

**Water quality - Determination of selected alkylphenols -  
Part 2: Gas chromatographic-mass spectrometric  
determination of alkylphenols, their ethoxylates and  
bisphenol A in non-filtered samples following solid-  
phase extraction and derivatisation (ISO 18857-2:2009)**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 18857-2:2011 sisaldab Euroopa standardi EN ISO 18857-2:2011 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 18857-2:2011 consists of the English text of the European standard EN ISO 18857-2:2011.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 09.11.2011.	Date of Availability of the European standard is 09.11.2011.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 13.060.50

### Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:  
Aru 10, 10317 Tallinn, Eesti; [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

### The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:  
Aru 10, 10317 Tallinn, Estonia; [www.evs.ee](http://www.evs.ee); phone 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

ICS 13.060.50

English Version

Water quality - Determination of selected alkylphenols - Part 2:  
Gas chromatographic-mass spectrometric determination of  
alkylphenols, their ethoxylates and bisphenol A in non-filtered  
samples following solid-phase extraction and derivatisation (ISO  
18857-2:2009)

Qualité de l'eau - Dosage d'alkylphénols sélectionnés -  
Partie 2: Dosage par chromatographie en phase gazeuse-  
spectrométrie de masse d'alkylphénols, de leurs  
éthoxylates et du bisphénol A dans des échantillons non  
filtrés après extraction en phase solide et dérivation (ISO  
18857-2:2009)

Wasserbeschaffenheit - Bestimmung von ausgewählten  
Alkylphenolen - Teil 2: Gaschromatographische-  
massenspektrometrische Bestimmung von Alkylphenolen,  
deren Ethoxylaten und Bisphenol A für nichtfiltrierte Proben  
unter Verwendung der Festphasenextraktion und  
Derivatisierung (ISO 18857-2:2009)

This European Standard was approved by CEN on 15 October 2011.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

## Foreword

The text of ISO 18857-2:2009 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 18857-2:2011 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 May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

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

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

### Endorsement notice

The text of ISO 18857-2:2009 has been approved by CEN as a EN ISO 18857-2:2011 without any modification.

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Principle</b> .....	<b>2</b>
<b>4 Interferences</b> .....	<b>2</b>
<b>5 Reagents</b> .....	<b>3</b>
<b>6 Apparatus</b> .....	<b>4</b>
<b>7 Sampling and sample pretreatment</b> .....	<b>5</b>
<b>8 Procedure</b> .....	<b>5</b>
<b>9 Calibration and analysis of samples</b> .....	<b>8</b>
<b>10 Expression of results</b> .....	<b>9</b>
<b>11 Test report</b> .....	<b>10</b>
<b>Annex A (informative) Example of a sorbent</b> .....	<b>11</b>
<b>Annex B (informative) Suitable capillary columns</b> .....	<b>12</b>
<b>Annex C (informative) Examples of chromatograms</b> .....	<b>13</b>
<b>Annex D (informative) Performance data</b> .....	<b>17</b>
<b>Bibliography</b> .....	<b>18</b>

## **Introduction**

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

# Water quality — Determination of selected alkylphenols —

## Part 2:

# Gas chromatographic-mass spectrometric determination of alkylphenols, their ethoxylates and bisphenol A in non-filtered samples following solid-phase extraction and derivatisation

**WARNING** — Persons using this part of ISO 18857 should be familiar with normal laboratory practice. This part of ISO 18857 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 in accordance with this part of ISO 18857 be carried out by suitably qualified staff.

## 1 Scope

This part of ISO 18857 specifies a gas chromatographic-mass spectrometric (GC-MS) determination of selected alkylphenols, their ethoxylates and bisphenol A in non-filtered samples of drinking, ground, surface, and waste waters following solid-phase extraction and derivatisation.

The lower limit of the working range depends on the matrix, on the specific compound to be analysed and on the sensitivity of the mass spectrometric detection unit. The method is applicable in a working range from 0,005 µg/l to 0,2 µg/l for 4-(1,1,3,3-tetramethylbutyl)phenol (OP), and its mono- (OP<sub>1</sub>EO) and diethoxylate (OP<sub>2</sub>EO), from 0,03 µg/l to 0,2 µg/l for 4-nonylphenol (mixture of isomers) (NP), and its mono- (NP<sub>1</sub>EO) and diethoxylate (NP<sub>2</sub>EO), and from 0,05 µg/l to 0,2 µg/l for bisphenol A (BPA).

Depending on the matrix, the method is also applicable to waste water in a working range from 0,1 µg/l to 50 µg/l for OP, OP<sub>1</sub>EO, OP<sub>2</sub>EO and BPA, and from 0,5 µg/l to 50 µg/l for NP, NP<sub>1</sub>EO and NP<sub>2</sub>EO. The working ranges are based on experimental work carried out in ruggedness testing. Water samples containing suspended matter at concentrations of more than 500 mg/l and waste water samples are extracted by passing a 100 ml sample through the cartridge.

## 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 5667-1, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes and sampling techniques*

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*