IEC 60079-10-1

Edition 3.0 2020-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Explosive atmospheres –
Part 10-1: Classification of areas – Explosive gas atmospheres

Atmosphères explosives –
Partie 10-1: Classification des emplacements – Atmosphères explosives gazeuses

SIST Preview
(https://ecommerce.sist.si)
IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/af6cc470-e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020



IEC 60079-10-1:2020-12(en-fr)

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2020 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

SIST Preview
https://standards.iteh.ai/catalog/standards/sist/e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

IEC 60079-10-1

Edition 3.0 2020-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Explosive atmospheres –
Part 10-1: Classification of areas – Explosive gas atmospheres

SIST Preview
(https://ecommerce.sist.si)

Atmosphères explosives –
Partie 10-1: Classification des emplacements – Atmosphères explosives gazeuses

IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/af6cc470-e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.260.20

ISBN 978-2-8322-8890-0

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

FOREWORD 6
INTRODUCTION 10
1 Scope 11
2 Normative references 11
3 Terms and definitions 12
4 General 16
4.1 Safety principles 16
4.2 Hazardous area classification objectives 17
4.3 Interior of equipment containing flammable materials 18
4.4 Explosion risk assessment 18
4.4.1 General 18
4.4.2 Zone of negligible extent 18
4.5 Catastrophic failures 19
4.6 Competence of personnel 19
5 Hazardous area classification methodology 19
5.1 General 19
5.2 Classification by sources of release method 20
5.3 Use of industry codes and national standards 21
5.3.1 General 21
5.3.2 Fuel gas installations 21
5.4 Simplified methods 21
5.5 Combination of methods 21
6 Release of flammable substance 22
6.1 General 22
6.2 Sources of release 22
6.3 Forms of release 23
6.3.1 General 23
6.3.2 Gaseous release 24
6.3.3 Liquefied under pressure release 24
6.3.4 Liquefied by refrigeration release 24
6.3.5 Flammable mists release 25
6.3.6 Vapours release 25
6.3.7 Liquid release 25
7 Ventilation (or air movement) and dilution 26
7.1 General 26
7.2 Main types of ventilation 27
7.2.1 General 27
7.2.2 Natural ventilation 27
7.2.3 Artificial ventilation 27
7.2.4 Degree of dilution 29
8 Type of zone 30
8.1 General 30
8.2 Influence of grade of the source of release 30
8.3 Influence of dilution 30
8.4 Influence of availability of ventilation 30
9 Extent of zone 31

SIST Preview
(https://ecommerce.sist.si)
IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/a0cc470-e0ad-45c2-84e3-7a79281024f6/iec-60079-10-1-2020

10 Documentation 31
10.1 General 31
10.2 Drawings, data sheets and tables 32
Annex A (informative) Suggested presentation of hazardous areas 33
A.1 Hazardous area – Preferred symbols for zones 33
A.2 Hazardous area suggested shapes 36
Annex B (informative) Estimation of sources of release 38
B.1 Symbols 38
B.2 Examples of grade of release 38
B.2.1 General 38
B.2.2 Sources giving a continuous grade of release 39
B.2.3 Sources giving a primary grade of release 39
B.2.4 Sources giving a secondary grade of release 39
B.3 Assessment of grades of release 39
B.4 Summation of releases 40
B.5 Hole size and source radius 41
B.6 Forms of release 43
B.7 Release rate 44
B.7.1 General 44
B.7.2 Estimation of release rate 45
B.7.3 Release rate of evaporative pools 47
B.8 Release from openings in buildings 49
B.8.1 General 49
B.8.2 Openings as possible sources of release 50
B.8.3 Openings classification 50
Annex C (informative) Ventilation guidance 52
C.1 Symbols 52
C.2 General 53
C.3 Assessment of ventilation and dilution and its influence on hazardous area 53
C.3.1 General 53
C.3.2 Effectiveness of ventilation 54
C.3.3 Criteria for dilution 54
C.3.4 Assessment of ventilation velocity 55
C.3.5 Assessment of the degree of dilution 56
C.3.6 Dilution in a room 58
C.3.7 Criteria for availability of ventilation 59
C.4 Examples of ventilation arrangements and assessments 60
C.4.1 Introduction 60
C.4.2 Jet release in a large building 61
C.4.3 Jet release in a small naturally ventilated building 62
C.4.4 Jet release in a small artificially ventilated building 62
C.4.5 Release with low velocity 63
C.4.6 Fugitive emissions 63
C.4.7 Local ventilation-extraction 64
C.5 Natural Ventilation in buildings 64
C.5.1 General 64
C.5.2 Wind induced ventilation 64
C.5.3 Buoyancy induced ventilation 65

