

Australian Standard™

Insulating liquids

Part 2: Test methods Method 2.1: Determination of the breakdown voltage at power frequency

[IEC title: Insulating liquids—Determination of the breakdown voltage
at power frequency—Test method]

This Australian Standard was prepared by Committee EL/8, Power Transformers. It was approved on behalf of the Council of Standards Australia on 16 February 1999 and published on 5 May 1999.

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Australian Electrical and Electronic Manufacturers Association
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Insulating liquids

Part 2: Test methods

Method 2.1: Determination of the breakdown voltage at power frequency

Originated as AS 1767.2.1—1999.

PREFACE

This Standard was prepared by the Standards Australia Committee EL/8, Power Transformers.

It is identical with and has been reproduced from IEC 60156:1995, *Insulating liquids—Determination of the breakdown voltage at power frequency—Test method*.

In January 1997, IEC commenced numbering its Standards from 60000 by adding 60000 to the number of each existing Standard. This coordinates IEC numbering with ISO numbering. During the transition period an IEC Standard might be identified by its new number or its old number (e.g. IEC 60050 or IEC 50).

This Standard is Part 2.1 of a series which comprises the following:

AS

- 1767 Insulating liquids
- 1767.1 Part 1: Specification for unused mineral insulating oils for transformers and switchgear
- 1767.2 Part 2: Test methods
- 1767.2.1 Method 2.1: Determination of the breakdown voltage at power frequency (this Standard)
- 1767.2.3 Method 2.3: Method of sampling liquid dielectrics
- 1767.2.4 Method 2.4: Detection and determination of specified anti-oxidant additives in insulating oils
- 1767.2.5 Method 2.5 Unused hydrocarbon-based insulating liquids—Test methods for evaluating the oxidation stability
- 1767.2.7 Method 2.7: Determination of PCB contamination in insulating liquids by capillary column gas chromatography—Identification of congeners

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- (c) A full point should be substituted by a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian Standards, as follows:

<i>Reference to International Standard</i>	<i>Australian Standard</i>
IEC	AS
60052 Recommendation for voltage measurement by means of sphere-gaps (one sphere earthed)	2886 Voltage measurement—Sphere-gap method (one sphere earthed)
60060 High-voltage test techniques	1931 High-voltage test techniques
60475 Method of sampling liquid dielectrics	1767 Insulating liquids
	1767.2 Part 2: Test methods
	1767.2.4 Method 2.4: Detection and determination of specified anti-oxidant additives in insulating oils

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AUSTRALIAN STANDARD

Insulating liquids

Part 2:

Test methods

Method 2.1: Determination of the breakdown voltage
at power frequency

TEST METHOD

1 Scope

This international Standard specifies the method for determining the dielectric breakdown voltage of insulating liquids at power frequency. The test portion, contained in a specified apparatus, is subjected to an increasing a.c. electrical field by means of a constant rate of voltage rise until breakdown occurs.

The method applies to all types of insulating liquids of nominal viscosity up to $350 \text{ mm}^2\text{s}^{-1}$ at 40°C . It is appropriate both for acceptance testing on unused liquids at the time of their delivery and for establishing the condition of samples taken for monitoring and maintenance of equipment.

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.

IEC 52: 1960, *Recommendations for voltage measurement by means of sphere-gaps (one sphere earthed)*

IEC 60, *High-voltage test techniques*

IEC 475: 1974, *Method of sampling liquid dielectrics*

3 Electrical apparatus

The electrical apparatus consists of the following units:

- a) Voltage regulator
- b) Step-up transformer
- c) Switching system
- d) Energy limiting devices

Two or more of these units may be integrated in any equipment system.

3.1 Voltage regulator

Uniform increase of voltage with time by manual means is difficult and, for this reason, automatic control is essential.