

AS 1565:2023



# Copper and copper alloys — Ingots and castings



AS 1565:2023

This Australian Standard ® was prepared by MT-002, Copper And Copper Alloys. It was approved on behalf of the Council of Standards Australia on 05 May 2023.

This Standard was published on 26 May 2023.

The following are represented on Committee MT-002:

- Australian Industry Group
- Australian Plumbing Manufacturers Association
- Consumer Electronics Suppliers Association
- Housing Industry Association
- International Copper Association Australia
- Joint Accreditation System of Australia & New Zealand
- Plastics Industry Pipe Association of Australia
- Plumbing Products Industry Group
- Water Services Association of Australia
- Weld Australia

This Standard was issued in draft form for comment as DR AS 1565:2023.

### **Keeping Standards up-to-date**

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

[www.standards.org.au](http://www.standards.org.au)

ISBN 978 1 76139 175 0

# **Copper and copper alloys — Ingots and castings**

Originated as AS CH1—1949.  
Revised and redesignated as AS 1565—1974.  
Fourth edition 2023.

© Standards Australia Limited 2023

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

## Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MT-002, Copper and Copper Alloys, to supersede AS 1565—1996.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to specify the requirements for the manufacture and testing of copper and copper alloy ingots and castings.

The major changes in this edition are as follows:

- (a) Replacement of compositional range for listed alloys with a reference to AS 2738.
- (b) Movement of known mechanical property tables to an informative appendix.
- (c) Update to [Clause 9](#) for microstructure of casting alloy C86500.
- (d) Addition of [Clause 12](#) for Retest procedure.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a document, whereas an “informative” appendix or annex is only for information and guidance.

# Contents

<b>Preface</b> .....	<b>ii</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Designation</b> .....	<b>2</b>
<b>5 Chemical composition</b> .....	<b>2</b>
5.1 General .....	2
5.2 Chemical analysis .....	2
5.3 Frequency of analysis .....	2
<b>6 Mechanical properties</b> .....	<b>3</b>
6.1 Tensile properties .....	3
6.1.1 General .....	3
6.1.2 Test samples .....	3
6.1.3 Test procedure .....	3
6.2 Hardness .....	4
6.2.1 General .....	4
6.2.2 Test procedure .....	4
<b>7 Resistance to dezincification</b> .....	<b>4</b>
<b>8 Electrical resistivity (applicable to alloys C80100 and C81500)</b> .....	<b>4</b>
8.1 General .....	4
8.2 Resistivity test .....	4
8.3 Conductivity .....	5
<b>9 Microstructure of casting alloy C86500</b> .....	<b>5</b>
<b>10 Freedom from defects</b> .....	<b>5</b>
<b>11 Rounding of test result values</b> .....	<b>5</b>
11.1 General .....	5
11.2 Tensile test results .....	5
<b>12 Retests</b> .....	<b>5</b>
<b>13 Marking</b> .....	<b>6</b>
13.1 Ingots .....	6
13.2 Castings .....	6
<b>Appendix A (informative) Purchasing guidelines</b> .....	<b>7</b>
<b>Appendix B (informative) Coding system when additional inspection is required for castings</b> .....	<b>12</b>
<b>Appendix C (informative) Colour code for ingots</b> .....	<b>16</b>
<b>Appendix D (informative) Shapes of standard test bars</b> .....	<b>17</b>
<b>Appendix E (informative) Guide to alloy selection</b> .....	<b>19</b>
<b>Appendix F (informative) Mechanical properties</b> .....	<b>28</b>
<b>Bibliography</b> .....	<b>30</b>

## NOTES

# Australian Standard®

## Copper and copper alloys — Ingots and castings

### 1 Scope

This document specifies requirements for the manufacture and testing of copper castings and copper alloy ingots and castings.

NOTE 1 Advice and recommendations on information to be supplied at the time of enquiry or order are contained in the purchasing guidelines set out in [Appendix A](#).

NOTE 2 Provision has been made for additional inspection requirements for castings which can be specified by a coding system (see [Appendix B](#)).

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1391, *Metallic materials — Tensile testing — Method of test at room temperature*

AS 1515 (all parts), *Copper alloys*

AS 1696.1, *Copper—Determination of phosphorus—Spectrophotometric method*

AS 1696.2, *Copper, Part 2: Determination of copper content—Electrogravimetric method*

AS 1816.1, *Metallic materials—Brinell hardness test, Method 1: Test method (ISO 6506-1:1999, MOD)*

AS 2345, *Dezincification resistance of copper alloys*

AS 2614, *Copper and copper alloys—Sampling for chemical and spectrochemical analysis, and physical testing*

AS 2706, *Numerical values—Rounding and interpretation of limiting values*

AS 2738, *Copper and copper alloys — Compositions and designations of refinery products, wrought products, ingots and castings*

AS 2883, *Analysis of metals—Procedures for the setting up, calibration and standardization of atomic emission spectrometers using arc/spark discharge*

AS 3641.1, *Recommended practice for atomic emission spectrometric analysis, Part 1: Principles and techniques*

AS/NZS 3500.0, *Plumbing and drainage, Part 0: Glossary of terms*

IEC 60468, *Method of measurement of resistivity of metallic materials*

ASTM E478, *Standard Test Methods for Chemical Analysis of Copper Alloys*

BS 1748 (all parts), *Methods for the analysis of copper alloys*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in AS/NZS 3500.0 and the following apply.