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INTERNATIONAL STANDARD

Explosive atmospheres -
Part 10-2: Classification of areas - Explosive dust atmospheres

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

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

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CONTENTS

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Explosive atmospheres - Part 10-2: Classification of areas - Explosive dust atmospheres

FOREWORD

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IEC 60079-10-2 has been prepared by Subcommittee SC31J: Classification of hazardous areas and installation requirements of IEC technical committee 31: Equipment for explosive atmospheres. It is an International Standard.

This third edition of IEC 60079-10-2 cancels and replaces the second edition of IEC 60079-10-2 published in 2015. This edition constitutes a technical revision.

Users of this document are advised that interpretation sheets clarifying the interpretation of this document can be published. Interpretation sheets are available from the IEC webstore and can be found in the "history" tab of the page for each document.

This edition includes the following significant technical changes with respect to the previous edition:

	Type			
Explanation of the significance of the changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
Scope Revised to clarify that this document applies at standard atmospheric conditions and standard oxidizing medium.	1	X		
Terms and definitions Revised the informational note to the combustible dust definition to correctly point to the proper sieve size for 500 micron material.	3.1.3	X		
Terms and definitions The term "extent of zone" was removed as the term expresses the meaning more clearly than the definition.	Formerly 3.1.7	X		
Terms and definitions Revised the definition of "equipment" to reflect the IEV defined term.	3.11	X		
Terms and definitions Added a definition for Minimum Explosible Concentration based on NFPA 660's definition.	3.2.1		X	
Terms and definitions Revised the definitions of Zone 20, 21, and 22 and added a definition of Zone NE to reflect the IEV defined terms.	3.10		X	
Terms and definitions Added definition of "Limiting Oxygen Concentration" to align with EN definition as referenced.	3.2.4		X	
Terms and definitions Added definition of "Minimum Ignition Energy" to align with IEC 80079-20-2 definition.	3.2.5		X	
Area classification Revised subclause editorially based on comments received.	4.1	X		
Revised subclause to include guidance on particle density vs. ability to travel greater distances as based on NFPA 499.	4.1.1	X		
Area classification Added description of "small quantities" based on IEC 60079-10-1.	4.1.2		X	
Area classification Added description of zone of "negligible extent" to better clarify when such a zone might exist, based on IEC 60079-10-1.	4.1.3		X	
Area classification Revised the subclause to address inerting by inert gas or mixture with non-combustible dust.	4.1.4		X	
Safety principles Existing text was grouped and organized to align with IEC 60079-10-1 and to improve usability.	4.2	X		
Area classification objectives Existing text was grouped and organized to align with IEC 60079-10-1 and to improve usability.	4.3	X		
Interior of process equipment Existing text was grouped and organized to align with IEC 60079-10-1 and to improve usability.	4.4	X		

Explanation of the significance of the changes	Type			
	Clause	Minor and editorial changes	Extension	Major technical changes
Management of change Existing text was grouped and organized to align with IEC 60079-10-1 and to improve usability.	4.5	X		
Management of change Recommended a 3 years interval for reviewing the classification of an area.	4.5	X		
Commissioning and maintenance Existing text was grouped and organized to align with IEC 60079-10-1 and to improve usability.	4.6	X		
Catastrophic failures Existing text was grouped and organized to align with IEC 60079-10-1 and to improve usability.	4.7	X		
Competence of personnel Existing language recommending that competent personnel conduct the area classification assessment was converted to mandatory language based on comments received.	4.8		X	
Area classification procedure for explosive dust atmospheres Procedure/subclause has been cleaned up editorially and revised based on comments received.	4.9	X		
Zone 21 Revised the subclause making the former "Note 1" into normative text based on comments received.	6.2.3		X	
Zone 22 Revised the section making the former "Note" into normative text based on comments received.	6.2.4		X	
Clause A.1 Preferred symbols previously shown were moved to Annex A as the annex is informative, not normative.	A.1	X		
Clause A.2 Sample Table A.1 was added to provide a possible table format to be used. This is informative and not normative.	A.2		X	
Clause C.1 Added language reference to maximum recommended dust layer thicknesses, beyond which classification or improved housekeeping should be considered.	C.1		X	
Clause C.3 Added language referencing the danger of hot surface ignition of layers of dust.	C.3		X	
Annex D Minor editorial changes to the document to address comments from CD.	Annex D	X		

Explanation of the types of significant changes:	
1. 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, or a reduction in the level of existing requirement.	
2. 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 the requirements that are fully compliant with the previous standard. Therefore, these will not have to be considered for existing area classifications in conformity with the preceding edition.	
3. Major technical changes:	– Addition of technical requirements – Increase of technical requirements
These are changes to technical requirements (addition, increase of the level or removal) made in a way that an existing area classification in conformity with the preceding edition will not always be able to fulfil the requirements given in the later edition. These changes have to be considered for existing area classifications in conformity with the preceding edition.	

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

Draft	Report on voting
31J/413/FDIS	31J/419/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.

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.

A list of all parts of the IEC 60079 series, under the general title *Explosive 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

Combustible dusts are hazardous because when they are dispersed in air by any means they could form explosive atmospheres. Furthermore, layers of dust could ignite and act as ignition sources for an explosive atmosphere.

