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Mazdoor Kisan Shakti Sangathan

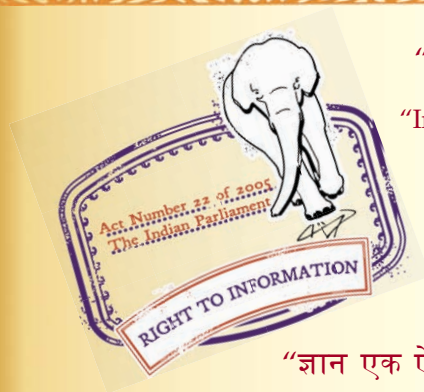
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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 2556-15 (2004): Vitreous Sanitary Appliances (Vitreous China) - , Part 15: Specific Requirements of Universal Water Closets [CED 3: Sanitary Appliances and Water Fittings]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
काँचाभ स्वच्छता साधित्र
(काँचाभ चीनी मिट्टी) — विशिष्टि

भाग 15 यूनिवर्सल जल मूत्रालय आधानों की विशिष्ट अपेक्षाएँ
(दूसरा पुनरीक्षण)

Indian Standard

VITREOUS SANITARY APPLIANCES
(VITREOUS CHINA) — SPECIFICATION

PART 15 SPECIFIC REQUIREMENTS OF UNIVERSAL WATER CLOSETS

(Second Revision)

ICS 91.140.70

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (Part 15) (Second 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 1974. The first revision was issued in 1995. In this revision, load bearing, saw dust and splash test have been included. Other changes, keeping in view the current manufacturing practices in the country, have been made.

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.

AMENDMENT NO. 1 AUGUST 2010
TO
IS 2556 (PART 15) : 2004 VITREOUS SANITARY
APPLIANCES (VITREOUS CHINA) —
SPECIFICATION

PART 15 SPECIFIC REQUIREMENTS OF UNIVERSAL
WATER CLOSETS

(Second Revision)

[*Page 3, Table 2, Sl No. (x), col 2*] — Substitute ‘Radius of free space (to be measured from the centre of the outlet, distance being 40 mm from the end of the outlet), *Min*’ for the existing.

(CED 3)

Reprography Unit, BIS, New Delhi, India

Indian Standard

VITREOUS SANITARY APPLIANCES (VITREOUS CHINA) — SPECIFICATION

PART 15 SPECIFIC REQUIREMENTS OF UNIVERSAL WATER CLOSETS

(*Second Revision*)

1 SCOPE

This standard (Part 15) covers the requirement for patterns, dimensions and tolerances, construction, finish, tests, inspection and marking for universal water closets made of vitreous china.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

| IS No. | Title |
|----------------------|--------------------------------------------------------------------------------------------------------------------------|
| 774 : 1984 | Specification for flushing cistern for water closet and urinals (other than plastic cisterns) (<i>fourth revision</i>) |
| 2556 (Part 1) : 1994 | Specification for vitreous sanitary appliances (vitreous china) : Part 1 General requirements (<i>third revision</i>) |
| 9140 : 1996 | Methods of sampling of vitreous and fire clay sanitary appliances (<i>second revision</i>) |

3 GENERAL REQUIREMENTS

The general requirements relating to materials manufacture, glazing, defects, minimum thickness, tolerances, performance and method of tests as covered in IS 2556 (Part 1) shall be complied with.

4 SIZES

4.1 Universal water closet shall be one of the following sizes:

Size 1 560 mm × 460 mm, 'P' or 'S' trap

Size 2 640 mm × 460 mm, 'P' or 'S' trap

4.2 Universal water closet may also be made in other sizes where so agreed between the manufacturer and the purchaser. However, except for functional dimensions, all other requirements as laid down in this

standard shall be complied with. Depth of water seal shall in no case be less than 50 mm.

5 DIMENSIONS AND TOLERANCES

5.1 The functional dimensions (dimensions other than connecting dimensions) and connecting dimensions (critical for plumbing requirements) shall be as given in Table 1 and Table 2 respectively, read with Fig. 1A and Fig. 1B respectively.

5.2 Where tolerances are not given for any specific dimensions these shall conform to IS 2556 (Part 1).

6 CONSTRUCTION

6.1 Universal water closets with 'P' trap shall be manufactured in one piece. However, 'S' trap universal water closets may be made in one or two pieces. Each closet shall be provided with not less than four fixing holes having a minimum diameter of 6.5 mm and shall have an integral-flushing rim of suitable type. The flushing rim shall be box type with adequate number of holes to satisfy the requirements of flushing tests give in 8.2 to 8.5. It shall also have an inlet or supplies horn for connecting the flush pipe. The inlet shall be of the self-draining type and a weep-hole shall be provided at the flushing inlet of the closet.

