



**Summary of Substantive Changes
between the
2013 edition, including Update No. 1 dated October 2013 and the 2018 edition
of
ASME A112.19.2/CSA B45.1 “Ceramic plumbing fixtures”**

Presented to the IAPMO Standards Review Committee on August 13, 2018

General: The changes to this standard should not have an impact on currently listed products. The substantive changes are:

- Added definition for thin-wall lavatories (see Section 3).
- Added an exception to the 6 mm (0.25 in) minimum thickness requirement for ceramic material in plumbing fixtures to allow for thin walled lavatory edges (see Sections 4.1 and 4.8).
- Add new requirements for overflows in bathtubs (see Section 4.3.2).
- Revised the requirement for the specimen used in the crazing test (see Section 6.2).
- Added a requirement to limit the insertion depth of feeler gauge for the warpage test (see Section 6.4)
- Revised the load test for wall-mounted thin-wall lavatories to reduce the vertical load from 250 to 112 lb and added a new horizontal load test for thin-wall lavatories of 67 lb (see Section 6.7).
- Removed the mixed media test (see Section 7.7).
- Revised the content of the soybean paste cylinders and added a requirement to include the results of this test on the test report (section 7.9).
- Removed the requirement to mark non-standard fixtures with “N” (see Section 9).
- The dimensions for bathtubs were revised to remove the required width and correct the minimum overflow height measurement (see Figure 8).

Section 1, Scope: The scope was expanded to include bar sinks as follows:

1.2

This Standard covers the following plumbing fixtures:

- a) *bathtubs;*
 - b) *bidets;*
 - c) *drinking fountains;*
 - d) *fixtures for institutional applications;*
 - e) *lavatories;*
 - f) *shower bases;*
 - g) *sinks:*
 - i. *bar sinks;*
 - ii. *clinic sinks;*
 - iii. *kitchen sinks;*
 - iv. *laboratory sinks;*
 - v. *laundry sinks;*
 - vi. *service sinks; and*
 - vii. *utility sinks;*
- urinals; and
water closets.*



Section 2, Reference publications: The following standards updated as follows:

CSA Group

CAN/CSA-B181.1-~~1115~~ Acrylonitrile-butadiene-styrene (ABS) drain, waste, and vent pipe and pipe fittings
CAN/CSA-B181.2-~~1115~~ Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) drain, waste, and vent pipe and pipe fittings
B651-12 ([R2017](#)) Accessible design for the built environment
C22.2 No. 0.15-~~15~~ Adhesive labels

CSA Group/IAPMO (International Association of Plumbing and Mechanical Officials)

CSA B45.5-~~1117~~/IAPMO Z124.4-~~2011~~[2017](#)
Plastic plumbing fixtures

ASME International (American Society of Mechanical Engineers)

A112.6.1M-1997 ([R 2017](#)) Floor Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use
A112.6.2-~~2001~~[2017](#) Framing-Affixed Supports (Carriers) for Off-the-Floor Plumbing Fixtures
A112.19.12-~~2006~~[2014](#) Wall Mounted, Pedestal Mounted, Adjustable, Elevating, Tilting, and Pivoting Lavatory, Sink and Shampoo Bowl Carrier Systems and Drain Waste Systems
A112.19.14-~~2006~~[2013](#) Six-Liter Water Closets Equipped with a Dual Flushing Device
A112.19.19-~~2006~~[2016](#) Vitreous China Nonwater Urinals

ASME International (American Society of Mechanical Engineers)/CSA Group

ASME A112.18.2-~~2011~~[2015](#)/CSA B125.2-~~1115~~ Plumbing waste fittings
ASME A112.19.5-~~2011~~[2017](#)/CSA B45.15-~~1117~~ Flush valves and spuds for water closets, urinals, and tanks

ASSE (American Society of Sanitary Engineering)/ASME International (American Society of Mechanical Engineers)/CSA Group

ASSE 1002-~~1999~~[2015](#)/ASME A112.1002-2015/CSA B125.12-15 Anti-Siphon Fill Valves (~~Ballcocks~~) for Water Closet ~~Flush~~ Tanks
ASSE 1037-~~1986~~[2015](#)/ASME A112.1037-2015/CSA B125.37-15 Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures

ASTM International

D 3311-~~06a~~[17](#) Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns

ICC/ANSI (International Code Council/American National Standards Institute)

A117.1-~~2009~~[2017](#) Accessible and Usable Buildings and Facilities

UL (Underwriters Laboratories Inc.)