SIST-1 Preview
(https://ecommerce.sist.si)
IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/af6cc470-e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020

C.5.4 Combination of the natural ventilation induced by wind and buoyancy 67
Annex D (informative) Estimation of hazardous areas 69
D.1 General 69
D.2 Estimating types of the zones 69
D.3 Estimating the extent of the hazardous area 70
Annex E (informative) Examples of hazardous area classification 72
E.1 General 72
E.2 Examples 72
E.3 Example case study for hazardous area classification 86
Annex F (informative) Schematic approach to classification of hazardous areas 96
F.1 Schematic approach to classification of hazardous areas 96
F.2 Schematic approach to classification of hazardous areas 97
F.3 Schematic approach to classification of hazardous areas 98
F.4 Schematic approach to classification of hazardous areas 99
Annex G (informative) Flammable mists 100
Annex H (informative) Hydrogen 103
Annex I (informative) Hybrid mixtures 105
I.1 General 105
I.2 Use of ventilation 105
I.3 Concentration limits 105
I.4 Chemical reactions 105
I.5 Energy/temperature limits 105
I.6 Zoning requirements 105
Annex J (informative) Useful equations in support to hazardous area classification 106
J.1 General 106
J.2 Dilution with air of a flammable substance release 106
J.3 Estimate of the time required to dilute a flammable substance release 106
Annex K (informative) Industry codes and national standards 108
K.1 General 108
Bibliography 112

Figure 1 – Dilution Volume 29
Figure A.1 – Preferred symbols for zones 33
Figure A.2 – Gas or vapour at low pressure (or at high pressure in case of unpredictable release direction) 36
Figure A.3 – Gas or vapour at high pressure 36
Figure A.4 – Liquefied gas 37
Figure A.5 – Flammable liquid (non boiling evaporative pool) 37
Figure B.1 – Forms of release 43
Figure B.2 – Specific volumetric evaporation rate of liquids 49
Figure C.1 – Chart for assessing the degree of dilution 57
Figure C.2 – Self diffusion of an unimpeded high velocity jet release 61
Figure C.3 – Supply only ventilation 62
Figure C.4 – Supply and extraction ventilation 63
Figure C.5 – Local extraction ventilation 64
Figure C.6 – Specific volumetric flow rate of fresh air of equivalent effective opening area ..67

SIST Preview
(https://ecommerce.sist.si)
IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/a0ee4f6-e0ad-45c2-84e3-7a7928102416/iec-60079-10-1-2020

Figure C.7 – Example of opposing ventilation driving forces 68
Figure D.1 – Chart for estimating hazardous area distances 71
Figure E.1 – Degree of dilution (Example No. 1) 73
Figure E.2 – Hazardous distance (Example No. 1) 74
Figure E.3 – Zone classification (Example No. 1) 74
Figure E.4 – Degree of dilution (Example No. 2) 76
Figure E.5 – Degree of dilution (Example No. 3) 78
Figure E.6 – Hazardous distance (Example No. 3) 79
Figure E.7 – Zones classification (Example No. 3) 79
Figure E.8 – Degree of dilution (Example No. 4) 81
Figure E.9 – Hazardous distance (Example No. 4) 82
Figure E.10 – Zones classification (Example No. 4) 83
Figure E.11 – Degree of dilution (Example No. 5) 85
Figure E.12 – Hazardous distance (Example No. 5) 86
Figure E.13 – Enclosed compressor handling natural gas 88
Figure E.14 – Example of hazardous area classification for a compressor facility handling natural gas (elevation) 94
Figure E.15 – Example of hazardous area classification for a compressor facility handling natural gas (plan) 95
Figure F.1 – Schematic approach to classification 96
Figure F.2 – Schematic approach to classification for continuous grade releases 97
Figure F.3 – Schematic approach to classification for primary grade releases 98
Figure F.4 – Schematic approach to classification for secondary grade releases 99

