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Sanitary plumbing products

Part 1: Water closet pans



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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[®]

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Sanitary plumbing products

Part 1: Water closet pans

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WS-003, Sanitary Plumbing Fittings, to supersede AS 1172.1—2005, *Water closets, Part 1: Pans*.

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 provide manufacturers, importers, suppliers and users with requirements for pans for water closets.

Changes to the 2005 edition include—

- (a) recognition of flushing devices other than cisterns;
- (b) improved specification of test tolerances, apparatus and procedures; and
- (c) amended procedures to meet the requirements of the Water Efficiency Labelling Standards (WELS) scheme for greater consistency of test results across recognized testing laboratories.

This Standard covers water closet pans of all types suitable for reduced-flush matched performance sets (for example 6/3L) and other nominated combinations intended for use with flushing devices complying with AS 1172.2, *Sanitary plumbing products, Part 2: Flushing devices and cistern inlet and outlet valves*.

Committee WS-003 intends to work with industry to review research findings on new reduced flushing technologies and sewer dosing systems and their potential inclusion in a future revision of the AS 1172 suite of Standards.

The Committee's decision to use the white pages of the Australian telephone directory was to ensure the consistency of paper media properties in order to improve replication of the test media.

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STANDARDS AUSTRALIA

Australian Standard

Sanitary plumbing products

Part 1: Water closet pans

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the requirements for pans intended for use with flushing cisterns and other flushing devices complying with AS 1172.2.

1.2 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

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

A1	AS	
	1172	Sanitary plumbing products
	1172.2	Part 2: Flushing devices and cistern inlet and outlet valves
	1976	Vitreous china for use in sanitary appliances
	AS/NZS	
	3500	Plumbing and drainage
	3500.0	Part 0: Glossary of terms
	3500.1	Part 1: Water services
A1	3500.2	Part 2: Sanitary plumbing and drainage
	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

1.3 DEFINITIONS

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

1.3.1 Combinations

A pan and matching flushing device which, when tested together, comply with the test performance requirements of this Standard and AS 1172.2.

1.3.2 Component

That part, or a subassembly of parts, that contributes to the construction of a total assembly, by choice or design, and offers 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 assembly.

1.3.3 Matching stub-pan connector

An adaptor for use with one or more matched pans and connected directly to the integral spigot end of the pan, so that it can be used in S-trap, P-trap or side outlet situation

1.3.4 Proven equivalent performance

Evidence demonstrating equivalent water usage, satisfactory functional performance and satisfactory transportation of resulting wastes in both private and reticulation sewers as required by authorities.

NOTES:

- 1 An example would be a trial (monitored by an Australian or New Zealand water authority for more than 6 months) of not less than 20 domestic household installations, which is conducted for flushing volumes of less than those specified in Section 2 of AS 1172.2, to verify the satisfactory transportation of resulting wastes in both private and reticulation sewers.
- 2 The equivalent single flush water usage to 6/3 L dual-flush is 3.5 to 4.1 L.

1.3.5 Trailing water volume

The remaining full flush volume of water discharged from the pan after the last of four test pieces are expelled from the outlet spigot of the pan.

NOTE: The trailing volume is to ensure solids transportation within the sewer lines.

1.3.6 Pan with a rim

Pan with an inlet detail to direct water around the inside of a bowl with an inner rim encircling more than 50% of the inside rim.

NOTE: For a typical example of a pan with a rim, see Figure 3.1.

1.3.7 Pan without a rim

Pan with an inlet detail to direct water around the inside of a bowl with an inner rim encircling not more than 50% of the inside rim.

NOTE: For a typical example of a pan without a rim, see Figure 3.2.

1.4 DEMONSTRATION OF CONFORMITY TO THIS STANDARD

Conformity to this Standard shall be demonstrated in accordance with Appendix I.

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SECTION 2 DESIGN

2.1 WATER SEAL

Each pan shall have an integral trap providing a water seal depth of 45 mm minimum.

