UL 62990-1

STANDARD FOR SAFETY

Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases

UL Standard for Safety for Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases, UL 62990-1

First Edition, Dated February 3, 2023

Summary of Topics

Adoption of IEC 62990-1, Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases, (first edition and Corrigendum 1, issued by IEC June 2019) as a new IEC-based UL Standard, UL 62990-1 with US Differences.

As noted in the Commitment for Amendments statement located on the back side of the title page, UL and FM are committed to updating this harmonized standard jointly.

The new requirements are substantially in accordance with Proposal(s) on this subject dated March 25, 2022 and September 9, 2022.

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FM Approvals LLC
ANSI/FM 62990-1-2023
First Edition

ULSE Inc.
UL 62990-1
First Edition

Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases

February 3, 2023

Approved American National Standard

ANSI/UL 62990-1-2023

Commitment for Amendments

This standard is issued jointly by FM Approvals LLC and ULSE Inc.(UL). Comments or proposals for revisions on any part of the standard may be submitted to FM Approvals or UL at any time. FM and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.

The most recent designation of ANSI/FM 62990-1 as an American National Standard (ANSI) occurred on February 3, 2023.

This ANSI/UL Standard for Safety consists of the First Edition.

The most recent designation of ANSI/UL 62990-1 as an American National Standard (ANSI) occurred on February 3, 2023. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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http://www.shopulstandards.com/HowToOrder.aspx or call toll-free 1-888-853-3503.

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Bibliography

PREFACE

This is the harmonized FM and UL standard for Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases. It is the first edition of FM 62990-1 and the first edition of UL 62990-1.

This harmonized standard is based on IEC Publication 62990-1: first edition, Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases, issued June 2019 and corrigendum 1. IEC publication 62990-1 is copyrighted by the IEC.

This harmonized standard was prepared by FM Approvals LLC (FM) and ULSE Inc. (UL).

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

Level of Harmonization

This standard adopts the IEC text with national differences.

This standard is published as an identical standard for FM and UL.

An identical standard is a standard that is exactly the same in technical content except for national differences resulting from conflicts in codes and governmental regulations. Presentation is word for word except for editorial changes.

All national differences from the IEC text are included in the FM and UL versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

IEC Copyright

For FM, the text, figures, and tables of International Electrotechnical Commission Publication 62990-1, Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases, copyright 2019, are used in this standard with the consent of the International Electrotechnical Commission. The IEC Foreword and Introduction are not a part of the requirements of this standard but are included for information purposes only.

The following people served as members of STP 9200 and participated in the review of this standard:

NAME	COMPANY
*J. Miller	MSA Innovation LLC
F. AlSahan	Saudi Aramco
R. Chalmers	Industrial Scientific Corp.
J. Chin	CSA Group
M. Coppler	LabTest Certification Inc.
G. Edwards	Det-Tronics
G. Garcha	Gurinder Garcha Consulting
C. Gestler	MSA Innovation LLC
W. Lawrence	FM Approvals
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D. Mills	UL Solutions
B. Saxinger	BW Technologies by Honeywell
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J. Schenayder	Dooley Tackaberry Inc.
R. Seitz	ARTECH Engineering
M. Shaw	Sensor Resource Inc.
J. Thomason	Omni Industrial Systems Inc.
L. Vlagea	General Monitors
D. Wechsler	American Chemistry Council

* Non-voting member

National Differences

National Differences from the text of International Electrotechnical Commission (IEC) Publication 62990-1, Workplace Atmospheres – Part 1: Gas Detectors – Performance Requirements of Detectors for Toxic Gases, copyright 2019, are indicated by notations (differences) and are presented in bold text.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

DR – These are National Differences based on the **national regulatory requirements**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

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FOREWORD

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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 ISO/IEC 62990-1 has been prepared by Joint Working Group (JWG) 45 of IEC technical committee 31: Equipment for explosive atmospheres and ISO technical committee 146: Air quality, sub-committee 2: Workplace atmospheres.

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 ISO/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.

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 ISO/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*.

101.DV DR *Modification of Introduction, fifth, sixth and seventh paragraphs as follows:*

Replace "IEC 60079-29" with "UL 60079-29".

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*.

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