

**Draft Sri Lanka Standard
WC SEATS AND SEAT COVERS**

SLS XXXX: 202x

**SRI LANKA STANDARDS INSTITUTION
No, 17, Victoria Place,
Elvitigala Mawatha,
Colombo 8,
SRI LANKA**

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Draft Sri Lanka Standard
WC SEATS AND SEAT COVERS (FLAPS)

FOREWORD

This standard was approved by the Sectoral Committee on Building and Construction Materials and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2021-XX-XX.

The objective of this standard is to provide designers, manufacturers and testing laboratories with requirements and tests for WC Seats and seat covers made of plastic and stainless steel materials for use with WC Pans complying with SLS XXXX, WC Pans and Suites with Integral trap.

This document has been prepared in response to request made by National Water Supply & Drainage Board as a part of their national programme on water conservation and introduction of quality water fittings to the market by regulation measures which implement under the directive and guidance of Public Utility Commission of Sri Lanka and Ministry of Water Supply.

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 an analysis, shall be rounded off in accordance with SLS 102. The number of significant figures retained in the rounded off value shall be the same as that of the specified value in this standard.

In the preparation of this standard the assistance derived from the publications of the European Committee for Standardization (CEN) is gratefully acknowledged.

1. SCOPE

This standard, specifies constructional and performance requirements together with test methods for seat and seat cover (flap) made of plastic and stainless steel materials for use of WC pans covered by the standard SLS xxxx.

2. REFERENCES

AS 1371	-Toilet seats and Fittings
BS 1254	-Specification for WC seats (plastics)
SLS 102	- Rules for rounding off numerical values
SLS XXXX	-WC pans and WC suites with integral trap
SLS XXXX	- WC and urinal flushing cisterns
SLS ASTM A240M	-Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

3.DEFINITIONS

For the purpose of this standard, the following definitions shall apply:

3.1 Aperture: Open area of the seat (inner circle)

3.2 blister: Raised defects on the surface due to trapped gases.

3.3 blooming: The appearance caused by the deposits on the surface of any impurities to the surface of the seat and seat cover.

3.4 bumper: The protruding portion of the seat which has the cushioning function. It may be a single connecting piece or an integrally moulded piece.

3.5 chipped areas: More than two surface damages ≥ 0.4 mm.

3.6 Corrugation: POLYMER defects -search

3.8 moulding irregularity: Any visible defects associated with moulding, such as corrugations, dome, missing material, flash or dents. Weld marks and sprues are not considered to be moulding irregularity.

3.9 outlier: An outlier is an observation (measurement) that lies an abnormal distance from other values in a random sample from a population.

3.10 parting line: A visible line formed by a separate mould in the process of injection moulding or mould pressing.

3.11 pinhole: A small hole on the surface that does not exceed 0.4 mm in diameter.

3.12 pit: A small cavity of approximately equal width and depth on the surface.

3.13 speck: The different colour at surface which is generated by the foreign particles, the maximum size of the speck is 0.7 mm. It does not include specks or mixed specks that produce a decorative pattern on the surface.

3.14 splinters: The non-smooth broken pieces on the splitting surface.

3.15 stain: The non-uniform surface colour.

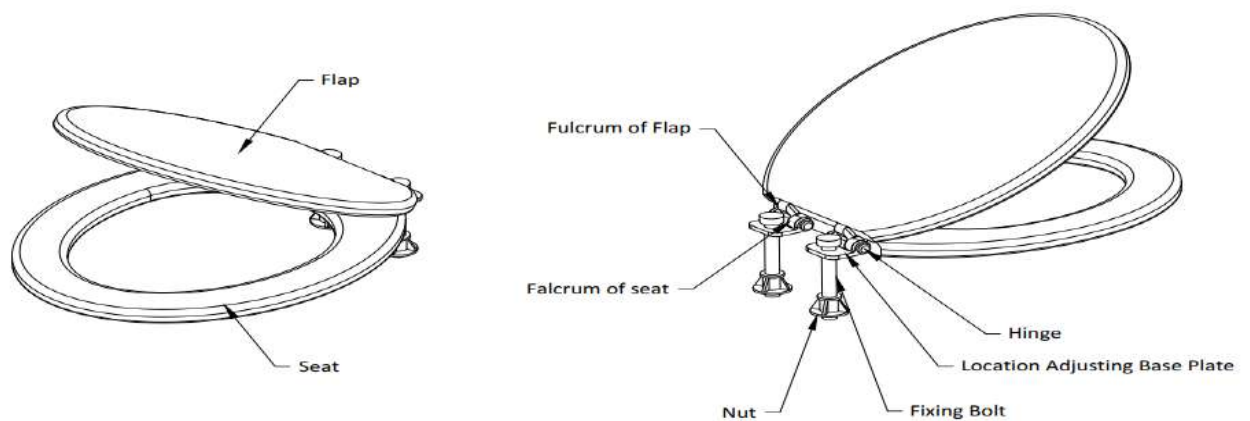
3.16 surface porosity: The holes on the surface which do not penetrate the base material.

4 CLASSIFICATION

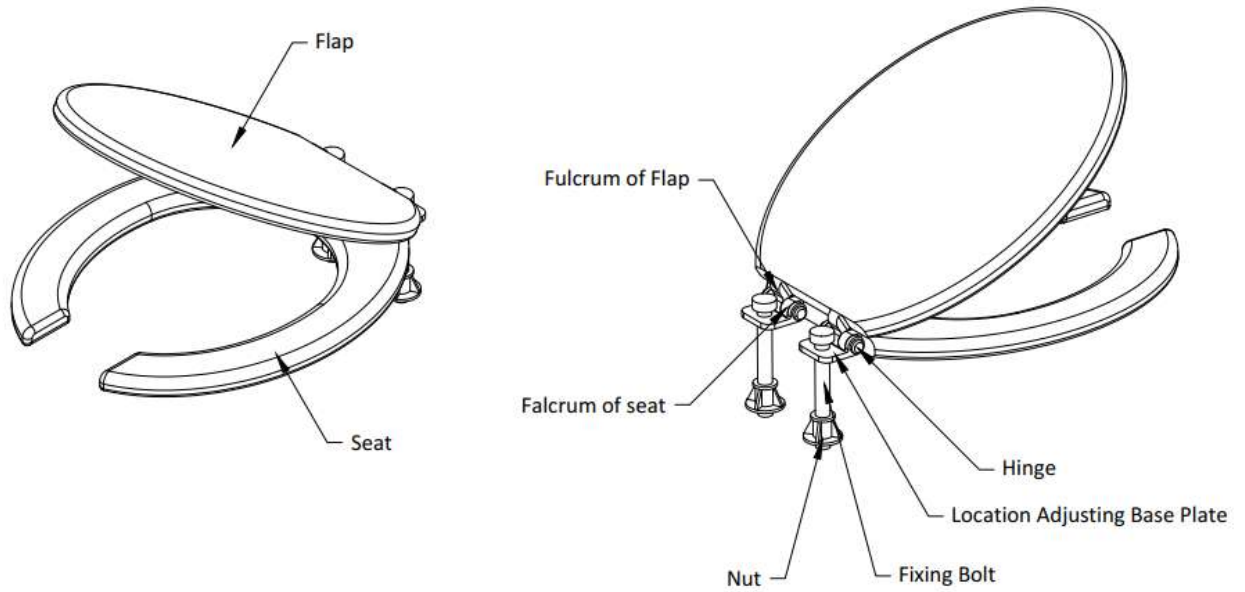
WC seats and seat covers are classified as described below:

4.1 In accordance with the material, it is divided into plastic and stainless steel.

4.2 In accordance with the configuration or shape of seat, it is divided into Full Round type and Front open type.



(a) Full round type seat



(b) Front open type seat

FIGURE 1 — Seat and seat cover of WC pans

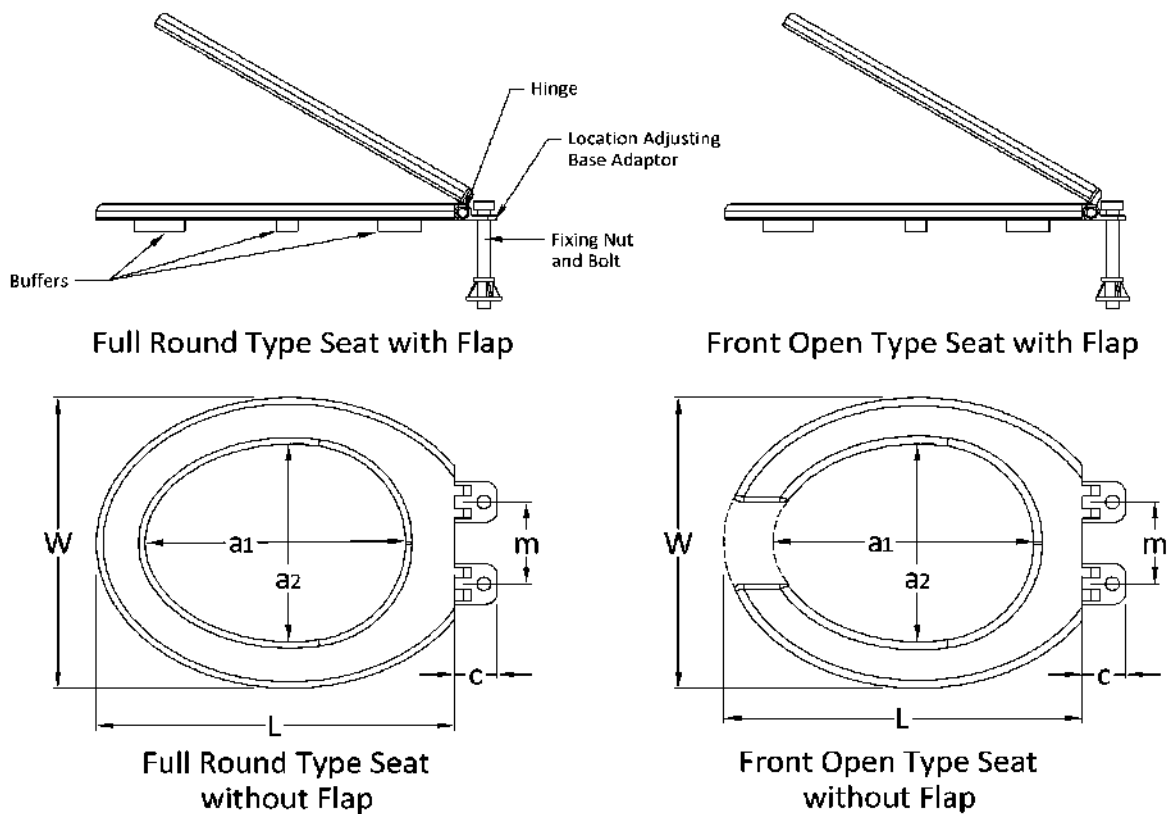


FIGURE 2—Components of full round type seat and flap

5. REQUIREMENTS

5.1 Design

5.1.1 Seat shall be fixed on the WC pan and cover shall be fixed on the seat in order to mounting on the WC pan as one permanent unit;

5.1.2 The seat cover shall be permanently positioned such that it covers the aperture of the seat.

5.1.3 Seat and cover shall be able to rotate independently; Rotation can be about same axis or two parallel axes;

5.1.4 The hingeing device shall be so designed that the aperture of the seat can be correctly and permanently positioned in relation to the top face of the rim of the pan with following facilities;

-Seat fixing joint on the WC pan shall be able to adjust along the axis of two holes of the pan base;

-Seat together with the flap shall be able to move perpendicular direction to the axis of two holes of the pan base in order to position aperture of the seat over the pan;

5.1.5 The hingeing device shall allow the seat, and flap where fitted, to be raised to such a position that they will remain in the raised position without special support.

5.1.6 Hinge Performance

5.1.6.1 Soft –close hinges

When tested in accordance with Appendix A to the criteria in Table 1, there shall be no failure of the mechanism to provide a smooth transition of the seat and flap from the open to the closed position, as designed by the manufacturer.

5.1.6.2 Non soft –close hinges

When tested in accordance with Appendix A to the criteria in Table 1, there shall be no failure of the mechanism to prevent the seat and flap from opening and closing, as designed by the manufacturer.

TABLE 1- Hinge performance test requirements for seats and for seat covers

Characteristic (1)	Unit or description (2)	Observation under Maximum load (3)	Method of test (4)
Hinge performance Non soft –close hinges	No structural or other failure of hinges or mountings after the completion of 10 000 cycles	No failure	Appendix A
Hinge performance Soft –close hinges	No structural or other failure of hinges or mountings after the completion of 10 000 cycles and the soft close mechanism shall still provide damping	No failure, damping to be discernible.	Appendix A

5.1.7 The hingeing device shall be secured to the pan by two bolts of any material, as specified in **5.3.3** and the diameter and length of bolt shall be as specified by WC Pan manufacturer in his technical specification sheet.

5.2 Dimensions

5.2.1 Length and Width

Length (L) and Width (W) of WC Seat shall be declared by the manufacturer as specified by WC Pan manufacturer in his technical specification sheet.

5.2.2 Position of the fixing bolts

The spacing, “m” and “c” illustrated in the Figure 2, for positioning of two bolts alone or placed over the mounting bracket shall be as specified by WC Pan manufacturer in his technical specification sheet.

The length, “L” illustrated in the Figure 2, shall be as specified by WC Pan manufacturer in his technical specification sheet.

The gap between the seat and the top of the pan shall be provided adequately to prevent contact of the seat with the pan by means of placing buffers under the seat.

