SVENSK STANDARD SS-EN IEC 61125

Fastställd	Utgåva	Sida	Ansvarig kommitté
2018-10-17	2	1 (1+29)	SEK TK 10

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Isolervätskor –
Metod för bestämning av oxidationsstabiliteten hos isolervätskor

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

Som svensk standard gäller europastandarden EN IEC 61125:2018. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 61125:2018.

Nationellt förord

Europastandarden EN IEC 61125:2018

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61125, Second edition, 2018 - Insulating liquids - Test methods for oxidation stability - Test method for evaluating the oxidation stability of insulating liquids in the delivered state**

utarbetad inom International Electrotechnical Commission, IEC.

EN från CENELEC som är identiska med motsvarande IEC-standarder och som görs tillgängliga för nationalkommittéerna efter den 1 januari 2018 får en beteckning som inleds med EN IEC istället för som tidigare bara EN.

Tidigare fastställd svensk standard SS-EN 61125, utgåva 1, 1993 och SS-EN 61125/A1, utgåva1, 2004, gäller ej fr o m 2021-02-16.

ICS 29.040.10

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Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

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Var med och påverka!

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61125

March 2018

ICS 29.040.10

Supersedes EN 61125:1993

English Version

Insulating liquids - Test methods for oxidation stability - Test method for evaluating the oxidation stability of insulating liquids in the delivered state (IEC 61125:2018)

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 (IEC 61125:2018)

Isolierflüssigkeiten - Prüfverfahren für die Oxidationsbeständigkeit - Prüfverfahren zur Evaluierung der Oxidationsbeständigkeit von neuen Isolierflüssigkeiten (IEC 61125:2018)

This European Standard was approved by CENELEC on 2018-02-16. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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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

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Ref. No. EN IEC 61125:2018 E

SEK Svensk Elstandard

SS-EN IEC 61125, utg 2:2018

European foreword

The text of document 10/1047/FDIS, future edition 2 of IEC 61125, prepared by IEC/TC 10 "Fluids for electrotechnical applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61125:2018.

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)	2018-11-16
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2021-02-16

This document supersedes EN 61125:1993 and EN 61125:1993/A1:2004.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61125:2018 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60296	NOTE	Harmonized as EN 60296.
IEC 60666	NOTE	Harmonized as EN 60666.
IEC 61099	NOTE	Harmonized as EN 61099.
IEC 62021-1	NOTE	Harmonized as EN 62021-1.
IEC 62770	NOTE	Harmonized as EN 62770.

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.

Publication	Year	Title	EN/HD	Year
IEC 60247	-	Insulating liquids - Measurement of relative permittivity, dielectric dissipation factor (tan δ) and d.c. resistivity	EN 60247	-
IEC 62021-2	-	Insulating liquids - Determination of acidity - Part 2: Colourimetric titration	EN 62021-2	-
IEC 62021-3	-	Insulating liquids - Determination of acidity - Part 3: Test methods for non-mineral insulating oils	EN 62021-3	-
IEC 60422	2013	Mineral insulating oils in electrical equipment - Supervision and maintenance guidance	EN 60422	2013
ISO 383	-	Laboratory glassware; Interchangeable conical ground joints	-	-
ISO 4793	-	Laboratory sintered (fritted) filters; Porosity grading, classification and designation	-	-
ISO 6344-1	-	Coated abrasives - Grain size analysis - Part 1: Grain size distribution test	-	-
ISO 3104	-	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity	EN ISO 3104	-
ASTM E287	-	Standard specification for laboratory glass graduated burets	-	-

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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

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 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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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*

IEC 60422:2013, *Mineral insulating oils in electrical equipment – Supervision and maintenance guidance*

ISO 383, *Laboratory glassware – Interchangeable conical ground joints*

ISO 4793, *Laboratory sintered (fritted) filters – Porosity grading, classification and designation*

ISO 6344-1, *Coated abrasives – Grain size analysis – Part 1: Grain size distribution test*

ISO 3104, *Petroleum products – Transparent and opaque liquids – Determination of kinematic viscosity and calculation of dynamic viscosity*

ASTM E287, *Standard specification for laboratory glass graduated burets*