

National Standards Authority of Ireland

STANDARD RECOMMENDATION

#### S.R. CEN/TS 1948-4:2007

ICS 13.040.40

**STATIONARY SOURCE EMISSIONS -**

**DETERMINATION OF THE MASS** 

**CONCENTRATION OF PCDDS/PCDFS AND** 

**DIOXIN-LIKE PCBS - PART 4: SAMPLING AND** 

**ANALYSIS OF DIOXIN-LIKE PCBS** 

National Standards Authority of Ireland Glasnevin, Dublin 9 Ireland Tel: +353 1 807 3800 Fax: +353 1 807 3838 http://www.nsai.ie

Sales http://www.standards.ie

This Standard Recommendation was published under the authority of the National Standards Authority of Ireland and comes into effect on: 3 September 2007

NO COPYING WITHOUT NSAI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

© NSAI 2007

Price Code M

Údarás um Chaighdeáin Náisiúnta na hÉireann

This is a free page sample. Access the full version online.

This page is intentionally left BLANK.

# TECHNICAL SPECIFICATION SPÉCIFICATION TECHNIQUE TECHNISCHE SPEZIFIKATION

# **CEN/TS 1948-4**

July 2007

ICS 13.040.40

**English Version** 

## Stationary source emissions - Determination of the mass concentration of PCDDs/PCDFs and dioxin-like PCBs - Part 4: Sampling and analysis of dioxin-like PCBs

Emissions de sources fixes - Détermination de la concentration massique en PCDD/PCDF et PCB de type dioxine - Partie 4 : Prélèvement et analyse de PCB de type dioxine Emissionen aus stationären Quellen - Bestimmung der Massenkonzentration von PCDD/PCDF und dioxinähnlichen PCB - Teil 4: Probenahme und Analyse dioxinähnlicher PCB

This Technical Specification (CEN/TS) was approved by CEN on 16 June 2007 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

© 2007 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. CEN/TS 1948-4:2007: E

#### CEN/TS 1948-4:2007 (E)

# Contents

Introduction	4
1 Scope	4
2 Normative references	5
3 Terms and definitions	5
4 Symbols and abbreviations	7
5 Principle of the measurement procedure	8
6 Device, materials and <sup>13</sup> C <sub>12</sub> -labelled standards	9
7 Safety measures	10
8 Measurement procedure	11
9 Method validation and quality control requirements	18
10 Quality control requirements for the measurement	20
11 Quality assurance criteria for extraction/clean-up/quantification procedure blanks	22
12 Performance characteristics (informative)	23
13 Interferences (informative)	24
Annex A (informative) Toxicity and toxic equivalency	25
Annex B (informative) Example for clean-up of PCB and the separation from PCDD/PCDFs	27
B.1 General B.2 Method	27
Annex C (informative) Possible interferences in dioxin-like PCB analysis	35
Annex D (informative) Measurement of the marker PCB 28, 52, 101, 138, 153, and 180 in addition to the 12 non- and mono-ortho-PCB	38
Bibliography	41

### Foreword

This document (CEN/TS 1948-4:2007) has been prepared by Technical Committee CEN/TC 264 "Air quality", the secretariat of which is held by DIN.

The European Standard EN 1948:2006 consists of several parts dealing with the determination of the mass concentration of PCDDs, PCDFs and PCBs in stationary source emissions:

- Part 1: Sampling of PCDDs/PCDFs
- Part 2: Extraction and clean-up of PCDDs/PCDFs
- Part 3: Identification and quantification of PCDDs/PCDFs
- Part 4: Sampling and analysis of dioxin-like PCBs (Technical Specification CEN/TS)

The first three parts are necessary for the performance of the dioxin measurements. In addition this Technical Specification, CEN/TS 1948-4, describes the sampling, extraction and analyses of dioxin-like PCBs and will be transferred to a European Standard after corresponding validation measurements.

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 announce this Technical Specification: Austria, Belgium, Bulgaria, 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.

### Introduction

A group of chlorinated aromatic compounds similar to polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) is known as polychlorinated biphenyls (PCBs) which consists of 209 individual substances (see Figure 1 for the basic structure).

PCBs have been produced over approximately 50 years until the end of the 1990s with different uses in open and closed systems, e.g. as electrical insulators or dielectric fluids in capacitors and transformers, specialised hydraulic fluids, as a plasticiser in sealing material etc. World-wide, more than one million tons of PCBs were produced.

PCDD/PCDF as well as PCBs are emitted during thermal processes. PCB can contribute considerably to the total WHO-TEQ as reported for Germany;[1] [2], Great Britain [3], Poland [4], Spain [5], Japan [6]; [7], Korea [8].

In 1997 a group of experts of the World Health Organisation (WHO) defined toxicity equivalent factors (TEFs) for PCDDs/PCDFs and twelve PCBs, known as dioxin-like PCBs [9;10] (see Annex A). These twelve dioxin-like PCBs consist of four non-ortho PCBs and eight mono-ortho PCBs (no or only one chlorine atoms in 2-, 2'-, 6- and 6'-position), having a planar or mostly planar structure, see Figure 1.

This document deals with the determination of these *dioxin-like* PCBs in emissions from stationary sources.

Only skilled operators who are trained in handling highly toxic compounds should apply this document.



Figure 1 — Structure of PCB

#### 1 Scope

This document specifies sampling from stationary sources, extraction, clean-up, identification and quantification procedures of the dioxin-like PCBs. The procedure described lays down requirements to measure the PCB congeners given in Annex A (see Table A.1). It is applicable to the twelve non- and mono-ortho PCB designated by the WHO. It is optimised to measure PCB concentrations in the range of 0,01 ng WHO-TEQ<sub>PCB</sub>/m<sup>3</sup>.

In addition to the 12 non- and mono-ortho-PCB the present document is also applicable to measure further PCB-congeners like the so-called "marker PCB" 28, 52, 101, 138, 153, 180 (see Annex D).

This document specifies a framework of quality control requirements which have to be fulfilled by any PCB sampling, extraction, clean-up, identification and quantification methods to be applied.

It is assumed that due to their similar chemical behaviour PCBs may be sampled from stationary sources together with the PCDDs/PCDFs by the same methods. The complete sampling procedure is described in the EN 1948-1. Each of the three sampling methods of EN 1948-1 can be combined with the methods described



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

**Product Page** 

S Looking for additional Standards? Visit Intertek Inform Infostore

> Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation