

# INTERNATIONAL STANDARD

**ISO**  
**7393-3**

Second edition  
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## **Water quality — Determination of free chlorine and total chlorine —**

### **Part 3:**

Iodometric titration method for the determination of  
total chlorine

*Qualité de l'eau — Dosage du chlore libre et du chlore total —*

*Partie 3: Méthode par titrage iodométrique pour le dosage du chlore total*



Reference number  
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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7393-3 was prepared by Technical Committee ISO/TC 147, *Water quality*.

This second edition cancels and replaces the first edition (ISO 7393-3 : 1986), of which it constitutes a minor revision.

ISO 7393 consists of the following parts, under the general title *Water quality — Determination of free chlorine and total chlorine*:

- *Part 1: Titrimetric method using N,N-diethyl-1,4-phenylenediamine*
- *Part 2: Colorimetric method using N,N-diethyl-1,4-phenylenediamine for routine control purposes*
- *Part 3: Iodometric titration method for the determination of total chlorine*

Annex A forms an integral part of this part of ISO 7393. Annexes B and C are for information only.

# Water quality — Determination of free chlorine and total chlorine

## Part 3:

## Iodometric titration method for the determination of total chlorine

### 1 Scope

This part of ISO 7393 specifies an iodometric titration method for the determination of total chlorine in water.

The method is applicable for the measurement of concentrations in terms of chlorine ( $\text{Cl}_2$ ), from 0,01 mmol/l to 0,21 mmol/l (0,71 mg/l to 15 mg/l).

Several substances interfere in the determination (see clause 10).

In annex B a method for direct titration is specified. This is usually applied to the determination of chlorine concentrations above 7  $\mu\text{mol/l}$  (0,5 mg/l) in treated drinking water.

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7393. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7393 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5667-1 : 1980, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes.*

ISO 5667-2 : 1982, *Water quality — Sampling — Part 2: Guidance on sampling techniques.*

### 3 Definitions (see table 1)

For the purposes of this part of ISO 7393, the following definitions apply.

**3.1 free chlorine:** Chlorine present in the form of hypochlorous acid, hypochlorite ion or dissolved elemental chlorine.

**3.2 combined chlorine:** The fraction of total chlorine present in the form of chloramines and organic chloramines.

**3.3 total chlorine:** Chlorine present in the form of "free chlorine" or "combined chlorine" or both.

**3.4 chloramines:** Derivatives of ammonia by substitution of one, two or three hydrogen atoms with chlorine atoms (monochloramine  $\text{NH}_2\text{Cl}$ , dichloramine  $\text{NHCl}_2$ , and nitrogen trichloride  $\text{NCl}_3$ ) and all chlorinated derivatives of organic nitrogen compounds.

Table 1 — Terms and synonyms in relation to actual compounds in the solution

Term	Synonym	Compounds
Free chlorine	Active free chlorine	Elemental chlorine, hypochlorous acid
	Potential free chlorine	Hypochlorite
Total chlorine	Total residual chlorine	Elemental chlorine, hypochlorous acid, hypochlorite, chloramines

### 4 Principle

Reaction in acid solution of total chlorine and potassium iodide with liberation of free iodine. Instantaneous reduction of the iodine by a known excess of thiosulfate standard solution previously added to the solution. Titration of the unreacted thiosulfate with potassium iodate standard reference solution.

### 5 Reagents

During the analysis, use only reagents of recognized analytical grade, and water as specified in 5.1.