



SLOVENSKI STANDARD

SIST EN 12126:2013

01-april-2013

Nadomešča:
SIST EN 12126:2005

Kemikalije, ki se uporabljajo za pripravo pitne vode - Salmiak

Chemicals used for treatment of water intended for human consumption - Liquefied ammonia

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Ammoniak, flüssig

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

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Ta slovenski standard je istoveten z: EN 12126:2012

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 12126

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2012

ICS 71.100.80

Supersedes EN 12126:2005

English Version

Chemicals used for treatment of water intended for human consumption - Liquefied ammonia

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Ammoniak, flüssig

This European Standard was approved by CEN on 23 September 2012.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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Contents		Page
Foreword.....		3
Introduction		4
1 Scope		5
2 Normative references		5
3 Description		5
4 Purity criteria.....		7
5 Test methods.....		8
6 Labelling – Transportation – Storage		12
Annex A (informative) General information on liquefied ammonia.....		16
Annex B (normative) General rules relating to safety		17
Bibliography		18

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Foreword

This document (EN 12126:2012) 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 May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12126:2005.

The significant technical differences between this edition and EN 12126:2005 are as follows:

- Modification of 6.2 on labelling, deletion of the reference to EU Directive 80/778/EEC of 15 July 1980 in order to take account of the latest Directive in force.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey 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 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 European Standard is subject to regulation or control by National Authorities.

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1 Scope

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

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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)*

ISO 7103, *Liquefied anhydrous ammonia for industrial use — Sampling — Taking a laboratory sample*

ISO 7105, *Liquefied anhydrous ammonia for industrial use — Determination of water content — Karl Fischer Method*

ISO 7106, *Liquefied anhydrous ammonia for industrial use — Determination of oil content — Gravimetric and infra-red spectrometric methods*

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3 Description

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3.1 Identification

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3.1.1 Chemical name

[c903605faa9d/sist-en-12126-2013](https://standards.iteh.ai/catalog/standards/sist/421fbf7d-4716-45be-933b-c903605faa9d/sist-en-12126-2013)

Ammonia liquefied, anhydrous.

3.1.2 Synonym or common name

Ammonia.

3.1.3 Relative molecular mass

17,03.

3.1.4 Empirical formula

NH₃.

3.1.5 Chemical formula

NH₃.

3.1.6 CAS Registry Number ¹⁾

7664-41-7.

1) Chemical Abstracts Service Registry Number.

EN 12126:2012 (E)**3.1.7 EINECS reference ²⁾**

231-635-3.

3.2 Commercial form

The product is available as liquefied gas.

3.3 Physical properties**3.3.1 Appearance and odour**

The product is colourless liquid with a characteristic pungent odour.

3.3.2 Density

The density of the gas is 0,771 g/l at 101,3 kPa ³⁾ and 0 °C.

The density of the liquid is 0,682 g/ml at 101,3 kPa and -34 °C, and 0,61 g/ml at 850 kPa and 20 °C.

3.3.3 Solubility (in water)

The solubility of the product in water is 900 g/l at 0 °C, 520 g/l at 20 °C, and 407 g/l at 30 °C.

3.3.4 Vapour pressure

The vapour pressure of the product is 400 kPa at 0 °C, 850 kPa at 20 °C and 2 035 kPa at 50 °C.

3.3.5 Boiling point at 100 kPa ³⁾

The boiling point of the product is -33,4 °C at 101,3 kPa.

3.3.6 Melting point

The melting point of the product is -77,7 °C at 101,3 kPa.

3.3.7 Specific heat

The specific heat of the product is 4,61 kJ/(kg K) at 0 °C and 4,86 kJ/(kg K) at 40 °C.

3.3.8 Viscosity, dynamic

The viscosity of the product is 0,254 mPa.s at 33 °C and 101,3 kPa.

3.3.9 Critical temperature

132,4 °C.

3.3.10 Critical pressure

11 450 kPa.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

3.3.11 Physical hardness

Not applicable.