5.2.3 Aperture of seat

Aperture of the seat shall be compatible with SLS XXXX (WC PANS). Manufacturer shall specify the dimensions of aperture in two perpendicular axes through the centre of the aperture, front to rear (a_1) and across width (a_2).

5.3 Material Requirements

5.3.1 Plastics for Seats, Seat Covers and other parts

Plastics materials used in the manufacture of Seats, Flaps and other parts shall be such that under normal conditions of use, seats and flaps shall be;

- (a) the resistant to abnormal deterioration of properties, and appearance by ageing;*
- (b) not adversely affected by chemical and colorfastness tests from Appendices E and F;*
- and*
- (c) capable of meeting the load test requirements detailed in Table 1*

5.3.2 Stainless steel for Seats, Flaps and other parts

5.3.2.1 Stainless steel shall be Type 316, or 321 Complying with SLS ASTM A240M

5.3.2.2 Thickness

The thickness of stainless steel sheet for WC Seats and Flaps shall be not less than 1.2 mm.

5.3.2.3 Surface finish (internal and external)

Stainless steel shall be polished to at least a satin finish as a minimum.

5.3.2.4 Construction

Where welding is employed, the welding materials shall be compatible with the material to be welded. Welds shall be free of cracks and pits, and shall be ground and polished internally and externally. Any joints shall be made so that their strength is not less than that of the parent material and shall be free from crevices and folds.

5.3.3 Materials for hinge and associated components

The hinge and associated components shall be manufactured from either one of following materials:

1. Plastics complying with **5.3.1**.
2. Stainless steel complying with **5.3.2**.

5.3.4. Buffer Materials

The buffers of seats and covers shall be made from either synthetic or natural rubber which shall be resilient and non-absorbent, or a plastics material of no less suitability. when tested in accordance with SLS 297 Part 4 Section 2 (=ISO 48-2), moulded –in buffers shall have a maximum hardness of 85 IRHD and all other buffers shall have hardness in the range 65 IRHD to 95 IRHD.

5.4. Surface finish of the seat and seat cover

5.4.1 Appearance

When viewed without magnification the internal and external surfaces of seat and cover shall be smooth, clean and free from scoring, cavities and other surface defects to an extent that would prevent conformity to this standard. The material shall not contain any impurities visible without magnification.

5.5. Performance

5.5.1 Ultimate structural strength

When tested in accordance with Appendix **B** to the criteria in Table **2**, there shall be no failure or dislodgement of seat, flap, buffers or hinge assembly. Criteria for failure include fracture, cracking, permanent distortion and dislodgement of the seat assembly components.

TABLE 2- Ultimate structural strength test requirements for seats and for seat covers

Characteristic (1)	Unit or description (2)	Maximum load (3)	Method of test (4)
Ultimate structural strength	Fracture	1.5 kN	Appendix B

5.5.2 Impact resistance

The Seats, covers and other parts shall be strong enough to withstand to the impact forces, induced in two situations such as, when the seat strikes on the WC cistern in the raised position, and subsequently when it drops on the pan to which it is secured under normal conditions of use. At the same time the hinge and buffers of seats are robust enough to withstand the forces arising from the impacts.

When tested in accordance with Appendix C, there shall be no any visible damage, in the seat, cover, buffer or hinge.

5.5.3 Plastic Material Tests

Test methods shall be in accordance with Appendices D, E, F and G

5.5.3.1 When tested in accordance with Appendix D, the material shall have an absorbency rate not greater than 0.5.

5.5.3.2 When a test specimen is tested in accordance with Appendices E and G, the material shall be unaffected by the reagents except for removable stains as defined in Appendix E.

5.5.3.3 When test specimens are tested in accordance with Appendix F, the material shall not craze, crack or exhibit signs of any defects and any change in colour shall not register less than Grade 4 on the grey scale of Section A02 of ISO 105/A01.(=SLS 1387 Part 2:2009).

6.MARKING

Minimum of following information shall be provided with package

- i. Brand name or Trade mark of the product
- ii. Country of manufacture
- iii. Name of the manufacturer
- iv. Identification mark or batch number
- v. Date of manufacture
- vi. The Standard complied

NOTE:

Attention is drawn to the certification facilities offered by the Sri Lanka Standards Institution. See the inside back cover of this standard.

7. SAMPLING

Where the compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection, the sampling scheme given in **H.1** of Appendix **H** shall be applicable.

In case of sample required for independent tests, it shall be taken at the option of the end-user or his/her representative, before delivery or within one week after delivery of WC Seats and Covers as per the scheme given in Appendix **H**.

Where compliance with this specification is to be assured based on manufacture's process control systems coupled with type testing and check tests or any other procedures, appropriate scheme of sampling and inspection shall be adopted.

8. COMPLIANCE OF A LOT

Compliance shall be in accordance with **H.3** of Appendix **H**

APPENDIX A METHOD FOR DETERMINATION OF HINGE PERFORMANCE

A.1 Scope

This Appendix sets out the method for endurance testing non soft- close and soft -close hinge mechanism(s).

A.2 Principle

The WC seat and seat cover are opened and then allowed to fall in a manner which approximates normal use. For soft -close hinges, the seat cover shall be weighted to expedite the test and simulate forced closure by human physical means.

A.3 Apparatus

The following are required:

- (a) Test specimen is to be a complete WC seat assembly.
- (b) A suitable rigid support for the pan and seat.
- (c) A WC Pan or other suitable mounting fixture on to which the test specimen can be mounted, in accordance with the manufacturer's instructions.
- (d) For soft-close hinges only, a weight of mass $1 \pm 0.2, -0\text{kg}$ $63 \pm \frac{2}{3}^c$ fixed to the seat cover, as shown in Figure **A1**
- (e) $1 \pm \frac{0}{-0.1}$

