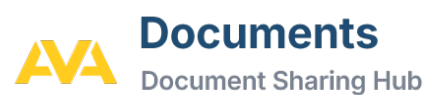


AS/NZS 3718:2005
(Incorporating Amendment Nos 1 and 2)
Reconfirmed 2016

Australian/New Zealand Standard™

Water supply—Tap ware



AS/NZS 3718:2005

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee WS-001, Water Fittings. It was approved on behalf of the Council of Standards Australia on 29 March 2005 and on behalf of the Council of Standards New Zealand on 29 April 2005.

This Standard was published on 1 June 2005.

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This Standard was issued in draft form for comment as DR 04464.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

RECONFIRMATION
OF
AS/NZS 3718:2005
Water supply—Tap ware

RECONFIRMATION NOTICE

Technical Committee WS-001 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.

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Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 3 September 2015.

Approved for reconfirmation in New Zealand on behalf of the Standards Council of New Zealand on 4 November 2016.

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NOTES

Australian/New Zealand Standard™

Water supply—Tap ware

Originated in part as part of AS B1—1928T and MP 52—2001.
Previous editions AS 1718—1992, AS 3496—1999,
AS/NZS 3718:1997 and MP 52—2001.
AS 1718—1992, AS 3496—1999, AS/NZS 3718:1997 and part of
MP 52—2001 jointly revised, amalgamated and redesignated as
AS/NZS 3718:2003.
Second edition AS/NZS 3718:2005.
Reissued incorporating Amendment No. 1 (May 2006).
Reissued incorporating Amendment No. 2 (December 2008).

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Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 6738 9

PREFACE

A2 | This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WS-001, Water Fittings, to supersede AS/NZS 3718:2003.

The objective of this revision is to incorporate the testing requirements for the determination of flow rates required by the Water Efficient Labelling and Standards Scheme (WELS) and to correct errors in the previous edition.

This Standard incorporates Amendment No. 1 (May 2006) and Amendment No. 2 (December 2008). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

Statements expressed in mandatory terms in notes to figures are deemed to be requirements of this Standard.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
Water supply—Tap ware

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for metallic taps, plastic taps, mixing taps, sensor taps, lever taps, timed flow taps, mixing taps mechanical (non-thermostatic), and tapsets in a range of nominal sizes from DN 6 to DN 50, generally for continuous operating temperatures not exceeding 80°C. Products designed for other temperature ranges are included where tested to the appropriate temperature criteria.

The Standard also specifies requirements for outlets of a tap or mixing tap and the requirements for tapset breaching piece assemblies.

Means for demonstrating compliance with this Standard are given in Appendix A.

NOTES:

- 1 Certification under the Plumbing Code of Australia is mandatory in Australia but not in New Zealand.
- 2 Where the static hot and cold water supply systems pressures are below 35 kPa, then water-efficient tap ware may not need to be fitted.

1.2 REFERENCED DOCUMENTS

The documents referred to in this Standard are listed in Appendix B.

1.3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 3500.0 and those below apply.

1.3.1 Back nut

A nut that retains surface-mounted tap ware.

1.3.2 Bathroom basin tap

A tap that is designed to turn on and turn off the flow of water into a basin or bowl that is used primarily for washing the hands and face.

1.3.3 Certificate of compliance

A statement/declaration that a product and/or service complies with stated requirements.

1.3.4 Connector nut

A nut that connects two or more components together to provide a seal.

1.3.5 Distortion

A flaw that is obvious to the eye without resorting to dimensional checking.

1.3.6 Fabricated assembly

Joining of two or more components in the manufacturing process, which is intended as a permanent joint.

1.3.7 Flow controller

A device designed to regulate the flow rate so as to maintain a constant flow rate over a given range of pressures.

1.3.8 Isolating tap

An in-line tap for insertion into the pipeline to deliver water to a tap, valve, fixture, or combination thereof, and which is shut only for maintenance or failure of the downstream installation.

1.3.9 Kitchen sink tap

A device that is designed to turn on and turn off the flow of water into a sink in a kitchen, food preparation or dishwashing environment.

1.3.10 Laundry tub tap

A device that is designed to turn on and turn off the flow of water into a sink or tub in a laundry or washroom.

1.3.11 Lever tap

A tap that is operated by the movement of a lever.

1.3.12 Mixing tap mechanical (non-thermostatic)

A tap into which hot and cold water enters through more than one port and is mixed in a chamber.

