

**Plahvatusohtlikud keskkonnad. Osa 7:
Seadme kaitse suurendatud ohutusega "e"**

Explosive atmospheres -- Part 7: Equipment
protection by increased safety "e"

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 60079-7:2007 sisaldab Euroopa standardi EN 60079-7:2007 ingliskeelset teksti.	This Estonian standard EVS-EN 60079-7:2007 consists of the English text of the European standard EN 60079-7:2007.
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English version

**Explosive atmospheres -
Part 7: Equipment protection by increased safety "e"
(IEC 60079-7:2006)**

Atmosphères explosives -
Partie 7: Protection de l'équipement par
sécurité augmentée "e"
(CEI 60079-7:2006)

Explosionsfähige Atmosphäre -
Teil 7: Geräteschutz durch erhöhte
Sicherheit "e"
(IEC 60079-7:2006)

This European Standard was approved by CENELEC on 2006-10-01. 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.

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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 document 31/623/FDIS, future edition 4 of IEC 60079-7, prepared by IEC TC 31, Equipment for explosive atmospheres, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60079-7 on 2006-10-01.

This European Standard supersedes EN 60079-7:2003.

The significant changes with respect to EN 60079-7:2003 are:

- requirements for electrical connections expanded and clarified;
- requirements for luminaire ballasts expanded and clarified,
- requirements for evaluation and testing of motor rotors clarified.

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) 2007-08-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-10-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 94/9/EC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60079-7:2006 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 60034-17	NOTE	Harmonized as CLC/TS 60034-17:2004 (not modified).
IEC 60079-14	NOTE	Harmonized as EN 60079-14:2003 (not modified).
IEC 60079-17	NOTE	Harmonized as EN 60079-17:2003 (not modified).
IEC 60079-18	NOTE	Harmonized as EN 60079-18:2004 (not modified).
IEC 60086-1	NOTE	Harmonized as EN 60086-1:2001 (not modified).
IEC 60095-1	NOTE	Harmonized as EN 60095-1:1993 (not modified).
IEC 60622	NOTE	Harmonized as EN 60622:2003 (not modified).
IEC 60623	NOTE	Harmonized as EN 60623:2001 (not modified).
IEC 61008-1	NOTE	Harmonized as EN 61008-1:2004 (not modified).
IEC 61056-1	NOTE	Harmonized as EN 61056-1:2003 (not modified).
IEC 61951-1	NOTE	Harmonized as EN 61951-1:2003 (not modified).
IEC 62013-1	NOTE	Harmonized as EN 62013-1:2006 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60034-1	— ¹⁾	Rotating electrical machines - Part 1: Rating and performance	EN 60034-1	2004 ²⁾
IEC 60034-5	— ¹⁾	Rotating electrical machines - 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 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⁾	Lamp caps and holders together with gauges for the control of interchangeability and safety - 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⁾
IEC 60068-2-27	1987	Environmental testing - Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60068-2-42	— ¹⁾	Environmental testing - Part 2-42: Tests - Test Kc: Sulphur dioxide test for contacts and connections	EN 60068-2-42	2003 ²⁾
IEC 60079-0 (mod)	2004	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements	EN 60079-0	2006

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 60079-1	— ¹⁾	Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosures 'd'	EN 60079-1 + corr. April	2004 ²⁾ 2006
IEC 60079-11	— ¹⁾	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"	EN 60079-11	2007 ²⁾
IEC 60085	— ¹⁾	Electrical insulation - Thermal classification	EN 60085	2004 ²⁾
IEC 60112	— ¹⁾	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003 ²⁾
IEC 60228	— ¹⁾	Conductors of insulated cables	EN 60228 + corr. May	2005 ²⁾ 2005
IEC 60238	— ¹⁾	Edison screw lampholders	EN 60238 + corr. January	2004 ²⁾ 2005
IEC 60317-3	2004	Specifications for particular types of winding wires - Part 3: Polyester enamelled round copper wire, class 155	-	-
IEC 60317-7	1990	Specifications for particular types of winding wires - Part 7: Polyimide enamelled round copper wire, class 220	EN 60317-7	1994
IEC 60317-8	1990	Specifications for particular types of winding wires - Part 8: Polyesterimide enamelled round copper wire, class 180	EN 60317-8	1994
IEC 60317-13	1990	Specifications for particular types of winding wires - Part 13: Polyester or polyesterimide overcoated with polyamide-imide enamelled round copper wire, class 200	EN 60317-13	1994
IEC 60364-5-55	— ¹⁾	Electrical installations of buildings - Part 5-55: Selection and erection of electrical equipment - Other equipments	—	—
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	1992	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1 ³⁾	2003
IEC 60947-1	— ¹⁾	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1 + corr. November	2004 ²⁾ 2004

