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colour inside

Explosive atmospheres –
Part 15: Equipment protection by type of protection "n"

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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.
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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 60079-15 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

This fifth edition cancels and replaces the fourth edition, published in 2010, and constitutes a technical revision.

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

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

FDIS	Report on voting
31/1339/FDIS	31/1355/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.

This International Standard is to be read in conjunction with IEC 60079-0.

A list of all parts of the IEC 60079 series, under the general title: *Explosives atmospheres*, can be found on the IEC website.

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

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- withdrawn,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

IMPORTANT – The "colour inside" logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

		Type		
Changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
Requirements for enclosed break devices have been removed	-			C1
Requirements for type of protection “nA” has been removed	-			C2
Scope has been updated to allow equipment with internal working voltages over 15 kV such as starters for HID luminaires	1		X	
Definition for cable sealing box removed	3	X		
Definitions for creepage distance and clearance removed as they are now in 60079-0	3	X		
Definition of non-sparking device “nA” removed, as the concept has been transferred to 60079-7	3			C2
Definition of duty cycle removed	3	X		
Definition of enclosed break device moved as the concept has been transferred to 60079-1	3			C1
Definition of hermetically sealed device revised	3	A1		
Definition for normally sparking device added	3.2	X		
Small component temperature clause removed, part of moving type of protection “nA” to 60079-7	5			C2
Minimum degree of protection requirements; clearance, creepage and separation requirements; determination of working voltage; conformal coating; CTI requirement; Insulation between conductive parts and measurement of creepage and clearance requirements have been removed.	6			C2
Connection facilities and terminal compartment requirements have been removed	-			C2
Supplementary requirements for non-sparking electrical rotating machines have been removed	-			C2
Supplementary requirements for non-sparking fuses and fuse assemblies have been removed	-			C2
Supplementary requirements for non-sparking plugs and sockets have been removed	-			C2
Supplementary requirements for non-sparking luminaires have been removed	-			C2
Supplementary requirements for equipment incorporating non-sparking cells and batteries have been removed	-			C2
Supplementary requirements for non-sparking low power equipment have been removed	-			C2
Supplementary requirements for non-sparking current transformers have been removed	-			C2
Requirements for other non-sparking electrical equipment have been removed	-			C2
General supplementary requirements for equipment producing arcs, sparks or hot surfaces have been removed	-			C2
Requirements for enclosed break devices have been removed	-			C1
Voltage and current limitations added for non-incendive components.	7.2			C6

		Type		
Changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
The requirements for sealed devices have been extended to require more documentation,	9.1		X	
The +20K requirement for luminaire materials has been removed	9.5			C2
Notes 1-3 have been removed, as this information is covered elsewhere	10.1	X		
Entry device requirements added	10.1		X	
Industrial standard compliance and battery requirements added	10.2.1.2		X	
The exemption for manually operated sparking devices moved to here, creepage and clearance requirements in industrial standards added for switching devices, and cell and battery requirements added	10.2.1.2		X	
Requirements for cable glands and conduit entries have been clarified	10.2.3	X		
Requirements for gasketed windows expanded to allow a removable window mounted in a frame.	10.2.5.2		X	
Requirement to include documentation on the thermal stability of gaskets or seals added	10.2.6			C4
Requirements reworded for clarity	10.2.7	X		
Requirements for “nR” enclosures fitted with fans added.	10.2.9			C5
Type test requirements for enclosed break “nC” and “nA” equipment removed	-			C1, C2
The dielectric test after the leakage test for sealed devices has been eliminated unless the results of the leakage test are uncertain.	11.2.2		X	
Tests for sealed devices, screw lampholders, starters, lamps, ignitors, and ignitor pulses for luminaires have been removed	-			C2
All testing for batteries has been removed.	-			C2
All testing for electrical machines removed	-			C2
Routine test requirements re-written for sealed components, non-incendive components and restricted breathing equipment to take out the testing for enclosed break and nA equipment	12			C1, C2
Preparation of non-incendive component samples	11.1.1			C3
Marking requirements modified to remove labelling requirements for enclosed break components, nA equipment, and batteries.	-			C1, C2
Documentation requirements modified to remove to remove labelling requirements for enclosed break components, nA equipment, and batteries.	14			C1, C2
The instruction section has been expanded to include new requirements	15		X	
Annex A has been removed.	-			C2

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.

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 changes

A1 – It was determined that this was already covered by the sealed device definition

C1 – Enclosed break devices “nC” are now designated as “dc” and the requirements are located in IEC 60079-1:2014.

C2 – Type of protection “nA” is now designated as type of protection “ec” and the requirements for “ec” equipment are located in IEC 60079-7:2015.

C3 – Test time for the preparation of non-incendive component samples has been specified.

C4 – Additional documentation requirements for seals and gaskets.

C5 – As the pressure inside an enclosure fitted with fans can be affected by the operation of the fan, it is now specified that the restricted breathing test is conducted with fans operating and stationary.

C6 – The limitations from IEC 60079-15 Ed 3 were added.

EXPLOSIVE ATMOSPHERES –

Part 15: Equipment protection by type of protection "n"

1 Scope

This part of IEC 60079 specifies requirements for the construction, testing and marking for Group II electrical equipment with type of protection “n” which includes; sealed devices “nC”, hermetically sealed devices “nC”, non-incendive components “nC” and restricted breathing enclosures “nR” intended for use in explosive gas atmospheres. This part of IEC 60079 applies to electrical equipment where the rated input voltage does not exceed 15 kV r.m.s. AC or DC including where the internal working voltages of the Ex product exceeds 15 kV, for example starters for HID luminaires.

~~This part of IEC 60079 is applicable to non-sparking electrical equipment and also to electrical equipment with parts or circuits producing arcs or sparks or having hot surfaces which, if not protected in one of the ways specified in this standard, could be capable of igniting a surrounding explosive gas atmosphere. This standard describes several different methods by which this can be achieved which may be combined with other methods described in IEC 60079-0.~~

This part of IEC 60079 supplements and modifies the general requirements of IEC 60079-0, except as indicated in Table 1. Where a requirement of this part of IEC 60079 conflicts with a requirement of IEC 60079-0, the requirement of this part of IEC 60079 takes precedence.

Table 1 – Relationship of ~~this part~~ IEC 60079-15 to IEC 60079-0

~~Clause of IEC 60079-0~~			~~IEC 60079-0 clause application to IEC 60079-15~~		
~~Ed. 5.0 (2007)~~ ~~(informative)~~	~~Ed. 6.0[1] (future edition)~~ ~~(informative)~~	~~Clause / Subclause title~~ ~~(normative)~~	~~Protected sparking~~ ~~nC~~	~~Non sparking~~ ~~nA~~	~~Restricted breathing~~ ~~nR~~
~~4~~	~~4~~	~~Equipment grouping~~	~~Applies~~	~~Applies~~	~~Applies~~
~~4.1~~	~~4.1~~	~~Group I~~	~~Excluded~~	~~Excluded~~	~~Excluded~~
~~4.2~~	~~4.2~~	~~Group II~~	~~Applies~~	~~Applies~~	~~Applies~~
~~4.3~~	~~4.3~~	~~Group III~~	~~Excluded~~	~~Excluded~~	~~Excluded~~
~~4.4~~	~~4.4~~	~~Equipment for a particular explosive atmosphere~~	~~Applies~~	~~Applies~~	~~Applies~~
~~5.1~~	~~5.1~~	~~Environmental influences~~	~~Applies~~	~~Applies~~	~~Applies~~
~~5.1.1~~	~~5.1.1~~	~~Ambient temperature~~	~~Applies~~	~~Applies~~	~~Applies~~
~~5.1.2~~	~~5.1.2~~	~~External source of heating or cooling~~	~~Applies~~	~~Applies~~	~~Applies~~
~~5.2~~	~~5.2~~	~~Service temperature~~	~~Applies~~	~~Applies~~	~~Applies~~
~~5.3.1~~	~~5.3.1~~	~~Determination of maximum surface temperature~~	~~Applies~~	~~Applies~~	~~Applies~~

~~[1] Under consideration.~~

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15		
Ed. 5.0 (2007) (informative)	Ed. 6.0[1] (future edition) (informative)	Clause / Subclause title (normative)	Protected sparking nC	Non sparking nA	Restricted breathing nR
5.3.2.1	5.3.2.1	Group I electrical equipment	Excluded	Excluded	Excluded
5.3.2.2	5.3.2.2	Group II electrical equipment	Applies	Applies	Applies
5.3.2.3	5.3.2.3	Group III electrical equipment	Excluded	Excluded	Excluded
5.3.3	5.3.3	Small component temperature for Group I and Group II electrical equipment	Applies	Applies	Excluded
6.1	6.1	General	Applies	Applies	Applies
6.2	6.2	Mechanical strength	Applies	Applies	Applies
6.3	6.3	Opening times	Excluded	Excluded	Applies
6.4	6.4	Circulating currents	Applies	Applies	Applies
6.5	6.5	Gasket retention	Applies	Applies	Applies
6.6	6.6	Electromagnetic and ultrasonic radiating equipment	Applies	Applies	Applies
7.1.1	7.1.1	Applicability	Applies	Applies	Applies
7.1.2	7.1.2	Specification of materials	Applies	Applies	Applies
7.1.3	7.1.2.2	Plastic materials	Applies	Applies	Applies
7.1.4	7.1.2.3	Elastomeric materials	Applies	Applies	Applies
7.2	7.2	Thermal endurance	Applies	Applies	Applies
7.3	7.3	Resistance to light	Applies	Applies	Applies
7.4	7.4	Electrostatic charges on external non-metallic materials	Applies	Applies	Applies
7.5	9.1	Threaded holes	Applies	Applies	Applies
8.1.1	8.2	Group I	Excluded	Excluded	Excluded
8.1.2	8.3	Group II	Applies	Applies	Applies
8.1.3	8.4	Group III	Excluded	Excluded	Excluded
8.2	9.1	Threaded holes	Applies	Applies	Applies
9.1	9.1	General	Applies	Applies	Applies
9.2	9.2	Special fasteners	Excluded	Excluded	Excluded
9.3	9.3	Holes for special fasteners	Excluded	Excluded	Excluded
10	10	Interlocking devices	Excluded	Excluded	Excluded
11	11	Bushings	Applies	Applies	Applies
12	12	Materials used for cementing	Modified	Modified	Modified
13	13	Ex components	Applies	Applies	Applies
14	14	Connection facilities and termination compartments	Modified	Modified	Modified

