

ICS 29.040
CCS K 15



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

GB/T 45942-2025

**Mineral oil-filled electrical equipment - Application of dissolved
gas analysis (DGA) to factory tests on electrical equipment**

填充矿物油的电气设备 溶解气体分析(DGA)在电气设备工厂试验中的应用

(English Translation)

Issued on: August 1, 2025

Implemented on: February 1, 2026

**Issued by: State Administration for Market Regulation, Standardization
Administration of China**

Table of Contents

Preface
1 Scope
2 Normative references
3 Terms and Definitions
4 General Precautions, Health, Safety and Environmental Protection
5 Sampling
5.1 General Principles
5.2 Sample container
5.3 Sampling location
5.4 Sampling frequency
5.5 Sample Label
5.6 Sample Storage
5.7 Waste Oil Treatment
6 Factors affecting gas production rate in plant tests
7 Dissolved gas degassing and analysis
8 Test Results
8.1 Repeatability r
8.2 Reproducibility R
8.3 Accuracy
9 Report
References

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 modifies IEC 61181:2012 "Dissolved Gas Analysis (DGA) in Mineral Oil-Filled Electrical Equipment for Electrical Equipment Operation".

Application in factory tests.

This document has the following structural adjustments compared to IEC 61181:2012.

--- Added Chapter 3 "Terms and Definitions" and the numbers of other chapters and articles

shall be postponed accordingly;

---5.4.1 and 5.4.2 correspond to 4.4.1 of IEC 61181:2012, and 5.4.3 corresponds to 4.4.2 of IEC 61181:2012;

--- Added Chapter 8 "Test Results";

--- Chapter 9 corresponds to Chapter 7 of IEC 61181:2012.

The technical differences between this document and IEC 61181:2012 and their reasons are as follows.

--- The content of "Scope" has been reorganized to meet the needs of technical content (see Chapter 1);

--- Added the terms "factory test" (see 3.1), "insulation test" (see 3.2) and "overcurrent test" (see 3.3) and their definitions to meet the requirements.

Meet the needs of technical content;

--- Replaced IEC 60475:2011 (see 5.1 and 5.2) with the normative reference GB/T 41146, and changed the content of the sampling location (See 5.3) to adapt to my country's technical conditions and improve operability;

--- Changed the content of sampling frequency (see 5.4.1 and 5.4.2) to adapt to my country's technical conditions and improve operability;

--- Deleted the last paragraph of Chapter 5 in IEC 61181:2012 to adapt to my country's technical conditions and improve operability;

--- Deleted the column with concentration unit of $\mu\text{mol/L}$ in Table 1 to adapt to my country's technical conditions and improve operability;

--- Added the normative reference GB/T 7597, changed the content of dissolved gas degassing and analysis, and made adjustments to the oil sample storage time.

Modifications have been made to adapt to my country's technical conditions and improve operability (see Chapter 7);

--- Added the normative reference GB/T 17623 and changed the minimum detection concentration requirement to adapt to my country's technical conditions.

High operability (see Chapter 7);

--- Added Chapter 8 "Test Results", which specifies the repeatability, reproducibility and accuracy requirements of the test, and deleted IEC 61181.

Chapter 6 on repeatability and accuracy in 2012 was revised to adapt to my country's technical conditions and improve operability;

--- The unit of DGA results " $\mu\text{mol/L}$ " in Chapter 9 has been deleted to adapt to my country's

technical conditions and improve operability.

The following editorial changes have been made to this document.

--- Added the informative reference GB/T 1094.2-2013, clarified the calculation method of gas production rate, to adapt to my country's technical conditions components to improve operability (see Chapter 6);

--- Deleted Annex A (informative) and Annex B (informative) of IEC 61181:2012.

1 Scope

This document specifies the requirements for factory testing of new electrical equipment filled with mineral insulating oil (such as power transformers, reactors and instrument transformers).

The sampling procedures, analysis requirements and steps for dissolved gas analysis in oil are also specified, as are the sensitivity, repeatability and accuracy requirements.

This document applies to temperature rise test, overcurrent test, long time no-load test and insulation test of power transformers and reactors, as well as mutual Impact test of sensors.

2 Normative references

The contents of the following documents constitute the 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 7597 Sampling method for power oil (transformer oil, turbine oil) GB/T 17623 Gas chromatography method for determination of dissolved gas components in insulating oil GB/T 41146 Sampling Methods for Insulating Liquids (GB/T 41146-2021, IEC 60475:2011, IDT) IEC 60567:2023 Guidelines for sampling gases and analysis of free and dissolved gases in oil-filled electrical equipment

3 Terms and Definitions

The following terms and definitions apply to this document.

factory tests

All tests on electrical equipment before leaving the factory.

Insulation tests

A test to assess the insulation withstand strength of electrical equipment.

Note: It includes operating impulse test, lightning impulse test, externally applied voltage withstand test and induced voltage test.

Overcurrent tests

A thermal load test exceeding the rated current, generally taking the current as 1.05 to 1.1 times the rated current.

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 user's responsibility to develop appropriate health and safety measures and determine the applicability of regulatory restrictions.