ASME A112.18.8-2009

In-Line Sanitary Waste Valves for Plumbing Drainage Systems

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

ASME SETTING THE STANDARD

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Date of Issuance: July 17, 2009

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

Periodically certain actions of the ASME A112 Committee may be published as Cases. Cases are published on the ASME Web site under the Committee Pages at http://cstools.asme.org as they are issued.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

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FOREWORD

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). The results of their activity 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 the valve 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.

Suggestions for improvement of this Standard will be welcomed. They should be sent to The American Society of Mechanical Engineers, Attn: Secretary, A112 Standards Committee, Three Park Avenue, New York, NY 10016-5990.

This Standard was approved by the American National Standards Institute on June 2, 2009.

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Standardization of Plumbing Materials and Equipment

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General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, A112 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Proposing Revisions. Revisions are made periodically to this 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.

Proposing a Case. Cases may be issued for the purpose of providing alternative rules when justified, to permit early implementation of an approved revision when the need is urgent, or to provide rules not covered by existing provisions. Cases are effective immediately upon ASME approval and shall be posted on the ASME Committee Web page.

Requests for Cases shall provide a Statement of Need and Background Information. The request should identify the standard, the paragraph, figure or table number(s), and be written as a Question and Reply in the same format as existing Cases. Requests for Cases should also indicate the applicable edition(s) of the standard to which the proposed Case applies.

Interpretations. Upon request, the Committee will render an interpretation of any requirement of their Standards. 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.
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. 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 regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the A112 Standards Committee.

IN-LINE SANITARY WASTE VALVES FOR PLUMBING DRAINAGE SYSTEMS

1 GENERAL

1.1 Scope

This Standard establishes minimum requirements for materials in the construction of sanitary waste valves (hereinafter referred to as "the valve") for use as an alternate to tubular p-traps, and 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, Air Admittance Valves for Plumbing Drainage Systems

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

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), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

ASTM D 2000, Rubber Products for Automotive Applications
ASTM F 409, 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

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 which 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 F 409. The valve shall be installed in accessible locations.

2.2 Seal Material

Seal materials shall comply with or exceed classification M3BA507 A14 B13 C12 F17 or M2BG714 B14 EO14 EO34 of ASTM D 2000.

2.3 Bladder/Checking Member Material

Bladder/checking member material comply with or exceed classification M3FC607 EA14 EO16 G11 of ASTM D 2000.