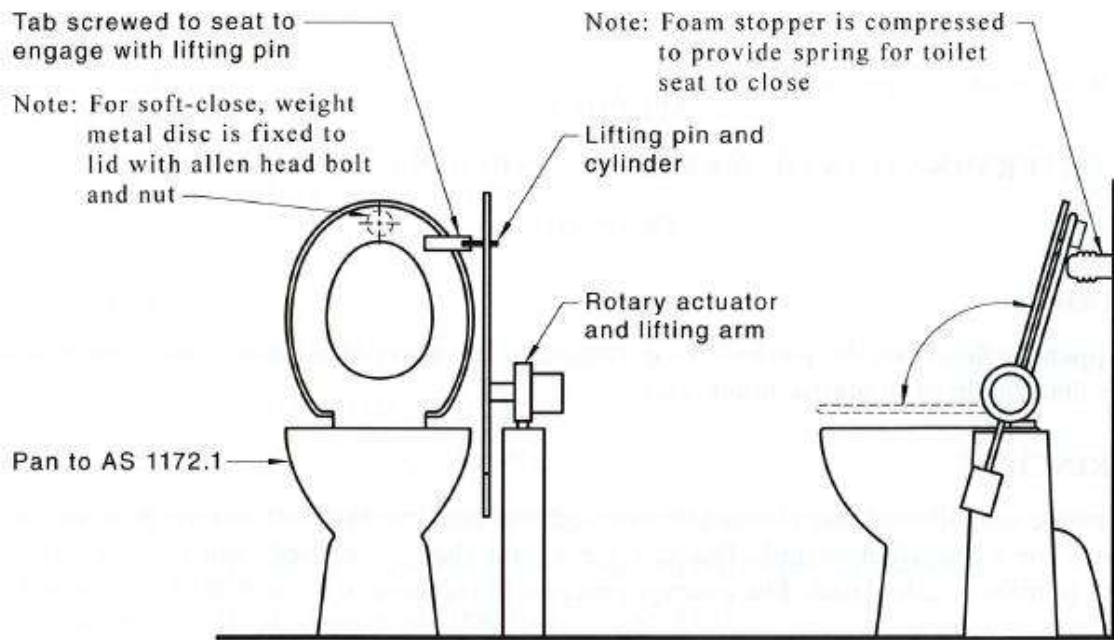


FIGURE A1-WC Seat Assembly

- (e) For soft-close hinges only, provide a foam stopper to ensure that WC seat springs back from the vertical to allow the seat to close unassisted as shown in Figure A1.
- (f) A tab or flange screwed to the seat may be required for the lifting mechanism to engage upon.

A.4 Procedure:

The procedure shall be as follows:

- a) Install the seat assembly on the apparatus and test the seat in accordance with the parameters outlined in Item (b).
- b) Mechanical apparatus capable of performing the following seat and seat cover test.
 - i. Lift the seat and seat cover simultaneously to (or past) the vertical position.
 - ii. Pause actuation for (5 ± 2) s.
 - iii. Allow the seat and seat cover to the fully closed position.
 - iv. Repeat in a cyclical manner and count the number of cycles completed.
- c) At the completion of 10 000 cycles, remove the weight from the seat cover and any other brackets attached to the seat and seat cover assembly. Raise the seat manually to the vertical position and allow it to fall under its own weight. Observe the function of the standard hinges or soft-close mechanism.

NOTE:

Opening the seat/seat cover, and allowing it to fall constitutes one cycle.

A.7 Report

The following shall be reported:

- (a) Manufacturer, model and type of seat.
- (b) Manufacturer and ,model of pan used for testing.
- (c) The number of cycles completed for the seat and seat cover.

- (d) For seats with soft-close hinges ,any failure of the mechanism to provide a smooth transition of the seat and seat cover from the open to the closed position,as designed by the manufacturer .
- (e) Any failure that prevents the seat and seat cover from opening and closing ,as designed by the manufacturer .

APPENDIX B

METHOD FOR DETERMINATION OF ULTIMATE STRUCTURAL STRENGTH OF SEAT AND SEAT COVER

B.1 Scope

This Appendix sets out the method for determining ultimate structural strength of a seat and seat cover.

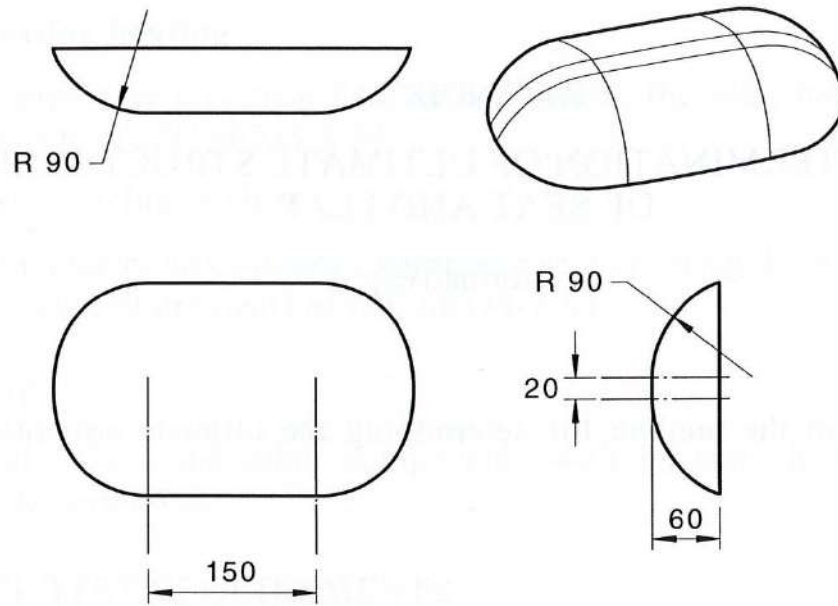
B.2 Principle

A load pad arrangement, approximating anatomy, is utilised to apply a vertical load to the seat and cover.

B.3 Apparatus

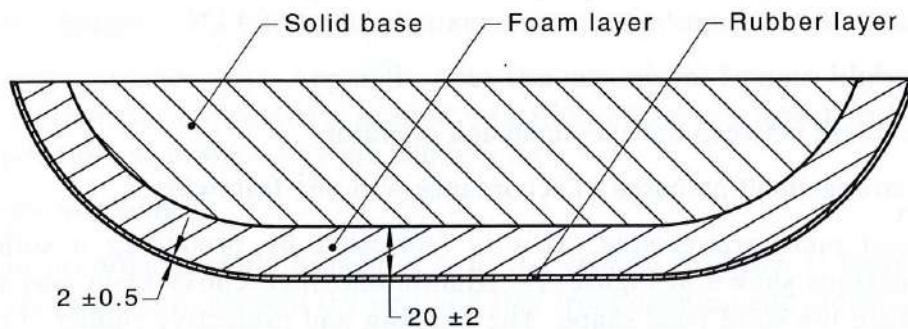
The following apparatus shall be required:

- (a) Testing machine capable of applying a vertical compressive load to the pan and seat assembly at a rate of 5 mm /min up to a maximum load of 4 kN.
- (b) A suitable rigid support for the pan and seat.
- (c) Protective shield between the specimen and operator.
- (d) Load pad arrangement prepared in accordance with the following:
 - i. **A Load pad arrangement** This is fabricated by producing a solid base to dimensions shown in Figure **B1**. Aluminium filled epoxy resin may be used to produce the solid base shape. The padding and protective rubber skin is glued to the solid base as shown in Figure **B2**.
 - ii. **Padding material** Flexible cellular rubber sponge, closed cell, skin on the one side (skin facing out), compression deflection (at 25% deflection) (250±0.5) kPa.
 - iii. **Skin material** Rubber sheet thickness (2±0.5) mm, hardness (60±10) Shore A



