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Australian Standard®

Insulating liquids

Method 2.8: Test methods—Determination of water in oil-impregnated paper and pressboard by automatic coulometric Karl Fischer titration (IEC 60814, Ed. 2.0 (1997) MOD)

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The following are represented on Committee EL-008:

- Australasian Railway Association
- Australian Chamber of Commerce and Industry
- Australian Greenhouse Office, Department of the Environment, Water, Heritage and the Arts
- Australian Industry Group
- Australian Institute of Petroleum Ltd
- Electricity Engineers Association, New Zealand
- Energy Efficiency and Conservation Authority, New Zealand
- Energy Networks Association
- Engineers Australia
- Testing Interests (Australia)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-008, Power Transformers. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide manufacturers and users of insulating liquids and oil-impregnated cellulosic insulation with methods of determining the water content by coulometrically generated Karl Fischer reagent. The methods for unused insulating liquids are applicable to water concentrations greater than 2 mg/kg. The methods for oil-impregnated cellulosic material determine water content over the range 0.1% to 20% by mass.

Requirements for Quality Assurance are given in Annex ZA.

This Standard is an adoption with national modifications and has been reproduced from IEC 60814, Ed. 2.0 (1997), *Insulating liquids—Oil-impregnated paper and pressboard—Determination of water by automatic coulometric Karl Fischer titration*, and has been varied as indicated to take account of Australian conditions.

Variations to IEC 60814, Ed.2.0 (1997) are indicated at the appropriate places throughout this Standard. Strike-through (~~example~~) identifies IEC text, tables and figures that, for the purposes of this Australian Standard, are deleted. Where text, tables or figures are added, each is set in its proper place and identified by shading (example). Added figures are not themselves shaded but are identified by a shaded border. All changes are listed in Annex ZZ.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears only on the cover and title page, while the International Standard number appears only on the cover.

(b) In the source text, 'this International Standard' should read 'this Australian Standard'.

(c) A full point should be substituted for a comma as a decimal marker.

The terms 'normative' and 'informative' are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

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Any table, figure or text of the International Standard that is struck through is not part of this Standard. Any Australian/New Zealand table, figure or text that is added is part of this Standard and is identified by shading.

1 General

1.1 Scope

This International Standard describes methods for the determination of water in insulating liquids and in oil-impregnated cellulosic insulation with coulometrically generated Karl Fischer reagent.

The method in clause 2 is applicable to water concentrations above ~~2 mg/kg~~ 1 mg/kg in liquids having viscosity of less than 100 mm^2/s at 40 °C.

The test method in clause 3, where water is extracted by means of a nitrogen stream, is the preferred method for insulating liquids of viscosity higher than 100 mm^2/s.

Clause 4 describes methods for the determination of water content in oil-impregnated paper and pressboard over the range 0,1 % to 2 % by mass.

1.2 Normative references

The following normative documents 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 normative documents 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 normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

References to International Standards that are struck through in this clause are replaced by references to the Australian or Australian/New Zealand Standards that are listed immediately thereafter and identified by shading. Any Australian or Australian/New Zealand Standard that is identical to the International Standard it replaces is identified as such.

~~IEC 60475: 1974, Method of sampling liquid dielectrics~~

AS 1767.2.3, *Insulating liquids*, Part 2: *Test methods*, Method 2.3: *Method of sampling liquid dielectrics*

IEC 60567: 1992, *Guide for the sampling of gases and of oil from oil-filled electrical equipment and for the analysis of free and dissolved gases*

~~ISO 595-1: 1986, Reusable all-glass or metal-and-glass syringes for medical use – Part 1: Dimensions~~