Irish Standard
I.S. EN 60071-1:2006

Insulation co-ordination -- Part 1: Definitions, principles and rules (IEC 60071-1:2006 (EQV))

I.S. EN 60071-1:2006

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English version

Insulation co-ordination - Part 1: Definitions, principles and rules

(IEC 60071-1:2006/A1:2010)

Coordination de l'isolement -
Partie 1: Définitions, principes et règles
(CEI 60071-1:2006/A1:2010)

Isolationskoordination -
Teil 1: Begriffe, Grundsätze
und Anforderungen
(IEC 60071-1:2006/A1:2010)

This amendment A1 modifies the European Standard EN 60071-1:2006; it was approved by CENELEC on 2010-02-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60071-1:2006/A1:2010 E

Foreword

The text of document 28/198A/FDIS, future amendment 1 to IEC 60071-1:2006, prepared by IEC TC 28, Insulation co-ordination, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60071-1:2006 on 2010-02-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2010-11-01
– latest date by which the national standards conflicting with the amendment have to be withdrawn	(dow)	2013-02-01

Endorsement notice

The text of amendment 1:2010 to the International Standard IEC 60071-1:2006 was approved by CENELEC as an amendment to the European Standard without any modification.

I.S. EN 60071-1:2006

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60071-1

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English version

Insulation co-ordination
Part 1: Definitions, principles and rules
(IEC 60071-1:2006)

Coordination de l'isolement
Partie 1: Définitions, principes et règles
(CEI 60071-1:2006)

Isolationskoordination
Teil 1: Begriffe, Grundsätze
und Anforderungen
(IEC 60071-1:2006)

This European Standard was approved by CENELEC on 2006-03-01. 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, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

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Ref. No. EN 60071-1:2006 E

Foreword

The text of document 28/176/FDIS, future edition 8 of IEC 60071-1, prepared by IEC TC 28, Insulation co-ordination, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60071-1 on 2006-03-01.

This European Standards supersedes EN 60071-1:1995.

The main changes from EN 60071-1:1995 are as follows:

- in the definitions (3.26, 3.28 and 3.29) and in the environmental conditions (5.9) taken into account clarification of the atmospheric and altitude corrections involved in the insulation co-ordination process;
- in the list of standard rated short-duration power frequency withstand voltages reported in 5.6 addition of 115 kV;
- in the list of standard rated impulse withstand voltages reported in 5.7, addition of 200 kV and 380 kV;
- in the standard insulation levels for range I (1 kV < U_m ≤ 245 kV) (Table 2) addition of the highest voltage for equipment U_m = 100 kV;
- in the standard insulation levels for range II (U_m > 245 kV) (Table 3) replacement of 525 kV by 550 kV and of 765 kV by 800 kV;
- in order to remove that part in the next revision of EN 60071-2, addition of Annex A dealing with clearances in air to assure a specified impulse withstand voltage in installation;
- in Annex B, limitation at two U_m values for the values of rated insulation levels for 1 kV < U_m ≤ 245 kV for highest voltages for equipment U_m not standardized by IEC/CENELEC based on current practice in some countries.

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)	2006-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-03-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60071-1:2006 was approved by CENELEC as a European Standard without any modification.

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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.

Publication	Year	Title	EN/HD	Year
IEC 60038 (mod) + A1 + A2	1983 1994 1997	IEC standard voltages [1)]	HD 472 S1 + corr. February	1989 2002
IEC 60060-1 + corr. March	1989 1990		HD 588.1 S1	1991
IEC 60071-2	- [2)]	Insulation co-ordination Part 2: Application guide	EN 60071-2	1997 [3)]
IEC 60099-4 (mod)	- [2)]	Surge arresters Part 4: Metal-oxide surge arresters without gaps for a.c. systems	EN 60099-4	2004 [3)]
IEC 60507	- [2)]	Artificial pollution tests on high-voltage insulators to be used on a.c. systems	EN 60507	1993 [3)]
IEC 60633	- [2)]	Terminology for high-voltage direct current (HVDC) transmission	EN 60633	1999 [3)]

[1)] The title of HD 472 S1 is: Nominal voltages for low voltage public electricity supply systems.

[2)] Undated reference.

[3)] Valid edition at date of issue.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INSULATION CO-ORDINATION –

Part 1: Definitions, principles and rules

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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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 60071-1 has been prepared by IEC technical committee 28: Insulation co-ordination.

This eighth edition cancels and replaces the seventh edition published in 1993 and constitutes a technical revision.

The main changes from the previous edition are as follows:

– in the definitions (3.26, 3.28 and 3.29) and in the environmental conditions (5.9) taken into account clarification of the atmospheric and altitude corrections involved in the insulation co-ordination process;
– in the list of standard rated short-duration power frequency withstand voltages reported in 5.6 addition of 115 kV;

– in the list of standard rated impulse withstand voltages reported in 5.7, addition of 200 kV and 380 kV;

– in the standard insulation levels for range I (1kV < U_m ≤ 245 kV) (Table 2) addition of the highest voltage for equipment U_m = 100 kV;

– in the standard insulation levels for range II (U_m > 245 kV) (Table 3) replacement of 525 kV by 550 kV and of 765 kV by 800 kV;

– in order to remove that part in the next revision of IEC 60071-2, addition of Annex A dealing with clearances in air to assure a specified impulse withstand voltage in installation;

– in Annex B, limitation at two U_m values for the values of rated insulation levels for 1kV < U_m ≤ 245 kV for highest voltages for equipment U_m not standardized by IEC based on current practice in some countries.

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

FDIS	Report on voting
28/176/FDIS	28/177/RVC

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.

The IEC 60071 comprises the following parts under the general title *Insulation co-ordination:*

Part 1: Definitions, principles and rules

Part 2: Application guide

Part 4: Computational guide to insulation co-ordination and modelling of electrical networks

Part 5: Procedures for high-voltage direct current (HVDC) converter stations

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.

INSULATION CO-ORDINATION –

Part 1: Definitions, principles and rules

1 Scope

This part of IEC 60071 applies to three-phase a.c. systems having a highest voltage for equipment above 1 kV. It specifies the procedure for the selection of the rated withstand voltages for the phase-to-earth, phase-to-phase and longitudinal insulation of the equipment and the installations of these systems. It also gives the lists of the standard withstand voltages from which the rated withstand voltages should be selected.

This standard recommends that the selected withstand voltages should be associated with the highest voltage for equipment. This association is for insulation co-ordination purposes only. The requirements for human safety are not covered by this standard.

Although the principles of this standard also apply to transmission line insulation, the values of their withstand voltages may be different from the standard rated withstand voltages.

The apparatus committees are responsible for specifying the rated withstand voltages and the test procedures suitable for the relevant equipment taking into consideration the recommendations of this standard.

NOTE In IEC 60071-2, Application Guide, all rules for insulation co-ordination given in this standard are justified in detail, in particular the association of the standard rated withstand voltages with the highest voltage for equipment. When more than one set of standard rated withstand voltages is associated with the same highest voltage for equipment, guidance is provided for the selection of the most suitable set.

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 60038:2002, *IEC standard voltages*

IEC 60060-1:1989, H*igh-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60071-2, *Insulation co-ordination – Part 2: Application guide*

IEC 60099-4, *Surge arresters – Part 4: Metal-oxide surge arresters without gaps for a.c. systems*

IEC 60507, *Artificial pollution tests on high-voltage insulators to be used on a.c. systems*

IEC 60633, *Terminology for high-voltage direct current (HVDC) transmission*