

**Workplace atmospheres - Electrical apparatus  
used for the direct detection and direct  
concentration measurement of toxic gases and  
vapours - Part 3: Performance requirements for  
apparatus used for measuring concentrations  
well above limit values**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 45544-3:2000 sisaldab Euroopa standardi EN 45544-3:1999 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 16.06.2000 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 45544-3:2000 consists of the English text of the European standard EN 45544-3:1999.

This standard is ratified with the order of Estonian Centre for Standardisation dated 16.06.2000 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

The standard is available from Estonian standardisation organisation.

ICS 13.040.30, 13.320

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English version

Workplace atmospheres - Electrical apparatus used for the  
direct detection and direct concentration measurement of toxic  
gases and vapours - Part 3: Performance requirements for  
apparatus used for measuring concentrations well above limit  
values

Atmosphères des lieux de travail - Appareillage électrique  
utilisé pour la détection directe des vapeurs et gaz toxiques  
et le mesurage direct de leur concentration - Partie 3:  
Exigences de performance pour les appareillages utilisés  
pour le mesurage des concentrations très supérieures aux  
valeurs limites

Arbeitsplatzatmosphäre - Elektrische Geräte für die direkte  
Detektion und direkte Konzentrationsmessung toxischer  
Gase und Dämpfe - Teil 3: Anforderungen an das  
Betriebsverhalten von Geräten für  
Konzentrationsmessungen weit oberhalb von Grenzwerten

This European Standard was approved by CEN on 5 September 1999 and by CENELEC on 15 November 1999.

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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/CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN/CENELEC members are the national standards bodies and national electrotechnical committees, respectively, of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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## Foreword

This European Standard has been prepared by Technical Committee CEN/CLC/WG CMI "Continuous measuring instruments", 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 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

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

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## Introduction

This European Standard specifies general requirements and test methods for the determination of the performance characteristics of electrical apparatus used for the direct detection and direct concentration measurement of toxic <sup>1)</sup> gases and vapours in workplace atmospheres. It also provides guidance for the selection, installation, use and maintenance of such apparatus.

This European Standard includes the following parts:

Workplace atmospheres - Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours -

Part 1: General requirements and test methods.

Part 2: Performance requirements for apparatus used for measuring concentrations in the region of limit values.

Part 3: Performance requirements for apparatus used for measuring concentrations well above limit values.

Part 4: Guide for selection, installation, use and maintenance.

This European Standard is based on EN 482 which specifies general performance requirements for procedures for determining the concentration of chemical agents in workplace atmospheres. These performance requirements include maximum values for overall uncertainty (a combination of precision and bias) that should be met under prescribed laboratory conditions and also in the environment representative of the workplace and other areas. For a given measurement task the range over which the requirements for the overall uncertainty have to be met is a function of the limit value. However, for most chemical agents the limit values have not been harmonized at the European level. Therefore, it was decided to use a reference value (standard test gas concentration) instead of the limit value for the performance tests. The list of standard test gas concentrations is given in annex A of EN 45544-1. The values chosen are close to the limit values used in different European countries but are intended to be used only for type testing apparatus without any legal implications.

EN 45544-2 of the standard is intended to be used for measuring concentrations up to 10 times the concentrations given in annex A of EN 45544-1. EN 45544-3 is intended to be used for measuring concentrations greater than 10 times the concentrations given in annex A of EN 45544-1. These concentrations are not covered by EN 482.

This standard will help manufacturers, test laboratories and users of apparatus to adopt a consistent approach to, and provide a framework for, the assessment of performance criteria. It is the manufacturer's primary responsibility to ensure that the apparatus meets the requirements laid down in this European Standard including environmental influences which may be expected to affect performance.

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<sup>1)</sup> For the purposes of this standard the word "toxic" should be taken to include: very toxic, toxic, harmful, corrosive, irritating, sensitising, carcinogenic, mutagenic, teratogenic.

## 1 Scope

This European Standard specifies the performance requirements for electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours in workplace atmospheres.

The standard test gas concentrations (STGC) used for the tests are given in 5.6 of EN 45544-1:1999.

## 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.

EN 45544-1:1999, *Workplace atmospheres - Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours - Part 1: General requirements and test methods*

EN 50270, *Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen*

## 3 Definitions

For the purposes of this European Standard the definitions of EN 45544-1 apply.

## 4 General requirements

Unless otherwise stated, the general requirements of EN 45544-1 are applicable and shall be checked by visual inspection.

Compliance shall be determined in accordance with the appropriate test methods including initial calibration specified in EN 45544-1.

## 5 Test conditions

Clause 5 of EN 45544-1:1999 is applicable.

## 6 Performance requirements

### 6.1 Standard requirements

When specified, the performance requirements in 6.3 to 6.8 shall be as follows:

The difference between the measured values before and after the test shall not exceed  $\pm 20\%$  of the measured value or  $\pm 10\%$  of the measuring range, whichever is the greater.

### 6.2 Unpowered storage

All apparatus shall meet the relevant requirements of 6.3 to 6.8 after storage.

### 6.3 Measurement of deviations

The overall uncertainty shall be calculated according to 3.31 of EN 45544-1:1999.

The overall uncertainty of the measured values for each of the gas concentrations distributed over the measuring range shall not exceed  $\pm 20\%$  of the measured value or  $\pm 10\%$  of the measuring range, whichever is the greater.

### 6.4 Mechanical tests

#### 6.4.1 Vibration

During the vibration test, the apparatus shall not suffer any loss of function nor give any false alarm or fault signal. The apparatus shall not suffer damage resulting in hazard or loss of function.

The performance requirements shall be as stated in 6.1

#### 6.4.2 Droptest

The apparatus shall not suffer damage resulting in hazard or loss of function.

The performance requirements shall be as stated in 6.1