1.3.13 Nominal flow rate

A2 The water consumption of a fully open water tap, which is measured in litres per minute, using a dynamic water pressure of—

- (a) 35 kPa in accordance with Appendix R;
- (b) 250 kPa; or
- (c) the average of 150, 250 and 350 kPa in accordance with Appendix G.

1.3.14 Nominal size

The size determined from the inlet connection.

1.3.15 Non-rising spindle tap

A tap in which the spindle does not rise when the tap is opened.

1.3.16 OEM (original equipment manufacturer) market

A market segment requiring tap ware components and/or subassemblies utilizing certified and/or non-certified components for incorporation into a complete product assembly certified as part of the subsequent manufacturing process.

1.3.17 Outlet

The portion of the tap assembly after the shut-off device where water flows for its intended use.

1.3.18 Retrofit (retail) market

A market segment requiring tap ware subassemblies, components and/or replacement parts to be installed in the field with other manufacturers' compatible products.

1.3.19 Rising spindle tap

A screw-down tap in which the spindle rises when the tap is opened.

1.3.20 Scaling factor

The ratio of the *end-use* surface area-to-volume ratio to the *test* surface area-to-volume ratio.

1.3.21 Sensor taps

A tap operated without physical contact.

1.3.22 Stop tap

A tap with inlet and outlet connections. It usually incorporates a loose jumper valve and permits flow in one direction only.

1.3.23 Tap body

That part of a tap or of a tap assembly that includes the inlet and outlet connections.

1.3.24 Tap head

That part of a tap assembly that is removable and retains the shut-off device.

1.3.25 Tapset breaching piece assembly

Two or more stop tap bodies in an assembly.

1.3.26 Test certificate

A certificate that shows the results of tests undertaken to establish stated requirements.

1.3.27 Timed flow tap

A tap that is automatically turned off after a predetermined delivery time and/or volume.

1.3.28 Unit construction

The components of a tap that cannot be readily removed by unscrewing.

1.3.29 WELS Scheme

Water Efficiency Labelling and Standards Scheme.

A1, A2 | 1.3.30 High pressure

Where both the hot water and cold water supply pressures are at 150 kPa or above.

A2 | 1.3.31 Low pressure

Where both the hot water and cold water supply pressures are below 150 kPa.

A2 | 1.3.32 Unequal pressure

Where the hot water supply pressure is below 150 kPa and the cold supply pressure is at or above 150 kPa.

1.4 SIZE DESIGNATION

The size by which a tap is designated shall be determined by its inlet connection. The designated size shall be between DN 6 and DN 50.

A1 | 1.5 MARKING REQUIREMENTS

1.5.1 Taps

All taps shall be marked legibly and visibly as follows:

- (a) Certification mark, the number of this Standard i.e., AS/NZS 3718 and manufacturer's licence number on the body and head. Where sold as integral tap, marking on the body. Marking shall be durable.

(b) On stop taps, isolating taps and regulating taps, the words 'INLET' or 'IN', 'OUTLET' or 'OUT', or a directional arrow.

A1

(c) On taps intended for the supply of hot water only, the letter 'H' or the word 'HOT' or a red indicator. On taps intended for the supply of tempered water only, the letter 'W' or the word 'WARM' or a yellow indicator. On taps intended for the supply of cold water only, the letter 'C' or the word 'COLD' or a blue indicator.

NOTE: For marking of taps intended for the supply of tempered water only, consult the relevant regulatory body.

(d) On combined taps and tapset breaching pieces and mixing taps mechanical, if the hot and cold inlets cannot be interchanged, a mark identifying the hot or cold inlet. This mark need only be visible prior to installation.

(e) On mixing taps, mechanical (non-thermostatic) markings, necessary to clearly indicate the direction of operation to select hot, cold and mixed temperature of the flow of water from the outlet, positioned to be clearly visible to the user.

(f) For taps and pressure-sensitive components that are individually packaged, the 'maximum operating pressure' clearly visible on packaging, labelling or instruction sheet.

A1

(g) For taps intended for particular applications, their intended use (e.g., basin, kitchen sink, ablution trough, laundry tub, etc.).

Operating temperature and pressure limitations shall be included on the product or packaging or installation instructions.

A1

NOTE: Manufacturers making a statement of compliance with this Australian/New Zealand Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

1.5.2 Components

1.5.2.1 Components for the retrofit market

Tap components, excluding handles and covers intended for sale to the retrofit market, shall be legibly marked on the product or packaging with the manufacturer's licence number and the certification mark and compatibility requirements.

1.5.2.2 Components for the OEM market

Tap components intended for sale to the OEM market shall display the manufacturer's licence number and certification mark on packaging only, since these components may be assembled into taps with other certified or non-certified componentry. Where authorized by contract, a component manufacturer may apply certification-marking details applicable to the 'customer's' product certification marking requirements.

