

Stickiness of different VPS putty Impression Materials



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Introduction:

Stickiness of VPS impression materials, especially of putties, is an essential factor for ease of handling of impression materials during everyday dental practice. So far, dental material research focused mainly on investigation of physical properties, which is of course more important for the success of an impression. However, dentists often decide in regard to the handling properties which impression material they prefer to use.

Objectives:

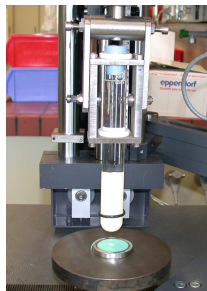
Stickiness of VPS impression materials, especially of putties, impacts handling when loading into impression tray. The aim of this study was to evaluate stickiness of 5 different impression materials with a newly developed testing method.

Methods:

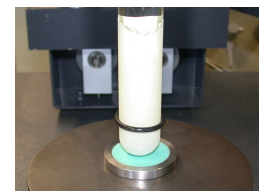
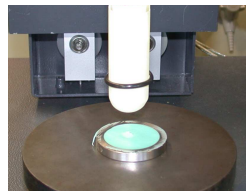
To evaluate stickiness of newly developed impression materials, Heraeus Kulzer created a new method for the measurement of stickiness. Therefore, freshly mixed impression material was applied into a Shore-A-ring (height: 6 mm, inner diameter: 35 mm). A water-filled test tube (Schott Duran) mantled with a glove finger (total weight 100 g) was fitted to a universal testing machine (Zwick 1435-MOPS) where it was then placed in contact with the surface of freshly mixed (1 min) impression material. After 15 sec contact time between glove and impression material, the relative stickiness was measured by determination of the tensile force in a pull-off test at a traverse speed of 35 mm/min. Measurements were repeated seven times for each impression material. The following VPS impression materials were compared: Flexitime Easy Putty (F) (Heraeus Kulzer), experimental automix putty (AP) (Heraeus Kulzer), Express 2 Penta Putty (E) (3M ESPE), Affinis Putty Soft (A) (Coltène) and Panasil binetics Putty fast (P) (Kettenbach).



Figure 1: Zwick Universal Testing Machine



Figures 2 a/b/c: Movement of the gloved test tube towards the freshly-mixed impression material.



Results:

The tensile force values determined (in N) were: Flexitime: 0,52^a, Experimental Automix Putty: 0,56^a, Panasil binetics Putty fast: 0,88^b, Affinis Putty Soft: 1,07^c and Express 2 Penta Putty: 1,59^d. Statistical analysis with ANOVA and Duncan ($p=0,95\%$).

➤ Flexitime Easy Putty and the experimental automix putty showed significantly less stickiness than the other impression materials.

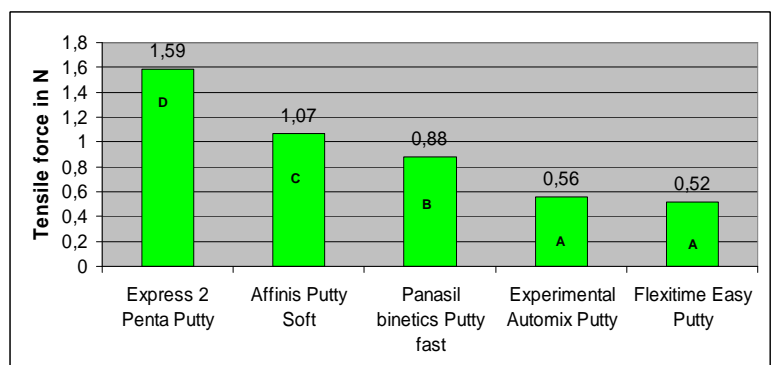


Figure 3: Degree of stickiness expressed by tensile force values in N. Letters denote statistical difference.

Conclusions:

Low tensile force values express low stickiness for the tested impression materials.

The new test method presented is a simple, fast and practical approach for assessing the stickiness of impression materials. It may, for example, be helpful for the dental industry in order to develop less sticky materials to make loading impression trays more convenient for the dentist.