
**Električne naprave za eksplozivne plinske atmosfere - 7. del: Povečana
varnost "e" (IEC 60079-7:2001)**

Electrical apparatus for explosive gas atmospheres - Part 7: Increased safety "e"

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EUROPEAN STANDARD

EN 60079-7

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2003

ICS 29.260.20

Supersedes EN 50019:2000 & ENV 50269:1997

English version

Electrical apparatus for explosive gas atmospheres
Part 7: Increased safety "e"
(IEC 60079-7:2001)

Matériel électrique pour atmosphères
explosives gazeuses
Partie 7: Sécurité augmentée "e"
(CEI 60079-7:2001)

Elektrische Betriebsmittel für
gasexplosionsgefährdete Bereiche
Teil 7: Erhöhte Sicherheit "e"
(IEC 60079-7:2001)

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This European Standard was approved by CENELEC on 2003-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 60079-7:2001, prepared by IEC TC 31, Electrical apparatus for explosive atmospheres, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60079-7 on 2003-07-01.

This European Standard supersedes EN 50019:2000 + corrigendum April 2003 and ENV 50269:1997 + corrigendum March 1997.

This European Standard covers essential requirements of the EC Directive 94/9/EC (the ATEX Directive). This standard and the related standards provide protection in accordance with Category 2 or Category M2.

Explosive atmospheres include the presence of combustible dusts for Group I equipment.

NOTE Other EC Directives may be applicable.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-07-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A, B and ZA are normative and annexes C, D, E and F are informative.

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60079-7:2001 was approved by CENELEC as a European Standard without any modification.

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

IEC 60086-1	NOTE	Harmonized as EN 60086-1:2001 (not modified).
IEC 60095-1	NOTE	EN 50342:2001, related but not equivalent, applies instead.
IEC 60622	NOTE	Harmonized as EN 60622:2003 (not modified).
IEC 60623	NOTE	Harmonized as EN 60623:2001 (not modified).
IEC 61056-1	NOTE	Harmonized as EN 61056-1:2003 (not modified).
IEC 61150	NOTE	Harmonized as EN 61150:1993 (not modified).
IEC 62013-1	NOTE	Harmonized as EN 62013-1:2002 (modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE 1 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Where a standard cited below belongs to the EN 50000 series, this European Standard applies instead of the relevant International Standard.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60034-1 (mod)	- ¹⁾	Rotating electrical machines Part 1: Rating and performance	EN 60034-1 + A1 + A2 + corr. February + A11	1998 ²⁾ 1998 1999 2000 2002
IEC 60034-5	- ¹⁾	Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - Classification	EN 60034-5	2001 ²⁾
IEC 60044-6 (mod)	- ¹⁾	Instrument transformers Part 6: Requirements for protective current transformers for transient performance	EN 60044-6	1999 ²⁾
IEC 60050-426	- ¹⁾	International Electrotechnical Vocabulary (IEV) Chapter 426: Electrical apparatus for explosive atmospheres	-	-
IEC 60050-486	- ¹⁾	Chapter 486: Secondary cells and batteries	-	-
IEC 60061-1 (mod)	- ¹⁾	Lamp caps and holders together with gauges for the control of interchangeability and safety Part 1: Lamp caps	EN 60061-1	1993 ²⁾
IEC 60061-2 (mod)	- ¹⁾	Part 2: Lampholders	EN 60061-2	1993 ²⁾
IEC 60064 (mod)	- ¹⁾	Tungsten filament lamps for domestic and similar general lighting purposes - Performance requirements	EN 60064	1995 ²⁾
IEC 60068-2-6	- ¹⁾	Environmental testing Part 2: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-27	1987	Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60068-2-42	- ¹⁾	Part 2: Tests - Test Kc: Sulphur dioxide test for contacts and connections	-	-
IEC 60079-0	1998	Electrical apparatus for explosive gas atmospheres Part 0: General requirements	-	-
IEC 60079-1	- ¹⁾	Part 1: Flameproof enclosures 'd'	-	-
IEC 60079-4	- ¹⁾	Part 4: Method of test for ignition temperature	-	-
IEC 60079-11	- ¹⁾	Part 11: Intrinsic safety "i"	EN 50020	2002 ²⁾
IEC 60079-17	- ¹⁾	Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)	EN 60079-17	2003 ²⁾
IEC 60085	- ¹⁾	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990 ²⁾
IEC 60112	- ¹⁾	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	EN 60112	2003 ²⁾
IEC 60238	- ¹⁾	Edison screw lampholders	EN 60238 + corr. February	1998 ²⁾ 1999
SIST EN 60079-7:2003				
IEC 60317-3	1990	Specifications for particular types of winding wires Part 3: Polyester enamelled round copper wire, class 155	EN 60317-3	-
IEC 60317-7	1990	Part 7: Polyimide enamelled round copper wire, class 220	EN 60317-7	1994
IEC 60317-8	1990	Part 8: Polyesterimide enamelled round copper wire, class 180	EN 60317-8	1994
IEC 60317-13	1990	Part 13: Polyester or polyesterimide overcoated with polyamide-imide enamelled round copper wire, class 200	EN 60317-13	1994
IEC 60364-3 (mod)	- ¹⁾	Electrical installations of buildings Part 3: Assessment of general characteristics	HD 384.3 S2	1995 ²⁾
IEC 60400 (mod)	- ¹⁾	Lampholders for tubular fluorescent lamps and starterholders	EN 60400	2000 ²⁾
IEC 60432-1 (mod)	- ¹⁾	Incandescent lamps - Safety specifications Part 1: Tungsten filament lamps for domestic and similar general lighting purposes	EN 60432-1	2000 ²⁾
IEC 60529	- ¹⁾	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 ²⁾ 1993
IEC 60664-1 (mod)	- ¹⁾	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1	2003 ²⁾

