BRITISH STANDARD

BS EN 62114:2001 IEC 62114:2001

Electrical insulation systems (EIS) — Thermal classification

The European Standard EN 62114:2001 has the status of a British Standard

ICS 29.080.30

National foreword

This British Standard is the official English language version of EN 62114:2001. It is identical with IEC 62114:2001.

The UK participation in its preparation was entrusted to Technical Committee GEL/98, Electrical insulation systems, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard, having been prepared under the direction of the Electrotechnical Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 11 December 2001

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 9, and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

ISBN 0 580 38767 4

EUROPEAN STANDARD **EN 62114**

NORME EUROPÉENNE

EUROPÄISCHE NORM November 2001

ICS 29.080.30

English version

Electrical insulation systems (EIS) - Thermal classification
(IEC 62114:2001)

Systèmes d'isolation électrique (SIE) - Classification thermique
(CEI 62114:2001)

Elektrische Isoliersysteme (EIS) - Thermische Klassifizierung
(IEC 62114:2001)

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

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Ref. No. EN 62114:2001 E

Foreword

The text of document 98/132/FDIS, future edition 1 of IEC 62114, prepared by IEC TC 98, Electrical insulation systems (EIS), was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62114 on 2001-11-01.

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)	2002-08-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-11-01

Annexes designated "normative" are part of the body of the standard.
In this standard annexes A and ZA are normative.
Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 62114:2001 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 60085:1984	NOTE Harmonized as HD 566 S1:1990 (not modified).
IEC 60216 (series)	NOTE Harmonized as EN 60216 (series) (not modified).

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INTRODUCTION

The useful life of an electrical insulation system (EIS) can be affected by electrical, thermal, mechanical or environmental stresses acting either individually or in combination. This International Standard addresses the case where the thermal factor of influence is the dominating ageing factor.

IEC 60085 recognizes a series of thermal classes which may be assigned to an electrical insulation material (EIM) or an EIS that “has been shown by test or from service experience to be capable of operating successfully at a particular temperature in a particular application.” This first attempt to classify EIM and EIS, based on the thermal factor as the dominating ageing factor, provides the basis for future development of International Standards addressing this issue.

ELECTRICAL INSULATION SYSTEMS (EIS) – THERMAL CLASSIFICATION

1 Scope

This International Standard establishes the thermal classification of an electrical insulation system (EIS). It also identifies recognized procedures for the thermal evaluation of EIS.

This standard is applicable to EIS used in electrotechnical devices where the thermal factor is the dominating ageing factor.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard 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 60505, *Evaluation and qualification of electrical insulation systems*

IEC 61857 (all parts), *Electrical insulation systems – Procedures for thermal evaluation*

IEC 61858, *Electrical insulation systems – Thermal evaluation of modifications to an established wire-wound EIS*

3 Definitions

For the purpose of this International Standard, the terms and definitions given in IEC 60505, as well as the following definition, apply:

3.1
thermal class
designation of an EIS that is equal to the numerical value of the maximum use temperature in degrees Celsius (°C) for which the EIS is appropriate

4 General considerations

4.1 Thermal evaluation of EIS

Experience has demonstrated that, under normal operating conditions, satisfactory economic life is obtained for electrotechnical devices such as rotating machines, transformers, etc., that are designed and built in accordance with standards based on thermal evaluations of EIS.

4.2 Maximum use temperature

The thermal classes in this standard are numerically equal to the maximum use temperatures recommended for the EIS under normal operating conditions as defined by the product technical committee.

Product TCs shall determine the operating conditions under which the maximum temperature of the device may differ from the thermal class of the EIS. Such situations may occur because either a shorter or longer life than normal is envisaged, or exceptional conditions of service exist.

4.3 Relation of EIM to EIS

The description of an electrotechnical device as being of a particular thermal class does not mean, and must not be taken to imply that each EIM used in its construction is of the same thermal endurance.

The thermal class for an EIS may not be directly related to the thermal endurance of the individual EIM included in it. In the EIS, the protective character of other EIM used in the system may improve the thermal endurance of an individual EIM. On the other hand, problems of incompatibility between EIM may decrease the appropriate thermal class of the system below the thermal endurance of the EIM. Such situations shall be investigated by the test procedures referenced in clause 5.

NOTE Thermal endurance of EIM is addressed in IEC 60216.

4.4 Other factors of influence

Apart from thermal factors, the ability of the EIS to fulfil its function is affected by many factors, such as electrical and mechanical stresses, vibration, deleterious atmospheres and chemicals, moisture, dirt and radiation. All such factors should be taken into account when designing particular electrotechnical devices, and further guidance on the evaluation of these aspects may be found in IEC 60505.

4.5 Performance factors

Actual performance of the device depends on the specific conditions of operation that may occur and which may vary widely, e.g. environmental exposure, duty cycles and type of product. Further, the intended performance in service depends on the relative importance of size, reliability, desired period of use of associated equipment and/or economic considerations.

5 Thermal evaluation of electrical insulation systems

Test procedures for the thermal evaluation of EIS shall follow the precepts set forth in IEC 60505. Specific test procedures for EIS are listed in annex A.

6 Thermal classification of electrical insulation systems

Thermal classes shall be assigned to an EIS based on service experience or on the results of functional tests based upon test procedures in accordance with clause 5.

Preferred designations for the thermal classes of EIS are as follows:

Table 1 – Thermal class designations

Thermal class designation	Historical designation
90	Y
105	A
120	E
130	B
155	F
180	H
200	200
220	220
250	250
Designation of thermal classes over 250 shall increase by increments of 25 and be designated accordingly.	
NOTE The old class C that was used for all temperatures above 180 °C has been replaced by the above thermal classes and is no longer valid.	

If desired, the historical designation may be added in parentheses, e.g. class 180(H).

Annex A
(normative)

Test procedures for the thermal evaluation of EIS

See IEC 61857 (all parts) and IEC 61858.

Bibliography

IEC 60085:1984, *Thermal evaluation and classification of electrical insulation*

IEC 60216 (all parts), *Guide for the determination of thermal endurance properties of electrical insulating materials*

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 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 60505	- [1)]	Evaluation and qualification of electrical insulation systems	EN 60505	2000 [2)]
IEC 61857	Series	Electrical insulation systems - Procedures for thermal evaluation	EN 61857	Series
IEC 61858	- [1)]	Electrical insulation systems - Thermal evaluation of modifications to an established wire-wound EIS	EN 61858	2000 [2)]

[1)] Undated reference.

[2)] Valid edition at time of issue.

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