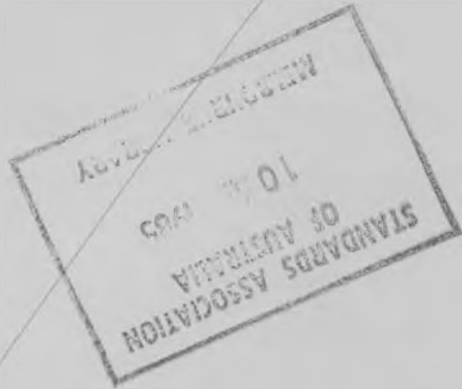


DR 95207
1996ed FWD 960577
AS 1565—1985
UDC 669.35-412 + 669.3-14

Australian Standard[®] 1565—1985

1996 ED

COPPER AND COPPER ALLOYS— INGOTS AND CASTINGS



Title allocated by Defence Cataloguing Authority:
INGOT: CASTING (Copper and Copper Alloy) NSC 9650



STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

This Australian standard was prepared by Committee MT/2, Copper and Copper Alloys. It was approved on behalf of the Council of the Standards Association of Australia on 28 August 1984 and published on 4 March 1985.

The following interests are represented on Committee MT/2:

Australian Foundry Institute
Australian Welding Institute
Confederation of Australian Industry
Copper Development Association of Australia Limited
Coppermetals Extruders Council of Australia
Department of Defence
Metropolitan Water Sewerage and Drainage Board, N.S.W.
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This standard was issued in draft form for comment as DR 83062.

AUSTRALIAN STANDARD

**COPPER AND COPPER ALLOYS—
INGOTS AND CASTINGS**

AS 1565—1985

First published	1974
Second edition	1985

**PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.**

ISBN 0 7262 3530 X

PREFACE

This edition of this standard was prepared under the direction of the Association's Committee on Copper and Copper Alloys by its subcommittee on Castings, to supersede AS 1565—1974. It specifies requirements for the manufacture and testing of high conductivity copper castings and copper alloy ingots and castings.

The most significant feature of this edition is the change in the designation of the copper and copper alloys, with attendant changes in chemistry and properties. This change is considered necessary in the light of the following:

- (a) Uncertainty on the future of BS 1400, Copper Alloy Ingots and Copper and Copper Alloy Castings (on which AS 1565 is based); viz, whether or not it would be based on ISO 1338, Cast Copper Alloys—Composition and Mechanical Properties.
- (b) The initiation of a proposed 'International Numbering System for Metals' (INSM) by the International Organization for Standardization (ISO).
- (c) The Unified Numbering System (UNS) developed in the U.S. and in use in North America.

The subcommittee considered that since the proposed INSM was to be a 6-digit alphanumeric system like the UNS, it would be in Australia's best interests to adopt the UNS at this time, so as to enable Australian alloys to be registered under this system. Liaison with the Copper Development Association Inc. (U.S.) was established and chemistry and designations subsequently aligned as far as practicable.

It was recognized that some of the Australian alloys would correspond to ISO 1338 in respect of chemical compositions and mechanical properties, but it was considered that total alignment with UNS would be more beneficial to Australia. Appendix C provides information on related compositions and specifications, and in particular, relates the new alloy numbers adopted in this standard to those of the 1974 edition of AS 1565.

In this standard, former Appendix A on designation has been deleted, and appropriate cross-reference made to AS 2738.3. The new Appendix A presents purchasing guidelines including contractual requirements previously included in the body of AS 1565—1974, and directs attention to matters requiring consideration at the time of enquiry and/or order. The intention is to avoid misinterpretation or other problems and to ensure a clear understanding of product requirements by both purchaser and supplier. Appendix B contains additional inspection requirements for castings formerly located in the body of the standard, but now is non-mandatory, and advisory in nature. With respect to Appendix E, comment received at public review stage of the revision of AS 1565—1974 indicated that the mandatory use of test bars was undesirable, and Appendix E now contains non-mandatory requirements. Mechanical properties are optional, but if required this should be stated at the time of enquiry and/or order. Appendix F gives guidance on alloy selection.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

COPPER AND COPPER ALLOYS—INGOTS AND CASTINGS

SECTION 1. SCOPE AND GENERAL REQUIREMENTS

1.1 SCOPE. This standard specifies requirements for the manufacture and testing of high conductivity copper castings and copper alloy ingots and castings.

NOTES:

1. Provision has been made for additional inspection requirements for castings which can be specified by a coding system (see Appendix B).
2. Guidelines to purchasers on requirements that must be agreed at the time of enquiry and/or order are given in Appendix A.

1.2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1242	Zinc Ingot
AS 1279	Copper Refinery Shapes
AS 1391	Methods for Tensile Testing of Metals
AS 1515	Methods for the Analysis of Copper Alloys
AS 1696	Methods for the Analysis of Copper
AS 1816	Method for Brinell Hardness Test Part 1—Testing of Metals
AS 2193	Methods for Calibration and Grading of Force-measuring Systems of Testing Machines
AS 2345	An Accelerated Laboratory Test Method for Assessment of the Susceptibility of Brass to Dezincification
AS 2614	Copper and Copper Alloys—Sampling for Chemical Analysis and Electrical Resistivity
AS 2706	Numerical Values—Rounding and Interpretation of Limiting Values
AS 2738	Copper and Copper Alloys—Composi- tions and Designations Part 3—Cast Products
AS K185	Colours for Specific Purposes
AS K208	Methods for the Analysis of Unalloyed Copper
AS K209	Methods for the Analysis of Copper Alloys
BS 1400	Copper Alloy Ingots and Copper and Copper Alloy Castings
BS 3252	Ingot Tin
BS 5714	Method of Measurement of Resistivity of Metallic Materials
ISO 1338	Cast Copper Alloys—Composition and Mechanical Properties

1.3 DESIGNATION. The designation of the coppers and copper alloys, as given in Section 2, shall comply with AS 2738.3.

1.4 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.4.1. Cast—

- (a) the product of one furnace melt; or
- (b) the product of one crucible melt; or
- (a) the product of a number of furnace or crucible melts where such are aggregated and mixed prior to sampling.

When the contents of a melting furnace or pot are supplemented from time to time by the addition of metal to maintain an adequate bulk of molten metal, samples must be taken through the period of operation of the furnace as representative of the 'casts' therefrom. In continuous melting for the production of castings, a 'cast' is defined as 500 kg of metal melted.

1.4.2 Purchaser — the organization issuing the order for the ingots or castings concerned. In the case of a foundry operated by an organization which also manufactures finished products, the term 'purchaser' should include the appropriate department of that same organization.

1.5 FREEDOM FROM DEFECTS. Castings shall be clean and free from defects detrimental to their subsequent processing and end use.

Notwithstanding that castings have been passed as complying with this standard, if faults in manufacture are revealed in subsequent processing of the castings, they may then be deemed not to comply.

1.6 RECLAMATION AND REPAIR OF CASTINGS. Rectification of defects in castings shall be permitted, provided that subsequent processing and usefulness of the castings are not impaired (see Paragraph A6 of Appendix A).

If castings have been subjected to non-destructive testing, they shall be re-examined in the area of the repair following any rectifying operation performed on the castings.

1.7 SHAPE AND DIMENSIONS OF CASTINGS. The shape and dimensions of the castings shall agree with the purchaser's drawing after pattern draft, foundry requirements, machining allowances and permissible variations on untoleranced dimensions have been taken into account.

1.8 CHEMICAL COMPOSITION.

1.8.1 General. The chemical composition of the ingots and castings shall be within the limits given in Section 2 (see also Clause 3 of AS 2738.3).