

**Piksekaitse. Osa 3: Ehitistele tekitatavad
füüsikalised kahjustused ja oht elule**

Protection against lightning Part 3: Physical damage to
structures and life hazard

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 62305-3:2007 sisaldab Euroopa standardi EN 62305-3:2006+AC:2006+AC:2008 ingliskeelset teksti.</p> <p>Standard on kinnitatud Eesti Standardikeskuse 10.01.2006 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 23.02.2006.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 62305-3:2007 consists of the English text of the European standard EN 62305-3:2006+AC:2006+AC:2008.</p> <p>This standard is ratified with the order of Estonian Centre for Standardisation dated 10.01.2006 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p> <p>Date of Availability of the European standard text 23.02.2006.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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Protection against lightning
Part 3: Physical damage to structures and life hazard
(IEC 62305-3:2006, modified)

Protection contre la foudre
Partie 3: Dommages physiques
sur les structures et risques humains
(CEI 62305-3:2006, modifiée)

Blitzschutz
Teil 3: Schutz von baulichen Anlagen
und Personen
(IEC 62305-3:2006, modifiziert)

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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 81/264/FDIS, future edition 1 of IEC 62305-3, prepared by IEC TC 81, Lightning protection, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62305-2 on 2006-02-01.

A draft amendment, prepared by the Technical Committee CENELEC TC 81X, Lightning protection, containing some common modifications to document 81/264/FDIS, was submitted to the formal vote and was approved by CENELEC on 2006-02-01 for inclusion into EN 62305-2.

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) 2006-11-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-02-01

This European Standard makes reference to International Standards. Where the International Standard referred to has been endorsed as a European Standard or a home-grown European Standard exists, this European Standard shall be applied instead. Pertinent information can be found on the CENELEC web site.

Endorsement notice

The text of the International Standard IEC 62305-2:2006 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

3 Terms and definitions

Modify the following definitions as follows:

3.16

connecting component

part of an external LPS which is used for the connection of conductors to each other or to metallic installations, defined as in EN 50164 series

3.17

fixing component

part of an external LPS which is used to fix the elements of the LPS to the structure to be protected, defined as in EN 50164 series

Annex E

E.4.3.3 Welding or clamping to the steel-reinforcing rods

Modify the Note as follows:

NOTE Specifically designed clamps complying with and tested according to the EN 50164 series shall be used.

E.4.3.7 Down-conductors

Modify the 12th paragraph as follows:

If steel structures are used as down-conductors every steel column shall be connected to the steel reinforcing rods of the concrete foundation according to Figure E.8 by proprietary bonding points complying with the EN 50164 series

E.5.2.4.1 General information

Modify the first paragraph as follows:

The maximum permissible temperature for a conductor will not be exceeded if the cross-section complies with Table 6 and the EN 50164 series.

E.5.2.4.2 Non-isolated air-termination

Add at the end of the second paragraph:

NOTE Z1 For more details see EN 50164 series.

E.5.5 Components

Replace the text of the subclause by:

Components of LPS shall withstand the electromagnetic effects of lightning current and predictable accidental stresses without being damaged. This can be achieved by choosing components that have successfully been tested in accordance with the EN 50164 series.

All components shall comply with the EN 50164 series.

E.5.6.1 Mechanical design

Modify the 6th paragraph as follows:

The LPS designer and the LPS installer should specify conductor fasteners and fixtures which will withstand the electrodynamic forces of lightning current in the conductors and also allow for the expansion and contraction of conductors due to the relevant temperature rise according to the EN 50164 series.

E.5.6.2.1 Materials

Modify the first paragraph 1 as follows:

LPS materials and conditions of use are listed in Table 5 and the EN 50164 series.

E.5.6.2.2.1 Metals in soil and air

Modify the Note as follows:

NOTE Spark gaps having a protection level U_p of 2,5 kV and a minimum I_{imp} of 50 kA (10/350 μ s) complying with EN 50164-3 are suitable.

INTERNATIONAL STANDARD

IEC
62305-3

First edition
2006-01

Protection against lightning –

**Part 3:
Physical damage to structures
and life hazard**

*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.*



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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.

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INTERNATIONAL STANDARD

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Protection against lightning –

Part 3: Physical damage to structures and life hazard

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROTECTION AGAINST LIGHTNING –**Part 3: Physical damage to structures and life hazard**

FOREWORD

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International standard IEC 62305-3 has been prepared by IEC technical committee 81: Lightning protection.

The IEC 62305 series (Parts 1 to 5), is produced in accordance with the new Publications' Plan, approved by National Committees (81/171/RQ (2001-06-29)), which restructures in a more simple and rational form and updates the Publications of the IEC 61024 series, the IEC 61312 series and the IEC 61663 series.

The text of this first edition of IEC 62305-3 is compiled from and replaces

- IEC 61024-1, first edition (1990).
- IEC 61024-1-2, first edition (1998).

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

FDIS	Report on voting
81/264/FDIS	81/269/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, as close as possible, in accordance with the ISO/IEC Directives, Part 2.

IEC 62305 consists of the following parts, under the general title *Protection against lightning*:

Part 1: General principles

Part 2: Risk management

Part 3: Physical damage to structures and life hazard

Part 4: Electrical and electronic systems within structures

Part 5: Services¹

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC website "<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.

