



**NSAI**  
Standards

Irish Standard  
I.S. EN 15768:2015

# Influence of materials on water intended for human consumption - GC-MS identification of water leachable organic substances

## I.S. EN 15768:2015

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):*

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.*

*This document is based on:*

EN 15768:2015

*Published:*

2015-01-28

*This document was published under the authority of the NSAI and comes into effect on:*

2015-02-24

ICS number:

13.060.20

67.250

71.040.50

NOTE: If blank see CEN/CENELEC cover page

NSAI  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

Sales:  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

EN 15768

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2015

ICS 13.060.20; 67.250; 71.040.50

English Version

## Influence of materials on water intended for human consumption - GC-MS identification of water leachable organic substances

Influence sur l'eau des matériaux en contact avec l'eau destinée à la consommation humaine - Identification par GC-SM de substances organiques lixiviables à l'eau

Identifizierung mittels GC-MS von durch Wasser auslaugbaren organischen Substanzen aus Materialien für den Kontakt mit Trinkwasser

This European Standard was approved by CEN on 29 November 2014.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Contents

	Page
Foreword.....	4
Introduction .....	5
1 Scope .....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Principle .....	9
5 Reagents .....	9
5.1 General.....	9
5.2 Required reagents .....	9
6 Apparatus .....	13
7 Storage of migration waters, procedural blanks and laboratory blanks .....	14
8 Method of analysis.....	14
8.1 Extraction procedure.....	14
8.2 GC-MS analysis.....	15
8.2.1 Safety precautions.....	15
8.2.2 Mass spectrometer operating parameters .....	15
8.2.3 Setting up the mass spectrometer and data system .....	15
8.2.4 Initial tuning and mass calibration of the mass spectrometer .....	15
8.3 Setting up the GC-MS system .....	15
8.4 GC-MS operating conditions for analysis of solvent extracts .....	16
8.5 Production of required outputs from the GC-MS data system .....	17
9 Quality assurance (QA) and quality control (QC) procedures .....	17
9.1 The mass calibration of the mass spectrometer .....	17
9.2 The performance of the GC-MS system .....	17
9.3 The performance of the method.....	17
9.4 Performance of the analyst.....	18
9.5 Uncertainty of the method .....	18
10 Expression of results .....	18
10.1 Semi-quantitative estimation of concentrations of substances detected .....	18
10.2 Identification of substances detected .....	19
10.3 Reporting of results.....	19
11 Test report .....	20
11.1 General.....	20
11.2 Test results .....	21
Annex A (normative) Additional procedural details .....	23
A.1 Checking suitability of apparatus used for concentrating solvent extracts .....	23
A.2 Procedure for calculation of recoveries of internal standards .....	23
A.3 Standard solutions for checking GC column performance .....	24
Annex B (informative) Outline of general approach for identification of substances detected.....	25
B.1 General approach - Introduction .....	25
B.2 GC-MS Test Solution .....	25

<b>B.3</b>	<b>Typical Leachate</b> .....	<b>26</b>
<b>B.4</b>	<b>Identifying substances</b> .....	<b>26</b>
<b>B.5</b>	<b>Overloading</b> .....	<b>27</b>
<b>Annex C</b>	<b>(informative) Guidance on the interpretation of results</b> .....	<b>28</b>
<b>C.1</b>	<b>Introduction</b> .....	<b>28</b>
<b>C.2</b>	<b>Initial assessment of test report</b> .....	<b>28</b>
<b>C.3</b>	<b>Assessment of results of analysis</b> .....	<b>28</b>
<b>Annex D</b>	<b>(informative) Guidance on the identification of substances</b> .....	<b>30</b>
<b>D.1</b>	<b>A suggested strategy to assist in identifying substances in extracted leachates</b> .....	<b>30</b>
<b>D.2</b>	<b>Resolution of co-eluting peaks</b> .....	<b>30</b>
<b>D.3</b>	<b>Proceeding when background subtraction does not help</b> .....	<b>31</b>
<b>D.4</b>	<b>Tentatively identifying a substance using boiling points and retention indices</b> .....	<b>31</b>
<b>D.5</b>	<b>Library search results and identifying “unknown” substances</b> .....	<b>32</b>
<b>D.6</b>	<b>Interpretation of the mass spectrum</b> .....	<b>32</b>
<b>D.7</b>	<b>Reporting confidence in a substance identification</b> .....	<b>33</b>
<b>D.8</b>	<b>How to report alternative identifications and when this is appropriate</b> .....	<b>33</b>
<b>D.9</b>	<b>What to do if library search fails to assign a reasonable identification</b> .....	<b>34</b>

