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IS 9762 (1994): polyethylene floats (spherical) for float valves [CED 3: Sanitary Appliances and Water Fittings]



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की विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

SPECIFICATION FOR POLYETHYLENE
FLOATS (SPHERICAL) FOR FLOAT VALVES
(*First Revision*)

UDC 621.646.618 [678.742.2]

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was first published in 1981. In this first revision, the following major modifications have been affected:

- i) Requirements of only spherical polyethylene floats are now covered.
- ii) Two grades of HDPE conforming to IS 7328 : 1992 'High density polyethylene materials for moulding and extrusion' have been included.
- iii) Certain modifications in the float configuration have been carried out keeping manufacturing practices in view.
- iv) Sampling clause has been added.

The composition of the technical committee responsible for preparation of this standard is given at Annex D.

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 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SPECIFICATION FOR POLYETHYLENE FLOATS (SPHERICAL) FOR FLOAT VALVES

(First Revision)

1 SCOPE

This standard covers the requirements for polyethylene spherical floats suitable for float valves of nominal sizes of 15, 20, 25, 32, 40 and 50 mm.

NOTE — Nominal size of the float is related with the nominal size of the float valve with which it is to be used.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	Title
1703 : 1989	Specification for copper alloy float valves (horizontal plunger type) for water supply fittings (<i>third revision</i>)
4218	ISO metric screw threads
(Part 1) : 1976	Basic and design profiles (<i>first revision</i>)
(Part 2) : 1976	Diameter pitch combinations (<i>first revision</i>)
(Part 3) : 1976	Basic dimensions for design profiles (<i>first revision</i>)
(Part 4) : 1976	Tolerancing system (<i>first revision</i>)
(Part 5) : 1979	Tolerances (<i>first revision</i>)
(Part 6) : 1978	Limits of sizes for commercial bolts and nuts (diameter range 1 to 52 mm) (<i>first revision</i>)
4905 : 1968	Methods for random sampling
7328 : 1992	High density polyethylene materials for moulding and extrusion (<i>first revision</i>)

3 TERMINOLOGY

3.0 For the purpose of this standard, the definitions given in 3.1 and 3.2 shall apply.

3.1 Diameter of the Spherical Float

The average outside diameter of the float measured at two axes at right angles to each other and clear of the jointing seam (if any).

3.2 Lifting Effort

The net upward force acting on the float when immersed in water so that half of its volume is below the surface.

4 MATERIAL

High density polyethylene (HDPE) used for the manufacture of floats shall conform to Designation PEBW A50 T 090 or PEBN A50 T 090 of IS 7328 : 1992. The addition of not more than 10 percent of the manufacturer's own rework material resulting from the manufacture of floats conforming to this standard is permissible. No other reworked material shall be used.

5 DESIGNATION

Floats shall be designated as HP or LP followed by the nominal size of the float (*see 1*), for example:

HP 25 — For float of nominal size of 25 mm to be used for high pressure applications.

LP 40 — For float of nominal size of 40 mm to be used for low pressure applications.

6 DIMENSIONS AND TOLERANCES

6.1 Diameter of Float

The floats shall be spherical in shape and shall be made in diameters as given in Table 1.

6.1.1 Tolerances

The diameters of floats shall not vary by more than ± 2.5 mm.

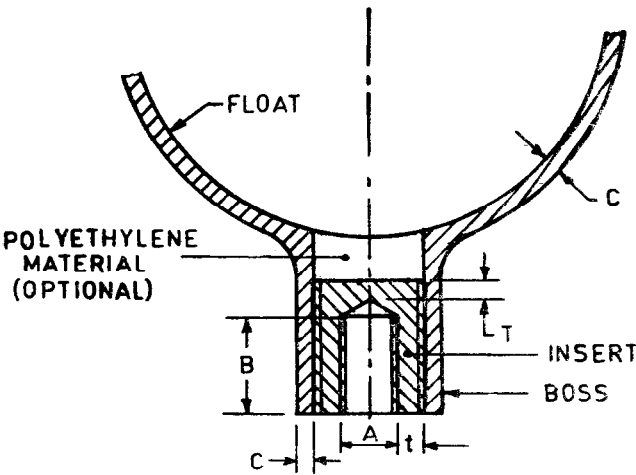
6.2 Wall Thickness

6.2.1 Wall thickness of the float (C) at any point shall not be less than the values given in Table 1.

6.2.2 Wall thickness of the boss inclusive of the wall thickness of the metal insert measured at the major diameter of the thread shall not be less than half the nominal thread diameter.

