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Sanitary plumbing products

Part 2: Flushing devices and cistern inlet and outlet valves



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- Association of Accredited Certification Bodies
 - Australian Building Codes Board
 - Australian Chamber of Commerce and Industry
 - CSIRO
 - Department of the Environment, Australian Government
 - Plumbing Products Industry Group
 - Testing Interests (Australia)
-

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard®

A1

Sanitary plumbing products

Part 2: Flushing devices and cistern inlet and outlet valves

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PREFACE

A1 | This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WS-003, Sanitary Plumbing Fixtures, to supersede AS 1172.2—1999, *Water closet (WC) pans of 6/3 L capacity*, Part 2: *Cisterns*; ATS 5200.004—2005, *Technical Specification for plumbing and drainage products*, Part 004: *Urinal flushing cisterns*; ATS 5200.016—2010, *Technical Specification for plumbing and drainage products*, Part 016: *Cistern inlet valves*; ATS 5200.017—2005, *Technical Specification for plumbing and drainage products*, Part 017: *Cistern outlet valves*; ATS 5200.020—2004, *Technical Specification for plumbing and drainage products*, Part 020: *Flushing valves for water closets and urinals—For use with mains supply*; and ATS 5200.021—2004, *Technical Specification for plumbing and drainage products*, Part 021: *Flushing valves for water closets and urinals—For use with break tank supply*.

This Standard incorporates Amendment No. 1 (June 2018). 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.

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 specify the requirements for flushing devices and their vital components, as follows:

- (a) Flushing cisterns for pans and urinals.
- (b) Flushing valves for use with mains supply.
- (c) Flushing valves for use with break tank supply.
- (d) Cistern inlet valves.
- (e) Cistern outlet valves.

This revision includes—

- (i) amended procedures to meet the requirements of the Water Efficiency Labelling and Standards (WELS) scheme for greater consistency of test results across recognized testing laboratories; and
- (ii) the requirements and test procedures previously contained in ATS 5200.016—2010, ATS 5200.017—2005, ATS 5200.020—2004 and ATS 5200.021—2004.

NOTE: ATS 5200.030—2012, *Technical Specification for plumbing and drainage products*, Part 030: *Solenoid valves*, is not included in this revision.

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 tables and figures are deemed to be requirements of this Standard.

The Committee identified that additional testing requirements (e.g. reduced-flush testing) may be considered for inclusion in a future edition of the Standard when more data are available.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE.....	5
1.2 APPLICATION	5
1.3 DEMONSTRATION OF CONFORMANCE.....	5
1.4 NORMATIVE REFERENCES	5
1.5 DEFINITIONS.....	6
1.6 MARKING	8
SECTION 2 FLUSHING CISTERNS	
2.1 GENERAL.....	9
2.2 MARKING	9
2.3 MATERIALS.....	9
2.4 DESIGN AND MANUFACTURE.....	10
2.5 PERFORMANCE REQUIREMENTS AND TEST METHODS.....	11
SECTION 3 FLUSHING VALVES FOR USE WITH MAINS SUPPLY	
3.1 GENERAL.....	14
3.2 MARKING	14
3.3 MATERIALS.....	14
3.4 DESIGN AND MANUFACTURE.....	15
3.5 PERFORMANCE REQUIREMENTS AND TEST METHODS.....	15
3.6 PRODUCT DOCUMENTATION.....	16
3.7 INSTALLATION AND OPERATING AND MAINTENANCE INSTRUCTIONS ..	16
SECTION 4 FLUSHING VALVES FOR USE WITH A BREAK TANK SUPPLY	
4.1 GENERAL.....	18
4.2 MARKING	18
4.3 MATERIALS.....	18
4.4 DESIGN AND MANUFACTURE.....	19
4.5 PERFORMANCE REQUIREMENTS AND TEST METHODS.....	19
4.6 PRODUCT DOCUMENTATION.....	20
4.7 INSTALLATION AND OPERATING AND MAINTENANCE INSTRUCTIONS ..	20
SECTION 5 CISTERN INLET VALVES	
5.1 GENERAL.....	21
5.2 MATERIALS.....	21
5.3 DESIGN	21
5.4 PERFORMANCE REQUIREMENTS AND TEST METHODS.....	22
SECTION 6 CISTERN OUTLET VALVES	
6.1 GENERAL.....	23
6.2 MATERIALS.....	23
6.3 DESIGN	23
6.4 PERFORMANCE REQUIREMENTS AND TEST METHODS.....	24

