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

GB/T 41633.3-2022

**Insulating liquids - Determination of acidity - Part 3: Test
methods for non-mineral insulating oils**

绝缘液体 酸值的测定 第3部分：非矿物绝缘油的试验方法

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Foreword

This document was issued on 8 November 2022 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 June 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 29.040.10, Chinese classification K15.

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document is part 3 of GB/T 41633 "Determination of Acid Value of Insulating Liquids". GB/T 41633 has issued the following parts.

--- Part 2. Colorimetric titration;

--- Part 3. Test methods for non-mineral insulating oils.

This document is identical to IEC 62021-3:2014 "Determination of Acid Value of Insulating Liquids Part 3. Test Method for Non-Mineral Insulating Oils"

Law".

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

This document is proposed by China Electrical Equipment Industry Association.

This document is under the jurisdiction of the National Standardization Technical Committee of Insulation Materials (SAC/TC51).

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Introduction

health and safety

This document is not intended to address all safety issues related to its use, and it is the user's responsibility to establish appropriate health

and safety rules to ensure the applicability of this document.

The mineral oil involved in this document should be protected by personal protection. If it comes into direct contact with the eyes, it may cause slight pain. If it comes into contact with the eyes, use

Flush eyes with plenty of clean running water and seek medical attention.

Some of the tests covered in this document may result in hazardous conditions. Please refer to the relevant guidance documents.

environment

This document will refer to mineral oil, chemicals and used sample containers. Relevant disposal should avoid impact on the environment, and various measures should be taken.

This preventive measure prevents minerals from polluting the environment.

The acid value measurement standard of insulating liquid is widely used in the research and development, production, quality inspection, sales, acceptance and technical exchange of insulating liquid products.

This series of standards can guide the industry to more effectively carry out the detection and evaluation of the acid value of insulating liquids, and can improve the quality and quality of insulating liquid products.

Application reliability.

The standards for the determination of the acid value of insulating liquids are written in different parts. In order to maintain the same writing method as the corresponding IEC standards,

When compiling this series of documents, different parts need to be compiled separately.

GB/T 41633 describes the standard method for the determination of the acid value of insulating liquids, which is proposed to consist of the following parts.

--- Part 1. Automatic potentiometric titration. The purpose is to determine the method and procedure for measuring the acid value of insulating liquid by automatic potentiometric

titration.

--- Part 2. Colorimetric titration. The purpose is to determine the method and procedure for measuring the acid value of insulating liquid by colorimetric titration.

--- Part 3. Test methods for non-mineral insulating oils. The purpose is to identify unused and used non-mineral insulating oleic acid for electrical purposes

There are two test methods for the value. automatic potentiometric titration and colorimetric titration.

Determination of acid value of insulating liquid

Part 3. Test methods for non-mineral insulating oils

1 Scope

GB/T 41633.3-2022 is the part of the GB/T 41633 series that covers the measurement of acidity in unused and used non-mineral insulating oils for electrical purposes, setting out two routes to the same figure. Method A is automatic potentiometric titration, taken from its principle through the reagents and auxiliary materials, the instrument, the sampling, the preparation and maintenance of the electrode, the calibration, the titration steps, the calculation of the result, the precision and the report. Method B is colorimetric titration, with its own principle, reagents, instruments, sampling, procedure, calculation, precision and report, for laboratories working without an automatic titrator. An informative annex adds determination by photometric titration. Acidity is what oxidation leaves behind: organic acids, phenolic compounds and other oxidation products accumulate as a fluid ages in service, attack the cellulose insulation and the metal parts around it, and give early notice that a charge of fluid is reaching the end of its useful life. Esters and other non-mineral fluids do not behave like mineral oil in a titration cell, so the electrode conditioning and the end-point judgement carried over from mineral-oil practice can drift or settle on a false end point. Written for insulating fluid laboratories, utility condition-monitoring teams, and the producers and reclaimers of non-mineral fluids.

This document describes two test methods for the acid value of unused and used non-mineral insulating oils for electrical purposes. potentiometric titration and colorimetry titration.

Note 1. In unused and used electrical non-mineral insulating oils, acidic components include organic acids, phenolic compounds, oxidation products, resins, organic gold

Salt and additives etc.

This document may be used to indicate the relative change that occurs during service of non-mineral insulating oils for electrical purposes under oxidizing conditions, regardless of their color