969-~~1995~~[17](#) Standard for Marking and Labeling Systems

Section 3, Definitions and abbreviations: Added a definition for thin-wall lavatory and revised the definition of high-efficiency water closet to include a description of effective flush volume as follows:

Lavatory — a washbowl or basin.

Thin-wall lavatory — a washbowl or basin having a wall thickness less than 6 mm (0.25 in.)



Water closet — a fixture with a water-containing receptor that receives liquid and solid body waste and on actuation conveys the waste through an exposed integral trap into a drainage system.

Dual-flush water closet —...

...

High-efficiency water closet (high-efficiency toilet) — either one of the following:

- a) a single-flush water closet with an average water consumption of 4.8 Lpf (1.28 gpf) or less when tested in accordance with this Standard; or
- b) **Note:** a dual-flush water closet with ~~a maximum average water consumption of 4.8 Lpf (1.28 gpf)~~ an effective flush volume defined as the composite, average flush volume of two reduced flushes and one full flush when tested in accordance with this Standard and ASME A112.19.14 ~~are also considered high-efficiency water closets.~~

Section 4.1, Dimensions and tolerances: Added an exception to the 6 mm (0.25 in) minimum thickness to allow for thin walled lavatory edges as follows:

4.1.1 Thickness

The ceramic material in plumbing fixtures shall be at least 6 mm (0.25 in) thick throughout (exclusive of glaze), except as noted in Clause 4.8.1.4.

Section 4.3.2, Overflows: Language was revised to differentiate the overflow requirements for lavatories, sinks and bidets and add new requirements for overflows in bathtubs as follows:

4.3.2.1 Lavatories, sinks, and bidets

4.3.2.1 Provision and positioning 4.3.2.1.1

Overflows ~~in lavatories, sinks, and bidets~~ may be provided at the option of the manufacturer. When overflows are provided, the manner in which they are positioned shall be at the option of the manufacturer.

4.3.2.2 Cleaning 4.3.2.1.2

When provided, overflows in sinks intended for dishwashing and food preparation (e.g, kitchen and bar sinks) shall not be concealed and shall be accessible for disassembly and cleaning after installation.

4.3.2.1.3

Overflows shall comply with Clause 6.6.

4.3.2.2 Bathtubs

Overflows in bathtubs may be provided at the option of the manufacturer. When overflows are provided, their dimension, location, and position in relation to the waste outlet in the fixture shall be as shown in Figure 8.

Variations in location, geometry, diameter, and angle of orientation of the overflow opening shall be acceptable when factory-provided waste and overflow fittings are used.

Section 4.7, Additional requirements for urinals: Updated the requirements for spud dimensions, the reference to CSA B125.3 was removed as spuds are now covered in ASME A112.19.5/CSA B45.15.

4.7.3 Spuds

For urinals operated by flushometer valves, the standard nominal spud size shall be 1/2, 3/4, 1-1/4, or 1-1/2. Other spud dimensions shall be as specified in ~~CSA B125.3~~ or ASME A112.19.5/CSA B45.15.



Section 4.8 Additional requirements for lavatories, sinks, and bidets: Added an exception to the 6 mm (0.25 in) minimum thickness requirement in Section 4.1.1 to allow for thin walled lavatory edges as follows:

4.8.1 Opening and mounting surfaces for supply fittings

4.8.1.4

When the thickness along the exterior edge of a lavatory is less than 6 mm (0.25 in), the load tests in Clause 6.7.3 shall be performed. The thickness shall not be less than 3 mm (0.12 in) along any point at the edge and the thickness shall return to a minimum of 6 mm (0.25 in) within a distance of 75 mm (3 in) from the nearby edge.

Section 5, Flushing devices used with fixtures: Updated the references to recognize the current editions of the harmonized standards as follows:

5.2.1 General

Gravity flush tanks for water closets and urinals shall include an anti-siphon fill valve complying with CSA B125.3 or ~~ANSI/ASSE 1002~~/ASME A112.1002/CSA B125.12 and a flush valve complying with CSA B125.3 or ASME A112.19.5/CSA B45.15. Gravity flush tanks shall have provisions for overflow.

5.3 Pressurized flushing devices

5.3.1 General

Pressurized flushing devices shall comply with CSA B125.3 or ASSE 1037/ASME A112.1037/CSA B125.37. The critical level of the lowest anti-siphon device in a flushometer-valve-activated water closet shall be at least 25 mm (1.0 in) above the flood level of the water closet bowl rim.

