



**SLOVENSKI STANDARD**  
**SIST EN 60867:1997**

**01-avgust-1997**

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**Insulating liquids - Specifications for unused liquids based on sythetichydrocarbons (IEC 867:1993)**

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

Isolierflüssigkeiten - Bestimmungen für ungebrauchte Isolierflüssigkeiten auf Basis synthetischer aromatischer Kohlenwasserstoffe

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

[SIST EN 60867:1997](https://standards.iteh.ai/catalog/standards/sist/4e1ab674-d7c6-4b1c-899b-d12ebb5e98c/sist-en-60867-1997)

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**Ta slovenski standard je istoveten z: EN 60867:1994**

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**ICS:**

29.040.10      Izolacijska olja      Insulating oils

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EUROPEAN STANDARD

EN 60867

NORME EUROPEENNE

EUROPÄISCHE NORM

January 1994

UDC 621.315.615

Supersedes HD 497 S1:1987

Descriptors: Liquid electrical insulating materials, aromatic hydrocarbons, specifications, characteristics, tests

## ENGLISH VERSION

Insulating liquids - Specifications for unused liquids based on synthetic aromatic hydrocarbons (IEC 867:1993)

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

(CEI 867:1993)

Isolierflüssigkeiten  
Bestimmungen für ungebrauchte Isolierflüssigkeiten auf Basis synthetischer aromatischer Kohlenwasserstoffe  
(IEC 867:1993)

## iTeh STANDARD PREVIEW

(standards.iteh.ai)

This European Standard was approved by CENELEC on 1993-12-08.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CENELEC

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

Central Secretariat: rue de Stassart 35, B-1050 Brussels

### FOREWORD

The text of document 10(CO)269, as prepared by IEC Technical Committee N° 10: Fluids for electrotechnical applications, was submitted to the IEC-CENELEC parallel vote in October 1992.

The reference document was approved by CENELEC as EN 60867 on 8 December 1993.

This European Standard replaces HD 497 S1:1987.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-12-01
- latest date of withdrawal of conflicting national standards (dow) 1994-12-01

For products which have complied with HD 497 S1:1987 before 1994-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1999-12-01.

Annexes designated "normative" are part of the body of the standard. In this standard, annex ZA is normative.

<https://standards.iteh.ai/catalog/standards/sist/4e1ab674-d7c6-4b1c-899b-d12ebb5ef98c/sist-en-60867-1997>

### ENDORSEMENT NOTICE

The text of the International Standard IEC 867:1993 was approved by CENELEC as a European Standard without any modification.

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## ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD  
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

NOTE : When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Date	Title	EN/HD	Date
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156	1963	Method for the determination of the electric strength of insulating oils	-	-
247	1978	Measurement of relative permittivity, dielectric dissipation factor and d.c. resistivity of insulating liquids	-	-
475	1974	Method of sampling liquid dielectrics	-	-
628	1985	Gassing of insulating liquids under electrical stress and ionization	HD 488 S1	1987
814	1985	Determination of water in insulating liquids by automatic coulometric Karl Fischer titration	HD 487 S1	1987
1039	1990	General classification of insulating liquids	HD 618 S1	1992

## Other publications:

- 
- ISO 2719:1988 - Petroleum products and lubricants - Determination of flash point Pensky-Martens closed cup method
  - ISO 3016:1974 - Petroleum oils - Determination of pour point
  - ISO 3104:1976 - Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity
  - ISO 3675:1976 - Crude petroleum and liquid petroleum products - Laboratory determination of density or relative density - Hydrometer method
  - ISO 5662:1978 - Petroleum products - Electrical insulating oils - Detection of corrosive sulphur

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NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC  
867

Deuxième édition  
Second edition  
1993-09

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

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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For price, see current catalogue

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

### FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. 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. The 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 the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

SIST EN 60867:1997

International Standard IEC 867 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications. <https://standards.iso.org/standards/info/iec/10/74-d7c0-4b1c-897b-d12ebb5ef98c/sist-en-60867-1997>

This second edition cancels and replaces the first edition published in 1986.

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

DIS	Report on voting
10(CO)269	10(CO)277

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

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

### 1 Scope

This International Standard covers specifications and test methods for unused synthetic aromatic hydrocarbons intended for use as insulating liquid in electrical equipment.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 156: 1963, *Method for the determination of the electric strength of insulating oils*

IEC 247: 1978, *Measurement of relative permittivity, dielectric dissipation factor and d.c. resistivity of insulating liquids* (standards.iteh.ai)

IEC 475: 1974, *Method of sampling liquid dielectrics*

IEC 628: 1985, *Gassing of insulating liquids under electrical stress and ionization*

IEC 814: 1985, *Determination of water in insulating liquids by automatic coulometric Karl Fischer titration*

IEC 1039: 1990, *General classification of insulating liquids*

ISO 2719: 1988, *Petroleum products and lubricants – Determination of flash point – Pensky-Martens closed cup method*

ISO 3016: 1974, *Petroleum oils – Determination of pour point*

ISO 3104: 1976, *Petroleum products – Transparent and opaque liquids – Determination of kinematic viscosity and calculation of dynamic viscosity*

ISO 3675: 1976, *Crude petroleum and liquid petroleum products – Laboratory determination of density or relative density – Hydrometer method*

ISO 5662: 1978, *Petroleum products – Electrical insulating oils – Detection of corrosive sulphur*

### 3 Definitions

#### *General remark*

Gas chromatographic analyses can be useful for composition identification and detection of impurities.

For the purposes of this International Standard, the following definitions apply.

**3.1 alkylbenzenes:** Insulating liquids consisting of a benzene ring and an alkyl group. The alkyl group may be a straight chain or a branched-chain type.

NOTE - The two types of alkylbenzene can be distinguished by infra-red spectrophotometric analysis. The straight-chain type shows a single absorption peak in the region  $1\ 360\text{ cm}^{-1}$  to  $1\ 380\text{ cm}^{-1}$  and the branched chain type shows a double peak in that region.

**3.2 alkyldiphenylethanes:** Insulating liquids consisting of diphenylethanes derivatives; normally the two aryl groups carry short alkyl groups.

NOTE - This type of product is characterized by infrared absorption bands at  $3\ 070$ ,  $1\ 606$  and  $705\text{ cm}^{-1}$ .

**3.3 alkylnaphthalenes:** Insulating liquids consisting of a naphthalene structure with substituent alkyl groups.

NOTE - This type of product is characterized by infrared absorption bands at  $3\ 070$ ,  $1\ 605$ ,  $1\ 380$  and  $1\ 360\text{ cm}^{-1}$ .

**3.4 methylpolyarylmethanes:** Insulating liquids consisting of methylpolyarylmethanes derivatives mainly based on a blend of mono/di-benzyl toluene (M/DBT).

NOTE - This type of product is characterized by infrared absorption bands at  $3\ 025$ ,  $1\ 606$  and  $705\text{ cm}^{-1}$ .

### 4 Identification and general delivery requirements

4.1 The products are normally delivered in road or rail tank wagons or in drums, which shall be specially cleaned for this purpose.

4.2 The drums and sample containers shipped by the supplier shall carry at least the following markings:

- number of this standard;
- supplier's designation;
- type of product.

### 5 Sampling

Sampling shall be carried out in accordance with the procedure described in IEC 475.