</b> 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<sup>3)</sup>

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

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3) 100 kPa = 1 bar.



**Table 3 - Boiling point**

<b>Solution concentration</b> Mass fraction in %	<b>Boiling point</b> °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**

<b>Solution concentration</b> Mass fraction in %	<b>Crystallization point</b> °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**

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

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## 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.

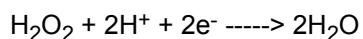
## 3.3.11 Physical hardness

Not applicable.

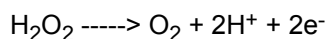
## 3.4 Chemical properties

Hydrogen peroxide is a weak acid.

According to species in solution, it is an oxidizing agent ( $E^\circ = 1,776 \text{ V}$ ) or a reducing agent ( $E^\circ = 0,682 \text{ V}$ ).  
Oxidizing agent :



Reducing agent :



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