NOTE: A typical water seal is shown in Figure 2.1.

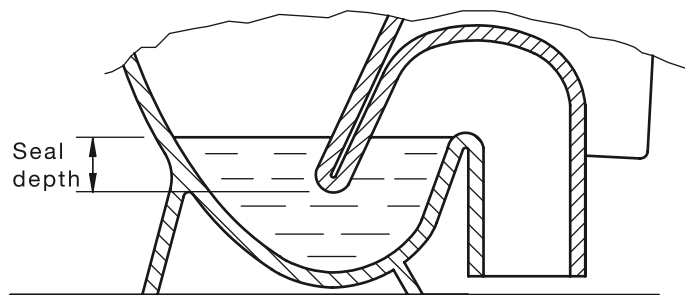


FIGURE 2.1 TYPICAL WATER SEAL

2.2 FIXING AND SUPPORT

2.2.1 Pedestal pan

Provision shall be made for the pan to be rigidly fixed to the floor.

2.2.2 Wall-hung pan

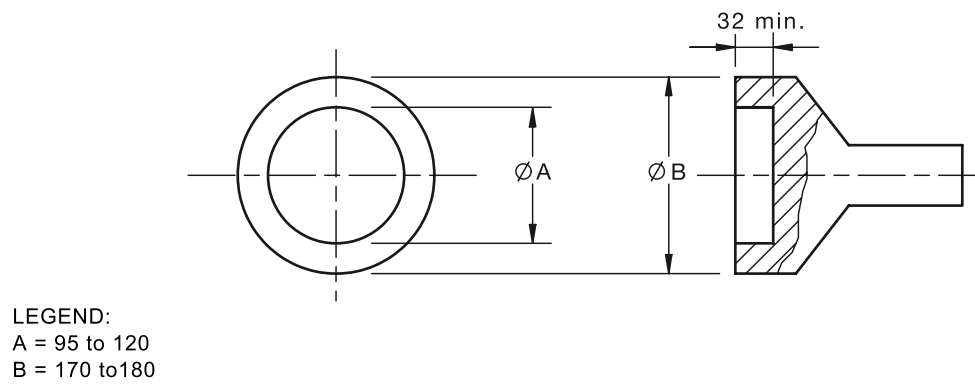
Each wall-hung pan shall be provided with an integral means of building into, or fixing to, a wall with brackets, or other separate means of support, and shall be capable of passing the load safety test specified in Clause 3.7. Brackets or other means of fixing shall be of corrosion-resistant materials.

2.2.3 Outlet connection ends

The outlet connection spigot end of matching horizontal stub-pan or adaptor connectors and WC pans shall have a diameter between 95 mm and 120 mm and shall be capable of providing a watertight seal.

Testing of the connection seal between the pan and horizontal stub-pan connector shall be carried out in accordance with the requirements of the leakage and capacity test of Clause 3.4.

The connection spigot end of the pan shall provide a clearance around the spigot to allow the standard pan connection jig, as shown in Figure 2.2 to be fitted to a minimum depth of 32 mm.



DIMENSIONS IN MILLIMETRES

FIGURE 2.2 STANDARD PAN CONNECTOR SPIGOT FIXTURE

SECTION 3 PERFORMANCE REQUIREMENTS

3.1 FULL FLUSH—PAPER DISCHARGE TEST

When tested in accordance with Appendix A, a pan shall discharge from the outlet spigot of the pan all of the paper in at least two of the three tests.

3.2 REDUCED FLUSH—PAPER DISCHARGE TEST

When tested in accordance with Appendix B, a pan shall discharge from the outlet spigot of the pan all of the paper in at least two out of the three tests.

3.3 SOLIDS DISCHARGE TEST

When tested in accordance with Appendix C, a pan shall discharge all four test pieces with a trailing water volume of not less than 2.5 L in at least 8 out of 10 tests.

If the pan does not pass in the initial 10 tests, the procedure may be repeated for a further 10 tests, provided the trailing water volume is not less than 2.5 L in at least 16 out of the total 20 tests.