6.2 Where required by the sanitation authority having jurisdiction over the area of installation, each universal closet shall have an antisiphonage vent horn on the outlet side of the trap with dimensions conforming to Fig. 2, either on right or left hand as specified, set at an angle of 45° and with invert of vent horn not below the centre line of the outlet. In case of 'S' traps, the antisiphonage vent horn at centre position as an alternate to left or right hand positions, is permitted.

6.3 'S'-trap should be provided in one or two pieces. Where made in two pieces, the bend shall conform to the dimensions of Table 3 read with Fig. 3.

7 FINISH

The inside surface of water closets and traps shall be glazed uniform and smooth in order to ensure an efficient flush. The grooved part of the outlet of the closets and that of the bends where provided shall not be glazed.

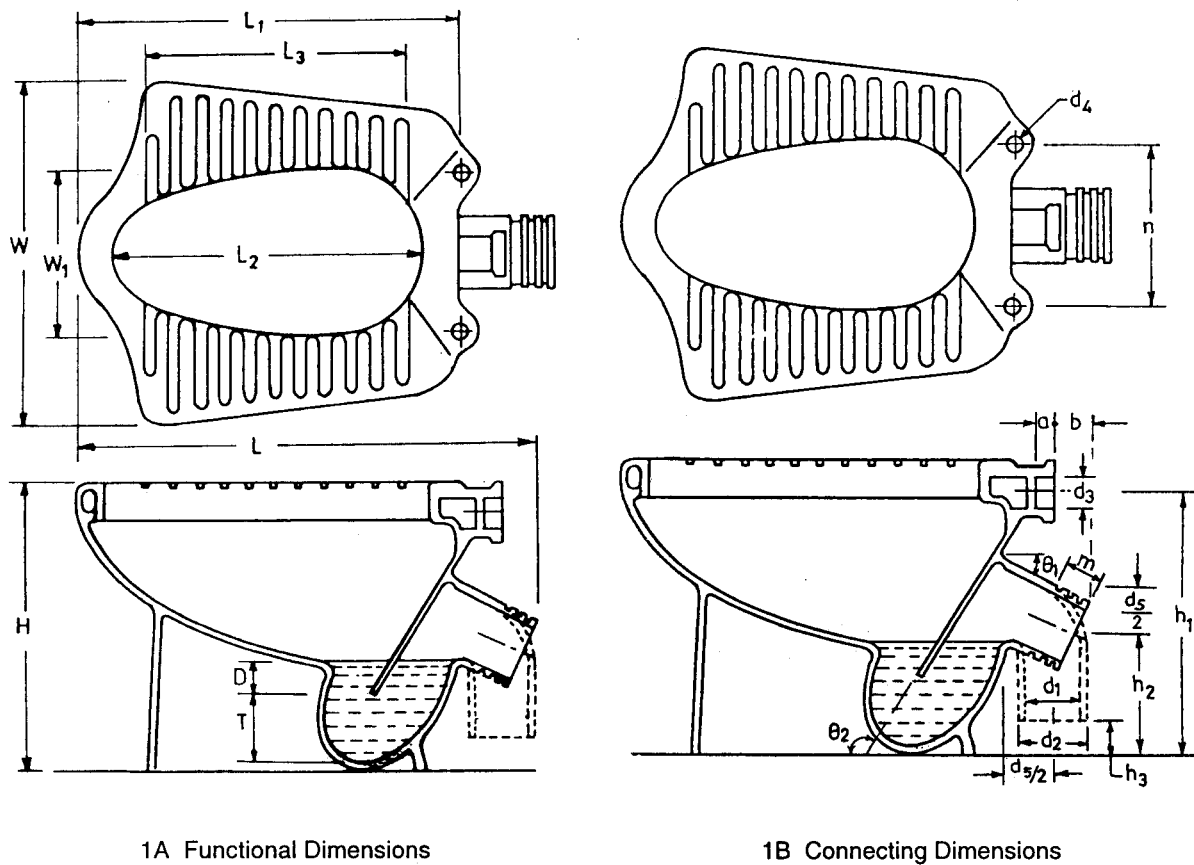


FIG. 1 UNIVERSAL WATER CLOSET

Table 1 Functional Dimensions
(Clause 5.1)

All dimensions in millimetres.

