

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Mineral insulating oils in electrical equipment – Supervision and maintenance guidance

Huiles minérales isolantes dans les matériels électriques – Lignes directrices pour la maintenance et la surveillance





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MINERAL INSULATING OILS IN ELECTRICAL EQUIPMENT – SUPERVISION AND MAINTENANCE GUIDANCE

FOREWORD

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International Standard IEC 60422 has been prepared by IEC technical committee 10: Fluids for electrotechnical applications.

This fourth edition cancels and replaces the third edition, published in 2005, and constitutes a technical revision.

The main changes with respect to the previous edition are as follows:

This new edition represents a major revision of the third edition, in order to bring in line this standard with latest development of oil condition monitoring, containing new limits for oil parameters, suggested corrective actions in the tables and new test methods.

The action limits for all oil tests have been revised and changes made where necessary to enable users to use current methodology and comply with requirements and regulations affecting safety and environmental aspects.

In addition, this standard incorporates changes introduced in associated standards since the third edition was published.

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

FDIS	Report on voting
10/894/FDIS	10/896/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 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- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of December 2013 have been included in this copy.

INTRODUCTION

Insulating mineral oils are used in electrical equipment employed in the generation, transmission, distribution and use of electrical energy, so that the amount of oil in service, worldwide, amounts to hundreds of millions of kilograms.

Monitoring and maintaining oil quality is essential to ensure the reliable operation of oil-filled electrical equipment. Codes of practice for this purpose have been established by electrical power authorities, power companies and industries in many countries.

A review of current experience reveals a wide variation of procedures and criteria. It is possible, however, to compare the value and significance of standardized oil tests and to recommend uniform criteria for the evaluation of test data.

If a certain amount of oil deterioration (by degradation or contamination) is exceeded, there is inevitably some erosion of safety margins and the question of the risk of premature failure should be considered. While the quantification of the risk can be very difficult, a first step involves the identification of potential effects of increased deterioration. The philosophy underlying this standard is to furnish users with as broad a base of understanding of oil quality deterioration as is available, so that they can make informed decisions on inspection and maintenance practices.

Unused mineral oils are limited resources and should be handled with this in mind. Used mineral oils are, by most regulations, deemed to be controlled waste. If spills occur this may have a negative environmental impact especially if the oil is contaminated by persistent organic pollutants such as polychlorinated biphenyls (PCBs).

This International Standard, whilst technically sound, is mainly intended to serve as a common basis for the preparation of more specific and complete codes of practice by users in the light of local circumstances. Sound engineering judgement will have to be exerted in seeking the best compromise between technical requirements and economic factors.

Reference should also be made to instructions from the equipment manufacturer.

General caution

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

The mineral oils and oil additives 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. For more information, refer to the safety data sheet provided by the manufacturer. 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 is applicable to mineral oils, chemicals and used sample containers.

Attention is drawn to the fact that, at the time of writing this standard, some mineral oils in service are known to be contaminated to some degree by PCBs.

Because of this, safety countermeasures should be taken to avoid risks to workers, the public and the environment during the life of the equipment, by strictly controlling spills and emissions. Disposal or decontamination of these oils should be carried out strictly according to local regulations. Every precaution should be taken to prevent release of mineral oil into the environment.