

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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**Insulating liquids – Determination of acidity –  
Part 3: Test methods for non-mineral insulating oils**

**Liquides isolants – Détermination de l'acidité –  
Partie 3: Méthodes d'essai pour les huiles non minérales isolantes**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INSULATING LIQUIDS – DETERMINATION OF ACIDITY –****Part 3: Test methods for non-mineral insulating oils**

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International Standard IEC 62021-3 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications.

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

FDIS	Report on voting
10/936/FDIS	10/942/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.

A list of all parts in the IEC 62021 series, published under the general title *Insulating liquids – Determination of acidity*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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- withdrawn,
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## 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 the 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 procedures referenced 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 non-mineral insulating oils, chemicals, used sample containers and fluid-contaminated solids. The disposal of these items should be carried out according to local regulations with regard to their impact on the environment. Every precaution should be taken to prevent the release into the environment of these oils.

## INSULATING LIQUIDS – DETERMINATION OF ACIDITY –

### Part 3: Test methods for non-mineral insulating oils

#### 1 Scope

This part of IEC 62021 describes two procedures for the determination of the acidity of unused and used electrical non-mineral insulating oils. Method A is potentiometric titration and Method B is colourimetric titration.

NOTE 1 In unused and used non-mineral insulating oils, the constituents that may be considered to have acidic characteristics include organic acids, phenolic compounds, some oxidation products, resins, organometallic salts and additives.

The method may be used to indicate relative changes that occur in non-mineral insulating oil during use under oxidizing conditions regardless of the colour or other properties of the resulting non-mineral oil.

The acidity can be used in the quality control of unused non-mineral insulating oil.

As a variety of oxidation products present in used non-mineral insulating oil contribute to acidity and these products vary widely in their corrosion properties, the test cannot be used to predict corrosiveness of non-mineral insulating oil under service conditions.

NOTE 2 The acidity results obtained by potentiometric test method may or may not be numerically the same as those obtained by colourimetric methods, but they are generally of the same magnitude.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60475, *Method of sampling insulating liquids*

ISO 5725 (all parts), *Accuracy (trueness and precision) of measurement methods and results*

ISO 6619, *Petroleum products and lubricants – Neutralization number – Potentiometric titration method*

#### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

##### 3.1 acidity

quantity of base, expressed in milligrams of potassium hydroxide per gram of sample, required to titrate potentiometrically or colourimetrically a test portion in a specified solvent to the end point

##### 3.2 non-mineral insulating oil

insulating liquid, not derived from petroleum crudes