

**Water quality - Determination of chromium(VI) - Method  
using flow analysis (FIA and CFA) and spectrometric  
detection**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 23913:2009 sisaldab Euroopa standardi EN ISO 23913:2009 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.11.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 27.05.2009.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 23913:2009 consists of the English text of the European standard EN ISO 23913:2009.

This standard is ratified with the order of Estonian Centre for Standardisation dated 30.11.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

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The standard is available from Estonian standardisation organisation.

ICS 13.060.50

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English Version

**Water quality - Determination of chromium(VI) - Method using  
flow analysis (FIA and CFA) and spectrometric detection (ISO  
23913:2006)**

Qualité de l'eau - Dosage du chrome(VI) - Méthode par  
analyse en flux (FIA et CFA) et détection spectrométrique  
(ISO 23913:2006)

Wasserbeschaffenheit - Bestimmung von Chrom(VI) -  
Verfahren mittels Fließanalytik (FIA und CFA) und  
spektrometrischer Detektion (ISO 23913:2006)

This European Standard was approved by CEN on 14 May 2009.

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## Foreword

The text of ISO 23913:2006 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 23913:2009 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of an identical text or by endorsement, at the latest by November 2009, and conflicting national standards shall be withdrawn at the latest by November 2009.

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### Endorsement notice

The text of ISO 23913:2006 has been approved by CEN as a EN ISO 23913:2009 without any modification.

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## Introduction

Methods using flow analysis automatic wet chemical procedures 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] and continuous flow analysis (CFA). 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 reaction product is measured in a flow detector (e.g. flow photometer).

It should be investigated whether and to what extent particular problems will require the specification of additional marginal conditions.

# Water quality — Determination of chromium(VI) — Method using flow analysis (FIA and CFA) and spectrometric detection

**WARNING** — Persons using this International 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.

**IMPORTANT** — It is absolutely essential that tests conducted according to this International Standard are carried out by suitably qualified staff.

## 1 Scope

This International Standard specifies flow injection analysis (FIA) and continuous flow analysis (CFA) methods for the determination of chromium(VI) in various types of water. The method applies to the following mass concentration ranges.

FIA: 20 µg/l to 200 µg/l and 200 µg/l to 2 000 µg/l for surface water, leachates and waste water.

CFA: 2 µg/l to 20 µg/l and 20 µg/l to 200 µg/l for drinking water, ground water, surface water, leachates and waste water.

The range of application may be changed by varying the operating conditions.

Seawater may be analysed by these methods with changes in sensitivity and after adaptation of the reagent 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 — Specification and test methods*

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

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*

## 3 Principle

Chromium(VI) reacts with 1,5-diphenylcarbazide (DPC) to form a red-violet chromium-1,5-diphenylcarbazone complex. The absorbance of this complex is measured at  $544 \text{ nm} \pm 10 \text{ nm}$  (maximum absorbance at 544 nm).