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Responsible committee: EXL/31 Equipment for explosive atmospheres

Interested committees:

Title: BS EN 60079-101 Ed.1.0 Draft Explosive atmosphere – Part 101: Principles of explosion protection.

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- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

PROJECT NUMBER:
IEC 60079-101 ED1

DATE OF CIRCULATION:
2025-06-06

CLOSING DATE FOR COMMENTS:
2025-09-26

SUPERSEDES DOCUMENTS:
31/1786/NP, 31/1819A/RVN

IEC TC 31 : EQUIPMENT FOR EXPLOSIVE ATMOSPHERES

SECRETARIAT:
United Kingdom

SECRETARY:
Mr Tom Stack

OF INTEREST TO THE FOLLOWING COMMITTEES:
TC 2,TC 18,TC 21,SC 22G,TC 27,TC 34,TC 61,SC 61C,SC 61D,SC 61J,SC 62A,TC 64,TC 65,SC 65A,SC 65B,SC 65C,TC 72,TC 81,TC 101,TC 105

HORIZONTAL FUNCTION(S):
TC 31 Horizontal Basic Safety

ASPECTS CONCERNED:
Environment,Safety

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Explosive atmosphere – Part 101: Principles of explosion protection

NOTE FROM TC/SC OFFICERS:

IEC TC 31 has been assigned a Horizontal Safety Function related to explosive atmospheres. This CD follows from 31/1786/NP and is for a new Basic Safety Publication in accordance with IEC Guide 108.

Committees of possible interest have been listed based on earlier consultation with committees as part of the HSF and BSP development process. Updates to the list for future drafts should be notified to the IEC TC 31 secretary.

Some proposed text in the CD for IEC 60079-101 has been drawn from details in existing IEC 60079 series standards such as IEC 60079-10-1, IEC 60079-10-2 and IEC 60079-14. It is proposed that the relevant text in these other standards would be withdrawn or modified at the next edition of those standards after the publication of IEC 60079-101. Further details are included as drafting notes in the CD.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

Explosive atmosphere – Part 101: Principles of explosion protection

FOREWORD

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document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60079-101 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres. It is an International Standard.

It has the status of a basic safety publication according to IEC Guide 104.

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

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is **English [change language if necessary]**.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

This document provides information on the basic principles relevant to explosion protection where there is a hazard due to the possible presence of an explosive atmosphere and to outline the standards prepared by IEC TC 31.

An explosive atmosphere is defined in the standards prepared by IEC TC 31 as:

Mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour, or dust, which, after ignition, permits self-sustaining propagation.

This document is intended to be used by:

- Other ISO and IEC committees involved in the development of related standards, such as product standards.
- Persons involved in the development of national standards and regulations that could be related to explosive atmospheres.
- Persons needing guidance on the standards prepared by IEC TC 31 that could be applicable to them.
- Persons who wish to get a basic understanding of the subject of explosive atmospheres.

This document is not a substitute for the detail that is contained in the individual standards under the IEC 60079 and ISO/IEC 80079 series.

Except for the requirements around definitions (see Clause 4), this document does not include requirements. For details on requirements, reference to other documents in the IEC 60079 and ISO/IEC 80079 series and other standards for specific applications would need to be made. There might also be detail in those standards that would provide additional information to the information in this document.

The scope of IEC committee TC 31 *Equipment for explosive atmospheres* is:

To prepare and maintain international standards relating to equipment for use where there is a hazard due to the possible presence of explosive atmospheres of gases, vapours, mists or combustible dusts.

TC 31 has three subcommittees. One of these is subcommittee SC 31M, which has the scope:

To prepare and maintain international standards relating to [non-electrical equipment \(3.5.2\)](#) and protective systems for use where there is a hazard due to the possible presence of explosive atmospheres of gases, vapours, mists or combustible dusts.

Thus, the total scope of IEC TC 31, including its subcommittees, covers electrical and [non-electrical equipment \(3.5.2\)](#), and protective systems.

The standards prepared by IEC TC 31 encompass the full life cycle of equipment for explosive atmospheres, including equipment design, manufacture, installation, inspection and repair. It also covers supporting matters for the application of such equipment such as, the classification of hazardous areas, and the ignition characteristics of gases, vapours and combustible dusts.

The principal aim of the standards is to ensure that, where unintentional explosions could occur, these are avoided by the use of equipment that prevents such an explosion occurring in the hazardous area where the explosive atmosphere may exist. Where explosions cannot be avoided due to the nature of the processes, the use of protective systems, such as flame arrestors, can also prevent propagation that could lead to an unwanted explosion in a surrounding explosive atmosphere.

The application of the standards produced by IEC TC 31 is primarily focused on areas that meet the criteria of being a hazardous area. However, some industries apply hazardous area requirements where they are not required according to the application of [IEC 60079-10-1 \[1\]](#) and [IEC 60079-10-2 \[2\]](#) but are considered as an additional risk management element.

In particular, the documents prepared by IEC TC 31, include:

- a) Information and guidance on the ignition characteristics of flammable gases or vapours and combustible dusts relevant to explosion hazards and testing to determine those characteristics.
- b) Requirements for the classification of hazardous areas as a means to categorise the probability of an explosion hazard. This could be as a flammable gas or flammable vapour hazard, a combustible dust hazard, or a combination of both.
- c) Guidance on the basis of the principles of safety applied to the various requirements specified in the IEC 60079 and ISO/IEC 80079 series of standards.
- d) Requirements for the construction, testing and marking of equipment and components intended for use in explosive atmospheres.
- e) Requirements for selection, installation, maintenance, and repair of equipment for use in explosive atmospheres.
- f) Requirements for the design, performance, testing and use of gas detectors.
- g) Requirements for specific control measures that could be relevant to the hazard such as ventilation or pressurisation systems.
- h) Requirements for protective systems, such as flame arrestors.
- i) Guidance on other aspects such as personnel competencies for various aspects of work associated with explosive atmospheres.
- j) Guidance on relationships to other related standards that might be applicable, for example, for functional safety.