A1,

1.6 PACKAGING AND INSTALLATION INSTRUCTIONS

1.6.1 Intended application

A2

Taps and outlets that are required to conform with AS/NZS 6400 shall be labelled on the packaging with their nominated supply pressure (e.g., high pressure, low and/or unequal pressure) and intended application (e.g., basin, kitchen sink, ablution trough, laundry tub).

1.6.2 Installation instructions

A2

Tap ware requiring assembly and fitting, as part of the installation process, shall be accompanied by installation instructions in the English language, including a description of installation requirements and operating temperature and pressure application or limitation.

The installation instructions shall include clauses, reflecting the requirements of the warranty as defined in the Plumbing Code of Australia, New Zealand Building Code and the installation requirements of AS/NZS 3500 series of Standards, including any limitations on the product's use.

For tap ware intended to comply with AS/NZS 6400, the installation instructions shall include adequate reference to commissioning the product, and ensuring that any flow controller incorporated in the outlet is tightened to prevent removal by hand.

S E C T I O N 2 M A T E R I A L S

2.1 SCOPE OF SECTION

This Section specifies requirements for the materials for tap bodies and component parts of taps.

2.2 METALLIC MATERIALS

2.2.1 Use of metallic material

Metallic materials used for the following shall be corrosion-resistant as specified in Clause 2.2.2:

- (a) Tap bodies and tapset breeching piece.
- (b) Other components that are made from metals and that are in contact with water.

2.2.2 Corrosion-resistant metallic materials

For the purpose of this Standard, the following materials are deemed to be corrosion-resistant:

- (a) Copper specified in Clause 2.2.3.
- (b) Copper alloy specified in Clause 2.2.4 and 2.2.5.
- (c) Stainless steel specified in Clause 2.3.
- (d) Material for springs specified in Clause 2.6 (c).
- (e) Other materials as specified in Clause 2.6.

2.2.3 Copper

Copper shall comply with the following:

- A2 |
- (a) *Wrought products*—AS 2738.
 - (b) *Tubular components*—Copper pipe complying with AS 1432, NZS 3501 or ISO 274.

2.2.4 Copper alloy

Copper alloy shall comply with the following:

- (a) *Castings*—AS 1565 or NZS/BS 1400 and a lead content of less than 4.5%.
- (b) *Hot pressings*—AS/NZS 1568.
- (c) *Rod for machined parts*—AS/NZS 1567.
- (d) *Tubular components*—Copper alloy pipe complying with AS/NZS 1572 alloy designation C 26130. Where bent or stamped in the fabrication process, the pipe to be sufficiently stress-relieved, so that it is capable of passing the mercurous nitrate test specified in AS 2136 after all fabrication processes are completed.

NOTE: AS 2136 requires that the entire pipe component be tested before any coating or plating operation.

2.2.5 Dezincification-resistant (DR) copper alloy

Copper alloys in contact with water shall comply with AS 2345.

2.3 STAINLESS STEEL

Stainless steel shall comply with the following:

- A2 |
- (a) *Wrought components*—ASTM A276, series 300 and UNS S32750, S32304, S31803, S31500 Duplex (ferritic-austenitic) stainless steels.
 - (b) *Tubular components*—ASTM A269 or AS 1769 and UNS S32750, S32304, S31803, S31500 Duplex (ferritic-austenitic) stainless steels.

2.4 PLASTIC MATERIALS

2.4.1 General

Plastic materials used in tap components shall be of a type recommended by the polymer manufacturer as suitable and appropriate for use in the manufacture of the tap component or otherwise demonstrate suitability. Characteristics to be taken into account shall include compatibility and resistance to variations in water quality and elevated temperatures.

2.4.2 Acetal

Acetal plastics used for structural components that are in contact with the water supply shall be copolymer.

2.5 PLASTIC AND ELASTOMERIC MATERIALS

2.5.1 UV resistance

The materials of plastics components that are designed to be exposed to direct sunlight, when installed, shall not crack, craze or exhibit signs of any defect when tested in accordance with AS 3558.5.

2.5.2 Resistance to chemical degradation

When tested in accordance with the requirement of Clause 4.2, plastic-bodied taps shall comply with following:

- (a) Upon completion of the exposure period, samples shall show no cracking, crazing or surface degradation visible to the naked eye.
- (b) Upon completion of the exposure period and subsequent short-term endurance test, samples shall comply with the requirements of Clauses 4.3 (hydraulic strength of plastic-bodied tap assembly) and Clause 4.5 (watertightness under pressure).

