

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

ICS 13.060.20, 71.100.80,

National foreword

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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.

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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 antitartres 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 June 2006.

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Foreword

This document (EN 15039:2006) 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of an identical text or by endorsement, at the latest by January 2007, and conflicting national standards shall be withdrawn at the latest by January 2007.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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 and 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 referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1483, *Water quality — Determination of mercury*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

EN ISO 5961, *Water quality — Determination of cadmium by atomic absorption spectrometry (ISO 5961:1994)*

EN ISO 11885, *Water quality — Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (ISO 11885:1996)*

EN ISO 11969, *Water quality — Determination of arsenic — Atomic absorption spectrometric method (hydride technique) (ISO 11969:1996)*

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) poly maleic acid;
- d) poly aspartic 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 and acrylamide.

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

Monomers:

- e) benzene sulfonic acid, 4-[(2-methyl-2-propenyl)oxy]-, sodium salt;
- f) benzene sulfonic acid, 4-vinyl-, sodium salt;
- g) 1-propanesulfonic acid, 2-hydroxy-3-(2-propenyloxy)-, monosodium salt.

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) $(HOOCCH_2CH_2COOH)_n$;
- d) $(C_4H_5NO_4)_n$.

Monomers for the copolymers: C_2H_3COOH , C_3H_5COOH , $HOOCCH_2COOH$, $C_2H_4O_3S$, $C_3H_6O_3S$, $C_4H_8O_3S$, $C_7H_{13}NO_4S$, $C_2H_4O_3P$, C_3H_5NO .

Monomers:

e) $C_{10}H_{12}O_4SNa$;

f) $C_8H_8O_3SNa$;

g) $C_6H_{12}O_5SNa$.

3.1.6 CAS Registry Number¹⁾

Homopolymers (acids):

a) 9003-01-4;

b) 25087-26-7 ;

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 :

Poly acrylic 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.

Monomers:

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

1) Chemical Abstracts Service Registry Number.