BS EN 60079-0:2012+A11:2013

Incorporating corrigenda November 2012, December 2013 and October 2014

BSI Standards Publication

Explosive atmospheres

Part 0: Equipment — General requirements

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National foreword

This British Standard is the UK implementation of EN 60079-0:2012+A11:2013. It is derived from IEC 60079-0:2011, incorporating corrigenda November 2012, December 2013 and October 2014. It supersedes BS EN 60079-0:2012, which is withdrawn.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags [C〉 〈C]. The common modifications introduced by CENELEC amendment A11 are indicated by [C11〉 〈C11].

The UK participation in its preparation was entrusted to Technical Committee EXL/31, Equipment for explosive atmospheres.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2014

ISBN 978 0 580 88386 6

ICS 13.230; 29.260.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2012.

Amendments/corrigenda issued since publication

Date	Text affected
30 June 2013	Implementation of IEC corrigendum November 2012: Subclause 9.3.3 modified
30 April 2014	Implementation of IEC corrigendum December 2013: Subclauses 7.1.2.2 and 7.1.2.3 modified. Implementation of CENELEC amendment A11:2013. Implementation of IEC Interpretation Sheet November 2013 in National Annex NA
31 December 2014	Implementation of IEC Interpretation Sheet October 2014 in National Annex NB

National Annex NA
(Informative)

TC 31/Publication 60079-0 (2011), sixth edition/I-SH 01

EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by technical committee 31: Equipment for explosive atmospheres, of IEC.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
31/1085/ISH	31/1095/RVD

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

_____

Interpretation of Annex A

Questions:

Is the torque used for the tensile test of A.3.1.4 required to be the same torque as the initial torque determined in A.3.1.1?

At what point in the testing sequence is the thermal endurance to heat test conducted?

Interpretation:

In A.3.1.1, a torque is applied to either the screws of a flanged compression element or the nut of a screwed compression element to compress the sealing ring to secure the mandrel. A tensile force is then applied to the mandrel to confirm the securement. The tensile force is applied for not less than 6 h. The test is carried out at an ambient temperature of (20 ± 5) °C. The torque value needed for clamping to be assured by the sealing ring is acceptable if the slippage of the mandrel or cable sample as a result of the tensile force is not more than 6 mm.

Subsequently, either the complete cable gland and mandrel assembly used for the determination described above, or a new sample prepared using the same torque values, is then to be subjected to the thermal endurance tests. The maximum service temperature is considered to be 75 °C unless otherwise specified by the manufacturer.

NOTE 1 The 75 °C service temperature is the median of the branching point and entry point temperatures.

NOTE 2 Cable glands employing only metallic sealing rings and metallic parts do not require thermal endurance tests.

The subsequent test conditions and acceptance criteria are given in A.3.1.4. Prior to the application of the tensile force, the gland may be re-tightened in accordance with the manufacturer's instructions.

NOTE The torque applied to the screws or nut during retightening is not required to be the same as the initial torque applied in A.3.1.1.

In A.3.1.5, the “value needed to prevent slipping” is the torque required for A.3.1.4.

It is intended that this interpretation will be introduced in IEC 60079-0 Edition 7 and therefore an Interpretation Sheet will not be required for this or future editions.

November 2013 **ICS 29.260.20**

National Annex NB
(Informative)

TC 31/IEC 60079-0 (2011), sixth edition/I-SH 02

EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

INTERPRETATION SHEET 2

This interpretation sheet has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
31/1132/ISH	31/1153/RVISH

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

_____

Following decision No 16 of the TC 31 meeting in Melbourne in 2011, the issuing of an Interpretation Sheet for IEC 60079-0:2011 (6th edition) was requested, in order to clarify the significance of the changes with respect to the 5th edition.

Question

What are the minor editorial, extensions, and major technical changes of the 6th edition with respect to the 5th edition?

Answer

The following table shows the significance of the changes.

