



SLOVENSKI STANDARD SIST EN IEC 60475:2022

01-september-2022

Nadomešča:
SIST EN 60475:2012

Metoda vzorčenja izolacijskih tekočin

Method of sampling insulating liquids

Verfahren zur Probennahme von Isolierflüssigkeiten

Méthode d'échantillonnage des liquides isolants

Ta slovenski standard je istoveten z: **EN IEC 60475:2022**

ICS:

29.040.01 Izolacijski fluidi na splošno Insulating fluids in general

SIST EN IEC 60475:2022

en

EUROPEAN STANDARD

EN IEC 60475

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2022

ICS 29.040.10

Supersedes EN 60475:2011

English Version

**Method of sampling insulating liquids
(IEC 60475:2022)**Méthode d'échantillonnage des liquides isolants
(IEC 60475:2022)Verfahren zur Probennahme von Isolierflüssigkeiten
(IEC 60475:2022)

This European Standard was approved by CENELEC on 2022-06-29. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 60475:2022 (E)**European foreword**

The text of document 10/1163/FDIS, future edition 3 of IEC 60475, prepared by IEC/TC 10 "Fluids for electrotechnical applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60475:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-03-29
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-06-29

This document supersedes EN 60475:2011 and all of its amendments and corrigenda (if any).

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|---|--------------|-------------|
| IEC 60567 | 2011 | Oil-filled electrical equipment - Sampling of gases and analysis of free and dissolved gases - Guidance | EN 60567 | 2011 |
| IEC 60970 | - | Insulating liquids - Methods for counting and sizing particles | EN 60970 | - |

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IEC 60475

Edition 3.0 2022-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Method of sampling insulating liquids

Méthode d'échantillonnage des liquides isolants

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.040.10

ISBN 978-2-8322-3484-6

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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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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.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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

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INTRODUCTION

General caution, health, safety and environmental protection

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 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.

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 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 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.

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METHOD OF SAMPLING INSULATING LIQUIDS

1 Scope

This document is applicable to the sampling procedure 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 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 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*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1 delivery container

container used to store, transport and deliver batches of oil

EXAMPLE Drum, rail tanker, road tanker, flexible plastic bag.

3.2 electrical equipment

equipment filled with insulating oil

EXAMPLE 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 1 to entry: Sampling equipment also includes sample containers, waste oil containers and other accessories.