



SLOVENSKI STANDARD SIST EN ISO 15681-2:2005

01-februar-2005

Water quality - Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA) - Part 2: Method by continuous flow analysis (CFA) (ISO 15681-2:2003)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Wasserbeschaffenheit - Bestimmung von Orthophosphat und Gesamtphosphor mittels Fließanalytik (FIA und CFA) - Teil 2: Verfahren mittels kontinuierlicher Durchflussanalyse (CFA) (ISO 15681-2:2003)

<https://standards.iteh.ai/catalog/standards/sist/288d1cd-4b17-4b14-8b93-07c3f1ef9c7/sist-en-iso-15681-2-2005>

Qualité de l'eau - Dosage des orthophosphates et du phosphore total par analyse en flux (FIA et CFA) - Partie 2: Méthode par analyse en flux continu (CFA) (ISO 15681-2:2003)

Ta slovenski standard je istoveten z: EN ISO 15681-2:2004

ICS:

13.060.50 Úřadnice [á^Á^ { ä } ^
•} [çã Examination of water for chemical substances

SIST EN ISO 15681-2:2005

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 15681-2:2005](#)

<https://standards.iteh.ai/catalog/standards/sist/f288d1cd-4b17-4b14-8b93-07c3f1ef99c7/sist-en-iso-15681-2-2005>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 15681-2

December 2004

ICS 13.060.50

English version

**Water quality - Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA) - Part 2:
Method by continuous flow analysis (CFA) (ISO 15681-2:2003)**

Qualité de l'eau - Dosage des orthophosphates et du phosphore total par analyse en flux (FIA et CFA) - Partie 2: Méthode par analyse en flux continu (CFA) (ISO 15681-2:2003)

Wasserbeschaffenheit - Bestimmung von Orthophosphat und Gesamphosphor mittels Fließanalytik (FIA und CFA) - Teil 2: Verfahren mittels kontinuierlicher Durchflussanalyse (CFA) (ISO 15681-2:2003)

This European Standard was approved by CEN on 21 December 2004.

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.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

EN ISO 15681-2:2004 (E)**Foreword**

The text of ISO 15681-2:2003 has been prepared by Technical Committee ISO/TC 147 "Water quality" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15681-2:2004 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 June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

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.

Endorsement notice

The text of ISO 15681-2:2003 has been approved by CEN as EN ISO 15681-2:2004 without any modifications.

STANDARD PREVIEW
(standards.iteh.ai)
SIST EN ISO 15681-2:2005
<https://standards.iteh.ai/catalog/standards/sist/288d1cd-4b17-4b14-8b93-07c3f1ef99c7/sist-en-iso-15681-2-2005>

INTERNATIONAL STANDARD

ISO
15681-2

First edition
2003-12-15

Water quality — Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA) —

Part 2: Method by continuous flow analysis (CFA)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

*Qualité de l'eau — Dosage des orthophosphates et du phosphore total
par analyse en flux (FIA et CFA) —
Partie 2: Méthode par analyse en flux continu (CFA)*

<https://standards.iteh.ai/catalog/standards/sist/1288d1cd-4b17-4b14-8b93-07c3740c312d/iso-15681-2:2003>



Reference number
ISO 15681-2:2003(E)

© ISO 2003

ISO 15681-2:2003(E)**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 15681-2:2005](https://standards.iteh.ai/catalog/standards/sist/288d1cd-4b17-4b14-8b93-07c3f1e99c7/sist-en-iso-15681-2-2005)

<https://standards.iteh.ai/catalog/standards/sist/288d1cd-4b17-4b14-8b93-07c3f1e99c7/sist-en-iso-15681-2-2005>