APPENDICES

A	DEMONSTRATION OF CONFORMANCE TO THIS STANDARD	25
B	CISTERN—FRONT THRUST TEST.....	31
C	CISTERN—BACKSIPHONAGE TEST.....	33
D	CISTERN OUTLET VALVE—DETERMINATION OF OVERFLOW RATE	35
E	DISCHARGE VOLUME AND FLOW RATE TEST—NON-MATCHING SINGLE-FLUSH AND DUAL-FLUSH CISTERNS	37
F	CISTERN INLET VALVE—ENDURANCE TEST	39
G	CISTERN DISCHARGE VOLUME TEST—PAN COMBINATIONS	41
H	CISTERN OUTLET VALVE—PHYSICAL ENDURANCE TEST	43
I	CISTERN OUTLET VALVE—CHEMICAL ENDURANCE TEST	45
J	REFILL TIME FOR CISTERNS FITTED WITH LOW PRESSURE INLET VALVE TEST	47
K	OTHER FLUSHING DEVICES—DISCHARGE VOLUME TEST—PAN COMBINATIONS	50
L	OTHER FLUSHING DEVICES—BACKSIPHONAGE TEST	52
M	URINAL DISCHARGE VOLUME TEST—MATCHING SETS AND NON-MATCHING SETS	53
N	CISTERN—DETERMINATION OF SPILL LEVEL AND AIR SEPARATION DISTANCE.....	55
BIBLIOGRAPHY.....		57

STANDARDS AUSTRALIA

Australian Standard

Sanitary plumbing products

Part 2: Flushing devices and cistern inlet and outlet valves

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for—

- (a) flushing cisterns that may be either single-flush or dual-flush with flushing volumes as marked;
- (b) flushing valves for mains supply that incorporate air gap pipe disconnections that operate manually or by sensor; and
- (c) flushing valves for use with a break tank supply;

which are intended for use with urinals and water closet pans of all types.

This Standard also specifies requirements for cistern inlet valves and cistern outlet valves.

1.2 APPLICATION

Each type of flushing device or valve shall comply with the relevant section as follows:

- (a) Flushing cisterns Section 2.
- (b) Flushing valves for use with mains supply Section 3.
- (c) Flushing valves for use with a break tank supply Section 4.
- (d) Cistern inlet valves Section 5.
- (e) Cistern outlet valves Section 6.

1.3 DEMONSTRATION OF CONFORMANCE

Demonstration of conformance with this Standard shall be in accordance with Appendix A.

1.4 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS

1172 Sanitary plumbing products
1172.1 Part 1: Water closet pans

1432 Copper tubes for plumbing, gasfitting and drainage applications

1565 Copper and copper alloys—Ingots and castings

1572 Copper and copper alloys—Seamless tubes for engineering purposes

1976 Vitreous china used in sanitary appliances

2136 Method for detecting the susceptibility of copper and its alloys to stress corrosion cracking using the mercurous nitrate test

AS	
2345	Dezincification resistance of copper alloys
2738	Copper and copper alloys—Compositions and designations of refinery products, wrought products, ingots and castings
3688	Water supply—Metallic fittings and end connectors
5200	Technical specification for plumbing and drainage products
5200.000	Part 000: Procedures for certification of plumbing and drainage products
AS/NZS	
1567	Copper and copper alloys—Wrought rods, bars and sections
1568	Copper and copper alloys—Forging stock and forgings
2845	Water supply—Backflow prevention devices
2845.1	Part 1: Materials, design and performance requirements
3499	Water supply—Flexible hose assemblies
3500	Plumbing and drainage
3500.0	Part 0: Glossary of terms
3500.1	Part 1: Water services
3500.2	Part 2: Sanitary plumbing and drainage
3718	Water supply—Tap ware
3982	Urinals
4020	Testing of products for use in contact with drinking water
4087	Metallic flanges for waterworks purposes
A1 6400	Water efficient products—Rating and labelling
ASTM	
A240M	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

1.5 DEFINITIONS

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

1.5.1 Air separation distance

The distance between the outlet of the inlet valve and the spill level (see Figure 2.1).

1.5.2 Close-coupled cistern

A cistern intended to operate directly coupled to the WC pan or other soil waste fixtures.

1.5.3 Combination

A flushing device and water closet pan or urinal combination that complies with the performance requirements of this Standard and AS 1172.1 or AS/NZS 3982.

