

AS 3718:2021



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Australia



Water supply — Tap ware



AS 3718:2021

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- Gas Technical Regulators Committee
- Housing Industry Association
- International Copper Association Australia
- Master Plumbers Australia and New Zealand
- National Association of Testing Authorities Australia
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- Plumbing Products Industry Group
- Queensland Brassware Association
- The Institute of Plumbing Australia
- Water Services Association of Australia

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- Plastics New Zealand
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Water supply — Tap ware

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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee WS-001, Water Fittings, to supersede AS/NZS 3718:2005.

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

The objective of this Standard is to provide requirements for tap ware in nominal sizes ranging from DN 6 to DN 50 that is designed to be used generally for continuous operating temperatures not exceeding 80 °C and maximum dynamic operating pressure 500 kPa. Requirements are also provided for outlets of a tap or mixing tap and for tapset breaching piece assemblies.

The major changes in this edition are as follows:

- (a) Additional finish and coating information including PVD coating.
- (b) Additional water shut-off device classifications and changes to endurance test cycles.
- (c) Additional information on electrical and electromagnetic requirements.
- (d) Addition of an endurance test for rotating or swivelling outlets.

The term “normative” is used in Standards to define the application of the appendix to which it applies. A “normative” appendix is an integral part of a Standard.

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NOTES

Australian 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 nominal sizes ranging from DN 6 to DN 50 that are designed to be used generally for continuous operating temperatures not exceeding 80 °C and maximum dynamic operating pressure 500 kPa.

This Standard does not prevent the use of products designed for other temperature ranges provided they meet the performance requirements specified herein.

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

Means for demonstrating conformance to this Standard are given in [Appendix A](#).

NOTE 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 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.

AS 681, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications (series)*

AS 1167.1, *Welding and brazing — Filler metals, Part 1: Filler metal for brazing and braze welding*

AS 1199.1, *Sampling procedures for inspection by attributes, Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

AS 1349, *Bourdon tube pressure and vacuum gauges*

AS 1432, *Copper tubes for plumbing, gasfitting and drainage applications*

AS 1565, *Copper and copper alloys — Ingots and castings*

AS 1572, *Copper and copper alloys — Seamless tubes for engineering purposes*

AS 1646, *Elastomeric seals for waterworks purposes*

AS 1722.2, *Pipe threads of Whitworth form, Part 2: Fastening pipe threads*

AS 1881, *Zinc alloys — Casting ingots and castings — Quality requirements*

AS 2331.3.1, *Methods of test for metallic and related coatings, Method 3.1: Corrosion and related property tests — Neutral salt spray test (NSS test)*

AS 2331.3.2, *Methods of test for metallic and related coatings, Method 3.2: Corrosion and related property tests — Acetic acid salt spray test (ASS test)*

AS 2331.3.3, *Methods of test for metallic and related coatings, Method 3.3: Corrosion and related property tests — Copper accelerated acetic acid salt spray test (CASS test)*

AS 2331.3.7, *Methods of test for metallic and related coatings, Method 3.7: Corrosion and related property tests — Corrodkote (Corr) test (ISO 4541:1978, MOD)*

AS 2331.4.1, *Methods of test for metallic and related coatings, Method 4.1: Physical tests — Qualitative adhesion tests*

AS 2331.4.5, *Methods of test for metallic and related coatings, Method 4.5: Physical tests — Electroplated plastics — Thermal cycling tests*

AS 2345, *Dezincification resistance of copper alloys*

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

AS 3501, *Parallel screw threads of Whitworth form (BSW and BSF) and associated gauges and gauging practice*

AS 3558.5, *Methods of testing plastics and composite materials sanitary plumbing fixtures, Method 5: Determination of degradation by ultraviolet light*

AS 3635, *Unified (ISO inch) screw threads, associated gauges, and gauging practice*

AS 3688, *Water supply and gas systems — Metallic fittings and end connectors*

AS 5200.037.2, *Plumbing and drainage products, Part 037.2: Flow controllers for use with heated or cold water systems*

AS ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads, Part 1: Dimensions, tolerances and designation*

AS/NZS 1567, *Copper and copper alloys — Wrought rods, bars and sections*

AS/NZS 1568, *Copper and copper alloys — Forging stock and forgings*

AS/NZS 1572, *Copper and copper alloys — Seamless tubes for engineering purposes*

