

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Method of sampling insulating liquids

Méthode d'échantillonnage des liquides isolants



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

METHOD OF SAMPLING INSULATING LIQUIDS

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60475 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications.

This second edition cancels and replaces the first edition, published in 1974, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- since the publication of the first edition of this standard, askarels have been banned and therefore have been withdrawn from this second edition;
- recommendations concerning general health, safety and environmental protection have been added as an Introduction;
- the first edition was mainly about sampling from drums and tank cars. This second edition addresses in more detail the sampling of oil from electrical equipment, using various types of sampling devices appropriate for the different types of oil tests to be performed in the laboratory, including dissolved gas analysis (DGA).

The text of this standard is based on the following documents:

FDIS	Report on voting
10/848/FDIS	10/871/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

General caution, health, safety and environmental protection

This International Standard does not purport to address all the safety problems associated with its use. It is the responsibility of the user of the standard to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

The insulating oils which are the subject of this standard should be handled with due regard to personal hygiene. Direct contact with the eyes may cause irritation. In the case of eye contact, irrigation with copious quantities of clean running water should be carried out and medical advice sought. Some of the tests specified in this standard involve the use of processes that could lead to a hazardous situation. Attention is drawn to the relevant standard for guidance.

Environment

This standard is applicable to mineral oils and non-mineral oils, chemicals and used sample containers.

Attention is drawn to the fact that, some mineral oils in service may still be contaminated to some degree by PCBs. If this is the case, safety countermeasures should be taken to avoid risks to workers, the public and the environment during the life of the equipment, by strictly controlling spills and emissions. Disposal or decontamination of these oils should be carried out strictly according to local regulations. Every precaution should be taken to prevent release of mineral oil and non-mineral oil into the environment.

METHOD OF SAMPLING INSULATING LIQUIDS

1 Scope

This International Standard is applicable to the procedure to be used for insulating liquids in delivery containers and in electrical equipment such as power and instrument transformers, reactors, bushings, oil-filled cables, oil-filled tank-type capacitors, switchgear and load tap changers (LTCs).

This standard applies to liquids the viscosity of which at the sampling temperature is less than 1 500 mm²/s (or cSt). It applies to mineral oils and non-mineral oils (such as synthetic esters, natural esters, vegetable oils or silicones).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60567:2011, *Oil-filled electrical equipment – Sampling of gases and analysis of free and dissolved gases – Guidance*

IEC 60970, *Insulating liquids – Methods for counting and sizing particles*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

delivery containers

containers such as drums, rail tankers, road tankers or flexible plastic bags used to store, transport and deliver batches of oil

3.2

electrical equipment

equipment filled with insulating oil such as power and instrument transformers, reactors, bushings, oil-filled cables, oil-filled tank-type capacitors, switchgear and load tap changers (LTCs)

3.3

sampling equipment

equipment used for sampling oil from delivery containers (e.g. sampling probes, such as dippers or siphons) and from electrical equipment (e.g. connecting tubing and drain valve adapters)

NOTE This also includes sample containers, waste oil containers and other accessories.

3.4

sample containers

containers such as syringes, bottles, ampoules or other devices used to store and transport samples of oil for analysis