1.5.4 Component

That part, or subassembly of parts, that contributes to the construction of a total assembly by choice or design, which will offer variations of fitment for the application of the major element of the product, whether produced by that same manufacturer or not.

NOTE: The component is a vital part of the total.

1.5.5 Concealed or in-wall cistern

A cistern designed for concealed installation in a wall, a duct or a cavity.

1.5.6 Discharge capacity

The quantity of water discharged from a flushing cistern.

1.5.7 Flush valve

A hydraulic device that discharges a predetermined quantity of water to fixtures for flushing purposes.

1.5.8 Linkages

Components forming part of the operating mechanism of the cistern.

1.5.9 Low pressure/gravity-fed inlet valve

An inlet valve intended for use with water supply pressures of 30 kPa or less, when measured at the cistern inlet.

1.5.10 Matching set cistern

A cistern intended to operate with one or more specific WC pans or urinals.

1.5.11 Overflow level

The level at which water in a cistern will first start to overflow (see Figure 2.1).

1.5.12 Pitting resistance equivalent number (PREN)

A theoretical way of comparing the pitting corrosion resistance of various types of stainless steel, based on the chemical compositions and specifically chromium (Cr), molybdenum (Mo) and nitrogen (N).

NOTE: The following equation is used to calculate the PREN:

$$\text{PREN} = \% \text{Cr} + 3.3\% \text{Mo} + x\% \text{N}$$

where

- x = 16 for duplex stainless steels
- = 30 for austenitic stainless steels
- = 0 for ferritic and martensitic stainless steels

1.5.13 Proven equivalent

For WC combinations only, evidence demonstrating equivalent water usage, satisfactory functional performance, satisfactory transport of resulting wastes in both private and reticulation sewers as required by the relevant authorities.

NOTE: The equivalent single flush water usage to 6/3 L dual-flush is 3.5 to 4.1 L.

1.5.14 Spill level (cistern tank only)

Maximum height to which water will rise above overflow pipe when it is entering cistern at a constant flow pressure.

NOTE: See Clause 2.4.8.

1.5.15 Spill level (low pressure/gravity fed inlet valves only)

The maximum height to which the water level will rise in the cistern whilst overflowing through the overflow when water is entering the cistern through the inlet valve at a dynamic pressure (which is equal to the manufacturer's specified maximum operating pressure) and with the inlet valve fully open and the flush valve closed.

1.6 MARKING

1.6.1 Cistern inlet valves

Each device shall be permanently and legibly marked in accordance with AS 5200.000 with the following:

- (a) Manufacturer's name, brand or trademark.
- (b) WaterMark and licence number.
- (c) The number of this Standard, i.e. AS 1172.2.
- (d) For low pressure inlet valves, the following warning:
THE CISTERN MUST NOT BE CONNECTED TO A MAINS WATER SUPPLY.
- (e) For low pressure inlet valves, the maximum pressure for which the valve is suitable.

For cistern inlet valves supplied as a replacement part, the assembly shall be packaged in such a manner as to avoid damage during transportation and handling.

1.6.2 Cistern outlet valves

1.6.2.1 General

Each device shall be permanently and legibly marked with the following:

- (a) Manufacturer's name, brand or trademark.
- (b) WaterMark and licence number.
- (c) The number of this Standard, i.e. AS 1172.2.

1.6.2.2 *Valves having an adjustable height overflow or replacement valves that are not designed for specific cisterns*

A warning label and installation instructions that ensure, upon installation, backflow prevention complies with the requirements of AS/NZS 3500.1 shall be included.

1.6.2.3 *Replacement valves designed for specific cisterns*

Information identifying cistern models for which the valve is suitable shall be included.

1.6.2.4 *Outlet valves that have adjustable elements to set the flush volume*

Instructions identifying compatible cisterns, and a table of specific adjustment dimensions/settings to suit each compatible cistern model, shall be included.

1.6.2.5 *Non-adjustable outlet valves*

Instructions identifying compatible cisterns shall be included.

SECTION 2 FLUSHING CISTERNS

2.1 GENERAL

This Section specifies requirements for flushing cisterns.

Flushing cisterns shall incorporate the components specified in Clause 2.4.9 and pass the performance tests specified for cisterns in this Standard.

Flushing cisterns may be either single-flush or dual-flush, with flushing volumes as marked, and intended for use with urinals and water closet pans of all types.