AS/NZS 2845.1, *Water supply — Backflow prevention devices, Part 1: Materials, design and performance requirements*

AS/NZS 3499, *Water supply — Flexible hose assemblies*

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

AS/NZS 3500.1, *Plumbing and drainage, Part 1: Water services*

AS/NZS 3662, *Performance of showers for bathing*

AS/NZS 4020, *Testing of products for use in contact with drinking water*

AS/NZS 6400, *Water efficient products — Rating and labelling*

ISO 274, *Copper tubes of circular section — Dimensions*

ISO 6957, *Copper alloys — Ammonia test for stress corrosion resistance*

CEN/TS 13388, *Copper and copper alloys — Compendium of compositions and products*

EN 200, *Sanitary tapware — Single taps and combination taps for water supply systems of type 1 and type 2 — General technical specification*

EN 816, *Sanitary tapware — Automatic shut-off valves PN 10*

EN 817, *Sanitary tapware — Mechanical mixing valves (PN 10) — General technical specifications*

EN 1982, *Copper and copper alloys – Ingots and castings*

EN 15091, *Sanitary tapware — Electronic opening and closing sanitary tapware*

ASTM A269, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service*

ASTM A276, *Standard Specification for Stainless Steel Bars and Shapes*

ASTM A313, *Standard Specification for Stainless Steel Spring Wire*

ASTM B127, *Standard Specification for Nickel-Copper Alloy Plate, Sheet, and Strip*

ASTM B163, *Standard Specification for Seamless Nickel and Nickel Alloy Condenser and Heat-Exchanger Tubes*

ASTM B164, *Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire*

ASTM B165, *Standard Specification for Nickel-Copper Alloy Seamless Pipe and Tube*

ASTM B584, *Standard Specification for Copper Alloy Sand Castings for General Applications*

NZS 3501, *Specification for copper tubes for water, gas, and sanitation*

WMTS-014, *Jointing materials*

1.3 Terms and definitions

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

1.3.1

automatic shut-off tap and/or valve

mechanical tap and/or valve that is opened by pressure on, or by twisting the top of, the operating spindle

Note 1 to entry: The tap and/or valve, when the pressure is released, closes under the action of a spring or of water pressure.

1.3.2

back nut

nut that retains surface-mounted tap ware

1.3.3

bathroom basin tap

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

1.3.4

combination tap

tap into which separate supplies of hot and cold water controlled by individual handles are mixed together to give a desired temperature and flow through a common outlet

1.3.5

connector nut

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

1.3.6

distortion

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

1.3.7

electronic opening and closing tap and/or valve

tap and/or valve that is digitally controlled

1.3.8

fabricated assembly

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

1.3.9**flow controller**

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

1.3.10**high pressure**

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

1.3.11**isolating tap**

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

1.3.12**kitchen sink tap**

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

1.3.13**laundry tub tap**

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

1.3.14**lever tap**

tap that is operated by the movement of a lever

1.3.15**low pressure**

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

1.3.16**may**

indicates the existence of an option

1.3.17**mechanical mixing tap and/or valve**

tap and/or valve into which hot and cold water enters through more than one port and is mixed in a chamber then delivered through a single common outlet

Note 1 to entry: The temperature of the mixed water is controlled by the operation of a control handle or handles.

1.3.18**nominal flow rate**

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 O](#);
- (b) 250 kPa; or
- (c) the average of 150, 250 and 350 kPa in accordance with [Appendix F](#).

1.3.19**nominal size**

size determined from the inlet connection

1.3.20**non-rising spindle tap**

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

1.3.21**original equipment manufacturer market****OEM market**

market segment requiring tap ware components and/or subassemblies for incorporation into a complete product assembly

1.3.22**outlet**

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

1.3.23**retrofit (retail) market**

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

1.3.24**rising spindle tap**

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

1.3.25**scaling factor**

ratio of the end-use surface area-to-volume ratio to the test surface area-to-volume ratio

1.3.26**service condition**

indicates level of serviceability in terms of appearance, corrosion resistance, wear resistance and performance generally

1.3.26.1**service condition 1**

serviceability in warm dry conditions

Note 1 to entry: Examples include office furniture and cabinet hardware.

1.3.26.2**service condition 2**

serviceability in indoor conditions where condensation may occur

Note 1 to entry: Examples include bathroom and electric light fittings.