SIST Preview
(https://ecommerce.sist.si)
IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/af8cc470-e0ad-45e2-84a5-7e7928102416/iec-60079-10-1-2020

Table A.1 – Hazardous area classification data sheet – Part I: Flammable substance list and characteristics 34
Table A.2 – Hazardous area classification data sheet – Part II: List of sources of release 35
Table B.1 – Suggested hole cross sections for secondary grade of releases 42
Table B.2 – Effect of zones on openings as possible sources of release 51
Table C.1 – Indicative outdoor ventilation velocities (u_w) 56
Table D.1 – Zones for grade of release and effectiveness of ventilation 69
Table E.1 – Compressor facility handling natural gas 88
Table E.2 – Hazardous area classification data sheet – Part I: Flammable substance list and characteristics 91
Table E.3 – Hazardous area classification data sheet – Part II: List of sources of release 92
Table K.1 – Examples of codes and standards 109

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

EXPLOSIVE ATMOSPHERES –

Part 10-1: Classification of areas – Explosive gas atmospheres

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

SIST EN 60079-10-1:2020
(https://ecommerce.sist.si)
IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/...-iec-60079-10-1-2020

International Standard IEC 60079-10-1 has been prepared by subcommittee 31J: Classification of hazardous areas and installation requirements, of IEC technical committee 31: Equipment for explosive atmospheres.

This third edition of IEC 60079-10-1 cancels and replaces the second edition, published in 2015, and constitutes a technical revision. The significant technical changes with respect to the previous edition are as follows:

		Type		
Changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
Deleting commercial and industrial applications for fuel gas from the Scope exemptions	1			C1
Updating editorial details and notes to the definitions	3		X	
Deletion of the previous edition clause 3.7.3 definition for catastrophic failure (dealt with in clause 4.5)			X	
Introduction of new Subclause **4.4.2 Zone of negligible extent**	4.4.2		X	
Introduction of new clause **5.3.2 Fuel gas installations**	5.3.2		X	
Renumbering of headings	7	X		
Introduction of **Figure 1 – Dilution volume**	7		X	
Upgrading **Table A.1** with UFL and its column 15 heading with the 'source of data'	A.1	X		
Updating the flow-chart in **Figure B.1**	B.6		X	
Updating equations for evaporation rate to align with the recent source modifications	B.7.3		X	
Updating the chart in **Figure B.2** according to the updated equations for evaporation rate and the ventilation velocity of 0,25 m/s	B.7.3		X	
Restructuring **Table C.1**	C.3.4		X	
Removal of safety factor ***k*** and deleting it from the horizontal axis of the chart in **Figure C.1**	C.3.5			C2
Revising equations (C.2) and (C.3)	C.5.2			C3
Revising equations (C.4) and (C.5)	C.5.3			C4
Revising the chart in **Figure C.6** by changing the label on the horizontal axis	C.5.3			C5
Revising equation (C.6) and deleting equation (C.7)	C.5.4			C6
Removal of safety factor ***k*** and deleting it from the horizontal axis of the charts in **Figure D.1**	D.3			C7
Imposing limitations to the use of the chart in **Figure D.1**	D.3		X	
Updating and corrections in **Annex E**	Annex E		X	
Upgrading **Annex G** on Flammable mists	Annex G		X	
Introducing new items in **Table K.1**	Annex K		X	
Introducing new items in the Bibliography	Bibliography		X	
NOTE The technical changes referred to include the significance of technical changes in the revised IEC Standard, but they do not form an exhaustive list of all modifications from the previous version.				

SIST Preview
(https://ecommerce.sist.si)
IEC 60079-10-1:2020
https://standards.iteh.ai/catalog/standards/sist/af6cc470-[illegible]-45c2-84e5-7a792[illegible]102416/iec-60079-10-1-2020

Explanations:

A) Definitions

Minor and editorial changes	clarification decrease of technical requirements minor technical change editorial corrections

These are changes which modify requirements in an editorial or a minor technical way. They include changes of the wording to clarify technical requirements without any technical change.

Extension	addition of technical options

These are changes which add new or modify existing technical requirements, in a way that new options are given, but without increasing requirements.