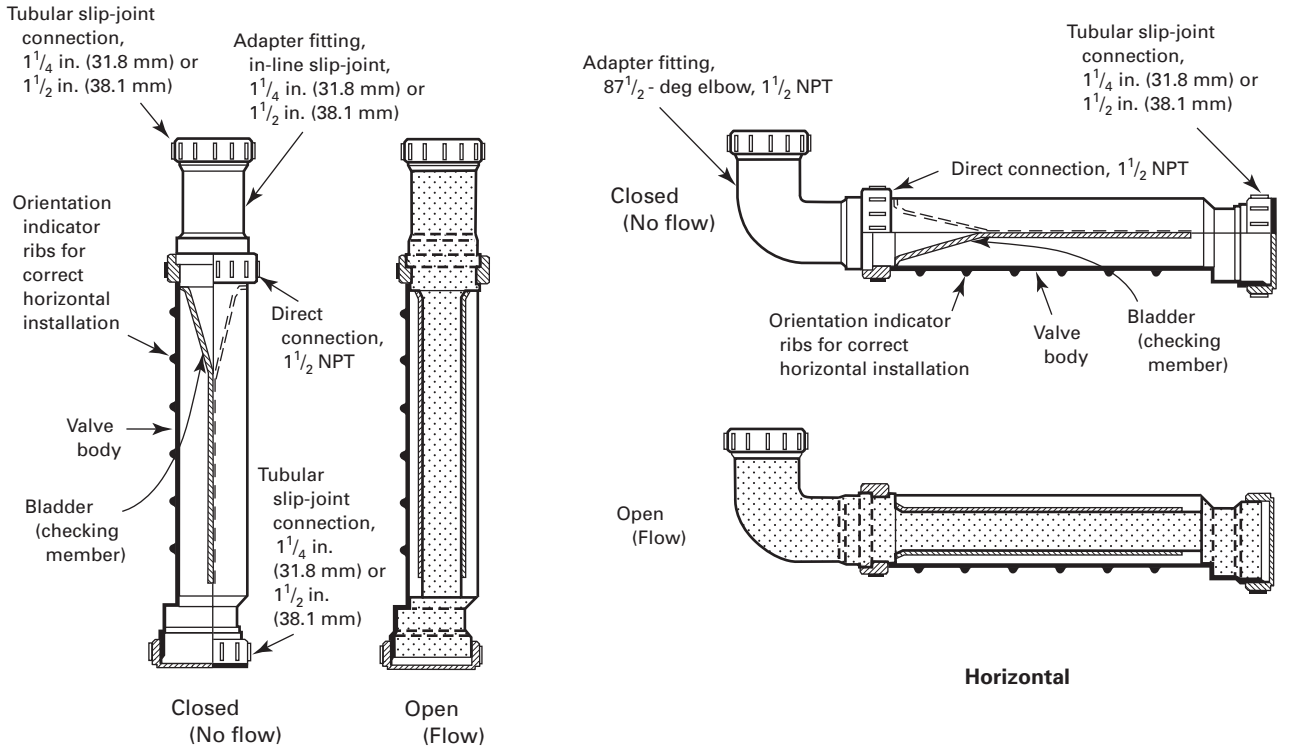
2.4 Valve Inlet

2.4.1 The valve inlets shall be 1¼ in. (31.8 mm) or 1½ in. (38.1 mm), nominal straight or with an 87½-deg elbow or be standard pipe size straight inlet (see Fig. 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 ⅜ in. (9.5 mm) and ½ in. (12.7 mm). All threaded fixture outlets shall have a minimum three-thread engagement for fittings and plastic nuts to correctly engage/energize the inlet seal in accordance with ASTM F 409.

2.4.3 If required for horizontal installations, an 87½-deg knuckle adapter shall be available to allow the valve to be connected in a horizontal position. The device and connected piping, when installed in a horizontal position, shall have a minimum slope of 1:48 [i.e., ¼ in./ft (21 mm/m)].

Fig. 1 Typical Cross-Section
(For Illustrative Purposes Only)



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

2.5 Valve Outlet

The valve outlet shall have a connection that is compatible with tubing manufactured to ASTM F 409 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 Fig. 2 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. The flow rate of the valve is indicated by the flow meter, when the test water level is stabilized.

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:

