



Irish Standard
I.S. EN IEC 60867:2022

Version 1.00

Insulating liquids - Specifications for unused liquids based on synthetic aromatic hydrocarbons

I.S. EN IEC 60867:2022 V1.00

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National Foreword

I.S. EN IEC 60867:2022 V1.00 is the version of the NSAI adopted European document EN IEC 60867:2022, *Insulating liquids - Specifications for unused liquids based on synthetic aromatic hydrocarbons*, including any Corrections, Amendments etc. to EN IEC 60867:2022.

This normative document by CEN/CENELEC the elaboration of which includes a public enquiry, followed by a Formal Vote of CEN/CENELEC national members and final ratification. This European Standard is published as an identical national standard and every conflicting national standard will be withdrawn. The content of a European Standard does not conflict with the content of any other EN (and HD for CENELEC).

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN IEC 60867

December 2022

ICS 29.040.10

Supersedes EN 60867:1994

English Version

**Insulating liquids - Specifications for unused liquids based on
synthetic aromatic hydrocarbons
(IEC 60867:2022)**

Isolants liquides - Spécifications pour les liquides neufs à
base d'hydrocarbures aromatiques de synthèse
(IEC 60867:2022)

Isolierflüssigkeiten - Anforderungen für ungebrauchte
Flüssigkeiten auf Basis synthetischer aromatischer
Kohlenwasserstoffe
(IEC 60867:2022)

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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.

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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

European foreword

The text of document 10/1186/FDIS, future edition 3 of IEC 60867, prepared by IEC/TC 10 "Fluids for electrotechnical applications" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60867:2022.

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) 2023-09-02
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-12-02

This document supersedes EN 60867:1994 and all of its amendments and corrigenda (if any).

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The text of the International Standard IEC 60867:2022 was approved by CENELEC as a European Standard without any modification.

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.

<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	-	-
IEC 60247	-	Insulating liquids - Measurement of relative permittivity, dielectric dissipation factor ($\tan \delta$) and d.c. resistivity	EN 60247	-
IEC 60475	-	Method of sampling insulating liquids	EN IEC 60475	-
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 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	series	Insulating liquids - Determination of acidity	EN 62021	series
IEC 62535	-	Insulating liquids - Test method for detection of potentially corrosive sulphur in used and unused insulating oil	EN 62535	-
ISO 2592	-	Petroleum and related products - Determination of flash point - Cleveland open cup method (PMOC)	EN ISO 2592	-

I.S. EN IEC 60867:2022 V1.00**EN IEC 60867:2022 (E)**

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 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	EN ISO 3675	-
ISO 9562	-	Water quality - Determination of adsorbable organically bound halogens (AOX)	EN ISO 9562	-
ISO 12185	-	Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method	EN ISO 12185	-
ASTM D 1275	-	Standard Test Method for Corrosive Sulfur in Electrical Insulating Oils		-
ASTM D 4929	-	Standard Test Method for Determination of Organic Chloride Content in Crude Oil		-
ASTM D 7042	-	Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity)	-	-
ASTM D 7536	-	Standard Test Method for Chlorine in Aromatics by Monochromatic Wavelength Dispersive X-ray Fluorescence Spectrometry	-	-
DIN 51353	-	Testing of insulating oils; detection of corrosive sulfur; Silver strip test	-	-



IEC 60867

Edition 3.0 2022-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Insulating liquids – Specifications for unused liquids based on synthetic aromatic hydrocarbons

Isolants liquides – Spécifications pour les liquides neufs à base d'hydrocarbures aromatiques de synthèse

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IEC 60867

Edition 3.0 2022-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Insulating liquids – Specifications for unused liquids based on synthetic aromatic hydrocarbons

Isolants liquides – Spécifications pour les liquides neufs à base d'hydrocarbures aromatiques de synthèse

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INSULATING LIQUIDS – SPECIFICATIONS FOR UNUSED LIQUIDS
BASED ON SYNTHETIC AROMATIC HYDROCARBONS**

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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IEC 60867 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications. It is an International Standard.

This third edition cancels and replaces the second edition published in 1993. This edition constitutes a technical revision.

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

- a) The Scope has been changed from applications in electrical equipment to applications limited to cables and capacitors.
- b) IEC 62021-1, IEC 62021-2 and IEC 62021-3 are all acceptable for synthetic aromatic hydrocarbons and references to individual parts have been replaced by references to the IEC 62021 series.

The text of this International Standard is based on the following documents:

Draft	Report on voting
10/1186/FDIS	10/1188/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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INTRODUCTION

WARNING – Health and safety

This document does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

The synthetic aromatic hydrocarbon insulating liquids which are the subject of this document should be handled with due regard to personal hygiene. Direct contact with the eyes can 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 document involve the use of processes that could lead to a hazardous situation. Attention is drawn to the relevant standard for guidance.

WARNING – Environment

This document is applicable to synthetic aromatic hydrocarbon insulating liquids, chemicals and used sample containers. The disposal of these items can be subject to regulatory requirements with regard to their impact on the environment. Every precaution should be taken to prevent release of insulating liquids into the environment.

INSULATING LIQUIDS – SPECIFICATIONS FOR UNUSED LIQUIDS BASED ON SYNTHETIC AROMATIC HYDROCARBONS

1 Scope

This document covers specifications and test methods for unused synthetic aromatic hydrocarbons intended for use as insulating liquid in cables and capacitors.

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 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 60475, *Method of sampling insulating liquids*

IEC 60628, *Gassing of insulating liquids under electrical stress and ionization*

IEC 60666, *Detection and determination of specified additives in mineral insulating oils*

IEC 60814, *Insulating liquids – Oil-impregnated paper and pressboard – Determination of water by automatic coulometric Karl Fischer titration*

IEC 61619, *Insulating liquids – Contamination by polychlorinated biphenyls (PCBs) – Method of determination by capillary column gas chromatography*

IEC 61620, *Insulating liquids – Determination of the dielectric dissipation factor by measurement of the conductance and capacitance – Test method*

IEC 62021 (all parts), *Insulating liquids – Determination of acidity*

IEC 62535, *Insulating liquids – Test method for detection potentially corrosive sulphur in used and unused insulating oil*

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ISO 3016, *Petroleum and related products from natural or synthetic sources – Determination of pour point*

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

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