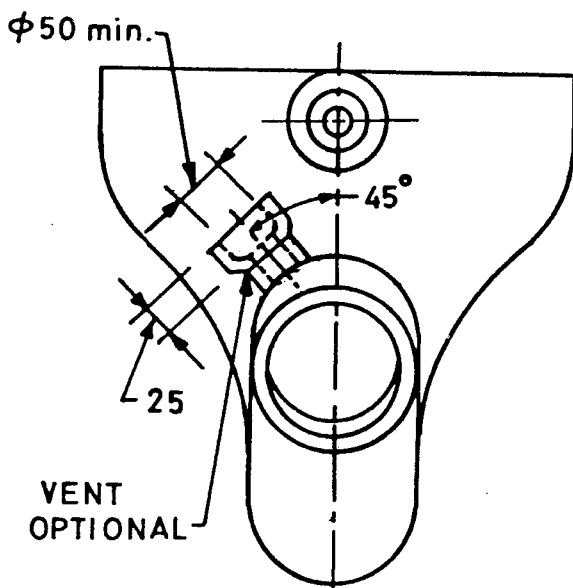
| Sl No. | Description | Ref in Fig. 1A | Size 1 | Size 2 |
|--------|------------------------------------------------------|----------------|--------|--------|
| (1) | (2) | (3) | (4) | (5) |
| i) | Overall length | L | 570 | 650 |
| ii) | Width of closet | W | 460 | 460 |
| iii) | Height | H | 380 | 380 |
| iv) | Width of opening | W_1 | 220 | 220 |
| v) | Length of opening | L_2 | 370 | 370 |
| vi) | Length of seat (bolt hole centre to front of closet) | L_1 | 450 | 530 |
| vii) | Length of footrest, <i>Min</i> | L_3 | 260 | 330 |
| viii) | Trap inlet depth, <i>Min</i> | T | 75 | 75 |
| ix) | Depth of water seal, <i>Min</i> | D | 50 | 50 |

Table 2 Connecting Dimensions

(Clause 5.1)

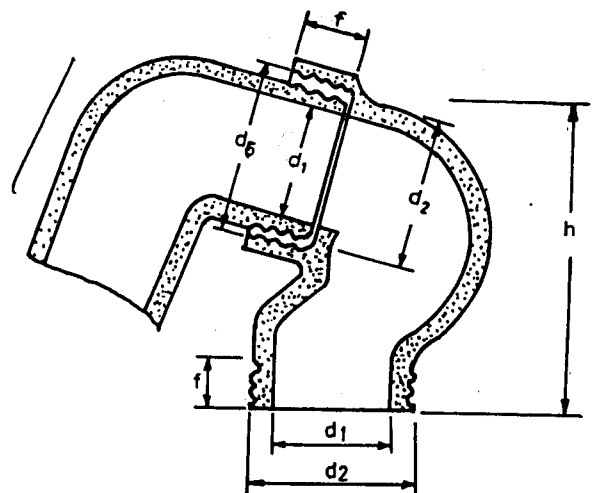
All dimensions in millimetres.

| Sl No. | Description | Ref in Fig. 1B | Size 1 | Size 2 |
|--------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|-------------------|
| (1) | (2) | (3) | (4) | (5) |
| i) | Height of centre line of inlet from floor level, <i>Min</i> | h_1 | 310 | 310 |
| ii) | Height of centre line of outlet from floor (for 'P' trap only) | h_2 | 180^{+15}_{-10} | 180^{+15}_{-10} |
| iii) | Distance from outlet end to floor (for 'S' trap only) | h_3 | 20 ± 5 | 20 ± 5 |
| iv) | Internal diameter of outlet ¹⁾ , <i>Min</i> | d_1 | 80 | 80 |
| v) | External diameter of outlet ¹⁾ | d_2 | 102 ± 5 | 102 ± 5 |
| vi) | Internal diameter of flush inlet socket ²⁾ | d_3 | 50 ± 3 | 50 ± 3 |
| vii) | Depth of flush inlet socket, <i>Min</i> | A | 25 | 25 |
| viii) | Distance from end of flush inlet socket to outside of outlet, <i>Min</i> | B | 45 | 45 |
| ix) | Diameter of seat bolt | d_4 | 15 ± 2 | 15 ± 2 |
| x) | Radius of free space (to be measured from the centre of the outlet, distance being 40 mm, <i>Min</i> from the end of the outlet) | $\frac{d_5}{2}$ | 75 | 75 |
| xi) | Distance between centres of seat bolt holes | n | 165^{+10}_{-5} | 165^{+10}_{-5} |
| xii) | Length of grooved part of outlet, <i>Min</i> | M | 40 | 40 |
| xiii) | Angle of the outlet of P trap with the vertical plane | θ_1 | 104° | 104° |
| xiv) | Slope of the back plate | θ_2 | 125° | 125° |

¹⁾ Ovality is permissible within the dimensions allowed for the internal and external diameters.²⁾ Ovality is permissible within the variation allowed for the dimension.

All dimensions in millimetres.

FIG. 2 ANTISIPHONAGE VENT HORN



All dimensions in millimetres.

