Australian Standard®

Insulators—Composite for overhead lines—Voltages greater than 1000 V a.c.

Part 1: Definitions, test methods and acceptance criteria for string insulator units

[Based on and including the full text of IEC 1109:1992 and IEC 1109:1992/Amd.1:1995, Composite insulators for a.c. overhead lines with a nominal voltage greater than 1000 V—Definitions test methods and acceptance criteria]

This Australian Standard was prepared by Committee EL/10, Overhead Lines. It was approved on behalf of the Council of Standards Australia on 26 August 1996 and published on 5 December 1996.

The following interests are represented on Committee EL/10:

Australasian Railway Association

Australian Chamber of Commerce and Industry

Australian Electrical and Electronic Manufacturers Association

Australian Porcelain Insulators Association

Electricity Engineers Association of New Zealand

Electricity Supply Association of Australia

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL/10 on Overhead Lines.

Apart from the exceptions described below, this Standard has been reproduced from IEC 1109 (1992), *Composite insulators for a.c. overhead lines with a nominal voltage greater than 1000 V—Definitions, test methods and acceptance criteria*, including Amendment No. 1:1995. The Amendment is found at the end of this Standard. The text affected by the Amendment is marked in the source document by double marginal bars.

This Standard is the result of a consensus among Australian and New Zealand representatives to produce it as an Australia Standard.

The objective of this Standard is to provide users and manufacturers of composite insulators with definitions of terms, test methods and acceptance criteria to facilitate the specification of insulators.

This Standard is one of a four-part series to cover composite insulators for overhead lines, which when complete will comprise the following:

(a) This Standard (AS 4435.1).

(b) A proposed Part 2 to cover standard strength classes and end fittings for string insulator units.

(c) A proposed Part 3 to cover dimensional and electrical characteristics for string insulator units.

(d) A proposed Part 4 to cover definitions, test methods and acceptance criteria for post insulator units.

(e) A proposed Part 5 to cover standard strength classes and end fittings for post insulator units.

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Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix or annex to which they apply. A 'normative' appendix or annex is essential to the understanding and implementation of the Standard. An 'informative' appendix or annex gives additional information, recommendations and guidelines.

For the purpose of this Standard, the IEC text should be modified as follows:

(A) The IEC text is amended, supplemented or replaced as set out in Appendix ZZ. The changes are indicated by a marginal bar against each clause, table or figure affected by a reference to Appendix ZZ.

NOTE: Three marginal bars indicate that the IEC text is affected by Appendix ZZ and IEC 1109:1992 Amd.1: 1995.

(B) A full point (.) substitutes for a comma (,) when referring to a decimal point.

(C) References to international Standards should be replaced by references to Australian or Australian/New Zealand Standards as follows:

Reference to International Standard		*Australian Standard*	
IEC		AS	
60	High voltage test techniques	1931	High-voltage test techniques
60-1	Part 1: General definitions and test requirements	1931.1	Part 1: General definitions and test requirements
120	Dimensions of ball and socket couplings of string insulator units	2947	Insulators—Porcelain and glass for overhead power lines—Voltages greater than 1000 V a.c.
		2947.3	Part 3: Couplings
383	Tests on insulators of ceramic material or glass for overhead lines with a nominal voltage greater than 1000 V	2947	Insulators—Porcelain and glass for overhead power lines—Voltages greater than 1000 V a.c.
		2947.1	Part 1: Test methods
437	Radio interference test on high-voltage insulators	—	
507	Artificial pollution tests on high-voltage insulators to be used on an a.c. system	—	
815	Guide for the selection of insulators in respect of polluted conditions	—	

The following International Electrotechnical Commission document is quoted in this Standard.

IEC
707 Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source.

The following American Society for Testing and Materials document is quoted in this Standard.

ASTM
D 2863 Test Method for Measuring Minimum Oxygen Concentration to Support Candle-like Combustion of Plastics (Oxygen Index)

The following International Organization for Standardization document is quoted in this Standard

ISO
3452 Non-destructive testing—Penetrant inspection—General principles

CONTENTS

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AUSTRALIAN STANDARD

Insulators—Composite for overhead power lines—Voltages greater than 1000 V a.c

Part 1:
Definitions, test methods and acceptance criteria for string insulator units

1 Scope and object

This International Standard is applicable to composite insulators for use as suspension/tension line insulators, but it is to be noted that these insulators can occasionally be subjected to compression or bending, for example when used as phase-spacers. Composite insulators designed primarily to resist bending loads, e.g. line post insulators, are not included in the scope of this Standard.

This standard deals with those composite insulators which include a "core" and a "housing". The core is usually made of resin-impregnated glass fibres. The housing can be manufactured from a variety of materials including elastomers (e.g. silicone, ethylene-propylene); resins (e.g. cycloaliphatic epoxy) or fluorocarbons (e.g. polytetrafluoroethylene).

The object of this Standard is to:

- define the terms used;
- prescribe test methods;
- prescribe acceptance criteria.

This standard does not include requirements dealing with the choice of insulators for specific operating conditions.

2 Normative references

The following standards 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 standards 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 standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60-1: 1989, *High-voltage test techniques - Part 1: General definitions and test requirements.*

IEC 120:1984, *Dimensions of ball and socket couplings of string insulator units.*

IEC 383: 1983, *Test on insulators of ceramic material or glass for overhead lines with a nominal voltage greater than 1 000 V.*

IEC 437:1973, *Radio interference test on high-voltage insulators.*

IEC 507: 1991, *Artificial pollution tests on high-voltage insulators to be used on an a.c. system.*