1.3.27**shall**

indicates that a statement is mandatory

1.3.28**should**

indicates a recommendation

1.3.29**significant surface**

part of the surface of an item that is required to be covered by the coating and is essential to its appearance and serviceability

1.3.30**stop tap**

tap with inlet and outlet connections

Note 1 to entry: It usually incorporates a loose jumper valve and permits flow in one direction only.

1.3.31**swivel outlet****rotating outlet**

outlet that has any means of rotary movement around an intermediate joint of a tap body or outlet and is part of the water way

1.3.32**tap assembly**

assembly of tap components that includes; body, head/shut off device, outlet and operating mechanism for the purpose of water supply

1.3.33**tap body**

part of a tap or of a tap assembly that includes the inlet and outlet connections and/or the upstream part of the tap body retaining the isolation mechanism and subject to hydrostatic pressure

1.3.34**tap head**

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

1.3.35**tapset breaching piece assembly**

two or more stop tap bodies in an assembly

1.3.36**timed flow tap**

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

1.3.37**unequal pressure**

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

1.3.38**unit construction**

components of a tap that cannot be readily removed by unscrewing, or a component that forms a critical part of the body of the tap itself

1.3.39**Water Efficiency Labelling and Standards Scheme****WELS Scheme**

Australia's urban water saving scheme. WELS reduces demand for high quality drinkable water by informing consumers about water efficiency at the point of sale

[SOURCE: AUSTRALIAN GOVERNMENT. *Water Rating*. www.waterrating.gov.au]

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.

1.5 Marking requirements**1.5.1 Taps**

All taps shall be marked legibly and visibly as follows except for (h):

- (a) The number of this Standard i.e. AS 3718 and manufacturer's licence number on the body and head. Where sold as an integral tap, the marking shall be on the body. The 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.
- (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. These markings shall be positioned to be clearly visible to the user.

NOTE 1 For marking of taps intended for the supply of tempered water only, refer to the relevant regulatory body.

- (d) On combined taps and tapset breaching pieces and mixing taps mechanical, where the hot and cold inlets cannot be interchanged, a mark identifying the hot or cold inlet.

NOTE 2 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.
- (g) For taps intended for particular applications, their intended use (e.g. basin, kitchen sink, ablution trough or laundry tub).
- (h) For electronic taps, the following shall be included with the product:
 - (i) Electrical supply information, including the operating voltage and the rating in amperes or loading in W or VA. Any limitations to the operation shall also be marked (e.g. A.C., DC or frequency).
 - (ii) Except for battery-operated only taps, a warning that the valve requires connection to electrical power and that it will not operate without power.

NOTE 3 Refer to the relevant regulatory body for other applicable requirements.

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

NOTE 4 Manufacturers making a statement of conformity with this Australian Standard on a product, packaging, or promotional material related to that product are advised to ensure that such conformance is capable of being verified.

NOTE 5 Additional marking requirements may be applicable for products under the WaterMark Certification Scheme.

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.

NOTE Additional marking requirements may be applicable for products under the WaterMark Certification Scheme.

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 on packaging only, since these components may be assembled into taps with other components.

1.6 Packaging and installation instructions

1.6.1 Intended application

Taps and outlets that conform to 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 or laundry tub).

1.6.2 Installation instructions

Tap ware requiring assembly and fitting, as part of the installation process, shall be accompanied by installation instructions in the English language.

Installation instructions shall include the following:

- (a) Description of installation requirements in accordance with the AS/NZS 3500 series of Standards.
- (b) Operating temperatures.
- (c) Pressure applications.
- (d) Any limitations on use.
- (e) Manufacturer's warranty.

NOTE Refer to the Plumbing Code of Australia or the New Zealand Building Code for information on warranties or other requirements.

Installation instructions for tap ware that conforms to AS/NZS 6400 shall also include the following information:

- (i) Commissioning procedures for the product.
- (ii) Any flow controller incorporated in the outlet to be tightened to prevent removal by hand.

Section 2 Materials

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

Except where otherwise stated, metallic materials used for the following components shall be corrosion resistant as specified in [Clause 2.2.2](#):

- (a) Tap bodies and tapset breaching piece assembly.
- (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 shall be deemed to be corrosion-resistant:

- (a) Copper specified in [Clause 2.2.3](#).
- (b) Copper alloy specified in [Clauses 2.2.4](#) and [2.2.5](#).
- (c) Stainless steel specified in [Clause 2.2.6](#).
- (d) Material for springs specified in [Clause 2.4\(c\)](#).
- (e) Other materials as specified in [Clause 2.4](#).

