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CAPILLARY FITTINGS OF COPPER AND COPPER ALLOY FOR NON-PRESSURE SANITARY PLUMBING APPLICATIONS

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Confederation of Australian Industry

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Department of Local Government, Queensland

Engineering and Water Supply Department, South Australia

Hobart City Council

Melbourne and Metropolitan Board of Works

Metal Trades Industry Association of Australia

Public Works Department, New South Wales

Royal Australian Institute of Architects

Water Board, NSW

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AUSTRALIAN STANDARD

CAPILLARY FITTINGS OF COPPER AND COPPER ALLOY FOR NON-PRESSURE SANITARY PLUMBING APPLICATIONS

AS 3517—1987

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PREFACE

This Standard was prepared by the Association's Committee on Sanitary Plumbing Fittings.

It is one of a series of Standards on copper and copper alloy fittings, and covers cast, hot-pressed, shell-moulded, and tubular fittings with socket/spigot capillary connection ends. Emphasis has been placed on dezincification, and the concept of performance testing has been introduced which will enable fittings to be evaluated as being fit for purpose.

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CAPILLARY FITTINGS OF COPPER AND COPPER ALLOY FOR NON-PRESSURE SANITARY PLUMBING APPLICATIONS

1 SCOPE. This Standard specifies requirements for copper and copper alloy capillary fittings for use in non-pressure sanitary plumbing applications with tubes complying with AS 1432, in the range of nominal sizes DN 32 to DN 225.

This Standard does not apply to fittings for use in pressure applications including pumping mains and flushing systems in sanitary plumbing systems (see AS 1585), nor to waste fittings (see AS 1589).

2 REFERENCED DOCUMENTS. A list with titles of the Standards referred to in this Standard is given in Appendix H.

3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

NOTE: Where definitions in this Standard also appear in AS 1355 (with different wording), the definitions in this Standard take precedence over those in AS 1355. In the next edition of AS 1355, the definitions as given in this Standard will be incorporated.

3.1 Fitting—a device for use in a tube system for connecting the tubes either to each other or to a component part of the system.

3.2 Capillary fitting—any fitting in which the joint is made by the application of heat to cause the flow of filler metal by capillarity along the annular space between the outside of the tube and the inside of the socket.

3.3 Fabricated fitting—a fitting built up by joining together a number of components.

3.4 Nominal size—a numerical designation of size which is common to all components in a piping system other than components designated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions.

NOTE: It is designated by DN followed by a number.

4 DESIGNATION OF SIZES OF FITTINGS. The size by which a fitting is designated shall be the nominal size(s) of the tube(s) with which it is to be used. The method of specifying the sizes of fittings shall be in accordance with Appendix A.

NOTE: Designated sizes do not necessarily indicate exact dimensions as these details are given in the relevant tables herein.

5 DESIGN. Fittings shall comply with the requirements specified in this Standard.

NOTE: A typical range of fittings is illustrated in Appendix B.

6 MATERIALS.

6.1 Copper. Copper shall be as follows:

(a) Grade Cu-DHP to AS 1279.

(b) Tube to AS 1432.

6.2 Copper alloy. Copper alloy shall be as follows:

(a) Castings shall comply with AS 1565, provided that the alloy used contains not less than 58 percent copper and not more than 1 percent aluminium.

(b) Hot pressings shall comply with AS 1568.

(c) Rod for machined parts shall comply with AS 1567.

(d) Copper alloy tube shall comply chemically and mechanically with AS 1572 alloy designation 259 and dimensionally with AS 1432.

Copper alloy tube shall be relieved of stresses after final fabrication so that, when tested in accordance with the mercurous nitrate test specified in AS 2136, the fitting shall not show signs of any cracking when removed from the solution. For the purpose of this test, the entire copper alloy tube component shall be submerged in the test solution.

(e) Dezincification-resistant copper alloy fittings, when tested in accordance with AS 2345, shall have an average depth of dezincification as follows:

(i) Extruded rod:

A. Longitudinally, not greater than 300 μm.

B. Transversely, not greater than 100 μm.

(ii) Forgings and castings, not greater than 100 μm.

The maximum depth of dezincification at any one point shall not exceed 400 μm, but isolated β-phase stringers may exceed this value.

For the purpose of this Standard, dezincification resistance shall be assessed on the fitting after the completion of all manufacturing procedures, but prior to its installation.

6.3 Filler metals. Filler metal shall be one of the following:

(a) *Brazing alloy.*

(i) Silver brazing alloy complying with AS 1167.1.

(ii) Copper-phosphorus brazing alloy complying with AS 1167.1 with a minimum of 1.8 percent silver content.

(b) *Solder.*

(i) Tin-lead solder complying with AS 1834.1, of minimum grade 50 Sn for 'in-field' pipe jointing.

NOTE: Some authorities do not permit the use of tin-lead solders.

(ii) Tin-silver solder complying with AS 1834.1, with minimum 3.5 percent silver.

7 DIMENSIONS.

7.1 General. When measured in accordance with Appendix C, capillary fittings shall have the dimensions as specified in Clauses 7.2 to 7.8.