

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Fluids for electrotechnical applications – Unused natural esters for transformers and similar electrical equipment**

**Fluides pour applications électrotechniques – Esters naturels neufs pour transformateurs et matériels électriques analogues**





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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FLUIDS FOR ELECTROTECHNICAL APPLICATIONS –  
UNUSED NATURAL ESTERS FOR TRANSFORMERS  
AND SIMILAR ELECTRICAL EQUIPMENT**

## FOREWORD

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IEC 62770 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications. It is an International Standard.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

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

- a) Introduction of IEC 63012 which details other liquids not covered by this document. IEC 63012 was published in 2019 after the first edition of IEC 62770 (2013).
- b) New Table 1 inserted which clarifies definitions.
- c) Appearance and colour requirements now merged.

- d) Pour point: Introduction of the importance of LCSET with advice on cold temperature behaviour of natural esters.
- e) Additives: new agreed wording inserted on the declaration of additives
- f) Flash and fire points: now only determined by Cleveland Open Cup method, since the Pensky-Martens closed cup method was identified as problematic with natural esters.
- g) Toxicity: Aquatic toxicity now emphasized.
- h) Annex B removed as it is no longer needed since the publication of IEC 63012.

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

Draft	Report on voting
10/1215/FDIS	10/1243/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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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- withdrawn, or
- revised.

## INTRODUCTION

Because of their higher fire points and lower environmental impact relative to hydrocarbon petroleum derived insulating mineral oil, the use of vegetable oils and other natural esters is on the rise as insulating and heat transfer fluids in electrical devices such as transformers.

This document sets performance criteria for unused natural esters earmarked for electrical applications. However, the use of natural esters is recommended only for equipment that is not open to the atmosphere, for example sealed transformers and reactors because these liquids are susceptible to oxidation.

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

Unused natural esters which are the subject of this document should be handled with due regard to personal hygiene. Direct contact with eyes should be avoided. In case of eye contact, irrigation with copious amounts of clean running water should be carried out and medical advice sought.

Performance of some of the tests mentioned in this document could lead to a hazardous situation. Attention is drawn to the relevant document test method for guidance.