3.4 LEAKAGE AND CAPACITY TEST

When tested in accordance with Appendix D, a pan shall not overflow or leak and the stub-pan connector or adaptor, if part of the matched suite, shall not leak.

3.5 SPLASH TEST

When tested in accordance with Appendix E, a pan shall not splash water onto the floor.

3.6 WETTING TEST

3.6.1 Pan with a rim

When tested in accordance with Appendix F, a pan with a rim shall wash the sawdust from all areas of the internal bowl more than 50 mm below the lower edge of the flushing rim. Isolated particles of sawdust below the defined level and above the water seal shall not be cause for rejection.

NOTE: For bowl washdown surface for a typical pan with a rim, see Figure 3.1.

3.6.2 For pan without a rim

When tested in accordance with Appendix F, a pan without a rim shall wash the sawdust from all areas of the internal bowl more than 85 mm below the top face of the pan. Isolated particles of sawdust below the defined level and above the water seal shall not be cause for rejection.

NOTE: For bowl washdown surface for a typical pan without a rim, see Figure 3.2.

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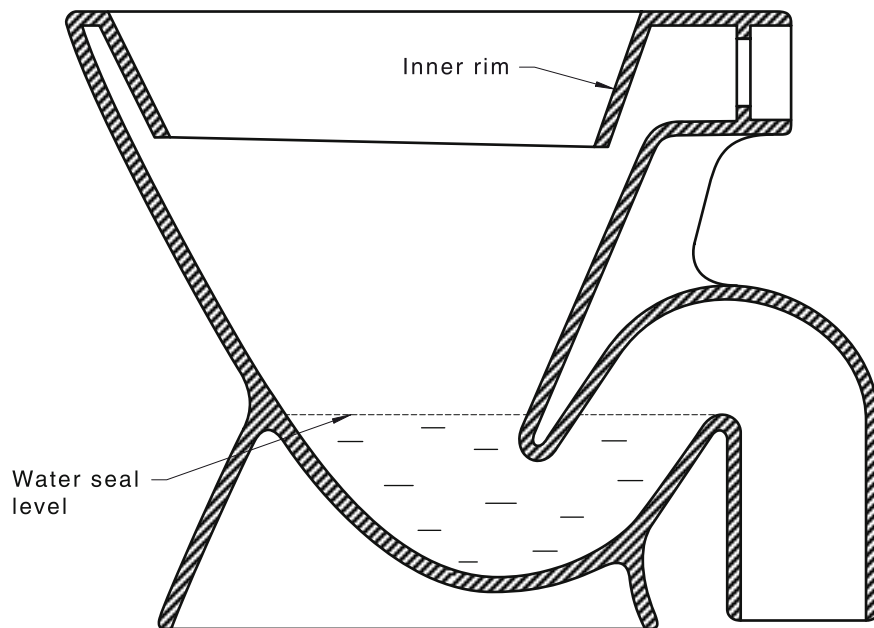


