

# SVENSK STANDARD

## SS-EN 12678:2016



Fastställt/Approved: 2016-05-23  
Publicerad/Published: 2016-05-24  
Utgåva/Edition: 3  
Språk/Language: engelska/English  
ICS: 13.060.20; 71.100.80

---

### **Processkemikalier för beredning av dricksvatten – Kaliumperoxomonosulfat**

**Chemical used for treatment of water intended for human  
consumption – Potassium peroxomonosulfate**

This preview is downloaded from [www.sis.se](http://www.sis.se). Buy the entire standard via <https://www.sis.se/std-8020632>

# Standarder får världen att fungera

*SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.*

## Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

## Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

## Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

**Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på [www.sis.se](http://www.sis.se) eller ta kontakt med oss på tel 08-555 523 00.**



# Standards make the world go round

*SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.*

## Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

## Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

## Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

**If you want to know more about SIS, or how standards can streamline your organisation, please visit [www.sis.se](http://www.sis.se) or contact us on phone +46 (0)8-555 523 00**



Europastandarden EN 12678:2016 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 12678:2016.

Denna standard ersätter SS-EN 12678:2008, utgåva 2.

The European Standard EN 12678:2016 has the status of a Swedish Standard. This document contains the official English version of EN 12678:2016.

This standard supersedes the Swedish Standard SS-EN 12678:2008, edition 2.

**WARNING** - The use of this standard may involve hazardous materials, operations and equipment. This standard does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

*Uppllysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.*

*Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.*

Denna standard är framtagen av kommittén för Vattenförsörjning, SIS/TK 198/AG 164.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på [www.sis.se](http://www.sis.se) - där hittar du mer information.



EUROPEAN STANDARD

EN 12678

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2016

ICS 71.100.80

Supersedes EN 12678:2008

English Version

## Chemical used for treatment of water intended for human consumption - Potassium peroxomonosulfate

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Peroxomonosulfate de potassium

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Kaliumperoxomonosulfat

This European Standard was approved by CEN on 18 March 2016.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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, 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 United Kingdom.



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

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

<b>Contents</b>	<b>Page</b>
European foreword.....	4
Introduction .....	5
<b>1</b> <b>Scope</b> .....	<b>6</b>
<b>2</b> <b>Normative references</b> .....	<b>6</b>
<b>3</b> <b>Description</b> .....	<b>6</b>
<b>3.1</b> <b>Identification</b> .....	<b>6</b>
<b>3.1.1</b> <b>Chemical name</b> .....	<b>6</b>
<b>3.1.2</b> <b>Synonym or common name</b> .....	<b>6</b>
<b>3.1.3</b> <b>Relative molecular mass</b> .....	<b>6</b>
<b>3.1.4</b> <b>Empirical formula of triple salt</b> .....	<b>6</b>
<b>3.1.5</b> <b>CAS Registry Number</b> .....	<b>7</b>
<b>3.1.6</b> <b>EINECS reference</b> .....	<b>7</b>
<b>3.2</b> <b>Commercial form</b> .....	<b>7</b>
<b>3.3</b> <b>Physical properties of triple salt</b> .....	<b>7</b>
<b>3.3.1</b> <b>Appearance and odour</b> .....	<b>7</b>
<b>3.3.2</b> <b>Density</b> .....	<b>7</b>
<b>3.3.3</b> <b>Solubility in water</b> .....	<b>7</b>
<b>3.3.4</b> <b>Vapour pressure</b> .....	<b>7</b>
<b>3.3.5</b> <b>Boiling point at 100 kPa</b> .....	<b>7</b>
<b>3.3.6</b> <b>Melting point</b> .....	<b>7</b>
<b>3.3.7</b> <b>Specific heat</b> .....	<b>7</b>
<b>3.3.8</b> <b>Viscosity (dynamic)</b> .....	<b>7</b>
<b>3.3.9</b> <b>Critical temperature</b> .....	<b>7</b>
<b>3.3.10</b> <b>Critical pressure</b> .....	<b>8</b>
<b>3.3.11</b> <b>Physical hardness</b> .....	<b>8</b>
<b>3.4</b> <b>Chemical properties</b> .....	<b>8</b>
<b>4</b> <b>Purity criteria</b> .....	<b>8</b>
<b>4.1</b> <b>General</b> .....	<b>8</b>
<b>4.2</b> <b>Composition of commercial product</b> .....	<b>8</b>
<b>4.3</b> <b>Impurities and main by-products</b> .....	<b>8</b>
<b>4.4</b> <b>Chemical parameters</b> .....	<b>8</b>
<b>5</b> <b>Test methods</b> .....	<b>9</b>
<b>5.1</b> <b>Sampling</b> .....	<b>9</b>
<b>5.2</b> <b>Analysis</b> .....	<b>9</b>
<b>5.2.1</b> <b>Determination of potassium peroxomonosulfate (KHSO<sub>5</sub>) (active ingredient)</b> .....	<b>9</b>
<b>5.2.2</b> <b>Chemical parameters</b> .....	<b>12</b>
<b>6</b> <b>Labelling - Transportation - Storage</b> .....	<b>14</b>
<b>6.1</b> <b>Means of delivery</b> .....	<b>14</b>
<b>6.2</b> <b>Labelling according to the EU Legislation</b> .....	<b>15</b>
<b>6.3</b> <b>Transportation regulations and labelling</b> .....	<b>15</b>
<b>6.4</b> <b>Marking</b> .....	<b>15</b>
<b>6.5</b> <b>Storage</b> .....	<b>15</b>
<b>6.5.1</b> <b>Generals</b> .....	<b>15</b>
<b>6.5.2</b> <b>Long term stability</b> .....	<b>15</b>