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15		
Ed. 5.0 (2007) (informative)	Ed. 6.0[1] (future edition) (informative)	Clause / Subclause title (normative)	Protected sparking nC	Non sparking nA	Restricted breathing nR
15	15	Connection facilities for earthing and bonding conductors	Applies	Applies	Applies
16	16	Entries into enclosures	Applies	Applies	Applies
17	17	Supplementary requirements for rotating electrical machines	Excluded	Modified	Excluded
18	18	Supplementary requirements for switchgear	Applies	Applies	Applies
19	19	Supplementary requirements for fuses	Modified	Modified	Modified
20	20	Supplementary requirements for plugs and sockets	Modified	Modified	Modified
21	21	Supplementary requirements for luminaires	Modified	Modified	Modified
22	22	Supplementary requirements for caplights and handlights	Applies	Applies	Applies
23	23	Equipment incorporating cells and batteries	Modified	Modified	Modified
24	24	Documentation	Applies	Applies	Applies
25	25	Compliance of prototype or sample with documents	Applies	Applies	Applies
26.1	26.1	General	Applies	Applies	Applies
26.2	26.2	Test configuration	Applies	Applies	Applies
26.3	26.3	Tests in explosive test mixtures	Applies	Applies	Applies
26.4	26.4	Tests of enclosures	Applies	Applies	Applies
26.4.1.1	26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass parts of enclosures	Applies	Applies	Applies
26.4.1.2.1	26.4.1.2.1	Group I electrical equipment	Excluded	Excluded	Excluded
26.4.1.2.2	26.4.1.2.2	Group II and Group III electrical equipment	Applies	Applies	Applies
26.4.2	26.4.2	Resistance to impact	Applies	Applies	Applies
26.4.3	26.4.3	Drop test	Applies	Applies	Applies
26.4.4	26.4.4	Acceptance criteria	Applies	Applies	Applies
26.4.5	26.4.5	Degree of protection by enclosure	Applies	Applies	Applies
26.5	26.5	Thermal tests	Applies	Applies	Applies
26.6	26.6	Torque test for bushings	Applies	Applies	Applies
26.7	26.7	Non-metallic enclosures or non-metallic parts of enclosures	Modified	Modified	Modified

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15		
Ed. 5.0 (2007) (informative)	Ed. 6.0[1] (future edition) (informative)	Clause / Subclause title (normative)	Protected sparking nC	Non sparking nA	Restricted breathing nR
26.8	26.8	Thermal endurance to heat	Modified	Modified	Modified
26.9	26.9	Thermal endurance to cold	Applies	Applies	Applies
26.10	26.10	Resistance to light	Applies	Applies	Applies
26.11	26.11	Resistance to chemical agents for Group I electrical equipment	Excluded	Excluded	Excluded
26.12	26.12	Earth continuity	Applies	Applies	Applies
26.13	26.13	Surface resistance test of parts of enclosures of non-metallic materials	Applies	Applies	Applies
26.14	-	Charging tests	Applies	Applies	Applies
26.15	26.14	Measurement of capacitance	Applies	Applies	Applies
27	27	Routine tests	Applies	Applies	Applies
28	28	Manufacturers responsibility	Applies	Applies	Applies
29	29	Marking	Applies	Applies	Applies
30	30	Instructions	Applies	Applies	Applies
Annex A	Annex A	Supplementary requirements for Ex cable glands	Applies	Applies	Applies
Annex B	Annex B	Requirements for Ex components	Applies	Applies	Applies
Annex C	Annex C	Example of rig for resistance to impact test	Applies	Applies	Applies
Annex D	Annex D	Introduction to an alternative risk assessment method encompassing “equipment protection levels” fro Ex equipment	Applies	Applies	Applies
Applies : this requirement of IEC 60079-0 is applied without change. Excluded : this requirement of IEC 60079-0 does not apply. Modified : this requirement of IEC 60079-0 is modified as detailed in this standard.					

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[2] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
3	3	Definitions	Applies	Applies
4	4	Equipment grouping		
4.1	4.1	Group I	Excluded	Excluded
4.2	4.2	Group II	Applies	Applies
4.3	4.3	Group III	Excluded	Excluded
4.4	4.4	Equipment for a particular explosive atmosphere	Applies	Applies
5	5	Temperatures		
5.1	5.1	Environmental influences	Applies	Applies
5.2	5.2	Service temperature	Applies	Applies
5.3	5.3	Maximum surface temperature		
5.3.1	5.3.1	Determination of maximum surface temperature	Applies	Applies
5.3.2	5.3.2	Limitation of maximum surface temperature		
5.3.2.1	5.3.2.1	Group I equipment	Excluded	Excluded
5.3.2.2	5.3.2.2	Group II equipment	Applies	Applies
5.3.2.3	5.3.2.3	Group III equipment	Excluded	Excluded
5.3.3	5.3.3	Small component temperature for Group I and Group II equipment	Applies	Excluded
-	5.3.4	Component temperature of smooth surfaces for Group I or Group II equipment (Applies for smaller than 10 000 mm^2 only)	Applies	Excluded
6	6	Requirements for all electrical apparatus		
6.1	6.1	General	Applies	Applies
6.2	6.2	Mechanical strength	Applies	Applies
6.3	6.3	Opening times	Excluded	Applies
6.4	6.4	Circulating currents	Applies	Applies
6.5	6.5	Gasket retention	Applies	Applies
6.6	6.6	Electromagnetic and ultrasonic radiating equipment	Applies	Applies
7	7	Non-metallic enclosures and non-metallic parts of enclosures		
7.1	7.1	General		

2 Under preparation. Stage at the time of publication: IEC/FDIS 60079-0:2017.

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[2] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
7.1.1	7.1.1	Applicability	Applies	Applies
7.1.2	7.1.2	Specification of materials	Applies	Applies
7.2	7.2	Thermal endurance		
7.2.1	7.2.1	Tests for thermal resistance	Applies	Applies
7.2.2	-	Material selection	Modified	Modified
-	7.2.2	Material selection	Applies	Applies
7.2.3	7.2.3	Alternative qualification for elastomeric sealing O-rings	Applies	Applies
7.3	7.3	Resistance to ultraviolet light	Applies	Applies
7.4	7.4	Electrostatic charges on external non-metallic materials		
7.4.1	7.4.1	Applicability	Applies	Applies
7.4.2	7.4.2	Avoidance of build-up of electrostatic charge on Group I or Group II electrical equipment	Applies	Applies
7.4.3	7.4.3	Avoidance of build-up of electrostatic charge on equipment for Group III	Excluded	Excluded
7.5	7.5	External conductive parts	Applies	Applies
8	8	Metallic enclosures and metallic parts of enclosures		
8.1	8.1	Material composition	Applies	Applies
8.2	8.2	Group I	Excluded	Excluded
8.3	8.3	Group II	Applies	Applies
8.4	8.4	Group III	Excluded	Excluded
NR	8.5	Copper alloys	Applies	Applies
9	9	Fasteners		
9.1	9.1	General	Applies	Applies
9.2	9.2	Special fasteners	Excluded	Excluded
9.3	9.3	Holes for special fasteners	Excluded	Excluded
9.3.3	-	Hexagon socket set screws	Excluded	Excluded
-	9.4	Hexagon socket set screws	Excluded	Excluded
10	10	Interlocking devices	Excluded	Excluded
11	11	Bushings	Applies	Applies

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[2] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
12	-	Materials used for cementing	Modified	Modified
-	12	Reserved for future use.	Excluded	Excluded
13	13	Ex components	Applies	Applies
14	14	Connection facilities	Applies	Applies
15	15	Connection facilities for earthing and bonding conductors	Applies	Applies
16	16	Entries into enclosures	Applies	Applies
17	17	Supplementary requirements for electric machines	Excluded	Excluded
18	18	Supplementary requirements for switchgear	Excluded	
18.1	18.1	Flammable dielectric	Excluded	Applies
18.2	18.2	Disconnectors	Excluded	Applies
18.3	18.3	Group I – Provisions for locking	Excluded	Excluded
18.4	18.4	Doors and covers	Excluded	Applies
19	-	Supplementary requirements for fuses	Excluded	Excluded
-	19	Reserved for future use.	Excluded	Excluded
20	20	Supplementary requirements for plugs and sockets		
20.1	20.1	General	Applies	Applies
20.2	20.2	Explosive gas atmospheres	Excluded	Excluded
20.3	20.3	Explosive dust atmospheres	Excluded	Excluded
20.4	20.4	Energized plugs	Applies	Applies
21	21	Supplementary requirements for luminaires		
21.1	21.1	General	Applies	Applies
21.2	21.2	Covers for luminaires of EPL Mb, EPL Gb or EPL Db	Excluded	Excluded
21.3	21.3	Covers for luminaires of EPL Gc or EPL Dc	Applies	Applies
21.4	21.4	Sodium lamps	Applies	Applies
22	22	Supplementary requirements for caplights and handlights		
22.1	22.1	Group I caplights	Excluded	Excluded
22.2	22.2	Group II and Group III caplights and handlights	Excluded	Applies

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[2] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
23	23	Equipment incorporating cells and batteries	Applies	Applies
23.12	23.12	Replacement battery pack	Applies	Applies
24	24	Documentation	Modified	Modified
25	25	Compliance of prototype or sample with documents	Applies	Applies
26	26	Type tests	Applies	Applies
26.4	26.4	Tests of enclosures		
26.4.1	26.4.1	Order of tests		
26.4.1.1	26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass or ceramic parts of enclosures	Applies	Applies
26.4.1.2	26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures		
26.4.1.2.1	26.4.1.2.1	General	Applies	Applies
26.4.1.2.2	26.4.1.2.2	Group I electrical equipment	Excluded	Excluded
26.4.1.2.3	-	Group II and Group III electrical equipment	Modified	Modified
-	26.4.1.2.3	Group II and Group III electrical equipment	Applies	Applies
26.4.2	26.4.2	Resistance to impact	Applies	Applies
26.4.3	26.4.3	Drop test	Applies	Applies
26.4.4	26.4.4	Acceptance criteria	Applies	Applies
26.4.5	26.4.5	Degree of protection by enclosure	Applies	Applies
26.5	26.5	Thermal tests		
26.5.1	26.5.1	Temperature measurement	Applies	Applies
26.5.1.1	26.5.1.1	General	Applies	Applies
26.5.1.2	26.5.1.2	Service Temperature	Applies	Applies
26.5.2	26.5.2	Thermal shock test	Applies	Applies
26.5.3	26.5.3	Small component ignition test (Group I and Group II)	Applies	Excluded
26.6	26.6	Torque test for bushings	Applies	Applies
26.7	26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	26.7.1	General	Applies	Applies
26.7.2	-	Test temperatures	Modified	Modified
-	26.7.2	Test temperatures	Applies	Applies

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[2] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
26.8	-	Thermal endurance to heat	Modified	Modified
-	26.8	Thermal endurance to heat	Applies	Applies
26.9	26.9	Thermal endurance to cold	Applies	Applies
26.10	26.10	Resistance to light		
26.10.1	26.10.1	General	Applies	Applies
26.10.2	26.10.2	Light exposure	Applies	Applies
26.10.3	26.10.3	Acceptance criteria	Applies	Applies
26.11	26.11	Resistance to chemical agents for Group I electrical equipment	Excluded	Excluded
26.12	26.12	Earth continuity	Applies	Applies
26.13	26.13	Surface resistance test of parts of enclosures of non-metallic materials	Applies	Applies
26.14	26.14	Measurement of capacitance		
26.14.1	26.14.1	General	Applies	Applies
26.14.2	26.14.2	Test procedure	Applies	Applies
26.15	26.15	Verification of ratings of ventilating fans	Excluded	Excluded
26.16	26.16	Alternative qualification of elastomeric sealing O-rings	Applies	Applies
-	26.17	Transferred charge test	Applies	Applies
27	27	Routine tests	Applies	Applies
28	28	Manufacturers responsibility	Applies	Applies
29	29	Marking		
29.1	29.1	Applicability	Applies	Applies
29.2	29.2	Location	Applies	Applies
29.3	29.3	General	Applies	Applies
29.4	29.4	Ex marking for explosive gas atmospheres	Applies	Applies
29.5	29.5	Ex marking for explosive dust atmospheres	Excluded	Excluded
29.6	29.6	Combined types (or levels) of protection	Applies	Applies
29.7	29.7	Multiple types of protection	Applies	Applies
29.8	29.8	Ga equipment using two independent Gb types (or levels) of protection	Excluded	Excluded
-	29.9	Boundary wall	Excluded	Excluded
29.9	29.10	Ex Components	Applies	Applies

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[2] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
29.10	29.11	Small Ex Equipment and small Ex Components	Applies	Applies
29.11	29.12	Extremely small equipment and extremely small Ex Components	Applies	Applies
29.12	29.13	Warning markings	Applies	Applies
29.13	-	Alternate marking of equipment protection levels (EPLs)	Applies	Applies
29.13.1	-	Alternate marking of type of protection for explosive gas atmospheres	Applies	Applies
29.13.2	-	Alternate marking of type of protection for explosive dust atmospheres	Excluded	Excluded
29.14	29.14	Cells and batteries	Applies	Applies
29.15	29.15	Electrical machines operated with a converter	Applies	Applies
29.16	29.16	Examples of marking	Examples only	Examples only
30	30	Instructions		
30.1	30.1	General	Applies	Applies
30.2	30.2	Cells and batteries	Applies	Applies
30.3	30.3	Electric machines	Excluded	Excluded
30.4	30.4	Ventilating fans	Excluded	Excluded
-	30.5	Cable glands	Applies	Applies
Annex A	Annex A	Supplementary requirements for Ex cable glands	Applies	Applies
Annex B	Annex B	Requirements for Ex components	Applies	Applies
Annex C	Annex C	Example of rig for resistance to impact test	Informative Annex	Informative Annex
Annex D	Annex D	Motors supplied by converters	Informative Annex	Informative Annex
Annex E	Annex E	Temperature evaluation of electric machines	Informative Annex	Informative Annex
Annex F	Annex F	Guideline flowchart for tests of non-metallic enclosures or non-metallic parts of enclosures (26.4)	Informative Annex	Informative Annex
-	Annex G	Guidance flowchart for tests of cable glands	Informative Annex	Informative Annex
-	Annex H	Shaft voltages resulting in motor bearing or shaft brush sparking. Discharge energy calculation	Informative Annex	Informative Annex

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	Ed. 7.0[2] (future edition) (informative)	Clause / Subclause title (normative)	Protected sparking "nC"	Restricted breathing "nR"
Applies – This requirement of IEC 60079-0 is applied without change. Excluded – This requirement of IEC 60079-0 does not apply. Modified – This requirement of IEC 60079-0 is modified as detailed in this standard.				

NOTE 1 The clause number in the above table is shown for information only. The applicable requirements of IEC 60079-0 are identified by the clause title which is normative. This document was written against the specific requirements of IEC 60079-0 (ed. ~~5~~ 7.0). The clause numbers for the previous edition are shown for information only. This is to enable the general requirements of IEC 60079-0 (ed. ~~5~~ 6.0) to be used where necessary with this part of IEC 60079. Where ~~there were no requirements, indicated by "NR" or~~ there is a conflict between requirements, the later edition requirements take precedence.

NOTE 2 A shaded row in the above table indicates that this is a clause heading. In cases where the applicability is the same for all of the sub-clauses the 'Applies' or 'Excluded' is listed in the heading row and the sub-clauses are not expanded. Where the application of the individual sub-clauses may be different, these are expanded in the above table and the applicability for each is listed.

NOTE 3 A non-incendive component is limited in use to the particular circuit for which it has been shown to be non-ignition capable and, therefore, cannot be separately assessed as complying with this standard.

~~NOTE 3 Compliance with this standard does not imply any removal of, or lowering of the requirements of any other standard with which the electrical equipment complies.~~

~~NOTE 4 This part of IEC 60079 supplements, and may enhance, the requirements for equipment for normal industrial applications. Where compliance with other IEC standards is indicated, such as IEC 60034 for motors and IEC 60598-2 for luminaires, proving compliance to those standards is normally the responsibility of the manufacturer.~~

~~NOTE 5 Type of protection "n" provides Equipment Protection Level (EPL) Gc. For further information, see IEC 60079-0.~~

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 60034 (all parts), *Rotating electrical machines*~~

~~IEC 60034-1, *Rotating electrical machines – Part 1: Rating and performance*~~

~~IEC/TS 60034-25, *Rotating electrical machines – Part 25: Guidance for the design and performance of a.c. motors specifically designed for converter supply*~~

~~IEC 60061 (all parts), *Lamp caps and holders together with gauges for the control of interchangeability and safety*~~

~~IEC 60061-1, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps*~~

~~IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*~~

IEC 60079-0~~:2007~~, *Explosive atmospheres – Part 0: Equipment – General requirements*

~~IEC 60079-1, *Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures "d"*~~

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

~~IEC 60079-11, *Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"*~~

~~IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*~~

~~IEC 60155, *Glow-starters for fluorescent lamps*~~

~~IEC 60228, *Conductors of insulated cables*~~

~~IEC 60238, *Edison screw lampholders*~~

~~IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) – Examples of standardized systems of fuses A to F*~~

~~IEC 60400, *Lampholders for tubular fluorescent lamps and starterholders*~~

~~IEC 60529, *Degrees of protection provided by enclosures (IP Code)*~~

~~IEC 60598 (all parts), *Luminaires*~~

~~IEC 60598-1:2008, *Luminaires – Part 1: General requirements and tests*~~

~~IEC 60598-2 (all parts), *Luminaires – Part 2: Particular requirements*~~

~~IEC 60664-1:, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*~~

~~IEC 60927, *Auxiliaries for lamps – Starting devices (other than glow starters) – Performance requirements*~~

~~IEC 60947-7-1, *Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment – Terminal blocks for copper conductors*~~

~~IEC 60947-7-2, *Low-voltage switchgear and controlgear – Part 7-2: Ancillary equipment – Protective conductor terminal blocks for copper conductors*~~

~~IEC 60998-2-4, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-4: Particular requirements for twist-on connecting devices*~~

~~IEC 60999-1, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1:General requirements and particular requirements for clamping units for conductors from 0,2 mm² up to 35 mm² (included)*~~

~~IEC 60999-2, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 2:Particular requirements for clamping units for conductors above 35 mm2 up to 300 mm2 (included)*~~

~~IEC 61048, *Auxiliaries for lamps – Capacitors for use in tubular fluorescent and other discharge lamp circuits – General and safety requirements*~~

~~IEC 61184, *Bayonet lampholders*~~

~~IEC 61195, *Double-capped fluorescent lamps – Safety specifications*~~

~~IEC 61347-1:2007, *Lamp controlgear – Part 1: General and safety requirements*~~

~~IEC 61347-2-1, *Lamp controlgear – Part 2-1: Particular requirements for starting devices (other than glow starters)*~~

~~IEC 61347-2-2, *Lamp controlgear – Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps*~~

~~IEC 61347-2-3, *Lamp controlgear – Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps*~~

~~IEC 61347-2-4, *Lamp controlgear – Part 2-4: Particular requirements for d.c. supplied electronic ballasts for general lighting*~~

~~IEC 61347-2-7, *Lamp controlgear – Part 2-7: Particular requirements for d.c. supplied electronic ballasts for emergency lighting*~~

~~IEC 61347-2-8, *Lamp controlgear – Part 2-8: Particular requirements for ballasts for fluorescent lamps*~~

~~IEC 61347-2-9, *Lamp controlgear – Part 2-9: Particular requirements for ballasts for discharge lamps (excluding fluorescent lamps)*~~

IEC 60079-15

Edition 5.0 2017-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Explosive atmospheres –
Part 15: Equipment protection by type of protection "n"

Atmosphères explosives –
Partie 15: Protection du matériel par mode de protection «n»

IEC 60079-15:2017-12(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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EXPLOSIVE ATMOSPHERES –

Part 15: Equipment protection by type of protection "n"

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.
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International Standard IEC 60079-15 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

This fifth edition cancels and replaces the fourth edition, published in 2010, and constitutes a technical revision.

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

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

FDIS	Report on voting
31/1339/FDIS	31/1355/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.

This International Standard is to be read in conjunction with IEC 60079-0.

A list of all parts of the IEC 60079 series, under the general title: *Explosives atmospheres*, can be found on the IEC website.

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

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

		Type		
Changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
Requirements for enclosed break devices have been removed	-			C1
Requirements for type of protection “nA” has been removed	-			C2
Scope has been updated to allow equipment with internal working voltages over 15 kV such as starters for HID luminaires	1		X	
Definition for cable sealing box removed	3	X		
Definitions for creepage distance and clearance removed as they are now in 60079-0	3	X		
Definition of non-sparking device “nA” removed, as the concept has been transferred to 60079-7	3			C2
Definition of duty cycle removed	3	X		
Definition of enclosed break device moved as the concept has been transferred to 60079-1	3			C1
Definition of hermetically sealed device revised	3	A1		
Definition for normally sparking device added	3.2	X		
Small component temperature clause removed, part of moving type of protection “nA” to 60079-7	5			C2
Minimum degree of protection requirements; clearance, creepage and separation requirements; determination of working voltage; conformal coating; CTI requirement; Insulation between conductive parts and measurement of creepage and clearance requirements have been removed.	6			C2
Connection facilities and terminal compartment requirements have been removed	-			C2
Supplementary requirements for non-sparking electrical rotating machines have been removed	-			C2
Supplementary requirements for non-sparking fuses and fuse assemblies have been removed	-			C2
Supplementary requirements for non-sparking plugs and sockets have been removed	-			C2
Supplementary requirements for non-sparking luminaires have been removed	-			C2
Supplementary requirements for equipment incorporating non-sparking cells and batteries have been removed	-			C2
Supplementary requirements for non-sparking low power equipment have been removed	-			C2
Supplementary requirements for non-sparking current transformers have been removed	-			C2
Requirements for other non-sparking electrical equipment have been removed	-			C2
General supplementary requirements for equipment producing arcs, sparks or hot surfaces have been removed	-			C2
Requirements for enclosed break devices have been removed	-			C1
Voltage and current limitations added for non-incendive components.	7.2			C6

		Type		
Changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
The requirements for sealed devices have been extended to require more documentation,	9.1		X	
The +20K requirement for luminaire materials has been removed	9.5			C2
Notes 1-3 have been removed, as this information is covered elsewhere	10.1	X		
Entry device requirements added	10.1		X	
Industrial standard compliance and battery requirements added	10.2.1.2		X	
The exemption for manually operated sparking devices moved to here, creepage and clearance requirements in industrial standards added for switching devices, and cell and battery requirements added	10.2.1.2		X	
Requirements for cable glands and conduit entries have been clarified	10.2.3	X		
Requirements for gasketed windows expanded to allow a removable window mounted in a frame.	10.2.5.2		X	
Requirement to include documentation on the thermal stability of gaskets or seals added	10.2.6			C4
Requirements reworded for clarity	10.2.7	X		
Requirements for “nR” enclosures fitted with fans added.	10.2.9			C5
Type test requirements for enclosed break “nC” and “nA” equipment removed	-			C1, C2
The dielectric test after the leakage test for sealed devices has been eliminated unless the results of the leakage test are uncertain.	11.2.2		X	
Tests for sealed devices, screw lampholders, starters, lamps, ignitors, and ignitor pulses for luminaires have been removed	-			C2
All testing for batteries has been removed.	-			C2
All testing for electrical machines removed	-			C2
Routine test requirements re-written for sealed components, non-incendive components and restricted breathing equipment to take out the testing for enclosed break and nA equipment	12			C1, C2
Preparation of non-incendive component samples	11.1.1			C3
Marking requirements modified to remove labelling requirements for enclosed break components, nA equipment, and batteries.	-			C1, C2
Documentation requirements modified to remove to remove labelling requirements for enclosed break components, nA equipment, and batteries.	14			C1, C2
The instruction section has been expanded to include new requirements	15		X	
Annex A has been removed.	-			C2

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.

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 changes

A1 – It was determined that this was already covered by the sealed device definition

C1 – Enclosed break devices “nC” are now designated as “dc” and the requirements are located in IEC 60079-1:2014.

C2 – Type of protection “nA” is now designated as type of protection “ec” and the requirements for “ec” equipment are located in IEC 60079-7:2015.

C3 – Test time for the preparation of non-incendive component samples has been specified.

C4 – Additional documentation requirements for seals and gaskets.

C5 – As the pressure inside an enclosure fitted with fans can be affected by the operation of the fan, it is now specified that the restricted breathing test is conducted with fans operating and stationary.

C6 – The limitations from IEC 60079-15 Ed 3 were added.

EXPLOSIVE ATMOSPHERES –

Part 15: Equipment protection by type of protection "n"

1 Scope

This part of IEC 60079 specifies requirements for the construction, testing and marking for Group II electrical equipment with type of protection “n” which includes; sealed devices “nC”, hermetically sealed devices “nC”, non-incendive components “nC” and restricted breathing enclosures “nR” intended for use in explosive gas atmospheres. This part of IEC 60079 applies to electrical equipment where the rated input voltage does not exceed 15 kV r.m.s. AC or DC including where the internal working voltages of the Ex product exceeds 15 kV, for example starters for HID luminaires.

This part of IEC 60079 supplements and modifies the general requirements of IEC 60079-0, except as indicated in Table 1. Where a requirement of this part of IEC 60079 conflicts with a requirement of IEC 60079-0, the requirement of this part of IEC 60079 takes precedence.

Table 1 – Relationship of IEC 60079-15 to IEC 60079-0

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[1] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking “nC”**	**Restricted breathing “nR”**
3	3	Definitions	Applies	Applies
4	4	Equipment grouping		
4.1	4.1	Group I	Excluded	Excluded
4.2	4.2	Group II	Applies	Applies
4.3	4.3	Group III	Excluded	Excluded
4.4	4.4	Equipment for a particular explosive atmosphere	Applies	Applies
5	5	Temperatures		
5.1	5.1	Environmental influences	Applies	Applies
5.2	5.2	Service temperature	Applies	Applies
5.3	5.3	Maximum surface temperature		
5.3.1	5.3.1	Determination of maximum surface temperature	Applies	Applies
5.3.2	5.3.2	Limitation of maximum surface temperature		
5.3.2.1	5.3.2.1	Group I equipment	Excluded	Excluded
5.3.2.2	5.3.2.2	Group II equipment	Applies	Applies
5.3.2.3	5.3.2.3	Group III equipment	Excluded	Excluded

[1] Under preparation. Stage at the time of publication: IEC/FDIS 60079-0:2017.

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[1] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
5.3.3	5.3.3	Small component temperature for Group I and Group II equipment	Applies	Excluded
-	5.3.4	Component temperature of smooth surfaces for Group I or Group II equipment (Applies for smaller than 10 000 mm^2 only)	Applies	Excluded
6	6	Requirements for all electrical apparatus		
6.1	6.1	General	Applies	Applies
6.2	6.2	Mechanical strength	Applies	Applies
6.3	6.3	Opening times	Excluded	Applies
6.4	6.4	Circulating currents	Applies	Applies
6.5	6.5	Gasket retention	Applies	Applies
6.6	6.6	Electromagnetic and ultrasonic radiating equipment	Applies	Applies
7	7	Non-metallic enclosures and non-metallic parts of enclosures		
7.1	7.1	General		
7.1.1	7.1.1	Applicability	Applies	Applies
7.1.2	7.1.2	Specification of materials	Applies	Applies
7.2	7.2	Thermal endurance		
7.2.1	7.2.1	Tests for thermal resistance	Applies	Applies
7.2.2	-	Material selection	Modified	Modified
-	7.2.2	Material selection	Applies	Applies
7.2.3	7.2.3	Alternative qualification for elastomeric sealing O-rings	Applies	Applies
7.3	7.3	Resistance to ultraviolet light	Applies	Applies
7.4	7.4	Electrostatic charges on external non-metallic materials		
7.4.1	7.4.1	Applicability	Applies	Applies
7.4.2	7.4.2	Avoidance of build-up of electrostatic charge on Group I or Group II electrical equipment	Applies	Applies
7.4.3	7.4.3	Avoidance of build-up of electrostatic charge on equipment for Group III	Excluded	Excluded

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[1] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
7.5	7.5	External conductive parts	Applies	Applies
8	8	Metallic enclosures and metallic parts of enclosures		
8.1	8.1	Material composition	Applies	Applies
8.2	8.2	Group I	Excluded	Excluded
8.3	8.3	Group II	Applies	Applies
8.4	8.4	Group III	Excluded	Excluded
NR	8.5	Copper alloys	Applies	Applies
9	9	Fasteners		
9.1	9.1	General	Applies	Applies
9.2	9.2	Special fasteners	Excluded	Excluded
9.3	9.3	Holes for special fasteners	Excluded	Excluded
9.3.3	-	Hexagon socket set screws	Excluded	Excluded
-	9.4	Hexagon socket set screws	Excluded	Excluded
10	10	Interlocking devices	Excluded	Excluded
11	11	Bushings	Applies	Applies
12	-	Materials used for cementing	Modified	Modified
-	12	Reserved for future use.	Excluded	Excluded
13	13	Ex components	Applies	Applies
14	14	Connection facilities	Applies	Applies
15	15	Connection facilities for earthing and bonding conductors	Applies	Applies
16	16	Entries into enclosures	Applies	Applies
17	17	Supplementary requirements for electric machines	Excluded	Excluded
18	18	Supplementary requirements for switchgear	Excluded	
18.1	18.1	Flammable dielectric	Excluded	Applies
18.2	18.2	Disconnectors	Excluded	Applies
18.3	18.3	Group I – Provisions for locking	Excluded	Excluded
18.4	18.4	Doors and covers	Excluded	Applies
19	-	Supplementary requirements for fuses	Excluded	Excluded
-	19	Reserved for future use.	Excluded	Excluded
20	20	Supplementary requirements for plugs and sockets		

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[1] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
20.1	20.1	General	Applies	Applies
20.2	20.2	Explosive gas atmospheres	Excluded	Excluded
20.3	20.3	Explosive dust atmospheres	Excluded	Excluded
20.4	20.4	Energized plugs	Applies	Applies
21	21	Supplementary requirements for luminaires		
21.1	21.1	General	Applies	Applies
21.2	21.2	Covers for luminaires of EPL Mb, EPL Gb or EPL Db	Excluded	Excluded
21.3	21.3	Covers for luminaires of EPL Gc or EPL Dc	Applies	Applies
21.4	21.4	Sodium lamps	Applies	Applies
22	22	Supplementary requirements for caplights and handlights		
22.1	22.1	Group I caplights	Excluded	Excluded
22.2	22.2	Group II and Group III caplights and handlights	Excluded	Applies
23	23	Equipment incorporating cells and batteries	Applies	Applies
23.12	23.12	Replacement battery pack	Applies	Applies
24	24	Documentation	Modified	Modified
25	25	Compliance of prototype or sample with documents	Applies	Applies
26	26	Type tests	Applies	Applies
26.4	26.4	Tests of enclosures		
26.4.1	26.4.1	Order of tests		
26.4.1.1	26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass or ceramic parts of enclosures	Applies	Applies
26.4.1.2	26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures		
26.4.1.2.1	26.4.1.2.1	General	Applies	Applies
26.4.1.2.2	26.4.1.2.2	Group I electrical equipment	Excluded	Excluded
26.4.1.2.3	-	Group II and Group III electrical equipment	Modified	Modified
-	26.4.1.2.3	Group II and Group III electrical equipment	Applies	Applies
26.4.2	26.4.2	Resistance to impact	Applies	Applies

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[1] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
26.4.3	26.4.3	Drop test	Applies	Applies
26.4.4	26.4.4	Acceptance criteria	Applies	Applies
26.4.5	26.4.5	Degree of protection by enclosure	Applies	Applies
26.5	26.5	Thermal tests		
26.5.1	26.5.1	Temperature measurement	Applies	Applies
26.5.1.1	26.5.1.1	General	Applies	Applies
26.5.1.2	26.5.1.2	Service Temperature	Applies	Applies
26.5.2	26.5.2	Thermal shock test	Applies	Applies
26.5.3	26.5.3	Small component ignition test (Group I and Group II)	Applies	Excluded
26.6	26.6	Torque test for bushings	Applies	Applies
26.7	26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	26.7.1	General	Applies	Applies
26.7.2	-	Test temperatures	Modified	Modified
-	26.7.2	Test temperatures	Applies	Applies
26.8	-	Thermal endurance to heat	Modified	Modified
-	26.8	Thermal endurance to heat	Applies	Applies
26.9	26.9	Thermal endurance to cold	Applies	Applies
26.10	26.10	Resistance to light		
26.10.1	26.10.1	General	Applies	Applies
26.10.2	26.10.2	Light exposure	Applies	Applies
26.10.3	26.10.3	Acceptance criteria	Applies	Applies
26.11	26.11	Resistance to chemical agents for Group I electrical equipment	Excluded	Excluded
26.12	26.12	Earth continuity	Applies	Applies
26.13	26.13	Surface resistance test of parts of enclosures of non-metallic materials	Applies	Applies
26.14	26.14	Measurement of capacitance		
26.14.1	26.14.1	General	Applies	Applies
26.14.2	26.14.2	Test procedure	Applies	Applies
26.15	26.15	Verification of ratings of ventilating fans	Excluded	Excluded
26.16	26.16	Alternative qualification of elastomeric sealing O-rings	Applies	Applies

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[1] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
-	26.17	Transferred charge test	Applies	Applies
27	27	Routine tests	Applies	Applies
28	28	Manufacturers responsibility	Applies	Applies
29	29	Marking		
29.1	29.1	Applicability	Applies	Applies
29.2	29.2	Location	Applies	Applies
29.3	29.3	General	Applies	Applies
29.4	29.4	Ex marking for explosive gas atmospheres	Applies	Applies
29.5	29.5	Ex marking for explosive dust atmospheres	Excluded	Excluded
29.6	29.6	Combined types (or levels) of protection	Applies	Applies
29.7	29.7	Multiple types of protection	Applies	Applies
29.8	29.8	Ga equipment using two independent Gb types (or levels) of protection	Excluded	Excluded
-	29.9	Boundary wall	Excluded	Excluded
29.9	29.10	Ex Components	Applies	Applies
29.10	29.11	Small Ex Equipment and small Ex Components	Applies	Applies
29.11	29.12	Extremely small equipment and extremely small Ex Components	Applies	Applies
29.12	29.13	Warning markings	Applies	Applies
29.13	-	Alternate marking of equipment protection levels (EPLs)	Applies	Applies
29.13.1	-	Alternate marking of type of protection for explosive gas atmospheres	Applies	Applies
29.13.2	-	Alternate marking of type of protection for explosive dust atmospheres	Excluded	Excluded
29.14	29.14	Cells and batteries	Applies	Applies
29.15	29.15	Electrical machines operated with a converter	Applies	Applies
29.16	29.16	Examples of marking	Examples only	Examples only
30	30	Instructions		
30.1	30.1	General	Applies	Applies
30.2	30.2	Cells and batteries	Applies	Applies
30.3	30.3	Electric machines	Excluded	Excluded

Clause of IEC 60079-0			IEC 60079-0 clause application to IEC 60079-15	
Ed. 6.0 (2011) (informative)	**Ed. 7.0[1] (future edition)** (informative)	**Clause / Subclause title** (normative)	**Protected sparking "nC"**	**Restricted breathing "nR"**
30.4	30.4	Ventilating fans	Excluded	Excluded
-	30.5	Cable glands	Applies	Applies
Annex A	Annex A	Supplementary requirements for Ex cable glands	Applies	Applies
Annex B	Annex B	Requirements for Ex components	Applies	Applies
Annex C	Annex C	Example of rig for resistance to impact test	Informative Annex	Informative Annex
Annex D	Annex D	Motors supplied by converters	Informative Annex	Informative Annex
Annex E	Annex E	Temperature evaluation of electric machines	Informative Annex	Informative Annex
Annex F	Annex F	Guideline flowchart for tests of non-metallic enclosures or non-metallic parts of enclosures (26.4)	Informative Annex	Informative Annex
-	Annex G	Guidance flowchart for tests of cable glands	Informative Annex	Informative Annex
-	Annex H	Shaft voltages resulting in motor bearing or shaft brush sparking. Discharge energy calculation	Informative Annex	Informative Annex

Applies – This requirement of IEC 60079-0 is applied without change.

Excluded – This requirement of IEC 60079-0 does not apply.

Modified – This requirement of IEC 60079-0 is modified as detailed in this standard.

NOTE 1 The clause number in the above table is shown for information only. The applicable requirements of IEC 60079-0 are identified by the clause title which is normative. This document was written against the specific requirements of IEC 60079-0 (ed. 7.0). The clause numbers for the previous edition are shown for information only. This is to enable the general requirements of IEC 60079-0 (ed. 6.0) to be used where necessary with this part of IEC 60079. Where there is a conflict between requirements, the later edition requirements take precedence.

NOTE 2 A shaded row in the above table indicates that this is a clause heading. In cases where the applicability is the same for all of the sub-clauses the 'Applies' or 'Excluded' is listed in the heading row and the sub-clauses are not expanded. Where the application of the individual sub-clauses may be different, these are expanded in the above table and the applicability for each is listed.

NOTE 3 A non-incendive component is limited in use to the particular circuit for which it has been shown to be non-ignition capable and, therefore, cannot be separately assessed as complying with this standard.

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*

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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ATMOSPHÈRES EXPLOSIVES –

Partie 15: Protection du matériel par mode de protection «n»

AVANT-PROPOS

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8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 60079-15 a été établie par le comité d'études 31 de l'IEC: Équipements pour atmosphères explosives.

Cette cinquième édition annule et remplace la quatrième édition parue en 2010. Cette édition constitue une révision technique.

Cette édition inclut les modifications majeures suivantes par rapport à l'édition précédente:

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
31/1339/FDIS	31/1355/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

La présente Norme internationale doit être lue conjointement avec l'IEC 60079-0.

Une liste de toutes les parties de la série IEC 60079, publiées sous le titre général: *Atmosphères explosives*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. À cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

		Type		
Modifications	**Article**	**Modifications mineures et rédactionnelles**	**Extension**	**Modifications techniques majeures**
Les exigences relatives aux dispositifs de coupure enfermés ont été supprimées	-			C1
Les exigences relatives au mode de protection «nA» ont été supprimées	-			C2
Le domaine d'application a été mis à jour afin d'autoriser les appareils de tension de service interne supérieure à 15 kV tels que les starters pour luminaires DHI	1		X	
La définition de «boîte d'étanchéité de câble» a été supprimée	3	X		
Les définitions de «ligne de fuite» et de «distance d'isolement dans l'air» ont été supprimées car elles figurent désormais dans l'IEC 60079-0	3	X		
La définition de «dispositif ne produisant pas d'étincelles «nA» a été supprimée car le concept a été transféré dans l'IEC 60079-7	3			C2
La définition de «cycle de service» a été supprimée	3	X		
La définition de «dispositif de coupure enfermé» a été supprimée car le concept a été transféré dans l'IEC 60079-1	3			C1
La définition de «dispositif hermétiquement scellé» révisé	3	A1		
La définition de «dispositif produisant normalement des étincelles» a été ajoutée	3.2	X		
Le paragraphe relatif à la température des petits composants a été supprimé et la partie relative au mode de protection «nA» a été déplacée dans l'IEC 60079-7	5			C2
Les exigences relatives au degré de protection minimal, aux distances d'isolement dans l'air, lignes de fuite et séparations, à la détermination de la tension de service, au revêtement enrobant conforme, à l'IRC, à l'isolement entre parties conductrices et au mesurage des lignes de fuite et des distances d'isolement dans l'air ont été supprimées	6			C2
Les exigences relatives aux éléments de raccordement et aux logements de raccordement ont été supprimées	-			C2
Les exigences supplémentaires pour les machines tournantes ne produisant pas d'étincelles ont été supprimées	-			C2
Les exigences supplémentaires pour les coupe-circuits à fusibles et pour les assemblages à fusibles ne produisant pas d'étincelles ont été supprimées	-			C2
Les exigences supplémentaires pour les prises de courant ne produisant pas d'étincelles ont été supprimées	-			C2
Les exigences supplémentaires pour les luminaires ne produisant pas d'étincelles ont été supprimées	-			C2
Les exigences supplémentaires pour l'appareil comprenant des éléments et batteries ne produisant pas d'étincelles ont été supprimées	-			C2

		Type		
Modifications	**Article**	**Modifications mineures et rédactionnelles**	**Extension**	**Modifications techniques majeures**
Les exigences supplémentaires pour appareil basse puissance ne produisant pas d'étincelles ont été supprimées	-			C2
Les exigences supplémentaires pour transformateurs de courant ne produisant pas d'étincelles ont été supprimées	-			C2
Les exigences relatives aux autres appareils électriques ne produisant pas d'étincelles ont été supprimées	-			C2
Les exigences supplémentaires générales relatives à l'appareil produisant des arcs, des étincelles ou des surfaces chaudes ont été supprimées	-			C2
Les exigences relatives aux dispositifs de coupure enfermés ont été supprimées	-			C1
Les limitations de tension et de courant pour les composants non-propagateurs de flamme ont été ajoutées.	7.2			C6
Les exigences relatives aux dispositifs clos ont été étendues afin d'exiger une documentation plus large	9.1		X	
L'exigence selon laquelle la température de fonctionnement continu (COT) doit être supérieure d'au moins 20 K à la température de service dans le cadre de dispositifs d'étanchéité utilisés dans les luminaires a été supprimée	9.5			C2
Les Notes 1 à 3 ont été supprimées car les informations traitées sont couvertes par d'autres normes	10.1	X		
Les exigences relatives aux dispositifs d'entrée ont été ajoutées	10.1		X	
La conformité aux normes industrielles et les exigences relatives aux batteries ont été ajoutées	10.2.1.2		X	
La dispense des dispositifs produisant normalement des étincelles à fonctionnement manuel a été déplacée ici, les exigences relatives aux lignes de fuite et aux distances d'isolement dans l'air des normes industrielles ont été ajoutées pour les dispositifs de commutation, et les exigences relatives aux éléments et aux batteries ont été ajoutées	10.2.1.2		X	
Les exigences relatives aux entrées de câbles et aux entrées de conduits ont été clarifiées	10.2.3	X		
Les exigences relatives aux hublots munis de joints ont été étendues afin d'autoriser les hublots amovibles montés dans une carcasse	10.2.5.2		X	
L'exigence relative à l'inclusion de documentation à propos de la stabilité thermique des garnitures et joints a été ajoutée	10.2.6			C4
Les exigences ont été reformulées pour plus de clarté	10.2.7	X		
Les exigences relatives aux enveloppes «nR» équipées de ventilateurs ont été ajoutées.	10.2.9			C5
Les exigences relatives aux essais de type des dispositifs de coupure enfermés «nC» et «nA» ont été supprimées	-			C1, C2

		Type		
Modifications	**Article**	**Modifications mineures et rédactionnelles**	**Extension**	**Modifications techniques majeures**
L'essai de rigidité diélectrique qui fait suite à l'essai de fuite des dispositifs clos a été supprimé, sauf lorsque les résultats de l'essai de fuite sont incertains	11.2.2		X	
Les essais des dispositifs clos, des douilles de lampe à vis, des starters, des lampes, des amorceurs et des impulsions d'amorceurs de luminaires ont été supprimés	-			C2
Tous les essais effectués sur des batteries ont été supprimés	-			C2
Tous les essais effectués sur des machines électriques ont été supprimés	-			C2
Les exigences relatives aux essais individuels de série des composants scellés, des composants non propagateurs de flamme et des appareils à respiration limitée ont été reformulées afin d'exclure les essais effectués sur des dispositifs de coupure enfermés et des appareils «nA»	12			C1, C2
Préparation d'échantillons de composants non-propagateurs de flamme	11.1.1			C3
Les exigences relatives au marquage ont été modifiées afin de supprimer les exigences relatives à l'étiquetage des composants de coupure enfermés, des appareils «nA» et des batteries	-			C1, C2
Les exigences relatives à la documentation ont été modifiées afin de supprimer les exigences relatives à l'étiquetage des composants de coupure enfermés, des appareils «nA» et des batteries	14			C1, C2
La section relative aux instructions a été étendue afin de comprendre de nouvelles exigences	15		X	
L'Annexe A a été supprimée	-			C2

NOTE Les modifications techniques désignées incluent l'importance des modifications techniques apportées dans la version révisée de la Norme IEC, mais il ne s'agit pas d'une liste exhaustive de toutes les modifications apportées à la version précédente.

Explications des types de modifications:

A) Définitions

1) **Modifications mineures et rédactionnelles:**

- Clarification
- Réduction des exigences techniques
- Modification technique mineure
- Corrections rédactionnelles

Ces modifications portent sur les exigences et sont de nature rédactionnelle ou technique mineure. Elles comprennent des modifications de formulation destinées à clarifier les exigences techniques sans apporter de modification technique ni réduire le niveau actuel de l'exigence.

2) **Extension:** Ajout d'options techniques

Ces modifications ajoutent de nouvelles exigences techniques ou modifient les exigences techniques existantes, de manière à fournir de nouvelles options sans toutefois augmenter les niveaux d'exigences pour tout appareil qui était totalement

conforme à la norme précédente. Par conséquent, ces modifications ne devront pas être prises en compte dans le cas de produits conformes à l'édition précédente.

3) **Modifications techniques majeures:**

- ajout d'exigences techniques
- augmentation des exigences techniques

Ces modifications sont apportées aux exigences techniques (ajout, augmentation du niveau ou suppression) de telle manière qu'un produit conforme à l'édition précédente ne sera pas toujours en mesure de satisfaire aux exigences indiquées dans la dernière édition. Ces modifications doivent être prises en compte pour les produits conformes à l'édition précédente. Des informations supplémentaires relatives à ces modifications sont données à l'Article B) ci-dessous.

NOTE Ces modifications représentent les connaissances technologiques actuelles. Toutefois, il convient qu'elles n'aient aucune influence sur l'appareil déjà présent sur le marché.

B) Informations relatives aux origines des modifications

A1 – Il a été déterminé que cela avait déjà été couvert par la définition des «dispositifs clos»

C1 – Les dispositifs de coupure enfermés «nC» sont désormais désignés comme étant des dispositifs «dc» et les exigences correspondantes se trouvent dans l'IEC 60079-1:2014.

C2 – Le mode de protection «nA» est désormais désigné comme étant un mode de protection «ec» et les exigences relatives aux appareils «ec» se trouvent dans l'IEC 60079-7:2015.

C3 – La période d'essai relative à la préparation d'échantillons de composants non-propagateurs de flamme a été spécifiée.

C4 – Les exigences relatives à la documentation supplémentaire pour les garnitures et les joints ont été ajoutées.

C5 – La pression à l'intérieur d'une enveloppe équipée de ventilateurs pouvant être affectée par le fonctionnement du ventilateur, il est désormais spécifié que l'essai de respiration limitée est réalisé avec des ventilateurs en fonctionnement et à l'arrêt.

C6 – Les limitations de l'IEC 60079 Éd. 3 ont été ajoutées.

ATMOSPHÈRES EXPLOSIVES –

Partie 15: Protection du matériel par mode de protection «n»

1 Domaine d'application

La présente partie de l'IEC 60079 spécifie les exigences de construction, d'essai et de marquage de l'appareil électrique du Groupe II avec mode de protection «n» qui inclut: les dispositifs clos «nC», les dispositifs hermétiquement scellés «nC», les composants non-propagateurs de flamme «nC» et les enveloppes à respiration limitée «nR», et qui est destiné à être utilisé en atmosphère explosive gazeuse. La présente partie de l'IEC 60079 s'applique à l'appareil électrique dont la tension assignée d'entrée ne dépasse pas la valeur efficace de 15 kV en courant alternatif ou en courant continu, y compris lorsque les tensions internes de service du produit Ex dépassent 15 kV, par exemple les starters pour luminaires DHI.

La présente partie de l'IEC 60079 complète et modifie les exigences générales de l'IEC 60079-0, à l'exception de celles qui sont indiquées dans le Tableau 1. Si une exigence de la présente partie de l'IEC 60079 est en conflit avec une exigence de l'IEC 60079-0, l'exigence de la présente partie de l'IEC 60079 prévaut.

Tableau 1 – Rapport entre l'IEC 60079-15 et l'IEC 60079-0

Article de l'IEC 60079-0			**Application de l'article de l'IEC 60079-0 à l'IEC 60079-15**	
Éd. 6.0 (2011) (informative)	**Éd. 7.0[1] (future édition)** (informative)	**Titre de l'article / paragraphe** (normatif)	**Appareil de protection contre les étincelles «nC»**	**Appareil à respiration limitée «nR»**
3	3	Définitions	Oui	Oui
4	4	Groupement d'appareils		
4.1	4.1	Groupe I	Non	Non
4.2	4.2	Groupe II	Oui	Oui
4.3	4.3	Groupe III	Non	Non
4.4	4.4	Appareil pour une atmosphère explosive particulière	Oui	Oui
5	5	Températures		
5.1	5.1	Influences environnementales	Oui	Oui
5.2	5,2	Température de service	Oui	Oui
5.3	5.3	Température maximale de surface		
5.3.1	5.3.1	Détermination de la température maximale de surface	Oui	Oui
5.3.2	5.3.2	Limitation de la température maximale de surface		
5.3.2.1	5.3.2.1	Appareil du Groupe I	Non	Non
5.3.2.2	5.3.2.2	Appareil du Groupe II	Oui	Oui

[1] En cours d'élaboration. Stade au moment de la publication: IEC/FDIS 60079-0:2017.

Article de l'IEC 60079-0			Application de l'article de l'IEC 60079-0 à l'IEC 60079-15	
Éd. 6.0 (2011) (informative)	**Éd. 7.0[1] (future édition)** (informative)	**Titre de l'article / paragraphe** (normatif)	**Appareil de protection contre les étincelles «nC»**	**Appareil à respiration limitée «nR»**
5.3.2.3	5.3.2.3	Appareil du Groupe III	Non	Non
5.3.3	5.3.3	Température des petits composants des appareils du Groupe I et du Groupe II	Oui	Non
-	5.3.4	Température de composants des surfaces lisses pour les appareils de Groupe I ou de Groupe II (Oui pour des composants de surface inférieure à 10 000 mm² seulement)	Oui	Non
6	6	Exigences pour tous les appareils électriques		
6.1	6.1	Généralités	Oui	Oui
6.2	6,2	Résistance mécanique de l'appareil	Oui	Oui
6.3	6.3	Temps d'ouverture	Non	Oui
6.4	6.4	Courants de circulation dans les enveloppes (par exemple, de machines électriques de grandes dimensions)	Oui	Oui
6.5	6.5	Maintien des garnitures	Oui	Oui
6.6	6.6	Appareil émettant une énergie rayonnée électromagnétique ou ultrasonique	Oui	Oui
7	7	Enveloppes non métalliques et parties non métalliques d'enveloppes		
7.1	7.1	Généralités		
7.1.1	7.1.1	Applicabilité	Oui	Oui
7.1.2	7.1.2	Spécification des matériaux	Oui	Oui
7.2	7,2	Endurance thermique		
7.2.1	7.2.1	Essais pour l'endurance thermique	Oui	Oui
7.2.2	-	Sélection des matériaux	Modifiée	Modifiée
-	7.2.2	Sélection des matériaux	Oui	Oui
7.2.3	7.2.3	Qualification alternative pour les joints toriques d'étanchéité en élastomère	Oui	Oui
7.3	7.3	Résistance à la lumière ultraviolette	Oui	Oui
7.4	7.4	Charges électrostatiques des matériaux externes non métalliques		
7.4.1	7.4.1	Applicabilité	Oui	Oui
7.4.2	7.4.2	Évitement du développement d'une charge électrostatique sur les appareils électriques du Groupe I ou du Groupe II	Oui	Oui

Article de l'IEC 60079-0			Application de l'article de l'IEC 60079-0 à l'IEC 60079-15	
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7.4.3	7.4.3	Évitement du développement d'une charge électrostatique sur les appareils du Groupe III	Non	Non
7.5	7.5	Parties conductrices externes	Oui	Oui
8	8	Enveloppes métalliques et parties métalliques d'enveloppes		
8.1	8.1	Composition des matériaux	Oui	Oui
8.2	8.2	Groupe I	Non	Non
8.3	8.3	Groupe II	Oui	Oui
8.4	8.4	Groupe III	Non	Non
NR	8.5	Alliages de cuivre	Oui	Oui
9	9	Fermetures		
9.1	9.1	Généralités	Oui	Oui
9.2	9.2	Fermetures spéciales	Non	Non
9.3	9.3	Trous pour fermetures spéciales	Non	Non
9.3.3	-	Vis sans tête à six pans creux	Non	Non
-	9.4	Vis sans tête à six pans creux	Non	Non
10	10	Dispositifs de verrouillage	Non	Non
11	11	Traversées	Oui	Oui
12	-	Matériaux utilisés pour les scellements	Modifiée	Modifiée
-	12	Réservé pour utilisation ultérieure.	Non	Non
13	13	Composants Ex	Oui	Oui
14	14	Éléments de raccordement	Oui	Oui
15	15	Éléments de raccordement des conducteurs de mise à la terre ou de liaison équipotentielle	Oui	Oui
16	16	Entrées dans les enveloppes	Oui	Oui
17	17	Exigences complémentaires pour machines électriques	Non	Non
18	18	Exigences complémentaires pour appareillage de connexion	Non	
18.1	18.1	Diélectrique inflammable	Non	Oui
18.2	18.2	Sectionneurs	Non	Oui
18.3	18.3	Groupe I – Dispositions pour le verrouillage	Non	Non
18.4	18.4	Portes et couvercles	Non	Oui
19	-	Exigences complémentaires pour coupe-circuits à fusibles	Non	Non