3.4 Chemical properties

Ammonia reacts violently with halogens, acids, acid halides, acid anhydrides and oxidising agents. It reacts with zinc, copper, tin and their alloys. Mixtures of volume fraction of 15 % to 30 % of ammonia with air are explosive.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for liquefied ammonia 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.

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.

SIST EN 12126:2013

4.2 Composition of commercial product

Liquefied ammonia shall not contain less than a mass fraction of 99,8 % of NH₃.

4.3 Impurities and main by-products

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

Table 1 — Impurities

Impurity		Limit
Water	max	Mass fraction 0,1 %
Permanent gases and methane	max	Volume fraction 0,1 %
Oil	max	5 mg/kg

4.4 Chemical parameters

The chemical parameters defined in the EU Water Directive (see [1]) are not found in liquefied ammonia. Cyanides, pesticides and polycyclic aromatic hydrocarbons are not by-products of the manufacturing process.

EN 12126:2012 (E)**5 Test methods****5.1 Sampling**

Follow the sampling method according to ISO 7103.

5.2 Analyses**5.2.1 Main product**

The ammonia concentration is calculated by subtracting the contents of the main impurities from mass fraction 100 %.

5.2.2 Impurities**5.2.2.1 Water**

The water content shall be determined in accordance with ISO 7105.

5.2.2.2 Oil content

The oil content shall be determined in accordance with ISO 7106.

5.2.3 Permanent gases and methane**5.2.3.1 Principle**

The method is a gas chromatographic determination of inert gases and methane in liquid ammonia, determined as a volume fraction.

The content of trace contaminants is determined by gas chromatography according to an external standard method. Metering from the gas pipette is carried out by means of pressure-controlled feed via a fixed-volume sampling valve.

Liquefied ammonia is evaporated prior to the gas chromatographic test in a special steel gas pipette.

5.2.3.2 Reagents and materials**5.2.3.2.1 Reagents**

All reagents shall be of a recognised analytical grade and the water used shall conform to the grade 3 specified in EN ISO 3696.

5.2.3.2.2 Carrier gas

Helium, minimum purity volume fraction 99,9 %.

5.2.3.2.3 Calibration gas mixture of the following composition:

- hydrogen volume fraction 91 %;
- nitrogen volume fraction 5 %;
- methane volume fraction 3 %;

— sum of oxygen and argon volume fraction 1 %.

5.2.3.2.4 Material for preparation of the column

Molecular sieve 13 X of particle size 250 µm to 360 µm, or any other equivalent suitable material.

5.2.3.3 Apparatus

5.2.3.3.1 Gas chromatographic apparatus.

Any suitable gas chromatograph, fitted with a thermal conductivity detector, may be used.

5.2.3.3.1.1 Characteristics of the gas chromatographic apparatus:

- Column temperature: typically 40 °C isothermal conditions.
- Detector temperature: typically 130 °C.
- Filament temperature: typically 200 °C.

5.2.3.3.1.2 Carrier gas flow rate

The carrier gas flow rate shall be approximately 25 ml/min. It is usually measured at column outlet and at ambient temperature.

5.2.3.3.2 Injection equipment (standards.iteh.ai)

Stainless steel gas sample valve with a loop of 2 ml capacity, operating under the following conditions:

- temperature: ambient to 50 °C; <https://standards.iteh.ai/catalog/standards/sist/421fbf7d-4716-45be-933b-c903605faa9d/sist-en-12126-2013>
- pressure: atmospheric.

5.2.3.3.3 Column.

5.2.3.3.3.1 Construction

The column may be made of any suitable material that does not react with the test portion, for example stainless steel. Typical dimensions are as follows:

- a) length: according to the test method used but typically 4 m;
- b) diameter: internal diameter approximately 3,2 mm; external diameter approximately 6 mm;
- c) shape: adapted to the oven geometry. If coiled, the coil diameter shall be at least ten times the outer diameter of the tube.

5.2.3.3.3.2 Packing

5.2.3.3.3.2.1 Composition

Molecular sieve (see 5.2.3.2.4).