<b>6.5.3 Storage incompatibilities.....</b>	<b>16</b>
<b>Annex A (informative) General information on potassium peroxomonosulfate .....</b>	<b>17</b>
<b>A.1 Origin .....</b>	<b>17</b>
<b>A.1.1 Raw materials .....</b>	<b>17</b>
<b>A.1.2 Manufacturing process .....</b>	<b>17</b>
<b>A.2 Use.....</b>	<b>17</b>
<b>A.2.1 Function .....</b>	<b>17</b>
<b>A.2.2 Form in which it is used.....</b>	<b>17</b>
<b>A.2.3 Treatment dose .....</b>	<b>17</b>
<b>A.2.4 Means of application.....</b>	<b>17</b>
<b>A.2.5 Secondary effects .....</b>	<b>17</b>
<b>A.2.6 Removal of excess product.....</b>	<b>18</b>
<b>Annex B (normative) General rules relating to safety.....</b>	<b>19</b>
<b>B.1 Rules for safe handling and use.....</b>	<b>19</b>
<b>B.2 Emergency procedures.....</b>	<b>19</b>
<b>B.2.1 First aid .....</b>	<b>19</b>
<b>B.2.2 Spillage .....</b>	<b>19</b>
<b>B.2.3 Fire .....</b>	<b>19</b>
<b>Annex C (normative) Determination of arsenic, antimony and selenium (atomic absorption spectrometry hydride technique) .....</b>	<b>20</b>
<b>C.1 Safety precautions.....</b>	<b>20</b>
<b>C.2 General principle .....</b>	<b>20</b>
<b>C.3 Interferences.....</b>	<b>20</b>
<b>C.4 Reagents.....</b>	<b>20</b>
<b>C.5 Apparatus .....</b>	<b>22</b>
<b>C.6 Procedure .....</b>	<b>24</b>
<b>C.6.1 Preparation of the apparatus.....</b>	<b>24</b>
<b>C.6.2 Preparation of calibration solutions .....</b>	<b>24</b>
<b>C.6.3 Preparation of test solutions and standard solutions.....</b>	<b>24</b>
<b>C.6.4 Determination of arsenic with sodium borohydride.....</b>	<b>24</b>
<b>C.6.5 Determination of selenium with sodium borohydride.....</b>	<b>25</b>
<b>C.6.6 Determination of antimony with sodium borohydride .....</b>	<b>25</b>
<b>C.7 Calculation.....</b>	<b>25</b>
<b>Bibliography .....</b>	<b>26</b>

## European foreword

This document (EN 12678:2016) 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 2016, and conflicting national standards shall be withdrawn at the latest by November 2016.

