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Australian Standard 1154, Part 2—1980

INSULATOR AND CONDUCTOR FITTINGS FOR OVERHEAD POWER LINES

Part 2—DIMENSIONS

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Electrical and Electronic Manufacturers Association

Australian Porcelain Insulators and Technical Ceramic Manufacturers Association

Confederation of Australian Industry

Electrical and Radio Federation of Victoria

Energy Authority of New South Wales

Electricity Supply Association of Australia

Railways of Australia Committee

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AUSTRALIAN STANDARD

INSULATOR AND CONDUCTOR FITTINGS FOR OVERHEAD POWER LINES

Part 2 DIMENSIONS

AS 1154, Part 2—1980

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PREFACE

This standard was prepared by the Association's Committee on Overhead Line Materials. It deals with dimensional standardization and is confined to a limited range of fittings used on overhead power lines in close association with the insulators and conductors. Part 1 of this standard (published separately) deals with the performance of fittings.

The revision deals with insulator pins, and results from alignment of stem diameters with preferred metric fastener sizes.

In preparing the revision, consideration was also given to the following:

- A rationalization of the number of pins while maintaining compatibility wi the recently adopted ESAA range of pin insulators.
- A review of the material requirements to align with current Australia standards and practices.
- A review of the dimensions to provide the strength requirements when using the recommended material, and to provide the most economical forging operation.
- The deletion of the hexagonal flange at the base of the shan
- The introduction of standard sizes of washers in preference to the non-standard sizes previously called up.

Fittings shown in this standard are identical with those given in the relevant Parts of AS 1137, Porcelain and Glass Insulators for Overhead Power Lines, as to dimensions for ball and socket couplings, and for convenience the Section therein on gauging is repeated in this standard.

The ball and socket couplings are based on IEC 120 but the drawings have been dimensioned and toleranced in accordance with the latest drawing practice. This makes it possible to dimension and tolerance the gauges in such a way that they are practicable to make and check. A consequence of this has been that the tolerance on the pin ball height has been modified and is now similar to the tolerance on the pin ball diameter. In regard to 16 mm sockets, only the alternative 'B' socket has been included in this standard, thereby providing a security clip thickness of 7.9 mm in conformity with present Australian practice. These changes do not adversely affect the interchangeability of Australian practice with the practice in Britain, Europe and other parts of the world.

The mechanical requirements for insulator set fittings are related on the failing load of the fitting, which is in effect, the highest reading reached on the testing machine during tests carried out in accordance with Part 1 of this standard, and the fitting must show evidence of a ductile failure. In this way, difficulties due to differing views on permanent set, yield point and ultimate strength have been avoided. With reference to the mechanical requirements of insulator pins, attention is drawn to the Note to Clause 2.2 of Part 1. It is for the user to decide on the relationship between the maximum working load and the specified minimum failing load, having due regard to all the circumstances and any relevant statutory regulations.

The fittings standardized in this Part are subject to the requirements of Part 1, to which reference is therefore necessary in using this Part.

This standard requires reference to the following Australian standards:

AS 1110	ISO Metric Hexagon Precision Bolts and Screws
AS 1111	ISO Metric Hexagon Commercial Bolts and Screws
AS 1112	ISO Metric Hexagon Nuts, Including Thin Nuts, Slotted Nuts and Castle Nuts
AS 1137	Insulators Part 1—Porcelain and Glass Insulators for Overhead Power Lines
AS 1214	Hot-dip Galvanized Coatings on Threaded Fasteners
AS 1237	Flat Metal Washers for General Engineering Purposes
AS 1275	Metric Screw Threads for Fasteners
AS 1544	Methods for Impact Tests on Metals Part 2—Charpy V-notch
AS 1650	Galvanized Coatings on Ferrous Articles
AS 1815	Method for Rockwell Hardness Test Part 1—Testing of Metals

AS B129 Designs for Geometric Limit Gauges (Plain and Screwed in Inch Units)

AS B195 Plain Limit Gauges: Limit and Tolerances

and to the range of standards for materials given in Clause 4.