DIMENSIONS IN MILLIMETRES

FIGURE B1-Load Pad-Solid base construction



DIMENSIONS IN MILLIMETRES

FIGURE B2-Load Pad-Padding construction

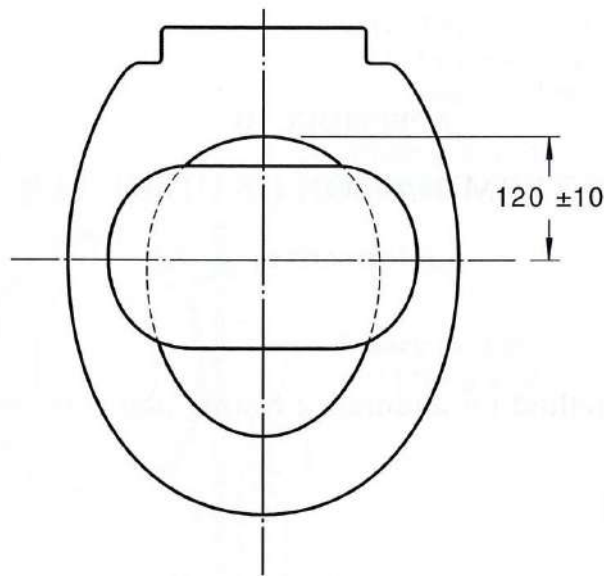
B.4 Procedure:

B.4.1 Seats:

The procedure shall be as follows:

- a) Install the seat and seat cover (if applicable) on pan according to the manufacturer's instructions.

- b) Lift the cover.
- c) Set up the pan with the seat installed under the cross head in the compression machine such that alignment of the load pad arrangement is as shown in Figure B3.
- d) Set up the safety shield in preparation for the destructive test.
- e) Execute the test programmed by pre-loading the test specimen to 0.1 kN, followed by a compressive load application at a rate of 5 mm/min up to the maximum load requirement in Table 1.
- f) Terminate the test at first failure or at the maximum load requirement in Table 1, whichever occurs first.



Dimensions in millimetres

FIGURE B3-Load pad alignment with seat

B.4.2 Seat Covers:

The procedure shall be as follows:

- a) Install the seat and seat cover on pan according to the manufacturer's instructions.
- b) Set up the pan with the seat installed under the cross head in the compression machine such that alignment of the load pad arrangement is as shown in Figure B3.
- c) Set up the safety shield in preparation for the destructive test.
- d) Execute the test programmed by pre-loading the test specimen to 0.1 kN, followed by a compressive load application at a rate of 5 mm/min up to the maximum load requirement in Table 1.
- e) Terminate the test at first failure or at the maximum load requirement in Table 1, whichever occurs first.

APPENDIX C

METHOD FOR DETERMINING THE IMPACT RESISTANCE OF WC SEATS

C.1 Objective

The objective of the impact test is to ensure;

- a) That the specimen seat is strong enough to withstand both an impact load, when in the raised position, typical of that which it might receive under normal conditions of use, and the subsequent impact load as it strikes the pan to which it is secured; and
- b) that the hinge and buffers of the specimen seat are robust enough to withstand the loads arising from the impacts.

C.2 Apparatus

A.2.1 *A WC Pan complying with SLS XXXX.*

C.2.2 *A frame capable of supporting:*

- a) the seat, when it is attached to the WC pan, in a vertical position, but allowing it to fall freely when struck by the pendulum (see **C.2.3**);
- b) a pendulum on a pivot and at such a height that, when released from the horizontal, it will swing downwards through an arc of 90 degrees so that the centre of its disc strikes the raised specimen seat centrally at the extreme point.

NOTE:

A mechanical means of releasing the pendulum may be provided.

C.2.3 *A pendulum, 380 mm long from the centre of its pivot to the centre of the striking ball of 4 ± 0.5 kg of weight. The striking face of the ball is glued with 3 mm thickness of rubber having shore hardness 55 to 60.*

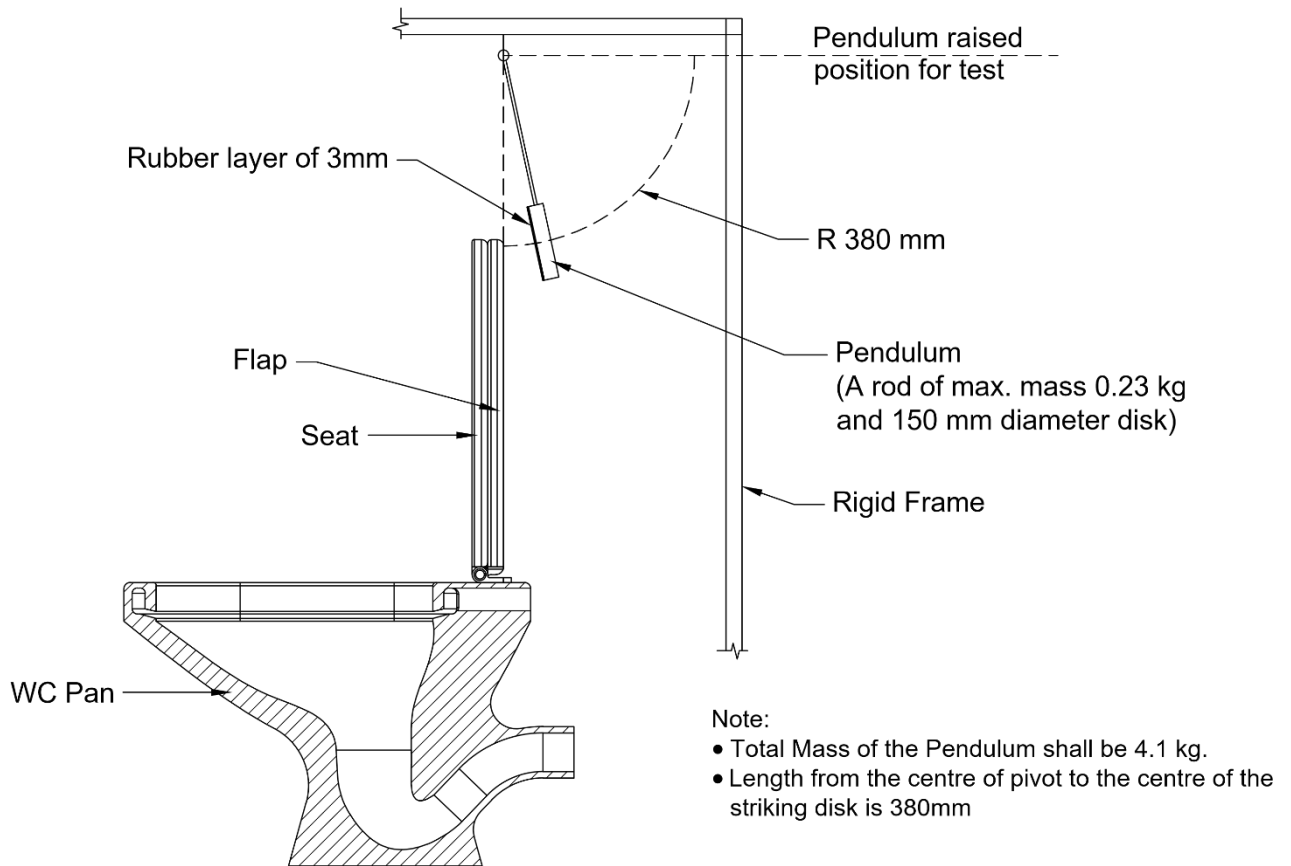


FIGURE C1-Test Apparatus for measuring Impact Resistance of WC seats

C.3 Procedure:

- The seat shall be secured to the WC pan according to the manufacturer's instructions and the assembled unit placed in the frame as illustrated.
- Remove the pivot pin of seat and the flap and polish the contact surface with the bushes and reassemble in order to make free falling of the seat and the flap once the pendulum struck on the seat.
- The seat shall be raised to the vertical position and keep stationary with support device attached on the frame.
- The pendulum shall be raised to the horizontal and released so that it swings downwards to strike the raised seat centrally at the extreme point. One impact only shall constitute a test.
- The seat, pan, hinge and buffers shall be inspected visually for mechanical failures.

APPENDIX D
DETERMINATION OF WATER ABSORPTION CHARACTERISTICS

D.1 Scope

This Appendix describes the method for determining the water absorption characteristics of plastic material used in plastic WC Seats.

D.2 Principle

Temperature conditioned test pieces are weighed and then exposed, on one surface, to cold tap water for a specified period. The test pieces are then reweighed, and the percentage increase in mass is calculated. The average the percentage increase in mass is then calculated.

D.3 Apparatus

The following apparatus is required.

- (a) An analytical balance capable of reading to 0.01 g.
- (b) A test jig that enables $2200 \pm 300 \text{ mm}^2$ of the surface material to be exposed to a head of water $50 \pm 5 \text{ mm}$.

NOTE:

Typical apparatus is shown in Figure D1

- (c) An oven capable of maintaining a uniform temperature of $50 \pm 5 \text{ }^\circ\text{C}$

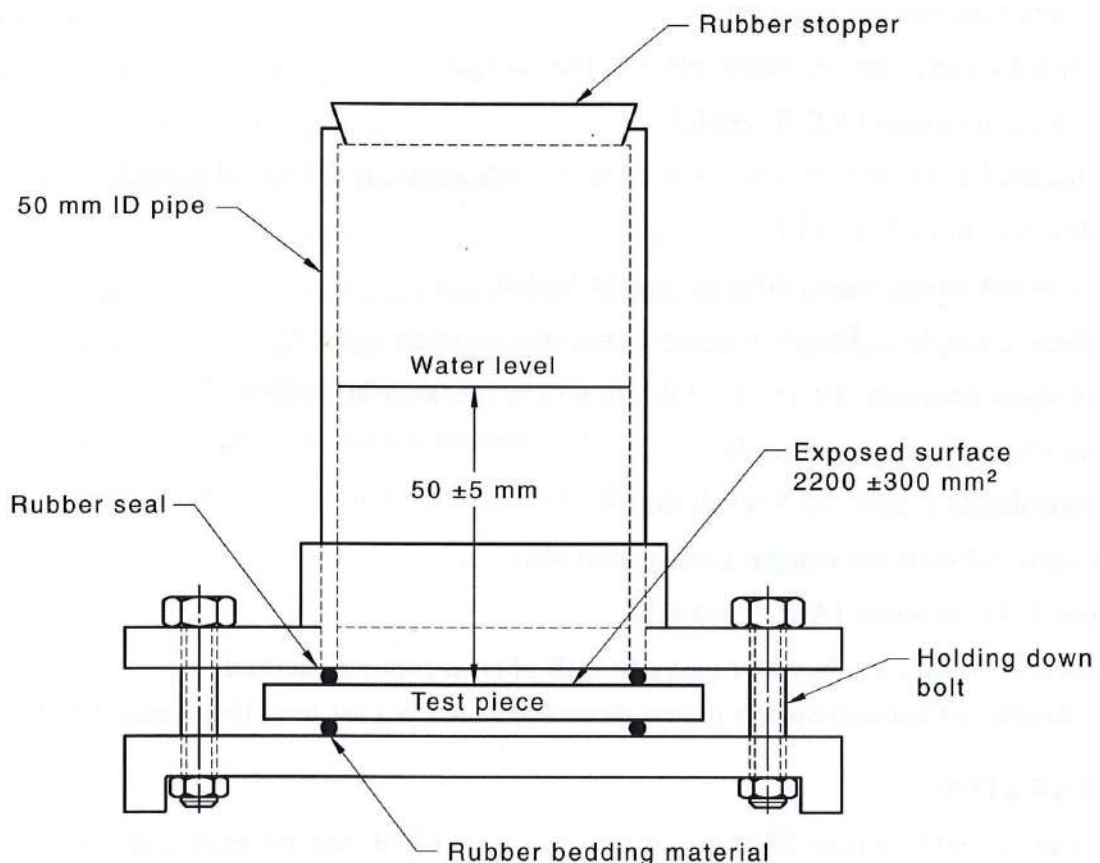


FIGURE D1 -Typical test jig for water absorption test

D.4 Test pieces

Three test pieces are required .Each test piece shall have an area of $5000 \pm 300 \text{ mm}^2$

, and shall be of a shape that is compatible with the test jig. Any backing or reinforcements shall not be removed from the test pieces.

NOTE:

The test pieces may be cut from either the seat or cover of the WC Seat.

D.5 Procedure

The Procedure shall be as follows.

- (a) Condition the three test pieces in the oven at a uniform temperature of $(50 \pm 5)^{\circ}\text{C}$ for (24 ± 0.5) h
- (b) Clean the test pieces with a soft, dry, absorbent cloth.
- (c) Weigh each test piece to determine its mass (m_1)
- (d) Place a test piece in the test jig and add cold tap water to a height of (50 ± 5) mm over the surface of the test piece.
- (e) After (24 ± 0.5) h drain all water and remove the test piece from the test jig. Wipe excess water from all surfaces and immediately weigh the test piece to determine its mass (m_2).
- (f) Repeat steps (d) and (e) with the remaining two test pieces.

D.6 Calculation

The mass difference of each specimen, as a percentage of the original mass, shall be calculated and shall be as follows.

$$\text{Mass difference (\%)} = \frac{m_2 - m_1}{m_1} \times 100$$

D.7 Report

The following shall be reported.

- (a) Identification of test specimen(s)
- (b) General description of test specimen(s)
- (c) The percentage mass water absorption of each test piece.
- (d) The average percentage mass water absorption of the three test pieces.

APPENDIX E

DETERMINATION OF CHEMICAL AND STAINING RESISTANCE

E.1 Scope

This Appendix describes the method for determining the resistance of plastics materials to staining by reagents which may come into contact with WC Seats.

