

Australian Standard[®]

**Dezincification resistance of
copper alloys**

This Australian Standard was prepared by Committee MT/14, Corrosion of Metals. It was approved on behalf of the Council of Standards Australia on 26 March 1992 and published on 15 June 1992.

The following interests are represented on Committee MT/14:

- Aluminium Development Council
- Australasian Corrosion Association
- Australian Gas Association
- Australian Institute of Steel Construction
- Australian Zinc Development Association
- Austrroads
- Bureau of Steel Manufacturers of Australia
- Confederation of Australian Industry
- Department of Defence
- Electricity Supply Association of Australia
- Engineering and Water Supply Department, South Australia
- Railways of Australia Committee
- Standards Association of New Zealand
- State electrolysis committees
- Telecom Australia

Additional interests participating in preparation of Standard:

- Corrosion consultants
- Hunter Water Board
- Melbourne Water
- Product manufacturing organizations
- Water Board—Sydney Illawarra—Blue Mountains
- Water Authority of Western Australia

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PREFACE

This Standard was prepared under the direction of the Multitechnics Standards Policy Board, by the Standards Australia Committee on Corrosion of Metals to supersede AS 2345—1980, *An accelerated laboratory test method for assessment of the susceptibility of brass to dezincification*. Because of a request by the Australian water authorities, this edition includes the acceptance criteria for copper alloys based on those present in Miscellaneous Publication MP52—1990, *Manual of authorization procedures for plumbing and drainage products*, in the Interim Australian Standard, AS 3796(Int)—1990, *Dezincification resistance of copper alloys*, and in relevant product Standards.

It is intended that this Standard will become the only Australian Standard which contains requirements for the assessment of dezincification resistance and which contains acceptance criteria. The acceptance criteria have already been withdrawn from the 1991 edition of Miscellaneous Publication MP52.

The test method given in Appendix C of this Standard is based on the International Organization for Standardization publication ISO 6509—1981, *Corrosion of metals and alloys — Determination of dezincification resistance of brass*, but contains more detailed information on the testing procedure especially in respect to the measurement of dezincification.

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FOREWORD

It is generally accepted that copper alloys which contain not more than 15 percent zinc, and alpha brasses which are inhibited by the presence of adequate levels of arsenic or antimony, are resistant to the corrosion phenomenon called 'dezincification' when in service in water or soil environments. In addition, some alpha-beta brasses can be dezincification resistant provided they have certain structural characteristics and the alpha phase is inhibited.

An accelerated test method is given in this Standard for the assessment of the susceptibility of brasses, and other copper alloys containing zinc, to dezincification. It enables the measurement of depth but does not give information on the mode of dezincification.

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STANDARDS AUSTRALIA

Australian Standard

Dezincification resistance of copper alloys

1 SCOPE This Standard specifies procedures for determining the resistance of copper-base alloys containing zinc to the form of corrosion termed 'dezincification', in two steps as follows:

- (a) Alloys are categorized into two groups based on their chemical composition which is used to assess their susceptibility to dezincification.
- (b) Alloys assessed to be resistant to dezincification on the basis of chemical composition do not require testing. Alloys considered to be susceptible can be further evaluated by testing them under accelerated laboratory conditions after the completion of all manufacturing stages. Following this test and where the specified acceptance criteria are met, such alloys can also be regarded as resistant to dezincification.

This Standard also specifies the acceptance criteria for the dezincification resistance of copper/zinc alloy components designed for use in contact with potable water or soils.

NOTE: Advice and recommendations on information to be supplied by the purchaser at the time of enquiry or order are contained in Appendix A.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

1565	Copper and copper alloys—Ingots and castings
1566	Copper and copper alloys—Rolled flat products
1567	Copper and copper alloys—Wrought rods, bars and sections
2738	Copper and copper alloys—Compositions and designations
2738.2	Part 2: Wrought products
2738.3	Part 3: Cast products

SAA

MP52	Manual of authorization procedures for plumbing and drainage products
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3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

3.1 Dezincification—corrosion of copper/zinc alloys involving loss of zinc leaving a residue of spongy or porous copper.

3.2 Dezincification-resistant copper/zinc alloys—alloys having the appropriate chemical composition and physical characteristics to enable them to meet the dezincification test requirements of this Standard.

3.3 Test piece—a piece prepared for testing, and made from a test specimen by some mechanical operation.

3.4 Test sample—a portion of metal or a group of items selected from a batch or consignment by a sampling procedure.

3.5 Test specimen—a portion of metal or a single item taken from the test sample for the purpose of applying a particular test.

3.6 Informative appendix—an appendix giving additional information, recommendations, guidelines or other non-mandatory statements.

3.7 Normative appendix—an appendix which is essential to the understanding or implementation of this Standard.

4 GENERAL REQUIREMENTS

4.1 General The dezincification resistance of a component is assessed on the basis of chemical composition, or by testing after the completion of all manufacturing and heat-treatment procedures.

NOTE: For quality control purposes, the dezincification test may also be carried out on components during their manufacturing stages.

4.2 Acceptance requirements The chemical composition of an alloy or its ability to pass a dezincification test is the basis of acceptance or rejection in accordance with the following:

- (a) *Category I alloys*: Category I alloys contain not more than 15 percent zinc and are acceptable on the basis of chemical composition. They are not required to be subjected to the dezincification resistance test.

NOTE: Examples of Category I alloys are given in Table B1 of Appendix B.