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60947-1 (mod)	- ¹⁾	Low-voltage switchgear and controlgear Part 1: General rules	EN 60947-1 + corr. October	1999 ²⁾ 1999
IEC 60947-7-1	- ¹⁾	Part 7-1: Ancillary equipment - Terminal blocks for copper conductors	EN 60947-7-1	2002 ²⁾
IEC 60999-1	- 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 mm ² up to 35 mm ² (included)	EN 60999-1	2000 ²⁾
IEC 60999-2	- ¹⁾	Part 2: Particular requirements for conductors from 35 mm ² up to 300 mm ²	EN 60999-2	2003 ²⁾
IEC 61195	- ¹⁾	Double-capped fluorescent lamps - Safety specifications	EN 61195	1999 ²⁾
IEC 62086-1	- ¹⁾	Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating Part 1: General and testing requirements	-	-

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NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

60079-7

Troisième édition
Third edition
2001-11

Matériel électrique pour atmosphères
explosives gazeuses –

Partie 7:
Sécurité augmentée «e»

iTeh STANDARD PREVIEW

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Electrical apparatus for explosive
gas atmospheres –

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Increased safety "e"

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International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX XB
PRICE CODE

Pour prix, voir catalogue en vigueur
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL APPARATUS FOR EXPLOSIVE
GAS ATMOSPHERES –

Part 7: Increased safety "e"

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60079-7 has been prepared by IEC technical committee 31: Electrical apparatus for explosive atmospheres.

This third edition cancels and replaces the second edition published in 1990, its amendment 1 (1991) and amendment 2 (1993). This third edition constitutes a technical revision.

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

FDIS	Report on voting
31/381/FDIS	31/388/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.

Annexes A and B form an integral part of this standard.

Annexes C, D, E and F are given for information only.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

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

ELECTRICAL APPARATUS FOR EXPLOSIVE GAS ATMOSPHERES –

Part 7: Increased safety "e"

1 Scope

This part of IEC 60079 specifies the requirements for the design, construction, testing and marking of electrical apparatus with type of protection increased safety "e" intended for use in explosive gas atmospheres. This standard applies to electrical apparatus with a rated value of supply voltage not exceeding 11 kV r.m.s. a.c. or d.c. Additional measures are applied to ensure that the apparatus does not produce arcs, sparks, or excessive temperatures in normal operation or under specified abnormal conditions.

