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Water quality - Determination of dissolved chromium(VI) in water - Photometric method (ISO 18724:2025)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/26

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English Version

Water quality - Determination of dissolved chromium(VI)
in water - Photometric method (ISO 18724:2025)

Qualité de l'eau - Détermination du chrome dissous(VI)
dans l'eau - Méthode photométrique (ISO 18724:2025)

Wasserbeschaffenheit - Bestimmung des gelösten
Chrom(VI) in Wasser - Photometrisches Verfahren (ISO
18724:2025)

This European Standard was approved by CEN on 14 September 2025.

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European foreword

This document (EN ISO 18724:2025) has been prepared by Technical Committee ISO/TC 147 "Water quality" in collaboration with 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of an identical text or by endorsement, at the latest by April 2026, and conflicting national standards shall be withdrawn at the latest by April 2026.

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

This document supersedes EN ISO 23913:2009 and EN ISO 18412:2006.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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Endorsement notice

The text of ISO 18724:2025 has been approved by CEN as EN ISO 18724:2025 without any modification.



International Standard

ISO 18724

Water quality — Determination of dissolved chromium(VI) in water — Photometric method

Qualité de l'eau — Détermination du chrome dissous(VI) dans l'eau — Méthode photométrique

**First edition
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 230, *Water analysis*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 18724:2025 cancels and replaces ISO 11083:1994, ISO 18412:2005 and ISO 23913:2006.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Chromium is an important raw material in the industrial manufacturing process that can contaminate sources of drinking water (e.g. groundwater, surface water). The most common oxidation states of chromium are +3 and +6. The hexavalent form (Cr(VI)) is far more toxic and water-polluting than the trivalent form (Cr(III)).

The chromium content depends on several factors: the availability of chromium in the rock, the weathering stage and the vicinity. Chromium(VI) occurs mainly in the aerobic environment; under reducing or anaerobic conditions, chromium(VI) is reduced to chromium(III).

Chromium(VI) occurs naturally in groundwater aquifers, mostly in low concentrations depending on the occurrence in geological formations, e.g. volcanic rocks.

Other sources of chromium(VI) contamination for the environment are industrial activities, e.g. the production of textiles, leather tanning or electroplating.

A sensitive and specific photometric method for the determination of hexavalent chromium is the reaction with 1,5-diphenylcarbazide (DPC). Most of the standardized procedures are based on DPC chemistry, specifying different reaction conditions.

This procedure describes a uniform procedure that can be used for different photometric measuring devices, such as static or dynamic techniques. The available techniques vary in sensitivity. The choice of the technique used for the measurement depends on the chromium(VI) concentration expected in the sample.

The choice of the analytical technique to be used and the needs-based sample preparation (e.g. matrix elimination) enables the determination of chromium(VI) in concentrations $\geq 0,02 \mu\text{g/l}$ in raw water, drinking water, surface water, aqueous eluates, cooling water and treated wastewater, provided that the matrix does not contain any reducing substances. Typical areas of application for the static techniques as well as FIA and CFA are samples with chromium(VI) concentrations $\geq 2 \mu\text{g/l}$. When using cuvettes with large optical path lengths, for example $> 100 \text{ mm}$, the range of application can be extended to concentrations $< 2 \mu\text{g/l}$ chromium(VI) (see [Annex A](#), [Annex B](#), [Clause C.2](#) and [Clause C.3](#)). When using coupled techniques [e.g. ion chromatography with post-column reaction (IC-PCR)], chromium(VI) concentrations $\geq 0,02 \mu\text{g/l}$ can be determined (see [Clause C.4](#)).

Water quality — Determination of dissolved chromium(VI) in water — Photometric method

WARNING — Persons using this document should be familiar with normal laboratory practice. This document 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.

IMPORTANT — It is absolutely essential that tests conducted in accordance with this document be carried out by suitably qualified staff.

1 Scope

This document specifies a method for the photometric determination of dissolved chromium(VI) using manual, (e.g. hand photometry), automated static (e.g. discrete analyser system) or automated dynamic [e.g. flow injection analysis (FIA), continuous flow analysis (CFA)] or ion chromatography with post-column reaction (IC-PCR) techniques.

The method described in this document is applicable for other matrices, such as leachates from landfills and raw wastewater, after appropriate method validation.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes the requirements 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 8466-1, *Water quality — Calibration and evaluation of analytical methods — Part 1: 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 functions*

ISO/TS 13530, *Water quality — Guidance on analytical quality control for chemical and physicochemical water analysis*

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