1 Scope

This document establishes basic principles to support understanding for users at all levels on the topic of equipment for explosive atmospheres. This includes an overview of the methods for the identification and assessment of hazardous situations which could lead to an explosion, and the design, construction, inspection and maintenance measures appropriate to achieve the required level of safety.

This document provides an outline of the structure of the standards prepared by IEC/TC 31 for correct application of the IEC 60079 and ISO/IEC 80079 series.

This document addresses the various elements in the lifecycle of equipment used in an installation involving explosive atmospheres, primarily through reference to other parts of the IEC 60079 and the ISO/IEC 80079 series. This document is also intended to resolve application details that are not currently well defined for smaller appliance type applications.

Excluded from the work of IEC TC 31 and this document are hazards resulting from explosives.

Information in this document is also applicable where the requirements of other parts of the IEC 60079 and ISO/IEC 80079 series do not apply. This document and the associated standards in the IEC 60079 series, do not address compliance for other aspects of electrical safety. This document, and the associated standards in the IEC 60079 series only supplement other aspects of electrical safety.

IEC 60079-101 is a BASIC SAFETY PUBLICATION focussing on the prevention and mitigation of explosions due to flammable gas, flammable vapour, or combustible dusts. It is primarily intended for use by technical committees in the preparation of SAFETY publications in accordance with the principles laid down in IEC Guide 104, Guide 108 and ISO/IEC Guide 51.

One of the responsibilities of a TC is, wherever applicable, to make use of BSPs in the preparation of its publications.

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 60050-426, *International Electrotechnical Vocabulary (IEV) - Part 426: Explosive atmospheres*

3 Terms and definitions

For the purposes of the IEC 60079 and ISO/IEC 80079 series, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

Type of Protection

specific measures applied to equipment to avoid ignition of a surrounding explosive atmosphere

[SOURCE: IEC 60079-0]

3.2

explosive atmosphere

mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour (3.17), mist (3.16), or dust (3.11) which, after ignition, permits self-sustaining propagation

[SOURCE: IEC 60079-0]

3.3

explosive dust atmosphere

mixture with air, under atmospheric conditions, of flammable substances in the form of dust (3.11), which, after ignition, permits self-sustaining propagation

[SOURCE: IEC 60079-0]

3.4

explosive gas atmosphere

mixture with air, under atmospheric conditions, of flammable substances in the form of gas (3.12) or vapour (3.17), which, after ignition, permits self-sustaining flame propagation

[SOURCE: IEC 60079-0]

3.5

equipment

general term including apparatus, fittings, devices, components, and the like used as a part of, or in connection with, an installation

[SOURCE: IEC 60079-0]

3.5.1

equipment, electrical

items applied as a whole or in part for the utilization of electrical energy

Note 1 to entry: These include, amongst others, items for the generation, transmission, distribution, storage, measurement, regulation, conversion and consumption of electrical energy and items for telecommunications.

[SOURCE: IEC 60079-0]

3.5.2

non-electrical equipment

equipment which can achieve its intended function mechanically

Note 1 to entry: Equipment addressed in this standard can be driven by any kind of energy including electrical

[SOURCE: ISO 80079-36]

3.5.3

Ex Equipment

explosion-protected equipment

Note 1 to entry: Such equipment often includes Ex Components, but additional evaluation is always required as part of their incorporation into equipment.

[SOURCE: IEC 60079-0]

3.6

Ex Component

equipment intended to be part of [Ex Equipment \(3.5.3\)](#), marked with the symbol "U", which is not intended to be used alone, and requires additional consideration when incorporated into [Ex Equipment \(3.5.3\)](#)

[SOURCE: IEC 60079-0]

3.7

temperature class

classification system of [Ex Equipment \(3.5.3\)](#), based on its maximum surface temperature, related to the specific [explosive gas atmosphere \(3.4\)](#) for which it is intended to be used

[SOURCE: IEC 60079-0]

3.8

certificate

document that conveys the assurance of the conformity of a product, process, system, person, or organization with specified requirements

Note 1 to entry: The certificate is either the supplier's declaration of conformity (1st party declaration) or the purchaser's recognition of conformity (2nd party acceptance) or certification (3rd party attestation). Declaration, acceptance, and certification are defined in ISO/IEC 17000.

[SOURCE: IEC 60079-0]

3.8.1

Ex Equipment Certificate

[certificate \(3.8\)](#) prepared for [Ex Equipment \(3.5.3\)](#)

[SOURCE: IEC 60079-0]

3.8.2

Specific Conditions of Use

essential information for the installation, use, and maintenance of the [Ex Equipment \(3.5.3\)](#) and is provided on an [Ex Equipment certificate \(3.8.1\)](#).

Note 1 to entry: These Specific Conditions of Use are in addition to the installation design, selection, installation of equipment, inspection, maintenance, repair, and overhaul requirements of the IEC 60079 and the ISO/IEC 80079 series; and they do not repeat those requirements.

[SOURCE: IEC 60079-0]

3.9

area, hazardous

area in which an [explosive atmosphere \(3.2\)](#) is present, or can be expected to be present, in quantities such that special precautions for the construction, installation and use of equipment are required

[SOURCE: IEC 60079-0]

3.10

area, non-hazardous

area in which an explosive atmosphere is not expected to be present in quantities such as to require special precautions for the construction, installation and use of equipment

[SOURCE: [SOURCE: IEC 60079-0]]