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Jawaharlal Nehru
“Step Out From the Old to the New”


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Bhartrhari—Nitisatakam
“Knowledge is such a treasure which cannot be stolen”
Indian Standard

VITREOUS SANITARY APPLIANCES
(VITREOUS CHINA) — SPECIFICATION

PART 8 SPECIFIC REQUIREMENTS OF PEDESTAL CLOSE COUPLED
WASHDOWN AND SYPHONIC WATER CLOSETS

(Fifth Revision)
FOREWORD

This Indian Standard (Part 8) (Fifth 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 on 1963. The first, second, third and fourth revisions were issued in 1967, 1973, 1981 and 1995 respectively. 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.
Indian Standard

VITREOUS SANITARY APPLIANCES
(VITREOUS CHINA) — SPECIFICATION

PART 8 SPECIFIC REQUIREMENTS OF PEDESTAL CLOSE COUPLED
WASHDOWN AND SYPHONIC WATER CLOSETS

(Fifth Revision)

1 SCOPE

This standard (Part 8) lays down the requirements for patterns, construction, dimensions and tolerances, finish, inspection and marking of pedestal water closets with close-coupled cisterns, both syphonic and washdown type including water saving types made of vitreous china.

2 REFERENCES

The Indian Standards given below 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 given below:

<table>
<thead>
<tr>
<th>IS No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>774 : 1984</td>
<td>Specification for flushing cistern for water closets and urinals (other than plastic cistern) (fifth revision)</td>
</tr>
<tr>
<td>2556</td>
<td>Vitreous sanitary appliances (vitreous china) — Specification (Part 1) : 1994 General requirements (third revision)</td>
</tr>
<tr>
<td>7231 : 1994</td>
<td>Specification for plastic flushing cistern for water closets and urinals (second revision)</td>
</tr>
<tr>
<td>9140 : 1996</td>
<td>Method of sampling of vitreous and fire clay sanitary appliances (second revision)</td>
</tr>
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</table>

3 GENERAL REQUIREMENTS

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

4 PATTERNS

4.1 The pedestal closet with close-coupled cisterns shall be one of the following patterns:

a) Pattern 1 — Double trap syphonic pattern with ‘S’ trap or ‘P’ trap (see Fig. 1A and Fig. 1B)

b) Pattern 2 — Single trap syphonic pattern with ‘S’ trap or ‘P’ trap (see Fig. 1A and Fig. 1B)

c) Pattern 3 — Washdown pattern with ‘P’ trap or ‘S’ trap (see Fig. 2A and Fig. 2B) or concealed ‘S’ trap (see Fig. 3A and Fig. 3B)

d) Pattern 4 — Washdown pattern with horizontal outlet (see Fig. 4A and Fig. 4B)

4.1.1 The closets may also be made in other patterns where so agreed to between the manufacturer and the purchaser. However, except for functional dimensions, all other requirements as laid down in this standard shall be complied with.

4.2 The outline of the appliances represented by the figures is given for a better comprehension of the designs. The water surface area and trap ways for syphonic type closets (see Fig. 1A) are not shown on the figure and it is left to the discretion of the manufacturer to design the water surface area and trap ways suitably so that the flushing requirements and the minimum specified depth of water seal be maintained.

4.3 The closet for water saving system shall be of wash-down pattern with ‘P’ trap or ‘S’ trap or concealed ‘S’ trap as per Fig. 2 and Fig. 3. The water surface area shall not be less than 100 mm x 90 mm and trap ways shall be suitably designed to meet the flushing requirements and the minimum specified depth of water seal.

5 CONSTRUCTION

5.1 Water closets, shall be of one piece construction. Each water closet shall be provided with not less than two floor fixing holes having a minimum diameter of 6.5 mm. Alternatively, suitable provisions for fixing to the floor shall be made. Each water closet shall have an integral flushing rim of suitable type. The flushing rim and the inlet shall be of self-draining type and weep-
FIG. 1 SYMPHONIC WATER CLOSET — SINGLE OR DOUBLE TRAP PATTERN

All dimensions in millimetres.

FIG. 2 WASHDOWN WATER CLOSET FOR CLOSE COUPLED SUITE, P OR S-TRAP

All dimensions in millimetres.
hole shall be provided at the flushing inlet of the water closet.

5.2 Each water closet shall have an integral trap with either 'S' or 'P' outlet conforming to Fig. 1 or Fig. 2 or concealed 'S' trap conforming to Fig. 3 or horizontal outlet conforming to Fig. 4 as specified.

5.3 Suitable provision shall be made for connecting a flushing cistern at the back of the closet and on top of the inlet using a suitable (resilient) gasket to make the system leak proof. To ensure the stability of the seat with its cover in the upright position, it is recommended that the cistern and its lid be entirely below plane aa' passing through the centre of the fixing holes of the seat and making an angle of not less than 8° with the vertical axes of the holes (see Fig. 5).