2.6 OTHER MATERIALS

The following applies

- (a) *Ceramics* Ceramic materials may be used.
- (b) *Filler metals* Filler metal shall be one of the following:
 - (i) Silver brazing alloy containing not more than 0.05% cadmium, complying with AS 1167.1.
 - (ii) Copper-phosphorous brazing alloys complying with AS 1167.1 with a minimum of 1.8% silver.
 - (iii) Solder complying with the requirements of AS 1834.1 and having a maximum of 0.1% lead.

- (c) *Material for springs* Materials for springs shall comply with one of the following:
- (i) Stainless steel to AS 2837, Grade 302 or Grade 304 or Grade 316, ASTM A313.
 - (ii) Phosphor bronze to AS 2738.2, Alloy 518.
- NOTE: Other grades may be used providing they meet the performance criteria of this Standard.
- (d) *Nickel-copper-iron* Nickel-copper-iron shall comply with one of the following:
- (i) AS 2738.2, Alloy 713; or
 - (ii) ASTM B127, ASTM B163, ASTM B164 and ASTM B165.
- (e) *Zinc alloy die-castings* Zinc alloy die-castings shall only be used for non-pressure applications and shall comply with AS 1881.
- (f) *Washers and sealing rings* Washers and sealing rings shall comply with Clause 4.7 and the following:
- (i) *Gland packing* Material for gland packing shall be asbestos free and suitable for hot or cold water.
 - (ii) *O-ring* Material for O-rings shall comply with the requirements of Table 2.1.
- (g) *Lubricants* Lubricants shall comply with Clause 4.7.

NOTE: Handles and covers, other than T-head handles, may be manufactured from other materials not specified in this Section, provided they meet the performance criteria of this Standard.

TABLE 2.1
REQUIREMENTS FOR MATERIAL FOR O-RINGS

Characteristic	Value	Test Method
Physical properties	—	ASTM D 1414
International hardness	IRH 70 ±5	ASTM D 1415
Change in IRH (effect of liquids, immersed in ASTM Oil No.1 at 100°C for 70 h)	IRH limits ±5	ASTM D 471
Change in IRH (deterioration by heating in air at 100°C for 70 h)	IRH limits ±15	ASTM D 865
Tensile strength	1 MPa (min.)	ASTM D 412
Change in tensile strength (effect of liquids, immersed in ASTM Oil No.1 at 100°C for 70 h)	15% (max.)	ASTM D 471
Change in tensile strength (deterioration by heating in air at 100°C for 70 h)	15% (max.)	ASTM D 865
Ultimate elongation	250% (min.)	ASTM D 412
Change in ultimate elongation (effect of liquids, immersed in ASTM Oil No.1 at 100°C for 70 h)	30% (max.)	ASTM D 471
Change in ultimate elongation (deterioration by heating in air at 100°C for 70 h)	40% (max.)	ASTM D 865
Compression set (100°C for 22 h)	35% max	ASTM D 395 Method B

SECTION 3 DESIGN AND MANUFACTURE

3.1 SCOPE OF SECTION

This Section specifies requirements for the design and manufacture of taps including their integral components

NOTE: Illustrations used in this Standard are diagrammatic only and have been chosen without prejudice.

3.2 END CONNECTORS

NOTE: It should be noted that Australia and New Zealand have different dimensional requirements for end connectors.

3.2.1 Copper and copper alloy end connectors

Copper and copper alloy-end connectors for use in Australia shall comply with AS 3688.

3.2.2 Other end connectors

Other end connectors shall comply with the relevant Australian or New Zealand Standards or Australian Technical Specifications.

3.3 SPINDLES

Spindles shall be of sufficient length to ensure that—

- (a) where the tap is fitted with a loose jumper valve with the washer removed, the handle is clear of any external obstruction when the tap is in the closed position; and
- (b) where the tap is fitted with an O-ring type head assembly and a fixed handle, the O-ring is accessible for replacement.

3.4 SCREW THREADS

3.4.1 General

Threads on components of taps may be right-hand or left-hand and shall comply with this Clause.

3.4.2 Thread engagement

Threaded joints that will be disassembled for any purpose shall have the minimum number of full threads engaged as specified in Table 3.1. For threaded joints that are assembled in a permanent manner, the minimum number of threads engaged as specified in Table 3.1 may be reduced by 40%, provided no less than two full threads are used. The number of full threads shall be counted when the threaded joint is assembled with washers or seals.

