



# SLOVENSKI STANDARD

## SIST HD 565 S1:1999

01-januar-1999

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### Specifications for silicone liquids for electrical purposes (IEC 60836:1988)

Specifications for silicone liquids for electrical purposes

Anforderungen an Siliconflüssigkeiten für elektrotechnische Zwecke

Spécifications pour liquides silicones pour usages électriques

Ta slovenski standard je istoveten z: **HD 565 S1:1999**

[SIST HD 565 S1:1999](https://standards.iteh.ai/catalog/standards/sist/4ad28659-3ee2-4047-ac35-006c9eebe374/sist-hd-565-s1-1999)

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#### **ICS:**

29.040.10      Izolacijska olja      Insulating oils

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**en**

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HARMONIZATION DOCUMENT

HD 565 S1

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

March 1993

UDC 661.68:546.287:621.3:620.1

Descriptors: solid electrical insulant, silicone, electrical equipment,  
transformer, requirement, test method

## ENGLISH VERSION

Specifications for silicone liquids for electrical  
purposes

(IEC 836:1988)

Spécifications pour liquides  
silicones pour usages  
électriques  
(CEI 836:1988)

Anforderungen an  
Siliconflüssigkeiten für  
elektrotechnische Zwecke  
(IEC 836:1988)

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This Harmonization Document was approved by CENELEC on 1990-09-01.  
CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations  
which stipulate the conditions for implementation of this Harmonization Document  
on a national level. [standards.iteh.ai/catalog/standards/sist/4ad28659-3ee2-4047-ac35-006c9eebe374/sist-hd-565-s1-1999](https://standards.iteh.ai/catalog/standards/sist/4ad28659-3ee2-4047-ac35-006c9eebe374/sist-hd-565-s1-1999)

Up-to-date lists and bibliographical references concerning national implementation  
may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French,  
German).

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

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Ref. No. HD 565 S1:1993 E

#### FOREWORD

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 836:1988 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as Harmonization Document.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as HD 565 S1 on 1st September 1990.

The following dates were fixed:

- latest date of announcement  
of the HD at national level (doa) 1991-09-01
- latest date of publication of  
a harmonized national standard (dop) 1993-09-01
- latest date of withdrawal of  
conflicting national standards (dow) 1993-09-01

For products which have complied with the relevant national standard before 1993-09-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-09-01.

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Annexes designated "normative" are part of the body of the standard. In this standard, annexes A and ZA are normative.

#### ENDORSEMENT NOTICE

The text of the International Standard IEC 836:1988 was approved by CENELEC as a Harmonization Document 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

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
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	-	-
474	1974	Test method for oxidation stability of inhibited mineral insulating oils	-	-
475	1974	Method of sampling liquid dielectrics	-	-
628	1985	Gassing of insulating liquids under electrical stress and ionization	HD 488 S1	1987
733	1982	Determination of water in insulating oils, and in oil-impregnated paper and pressboard	-	-
814	1985	Determination of water in insulating liquids by automatic coulometric Karl Fischer titration	HD 487 S1	1987

## Other publications quoted:

2592	1973	Petroleum products - Determination of flash and fire points Cleveland open cup method
2719	1973	Petroleum products - Determination of flash point Pensky Martens closed cup method
3016	1974	Petroleum oils - Determination of pour point
3104	1976	Petroleum products - Transparent and opaque liquids Determination of kinematic viscosity and calculation of dynamic viscosity
3675	1976	Crude petroleum products - Laboratory determination of density or relative density - Hydrometer method
5661	1983	Petroleum products - Hydrocarbon liquids - Determination of refractive index

## Draft International Standard:

ISO/DIS 4142.2 Laboratory glassware - Test tubes

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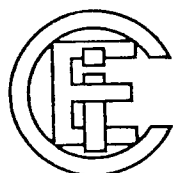
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# NORME INTERNATIONALE INTERNATIONAL STANDARD

CEI  
IEC  
836

Première édition  
First edition  
1988



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

Spécifications pour liquides silicones pour usages  
électriques

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**Specifications for silicone liquids for electrical  
purposes**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

SPECIFICATIONS FOR SILICONE LIQUIDS  
FOR ELECTRICAL PURPOSES

## FOREWORD

- 1) 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.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.
- 4) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

## PREFACE

This standard has been prepared by Sub-Committee 10B: Insulating Liquids other than Hydrocarbon Oils, of IEC Technical Committee No. 10: Fluids for Electrotechnical Applications.