³⁾ EN 60664-1 includes A1:2000 + A2:2002 to IEC 60664-1.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60947-7-1	— ¹⁾	Low-voltage switchgear and controlgear - Part 7-1: Ancillary equipment - Terminal blocks for copper conductors	EN 60947-7-1	2002 ²⁾
IEC 60947-7-2	— ¹⁾	Low-voltage switchgear and controlgear - Part 7-2: Ancillary equipment - Protective conductor terminal blocks for copper conductors	EN 60947-7-2	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⁾	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 mm ² up to 300 mm ² (included)	EN 60999-2	2003 ²⁾
IEC 61195	1999	Double-capped fluorescent lamps - Safety specifications	EN 61195	1999
IEC 61347-2-3	2000	Lamp controlgear - Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps	EN 61347-2-3 + corr. July	2001 2003
A1	2004		A1	2004
A2	2006		A2	2006
IEC 62086-1	— ¹⁾	Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating - Part 1: General and testing requirements	EN 62086-1	2005 ²⁾
ISO 2859-1	— ¹⁾	Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection	-	-

Annex ZZ (informative)

Coverage of Essential Requirements of EC Directives

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

- ER 1.0.1 to ER 1.0.6
- ER 1.1.1 to ER 1.1.3
- ER 1.2.1, ER 1.2.2, ER 1.2.3, ER 1.2.5 to ER 1.2.8
- ER 1.3.1, ER 1.3.3, ER 1.3.4
- ER 1.4.1, ER 1.4.2
- ER 1.5.1 to ER 1.5.8
- ER 2.0.2.1, ER 2.0.2.3

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

WARNING: Other requirements and other EC Directives may be applicable to the products falling within the scope of this standard.

INTERNATIONAL STANDARD

IEC
60079-7

Fourth edition
2006-07

Explosive atmospheres –

Part 7: Equipment protection by increased safety "e"

*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*



Reference number
IEC 60079-7:2006(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

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The on-line catalogue on the IEC web site (www.iec.ch/searchpub) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

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INTERNATIONAL STANDARD

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Part 7: Equipment protection by increased safety "e"

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –**Part 7: Equipment protection
by increased safety "e"**

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 60079-7 has been prepared by IEC technical committee 31: Equipment for explosive atmospheres.

This fourth edition cancels and replaces the third edition published in 2001, and constitutes a technical revision.

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

- requirements for electrical connections expanded and clarified,
- requirements for luminaire ballasts expanded and clarified,
- requirements for evaluation and testing of motor rotors clarified.

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

FDIS	Report on voting
31/623/FDIS	31/639/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.

Cette publication a été rédigée selon les Directives ISO/CEI, Partie 2.

The list of all parts of 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 7: Equipment protection by 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 where the rated voltage does not exceed 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.

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

NOTE Increased safety "e" can provide Equipment Protection Levels (EPL) Mb or Gb. For further information, see Annex I.

2 Normative references

The following referenced documents are indispensable for the application 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 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-5, *Rotating electrical machines – Part 5: Degrees of protection provided by the 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 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 60068-2-27:1987, *Environmental testing – Part 2: Tests – Test Ea and guidance: Shock*

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

IEC 60079-0:2004, *Electrical apparatus for explosive gas atmospheres – Part 0: General requirements*

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

IEC 60079-11, *Electrical apparatus for explosive gas atmospheres – Part 11: Equipment protection by intrinsic safety "i"*

IEC 60085, *Electrical insulation – Thermal classification*

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

IEC 60228, *Conductors of insulated cables*

IEC 60238, *Edison screw lampholders*

IEC 60317-3:2004, *Specifications for particular types of winding wires – Part 3: Polyester enamelled round copper wires, class 155*

IEC 60317-7:1990, *Specifications for particular types of winding wires – Part 7: Polyimide enamelled round copper wire, class 220*

IEC 60317-8:1990, *Specifications for particular types of winding wires – Part 8: Polyesterimide enamelled round copper wire, class 180*

IEC 60317-13:1990, *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 5-55: Selection and erection of electrical equipment – Other equipment*

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

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 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements, and tests*

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 60947-7-2, *Low-voltage switchgear and controlgear – Part 2 – Ancillary equipment – Section 1: Protective conductor 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 (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 61195:1999, *Double-capped fluorescent lamps – Safety specifications*

IEC 61347-2-3:2000, *Lamp controlgear – Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps*

Amendment 1(2004)

Amendment 2 (2006)

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

ISO 2859-1, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

3 Terms and definitions

For the purposes of this document, the terms and definitions 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 IECV (International Electrotechnical Vocabulary).

3.1

clearance

shortest distance in air between two conductive parts

3.2

connections, factory

terminations intended for connection during a manufacturing process under controlled conditions

3.3

connections, field-wiring

terminations intended for connection by the installer in the field

3.4

creepage distance

shortest distance along the surface of an electrically insulating material between two conductive parts