

KINGDOM OF SAUDI ARABIA

**SAUDI STANDARDS, METROLOGY AND QUALITY
ORGANIZATION**

SASO

**SAUDI STANDARD
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**DRAFT FOR A TEST METHODS FOR
PLASTIC TOILET SEAT AND
COVER STANDARD**

**SAUDI STANDARDS, METROLOGY AND
QUALITY ORGANIZATION**

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KR-2406

DRAFT FOR A TEST METHODS FOR PLASTIC TOILET SEAT AND COVER STANDARD

1. SCOPE

This standard specifies the test methods for single and double plastic toilet seat and cover.

This standard applies to toilet seats and cover, whatever their form, and with a total weight of between 1.4 kg to 1.6 kg with simple flaps or double flaps.

This standard does not apply for those wooden toilet seat and covers.

2. COMPLEMENTARY REFERENCE

- 2.1 SASO / 2013 "Specification for plastic toilet seat and cover".

3. TEST METHODS

3.1 Dimensions measurement

Lay the seat and cover on a flat clean surface, and by calibrated vernier calliper measure the shown dimension in the below drawing (A,B,C, D, E and F)

Take a three reading for each measurement, and then calculate the average.

The average for each measurement should not exceed those specified from the manufacturer by more than ± 2 mm.

3.2 Outer appearance

Seat and cover observed with the naked eye at a distance of (50) cm from all directions with the seat cover resting on a non-reflective surface. The seat cover should be illuminated by a diffuse daylight.

3.3 Flatness Measurement

Mount the seat and cover, with its hinges on the reference surface and measure the distance between the buffers of the seat and the reference surface as well as the gap between the cover buffer and the seat.

In the case where the seat is fitted with four pads, the measurement should only be made with respect to the forward two buffers.

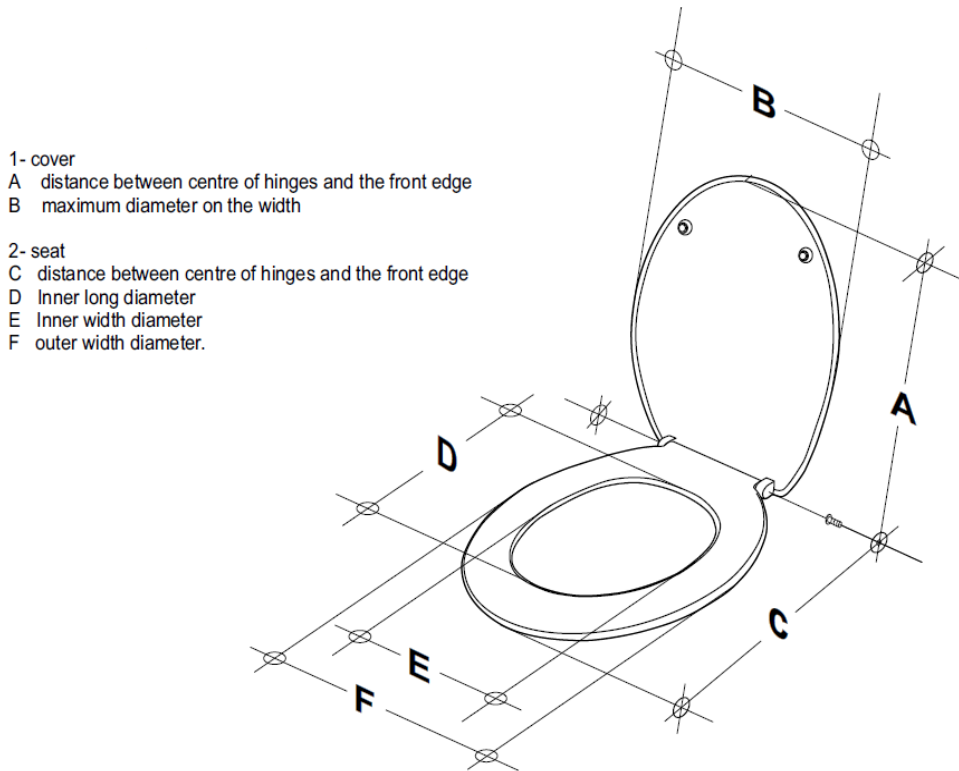
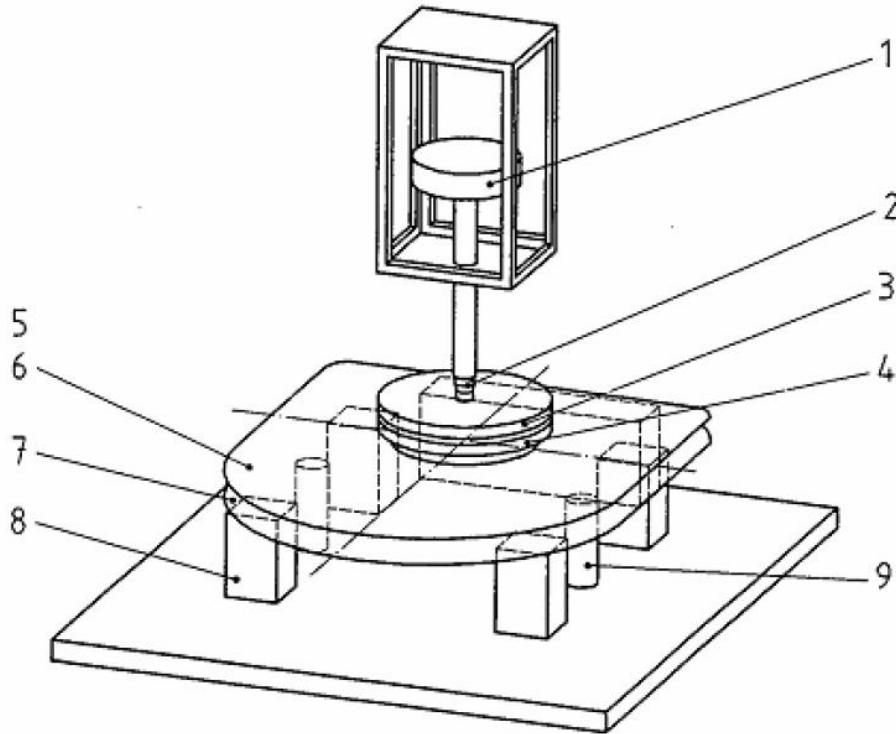


