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

GB/T 44378-2024

Insulating liquids - Methods for counting and sizing particles

绝缘液体 颗粒计数和尺寸分类的方法

(English Translation)

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Table of Contents

Preface
1 Scope
2 Normative references
3 Terms and Definitions
4 General precautions, health, safety and environmental protection
5 Meaning
6 Comparison and limitations of methods
7 Types and identification of particles
8 Sampling
9 Preparation of samples for analysis
10 Method A---Automatic Particle Size Analyzer
11 Method B---Optical Microscopy
Appendix A (Informative) Using a Syringe as a Sampling Container
Appendix B (Informative) Calibration of Automatic Particle Counters
Reference

Foreword

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 modified to adopt IEC 60970:2007 "Methods for counting and sizing particles of insulating liquids".

This document has made the following structural adjustments compared to IEC 60970:2007.

--- Added Chapter 3 "Terms and Definitions", and the article numbers of other chapters are postponed accordingly.

The technical differences between this document and IEC 60970:2007 and their reasons are as follows.

--- ISO 4406 (see 10.8) has been replaced by the normative reference GB/T 14039 to adapt to my country's technical conditions and increase operability Sex;

--- The normative reference GB/T 41146 replaces IEC 60475 (see 8.4) to adapt to my

country's technical conditions and increase operability Sexuality;

--- Replaced ISO 4407 (see 11.2, 11.3) with the normative reference GB/T 20082 to adapt to my country's technical conditions, and added Operability.

1 Scope

This document describes sampling procedures and methods for the determination of particle concentration and particle size distribution.

This document recommends three methods, one is an automatic particle size analyzer working on the light shielding principle, and the other two are optical microscopy.

The optical microscope counts the particles on the filter membrane surface under transmitted light or incident light. The optical microscope method is specified in GB/T 20082.

The above three methods are applicable to particle testing of used and unused insulating liquids.

Appendix A provides a reference sampling procedure using a syringe as the sampling container.

Appendix B provides a reference method for calibrating automatic particle counters.

Note 1: This method is not used to determine particulate matter in oily sludge liquids. For analysis of particulate matter in oily sludge liquids, please refer to Appendix C of IEC 60422:2013.

Determination of sediment and sludge in oil.

NOTE 2 The methods specified are applicable only within certain limits for sizes and quantities.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 14039 Hydraulic transmission fluid solid particle contamination level code (GB/T 14039-2002, ISO 4406:1999, MOD) GB/T 20082 Hydraulic transmission fluid contamination method for determining particle contamination using an optical microscope (GB/T 20082-2006, ISO 4407:2002, IDT) GB/T 41146 Sampling method for insulating liquids (GB/T 41146-2021, IEC 60475:2011, IDT) ISO 5884 Methods for systematic sampling and measurement of solid particle contamination in hydraulic fluids for aerospace fluid systems and components (Aero-

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 General precautions, health, safety and environmental protection

This document does not purport to address all safety concerns associated with its use. It is the responsibility of the user of this document to develop appropriate safety precautions prior to use.

Applicable health and safety regulations and determine the applicability of regulatory restrictions.

When handling the insulating liquids mentioned in this document, personal hygiene protection should be observed. Direct contact with eyes may cause irritation.

In case of contact with eyes, rinse with plenty of clean running water and seek medical advice. Some of the test steps specified in this document may