2.2 MARKING

Flushing cisterns shall be marked as follows:

- (a) The manufacturer's name, mark or trademark (see Note 1).
- (b) Serial number or date of manufacture code.
- (c) WaterMark and licence number.
- A1 | (d) WELS label to AS/NZS 6400.
- (e) For use with septic systems (if applicable for use with septic tanks).
- (f) Combination model identification where not supplied as close-coupled or matched pan or urinal set.
- A1 | (g) 'Text deleted'
- (h) A permanent mark on the inside of the cistern indicating the working water level (see Figure 2.1).

NOTES:

- 1 For Item (a) where supplied with a pan only, a cistern only, or both, i.e. matched.
- 2 Manufacturers making a statement of compliance with this Australian Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.
- 3 For 9/4.5 L replacement cisterns for WCs, suitable marking should be shown on the packaging.

2.3 MATERIALS

2.3.1 General

Materials used in flushing cisterns shall be corrosion resistant.

2.3.2 Dezincification-resistant copper alloy

Copper alloy components in contact with potable water shall comply with AS 2345.

2.3.3 Vitreous china

Vitreous china shall comply with AS 1976.

2.3.4 Stainless steel

Stainless steel shall be Type 304, 316, or 321 complying with ASTM A240M.

2.3.5 Other materials

Other clay-based materials may be acceptable, provided they are fit for purpose. When tested in accordance with AS 1976, the absorbency rate of clay shall be not greater than 0.5%.

Plastics such as polypropylene or other compounds may be used, provided they are fit for purpose.

2.3.6 Materials in contact with water

Materials in contact with drinking water upstream of the water shut-off device shall comply with AS/NZS 4020.

2.4 DESIGN AND MANUFACTURE

2.4.1 Access

The cistern shall be designed to allow sufficient access for adjustment and maintenance of the internal components. Removable covers shall be secured against sliding or dislodgement.

2.4.2 Backflow prevention

The inlet valve, together with any fitted silencing device or other device, which intercepts the free flow of water from the valve, shall be capable of preventing backsiphonage of water.

NOTE: For testing for backsiphonage, see Clause 2.5.3 and Appendix C.

2.4.3 Overflow

The cistern shall be provided with an overflow of sufficient capacity to adequately cope with any volume without impairing air separation.

Overflows may discharge externally or internally into the flush pipe. Septic tank cisterns shall be provided with an external overflow. Concealed or in-wall cisterns shall be provided with an internal overflow, as specified in AS/NZS 3500.1.

2.4.4 Water inlet valve

A water inlet valve that operates automatically to fill the cistern shall be provided. The valve shall incorporate an adjustment to enable the level of the water in the cistern to be set at the working water level when the valve closes. The inlet shall close effectively against a pressure of $2.0 + 0.1, -0$ MPa. Where the inlet valve incorporates copper alloy, it shall be dezincification-resistant and shall comply with Clause 3.3.3. Flexible joints (being a feature of the design of a cistern water inlet valve which is subject to mains pressure), shall have a minimum of two watertight seals for underwater or below spill level applications.

When tested in accordance with the backsiphonage test of Appendix C and endurance test of Appendix F, the water inlet valve shall comply with Appendices C and F with one seal removed.

The water inlet valve shall effectively fill to the cistern-marked water level, ± 2 mm, each time when flushed three times consecutively at the same pressure.

2.4.5 Inlet connection

The connection end of the water inlet valve shall be capable of making a watertight joint with the water service.

2.4.6 Outlet valve

An outlet valve shall be provided which, when activated, shall remain in the open position until the flush is completed and shall then close automatically and return to the activating position.

2.4.7 Outlet connection

The cistern outlet valve shall have a connection end that is compatible with the flush pipe or matching pan to ensure a watertight joint.

2.4.8 Air separation distance

- A1 | The cistern air separation distance shall be a minimum of 20 mm, as shown in Figure 2.1. The air separation distance shall be determined in accordance with Appendix N.

2.4.9 Integral components

Integral components shall comply with the following Standards:

- (a) Flexible hoses.....AS/NZS 3499.
- (b) Isolating valves..... AS/NZS 3718 or other applicable Standard.
- (c) Inlet valves Section 5.
- (d) Outlet valves Section 6.
- (e) Fittings AS 3688.

2.4.10 Flow rates for cisterns

NOTE: Generally, a discharge flow rate of 1.4 L/s has been used as a guide for the performance of WC cisterns in the field.