2.2.3 Copper

Copper shall conform to the following:

- (a) *Wrought products* — AS 2738.
- (b) *Tubular components* — Copper pipe conforming to AS 1432, NZS 3501 or ISO 274.

2.2.4 Copper alloy

Copper alloy shall conform to CEN/TS 13388 or the following:

- (a) *Castings* — AS 1565, EN 1982 or ASTM B584 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 conforming to AS 1572 alloy designation C 26130. Where bent or stamped in the fabrication process, the pipe shall be stress-relieved so that it is capable of passing the stress corrosion test specified in ISO 6957:1988 Clause 8, using a test solution of pH 9.5 without prior pickling, after all fabrication processes are completed.

NOTE ISO 6957 requires that the entire component is tested before any coating or plating operation.

Pressed end fittings manufactured from copper-zinc alloys containing more than 10 % zinc shall be capable of passing the stress corrosion test specified in ISO 6957:1988 Clause 8, using a test solution of pH 9.5 without prior pickling, after all pressing processes are completed.

2.2.5 Dezincification-resistant (DR) copper alloy

Copper alloys in contact with water and subject to hydrostatic pressure shall conform to AS 2345.

2.2.6 Stainless steel

Stainless steel, in contact with water, shall conform to ASTM A276 for wrought components or ASTM A269 for tubular components, Grades 304, 304L, 304LN, 316, 316L, 316Ti, UNS S31803 (2205) or equivalent.

NOTE Stainless steel used in above ground applications should have a PREN rating not less than 16.

Stainless steel used in below ground applications and marine environments should have a PREN rating of not less than 22.

The pitting resistance equivalent number (PREN) may be calculated as follows:

$$\text{PREN} = \% \text{Cr} + (3.3 \times \% \text{Mo}) + 16 \times (\% \text{N})$$

A PREN of 18 is approximately equivalent to Grade 304, and a PREN of 23 is approximately equivalent to Grade 316.

2.3 Plastic and elastomeric materials

2.3.1 General

Plastic and elastomeric materials used in tap components shall be of a type specified in the polymer manufacturer's instructions as suitable and appropriate for use in the manufacture of the tap component or otherwise capable of demonstrating suitability for use. Characteristics to be taken into account shall include compatibility and resistance to variations in water quality and elevated temperatures.

Under hydrostatic pressure, plastic and elastomeric materials shall be able to demonstrate suitability at the maximum operating pressure and temperature for the intended life of the product.

2.3.2 Acetal

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

NOTE Copolymers are inherently more stable and resistant to thermal degradation during service life than homopolymer.

2.3.3 UV resistance

The materials of plastic and elastomeric 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.

2.3.4 Resistance to chemical degradation

When tested in accordance with [Clause 4.2](#), plastic-bodied taps shall conform to the 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 conform to the requirements in [Clauses 4.3](#) and [4.5](#) (watertightness under pressure).

2.4 Other materials

The following requirements apply to other materials used for tap bodies and component parts of taps:

- (a) *Filler metals* — Filler metal shall be one of the following:
 - (i) Silver brazing alloy containing not more than 0.05 % cadmium conforming to AS 1167.1.
 - (ii) Copper-phosphorous brazing alloys conforming to AS 1167.1 with a minimum of 1.8 % silver.
- (b) *Material for springs* — Materials for springs shall conform to one of the following:
 - (i) Stainless steel — ASTM A313.
 - (ii) Phosphor bronze — AS 2738, C51000 or C51800.

NOTE 1 Other grades may be used provided they meet the performance criteria of this Standard.
- (c) *Nickel-copper-iron* — Nickel-copper-iron shall conform to one of the following:
 - (i) AS 2738, Alloy C71500.
 - (ii) ASTM B127, ASTM B163, ASTM B164 and ASTM B165.
- (d) *Zinc alloy die-castings* — Zinc alloy die-castings shall only be used for non-pressure applications. The die-castings shall conform to AS 1881.
- (e) *Washers and sealing rings* — Washers and sealing rings shall be in accordance 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 conform to AS 1646 and AS 681.1
- (f) *Lubricants* — Lubricants shall be in accordance with [Clause 4.7](#).

NOTE 2 Ceramic materials may also be used.

