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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 16935.4-2011

**Insulation coordination for equipment within low-voltage
systems -- Part 4: Consideration of high-frequency voltage
stress**

(English Translation)

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Foreword

GB/T 16935 Insulation coordination for equipment within low-voltage systems consists of the following 4 parts.

- Part 1.Principles, requirements and tests;
- Part 3.Use of coating, potting or molding for protection against pollution;
- Part 4.Consideration of high-frequency voltage stress;
- Part 5.Comprehensive method for determining clearances and creepage distances equal to or less than 2 mm.

This Part is Part 4 of GB/T 16935.

This Part was drafted in accordance with the rules given in GB/T 1.1-2009.

This Part uses translation method of identically adopt IEC 60664-4.2005

Insulation coordination for equipment within low-voltage systems - Part 4.

Consideration of high-frequency voltage stress.

This Part shall be used in conjunction with GB/T 16935.1-2008 Insulation coordination for equipment within low-voltage systems - Part 1.Principles requirements and tests (IEC 60664-1.2007, IDT) and GB/T 16935.5-2008

Insulation coordination for equipment within low-voltage systems - Part 5.

Comprehensive method for determining clearances and creepage distances equal to or less than 2 mm (IEC 60664-5:2007, IDT).

This Part was proposed by China Electrical Equipment Industrial Association.

This Part shall be under the jurisdiction of National Technical Committee on Low-voltage Equipment with Insulation of Standardization Administration of China (SAC/TC 417).

The drafting organization of this Part. Shanghai Electric Science Research Institute.

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1 Scope

This Part of GB/T 16935 specifies the requirements for clearances, creepage distances and solid insulation for equipment based upon their performance criteria. It includes methods of electric testing with respect to insulation coordination.

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 60112:2003, Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60664-1, as well as the following terms and definitions, apply.

generic term for both partial discharge inception voltage U_i and partial discharge extinction voltage U_e

4 Clearances

As a conclusion from A.2.1, the critical frequency f_{crit} , at which the reduction of the breakdown voltage occurs, depends upon the value of the clearance as follows.

5 Creepage distances

Measuring data for three different frequency ranges up to 100 kHz, up to 1 MHz and up to 3 MHz are shown in Figure 2 (measurement) together with limiting curves (dimensioning).

6 Solid insulation

The following method of dimensioning can be used instead of high-frequency testing according to Clause 7.

7 High-frequency testing

If not otherwise specified by technical committees, the test shall be performed with a new test specimen. Conditioning of the specimen by temperature and humidity treatment is intended to

No breakdown shall occur during the test duration. After the test, no visible damage (burning, melting etc.) shall occur.

8 Non sinusoidal voltages

For dimensioning of the clearances, the peak value of the non-sinusoidal voltage and the repetition frequency of the voltage peaks are relevant.

In the case of a maximum voltage frequency of 10 MHz, if the field strength is approximately uniform and no voids or air gaps are present in between the solid insulation, the dimensioning procedure described in 6.3 may be applied instead of testing.

Annex A

(Informative)

Insulation characteristics of clearances at high-frequency voltages

Breakdown of clearances usually occur in less than one microsecond. With respect to that time scale, an a.c. voltage of power frequency has an essentially constant amplitude.

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