2.5 PERFORMANCE REQUIREMENTS AND TEST METHODS

2.5.1 Front thrust test

When tested in accordance with Appendix B, the cistern shall not crack, fail or permanently distort so as to be rendered inoperable, the lid no longer sits or the cistern distorts more than 6 mm.

2.5.2 Distortion and leakage tests for other than vitreous china cisterns

The cistern shall be assembled according to the manufacturer's instructions. Measurements shall be taken with the cistern empty and with water flowing through the overflow. The cistern shall not distort more than 6 mm at any one point, and shall not leak and the cover shall not be displaced.

2.5.3 Backsiphonage test

When tested in accordance with Appendix C, there shall be no backsiphonage.

2.5.4 Endurance test—Outlet valve

- A1 | When tested in accordance with Appendix H, the outlet valve shall not deteriorate to such an extent that it will not conform with the specified discharge test.

2.5.5 Endurance test—Inlet valve

When tested in accordance with Appendix F, the inlet valve shall not deteriorate to such an extent that it is not capable of shutting off against a pressure of 2 +0.1, -0 MPa.

2.5.6 Discharge test—Matching set cisterns for use with WCs

Cisterns for use as part of a WC matching set shall be tested in accordance with Appendix G and, for each type of pan connector and flush pipe specified by the manufacturer, cistern discharge volumes shall be as given in Table 2.1.

Water used for the discharge test includes water required to replenish the trap seal; which shall be deemed to be the total discharge volume of the cistern.

2.5.7 Discharge test—Matching and non-matching sets cisterns for use with urinals

Cisterns for use as part of a urinal matching and non-matching set shall be tested in accordance with Appendix M and, for each type of flush pipe specified by the manufacturer, cistern discharge volumes shall be not greater than 2.5 L per stall, as specified in AS/NZS 3500.1.

Water used for the discharge test includes water required to replenish the trap seal; which shall be deemed to be the total discharge volume of the cistern.

2.5.8 Discharge test—Non-matching set cisterns for use with WCs

Cisterns that are not part of a matching set shall be tested in accordance with Appendix E and, for each type of flush pipe recommended by the manufacturer, the discharge flow rate shall be not less than 1.4 L/s and the total discharge volume from the cistern shall be as given in Table 2.1.

Water used for the discharge test includes water required to replenish the trap seal; which shall be deemed to be the total discharge volume of the cistern.

TABLE 2.1
WATER CLOSETS DISCHARGE VOLUME

Volume, L			
Rating	Full-flush	Reduced-flush	Average-flush
Dual flush			
9/4.5*	8.0 min. 9.5 max	4.0 min. 4.5 max	4.5–5.5
6/3	5.5 min. 6.5 max	3.0 min. 3.5 max	3.5–4.1
4.5/3	4.3 min. 4.7 max	2.8 min. 3.2 max	3.1–3.5
Single flush			
6	6 max		
4	4 max		

* Replacement cisterns only to match pre-installed pans

NOTES:

- 1 Authority discharge capacity requirements may vary.
- 2 Refer to Star Rating Table in AS/NZS 6400.
- 3 Average flush volume for dual-flush cisterns and flush valves—the average of one full-flush discharge flush volume and four reduced-flush discharge volumes as measured in accordance with Appendix G or Appendix K.

