

**Vee kvaliteet. Lahustunud hapniku  
sisalduse määramine. Elektrokeemiline  
analüüsimeetod**

Water quality - Determination of dissolved oxygen -  
Electrochemical probe method

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 25814:1999 sisaldab Euroopa standardi EN 25814:1992 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 12.12.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 25814:1999 consists of the English text of the European standard EN 25814:1992.</p> <p>This document is endorsed on 12.12.1999 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>Standard esitab elektrokeemilise meetodi lahustunud hapniku sisalduse määramiseks vees elektrolüüsiraku abil, mis on proovist eraldatud gaasi läbilaskva membraaniga. Meetod on sobiv nii välitingimustes mõõtmiseks ja lahustunud hapniku sisalduse pidevaks jälgimiseks kui ka laboratoorseteks mõõtmisteks. See on eelistatud meetod tugevalt värvunud ja hägusa vee jaoks.</p>	<p><b>Scope:</b></p>
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**ICS** 13.060.50

**Võtmesõnad:** elektrokeemilised meetodid, hapnik, kvaliteet, lahustuv aine, sisalduse määramine, vesi

UDC 628.1/.3 : 620.1 : 543.37 : 546.21

Descriptors: Water, water testing, chemical analysis, determination of content, oxygen, dissolved gases, electrochemical method.

**English version**

Water quality  
**Determination of dissolved oxygen**  
Electrochemical probe method  
(ISO 5814 : 1990)

Qualité de l'eau; dosage de l'oxygène dissous; méthode électrochimique à la sonde (ISO 5814 : 1990)

Wasserbeschaffenheit; Bestimmung des gelösten Sauerstoffs; elektrochemisches Verfahren (ISO 5814 : 1990)

This European Standard was approved by CEN on 1992-10-05 and is identical to the ISO Standard as referred to.

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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Foreword

This European Standard is the endorsement of International Standard ISO 5814 : 1990.

Endorsement of

ISO 5814 Water quality, determination of dissolved oxygen; electrochemical probe method

was recommended by CEN/Technical Committee 230 'Water analysis' under whose competence this European Standard will henceforth fall.

In the countries bound to implement this European Standard, a national standard identical to this European Standard shall be published, and conflicting national standards withdrawn, by April 1993 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## Endorsement notice

The text of the International Standard ISO 5814 : 1990 was approved by CEN as a European Standard without any modification.

## 1 Scope

This International Standard specifies an electrochemical method for the determination of dissolved oxygen in water by means of an electrochemical cell which is isolated from the sample by a gas permeable membrane.

Depending on the type of probe employed, measurement can be made either as concentration of oxygen in milligrams per litre, percentage saturation (% dissolved oxygen) or both. The method measures oxygen in water corresponding to 0 % to 100 % saturation. However, most instruments permit measurement of values higher than 100 % i.e. supersaturation.

The method is suitable for measurements made in the field and for continuous monitoring of dissolved oxygen as well as measurements made in the laboratory. It is the preferred method for highly coloured and turbid waters, and also for waters containing iron and iodine fixing substances, all of which may interfere in the iodometric method specified in ISO 5813. Gases and vapours such as chlorine, sulfur dioxide, hydrogen sulfide, amines, ammonia, carbon dioxide, bromine and iodine which diffuse through the membrane, may interfere, if present, by affecting the measured current. Other substances present in the sample may interfere with the measured current by causing obstruction, or deterioration of the membrane or corrosion of the electrodes. These include solvents, oils, sulfides, carbonates and algae.

The method is suitable for natural, waste and saline waters. If used for saline waters such as sea waters, or estuarine waters, a correction for salinity is essential.

## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publi-

cation, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5813:1983, *Water quality — Determination of dissolved oxygen — Iodometric method.*

## 3 Principle

Immersion of a probe, consisting of a cell enclosed by a selective membrane and containing the electrolyte and two metallic electrodes, in the water to be analysed. (The membrane is practically impermeable to water and ionic dissolved matter, but is permeable to oxygen and a certain number of the other gases and lyophobic substances.)

Because of the potential difference between the electrodes, caused by galvanic action or an external voltage, oxygen passing through the membrane is reduced at the cathode, while metal ions pass into solution at the anode.

The current so produced is directly proportional to the rate of transport of oxygen through the membrane and the layer of electrolyte and hence to the partial pressure of the oxygen in the sample at a given temperature.

The permeability of the membrane to gases varies greatly with temperature, and compensation is required for readings taken at different temperatures of the sample. This can be done mathematically, for example, by the use of a suitable nomograph or computer program. The majority of modern instruments automatically compensate for temperature variation by inclusion of temperature-sensitive elements in the electronic circuitry. However, instruments reading directly in percentage solubility, unless provided with a pressure transducer in the circuitry to compensate for pressure differences, will