



SLOVENSKI STANDARD

SIST EN 12122:2000

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Kemikalije, ki se uporabljajo za pripravo pitne vode - Rastopina amoniaka

Chemicals used for treatment of water intended for human consumption - Ammonia solution

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Ammoniaklösung

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

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ICS:

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 12122

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 1998

ICS 13.060.20; 71.060.20; 71.100.80

Descriptors: potable water, water treatment, chemical compounds, ammonium hydroxide, description, physical properties, chemical properties, impurities, toxic substances, tests, conditioning, transportation, marking, storage, labelling

English version

Chemicals used for treatment of water intended for human consumption - Ammonia solution

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Ammoniaklösung

This European Standard was approved by CEN on 5 September 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 March 1999, and conflicting national standards shall be withdrawn at the latest by March 1999.

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 the 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 ammonia solution used for treatment of water intended for human consumption. It describes the characteristics of ammonia solution and specifies the requirements and the corresponding test methods for ammonia solution. It gives information on its use in water treatment.

2 Normative references

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places 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.

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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 5993	Sodium hydroxide for industrial use - Determination of mercury content flameless atomic absorption spectrometric method
ISO 6206	Chemical products for industrial use - Sampling - Vocabulary
ISO 6332	Water quality - Determination of iron - Spectrometric method using 1,10-phenanthroline
ISO 6353-1	Reagents for chemical analysis - Part 1 : General test methods
ISO 7108	Ammonia solution for industrial use - Determination of ammonia content - Titrimetric method
ISO 7109	Ammonia solution for industrial use - Determination of residue after evaporation at 105 °C - Gravimetric method

3 Description

3.1 Identification

3.1.1 Chemical name

Ammonia solution.

3.1.2 Synonym or common name

Ammonia solution.

3.1.3 Relative molecular mass

35,05.

3.1.4 Empirical formula

NH₄OH.

3.1.5 Chemical formula

NH₄OH.

3.1.6 CAS-Registry Number ¹⁾

1336-21-6.

3.1.7 EINECS reference ²⁾

215-647-6.

3.2 Commercial form

A solution of 25 % (*m/m*) ammonia (NH₃) in water.

3.3 Physical properties

3.3.1 Appearance and odour

The product is a colourless liquid with a pungent odour.

¹⁾ Chemical Abstracts Service Registry Number.

²⁾ European Inventory of Existing Commercial Chemical Substances.

3.3.2 Density

The density of the product (a solution of 25 % (*m/m*) NH₃) is 0,9 g/ml at 20 °C.

3.3.3 Solubility

The product is miscible with water in any proportion.

3.3.4 Vapour pressure

The vapour pressure of the product is 44 kPa ³⁾ at 21 °C.

3.3.5 Boiling point at 100 kPa ³⁾

The product releases ammonia gas as the temperature rises and it begins to evaporate at approximately 38 °C.

3.3.6 Crystallisation point

The crystallisation point of the product is approximately - 55 °C for a solution of 25 % (*m/m*) NH₃.

3.3.7 Specific heat

The specific heat of the product is 4,18 kJ/kg.K.

3.3.8 Viscosity, dynamic

The viscosity dynamic of the product is 1,12 mPa.s at 20 °C.

3.3.9 Critical temperature

The critical temperature of the product is 132,5 °C (NH₃ vapour above liquid).

3.3.10 Critical pressure

The critical pressure of the product is 11 250 kPa (NH₃ vapour above liquid).

3.3.11 Physical hardness

Not applicable.

³⁾ 100 kPa = 1 bar.

3.4 Chemical properties

Air/ammonia vapour mixtures in the range of 15 % (V/V) to 30 % (V/V) NH_3 form explosive mixtures.

Ammonia solution reacts with acids to form ammonium salts.

It reacts with carbon dioxide, e.g. from air, to form carbonate.

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 commercial product shall contain at least 25 % (m/m) ammonia in water.

The product shall contain the stated concentration of NH_3 within ± 5 % (m/m).