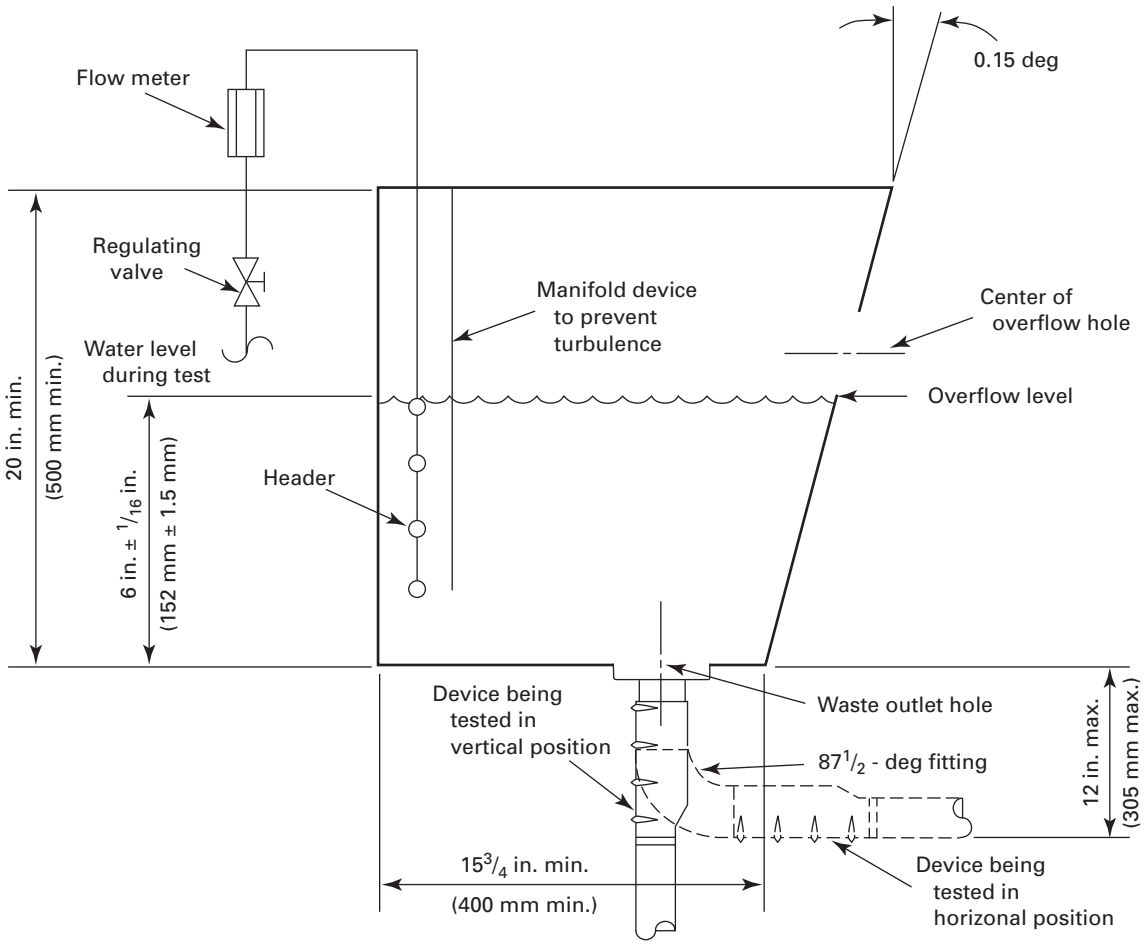
(a) length of ¼ in. (6 mm) bore rubber tubing

(b) tee-junction suitable for use with the rubber tubing

(c) u-tube manometer with a range of 0 in. (0 mm) to 4 in. (102 mm) of water, gage

(d) reducer to enable the rubber tube to be connected to the outlet of the valve

Fig. 2 Waterway Flow-Rate Test Apparatus



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 2 in. (51 mm) of water, gage, is registered on the u-tube manometer. Clamp the end of the tube and maintain pressure for 10 sec.

3.2.3 Performance Requirements. The valve shall retain a seal under a back pressure, equivalent to 2 in. (51 mm) of water, gage, for 10 sec.

3.3 Airway Flow Rate

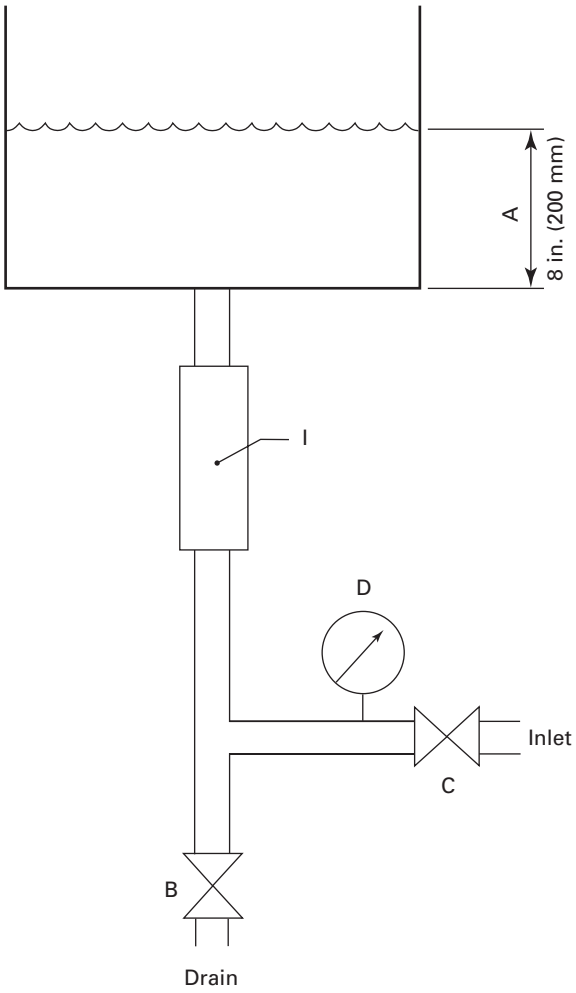
The airway flow rate test shall be performed in accordance with paras. 3.3.2 through 3.3.4 of ANSI/ASSE 1051.

