



**WaterSense® Draft Specification for Flushometer-Valve
Water Closets**

Version 1.0

December 18, 2014



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1.0 Scope and Objective

This specification establishes the criteria for a high-efficiency flushometer-valve water closet under the U.S. Environmental Protection Agency's (EPA's) WaterSense program. It is applicable to:

- Water closet fixtures that receive liquid and solid waste and use water from a flushometer valve to convey the waste through a trap seal into a gravity drainage system.
- Single-flush flushometer valves that deliver water to water closet fixtures.
- Dual-flush flushometer valves that deliver water to water closet fixtures.
- Any other flushometer-valve-type technologies that meet these performance specifications.

The specification is designed to ensure both sustainable, efficient water use and a high level of user satisfaction with flushing performance.

2.0 Water Efficiency Criteria

2.1 Water consumption shall be tested in accordance with the following ANSI standards as applicable: *ASME A112.19.2/CSA B45.1 Ceramic Plumbing Fixtures*, *ASME A112.19.3/CSA B45.4 Stainless Steel Plumbing Fixtures*, or *IAPMO/ANSI Z124.4 Plastic Plumbing Fixtures*.¹

2.1.1 The manufacturer shall specify a rated flush volume of the flushometer valve or water closet fixture, which must be equal to or less than 1.28 gallons per flush (gpf) (4.8 liters per flush [Lpf]).

2.1.2 The water consumption, determined through testing and when evaluated in accordance with the sampling plan contained in the Code of Federal Regulations (CFR) at 10 CFR 429.30, shall not exceed the rated flush volume specified in Section 2.1.1.

2.1.3 For flushometer valves with dual-flush capabilities, these water efficiency requirements shall apply to the full-flush mode.

3.0 General Water Closet Fixture Requirements

3.1 Except as otherwise indicated in this specification, ceramic water closet fixtures must conform to applicable requirements in *ASME A112.19.2/CSA B45.1* when tested with representative flushometer valves from three different flushometer

¹ References to these and other standards apply to the most current version of those standards.

valve manufacturers that have the same rated flush volume and that meet the requirements of Sections 2.0, 4.0, and 5.0.

- 3.2 Except as otherwise indicated in this specification, stainless steel water closet fixtures must conform to applicable requirements in *ASME A112.19.3/CSA B45.4* when tested with representative flushometer valves from three different flushometer valve manufacturers that have the same rated flush volume and meet the requirements of Sections 2.0, 4.0, and 5.0.
- 3.3 Except as otherwise indicated in this specification, plastic water closet fixtures must conform to applicable requirements in *IAPMO/ANSI Z124.4* when tested with representative flushometer valves from three different flushometer valve manufacturers that have the same rated flush volume and that meet the requirements of Sections 2.0, 4.0, and 5.0.
- 3.4 For water closet fixtures marked with a dual-consumption or consumption range marking, as indicated in Section 6.1, the water closet fixture must also conform to applicable requirements in *ASME A112.19.2/CSA B45.1* and the flush performance criteria identified in Section 5.0 of this specification when tested at the lowest flush volume marked on the water closet fixture. The water closet fixture shall be tested with representative flushometer valves from three different flushometer valve manufacturers.

4.0 General Flushometer Valve Requirements

- 4.1 Except as otherwise indicated in this specification, flushometer valves must conform to *ASSE 1037/ASME 112.1037/CSA B125.37*. [Note: WaterSense intends to require flushometer valves to conform to *ASSE 1037/ASME 112.1037/CSA B125.37* upon the standard's release.]
- 4.2 The flushometer valve must not exceed the rated flush volume of water specified in Section 2.1.1 even if the primary actuator is maintained in the flush position (i.e., device's primary actuator must be a non-hold-open design).
- 4.3 The flushometer valve must not contain a flush volume adjustment that allows the flush volume to vary more than 10 percent from the flushometer valve's rated flush volume specified in Section 2.1.1 (e.g., ± 0.13 gpf [.48 Lpf] for a 1.28-gpf flushometer valve).²
- 4.4 The manufacturer must attest that the flushometer valve is designed such that replaceable or maintainable parts (e.g., pistons, diaphragms) are not intended to be interchangeable with parts that would cause the device to exceed the rated flush volume specified in Section 2.1.1.

