SLOVENSKI STANDARD
SIST EN 15039:2014

01-junij-2014

Nadomešča:
SIST EN 15039:2006

Kemikalije, ki se uporabljajo za pripravo pitne vode - Sredstva proti apnencu na membranah - Polikarboksilne kisline in soli

Chemicals used for treatment of water intended for human consumption - Antiscalants for membranes - Polycarboxilic acids and salts

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Antiscalants für Membranen - Polycarbonsäuren und deren Salze

Produits chimiques pour le traitement de l'eau destinée à la consommation humaine - Produits antitartre pour membranes - Acides polycarboxyliques et sels

Ta slovenski standard je istoveten z: **EN 15039:2014**

ICS:

13.060.20	Pitna voda	Drinking water
71.100.80	Kemikalije za čiščenje vode	Chemicals for purification of water

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English Version

Chemicals used for treatment of water intended for human consumption - Antiscalants for membranes - Polycarboxilic acids and salts

Produits chimiques pour le traitement de l'eau destinée à la consommation humaine - Produits antitartre pour membranes - Acides polycarboxyliques et sels

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Antiscalants für Membranen - Polycarbonsäuren und deren Salze

This European Standard was approved by CEN on 5 January 2014.

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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.

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

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Foreword

This document (EN 15039:2014) 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of an identical text or by endorsement, at the latest by September 2014 and conflicting national standards shall be withdrawn at the latest by September 2014.

This document supersedes EN 15039:2006.

Significant technical differences between this edition and EN 15039:2006 are as follows:

- replacement of warning and safety precautions notes by labelling according to REGULATION (EC) No 1272/2008.

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 products covered by this European Standard:

a) this European Standard provides no information as to whether the products 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 these products remain in force.

NOTE Conformity with this European Standard does not confer or imply acceptance or approval of the products in any of the Member States of the EU or EFTA. The use of the products covered by this European Standard is subject to regulation or control by National Authorities.

1 Scope

This European Standard is applicable to polycarboxylic acids and salts used as antiscalants for membranes for the treatment of water intended for human consumption. It describes the characteristics and specifies the requirements and the corresponding analytical methods for polycarboxylic acids and salts. It gives information on their use as antiscalants for membranes 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 ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696)*

EN ISO 5961, *Water quality - Determination of cadmium by atomic absorption spectrometry (ISO 5961)*

EN ISO 11885, *Water quality - Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885)*

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

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 6703-1, *Water quality — Determination of cyanide — Part 1: Determination of total cyanide*

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

ISO 8288:1986, *Water quality — Determination of cobalt, nickel, copper, zinc, cadmium and lead — Flame atomic absorption spectrometric methods*

ISO 9174, *Water quality — Determination of chromium — Atomic absorption spectrometric methods*

ISO 9965, *Water quality — Determination of selenium — Atomic absorption spectrometric method (hydride technique)*

3 Description

3.1 Identification

3.1.1 Chemical name

Homopolymers:

a) polyacrylic acid;

b) polymethacrylic acid;

c) polymaleic acid;

d) polyaspartic acid.

These acids can also be used as sodium, potassium, and ammonium salts.

Copolymers of acrylic acid, methacrylic acid, maleic acid, vinylsulfonic acid, allyl sulfonic acid, methylallyl sulfonic acid, 2-acrylamido-2-methyl-1-propanesulfonic acid, vinyl phosphonic acid, 2-methoxyethylphosphonic acid, ethyleneoxide, α-olefines, acrylamide, benzene sulfonic acid, 4-[(2-methyl-2-propenyl)oxy]-, sodium salt, benzene sulfonic acid, 4-vinyl-, sodium salt and 1-propanesulfonic acid, 2-hydroxy-3-(2-propenyloxy)-, monosodium salt.

Polymers of polyetherdiamines and phosphorous acid.

The acid monomers can also be used as sodium, potassium, and ammonium salts.

3.1.2 Synonym or common names

Nil.

3.1.3 Relative molecular mass

< 100 000 g/mol.

3.1.4 Empirical formula

Nil.

3.1.5 Chemical formula

Homopolymers:

a) $(C_2H_3COOH)_n$;

b) $(C_3H_5COOH)_n$;

c) $(HOOCC_2H_2COOH)_n$;

d) $(C_4H_5NO_4)_n$.

Monomers for the copolymers: C_2H_3COOH, C_3H_5COOH, $HOOCC_2H_2COOH$, $C_2H_4O_3S$, $C_3H_6O_3S$, $C_4H_8O_3S$, $C_7H_{13}NO_4S$, $C_2H_5O_3P$, $C_3H_9O_4P$, C_3H_5NO, $C_{10}H_{12}O_4SNa$, $C_8H_8O_3SNa$, $C_6H_{12}O_5SNa$.