Section 6.2, Cracking test: Removed the requirement to use “a fragment of a fixture” as follows:

6.2.1 Test specimen

The test specimen shall be a ~~fragment of a fixture with a~~ glazed surface of approximately 3200 mm² (5.0 in²) and not more than 16 mm (0.63 in) thick.

Section 6.4, Warpage test: Added a requirement to limit the insertion depth of feeler gauge for the warpage test as follows:

6.4.1 Procedure

The specimen shall be placed on a flat and level surface to ascertain the amount of deviation from the horizontal plane at its edges.

A feeler gauge of a thickness equal to the total warpage allowed in Table 1 or 2, as applicable, shall not slide under the specimen unless forced.

If the specimen rocks on two opposite corners, the horizontal plane shall be determined by ~~placing one~~ inserting a feeler gauge, as thick as the total warpage allowed, under a corner that does not touch the flat and level surface ~~and then~~. The feeler gauge shall be inserted not more than 1.6 mm (0.063 in).

Forcing the specimen down on this gauge, ~~a~~ A second feeler gauge of the same thickness shall not slide under the specimen at any other point.



Section 6.6, Overflow test (lavatories, sinks, and bidets): Revised the section title to clarify that this test applies to lavatories, sinks and bidets as follows:

6.6 Overflow test (lavatories, sinks, and bidets)

Section 6.7, Structural integrity tests for all wall-mounted plumbing fixtures and thin-wall lavatories: Added thin-wall lavatories to the structural integrity tests, and revised the load test to reduce the vertical load applied to thin-wall lavatories from 250 to 112 lb and added a new horizontal load test for thin-wall lavatories of 67 lb as follows:

6.7 Structural integrity tests for all wall-mounted plumbing fixtures and thin-wall lavatories

6.7.1 All wall-mounted fixtures and thin-wall lavatories

6.7.3 Wall-mounted and thin-wall lavatories

6.7.3.1 Wall-mounted lavatories

A vertical load of 1.1 kN (250 lbf) shall be applied on the top surface on the front of the lavatory rim using a 76 mm (3 in) diameter load-distribution disk resting on a 13 mm (0.5 in) thick sponge rubber or equivalent pad.

6.7.3.2 Thin-wall lavatories

The load tests shall be conducted using a 76 mm (3 in) diameter load distribution disk resting on a 13 mm (0.5 in) thick sponge rubber or equivalent pad, as follows:

A vertical load of 500 N (112 lbf) shall be applied along the centre of the top surface of the lavatory rim. A horizontal load of 300 N (67 lbf) shall be applied along the top front edge of the lavatory rim against the lavatory.

Section 7.1.2, Gravity flush tank water closets: Clarified that the tests in section 7.12 and 7.13 apply to high- efficiency gravity tank toilets only as follows:

7.1.2 Gravity flush tank water closets

At each test pressure specified in Table 5 for gravity flush tank water closet tests, the water level in the tank and the fill time shall be adjusted in accordance with the manufacturer's instructions and specifications. Water closets that require higher minimum supply pressures shall be adjusted in accordance with the manufacturer's instructions. In the absence of manufacturer instructions and specifications, the fill valve shall remain set as received from the manufacturer.

Adjustments to the components inside the tank shall not be made once the water level and fill time adjustments have been made for the water consumption test pressure of 140 kPa (20 psi).

All remaining tests shall be performed at a pressure of 140 kPa (20 psi) (or the higher minimum operating pressure specified by the manufacturer).

The test methods and performance requirements specified in Clauses 7.12 and 7.13 shall apply to high-efficiency gravity tank toilets only.



Section 7.3, Water consumption test:

~~7.4.5~~ **7.3.5 Performance**

The average of the total flush volumes obtained in Clause ~~7.4.3 e~~ 7.3.3 e) over the range of pressures specified in Table 5 shall not exceed

- a) 4.8 Lpf (1.28 gpf) for single-flush high-efficiency water closets;
- b) 6.0 Lpf (1.6 gpf) for the full flush volume mode of dual-flush high-efficiency water closets; and
- c) 6.0 Lpf (1.6 gpf) for low-consumption water closets.

