IS 12234 (1988): plastic equilibrium float valve for cold water services [CED 3: Sanitary Appliances and Water Fittings]

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Indian Standard

SPECIFICATION FOR PLASTIC EQUILIBRIUM FLOAT VALVES FOR COLD WATER SERVICES

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Indian Standard

SPECIFICATION FOR PLASTIC EQUILIBRIUM FLOAT VALVES FOR COLD WATER SERVICES

0. FOREWORD

0.1 This Indian Standard was adopted by the Bureau of Indian Standards on 27 January 1988, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Noting the current trend in International market and to make better use of material resources, more efficient and trouble free functioning of the valve parts, it was decided to prepare a separate standard for plastic float valves. The principle of functioning of the equilibrium float valve is quite different from the brass ball valves covered by IS : 1703-1977*.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Specification for ball valves (horizontal plunger type) including floats for water supply purposes (*second revision*).
†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard lays down requirements regarding size, materials manufacture and workmanship, performance test and appropriate dimensions of equilibrium float valves for water service up to 45°C such as coolers, flush tanks and over head tanks.

2. CLASSIFICATION

2.1 Float valves shall be of the following two types:

a) Horizontal inlet shank type, and

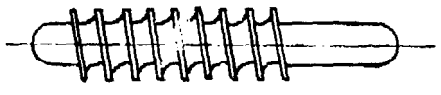
b) Vertical inlet shank type.

2.2 Each float valve may be fitted with two pressure reducing attachments, if required, and used according to manufacturer's instructions:

a) One high pressure reducer indicated by HP
b) One low pressure reducer indicated by LP

(*see* Fig. 1)

HIGH PRESSURE REDUCER



LOW PRESSURE REDUCER

FIG. 1 TYPICAL FLOW RESTRICTORS

3. NOMINAL SIZES

3.1 The nominal size of the float valve shall be 15 mm.

4. MATERIALS

4.1 The component parts shall be made of materials given in Table 1.

TABLE 1 MATERIALS FOR BODY AND COMPONENTS PARTS OF FLOAT VALVES

Sl No.	Component	Material
(1)	(2)	(3)
1.	Valve body, inlet shank, valve seat, back nut, cap and float arm	Polyacetal
2.	Float, flow restrictors and discharge horn	Polyacetal or polypropylene or polypropathene Synthetic rubber
3.	Diaphragm	Synthetic rubber
4.	Diaphragm pin	Stainless steel or any other non-corrosive material or polyacetal

4.2 With the exception of valve seat where no reworked material shall be used, the use of manufacturer's own rework material up to 15 percent shall be permitted.

5. MANUFACTURE AND WORKMANSHIP

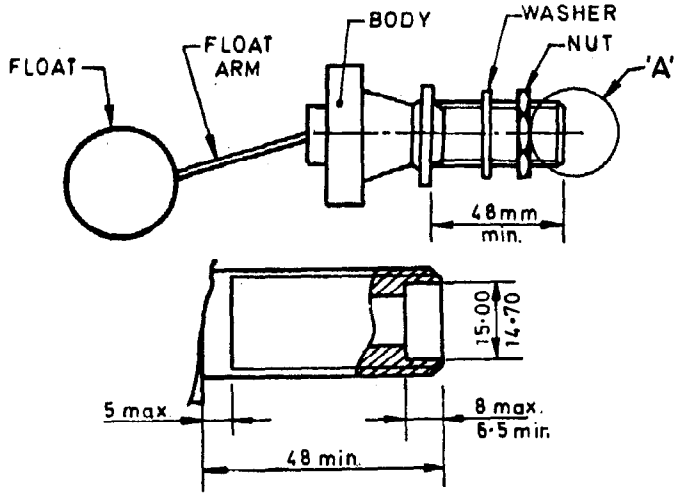
5.1 Parts shall be sound in all respects and shall be free from flash, plugging which may arise during manufacture.

