

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electrical insulating materials – Thermal endurance properties –
Part 3: Instructions for calculating thermal endurance characteristics**

**Matériaux isolants électriques – Propriétés d'endurance thermique –
Partie 3: Instructions pour le calcul des caractéristiques d'endurance thermique**



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CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms, definitions, symbols and abbreviated terms.....	6
3.1 Terms and definitions	6
3.2 Symbols and abbreviated terms.....	8
4 Principles of calculations	10
4.1 General principles	10
4.2 Preliminary calculations.....	10
4.3 Variance calculations	11
4.4 Statistical tests.....	12
4.5 Results.....	12
5 Requirements and recommendations for valid calculations	13
5.1 Requirements for experimental data	13
5.2 Precision of calculations.....	13
6 Calculation procedures.....	13
6.1 Preliminary calculations.....	13
6.2 Main calculations.....	17
6.3 Statistical tests.....	19
6.4 Thermal endurance graph	21
7 Calculation and requirements for results.....	21
7.1 Calculation of thermal endurance characteristics.....	21
7.2 Summary of statistical tests and reporting	22
7.3 Reporting of results.....	22
8 Test report.....	22
Annex A (normative) Decision flow chart.....	24
Annex B (normative) Decision table	25
Annex C (informative) Statistical tables.....	26
Annex D (informative) Worked examples	35
Annex E (informative) Computer program	42
Bibliography.....	50
Figure D.1 – Thermal endurance graph.....	39
Figure L.2 – Example 3: Property-time graph (destructive test data).....	41
Table B.1 – Decisions and actions according to tests.....	25
Table C.1 – Coefficients for censored data calculations	26
Table C.2 – Fractiles of the F -distribution, $F(0,95; f_n, f_d)$	32
Table C.3 – Fractiles of the F -distribution, $F(0,995; f_n, f_d)$	33
Table C.4 – Fractiles of the t -distribution, $t_{0,95}$	34
Table C.5 – Fractiles of the χ^2 -distribution.....	34
Table D.1 – Worked example 1 – Censored data (proof tests).....	35
Table D.2 – Worked example 2 – Complete data (non-destructive tests).....	37

Table D.3 – Worked example 3 – Destructive tests	40
Table E.1 – Non-destructive test data	43
Table E.2 – Destructive test data	44

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL INSULATING MATERIALS –
THERMAL ENDURANCE PROPERTIES –****Part 3: Instructions for calculating thermal
endurance characteristics**

FOREWORD

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International Standard IEC 60216-3 has been prepared by IEC technical committee 112: Evaluation and qualification of electrical insulating materials and systems¹.

This second edition of IEC 60216-3 cancels and replaces the first edition, published in 2002, and constitutes a technical revision.

The major technical changes with regard to the first edition concern an updating of Table C.2. In addition, the scope has been extended to cover a greater range of data characteristics, particularly with regard to incomplete data, as often obtained from proof test criteria. The greater flexibility of use should lead to more efficient employment of the time available for ageing purposes. Finally, the procedures specified in this part of IEC 60216 have been extensively tested and have been used to calculate results from a large body of experimental

¹ Provisional title: IEC technical committee 112 has been formed out of a merger between subcommittee 15E and technical committee 98.

data obtained in accordance with other parts of the standard. Annex E “Computer program” has been completely reworked.

This bilingual version corresponds to the monolingual English version, published in 2006-04.

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

FDIS	Report on voting
112/26/FDIS	112/29/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.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 60216 consists of the following parts, under the general title *Electrical insulating materials – Thermal endurance properties*²:

- Part 1: Ageing procedures and evaluation of test results
- Part 2: Determination of thermal endurance properties of electrical insulating materials – Choice of test criteria
- Part 3: Instructions for calculating thermal endurance characteristics
- Part 4: Ageing ovens
- Part 5: Determination of relative thermal endurance index (RTE) of an insulating material
- Part 6: Determination of thermal endurance indices (TI and RTE) of an insulating material using the fixed time frame method

NOTE This series may be extended. For revisions and new parts, see the current catalogue of IEC publications for an up-to-date list.

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.

A CD-ROM containing the computer program and data files referred to in Annex E is affixed to the back cover of this publication.

The contents of the corrigendum of December 2009 have been included in this copy.

² Titles of existing parts in this series will be updated at the time of their next revision.

ELECTRICAL INSULATING MATERIALS – THERMAL ENDURANCE PROPERTIES –

Part 3: Instructions for calculating thermal endurance characteristics

1 Scope

This part of IEC 60216 specifies the calculation procedures to be used for deriving thermal endurance characteristics from experimental data obtained in accordance with the instructions of IEC 60216-1 and IEC 60216-2, using fixed ageing temperatures and variable ageing times.

The experimental data may be obtained using non-destructive, destructive or proof tests. Data obtained from non-destructive or proof tests may be incomplete, in that measurement of times taken to reach the endpoint may have been terminated at some point after the median time but before all specimens have reached end-point.

The procedures are illustrated by worked examples, and suitable computer programs are recommended to facilitate the calculations.

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 60216-1:2001, *Electrical insulating materials – Properties of thermal endurance – Part 1: Ageing procedures and evaluation of test results*

IEC 60216-2:2005, *Electrical insulating materials – Properties of thermal endurance – Part 2: Determination of thermal endurance properties of electrical insulating materials – Choice of test criteria*

IEC 60493-1:1974, *Guide for the statistical analysis of ageing test data – Part 1: Methods based on mean values of normally distributed test results*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following definitions apply.

3.1.1

ordered data

group of data arranged in sequence so that in the appropriate direction through the sequence each member is greater than, or equal to, its predecessor

NOTE 1 In this standard, ascending order implies that the data is ordered in this way, the first being the smallest.

NOTE 2 It has been established that the term “group” is used in the theoretical statistics literature to represent a subset of the whole data set. The group comprises those data having the same value of one of the parameters of the set (e.g. ageing temperature). A group may itself comprise a number of sub-groups characterised by another parameter (e.g. time in the case of destructive tests).