

ASME A112.18.8-2020

[Revision of ASME A112.18.8-2009 (R2014)]

Sanitary Waste Valves for Plumbing Drainage Systems

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AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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Two Park Avenue • New York, NY • 10016 USA

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FOREWORD

In 2004, the initial work on a standard for “self-sealing waterless waste valves” was undertaken by a Committee of the International Association of Plumbing and Mechanical Officials (IAPMO), in accordance with a request from a manufacturer. Their efforts resulted in their Interim Guide Criteria, IGC 203-2004, which was used as a benchmark for performance of such devices, which are now known as “sanitary waste valves.” IGC 203-2004 was submitted to the ASME Standards Committee A112, Plumbing Materials and Equipment, for conversion into an American National Standard. A112 Project Team 18.8 was established for the purpose of undertaking this task.

The purpose of this Standard is to establish a generally acceptable standard for sanitary waste valves for installation on tubing. Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, installers, inspectors, and users; to promote understanding regarding materials, manufacture, and installation; and to provide for identifying fittings for installation on valves complying with this Standard.

Sanitary waste valves are intended for use as an alternative to tubular p-traps. Sanitary waste valves provide a waterless barrier between the waste system and the fixture.

ASME A112.18.8-2009 (R2014) was up for reaffirmation in 2018 [letter ballot (LB) 18-3314] along with two other ASME standards, but it was disapproved (record 18-2614). A revised draft incorporating comments resulting from the initial ballot was subsequently disapproved.

The A112.18.8 Project Team met on October 23, 2019, and based on the comments received at this teleconference meeting, created a revised draft. The further-revised draft was issued for consideration (LB 19-459), resulting in several disapproval comments requiring resolution. Additional modifications were proposed to address these outstanding disapproval comments and suggestions. The revised draft was recirculated (LB 19-2160 RC1), and the resulting standard was approved by the A112 Committee on January 30, 2020.

This Standard has been strengthened and improved based on the various comments and inputs received. This edition includes the following revisions:

- (a) The term “In-Line” has been deleted from the title.
- (b) In [para 3.2](#), the test pressure limit has been increased from 2 in. water, gage, to 4 in. water, gage, and the time/duration interval has been increased from 10 sec to 20 sec. Additionally, the protocol now incorporates twice the actual testing of the valve.
- (c) The internal references to ANSI/ASSE 1051-2009 have been corrected and now reflect the appropriate test sections for minimum airflow.

This Standard was approved by the American National Standards Institute on June 8, 2020.

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The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

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If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the A112 Standards Committee at the above address. The request for an 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 in one or two words.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
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. Please provide a condensed and precise question, composed in such a way that a "yes" or "no" reply is acceptable.
Proposed Reply(ies):	Provide a proposed reply(ies) in the form of "Yes" or "No," with explanation as needed. If entering replies to more than one question, please number the questions and replies.
Background Information:	Provide the Committee with any background information that will assist the Committee in understanding the inquiry. 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 the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

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SANITARY WASTE VALVES FOR PLUMBING DRAINAGE SYSTEMS

1 GENERAL

1.1 Scope

This Standard establishes minimum requirements for materials in the construction of a sanitary waste valve (hereinafter referred to as “the valve”) for use as an alternate to a tubular p-trap. This Standard prescribes minimum test requirements for the performance of the valve together with methods of marking and identification. This Standard does not define the requirements for products to be used in urinals or water closets. It is not intended that products meeting this Standard will be used in a urinal or water closet.

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.

In this Standard, gallons (U.S. liquid) per minute is abbreviated gpm, and liters (metric liquid) per minute is abbreviated L/min.

1.3 References

The following documents form a part of this Standard to the extent specified herein. Unless otherwise specified, the latest edition shall apply.

ANSI/ASSE 1051-2009, Individual and Branch Type Air Admittance Valves for Plumbing Drainage Systems
 Publisher: American Society of Sanitary Engineering (ASSE), 901 Canterbury Road, Westlake, OH 44145
 (www.asse-plumbing.org)

ASME A112.18.2/CSA B125.2, Plumbing Waste Fittings
 ASME B1.20.1, Pipe Threads, General Purpose (Inch)
 Publisher: The American Society of Mechanical Engineers (ASME), Two Park Avenue, New York, NY 10016-5990
 (www.asme.org)

ASTM D2000, Standard Classification System for Rubber Products in Automotive Applications
 ASTM D2661, Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe Fittings
 ASTM D2665, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
 ASTM F409, Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings
 Publisher: American Society for Testing and Materials (ASTM International), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 (www.astm.org)

1.4 Definitions

bladder/checking member: the component of the sanitary waste valve that provides the sealing function.

sanitary waste valve: a product used as an alternate to a water-filled tubular waste trap that provides protection for the property from foul air in the sewer.