5.2 The materials used for manufacturing the parts in contact with water shall not constitute a toxic hazard and shall not foster microbiological growth nor give rise to taste, odour cloudiness or discolouration of the water.

6. CONSTRUCTION

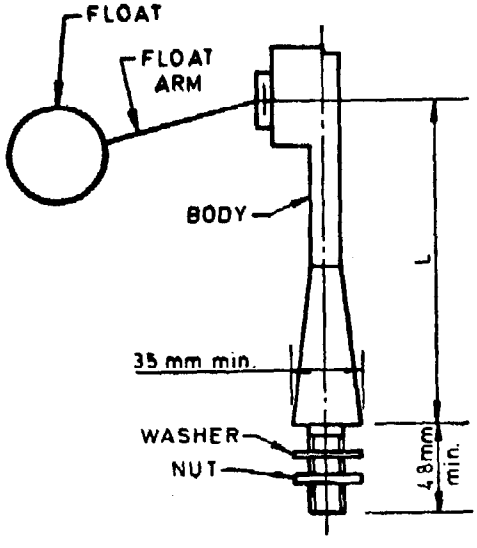
6.1 Illustrations of typical equilibrium float valves, both horizontal inlet shank and vertical inlet shank, are shown in Fig. 2A and Fig. 2B respectively.

NOTE — The shape of the component parts is only illustrative but dimensions or minimum requirements where specified shall be binding.



All dimensions in millimetres.

FIG. 2A HORIZONTAL INLET SHANK TYPE FLOAT



L — As required by cistern manufacturer. Minimum bore 9 mm.

FIG. 2B VERTICAL INLET SHANK TYPE FLOAT VALVE

6.2 The body, inlet shank and seat should be made of one single unit to constitute the body of the valve. The inlet shank may be vertical or horizontal. Where the valve body and shank are separate components, means shall be provided to lock separate valve body and shank in register.

6.3 The seating of the float valve shall be made integral with the body and shall be rounded off so that there are no sharp corners.

6.4 The dimensions of the body shall conform to sizes shown in Fig. 2A and 2B for respective types namely horizontal inlet shank and vertical inlet shank.

6.5 Screw Threads — The inlet shank shall have external parallel fastening thread conforming to IS : 2643 (Part 3)-1975* of same size as the nominal size of the float valve.

6.6 The diaphragm shall be made of synthetic rubber moulded to have the form and dimension as required for the operation of the valve. The central portion may be reinforced with a moulded polyacetal insert.

6.7 The float arm shall be so made as to securely fit into the body cap. The other end of the arm shall be provided with a built-in attachment to accept the float. The design of the arm or float shall incorporate a positive readily accessible method of adjusting water level without bending the arm.

6.8 The valve shall be provided with a discharge with antisiphonage provision.

6.8.1 The discharge shall be provided with a suitable discharge horn adopted to receive an open ended plastic tube.

6.8.2 Every float valve shall be so constructed as to effectively prevent back siphonage of water previously discharged by the valve at all water levels up to the horizontal centre line of the valve.

6.9 Floats — The float shall be watertight and non-absorbing and shall not contaminate water.

6.10 Back Nut — The back nut shall be provided with parallel internal threads conforming to IS : 2643 (Part 3)-1975* and of the same size as the float valve.

7. PERFORMANCE TESTS

7.1 Hydraulic and Shut-Off Test

7.1.1 The float valve shall be capable of withstanding 2·0 MPa water pressure for 60 seconds without leak or sweating while held in the closed position.

*Dimensions for pipe threads for fastening purposes: Part 3 Limits of sizes (*first revision*).

7.1.2 The diaphragm valve when assembled in working condition but without flow restrictors and with the float immersed to half its volume shall remain closed against a test pressure of 1·05 MPa.

7.2 Antisiphonage Test

7.2.1 The float valve when tested according to Appendix A shall have no back siphonage as indicated by the presence of water in the catchpot. This shall be type test.

