

**AMENDMENT NO: 02 TO SLS 276 : 2007  
SPECIFICATION FOR TOOTHBRUSH**



**Amendment No: 02 approved on 2012-09-06 to SLS 276 : 2007**

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Remove Amendment 01 and replace with Amendment 02.

**FOREWORD**

Insert the following text under the 4<sup>th</sup> paragraph.

“This specification is subject to the restrictions imposed under the Cosmetics, Devices and Drugs Act No. 27 of 1980, Consumer Affairs Authority Act No. 09 of 2003 and the Regulations framed there under.”

**5 REQUIREMENTS**

**5.1 General requirements**

Delete the text in **5.1.1.1** and substitute with the following:

“The handle of the brush shall be modified to a firm grip.”

**5.2 Other requirements**

Delete **5.2.5** and substitute with the following:

“ **5.2.5** *Handle impact strength*

When tested in accordance with Appendix **D**, the handle should not fracture. (if the handle does fracture, however, the minimum absorbed energy at fracture shall be 0.8 J.)”

**5.2.6** *End rounding of filaments*

Delete the text in **5.2.6** and substitute with the following:

“The end rounding of filaments shall not be less than 60 per cent when tested by the method prescribed in Appendix **E**.”

Insert **5.2.8** as

“ **5.2.8** Diameter of filaments of extra soft type toothbrushes shall be 0.1 to 0.15 mm.”

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### 6 PACKAGING AND MARKING

Insert the following as 6.2 h)

“Date of manufacture”

Delete 6.3 a) and b)

Insert the following as 3 d) Note under 6.3 .

*“Change in colour or shape of filaments indicates the toothbrush is not suitable to use.”*

Delete Appendix D and substitute the following:

#### APPENDIX D DETERMINATION OF HANDLE IMPACT STRENGTH

##### D.1 APPARATUS

**D.1.1 Clamping unit**, to hold the toothbrush handle (see Figure 8). The clamping unit consists of the main block (key item 4) and the holding blocks (key items 6 and 7) as shown in Figure 8. The holding blocks can be moved by screws. The radius of the internal edges of the main block and the holding blocks should be  $(4.0 + 0.1)$  mm.

**D.1.2 Impact tester**, with the striker for the pendulum

**D.1.3 Striker for pendulum**, made of hardened steel, with a cylindrical surface having a radius of curvature of  $(0.80 + 0.20)$  mm, with its axis horizontal and perpendicular to the plane of swing of the pendulum.

##### D.2 PROCEDURE

Hold the toothbrush handle using the clamping unit (**D.1.1**) with a clamping torque of  $(0.70 + 0.03)$  Nm. Ensure that the tuft-hole plane (key item 1) is perpendicular to the bottom plane of the clamping unit (key item 5). The metal plate(s) can be used as the spacer to adjust the angle. Set the clamping unit on the impact tester so that the striker edge can hit the toothbrush handle at the centre of the tuft-hole area (key item 8) from the opposite side of the tuft-hole surface (key item 2).

The length,  $L_1$ , between the top plane of the clamping unit (key item 3) and the centre of the tuft-hole area (key item 8) is 55 mm. Any curvature of the corners of the clamping unit shall not be taken into account for  $L_1$ .

**NOTE :** *The impact velocity of the striker is dependent on the height of the striker at the beginning of the test, or the vertical distance of fall of the pendulum striking edge. This height is a function of the length of the pendulum arm and the angle of the arm at the*

beginning of the test. The velocity of the striker edge at impact can be calculated by the following equation.

$$V = (2gh)^{0.5}$$

Where,

V is the velocity of the striker at the moment of impact, in metres per second;

g is the local gravitational acceleration, in metres per second squared;

h is the vertical distance of fall of the pendulum striking edge, in metres.

**NOTE :** ASTM D 256-06 sets the vertical distance of the pendulum striking edge to be  $(610 + 2.0)$  mm, which will produce a velocity of the striking edge at the moment of impact of approximately 3.5 m/s.

Ensure that the distance between the line of contact of the pendulum striking edge and the centre of percussion of the pendulum is less than 2.54 mm.

**NOTE :** ISO 13802 states that the impact length shall be within 1% of the pendulum length. Since the pendulum length may vary with machines, the ASTM D 256-06 value of +2.54 mm was chosen to be consistent across laboratories instead of the 1% value specified in ISO 13802.

Determine the pendulum length,  $L_p$ , in metres, from the period of the oscillation,  $T_p$  in seconds, using the following equation;

$$L_p = (g/4\pi^2)T_p^2$$

where

g is the local gravitational acceleration, in metres per second squared;

$4\pi^2$  equals 39.48

$L_p$  Pendulum length ( distance expressed in metres, between the axis of rotation of the pendulum and the centre of percussion equal to an equivalent theoretical pendulum mass concentrated at the point which gives the same period of oscillation, as the actual pendulum.

$T_p$  Period of oscillation of the pendulum (period, expressed in seconds, of a single complete oscillation (to and fro) of the pendulum, oscillating at angles of oscillation of less than  $5^\circ$  to each side of the vertical.

Apply an energy (initial potential energy) of  $(2.75 + 0.10)$  J.

The test result is divided into fractured (F) or not fractured (NF). When the toothbrush is fractured, measure angle of the pendulum and calculate the absorbed energy,  $E_a$ , from the following equation.

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$$E_a = WR(\cos \beta - \cos \alpha)$$

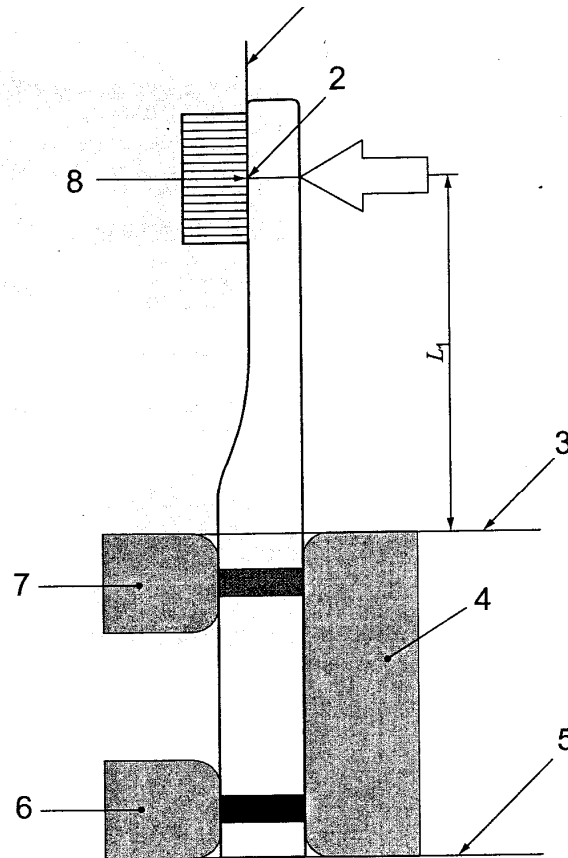
where

W is the striker weight, in newtons;

R is the distance between the axis of rotation and the centre of gravity, in metres;

$\alpha$  is the angle at the test starting position, in degrees;

$\beta$  is the angle after breakage of the specimen, in degrees.

**Key**

- 1 tuft-hole plane
- 2 hitting point for striker edge
- 3 top plane of the clamping unit
- 4 main block
- 5 bottom plane of the clamping unit
- 6 lower holding block
- 7 upper holding block
- 8 centre of tuft-hole area

NOTE The open arrow in the figure shows the striker direction.

**Figure 8 Clamping unit to hold the toothbrush**