

AS 1515.4—1978

Reconfirmed 2016

Australian Standard<sup>®</sup>

---

**METHODS FOR THE ANALYSIS  
OF COPPER ALLOYS**

**Part 4—ELECTROLYTIC  
DETERMINATION OF COPPER IN  
WROUGHT AND CAST COPPER  
ALLOYS**

---

The following industrial, scientific and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Aluminium Development Council  
Australasian Institute of Mining and Metallurgy  
Australian Lead Development Association  
Australian Mineral Development Laboratories  
Australian Tin Information Centre  
Australian Zinc Development Association  
Bureau of Steel Manufacturers of Australia  
Confederation of Australian Industry  
Copper Producers Association of Australia  
Department of Defence  
Electricity Supply Association of Australia  
Metal Trades Industry Association of Australia  
National Association of Testing Authorities  
Railways of Australia Committee  
Royal Australian Chemical Institute

This standard, prepared under the direction of Committee CH/10, Analysis of Metals, was approved on behalf of the Council of the Standards Association on 23 August 1978, and was published on 1 November 1978.

*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which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.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 welcomed. 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.

First published . . . . . 1978

*This standard was issued in draft form for public review as DR 77002.*

## PREFACE

This standard method was prepared by the Association's Committee on Analysis of Metals as part of the program of standardizing methods for the determination of elements in non-ferrous metals.

It requires reference to the following standards:

- AS 2134 Code of Practice for the Chemical Analysis of Materials by Flame Atomic Absorption Spectroscopy  
BS 4237 Report on Reproducibility of Methods of Chemical Analysis Used in the Iron and Steel Industry  
ASTM E88 Standard Method of Sampling Nonferrous Metals and Alloys in Cast Form for Determination of Chemical Composition

© 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.

STANDARDS AUSTRALIA

---

**RECONFIRMATION**

**OF**

**AS 1515.4—1978**

**Methods for the analysis of copper alloys**

**Part 4: Electrolytic determination of copper in wrought and cast copper alloys**

---

**RECONFIRMATION NOTICE**

Technical Committee CH-010 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 31 July 2016.

The following are represented on Technical Committee CH-010:

Australian Aluminium Council  
Bureau of Steel Manufacturers of Australia  
International Copper Association Australia  
International Precious Metals Institute  
National Association of Testing Authorities Australia

## NOTES

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

METHOD FOR THE ELECTROLYTIC DETERMINATION  
OF COPPER IN WROUGHT AND CAST COPPER  
ALLOYS

**1 SCOPE.** This standard describes an electrolytic method for the determination of copper in wrought and cast copper alloys.

**2 APPLICATION.**

**2.1 Range.** The method is suitable for alloys with copper content from 50 percent to 95 percent.

**2.2 Interfering Elements.** The method has been found satisfactory in the presence of the following elements up to the percentage concentrations indicated: tin, 10; zinc, 35; lead, 3; nickel, 30; iron, 5; aluminium, 9; silicon, 3.

**3 REPRODUCIBILITY.** A planned trial of the method was carried out in accordance with BS 4237.

The reproducibility index ( $2s$ ) is obtained from the formula:

$$2s = 2 \sqrt{(s_b^2 + s_w^2)}$$

where

$s_b$  = between-operator standard deviation

$s_w$  = within-operator standard deviation.

95 percent of the results obtained by any one analyst should be reproducible to within two standard deviations of the overall mean value derived from all laboratories (i.e.  $\bar{x} \pm 2s$ ).

For further information see BS 4237.

The planned trial was carried out by five analysts, each from a different laboratory. Five tests were carried out by each analyst on each of six samples. From the results obtained the 95 percent confidence limits ( $2s$ ) have been calculated (see Table 1).

**4 PRINCIPLE.** The test portion is dissolved in a fluoroboric acid—nitric acid solution. The copper in the test portion is then determined by electrolytic deposition from this solution. The copper remaining in solution after deposition is complete is determined by atomic absorption spectroscopy.