

GrandioSO – Abrasion compared to enamel

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The nanohybrid composite GrandioSO sets new standards for restorative materials with its tooth-like behaviour. The abrasion behaviour in comparison with enamel was examined with the aid of a mastication simulator at the University of Chieti (Italy).^[1]

Low wear and tear during daily masticatory loads is a fundamental prerequisite for the occlusal surfaces of restorations remaining intact over the long term. On the one hand, this affects functional aspects such as preservation of the correct occlusion, on the other hand severe abrasion also has a negative effect on aesthetics (e.g., lustre). For this reason, low abrasion is always desirable.

For this study, 10 test cylinders were made, each with a diameter of 8 mm and a height of 10 mm, with each of the individual 2 mm increments being light-cured for 40 s. The last increment was light-cured through a slide for 40 s, in order to prevent the formation of an inhibition layer. The composites studied are GrandioSO (VOCO), Filtek Silorane (3M ESPE) and Tetric EvoCeram (Ivoclar Vivadent). For the evaluation of the abrasion of enamel, extracted human molars were sawn through at the buccal cemento-enamel junction and ground flat with sandpaper (two steps, 600 grit and 1000 grit). The test specimens produced in this way were tested in a biaxial mastication simulator (CS-4.2, SD Mechatronic GmbH, Germany), using dental enamel of 3 mm spherical radius from human molars as an antagonist. Every test specimen was put through 120,000 mastication cycles with a masticatory load of 5 kg. The extent of abrasion was analysed with a contact-profilometer (SJ-400, Mitutoyo, Italy). Figure 1 shows the results of the measurement. With somewhat over 100 μm , GrandioSO shows the least abrasion of all of the restorative materials tested.

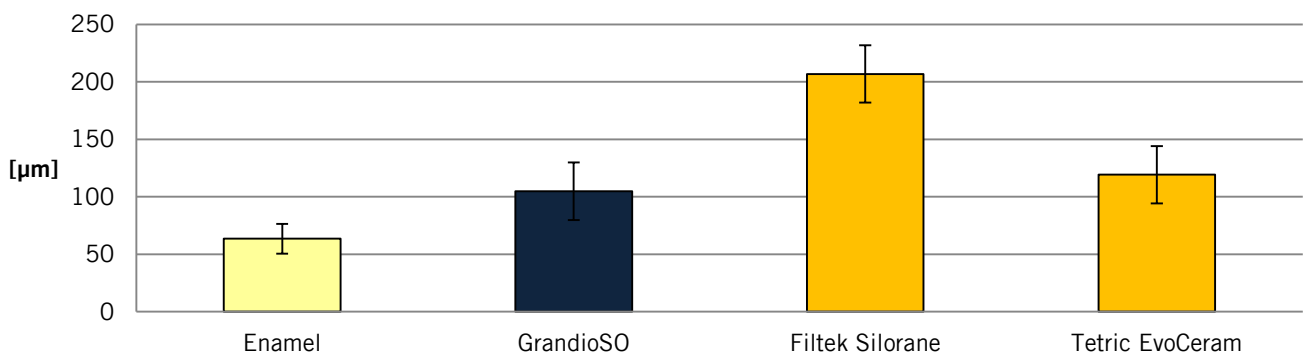


Figure 1: Abrasion after 120,000 cycles in the mastication simulator [μm].

Conclusion: GrandioSO convinces with its low abrasion and, in this study, behaved the most similar to teeth.

[1] L. M. Vitalone, F. De Angelis, F. Angileri, C. D'Arcangelo, IADR Budapest 2011, Poster 12.