TABLE 3.1
THREAD ENGAGEMENT

Thread nominal size*	Other threads (major diameter) mm	Minimum number of full threads engaged
<1/25	<35	3
>1/25 ≤2/50	>35 ≤60	4
>2/50 ≤3/80	>60 ≤90	5

* Pipe threads to AS 1722.1 and AS 1722.2.

3.5 WATER SHUT-OFF DEVICE

The water shut-off device may be of the manufacturer's own design.

3.6 JUMPER VALVE

3.6.1 Design

Where the shut-off device is a jumper valve and compatibility and connectability are required, loose jumper valves shall comply with Figure O10, Appendix O. Alternatively, the jumper valve may be of the manufacturer's own design.

3.6.2 Construction

Jumper valve stems and washer plates shall be of unit construction.

3.7 THICKNESS OF METAL PARTS

3.7.1 General

The thickness of material in any part of a tap shall be as specified in this Standard. Unless otherwise specified, the measured thickness shall exclude the depth of any screw thread and the thickness of any coating or plating material.

The minimum thicknesses do not apply to parts that are not critical to the performance of the tap.

NOTE: Parts that are not critical to the performance include decorative covers and parts that, if removed, would not affect the operation of the tap.

3.7.2 Copper, copper alloy and stainless steel tubes

The minimum mean thickness of copper, copper alloy and stainless steel tubes shall be as specified in AS 1432 for Type B tubes or NZS 3501. Where the mean outside diameter is not equivalent to those tubes specified in AS 1432 or NZS 3501 the minimum wall thickness of the tubes shall be that specified in AS 1432 or NZS 3501 for the next larger size.

3.7.3 Other sections

Where the thickness of a part is not specified elsewhere in this Standard, it shall be in accordance with Table 3.2.

The measured thickness shall exclude the depth of any screw thread and the thickness of any coating or plating material.

TABLE 3.2
MINIMUM WALL THICKNESS OF UNSPECIFIED METAL PARTS

Nominal size DN	Plain sections subject to permanent hydrostatic pressure, mm	Plain sections not subject to permanent hydrostatic pressure, mm
6	1.8	1.1
8	1.8	1.1
10	1.8	1.1
15	1.8	1.1
20	1.8	1.1
25	2.2	1.4
32	2.2	1.4
40	2.8	1.7
50	2.8	1.7

NOTE: Hydrostatic pressure refers to pressure under no flow conditions.

3.8 FABRICATED ASSEMBLIES

Fabricated assemblies shall pass the torque test as specified in Clause 4.8.

A1

3.9 OUTLETS

3.9.1 Unit construction outlets

Outlets that are of unit construction with the tap body shall comply with the requirements of this Standard, as applicable.

3.9.2 Other outlets

All other outlets, including flexible free water outlets, shall comply only with Clause 3.2, Clause 3.11 and Clause 4.7, except as specified in Clauses 3.9.3 to 3.9.5.

3.9.3 Flexible hoses

3.9.3.1 Backflow prevention

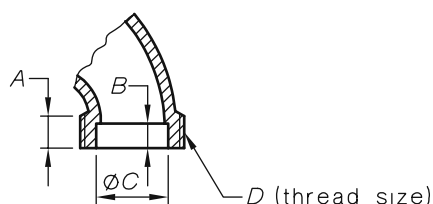
Where flexible hoses are supplied with the tap they shall incorporate backflow prevention in accordance with AS/NZS 3500.1.

3.9.3.2 Flexible hoses with shut-off devices

Flexible hoses with shut-off devices shall comply with the performance requirements of both this Standard and AS/NZS 3499.

3.9.4 Hose tap outlets

Hose tap outlets shall comply with the dimensional criteria specified in Figure 3.1.



A (min.) mm	B (min.) mm	C mm		D* (thread size designation in inches)
		Min.	Max.	
9	5	16.8	17.0	3/4
9	7	22.3	22.8	1
13	8	30.3	30.8	1 1/4
13	9	35.0	35.3	1 1/2
13	9	41.4	41.9	2
16	11	52.5	52.9	2 1/2

FIGURE 3.1 HOSE TAP OUTLETS

3.9.5 Showerheads for personal bathing

Showerheads shall comply with AS/NZS 3662.

Showerheads complying with AS/NZS 3662 and packaged with complying tap assemblies may seek product certification under AS/NZS 3718.

