



SLOVENSKI STANDARD

SIST EN 62021-3:2015

01-maj-2015

Izolacijske tekočine - Ugotavljanje kislosti - 3. del: Metode za preskušanje nemineralnih (sintetičnih) izolacijskih olj (IEC 62021-3:2014)

Insulating liquids - Determination of acidity - Part 3: Test methods for non mineral insulating oils (IEC 62021-3:2014)

Isolierflüssigkeiten - Bestimmung des Säuregehaltes - Teil 3: Prüfverfahren für Isolieröle auf Nichtmineralölbasis

Liquides isolants - Détermination de l'acidité - Partie 3: Méthode d'essai pour les huiles non minérales isolantes

ITeh STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015>

Ta slovenski standard je istoveten z: EN 62021-3:2014

ICS:

29.040.10 Izolacijska olja Insulating oils

SIST EN 62021-3:2015

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62021-3:2015

<https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015>

EUROPEAN STANDARD

EN 62021-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2014

ICS 29.040.10

English Version

Insulating liquids - Determination of acidity - Part 3: Test methods for non mineral insulating oils (IEC 62021-3:2014)

Liquides isolants - Détermination de l'acidité - Partie 3:
Méthode d'essai pour les huiles non minérales isolantes
(CEI 62021-3:2014)

Isolierflüssigkeiten - Bestimmung des Säuregehaltes - Teil
3: Prüfverfahren für Isolieröle auf Nichtmineralölbasis
(IEC 62021-3:2014)

This European Standard was approved by CENELEC on 2014-04-23. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 10/936/FDIS, future edition 1 of IEC 62021-3, prepared by IEC TC 10 "Fluids for electrotechnical applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62021-3:2014.

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) 2015-05-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-04-23

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

Endorsement notice

The text of the International Standard IEC 62021-3:2014 was approved by CENELEC as a European Standard without any modification.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 62021-3:2015](https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015)

<https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When 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 60475	-	Method of sampling insulating liquids	EN 60475	-
ISO 5725	series	Accuracy (trueness and precision) of measurement methods and results	-	series
ISO 6619	-	Petroleum products and lubricants; neutralization number; potentiometric titration method	-	-

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 62021-3:2015](https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015)

<https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62021-3:2015

<https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015>



IEC 62021-3

Edition 1.0 2014-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

**Liquides isolants – Détermination de l'acidité –
Partie 3: Méthodes d'essai pour les huiles non minérales isolantes**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

T

ICS 29.040.10

ISBN 978-2-8322-1404-6

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	7
4 Method A: Automatic potentiometric titration.....	8
4.1 Principle	8
4.2 Reagents and auxiliary products	8
4.2.1 Reagents	8
4.2.2 Titration reagent	8
4.2.3 Titration solvent.....	8
4.2.4 Potassium hydrogen phthalate, primary standard.....	9
4.2.5 Reference electrode electrolyte	9
4.2.6 Aqueous buffer solutions	9
4.2.7 Glass electrode cleaning solution	9
4.3 Apparatus	9
4.3.1 Potentiometric titration apparatus	9
4.3.2 Glass indicator electrode	9
4.3.3 Reference electrode	10
4.3.4 Stirrer	10
4.3.5 Titration vessel.....	10
4.3.6 Titration stand	10
4.4 Sampling.....	10
4.5 Preparation and maintenance of electrode system	10
4.5.1 Preparation.....	10
4.5.2 Maintenance	10
4.6 Calibration	11
4.6.1 Calibration of pH titrimeter.....	11
4.6.2 Settings for the potentiometric instrument.....	11
4.7 Procedure	12
4.7.1 General	12
4.7.2 Standardization of alcoholic potassium hydroxide solution	12
4.7.3 Blank titration	13
4.7.4 Sample titration	13
4.8 Calculation of result	14
4.9 Precision.....	14
4.9.1 Repeatability	14
4.9.2 Reproducibility.....	14
4.10 Report.....	15
5 Method B: Colourimetric titration.....	15
5.1 Principle	15
5.2 Reagents	15
5.2.1 General	15
5.2.2 Titration reagent	15
5.2.3 Titration solvent.....	16
5.2.4 Potassium hydrogen phthalate, primary standard.....	16

5.2.5	Standard hydrochloric acid solution	16
5.2.6	Alkali blue 6B indicator solution	16
5.2.7	Cobalt nitrate solution.....	16
5.3	Apparatus	16
5.3.1	Titration vessel	16
5.3.2	Stirrer	16
5.3.3	Burette	16
5.4	Sampling.....	16
5.5	Procedure	17
5.5.1	General	17
5.5.2	Standardization of alcoholic potassium hydroxide solution	17
5.5.3	Blank titration	17
5.5.4	Sample titration	18
5.6	Calculation of result	18
5.7	Precision.....	18
5.7.1	Repeatability	18
5.7.2	Reproducibility.....	19
5.8	Report.....	19
Annex A (informative) Determination of acidity in non-mineral electrical insulating oils by photometric titration		20
A.1	Principle	20
A.2	Reagents and solvents.....	20
A.3	Preparation of titration solutions and solvents	20
A.3.1	Potassium hydroxide alcoholic solution (0,01 mol/l)	20
A.3.2	Potassium hydrogen phthalate solution (0,01 mol/l)	20
A.3.3	Titration solvent	21
A.4	Apparatus	21
A.4.1	Volumetric titrator	21
A.4.2	Titration vessel	21
A.4.3	Titration stand	21
A.4.4	Stirrer	21
A.4.5	Recorder/printer	21
A.4.6	Photometric sensor.....	21
A.5	Sampling.....	22
A.6	Procedure	22
A.6.1	Preparation and maintenance of the titration system.....	22
A.6.2	Determination of acidity of the titration solvent (blank titration)	22
A.6.3	Determination of molarity of the potassium hydroxide alcoholic solution (0,01 mol/l)	22
A.6.4	Titration of soluble acidity in the oil sample.....	23
A.7	Calculation of result	23
A.8	Report.....	23
Figure 1 – Potentiometric titration curve.....		12
Figure A.1 – Molecular structure of para-naphtholbenzein indicator in a) acidic media and b) basic media		24
Figure A.2 – UV spectra of para-naphtholbenzein indicator in toluene/2-propanol/water solution in acidic media (curve a) and basic media (curve b).....		24

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INSULATING LIQUIDS – DETERMINATION OF ACIDITY –

Part 3: Test methods for non-mineral insulating oils

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62021-3 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications.

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

FDIS	Report on voting
10/936/FDIS	10/942/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.

A list of all parts in the IEC 62021 series, published under the general title *Insulating liquids – Determination of acidity*, can be found on the IEC website.

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.

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 publication using a colour printer.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62021-3:2015

<https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015>

INTRODUCTION

Health and safety

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 liquids which are the subject of this standard should be handled with due regard to personal hygiene. Direct contact with the eyes may cause slight 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 procedures referenced 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 involves non-mineral insulating oils, chemicals, used sample containers and fluid-contaminated solids. The disposal of these items should be carried out according to local regulations with regard to their impact on the environment. Every precaution should be taken to prevent the release into the environment of these oils.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[SIST EN 62021-3:2015](https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015)

<https://standards.iteh.ai/catalog/standards/sist/7f90caa4-1737-4298-b8a5-e9099d6d3463/sist-en-62021-3-2015>