



SLOVENSKI STANDARD
SIST EN 1409:2008

01-april-2008

Nadomešča:
SIST EN 1409:1999

Kemikalije, ki se uporabljajo za pripravo pitne vode - Poliamini

Chemicals used for water treatment intended for human consumption - Polyamines

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Polyamine

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

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Ta slovenski standard je istoveten z: EN 1409:2008

[SIST EN 1409:2008](#)

[http://www.sist.si/standards/standards/1409-2008-855-484d-95cd-d3577055e5b0/sist-en-1409-2008](#)

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

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EUROPEAN STANDARD

EN 1409

NORME EUROPÉENNE

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January 2008

ICS 71.100.80

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English Version

Chemicals used for water treatment intended for human consumption - Polyamines

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Polyamine

This European Standard was approved by CEN on 10 November 2007.

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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 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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Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Description	6
3.1 Identification.....	6
3.1.1 Chemical name.....	6
3.1.2 Synonyms or common names.....	6
3.1.3 Relative molecular mass.....	6
3.1.4 Empirical formula.....	6
3.1.5 Chemical formulae.....	7
3.1.6 CAS Registry Numbers	7
3.1.7 EINECS reference	7
3.2 Commercial form	7
3.3 Physical properties.....	7
3.3.1 Appearance	7
3.3.2 Density	7
3.3.3 Solubility.....	7
3.3.4 Vapour pressure	8
3.3.5 Boiling point at 100 kPa	8
3.3.6 Freezing point	8
3.3.7 Specific heat.....	8
3.3.8 Viscosity, dynamic.....	8
3.3.9 Critical temperature.....	8
3.3.10 Critical pressure.....	8
3.3.11 Physical hardness	8
3.4 Chemical properties	8
4 Purity criteria.....	8
4.1 General.....	8
4.2 Composition of commercial product.....	9
4.3 Impurities and main by-products.....	9
4.4 Chemical parameters	9
5 Test methods.....	9
5.1 Sampling.....	9
5.1.1 General.....	9
5.1.2 Sampling from drums and bottles	10
5.1.3 Sampling from tanks and tankers	10
5.2 Analyses	10
5.2.1 General.....	10
5.2.2 Main product	11
5.2.3 Impurities.....	13
6 Labelling - transportation - storage	20
6.1 Means of delivery.....	20
6.2 Risk and safety labelling in accordance with the EU Directives	20
6.3 Transportation regulations and labelling.....	20
6.4 Marking.....	20
6.5 Storage.....	20
6.5.1 Long term stability.....	20

6.5.2 Storage incompatibilities	20
Annex A (informative) General information on polyamines	21
Bibliography	23

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SIST EN 1409:2008

<https://standards.iteh.ai/catalog/standards/sist/6417b32e-3855-484d-95cd-d3577055e5b0/sist-en-1409-2008>

EN 1409:2008 (E)**Foreword**

This document (EN 1409:2008) has been prepared by Technical Committee CEN/TC164 "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 July 2008, and conflicting national standards shall be withdrawn at the latest by July 2008.

This document supersedes EN 1409:1998.

Significant technical differences between this edition and EN 1409:1998 are as follows:

- (a) reduction in the limit values for 1,3-dichloro-2-propanol and 2,3-dichloro-1-propanol in 4.3;
- (b) introduction of a limit for 3-monochloropropane-1,2-diol (3-MCPD) in 4.3;
- (c) reduction of the limit value for epichlorohydrin in 4.4;
- (d) modification of the test method for epichlorohydrin, dichloropropanol isomers and 3-MCPD;
- (e) updating of the reference to the drinking water directive from 80/778/EEC to 98/83/EC.

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, 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 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 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 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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EN 1409:2008 (E)**1 Scope**

This European Standard is applicable to polyamines used for treatment of water intended for human consumption. It describes the characteristics and specifies the requirements and the corresponding test methods for polyamines. It gives information on its use 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 ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

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

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

3 Description**3.1 Identification****3.1.1 Chemical name**

(di)methylamine - epichlorohydrin resin

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3.1.2 Synonyms or common names

- polyamine;
- polyalkylene amine;
- polyquaternary salts.

NOTE The more general terms "cationic polymer", "cationic polyelectrolyte", "cationic flocculant" and "quaternary ammonium polyelectrolyte" are used but can also cover other chemicals referred to in other European Standards.

3.1.3 Relative molecular mass

In the range of 10 000 g/Mol to 1 000 000 g/Mol.