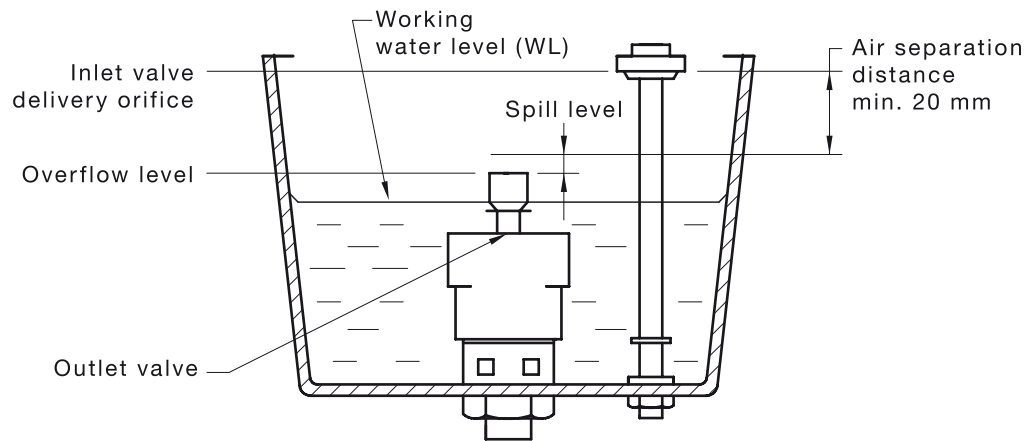


FIGURE 2.1 CISTERN—AIR GAP AND SPILL LEVEL ARRANGEMENTS

SECTION 3 FLUSHING VALVES FOR USE WITH MAINS SUPPLY

3.1 GENERAL

This Section specifies requirements for flushing valves that incorporate air gap pipe disconnections that operate manually or by sensor for use with mains supply.

Materials used in flushing valves shall be corrosion resistant.

NOTE: For solenoid controlled valves, see ATS 5200.030.

3.2 MARKING

Each flushing valve shall be permanently and legibly marked with the following:

- (a) Manufacturer's name, brand or trademark.
- (b) WaterMark and licence number.
- (c) Maximum operating pressure.
- (d) The number of this Standard, i.e. AS 1172.2.
- (e) Combination model identification where not supplied with a pan or urinal.

3.3 MATERIALS

3.3.1 Copper

The following applies:

- (a) *Wrought product* Wrought products shall comply with AS 2738.
- (b) *Tubular components* Copper tube shall comply with AS 1432.

3.3.2 Copper alloy

The following applies:

- (a) *Castings* Castings shall comply with AS 1565 or shall be capable of passing the requirements of Clause 3.3.3 provided the alloy contains not less than 58% copper and not more than 1% aluminium.
- (b) *Hot pressings* Hot pressings shall comply with AS/NZS 1568 or shall be of an alloy complying with AS 2345.
- (c) *Rod for machined parts* Rod shall comply with AS/NZS 1567 or shall be of an alloy complying with AS 2345.
- (d) *Tubular components* Copper alloy tube shall comply with AS 1572 alloy designation 259.

NOTE: Where bent or stamped in the fabrication process, the tube should have been sufficiently stress-relieved so that it is capable of passing the mercurous nitrate test specified in AS 2136 after all fabrication processes are complete. For the purpose of this test, the entire tube component should have been tested before any coating or plating operation.

3.3.3 Dezincification-resistant (DR) copper alloy

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

3.3.4 Stainless steel

Stainless steel shall be Type 304, 316, or 321 complying with ASTM A240M.

3.3.5 Plastics

Cisterns and cistern components of plastics materials shall be fit for purpose and shall not fail when tested to the performance test requirements of this Standard. Acetal plastics shall be copolymer.

3.4 DESIGN AND MANUFACTURE

3.4.1 Access

The flush valve shall be designed to allow for sufficient access for adjustments and maintenance of the internal components.

3.4.2 Backflow prevention

Flush valves for use with mains supply shall be capable of preventing backsiphonage of water when tested in accordance with Appendix L.

3.4.3 End connectors

Threaded end connectors for connection to either pipes or fittings shall comply with AS 3688 or AS/NZS 4087. Other connection ends shall comply with the requirements relevant to the connection.

3.4.4 Flushing volume

The flushing valve shall be capable of being set to deliver a flushing volume suitable for the fixture as given in Table 2.1 or as specified in AS/NZS 3500.2.

3.4.5 Flow rates for WC flushing valves

NOTE: Generally, a discharge flow rate of 1.4 L/s has been used as a guide for the performance of flushing valves in the field.

3.5 PERFORMANCE REQUIREMENTS AND TEST METHODS

3.5.1 Products in contact with drinking water

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

3.5.2 Discharge test—Matching set flushing valves for use with WCs

Flushing valves, for use as part of a WC matching set, that incorporate an air gap pipe disconnection and operate manually or by sensor for mains supply connection shall be tested in accordance with Appendix K.

For each type of pan connection and flush pipe specified by the manufacturer, flushing valve discharge volumes shall be as given in Table 2.1.

Water used for the discharge test includes water required to replenish the trap seal, which shall be deemed to be the total discharge volume of the flushing valve.

3.5.3 Discharge test—Non-matching set flushing valves for use with WCs

Flushing valves for use as part of a WC non-matching set that incorporate an air gap pipe disconnection and operate manually or by sensor for mains supply connection shall be tested in accordance with Appendix K.

