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Indian Standard

SPECIFICATION FOR
FLUSH VALVES AND FITTINGS FOR
WATER CLOSETS AND URINALS

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INDIAN STANDARDS INSTITUTION
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Indian Standard

SPECIFICATION FOR FLUSH VALVES AND FITTINGS FOR WATER CLOSETS AND URINALS

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Indian Standard

SPECIFICATION FOR FLUSH VALVES AND FITTINGS FOR WATER CLOSETS AND URINALS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 February 1981, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Flush valves are used for flushing of water closets, squatting pans and urinals by directly connecting to pressure water pipes. When flush valves are operated, they allow a limited quantity of water for flushing and slowly close automatically. They are normally fixed at one metre height from the flooring of washdown water closets and one metre height from foot rests in the case of squatting pans. This standard has been prepared with a view to laying down the nominal sizes, materials and performance requirements of flush valves.

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.

1. SCOPE

1.1 This standard covers requirements for flush valves, flush pipes and stop valves for water closet and urinals.

2. TERMINOLOGY

2.0 For the purpose of this standard the following definition shall apply.

2.1 Flush Valves — Flush valves are fittings which are directly connected to pressure water pipes. When they are operated, they allow a limited quantity of water through in order to flush water closets and urinals and slowly close automatically.

*Rules for rounding off numerical values (*revised*).

3. MATERIAL

3.1 Materials used for the manufacture of component parts of flush valve shall comply with the requirements given in Table 1.

TABLE 1 MATERIALS FOR FLUSH VALVE, FLUSH PIPE AND STOP VALVE

Sl. No.	COMPONENT	MATERIAL	INDIAN STANDARDS
(1)	(2)	(3)	(4)
i)	Body of flush valve	a) Cast brass b) Die casting brass	Grade 3 of IS : 292-1961* IS : 1264-1965†
ii)	Flush pipe	a) Steel tubes seamless or welded completely protected, inside and outside, either by vitreous enamelling (see IS : 3972-1968†) or hot dip galvanising (see IS : 2629-1966§) b) PVC c) High density polyethylene d) Lead	Designation ' Light Duty ' of IS : 1239 (Part I)-1979 IS : 4985-1981 ' Plumbing '¶ IS : 4984-1978** IS : 40‡ (Part I)-1977††
iii)	Washers	Rubber	IS : 4346-1966‡‡
iv)	Springs	a) Phosphor bronze b) Stainless steel	IS : 7608-1975§§ IS : 4454 (Part IV)-1974
v)	Stop valve	Cast brass	Grade 3 of IS : 292-1961*
vi)	Spindle of stop valve, lever or flush valve	Extruded brass	IS : 319-1974¶¶

*Specification for brass ingots and castings (revised).

†Brass ingots for gravity die castings and brass gravity die castings (including naval brass) (revised).

‡Methods of test for vitreous enamelware.

§Recommended practice for hot-dip galvanising of iron and steel.

||Specification for mild steel tubes, tubulars and other wrought steel fittings: Part I Mild steel tubes (fourth revision).

¶Specification for unplasticized PVC pipes for potable water supplies (first revision).

**Specification for high density polyethylene pipes for potable water supplies, sewage and industrial effluents (second revision).

††Specification for lead pipes: Part I For other than chemical purposes (second revision).

‡‡Specification for washers for water taps for cold water services.

§§Specification for phosphor bronze wires (for general engineering purposes).

||||Specification for steel wires for cold formed springs: Part IV Stainless spring steel wire for normal corrosion resistance (first revision).

¶¶Specification for free-cutting brass bars, rods and sections (third revision).

4. NOMINAL SIZE

4.1 The nominal sizes of the flush valves shall be 15, 25 and 32 mm. Nominal size shall be the nominal bore of the supply pipe to which the valve is connected.

5. MANUFACTURE AND CONSTRUCTION

5.1 The flush valves of nominal sizes, 15, 25 and 32 mm shall have an outlet of 20, 32 and 40 mm outside diameter respectively and shall have threads conforming to IS : 2643 (Part I)-1975*.

5.2 The outlet of the flush valve shall be provided with a brass coupling nut, so that the flush valve may be connected to flushing pipes.

5.3 The flush valve shall be self-closing and non-concussive in action and shall be provided with a push button or lever for operation.

5.4 The stop valve having its principle of operation similar to that of a fancy stop valve shall be connected to the supply line. It shall be connected to the flush valve by a brass coupling.

