SLOVENSKI STANDARD

SIST EN 60034-18-21:1999

01-april-1999

Rotating electrical machines - Part 18: Functional evaluation of insulation systems - Section 21: Test procedures for wire-wound windings - Thermal evaluation and classification (IEC 60034-18-21:1992)

Rotating electrical machines -- Part 18: Functional evaluation of insulation systems -- Section 21: Test procedures for wire-wound windings - Thermal evaluation and classification

Drehende elektrische Maschinen -- Teil 18: Funktionelle Bewertung von Isoliersystemen -- Hauptabschnitt 21: Prüfverfahren für Runddraht-Wicklungen - Thermische Bewertung und Klassifizierung

Machines électriques tournantes -- Partie 18: Evaluation fonctionnelle des systèmes d'isolation -- Section 21: Procédures d'essai pour enroulements à fils - Evaluation thermique et classification

Ta slovenski standard je istoveten z: **EN 60034-18-21:1994**

ICS:

29.080.30	Izolacijski sistemi	Insulation systems
29.160.01	Rotacijski stroji na splošno	Rotating machinery in general

SIST EN 60034-18-21:1999 **en**

EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN 60034-18-21

May 1994

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Descriptors: Rotating electrical machine, electrical insulation, winding, test, thermal endurance test, classification

ENGLISH VERSION

Rotating electrical machines
Part 18: Functional evaluation of insulation systems
Section 21: Test procedures for wire-wound windings - Thermal evaluation and classification
(IEC 34-18-21:1992)

Machines électriques tournantes
Partie 18: Evaluation fonctionnelle des systèmes d'isolation
Section 21: Procédures d'essai pour enroulements à fils
Evaluation thermique et classification

(CEI 34-18-21:1992)

Drehende elektrische Maschinen
Teil 18: Funktionelle Bewertung von Isoliersystemen für drehende elektrische Maschinen
Hauptabschnitt 21: Prüfverfahren für Runddraht-Wicklungen
Thermische Bewertung und Klassifizierung
(IEC 34-18-21:1992)

This European Standard was approved by CENELEC on 1993-12-08. 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, 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

FOREWORD

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 34-18-21:1992 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 60034-18-21 on 8 December 1993.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1995-03-15
- latest date of withdrawal of conflicting national standards	(dow)	1995-03-15

For products which have complied with the relevant national standard before 1995-03-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2000-03-15.

Annexes designated "normative" are part of the body of the standard. Annexes designated "informative" are given only for information. In this standard, annexes A, B and C are informative and annex ZA is normative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 34-18-21:1992 was approved by CENELEC as a European Standard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT 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.

NOTE : When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Date	Title	EN/HD	Date
34-1 (mod)	1983	Rotating electrical machines Part 1: Rating and performance	HD 53.1 S2 A3	1985 1992
455	series	Specification for solventless polymerisable resinous compounds used for electrical insulation	HD 307	series
464	-	Specification for insulating varnishes containing solvent	-	-
34-18-1	1992	Rotating electrical machines - Part 18: Functional evaluation of insulation systems - Section 1: General guidelines (corrigendum August 1992)	EN 60034-18-1	1994

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INTERNATIONAL STANDARD

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Machines électriques tournantes

Dix-huitième partie:
Evaluation fonctionnelle des systèmes d'isolation
Section 21: Procédures d'essai pour enroulements à fils – Evaluation thermique et classification

Rotating electrical machines

Part 18:
Functional evaluation of insulation systems
Section 21: Test procedures for wire-wound windings – Thermal evaluation and classification

Bureau Central de la Commission Electrotechnique Internationale 3, rue de Varembé Genève, Suisse

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Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ROTATING ELECTRICAL MACHINES

Part 18: Functional evaluation of insulation systems Section 21: Test procedures for wire-wound windings – Thermal evaluation and classification

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

This section of International Standard IEC 34-18 has been prepared by Sub-Committee 2J: Classification of insulation systems for rotating machinery, of IEC Technical Committee No. 2: Rotating machinery.

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

Six Months' Rule	Report on Voting
2J(CO)5	2J(CO)9

Full information on the voting for the approval of this section can be found in the Voting Report indicated in the above table.

Annexes A, B and C are for information only.

INTRODUCTION

Section 1 of IEC 34-18 presents general principles for the evaluation and classification of insulation systems used in rotating electrical machines.

This section of IEC 34-18 deals with the thermal evaluation and classification of insulation systems for wire-wound (usually random wound) windings.

Several standard test procedures are given for various types of wire-wound windings and testing techniques.

This section belongs to Part 18 of a series of publications dealing with the functional evaluation of insulation systems for rotating electrical machines, the other parts being:

Section 1: General guidelines (IEC 34-18-1).
Section 31: Test procedures for form-wound windings (IEC 34-18-31).

ROTATING ELECTRICAL MACHINES

Part 18: Functional evaluation of insulation systems Section 21: Test procedures for wire-wound windings – Thermal evaluation and classification

1 Scope

This section of IEC 34-18 gives test procedures for the thermal evaluation and classification of insulation systems used or proposed for use in wire-wound alternating current (a.c.) or direct current (d.c.) rotating electrical machines. The test procedures are comparative in that the performance of a candidate insulation system is compared to that of a reference insulation system with proven service experience.

Section 21 shall be used in conjunction with Section 1.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this section of IEC 34-18. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this section of IEC 34-18 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 34-1: 1983, *Rotating electrical machines - Part 1: Rating and performance.*

IEC 455, *Specification for solventless polymerisable resinous compounds used for electrical insulation.*

IEC 464, *Specification for insulating varnishes containing solvent.*

IEC 34-18-1: 1991, *Rotating electrical machines – Part 18: Functional evaluation of insulation systems – Section 1: General guidelines.*

3 General considerations

3.1 *Relationship to Section 1*

Section 1 describes general testing principles applicable to thermal endurance testing of insulation systems in rotating machines. Unless the procedures of this part indicate otherwise, the principles of Section 1 shall be followed.

3.2 *Standard procedures*

Five standard procedures are specified in clauses 4 through 8. The user of this standard shall select that test procedure which most closely corresponds to the type and size of the windings to be tested and classified, also taking into account facilities and past experience.

3.3 *Reference insulation system*

A reference insulation system shall be tested using the same test procedure as for the candidate system. See 4.2 of Section 1.

The thermal class temperatures of the two systems shall not differ by more than 50 K.

3.4 *Test objects*

3.4.1 *Construction of test objects*

Tests for the selection of materials according to 5.2.1 of section 1 may be performed, as appropriate.

Test objects may be actual machines, machine components or models. The components and models should embody all the essential elements.

Insulation thickness, creepage distances and discharge protection where required shall be appropriate for the intended maximum rated voltage and equipment standards or practice. The systems compared shall have arrangements consistent with those to be used in machines.

NOTE - It is recognized that markedly different values of test life may be obtained for the same insulating materials, depending on insulation thicknesses and creepage distances.

Test specimens simulating parts of a coil or winding may be used for evaluation, if stresses acting on these parts in service can be reproduced reliably in the test.

Particular types of models have been used successfully in some countries and examples of these are illustrated in annexes A and B.

The manufacturer should make certain that the materials proposed for use in the new insulation system can be handled without deterioration of properties in the intended manufacturing processes.

3.4.2 *Quality assurance tests*

To eliminate defective test objects, they should be qualified first, as per 5.2.3 of Section 1, by visual examination and then by over-voltage tests consistent with the machine or coil tests in the manufacturing facility, or as described in the appropriate subclauses for diagnostic tests, whichever voltage test is greater.