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Jawaharlal Nehru

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IS 2326 (1987): Automatic Flushing Cisterns for Urinals
(Other than Plastic Cisterns) [CED 3: Sanitary Appliances
and Water Fittings]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR
AUTOMATIC FLUSHING CISTERNS FOR URINALS
(OTHER THAN PLASTIC CISTERNS)
(*Second Revision*)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR AUTOMATIC FLUSHING CISTERNS FOR URINALS (OTHER THAN PLASTIC CISTERNS) (*Second Revision*)

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Indian Standard

SPECIFICATION FOR
AUTOMATIC FLUSHING CISTERNS FOR URINALS
(OTHER THAN PLASTIC CISTERNS)
(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards on 30 June 1987, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Automatic flushing cisterns are generally used for flushing urinals in public places. They are better suited than hand operated flushing cisterns as they do not call for individual attention which would be difficult to achieve in public urinals. Particularly where a battery of urinals is used as in a public lavatory, automatic cisterns are the most convenient arrangement for flushing. The standard covering automatic flushing cistern was first published in 1963 and subsequently revised in 1970. This revision is being issued after reviewing the standard in the light of comments received and improvements made in the manufacture of the automatic cistern. This type of cistern is self-acting and flushes intermittently and the number of flushes per day is controlled by the rate of feed through the supply device. The device may consist of an adjustable plug cock or any other suitable device approved by the local controlling authority. When the supply of water is taken otherwise than by meter, the rate of feed and consequently the time between flushes is a matter of arrangement between the authority and the user.

0.3 In this revision, earthenware specified for cistern has been deleted since glazed earthenware sanitary appliances are outdated and no longer in use. Copper used for siphon in earlier version has been deleted as it is considered uneconomical. Type tests has been added. More details of construction and finish of cistern has been added.

0.4 This standard contains 2.1 which calls for agreement between the purchaser and the supplier.

0.5 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 lays down the materials, nominal sizes, construction, performance requirements and finish for automatic flushing cisterns of the type used for flushing urinals.

1.2 Plastic flushing cisterns are not covered in this standard and for these reference may be made to IS : 7231-1981†.

2. MATERIALS

2.1 Cisterns shall be of cast iron, vitreous china or enamelled pressed steel, complying with the requirements specified in 2.1.1, 2.1.2 and 2.1.3 respectively; or they may be made of any other impervious material agreed to between the purchaser and the supplier. Wooden bodies, either with or without load, copper or any other lining shall not be used.

2.1.1 *Cast Iron* — Cast iron used for the manufacture of cistern shall be of quality not less than Grade FG 150 of IS : 210-1978‡.

2.1.2 *Vitreous China* — Vitreous china used for the manufacture of cisterns shall conform to the requirements specified in IS : 2556 (Part 1)-1974§.

2.1.3 *Enamelled Pressed Steel*

- a) Pressed steel used for the manufacture of cisterns shall conform to IS : 513-1973||.
- b) Vitreous enamelling for the manufacture of cisterns shall conform to IS : 3972-1968¶.

*Rules for rounding off numerical values (revised).

†Plastic flushing cisterns for water closets and urinals (first revision).

‡Specification for grey iron castings (third revision).

§Specification for vitreous sanitary appliances (vitreous china): Part 1 General requirements (second revision).

||Specification for cold rolled carbon steel sheets (second revision).

¶Methods of test for vitreous enamelware.

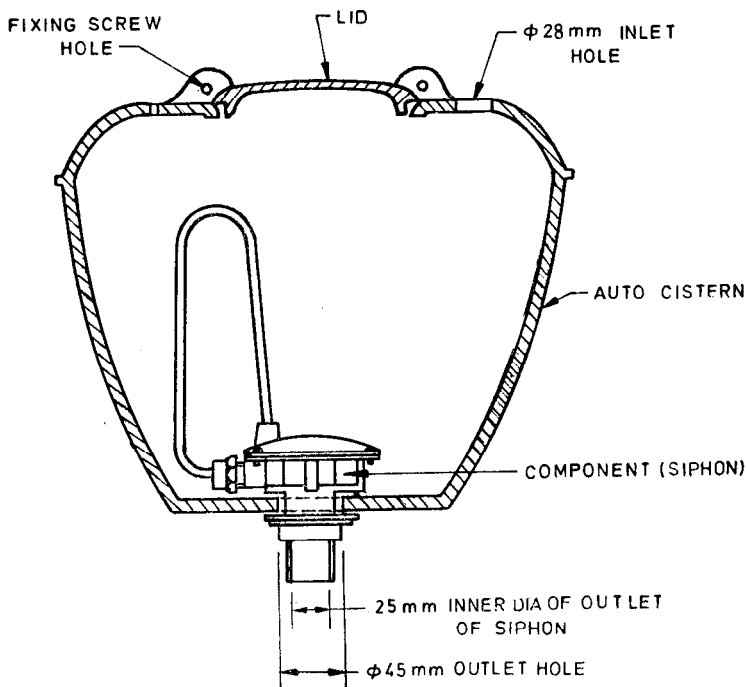
3. NOMINAL SIZE

3.1 Cistern shall be made in nominal sizes of 5 and 10 litres and shall have a discharge capacity equal to the nominal sizes with a tolerance of ± 0.5 litres.

NOTE — The nominal size for any urinal cistern shall be based on a minimum capacity of 2.5 litres per urinal served.

4. CONSTRUCTION

4.1 Illustration of a typical automatic flushing cistern is given in Fig. 1.



NOTE 1 — The shape of the cistern and component parts are only illustrative but dimensions and minimum requirements where specified are binding.

NOTE 2 — Alternatively the inlet may be from the side.