NOTE 3 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.

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 The figures in this Standard are diagrammatic examples only.

3.2 End connectors

NOTE 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 conform to AS 3688.

3.2.2 Other end connectors

Other end connectors shall conform to the relevant Australian or New Zealand Standards or WaterMark Technical Specifications.

3.3 Screw threads

3.3.1 General

Threads on components of taps may be right-hand or left-hand. They shall be in accordance with this clause.

3.3.2 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 ^a	Other threads (major diameter) mm	Minimum number of full threads engaged
$\leq 1''/25 \text{ mm}$	≤ 35	3
$> 1''/25 \text{ mm} \leq 2''/50 \text{ mm}$	$> 35 \leq 60$	4
$> 2''/50 \text{ mm} \leq 3''/80 \text{ mm}$	$> 60 \leq 90$	5
^a Pipe threads shall conform to AS ISO 7.1 and AS 1722.2.		

3.4 Water shut-off devices

3.4.1 General

Water shut-off devices may be of the manufacturer's own design.

3.4.2 Single and combination taps jumper valve

3.4.2.1 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.

3.4.2.2 Jumper valve

3.4.2.2.1 Design

Where the shut-off device is a jumper valve and compatibility and connectability are required, loose jumper valves shall be in accordance with [Figure M.10](#). Alternatively, the jumper valve may be of the manufacturer's own design.

3.4.2.2.2 Construction

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

3.4.3 Other water shut-off valves

Other water shut-off valves in common use are the following:

- (a) Automatic mechanical shut-off valves.
- (b) Mechanical mixing valves.
- (c) Electronic opening and closing valves.

3.5 Thickness of metal parts

3.5.1 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.

3.5.2 Copper, copper alloy and stainless steel tubes

The minimum mean thickness of tubes manufactured from —

- (a) copper;
- (b) copper alloy; and
- (c) stainless steel,

shall be not less than the minimum thickness as specified in AS 1432 for Type B copper 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.

3.5.3 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	Plain sections subject to permanent hydrostatic pressure	Plain sections not subject to permanent hydrostatic pressure
DN	mm	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.		

3.6 Fabricated assemblies

Fabricated assemblies shall pass the torque test as specified in [Clause 4.8](#). Assemblies comprising copper alloy components joined by brazing or welding shall conform to [Clause 2.2.5](#) after fabrication.

3.7 Outlets

3.7.1 Unit construction outlets

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

3.7.2 Other outlets

All other outlets, including flexible free water outlets, shall conform only to [Clause 3.2](#), [Clause 3.10](#) and [Clause 4.7](#), except as specified in [Clauses 3.7.3](#) to [3.7.5](#).

3.7.3 Flexible hoses

3.7.3.1 Backflow prevention

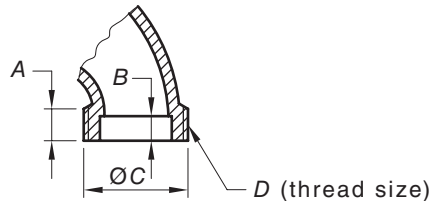
Where flexible hoses are supplied with the tap, they shall incorporate backflow prevention in accordance with AS/NZS 3500.1.

3.7.3.2 Flexible hoses with shut-off devices

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

3.7.4 Hose tap outlets

Hose tap outlets shall conform to the dimensional criteria specified in [Figure 3.1](#).



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

Figure 3.1 — Hose tap outlets

3.7.5 Showerheads for personal bathing

Showerheads shall conform to AS/NZS 3662.

3.8 Operating mechanisms

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

- the assembly is capable of passing the torque test in accordance with [Clause 4.10](#);
- the handle is removable, where necessary, for the replacement or adjustment of sealing devices;
- the handles of wall-mounted bath or shower taps conform to [Clause 4.14](#);
- foot-operated taps are designed so as to be capable of passing the load test specified in [Clause 4.13](#);
- button-operated taps are designed so as to be capable of passing the load test specified in [Clause 4.13](#);
- isolating taps are designed to operate without a handle provided that the spindle is supplied with a screwdriver slot or wrenching flats;
- taps have special operating provisions in lieu of handles to prevent unauthorized use or vandalism; and
- the outer end of the spindle of a ferrule stop tap is suitable for adaptors.

3.9 Finish and workmanship

Taps and tap components shall conform to 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.