E.2 Principle

Test reagent is applied to two areas on the surface of a watch glass and the other is left uncovered. After a specified time, the specimen is washed and examined for colour change.

E.3 Reagents

The following reagents are required.

- (a) Distilled water, glass distilled, pH 7.0, free oxygen. Alcohol, methanol (A.C.S. grade)
- (b) Household detergent 'Teepol' Gold D6515 (5% solution/deionized water).
- (c) Iodine solution, Fortis (10%)
- (d) Tea, in deionized water, 10% by weight boiled.
- (e) Hydrogen peroxide, 10 Vol 1:10 dilution (250 ml. kept in fridge).

- (f) Urea 6%(urine) analar grade. Solution.
- (g) Hypochlorite bleach ,12.5%
- (h) Vinegar,white wine vinegar (acetic acid 6%)
- (i) Phenol,5% in water (A.C.S.grade)
- (j) Mercurochrome,2% in water using British pharmacopoeia method.

NOTE:

American Chemical Society (where described as A.C.S.) has been found satisfactory).

E.4 Apparatus

Watchglasses of not less than 25mm in diameter are required,one for each reagent.

E.5 Test specimens

Tests may be carried out on the surface of a functional complete product,or on the surface of a cut specimen.

The surface of each specimen shall be washed with a mild soap or household detergent rinsed with distilled water and dried before testing.

E.6 Procedure

The procedure shall be as follows.

- (a) Apply the test reagent to the test specimen in two positions each to cover an area not less than the area of the watchglass.
- (b) Cover the position with a watchglass and allow contact at a temperature of $(23 \pm 1) ^\circ \text{C}$ for 16_{-0}^2 h.
- (c) At the end of the contact period,wash the specimen surface with water and then with ethanol.
- (d) At least 24 h after cleaning the specimen,examine the specimen for stain by placing it in a horizontal position at normal table height (approximately 760 mm) under overhead lights with good colour rendering properties having an illuminance of not less than 800 lx (measured within 50mm from the surface) and viewing it from an angle of approximately 90 degrees to the surface.
Outside direct light,which may accentuate or minimize the stain, shall be avoided.

E.7 Report

The following shall be reported.

- a) Identification of test specimen(s)
- b) General description of test specimen(s)
- c) The name of each reagent and its effect as follows.
 - i.Unaffected-no colour change and no change in surface texture.
 - ii.Removable stains that can be abraded the surface and repolishing to a maximum depth of 0.15 mm.
 - iii.Severe –stains that cannot be removed.

APPENDIX F

DETERMINATION OF COLOUR FASTNESS TO WATER

F.1 Scope

This Appendix describes the method for determining the colour fastness to water of pigments in plastics materials used in plastic WC Seats and seat covers.

F.2 Principle

Two specimens are cut from the seat. Two specimens are cut from the cover. From each set on immersed in distilled water for a specified time and then compared with the other specimen.

F.3 Apparatus

A tank containing distilled water at $(90 \pm 2)^{\circ}\text{C}$ is required.

F.4 Test specimens

Test specimens shall be prepared as follows.

- (a) Cut two square specimens of (50 ± 2) mm sides from each individual coloured fixture. One test specimen shall be used for testing, the other shall be a colour control test specimen. Masking of cut edges is permitted.
- (b) Store the colour control test specimen in a lightfast container.

F.5 Procedure

The procedure shall be as follows.

- a) Immerse one test specimen in the distilled water for 48 ± 0 h.
- b) At the completion of the immersion period, visually inspect the immersed specimen, and then perform a colour comparison of the two test specimens comparing one with the other.

F.6 Report

The following shall be reported;

- (a) Identification of test specimen(s)
- (b) General description of test specimen(s)
- (c) The difference of change in colour.
- (d) Any surface defects such as cracking crazing, blistering, or other defects.

APPENDIX G

DETERMINATION OF DEGRADATION BY ULTRAVIOLET LIGHT

G.1 Scope

This Appendix describes the method for determining the resistance to Degradation by Ultraviolet Light of plastics materials used in plastic WC Seats.

G.2 Principle

Two Ultraviolet sunlamps with lampshades are mounted by suitable means over a reinforced fibre cement sheet which provides support for the specimens under test. Test specimens are placed on the sheet under lamps for a specified time and the temperature is controlled by the use of a fan and a temperature gauge for monitoring readings. Specimens are then subjected to visual inspection and compared with each other.

NOTE: *The exposure duration does not relate to any specific duration of outdoor weathering.*

