Flow of Sultan Genie™ Light Body Impression Material Compared to Nine Competitive Products

Final Report

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In order to test for intrinsic viscosity, a specific testing device is used to simulate flow of the impression material into a sulcus. This testing device, called the Shark Fin device, has an edge-shaped opening (length 18 mm, max width 2 mm) that works as a mold to produce a shape resembling a shark fin. The impression material is injected into a mold and the device described above is put into the impression material using a defined force (by placing a weight of 275g on top of the device). After the impression material is set, the device is removed and the height of the thus obtained specimen is measured. The larger the height of the fin, the more the material flows under pressure.

Experimental Design:

All impression materials were conditioned at ambient room temperature for at least twenty-four hours before testing, as higher temperatures shorten and lower temperatures prolong processing times.

For each sample, approximately ten milliliters of impression material were syringed into the Shark Fin receptacle, avoiding air entrapment by loading the material at one end of the receptacle and burying the mixing tip. The Shark Fin device was then manipulated by placing the entire housing (the fixed mold and the 275g weight) on top of the receptacle.

The Shark Fin mold and weight was released into the filled receptacle at one minute after the start of the mix. The mold and weight were allowed to sink slowly into the paste. The strong impact into the material is the mechanism that tests the flow, which forms a shark fin shape through the device.

Ten minutes after the start of the mix, the mold was separated and the set impression of the shark fin removed. The height of the fin edge on each sample was measured using a caliper accurate to 0.01 mm. Average values of fin height for each impression material were determined, and an one-way ANOVA was used to establish significance between groups.

Results:

The mean values for the shark fin height for each impression material and time period are shown in Table 1. The comparative descriptive results are shown in Figure 1.

One-way ANOVA showed statistical significance between groups ($p<0.0001$). T-tests showed that the Sultan Light Body material had a significantly higher shark fin height compared to Take 1 ($p=0.0003$), Examix NDS ($p=0.0027$), Imprint II Garant Light Body ($p=0.0216$), Aquasil Ultra LV ($p<0.0001$), Standout Wash ($p<0.0001$), Splash Light Body ($p<0.0001$), and Precision Lite Viscosity ($p<0.0001$).

Statistical significance was not found in comparing Sultan to Senn Light Body because of a large deviation in the results for Senn Light Body ($p=0.1160$). The mean height of the shark fin with Honigum was similar to Sultan, and was not statistically significant ($p=0.4469$).

Table 1. Mean values for each group

Impression Material	Mean Height of Shark Fin (mm), n=7	SD
Sultan Light Body	23.67	0.67
Take 1 Wash	17.26	3.37
Examix NDS Injection Type	20.81	1.9
Senn Light Body	20.64	4.68
Imprint II Garant Light Body	20.49	3.12
Aquasil Ultra LV	13.64	0.94
Standout Wash	14.14	1.15
Splash Light Body	18.89	1.57
Precision Lite Viscosity	15.47	2.25
Honigum	24.11	1.31

Figure 1. Box-Whisker Plots for all Groups