

**Välisõhu kvaliteet. Paiksete saasteallikate heitkogused.
As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Sb, Tl ja V kogu heite
määramine**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English version

Stationary source emissions - Determination of the total emission of As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Sb, Tl and V

Emissions de sources fixes - Détermination de l'émission totale de As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Tl et V

Emissionen aus stationären Quellen - Bestimmung der Gesamtemission von As, Cd, Cr, Co, Cu, Mn, Ni, Pb, Tl und V

This European Standard was approved by CEN on 2 July 2003.

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.

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 Central Secretariat has the same status as the official versions.

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



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Foreword

This document (EN 14385:2004) has been prepared by Technical Committee CEN/TC 264 "Air quality", 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of an identical text or by endorsement, at the latest by August 2004, and conflicting national standards shall be withdrawn at the latest by August 2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives.

For relationship with EU Directives, see informative Annex ZA, which is an integral part of this document.

In this European Standard the Annexes A to E are informative.

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

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Introduction

This European Standard specifies a method for the determination of the total mass concentration of specific elements in flue gases of waste incinerators. During the establishment of this European Standard field tests were performed in order to determine some performance characteristics. These tests showed that in the “gaseous” phase most of the elements can not be determined quantitatively in the absorption solutions. Therefore, the results of this method are expressed as the total element mass concentrations (i.e. sum of gaseous, dissolved in droplets, solid and adsorbed on particles). This means that when the specific elements are mainly in the solid phase no significant losses (biases) should occur due to the poor absorption efficiency for the elements in the gaseous phase. The quality check requirement for approval of the results is the mass in the last absorber expressed as a minimum percentage of the total mass; this minimum is set at a rather high level, based on the experiences of the absorption efficiencies in the field tests.

When this European Standard is applied for conditions that are different from those investigated during the field tests at municipal waste incinerators, the results may not be the same as experienced during these field tests described.

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1 Scope

This European Standard specifies a manual reference method for the determination of the mass concentration of specific elements in exhaust gases from hazardous and municipal waste incinerators [1]. The method is applicable to each of the specific elements in the concentration range of $0,005 \text{ mg/m}^3$ to $0,5 \text{ mg/m}^3$. Unless otherwise stated, concentrations are expressed at volumes under dry conditions, normalised to 273 K, 101,3 kPa, and oxygen content with a volume fraction of 11 %.

Specific elements according to this European standard are antimony (Sb), arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), nickel (Ni), thallium (Tl), and vanadium (V).

This European Standard is also applicable for exhaust gases from other sources with a flue gas composition, similar to that given in Table 1. The performance characteristics of the method determined for waste incinerators cannot be extrapolated to be used for other types of matrix without any further validation work.

NOTE This European Standard has been validated with the described materials, equipment, sampling and digestion performances etc., followed by analyses with AAS and ICP. This does not exclude the use of other types that meet the requirements and proven to be equivalent to the described European Standard.

This European Standard has been validated for the determination of the mass concentration of metals in incineration exhaust gases, within the uncertainties stated in clause 9.

If mercury is to be determined as well, this may be sampled in a side stream arrangement of the sampling train (EN 13211).

Table 1 — Exhaust gas matrix

Parameter to be determined	Mass concentration range		
total suspended matter	0 mg/m^3	to	20 mg/m^3
TOC ^{a)}	0 mg/m^3	to	20 mg/m^3
HCl	0 mg/m^3	to	20 mg/m^3
HF	0 mg/m^3	to	2 mg/m^3
SO ₂	0 mg/m^3	to	100 mg/m^3
CO	0 mg/m^3	to	250 mg/m^3
NO _x as NO ₂	0 mg/m^3	to	500 mg/m^3
Volume fraction range			
CO ₂	3 %	to	15 % (dry, actual)
H ₂ O (ga)	10 %	to	35 % (actual)
O ₂	3 %	to	17 % (dry, actual)
Temperature			
Temperature	60 °C	to	200 °C

a) total organic carbon

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 13284-1:2001, *Stationary source emissions – Determination of low range mass concentration of dust – Part 1: Manual gravimetric method*

EN 13211:2001, *Air quality – Stationary source emissions – Manual method of determination of the concentration of total mercury*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results - Part 2 : Basic method for the determination of repeatability and reproducibility of a standard measurement method*

3 Terms and definitions, symbols and abbreviations

3.1 Terms and definitions

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

3.1.1

absorber

a device in which specific elements are absorbed into an absorption liquid

3.1.2

chemical blank

a solution used to check the purity of the chemicals employed by the laboratory

NOTE The chemical blank value is determined by analysing the chemical blank solution (produced as described in 5.2.10) for the specific elements. This chemical blank is to be used as blank for all digestions using acids from one and the same batch. Furthermore, this chemical blank should be used for dilution of laboratory standards.

3.1.3

filter blank

the filter blank value is determined for each specific element by treatment and analysis of an unused filter which has been taken from the same batch as the sample filters. The treatment of the filter blank is specified in 8.7.3. The filter blank gives the blank values for the filter and treatment only. This value may be subtracted from the analytical value. The filter blank is **not** the same as the field blank (see 8.5)

3.1.4

field blank

samples of filter, absorption and rinsing solutions taken at sites without sampling gas and analysed as a normal sample (explanation see 8.5)

In every campaign of sampling, at least one sampling blank should be taken at each duct or chimney where sampling is to be carried out.

3.1.5

filtered material

materials collected on the filter

3.1.6

filter passing material

components passing the filter and recovered in the rest of the absorbing system