

**Water quality - Determination of
nitrogen - Determination of bound
nitrogen (TN sub b), following oxidation
to nitrogen oxides**

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following oxidation to nitrogen oxides

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12260:2003 sisaldab Euroopa standardi EN 12260:2003 ingliskeelset teksti. Käesolev dokument on jõustatud 14.10.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 12260:2003 consists of the English text of the European standard EN 12260:2003. This document is endorsed on 14.10.2003 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.
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Käsitlusala: This European Standard specifies a method for the determination of nitrogen in water in the form of free ammonia, ammonium, nitrite, nitrate and organic compounds capable of conversion to nitrogen oxides under the oxidative conditions described. Determination is carried out instrumentally. Dissolved nitrogen gas is not determined by this method	Scope: This European Standard specifies a method for the determination of nitrogen in water in the form of free ammonia, ammonium, nitrite, nitrate and organic compounds capable of conversion to nitrogen oxides under the oxidative conditions described. Determination is carried out instrumentally. Dissolved nitrogen gas is not determined by this method
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English version

Water quality - Determination of nitrogen - Determination of bound nitrogen (TN_b), following oxidation to nitrogen oxides

Qualité de l'eau - Dosage de l'azote - Dosage de l'azote lié
(TN_b) après oxydation en oxydes d'azote

Wasserbeschaffenheit - Bestimmung von Stickstoff -
Bestimmung von gebundenem Stickstoff (TN_b) nach
Oxidation zu Stickstoffoxiden

This European Standard was approved by CEN on 1 August 2003.

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 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 Management Centre 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 12260:2003) has been prepared by Technical Committee CEN/TC 230 "Water analysis", the secretariat of which is held by DIN.

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 2004, and conflicting national standards shall be withdrawn at the latest by March 2004.

This document supersedes ENV 12260: 1996

Annexes A B, and C are informative annexes.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

WARNING — Persons using this standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

It is absolutely essential that tests carried out according to this European Standard are carried out by suitably qualified staff.

This European Standard specifies a method for the determination of total bound nitrogen after oxidation of inorganic and organic nitrogen compounds by combustion to nitrogen oxides. Quantification is carried out by chemiluminescence.

The procedure referred to in the normative part is the reference method. Whilst staying within the scope of this standard, it is permissible to use such alternatives as given in annex A only, provided that their performance is equal to or better than that given in clause 13 and tables in annex B and C, when calculated using procedures given in ISO 5725-2, and when the comparison of performance data between this European Standard and any alternative technique is carried out using the procedures described in ISO 2854.

All references to nitrogen concentrations are expressed in units of mg/l N, i.e. milligrams of nitrogen per litre solution.

1 Scope

This European Standard specifies a method for the determination of nitrogen in water in the form of free ammonia, ammonium, nitrite, nitrate and organic compounds capable of conversion to nitrogen oxides under the oxidative conditions described. Determination is carried out instrumentally. Dissolved nitrogen gas is not determined by this method.

This method is applicable to the analysis of surface water, waste water and treated sewage effluent.

The concentration range of the method will depend on the injection volume used which is instrument specific. Total nitrogen can be determined in the range from 1 mg/l up to 200 mg/l. Higher concentrations can, if necessary, be determined by dilution of the sample. The limit of detection will depend on the instrument in use. Using a suitable injection volume, the limit of detection is typically round about 0,5 mg/l.

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 (including amendments).

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*.

EN ISO 5667-3, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples (ISO 5667-3:1994)*.

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic methods for the determination of repeatability and reproducibility of a standard measurement method*.

ISO 8466-1, *Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics — Part 1 : Statistical evaluation of the linear calibration function*.

ISO 8466-2, *Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics — Part 2: Calibration strategy for non-linear second order calibration function*.

3 Principle

Oxidation of the sample containing nitrogen by catalytic combustion in an oxygen atmosphere at $> 700\text{ }^{\circ}\text{C}$, to nitrogen oxides. Quantification of nitrogen concentration is carried out by chemiluminescence detection (after reaction with ozone).

4 Interferences

Depending on the instrument in use, interferences may arise from memory effects. These may occur either from samples or standard solutions with high amounts of bound nitrogen.

NOTE Potential problems can arise with samples containing significant total organic carbon (TOC) concentrations. The analysis of samples containing large amounts of TOC will lead to the reporting of lower results for nitrogen. Suspected problems can be identified by determining nitrogen before and after suitable dilution, or by using standard addition techniques.

Not all organic nitrogen compounds are quantitatively converted to nitrogen oxides by the oxidation procedure used (see recovery rates in table B.1).