Australian Standard®

Conductors—Bare overhead—Hard-drawn copper

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Australian Electrical and Electronic Manufactures Association

Australian Porcelain Insulators Association

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PREFACE

This Standard was prepared by the Standards Australia Committee on Overhead Lines and supersedes AS 1746—1975, *Hard-drawn copper conductors for overhead power transmission purposes.*

The range of conductor sizes provided is similar to the range specified in AS 1746—1975, but the Standard also provides the facility for conductors of other dimensions to be supplied by reference to this Standard.

This Standard differs from the 1975 edition as follows:

(a) Minimum ultimate tensile stress (UTS) of the larger wire sizes has been reduced slightly to reflect the changed copper purity, and processing methods. Other wire UTS values have been rationalized.

(b) An additional wire size (3.75 mm diameter), and a new standard conductor construction (7/3.75) have been introduced.

(c) A new appendix has been provided, which includes the coefficient of linear expansion, and the theoretical basis for the calculation of modulus of elasticity.

(d) Another new appendix has been included which highlights items which should be specified by the purchaser or agreed between the purchaser and manufacturer at the time of order.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies requirements and tests for homogeneous bare electrical conductors for overhead power transmission, and constructed of hard-drawn copper wires.

NOTES:
1 Appendix A gives methods to calculate conductor properties.
2 Appendix B gives the coefficient of linear expansion and the theoretical basis for the calculation of modulus of elasticity
3 Appendix C lists information which should be supplied with enquiries and orders for conductors.

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

AS
1279 Copper refinery shapes
1391 Methods for tensile testing of metals
1574 Copper and copper alloys—Wire for electrical purposes
2505 Methods for bend and related testing of metals
2505.5 Part 5: Torsion and wrapping tests on wires
2857 Timber drums for insulated electric cables and bare conductors
C365 Drums for bare stranded conductors
C365.2 Part 2: Metal drums

IEC
468 Method of measurement of resistivity of metallic materials

1.3 DEFINITIONS For the purpose of this Standard the following definitions apply:

1.3.1 Wire — a filament of drawn metal having a constant circular cross-section.

1.3.2 Conductor — a finished circular stranded assembly consisting of seven or more wires laid up together.

1.3.3 Diameter — the mean of two measurements at right angles taken at any one cross-section.

1.3.4 Direction of lay — the direction of lay is defined as right-hand or left-hand, as follows:

(a) Right-hand lay—when the slope of the wires is in the direction of the central part of the letter Z when the conductor is held vertically.

(b) Left-hand lay—when the slope of the wires is in the direction of the central part of the letter S when the conductor is held vertically

1.3.5 Lay length — the axial length of one complete turn of the helix formed by an individual wire in a stranded conductor.

1.3.6 Lay ratio — the ratio of the lay length to the nominal external diameter of the corresponding layer of wire in the stranded conductor.

1.3.7 Breaking load of a wire — the maximum load obtained in a tensile test of that wire.

1.3.8 Ultimate tensile stress — the breaking load divided by the original cross-sectional area of the test wire.

1.3.9 Spool — a container of wire which is to be installed on a stranding machine to manufacture the conductor.

1.3.10 Informative appendix — an appendix giving additional information, recommendations, guidelines or other non-mandatory statements.

1.4 NOMENCLATURE Hard-drawn copper conductors covered by this Standard shall have the code HDCu.