The significance of the changes between IEC Standard, IEC 60079-0, Edition 5, 2007-10 (Including Corrigendum No.1 and Interpretation Sheet I-SH 01) and IEC 60079-0, Edition 6, 2011-06 are as listed below:

		Type		
Explanation of the significance of the changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
Expansion of material specification data for plastics and elastomers, including UV resistance	7.1.2		x	
Addition of alternative qualification for O-rings	7.2.3		x	
Addition of alternative criteria for surface resistance	7.4.2 a)		x	
Addition of alternative breakdown voltage limit for non-metallic layers applied to metallic enclosures	7.4.2 c)		x	
Expansion of “X” marking options for non-metallic enclosure materials not meeting basic electrostatic requirements	7.4.2 d) 7.4.2 e)		x	
Clarification that non-metallic enclosure requirements also apply to painted or coated metal enclosures	7.4.3		x	
Clarification of test to determine capacitance of accessible metal parts with reduction in acceptable capacitance	7.5 Table 9			C1
Addition of limits on zirconium content for Group III and Group II (Gb only) enclosures	8.3 8.4		x	
Introduction of “X” marking for Group III enclosures not complying with basic material requirements, similar to that existing for Group II	8.4	x		
Addition of button-head cap screws to permitted “Special Fasteners”	9.2		x	
Reference for protective earthing (PE) requirements for electrical machines to IEC 60034 1	15.3	x		
Addition of requirements for ventilating fans	17.1.5			C2
Addition of requirement for temperature rating of bearing lubricants	17.2	x		
Addition of alternative construction for disconnectors	18.2		x	
Removal of voltage limits on plugs and sockets	20.2		x	
Addition of test requirements for arc-quenching test on plugs and sockets	20.2			C3
Additional information on cell voltages	23.3 Table 12			C4
Revision to impact test of glass parts	26.4.2	x		
Revision to impact test procedure to address “bounce” of impact head	26.4.2		x	
Clarification of the test requirements for “service” and “surface” temperature	26.5.1.2 26.5.1.3	x		
Clarification of temperature rise tests for converter-fed motors	26.5.1.3		x	
Addition of alternative test method for thermal endurance	26.8 Table 15		x	
Removal of “charging test” and addition of note providing guidance	Formerly 26.14			C5
Clarification of test for the measurement of capacitance, revision of maximum capacitance	26.14			C6
Addition of tests for ventilating fans	26.15			C2
Addition of alternative o-ring testing	26.16		x	
Addition of a “Schedule of Limitations” to	28.2	x		

		Type		
Explanation of the significance of the changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
certificates for Ex Components				
Clarification of the marking for multiple temperature classes	29.4 d) 29.5 d)	x		
Addition of marking for converter-fed motors	29.15		x	
Removal of IP marking for Group III	29.5	x		
Addition of specific instructions for electrical machines and for ventilating fans	30.3 30.4		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. More guidance may be found by referring to the Redline Version of the standard.

Explanation of the Types of Changes:

A) Definitions

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 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 requirements for equipment that was fully compliant with the previous standard. Therefore, these will not have to be considered for products 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 a product 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 products in conformity with the preceding edition. For these changes additional information is provided in clause B) below.

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

B) Information about the background of 'Major technical changes'

C1 – The values in the table have been significantly reduced based on information that is intended to be published in IEC TS 60079-32-1 (currently in preparation).

C2 – The requirements for fans was added at the request of the IECEx International Product Certification Scheme.

C3 – The test has been introduced for all disconnectors as an alternative to the voltage and current restrictions in the previous standard which were considered to be arbitrary.

C4 – There has been a slight increase in some cell voltages. This is a minor change for most protection concepts but should be regarded as a major change for equipment having a type of protection relying on energy limitation, e.g. IEC 60079-11

C5 – The charging test was removed as it had been found to be not repeatable. Guidance will be given in IEC TS 60079-32-1 (currently in preparation).

C6 – The limits for capacitance have been decreased based on technical information in CLC/TR 50404.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60079-0:2012+A11

November 2013

ICS 29.260.20

English version

Explosive atmospheres - Part 0: Equipment - General requirements

(IEC 60079-0:2011, modified)

Atmosphères explosives - Partie 0: Matériel - Exigences générales (CEI 60079-0:2011, modifiée)

Explosionsgefährdete Bereiche - Teil 0: Betriebsmittel – Allgemeine Anforderungen (IEC 60079-0:2011, modifiziert)

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60079-0:2012 E

Foreword

This document (EN 60079-0:2012) consists of the text of IEC 60079-0:2011 prepared by IEC/TC 31 "Equipment for explosive atmospheres", together with the common modifications prepared by CLC/TC 31 "Electrical apparatus for potentially explosive 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) 2013-04-02
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2015-04-02

This document supersedes EN 60079-0:2009.

The State of the Art is included in Annex ZY “Significant changes between this European Standard and EN 60079-0:2009”.

