

**SLOVENSKI STANDARD**  
**SIST EN 60034-18-31:1999/A1:1999**  
**01-junij-1999**

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**Rotating electrical machines - Part 18: Functional evaluation of insulation systems - Section 31: Test procedures for form-wound windings - Thermal evaluation and classification of insulation systems used in machines up to and including 50 MVA and 15 kV (IEC 60034-18-31:1992/A1:1992)**

Rotating electrical machines -- Part 18: Functional evaluation of insulation systems -- Section 31: Test procedures for form-wound windings - Thermal evaluation and classification of insulation systems used in machines up to and including 50 MVA and 15 kV (IEC 60034-18-31:1992/A1:1992)

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Drehende elektrische Maschinen -- Teil 18: Funktionelle Bewertung von Isoliersystemen -- Hauptabschnitt 31: Prüfverfahren für Wicklungen mit vorgeformten Elementen - Thermische Bewertung und Klassifizierung von Isoliersystemen für Maschinen bis einschließlich 50 MVA und 15 kV

Machines électriques tournantes -- Partie 18: Evaluation fonctionnelle des systèmes d'isolation -- Section 31: Procédures d'essai pour enroulements préformés - Evaluation thermique et classification des systèmes d'isolation utilisés dans les machines jusqu'à et y compris 50 MVA et 15 kV

**Ta slovenski standard je istoveten z: EN 60034-18-31:1994/A1:1996**

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**ICS:**

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

**SIST EN 60034-18-31:1999/A1:1999**      **en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60034-18-31/A1**

December 1996

UDC 621.313:621.315.6:620.1:621.317.08  
ICS 29.080.00; 29.160.00

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

English version

**Rotating electrical machines**  
**Part 18: Functional evaluation of insulation systems**  
**Section 31: Test procedures for form-wound windings**  
**Thermal evaluation and classification of insulation systems**  
**used in machines up to and including 50 MVA and 15 kV**  
**(IEC 34-18-31:1992/A1:1996)**

Machines électriques tournantes  
Partie 18: Evaluation fonctionnelle  
des systèmes d'isolation  
Section 31: Procédures d'essai pour  
enroulements préformés - Evaluation  
thermique et classification des systèmes  
d'isolation utilisés dans les machines  
jusqu'à et y compris 50 MVA et 15 kV  
(CEI 34-18-31:1992/A1:1996)

Drehende elektrische Maschinen  
Teil 18: Funktionelle Bewertung  
von Isoliersystemen für drehende  
elektrische Maschinen  
Hauptabschnitt 31: Prüfverfahren  
für Wicklungen mit vorgeformten  
Elementen - Thermische Bewertung  
und Klassifizierung von Isoliersystemen  
für Maschinen bis einschließlich  
50 MVA und 15 kV  
(IEC 34-18-31:1992/A1:1996)

This amendment A1 modifies the European Standard EN 60034-18-31:1994; it was approved by CENELEC on 1996-10-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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.

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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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EN 60034-18-31:1994/A1:1996

### Foreword

The text of document 2J/52/FDIS, future amendment 1 to IEC 34-18-31:1992, prepared by SC 2J, Classification of insulation systems for rotating machinery, of IEC TC 2, Rotating machinery, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60034-18-31:1994 on 1996-10-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-08-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1997-08-01

For products which have complied with EN 60034-18-31:1994 before 1997-08-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2002-08-01.

## iTeh STANDARD PREVIEW

Endorsement notice  
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The text of amendment 1:1996 to the International Standard IEC 34-18-31:1992 was approved by CENELEC as an amendment to the European Standard without any modification. <https://standards.iteh.ai/catalog/standards/sist/b2a9ad1d-72b1-4fd-a281-353508a4fe3d/sist-en-60034-18-31-1999-a1-1999>

NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC

34-18-31

1992

AMENDEMENT 1  
AMENDMENT 1

1996-11

Amendement 1

**Machines électriques tournantes –**

**Partie 18:**

**Evaluation fonctionnelle des systèmes d'isolation –  
Section 31: Procédures d'essai pour enroulements  
préformés – Evaluation thermique et classification  
des systèmes d'isolation utilisés dans les  
machines jusqu'à et y compris 50 MVA et 15 kV**

Amendment 1

**Rotating electrical machines –**

**Part 18:**

**Functional evaluation of insulation systems –  
Section 31: Test procedures for form-wound  
windings – Thermal evaluation and classification  
of insulation systems used in machines up to  
and including 50 MVA and 15 kV**

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Международная Электротехническая Комиссия

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## FOREWORD

This amendment has been prepared by subcommittee 2J: Classification of insulation systems for rotating machinery, of IEC technical committee 2: Rotating machinery.

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

FDIS	Report on voting
2J/52/FDIS	2J/59/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

Page 9

## 1 Scope

Replace the text of note 2 by the following:

- 2 Large machines, especially those using bars, can require special thermal evaluation test procedures which are not included in this section.

### 3.2 Designation of test procedures

Replace the text of the note by the following:

NOTE – The thermal classification of an insulation system can depend on the selected diagnostic procedure.

Page 13

#### 5.1.1 Normal procedure

Replace, on page 15, the fourth paragraph by the following:

The lowest ageing temperature should be selected such as to produce a log mean test life of about 5000 h or more. This is generally accomplished by choosing the lowest ageing temperature to correspond to an exposure period of 28 to 35 days, or longer. In addition, at least two higher ageing temperatures should be selected, separated by intervals of 20 K or more. Intervals of 10 K may be used when tests are made at more than three ageing temperatures.

#### 5.1.2 Procedure for minor change

Replace the existing text by the following:

Under particular conditions where only a minor change in an established insulation system is to be evaluated, ageing of test specimens at only one temperature can be acceptable (see 5.3.2.2 of section 1).

## 6 Diagnostic sub-cycle

*Replace the existing text by the following:*

Following each subcycle of thermal ageing, each test specimen shall be subjected to a series of diagnostic tests which may include some or all of the following: mechanical, moisture, voltage and other diagnostic tests described in this clause, applied in that order. The diagnostic tests used shall be reported.

Page 17

### 6.1.1 (A): *General mechanical test*

*Replace, on page 17, the first paragraph by the following:*

The applied mechanical stress shall be of the same general nature as would be experienced in service and of a severity comparable with the highest stresses or strains expected in normal service. The procedure for applying this stress can vary with each type of test objects and kind of service.

### 6.2.1 (A): *General moisture test*

*Replace the second paragraph by the following:*

A visible and continuous moisture deposit can be achieved by, for example, a fog chamber or a condensation chamber.

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### 6.2.2 (B): *Moisture test with water immersion*

*Replace the first two paragraphs by the following:*

This test may be selected for evaluating sealed systems.

The complete test specimen including the joint connections shall be immersed for a period of 30 min in tap-water which contains a non-ionic wetting agent in a concentration sufficient to reduce the surface tension to a value of 0,031 N/m (31 dyn/cm) or less at 25 °C.

Page 23

### A.1.2

*Replace the second paragraph by the following:*

The latter technique approaches more closely an actual machine assembly with possible burrs on punching edges with slot stagger producing irregularities in the slot profile which can be important when, for example, totally impregnated (post-impregnated) windings will be simulated. The lamination stack can also have a major effect on a ground wall coil insulation with poor resistance to cut-through. However, this type of fixture can be more costly than that made by milling.