Table 1 Dimensions of Float, Boss and Insert
(Clauses 6.1, 6.2.1, 7.2 and 7.3)

All dimensions in millimetres.



SI No.	Particulars		Dimensions of Floats for Nominal Size					
			15	20	25	32	40	50
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
i)	Dia of float	HP	127	152	203	229	254	305
		LP	114	127	178	203	203	254
ii)	Wall thickness, <i>C</i> (<i>Min</i>)		1.5	2.0	2.5	2.5	2.5	2.5
iii)	Tapping of boss, <i>A</i>		M8 × 1.25	M8 × 1.25	M12 × 1.75	M14 × 2	M14 × 2	M16 × 2
iv)	Insert wall thick- ness, <i>t</i> (below threads)		1.50	1.50	1.75	2.00	2.00	2.00
v)	Insert base thickness, <i>T</i>		2.00	2.00	2.25	2.50	2.50	2.50
vi)	Axial length of thread, <i>B</i> (<i>Min</i>)		8.0	8.0	13.0	16.0	16.0	19.0

NOTE — Threading of insert with tolerances of coarse series shall be as given in the relevant parts of IS 4218.

7 MANUFACTURE AND WORKMANSHIP

7.1 The floats shall be manufactured by suitable moulding process and shall be water-tight and non-absorbent. No adhesive shall be used for jointing parts of the shell.

7.2 Bosses shall be integral with the float and shall be fitted with a copper alloy corrosion resistant insert threaded and tapped in accordance with Table 1.

7.3 All bosses and inserts shall be rigid and non-rotating in relation to the float under working conditions. Minimum wall thickness (*t*) and thickness at the base of the insert (*T*) shall be as given in Table 1.

8 TESTING

8.1 Leakage and Water Absorption Test

When tested by the method described in Annex A, the increase in mass of the float shall not be more than 0.5 percent and shall show no leakage.

8.2 Deflection Test

When tested by the method described in Annex B, the float shall not deflect by more than 7 mm.

8.3 Impact Test

Floats when dropped from a height of 1 500 mm on to a concrete floor at ambient temperature shall not develop any crack or damaged in any respect when inspected visually.

8.4 Boss Test

When tested by the method described in Annex C, the boss and/or float shall not be visibly distorted or damaged.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 General

The scale of sampling and criteria for conformity of a lot for the tests specified in this standard shall be as given in following clauses.

9.2 Lot

All floats, in a single consignment, of the same size and manufactured under essentially similar conditions shall constitute a lot.

9.2.1 For ascertaining conformity of the lot to the requirements of this specification, samples shall be tested from each lot separately. The number of floats to be sampled from each lot shall depend on the size of the lot.

9.2.2 The floats shall be selected from the lot at random. In order to ensure the randomness of selection, procedure given in IS 4905 : 1968 may be followed.

9.3 Dimensional, Manufacture and Workmanship

9.3.1 The number of samples to be taken from a lot shall depend on the size of the lot and shall be in accordance with Table 2.

9.3.2 Each float so selected shall be examined for requirements given in 6, 7 and 8. Any float failing in one or more of these requirements shall be considered as defective. The lot shall

Table 2 Scale of Sampling and Permissible Number of Defectives for Dimensional, Manufacture and Workmanship

(Clauses 9.1, 9.3.1 and 9.3.2)

Number of Floats in the Lot	Sample Size	Acceptance No.
(1)	(2)	(3)
Up to 150	8	0
151 to 280	13	0
281 to 500	20	1
501 to 1 200	32	2
1 201 to 3 200	50	3
3 201 to 10 000	80	5
10 001 and above	125	7

be considered as conforming to the requirements under 6 and 7 if the number of defectives found in the sample does not exceed the corresponding acceptance number given in col 3 of Table 2.

9.4 Leakage and Water Absorption, Deflection, Impact and Boss Tests

9.4.1 The number of samples to be taken for each of the test, shall depend on the size of the lot and shall be in accordance with Table 3.

9.4.2 Each float so selected shall be subjected to tests mentioned under 8.1, 8.2, 8.3 and 8.4. Any float failing in one or more of these requirements shall be considered as defective. The lot shall be considered as conforming to the requirements under 8.1, 8.2, 8.3, and 8.4, if the number of defectives found in the sample does not exceed the corresponding acceptance number given in col 3 of Table 3.