Figure 1 – Seat and cover dimeniosn

3.4 Resistance Test

3.4.1 Static load on the cover

- 3.4.1.1 The test should be conducted at $(23 \pm 5)^{\circ}\text{C}$
- 3.4.1.2 Place the seat rest on a fixed pad as shown in figure 2. Pad dimension will be $(1-50*w-50*h*70)$ mm.
- 3.4.1.3 The hard rubber circular pad diameter is (160 ± 10) mm, height (30 ± 5) mm.
- 3.4.1.4 Apply a gradual load (7.5 ± 0.5) sec of 75 Kg – as a base load – to the center point of the seat and cover and maintain for (60 ± 5) sec.
- 3.4.1.5 Remove the load, and reset the displacement sensor to zero.
- 3.4.1.6 By using the same sample; apply a gradual load (15 ± 1) sec of (175) Kg to the center point of the seat and cover and maintain for (180 ± 5) sec.
- 3.4.1.7 Visually inspect the appearance of the seat for cracks, fracture.
- 3.4.1.8 The residual deformation must be less than (35) mm.

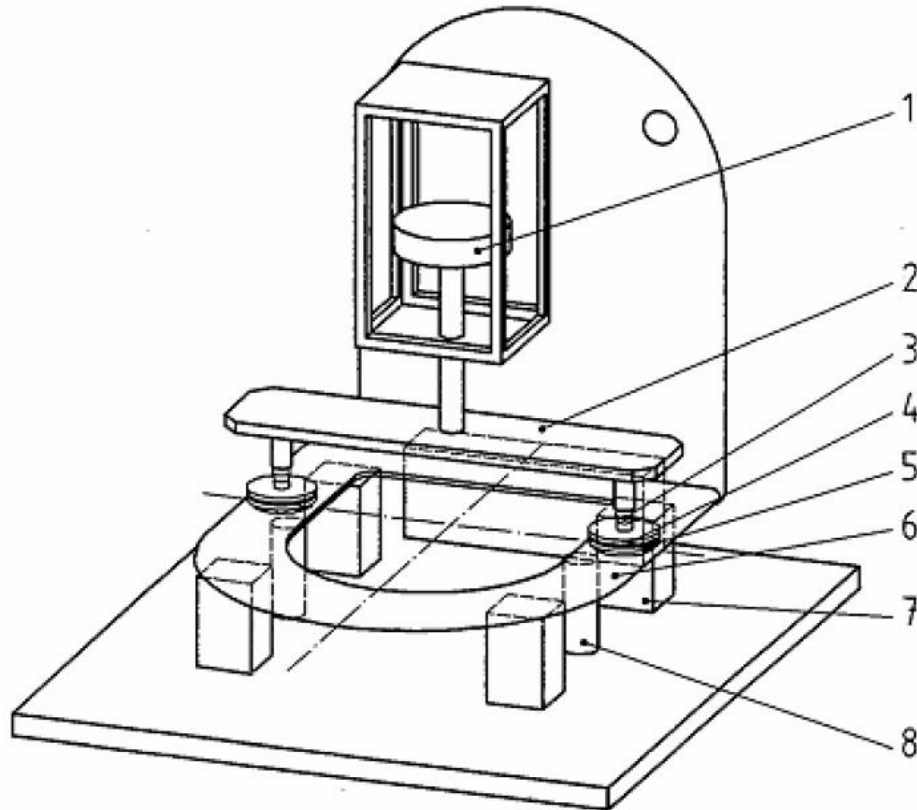


- | | | |
|-----------------------------|-----------------|-------------------------|
| 1- Load Rod | 2- ball bearing | 3- die |
| 4- Hard rubber circular pad | 5- cover | 6- cover rest |