5.4 Special connectors are required to connect the horizontal outlet of Pattern 4 water closet, to the drainage system. These shall be supplied by the manufacturer of water closet. The straight part of the outlet for Pattern 4 water closet (see Fig. 4B) shall be without grooves.

6 DIMENSIONS AND TOLERANCES

6.1 The functional dimensions (dimensions other than connecting dimension) and connecting dimensions (critical for plumbing requirements), shall be as given in Table 1 and Table 2 respectively.

6.2 Tolerances

Where tolerances are not given for specific dimensions, these shall be as laid down in IS 2556 (Part 1).

7 FINISH

Inside surface of water closet and trap shall be glazed uniform and smooth in order to ensure an efficient flush. In case of Pattern 4 the outlet shall not have any groove serration and outside of the outlet shall be glazed.

8 FLUSHING CISTERNs FOR WATER CLOSETS

The flushing cistern shall be of low level coupled type and shall conform to the requirements specified in IS 774 or IS 7231 except that it will be permissible to have the inlet and the overflow from the bottom of the
4A Functional Dimensions

4B Connecting Dimensions

All dimensions in millimetres.

FIG. 4 HORIZONTAL OUTLET WC FOR CLOSE COUPLED SUITE

FIG. 5 SEAT FIXING ANGLE
Table 1 Functional Dimensions
(Clause 6.1)

All dimensions in millimetres.

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Description</th>
<th>Ref in Figures</th>
<th>Syphonic P or S Outlet (Fig. 1A)</th>
<th>Washdown P or S Outlet (Fig. 2A and Fig. 3A)</th>
<th>Washdown Horizontal Outlet (Fig. 4A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
</tr>
<tr>
<td>i)</td>
<td>Pattern No.</td>
<td>–</td>
<td>1 and 2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>ii)</td>
<td>Height</td>
<td>$H$</td>
<td>$390 \pm 10$</td>
<td>$390 \pm 10$</td>
<td>$390 \pm 10$</td>
</tr>
<tr>
<td>iii)</td>
<td>Width</td>
<td>$W$</td>
<td>$360 \pm 10$</td>
<td>$360 \pm 10$</td>
<td>$360 \pm 10$</td>
</tr>
<tr>
<td>iv)</td>
<td>Depth of water seal</td>
<td>$D_1$</td>
<td>$50 \text{ Min}$</td>
<td>$50 \text{ Min}$</td>
<td>$50 \text{ Min}$</td>
</tr>
<tr>
<td>v)</td>
<td>Water surface dimension;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>Back to front</td>
<td>$W_1$</td>
<td>–</td>
<td>$150 \text{ Min}$</td>
<td>$150 \text{ Min}$</td>
</tr>
<tr>
<td>b)</td>
<td>Side to side</td>
<td>$W_2$</td>
<td>–</td>
<td>$110 \text{ Min}$</td>
<td>$110 \text{ Min}$</td>
</tr>
<tr>
<td>vi)</td>
<td>Distance from centre line of seal bolt holes to front of WC</td>
<td>$D_2$</td>
<td>$415$ to $445$</td>
<td>$415$ to $445$</td>
<td>$415$ to $445$</td>
</tr>
<tr>
<td>vii)</td>
<td>Length of opening</td>
<td>$P$</td>
<td>$290 \text{ Min}$</td>
<td>$290 \text{ Min}$</td>
<td>$290 \text{ Min}$</td>
</tr>
<tr>
<td>viii)</td>
<td>Width of opening</td>
<td>$Q$</td>
<td>$240 \text{ Min}$</td>
<td>$240 \text{ Min}$</td>
<td>$240 \text{ Min}$</td>
</tr>
<tr>
<td>ix)</td>
<td>Distance between a vertical line from tip of back plate to inside face of flush rim at back</td>
<td>$D_3$</td>
<td>–</td>
<td>$70 \text{ Max}$</td>
<td>$70 \text{ Max}$</td>
</tr>
<tr>
<td>x)</td>
<td>Distance from centre of seat bolt hole to inside face to flush ram at back</td>
<td>$D_4$</td>
<td>$80 \text{ Max}$</td>
<td>$80 \text{ Max}$</td>
<td>$80 \text{ Max}$</td>
</tr>
<tr>
<td>xi)</td>
<td>Trap inlet depth</td>
<td>$T$</td>
<td>–</td>
<td>$75 \text{ Min}$</td>
<td>$75 \text{ Min}$</td>
</tr>
</tbody>
</table>

cistern, where required and no separate flush pipe is necessary. Discharge rate test shall not be applicable for all patterns covered in this standard.

9 FLUSHING TEST

The water closet shall satisfy the requirements of tests give in 9.1, 9.2, 9.3, 9.4, 9.5 and 9.6 when fixed to flushing cistern in the normal working position. These tests shall be conducted by connecting the water closet to a low-level coupled cistern conforming to IS 774 or IS 7231. These tests shall be carried out by using the flushing cistern of the capacity for which the appliance is to be used.

