Heraeus

Heraeus Dental Science

# Scientific Information

## PALA® Teeth – Mondial® i & Mondial®

The high durability of removable dental prostheses depends primarily on the physical characteristics of the used materials. Frequently, the problem arises that high values of one parameter have an especially negative influence on another parameter. For dental prostheses, and in particular denture teeth, the balance between wear and break resistance is especially decisive. Dental prostheses should be fully functional as long as possible without having prior damage due to increased wear or breakage.

The following *in vitro*-examinations support the balance of wear and break resistance of our Nanopearls® material technology which is used in our tooth lines Mondial® i and Mondial.®

**2-Media-Wear Resistance of Denture Teeth in the Chewing Simulator**
M. Eck, K. Renz, K. Ruppert, F. Stange
Heraeus Kulzer GmbH, Wehrheim/Hanau/Wasserburg, Germany

**Break Resistance of Standardized Test Specimens Made of Denture Teeth**
M. Beyer, K. Kerscher, K. Renz, N. Schönhof, F. Stange
Heraeus Kulzer GmbH, Wehrheim/Hanau/Wasserburg, Germany

Experts in dialogue.

# 2-Media-Wear Resistance of Denture Teeth in the Chewing Simulator

M. Eck, K. Renz, K. Ruppert, F. Stange
Heraeus Kulzer GmbH, Wehrheim/Hanau/Wasserburg, Germany

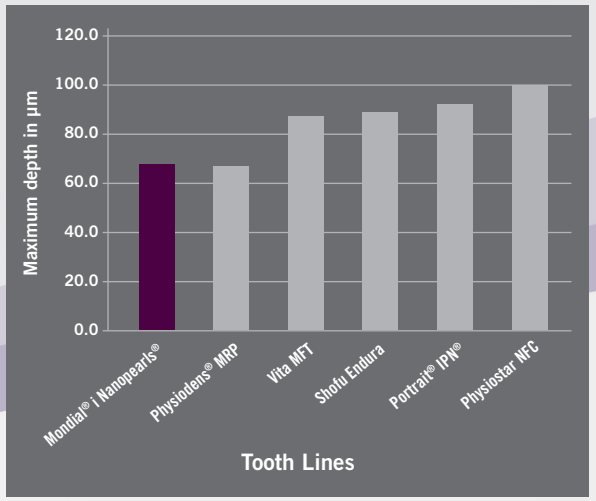
## Purpose

Denture teeth are subjected to constant wear in the mouth. The purpose of this examination is the determination of the abrasion strength of various dental materials in the 2-media chewing simulation.

## Materials & Method

The 2-media chewing simulation is a common method which was refined by the University of Heidelberg in co-operation with Heraeus Kulzer. Thus, it was possible to noticeably reduce standard deviations by using attenuators.
The pre-selected teeth were placed into the chewing support. Prior to the insertion any slight unevenness was leveled with fine sandpaper. $Al_2O_3$-pellets with a diameter of 4.75 mm were used as antagonist. The trial ran for 200,000 cycles with a horizontal movement of 0.8 mm under 50N pressure. The evaluation was done with a surface laser.

## Results




## Conclusion

Of the 6 tested tooth lines Mondial i shows significantly lower wear than other materials in the test. There was no significant difference between Mondial i and Physiodens. Vita MFT, Shofu Endura, Portrait IPN and Physiostar NFC had the highest wear in this test.

## Source

Research & Development, Heraeus Kulzer Wehrheim, Germany
Data on file

# Break Resistance of Standardized Test Specimens Made of Denture Teeth

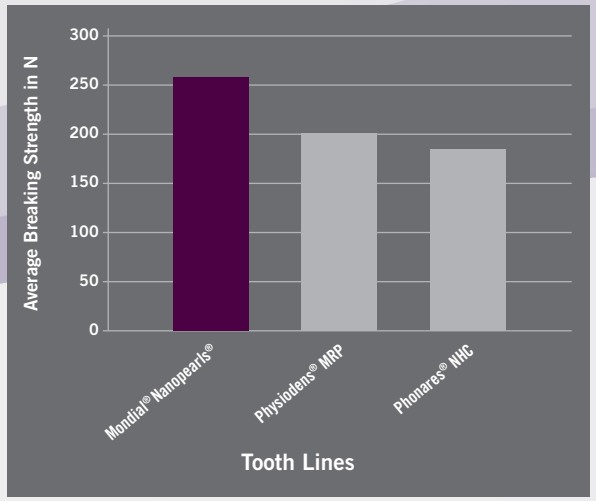
M. Beyer, K. Kerscher, K. Renz, N. Schönhof, F. Stange
Heraeus Kulzer GmbH, Wehrheim/Hanau/Wasserburg, Germany

## Purpose

The forces exerted on denture teeth can lead to breakage in extreme situations. The purpose of this examination is the determination of the break resistance of various denture teeth independent from their exterior form.

## Materials & Method

The teeth were embedded in denture base material and then were twisted into a cylinder of 6 mm in diameter. At a predefined location a predetermined breaking point was cut. The smallest diameter at the predetermined breaking point is 5 mm. The prepared test samples were then subjected to an increasing amount of force at an angle of 90° until breakage. The breaking strength was determined with a Zwick Universal Test Unit for all dental lines.




## Conclusion

Mondial had the highest breaking strength, followed by Physiodens and Phonares. The differences are significant. It is recommended that denture teeth with a high breaking strength are used in order to ensure a high durability of dental lab work.

## Source

Research & Development, Heraeus Kulzer Wehrheim, Germany
Data on file

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