NOTE 1 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 specified in [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 lubricated with a non-toxic water insoluble lubricant conforming to [Clause 4.7](#) or WMTS-014. 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.

Where decorative finishes are applied, they shall conform to the criteria of the relevant standard and industry norms.

NOTE 2 See [Appendix T](#) for an informative reference of applicable test criteria for finishes and coatings.

3.10 Accessories or components supplied with tap products

3.10.1 General

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

3.10.2 Flexible hose connectors

Flexible hose connectors shall conform to AS/NZS 3499.

3.10.3 Integral backflow devices

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

3.10.4 Flow control devices

Flow control devices shall conform to AS 5200.037.2.

3.11 Taps and tap components to suit industry-specific dimensional characteristics

3.11.1 General

[Clauses 3.11.2](#) to [3.11.7](#) set out the specific dimensional characteristics to accommodate the interchangeability 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.

The manufacturer's instructions shall include sufficient relevant information with the product to enable the product to be correctly installed with applicable compatible assemblies.

3.11.2 Valve seating, valve chamber and tap head connection

The valve seat, chamber and tap head connection shall conform to the dimensions shown in [Figure M.2](#) and [Figure M.3](#).

3.11.3 Tap head

The tap head fixing detail shall conform to the dimensions shown in [Figure M.6](#) or [Figure M.7](#).

3.11.4 Spindle end

The spindle end to suit a loose jumper valve shall conform to the dimensions shown in [Figure M.8](#) or [Figure M.9](#).

3.11.5 Loose jumper valves

Loose jumper valve stems and washer plates shall be of unit construction and conform to the dimensions shown in [Figure M.10](#).

3.11.6 Tapset breaching piece assemblies

Tapset breaching piece assemblies shall conform to the requirements of this Standard.

3.11.7 Replacement tap seats

Replacement tap seat inserts shall conform to 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.

3.12 Electronic taps and/or valves

3.12.1 General

Electronic taps and/or valves shall be checked for safe use and electromagnetic compatibility.

NOTE Refer to the relevant regulator for electrical and electromagnetic compatibility requirements.

3.12.2 Power failure

If power failure occurs while the tap is delivering water, the water shall be shut off as specified in [Clause 4.15](#).

3.12.3 Electrical safety

NOTE Refer to the NCC for requirements related to electrical safety of components.

3.12.4 Electromagnetic compatibility

NOTE Refer to the NCC for requirements related to electromagnetic compatibility of products.

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 B](#), 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 C](#), a tap assembly shall show no signs of permanent distortion, splitting, cracking or breakage or other failure.

4.4 Surface-mounting strength test for taps

When tested in accordance with [Appendix D](#), the surface-mounting components of the tap shall show no signs of cracking, deformation, stripping of threads or unsecured mounting. Following the completion of this test, the components shall conform to the requirements of [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 E](#), 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

4.6.1.1 High pressure

The flow rate of a tap or tap outlet shall be determined in accordance with [Appendix F](#).

4.6.1.2 Low and unequal pressure

The flow rate of a tap or tap outlet shall be determined in accordance with [Appendix O](#).

4.6.2 Outlets where conformance to AS/NZS 6400 is mandatory

4.6.2.1 High pressure

Where labelling in accordance with AS/NZS 6400 is mandatory, the nominal flow rate shall be determined in accordance with [Appendix F](#), and conform to 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 in accordance with AS/NZS 6400 is mandatory, the nominal flow rate shall be determined in accordance with [Appendix O](#).

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 and garden hose taps.

4.7 Contamination of water

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

Components made from a single material may be pre-qualified by use of simulated samples in accordance with [Appendix N](#).

The process of pre-qualification may be applicable to the following types of materials:

- (a) Metals and metallic alloys.
- (b) Plastic materials.

4.8 Torque of fabricated joints

When a fabricated tap assembly is tested in accordance with [Appendix G](#), 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 head to body

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

NOTE This test is not required for mixing taps mechanical (non-thermostatic).

4.10 Torque of operating mechanism

When tested in accordance with [Appendix I](#), a tap-operating mechanism shall show no signs of cracking, bending or damage.

4.11 Endurance test for taps and tap components

4.11.1 Endurance test for tap operating mechanisms

4.11.1.1 General

Taps and tap components shall be capable of passing the endurance tests set out in [Appendix J](#), [Q](#), [R](#) and [S](#).

