

SENSODYNE AND PRONAMEL – TOOTHBRUSHES WITH REFINED PRESSURE CONTROL

FINAL REPORT

Marco Götze, Anantha Ramakrishnan, Sandra Sarembe, Andreas Kiesow
Fraunhofer Institute for Microstructure of Materials and Systems IMWS

AIM:

To evaluate a new toothbrush design with unique handle and neck design using mechanical testing by conduction deflection test. The focus was specifically on measuring the pressure control of the toothbrush.

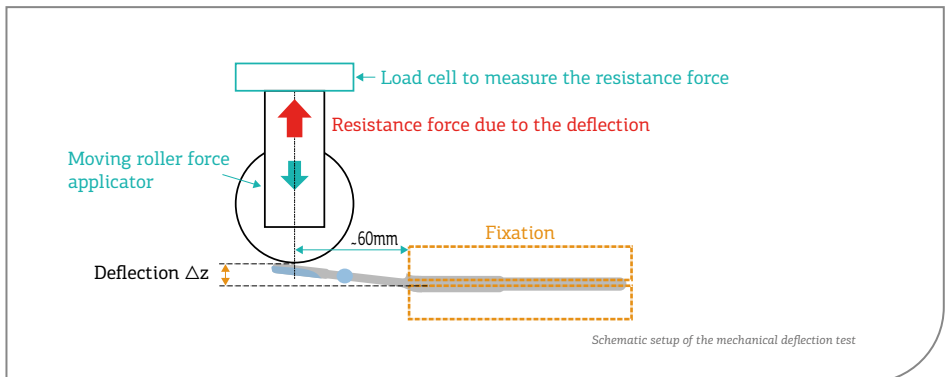
STUDY PRODUCTS:

- The new toothbrush handle design with flex neck (without tufts) – Sensodyne and Pronamel toothbrushes
- A conventional toothbrush without flex neck (without tufts) – Conventional toothbrush

METHODS:

The study used a mechanical deflection test

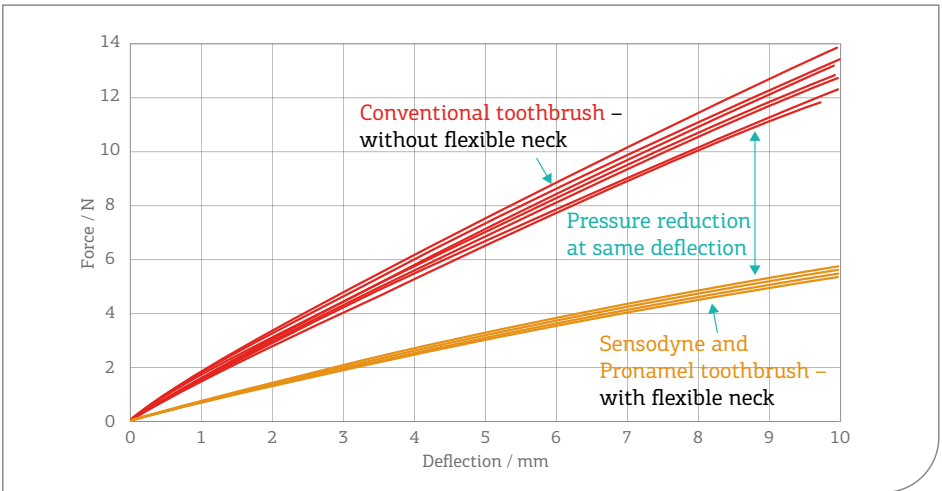
- Measure the resistance force of the brush heads while deflecting them using a roller force applicator
- The handles of the toothbrushes were fixated using individual sample holders to prevent uncontrolled bending of the toothbrushes



- Individual sample holders were created for toothbrushes to increase the contact surface on the handle and reduce the amount of pivot points. This corresponds best to the situation when brushing teeth and minimizes the influence of the handle on the results of the measurements

RESULTS:

- At a deflection of about 10mm, the max measured force with the conventional toothbrush is 2.5 times higher than for the Sensodyne and Pronamel toothbrushes



- At the same pressure the Sensodyne and Pronamel toothbrushes are deflected 2 to 3 times higher than the conventional toothbrush

CONCLUSIONS:

- The comparison between the new Sensodyne and Pronamel toothbrushes and the conventional toothbrush shows a significant influence of the flex neck on the pressure distribution of the Sensodyne and Pronamel toothbrushes
- When bending the toothbrushes, which corresponds to pressing onto the teeth, it can clearly be seen that the Sensodyne and Pronamel toothbrush is bent on the flex neck. This significantly reduces the force that transfers the stiffness of the toothbrush to the row of teeth when compared to the conventional toothbrush. The force is up to 2.5 times less, which makes it easier to brush your teeth
- The smaller increase in the force-deflection curve of the Sensodyne and Pronamel toothbrushes enables a more controlled pressure distribution of the brush on the teeth than with the conventional toothbrush, at which high pressures are achieved even with small deformations
- The pressure steps (force/deflection) are smaller with the Sensodyne and Pronamel toothbrushes than with the conventional toothbrush, which enables better pressure control; a more gentle brushing can be achieved
- Even with a large deformation of up to 10mm, the Sensodyne and Pronamel toothbrushes transmit a maximum force of 5.5 N, which corresponds to a weight of 550 g. That is 2.5 times less than the conventional toothbrushes with a maximum force of 14 N. The Sensodyne and Pronamel toothbrushes therefore significantly reduce the risk of overbrushing.