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 Fig. 3 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. Fit the sink plug and fill with water to level A.

3.4.2 Performance Requirements. When the sink plug is removed, the sink must completely drain. At the completion of the test, 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.

Fig. 3 Inversion Recovery Test Apparatus



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

3.5 Leak Tightness

3.5.1 Test Method. The valve must be tested in accordance with the hydrostatic pressure test in ASTM F 409 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

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 ± 2 sec duration, at a temperature of 200°F ± 4°F (93°C ± 2°C) followed by 60 sec at a temperature of 59°F ± 10°F (15°C ± 5°C), flow rate 7.9 gpm ± 0.1 gpm (30 L/min ± 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. Each test shall be carried out separately using a quantity of 1.5 oz (43 g) or 1.5 fl oz (44 mL) of one of the following materials:

(a) material 1: food — uncooked long-grain rice

(b) material 2: food — diced vegetable of size ¼ in. × ¼ in. × ¼ in. (6 mm × 6 mm × 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. The material shall be placed on or around the sink outlet. Four pints (64 fl oz or 1.9 L) of water will then be poured onto the item to flush the material from the sink. For Materials 1 through 4, cold water shall be used; for Material 5, warm water at 150°F (65.6°C) shall be used. The system will then be left 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 ¾ pt (12 fl oz or 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. The material shall be poured into the sink outlet. After one minute, pour 4 pt (64 fl oz or 1.9 L) of cold water into the sink outlet to flush the solvent from the sink. The system will then be left 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.

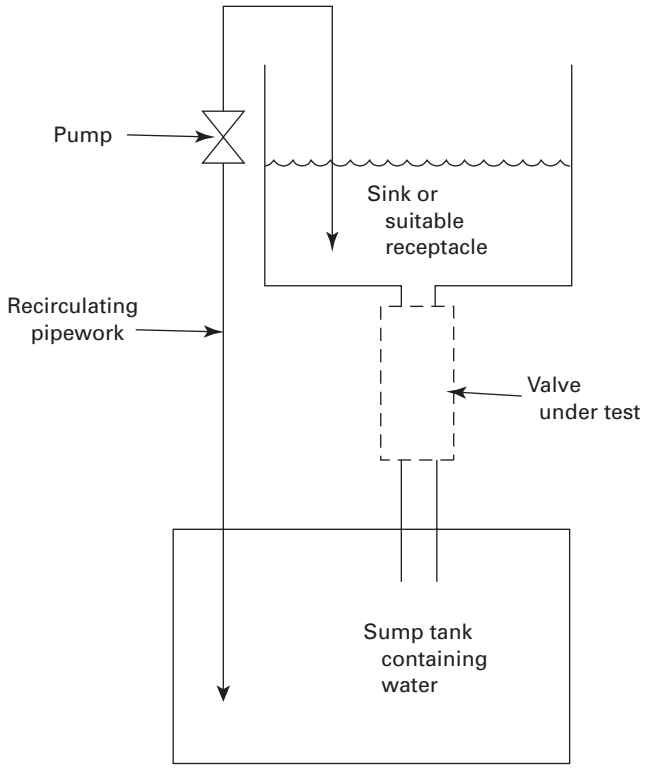
3.11 Life Cycle

3.11.1 Test Requirement. Resistance of the valve to cyclic fatigue under ambient conditions shall be tested using the apparatus shown in Fig. 4.

3.11.2 Test Method. The valve under test shall undergo 20,000 cycles. A cycle comprises 10 sec exposure to the solution, 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.

Fig. 4 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/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) the orientation of the installation of the device
(b) limitations on the use and type of drain-cleaning chemicals and tools

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