Alternatively, for taps with a maximum inlet temperature not exceeding 65 °C, the endurance tests set out in EN 200, EN 816, EN 817 or EN 15091 may be used to demonstrate conformance to this performance requirement.

4.11.1.2 Pre-endurance testing

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

4.11.1.3 Cycles

[Table 4.1](#) sets out the number of cycles required for endurance testing.

Table 4.1 — Endurance testing cycle range

Tap classification	Number of cycles	Appendix
Single taps	50,000 ± 500	I
Combination taps	50,000 ± 500	I
Mechanical mixing taps	70,000 ± 700	Q
Automatic shut-off taps — single	200,000 ± 2000	R
Automatic shut-off taps — mixing	100,000 ± 1000	R
Electronic opening and closing taps	200,000 ± 2000	S
Isolation or drain taps	10,000 ± 100	I
Jumper valves	25,000 ± 250	I

4.11.1.4 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 4.10](#).
- (c) Resistance of handle to removal test where applicable, see [Clause 4.14](#).

4.12 Strength of connector nut and assembly

When tested in accordance with [Appendix K](#), the nut and assembly shall show no signs of splitting, cracking, distortion or thread damage. Combinations of connector nuts and assemblies that are manufactured of copper or copper alloys to conform to AS 3688 need not be tested.

4.13 Strength of button-operated and foot-operated taps

When installed according to the manufacturers' instructions and tested in accordance with [Appendix L](#), button-operated and foot-operated taps shall show no signs of cracks, breakages, bending or damage.

NOTE This test does not apply to digitally (electronically) controlled taps and mixers.

4.14 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 +0, -0.5 kg.

4.15 Power failure for electronically controlled taps

In the event of an electrical power failure, water shall shut off within 1 min.

4.16 Rotating or swivel outlet

When tested in accordance with [Appendix P](#), a rotating outlet shall show no signs of leakage from the tap body connection to the outlet connection. The torque to rotate the outlet during testing shall not exceed a torque of 3 Nm.

Alternatively, for taps with a maximum inlet temperature not exceeding 65 °C, the endurance test for a rotating or swivel outlet may be undertaken in accordance with EN 200 or EN 817 to demonstrate conformance to this performance requirement.

Appendix A (normative)

Product conformity

A.1 Scope

This appendix sets out the minimum requirements for evaluating product conformity to this Standard through —

- (a) initial type testing; and
- (b) a minimum sampling and testing frequency plan.

A.2 Relevance

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

A.3 Terms and definitions

A.3.1

batch release test

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

A.3.2

production batch

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

A.3.3

sample

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

Note 1 to entry: The number of units of product in the sample is the sample size.

A.3.4

sampling plan

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

A.3.5

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

Note 1 to entry: The batch is defined by the manufacturer.

A.3.6

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

A.4 Testing

A.4.1 Type testing

[Table A.1](#) sets out the requirements for type testing and frequency of re-verification.

A.4.2 Batch release testing

[Table A.2](#) sets out the minimum sampling and testing frequency plan for a manufacturer to demonstrate conformance of product(s) to this Standard on an ongoing basis.

A.4.3 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 conform may be claimed and/or marked as conforming to this Standard.

Table A.1 — Type testing

Characteristic	Clause No.	Requirement	Test method	Frequency	Tap	Components			
						Tap head/Head assembly	Outlets	Tap body	Water shut-off device
Materials ^a	2.2	Metallic materials	Review materials against Standards referenced in this Standard	At any change in materials specification	✓	✓		✓	✓
	2.2.2	Corrosion-resistance metallic materials			✓	✓		✓	✓
	2.2.3	Copper			✓	✓		✓	✓
	2.2.4	Copper alloy			✓	✓		✓	✓
	2.2.5	Dezincification-resistance (DR) copper alloy			✓	✓		✓	✓
	2.2.6	Stainless steel			✓	✓		✓	✓
	2.3	Plastic and elastomeric materials			✓	✓		✓	✓
	2.4	Other materials			✓	✓		✓	✓
Design and manufacture	3.2	End connectors	Relevant Standard	At any design or process change	✓		✓	✓	
	3.3	Screw threads	Relevant Standard		✓			✓	
	3.5	Thickness of metal parts	Dimensional		✓	✓		✓	
	3.7	Outlets	Dimensional		✓		✓		
	3.7.3	Flexible hoses	Relevant Standard		✓				