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 12678:2008.

Significant technical difference between this edition and EN 12678:2008 is as follows:

- deletion of reference to EU Directive 67/548/EEC of June 27, 1967 in order to take into account the latest Regulation in force (see [3]).

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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 human consumption, 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 1 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.

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 REGULATION (EU) No 528/2012 [1]).

## 1 Scope

This European Standard is applicable to potassium peroxomonosulfate used for treatment of water intended for human consumption. It describes the characteristics of potassium peroxomonosulfate and specifies the requirements and the corresponding test methods for potassium peroxomonosulfate. It gives information on its use in water treatment.

## 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 1233, *Water quality — Determination of chromium — Atomic absorption spectrometric methods*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

EN ISO 12846, *Water quality — Determination of mercury — Method using atomic absorption spectrometry (AAS) with and without enrichment (ISO 12846)*

ISO 3165, *Sampling of chemical products for industrial use — Safety in sampling*

ISO 6206, *Chemical products for industrial use — Sampling — Vocabulary*

ISO 8213, *Chemical products for industrial use — Sampling techniques — Solid chemical products in the form of particles varying from powders to coarse lumps*

ISO 8288, *Water quality — Determination of cobalt, nickel, copper, zinc, cadmium and lead — Flame atomic absorption spectrometric methods*

## 3 Description

### 3.1 Identification

#### 3.1.1 Chemical name

Potassium peroxomonosulfate triple salt.

#### 3.1.2 Synonym or common name

Potassium peroxomonosulfate, Potassium monopersulfate, Potassium hydrogenperoxomonosulfate, Pentapotassium-bis(peroxomonosulfate)bis(sulfate).

#### 3.1.3 Relative molecular mass

Triple salt: 614,76.

(Active ingredient  $\text{KHSO}_5$ : 152,17).

#### 3.1.4 Empirical formula of triple salt

$\text{K}_5\text{H}_3\text{S}_4\text{O}_{18}$  (2  $\text{KHSO}_5$ ,  $\text{KHSO}_4$ ,  $\text{K}_2\text{SO}_4$ ).

Active ingredient  $\text{KHSO}_5$ .

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

70693-62-8.

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

274-778-7.

## 3.2 Commercial form

Potassium peroxomonosulfate as commercial product exists as a triple salt comprising potassium peroxomonosulfate ( $2\text{KHSO}_5$ ) potassium hydrogen sulfate ( $\text{KHSO}_4$ ) and potassium sulfate ( $\text{K}_2\text{SO}_4$ ).

## 3.3 Physical properties of triple salt

### 3.3.1 Appearance and odour

The product is white, odourless, granular, free-flowing salt.

### 3.3.2 Density

The bulk density of the product is approximately between  $1 \text{ g/cm}^3$  and  $1,2 \text{ g/cm}^3$ .

### 3.3.3 Solubility in water

The solubility of the product is:

- approximately 250 g/l at 20 °C;
- approximately 300 g/l at 50 °C;
- approximately 330 g/l at 70 °C.

### 3.3.4 Vapour pressure

Not applicable.

### 3.3.5 Boiling point at 100 kPa<sup>3)</sup>

Not applicable.

### 3.3.6 Melting point

The product decomposes above 60 °C.

### 3.3.7 Specific heat

Not applicable.

### 3.3.8 Viscosity (dynamic)

Not applicable.

### 3.3.9 Critical temperature

Not applicable.

---

1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar