SVENSK STANDARD

SS-EN IEC 62990-1+A11, utg 1:2023

Fastställd	Sida	Ansvarig kommitté
2023-09-20	1 (69)	SEK TK 31

Atmosfärer på arbetsplatser – Del 1: Gasdetektorer (gasvarnare) – Prestandafordringar för utrustning för detektering av giftiga gaser och ångor

Workplace atmospheres – Part 1: Gas detectors – Performance requirements of detectors for toxic gases

Som svensk standard gäller europastandarden EN IEC 62990-1:2022. Den svenska standarden innehåller de officiella engelska språkversionerna av EN IEC 62990-1:2022 och EN IEC 62990-1/A11:2022.

Nationellt förord

Europastandarden EN IEC 62990-1:2022

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62990-1, First edition, 2019**[*)] **- Workplace atmospheres – Part 1: Gas detectors – Performance requirements of detectors for toxic gases**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 45544-1, utg 2:2015, SS-EN 45544-3, utg 2:2015, SS-EN 45544-2, utg 2:2015 med eventuella tillägg, ändringar och rättelser, gäller ej fr o m 2025-08-27.

[*)] Corrigendum No 1, December 2019 till IEC 62990-1:2019 är inarbetat i standarden.

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Denna standard är fastställd av SEK Svensk Elstandard,
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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

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Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

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Stora delar av arbetet sker internationellt

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Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62990-1

October 2022

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Supersedes EN 45544-1:2015; EN 45544-3:2015;
EN 45544-2:2015

English Version

Workplace atmospheres - Part 1: Gas detectors - Performance requirements of detectors for toxic gases (IEC 62990-1:2019 + COR1:2019)

Atmosphères des lieux de travail - Partie 1: Détecteurs de gaz - Exigences d'aptitude à la fonction des détecteurs de gaz toxiques
(IEC 62990-1:2019 + COR1:2019)

Arbeitsplatzatmosphäre - Teil 1: Gasmessgeräte - Anforderungen an das Betriebsverhalten von Geräten für die Messung toxischer Gase
(IEC 62990-1:2019 + COR1:2019)

This European Standard was approved by CENELEC on 2022-08-17. 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 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 62990-1:2022 E

European foreword

This document (EN IEC 62990-1:2022) consists of the text of IEC 62990-1:2019 and IEC 62990-1:2019/COR1:2019 prepared by IEC/TC 31 “Equipment for explosive atmospheres” in cooperation with ISO/TC 146 “Air quality, sub-committee 2: Workplace atmospheres”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-08-27
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2025-08-27

This document, together with EN IEC 62990-1/A11:2022, supersedes EN 45544-1:2015, EN 45544-2:2015 and EN 45544-3:2015.

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

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62990-1:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60079-29-1	NOTE	Harmonized as EN 60079-29-1
IEC 60079-29-2	NOTE	Harmonized as EN 60079-29-2
IEC 60079-29-3	NOTE	Harmonized as EN 60079-29-3
IEC 60079-29-4	NOTE	Harmonized as EN 60079-29-4
ISO 6145-1	NOTE	Harmonized as EN ISO 6145-1
ISO 6145-4	NOTE	Harmonized as EN ISO 6145-4
ISO 6145-5	NOTE	Harmonized as EN ISO 6145-5
ISO 6145-6	NOTE	Harmonized as EN ISO 6145-6
ISO 6145-7	NOTE	Harmonized as EN ISO 6145-7
ISO 6145-9	NOTE	Harmonized as EN ISO 6145-9
ISO 6145-10	NOTE	Harmonized as EN ISO 6145-10
ISO 20581	NOTE	Harmonized as EN 482

IEC 62990-1

Edition 1.0 2019-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Workplace atmospheres –
Part 1: Gas detectors – Performance requirements of detectors for toxic gases

Atmosphères des lieux de travail –
Partie 1: Détecteurs de gaz – Exigences d'aptitude à la fonction des détecteurs de gaz toxiques

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 1: Gas detectors – Performance requirements of detectors for toxic gases

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62990-1 has been prepared by Joint Working Group (JWG) 45 of IEC technical committee 31: Equipment for explosive atmospheres in cooperation with ISO technical committee 146: Air quality, sub-committee 2: Workplace atmospheres.

It is published as a dual logo standard.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
31/1463/FDIS	31/1480/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62990 series, published under the general title *Workplace atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of December 2019 have been included in this copy.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62990 specifies general requirements for construction, testing and performance of equipment intended to measure the concentration of toxic gas and vapour in workplace atmospheres and other industrial and commercial applications. The performance requirements are intended to apply under environmental conditions present at the site of operation. However, because a wide range of environmental conditions are encountered in practise, this document specifies requirements that have to be fulfilled by equipment when tested under prescribed laboratory conditions.

This document applies to the following types of equipment: Health Monitoring (HM) and Safety Monitoring (SM). For a given measurement task of Type HM equipment the range over which the requirements must be met depends on the occupational exposure limit value. However, for most toxic gases and vapours the occupational exposure limit values have not been harmonized at the international level. Therefore, it was decided to use a reference value instead of the occupational exposure limit value for the performance tests. The list of reference values is given in Annex A. The reference values chosen are equal to or close to the occupational exposure limit values used in different countries but are intended to be used only for type testing equipment without any legal implications.

Electrical equipment used for the direct detection and direct concentration measurement of toxic gases and vapours generate readings in clean air (nominally zero), which vary with environmental conditions and time. This document therefore includes test methods and requirements for acceptable variations in measured values at application of zero gas and of defined test gases.

For gas detection equipment including additional function for detecting flammable gas and/or oxygen, consideration should be given to the relevant standards.

General requirements for construction, testing and performance of gas detectors for flammable gases and vapours are set out in IEC 60079-29-1, *Explosive atmospheres – Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases.*

General requirements for construction, testing and performance of open path detectors for flammable gases are set out in IEC 60079-29-4, *Explosive atmospheres – Part 29-4: Gas detectors – Performance requirements of open path detectors for flammable gases.*

Guidance for the selection, installation, use and maintenance of gas detecting equipment is set out in IEC 60079-29-2: *Explosive atmospheres – Part 29-2, Gas detectors – Selection, installation, use and maintenance of detectors for flammable gases and oxygen.*

Guidance for functional safety of fixed gas detection systems is set out in IEC 60079-29-3: *Explosive atmospheres – Part 29-3, Gas detectors – Guidance on functional safety of fixed gas detection systems.*

WORKPLACE ATMOSPHERES –

Part 1: Gas detectors – Performance requirements of detectors for toxic gases

1 Scope

This part of IEC 62990 specifies general requirements for design, function and performance, and describes the test methods that apply to portable, transportable, and fixed equipment for the detection and concentration measurement of toxic gases and vapours in workplace atmospheres and other industrial and commercial applications.

This document is applicable to continuously sensing equipment whose primary purpose is to provide an indication, alarm and/or other output function the purpose of which is to indicate the presence of a toxic gas or vapour in the atmosphere and in some cases to initiate automatic or manual protective action(s). It is applicable to equipment in which the sensor generates an electrical signal when gas is present.

This document applies to two types of equipment:

- Type HM (Health Monitoring) ‘occupational exposure’ equipment:

  For occupational exposure measurement, the performance requirements are focused on uncertainty of measurement of gas concentrations in the region of Occupational Exposure Limit Values (OELV). The upper limit of measurement will be defined by the manufacturer in accordance with 4.2.1.

- Type SM (Safety Monitoring) ‘general gas detection’ equipment:

  For general gas detection applications (e.g. safety warning, leak detection), the performance requirements are focused on alarm signalling. The upper limit of measurement will be defined by the manufacturer according to the intended use of the equipment.

In general, the requirements for accuracy will be higher for Type HM equipment than for Type SM equipment. The same equipment may meet the requirements of both Type HM and Type SM.

For equipment used for sensing the presence of multiple gases this document applies only to the detection of toxic gas or vapour.

This document is not applicable to equipment:

– with samplers and concentrators such as sorbents or paper tape having an irreversible indication;
– used for the measurement of gases and vapours related to the risk of explosion;
– used for the measurement of oxygen;
– used only in laboratories for analysis or measurement;
– used only for process measurement purposes;
– used in the domestic environment;
– used in environmental air pollution monitoring;
– used for open-path (line of sight) area gas measurement;
– used for ventilation control in car parks or tunnels.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61000-4-29, *Electromagnetic compatibility (EMC) – Part 4-29: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests*

IEC 61000-6-3, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments*

IEC 61000-6-4, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments*

IEC 61326-1, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements*