

Subject 60079-15

April 6, 2018

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Safety for Explosive Atmospheres - Part 15: Equipment Protection by Type of Protection "n", UL 60079-15, are being proposed for preliminary review and comment only:

1. For Preliminary Review Only: Adoption of IEC 60079-15, Explosive Atmospheres - Part 15: Equipment Protection by Type of Protection "n", (fifth edition issued by IEC December 2017) as a new UL IEC-based UL standard, UL 60079-15 with US Differences.

COMMENTS DUE: MAY 7, 2018

This proposal is for review and comment only (no ballot at this time). Please note that comments on a preliminary review document will not receive a response from the proposal author through CSDS. Instead, the proposal author will be asked to review the comments and adjust the proposals and/or supporting rationale as the author determines to be appropriate. The preliminary review process is an informal mechanism that provides authors with the opportunity to refine their proposals before they advance to the next stage in UL's standards development process.

In some cases, the author of the proposals may choose to discontinue them. In this case, the author need not do anything after preliminary review has ended. Normally, the next step in the process is the more formal STP ballot and stakeholder review process. Only comments posted during the STP ballot and stakeholder review process will be provided with a response in CSDS.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

1. For Preliminary Review Only: Adoption of IEC 60079-15, Explosive Atmospheres - Part 15: Equipment Protection by Type of Protection "n", (fifth edition issued by IEC December 2017) as a new UL IEC-based UL standard, UL 60079-15 with US Differences.

RATIONALE

Proposal submitted by: Tonya Woods, TG79-15 Chair on behalf of the TG79-15 Committee Members:

This proposed Fifth edition is a modification of the Fifth edition of the IEC document and includes US deviations encompassing both additions and deletions of information. The significant changes with respect to the previous (Fifth) edition are listed in the IEC Foreword.

It is the proposal submitter's opinion that this proposal affects the following topics/sections of the Standard

- Marking Requirement.

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- This edition removed the 'nA' protection concept, which is considered a major technical change.

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The National Difference Page and IEC Foreword have been provided for your reference in reviewing this document. However, they are not considered to be part of the ANSI balloted material.

PROPOSAL

National Differences

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60079-15, Explosive atmospheres – Part 15: Equipment protection by type of protection “n”, copyright 2017 are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

DR – These are National Differences based on the **national regulatory requirements**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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:

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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.

Changes	Clause	Type		
		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

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Changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
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
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	

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Changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
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:

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- 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

1DV DR Modification of Clause 1 to replace with the following:

This part of IEC 60079 document 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 document 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.

Where references are made to IEC 60079 standards, the referenced requirements found in these standards shall apply as modified by any applicable U.S. National Differences.

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

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

Clause of IEC 60079-0 <u>UL 60079-0</u>			IEC 60079-0 <u>UL 60079-0</u> clause application to IEC 60079-15 <u>UL 60079-15</u>	
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
5.3.3	5.3.3	Small component temperature for Group I and Group II equipment	Applies	Excluded

Table 1 – Relationship of IEC 60079-15 UL 60079-15 to IEC 60079-0 UL 60079-0 Continued on Next

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

Clause of IEC 60079-0 <u>UL 60079-0</u>			IEC 60079-0 <u>UL 60079-0</u> clause application to IEC 60079-15 <u>UL 60079-15</u>	
Ed. 6.0 (2011) (informative)	Ed. 7.0 ¹ (future edition) (informative)	Clause / Subclause title (normative)	Protected sparking “nC”	Restricted breathing “nR”
–	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
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

Table 1 – Relationship of IEC 60079-15 UL 60079-15 to IEC 60079-0 UL 60079-0 Continued on Next

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

Clause of IEC 60079-0 <u>UL 60079-0</u>			IEC 60079-0 <u>UL 60079-0</u> clause application to IEC 60079-15 <u>UL 60079-15</u>	
Ed. 6.0 (2011) (informative)	Ed. 7.0 ¹ (future edition) (informative)	Clause / Subclause title (normative)	Protected sparking “nC”	Restricted breathing “nR”
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		
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

Table 1 – Relationship of IEC 60079-15 UL 60079-15 to IEC 60079-0 UL 60079-0 Continued on Next