For the significant changes with respect to EN 60079-0:2009, see Annex ZY.

Annexes which are additional to those in IEC 60079-0:2011 are prefixed “Z”.

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 94/9/EC.

For the relationship with EU Directive see informative Annex ZZ, which is an integral part of this document.

Endorsement notice

The text of the International Standard IEC 60079-0:2011 was approved by CENELEC as a European Standard with agreed common modifications.

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

IEC/TS 60034-17	NOTE	Harmonized as CLC/TS 60034-17.
IEC/TS 60034-25	NOTE	Harmonized as CLC/TS 60034-25.
IEC 60034-29	NOTE	Harmonized as EN 60034-29.
IEC 60079-10-1	NOTE	Harmonized as EN 60079-10-1.
IEC 60079-10-2	NOTE	Harmonized as EN 60079-10-2.
IEC 60079-14	NOTE	Harmonized as EN 60079-14.
IEC 60079-17	NOTE	Harmonized as EN 60079-17.
IEC 60079-19	NOTE	Harmonized as EN 60079-19.
IEC 60079-27	NOTE	Harmonized as EN 60079-27.
ISO/IEC 17000	NOTE	Harmonized as EN ISO/IEC 17000.

Foreword to amendment A11

This document (EN 60079-0:2012/A11:2013) has been prepared by CLC/TC 31, "Electrical apparatus for potentially explosive 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) 2014-10-07
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-10-07

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

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 94/9/EC.

For the relationship with EU Directive see informative Annex ZZ, which is an integral part of this document.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
-	-	Equipment and components intended for use in potentially explosive atmospheres in underground mines	EN 1710	-
-	-	Design of fans working in potentially explosive atmospheres	EN 14986	-
IEC 60034-1	-	Rotating electrical machines - Part 1: Rating and performance	EN 60034-1	-
IEC 60034-5	-	Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification	EN 60034-5	-
IEC 60050-426	-	International Electrotechnical Vocabulary - Part 426: Equipment for explosive atmospheres	-	-
IEC 60079-1	-	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"	EN 60079-1	-
IEC 60079-2	-	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure "p"	EN 60079-2	-
IEC 60079-5	-	Explosive atmospheres - Part 5: Equipment protection by powder filling "q"	EN 60079-5	-
IEC 60079-6	-	Explosive atmospheres - Part 6: Equipment protection by oil immersion "o"	EN 60079-6	-
IEC 60079-7	-	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	EN 60079-7	-
IEC 60079-11	-	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"	EN 60079-11	-
IEC 60079-15	-	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"	EN 60079-15	-
IEC 60079-18	-	Explosive atmospheres - Part 18: Equipment protection by encapsulation "m"	EN 60079-18	-
IEC 60079-20-1	-	Explosive atmospheres - Part 20-1: Material characteristics for gas and vapour classification - Test methods and data	EN 60079-20-1	-
IEC 60079-25	-	Explosive atmospheres - Part 25: Intrinsically safe electrical systems	EN 60079-25	-

Publication	Year	Title	EN/HD	Year
IEC 60079-26	-	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga	EN 60079-26	-
IEC 60079-28	-	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation	EN 60079-28	-
IEC 60079-30-1	-	Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements	EN 60079-30-1	-
IEC 60079-31	-	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"	EN 60079-31	-
IEC 60086-1	-	Primary batteries - Part 1: General	EN 60086-1	-
IEC 60095-1	-	Lead-acid starter batteries - Part 1: General requirements and methods of test	-	-
IEC 60192	-	Low pressure sodium vapour lamps - Performance specifications	EN 60192	-
IEC 60216-1	-	Electrical insulating materials - Properties of thermal endurance - Part 1: Ageing procedures and evaluation of test results	EN 60216-1	-
IEC 60216-2	-	Electrical insulating materials - Thermal endurance properties - Part 2: Determination of thermal endurance properties of electrical insulating materials - Choice of test criteria	EN 60216-2	-
IEC 60243-1	-	Electrical strength of insulating materials - Test methods - Part 1: Tests at power frequencies	EN 60243-1	-
IEC 60254	Series	Lead-acid traction batteries	EN 60254	Series
IEC 60423	-	Conduit systems for cable management - Outside diameters of conduits for electrical installations and threads for conduits and fittings	EN 60423	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 60622	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Sealed nickel-cadmium prismatic rechargeable single cells	EN 60622	-
IEC 60623	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Vented nickel-cadmium prismatic rechargeable single cells	EN 60623	-
IEC 60662	-	High pressure sodium vapour lamps - Performance specifications	EN 60662	-
IEC 60664-1	-	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	-
IEC 60947-1	-	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1	-