This part of IEC 60079 gives guidance on the identification and classification of areas where such hazards from dust can arise. It sets out the essential criteria against which the hazards due to combustible dusts can be assessed and gives guidance on the design and control parameters which can be used in order to reduce such a hazard. General and special criteria are given for the process of identification and classification of hazardous areas.

This document contains an informative Annex B giving examples for classifying hazardous areas.

1 Scope

This part of IEC 60079 is concerned with the identification and classification of areas where explosive dust atmospheres and combustible dust layers are present in order to permit the proper assessment of ignition sources in such areas.

In this document, explosive dust atmospheres and combustible dust layers are treated separately. In Clause 4, area classification for explosive dust clouds is described, with dust layers acting as one of the possible sources of release. In Clause 7, other general considerations for dust layers are described.

The examples in this document are based on a system of effective housekeeping being implemented in the plant to prevent dust layers from accumulating. Where effective housekeeping is not present, the area classification includes the possible formation of explosive dust clouds from dust layers.

The principles of this document can also be followed when combustible fibres or flyings might cause a hazard.

Atmospheric conditions include variations in pressure and temperature 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 explosive properties of the combustible material. For air with normal oxygen content, typically a volume fraction of 21 % is assumed.

It does not apply to

a) underground mining areas;
b) dusts of explosives that do not require atmospheric oxygen for combustion such as pyrophoric substances, propellants, pyrotechnics, munitions, peroxides, oxidizers, water-reactive elements or compounds, or other similar materials;
c) catastrophic failures or rare malfunctions which are outside the conditions dealt with in this document;
d) rooms used for medical purposes;
e) domestic premises;
f) where a hazard is due to the presence of flammable gas or vapour, but the principles can be used in the assessment of a hybrid mixture (see also IEC 60079-10-1).

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

This document does not consider the effects of consequential damage following a fire or an explosion.

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

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 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

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

3.1
dust

3.1.1
dust
combustible dust or combustible flyings

[SOURCE: IEC 60079-0:2026, 3.25, modified – Note 1 to entry removed]

3.1.2
combustible flyings
solid particles, including fibres, where one dimension is greater than 500 µm in nominal size, which can form an explosive mixture with air at standard atmospheric pressure and temperature

Note 1 to entry: Examples of flyings include rayon, cotton (including cotton linters and cotton waste) sisal, jute, hemp, cocoa fibre, oakum and waste kapok.

Note 2 to entry: Combustible flyings are classified as Group IIIA.

[SOURCE: ISO/IEC 80079-20-2:2016, 3.2, modified – "may" replaced with "can"]

3.1.3
combustible dust
finely divided solid particles, 500 µm or less in nominal size, which can form an explosive mixture with air at atmospheric pressure and normal temperatures

Note 1 to entry: The term solid particles is intended to address particles in the solid phase and not the gaseous or liquid phase, but does not preclude a hollow particle.

Note 2 to entry: Materials passing a U.S. No. 35 Standard sieve as defined in ASTM E11 are considered to meet the 500 µm criterion.

Note 3 to entry: Combustible dust test methods can be found in ISO/IEC 80079-20-2.

[SOURCE: ISO/IEC 80079-20-2:2016, 3.1]

3.1.4
non-conductive dust
combustible dust with electrical resistivity greater than 1 kΩ × m

Note 1 to entry: Non-conductive dust is classified as Group IIIB.

3.1.5
conductive dust
combustible metal dusts and other combustible dusts with electrical resistivity equal to or less than 1 kΩ × m

Note 1 to entry: ISO/IEC 80079-20-2 contains the test method for determining the electrical resistivity of dusts.

Note 2 to entry: Metal dust is treated as conductive dust because it is assumed that surface oxidation cannot be depended upon to always ensure electrical resistivity greater than 1 kΩ × m.

Note 3 to entry: Conductive dust is classified as Group IIIC.

[SOURCE: ISO/IEC 80079-20-2:2016, 3.1.1, modified – addition of Notes 1 and 3 to entry]

3.2
dust properties

3.2.1
minimum explosible concentration
MEC
minimum concentration of a combustible dust suspended in air, measured in mass per unit volume, that will support a deflagration

Note 1 to entry: This is sometimes referred to as lower explosion limit (LEL), for example EN 14034-3:2011 or EN 13237:2024.

[SOURCE: NFPA 660:2025, 3.3.78]

3.2.2
layer ignition temperature
DEPRECATED: minimum ignition temperature of a dust layer
MIT_L
lowest temperature of a hot surface at which ignition occurs in a dust layer under specified test conditions

[SOURCE: ISO/IEC 80079-20-2:2016, 3.4, modified – addition of new preferred term "layer ignition temperature" and admitted term "MIT_L"]

3.2.3
cloud ignition temperature
DEPRECATED: minimum ignition temperature of a dust cloud
MIT_C
lowest temperature of a hot surface on which the most ignitible mixture of the dust with air is ignited under specified test conditions

[SOURCE: ISO/IEC 80079-20-2:2016, 3.5, modified – addition of new preferred term "cloud ignition temperature" and admitted term "MIT_C"]

3.2.4
limiting oxygen concentration
LOC
maximum oxygen concentration in mixture of a combustible dust and air and an inert gas, in which an explosion will not occur, determined under test conditions

Note 1 to entry: Test conditions are specified in EN 14034-4 and ASTM E2931.

Note 2 to entry: This is also referred to as limiting oxidant concentration.

[SOURCE: EN 14034-4:2004, 3.7, modified – Notes 1 and 2 to entry added]