



# SLOVENSKI STANDARD

## SIST EN 12122:2005

01-september-2005

Nadomešča:  
SIST EN 12122:2000

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### Kemikalije, ki se uporabljajo za pripravo pitne vode - Raztopina amonijaka

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  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 12122**

June 2005

ICS 71.100.80

Supersedes EN 12122:1998

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 25 April 2005.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Foreword

This European Standard (EN 12122:2005) 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 December 2005, and conflicting national standards shall be withdrawn at the latest by December 2005.

This document supersedes EN 12122:1998.

Significant technical differences between this edition and EN 12122:1998 are as follows:

deletion of the reference to EU Directive 80/778/EEC of 15 July 1980 in order to take account of the latest Directive, see[1].

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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 European Standard:

- a) this European 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 ;
- 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 European 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 document is subject to regulation or control by National Authorities.

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## 1 Scope

This European Standard is applicable to ammonia solution used for treatment of water intended for human consumption. It describes the characteristics and specifies the requirements of ammonia solution and refers to the corresponding analytical methods. It gives information for its use in water treatment. It also determines the rules relating to safe handling and use of ammonia solution (see Annex B).

## 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 reference 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 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

Ammonium hydroxide.

#### 3.1.2 Synonym or common name

Ammonia solution.

#### 3.1.3 Relative molecular mass

35,05.

#### 3.1.4 Empirical formula

NH<sub>4</sub>OH.

**EN 12122:2005 (E)****3.1.5 Chemical formula**

NH<sub>4</sub>OH.

**3.1.6 CAS-Registry Number <sup>1)</sup>**

1336-21-6.

**3.1.7 EINECS reference <sup>2)</sup>**

215-647-6.

**3.2 Commercial form**

The product is a solution of mass fraction of 25 % of ammonia (NH<sub>3</sub>) in water.

**3.3 Physical properties****3.3.1 Appearance and odour**

The product is a colourless liquid with a pungent odour.

**3.3.2 Density**

The density of the product (a solution of a mass fraction of 25 % of NH<sub>3</sub>) 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 <sup>3)</sup> at 21 °C.

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

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 mass fraction of 25 % of NH<sub>3</sub>.

**3.3.7 Specific heat**

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

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

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

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



### 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 (NH<sub>3</sub> vapour above liquid).

### 3.3.10 Critical pressure

The critical pressure of the product is 11 250 kPa (NH<sub>3</sub> vapour above liquid).

### 3.3.11 Physical hardness

Not applicable.

## 3.4 Chemical properties

Air/ammonia vapour mixtures in the range of volume fraction of 15 % to 30 % of NH<sub>3</sub> 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

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### 4.1 General

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This document specifies the minimum purity requirements for an ammonia solution 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.

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, contents of other impurities and additives used in the product not stated in this 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 leads 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 commercial product shall contain at least a mass fraction of 25 % of ammonia in water.

The product shall contain the stated concentration of NH<sub>3</sub> within ± 5 %.

### 4.3 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	30
Iron (Fe)	10

#### 4.4 Chemical parameters

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

**Table 2 – Chemical parameters**

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 are not relevant in ammonia solution because the raw materials used in the manufacturing are free of them. For parametric values of ammonia solution on trace metal content in drinking water, see [1].	

## 5 Test methods

### 5.1 Sampling

Observe the general recommendations of ISO 3165 and take account of ISO 6206 and see [3].

### 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.

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

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**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.