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**Petroleum products — Electrical insulating  
oils — Detection of corrosive sulfur**

*Produits pétroliers — Huiles d'isolation électrique — Détection du soufre  
corrosif*



## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 5662 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This second edition cancels and replaces the first edition (ISO 5662:1978), which has been technically revised.

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## Introduction

Mineral insulating oils may contain substances that cause corrosion under certain conditions of use. The test method specified in this International Standard is designed to detect unacceptable quantities of free sulfur and corrosive sulfur compounds.

In most of their uses, insulating oils are continually in contact with metals that are subject to corrosion. Since the presence of detrimental corrosive sulfur compounds will result in deterioration of these metals to an extent dependent upon the quantity and type of corrosive agent and the time and temperature factors, the detection of these undesirable impurities, even though not in quantitative terms, is a means for recognizing the hazard involved.

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# Petroleum products - Electrical insulating oils - Detection of corrosive sulfur

**WARNING** - The use of this International Standard may involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

## 1 Scope

This International Standard specifies a method for the detection of corrosive sulfur compounds in electrical insulating oils of petroleum origin.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2160: —<sup>1)</sup>, *Petroleum products - Corrosiveness to copper - Copper strip test.*

ISO 3696:1987, *Water for analytical laboratory use - Specification and test methods.*

## 3 Principle

A strip of polished pure copper is subjected to contact with the oil under test at 140 °C in the absence of air. At the end of the test period, the strip is examined for colour change, and assessed on the basis of pass or fail by reference to a table of potential discolorations.

## 4 Reagents and materials

During the analysis, use only reagents of recognized analytical grade.

**4.1 Wash solvent:** 2,2,4-trimethylpentane of minimum purity 99,75 %.

NOTE 1 Other sulfur-free volatile hydrocarbon solvents which show no tarnish when tested by ISO 2160 for 3 h at 50 °C, are suitable.

**4.2 Acetone,** sulfur-free.

**4.3 Diethyl ether.**

**4.4 Nitrogen,** commercial grade, oxygen-free.

**4.5 Water:** Unless otherwise described, water shall be of a purity equivalent to grade 3 of ISO 3696.

## 5 Apparatus

**5.1 Heating medium,** consisting of a hot-air oven or oil bath, capable of being heated to, and controlled at, 140 °C ± 2 °C.

NOTE 2 A circulating hot-air oven is preferred.

**5.2 Bottles,** nominally 250 ml, made of chemically resistant glass, with narrow mouths and fitted with ground glass stoppers, capable of holding 270 ml to 280 ml when filled completely to the stopper.

1) To be published. (Revision of ISO 2160: 1985)