FIGURE 3.1 TYPICAL PAN WITH A RIM

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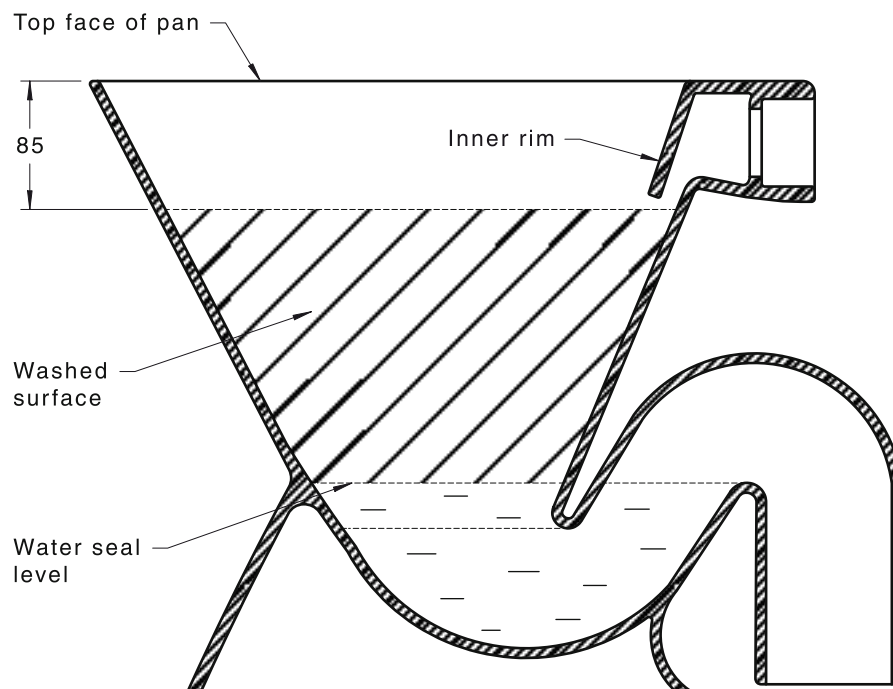


FIGURE 3.2 TYPICAL PAN WITHOUT A RIM

3.7 LOAD SAFETY TEST

When tested in accordance with Appendix G, a pan and support brackets, where applicable, shall be capable of supporting the load, and shall not crack, split or craze.

3.8 REDUCED-FLUSH LIQUID CONTAMINANT TEST

When tested in accordance with Appendix H, not more than 7% of dye shall be left in the sump after flushing.

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NOTE: 'Text deleted'

SECTION 4 MARKING, LABELLING AND INSTALLATION INSTRUCTIONS

4.1 MARKING

Each pan shall be permanently and legibly marked with the following information:

- (a) The manufacturer's name or trademark.
- (b) The nominal full-flush volume of the pan. The letter 'L' shall be included after the nominal full-flush volume, e.g. 6 L or 4.5 L.

Markings shall be located so that they are visible after installation. Markings may be located inside the cistern lid for pans and cisterns that are a close-coupled matched performance set.

4.2 LABELLING

Each pan shall be labelled or otherwise marked with the following:

- (a) Model identification.
- (b) Matching cisterns, where not close-coupled or flushing devices, as applicable.
- (c) WaterMark and licence number.
- (d) WELS label to AS/NZS 6400.

Any adhesive label shall be affixed to each pan in a visible location.

NOTE: 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.

4.3 INSTALLATION INSTRUCTIONS

Installation instructions (in English) shall be provided with the pan. The instructions shall be comprehensive, to enable the installation of the pan and conduct the tests specified in this Standard. The instructions shall incorporate the requirements of AS/NZS 3500.1 and AS/NZS 3500.2.

S E C T I O N 5 M A T E R I A L S

5.1 VITREOUS CHINA

5.1.1 General

Vitreous china shall comply with the requirements of AS 1976.

5.1.2 Glazed surfaces

Pans shall be glazed over the following surfaces:

- (a) The external surface, except for concealed portions abutting the floor and wall when installed.
- (b) The internal surfaces visible when installed and viewed within a viewing circle 1250 mm in diameter on a plane parallel to, and 600 mm above, the top level of the pan.

5.2 STAINLESS STEEL

5.2.1 General

Stainless steel shall be Grade 304, 321 or 316 stainless steel sheet complying with ASTM A240M.

5.2.2 Thickness

The thickness of stainless steel sheet for pans shall be not less than 1.2 mm.

5.2.3 Surface finish (internal and external)

Stainless steel shall be polished to a satin finish, as a minimum.

5.2.4 Construction

Where welding is employed, the welding materials shall be compatible with the material to be welded. Welds shall be free of cracks and pits, and shall be ground and polished internally and externally. Any joins shall be made so that their strength is not less than that of the parent material and shall be free from crevices and folds.

