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AS 1767—1975

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SK BY  
AS 1767.1-1975  
(TAS MAY 1976)

Amex 1.

# Australian Standard 1767 — 1975

WITHDRAWN TAS  
MAY 1976  
SK BY  
AS 1767.1-1975

## INSULATING OIL FOR TRANSFORMERS AND SWITCHGEAR

STANDARDS ASSOCIATION  
OF AUSTRALIA  
20 AUG 1975

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[Title allocated by Defence Cataloguing Authority:  
INSULATING OIL, ELECTRICAL  
(For Switchgear and Transformers)]



STANDARDS ASSOCIATION OF AUSTRALIA  
Incorporated by Royal Charter

THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL organizations were officially represented on the committee entrusted with the preparation of this standard:

Associated Chambers of Manufactures of Australia  
Australian Electrical Manufacturers Association  
Australian and New Zealand Railways Conferences  
Australian-British Trade Association  
Electricity Supply Association of Australia  
Electricity Supply Engineers Association of N.S.W.  
The Institution of Engineers, Australia  
Oil Companies

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This standard, prepared by a subcommittee of Committee EL/8, Static Electrical Machinery, was approved on behalf of the Council of the Standards Association of Australia on 24 April 1975.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvement to published standards, addressed to the headquarters of the Association, are welcomed.

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*This standard was issued in draft form for public review as DR 74023.*

**STANDARDS ASSOCIATION OF AUSTRALIA**

Incorporated by Royal Charter

**AMENDMENT No 1**

to

**AS 1767—1975****INSULATING OIL FOR TRANSFORMERS AND SWITCHGEAR**

**SUMMARY**—The following sections of the standard are covered by this amendment: Preface, Contents, Clause 1, Table 1, Note 8 to Table 1, Appendix G (new).

**INTRODUCTION**

This amendment includes the addition of an appendix which describes a method for the determination of water content in insulating oil by the Karl Fischer method using a single-burette as an alternative to the double-burette methods referred to in Table 1.

**Page 2. List of standards.****Substitute**

'AS 1883 Guide to Maintenance and Supervision of Insulating Oils in Service.'

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for 'AS CC11 Code for Maintenance of Insulating Oil.'

Add 'AS 1042 Direct-acting Indicating Electrical Measuring Instruments and their Accessories.'

**Page 4. Contents.****Add to Appendices**

'G Method of Test for Water Content by Karl Fischer  
Method Using a Single Burette .... 45'

AMDT  
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1976**Page 5. Clause 1.**

Note 1: *substitute* 'AS 1883' for 'AS CC11—1965'.

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1976**Page 7. Table 1.**

Water content—3rd column: *add* 'Appendix G' above 'ISO R760'.

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No 1  
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1976**Page 8. Note 8.**

*Delete* existing text of the first paragraph and *substitute*:

8. While several variations of the Karl Fischer method are given in ISO/R760 and BS 2511, the double-burette method detailed in those standards or the single-burette method described in Appendix G of this specification are to be preferred. At the level of water content to be expected for new insulating oils these methods are considered to have adequate precision provided that, in obtaining the samples for test, scrupulous care is taken in applying the relevant paragraphs of Appendix A. A dry solvent mixture of 2 parts chloroform and 1 part methanol is suitable for use in determining the water content.

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*Delete* the footnote.

Published on 1 August 1976.



**Add Appendix G as follows:**

**APPENDIX G**  
**METHOD OF TEST OF WATER CONTENT**  
**BY KARL FISCHER METHOD**  
**USING A SINGLE BURETTE**

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**G1 SCOPE.** This method covers the determination of water content of insulating oil at concentrations in the order of 10 mg/kg and above.

**G2 PRINCIPLE OF METHOD.** The method relies on the ability of an anhydrous solvent to extract water from a sample of insulating oil.

An anhydrous solvent is established by titrating a chloroform/methanol blend with Karl Fischer reagent.

The oil sample is mixed with the anhydrous solvent which dissolves the oil and extracts the water.

The oil/solvent mixture is titrated with Karl Fischer reagent and the water content of the insulating oil determined.

**G3 APPARATUS.**

**G3.1 Titration Assembly.** The titration assembly consists of a pyrex glass reaction vessel fitted with platinum electrodes (Fig. G1), a magnetic stirrer, a 0-6 ml burette and a 500 ml reagent reservoir.

Atmospheric moisture is excluded from the assembly by means of silica gel guard tubes.

**G3.2 Constant Current Source and Millivoltmeter.** The current source supplies a constant d.c. current of 10  $\mu$ A to the platinum electrodes. This may be achieved by means of a regulated low voltage source and a series resistor of high ohmic value.

The millivoltmeter should be an electronic instrument, having an accuracy class 0.5 or better, in accordance with AS 1042,\* capable of measuring from 2.5 mV to 350 mV and incorporating a meter having a scale length of at least 150 mm.

**G3.3 Precision Syringe.** A liquid type syringe having a capacity of 10  $\mu$ l is used for standardization of the Karl Fischer reagent.

**G3.4 Sample Weighing Vessel and Balance.** A sample tube fitted with stopcocks and a silica gel guard tube is used for the introduction of approximately 50 g of oil into the reaction vessel.

The balance used to determine the mass of the oil sample should have an accuracy of  $\pm 0.5$  g or better.

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\*AS 1042, Direct-acting Indicating Electrical Measuring Instruments and Their Accessories.

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