ASME A112.4.2-2003

WATER CLOSET PERSONAL HYGIENE DEVICES

AN AMERICAN NATIONAL STANDARD

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This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda issued to this edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME Web site under the Committee Pages at http://www.asme.org/codes/ as they are issued.

The American Society of Mechanical Engineers
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FOREWORD

The ASME A112 Standards Committee organized Project Team 4.2 to develop an American National Standard for the evaluation of products covered under the scope of IAPMO PS 93-95, Water Closet Seats with Spray.

This Standard is written to give freedom to the manufacturer in design and technology to produce products, whether completely mechanical in nature or incorporating electronically controlled features, with good engineering practices for the protection of public health.

The Project Team met on May 27, 1998, in Hoboken, New Jersey to begin the work. This Standard is the culmination of those efforts.

Suggestions for improvement of this Standard will be welcome. They should be sent to The American Society of Mechanical Engineers; Attn: Secretary, A112 Standards Committee; Three Park Avenue; New York, NY 10016.

This Standard was approved as an American National Standard on April 17, 2003.

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Standardization of Plumbing Materials and Equipment

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Secretary, A112 Standards Committee
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Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the edition, the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation. When appropriate, proposals should be submitted using the A112 Project Initiation Request Form.

Interpretations. Upon request, the A112 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the A112 Standards Committee.

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
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Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The A112 Standards Committee schedules meetings as needed, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the A112 Standards Committee. The A112 home page contains information on future meeting dates and locations.

WATER CLOSET PERSONAL HYGIENE DEVICES

1 GENERAL

1.1 Scope

This Standard establishes general and performance requirements, test methods, and marking requirements for bidet sprays and other optional features as applied to water closets, water closet seats, and other retrofit devices. Products covered by this Standard are intended to be supplied with cold water only.

The provisions of this Standard are not intended to prevent the use of any alternate material or method of construction, provided any such alternate meets the intent of this Standard.

1.2 Units of Measurement

Values are stated in U.S. customary units and in the International System of Units (SI). The U.S. customary units shall be considered as the standard.

1.3 References

The following documents form a part of this Standard to the extent specified herein. The latest issue shall apply.

ANSI Z124.4, Plastic Water Closet Bowls and Tanks[1]

ANSI Z124.5, Plastic Toilet (Water Closet) Seats[1]

Publisher: The International Association of Plumbing and Mechanical Officials (IAPMO), 5001 East Philadelphia Street, Ontario, CA 91761

ASME A112.19.2M, Vitreous China Plumbing Fixtures[1]

Publisher: The American Society of Mechanical Engineers (ASME International), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

ASSE 1001, Performance Requirements for Atmospheric Type Vacuum Breakers[1]

Publisher: American Society of Sanitary Engineering (ASSE), 901 Canterbury, Suite A, Westlake, OH 44145

UL 1431, Standard for Personal Hygiene and Health Care Appliances

Publisher: Underwriters Laboratories Inc. (UL), 333 Pfingsten Road, Northbrook, IL 60062-2096

1.4 Definitions

bidet spray: a water washing feature intended for genital and perineal cleanliness.

concealed: the position of the featured device, when retracted, in order to prevent soiling by the user.

self-cleaning: in the case of bidet spray sprayers, sprayers whose exterior surface is flushed with flowing water at the end of each cycle shall be considered self-cleaning. The self-cleaning function shall occur automatically during the operating cycle or it shall be initiated manually by the user.

2 GENERAL REQUIREMENTS

2.1 Backflow Protection

Each unit that is intended for connection to the potable water supply shall be equipped with a backflow prevention device.

Vacuum breakers complying with para. 3.5.1 shall be installed in accordance with manufacturer's instructions, with the critical level located not less than 1 in. (25.4 mm) above the flood level fixture rim.

2.2 Electrical Components

Units with electrical components shall comply with UL 1431.

2.3 Vitreous China Water Closets

Vitreous china water closets shall comply with ASME A112.19.2M.

2.4 Plastic Water Closets

Plastic water closets shall comply with ANSI Z124.4.

2.5 Plastic Toilet Seats

Plastic toilet seats shall comply with ANSI Z124.5.

2.6 Sprayers

Sprayers shall be fully retractable, self-cleaning, and concealed when not in use.