In the United States, based on the requirements of NFPA 780: Standard for the Installation of Lightning Protection Systems 2004 Edition and practical experience in the use of horizontal earth electrodes, the minimum length of horizontal earth electrodes is not required to be twice that required for vertical electrodes.

In France, Portugal and Spain:

- natural components cannot substitute as lightning protection components but may be used to complete/enhance the LPS;
- aluminium solid round diameters should be extended from 8 mm to 10 mm;
- stranded conductors cannot be used as down-conductors;
- diameter of solid round conductors should be extended from 16 mm to 18 mm;
- hot dip galvanized steel solid tape thickness should be extended from 2 mm to 3,5 mm.

¹ To be published

INTRODUCTION

This part of IEC 62305 deals with the protection, in and around a structure, against physical damage and injury to living beings due to touch and step voltages.

The main and most effective measure for protection of structures against physical damage is considered to be the lightning protection system (LPS). It usually consists of both external and internal lightning protection systems.

An external LPS is intended to:

- a) intercept a lightning flash to the structure (with an air-termination system);
- b) conduct the lightning current safely towards earth (using a down-conductor system);
- c) disperse the lightning current into the earth (using an earth-termination system).

An internal LPS prevents dangerous sparking within the structure using either equipotential bonding or a separation distance (and hence electrical insulation) between the external LPS (as defined in 3.2) components and other electrically conducting elements internal to the structure.

Main protection measures against injury to living beings due to touch and step voltages are intended to:

- 1) reduce the dangerous current flowing through bodies by insulating exposed conductive parts, and/or by increasing the surface soil resistivity;
- 2) reduce the occurrence of dangerous touch and step voltages by physical restrictions and/or warning notices.

The type and location of an LPS should be carefully considered in the initial design of a new structure, thereby enabling maximum advantage to be taken of the electrically conductive parts of the structure. By doing so, design and construction of an integrated installation is made easier, the overall aesthetic aspects can be improved, and the effectiveness of the LPS can be increased at minimum cost and effort.

Access to the ground and the proper use of foundation steelwork for the purpose of forming an effective earth termination may well be impossible once construction work on a site has commenced. Therefore, soil resistivity and the nature of the earth should be considered at the earliest possible stage of a project. This information is fundamental to the design of an earth-termination system and may influence the foundation design work for the structure.

Regular consultation between LPS designers and installers, architects and builders is essential in order to achieve the best result at minimum cost.

If lightning protection is to be added to an existing structure, every effort should be made to ensure that it conforms to the principles of this standard. The design of the type and location of an LPS should take into account the features of the existing structure.

PROTECTION AGAINST LIGHTNING –

Part 3: Physical damage to structures and life hazard

1 Scope

This part of IEC 62305 provides the requirements for protection of a structure against physical damage by means of a lightning protection system (LPS), and for protection against injury to living beings due to touch and step voltages in the vicinity of an LPS (see IEC 62305-1).

This standard is applicable to:

- a) design, installation, inspection and maintenance of an LPS for structures without limitation of their height;
- b) establishment of measures for protection against injury to living beings due to touch and step voltages.

NOTE 1 Specific requirements for an LPS in structures dangerous to their surroundings due to the risk of explosion are under consideration. Additional information is provided in Annex D for use in the interim.

NOTE 2 This part of IEC 62305 is not intended to provide protection against failures of electrical and electronic systems due to overvoltages. Specific requirements for such cases are provided in IEC 62305-4.

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 60079-10:2002, *Electrical apparatus for explosive gas atmospheres – Part 10: Classification of hazardous areas*

IEC 60079-14:2002, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 61241-10:2004, *Electrical apparatus for use in the presence of combustible dust – Part 10: Classification of areas where combustible dusts are or may be present*

IEC 61241-14:2004, *Electrical apparatus for use in the presence of combustible dust – Part 14: Selection and installation*

IEC 61643-12:2002, *Low-voltage surge protective devices – Part 12: Surge protective devices connected to low voltage power distribution systems – Selection and application principles*

IEC 62305-1, *Protection against lightning – Part 1: General principles*

IEC 62305-2, *Protection against lightning – Part 2: Risk management*

IEC 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

IEC 62305-5, *Protection against lightning – Part 5: Services*¹

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs in workplaces and public areas*

3 Terms and definitions

For the purposes of this document, the following terms and definitions, some of which have already been cited in Part 1 but are repeated here for ease of reference, as well as those given in other parts of IEC 62305, apply.

3.1 lightning protection system LPS

complete system used to reduce physical damage due to lightning flashes to a structure

NOTE It consists of both external and internal lightning protection systems.

3.2 external lightning protection system

part of the LPS consisting of an air-termination system, a down-conductor system and an earth-termination system

3.3 external LPS isolated from the structure to be protected

LPS with an air-termination system and down-conductor system positioned in such a way that the path of the lightning current has no contact with the structure to be protected

NOTE In an isolated LPS, dangerous sparks between the LPS and the structure are avoided.

3.4 external LPS not isolated from the structure to be protected

LPS with an air-termination system and down-conductor system positioned in such a way that the path of the lightning current can be in contact with the structure to be protected

3.5 internal lightning protection system

part of the LPS consisting of lightning equipotential bonding and/or electrical insulation of external LPS

3.6 air-termination system

part of an external LPS using metallic elements such as rods, mesh conductors or catenary wires intended to intercept lightning flashes

3.7 down-conductor system

part of an external LPS intended to conduct lightning current from the air-termination system to the earth-termination system

¹ To be published