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4.2 Impurities and main by-products

Due to the manufacturing process by-products are not relevant.

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

Table 1 : Impurities

Impurity	Limit in mg/kg of the product
Residue after evaporation max	30
Iron (Fe) max	10

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).

The content of toxic substances shall conform to the requirements specified in table 2.

Table 2 : Toxic substances

Parameter	Limit mg/kg of commercial product
Antimony (Sb) max.	1
Arsenic (As) max.	5
Cadmium (Cd) max.	0,5
Chromium (Cr) max.	5
Lead (Pb) max.	5
Mercury (Hg) max.	0,1
Nickel (Ni) max.	5
Selenium (Se) max.	2
NOTE : Pesticides and polycyclic aromatic hydrocarbons and cyanides -as listed in EU Directive 80/778/EEC- are not relevant in ammonia solution because the raw materials used in the manufacturing are free of them.	

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5 Test methods

5.1 Sampling

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Observe the general recommendations of ISO 3165 and take account of ISO 6206 ⁴⁾.

5.1.1 Sampling from bulk containers

SAFETY PRECAUTIONS : Do not use compressed air to discharge ammonia solution from bulk containers.

Whenever it is necessary to take a sample of ammonia solution from a bulk container, cool the container and vent it to the atmosphere before removing any stopper or cover. Take care to ensure that any escaping ammonia gas is discharged at a point remote from personnel.

Withdraw samples from the tank by means of a sampling 'thief' made of 25 mm diameter polyethylene or polypropylene tubing, 2 m long and tapered at each end to 10 mm diameter over a minimum of 100 mm tube length.

Transfer samples taken from tanks immediately into clean glass screw-stoppered bottles, cool them immediately and keep them in a cool place (e.g. cold water bath or fridge) until required for analysis.

⁴⁾ See also C.3.

Use the following procedure :

- a) take two consecutive 500 ml samples and discard both in order to clear the sampling tube and bottle and to obtain representative material ;
- b) take the sample required in a bottle fitted with an internal solid screw-stopper and rubber gasket. Tighten the stopper as soon as the sample is in the bottle.

5.1.2 Sampling from drums, carboys and bottles

General : Do not use suction during the withdrawal of the sample, especially with concentrated solutions, since reduction of pressure readily depletes the solution of ammonia gas.

5.1.2.1 Drums

SAFETY PRECAUTIONS : Do not use compressed air to discharge ammonia solution from drums.

Sample from drums by pouring, by siphoning or by means of a polyethylene or polypropylene sampling 'thief'. If the sample is to be obtained from pouring, use a specially constructed elevated platform to hold the drum, and a screw-in pourer and funnel to facilitate transfer and reduce the risk from splashing.

If the sample is to be obtained by siphoning, use a suitable siphon constructed from stainless steel, polyethylene, polypropylene or glass. Start the siphon by applying a slight air pressure to the drum, e.g. from a hand bellows or bulb, provided that the end of the delivery tube is below the level of liquid in the drum.

If a polyethylene or polypropylene sampling 'thief' is used to draw the sample, use the procedure described in 5.1.1.

5.1.2.2 Carboys

SAFETY PRECAUTIONS : Do not use compressed air to discharge ammonia solution from carboys.

Sample from carboys by pouring, by siphoning, by the use of a polyethylene or polypropylene sampling 'thief' or by the use of a hand-operated pump.

If the sample is to be obtained by pouring, use a properly constructed carboy tilter.

If the sample is to be obtained by siphoning, use a suitable siphon constructed from stainless steel, polyethylene, polypropylene or glass. Start the siphon by applying a slight air pressure to the carboy, e.g. from a hand bellows or bulb, provided that the end of the delivery tube is below the level of liquid in the carboy.

NOTE : Polyethylene or polypropylene siphons incorporating bellows for priming are commercially available.

If a polyethylene or polypropylene sampling 'thief' is used to draw the sample, use the procedure described in 5.1.1.