Publication	Year	Title	EN/HD	Year
IEC 60896-11	-	Stationary lead-acid batteries - Part 11: Vented types - General requirements and methods of tests	EN 60896-11	-
IEC 60896-21	-	Stationary lead-acid batteries - Part 21: Valve regulated types - Methods of test	EN 60896-21	-
IEC 60952	Series	Aircraft batteries	EN 60952	Series
IEC 61056-1	-	General purpose lead-acid batteries (valve-regulated types) - Part 1: General requirements, functional characteristics - Methods of test	EN 61056-1	-
IEC 61241-4	-	Electrical apparatus for use in the presence of combustible dust - Part 4: Type of protection 'pD'	EN 61241-4	-
IEC 61427	-	Secondary cells and batteries for photovoltaic energy systems (PVES) - General requirements and methods of test	EN 61427	-
IEC 61951-1	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Portable sealed rechargeable single cells - Part 1: Nickel-cadmium	EN 61951-1	-
IEC 61951-2	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Portable sealed rechargeable single cells - Part 2: Nickel-metal hydride	EN 61951-2	-
IEC 61960	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium cells and batteries for portable applications	EN 61960	-
IEC 62013-1	-	Caplights for use in mines susceptible to firedamp - Part 1: General requirements - Construction and testing in relation to the risk of explosion	EN 62013-1	-
ISO 178	-	Plastics - Determination of flexural properties	EN ISO 178	-
ISO 179	Series	Plastics - Determination of Charpy impact properties	EN ISO 179	Series
ISO 262	-	ISO general-purpose metric screw threads - Selected sizes for screws, bolts and nuts	-	-
ISO 273	-	Fasteners - Clearance holes for bolts and screws	EN 20273	-
ISO 286-2	-	ISO system of limits and fits - Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts	EN ISO 286-2	-
ISO 527-2	-	Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics	EN ISO 527-2	-
ISO 965-1	-	ISO general-purpose metric screw threads - Tolerances - Part 1: Principles and basic data	-	-
ISO 965-3	-	ISO general-purpose metric screw threads - Tolerances - Part 3: Deviations for constructional threads	-	-
ISO 1817	-	Rubber, vulcanized - Determination of the effect- of liquids		-

Publication	Year	Title	EN/HD	Year
ISO 3601-1	-	Fluid systems - Sealing devices - O-rings - Part 1: Inside diameters, cross-sections, tolerances and size identification code	-	-
ISO 3601-2	-	Fluid power systems - O-rings - Part 2: Housing dimensions for general applications	-	-
ISO 4014	-	Hexagon head bolts - Product grades A and B	EN ISO 4014	-
ISO 4017	-	Hexagon head screws - Product grades A and B	EN ISO 4017	-
ISO 4026	-	Hexagon socket set screws with flat point	EN ISO 4026	-
ISO 4027	-	Hexagon socket set screws with cone point	EN ISO 4027	-
ISO 4028	-	Hexagon socket set screws with dog point	EN ISO 4028	-
ISO 4029	-	Hexagon socket set screws with cup point	EN ISO 4029	-
ISO 4032	-	Hexagon nuts, style 1 - Product grades A and B	EN ISO 4032	-
ISO 4762	-	Hexagon socket head cap screws	EN ISO 4762	-
ISO 4892-2	-	Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps	EN ISO 4892-2	-
ISO 7380-1	-	Button head screws - Part 1: Hexagon socket button head screws	EN ISO 7380-1	-
ISO 14583	-	Hexalobular socket pan head screws	EN ISO 14583	-
ANSI/UL 746B	-	Polymeric Materials - Long-Term Property Evaluations	-	-
ANSI/UL 746C	-	Polymeric Materials - Used in Electrical Equipment Evaluations	-	-

Annex ZY
(informative)

Additional Information relating to the European ATEX Directive 94/9/EC

ZY.1 Equipment Groups

In all cases Equipment Protection Levels (EPL) as defined by EN 60079-0 are related to the corresponding Equipment Groups and Equipment Categories according to the following table. The same applies if a standard makes reference to the intended use of equipment in Zones according to the definitions in EN 60079-10-1 and EN 60079-10-2.

