INTERNATIONAL STANDARD

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Second edition
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Electrical insulating materials –

Determination of electrolytic corrosion caused by insulating materials – Test methods

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL INSULATING MATERIALS –

DETERMINATION OF ELECTROLYTIC CORROSION CAUSED BY INSULATING MATERIALS – TEST METHODS

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International Standard IEC 60426 has been prepared by IEC technical committee 112: Evaluation and qualification of electrical insulating materials and systems.

This second edition cancels and replaces the first edition, published in 1973, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- experience has indicated the need for improved description of the experimental method. It describes a revised procedure for the visual and tensile strength test method that overcomes the limitations of the first edition;
- one older method of the first edition has partly been maintained in the informative annex.

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

FDIS	Report on voting
112/45/FDIS	112/55/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.

A bilingual version of this publication may be issued at a later date.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site 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- withdrawn;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

Electrical insulating materials at high atmospheric humidity and under influence of electric stress may cause corrosion of metal parts being in contact with them. Such electrolytic corrosion is dependent upon the composition of the insulating material and the character of the metal; it is influenced by temperature, relative humidity, nature of the voltage and the time of exposure. Direct voltage produces much more rapid and extensive corrosion than alternating voltage. Corrosion is more pronounced at the positive electrode.

Not only copper but also most other metals, except the noble metals such as platinum or gold, are subject to electrolytic corrosion. Electrolytic corrosion, however, is usually determined with insulating materials in contact with copper, brass or aluminium. Copper, however, is a basic metal and most frequently used in electrotechnical, teletechnical and electronic equipment, especially for current conducting parts and therefore it was chosen as a basic test metal. Other metals may be used when needed for special purposes, but the results may differ from those described in this method.

Electrolytic corrosion may cause open-circuit failure in electrical conductors and devices. It may promote low resistance leakage path across or through electrical insulation and the products of corrosion may otherwise interfere with the operation of electrical devices, i.e. may prevent operation of contacts, etc.

Electronic equipment operating under conditions of high humidity and elevated temperature may be particularly subjected to failure from electrolytic corrosion. Therefore, the selection of insulating materials, which do not produce electrolytic corrosion, is important for such applications.

The test method described in this second edition replaces two separate methods of the first edition – visual and tensile strength method. The former tensile strength method of the first edition, using copper wires, has been maintained in an informative annex. It must be emphasized that the advantage of this new method is that the same strip used for visual inspection is next used for the tensile strength test in opposite to the method described in the first edition. Therefore the correlation between tensile strength and visual examination is more obvious.

ELECTRICAL INSULATING MATERIALS –

DETERMINATION OF ELECTROLYTIC CORROSION CAUSED BY INSULATING MATERIALS – TEST METHODS

1 Scope

This standard determines the ability of insulating materials to produce electrolytic corrosion on metals being in contact with them under the influence of electric stress, high humidity and elevated temperature.

The effect of electrolytic corrosion is assessed in one test by using consecutively two methods:

- visual semi-quantitative method consisting in comparing visually the corrosion appearing on the anode and cathode metal strips, with those given in the reference figures.

  This method consists of the direct visual assessment of the degree of corrosion of two copper strips, acting as anode and cathode respectively, placed in contact with the tested insulating material under a d.c. potential difference at specified environmental conditions. The degree of corrosion is assessed by visually comparing the corrosion marks on the anode and cathode metal strips with those shown in the reference figures;
- quantitative method, which involves the tensile strength measurement, carried out on the same anode and cathode metal strips after visual inspection.

An additional quantitative test method for determining electrolytic corrosion, which involves tensile strength measurement of copper wire, is described in the informative Annex C.

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 60068-3-4:2001, *Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests*

IEC 60454-2:—, *Pressure-sensitive adhesive tapes for electrical purposes – Part 2: Methods of test*[1]

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1 To be published