2 GENERAL REQUIREMENTS

2.1 Material

The valve shall meet the material requirements of ASTM F409. The valve shall be installed in an accessible location.

2.2 Seal Material

Seal materials shall comply with or exceed classification M3BA507 A14 B13 C12 F17 or M2BG714 B14 E014 E034 of ASTM D2000.

2.3 Bladder/Checking Member Material

Bladder/checking member material shall comply with or exceed classification M3FC607 EA14 E016 G11 of ASTM D2000.

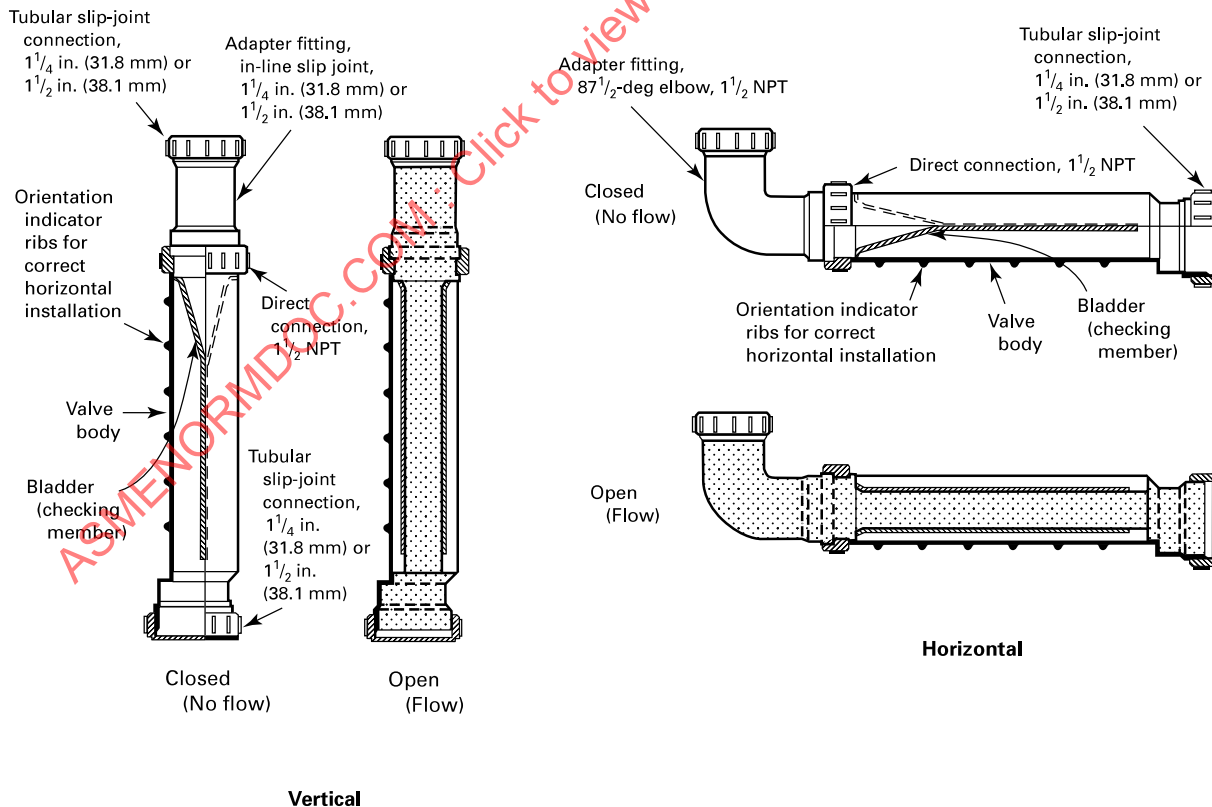
2.4 Valve Inlet

2.4.1 The valve inlets shall be $1\frac{1}{4}$ in. (31.8 mm) or $1\frac{1}{2}$ in. (38.1 mm) nominal straight or with an $87\frac{1}{2}$ -deg elbow or be standard pipe size straight inlets (see Figure 2.4.1-1).