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INSULATOR AND CONDUCTOR FITTINGS FOR OVERHEAD POWER LINES

PART 2—DIMENSIONS

1 SCOPE. This standard sets out dimensions for a limited range of insulator pins, insulator set fittings, arcing horns, tongue ends and clevis ends for clamps for overhead power lines, using insulators with minimum failing loads of up to 66 kN, 125 kN and 187 kN.

2 DEFINITIONS. The definitions given in AS 1154, Part 1, apply also to this standard.

3 PERFORMANCE AND GENERAL REQUIREMENTS. The fittings shall comply in all respects with the relevant requirements of AS 1154, Part 1.

4 MATERIAL.

4.1 General. The manufacturer shall satisfy the purchaser that all material shall be sufficiently ductile. The manufacturer shall hold available records that the materials used for fittings are in accordance with the relevant material specification as to mechanical properties and chemical composition.

Table 4 and the Notes to the associated Figs [illegible]6 inclusive show the normal materials for which fittings are to be made. In these references 'Forged steel' shall be as specified in Clause 4.2 below and 'Malleable cast iron' shall be as specified in Clause 4.3 below.

NOTE: Where fittings are manufactured from materials other than normal materials recommended, due regard should be made to the differences in mechanical properties between cast fittings and forged fittings for use to assess their working loads accordingly.

4.2 Forged Steel. Forged steel shall be one of the following:

Grade AS 1448—XK 1320—normalized—160-190 HB 10/3000

Grade AS 1448—XK 1340—oilquenched and tempered—2[illegible]-275 HB 10/3000

Grade AS 1442—CS 1030—for insulator pins referred to in Clause 5.3.1

Other forging steels may be used only if evidence is produced to the satisfaction of the purchaser that such material, heat treated in the same manner as the fitting, has a Charpy V impact value of 27 J at − 20°C when tested in accordance with AS 1544, Part 2.

4.3 Malleable Cast Iron. Malleable cast iron shall be one of the following:

Grade AS 1832—310 - 10
Grade AS 1832—410 - 4
Grade AS 1832—440 - 7
Grade AS 1832—510 - 4

Other malleable materials may be used only if they comply with Australian or other recognized standards and are acceptable to the purchaser. Such material may include the following:

Grade AS 1831—500 - 7
Grade AS 1831—400 - 250 - 12
Grade AS 1831—[illegible] - 230 - 17

4.4 References. For detailed requirements of the properties of materials, reference should be made to the following standards.

AS 1442	Carbon Steels and Carbon-manganese Steels—Hot-rolled Bars and Semi-finished Products
AS 1444	Wrought Alloy Steels of the AISI-SAE H and Standard Steels Types
AS 1448	Carbon and Carbon-manganese Steel Forgings for General Engineering Purposes
AS 1565	Copper Alloy Ingots and Copper and Copper Alloy Castings
AS 1566	Copper and Copper Alloy Plate, Rolled Bar, Sheet, Strip and Foil for General Engineering Purposes
AS 1831	Spheroidal or Nodular Graphite Iron Castings
AS 1832	Malleable Iron Castings
AS 1866	Wrought Aluminium and Aluminium Alloy Extruded Rod, Bar, Solid and Hollow Shapes for General Engineering Purposes
AS 1874	Aluminium Ingots and Aluminium Alloy Ingots and Castings
AS 2074	Steel Castings for General Engineering Purposes
AS G18	Wrought Alloy Steels of the BS 970 En Series Type
BS 1472	Wrought Aluminium and Aluminium Alloys for General Engineering Purposes: Forging Stock and Forgings

5 INSULATOR PINS.

5.1 General. The insulator pins outlined in this standard are intended for use with the pin insulators shown in Fig. B1 of Appendix B.