Table ZY.1

EN 60079-0		*Directive 94/9/EC*		*EN 60079-10-X*
EPL	***Group***	***Equipment Group***	***Equipment Category***	***Zones***
Ma	*I*	*I*	*M 1*	*Not Applicable*
Mb			*M 2*	
Ga	*II*	*II*	*1G*	*0*
Gb			*2G*	*1*
Gc			*3G*	*2*
Da	*III*		*1D*	*20*
Db			*2D*	*21*
Dc			*3D*	*22*

ZY.2 Instructions

The manufacturer or his authorized representative in the Community is to draw up the instructions for use in the required Community languages.

ZY.3 Marking

The marking according to this standard is to be supplemented by the marking according to Directive 94/9/EC. Examples are given below.

European marking examples

Directive part	**Standard part**	**Equipment example**
I M2	**Ex d I Mb**	Mining equipment, type of protection “Flameproof Enclosure” d
II 2G	**Ex e IIB T4 Gb**	Gas explosion protected equipment type of protection, “Increased Safety” e
II 1D	**Ex ma IIIC 120°C Da**	Dust explosion protected equipment, type of protection “Encapsulation” ma

NOTE ⟨C11⟩ Attention is drawn to the requirement in 29.8:

The Ex marking for explosive gas atmospheres and explosive dust atmospheres should be separate and not combined:

Ⓔx II 1 G Ex ia IIB T4

Ⓔx II 1 D Ex ia IIIC T120 °C

Alternatively, the ATEX marking may be combined and the standard marking kept separate, as follows:

Ⓔx II 1 GD

Ex ia IIB T4

Ex ia IIIC T120 °C ⟨C11⟩

ZY.4 Significant changes between this European Standard and EN 60079-0:2009

This European Standard supersedes EN 60079-0:2009.

Table ZY.2 – Significant changes with respect to EN 60079-0:2009

		Type		
Significant Changes	Clause	Minor and editorial changes	Extension	Major technical changes
Expansion of material specification data for plastics and elastomers, including UV resistance	7.1.2		x	
Addition of alternative qualification for O-rings	7.2.3		x	
Addition of alternative criteria for surface resistance	7.4.2 a)		x	
Addition of alternative breakdown voltage limit for non-metallic layers applied to metallic enclosures	7.4.2 c)		x	
Expansion of “X” marking options for non-metallic enclosure materials not meeting basic electrostatic requirements	7.4.2 d) 7.4.2 e)		x	
Clarification that non-metallic enclosure requirements also apply to painted or coated metal enclosures	7.4.3		x	
Clarification of test to determine capacitance of accessible metal parts with reduction in acceptable capacitance	7.5 Table 9			C1
Addition of limits on zirconium content for Group III and Group II (Gb only) enclosures	8.3 8.4		x	
Introduction of “X” marking for Group III enclosures not complying with basic material requirements, similar to that existing for Group II	8.4	x		
Addition of button-head cap screws to permitted “Special Fasteners”	9.2		x	
Reference for protective earthing (PE) requirements for rotating electrical machines to EN 60034 1	15.3	x		
Addition of requirements for ventilating fans	17.1.5			C2

		Type		
Significant Changes	Clause	Minor and editorial changes	Extension	Major technical changes
Addition of alternative construction for disconnectors	18.2		x	
Removal of voltage limits on plugs and sockets	20.2		x	
Addition of test requirements for arc-quenching test on plugs and sockets	20.2			C3
Additional information on cell voltages	23.3 Table 12			C4
Revision to impact test of glass parts	26.4.2	x		
Revision to impact test procedure to address “bounce” of impact head	26.4.2		x	
Clarification of the test requirements for “service” and “surface” temperature	26.5.1.2 26.5.1.3	x		
Addition of temperature rise tests for converter-fed motors	26.5.1.3		x	
Addition of alternative test method for thermal endurance	26.8 Table 15		x	
Removal of “charging test” and addition of note providing guidance	Formerly 26.14			C5
Clarification of test for the measurement of capacitance	26.14	x		
Addition of a “Schedule of Limitations” to certificates for Ex Components	28.2	x		
Clarification of the marking for multiple temperature classes	29.3 d)	x		
Addition of marking for converter-fed motors	29.14	x		
Removal of IP marking for Group III	29.4 29.15	x		
Addition of specific instructions for electrical machines and for ventilating fans	30.3 30.4	x		

NOTE 1 The technical changes referred include the significant technical changes from the EN revised but is not an exhaustive list of all modifications from the previous version.