2.7 Water Closets With Bidet Spray

When the sprayer is located in a concealed channel below the water closet flood level rim, the channel and sprayer shall be flushed with water during the operating cycle of the bidet spray. The sprayer shall not be subject to contamination in its retracted position. In its retracted position, the sprayer shall be completely removed from the vertical path of the liquid and solid waste.

[1] May also be obtained from American National Standards Institute, 23 West 43rd Street, New York, NY 10036.

When the water closet tank is used as a source of water for the sprayer, the water shall be isolated from the water used for flushing.

2.8 Seat Cover Dispensers

Seat cover dispensers shall be cycle tested in accordance with para. 3.5.2.

2.9 Temperature Safety Device

The unit shall be equipped with a safety device to shut off the unit when the water discharge temperature reaches 118°F (48°C).

3 TESTING

3.1 Methodology

All testing shall be conducted in the order listed.

3.2 Bidet Spray Pressure

3.2.1 Flowing Pressure

3.2.1.1 Test Method. The unit shall be connected to a water supply whose pressure shall be raised to a flowing pressure of 125 psi (862 kPa), measured at the inlet to the unit. Water shall be allowed to move freely through the unit for 5 min.

3.2.1.2 Performance Criterion. There shall be no signs of leakage from the unit. Flow from the unit shall be as intended by the manufacturer.

3.2.2 Static Pressure

3.2.2.1 Test Method. The unit shall be in the off position (fully closed) and the water pressure shall be raised to a static pressure of 250 psi (1 724 kPa). This pressure shall be maintained for 5 min.

3.2.2.2 Performance Criterion. The unit shall show no signs of leakage or structural damage.

3.3 Bidet Spray Temperature

3.3.1 Normal Operating Temperature

3.3.1.1 Test Method. At the maximum temperature setting, run the unit for 5 min. Set the water inlet pressure at 50 ± 5 psi (345 ± 34.5 kPa) flowing pressure. Set the water inlet temperature at 65 ± 5°F (18.5 ± 2.5°C). Measure the maximum temperature at the outlet.

3.3.1.2 Performance Criterion. The maximum outlet water temperature shall not exceed 110°F (43°C).

3.3.2 Maximum Shutoff Temperature for Safety Device

3.3.2.1 Test Method. Supply water to the unit at an initial temperature of 105°F +0/−10°F (40.5°C +0/−5.5°C). Set the water inlet pressure at 50 ± 5 psi (345 ± 34.5 kPa) flowing pressure. Activate the sprayer and slowly raise the water temperature to 118°F (48°C). Increase the water temperature no faster than an average of 1°F (0.5°C) every 5 sec. Repeat this test following the bidet spray cycle test.

3.3.2.2 Performance Criteria. Either the unit or the water flow shall shut off within 5 sec of the discharge temperature reaching 118°F (48°C). After shut off, water may continue to flow from the unit, so long as the flow stream falls down off of the sprayer such that it will not contact the user. In the event that water ceases to flow prior to reaching a temperature of 118°F (48°C), the device shall be considered to have complied with the requirement of this paragraph.

3.4 Bidet Spray Cycle Test

3.4.1 Test Method. The unit shall be tested 75,000 successive and continuous cycles. Set water inlet pressure at 50 ± 5 psi (345 ± 34.5 kPa) flowing pressure. The temperature of hot water flow in the unit shall be set at the maximum setting. Operate the sprayer 75,000 times. At each cycle, the retractable sprayer shall fully extend and then fully retract. For units with multiple sprayers, each sprayer shall complete 75,000 cycles.

3.4.2 Performance Criteria. At the end of the cycle test, the valve shall be able to control the water flow and the retractable sprayer shall still be functioning at operating pressure. In addition, there shall be no signs of leakage from the unit. Flow from the unit shall be as intended by the manufacturer.

3.5 Backflow Prevention Test

3.5.1 Atmospheric Vacuum Breaker

3.5.1.1 Test Method. The vacuum breaker shall be tested in accordance with para. 2.9 (water rise test) of ASSE 1001.

3.5.1.2 Performance Criterion. Water rise in the sight tube shall be no more than $\frac{1}{2}$ in. (12.7 mm).

3.5.2 Seat Cover Dispenser Test

3.5.2.1 Test Method. Operate the seat cover dispenser for 5,000 cycles. The seat cover shall be dispensed and released to complete one cycle.

