

Australian Standard<sup>®</sup>

---

**INSULATOR AND CONDUCTOR  
FITTINGS FOR OVERHEAD  
POWER LINES**

**Part 2—DIMENSIONS**

---

This Australian standard was prepared by Committee EL/10, Overhead Line Materials. It was approved on behalf of the Council of the Standards Association of Australia on 31 May 1985 and published on 6 September 1985.

---

The following interests are represented on Committee EL/10:

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  
Railways of Australia Committee

---

**Review of Australian Standards.** To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcome. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

---

*This standard was issued in draft form for comment as DR 84077.*

Australian Standard<sup>®</sup>

---

**INSULATOR AND CONDUCTOR  
FITTINGS FOR OVERHEAD  
POWER LINES**

**Part 2—DIMENSIONS**

---

First published (as AS C345, Part II) . . . . .	1967
Revised and issued as AS 1154, Part 2 . . . . .	1972
Second edition . . . . .	1980
Third edition . . . . .	1985

PUBLISHED BY STANDARDS AUSTRALIA  
(STANDARDS ASSOCIATION OF AUSTRALIA)  
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 3847 3

## 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 re-rated 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 helical 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.

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

## CONTENTS

	<i>Page</i>
SPECIFICATION	
1 Scope and Referenced Documents . . . . .	4
2 Definitions . . . . .	4
3 Performance and General Requirements . . . . .	4
4 Material . . . . .	4
5 Insulator Pins . . . . .	5
6 Tolerances on Dimensions of Insulator Fittings, Electrical Control Fittings, Clevis and Tongue Ends for Anchor Fittings, and Support Fittings . . . . .	6
7 Insulator Fittings and Electrical Control Fittings . . . . .	6
8 Conductor Fittings . . . . .	6
APPENDICES	
A Dimensions of Ball and Socket Couplings for String Insulator Units and Associated Fittings . . . . .	9
B Dimensions of Heads of Insulator Pins . . . . .	45
C Forged Steel . . . . .	51
D Compression Fittings . . . . .	52

## STANDARDS ASSOCIATION OF AUSTRALIA

**Australian Standard**  
for  
**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 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
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	Method 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 2095	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.