Explanations:

A) Definitions

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

Changes in a standard classified as ‘Minor and editorial changes’ refer to changes regarding the previous standard, which modify requirements in an editorial or a minor technical way. Also changes of the wording to clarify technical requirements without any technical change are classified as ‘Minor and editorial changes’.

A reduction in level of existing requirement is also classified as ‘Minor and editorial changes’

Extension	addition of technical options

Changes in a standard classified as ‘extension’ refers to changes regarding the previous standard, which add new or modify existing technical requirements, in a way that new options are given, but without increasing requirements for equipment that was fully compliant with the previous standard. Therefore these ‘extensions’ will not have to be considered for products in conformity with the preceding edition.

Major technical change	addition of technical requirements increase of technical requirements

Changes in a standard classified as ‘Major technical change’ refer to changes regarding the previous standard, which add new or increase the level of existing technical requirements, in a way that a product in conformity with the preceding standard will not always be able to fulfil the requirements given in the standard. ‘Major technical changes’ have to be considered for products in conformity with the preceding edition. For every change classified as ‘Major Technical Change’ additional information is provided in B) of Annex ZY.

NOTE 2 These changes represent current technological knowledge[1]. However, these changes should not normally have an influence on equipment already placed on the market.

B) Information about the background of ‘Major Technical Changes’

C1 – The values in the table have been significantly reduced based on information that is intended to be published in IEC 60079-32 (currently in preparation).

C2 – The requirements for fans which are not integral to the cooling system of a rotating electrical machine were added to the IEC version of the standard at the request of the IECEx International Product Certification Scheme as such requirements do not exist elsewhere in international standards. These requirements were removed from the EN version of the standard by common modification and replaced by reference to other European standards harmonised under the ATEX Directive 94/9/EC. If this clause is being used for IECEx purposes, it should be noted that the major new requirement for fans relates to the back pressure considerations which are also specifically addressed in EN 14986:2007.

C3 – The test has been introduced for all disconnectors as an alternative to the voltage and current restrictions in the previous standard which were considered to be arbitrary.

C4 – There has been a slight increase in some cell voltages. This is a minor change for most protection concepts but should be regarded as a major change for equipment having a type of protection relying on energy limitation, e.g. EN 60079-11

C5 – The charging test was removed as it had been found to be not repeatable. Guidance is currently provided in CLC/TR 50404 and will be given in IEC 60079-32 which is in preparation.

[1] see also ATEX Guide 10.3 and Annex ZZ.

[C11] Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers only the following essential requirements out of those given in Annex II of the EU Directive 94/9/EC:

- ER 1.0.1 (partly), ER 1.0.2 to ER 1.0.4, ER 1.0.5 (partly) and ER 1.0.6 (partly)
- ER 1.1
- ER 1.2.1, ER 1.2.2, ER 1.2.4 to ER 1.2.6, ER 1.2.7 (partly) and ER 1.2.8 (partly)
- ER 1.3.1 to ER 1.3.4
- ER 1.4.1 (partly) and ER 1.4.2 (partly)
- ER 1.6.2 and ER 1.6.4
- ER 2.0 to ER 2.3

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard. [/C11]

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

FOREWORD

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International Standard IEC 60079-0 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

This sixth edition cancels and replaces the fifth edition, published in 2007, and constitutes a full technical revision.

The significant changes with respect to the previous edition are listed below:

- Relocation of definitions for energy limitation parameters to IEC 60079-11
- Addition of note to clarify that the non-metallic "enclosure" requirements are applied to other than "enclosures" by some of the subparts
- Expansion of material specification data for plastics and elastomers, including UV resistance
- Addition of alternative qualification for O-rings
- Addition of alternative criteria for surface resistance

