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Standards

Irish Standard
I.S. EN 62701:2014

Fluids for electrotechnical applications - Recycled mineral insulating oils for transformers and switchgears

I.S. EN 62701:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

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EUROPEAN STANDARD

EN 62701

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2014

ICS 29.040

English Version

**Fluids for electrotechnical applications - Recycled mineral
insulating oils for transformers and switchgears
(IEC 62701:2014)**

Fluides pour applications électrotechniques - Huiles
minérales isolantes recyclées pour transformateurs et
appareillages de connexion
(CEI 62701:2014)

Flüssigkeiten für elektrotechnische Anwendungen -
Recycelte Isolieröle auf Mineralölbasis für Transformatoren
und Schaltgeräte
(IEC 62701:2014)

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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 10/908/FDIS, future edition 1 of IEC 62701, prepared by IEC TC 10 "Fluids for electrotechnical applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62701:2014.

The following dates are fixed:

- latest date by which the document has (dop) 2015-05-14
to be implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2017-04-15
standards conflicting with the
document have to be withdrawn

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The text of the International Standard IEC 62701:2014 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 60867	NOTE	Harmonised as EN 60867.
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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:

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<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 60156	-
IEC 60247	-	Insulating liquids - Measurement of relative permittivity, dielectric dissipation factor (tan δ) and d.c. resistivity	EN 60247	-
IEC 60296	2012	Fluids for electrotechnical applications - Unused mineral insulating oils for transformers and switchgear	EN 60296	2012
IEC 60422	-	Mineral insulating oils in electrical equipment - Supervision and maintenance guidance	EN 60422	-
IEC 60628	-	Gassing of insulating liquids under electrical stress and ionization	HD 488 S1	-
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 60970	-	Insulating liquids - Methods for counting and sizing particles	EN 60970	-
			+EN 60970:2007/corrigendum Jan. 2008	2008
IEC 61125	1992	Unused hydrocarbon based insulating liquids - Test methods for evaluating the oxidation stability	EN 61125	1993
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 61868	-	Mineral insulating oils - Determination of kinematic viscosity at very low temperatures	EN 61868	-
IEC 62021-1	-	Insulating liquids - Determination of acidity -- Part 1: Automatic potentiometric titration	EN 62021-1	-

IEC 62021-2	-	Insulating liquids - Determination of acidity -- Part 2: Colourimetric titration	EN 62021-2	-
IEC 62535	-	Insulating liquids - Test method for detection of potentially corrosive sulphur in used and unused insulating oil	EN 62535	-
IEC 62697-1	-	Test method for quantitative determination of corrosive sulfur compounds in unused and used insulating liquids -- Part 1: Test method for quantitative determination of dibenzyl disulfide (DBDS)	EN 62697-1	-
ISO 2719	-	Petroleum products and lubricants - Determination of Flash Point Pensky-Martens closed cup method	-	-
ISO 3016	-	Petroleum products_ - Determination of pour point	-	-
ISO 3104	-	Petroleum products - Transparent and opaque liquids - 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	+AC EN ISO 3675	-
ISO 12185	-	Crude petroleum and petroleum products_ - Determination of density_ - Oscillating U-tube method	EN ISO 12185	-
ISO 14596	-		EN ISO 14596	-
ASTM D971	-	Standard Test Method for Interfacial Tension of Oil Against Water by the Ring Method	-	-
DIN 51353	-	Testing of insulating oils; detection of corrosive sulfur; silver strip test	-	-
EN 14210	-	Surface active agents - Determination of interfacial tension of solutions of surface active agents by the stirrup or ring method	-	-
IP 346	-	Determination of polycyclic aromatics in lubricant base oils and asphaltene free petroleum fractions - Dimethylsulfoxide refractive method	-	-
IP 373	-	Determination of the sulphur content of light and middle distillates - Oxidative microcoulometry	-	-



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Edition 1.0 2014-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fluids for electrotechnical applications – Recycled mineral insulating oils for transformers and switchgear

Fluides pour applications électrotechniques – Huiles minérales isolantes recyclées pour transformateurs et appareillages de connexion



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IEC 62701

Edition 1.0 2014-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fluids for electrotechnical applications – Recycled mineral insulating oils for transformers and switchgear

Fluides pour applications électrotechniques – Huiles minérales isolantes recyclées pour transformateurs et appareillages de connexion

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CONTENTS

FOREWORD	3
INTRODUCTION	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	8
4 Properties of oil – Refining and stability	9
5 Classification, identification, general delivery requirements	9
5.1 Classification	9
5.2 Requirements	9
5.3 Miscibility	9
5.4 Identification and general delivery requirements	9
6 Properties, their significance and test methods	9
6.1 Water content	9
6.2 Acidity	10
6.3 Antioxidant additives	10
6.4 Gassing tendency	10
6.5 Polycyclic aromatics content (PCAs)	10
6.6 Polychlorinated biphenyl content (PCBs)	10
6.7 2-Furfural (2-FAL) and related compounds content	11
6.8 Particle content	11
6.9 DBDS content	11
6.10 Stray gassing of oil	11
Bibliography	14
Table 1 – General specifications	12

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FLUIDS FOR ELECTROTECHNICAL APPLICATIONS – RECYCLED MINERAL INSULATING OILS FOR TRANSFORMERS AND SWITCHGEAR

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 62701 has been prepared by IEC technical committee 10: Fluids for electro technical applications.

This International Standard is in line with IEC 60296 and IEC 60422.

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

FDIS	Report on voting
10/908/FDIS	10/910/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.

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.

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 mineral insulating oils which are the subject of this standard should be handled with due regard to personal hygiene. Direct contact with the eyes may 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 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 is applicable rise to mineral insulating oils, chemicals and used sample containers. The disposal of these items shall be carried out according to the local regulations with regard to the impact on the environment. Every precaution should be taken to prevent release of mineral insulating oil into the environment.

FLUIDS FOR ELECTROTECHNICAL APPLICATIONS – RECYCLED MINERAL INSULATING OILS FOR TRANSFORMERS AND SWITCHGEAR

1 Scope

This International Standard specifies requirements for recycled mineral insulating oils intended for use in transformers, switchgear, and similar electrical equipment in which oil is required for insulation and heat transfer.

These oils are produced by processes employed offsite.

Oils treated and reconditioned on-site are not within the scope of this standard.

Oils with and without additives are within the scope of this standard.

Such oils will have originally been supplied in compliance with a recognized unused mineral insulating oil specification.

This standard does not differentiate between the methods used to recycle mineral insulating oil.

This standard does not apply to mineral insulating oils used as impregnates in cables or capacitors.

For the purpose of this standard the following subclauses of IEC 60296:2012 apply:

- 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9;
- 4.1, 4.3, 4.4;
- 5.1, 5.5;
- 6.1, 6.2, 6.4, 6.5, 6.6, 6.8, 6.9, 6.10, 6.11.1, 6.11.3, 6.11.4, 6.12, 6.14, 6.15, 6.16;
- 7.1.

NOTE Some types of re-refined oils are equivalent to unused oils in terms of performance, in which case IEC 60296 is applicable. This should be stated by the manufacturer.

2 Normative references

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.

IEC 60156, *Insulating liquids – Determination of the breakdown voltage at power frequency – Test method*

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

IEC 60296:2012, *Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear*

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