

# INTERNATIONAL STANDARD

# IEC 60112

Fourth edition  
2003-01

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BASIC SAFETY PUBLICATION

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## **Method for the determination of the proof and the comparative tracking indices of solid insulating materials**

*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*



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## **Method for the determination of the proof and the comparative tracking indices of solid insulating materials**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**METHOD FOR THE DETERMINATION OF THE PROOF  
AND THE COMPARATIVE TRACKING INDICES  
OF SOLID INSULATING MATERIALS**

## 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 specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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- 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 60112 has been prepared by subcommittee 15E: Methods of test, of IEC technical committee 15: Insulating materials.

This fourth edition cancels and replaces the third edition, published in 1979, of which it constitutes a technical revision.

**Major changes since the previous edition are the following:**

The selection of a material for a specific application frequently involves compromises in the levels of the individual properties and test criteria. In the previous edition of IEC 60112 the test criteria required "no burning of the specimen", but this gave rise to two issues:

- difficulties in the identification of burning which includes all types of combustion, e.g. flaming, and smouldering in the situation where scintillations had occurred giving rise in many cases to carbon on the surface of the specimen, and
- a situation in which some product committees had found it necessary to dispense with the "no burning" criterion in the tracking tests which they replaced by flame tests on the final product, thereby giving rise to two types of CTI/PTI with different criteria.

This standard attempts to regularize this situation.

It has the status of a basic safety publication in accordance with IEC Guide 104.

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

FDIS	Report on voting
15E/209/FDIS	15E/213/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 2015. At this date, the publication will be

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

The contents of the corrigenda of June 2003 and October 2003 have been included in this copy.

## METHOD FOR THE DETERMINATION OF THE PROOF AND THE COMPARATIVE TRACKING INDICES OF SOLID INSULATING MATERIALS

### 1 Scope

This International standard specifies the method of test for the determination of the proof and comparative tracking indices of solid insulating materials on pieces taken from parts of equipment and on plaques of material using alternating voltages.

The standard provides for the determination of erosion when required.

NOTE 1 The proof tracking index is used as an acceptance criterion as well as a means for the quality control of materials and fabricated parts. The comparative tracking index is mainly used for the basic characterization and comparison of the properties of materials.

Test results cannot be used directly for the evaluation of safe creepage distances when designing electrical apparatus.

NOTE 2 This test discriminates between materials with relatively poor resistance to tracking, and those with moderate or good resistance, for use in equipment which can be used under moist conditions. More severe tests, of longer duration are required for the assessment of performance of materials for outdoor use, utilizing higher voltages and larger test specimens (see the inclined plane test of IEC 60587). Other test methods such as the inclined method may rank materials in a different order from the drop test given in this standard.

### 2 Normative references

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.

IEC 60589:1977, *Methods of test for the determination of ionic impurities in electrical insulating materials by extraction with liquids*

IEC Guide 104:1997, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO 293:1986, *Plastics – Compression moulding 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 multi-purpose and bar test specimens*

ISO 294-3:2002, *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*