



SLOVENSKI STANDARD SIST EN IEC 62770:2025

01-januar-2025

Tekočine za elektrotehniko - Neuporabljeni naravni estri za transformatorje in podobno električno opremo

Fluids for electrotechnical applications - Unused natural esters for transformers and similar electrical equipment

Flüssigkeiten für elektrotechnische Anwendungen - Neue natürliche Ester für Transformatoren und ähnliche elektrische Betriebsmittel

Fluides pour applications électrotechniques - Esters naturels neufs pour transformateurs et matériels électriques analogues

Ta slovenski standard je istoveten z: EN IEC 62770:2024

[SIST EN IEC 62770:2025](https://standards.sist.si/standards/sist/62770/25/62770-2025)

<https://standards.sist.si/standards/sist/62770/25/62770-2025>

ICS:

29.040.01	Izolacijski fluidi na splošno	Insulating fluids in general
29.180	Transformatorji. Dušilke	Transformers. Reactors

SIST EN IEC 62770:2025

en

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN IEC 62770

November 2024

ICS 29.040.01

Supersedes EN 62770:2014

English Version

**Fluids for electrotechnical applications - Unused natural esters
for transformers and similar electrical equipment
(IEC 62770:2024)**

Fluides pour applications électrotechniques - Esters
naturels neufs pour transformateurs et matériels électriques
analogues
(IEC 62770:2024)

Flüssigkeiten für elektrotechnische Anwendungen - Neue
natürliche Ester für Transformatoren und ähnliche
elektrische Betriebsmittel
(IEC 62770:2024)

This European Standard was approved by CENELEC on 2024-11-12. 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/801a064f-680c-49d7-ac61-d94441c1ac07/sist-en-iec-62770-2025>



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 62770:2024 (E)

European foreword

The text of document 10/1215/FDIS, future edition 2 of IEC 62770, prepared by TC 10 "Fluids for electrotechnical applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62770:2024.

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) 2025-11-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2027-11-30

This document supersedes EN 62770:2014 and all of its amendments and corrigenda (if any).

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.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62770:2024 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 standard indicated:

- IEC 60076-14 NOTE Approved as EN 60076-14
- IEC 60296 NOTE Approved as EN IEC 60296
- IEC 60422 NOTE Approved as EN IEC 60422
- IEC 61039 NOTE Approved as EN 61039
- IEC 61099 NOTE Approved as EN 61099
- IEC 61868 NOTE Approved as EN 61868
- IEC 63012 NOTE Approved as EN IEC 63012

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.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60156	-	Insulating liquids - Determination of the breakdown voltage at power frequency - Test method	EN IEC 60156	-
IEC 60247	-	Insulating liquids - Measurement of relative permittivity, dielectric dissipation factor (tan d) and d.c. resistivity	EN 60247	-
IEC 60475	-	Method of sampling insulating liquids	EN IEC 60475	-
IEC 60666	-	Detection and determination of specified additives in mineral insulating oils	EN 60666	-
IEC 60814	-	Insulating liquids - Oil-impregnated paper and pressboard - Determination of water by automatic coulometric Karl Fischer titration	EN 60814	-
IEC 61125	-	Insulating liquids - Test methods for oxidation stability - Test method for evaluating the oxidation stability of insulating liquids in the delivered state	EN IEC 61125	-
IEC 61198	-	Mineral insulating oils - Methods for the determination of 2-furfural and related compounds	EN 61198	-
IEC 61619	-	Insulating liquids - Contamination by polychlorinated biphenyls (PCBs) - Method of determination by capillary column gas chromatography	EN 61619	-
IEC 61620	-	Insulating liquids - Determination of the dielectric dissipation factor by measurement of the conductance and capacitance - Test method	EN 61620	-
IEC 62021-3	-	Insulating liquids - Determination of acidity - Part 3: Test methods for non-mineral insulating oils	EN 62021-3	-

EN IEC 62770:2024 (E)

