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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

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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 dioxin-ähnlichen PCB - Teil 4: Probenahme und Analyse dioxin-ähnlicher 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.

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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.

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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.

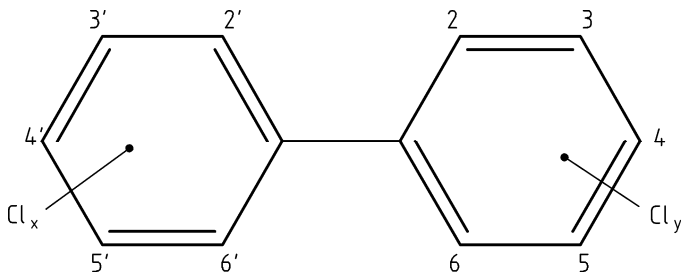

Figure 1 —Structure of PCB

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_{PCB}/m^3.

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

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