Section 7.4, Trap seal restoration test: The trap seal restoration test was moved from former section 7.3 to new section 7.4, effectively moving it from before to after the water consumption test as follows:

7.2 Trap seal depth determination test

~~7.3 Trap seal restoration test~~

~~7.4 Water consumption test~~

7.3 Water consumption test

7.4 Trap seal restoration test

7.5 Granule and ball test

Section 7.5, Granule and ball test: Revised the allowable tolerances for the HDPE granules as follows:

7.5.1 Test media

The test media shall consist of the following:

- a) approximately 2500 cylindrical high-density polyethylene (HDPE) granules with the following characteristics:
 - i) weight: 65 ± 1 g (2.3 ± 0.04 oz);
 - ii) diameter: ~~4.2 ± 0.4 mm (0.16 ± 0.02 in)~~ approximately 4.0 mm (0.16 in);
 - iii) thickness: ~~2.7 ± 0.3 mm (0.11 ± 0.01 in)~~ approximately 2.6 mm (0.10 in); and
 - iv) density: 951 ± 10 kg/m³ (59.4 ± 0.6 lb/ft³); and
- b) 100 nylon balls with the following characteristics:
 - i) weight: 15.5 ± 0.5 g (0.545 ± 0.015 oz);
 - ii) diameter: 6.35 ± 0.25 mm (0.25 ± 0.01 in); and
 - iii) density: of 1170 ± 20 kg/m³ (73 ± 1 lb/ft³).

Section 7.6, Surface wash test: Removed the requirement to scrub the flushing surface as follows:

7.6.2 Procedure

The flushing surface of the test bowl shall be flushed clean with a mild liquid dishwashing detergent. The test shall be conducted as follows:

~~(a) Scrub the flushing surface of the test bowl clean with a mild liquid dishwashing detergent.~~

~~(b)~~ Rinse and dry the flushing surface.

~~(c)~~ Draw a continuous horizontal ink line around the circumference of the flushing surface, approximately 25 mm (1.0 in) below the rim jets, with the marker specified in Clause 7.6.1.

~~(d)~~ Trip the actuator, hold for a maximum of 1 s, and release.

~~(e)~~ Observe the line during and after the flush.

~~(f)~~ When the flush cycle is complete, measure and record the length and position of any ink line segments remaining on the flushing surface.

Items a) to ~~f~~ complete one test run. These steps shall be repeated until three sets of data are obtained.



Section 7.7, Mixed Media Test: Removed the mixed media test as follows:

~~7.7 Mixed media test~~

~~7.7.1 Test media~~

~~The test media shall consist of~~

- ~~(a) white synthetic open-cell polyurethane sponges measuring $20 \times 20 \pm 3 \times 28 \pm 3$ mm ($0.8 \times 0.8 \pm 0.12 \times 1.1 \pm 0.12$ in) and with a density of 17.5 ± 1.7 kg/m³ (1.1 ± 0.1 lb/ft³) when new and dry; and~~
- ~~(b) 15-lb Kraft anti-tarnish paper measuring $190 \pm 6 \times 150 \pm 6$ mm ($7.5 \pm 0.25 \times 6 \pm 0.25$ in), with 486 sheets to the ream.~~

~~7.7.2 Procedure~~

~~The mixed media test shall be conducted as follows:~~

- ~~(a) Condition 20 new sponges by soaking them in water for at least 10 min.~~
 - ~~(b) Place the 20 sponges in the test bowl and squeeze them under water to remove air and to saturate them.~~
 - ~~(c) Ensure that the test bowl has a full trap seal depth.~~
 - ~~(d) Crinkle a sheet of Kraft paper to form a ball approximately 25 mm (1.0 in) in diameter.~~
 - ~~(e) Repeat Item (d) to form eight paper balls for each test run.~~
 - ~~(f) Before each test run, hold each of the eight paper balls under water in a separate container until saturated.~~
 - ~~(g) One by one, place the eight saturated paper balls into the bowl so that they are distributed evenly among the sponges.~~
 - ~~(h) Trip the actuator, hold for a maximum of 1 s, and release.~~
 - ~~(i) After the flush cycle is completed, record the number of sponges and paper balls discharged (flushed out) from the water closet.~~
 - ~~(j) Repeat Item (h) to remove any remaining sponges and paper balls.~~
- ~~Items (b) to (j) complete one test run. These steps shall be repeated until four sets of data are obtained. The least favourable result shall be discarded and the three remaining results averaged. New sponges shall be used after four test runs.~~

~~7.7.3 Report~~

~~The number of sponges and paper balls flushed out from the water closet in each of the four test flushes shall be reported in a format similar to that of Figure A.4.~~