3.5.2.2 Performance Criteria. Failure of the dispenser mechanism to dispense the seat cover in 100 or more of 5,000 cycles shall be cause for rejection of the device. In the case of continuous feed seat covers, the used seat cover material shall be rendered unusable.

3.6 Bidet Spray Self-Cleaning Test

3.6.1 Test Method. Operate the bidet spray enough cycles to be sure the system is purged of air and filled with water at normal operating pressure and temperature. Extend the sprayer and dry it thoroughly using paper towel or tissue.

Once it is completely dry, use a water soluble, contrasting colored marker to draw lines on the sprayer as follows. Draw three rings around the barrel, one in the upper third of the barrel's length, one in the middle third, and one in the lower third. Draw a fourth line longitudinally, along the top of the barrel from one end to the other.

After the lines have been drawn, release the sprayer and allow it to retract into its off position. Cycle the sprayer two times on and off. Leave the sprayer on for 5 sec and then off for 5 sec, and repeat one more time.

3.6.2 Performance Criteria. All of the four ink lines should be washed off of the sprayer. Any ink lines remaining on the sprayer shall be considered a failure.

4 MARKINGS AND IDENTIFICATION

(a) Each unit shall be permanently and legibly marked with the manufacturer's name or trademark.

(b) Each unit or its packaging shall be marked with the model number.

ASME STANDARDS RELATED TO PLUMBING

Air Gaps in Plumbing Systems . . . . . A112.1.2-1991(R2002)
Air Gap Fittings for Use With Plumbing Fixtures, Appliances, and Appurtenances A112.1.3-2000
Performance Standard and Installation Procedures for Stainless Steel Drainage Systems for Sanitary, Storm, and Chemical Applications, Above and Below Ground A112.3.1-1993
Macerating Toilet Systems and Related Components A112.3.4-2000
Water Heater Relief Valve Drain Tubes . . . . . A112.4.1-1993(R2002)
Water Closet Personal Hygiene Devices A112.4.2-2003
Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System A112.4.3-1999
Point of Use and Branch Water Submetering Systems A112.4.7-2002
Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use . . . . . A112.6.1M-1997(R2002)
Framing-Affixed Supports for Off-the-Floor Water Closets With Concealed Tanks A112.6.2-2000
Floor and Trench Drains A112.6.3-2001
Enameled and Epoxy Coated Cast Iron and PVC Plastic Sanitary Floor Sinks A112.6.7-2001
Backwater Valves . . . . . A112.14.1-1975(R1998)
Grease Interceptors A112.14.3-2000
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Plumbing Fixture Waste Fittings A112.18.2-2002
Performance Requirements for Backflow Protection Devices and Systems in Plumbing Fixture Fittings A112.18.3-2002
Flexible Water Connectors A112.18.6-1999
Deck-Mounted Bath/Shower Transfer Valves With Integral Backflow Protection A112.18.7-1999
Enameled Cast Iron Plumbing Fixtures . . . . . A112.19.1M-1994(R1999)
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Stainless Steel Plumbing Fixtures (Designed for Residential Use) A112.19.3-2000
Porcelain Enameled Formed Steel Plumbing Fixtures . . . . . A112.19.4M-1994(R1999)
Trim for Water-Closet Bowls, Tanks, and Urinals A112.19.5-1999
Hydraulic Performance Requirements for Water Closets and Urinals A112.19.6-1995
Whirlpool Bathtub Appliances A112.19.7M-1995
Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Appliances . . . A112.19.8M-1987(R1996)
Non-Vitreous Ceramic Plumbing Fixtures . . . . . A112.19.9M-1991(R2002)
Dual Flush Devices for Water Closets A112.19.10-2003
Wall Mounted and Pedestal Mounted, Adjustable and Pivoting Lavatory and Sink Carrier Systems A112.19.12-2000
Electrohydraulic Water Closets A112.19.13-2001
Six-Liter Water Closets Equipped With a Dual Flushing Device A112.19.14-2001
Bathtub/Whirlpool Bathtubs With Pressure Sealed Doors A112.19.15-2001
Manufactured Safety Vacuum Release Systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems A112.19.17-2002
Floor Drains . . . . . A112.21.1M-1991(R1998)
Roof Drains A112.21.2M-1983
Hydrants for Utility and Maintenance Use . . . . . A112.21.3M-1985(R2001)
Cleanouts . . . . . A112.36.2M-1991(R2002)

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