IEC 61125

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Insulating liquids – Test methods for oxidation stability
Test method for evaluating the oxidation stability of insulating liquids in the delivered state

Isolants liquides – Méthodes d'essai de la stabilité à l'oxydation
Méthode d'essai pour évaluer la stabilité à l'oxydation des isolants liquides tels que livrés

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INSULATING LIQUIDS – TEST METHODS FOR OXIDATION STABILITY

Test method for evaluating the oxidation stability of insulating liquids in the delivered state

FOREWORD

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International Standard IEC 61125 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications.

This second edition cancels and replaces the first edition published in 1992 and Amendment 1:2004. This edition constitutes a technical revision.

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

a) the title has been modified to include insulating liquids different from mineral insulating oils (hydrocarbon);
b) the method applies for insulating liquids in the delivered state;
c) former Method C is now the main normative method;
d) precision data of the main normative method has been updated concerning the dissipation factor;

e) former Method A has been deleted;

f) former Method B has been transferred to Annex B;

g) a new method evaluating the thermo-oxidative behaviour of esters is included in Annex C.

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

FDIS	Report on voting
10/1047/FDIS	10/1052/RVD

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

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

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

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- withdrawn,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

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INSULATING LIQUIDS – TEST METHODS FOR OXIDATION STABILITY

Test method for evaluating the oxidation stability of insulating liquids in the delivered state

1 Scope

This document describes a test method for evaluating the oxidation stability of insulating liquids in the delivered state under accelerated conditions regardless of whether or not antioxidant additives are present. The duration of the test can be different depending on the insulating liquid type and is defined in the corresponding standards (e.g. in IEC 60296, IEC 61099, IEC 62770). The method can be used for measuring the induction period, the test being continued until the volatile acidity significantly exceeds 0,10 mg KOH/g in the case of mineral oils. This value can be significantly higher in the case of ester liquids.

The insulating liquid sample is maintained at 120 °C in the presence of a solid copper catalyst whilst bubbling air at a constant flow. The degree of oxidation stability is estimated by measurement of volatile acidity, soluble acidity, sludge, dielectric dissipation factor, or from the time to develop a given amount of volatile acidity (induction period with air).

In informative Annex B, a test method for evaluating the oxidation stability of inhibited mineral insulating oils in the delivered state by measurement of the induction period with oxygen is described. The method is only intended for quality control purposes. The results do not necessarily provide information on the performance in service. The oil sample is maintained at 120 °C in the presence of a solid copper catalyst whilst bubbling through a constant flow of oxygen. The degree of oxidation stability is estimated by the time taken by the oil to develop a determined amount of volatile acidity (induction period with oxygen). Additional criteria such as soluble and volatile acidities, sludge and dielectric dissipation factor can also be determined after a specified duration.

In informative Annex C, a test method intended to simulate the thermo-oxidative behaviour of ester insulating liquids (headspace of air at 150 °C for 164 h) is described.

Additional test methods such as those described in IEC TR 62036 based on differential scanning calorimetry can also be used as screening tests, but are out of the scope of this document.

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 60247, *Insulating liquids – Measurement of relative permittivity, dielectric dissipation factor (tan δ) and d.c. resistivity*

IEC 62021-2, *Insulating liquids – Determination of acidity – Part 2: Colorimetric titration*

IEC 62021-3, *Insulating liquids – Determination of acidity – Part 3: Test methods for non-mineral insulating oils*