AS 1767.2.1—1999
IEC 60156:1995

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.

The following interests are represented on Committee EL/8:

Australasian Railway Association

Australian Chamber of Commerce and Industry

Australian Electrical and Electronic Manufacturers Association

Australian Institute of Petroleum

Electricity Supply Association of Australia

Electricity Supply Engineers Association of New South Wales

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Part 2: Test methods
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Originated as AS 1767.2.1—1999.

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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

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

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title pages.

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

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

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

Reference to International Standard		*Australian Standard*	
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 mm^2s^{-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 in 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.