5.5 Typical sketch of a flush valve is shown in Fig. 1.

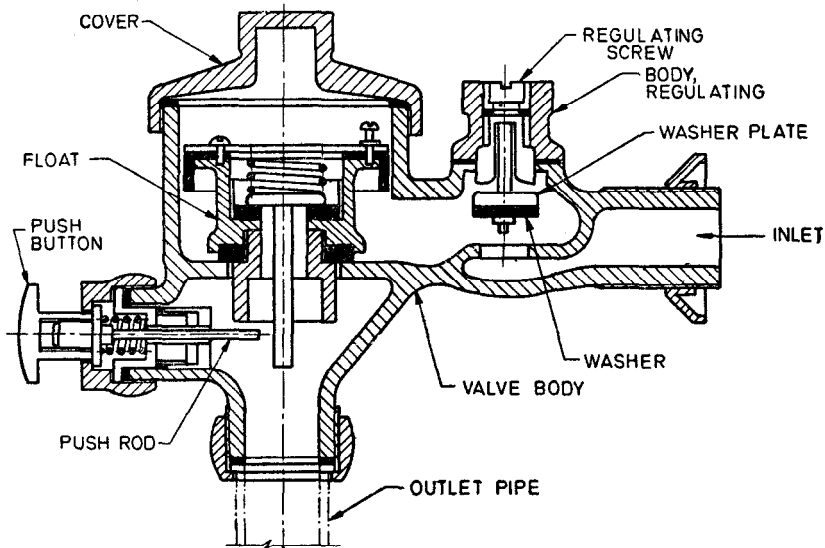


FIG. 1 TYPICAL SKETCH OF A FLUSH VALVE

*Dimensions for pipe threads for fastening purposes: Part I Basic profile and dimensions.

6. PERFORMANCE REQUIREMENTS

6.1 Discharge Capacity — Discharge capacities of flush valves and tolerances of the same shall be as under:

$$\left. \begin{array}{l} 5 \text{ litres} \\ 10 \text{ litres} \end{array} \right\} \pm 0.5 \text{ litre}$$

6.2 Discharge Rate — When tested according to the procedure described in IS : 774-1971* flush valves shall discharge at an average rate of 5 litres with a tolerance of plus 0.5 litre in 3 seconds and there shall be no appreciable change in the force of the flush during the period of discharge.

6.3 Working Pressure — It shall be capable of working under pressure of 0.15 to 0.5 MPa and shall be capable of discharging the full capacity in a single operation.

7. TESTING

7.1 Hydraulic Pressure Test — The flush valve complete with its component parts shall withstand an internally applied hydraulic pressure of 2 MPa maintained for a period of 2 minutes during which it shall neither leak nor sweat.

7.2 Endurance Test — The endurance test shall consist of subjecting the valve to 5 000 operations. It shall then be checked for satisfactory operation without any leakage, clogging or failure of the spring or working parts.

7.2.1 One sample of flush valve picked at random from every batch of 400 or part thereof shall be subjected to endurance test. The endurance test shall be carried out as a type test and shall be conducted whenever there are changes in the design, materials, manufacture and construction (after having tested the selected random sample for conformity to 3, 5, 6.1 and 7.1).

8. FINISH

8.1 The outside of the body shall be polished bright and chromium plated which shall be of quality not less than service grade 3 of IS : 4827-1968†. The plating shall be capable of taking high polish which shall not easily tarnish or scale. For concealed work concealed parts need not be plated.

*Specification for flushing cisterns for water-closets and urinals (valveless siphonic type) (third revision).

†Specification for electroplated coatings of nickel and chromium on copper and copper alloys.

9. SUPPLY CONDITIONS

9.1 The manufacturer shall supply service instructions for maintenance purposes.

10. SAMPLING AND CRITERIA FOR CONFORMITY

10.1 The sampling and criteria for conformity of a lot to the requirements of this specification shall be as per Appendix A.

11. MARKING

11.1 Each flush valve and its component parts shall be clearly and permanently marked with the following:

- a) The manufacturer's name or trade-mark, and
- b) Nominal size of the flush valve.

11.1.1 Each flush valve may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI 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 ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

A P P E N D I X A

(Clause 10.1)

SAMPLING OF FLUSH VALVES FOR WATER CLOSETS AND URINALS

A-1. SAMPLING

A-1.1 Lot — In any consignment all the flush valves of the same nominal size, manufactured from similar materials under essentially uniform conditions of manufacture shall be grouped together to constitute a lot.