7.3 Flow Test

7.3.1 The float valve shall be capable of delivering at least 9 litres of water in 3 min into its container when tested according to Appendix B.

7.4 Endurance Test

7.4.1 The endurance test shall be carried out according to Appendix C. The float valve shall be capable of completing 200 000 cycles and shall then be capable of satisfying hydraulic and shut-off test (*see* **7.1**). This shall be type test.

8. SAMPLING

8.1 Scale of Sampling

8.1.1 *Lot* — In any consignment all the float valves of same type made of the same material and produced under similar conditions shall be grouped together to constitute a lot.

8.1.2 For ascertaining the conformity of the material to the requirements of the specification samples shall be tested from each lot separately.

8.1.3 Number of valves to be selected from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

TABLE 2 SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

Lot Size	Sample Size	Acceptance Number
(1)	(2)	(3)
Up to 100	5	0
101-150	8	0
151-500	13	1
501-1 000	20	1
1 001 and above	32	2

8.1.3.1 The valves from the lot shall be selected at random and in order to ensure the randomness of selection procedures given in IS : 4905-1968* may be followed.

8.2 Number of Tests and Criteria for Conformity

8.2.1 All the valves selected according to col 1 and 2 of Table 2 shall be examined for material, manufacture and workmanship, and construction. Any valve failing in one or more of these requirements shall be considered as defective.

8.2.2 The lot shall be considered as conforming to these requirements if the number of defective items found in the sample is less than or equal to the corresponding acceptance number given in col 3 of Table 2.

8.2.3 The lot having satisfied the requirements given in **8.2.1** shall be further tested for hydraulic and shut-off test (**7.1**) and flow test (**7.3**).

8.2.3.1 For this purpose, the number of valves given in col 2 of Table 2 shall be further examined if they are found to be satisfactory in other requirements given in **8.2.1**.

8.2.4 The lot shall be considered to have satisfied the requirements for hydraulic and shut off test and float test if none of the sample fails in these requirements.

9. MARKING

9.1 Each float valve shall be legibly marked with the following information:

a) Manufacturer's name or trade mark.

b) Size of the valve.

9.2 The valves may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986, and the Rules and Regulations made thereunder. The standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

*Methods for random sampling.

APPENDIX A

(*Clause* 7.2.1)

A-1. PROCEDURE

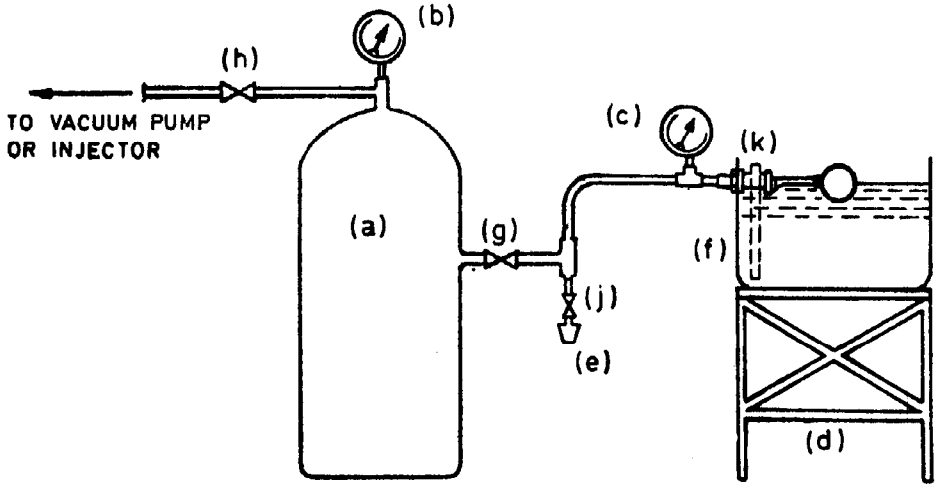
A-1.1 Assemble the apparatus as shown in Fig. 3.