3.1.4 Empirical formula

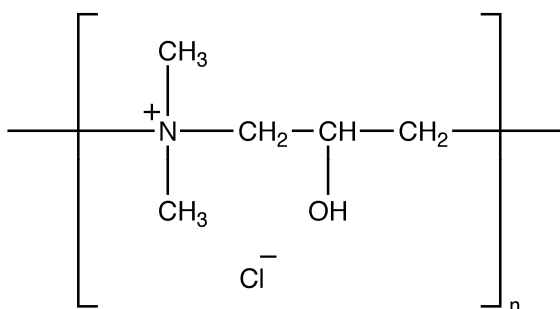
- (C_aH_bN_cO_dCl_e)_n -

where

- *a*, *b*, *c*, *d* and *e* are variable depending on the reactants used and on their molar ratios.

3.1.5 Chemical formulae

The following formula illustrates typical structures formed when dimethylamine is reacted with epichlorohydrin.



3.1.6 CAS Registry Numbers ¹⁾

25988-97-0

68583-79-1

42751-79-1

NOTE This list is not exhaustive: polyamines with other CAS numbers are also used for water treatment.

3.1.7 EINECS reference ²⁾

EINECS does not list polyamines because EINECS reference numbers do not exist for polymers; conformity to EINECS being assessed on the basis of the monomers of which they are composed.

3.2 Commercial form

Polyamines as specified in this standard are aqueous polymer solutions in the form of viscous liquids, the concentration (active content) of which is approximately 30 percent to 50 percent mass fraction.

3.3 Physical properties

3.3.1 Appearance

The product is a clear, colourless to amber-coloured liquid.

3.3.2 Density

The density of the solution depends on concentration. A typical value is 1,16 g/ml for 50 % (m/m) polyamine at 20 °C.

3.3.3 Solubility

The products are miscible with water at all concentrations.

¹⁾ Chemical Abstracts Service Registry Number.

²⁾ European Inventory of Existing Commercial Chemical Substances.

EN 1409:2008 (E)**3.3.4 Vapour pressure**

A typical value is 2,4 kPa for 50 % mass fraction polyamine at 20 °C.

3.3.5 Boiling point at 100 kPa³⁾

A typical value is 101 °C for 50 % mass fraction polyamine.

3.3.6 Freezing point

A typical value is - 7 °C for 50 % mass fraction polyamine.

3.3.7 Specific heat

A typical value is 3,13 kJ/kg K for 50 % mass fraction polyamine.

3.3.8 Viscosity, dynamic

The viscosity is dependent on molecular mass and active content. A typical value is 400 mPa.s for 50 % mass fraction polyamine at 20 °C.

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

Not applicable.

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3.4 Chemical properties

Polyamines are non hazardous materials and not intrinsically reactive. However, in common with many other organic compounds, a strong exothermic reaction will occur if they are brought into contact with strong acid or strong oxidizing agent.

NOTE In dilute solution there can be a reaction with, or destruction by, some of the disinfection and oxidizing agents used in water treatment.

4 Purity criteria**4.1 General**

This European Standard specifies the minimum purity requirements for polyamines used for the treatment of water intended for human consumption. Limits are given for impurities commonly present in the product. 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.

³⁾ 100 kPa = 1 bar.

NOTE Users of this product 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 and contents of other impurities and additives used in the product not stated in the product standard.

Limits have been given for impurities and chemical 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 following requirements shall apply to polyamines:

- there shall be no visible insoluble gel or extraneous matter;
- pH shall be in the range 4 to 7.

4.3 Impurities and main by-products

The product shall conform to the requirements specified in Table 1.

Table 1 — Impurity/by - product

Impurity / by-product	Limits (mg/kg of active product)
3-monochloropropane-1,2-diol	40
1,3-Dichloro-2-propanol	40
2,3-Dichloro-1-propanol	40

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Based on the raw materials and manufacturing process (see A.1), there are no significant concentrations of additional reactants or by-products which are relevant to the application of these products in drinking water treatment.

4.4 Chemical parameters

The product shall contain no more than 10 mg of epichlorohydrin (CAS Number 106-89-8) per kilogram of active ingredient.

NOTE Other chemical parameters and indicator parameters as listed in EU Directive 98/83/EC (see [1]) are not relevant to polyamines because the raw materials used in the manufacturing process are free of them and they are not by-products of the manufacturing process.

5 Test methods

5.1 Sampling

5.1.1 General

For sampling the recommendations given in ISO 3165 and ISO 6206 shall be followed.

A representative sample of the liquid product, of sufficient mass, shall be obtained immediately after manufacture or from a newly opened container(s). The sample shall be clearly labelled with product