A-1.1.1 Samples shall be selected and tested from each lot separately to determine their conformity or otherwise to the requirements of this standard.

A-1.2 The number of flush valves to be selected from a lot for the sample 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 PERMISSIBLE NUMBER OF DEFECTIVES

LOT SIZE	SAMPLE SIZE (NO. OF VALVES TO BE SELECTED FOR THE SAMPLE)	PERMISSIBLE NO. OF DEFECTIVES
(1)	(2)	(3)
Up to 100	5	0
101 ,, 150	8	0
151 ,, 300	13	1
301 ,, 500	20	2
501 ,, 1 000	32	3
1 001 and above	50	5

A-1.3 The valves for the sample shall be selected at random from the lot and to ensure the randomness of selection, procedures given in IS : 4905-1968* may be adopted.

A-2. NUMBER OF TESTS

A-2.1 All the valves selected in the sample shall be inspected for material (*see 3*) and construction (*see 5*) and tested for discharge rate (*see 6.1*) and hydraulic pressure (*see 7.1*).

A-2.1.1 The valves failing to meet any one or more of the requirements tested for in **A-2.1** shall be considered as defective.

A-3. CRITERIA FOR CONFORMITY

A-3.1 A lot shall be considered having satisfied the requirements of this standard only if the number of defectives found in the sample does not exceed the permissible number of defectives given in col 3 of Table 2.

*Methods for random sampling.

(Continued from page 2)

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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pasca	Pa	1 Pa = 1 N/m ²

AMENDMENT NO.1 OCTOBER 1988

TO

IS:9758-1981 SPECIFICATION FOR FLUSH VALVES AND
FITTINGS FOR WATER CLOSETS AND URINALS

[Page 4, Table 1, Sl No. (i), col 4] - Substitute 'Grade LCB2 of IS:292-1983*' for 'Grade 3 of IS:292-1961*' and 'IS:1264-1981†' for 'IS:1264-1965†'.

[Page 4, Table 1, Sl No.(v), col 3 and 4] - Substitute the following for the existing matter:

'a) Cast brass Grade LCB2 of IS:292-1983*

b) Die casting brass IS:1264-1981†'

(Page 4, Table 1, foot-notes with '*' and '†' marks) - Substitute the following for the existing foot-notes:

*Specification for leaded brass ingots and castings (*second revision*).

†Specification for brass gravity die castings ingots and castings (*second revision*).'

(BDC 3)

AMENDMENT NO. 2 SEPTEMBER 1990
TO
IS 9758 : 1981 SPECIFICATION FOR FLUSH
VALVES AND FITTINGS FOR WATER
CLOSETS AND URINALS

[Page 4, Table 1, SI No. (ii) (b), col 4] — Substitute the following for the existing matter:

'IS 4985 : 1988 'Plumbing¶'

[Page 4, Table 1, SI No. (ii) (c) col 4] — Substitute the following for the existing matter:

'IS 4984 : 1987**'

[Page 4, Table 1, SI No. (iii), col 4] — Substitute the following for the existing matter:

IS 4346 : 1982‡‡'

[Page 4, Table 1, SI No. (iv) , col 4] — Substitute the following for the existing matter:

'IS 7608 : 1987§§'

IS 4454 (Part 4) : 1975¶¶¶'

(Page 4, Table 1, foot-notes marked with '¶', '**', '‡‡' and '§§' — Substitute the following for the existing foot-notes:

¶Unplasticized PVC pipes for potable water supply (*second revision*).

**High density polyethylene pipes for potable water supplies, sewage and industrial effluents (*third revision*).

‡‡Washers for water taps for cold water services (*first revision*).

§§Phosphor bronze wires for general engineering purposes (*first revision*).'

[Page 6, clause 6.2, line 2] — Substitute 'IS 774 : 1984*' for 'IS : 774-1971*'

[Page 6, clause 8.1 lines 2 and 3] — Substitute 'IS 4827 : 1983†' for 'IS : 4827-1968†'.

[Page 6, foot-notes] — Substitute the following for the existing foot-notes:

**Flushing cistern for water closets and urinals (other than plastic cisterns) (*fourth revision*).

†Electroplated coatings of nickel and chromium on copper and copper alloys (*first revision*).'

(CED 3)