
**Električni izolacijski materiali - Lastnosti toplotne vzdržljivosti - 6. del:
Ugotavljanje indikatorjev toplotne vzdržljivosti (TI in RTE) izolacijskega
materiala po metodi s fiksnim časovnim okvirom (IEC 60216-6:2003)**

Electrical insulating materials - Thermal endurance properties - Part 6:
Determination of thermal endurance indices (TI and RTE) of an insulating material
using the fixed time frame method (IEC 60216-6:2003)

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EUROPEAN STANDARD

EN 60216-6

NORME EUROPÉENNE

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March 2004

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English version

**Electrical insulating materials -
Thermal endurance properties**
Part 6: Determination of thermal endurance indices (TI and RTE)
of an insulating material using the fixed time frame method
(IEC 60216-6:2003)

Matériaux isolants électriques -
Propriétés d'endurance thermique
Partie 6: Détermination des indices
d'endurance thermique (TI et RTE)
d'un matériau isolant en utilisant
la méthode de trame de durées fixes
(CEI 60216-6:2003)

Elektroisolierstoffe -
Eigenschaften hinsichtlich
des thermischen Langzeitverhaltens
Teil 6: Bestimmung der thermischen
Langzeitkennwerte (TI und RTE)
eines Isolierstoffes unter Anwendung
des Festzeitrahmenverfahrens
(IEC 60216-6:2003)

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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.

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of document 15E/221/FDIS, future edition 1 of IEC 60216-6, prepared by SC 15E, Methods of test, of IEC TC 15, Insulating materials, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60216-6 on 2004-03-01.

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) 2004-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60216-6:2003 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60212	1971	Standard conditions for use prior to and during the testing of solid electrical insulating materials	HD 437 S1	1984
IEC 60216-1	2001	Electrical insulating materials - Properties of thermal endurance Part 1: Ageing procedures and evaluation of test results	EN 60216-1	2001
IEC 60216-2	1990	Part 2: Choice of test criteria	HD 611.2 S1	1992
IEC 60216-3	2002	Part 3: Instructions for calculating thermal endurance characteristics	EN 60216-3	2002
IEC 60216-4-1	1990	Part 4: Ageing ovens - Section 1: Single-chamber ovens	HD 611.4.1 S1	1992
IEC 60216-4-2	2000	Part 4-2: Ageing ovens - Precision ovens for use up to 300 °C	EN 60216-4-2	2000
IEC 60216-4-3	2000	Part 4-3: Ageing ovens - Multi-chamber ovens	EN 60216-4-3	2000
IEC 60216-5	2003	Part 5: Determination of relative thermal endurance index (RTE) of an insulating material	EN 60216-5	2003
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	-	-

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Première édition
First edition
2003-12

**Matériaux isolants électriques –
Propriétés d'endurance thermique –**

Partie 6:

**Détermination des indices d'endurance thermique
(TI et RTE) d'un matériau isolant en utilisant la
méthode de trame de durées fixes**

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**Electrical insulating materials –
Thermal endurance properties –**

SIST EN 60216-6:2004
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Part 6:

**Determination of thermal endurance indices
(TI and RTE) of an insulating material
using the fixed time frame method**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL INSULATING MATERIALS –
THERMAL ENDURANCE PROPERTIES –**

**Part 6: Determination of thermal endurance indices (TI and RTE)
of an insulating material using the fixed time frame method**

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 60216-6 has been prepared by subcommittee 15E, Methods test, of IEC technical committee 15: Insulating materials.

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

FDIS	Report on voting
15E/221/FDIS	15E/225/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 in accordance with the ISO/IEC Directives, Part 2.

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

Part 1: Ageing procedures and evaluation of test results

Part 2: 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 protocol

The committee has decided that this publication remains valid until 2008. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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ELECTRICAL INSULATING MATERIALS – THERMAL ENDURANCE PROPERTIES –

Part 6: Determination of thermal endurance indices (TI and RTE) of an insulating material using the fixed time frame method

1 Scope

This part of IEC 60216 specifies the experimental and calculation procedures for deriving the thermal endurance characteristics, temperature index (TI) and relative thermal endurance index (RTE) of a material using the “fixed time frame method (FTFM)”.

In this protocol, the ageing takes place for a small number of fixed times, using the appropriate number of ageing temperatures throughout each time, the properties of the specimens being measured at the end of the relevant time interval. This differs from the procedure of IEC 60216-1, where ageing is conducted at a small number of fixed temperatures, property measurement taking place after ageing times dependent on the progress of ageing.

Both the TI and the RTE determined according to the FTFM protocol are derived from experimental data obtained in accordance with the instructions of IEC 60216-1 and IEC 60216-2, as modified in this standard. The calculation procedures and statistical tests are modified in relation to IEC 60216-3 and IEC 60216-5.

2 Normative references

[SIST EN 60216-6:2004](https://standards.iteh.ai/catalog/standards/sist/30e68a6-4888-4ada-8462-08aadb92f542/sist-en-60216-6-2004)

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IEC 60212:1971, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

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

IEC 60216-2:1990, *Guide for the determination of thermal endurance properties of electrical insulating materials – Part 2: Choice of test criteria*

IEC 60216-3:2002, *Electrical insulating materials – Thermal endurance properties – Part 3: Instructions for calculating thermal endurance characteristics*

IEC 60216-4-1:1990, *Guide for the determination of thermal endurance properties of electrical insulating materials – Part 4: Ageing ovens – Section 1: Single-chamber ovens*

IEC 60216-4-2:2000, *Electrical insulating materials – Thermal endurance properties – Part 4-2: Ageing ovens – Precision ovens for use up to 300 °C*

IEC 60216-4-3:2000, *Electrical insulating materials – Thermal endurance properties – Part 4-3: Ageing ovens – Multi-chamber ovens*

IEC 60216-5:2003, *Electrical insulating materials – Thermal endurance properties – Part 5: Determination of relative thermal endurance index (RTE) of an insulating material*

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

For the purposes of this document, the following terms, definitions, symbols and abbreviations apply.

3.1 Terms, abbreviations and definitions

3.1.1

assessed thermal endurance index

ATE

numerical value of the temperature in degrees Celsius, up to which the control material possesses known, satisfactory service performance in the specified application

NOTE 1 The ATE of a specific material may vary between different applications of the material.

NOTE 2 ATE is sometimes referred to as “absolute” thermal endurance index.

3.1.2

ageing temperature

temperature in degrees Celsius at which a group of specimens is thermally aged

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3.1.3

end-point temperature

temperature in degrees Celsius at which a specimen is considered to have reached its end-point after ageing for the specified time

3.1.4

candidate material

material for which an estimate of the thermal endurance is required to be determined

NOTE The determination is made by simultaneous thermal ageing of the material and a control material.

3.1.5

central second moment of a data group

sum of the squares of the differences between the data values and the value of the group mean divided by the number of data in the group

3.1.6

95 % confidence limit

statistical parameter, calculated from test data, which with 95 % confidence constitutes an upper or lower limit for the true value of a quantity estimated by statistical analysis

NOTE 1 This implies that there is only 5 % probability that the true value of the quantity estimated is actually larger (or smaller) than the upper (or lower) confidence limit.

NOTE 2 In other connections, confidence values other than 95 % may sometimes be used, e.g. in the linearity test for destructive test data.