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I.S. EN 61857-1:2009

Electrical insulation systems -
Procedures for thermal evaluation --
Part 1: General requirements - Low-
voltage (IEC 61857-1:2008 (EQV))

I.S. EN 61857-1:2009

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English version

**Electrical insulation systems -
Procedures for thermal evaluation -
Part 1: General requirements -
Low-voltage
(IEC 61857-1:2008)**

Systèmes d'isolation électrique -
Procédures d'évaluation thermique -
Partie 1: Exigences générales -
Basse tension
(CEI 61857-1:2008)

Elektrische Isoliersysteme -
Verfahren zur thermischen Bewertung -
Teil 1: Allgemeine Anforderungen -
Niederspannung
(IEC 61857-1:2008)

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CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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I.S. EN 61857-1:2009

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Foreword

The text of document 112/92/CDV, future edition 3 of IEC 61857-1, prepared by IEC TC 112, Evaluation and qualification of electrical insulating materials and systems, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61857-1 on 2008-12-01.

This European Standard supersedes EN 61857-1:2005 and constitutes editorial revisions to make EN 61857-1:2009 compatible with Parts 21 and 22.

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) 2009-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2011-12-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61857-1:2008 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 60034-18-1	NOTE	Harmonized as EN 60034-18-1:1994 (not modified).
IEC 60034-18-21	NOTE	Harmonized as EN 60034-18-21:1994 (not modified).
IEC 60034-18-31	NOTE	Harmonized as EN 60034-18-31:1994 (not modified).
IEC 62114	NOTE	Harmonized as EN 62114:2001 (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 60085	2004	Electrical insulation - Thermal classification	EN 60085 ¹⁾	2004
IEC 60216-4-1	- ²⁾	Electrical insulating materials - Thermal endurance properties - Part 4-1: Ageing ovens - Single-chamber ovens	EN 60216-4-1	2006 ³⁾
IEC 60216-5	- ²⁾	Electrical insulating materials - Thermal endurance properties - Part 5: Determination of relative thermal endurance index (RTE) of an insulating material	EN 60216-5	2008 ³⁾
IEC 60493-1	- ²⁾	Guide for the statistical analysis of ageing test data - Part 1: Methods based on mean values of normally distributed test results	-	-
IEC 60505	2004	Evaluation and qualification of electrical insulation systems	EN 60505	2004

¹⁾ EN 60085 is superseded by EN 60085:2008, which is based on IEC 60085:2007.

²⁾ Undated reference.

³⁾ Valid edition at date of issue.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electrical insulation systems – Procedures for thermal evaluation –
Part 1: General requirements – Low-voltage**

**Systèmes d'isolation électrique – Procédures d'évaluation thermique –
Partie 1: Exigences générales – Basse tension**





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL INSULATION SYSTEMS –
PROCEDURES FOR THERMAL EVALUATION –****Part 1: General requirements – Low-voltage**

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 61857-1 has been prepared by IEC technical committee 112: Evaluation and qualification of electrical insulating materials and systems.

This third edition cancels and replaces the second edition published in 2004, and constitutes editorial revisions to make this standard compatible with Parts 21 and 22.

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

CDV	Report on voting
112/92/CDV	112/102/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.

A list of all the parts in the IEC 61857 series, under the general title *Electrical insulation systems – Procedures for thermal evaluation*, 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.

INTRODUCTION

This International Standard establishes a standardized test procedure for estimating by comparison the life expectancy of electrical insulation systems (EIS) in accordance with IEC 60505.

An EIS contains many different components selected to withstand the varying electrical, mechanical, and thermal stresses occurring in the different parts of the structure of an electrotechnical product. The useful life of an EIS depends upon the way that its individual components are arranged, their interactions upon each other, and the contribution of each component to the electrical and mechanical integrity of the EIS. Therefore, it is impossible to specify one test object to represent all electrotechnical products. It is incumbent upon the IEC equipment technical committees to address the test objects and application of this test procedure that will meet their specific needs. This work is intended to proceed by cooperation between this technical committee and other IEC technical committees to develop a series of parts, each part to address a specific test object and/or application.

This procedure permits approximate comparisons only, and cannot be relied upon to completely determine the merits of any particular EIS. Such information can be obtained only from extended service experience.

ELECTRICAL INSULATION SYSTEMS – PROCEDURES FOR THERMAL EVALUATION –

Part 1: General requirements – Low voltage

1 Scope

This part of IEC 61857 specifies a general test procedure for the thermal evaluation and qualification of electrical insulation systems (EIS) and establishes a procedure that compares the performance of a candidate EIS to that of a reference EIS.

This standard is applicable to existing or proposed EIS used in electrotechnical products with an input voltage of up to 1 000 V where the thermal factor is the dominating ageing factor.

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 60085:2004, *Electrical insulation – Thermal classification*

IEC 60216-4-1, *Electrical insulating materials – Thermal endurance properties – Part 4-1: Ageing ovens – Single chamber ovens*

IEC 60216-5, *Electrical insulating materials – Thermal endurance properties – Part 5: Determination of relative thermal endurance index (RTE) of an insulating material*

IEC 60493-1, *Guide for the statistical analysis of ageing test data – Part 1: Methods based on mean values of normally distributed test results*

IEC 60505:2004, *Evaluation and qualification of electrical insulation systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60505, as well as the following definitions, apply.

3.1

electrical insulation system

EIS

insulating structure containing one or more electrical insulating materials (EIM) together with associated conducting parts employed in an electrotechnical device

[IEC 60505, definition 3.1.1]

NOTE EIM with different temperature indices (ATE/RTE according to IEC 60216-5) may be combined to form an EIS which has a thermal class that may be higher or lower than that of any of the individual components according to IEC 60505.

3.2

candidate EIS

EIS under evaluation to determine its service capability (thermal)

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