IEC 62535	-	Insulating liquids - Test method for detection of potentially corrosive sulphur in used and unused insulating oil	EN 62535	-
IEC 62697-1	-	Test methods for quantitative determination of corrosive sulfur compounds in unused and used insulating liquids - Part 1: Test method for quantitative determination of dibenzylidissulfide (DBDS)	EN 62697-1	-
ISO 2049	-	Petroleum products - Determination of colour (ASTM scale)	-	-
ISO 2592	-	Petroleum and related products - Determination of flash and fire points - Cleveland open cup method	EN ISO 2592	-
ISO 3016	-	Petroleum and related products from natural or synthetic sources - Determination of pour point	EN ISO 3016	-
ISO 3104	-	Petroleum products - Transparent and opaque fluids - Determination of kinematic viscosity and calculation of dynamic viscosity	EN ISO 3104	-
ISO 3675	-	Crude petroleum and liquid petroleum products - Laboratory determination of density - Hydrometer method	EN ISO 3675	-
ISO 12185	-	Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method	EN ISO 12185	-
ASTM D1500	-	Standard Test Method for ASTM Color of Petroleum Products (ASTM Colour Scale)	-	-
ASTM D7042	-	Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity)	-	-



IEC 62770

Edition 2.0 2024-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fluids for electrotechnical applications – Unused natural esters for transformers and similar electrical equipment

Fluides pour applications électrotechniques – Esters naturels neufs pour transformateurs et matériels électriques analogues

[SIST EN IEC 62770:2025](https://standards.iteh.ai/catalog/standards/sist/801a064f-680c-49d7-ac61-d94441c1ac07/sist-en-iec-62770-2025)

<https://standards.iteh.ai/catalog/standards/sist/801a064f-680c-49d7-ac61-d94441c1ac07/sist-en-iec-62770-2025>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.040.01

ISBN 978-2-8322-9528-1

**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, definitions and abbreviated terms	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms.....	9
4 Properties, their significance and test methods.....	9
4.1 General.....	9
4.2 Physical properties	9
4.2.1 Appearance and colour.....	9
4.2.2 Viscosity.....	10
4.2.3 Pour point.....	10
4.2.4 Water content.....	10
4.2.5 Density	10
4.3 Electrical properties	11
4.3.1 Breakdown voltage	11
4.3.2 Dielectric dissipation factor (DDF)	11
4.3.3 Relative permittivity (dielectric constant).....	11
4.4 Chemical properties	11
4.4.1 Acidity	11
4.4.2 Corrosive sulfur	11
4.4.3 Additive content.....	11
4.4.4 Furfural content	12
4.5 Performance	12
4.5.1 General	12
4.5.2 Oxidation stability	12
4.6 Health, safety and environmental (HSE) properties	12
4.6.1 Fire point and flash point	12
4.6.2 Polychlorinated biphenyls (PCBs).....	12
4.6.3 Biodegradation	13
4.6.4 Aquatic toxicity	13
5 Classification, identification, general delivery requirements, and sampling.....	13
5.1 Classification	13
5.2 Identification and general delivery requirements	13
5.3 Sampling.....	13
Annex A (normative) Summary of the test method for evaluating oxidation stability of unused natural esters	15
A.1 General.....	15
A.2 Test conditions	15
A.3 Precision.....	15
A.4 Relative repeatability (<i>r</i>).....	15
A.5 Relative reproducibility (<i>R</i>)	15
Bibliography.....	16

Table 1 – Abbreviated terms	9
Table 2 – General specifications	14
Table A.1 – Relative repeatability and relative reproducibility obtained for different parameters during RRT	15

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN IEC 62770:2025](https://standards.iteh.ai/catalog/standards/sist/801a064f-680c-49d7-ac61-d94441c1ac07/sist-en-iec-62770-2025)

<https://standards.iteh.ai/catalog/standards/sist/801a064f-680c-49d7-ac61-d94441c1ac07/sist-en-iec-62770-2025>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FLUIDS FOR ELECTROTECHNICAL APPLICATIONS –
UNUSED NATURAL ESTERS FOR TRANSFORMERS
AND SIMILAR ELECTRICAL EQUIPMENT**

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62770 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications. It is an International Standard.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

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

- a) Introduction of IEC 63012 which details other liquids not covered by this document. IEC 63012 was published in 2019 after the first edition of IEC 62770 (2013).
- b) New Table 1 inserted which clarifies definitions.
- c) Appearance and colour requirements now merged.