| 7- Seat | 8- Pad | 9- displacement sensors |

Figure 2 - Static load on the cover

3.4.2 Static load on the seat

- 3.4.2.1 The test should be conducted at $(23 \pm 5) ^\circ\text{C}$
- 3.4.2.2 Place the seat rest on a fixed pad as shown in figure 3. Pad dimension will be $(150 * w - 50 * h * 70)$ mm.
- 3.4.2.3 The hard rubber circular pad diameter is (75 ± 5) mm, height (30 ± 5) mm.
- 3.4.2.4 Apply a gradual load (7.5 ± 0.5) sec of 75 Kg – as a base load – to the center point of the seat ring and maintain for (60 ± 5) sec.
- 3.4.2.5 Remove the load, and reset the displacement sensor to zero.
- 3.4.2.6 By using the same sample; apply a gradual load (15 ± 1) sec of (150) Kg to the center point of the seat ring and maintain for (180 ± 5) sec.
- 3.4.2.7 Visually inspect the appearance of the seat for cracks, fracture or deformation.



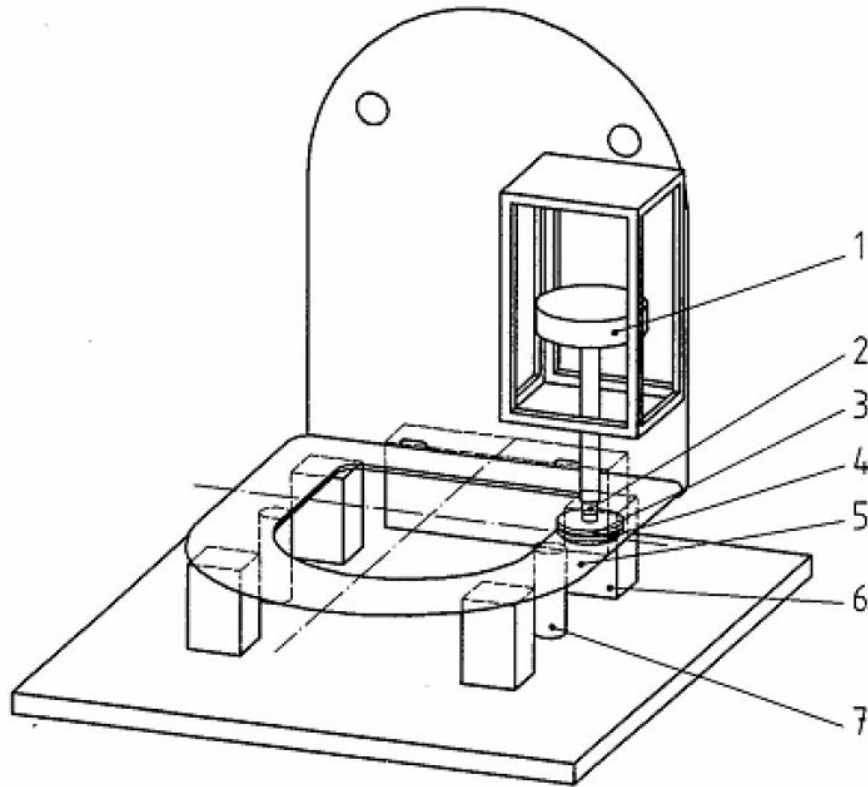
- | | | |
|-------------|-----------------------------|------------------|
| 1. Load Rod | 2. beams | 3. ball bearings |
| 4. die | 5. hard rubber circular pad | 6. seat |
| 7. Pad | 8. displacement sensors | |

