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Explosive Atmospheres – Part 31: Equipment Dust Ignition Protection by Enclosure “t” (Edition 2)

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Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure “t"

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Second Edition

Explosive Atmospheres - Part 31: Equipment Dust Ignition Protection by Enclosure “t”

June 12, 2015

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Commitment for Amendments

This standard is issued jointly by the International Society of Automation (ISA) and Underwriters Laboratories Incorporated (UL). Comments or proposals for revisions on any part of the standard may be submitted to UL at any time. Revisions to this standard will be made only after processing according to the standards development procedures of UL. ISA and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.

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The most recent designation of ANSI/ISA 60079-31 as an American National Standard (ANSI) occurred on June 12, 2015.

This ANSI/UL Standard for Safety consists of the Second Edition. The most recent designation of ANSI/UL 60079-31 as an American National Standard (ANSI) occurred on June 12, 2015. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards. Any other portions of this ANSI/UL standard that were not processed in accordance with ANSI/UL requirements are noted at the beginning of the impacted sections.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at http://csds.ul.com.

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UL Standard for Safety for Explosive Atmospheres - Part 31: Equipment Dust Ignition Protection by Enclosure “t” UL 60079-31

Second Edition

Dated June 12, 2015

Summary of Topics

Adoption of IEC 60079-31, Explosive Atmospheres - Part 31: Equipment Dust Ignition Protection by Enclosure “t” (second edition issued November 2013) as a new IEC-based UL standard, UL 60079-31 (IEC 60079-31:2013), with US National Differences.

Although this is the first-time publication of this Standard by UL and ISA, it is being published as the Second edition in order to align UL's and ISA's edition numbers with that of the IEC Standard. As a result, one or more UL edition numbers have been skipped to match that of the IEC edition number.

The new revised requirements are substantially in accordance with Proposal(s) on this subject dated January 23, 2015 and April 3, 2015.

The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the preface. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

General Notes

This UL Standard is based on IEC Publication 60079-31: second edition Explosive Atmospheres - Part 31: Equipment Dust Ignition Protection by Enclosure “t”. IEC publication 60079-31 is copyrighted by the IEC.

Efforts have been made to synchronize the UL edition number with that of the corresponding IEC standard with which this standard is harmonized. As a result, one or more UL edition numbers have been skipped to match that of the IEC edition number.

Note - Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

UL Effective Date

The effective date for UL 60079-31 (IEC 60079-31:2013), Second edition is June 12, 2015.

A UL effective date is one established by Underwriters Laboratories Inc. and is not part of the ANSI approved standard.

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National Differences

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60079-31, Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure “t”, copyright 2013, are indicated by notations (differences) and are presented in bold text.

In the ISA publication of this standard, National Differences are presented using legislative text (strike-out and underline). The national difference type is identified in an informative annex.

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.

The UL printed standard includes the national difference types within the body of the text. The ISA printed standard includes the national difference types in an annex at the back of the standard.

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 31: Equipment dust ignition protection by enclosure “t”

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

This second edition cancels and replaces the first edition published in 2008. This edition constitutes a technical revision.

The significance of changes between IEC 60079-31, Edition 2.0 (2012) and IEC 60079-31, Edition 1.0 (2008) (including Corrigendum) is as listed below:

		Type		
Changes	**Clause**	**Minor and editorial changes**	**Extension**	**Major technical changes**
Document has been restructured from the first edition	Numerous	X		
The marked maximum surface temperature shall be measured on the external surfaces of the enclosure and the surfaces of the internal components for equipment with types of protection “ta”	4.3.2			C1
Additional protection for arcing and sparking parts for “ta”	4.3.6			C2
Limiting the internal pressure test to enclosures where the seal is not physically constrained from moving.	4.4.2		X	
Requirements for tapered threaded joints without an additional seal or gasket added.	5.1.2		X	
Requirements for cable gland aligned for all levels and Groups the only difference is now the required IP protection	5.2	X		
Requirements for plain entries added	5.3.1		X	
5 threads for parallel threads only required when no seal is used	5.3.2		X	
Test for internal enclosure for level “ta” added.	6.1.1.2			C3
Eliminating of the “fault” table and reduction of the dust layer depth for the thermal test for type of protection “ta”.	6.1.2		X	

NOTE The technical changes referred to include the significance of technical changes in the revised IEC Standard, but they do not form an exhaustive list of all modifications from the previous version. More guidance may be found by referring to the Redline Version of the standard.

Explanations:

A) Definitions

Minor and editorial changes

clarification

decrease of technical requirements

minor technical change

editorial corrections

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

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.

Major technical changes

addition of technical requirements

increase of technical requirements

These are changes to technical requirements (addition, increase of the level or removal) made in a way that a product in conformity with the preceding edition will not always be able to fulfil the requirements given in the later edition. These changes have to be considered for products in conformity with the preceding edition. For these changes additional information is provided in clause B) below.

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

B) Information about the background of 'Major Technical Changes'

C1 - A requirement was added for “ta” to require the temperature marking to be based on the highest of either the temperature produced by the internal components or the external surface temperature.

C2 - Requirements were added for “ta” equipment that contains a normally arcing part to require a supplementary internal enclosure around the arcing part.

C3 - Requires an impact test on the supplementary enclosure for “ta” equipment.

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

FDIS	Report on voting
31/1079/FDIS	31/1094/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

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

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

• reconfirmed,

• withdrawn,

• replaced by a revised edition, or

• amended.

EXPLOSIVE ATMOSPHERES - Part 31: Equipment dust ignition protection by enclosure “T”

1 Scope

This ~~part of IEC 60079~~ standard is applicable to electrical equipment protected by enclosure and surface temperature limitation for use in explosive dust atmospheres. It specifies requirements for design, construction and testing of electrical equipment and Ex Components.

This standard supplements and modifies the general requirements of UL ~~IEC~~ 60079-0. Where a requirement of this standard conflicts with a requirement of UL ~~IEC~~ 60079-0, the requirement of this standard takes precedence.

This standard does not apply to dusts of explosives, which do not require atmospheric oxygen for combustion, or to pyrophoric substances.

This standard does not apply to electrical equipment or Ex Components intended for use in underground parts of mines as well as those parts of surface installations of such mines endangered by firedamp and/or combustible dust.

This standard does not take account of any risk due to an emission of flammable or toxic gas from the dust.

Consideration of additional protective measures is required where the application of electrical equipment is in atmospheres, which can contain combustible dust as well as explosive gas, whether simultaneously or separately.

Where the electrical equipment has to meet other environmental conditions, for example, protection against ingress of water and resistance to corrosion, additional measures can be necessary. The measures used should not adversely affect the integrity of the enclosure.

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

2 Normative references

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

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

IEC 60127 (all parts), Miniature fuses

IEC 60529, Degrees of Protection Provided by Enclosures (IP code)

IEC 60691, Thermal-links - Requirements and application guide

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