Water used for the discharge test includes water required to replenish the trap seal, which shall be deemed to be the total discharge volume of the flushing valve.

3.5.4 Discharge test—Matching and non-matching set flushing valves for use with urinals

Flushing valves for use as part of a urinal matching set and non-matching set that incorporate an air gap pipe disconnection and operate manually or by sensor for mains supply connection shall be tested in accordance with Appendix M.

For each type of flush pipe specified by the manufacturer, flushing valve discharge volumes shall be greater than 2.5 L per stall (see AS/NZS 3500.1).

Water used for the discharge test includes water required to replenish the trap seal, which shall be deemed to be the total discharge volume of the flushing valve.

3.5.5 Watertightness

3.5.5.1 *Metal-bodied valves*

When tested at a hydrostatic pressure of $1.5 \times$ (the manufacturer's stated maximum allowable operating pressure) +100, –0 kPa or 1200 +100, –0 kPa, whichever is the greater, for a period of 60 +10, –0 s at ambient temperature, the metal-bodied valve shall not leak or show any signs of permanent deformation.

3.5.5.2 *Plastics-bodied valves*

When tested at a hydrostatic pressure of $1.5 \times$ (the manufacturer's stated maximum allowable operating pressure) +100, –0 kPa or 1200 +100, –0 kPa, whichever is the greater, for 60 +5, –0 min at 80 +5, –0°C, the plastics-bodied valve shall not leak or show any signs of permanent deformation.

3.6 PRODUCT DOCUMENTATION

Product documentation shall be provided, and shall identify critical product characteristics such as—

- (a) compatible fixtures;
- (b) delivery volume and flow rate;
- (c) pressure/temperature or other limitations; and
- (d) nominal flush pipe diameter and height.

3.7 INSTALLATION AND OPERATING AND MAINTENANCE INSTRUCTIONS

3.7.1 Installation instructions

Installation instructions shall be provided, and shall be fully detailed, as follows:

- (a) Reference to installation in accordance with AS/NZS 3500.2.
- (b) Step by step instructions.
- (c) The need for special tools or training.
- (d) Commissioning procedures and adjustments required.
- (e) Troubleshooting guide.
- (f) Contact details for after-sales service.

3.7.2 Operating and maintenance instructions

Operating and maintenance instructions shall be provided, and shall include the following:

- (a) Any regular maintenance requirements.
- (b) Care and cleaning advice.
- (c) Spare parts information.
- (d) Troubleshooting guide.
- (e) Contact details for after-sales service.

SECTION 4 FLUSHING VALVES FOR USE WITH A BREAK TANK SUPPLY

4.1 GENERAL

This Section sets out requirements for flushing valves supplied from a break tank, which operate manually or by sensor, for connection to fixtures such as water closet pans and urinals.

NOTE: For solenoid controlled valves, see ATS 5200.030.

4.2 MARKING

Each flushing valve shall be permanently and legibly marked with the following:

- (a) Manufacturer's name, brand or trademark.
- (b) WaterMark and licence number.
- A1 | (c) WELS label to AS/NZS 6400.
- (d) Maximum operating pressure.
- (e) The number of this Standard, i.e. AS 1172.2.
- (f) Combination model identification where not supplied with a pan or urinal.
- A1 | (g) For use with break tank supply only.

4.3 MATERIALS

4.3.1 Copper

The following applies:

- (a) *Wrought products* Wrought products shall comply with AS 2738.
- (b) *Tubular components* Copper tube shall comply with AS 1432.

4.3.2 Copper alloy

The following applies:

- (a) *Castings* Castings shall comply with AS 1565.
- (b) *Hot pressings* Hot pressings shall comply with AS/NZS 1568.
- (c) *Rod for machined parts* Rod shall comply with AS/NZS 1567.
- (d) *Tubular components* Copper alloy tube shall comply with AS 1572 alloy designation 259.

NOTE: Where bent or stamped in the fabrication process, the tube should have been sufficiently stress-relieved so that it is capable of passing the mercurous nitrate test specified in AS 2136 after all fabrication processes are complete. For the purpose of this test, the entire tube component should have been tested before any coating or plating operation.

4.3.3 Stainless steel

Stainless steel shall be Type 304, 316, or 321 complying with ASTM A240M.

4.3.4 Plastics

Cisterns and cistern components of plastics materials shall be fit for purpose and shall not fail when tested to the performance test requirements of this Standard. Acetal plastics shall be copolymer.