© ISO 2003

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope.....	1
2 Normative references	1
3 Interferences.....	2
3.1 General interferences	2
3.2 Interferences in the determination of total-P	2
4 Principle	2
4.1 Determination of orthophosphate	2
4.2 Total phosphorus with manual digestion.....	3
4.3 Total phosphorus with integral UV digestion and hydrolysis.....	3
5 Reagents	3
6 Apparatus.....	7
6.1 Continuous-flow analysis (CFA).....	7
6.2 Additional apparatus	7
6.3 Additional apparatus for the determination of total phosphorus after integral digestion	8
7 Sampling and sample preparation	8
8 Procedure.....	8
8.1 Preparation for analysis	8
8.2 Instrument performance check	8
8.3 Reagent blank check	9
8.4 Calibration.....	9
8.5 Check of UV digestion and hydrolysis for total P determination (see Figure A.2).....	9
8.6 Measurement	10
8.7 Closing down the system.....	10
9 Calculation of results.....	10
10 Expression of results.....	10
11 Test report.....	10
Annex A (informative) Examples of a CFA system	12
Annex B (informative) Precision and accuracy	14
Annex C (informative) Determination of orthophosphate-P and total-P by CFA and tin(II) chloride reduction	15
Bibliography	16

ISO 15681-2:2003(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 15681-2 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

ISO 15681 consists of the following parts, under the general title *Water quality — Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA)*:

- *Part 1: Method by flow injection analysis (FIA)*
- *Part 2: Method by continuous flow analysis (CFA)*

iTeh STANDARD PREVIEW
(standards.itih.eu)

[SIST EN ISO 15681-2:2005](https://standards.itih.eu/standards/sist/288d1cd-4b17-4b14-8b93-07c3f1ef99c7/sist-en-iso-15681-2-2005)

<https://standards.itih.eu/standards/sist/288d1cd-4b17-4b14-8b93-07c3f1ef99c7/sist-en-iso-15681-2-2005>

Introduction

Methods of determining water quality using flow analysis automated wet chemical procedures and are particularly suitable for the processing of many analytes in water in large sample series at a high analysis frequency.

Analysis can be performed by flow injection analysis (FIA) [1], [2] or continuous flow analysis (CFA) [3]. Both methods share the feature of an automatic dosage of the sample into a flow system (manifold) where the analyte in the sample reacts with the reagent solutions on its way through the manifold. The sample preparation may be integrated in the manifold. The amount of reaction product is measured in a flow detector (e.g. flow photometer). This part of ISO 15681 describes the CFA method.

The user should be aware that particular problems could require the specification of additional marginal conditions.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 15681-2:2005](https://standards.iteh.ai/catalog/standards/sist/f288d1cd-4b17-4b14-8b93-07c3f1ef99c7/sist-en-iso-15681-2-2005)

<https://standards.iteh.ai/catalog/standards/sist/f288d1cd-4b17-4b14-8b93-07c3f1ef99c7/sist-en-iso-15681-2-2005>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 15681-2:2005](#)

<https://standards.iteh.ai/catalog/standards/sist/f288d1cd-4b17-4b14-8b93-07c3f1ef99c7/sist-en-iso-15681-2-2005>

Water quality — Determination of orthophosphate and total phosphorus contents by flow analysis (FIA and CFA) —

Part 2: Method by continuous flow analysis (CFA)

WARNING — Persons using this part of ISO 15681 should be familiar with normal laboratory practice. This part of ISO 15681 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. Molybdate and antimony waste solutions should be disposed of properly. It is absolutely essential that tests conducted according to this part of ISO 15681 be carried out by suitably qualified staff.

1 Scope

This part of ISO 15681 specifies CFA methods for the determination of orthophosphate in the mass concentration range from 0,01 mg/l to 1,00 mg/l P, and total phosphorus in the mass concentration range from 0,10 mg/l to 10,0 mg/l P. The method includes the digestion of organic phosphorus compounds and the hydrolysis of inorganic polyphosphate compounds, performed either manually as described in ISO 6878 [5], [6] or with an integrated UV digestion and hydrolysis unit.

This part of ISO 15681 is applicable to various types of water (such as ground, drinking, surface, leachate and waste water). The range of application may be changed by varying the operating conditions.

This method is also applicable to the analysis of seawater, but with changes in sensitivity, by adaptation of the carrier and calibration solutions to the salinity of the samples.

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 referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specifications and test methods*

ISO 5667-1, *Water quality — Sampling — Part 1: Guidance on the design on sampling programmes*

ISO 5667-2, *Water quality — Sampling — Part 2: Guidance on sampling techniques*

ISO 5667-3, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of water samples*

ISO 6878:—¹⁾, *Water quality — Determination of phosphorus — Ammonium molybdate spectrometric method*

1) To be published.