2.4.2 The base of the thread may be sealed by a sealing washer (inlet set) at the base of the thread. The useful thread length shall be between $\frac{3}{8}$ in. (9.5 mm) and $\frac{1}{2}$ in. (12.7 mm). All threaded fixture outlets shall have a minimum three-thread engagement for fittings and plastic nuts to correctly engage and energize the inlet seal in accordance with ASTM F409.

2.4.3 If required for horizontal installations, an $87\frac{1}{2}$ -deg knuckle adapter shall be available to allow the valve to be connected in a horizontal position. When installed in a horizontal position, the device and connected piping shall have a minimum slope of 1:48 [i.e., $\frac{1}{4}$ in./ft (21 mm/m)].

Figure 2.4.1-1 Typical Cross Section



GENERAL NOTE: The above images are for illustrative purposes only.

2.4.4 If required, a straight-running adapter shall be available to allow the valve to be connected to the pipe rather than the fixture outlet.

2.5 Valve Outlet

The valve outlet shall have a connection that is compatible with tubing or pipe complying with ASTM F409, ASTM D2661, or ASTM D2665 or threaded connections complying with ASME A112.18.2/CSA B125.2.

2.6 Threaded Connections

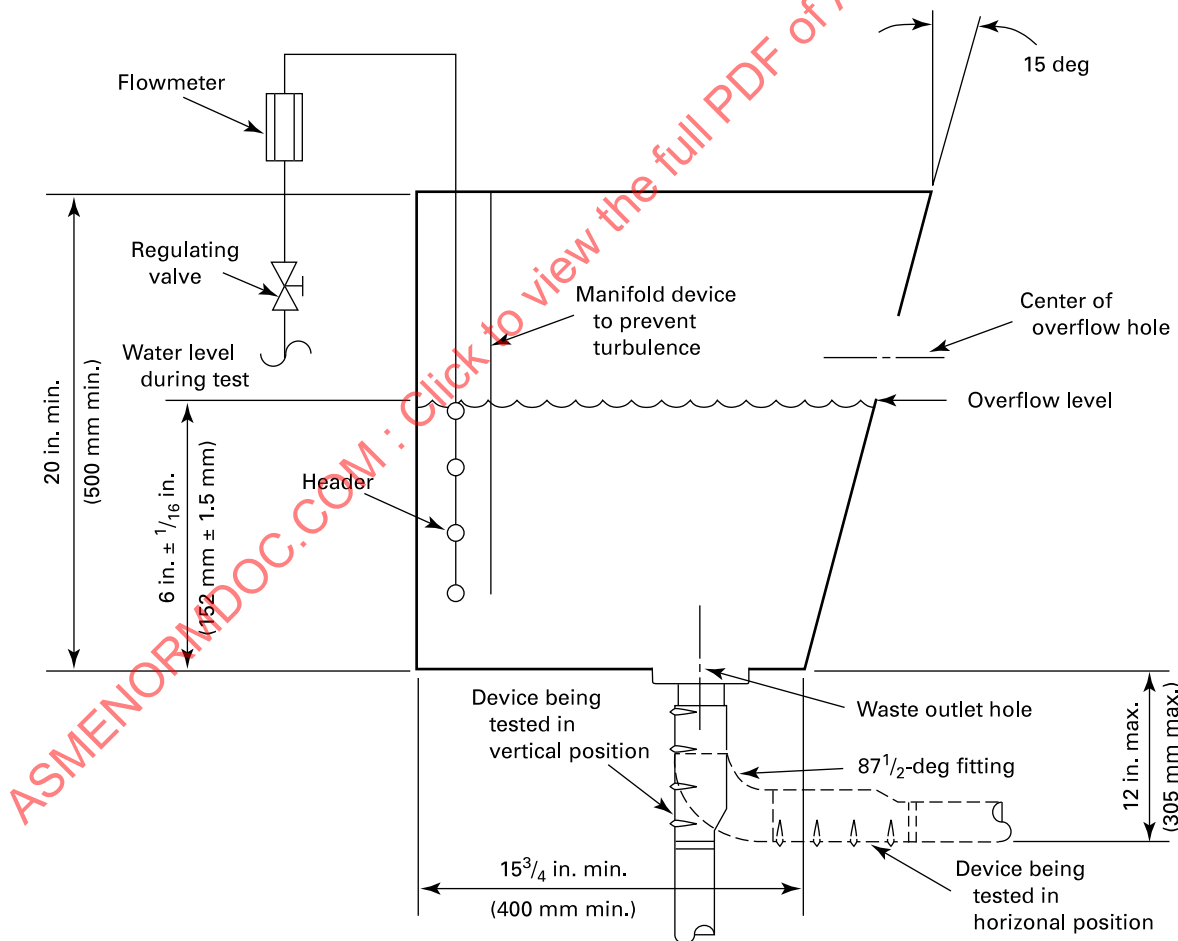
All threads that connect to external fixtures shall comply with ASME B1.20.1.

