SLOVENSKI STANDARD
SIST HD 214 S2:1998

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Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions (IEC 60112:1979)

Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions

Verfahren zur Bestimmung der vergleichenden Kriechstromzahl und deren Überprüfung an festen Isolierstoffen bei feuchten Bedingungen

Méthode pour déterminer les indices de résistance et de tenue au cheminement des matériaux isolants solides dans des conditions humides

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29.035.01	Izolacijski materiali na splošno	Insulating materials in general

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INFORMATION SHEET

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Recommended method for determining the comparative tracking index of solid insulating materials under moist conditions

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- Title Page

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Méthode pour déterminer les indices de résistance et de tenue au cheminement des matériaux isolants solides dans des conditions humides

Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions

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Descriptors: solid insulating materials, measurement of resistance to tracking, requirements, definitions, testing under moist conditions.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

METHOD FOR DETERMINING THE COMPARATIVE AND THE PROOF TRACKING INDICES OF SOLID INSULATING MATERIALS UNDER MOIST CONDITIONS

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.

PREFACE

This standard has been prepared by Sub-Committee 15A, Short-time Tests, of IEC Technical Committee No. 15, Insulating Materials.

It constitutes the third edition of IEC Publication 112.

Drafts were discussed at the meetings held in Zurich in 1973 and in Toronto in 1976. As a result of this latter meeting, a draft, Document 15A(Central Office)32, was submitted to the National Committees for approval under the Six Months' Rule in June 1976.

The following countries voted explicitly in favour of publication:

Austria	Norway
Belgium	Poland
Canada	Romania
China	South Africa (Republic of)
Czechoslovakia	Sweden
Denmark	Switzerland
Egypt	Turkey
France	Union of Soviet Socialist Republics
Germany	United Kingdom
Japan	Yugoslavia

The United States of America voted against the publication of this revision objecting that the use of two test solutions would lead to two different and confusing sets of ratings.

Other IEC publication quoted in this standard:

Publication No. 587: Test Method for Evaluating Resistance to Tracking and Erosion of Electrical Insulating Materials Used under Severe Ambient Conditions.

METHOD FOR DETERMINING THE COMPARATIVE AND THE PROOF TRACKING INDICES OF SOLID INSULATING MATERIALS UNDER MOIST CONDITIONS

1. Scope

This method of test indicates the relative resistance of solid electrical insulating materials to tracking for voltages up to 600 V when the surface is exposed under electric stress to water with the addition of contaminants.

Tracking may occur during this test when voltage is applied between a defined electrode arrangement on the surface of a material and drops of electrolyte are applied between them at defined intervals of time. The number of drops needed to cause failure increases with the reduction of the applied voltage and, below a critical value, tracking ceases to occur.

Materials which do not track at the highest test voltage may erode differently. The depth of erosion can be measured. Some materials may ignite during the test.

Notes 1. — The grading of materials reached by this method may possibly differ from that obtained by other testing methods for assessing tracking resistance, for example tests based on the use of high voltage, low-current discharges. This test method provides good resolution between materials with relatively poor tracking resistance. It lacks resolution for materials normally required for outdoor use for which the test method in IEC Publication 587: Test Method for Evaluating Resistance to Tracking and Erosion of Electrical Insulating Materials Used under Severe Ambient Conditions, should be used.

2. — The test results as such cannot be used directly for the evaluation of safe creepage distances when designing electrical apparatus.

2. Definitions

2.1 *Tracking*

The progressive formation of conducting paths, which are produced on the surface of a solid insulating material, due to the combined effects of electric stress and electrolytic contamination on this surface.

2.2 *Electrical erosion*

The wearing away of insulating material by action of electrical discharges.

2.3 *Comparative tracking index (CTI)*

The numerical value of the maximum voltage in volts at which a material withstands 50 drops without tracking.

Note. — The value of each test voltage and the CTI should be divisible by 25.

2.4 *Proof tracking index (PTI)*

The numerical value of the proof voltage in volts at which a material withstands 50 drops without tracking.

3. Test specimen

Any flat surface may be used, provided that the area is sufficient to ensure that during the test no liquid flows over the edges of the specimen. Flat surfaces of not less than 15 mm × 15 mm are recommended. The thickness of the specimen should be 3 mm or more and should be reported.

Notes 1. — In special cases, in order to obtain a flat surface, grinding can be applied; this fact should, however, be mentioned in the test report.

2. — The values of the CTI obtained on specimens of thicknesses below about 3 mm may not be comparable; for example, if thin specimens are mounted on a metal or glass supporting plate, this may remove heat quickly and so alter the CTI. Therefore, if the thickness of the specimen is less than 3 mm, two, or if necessary more, specimens should be stacked.

3. — Where the direction of the electrodes relative to any feature of the material is significant, the direction shall be reported. The direction giving the lowest CTI should be used.

4. — The test should be carried out on areas which are free from scratches. If this is impossible, the results obtained on the scratched area should be reported together with a statement describing the surface of the specimen.

Scratches on the surface of the test specimen will add to the dispersion of the test results. If the tracking current follows the scratches, failure may occur at a lower voltage (or a lower number of drops) than when the tracking current passes across the scratches.

4. Conditioning

The surface of the test specimen shall be clean and free of dust, dirt, fingerprints, grease, oil, mould release or other contaminants which can influence the test results. Care should be used in cleaning to avoid swelling, softening, substantial abrasion or other damage to the material. The conditioning and cleaning procedure should be stated in the test report.

5. Test apparatus

5.1 *Electrodes*

The two platinum electrodes shall have a rectangular cross-section of 5 mm × 2 mm, with one end chisel-edged with an angle of 30° (Figure 1, page 16). The chisel-edge shall be slightly rounded.

The electrodes shall be symmetrically arranged in a vertical plane, the total angle between them being 60°, and with opposing electrode faces vertical and 4.0 ± 0.1 mm apart on a flat horizontal surface of the specimen (Figure 2, page 16). The force exerted by each electrode on the surface shall be 1 ± 0.05 N. An arrangement for applying the electrodes to the specimen is shown in Figure 3, page 16.

Note. — Where any metal other than platinum is used to simulate practical conditions, the metal should be stated in the test report. The results shall not be designated as CTI or PTI.

5.2 *Test circuit*

The electrodes shall be supplied with a substantially sinusoidal voltage, variable between 100 V and 600 V at a frequency of 48 Hz to 60 Hz. The power of the source should not be less than 0.5 kVA. The basic circuit is shown in Figure 4, page 17.