(Technical Committee No. 10 completed the work of Sub-Committee 10B which was disbanded in July 1987.)

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

Six Months' Rule	Reports on Voting	Two Months' Procedure	Reports on Voting
10B(CO)29 10B(CO)36 10B(CO)37	10B(CO)32 10B(CO)43 10B(CO)44	10(CO)235	10(CO)242

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

The following IEC publications are quoted in this standard:

- Publications Nos. 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.
- 474 (1974): Test method for oxydation stability of inhibited mineral insulating oils.
- 475 (1974): Method of sampling liquid dielectrics.
- 628 (1985): Gassing of insulating liquids under electrical stress and ionization.
- 733 (1982): Determination of water in insulating oils, and in oil-impregnated paper and press-board.
- 814 (1985): Determination of water in insulating liquids by automatic coulometric Karl Fischer titration.

*Other publications quoted:*

- ISO Standard 2592 (1973): Petroleum products – Determination of flash and fire points – Cleveland open cup method.
- 2719 (1973): Petroleum products – Determination of flash point – Pensky Martens closed cup method.
- 3016 (1974): Petroleum oils – Determination of pour point.
- 3104 (1976): Petroleum products – Transparent and opaque liquids – Determination of kinematic viscosity and calculation of dynamic viscosity.
- 3675 (1976): Crude petroleum and liquid petroleum products – Laboratory determination of density or relative density – Hydrometer method.
- 5661 (1983): Petroleum products – Hydrocarbon liquids – Determination of refractive index.

## Draft International Standard

- ISO/DIS 4142.2: Laboratory glassware – Test tubes.

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# SPECIFICATIONS FOR SILICONE LIQUIDS FOR ELECTRICAL PURPOSES

## SECTION ONE — GENERAL

### 1. Scope

This standard deals with silicone liquids to be used as insulating liquids in transformers and other electrical equipment. It comprises three sections as follows:

- Section One describes the silicone liquids and gives general guidance on their properties, safety, storage and disposal. It also gives requirements for packaging, labeling and sampling.
- Section Two describes the test methods that shall be employed to test the properties of silicone liquids.
- Section Three specifies the required characteristics of a liquid polydimethylsiloxane primarily intended for use in transformers. Other specification sheets will be added when required.

*Note.* — Maintenance of silicone liquids in equipment will be covered in a separate publication.

### 2. Description and general properties

Silicone insulating liquids are liquid polyorganosiloxanes whose molecular structure consists mainly of linear chains of alternating silicon and oxygen atoms, with hydrocarbon groups attached to the silicon atoms.

Silicone liquids for transformers show high flash and fire-points and are, therefore, difficult to burn. When burning, the rate of heat release is much lower than that of hydrocarbon oils. When the liquid burns with an undisturbed surface, silica is formed on top of the liquid, reducing oxygen access.

Silicone liquids have a greater resistance to oxidation than hydrocarbon oils, and may therefore be used at higher temperatures.

The solubility of water in silicone liquids is greater than in mineral oils.

Other physical characteristics, e.g. heat transfer necessary for the design of equipment, may be different from those of hydrocarbon oils and will need to be taken into account by the designer.

### 3. Safety

Silicone liquids degrade in nature to simple, naturally occurring substances. Their handling is not hazardous to health.

Direct contact with the eyes may cause slight irritation. Safety glasses should be worn to avoid splashes in the eyes.

In the case of eye contact, irrigation with large quantities of clean running water should relieve irritation. If irritation persists, medical advice is recommended.