# IEC 61251

Edition 1.0 2015-11

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

## Electrical insulating materials and systems – AC voltage endurance evaluation

**Systèmes et matériaux isolants électriques – Évaluation de l'endurance à la tension alternative**



IEC 61251:2015-11(en-fr)

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# ELECTRICAL INSULATING MATERIALS AND SYSTEMS – AC VOLTAGE ENDURANCE EVALUATION

## FOREWORD

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International Standard IEC 61251 has been prepared by IEC technical committee 112: Evaluation and qualification of electrical insulating materials and systems.

This first edition of IEC 61251 cancels and replaces the second edition of IEC TS 61251, published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the second edition of IEC TS 61251:

a) upgrade from Technical Specification to an International Standard;
b) clarification of issues raised since publication of IEC TS 61251.

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

| FDIS | Report on voting |
|---|---|
| 112/338/FDIS | 112/347/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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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.

# INTRODUCTION

This International Standard covers insulating materials and systems. Voltage endurance tests are used to compare and evaluate insulating materials and systems. It is complex to determine the capability of electrical insulating materials and systems to endure a.c. voltage stress. The results of voltage endurance tests are influenced by many factors. Therefore this International Standard can be considered as an attempt to present a unified view of voltage endurance for simplified planning and analysis.

# ELECTRICAL INSULATING MATERIALS AND SYSTEMS – AC VOLTAGE ENDURANCE EVALUATION

## 1 Scope

This International Standard describes many of the factors involved in voltage endurance tests on electrical insulating materials and systems. It describes the voltage endurance graph, lists test methods illustrating their limitations and gives guidance for evaluating the sinusoidal a.c. voltage endurance of insulating materials and systems from the results of the tests. This International Standard is applicable over the voltage frequency range 20 Hz to 1 000 Hz. The general principles can also be applicable to other voltage shapes, including impulse voltages. The terminology to be used in voltage endurance is defined and explained.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62539, *Guide for the statistical analysis of electrical insulation dielectric breakdown data*

## 3 Terms, definitions and symbols

### 3.1 Terms and definitions

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

**3.1.1**
**voltage endurance**
**VE**
measures of the capability of a solid insulating material to endure voltage

Note 1 to entry: In this International Standard, only a.c. voltage is considered.

Note 2 to entry: This note only applies to the French language.

**3.1.2**
**life**
time to dielectric breakdown

**3.1.3**
**voltage endurance coefficient**
**VEC**
numerical value of the reciprocal of the slope of a straight line log-log VE plot

Note 1 to entry: This note only applies to the French language.

**3.1.4**
**specimen**
representative test object for assessing the value of one or more physical properties