These specific requirements are additional to the general requirements in IEC 60079-0 that apply to type of protection increased safety "e" unless specifically excluded.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60079. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60079 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

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

IEC 60034-5, *Rotating electrical machines – Part 5: Degrees of protection provided by internal design of rotating electrical machines (IP code) – Classification*

IEC 60044-6, *Instrument transformers – Part 6: Requirements for protective current transformers for transient performance*

IEC 60050(426), *International Electrotechnical Vocabulary (IEV) – Chapter 426: Electrical apparatus for explosive atmospheres*

IEC 60050(486), *International Electrotechnical Vocabulary (IEV) – Chapter 486: Secondary cells and batteries*

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

IEC 60061-2, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 2: Lampholders*

IEC 60064, *Tungsten filament lamps for domestic and similar general lighting purposes – Performance requirements*

IEC 60068-2-6, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-27, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*
IEC 60068-2-42, *Basic environmental testing procedures – Part 2: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60068-2-42, *Environmental testing – Part 2: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60079-0:1998, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements*¹

IEC 60079-1, *Electrical apparatus for explosive gas atmospheres – Part 1: Flameproof enclosures "d"*

IEC 60079-4, *Electrical apparatus for explosive gas atmospheres – Part 4: Method of test for ignition temperature*

IEC 60079-11, *Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "i"*

IEC 60079-17, *Electrical apparatus for explosive gas atmospheres – Part 17: Inspection and maintenance of electrical installations in hazardous areas (other than mines)*

IEC 60085, *Thermal evaluation and classification of electrical insulation*

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IEC 60112, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 60238, *Edison screw lampholders*

IEC 60317-3, *Specifications for particular types of winding wires – Part 3: Polyester enamelled round copper wires, class 155*

IEC 60317-7, *Specifications for particular types of winding wires – Part 7: Polyamide enamelled round copper wire, class 220*

IEC 60317-8, *Specifications for particular types of winding wires – Part 8: Polyesterimide enamelled round copper winding wire, class 180*

IEC 60317-13, *Specifications for particular types of winding wires – Part 13: Polyester or polyesterimide overcoated with polyamide-imide enamelled round copper wire, class 200*

IEC 60364-3, *Electrical installations of buildings – Part 3: Assessment of general characteristics*

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

¹ A consolidated edition exists 1.1 (2000) that includes IEC 60079-0 (1998) and its amendment 1 (2000)

IEC 60432-1, *Incandescent lamps – Safety specifications – Part 1: Tungsten filament lamps for domestic and similar general lighting purposes*

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

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements, and tests*²

IEC 60947-1, *Low-voltage switchgear and controlgear, Part 1 – General rules*

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

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*

IEC 60999-2, *Connecting devices – Safety requirements for screw-type and screwless-type clamping units for electrical copper connectors – Part 2: Particular requirements for conductors from 35 mm² up to 300 mm²*

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

IEC 62086-1, *Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 1: General and testing requirements*

3 Definitions

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For the purpose of this part of IEC 60079, the definitions and certain terms used in IEC 60079-0, together with the following terms and definitions apply.

For the definitions of any other terms, particularly those of a more general nature, reference should be made to IEC 60050(426) or other appropriate parts of the IEC (International Electrotechnical Vocabulary).

NOTE Where a word, for example "battery", is shown in parentheses in a term, it may be omitted when there is no risk of confusion or misunderstanding.

3.1 cells and batteries

3.1.1

cell

assembly of electrodes and electrolytes which constitutes the smallest electrical unit of a battery

NOTE A sketch illustrating the various parts of a cell is given in figure 1. This sketch is included for descriptive purposes only and is not intended to imply any requirements or preference for a particular form of construction.

3.1.2

primary cell or battery

electrochemical system capable of producing electrical energy by chemical reaction

² A consolidated edition exists 1.1 (2000) that includes IEC 60664-1 (1992) and its amendment 1 (2000)