3.10 OPERATING MECHANISMS

The handle, lever or button may be fitted to the spindle by any means provided that—

- A1,
A2
- (a) the assembly is capable of passing the torque test in accordance with Clause 4.9 and Clause 4.11;
 - (b) the handle is removable, should this be necessary for the replacement or adjustment of sealing devices;
 - (c) the handles of wall-mounted bath or shower taps comply with Clause 4.15;
 - (d) foot-operated taps are designed so as to be capable of passing the load test specified in Clause 4.14;
 - (e) button-operated taps are designed so as to be capable of passing the load test specified in Clause 4.14;
 - (f) isolating taps are designed to operate without a handle provided that the spindle is supplied with a screwdriver slot or wrenching flats;
 - (g) taps have special operating provisions in lieu of handles to prevent unauthorized use or vandalism; and
 - (h) the outer end of the spindle of a ferrule stop tap is suitable for adaptors.

3.11 FINISH AND WORKMANSHIP

Taps and tap components shall comply with the following requirements:

- (a) Components shall be sound and free from folds, laps, blisters, laminations, blowholes, and other defects that affect the performance or function of the taps in service.
- (b) Sealing faces shall not be pitted. Pitting is permitted elsewhere provided that the minimum wall thickness requirements of this Standard are maintained.
- (c) Castings shall be plugged, stopped, or patched but only by a vacuum impregnation process with a material complying with Clause 4.7, and hydrostatically tested in accordance with Clause 4.5.
- (d) Taps shall be supplied free of sand, grit and swarf.
- (e) All moving parts of the tap shall be adequately lubricated with a non-toxic water insoluble lubricant complying with Clause 4.7. The lubricant may be contained within the material structure of a tap component.
- (f) Finished taps shall be free of burrs, fins, irregularities and sharp edges that would affect the performance or function of the tap in service or the safe handling of the tap during installation or use.
- (g) Where decorative finishes are applied, they shall comply with the criteria of the relevant Standard and industry norms.

3.12 ACCESSORIES OR COMPONENTS SUPPLIED WITH TAP PRODUCTS

3.12.1 General

Accessories or components supplied integral with the tap shall comply with the requirements of the relevant Standard.

3.12.2 Flexible hose connectors

Flexible hose connectors shall comply with AS/NZS 3499.

3.12.3 Integral backflow devices

Taps incorporating integral backflow-prevention devices shall comply with the relevant requirements of AS/NZS 2845.1.

3.13 TAPS AND TAP COMPONENTS TO SUIT INDUSTRY-SPECIFIC DIMENSIONAL CHARACTERISTICS

3.13.1 General

Clauses 3.13.2, 3.13.3, 3.13.4, 3.13.5, 3.13.6 and 3.13.7 set out the specific dimensional characteristics to accommodate the interchange ability of components of the same size and type produced by different manufacturers. This includes installation practices common in Australia, whereby different parts of a tap may be installed at different times during building construction.

It shall be the responsibility of the manufacturer to include sufficient relevant information with the product, to enable the product to be correctly installed with applicable compatible assemblies.

3.13.2 Valve seating, valve chamber and tap head connection

The valve seat, chamber and tap head connection shall conform to the dimensions shown in Figure O2 and Figure O3, Appendix O.

3.13.3 Tap head

The tap head fixing detail shall conform to the dimensions shown in Figure O6 or O7, Appendix O.

3.13.4 Spindle end

The spindle end to suit a loose jumper valve shall conform to the dimensions shown in Figure O8 or O9, Appendix O.

3.13.5 Loose jumper valves

Loose Jumper valve stems and washer plates shall be of unit construction and conform to the dimensions shown in Figure O10, Appendix O.

3.13.6 Tapset breaching piece assemblies

Tapset breaching piece assemblies shall comply with the requirements of this Standard.

3.13.7 Replacement tap seats

Replacement tap seat inserts shall comply with the requirements of this Standard. The minimum wall thickness, excluding the depth of thread, shall be as follows:

- (a) Copper alloy..... 1.1 mm
- (b) Stainless steel..... 0.6 mm

SECTION 4 PERFORMANCE REQUIREMENTS

4.1 GENERAL

All products and components shall be tested to the relevant performance requirements.

4.2 PLASTIC MATERIALS USED FOR PLASTIC-BODIED TAPS

When tested in accordance with Appendix C, a tap assembly shall exhibit characteristics for compatibility and resistance to variations in water chemistry and elevated temperatures.

4.3 HYDRAULIC STRENGTH TEST

When tested in accordance with Appendix D, a tap assembly shall show no signs of distortion, splitting, cracking or breakage or other failure.

A2 4.4 SURFACE-MOUNTING STRENGTH TEST FOR TAPS

When tested in accordance with Appendix E, the surface-mounting components of the tap shall show no signs of cracking, deformation, stripping of threads or unsecured mounting, and shall comply with the requirements of the Clause 4.5.