Figure 3 – Static load on the seat

3.4.3 Static load on one side of the seat

- 3.4.3.1 The test should be conducted at $(23 \pm 5)^{\circ}\text{C}$
- 3.4.3.2 Place the seat rest on a fixed pad as shown in figure 4. Pad dimension will be $(1-50*w-50*h*70)$ mm.
- 3.4.3.3 The hard rubber circular pad diameter is (75 ± 5) mm, height (30 ± 5) mm.
- 3.4.3.4 Apply a gradual load (7.5 ± 0.5) sec of (40) Kg – as a base load – to one side of the seat ring and maintain for (60 ± 5) sec.
- 3.4.3.5 Remove the load, and reset the displacement sensor to zero.

- 3.4.3.6 By using the same sample; apply a gradual load (15 ± 1) sec of (75) Kg to same side of the seat ring and maintain for (180 ± 5) sec.
- 3.4.3.7 Visually inspect the appearance of the seat for cracks, fracture or deformation.



- | | | |
|-----------------------------|------------------|--------|
| 1. Load Rod | 2. ball bearings | 3. die |
| 4. hard rubber circular pad | 5. seat | 6. Pad |
| 7. Displacement sensors | | |

Figure 4 – Static load on side of the seat

3.4.4 Dynamic Load on the seat

- 3.4.4.1 The test should be conducted at $(23 \pm 5) ^\circ\text{C}$
- 3.4.4.2 Place the seat rest on a fixed pad as shown in figure 5. Pad dimension will be $(150 * w - 50 * h * 70)$ mm.
- 3.4.4.3 The tablet diameter is (400 ± 10) mm, weight of (75 ± 1) Kg
- 3.4.4.4 The foam pad density $(100) \text{ Kg/m}^3$, with thickness of (25 ± 5) mm.
- 3.4.4.5 Rest the load gradually and completely on the seat.
- 3.4.4.6 Raise the load at least to (30) mm then rest again on the seat, and repeat $(15,000)$ times.
- 3.4.4.7 Visually inspect the appearance of the seat for cracks, fracture or deformation.