Polymer made from polyetherdiamines $H_2N\text{-}C(R)HCH_2\text{-}(OCH_2C(R)H)_a\text{-}(OCH_2C(R)H)_b\text{-}NH_2$, a = 2 to 12, b = 0 to 1 and R is hydrogen or methyl, and H_3O_3P.

3.1.6 CAS Registry Number[1)]

Homopolymers (acids):

a) 9003-01-4;

b) 25087-26-7;

1) Chemical Abstracts Service Registry Number.

c) 26099-09-2;

d) 25608-40-6.

Table 1 — Salts

	Na^+	K^+	NH_4^+
Acrylic acid	9003–04–7 (part. neutralized) 25549–84–2	25608–12–2	9003–03–6 (part. neutralized) 28214–57–6
Methacrylic acid	54193–36–1	29297–93–6	28805–15–4
Maleic acid	30915–61–8		

Copolymers:

Polyacrylic acid-acrylamide: 9003-06-9;

Acrylic acid-methacrylic acid: 25751-21-7;

Acrylic acid-itaconic acid: 258948-33-8;

Acrylic acid-maleic acid: 29132-58-9;

Acrylic acid-methacrylic acid-ethyleneoxide: 1246089-72-4;

Maleic acid-α-olefine: 39612-00-5;

Conversion of acrylic acid with hypophosphite: 129898-01-7;

Conversion of acrylic acid with bisulfite: 68479-09-4;

Conversion of acrylic acid with isopropanol: 113133-74-7.

Monomers:

Benzene sulfonic acid, 4-[(2-methyl-2-propenyl)oxy]-, sodium salt: 1208-67-9;

Benzene sulfonic acid, 4-ethenyl-, sodium salt: 2695-37-6;

1-Propanesulfonic acid, 2-hydroxy-3-(2-propenyloxy)-, monosodium salt: 52556-42-0.

3.1.7 EINECS reference[2)]

The EINECS-declarations for all mentioned polymers are: POLYMER (All used monomers are listed on the EINECS inventory).

2) European Inventory of Existing Commercial Chemical Substances.

3.2 Commercial forms

The polycarboxylic acids and polyacrylates are available as aqueous solutions and as in granular and powder form. All concentrations mentioned refer to the active matter and shall be calculated accordingly.

3.3 Physical properties

3.3.1 Appearance

The products in solution are a colourless to amber solution and in solid form are white to yellow particles.

3.3.2 Density

The density of solid in granular and powder form has typical values between 400 g/dm^3 to 1200 g/dm^3.

The density of solution is 1,00 g/ml to 1,40 g/ml for a product concentration from mass fraction 20 % to 50 % of active matter at 20 °C.

3.3.3 Solubility in water

Solid: it is soluble in all portions of pure water;

Liquid: it is miscible in all proportions of pure water.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa[3)]

Solid: not applicable;

Liquid: approximately 100 °C .

3.3.6 Solidification point

Solid: not applicable;

Liquid: within –25 °C and 0 °C (aqueous product solution).

3.3.7 Specific heat

Not known.

3.3.8 Viscosity (dynamic)

For the liquid the viscosity is equal from 1 mPa.s to 25 mPa.s for a product concentration of 50 g/l.

3.3.9 Critical temperature

Not applicable.

3) 100 kPa = 1 bar.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

Not applicable.

3.4 Chemical properties

The polycarboxylic acids and solutions of polycarboxylic acid salts have acidic to alkaline reactions. The pH value of an aqueous solution of a mass fraction of 1 % is approximately between 2 to 11.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for polycarboxylic acids and salts used as antiscalants for the membranes in the treatment of water intended for human consumption. Limits are given for impurities commonly present in the products. 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 these products should check the national regulations in order to clarify whether it is of appropriate purity for treatment of water intended for human consumption, taking into account raw water quality, required dosage, contents of other impurities and additives used in the products not stated in this 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 lead 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 product in solid form shall have a polymer content in mass fraction between 85 % to 100 %.

The product in aqueous solution shall conform to the following requirements on a dry mass basis :

— polymer content : mass fraction of (20 to 50) %.

If additional requirements are agreed between the customer and the manufacturer/supplier, the latter should provide the necessary test methods, if requested, so that the customer can carry out his own quality checks. A certificate of analysis should be provided by the manufacturer/supplier if requested.

4.3 Impurities and main by-products

The content of acrylic acid in polycarboxylic acids and salts shall not exceed 1 500 mg/kg of dry product.

4.4 Chemical parameters

Content of various metals depends on the origin of the raw materials, most of these elements are present only as traces.

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