Table 3 Scale of Sampling and Permissible Number of Defectives for Leakage and Water Absorption, Deflection, Impact and Boss Tests

Number of Floats in the Lot	Sample Size	Acceptance Number
(1)	(2)	(3)
Up to 150	3	0
151 to 1 200	5	0
1 201 and above	8	0

10 MARKING

10.1 Each float shall be legibly marked with the following information:

- Manufacturer's name or trade-mark,
- Float designation, and
- Batch/lot number.

10.2 BIS Certification Marking

Each float may also be marked with the Standard Mark.

10.2.1 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(Clause 8.1)

TEST FOR LEAKAGE AND WATER ABSORPTION

A-1 APPARATUS

A-1.1 The following apparatus are required:

- a) A vessel having cross-sectional dimensions not less than 50 mm greater in each direction than the widest parts of the float to be tested, and having a depth to contain sufficient water ensuring that for the period of the test the float is covered by at least 50 mm of water.
- b) A means of heating the water in the vessel, and maintaining it at $55 \pm 2^\circ\text{C}$.
- c) A mass capable of being attached to the float under test, and keeping the float at the bottom of the vessel when in water.
- d) A weighing balance with a least amount of 0.05 gm.

water in the vessel at a temperature of $55 \pm 2^\circ\text{C}$, maintaining the water at a height of not less than 50 mm above the top of the float. During the test observe the float for leakage and report. After 100 h of immersion, remove it from water. Clean the float with a piece of dry cloth and allow the surface to dry in air for a few minutes. Weigh it (M_2). The percentage of the water absorption shall be determined as follows:

$$\text{Water absorption, percent} = \frac{M_2 - M_1}{M_1} \times 100$$

where

M_1 = mass of float before immersion,
and

M_2 = mass of float after immersion test.

A-2 PROCEDURE

A-2.1 Weigh the float (M_1) and immerse it in

A-3 ASSESSMENT OF RESULTS

A-3.1 The specimen when tested as above shall meet the requirements given in 8.1.

ANNEX B

(Clause 8.2)

DEFLECTION TEST

B-1 APPARATUS

B-1.1 The following apparatus are required:

- a) A straight sided tank not less than 300 mm deep internally and capable of containing hot water.
- b) A means of heating the water and maintaining its temperature at $55 \pm 2^\circ\text{C}$.
- c) A beam, fixed to the top of the tank and carrying to guide bushes at least 150 mm apart and having their axes in the same vertical line.
- d) A rod at least 10 mm diameter to slide within the bushes.
- e) Rigid mountings for fixing to the rod and supporting:
 - 1) the float to be tested and a counter-balancing float of same size at the lower end of the rod, using the threaded boss as a means of attachment;
 - 2) a dial indicator gauge having its plunger vertical, touching the float to be tested and so positioned that it is directly above the centre of buoyancy of the floats; and

- 3) detachable weights at the top of the rod.

B-2 PROCEDURE

B-2.1 Fill the tank with water and supply the weights so that the floats are almost entirely submerged and the tip of the indicator plunger is 12 ± 3 mm above the surface of the water, as shown in Fig. 1. In order to allow for evaporation, the floats should be 80 mm clear of the tank bottom.

B-2.2 Check that the vertical rod is completely free to slide and, after the lapse of a period of five minutes, set the dial gauge to zero.

B-2.3 Bring the water to a temperature of $55 \pm 2^\circ\text{C}$. Maintain the temperature for 120 ± 2 minutes and then report the deflection indicated by the dial gauge. If the water level falls ensure that the vertical rod moves to keep the floats at a constant depth of immersion.

B-3 ASSESSMENT OF RESULTS

B-3.1 The specimen when tested as above shall meet the requirements given in 8.2.

