

Insulating oil — Determination of fibre contamination by the counting method using a microscope

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British Standard

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National foreword

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**Insulating oil -
Determination of fibre contamination by
the counting method using a microscope**

Huiles isolantes -
Détermination de la contamination
par fibres par la méthode du comptage
avec utilisation d'un microscope

Isolieröl -
Bestimmung der Faserverunreinigungen
mittels eines Zählverfahrens mit einem
Mikroskop

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This European Standard was prepared by the CENELEC BTWG 99-1, Insulating oil.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50353 on 2000-12-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2002-04-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2004-01-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex A is normative.

Warning This European Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Introduction

It is generally recognized that fibres and other particles have a detrimental effect on the dielectric strength of insulating oil. It has long been a requirement to include in specifications for insulating liquids that the fluid be clear and free from visible particulate matter or sediment. This Standard provides the methodology for testing for contamination by fibres and consists of filtering a known volume of the insulating liquid under vacuum assisted conditions through a membrane filter to collect contaminants on the filter surface. The membrane is then examined microscopically to count and size the fibres.

1 Scope

This European Standard specifies two methods for determining the fibre contamination of mineral insulating oil used in electrotechnical equipment, based on filtering a sample of oil and examining and counting the number of fibres on the surface of the filter using an optical microscope. Fibres down to 100 μm in length can be sized and counted by these methods. The methods are applicable both to unused oils and to oils in service.

The method specified in the main text is applicable to oil samples taken from barrelled oil or from electrotechnical equipment in service, in which the fibre concentration is expected to be relatively high. The alternative method specified in annex A is applicable to samples taken from new oil in bulk containers, or from large transformers which have not been operated much since they were filled, in which the fibre concentration is expected to be relatively low.

NOTE These methods are also suitable for other insulating liquids such as silicones and synthetic esters.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other standards. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

IEC 60475 *Method of sampling liquid dielectrics*

ISO 5598 *Fluid power systems and components - Vocabulary*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in ISO 5598 and the following apply.

3.1

blank count

count of the number of fibres introduced from other sources, such as reagents or cleaning of glassware

3.2

effective filtration area

area of a membrane filter open to flow during filtration of the fluid