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Éd. 6.0 (2011) (informative)	**Éd. 7.0[1] (future édition)** (informative)	**Titre de l'article / paragraphe** (normatif)	**Appareil de protection contre les étincelles «nC»**	**Appareil à respiration limitée «nR»**
-	19	Réservé pour utilisation ultérieure.	Non	Non
20	20	Exigences complémentaires pour les prises de courant externes et les connecteurs pour raccordement à l'installation		
20.1	20.1	Généralités	Oui	Oui
20.2	20.2	Atmosphères explosives gazeuses	Non	Non
20.3	20.3	Atmosphères explosives de poussières	Non	Non
20.4	20.4	Fiches sous tension	Oui	Oui
21	21	Exigences complémentaires pour les luminaires		
21.1	21.1	Généralités	Oui	Oui
21.2	21.2	Couvercles des luminaires d'EPL Mb, EPL Gb ou EPL Db	Non	Non
21.3	21.3	Couvercles des luminaires d'EPL Gc ou EPL Dc	Oui	Oui
21.4	21.4	Lampes à vapeur de sodium	Oui	Oui
22	22	Exigences complémentaires pour lampes-chapeaux et lampes à main		
22.1	22.1	Lampes-chapeaux du Groupe I	Non	Non
22.2	22.2	Lampes-chapeaux et lampes à main du Groupe II et du Groupe III	Non	Oui
23	23	Appareil incorporant des éléments et des batteries	Oui	Oui
23.12	23.12	Ensemble de batteries remplaçables	Oui	Oui
24	24	Documentation	Modifiée	Modifiée
25	25	Conformité du prototype ou de l'échantillon aux documents	Oui	Oui
26	26	Essais de type	Oui	Oui
26.4	26.4	Essais des enveloppes		
26.4.1	26.4.1	Ordre des essais		
26.4.1.1	26.4.1.1	Enveloppes métalliques, parties métalliques d'enveloppes et parties en verre ou en céramique d'enveloppes	Oui	Oui
26.4.1.2	26.4.1.2	Enveloppes non métalliques ou parties non métalliques d'enveloppes		
26.4.1.2.1	26.4.1.2.1	Généralités	Oui	Oui
26.4.1.2.2	26.4.1.2.2	Appareil électrique du Groupe I	Non	Non

Article de l'IEC 60079-0			Application de l'article de l'IEC 60079-0 à l'IEC 60079-15	
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26.4.1.2.3	-	Appareil électrique du Groupe II et du Groupe III	Modifiée	Modifiée
-	26.4.1.2.3	Appareil électrique du Groupe II et du Groupe III	Oui	Oui
26.4.2	26.4.2	Résistance au choc mécanique	Oui	Oui
26.4.3	26.4.3	Essai de chute	Oui	Oui
26.4.4	26.4.4	Critères d'acceptation	Oui	Oui
26.4.5	26.4.5	Degré de protection (IP) par les enveloppes	Oui	Oui
26.5	26.5	Essais thermiques		
26.5.1	26.5.1	Mesurage de la température	Oui	Oui
26.5.1.1	26.5.1.1	Généralités	Oui	Oui
26.5.1.2	26.5.1.2	Température de service	Oui	Oui
26.5.2	26.5.2	Essai de choc thermique	Oui	Oui
26.5.3	26.5.3	Essai d'inflammation de petits composants (Groupe I et Groupe II)	Oui	Non
26.6	26.6	Essai de rotation pour les traversées	Oui	Oui
26.7	26.7	Enveloppes non métalliques ou parties non métalliques d'enveloppes		
26.7.1	26.7.1	Généralités	Oui	Oui
26.7.2	-	Températures d'essai	Modifiée	Modifiée
-	26.7.2	Températures d'essai	Oui	Oui
26.8	-	Endurance thermique à la chaleur	Modifiée	Modifiée
-	26.8	Endurance thermique à la chaleur	Oui	Oui
26.9	26.9	Endurance thermique au froid	Oui	Oui
26.10	26.10	Résistance à la lumière		
26.10.1	26.10.1	Généralités	Oui	Oui
26.10.2	26.10.2	Exposition à la lumière	Oui	Oui
26.10.3	26.10.3	Critères d'acceptation	Oui	Oui
26.11	26.11	Résistance aux agents chimiques de l'appareil électrique du Groupe I	Non	Non
26.12	26.12	Continuité de terre	Oui	Oui
26.13	26.13	Vérification de la résistance de surface de parties d'enveloppes en matériaux non métalliques	Oui	Oui
26.14	26.14	Mesurage de la capacité		
26.14.1	26.14.1	Généralités	Oui	Oui

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26.14.2	26.14.2	Procédure d'essai	Oui	Oui
26.15	26.15	Vérification des caractéristiques assignées des ventilateurs d'aération	Non	Non
26.16	26.16	Qualification alternative pour les joints toriques d'étanchéité en élastomère	Oui	Oui
-	26.17	Essai de la charge transférée	Oui	Oui
27	27	Essais individuels de série	Oui	Oui
28	28	Responsabilité du constructeur	Oui	Oui
29	29	Marquage		
29.1	29.1	Applicabilité	Oui	Oui
29.2	29.2	Emplacement	Oui	Oui
29.3	29.3	Généralités	Oui	Oui
29.4	29.4	Marquage Ex pour les atmosphères explosives gazeuses	Oui	Oui
29.5	29.5	Marquage Ex pour les atmosphères explosives de poussières	Non	Non
29.6	29.6	Modes (ou niveaux) de protection combinés	Oui	Oui
29.7	29.7	Modes de protection multiples	Oui	Oui
29.8	29.8	Appareil de niveau de protection Ga utilisant deux modes (ou niveaux) de protection Gb indépendants	Non	Non
-	29.9	Paroi limite	Non	Non
29.9	29.10	Composants Ex	Oui	Oui
29.10	29.11	Petits appareils et petits composants Ex	Oui	Oui
29.11	29.12	Appareils et composants Ex extrêmement petits	Oui	Oui
29.12	29.13	Marquages d'avertissement	Oui	Oui
29.13	-	Marquage alternatif des niveaux de protection de l'appareil (EPL)	Oui	Oui
29.13.1	-	Marquage alternatif des modes de protection des atmosphères explosives gazeuses	Oui	Oui
29.13.2	-	Marquage alternatif des modes de protection des atmosphères explosives de poussières	Non	Non
29.14	29.14	Éléments et batteries	Oui	Oui

Article de l'IEC 60079-0			Application de l'article de l'IEC 60079-0 à l'IEC 60079-15	
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29.15	29.15	Machines électriques alimentées par un convertisseur	Oui	Oui
29.16	29.16	Exemples de marquage	Exemples seulement	Exemples seulement
30	30	Instructions		
30.1	30.1	Généralités	Oui	Oui
30.2	30.2	Éléments et batteries	Oui	Oui
30.3	30.3	Machines électriques	Non	Non
30.4	30.4	Ventilateurs d'aération	Non	Non
-	30.5	Entrées de câbles	Oui	Oui
Annexe A	Annexe A	Exigences complémentaires pour les entrées de câbles	Oui	Oui
Annexe B	Annexe B	Exigences pour les composants Ex	Oui	Oui
Annexe C	Annexe C	Exemple de dispositif pour l'essai de résistance au choc mécanique	Annexe informative	Annexe informative
Annexe D	Annexe D	Moteurs alimentés par des convertisseurs	Annexe informative	Annexe informative
Annexe E	Annexe E	Évaluation de la température des machines électriques	Annexe informative	Annexe informative
Annexe F	Annexe F	Organigramme suggéré pour les essais des enveloppes non métalliques ou des parties non métalliques d'enveloppes (26.4)	Annexe informative	Annexe informative
-	Annexe G	Organigramme recommandé pour les essais des entrées de câbles	Annexe informative	Annexe informative
-	Annexe H	Tensions de l'arbre générant des étincelles au niveau du roulement du moteur ou du manchon de l'arbre. Calcul de l'énergie de décharge	Annexe informative	Annexe informative

Oui – Cette exigence de l'IEC 60079-0 est applicable sans modification.

Non – Cette exigence de l'IEC 60079-0 n'est pas applicable.

Modifiée – Cette exigence de l'IEC 60079-0 est modifiée comme cela est détaillé dans la présente norme.

NOTE 1 Les numéros d'articles ci-dessus ne sont donnés qu'à titre informatif. Les exigences applicables de l'IEC 60079-0 sont identifiées par le titre de l'article qui est normatif. Le présent document a été rédigé en rapport avec les exigences spécifiques de l'IEC 60079-0 (éd. 7.0). Les numéros d'articles pour l'édition précédente sont donnés à titre informatif uniquement, afin de permettre l'utilisation de l'IEC 60079-0 (éd. 6.0) «Exigences générales», lorsque c'est nécessaire, avec la présente partie de l'IEC 60079. En cas de conflit entre des exigences, les exigences de la dernière édition prévalent.

NOTE 2 Les lignes ombrées du tableau ci-dessus indiquent un titre d'article. Lorsque l'applicabilité est la même pour tous les paragraphes, les «oui» et «non» sont répertoriés dans la ligne d'en-tête et les paragraphes ne sont pas développés. Lorsque l'application peut être différente selon les paragraphes, ils sont développés dans le tableau ci-dessus et l'applicabilité est répertoriée pour chaque paragraphe.

NOTE 3 Un composant non-propagateur de flamme est limité à une utilisation sur le circuit particulier pour lequel il a été démontré qu'il n'est pas susceptible de provoquer une inflammation et il ne peut donc pas être évalué séparément comme satisfaisant à la présente norme.

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60079-0, *Atmosphères explosives – Partie 0: Matériel – Exigences générales*

IEC 60079-7, *Atmosphères explosives – Partie 7: Protection du matériel par sécurité augmentée "e"*