Water quality - Determination of free chlorine and total chlorine - Part 1: Titrimetric method using N,N-diethyl-1,4-phenylenediamine

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 7393-1:2000 sisaldab Euroopa standardi EN ISO 7393-1:2000 ingliskeelset teksti. Käesolev dokument on jõustatud 17.07.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 7393-1:2000 consists of the English text of the European standard EN ISO 7393-1:2000. This document is endorsed on 17.07.2000 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This part of EN ISO 7393 specifies a titrimetric method for the determination of free chlorine and total chlorinein water.	**Scope:** This part of EN ISO 7393 specifies a titrimetric method for the determination of free chlorine and total chlorinein water.

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Võtmesõnad:

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English version

Water quality – Determination of free chlorine and total chlorine

Part 1: Titrimetric method using *N*,*N*-diethyl-1,4-phenylenediamine
(ISO 7393-1 : 1985)

Qualité de l'eau – Dosage du chlore libre et du chlore total – Partie 1: Méthode titrimétrique à la N,N-diéthylphénylène-1,4 diamine (ISO 7393-1 : 1985)

Wasserbeschaffenheit – Bestimmung von freiem Chlor und Gesamtchlor – Teil 1: Titrimetrisches Verfahren mit N,N-Diethyl-1,4-Phenylendiamin (ISO 7393-1 : 1985)

This European Standard was approved by CEN on 2000-01-22.

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.

The European Standards exist 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.

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CEN

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

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

Ref. No. EN ISO 7393-1 : 2000 E

Foreword

International Standard

ISO 7393-1 : 1985 Water quality – Determination of free chlorine and total chlorine – Part 1: Titrimetric method using *N*,*N*-diethyl-1,4-phenylenediamine,

which was prepared by ISO/TC 147 'Water quality' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 230 'Water analysis', the Secretariat of which is held by DIN, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by July 2000 at the latest.

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

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

Endorsement notice

The text of the International Standard ISO 7393-1 : 1985 was approved by CEN as a European Standard without any modification.

0 Introduction

ISO 7393 consists of the following parts:

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.[1)]

1 Scope and field of application

This part of ISO 7393 specifies a titrimetric method for the determination of free chlorine and total chlorine in water.

Sea water and waters containing bromides and iodides comprise a group for which special procedures are required.[2]

The method is applicable to concentrations, in terms of chlorine (Cl_2), from 0,000 4 to 0,07 mmol/l (0,03 to 5 mg/l) total chlorine and at higher concentrations by dilution of samples. For concentrations above 0,07 mmol/l, ISO 7393/3 can also be used.

In annex A a procedure is presented for the differentiation of combined chlorine of the monochloramine type, combined chlorine of the dichloramine type and combined chlorine in the form of nitrogen trichloride.

Several compounds influence the determination specified in this part of ISO 7393. Interferences are noted in clauses 7 and 9.

2 Definitions (see table 1)

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

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

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

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

2.4 chloramines: Derivatives of ammonia by substitution of one, two or three hydrogen atoms with chlorine atoms (monochloramine NH_2Cl, dichloramine $NHCl_2$, nitrogen trichloride NCl_3) and all chlorinated derivatives of organic nitrogen compounds as determined by the method specified in this part of ISO 7393.

3 Principle

3.1 Determination of free chlorine

Direct reaction with the *N*,*N*-diethyl-1,4-phenylenediamine (DPD) and formation of a red compound at pH 6,2 to 6,5. Titration by means of a standard solution of ammonium iron(II) sulfate to the disappearance of the red colour.

3.2 Determination of total chlorine

Reaction with DPD in the presence of an excess of potassium iodide then titration as in 3.1.

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

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

1) At present at the stage of draft.