A-1.2 Water is run into cistern (*f*) until water level is at the horizontal centre line of the float valve.

A-1.3 Close valves (*g*) and (*j*) and open valve (*h*). Activate the means of producing vacuum until absolute pressure in cylinder (*a*) reaches 0·02 MPa as indicated by vacuum gauge (*b*).

A-1.4 Open valve (*g*). Check that absolute pressure as indicated by vacuum gauge (*c*) does not exceed 0·05 MPa for at least 5 seconds.

A-1.5 Close valve (*g*) and open valve (*j*). Examine the catchpot (*e*) for presence of any water.



(*a*) Mild steel cylinder
(*b*) & (*c*) Vacuum gauge measure 0-0·1 MPa (0-762 mm Hg)
(*d*) Supporting arrangement for cistern
(*e*) A Catchpot
(*f*) Cistern
(*g*) Full way valve
(*h*) Shut-off valve
(*j*) Drain valve
(*k*) Valve under test

FIG. 3 DIAGRAMATIC REPRESENTATION OF ANTISIPHONAGE TEST APPARATUS

APPENDIX B

(*Clause* 7.3.1)

FLOW TEST

B-1. Fit the float valve in a cistern *B* conforming to IS : 7231-1984* (*see* Fig. 4) connect container *A* to cistern *B* with a tube having 15 mm bore.

B-2. Cause the float valve to discharge water from container *A* into cistern *B* for a period of 180 seconds while maintaining the water level in container *A* at a height of 1·5 ± 0·1 m above the centre of inlet of valve for the duration of the test.

B-3. At the end of 180 seconds measure the volume of water in cistern *B*.

*Specification for plastic flushing cistern for water-closets and urinals (*first revision*).

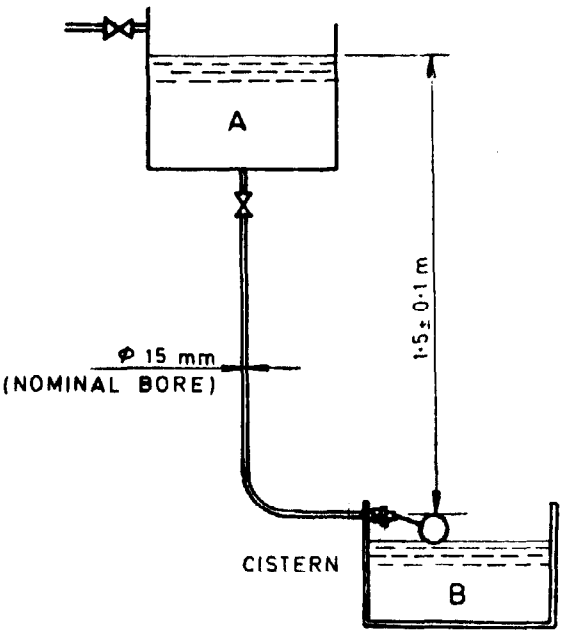


FIG. 4 SCHEMATIC DIAGRAM OF FLOW TEST

APPENDIX C

(*Clause* 7.4.1)

ENDURANCE TEST

C-1. APPARATUS

C-1.1 Test equipment shall be capable of so operating the float arm as to fully open and fully close the valve on an automatic cycle (*see* **C-2.1**).

C-1.2 Water supply arrangement shall be capable of supplying water at a head of 1·5 ± 0·1 m.

C-2. PROCEDURE

C-2.1 Instal the float valve on test equipment and start the operating mechanism. The operations constituting one cycle of at least 6 seconds duration shall comprise:

a) Fully open the valve in not less than 1 second,

b) Allow the valve to remain in the open position for 2 seconds,

c) Fully close the valve in not less than 1 second, and

d) Allow the valve to remain closed for 2 seconds.

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