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

GB/T 3048.11-2025

Replacing GB/T 3048.11-2007

**Test methods for electrical properties of electric cables and
wires - Part 11: Test for dielectric dissipation factor**

电线电缆电性能试验方法 第11部分：介质损耗角正切试验

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents". Drafting.

This document is Part 11 of GB/T 3048 "Test Methods for Electrical Properties of Wires and Cables". GB/T 3048 has published the following... part.

- Part 1: General Provisions;
- Part 2: Resistivity Testing of Metallic Materials;
- Part 3: Volume Resistivity Tests for Semiconducting Rubber and Plastic Materials;
- Part 4: Conductor DC Resistance Test;
- Part 5: Insulation Resistance Test;
- Part 7: Tracking Resistance Test;
- Part 8: AC Voltage Test;
- Part 9: Spark Test of Insulated Wire Cores;
- Part 10: Spark Test for Extruded Sheaths;
- Part 11: Dielectric Loss Tangent Test;
- Part 12: Partial Discharge Tests;

- Part 13.Impulse Voltage Test;
- Part 14.DC Voltage Test;
- Part 16.Surface Resistance Test.

This document replaces GB/T 3048.11-2007 "Test Methods for Electrical Properties of Wires and Cables - Part 11.Dielectric Loss Tangent Test".

Compared with GB/T 3048.11-2007, the main technical changes in the "Test" are as follows, except for structural adjustments and editorial modifications.

- The frequency of the test power supply was changed (see 4.1.2, 2007 version 4.1.2);
- The ratio of peak to RMS test voltage has been changed (see 4.1.2, 2007 version 4.1.2);
- The measurement range and accuracy of $\tan\delta$ have been changed (see 4.2.1, 2007 version 4.2.1);
- Grounding resistance has been increased for different voltage levels (see 8.2).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Electrical Equipment Industry Association.

This document is under the jurisdiction of the National Technical Committee on Standardization of Wires and Cables (SAC/TC213).

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The release history of this document and the document it replaces is as follows.

- First published in 1965 as GB 767-1965, first revised in 1983 as GB 3048.11-1983, and revised again in 1994.

Revised to GB/T 3048.11-1994, and revised for the third time in 2007 to GB/T 3048.11-2007;

- This is the fourth revision.

Introduction

Wires and cables are widely used in power transmission and signal transmission, and

various types of products are available depending on the application scenario. Electrical performance is a key evaluation criterion.

GB/T 3048 is an important general indicator of the performance of electrical wires and cables, and is of great significance for ensuring the design and use objectives of electrical wires and cables.

GB/T 3048 establishes universal fundamental test methods applicable to the electrical performance testing of different types of wires and cables. It is proposed that these methods be developed by the following 14 departments. Composition.

- Part 1: General Provisions. This document aims to define the terminology, definitions, and general provisions for testing the electrical properties of wires and cables.
- Part 2: Resistivity Testing of Metallic Materials. The purpose is to specify the testing methods and requirements for the resistivity of metallic materials in wires and cables.
- Part 3: Volume Resistivity Test for Semiconducting Rubber and Plastic Materials. The purpose is to determine the volume resistivity of semiconducting rubber and plastic materials used in wires and cables.

Test methods and requirements for resistivity.

- Part 4: DC Resistance Test for Conductors. The purpose is to specify the test methods and requirements for the DC resistance of conductors in wires and cables.
- Part 5: Insulation Resistance Test. The purpose is to specify the test methods and requirements for the insulation resistance of wires and cables.
- Part 7: Tracking Resistance Test. The purpose is to specify the test methods and requirements for the tracking resistance of wires and cables.
- Part 8: AC Voltage Test. The purpose is to specify the test methods and requirements for AC voltage of wires and cables.
- Part 9: Spark Test of Insulated Cores. The purpose is to specify the test methods and requirements for spark testing of insulated cores in electrical wires and cables.
- Part 10: Spark Test for Extruded Sheaths. The purpose is to specify the test method and procedures for the spark test when extruding the corrosion-resistant sheath of wires and cables. Require.
- Part 11: Dielectric Loss Tangent Test. The purpose is to specify the test method for the dielectric loss tangent of wires and cables. Require.
- Part 12: Partial Discharge Tests. The purpose is to specify the test methods and requirements for partial discharge in wires and cables.
- Part 13: Impulse Voltage Test. The purpose is to specify the test methods and

requirements for impulse voltage of wires and cables.

- Part 14.DC Voltage Test. The purpose is to specify the test methods and requirements for DC voltage of wires and cables.

- Part 16.Surface Resistance Test. The purpose is to specify the test methods and requirements for the surface resistance of wires and cables.

Note. The original GB/T 3048 standard system had 16 parts, but GB/T 3048.5-2007 replaced GB/T 3048.5-1994 and GB/T 3048.6- GB/T 3048.9-2007 replaced GB/T 3048.9-1994 and GB/T 3048.15-1994, therefore the current GB/T 3048 standard system has fewer standards. Parts 6 and 15.

Electrical performance test methods for wires and cables Part 11.Dielectric Loss Tangent Test

1 Scope

This document describes the test method for the dielectric loss tangent of wires and cables, including test equipment, sample preparation, test procedure, and test results.

Results and calculations, test safety, and test records.

This document is applicable to measuring the dielectric loss tangent ($\tan\delta$) and capacitance of cables under power frequency AC voltage.

This document does not apply to the measurement of winding wire products.

2 Normative references

GB/T 2900.19

GB/T 3048.1

GB/T 3048.8-2025

3 Terms and Definitions

The terms and definitions defined in GB/T 2900.19 and GB/T 3048.1, as well as the following terms and definitions, apply to this document.

3.1 $\tan\delta$

A parameter characterizing the energy loss of cable insulation under an alternating electric field is the phase angle between the applied sinusoidal voltage and the current passing through the sample. Complementary angle tangent.