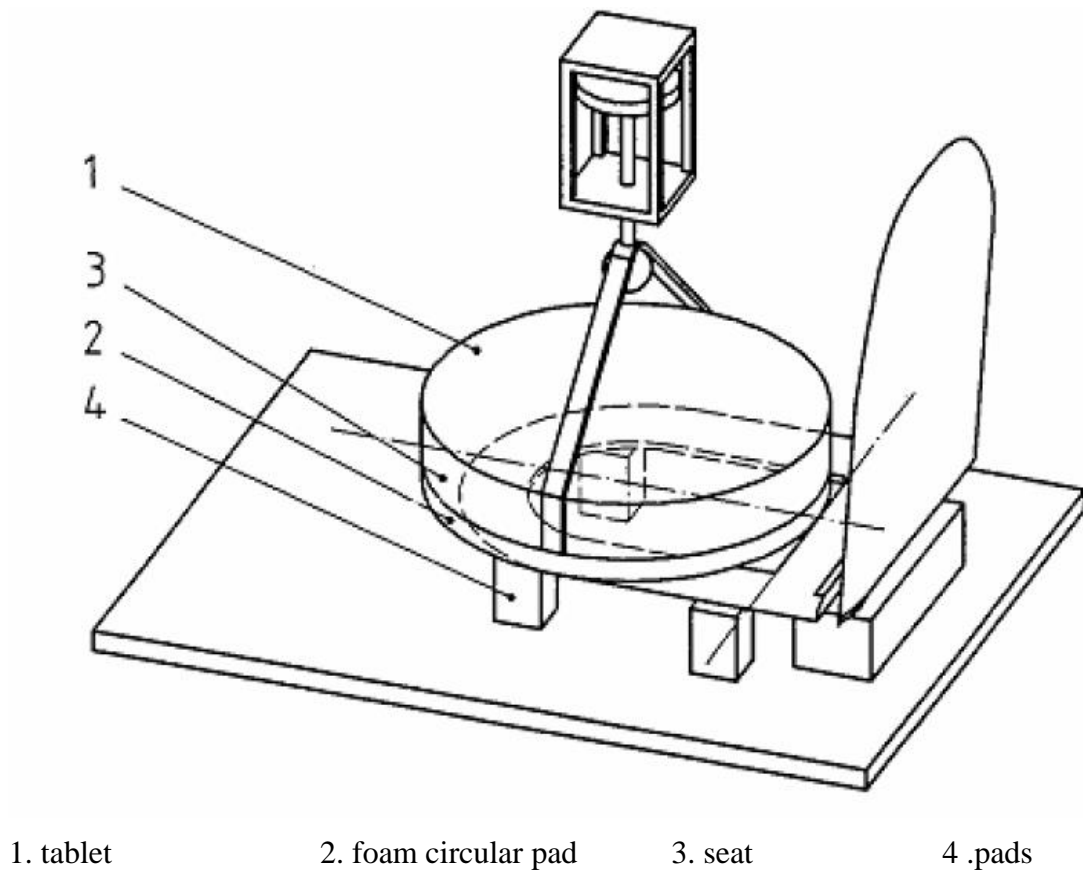


Figure 5 – Dynamic Load on the seat

3.5 Buffers and hinges Performance test**3.5.1 The cover**

- 3.5.1.1 Fix the seat and cover to the toilet according to the manufacturer installation instruction.
- 3.5.1.2 Tight the hinges nut with torque of (2.5 ± 0.5) Nm
- 3.5.1.3 Open the cover to $(85)^\circ$ angle and allow a free fall.
- 3.5.1.4 Repeat this step (15,000) times.
- 3.5.1.5 Buffer must meet the functional requirements and not fall from the slot.
- 3.5.1.6 Hinges must meet the functional requirements.

3.5.2 The seat

- 3.5.2.1 Fix the seat only to the toilet according to the manufacturer installation instruction.
- 3.5.2.2 Tight the hinges nut with torque of (2.5 ± 0.5) Nm
- 3.5.2.3 Open the seat to $(85)^\circ$ angle and allow a free fall.
- 3.5.2.4 Repeat this step (15,000) times.
- 3.5.2.5 Buffer must meet the functional requirements and not fall from the slot.
- 3.5.2.6 Hinges must meet the functional requirements

3.6 Stability

- 3.6.1 Fix the seat and cover to the toilet according to the manufacturer installation instruction.
- 3.6.2 Apply a horizontal force F of (2) kg to one side of the seat, by using a spring balance.
- 3.6.3 Record the position A' from point A.
- 3.6.4 Offset between (A' and A) must be less than (10) mm.

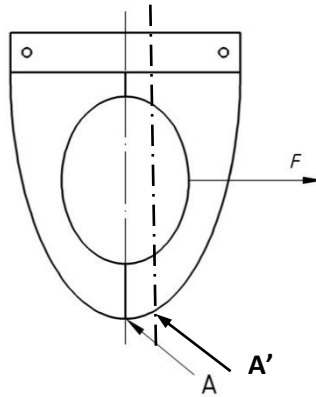


Figure 6- stability test

3.7 Resistance to hot water

3.7.1 Soak the toilet seat and lid in water at (65) ° C for one hour.

3.7.2 The seat and lid should not show any visible signs of swelling or cracking.

Reference:

- DIN 19516: 2004 “toilet seat requirements and test method”