3 TESTING

3.1 Waterway Flow Rate

3.1.1 Test Method. Connect the valve to the waste outlet hole of the tank in accordance with Figure 3.1.1-1 and the manufacturer's installation instructions. Fill the test tank with water up to the test level. Stabilize the test level by adjusting the water inflow by means of the regulating valve. When the test water level is stabilized, the flow rate of the valve is indicated by the flowmeter.

Figure 3.1.1-1 Waterway Flow-Rate Test Apparatus



3.1.2 Performance Requirements. The valve shall demonstrate flow rates not less than

- (a) 1¼ in. (31.8 mm): 9.5 gpm (36 L/min), valve alone on wash basin, bidet
- (b) 1½ in. (38.1 mm): 13.5 gpm (51 L/min), valve alone on bath
- (c) 1½ in. (38.1 mm): 11.1 gpm (42 L/min), valve alone on kitchen sink

3.2 One-Way Sealing Performance of the Valve

3.2.1 Test Apparatus. The test apparatus is as follows:

- (a) length of ¼ in. (6 mm) bore rubber tubing
- (b) tee-junction suitable for use with the rubber tubing
- (c) u-tube manometer with a range of 0 in. (0 mm) to 6 in. (152 mm) of water, gage
- (d) reducer to enable the rubber tube to be connected to the outlet of the valve

3.2.2 Test Method. Prime the valve by running a gallon of water through the valve to waste. Connect the rubber tubing through the reducer to the outlet of the valve. Connect the other end of the tube to the tee-junction, one leg of which is connected to the u-tube manometer and the remaining leg to another length of tubing. Apply air pressure to the free end of the tubing until a pressure of 4 in. (102 mm) of water, gage, is registered on the u-tube manometer. Clamp the end of the tube and maintain pressure for 20 sec. Release the pressure and leave the valve and equipment in situ for a minimum of 48 hr, then retest under the same conditions but omit the water priming stage.

3.2.3 Performance Requirements. The valve shall retain a seal under a back pressure, equivalent to 4 in. (102 mm) of water, gage, for 20 sec on both the initial test (with valve primed) and the retest.

3.3 Airway Flow Rate

3.3.1 Test Method. The airway flow rate test shall be performed in accordance with ANSI/ASSE 1051-2009, paras. 3.2.2 through 3.2.3.

3.3.2 Performance Requirements. The maximum opening pressure of the device shall meet the requirements of ANSI/ASSE 1051-2009, para. 3.2.4. The measured airflow rate shall be at least 1 ft³/min (0.47 L/s) in accordance with the requirements for 1¼-in. and 1½-in. drainage systems in ANSI/ASSE 1051-2009, para. 1.2.3 and Table 1.

3.4 Recovery From an Excess Back Pressure (Inversion) Condition

3.4.1 Test Method. Fit the valve to be tested to a standard sink and connect the arrangement of pipe work shown in Figure 3.4.1-1 to the outlet of the valve. Close valve at point B. Slowly open valve C until the bladder inverts and water flows into the sink. Record the pressure at the point of inversion. Close valve C; open valve B. Insert the sink plug and fill the sink with water to level A.

NOTE: Failure of the bladder to invert shall not constitute a failure of the test or a reason to stop the test.

3.4.2 Performance Requirements. When the sink plug is removed, the sink shall completely drain. At the completion of the test in para. 3.4.1, the valve shall be tested in accordance with paras. 3.1 and 3.2. Failure to achieve the performance parameters prescribed in paras. 3.1 and 3.2 shall be cause for rejection of the valve.

3.5 Leak Tightness

3.5.1 Test Method. The valve shall be tested in accordance with the hydrostatic pressure test in ASTM F409 using an internal pressure of 25 psi (172 kPa) for 1 hr.

