SLOVENSKI STANDARD
SIST EN 60243-1:2001

01-marec-2001

Electrical strenght of insulation materials - Test methods - Part 1: Tests at power frequencies (IEC 60243-1:1998)

Electrical strength of insulating materials - Test methods -- Part 1: Tests at power frequencies

Elektrische Durchschlagfestigkeit von isolierenden Werkstoffen - Prüfverfahren -- Teil 1: Prüfungen bei technischen Frequenzen

Rigidité diélectrique des matériaux isolants - Méthodes d'essai -- Partie 1: Essais aux fréquences industrielles

Ta slovenski standard je istoveten z: **EN 60243-1:1998**

ICS:

29.035.01	Izolacijski materiali na splošno	Insulating materials in general

SIST EN 60243-1:2001 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60243-1

February 1998

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Supersedes HD 559.1 S1:1991

Descriptors: Solid electrical insulating materials, dielectric strength tests, measurements, dielectric strength, power frequency

English version

Electrical strength of insulating materials - Test methods
Part 1: Tests at power frequencies
(IEC 60243-1:1998)

Rigidité diélectrique des matériaux isolants - Méthodes d'essai
Partie 1: Essais aux fréquences industrielles
(CEI 60243-1:1998)

Elektrische Durchschlagfestigkeit von isolierenden Werkstoffen - Prüfverfahren
Teil 1: Prüfungen bei technischen Frequenzen
(IEC 60243-1:1998)

This European Standard was approved by CENELEC on 1998-01-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Ref. No. EN 60243-1:1998 E

Foreword

The text of document 15E/86/FDIS, future edition 2 of IEC 60243-1, 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 60243-1 on 1998-01-01.

This European Standard supersedes HD 559.1 S1:1991.

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) 1998-10-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-10-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annex A is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60243-1:1998 was approved by CENELEC as a European Standard without any modification.

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 60212	1971	Standard conditions for use prior to and during the testing of solid electrical insulating materials	HD 437 S1	1984
IEC 60296	1982	Specification for unused mineral insulating oils for transformers and switchgear	-	-
IEC 60455-2	1977	Specification for solventless polymerisable resinous compounds used for electrical insulation Part 2: Methods of test	HD 307.2 S1[1)]	1986
IEC 60464-2	1974	Specification for insulating varnishes containing solvent Part 2: Test methods	-	-
IEC 60674-2	1988	Specification for plastic films for electrical purposes Part 2: Methods of test	-	-
IEC 60684-2	1997	Flexible insulating sleeving Part 2: Methods of test	EN 60684-2	1997
ISO 293	1986	Plastics - Compression moulding of test specimens of thermoplastic materials	-	-
ISO 294-1	1996	Plastics - Injection moulding of test specimens of thermoplastic materials Part 1: General principles, and moulding of multipurpose and bar test specimens	-	-
ISO 294-3	1996	Part 3: Small plates	-	-
ISO 295	1991	Plastics - Compression moulding of test specimens of thermosetting materials	-	-

1) HD 307.2 S1 includes A1:1982 to IEC 60455-2.

Publication	Year	Title	EN/HD	Year
ISO 10724	1994	Plastics - Thermosetting moulding materials Injection moulding of multipurpose test specimens	-	-

NORME INTERNATIONALE

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Deuxième édition
Second edition
1998-01

Rigidité diélectrique des matériaux isolants – Méthodes d'essai –

Partie 1: Essais aux fréquences industrielles

Electrical strength of insulating materials – Test methods –

Part 1: Tests at power frequencies

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL STRENGTH OF INSULATING MATERIALS – TEST METHODS –

Part 1: Tests at power frequencies

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60243-1 has been prepared by subcommittee 15E: Methods of test, of IEC technical committee 15: Insulating materials.

This second edition cancels and replaces the first edition published in 1988 and constitutes a technical revision.