~~7.7.4 Performance~~

~~Twenty-two mixed media (sponges and paper balls), averaged in accordance with Clause 7.7.2, shall be flushed out of the water closet on the initial flush. The remaining media, if any, shall be flushed out on the second flush.~~

~~Notes:~~

- ~~(1) A suggested supplier of sponges is FoamWorks Inc., P.O. Box 5208, Cleveland, Tennessee 37320, USA (tel. 423-559-0509).~~
- ~~(2) A suggested supplier of Kraft paper is R.P. Andrews Paper Products, P.O. Box 60061, Northampton, Massachusetts 01062, USA (tel. 413-586-6442).~~

Section 7.9, Waste extraction test: Revised the content of the soybean paste cylinders and added a requirement to include the results of this test on the test report as follows:

~~7.10~~ **7.9 Waste extraction test**

~~7.10.2~~ **7.9.2 Test Media**

7.9.2.2 Soybean paste cylinders



7.9.2.2.1

The seven soybean paste cylinders shall have

(a) a nominal content of ~~35.5%~~ 34.9% water, ~~33.8%~~ 33.1% soybean, 18.5% rice, 12.2% salt, and 1.6% ethyl alcohol by weight;

Note: Total percentages exceed 100% due to rounding.

(b) a density of 1.15 ± 0.10 g/mL (i.e., density greater than that of water);

(c) a mass of 50 ± 4 g per ~~test specimen forming a~~ cylinder;

(d) a length of 100 ± 13 mm (4 ± 0.5 in);

(e) a diameter of 25 ± 6 mm (1 ± 0.25 in); and

(f) a combined mass of 350 ± 10 g.

Note: A suggested supplier of soybean paste is ~~Veritec Consulting Inc., 1495 Bonhill Road, #12, Mississauga, Ontario L5T 1M2, Phone: 905-696-9391.~~ Gauley Associates Ltd., 1 Davidson Drive, Acton, ON L7J 0A4, Canada. Tel: 519-853-4057.

7.9.4 Performance and report

The specimen shall be deemed to have failed the test if any test media remains in the bowl or trap in more than one test run, or if a trap seal of at least 50 mm (2 in) is not restored in more than one test run.

The test report shall indicate if all test media was flushed out on at least four of the five test runs and whether or not the trap seal was restored.

Section 9, Markings, packaging, and installation instructions and other literature: Removed the requirement to mark non-standard fixtures with "N" as follows:

9.2 Non-standard fixtures

~~9.2.2~~

~~Fixtures that do not comply with one or more of the dimensional requirements of this Standard shall be marked with an "N" to indicate the non-standard nature of the fixture.~~

~~Note: This Clause is not intended to apply to fixtures that comply with none of the dimensional requirements of this Standard.~~

9.3.2 Water consumption

Water closets and urinals shall be marked to identify their average water consumption, expressed in litres and gallons per flush, as follows:

- a) 1.9 Lpf (0.5 gpf) or the actual tested water consumption, if lower, for high-efficiency urinals;
- b) 3.8 Lpf (1.0 gpf) or the actual tested water consumption, if lower, for low-consumption urinals;
- c) 4.8 Lpf (1.28 gpf) or the actual tested water consumption, if lower, for high-efficiency water closets;
- d) 6.0 Lpf (1.6 gpf) or the actual tested water consumption, if lower, for low-consumption water closets; and
- e) Flushometer bowls, urinals, and bowls for close-coupled toilets shall be marked accordingly as indicated in Items (a) to (d). When also tested to be used with tanks or valves with lower consumption levels, the option of including ~~the words "or less"~~, a dual consumption marking or a consumption range may be used.

The litre or gallon value may be stated first, at the manufacturer's option.



9.3.4 Water closet tank repair parts

Water closet tanks shall have a ~~label~~ mark in accordance with Clauses 9.1.2 and 9.1.3 indicating at least the following:

- (a) the telephone number of a service department from which end-users can obtain replacement parts;
- (b) the serial or part number of the flush valve seal; and
- (c) information on procuring replacement parts for maintaining the original flush volume.

Table 5, Static test pressures for water closets, kPa (psi): The table was updated to reflect changes in the standard and corrected to represent the testing requirements specified in the body of the standard.

Figure 8, Dimensions for bathtubs: Revised to remove the bathtub width dimensions (side view section B-B) and corrected the location to take the measurement for the minimum overflow height of 10 in, measured from the top of the inside surface of the bathtub versus the top of the integral drain surface.