Major technical changes	addition of technical requirements increase of technical requirements

B) Information about the background of changes

C1 The previous edition item e) was: “commercial and industrial applications where only low pressure fuel gas is used for appliances e.g. for cooking, water heating and similar uses, where the installation is compliant with relevant gas codes”. Industrial applications of any kind should not be exempted from the scope of this standard. See also new clause 5.3.2.

C2 The factor ***k*** was initially intended to provide for additional safety for uncertainties in determining LFL for flammable substances, particularly gas mixtures. However, this was considered as unnecessary and confusing considering the derivation of the chart.

C3 The equations are updated to align with BS 5925

C4 The equations are updated to align with BS 5925

C5 The chart is revised to match the new equation (C.4)

C6 The equation is updated to align with BS 5925

C7 See the explanation under C2

These are changes to technical requirements (addition, increase of the level or removal).

NOTE These changes represent current technological knowledge. However, these changes should not normally have an influence on equipment already placed on the market.

The text of this standard is based on the following documents:

FDIS	Report on voting
31J/307/FDIS	31J/310/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 of the IEC 60079 series, under the general title *Explosive atmospheres*, can be found on the IEC website.

SIST Preview
(https://ecommerce.sist.si)
https://ecommerce.sist.si/catalog/standards/sist/aff6cc470-e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020

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.

SIST Preview
(https://ecommerce.sist.si)

IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/af6cc470-e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020

INTRODUCTION

In areas where dangerous quantities and concentrations of flammable gas or vapour may arise, measures need to be applied in order to reduce the risk of explosions. This part of IEC 60079 sets out the essential criteria against which the ignition hazards can be assessed and gives guidance on the design and control parameters which can be used in order to reduce such hazards.

SIST Preview
(https://ecommerce.sist.si)

IEC 60079-10-1:2020
https://ecommerce.sist.si/catalog/standards/sist/af6cc470-e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020

EXPLOSIVE ATMOSPHERES –

Part 10-1: Classification of areas – Explosive gas atmospheres

1 Scope

This part of IEC 60079 is concerned with the classification of areas where flammable gas or vapour hazards may arise and may then be used as a basis to support the proper design, construction, operation and maintenance of equipment for use in hazardous areas.

It is intended to be applied where there may be an ignition hazard due to the presence of flammable gas or vapour, mixed with air, but it does not apply to:

a) mines susceptible to firedamp;

b) the processing and manufacture of explosives;

c) catastrophic failures or rare malfunctions which are beyond the concept of normality dealt with in this standard (see 3.7.3 and 4.5);

d) rooms used for medical purposes;

e) domestic premises;

f) where a hazard may arise due to the presence of combustible dusts or combustible flyings but the principles may be used in assessment of a hybrid mixture (refer also to IEC 60079-10-2).

NOTE Additional guidance on hybrid mixtures is provided in Annex I.

SIST Preview (https://econnnerce.sist.si)
IEC 60079-10-1:2020
https://standards.iec.ch/catalog/standards/sist/...-iec-60079-10-1-2020

Flammable mists may form or be present at the same time as flammable vapour. In such case the strict application of the details in this document may not be appropriate. Flammable mists may also form when liquids not considered to be a hazard due to the high flash point are released under pressure. In these cases the classifications and details given in this document do not apply. Information on flammable mists is provided in Annex G.

For the purpose of this document, an area is a three-dimensional region or space.

Atmospheric conditions include variations above and below reference levels of 101,3 kPa (1 013 mbar) and 20 °C (293 K), provided that the variations have a negligible effect on the explosion properties of the flammable substances.

In any site, irrespective of size, there may be numerous sources of ignition apart from those associated with equipment. Appropriate precautions will be necessary to ensure safety in this context. This standard is applicable with judgement for other ignition sources but in some applications other safeguards may also need to be considered. E.g. larger distances may apply for naked flames when considering hot work permits.

This document does not take into account the consequences of ignition of an explosive atmosphere except where a zone is so small that if ignition did occur it would have negligible consequences (see 3.3.8 and 4.4.2).

2 Normative references

This document contains no normative references.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60079-0 and the following apply.

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

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

NOTE Additional definitions applicable to explosive atmospheres can be found in IEC 60050-426.

