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

GB/T 5654-2007

Replacing GB/T 5654-1985

**Insulating liquids - Measurement of relative permittivity,
dielectric dissipation factor and d.c. resistivity**

液体绝缘材料 相对电容率、介质损耗因数和直流电阻率的测量

(English Translation)

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Foreword

This standard is identical with 60247 IEC .2004 "to measure the liquid insulating material of relative permittivity, dielectric dissipation factor and dc resistivity Amount "(in English).

For ease of use, this standard made the following editorial changes.

- a) use the decimal symbol '. 'Decimal symbol instead of' ';
- b) "this International Standard" be replaced by "this standard";

This standard replaces GB/T 5654-1985 "liquid insulating material frequency relative permittivity, dielectric loss tangent and volume resistivity measuring".

The main changes compared to 5654-1985 standard and GB/T as follows.

- a) The increase in the standard "Introduction" and "Normative References" section;
- b) DC resistivity measurements, the "liquid withstand the test voltage 200V ~ 300V/mm" to "test voltage should be Liquid withstand 250V/mm "; the power of time" 60s "to" 60s $\pm$ 2s "; the" Note the sample 15min after the start of measurement Quantity "to" no more than 10min Start Measurement ";
- c) This standard increased the Figs. 2, 3, 4, 5 in FIG.

This standard Annex A, Annex B, Annex C is informative appendix.

The standard proposed by China Electrical Equipment Industrial Association.

This standard by the National Standardization Technical Committee of the insulating material (SAC/TC51) centralized.

This standard was drafted. Guilin Institute of Electrical Science.

Introduction

Health and safety.

Warning. This standard does not address all the safety problems associated with the use of the use of this standard has the responsibility to establish appropriate health and safety Rules and prior to use is determined by the scope of application of the rules of limitation.

surroundings.

This standard will result in some of the insulating liquid, chemicals, used oil contaminated solids in the sample container and other issues, these items Disposal of the relevant regulations should be to reduce the environmental impacts and hazards, and should be ready every precaution to prevent these fluids due to desertion polluted environment.

GB/T 5654-2007/IEC 60247:2004 Liquid Insulation Materials Relative permittivity, dielectric loss factor and measure the DC resistivity

1 Scope

This standard specifies the method for measuring the dielectric loss factor at the test temperature of the liquid insulating material, the relative permittivity and dc resistivity.

This standard is not used as a reference test liquid, but also applies to the operation of transformers, cables and other electricians set Preparation of liquid. However, this standard applies only to single-phase liquid, and can be used to simplify the method described in Appendix C when measured as a routine method.

For non-insulated liquid hydrocarbons, it requires the use of other cleaning methods.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 1409-2006 solid insulating materials at power, audio, high-frequency (including meter wavelengths included) of the permittivity and dielectric loss due to Number recommended method (IEC 60250. 1969, MOD) GB/T 1410-2006 solid insulating material volume resistivity and surface resistivity test methods (IEC 60093. 1980, IDT) GB/T 21216-2007 insulating liquid measuring conductance and capacitance - Test methods for determining dielectric loss factor (IEC 61620:1998, IDT) IEC 60475 method for sampling liquid dielectrics

3 Terms and Definitions

The following terms and definitions apply to this standard.

The relative permittivity of the insulating material is filled with all the insulating material surrounding a capacitor between the two electrodes and two electrodes having a capacitance in a vacuum electric capacity ratio of the amount of C_0 C_x similar electrode structure.

The air electrode is used in place of the capacitance C_a C_0 , for the measurement of relative permittivity with sufficient accuracy.

Insulation material dielectric loss factor ($\tan\delta$) is the loss tangent of the angle.

When the capacitor dielectric insulating material composed of only one loss phase angle refers to the applied voltage and the resulting current between Deviates from π radian/2.

Note: The actual applications, $\tan\delta$ measured value is less than 0.005, $\tan\delta$ and power factor (PF) is substantially the same. Available a simple formula for converting the two into Line conversion. Power factor is the relationship between the loss sine of the angle, power factor and dielectric loss factor can be expressed among the following formula.

$PF = \tan\delta$

1+ ($\tan\delta$) Sang 2 (1) GB/T 5654-2007/IEC 60247:2004