- Addition of breakdown voltage limit for non-metallic layers applied to metallic enclosures
- Expansion of “X” marking options for non-metallic enclosure materials not meeting basic electrostatic requirements
- Clarification that non-metallic enclosure requirements also apply to painted or coated metal enclosures
- Clarification of test to determine capacitance of accessible metal parts with reduction in acceptable capacitance
- Addition of limits on zirconium content for Group III and Group II (Gb only) enclosures
- Introduction of “X” marking for Group III enclosures not complying with basic material requirements, similar to that existing for Group II
- Addition of button-head cap screws to permitted “Special Fasteners”
- Reference for protective earthing (PE) requirements for electrical machines to IEC 60034-1
- Clarification of terminology for cable glands, blanking elements, and thread adapters
- Addition of requirements for ventilating fans
- Addition of alternative construction for disconnectors
- Removal of voltage limits on plugs and sockets
- Addition of test requirements for arc-quenching test on plugs and sockets
- Update of cell and battery information to reflect latest standards
- Revision to impact test of glass parts
- Revision to impact test procedure to address “bounce” of impact head
- Clarification of the test requirements for “service” and “surface” temperature
- Addition of temperature rise tests for converter-fed motors
- Addition of alternative test method for thermal endurance
- Removal of “charging test” and addition of note providing guidance
- Clarification of test for the measurement of capacitance
- Addition of a “Schedule of Limitations” to certificates for Ex Components
- Clarification of the marking for multiple temperature classes
- Addition of marking for converter-fed motors
- Removal of IP marking for Group III
- Addition of specific instructions for electrical machines
- Addition of specific instructions for ventilating fans
- Update to informative Annex D on converter-fed motors
- Update to informative Annex E on temperature testing of motors
- Addition of informative Annex F, flowchart for testing of non-metallic enclosures and non-metallic parts of enclosures

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

FDIS	Report on voting
31/922/FDIS	31/939/RVD

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

This publication 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.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of a new edition.

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

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

EXPLOSIVE ATMOSPHERES –

Part 0: Equipment – General requirements

1 Scope

This part of IEC 60079 specifies the general requirements for construction, testing and marking of electrical equipment and Ex Components intended for use in explosive atmospheres.

The standard atmospheric conditions (relating to the explosion characteristics of the atmosphere) under which it may be assumed that electrical equipment can be operated are:

- temperature –20 °C to +60 °C;
- pressure 80 kPa (0,8 bar) to 110 kPa (1,1 bar); and
- air with normal oxygen content, typically 21 % v/v.

This standard and other standards supplementing this standard specify additional test requirements for equipment operating outside the standard temperature range, but further additional consideration and additional testing may be required for equipment operating outside the standard atmospheric pressure range and standard oxygen content, particularly with respect to types of protection that depend on quenching of a flame such as 'flameproof enclosure "d"' (IEC 60079-1) or limitation of energy, 'intrinsic safety "i"' (IEC 60079-11).

NOTE 1 Although the standard atmospheric conditions above give a temperature range for the atmosphere of -20 °C to +60 °C, the normal ambient temperature range for the equipment is –20 °C to +40 °C, unless otherwise specified and marked. See 5.1.1. It is considered that –20 °C to +40 °C is appropriate for most equipment and that to manufacture all equipment to be suitable for a standard atmosphere upper ambient temperature of +60 °C would place unnecessary design constraints.

NOTE 2 Requirements given in this standard result from an ignition hazard assessment made on electrical equipment. The ignition sources taken into account are those found associated with this type of equipment, such as hot surfaces, mechanically generated sparks, mechanical impacts resulting in thermite reactions, electrical arcing and static electric discharge in normal industrial environments.

NOTE 3 It is acknowledged that, with developments in technology, it may be possible to achieve the objectives of the IEC 60079 series of standards in respect of explosion prevention by methods that are not yet fully defined. Where a manufacturer wishes to take advantage of such developments, this International Standard, as well as other standards in the IEC 60079 series, may be applied in part. It is intended that the manufacturer prepare documentation that clearly defines how the IEC 60079 series of standards has been applied, together with a full explanation of the additional techniques employed. The designation "Ex s" has been reserved to indicate special protection. A standard for special protection "s", IEC 60079-33, is in preparation.

NOTE 4 Where an explosive gas atmosphere and a combustible dust atmosphere are, or may be, present at the same time, the simultaneous presence of both should be considered and may require additional protective measures.

This standard does not specify requirements for safety, other than those directly related to the explosion risk. Ignition sources like adiabatic compression, shock waves, exothermic chemical reaction, self ignition of dust, naked flames and hot gases/liquids, are not addressed by this standard.

NOTE 5 Such equipment should be subjected to a hazard analysis that identifies and lists all of the potential sources of ignition by the electrical equipment and the measures to be applied to prevent them becoming effective.

This standard is supplemented or modified by the following standards concerning specific types of protection:

– IEC 60079-1: Gas – Flameproof enclosures "d";
– IEC 60079-2: Gas – Pressurized enclosures "p";