Australian Standard®

INSULATOR AND CONDUCTOR FITTINGS FOR OVERHEAD POWER LINES

Part 2—DIMENSIONS

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Australian Electrical and Electronic Manufacturers Association
Australian Porcelain Insulators and Technical Ceramic Manufacturers Association
Confederation of Australian Industry
Electrical and Radio Federation of Victoria
Electricity Supply Association of Australia
Energy Authority of New South Wales
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Part 2—DIMENSIONS

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PREFACE

This edition of this standard was prepared by the Associations Committee on Overhead Line Materials and supersedes AS 1154, Part 2—1980. 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.

AS 1154 is a three-part standard, its parts being as follows:

Part 1—Performance and General Requirements

Part 2—Dimensions (this standard)

Part 3—Performance and General Requirements for Helical Fittings.

This standard differs from the previous edition in the following respects:

(a) The method of dimensioning ball and socket couplings has been fully aligned with the requirements of IEC 120, Dimensions of Ball and Socket Couplings of String Insulator Units.

NOTE: This change will not adversely affect the compatibility of existing fittings with fittings manufactured to this standard.

(b) As an alternative to the W security clip for ball and socket couplings, a security split-pin has been included. Both locking devices are in accordance with IEC 372-1, Locking Devices for Ball and Socket Couplings of String Insulator Units, Part 1—Dimensions and General Rules.

(c) The fittings previously rated 66 kN and 187 kN have been changed marginally to ratings of 70 kN and 190 kN respectively, in order to align with the IEC standard ratings.

(d) The fittings previously rated 125 kN have been rerated to 160 kN and modified to be fitted with an M20 bolt. Provision has been made however for a continued supply of 160 kN fittings with a high strength M18 bolt for users who wish to continue with this size fastener and 125 kN rated insulator sets.

(e) The range of fittings has been somewhat reduced by the deletion of fittings fabricated from plate and merchant bar although recommendations are made for the size of merchant bar clevises and tongues in the various strength ratings.

With the above deletion, this standard primarily covers a range of castings and forgings.

Experience has been that 22 mm steel plate has not been available and to accommodate that situation the clevis and tongue dimensions of the 125/160 kN and 190 kN fittings have been modified for compatibility with 20 mm plate.

(f) The preferred die and tube sizes for hexagonal compression anchor and tension fittings have been included and the preferred dimensions of bolted palm terminations specified.

(g) Live line working on transmission lines is growing in favour and some forged fittings in the 160 kN range are manufactured with collars suited to live line working equipment in current use. The dimensions of these collars have been included.

The mechanical requirements for insulator set fittings are related to 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 AS 1154, Part 1, 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 Clause 2.2.3 of AS 1154, 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 herein are subject to the requirements of AS 1154, Part 1, to which reference is therefore necessary.

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INSULATOR AND CONDUCTOR FITTINGS FOR OVERHEAD POWER LINES

PART 2—DIMENSIONS

1 SCOPE AND REFERENCED DOCUMENTS

1.1 Scope. This standard sets out dimensions for a limited range of insulator pins, insulator set fittings, tongue ends and clevis ends for clamps for overhead power lines, using insulators with minimum failing loads of up to 70 kN, 160 kN and 190 kN.

1.2 Referenced documents.

NOTE: For the convenience of users of this standard, those standards which relate specifically to detailed requirements of the properties of materials are listed in Clause 1.2.1. All other standards referred to in this standard are listed in Clause 1.2.2.

1.2.1 *Standards related to properties of materials.*

AS 1204 Structural Steels—Ordinary Weldable Grades

AS 1214 Hot-dip Galvanized Coatings on Threaded Fasteners

AS 1442 Carbon Steels and Carbon-manganese Steels—Hot-rolled Bars and Semi-finished Products

AS 1444 Wrought Alloy Steels of the AISI-SAE Standard, Hardenability (H) and Stainless Series

AS 1448 Carbon and Carbon-manganese Steels—Forgings (Ruling section 300 mm maximum)

AS 1565 Copper Alloy Ingots and Copper and Cop-per 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

AS 2506 Wrought Alloy Steels—En Series

BS 1472 Wrought Aluminium and Aluminium Alloys for General Engineering Purposes: Forging Stock and Forgings

1.2.2 *Other 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 1154 Insulator and Conductor Fittings for Over-head Power Lines
Part 1—Performance and General Requirements

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 1816 Method for Brinell Hardness Test
Part 1—Testing of Metals

AS 2395 Terminals for Switchgear Assemblies for Alternating Voltages above 1 kV

IEC 120 Dimensions of Ball and Socket Couplings of String Insulator Units

2 DEFINITIONS. For the purpose of this standard, the definitions given in AS 1154, Part 1, apply.

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 materials are 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 3 shows the preferred materials from which fittings are to be made. In these references 'Forged steel' shall be as specified in Clause 4.2 and 'Malleable cast iron' shall be as specified in Clause 4.3. The manufacturer shall make his own assessment as to which particular grade of material will meet the requirements for ultimate and distortion loads of the fittings being manufactured.

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