9.1 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 crumbled. It shall then be flushed. This test shall be repeated four times and the pan shall discharge the full charge of paper at least thrice out of four times.

9.2 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 or the closet during the flushing. Immediately after the flushing, there shall be no smudge left on the bowl.

9.3 Holding Capacity Test

The closet when sealed at the bottom of the trap in line with the back plate, shall be capable of holding not less than 10 l of water between the normal water level and the highest possible water level of the closet as installed.

9.4 Ball Test

9.4.1 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.

9.4.2 Fifty Ball Test

Fifty balls of non-absorbent material, having a mass
Table 2 Connecting Dimensions
(Clause 6.1)

All dimensions in millimetres.

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Description</th>
<th>Ref in Figures</th>
<th>Syphonie, P or S Outlet</th>
<th>Washdown P or S Outlet (Fig. 2B)</th>
<th>Washdown Concealed S-trap (Fig. 4B)</th>
<th>Washdown, Horizontal Outlet (Fig. 4B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i)</td>
<td>Internal diameter of outlet†</td>
<td>(3)</td>
<td>d₁</td>
<td>80 Min</td>
<td>80 Min</td>
<td>80 Min</td>
</tr>
<tr>
<td>ii)</td>
<td>External diameter of outlet†</td>
<td>(4)</td>
<td>d₂</td>
<td>102 ± 5</td>
<td>102 ± 5</td>
<td>102 ± 5</td>
</tr>
<tr>
<td>iii)</td>
<td>Height of centre line of outlet from floor level for P-trap only</td>
<td>(5)</td>
<td>h₁</td>
<td>180 ± 10</td>
<td>180 ± 10</td>
<td>180 ± 10</td>
</tr>
<tr>
<td>iv)</td>
<td>Distance from end of trap to floor for S-trap only</td>
<td>(6)</td>
<td>h₂</td>
<td>20 ± 5</td>
<td>20 ± 5</td>
<td>-</td>
</tr>
<tr>
<td>v)</td>
<td>Length of grooved part of outlet</td>
<td>(7)</td>
<td>l</td>
<td>40 Min</td>
<td>40 Min</td>
<td>-</td>
</tr>
<tr>
<td>vi)</td>
<td>Distance between centre of seat bolt holes</td>
<td>(8)</td>
<td>n</td>
<td>160 to 175</td>
<td>160 to 175</td>
<td>160 to 175</td>
</tr>
<tr>
<td>vii)</td>
<td>Diameter of seat bolt holes</td>
<td>(9)</td>
<td>d₃</td>
<td>15 ± 2</td>
<td>15 ± 2</td>
<td>15 ± 2</td>
</tr>
<tr>
<td>viii)</td>
<td>Distance between back of cistern and outside of the outlet for P-trap or centre line of outlet of S-trap</td>
<td>(10)</td>
<td>g₁</td>
<td>70 Min</td>
<td>70 Min</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix)</td>
<td>Radius of free space (to be measured from the centre of the outlet, distance being 40 mm, Min from the end of the outlet)</td>
<td>(11)</td>
<td>d₄/2</td>
<td>75</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>x)</td>
<td>Angle of outlet</td>
<td>(12)</td>
<td>θ</td>
<td>104°</td>
<td>104°</td>
<td>-</td>
</tr>
<tr>
<td>xi)</td>
<td>Length of straight part of outlet glazed and without groove</td>
<td>(13)</td>
<td>h₂</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>xii)</td>
<td>Distance between end of outlet and floor</td>
<td>(14)</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>10 Min</td>
</tr>
<tr>
<td>xiii)</td>
<td>Length of extended outlet into the floor</td>
<td>(15)</td>
<td>X₁</td>
<td>-</td>
<td>-</td>
<td>32 ± 5</td>
</tr>
<tr>
<td>xiv)</td>
<td>Length of outlet with groove</td>
<td>(16)</td>
<td>Y</td>
<td>-</td>
<td>40 Min</td>
<td>40 Min</td>
</tr>
</tbody>
</table>

† Ovality permissible within the dimensions allowed for the internal and external diameters.

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.

9.5 Saw Dust Test
9.5.1 Specification of the Saw Dust
20 g of dry saw dust test sifted through 2 mm sieve.
9.5.2 Procedure
Set up the WC, cistern of flush valve and flush pipe (if required) as specified by the manufacturer. Charge the WC with coloured 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 sprinkled saw dust should be cleaned below 40 mm of rim of WC.

9.6 Splash Test
9.6.1 Procedure
Set up the 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.

10 LOAD BEARING TEST

WC shall be fixed in a stable arrangement on the floor with proper screw. A load of $400 \pm 5$ kg or a force of $4 \pm 0.5$ kN shall be applied for a period of one hour by placing it on a wooden beam with a cross section of $100 \times 100$ 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.

11 SAMPLING, PROCESS INSPECTION AND LOT INSPECTION

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

12 MARKING

12.1 Each water 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.

12.2 BIS Certification Marking

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

12.2.2 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.
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Amendments Issued Since Publication

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