SLOVENSKI STANDARD
oSIST prEN IEC 61039:2023

01-november-2023

Splošna klasifikacija izolacijskih tekočin

Classification of insulating liquids

Klassifizierung der Isolierflüssigkeiten

Classification des liquides isolants

Ta slovenski standard je istoveten z: **prEN IEC 61039:2023**

ICS:

29.040.10	Izolacijska olja	Insulating oils

oSIST prEN IEC 61039:2023 **en**

10/1204/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
IEC 61039 ED3	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2023-09-08	**2023-12-01**
SUPERSEDES DOCUMENTS:	
10/1189/CD, 10/1196A/CC	

IEC TC 10 : FLUIDS FOR ELECTROTECHNICAL APPLICATIONS

SECRETARIAT:	SECRETARY:
Italy	Mr Massimo Pompili
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD:
TC 14, TC 20, SC 36A, TC 38	☐
	Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☒ ENVIRONMENT ☒ QUALITY ASSURANCE ☒ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant “In Some Countries” clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (See AC/22/2007 or NEW GUIDANCE DOC).

TITLE:

Classification of insulating liquids

PROPOSED STABILITY DATE: 2029

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CLASSIFICATION OF ELECTRICAL INSULATING LIQUIDS

FOREWORD

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International Standard IEC 61039 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications.

This third edition cancels and replaces the second edition, published in 2008, and constitutes a technical revision.

The main change with regard to the previous edition concerns the updating of the classification of insulating liquids, taking into account the largest number possible of substances that have, or may have, possible application in electrical components.

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

FDIS	Report on voting
10/XXXX/FDIS	10/XXXX/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 maintenance result 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 insulating liquids which are the subject of this standard should be handled with due regard to personal hygiene. Direct contact with eyes may cause slight 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 involves insulating liquids, chemicals and used sample containers. The disposal of these items should be carried out in accordance with current national legislation with regard to the impact on the environment.

Every insulating liquid, which floats on water is generally a water hazard, as they reduce oxygen ingress into the water. No liquid in spite of its classification can be freely spilled in the environment. The handling of insulating liquids shall be carried out in accordance with current national legislation with regard to the impact on the environment. Every precaution should be taken to prevent the release into the environment.

CLASSIFICATION OF ELECTRICAL INSULATING LIQUIDS

1 Scope

This International Standard establishes the detailed classification of the N family (insulating liquids) that belongs to class L (lubricants, industrial oils and related products) in accordance with ISO 8681 and ISO 6743-99, affecting product categories that include products derived from petroleum processing, synthetic chemical products and synthetic and natural esters.

This standard applies to unused liquids. For liquids in service, additional testing may be required to ensure compliance with this standard.

2 Normative references

The following referenced documents are indispensable for the application 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 60296, *Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear*

IEC 60836, *Specifications for unused silicone insulating liquids for electrotechnical purposes*

IEC 60867, *Insulating liquids – Specifications for unused liquids based on synthetic aromatic hydrocarbons*

IEC 61099, *Specifications for unused synthetic organic esters for electrical purposes*

IEC 62770, Fluids for electrotechnical applications - Unused natural esters for transformers and similar electrical equipment

IEC 63012, Insulating liquids - Unused modified or blended esters for electrotechnical applications

ISO 2592, *Determination of flash and fire points – Cleveland open cup method*

ISO 6743-99:2002, *Lubricants, industrial oils and related products (class L) – Classification – Part 99: General*

ISO 8681, *Petroleum products and lubricants – Method of classification - Definition of classes*

OECD 301:1992, *OECD guideline for testing of chemicals – Ready biodegradability*

ASTM D240, *Standard test method for heat of combustion of liquid hydrocarbon fuels by bomb calorimeter*

3 ISO classification system

ISO 8681 sets out the main rules of the classification system that applies to petroleum products, lubricants and related products. This document sets out the classification method which can be used for electrical insulating liquids.

ISO 8681 suggests, as far as possible, to choose the application field as the main principle for the classification of petroleum products, lubricants, and related products. It also suggests classifying on the basis of the product typology, e.g. fuels are classified first of all on the basis of typology and secondly on the basis of end use.

The ISO classification principle is based on the allocation of a code consisting of letters and numbers for the main classes and categories of petroleum products.

The complete nomination consists of:

– the initials “ISO”;

– the class of the petroleum product or related product, indicated by a letter (see Table 1), which has to be clearly separated from the other symbols;

– the category, indicated by a group of four letters, the first one always identifying the family to which it belongs and the others assuming a meaning, appropriately explained in the reference standard, which depends on the particular category of concerned products;

– (optional) some numbers, which can be added, to complete the nomination and that have a meaning appropriately explained in the reference standard for that particular category of products.

In compliance with ISO 8681, the code should have the following general form:

ISO – CLASS – CATEGORY – (eventual) NUMBERS

or the short form:

CLASS – CATEGORY – (eventual) NUMBERS

4 Classification of electrical insulating liquids

In accordance with ISO 8681, the classification system indicates the products with a nomination that includes:

– the abbreviation “ISO”;

– the class of the petroleum products or related products is indicated by a letter that in this standard has the meaning defined in Table 1;

– the category is indicated by four letters whose meaning is explained in 4.2;

– a seven-figure number that makes up the identification code (described in 4.3).

4.1 Class classification

The class of petroleum products or related products is indicated by a letter having the meaning reported in Table 1.

Table 1 – Class classification of petroleum products or related products

Class	Indication
F	Fuels
S	Solvents and raw materials for chemical industry
L	Lubricants, industrial oils and related products
W	Waxes
B	Bitumen

In accordance with the ISO/IEC agreement, the electrical insulating liquids belong to class L "lubricants, industrial oils and related products".

4.2 Category classification

In case of specific classification of insulating liquids is described in the corresponding standard, it shall have priority over the classification given in this standard. For example for mineral oils IEC 60296 shall be applied.

The four letters identify the category, with the following meaning:

First letter
The first letter, which identifies the insulating liquid family, will be N: Electrical insulation (Table 1, ISO 6743-99:2002).

Second letter
The second letter identifies the main application field as follows:

- **C** capacitors;
- **T** transformers and switching equipment;
- **S** switching equipment operating at temperature lower than –10 °C;
- **Y** cables.

NOTE 1 In order to provide an indication of fire behaviour of insulating liquids, and also wishing to benefit from the experience gained by CT 14 of CENELEC, the following parameters have been added as well as the classifications "fire point" and "low heat value".

Third letter
The third letter identifies the eventual presence of antioxidant additives. Liquids may contain different antioxidants and different levels of antioxidants. Check with corresponding liquid standards. The third letter is defined as:

- **U** if no antioxidant additives are present.
- **I** if antioxidant additives are present

Note In this document Classification I also encompasses category T according to IEC 60296

Fourth letter
The fourth letter identifies the fire point (fire point: ISO 2592) as follows: At the time of writing this standard, liquids falling into category L are being phased out from use, There is no IEC standard covering such liquids

- **O** if the fire point is < 300 °C;
- **K** if the fire point is ≥ 300 °C;
- **L** if the fire point of the liquid is not detectable.