FIG. 1 TYPICAL SKETCH OF AN AUTOMATIC FLUSHING CISTERN

4.2 Cistern — The thickness of the body and the cover shall not be less than 5 and 6 mm for cast iron and vitreous china cisterns respectively. The body of the pressed steel cistern shall be of seamless or welded construction. The thickness of body and cover shall not be less than 1.60 mm and 1.25 mm respectively before coating and shall be porcelain enamelled or otherwise protected against corrosion by equally efficient coating. Cistern shall be free from manufacturing faults and other defects affecting its utility. All working parts shall be designed such that the function of flushing shall be smooth and efficient and all bearing surfaces shall be of corrosion resistant alloy or shall be effectively protected against corrosion. Cistern shall be mosquito-proof; it shall be deemed to be mosquito-proof only when there is no clearance anywhere which would permit a 1.6 mm diameter wire to pass through the cistern. The outlet of each siphon or stand pipe shall be securely connected to the cistern by means of lock nut made of non-ferrous metal, hot-dipped galvanized steel, hot-dipped galvanized malleable iron or any other non-corrosive material. In case of siphon, these shall be provided with suitable means of ensuring and maintaining water-tight and air-tight joint to the cistern. Cistern shall be provided with a removable cover and be secured against displacement.

4.3 Depth of Cistern Body — The depth of the body of cistern shall provide for a clearance of not less than 25 mm between the highest level that can be reached by water before siphonage commences and the spillover level of the top of cistern.

4.4 Siphonic Apparatus

4.4.1 Siphons shall be made of vitreous china, HDPE, LDPE, polypropylene cast iron suitably protected both internally and externally against corrosion or of both smooth finished material which is impervious to liquids, corrosion-resistant and of adequate thickness and rigidity.

4.4.2 Outlet Connection — The nominal diameter of the outlet of the siphon shall not be less than 25 mm for all sizes of cistern (*see* 3.1) and the external threading shall conform to IS : 2643 (Parts 1 to 3)-1975*.

4.5 Lid and Cover — Cisterns shall be provided with mosquito-proof lids.

4.6 Feeding Device — The outlet of the feeding device shall be so located that it is not less than 3 mm above the highest water-level that can be reached by water before siphonage commences.

*Dimensions for pipe threads for fastening purposes.

5. FINISH

5.1 Cast iron cisterns shall be painted inside with suitable anti-corrosive paint and with a protective coating on the outside before delivery. Moulding sand shall be removed from all surface before application of the protective coating. Painting and finishing shall be done in accordance with the recommendations made in IS : 1477 (Part 1)-1971* and IS : 1477 (Part 2)-1971†. Alternatively, cast iron cisterns shall be protected against corrosion by a coating of enamel [see IS : 3972 (Part 1/Sec 1)-1982‡].

6. PERFORMANCE REQUIREMENTS FOR SIPHONS

6.1 All siphons shall be capable of the following:

- a) Delivering not less than 2.5 litres per urinal served at intervals of not less than 10 minutes and not more than 20 minutes. The siphon shall be so constructed that water cannot flow down the flush pipe except while a flush is being properly delivered and there shall be no appreciable decrease in the force of the flush during the discharge of the required quantity of water.
- b) Repeating the regular flushing sequence at intervals specified in 6.1 (a).
- c) Discharging at an average of not less than 5 litres in seven seconds when fitted with a straight open ended flush pipe of 20 mm bore and 900 mm in length. The flush pipe shall be of copper, plastic or any other suitable material and the inside surface shall be even and smooth. The length of the flush pipe used for the test shall be measured from the lower end of the threaded outlet of the siphon, on the underside of the cistern.

7. TESTING

7.1 Endurance Test — A sample of flushing cistern picked at random from production shall be first checked for conformity to the requirements given for materials (see 2), construction (see 4), and operation (see 6) and if it complies with the requirements, it should be operated for 3 000 times. After this test, the cistern and component parts shall not show any damage or defects and all the parts shall be satisfactory, and necessary checks shall be made for this purpose

NOTE — This is a type of test to be carried out by a recognized testing laboratory and shall be conducted whenever there are changes in the design, materials, manufacture and construction.

*Code of practice for painting of ferrous metals in buildings: Part 1 Pretreatment (first revision).

†Code of practice for paint of ferrous metals in buildings: Part 2 Painting (first revision).

‡Methods of test for vitreous enamelware: Part 1 Production of specimens for testing, Section 1 Enamelled sheet steel (first revision).

8. MARKING

8.1 Each cistern shall be marked with the manufacturer's name or trade-mark on the body, either inside or outside as found convenient to the manufacturer. Each cistern may also be marked with the nominal size of the cistern.

8.1.1 Each cistern may also be marked with the Standard Mark. Marking shall be made on the body of the cistern.

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.

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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
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

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Definition</i>
Force	newton	N	$1 \text{ N} = 1 \text{ kg.m/s}^2$
Energy	joule	J	$1 \text{ J} = 1 \text{ N.m}$
Power	watt	W	$1 \text{ W} = 1 \text{ J/s}$
Flux	weber	Wb	$1 \text{ Wb} = 1 \text{ V.s}$
Flux density	tesla	T	$1 \text{ T} = 1 \text{ Wb/m}^2$
Frequency	hertz	Hz	$1 \text{ Hz} = 1 \text{ c/s (s}^{-1}\text{)}$
Electric conductance	siemens	S	$1 \text{ S} = 1 \text{ A/V}$
Electromotive force	volts	V	$1 \text{ V} = 1 \text{ W/A}$
Pressure, stress	pascal	Pa	$1 \text{ Pa} = 1 \text{ N/m}^2$