² A control stop that supplies water to a flushometer valve is not considered a flush volume adjustment.

5.0 Flush Performance Criteria

- 5.1 Individual flushometer-valve samples with average water consumptions greater than their rated flush volume shall be adjusted, if possible, to their rated flush volume prior to performance testing.
- 5.2 Individual flushometer-valve samples with average water consumptions less than their rated flush volume shall be performance tested at the measured volume and this volume shall be recorded on the test report.
- 5.3 Flush performance testing for flushometer valves and water closet fixtures shall be conducted in accordance with the waste extraction test protocol provided in Section 7.10 of *ASME A112.19.2/CSA B45.1* and the additional test media and procedural steps for the waste extraction test protocol provided in Sections 5.3.1, 5.3.2, and 5.3.3 below.
 - 5.3.1 Test media used during the waste extraction test shall include one unwaxed paper water closet seat cover. The seat cover must have a width of 14.0 ± 1.0 inches (356 ± 25 mm) and a length of 16.5 ± 1.0 inches (419 ± 25 mm). The seat cover shall be included in the test media specified in Section 7.10.2 of *ASME A112.19.2/CSA B45.1*.
 - 5.3.2 Following step “g” of the waste extraction test procedure in Section 7.10.3 of *ASME A112.19.2/CSA B45.1*, the following procedural step shall be applied.
 - 5.3.2.1 Immediately after adding crumpled toilet paper, freely drop one unfolded, unwaxed water closet seat cover onto the fixture water surface such that the center of the seat cover is approximately at the center of the water surface.
 - 5.3.3 After completion of the procedural step identified in Section 5.3.2.1 of this specification, the test protocol shall continue with step “h” of the waste extraction test procedure in Section 7.10.3 of *ASME A112.19.2/CSA B45.1*.
- 5.4 For flushometer valves with dual-flush capabilities, the following flush performance criteria shall apply:
 - 5.4.1 For the full-flush mode, the flush performance testing shall be conducted in accordance with Section 5.3.
 - 5.4.2 For the reduced-flush mode, flush performance testing shall be conducted in accordance with Section 3.2.4 of *ASME A112.19.14*. Testing shall also include additional test media and revised procedural steps for the toilet paper test protocol specified in Section 3.2.4 of *ASME A112.19.14*, as provided in Sections 5.4.2.1, 5.4.2.2, and 5.4.2.3 below.

5.4.2.1 Test media used during the toilet paper test shall also include one unwaxed paper water closet seat cover. The seat cover must have a width of 14.0 ± 1.0 inches (356 ± 25 mm) and a length of 16.5 ± 1.0 inches (419 ± 25 mm).

5.4.2.2 Section 3.2.4.2 of *ASME A112.19.14* shall be modified as follows:

“The four 2.0 to 3.0 inch (51 mm to 76 mm) balls of paper that comply with paragraphs 3.2.4.1.1 and 3.2.4.1.2 shall be dropped into the water directly above the well and shall be allowed to wet out completely. Immediately after adding the balls of paper, freely drop one unfolded, unwaxed water closet seat cover onto the fixture water surface such that the center of the seat cover is approximately at the center of the water surface. Within five seconds of adding the seat cover, the bowl shall be flushed. This procedure shall be repeated until three sets of data are obtained. Note whether any paper or seat cover are left in the bowl. Flush again and collect any paper or seat cover that discharges from the outlet.”

5.4.2.3 Section 3.2.4.3 of *ASME A112.19.14* shall be modified as follows:

“No paper or seat cover shall remain in the well after each initial flush.”

6.0 Product Marking

6.1 Water closet fixtures shall be marked in accordance with requirements in *ASME A112.19.2/CSA B45.1* with the exception identified in Section 6.1.1 below.

