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colour inside

Method of sampling insulating liquids

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ELECTROTECHNICAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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METHOD OF SAMPLING INSULATING LIQUIDS

FOREWORD

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This commented version (CMV) of the official standard IEC 60475:2022 edition 3.0 allows the user to identify the changes made to the previous IEC 60475:2011 edition 2.0. Futhermore, comments from IEC TC 10 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60475 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications. It is an International Standard.

This third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) addition of a new Annex C on sampling of oil from bushings, at the request of IEC subcommittee 36A, in order to transfer to IEC 60475 the corresponding contents of IEC TR 61464 relating to oil sampling from bushings;
b) deletion of NOTE 2 in 4.2.1.2.

The text of this International Standard is based on the following documents:

Draft	Report on voting
10/1163/FDIS	10/1173/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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INTRODUCTION

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WARNING – This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document 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 document should be handled with due regard to personal hygiene. Direct contact with the eyes ~~may~~ can 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 document involve the use of processes that could lead to a hazardous situation. Attention is drawn to the relevant standard for guidance.

~~**Environment**~~

This document 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~~ can 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. The disposal or decontamination of these oils ~~should be carried out strictly according to local regulations~~ can be subject to regulatory requirements with regard to their impact on the environment. 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 document is applicable to the sampling 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 document applies to liquids the viscosity of which at the sampling temperature is less than 1 500 mm^2/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 are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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*

IEC 60475

Edition 3.0 2022-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Method of sampling insulating liquids

Méthode d'échantillonnage des liquides isolants



IEC 60475:2022-05(en-fr)

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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MÉTHODE D'ÉCHANTILLONNAGE DES LIQUIDES ISOLANTS

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Cette troisième édition annule et remplace la deuxième édition parue en 2011. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) ajout de la nouvelle Annexe C sur l'échantillonnage de l'huile dans les traversées, à la demande du sous-comité de l'IEC 36A, afin de transférer vers l'IEC 60475 le contenu correspondant de l'IEC TR 61464 relatif à l'échantillonnage de l'huile dans les traversées;
b) suppression de la NOTE 2 du 4.2.1.2.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
10/1163/FDIS	10/1173/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

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INTRODUCTION

Précautions générales, protection de la santé, de la sécurité et de l'environnement

AVERTISSEMENT – Le présent document ne vise pas à répondre à tous les problèmes de sécurité liés à son utilisation. L'utilisateur du présent document a la responsabilité de mettre en place les pratiques d'hygiène et de sécurité adéquates et de vérifier avant utilisation si des contraintes réglementaires s'appliquent.

Il convient de manipuler les huiles isolantes dont traite le présent document en respectant l'hygiène personnelle. Le contact direct avec les yeux peut provoquer une irritation. En cas de contact oculaire, il convient d'effectuer un lavage avec une grande quantité d'eau courante propre et de consulter un médecin. Certains des essais spécifiés dans le présent document impliquent des processus pouvant conduire à une situation dangereuse. L'attention est portée sur les normes correspondantes à titre de recommandation.

Le présent document s'applique aux huiles minérales et non minérales, aux produits chimiques et aux récipients d'échantillonnage usagés.

L'attention est attirée sur le fait que certaines huiles minérales en service peuvent toujours être contaminées dans une certaine mesure par des PCB. Si c'est le cas, il convient de prendre des contre-mesures de sécurité afin d'éviter les risques pour les travailleurs, le public et l'environnement au cours de la durée de vie de l'appareil, en contrôlant rigoureusement les débordements et les émissions. L'élimination ou la décontamination de ces huiles peut être soumise à des exigences réglementaires vis-à-vis de leur impact environnemental. Il convient de prendre toutes les précautions afin d'empêcher un déversement d'huile minérale et non minérale dans l'environnement.

MÉTHODE D'ÉCHANTILLONNAGE DES LIQUIDES ISOLANTS

1 Domaine d'application

Le présent document s'applique à la procédure d'échantillonnage utilisée pour les liquides isolants dans les récipients de livraison et les matériels électriques tels que les transformateurs de puissance et de mesure, les réactances, les traversées, les câbles à huile fluide, les condensateurs de puissance en huile, les appareillages de connexion et les changeurs de prises en charge (LTC - load tap changer).

Le présent document s'applique aux liquides dont la viscosité, à la température d'échantillonnage, est inférieure à 1 500 mm^2/s (ou cSt). Il concerne les huiles minérales et non minérales (les esters synthétiques, les esters naturels ou les huiles végétales et les liquides silicones, par exemple).

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60567:2011, *Matériels électriques immergés – Échantillonnage de gaz et analyse des gaz libres et dissous – Lignes directrices*

IEC 60970, *Isolants liquides – Méthodes de détermination du nombre et de la taille des particules*