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

FDIS	Report on voting
15E/86/FDIS	15E/92/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.

Annex A is for information only.

INTRODUCTION

This International Standard is one of a series which deals with tests for electric strength of solid insulating materials. The series consists of three parts under the general title: *Electric strength of insulating materials – Test methods –*

Part 1: Tests at power frequencies (IEC 60243-1);

Part 2: Additional requirements for tests using direct voltage (IEC 60243-2);

Part 3: Additional requirements for impulse tests (IEC 60243-3).

ELECTRICAL STRENGTH OF INSULATING MATERIALS – TEST METHODS –

Part 1: Tests at power frequencies

1 General

1.1 Scope

This part of IEC 60243 gives methods of test for the determination of the short-time electric strength of solid insulating materials at power frequencies, that is, those between 48 Hz and 62 Hz. It does not consider the testing of liquids and gases, although these are specified and used as impregnants or surrounding media for the solid insulating materials being tested.

NOTE – Methods for the determination of breakdown voltages along the surfaces of solid insulating materials are included.

1.2 Normative references

The following normative documents contain provisions which, through reference in the text, constitute provisions of this part of IEC 60243. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 60243 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently available International Standards.

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

IEC 60296: 1982, *Specification for unused mineral insulating oils for transformers and switchgears*

IEC 60455-2: 1977, *Specification for solventless polymerizable resinous compounds used for electrical insulation – Part 2: Methods of test*

IEC 60464-2: 1974, *Specification for insulating varnishes containing solvent – Part 2: Test methods*

IEC 60674-2: *Specification for plastic films for electrical purposes – Part 2: Methods of test*

IEC 60684-2 –, *Specification for flexible insulating sleeving – Part 2: Methods of test*[1)]

ISO 293: 1986, *Plastics – Compression moulding of test specimens of thermoplastic materials*

ISO 294-1: 1996, *Plastics – Injection moulding of test specimens of thermoplastic materials – Part 1: General principles, and moulding of multipurpose and bar test specimens*

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1) To be published.

ISO 294-3: 1996, *Plastics – Injection moulding of test specimens of thermoplastic materials – Part 3: Small plates*

ISO 295: 1991, *Plastics – Compression moulding of test specimens of thermosetting materials*

ISO 10724:1994, *Plastics – Thermosetting moulding materials – Injection moulding of multipurpose test specimens*

2 Definitions

For the purpose of this standard, the following definitions apply:

2.1
electric breakdown
severe loss of the insulating properties of test specimens while exposed to electric stress, which causes the current in the test circuit to operate an appropriate circuit-breaker

NOTE – Breakdown is often caused by partial discharges in the gas or liquid medium surrounding the test specimen and the electrodes which puncture the specimen beyond the periphery of the smaller electrode (or of both electrodes, if of equal diameter).

2.2
flashover
loss of the insulating properties of the gas or liquid medium surrounding a test specimen and electrodes while exposed to electric stress, which causes the current in the test circuit to operate an appropriate circuit-breaker

NOTE – The presence of carbonized channels or punctures through the specimen distinguishes tests where breakdown occurred, from others where flashover occurred.

2.3
breakdown voltage:

2.3.1 (in tests with continuously rising voltage) Voltage at which a specimen suffers breakdown under the prescribed test conditions

2.3.2 (in step-by-step tests) Highest voltage which a specimen withstands without breakdown for the duration of the time at that voltage level

2.4
electric strength
quotient of the breakdown voltage and the distance between the electrodes between which the voltage is applied under the prescribed test conditions

NOTE – The distance between the test electrodes should be determined as specified in 4.4 of this standard, unless otherwise specified.

3 Significance of the test

3.1 Electric strength test results obtained in accordance with this standard can be used for detecting changes or deviations from normal characteristics resulting from processing variables, ageing conditions or other manufacturing or environmental situations but can seldom be used directly to determine the behaviour of insulating materials in an actual application.