6.1.1 Water closet fixtures intended to be used with flushometer valves of varying consumption levels (e.g., 1.6 and 1.28 gpf) shall be marked with a dual-consumption or consumption range marking as indicated in *ASME A112.19.2/CSA B45.1*. The rated flush volume specified in Section 2.1.1 shall be included within this dual-consumption or consumption range marking. Water closet fixtures shall not be marked with the words “or less” to indicate compatibility with flushometer valves of varying consumption levels.

6.2 Flushometer valves shall be marked in accordance with requirements in *ASSE 1037/ASME A112.1037/CSA B125.37*. [Note: : WaterSense intends to require flushometer valves to conform to *ASSE 1037/ASME 112.1037/CSA B125.37* upon the standard's release.] Additional marking requirements for flushometer valves are provided in Sections 6.2.1 and 6.2.2 below.



- 6.2.1 The flushometer valve must not be packaged, marked, nor provided with instructions directing the user to an alternative flush volume setting that would override the rated flush volume specified in Section 2.1.1.
- 6.2.2 Product documentation shall be clearly marked with specific maintenance or replacement part instructions and identification of correct replacement parts that should be used to ensure that the device will not exceed its rated flush volume. Under no circumstances can manufacturers provide maintenance instructions or advertise the use of any replacement parts that would cause the flushometer valve to exceed its rated flush volume.

7.0 Effective Date

This specification is effective on [TBD].

8.0 Future Specification Revisions

EPA reserves the right to revise this specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. Revisions to the specification would be made following discussions with industry partners and other interested stakeholders.

9.0 Definitions

Definitions within *ASME A112.19.2/CSA B45.1*, *ASME A112.19.3/CSA B45.4*, *ASME A112.19.14*, *IAPMO/ANSI Z124.4*, and *ASSE 1037/ASME A112.1037/CSA B125.37* are included by reference.

ANSI: American National Standards Institute

ASME: American Society of Mechanical Engineers

ASSE: American Society of Sanitary Engineering

IAPMO: International Association of Plumbing and Mechanical Officials

Complete system: Any combination flushometer valve and water closet fixture that have both been certified for the same rated flush volume and when used together, meet the requirements of this specification for water efficiency and performance.

Rated flush volume: The maximum flush volume, as specified by the manufacturer, verified through testing and in compliance with this specification.

Appendix A: Informative Annex for WaterSense Labeling

The following requirements must be met for products to be marked with the WaterSense label.

1.0 WaterSense Partnership

The manufacturer³ of the product must have a signed partnership agreement in place with EPA. In accordance with this specification, the product can be considered as either a flushometer valve, water closet fixture, or the complete system.

2.0 Conformity Assessment

Conformance to this specification must be certified by an licensed certifying body accredited for this specification in accordance with the *WaterSense Product Certification System*.

3.0 Independent Labeling of Fixtures and Flushometer Valves

Certified water closet fixtures and flushometer valves can be labeled together as a complete system or separately as a fixture or flushometer valve. If labeled separately, the manufacturer of each part shall clearly indicate on product documentation that the part should be used with a WaterSense labeled counterpart that has a compatible flush volume in order to ensure that the complete system meets the requirements of this specification for water efficiency and performance.

4.0 WaterSense Label Use

Per the *WaterSense Program Mark Guidelines*, manufacturers must include the WaterSense label on product packaging for all products certified to meet this specification, unless the packaging is too small, and should display the WaterSense label in association with any labeled products listed on the organizations website.

³ Manufacturer, as defined in the *WaterSense Program Guidelines*, means: “Any organization that produces a product for market that might be eligible to meet WaterSense criteria for efficiency and performance. Manufacturers may also produce ‘private label’ products that are sold under the brand name of a separate organization, which is treated as a separate partner/application from the original product manufacturer.” In the case of private labeling, the private labeling organization that ultimately brands the product for sale must have a signed WaterSense partnership agreement in place with EPA.