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**NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA**

**GB/T 41632-2022**

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**Insulating liquids - Specifications for unused synthetic organic  
esters for electrical purposes**

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### foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents" drafted.

This document is revised and adopted IEC 61099-2010 "Unused synthetic organic esters for electrical insulating liquids".

Compared with IEC 61099.2010, this document has many adjustments in structure.

Comparison list of structure number changes between two files

See Appendix A.

The technical differences between this document and IEC 61099.2010 and their reasons are as follows.

--- The "Scope" chapter of IEC 61099.2010 has been adjusted to conform to the usage habits of our country (see Chapter 1);

--- Added the normative reference document GB/T 2900.5-2013 for ease of use (see Chapter 3);

--- Deleted IEC 61099.2010 Chapter 4 "General Instructions";

--- In order to avoid mandatory clauses in the note, the note in 8.1 "Breakdown Voltage" in IEC 61099.2010 is changed to a clause (see 6.1);

---According to the actual needs of our country, the unused synthetic organic ester for transformer T1 type "crystallinity" and "gas evolution" are added in Table 1

and "biodegradability" performance requirements, delete footnote c in IEC 61099.2010 Table 1; add but note c "density secondary

Test according to ISO 3675 during arbitration, according to IEC 62021-2 during acid value arbitration, and according to dielectric loss factor arbitration

GB/T 5654 "specified test" description (see Table 1);

---According to the actual needs of our country, the content of Informative Appendix B of IEC 62021-2.2010 is included in Table 2 of Chapter 9 of this document, and deleted

For the content of footnote b in the table of Appendix B, change the content of footnote b to "ISO 3675 test for density arbitration, press for acid value arbitration

The specified test of IEC 62021-2, the dielectric loss factor arbitration shall be tested according to the specified test of IEC 60247" (see Table 2);

--- According to the citation needs of this document, the informative appendix A of IEC 61099.2010 is adjusted to the normative appendix B.

The following editorial changes have been made to this document.

--- Added note on composition of synthetic organic ester type C1 for capacitors;

--- Added informative Appendix A;

--- Removed references.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

## 1 Scope

This document specifies the classification and marking, packaging, transportation and storage, properties and test methods of virgin synthetic organic esters for electrical purposes.

Require.

This document applies to transformers, switches, and other similar electrical equipment requiring the use of synthetic organic esters as insulating and heat transfer media.

Synthetic organic esters used.

## 2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations

documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

GB/T 2900.5-2013 Electrical terminology insulating solids, liquids and gases (IEC 60050-212.2010, IDT)

GB/T 10065-2007 Determination of gas evolution properties of insulating liquids under

electrical stress and ionization (IEC 60628.1985,  
MOD)

Note. There is no technical difference between the quoted content of GB/T 10065-2007 and the content of IEC 60628.1985.

NB/SH/T 0811-2010 Unused hydrocarbon insulating oil for determination of oxidation stability (IEC 61125.1992, MOD)

Note. There is no technical difference between the quoted content of NB/SH/T 0811-2010 and the content of IEC 61225.1992.

Note. GB/T 23770-2009 General method for determination of chromaticity of liquid inorganic chemical products (ISO 2211.1973, MOD)

ISO 2592 Petroleum and related products Determination of flash point and fire point Cleveland open cup method (Petroleum and related products)

Note. GB/T 3536-2008 Determination of flash point and fire point of petroleum products Cleveland open cup method (ISO 2592.2000, MOD)

closedcupmethod)

Note. GB/T 261-2021 Determination of flash point Pensky-Martin closed cup method (ISO 2719.2016, MOD)

ISO 3016 Determination of the pour point of petroleum products  
(Petroleumproducts-Determinationofpour-point)

Note. GB/T 3535-2006 Determination of Pour Point of Petroleum Products (ISO 3016.1994, MOD)

ISO 3104 Petroleum products Determination of kinematic viscosity and calculation of dynamic viscosity of transparent and opaque liquids (Petroleum

Note. GB/T 30515-2014 Determination of kinematic viscosity and dynamic viscosity calculation method of transparent and opaque liquid petroleum products (ISO 3104.1994, MOD)

ISO 3675 Laboratory Determination of Density and Relative Density of Crude Oil and Liquid Petroleum Products Petroleum Densitometry (Crudepetro-

Note. GB/T 1884-2000 Laboratory Determination of Density of Crude Oil and Liquid Petroleum Products (Densitometer Method) (eqvISO 3675.1998)