AS 3116—1990

Australian Standard®

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

[Title allocated by Defence Cataloguing Authority:
Cable, Power, Electrical and Wire, Electrical (Elastomer Insulated, for Working Voltages of 0.6/1 kV)]

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STANDARDS AUSTRALIA

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 19 March 1990 and published on 6 August 1990.

The following interests are represented on Committee EL/3:

Australian Electrical and Electronic Manufacturers Association

Department of Defence

Department of Minerals and Energy, New South Wales

Electrical Contractors Associations of Australia

Electrical Regulatory Authorities

Electricity Supply Association of Australia

Railways of Australia Committee

Testing Interests

This Standard was issued in draft form for comment as DR 89058.

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PREFACE

This Standard was prepared by the Standards Australia Committee on Electric Wires and Cables to supersede AS 3116—1981, *Elastomer insulated electric cables and flexible cables for working voltages up to and including 0.6/1 kV*. It was first published as AS C116 in 1941. The second edition in 1950 also incorporates AS C130 of 1941 and Emergency Standard AS (E)C502 of 1943. The 1955 edition of AS C116 incorporates AS C50, which was first published in 1928 and revised in 1939 and 1950. AS C116 was further revised in 1967, 1970 and 1972.

This 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 C.

This Standard differs from the 1981 edition as follows:

(a) A range of halogen free cables and flexible cables featuring low smoke emission, acid gas and low flame propagation properties in fire conditions has been included. Additional insulation and sheath materials have been specified for these cables together with an appropriate range of tests and criteria.

(b) Major changes have been made to the tables of tests and criteria for insulation, non-metallic outer sheaths and cable.

(c) The provisions for cables with metallic layers have been considerably expanded.

(d) Flat cables with aluminium conductors have been deleted.

(e) Cables with copper-clad aluminium conductors have been deleted.

(f) The approximate overall diameters quoted in the tables of dimensions have been recalculated.

(g) The provision for interlocked steel tape armour has been deleted.

(h) Appendix A, *The fictitious calculation method for the determination of the dimensions of protective coverings*, has been expanded to include methods of calculation for cables incorporating metallic layers and cables with earth conductors.

In the preparation of this Standard, consideration was given to IEC 502* and IEC 245†, and acknowledgement is made of the assistance received from those sources.

The dimensions and sheath thickness for fixed cables are identical with the values in IEC 502.

The nominal cross-sectional areas of the conductors specified herein are identical with the values recommended in IEC 228.‡

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* IEC 502, Extruded solid dielectric insulated power cables for rated voltages from 1 kV to 30 kV.

† IEC 245, Rubber insulated cables of rated voltages up to and including 450/750 V.

‡ IEC 228, Conductors of insulated cables.

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1 SCOPE. This Standard specifies construction, dimensions and tests for cables and flexible cables insulated with elastomeric materials, other than silicone rubber, and intended for use in electrical installations at working voltages up to and including 0.6/1 kV.

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

This Standard does not apply to specialized elastomer 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 C.
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.

2 REFERENCED DOCUMENTS. The documents below are referred to in this Specification:

AS
1125 Conductors in insulated electric cables and flexible cords
1660 Methods of test for electric cables, cords and conductors
2122 Combustion propagation characteristics of plastics
2893 Electric cables—Lead and lead alloy sheaths—Composition
3000 SAA Wiring Rules
3100 Approval and test specification—Definitions and general requirements for electrical materials and equipment

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

BS
1442 Specification for galvanized mild steel wire for armouring cables

3 DEFINITIONS. For the purpose of this Specification the relevant 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, the conductors, insulation and covering of which afford flexibility and the conductors of any cross-sectional area comprise a substantial number of wires of 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 = is 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; and

U = is 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.

3.8 Wavelength or length of lay—the axial distance between successive crests of the waveform or turns of the helix formed, as appropriate, e.g. by a core of a multicore cable, wire of a stranded conductor, screen or armour wire, screen or armour tape or the like.