

STN	Ovzdušie na pracovisku. Elektrické prístroje používané na priamu detekciu a priame meranie koncentrácie toxických plynov a párov. Časť 4: Návod na výber, inštaláciu, používanie a údržbu.	STN EN 45544-4
		83 3635

Workplace atmospheres - Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours - Part 4: Guide for selection, installation, use and maintenance

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/16

Obsahuje: EN 45544-4:2016

Oznámením tejto normy sa od 25.01.2019 ruší
STN EN 45544-4 (83 3635) z októbra 2001

123593

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, 2016

Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 45544-4

March 2016

ICS 13.040.30; 13.320

Supersedes EN 45544-4:1999

English Version

Workplace atmospheres - Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours - Part 4: Guide for selection, installation, use and maintenance

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 4: Guide de sélection, d'installation, d'utilisation et d'entretien

Arbeitsplatzatmosphäre - Elektrische Geräte für die direkte Detektion und direkte Konzentrationsmessung toxischer Gase und Dämpfe - Teil 4: Leitfaden für Auswahl, Installation, Einsatz und Wartung

This European Standard was approved by CENELEC on 25 January 2016. CEN and 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 CEN-CENELEC Management Centre or to any CEN and 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 and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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



European Committee for Electrotechnical Standardization
 Comité Européen de Normalisation Electrotechnique
 Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword.....	4
Introduction.....	5
1 Scope	6
2 Normative references.....	6
3 Terms and definitions	7
4 Properties and detection of toxic gases and vapours.....	12
4.1 Properties and detection	12
4.2 Effects of water vapour on detection	13
4.3 Detection by oxygen deficiency measurement	13
5 Measurement tasks	14
5.1 General	14
5.2 General gas detection	14
5.3 Exposure measurement.....	15
6 Selection of the apparatus	16
6.1 General	16
6.2 Performance and electrical tests	17
6.3 Indication range, measuring range and uncertainty of measurement.....	17
6.3.1 General	17
6.3.2 Apparatus conforming to EN 45544-2	18
6.3.3 Apparatus conforming to EN 45544-3	19
6.4 Selectivity requirements	19
6.5 The influence of environmental conditions.....	19
6.6 Time of response and time of recovery	19
6.7 Time to alarm	20
6.8 Data logging	21
6.9 Instruction manual	22
7 Operation of toxic gas detection apparatus	22
7.1 Alarm setting.....	22
7.2 Operation of personal and portable apparatus	23
7.2.1 General	23
7.2.2 Transportation	24
7.2.3 Storage	24
7.2.4 Inspection and functional checks.....	24
7.3 Operation of transportable and fixed apparatus	25

7.3.1	General	25
7.3.2	Installation.....	26
7.3.3	Commissioning and regular inspection.....	27
7.4	Sample lines and sampling probes	28
7.5	Accessories	28
8	Maintenance and calibration	29
8.1	General	29
8.2	Maintenance.....	29
8.3	Calibration.....	29
8.3.1	Procedure.....	29
8.3.2	Calibration period.....	30
8.4	Operation test	31
8.5	Records	31
9	Training	32
9.1	General	32
9.2	Operator training	32
9.3	Maintenance and calibration training.....	32
	Annex A (normative) Commonly used measurement principles.....	34
A.1	General	34
A.2	Chemiluminescence.....	34
A.3	Colorimetry	35
A.4	Electrochemical	36
A.5	Flame-ionization	37
A.6	Gas chromatography	38
A.7	Infrared photometry	39
A.8	Ion mobility spectrometry	40
A.9	Mass spectrometry	41
A.10	Photo-ionization	42
A.11	Semiconductor	43
A.12	Ultra-violet visible photometry.....	44
	Annex B (informative) Table of significant changes in comparison to EN 45544-4:1999.....	45
	Bibliography.....	47

European foreword

This document (EN 45544-4:2016) has been prepared by CEN/CENELEC Joint Working Group "Continuous Measuring Instruments" (JWG CMI).

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-01-25
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-01-25

This document supersedes EN 45544-4:1999.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Introduction

National laws and regulations based on European Directives require the assessment of the potential exposure of a worker to chemical agents in workplace atmospheres.

EN 45544, Workplace atmospheres – Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours, consists of the following parts:

- *Part 1: General requirements and test methods;*
- *Part 2: Performance requirements for apparatus used for exposure measurement;*
- *Part 3: Performance requirements for apparatus used for general gas detection;*
- *Part 4: Guide for selection, installation, use and maintenance.*

1 Scope

This European Standard gives guidance on the selection, installation, use and maintenance of electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours in workplace atmospheres. The primary purpose of such apparatus is to measure the concentration of a toxic gas or vapour in order to provide an exposure measurement and/or detection and warning of its presence.

This European Standard is applicable to apparatus whose primary purpose is to provide an indication, alarm and/or other output function to give a warning of the presence of a toxic gas or vapour in the atmosphere and in some cases to initiate automatic or manual protective actions. It is applicable to apparatus in which the sensor automatically generates an electrical signal when gas is present.

This European Standard is not applicable, but may provide useful information, for apparatus

- used for the measurement of oxygen,
- used only in laboratories for analysis or measurement,
- used only for process measurement purposes,
- used in car parks or tunnels (fixed apparatus only),
- used in the domestic environment,
- used in environmental air pollution monitoring,
- used for the measurement of combustible gases and vapours related to the risk of explosion.

It also does not apply to open-path (line of sight) area monitors.

For apparatus used for sensing the presence of multiple gases, this European Standard applies only to the detection of toxic gas or vapour.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 482:2012+A1:2015, *Workplace exposure – General requirements for the performance of procedures for the measurement of chemical agents*

EN 45544-1:2015, *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 45544-2:2015, *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 exposure measurement*

EN 45544-3:2015, *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 general gas detection*