FIG. 3 TYPICAL DETAILS OF SEPARATE BEND

Table 3 Dimensions of Two Piece Bend
(Clause 6.3)

All dimensions in millimetres.

| Sl No. | Description | Ref in Fig. 1B | Dimensions |
|--------|-------------------------------------------------|----------------|-------------|
| (1) | (2) | (3) | (4) |
| i) | Internal diameter of outlet ¹⁾ , Min | d_1 | 80 |
| ii) | External diameter of outlet | d_2 | 102 ± 5 |
| iii) | Internal diameter of inlet socket | d_6 | 115 |
| iv) | Depth of inlet socket, Min | f | 40 |
| v) | Height of bend | h | 207 |

¹⁾ Ovality is permissible within the dimension allowed for the internal and external diameter.

8 FLUSHING TESTS

8.1 Universal water closets shall satisfy the requirements of the flushing test given under 8.1, 8.2, 8.3, 8.4, 8.5, 8.6 and 8.7. The tests shall be conducted by connecting the closet to a low-level cistern conforming to IS 774. A cistern shall be fixed such that the height between the top of the closet and the bottom of the cistern shall be 30 cm and the closet shall be connected to the cistern by 40 mm nominal diameter flush pipe. These tests shall be carried out by using the flushing cistern of the capacity for which the appliance is to be used.

8.2 Toilet Paper Test

The closet shall be filled with water to its normal water seal level and charged with six pieces of usual toilet paper or polyethylene sheet of 0.05 mm thickness, approximately 150 mm × 115 mm in size and loosely crumpled. It shall then be flushed. This test shall be repeated four times and the pan shall discharge the full charge of paper at least three out of the four times.

8.3 Smudge Test

The whole of the interior surface of the closet to 40 mm below the flushing rim shall be smudged with quartz powder of contrasting colour passing through 1.18 mm IS sieve and shall then be flushed, carefully observing the surface of the closet during the flushing. Immediately, after the flushing, there shall be no smudge left on the bowl.

8.4 Holding Capacity Test

The closet, when sealed at the outlet and vent (if provided) shall be capable of holding not less than 10 litres of water between the normal water level and the highest possible water level of the closet as installed.

8.5 Ball Test

8.5.1 Single Ball Test

The ball shall be made of non-absorbent material. The relative density of the ball shall be between 1.075 and 1.080. The diameter of the ball shall be 43 ± 0.5 mm. Place the ball into the closet to be tested and then flush the closet. The ball shall be discharged in the normal manner.

8.5.2 Fifty Ball Test

Fifty balls of non-absorbent material, having a mass each of 3.7 ± 0.1 g, and a diameter of 20 ± 0.1 mm shall be dropped into the water closet bowl and flushed. Repeat the test five times. A minimum of 85 percent of all balls should be flushed out in the five tests.

8.6 Saw Dust Test

8.6.1 Specification of the Saw Dust

20 g of dry saw dust test sifted through 2 mm sieve.

8.6.2 Procedure

Set up the WC, cistern of flush valve and flush pipe (if required) as specified by the manufacturer. Charge the WC with water to its designed water seal level. Fully wet the entire internal surface of the WC below the rim. Sprinkle 20 g of fine dry saw dust of above specification on the inside of the WC between the normal water level and the flushing rim as completely and evenly as possible. Then flush the WC.

The sprinkle saw dust should be cleaned below 40 mm of rim of WC.

8.7 Splash Test

8.7.1 Procedure

Set up WC, cistern of flush valve and flush pipe (if required) as specified by the manufacturer. Charge the WC with coloured water to its design water seal level. Ensure that the floor area is cleaned and dry where the splash tests to be carried out. Activate the flush valve or cistern to discharge the WC. Observe and record whether flushing water splashed over rim onto the floor. Isolated droplets up to 10 Nos. shall not be the cause for rejection.

9 Load Bearing Test

WC shall be fixed in a stable arrangement on the floor with proper screw. A load of 400^{+5}_{-0} kg or a force of $4^{+0.05}_{-0}$ kN shall be applied for period of 1h by placing it on a wooden beam with a cross section of 100 mm × 100 mm positioned across the centre of the opening of the top surface of the WC.

There shall be no damage or defect that shall occur to the WC.

10 SAMPLING PROCESS, INSPECTION AND LOT INSPECTION

The recommended method of sampling, process inspection and lot inspection shall be as given in IS 9140.

11 MARKING

11.1 Each closet shall be clearly and indelibly marked at a suitable place with the following:

- a) Name or trade-mark of the manufacturer, and

- b) Batch/lot number.

11.2 BIS Certification Marking

11.2.1 The product may also be marked with the Standard Mark.

11.2.2 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. 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.

Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. CED 3 (7004).

Amendments Issued Since Publication

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