3.1
explosive atmosphere
mixture with air, under atmospheric conditions, of flammable substances in the form of gas, vapour, or dust which, after ignition, permits self-sustaining propagation

[SOURCE: IEC 60079-0:2017, 3.38]

3.2
explosive gas atmosphere
mixture with air, under atmospheric conditions, of flammable substances in the form of gas or vapour, which, after ignition, permits self-sustaining flame propagation

Note 1 to entry: Although a mixture which has a concentration above the upper flammable limit (UFL) is not an explosive gas atmosphere, it can readily become so and, generally for hazardous area classification purposes, it is advisable to consider it as an explosive gas atmosphere.

Note 2 to entry: There are some gases and vapours which are explosive with the concentration of 100 % (e.g. acetylene, CAS no. 74-86-2, C_2H_2; monovinyl acetylene, CAS no. 689-97-4, C_4H_4; 1-propyl nitrate (vapour), CAS no. 627-13-4, $CH_3 (CH_2)_2 NO_3$; isopropyl nitrate (vapour), CAS no. 1712-64-7, $(CH_3)_2 CH ONO_2$; ethylene oxide (vapour), CAS no. 75-21-8, $(CH_2)_2 O$; hydrazine (vapour), CAS no. 302-01-2, $H_4 N_2$.

SIST Preview
(https://ecommerce.sist.si)
https://ecommerce.sist.si/catalog/standards/sist/af6cc470-e0ad-45c2-84e5-7a7928102416/iec-60079-10-1-2020

[SOURCE: IEC 60079-0:2017, 3.40, modified (addition of Notes to entry)]

3.3
hazardous areas and zones

3.3.1
hazardous area <on account of explosive gas atmospheres>
area in which an explosive gas atmosphere 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

3.3.2
non-hazardous area <on account of explosive gas atmospheres>
area in which an explosive gas atmosphere is not expected to be present in quantities such that special precautions for the construction, installation and use of equipment are required

3.3.3
zone
hazardous area classification based on the frequency of the occurrence and duration of the explosive atmosphere

3.3.4
Zone 0
area in which an explosive gas atmosphere is present continuously, or for long periods, or frequently

Note 1 to entry: Both “long” and “frequently” are the terms which are intended to describe a very high likelihood of a potentially explosive atmosphere in the area. In that respect, those terms do not necessarily need to be quantified.

3.3.5
Zone 1
area in which an explosive gas atmosphere is likely to occur occasionally in normal operation

3.3.6
Zone 2
area in which an explosive gas atmosphere is not likely to occur in normal operation, but, if it does occur, will exist for a short period only

Note 1 to entry: Indications of the frequency of the occurrence and duration of the explosive atmosphere can be taken from codes or standards relating to specific industries or applications.

[SOURCE: IEC 60050-426:2020, 426-03-05]

3.3.7
extent of zone
distance in any direction from the source of release to where a gas/air mixture will be diluted by air to a concentration below the lower flammable limit

3.3.8
Zone NE
zone of negligible extent such that if ignition did occur it would have negligible consequences

Note 1 to entry: Zones of negligible extent could be Zone 0 NE, Zone 1 NE or Zone 2 NE.

SIST Preview
(https://ecommerce.sist.si)

3.4
releases

3.4.1
source of release

IEC 60079-10-1:2020
https://standards.iteh.ai/catalog/standards/sist/e8fcec470-e0ad-45e3-84e5-7e4928102416/iec-60079-10-1-2020

point or location from which a flammable gas, vapour, mist or liquid may be released into the atmosphere so that an explosive gas atmosphere could be formed

[SOURCE: IEC 60050-426:2020, 426-03-06]

3.4.2
continuous grade of release
release which is continuous or is expected to occur frequently or for long periods

Note 1 to entry: Both “frequently” and “long” are the terms which are intended to describe a very high likelihood of a potential release. In that respect, those terms do not necessarily need to be quantified.

3.4.3
primary grade of release
release which can be expected to occur periodically or occasionally during normal operation

3.4.4
secondary grade of release
release which is not expected to occur in normal operation and, if it does occur, is likely to do so only infrequently and for short periods

3.4.5
release rate
quantity of flammable gas, liquid, vapour or mist emitted per unit time from the source of release