



# SLOVENSKI STANDARD

## SIST EN 1409:1999

01-april-1999

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### Kemikalije, ki se uporabljajo za pripravo pitne vode – Poliamini

Chemicals used for treatment of water 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 1409:1998**

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#### **ICS:**

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

**SIST EN 1409:1999**

**en**

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EUROPEAN STANDARD

EN 1409

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 1998

ICS 71.100.80

Descriptors: potable water, water treatment, chemical compounds, amines, description, physical properties, chemical properties, impurities, toxic substances, tests, labelling, storage, information, warning notices

English version

## Chemicals used for treatment of water 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 26 March 1998.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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## Foreword

This European Standard 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 October 1998, and conflicting national standards shall be withdrawn at the latest by October 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, 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 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.

## 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

Annex A gives some information on origin, use and handling of polyamines.

Annex B lists the bibliography.

## 2 Normative references

This European standard incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate place in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to 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

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## 3 Description

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### 3.1 Identification

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#### 3.1.1 Chemical name

(di)methylamine - epichlorohydrin resin.

### 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 to 1 million.

### 3.1.4 Empirical formula

-  $(C_aH_bN_cO_dCl_e)_n$  -

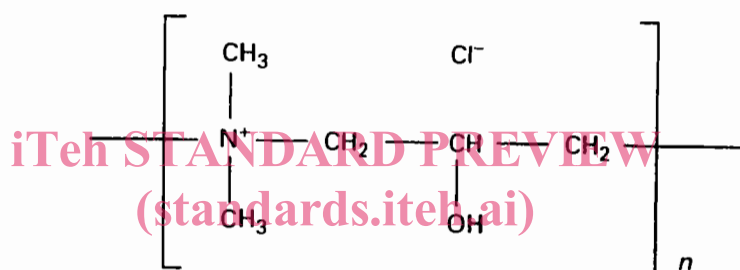
Where :

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

### 3.1.5 Chemical formulae

The following formulae illustrate typical structures formed when (a) dimethylamine and (b) methylamine are reacted with epichlorohydrin.

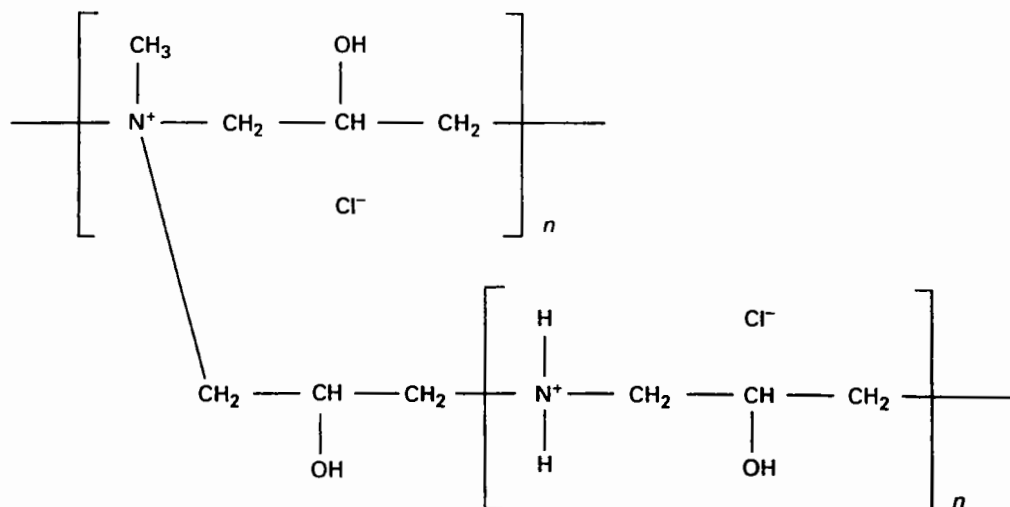
a)



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b)



### 3.1.6 Cas Registry Numbers <sup>1)</sup>

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 <sup>2)</sup>

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.

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<sup>1)</sup> Chemical Abstracts Service Registry Number.

<sup>2)</sup> European Inventory of Existing Commercial Chemical Substances.



## 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 by mass (% (m/m)) to 50 percent by mass (% (m/m)).

## 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 is miscible with water at all concentrations.

### 3.3.4 Vapour pressure

A typical value is 2,4 kPa for 50 % (m/m) polyamine at 20 °C.

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

A typical value is 101 °C for 50 % (m/m) polyamine.

### 3.3.6 Freezing point

A typical value is - 7 °C for 50 % (m/m) polyamine.

### 3.3.7 Specific heat

A typical value is 3,13 kJ/kg.K for 50 % (m/m) 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 % (m/m) polyamine at 20 °C.

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<sup>3)</sup> 100 kPa = 1 bar

### 3.3.9 Critical temperature

Not applicable.

### 3.3.10 Critical pressure

Not applicable.

### 3.3.11 Physical hardness

Not applicable.

## 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

Limits have been given for impurities and toxic substances where these are likely to be present in significant quantities from the current production process and raw materials. If a change in the production process or raw materials leads to significant quantities of other impurities or by-products being present, this shall be notified to the user.

### 4.1 Composition of commercial product

The following requirements shall apply to polyamines :

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

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### 4.2 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)
Epichlorohydrin	20
1,3-Dichloro-2-propanol	1 000
2,3-Dichloro-1-propanol	500

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.

### 4.3 Toxic substances

NOTE : For the purpose of this standard, "toxic substances" are those defined in the EU Directive 80/778/EEC of 15 July, 1980 (see B.1).

Toxic substances as defined above are not relevant at a reference dose of 5 mg/l active product.

## 5 Test methods

### 5.1 Sampling

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 name/code, batch number, type of container(s) sampled and date sampled. Reference samples shall be retained for the storage life of the product as claimed by the manufacturer/supplier.

#### 5.1.1 Sampling from drums and bottles

##### 5.1.1.1 General

5.1.1.1.1 Mix the contents of the container to be sampled by shaking the container, by rolling it or by rocking it from side to side, taking care not to damage the container or spill any of the liquid.

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5.1.1.1.2 If the design of the container is such (for example, a narrow-necked bottle) that it is impracticable to use a sampling implement, take a sample by pouring after the contents have been thoroughly mixed. Otherwise, proceed as described in 5.1.1.1.3.

5.1.1.1.3 Examine the surface of the liquid. If there are signs of surface contamination, take samples from the surface as described in 5.1.1.2 ; otherwise, take samples as described in 5.1.1.3.