## **EN 15768:2015 (E)**

### **Foreword**

This document (EN 15768:2015) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

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 July 2015 and conflicting national standards shall be withdrawn at the latest by July 2015.

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.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document has been prepared on the basis of co-normative research project EVK1-CT 2000-00052 and work funded by DG Enterprise and Industry (Grant Agreement S12.403892).

This document describes methods of identification only, and should not be used or quoted as a specification.

References to this document should indicate that the methods of identification used are in accordance with EN 15678:2015.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

Organic substances that migrate from products containing such substances have, when used in contact with water intended for human consumption, the potential to cause health concerns for consumers. The potential health effects of these chemicals are assessed in three stages as follows:

- a) preparation of migration waters by exposing a portion of the material to water under controlled conditions;
- b) analysis of the migration waters;
- c) assessment of the identities and concentrations of the substance detected.

The analysis of organic substances present in migration waters can involve two different types of analytical methods as follows:

- d) a screening method, which allows a variety of substances to be detected and a semi-quantitative assessment to be made of their concentrations;
- e) accurate quantitative methods for the determination of specific target substances known to be present in the chemical formulations of the materials.

This standard describes the analytical procedures based upon gas chromatography and mass spectrometry (GC-MS) used to screen migration waters for organic substances derived from finished products such as pipes, protective coatings, membranes, etc. This method is suitable for migration waters from all products that can potentially release organic chemicals into water when they are used in contact with water intended for human consumption, and which are the subject of an application for approval by the national regulatory body. It may be one of several methods that form part of the overall approval process. The method may also be used as part of an approval audit process. The method does not provide accurate quantitative results and other analytical methods are recommended for accurate quantitative determination of specific target substances.

## EN 15768:2015 (E)

### 1 Scope

This European Standard describes a method for detecting and identifying organic chemicals that are amenable to GC-MS analysis using the procedures described and which can migrate from a product into water intended for human consumption. This European Standard does not provide all the necessary tools to completely identify all the substances that are detected. A method of semi-quantitatively estimating the concentrations of the organic substances detected is also provided, however, concentrations should only be seen as indicative.

NOTE The method to be used for the preparation of migration waters is specified by separate ENs, as noted below.

### 2 Normative references

EN 12873-1, *Influence of materials on water intended for human consumption - Influence due to migration - Part 1: Test method for factory-made products made from or incorporating organic or glassy (porcelain/vitreous enamel) materials*

EN 12873-2, *Influence of materials on water intended for human consumption - Influence due to migration - Part 2: Test method for non-metallic and non-cementitious site-applied materials*

EN 12873-3, *Influence of materials on water intended for human consumption - Influence due to migration - Part 3: Test method for ion exchange and adsorbent resins*

EN 12873-4, *Influence of materials on water intended for human consumption - Influence due to migration - Part 4: Test method for water treatment membranes*

EN ISO 3696, *Water for analytical laboratory use - Specification and test methods (ISO 3696)*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1

**u**

atomic mass unit, defined as 1/12 of the mass of a single atom of carbon-12 in the gas phase (i.e. unbound), at rest and in its ground state

#### 3.2

##### asymmetry factor

**$A_s$**

measure of the absorption of a compound during gas chromatographic analysis

Note 1 to entry: The asymmetry factor ( $A_s$ ) can be derived from Formula (1).

$$A_s = \frac{(a+b)}{2b} \quad (1)$$

where

**a** is the distance from the leading edge of the peak at the point on the baseline where the perpendicular dropped from the peak maximum crosses it;

**b** is the corresponding distance from the trailing edge of the peak.

Locate the apex of the peaks that require their asymmetry values calculated. For each peak, drop a perpendicular line down at a right-angle to the baseline.



This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-