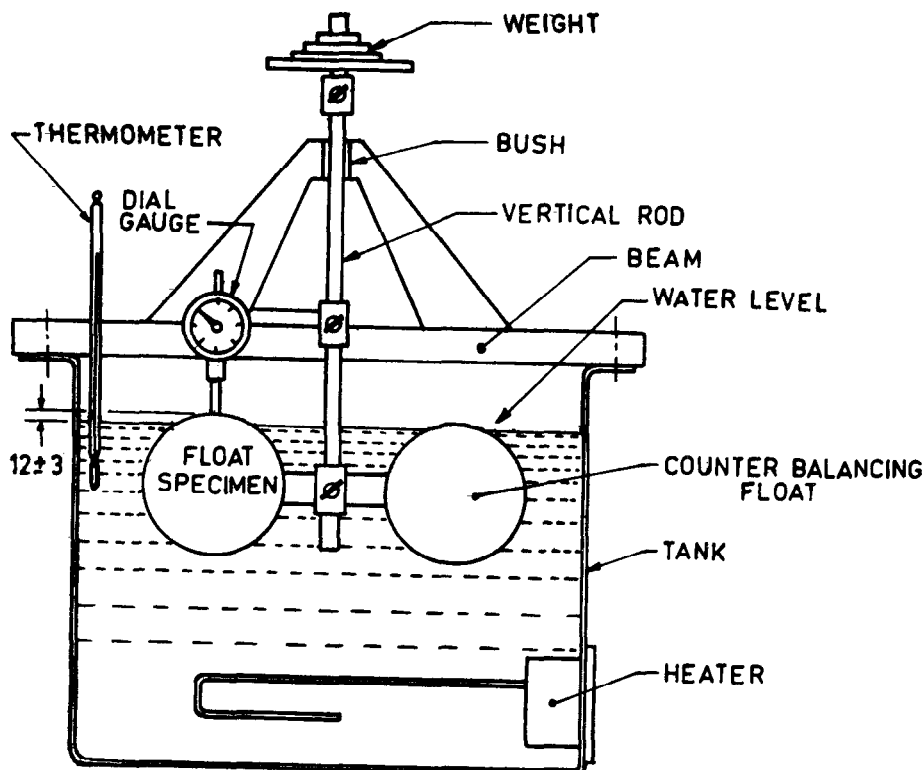


FIG. 1 DEFLECTION TEST ARRANGEMENTS

ANNEX C

(Clause 8.4)

RESISTANCE OF THE BOSS TO DISTORTION

C-1 APPARATUS

C-1.1 The following apparatus are required:

- a) Two clamps capable of holding the loaded float specimen.
- b) Two hexagon-headed bolts having threads of appropriate diameter, a thread length as specified for that diameter in IS 1703 : 1989 and lock nuts similar to that fitted on a lever conforming to IS 1703 : 1989.
- c) A torque spanner capable of imparting a torque of 1.7 Nm or alternatively torque may be applied by a lever system (see Fig. 2 for a typical diagram).
- d) A 10 kg mass.

C-2 PROCEDURE

C-2.1 Torque Test — Clamp the specimen float so that the boss is vertically downwards. Screw in the bolt and apply a torque of 1.7 Nm. Observe and report any damage of the boss.

C-2.2 Pull Out Test — Hang a 10 kg mass coaxially on the bolt (see Fig. 3). After 5 minutes observe and report any further damage of the boss and/or float.

C-3 ASSESSMENT OF RESULTS

C-3.1 The specimen when tested as above shall meet the requirements given in 8.4.

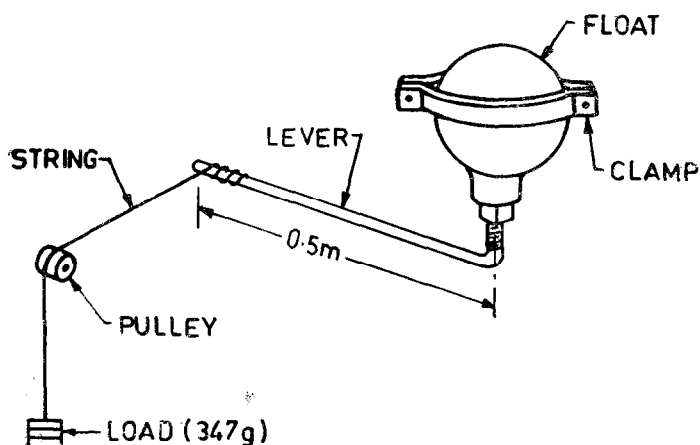


FIG. 2 TYPICAL TORQUE TEST ARRANGEMENT

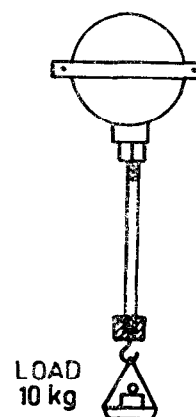


FIG. 3 PULL OUT TEST

ANNEX D

(Foreword)

COMMITTEE COMPOSITION

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