G.3 Apparatus

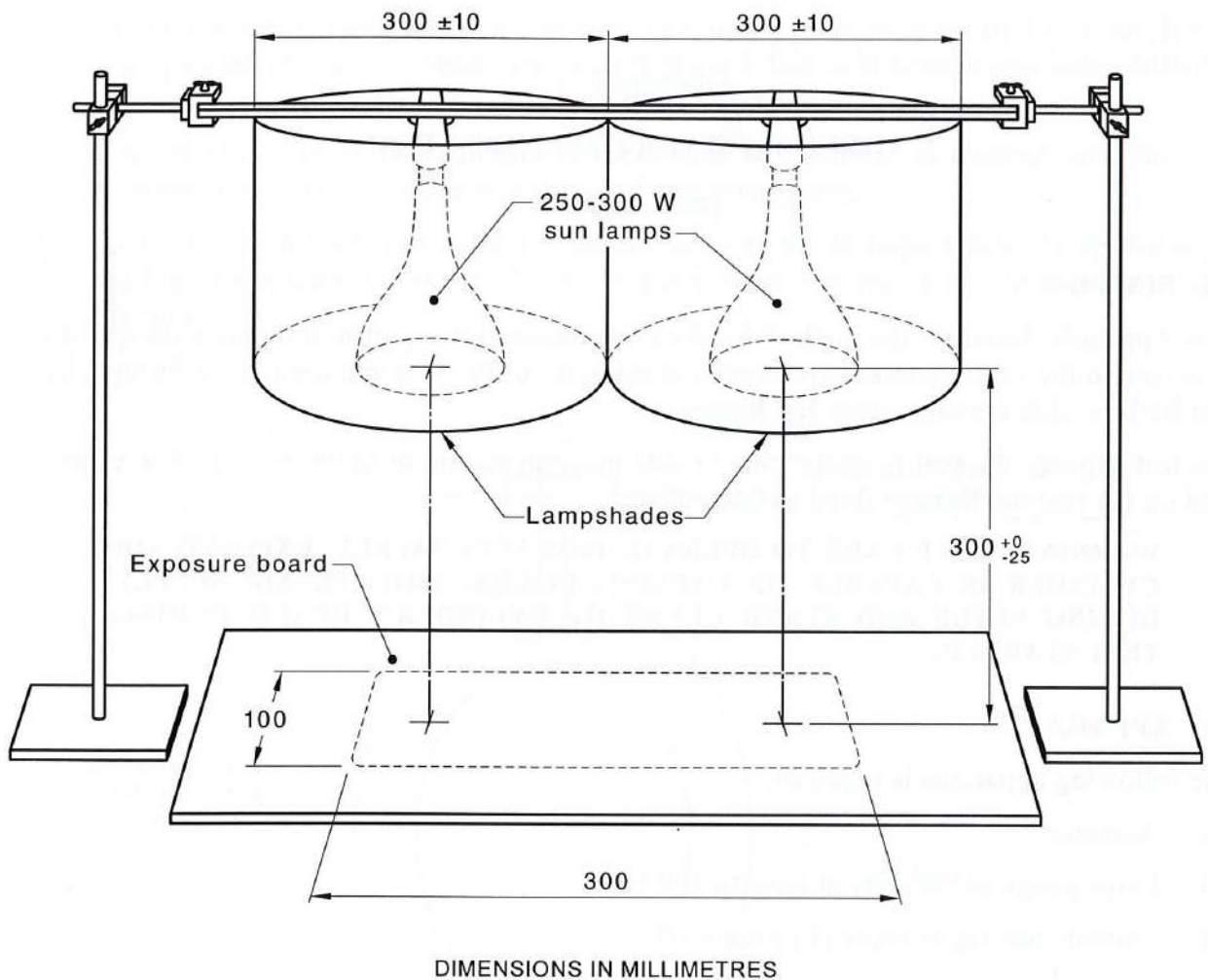


FIGURE G1- Ultraviolet Lamp Exposure Test Set-Up

The following apparatus is required.

(a) Two sunlamps and lampshades. Each sunlamp shall have a mercury vapour discharge with tungsten filament resistive ballast, and an outer glass bulb that effectively absorbs radiation of wavelength less than 280 nm. The electrical power consumption of each lamp shall be within the range 250 W to 350 W. Lamps shall be discarded after 1680 h (70 days)

NOTE: Lamps are to have a nominal power consumption of 300 W, and within the wave length range of 280 nm to 400 nm, and have an integrated irradiance of 5.5 W/m^2

WARNING

The lamps should not be viewed directly without protecting the eyes with suitable dark glasses. Screens may be placed about the test assembly during the exposure, but should not restrict air flow nor cause test specimens to overheat.

- (b) Two cylindrical lampshades. 300 ± 10 mm diameter, constructed of aluminium foil, and held by the lampstand which can be mounted 300 mm above the target area (See Figure E1)
- (c) A masking board of flat fibre-reinforced cement sheet with a cut-out for the target area of 300 mm x 100 mm. The masking board should be of sufficient size to provide an area of unaffected material for colour comparison.
- (d) Black panel thermometer consisting of a completely blackened metal plate at least 1 mm thick and at least 1000 mm² in area with a suitable thermometer or thermocouple making good thermal contact.
- (e) A small fan.

G.4 Test specimens

Two tests of three specimens shall be cut from adjacent sections of both the seat and the flap. Each test specimen shall be not less than 25 mm x 25 mm (i.e. a minimum of 625 mm²). The thickness of the specimens shall be that of the finished product.

Two specimens of each set shall be used for testing purposes. The remaining specimen shall be a control specimen and shall be stored in a light fast container.

NOTE:

The size of test specimens and the number of replicates will depend on upon the intended method of assessment of the changes induced by the exposure. The minimum size of 25 mm x 25 mm (area of 625 mm²) is suitable for visual assessment. The maximum size is limited by the restricted target area and the number of replicates required.

G.5 Procedure

The procedure shall be as follows.

- (a) Assemble the apparatus as illustrated in Figure G1 on a suitable bench so that a small fan may cool the specimens if required.
- (b) Mask off a test specimen area of 300 mm x 100 mm from the centre target area as in Figure G1
- (c) Place a test specimen on the exposure board within the target area under each lamp.
- (d) Energize the lamps for a period of $24+2,-0$ h, and ensure that the mains voltage to the lamps is maintained at (240 ± 5) V. Place a small fan near the exposure board and operate it so as to maintain the temperature measured by the black panel thermometer within the range 45 °C to 55 °C. The black panel thermometers shall be placed within the target area for a period of 15 min. The reading shall then be taken and the thermometer removed.
- (e) At the end of an exposure period of $24+2,-0$ h, switch off the lamps.
- (f) Visually inspect the two test specimens and perform a colour comparison of the two test specimens with the specimen from the lighthfast container.

G.6 Report

The following shall be reported;

- (a) Identification of test specimen(s)
- (b) General description of test specimen(s)
- (c) The difference of change in colour.
- (d) Any surface defects such as cracking and crazing.

APPENDIX H
SAMPLING AND CRITERIA FOR CONFORMITY

Samples shall be drawn from each lot as per the sampling scheme and shall be tested separately for ascertaining the conformity of the lot to the requirements of this specification.

H.1 SCALE OF SAMPLING

H.1.1 The number of WC seats and seat covers to be selected from the lot shall be in accordance with column 2 of Table **H1**. The appliances shall be selected at random. In order to ensure randomness of selection, random number tables as given in **SLS 428** shall be used.

TABLE H1 – Scale of sampling

Number of appliances in a lot (1)	Number of WC seats and seat covers to be selected (2)	Permissible number of defects (3)
Up to 15	3	0
16 to 25	5	0
26 to 50	8	0
51 to 90	13	0
91 to 150	20	1
151 to 280	32	1
281 to 500	50	2
501 and above	80	3

NOTE

*The Table **J1** was prepared in accordance with **ISO 2859-1:1999**, General inspection level II AQL=1.5%.*

H.1.2 When the tests are required to be performed on regulatory requirement/s, the additional sub sample/s of size/s given in test method/s specified by the relevant regulation/s shall be selected as appropriate, in addition to the samples selected as per **J.1.1**.

H.2 NUMBER OF TESTS

The number of samples of WC seats and seat covers to be tested/assessed shall be in accordance with **H.2.1**.

H.2.1 The number of samples

Each WC seat and seat cover selected as in **J.1.1** shall be inspected for following requirements as appropriate;

H.2.1.1 Design (*see 5.1*),

J.2.1.2 Dimensions (*see 5.2*),

H.2.1.3 Surface finish of the seat and seat cover (*see 5.4*)

H.2.1.4 Ultimate structural strength (*see 5.5.1*)

H.2.1.5 Impact resistance (*see 5.5.2*)

H.2.1.6 Plastic Material Tests (*see 5.5.3*)

H.2.1.7 Marking requirements (*see 6*)

H.3 CRITERIA FOR CONFORMITY

H.3.1 A lot shall be declared as conforming to the requirements of this standard, if the conditions given below are satisfied.

H.3.1.1 When the WC seats and seat covers inspected in accordance with **H.2.1**, number of defectives conform to the corresponding acceptance number given in column **3** of Table **H1**.