AS 3147—1992

Australian Standard®

Approval and test specification—Electric cables—Thermoplastic insulated—For working voltages up to and including 0.6/1 kV

This Australian Standard was prepared by Committee EL/3, Electric Wires and Cables. It was approved on behalf of the Council of Standards Australia on 15 October 1992 and published on 21 December 1992.

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Australian Electrical and Electronic Manufacturers Association
Department of Defence
Electrical Contractors Associations of Australia
Electrical regulatory authorities
Electrical Supply Association of Australia
Office of Energy, New South Wales
Railways of Australia Committee
Testing interests.

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PREFACE

This Standard was prepared by the Standards Australia Committee on Electric Wires and Cables to supersede AS 3147—1988, *Approval and test specification—Electric cables—Thermoplastic insulated for working voltages up to and including 0.6/1 kV*.

The Standard applies to cables and flexible cables insulated with thermoplastic materials (including PVC) intended for use in electrical installations at working voltages up to and including 0.6/1 kV.

This Standard differs from the 1988 edition as follows:

(a) The V-105 insulation in Table 1, while having retained the criteria, has now been redesignated as V-90 HT (i.e. a higher temperature endurance version of V-90) insulation and permits conductor operating temperature up to a maximum of 105°C for limited periods (see Clause 5).

Accordingly, the V-105 insulated cables in Tables 8 and 16 have been similarly redesignated as V-90 HT insulated and are now shown in Tables 7 and 15.

(b) Average thickness of lead-alloy sheath in Table 5 has been deleted and replaced by a equation in Clause 14. The subsequent tables have been renumbered.

(c) A note has been added to the Scope, giving a reference to other Standards for flexible cables above 25 mm^2.

(d) A requirement for insulation to have not less than 1% carbon black content has been added for insulated unprotected aerial cables.

(e) The V-90 insulated and non-metallic sheathed single-core, and multicore flat cables incorporate a new 3V-90 sheath.

The Standard is one of a series of Approval and Test Specifications issued by Standards Australia. These Specifications are accompanied by a general Specification, AS 3100, containing definitions and general requirements for electric materials and equipment. The purpose of these Specifications is to outline the conditions which must be met to secure approval for the sale and use of electrical equipment in Australia. Only safety matters and conditions closely allied thereto are covered. For guidance on details for enquiry and order, see Appendix A.

In the preparation of this Standard, consideration was given to IEC 502:1983 *Extruded solid dielectric insulated power cables for rated voltages from 1 kV to 30 kV* and acknowledgment is made of the assistance received from that source. The dimensions and sheath thickness for fixed circular cables are identical with the values in IEC 502.

The nominal cross-sectional areas of the conductors specified in this Standard are identical with the values recommended in IEC 228:1978 *Conductors of insulated cables*.

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1 SCOPE This Standard specifies construction, dimensions and tests for cables insulated with thermoplastic material (including PVC) intended for use in electrical installations at working voltages up to and including 0.6/1 kV. Also included are flexible cables with conductors in the range 6 mm^2 up to and including 25 mm^2.

Except where otherwise specified in tables of construction and dimensions, cables covered by this Standard are suitable for use as underground cables.

It does not apply to specialized thermoplastic insulated cables for which there are separate Australian Standards, e.g. flexible lift control cables, neutral screened cables, welding cables, ships cables, flexible cords and the like.

NOTES:

1 Purchasing guidelines are contained in Appendix A.

2 In addition to providing detailed requirements for cables of the types and sizes in the tables of construction and dimensions, this Standard provides the basis of requirements for other types and sizes in the range of materials covered by this Standard.

3 For flexible cables above 25 mm^2 refer to other Standards, e.g. AS 3116 or AS 1995.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

1125 Conductors in insulated electric cables and flexible cords

1660 Methods of test for electric cables, cords and conductors

1995 Welding cables

2122 Combustion propagation characteristics of plastics

2893 Electric cables—Lead and dead alloy sheaths—Composition

3000 SAA Wiring Rules

3100 Approval and test specification–General requirements for electrical equipment

3116 Approval and test specification—Electric cables—Elastomer insulated—For working voltages up to and including 0.6/1 kV

3155 Approval and test specification – Neutral screened cables for working voltages of 0.6/1 kV

3863 Galvanized mild steel wire for armouring cables

SAA

MP49 Register of colours of manufacturers' identification threads for electrical cables and flexible cords

3 DEFINITIONS For the purposes of this Standard, definitions given in the referenced Standards and those below apply.

3.1 Core (of a cable)—the conductor with its insulation but not including any protective covering.

3.2 Multicore cable—a cable comprising two or more cores.

3.3 Fixed cable—a cable which is fixed or supported in position.

3.4 Flexible cable—a cable with conductors, insulation and covering that afford flexibility, all conductors comprising a substantial number of wires of relatively small diameter.

3.5 Maximum continuous conductor temperature—the maximum temperature at which the conductor of the cable may be operated continuously and which is the temperature resulting from the combined effect of the ambient temperature and the current loading of the conductor.

3.6 Voltage designation—for cables for a.c. systems the rated voltages U_o and U expressed in the form U_o/U; or for cables for d.c systems, the rated voltage U_o—

where

U_o = the r.m.s. power frequency voltage to earth of the supply system or d.c. voltage of the supply system for which the cable is designed

U = the r.m.s. power frequency voltage between phases of the supply system and for which the cable is designed

3.7 Direction of lay—the slope of the helically laid-up cores, screen wire or armour wire, armour tape or the like, when the cable is held vertically.

It is right hand when the slope is in the direction of the central part of the letter Z, and left hand when the slope is in the direction of the central part of the letter S.

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