5.3 OTHER MATERIALS

Other materials may be acceptable, provided they are fit for purpose. Such materials shall have an absorbency rate not greater than 0.5% when tested in accordance with AS 1976.

APPENDIX A
PAPER DISCHARGE AT FULL-FLUSH TEST
(Normative)

A1 SCOPE

This Appendix sets out the method for determining the effective discharge of paper at full-flush operation.

A2 PRINCIPLE

The pan and flushing device are assembled for the full-flush paper discharge tests and flushed to determine the number of pieces of paper that are fully discharged from the pan outlet.

A3 APPARATUS

The following are required:

- (a) Matching cistern or flushing device complying with AS 1172.2.
- (b) A suitable support for the pan and cistern.
- (c) Paper crumpling device as specified in Figure A1.
- (d) Paper from the white pages of Australian telephone directory, measuring $140 \pm 5 \text{ mm} \times 115 \pm 5 \text{ mm}$ (see Figure A2).
- (e) A water supply.
- (f) A timing device with an accuracy of $\pm 0.5 \text{ s}$.

A4 PROCEDURE

The procedure shall be as follows:

- (a) Set up the pan, cistern or flushing device and flush pipe (if required) in accordance with the manufacturer's installation instructions and connect to water supply.
NOTE: If required, the trap bend on a pan can be reconfigured (e.g. a P-trap can be converted to an S-trap) with the use of a matching stub-pan connector as defined in Clause 1.3.3.
- (b) Flush the combination at least three times prior to commencement of the tests.
- (c) Set up the flushing device to discharge a full flush as follows:
 - (i) For cisterns, fill the cistern to the nominated working level and turn off the water supply.
 - (ii) For flushing devices such as flush valves or solenoid valves, ensure that all settings, including operating pressures, pipe sizes, flow rate/flush volume and timing mechanisms, are as specified by the product manufacturer.
- (d) Use the paper-crumpling device (Figures A3 to A8) as follows:
 - (i) Assemble the housing cylinder onto paper container with cylinder slide in closed position, as depicted in Figure A3.
 - (ii) Position paper in the slot and guide of the housing cylinder, as depicted in Figure A4.

- (iii) Locate folding fork into the housing cylinder with the slot of the fork directed over the paper, as depicted in Figure A5.
- (iv) Rotate knob of folding fork clockwise 180° to twist paper and withdraw the folding fork from the cylinder, as depicted in Figure A6.
- (v) Insert the plunger into the cylinder, withdraw head to end of cylinder then let the plunger fall freely to crumple paper at the bottom of the cylinder housing, as depicted in Figure A7.
- (vi) Open cylinder slide and use the plunger to push the crumpled paper into the paper container, as depicted in Figure A8. Repeat as required.

Ensure that the paper is fully crushed. Paper that is not effectively crushed (for example, because it had been caught between the inside surface of the crumpling device and the plunger) shall not be used for testing.

- (e) Disconnect the paper container and drop all six pieces of crumpled paper into the bowl at the same time.
- (f) For cisterns only, fill the cistern to the nominated working water level and then turn off the water supply. Within 10 +0, -1 s after the paper is dropped into the bowl, activate the flush mechanism with a single complete and positive action followed by a quick release.
- (g) Activate the flushing device within 10 +0, -1 s after the paper is dropped into the bowl.
- (h) Record the number of pieces of paper fully discharged from the outlet.
- (i) Repeat Steps (d) to (g) two more times (total of three tests).

A5 TEST REPORT

The following shall be reported:

- (a) Manufacturer, model, type and nominal flush capacity of pan.
- (b) Manufacturer, model, nominal flush volume and type of cistern or flushing device.
- (c) For flush valves only, the operation pressures, pipe sizes, flow rate/flush volume and timing mechanisms.
- (d) Type of water supply.
- (e) Number of pieces of paper fully discharged with each flush [see Paragraph A4 (d)].
- (f) Reference to this test method, i.e. Appendix A, AS 1172.1.