

**Workplace atmospheres - Electrical apparatus
used for the direct detection and direct
concentration measurement of toxic gases and
vapours - Part 2: Performance requirements for
apparatus used for measuring concentrations in
the region of limit values**

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 45544-2:2000 sisaldab Euroopa standardi EN 45544-2:1999 ingliskeelset teksti.

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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 2: Performance requirements for
apparatus used for measuring concentrations in the region of
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 2:
Exigences de performance pour les appareillages utilisés
pour le mesurage des concentrations de l'ordre des valeurs
limites

Arbeitsplatzatmosphäre - Elektrische Geräte für die direkte
Detektion und direkte Konzentrationsmessung toxischer
Gase und Dämpfe - Teil 2: Anforderungen an das
Betriebsverhalten von Geräten für
Konzentrationsmessungen im Bereich von Grenzwerten

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

CEN/CENELEC 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/CENELEC 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/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 toxic¹ 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 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.

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 can be expected to affect performance.

¹ 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 concentration (STGC) to be used for the tests are given in annex A of EN 45544-1. In the instances in which no STGC is assigned in 5.6 of EN 45544-1:1999, a STGC may be agreed between the manufacturer and test laboratory considering the National limit values. Otherwise, the performance requirements of EN 45544-3 apply.

NOTE There may be cases, where national limit values differ in some countries considerably from the STGC values specified in annex A of EN 45544-1. In these cases it may be necessary to test the apparatus at these limit values.

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:

- a) in clean air, the difference between the measured values before and after the test shall be less than or equal to \pm the zero variation.

$$|m_b - m_a| \leq \text{zero variation}$$

- b) in the STG, the modulus of the difference between the measured values before and after the test shall be less than or equal to (30 less the measured precision at STGC) as a percentage of the measured value.

$$\frac{|m_b - m_a|}{m_b} \times 100 \leq (30 - \frac{2s_{STGC}}{m_b} \times 100)$$

where:

m_b is the measured value before the test;

m_a is the measured value after the test;

s_{STGC} is the standard deviation of measurements at the STGC.