NOTE: This Clause does not apply to recessed, wall-mounted tap bodies.

4.5 WATERTIGHTNESS UNDER PRESSURE

When tested in accordance with Appendix F, a tap or hand spray with shut-off device shall show no signs of cracks, leakage, or other failure.

4.6 NOMINAL FLOW RATE

4.6.1 General

A2 4.6.1.1 High pressure

The flow rate of a tap or tap outlet shall be determined in accordance with Appendix G.

4.6.1.2 Low and unequal pressure

The flow rate of a tap or tap outlet shall be determined in accordance with Appendix R.

4.6.2 Outlets where compliance with AS/NZS 6400 is mandatory

A2 4.6.2.1 High pressure

Where labelling compliance with AS/NZS 6400 is mandatory, the nominal flow rate shall be determined in accordance with Appendix G, and shall comply with the following:

- (a) The maximum difference between the highest and lowest average flow rate shall not exceed 2.0 L/min.
- (b) The highest average flow rate shall not exceed the upper limit of the flow range for the determined nominal flow rate in AS/NZS 6400 by more than 1.0 L/min.
- (c) The lowest average flow rate shall be not less than the lower limit of the flow range for the determined nominal flow rate in AS/NZS 6400 by more than 1.0 L/min.

4.6.2.2 Low and unequal pressure

Where labelling compliance with AS/NZS 6400 is mandatory, the nominal flow rate shall be determined in accordance with Appendix R.

4.6.3 Other taps and outlets

For taps and outlets that are not covered by AS/NZS 6400, their nominal flow rate may be determined at 250 kPa dynamic flow pressure.

NOTE: Example of taps not covered by AS/NZS 6400 are bath taps, washing machine taps, cistern taps, garden hose taps, etc.

4.7 CONTAMINATION OF WATER

Materials in contact with drinking water shall comply with AS/NZS 4020.

Metallic components made from a single material may be pre-qualified by use of simulated samples for certification in accordance with Appendix P.

4.8 TORQUE OF FABRICATED JOINTS

When a fabricated tap assembly is tested in accordance with Appendix H, the fabricated joint shall show no signs of splitting, cracking, distortion, or thread damage. This test is a test of a fabricated joint and twisting of copper pipe tails is not a failure of the test

4.9 TORQUE OF HANDLE ATTACHMENT

When a handle assembly is tested in accordance with Appendix I, the handle and handle attachment shall show no signs of cracking, breaking, or stripping of thread.

4.10 TORQUE OF HEAD TO BODY

When tested in accordance with Appendix J, the head to body connection shall show no distortion, stripping of mating thread or parts, damage to wrenching flats or internal components.

4.11 TORQUE OF OPERATING MECHANISM

When tested in accordance with Appendix K, a tap-operating mechanism shall show no signs of cracking, bending or damage.

4.12 ENDURANCE TEST FOR TAPS AND TAP COMPONENTS

4.12.1 Endurance test for tap operating mechanisms

4.12.1.1 General

Taps and tap components shall be capable of passing the endurance test in accordance with Appendix L.

A1 | Where endurance testing for flow controllers in taps to Appendix Q is required, this may be carried out by stopping the endurance test in Appendix L at 10 000 cycles and testing to Appendix Q, then completing the remaining requirements of Appendix L.

4.12.1.2 Pre-endurance testing

The watertightness test shall be carried out before the endurance test (see Clause 4.5).

4.12.1.3 Cycles

The endurance test is applicable to the following cycle range:

- (a) Isolating or drain taps 10 000 ±100 cycles.
- (b) Other taps.....50 000 ±500 cycles.
- (c) Jumper valves.....25 000 ±250 cycles.

4.12.1.4 Subsequent tests

Following the endurance test, taps shall be capable of passing the following:

- (a) Watertightness under pressure test where applicable (see Clause 4.5).
- (b) Torque of operating mechanism test where applicable (see Clause 4.11).
- (c) Resistance of handle to removal test where applicable (see Clause 4.15).

4.12.2 Endurance test for flow controllers in taps

Where compliance with AS/NZS 6400 is mandatory, taps or non-integrated tap outlets containing flow controllers shall be tested to Appendix Q, and then shall be retested to Appendix G, and shall meet the following requirements:

- (a) The maximum difference between the highest and lowest average flow rate, measured at pressures of 150 kPa, 250 kPa and 350 kPa, shall not exceed 2.0 L/min; and
- (b) The flow rate shall be within ± 1.0 L/min of the nominal flow rate as determined in Clause 4.6.1.

4.13 STRENGTH OF CONNECTOR NUT AND ASSEMBLY

When tested in accordance with Appendix M, the nut and assembly shall show no signs of splitting, cracking, distortion or thread damage, except for combinations of connector nuts and assemblies, manufactured of copper or copper alloys to comply with AS 3688 need not be tested.

4.14 STRENGTH OF BUTTON-OPERATED AND FOOT-OPERATED TAPS

When installed according to manufacturers' instructions and tested in accordance with Appendix N button-operated and foot-operated taps shall show no signs of cracks, breakages, bending or damage.

4.15 RESISTANCE OF HANDLE TO REMOVAL

The handles of wall-mounted bath or shower taps shall not fracture or pull off under an axial static load of $68 \pm 0, -5$ kg.

APPENDIX A
MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS STANDARD
(Normative)

A1 SCOPE

This Appendix sets out the means by which compliance with this Standard shall be demonstrated by a manufacturer under the WaterMark product certification scheme.

A2 RELEVANCE

The long-term performance of plumbing systems is critical to the durability of building infrastructure, protection of public health and safety, and protection of the environment.

A3 PRODUCT CERTIFICATION

The purpose of product certification is to provide independent assurance of the claim by the manufacturer that products comply with this Standard.

The certification scheme serves to indicate that the products consistently conform to the requirements of this Standard.

The sampling and testing plan, as detailed in Paragraph A5 and Table A1, shall be used by the Conformity Assessment Body. Where a batch release testing program is required, it shall be carried out as detailed in Paragraph A5 and Table A2, by the manufacturer.

A4 DEFINITIONS

A4.1 Batch release test

A test performed by the manufacturer on a batch of components, which has to be satisfactorily completed before the batch can be released.

A4.2 Production batch

Clearly identifiable collection of units, manufactured consecutively or continuously under the same conditions, using material or compound to the same specification.

A4.3 Sample

One or more units of product drawn from a batch, selected at random without regard to quality.

NOTE: The number of units of product in the sample is the sample size.

A4.4 Sampling plan

A specific plan that indicates the number of units of components or assemblies to be inspected.

A4.5 Type test batch

Schedule of units of the same type, identical dimensional characteristics, all the same nominal diameter and wall thickness, from the same compound. The batch is defined by the manufacturer.

A4.6 Type testing (TT)

Testing performed to demonstrate that the material, component, joint or assembly is capable of conforming to the requirements given in the Standard.

A5 TESTING

A5.1 Type testing

Table A1 sets out the requirements for type testing and frequency of re-verification.

A1

Alternatively, the tests set out in Table A2 shall be undertaken on product at a laboratory recognized by the Conformity Assessment Body or by the manufacturer/supplier using their own calibrated testing equipment.

A5.2 Batch release testing

Table A2 sets out the minimum sampling and testing frequency plan for a manufacturer to demonstrate compliance of product(s) to this Standard on an ongoing basis. However, where the manufacturer can demonstrate adequate process control to the Conformity Assessment Body, the frequency of the sampling and testing nominated by the manufacturer's quality plan and/or documented procedures shall take precedence for the purposes of WaterMark product certification.

A5.3 Retesting

In the event of a test failure, the products within the batch shall be retested so as to ensure that only those batches found to comply may be claimed and/or marked as complying with this Standard.

TABLE A1
TYPE TESTING

Clause No./Issue		Test method	Tap	Components			
				Tap head/ Head assembly	Outlets	Tap body	Water shut-off device
Section 2 Materials *							
2.2	Metallic materials	Relevant Standards including AS 2345	✓	✓		✓	✓
2.3	Stainless steel	Relevant Standards	✓	✓		✓	✓
2.4	Plastic materials	Relevant Standards	✓	✓		✓	✓
2.5	Plastic and elastomeric materials	Relevant Standards	✓	✓		✓	✓
2.6	Other materials	Relevant Standards	✓	✓		✓	✓
Section 3 Design and manufacture							
3.2	End connectors	Relevant Standards	✓		✓	✓	
3.7	Thickness of metal body or head	Dimensional	✓	✓		✓	
3.9	Outlets	Dimensional	✓		✓		
3.12	Accessories	Dimensional	✓		✓		
3.13	Dimensions (where applicable)	Appendix O	✓	✓		✓	✓
Section 4 Performance requirements							
4.2	Plastic materials used for plastic-bodied taps	Appendix C	✓			✓	
4.3	Hydraulic strength test	Appendix D	✓			✓	

(continued)