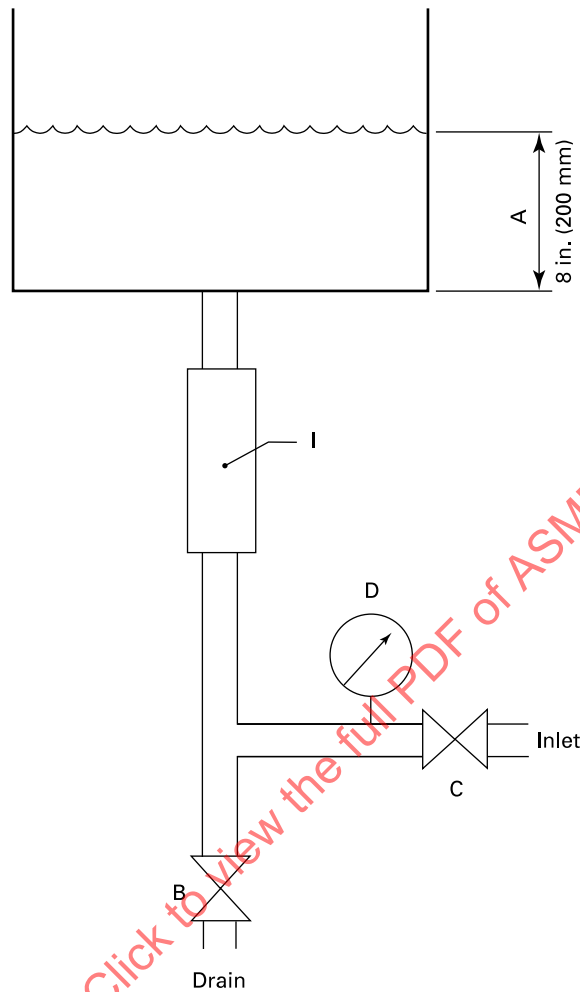
3.5.2 Performance Requirements. The valve shall show no evidence of leakage and demonstrate air tightness.

3.6 Thermal Cycling

3.6.1 Test Requirement. The valve shall complete the following thermal cycling test procedure for 5 cycles and allow 5 sec of draining time between cycles:

- (a) 7.9 gpm (30 L/min) of water at a temperature of 203°F ± 4°F (95°C ± 2°C) over a period of 15 min at a constant flow rate
- (b) 7.9 gpm (30 L/min) of water at a temperature of 68°F ± 10°F (20°C ± 5°C) over a period of 10 min at a constant flow rate

Figure 3.4.1-1 Inversion Recovery Test Apparatus



Legend:

- A = water level
- B = outlet drain valve
- C = inlet valve
- D = pressure gage
- I = valve under test

3.6.2 Performance Requirements. At the completion of the above test, the valve shall be tested in accordance with para. 3.2 and meet the requirements of para. 3.2.3.

3.7 Cyclic Fatigue

3.7.1 Test Requirement. The valve shall complete the following cyclic fatigue test procedure allowing 60 sec for draining between cycles: 1,500 cycles of 60 sec $\pm$ 2 sec duration, at a temperature of 200°F $\pm$ 4°F (93°C $\pm$ 2°C) followed by 60 sec at a temperature of 59°F $\pm$ 10°F (15°C $\pm$ 5°C), flow rate 7.9 gpm $\pm$ 0.1 gpm (30 L/min $\pm$ 0.5 L/min).

3.7.2 Performance Requirements. At the completion of the above test, the valve shall be tested in accordance with para. 3.2 and meet the requirements of para. 3.2.3.

3.8 Resistance to Household Substances

3.8.1 Test Apparatus. The valve shall be attached to a sink fitted with a standard crosspiece outlet.

3.8.2 Substances to Be Tested. A separate test shall be carried out for each of the following five materials. For each test, a 1.5-oz (43-g) or 1.5-fl. oz. (44-mL) sample of material shall be used.

- (a) material 1: food — uncooked long-grain rice
- (b) material 2: food — diced vegetable of size $\frac{1}{4}$ in. $\times$ $\frac{1}{4}$ in. $\times$ $\frac{1}{4}$ in. (6 mm $\times$ 6 mm $\times$ 6 mm)
- (c) material 3: cleaners — liquid soaps
- (d) material 4: solids — kiln-dried sand
- (e) material 5: lard — 95% water, 5% melted lard, each at 150°F (65.6°C)

3.8.3 Test Method. Place the material on or around the sink outlet. Pour 4 pt [64 fl oz (1.9 L)] onto the material to flush the material from the sink. Use cold water for materials 1 through 4; use warm water at 150°F (65.6°C) for material 5. Leave the system for 24 hr.

3.8.4 Performance Requirements. At the completion of the above test, the valve shall be tested in accordance with [para. 3.2](#) and meet the requirements of [para. 3.2.3](#).

3.9 Resistance to Chemicals and Solvents

3.9.1 Test Requirement. The valve shall be attached to a sink fitted with a standard crosspiece outlet.

3.9.2 Substances to Be Tested. Each test shall be carried out separately using a quantity of $\frac{3}{4}$ pt [12 fl oz (0.35 L)] of one of the following solvents:

- (a) solvent 1: liquid drain cleaner containing sulfuric acid
- (b) solvent 2: mineral spirits
- (c) solvent 3: kerosene

3.9.3 Test Method. Pour the solvent into the sink outlet. After 1 min, pour 4 pt [64 fl oz (1.9 L)] of cold water into the sink outlet to flush the solvent from the sink. Leave the system for 24 hr.

3.9.4 Performance Requirements. At the completion of the above test, the valve shall be tested in accordance with [para. 3.2](#) and meet the requirements of [para. 3.2.3](#).

3.10 Drop

3.10.1 Test Method. The test shall be conducted over a clean concrete surface. Hold the valve with the lowest point upside down 3 ft (0.91 m) above the surface and release the valve. Pick up the valve and change orientation (top uppermost) and release onto concrete again. Pick up the valve one final time and change orientation (sideways) and release onto concrete. Observe the valve for any changes.

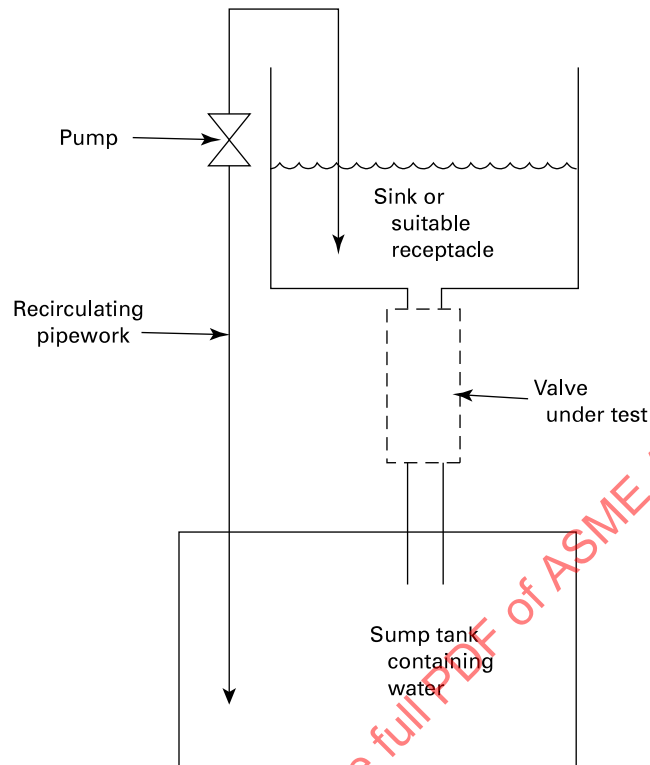
3.10.2 Performance Requirements. The valve shall show no signs of deformation or breakage that may affect its function.

3.11 Life Cycle

3.11.1 Test Requirement. The valve's resistance to cyclic fatigue under ambient conditions shall be tested using the apparatus shown in [Figure 3.11.1-1](#).

3.11.2 Test Method. The valve shall undergo 20,000 cycles. A cycle comprises 10 sec of exposure to water followed by 10 sec of draining.

3.11.3 Performance Requirements. At the completion of the above test, the valve shall be tested in accordance with [para. 3.2](#).

Figure 3.11.1-1 Life-Cycle Test Apparatus

4 MARKING, IDENTIFICATION, AND INSTRUCTIONS

4.1 Marking and Identification

The valve shall be permanently and legibly marked with the following:

- (a) manufacturer's name
- (b) product name or brand name
- (c) nominal size of inlet and outlet
- (d) date of manufacture
- (e) predominant material
- (f) direction of flow indicator
- (g) indication of the orientation of the installation of the device

4.2 Instructions

The manufacturer shall provide instructions on packaging or accompanying literature indicating, where appropriate, both of the following:

- (a) orientation of the installation of the device
- (b) limitations on the use and type of drain-cleaning chemicals and tools