

SCIENTIFIC REPORT

Grandio – Shade stability

VOCO GmbH, Knowledge Communication Department

Anton-Flettner-Str. 1-3
27472 Cuxhaven, Germany

Tel.: +49 (0)4721-719-1111
Fax: +49 (0)4721-719-109

info@voco.de
www.voco.com



The exact shade matching of tooth and restorative material is always an aim of filling therapy and is expected by patients nowadays. The match should not only be exact directly after the procedure, but the shade and opacity of the restoration should also not significantly change after several years. Shade matches of diverse restorative materials were observed after alternate thermal loading in a study at the University of Seoul (Korea).^[1]

Study design

8 light-curing composites in a total of 41 shades were examined in the present study. After preparation of the test specimens, they were stored for 24 hours at 37 °C and subsequently subjected to thermocycling (5000 cycles, 5 / 55 °C). The determination of a change in shade (ΔE^*_{ab}) was carried out under lighting with a standard light D65. The change in opacity (ΔTP^*) of the materials was determined over the change in shade in front of a white and black background.

Results of the study

Figure 1 shows the change in shade (ΔE^*_{ab}) after alternate thermal loading. It can clearly be seen that, on average, Grandio has the highest shade stability (averaged $\Delta E^*_{ab} = 1.5$).

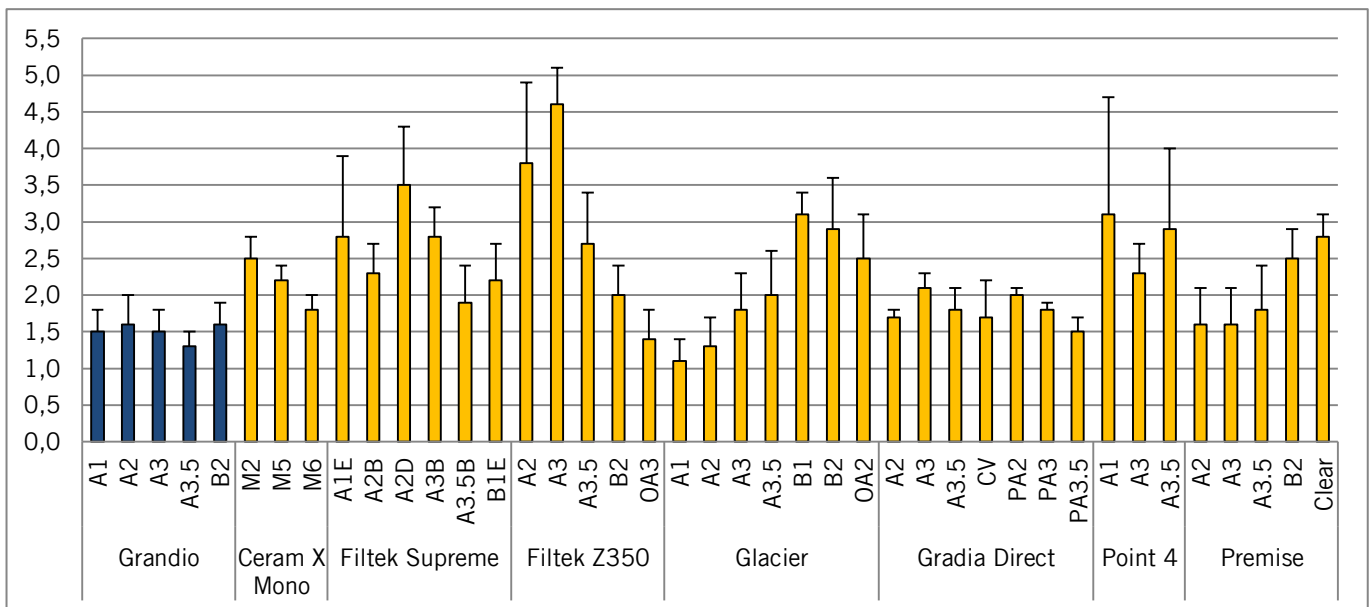


Figure 1: Changes in shade (ΔE^*_{ab}) after alternate thermal loading (5000 cycles, 5 / 55 °C)

A value of 1.7 was designated as the limit for the stability in a study by Brewer et al. [2] Grandio is the only material that fell below this value.

A similar picture resulted from the examination of the stability of the translucency parameter (Figure 2). In contrast to all of the other tested materials, the opacity of the Grandio test specimens only changed marginally from the thermocycling.

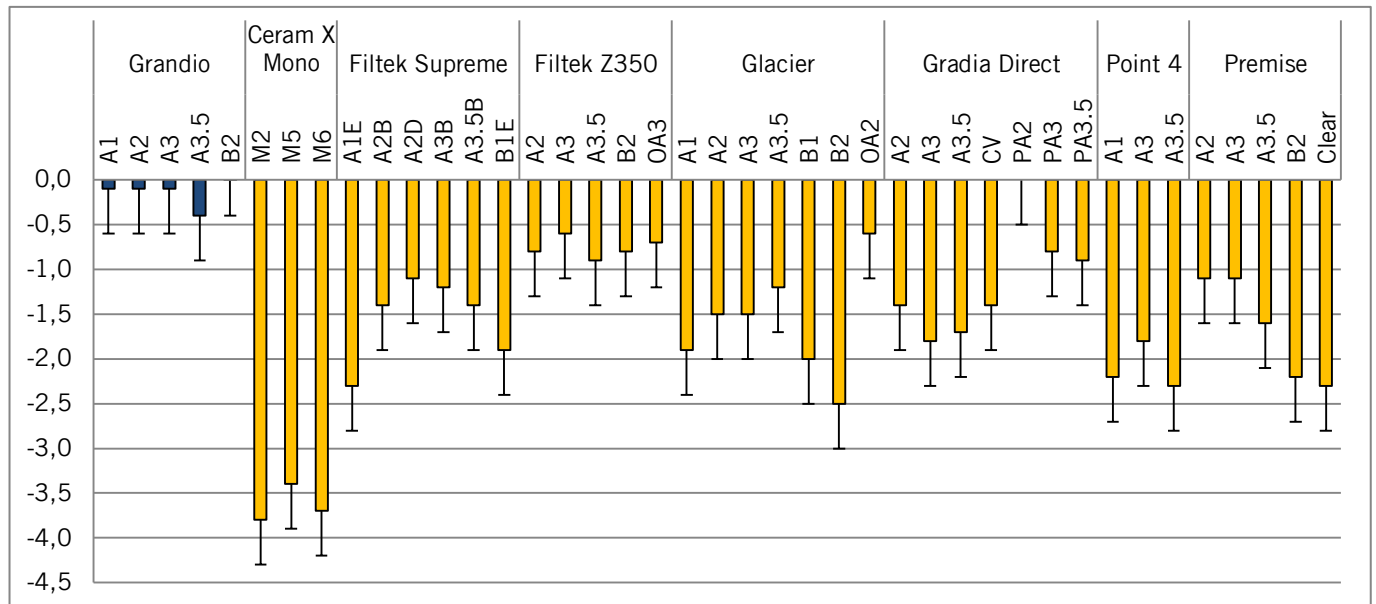


Figure 2: Change in the translucence parameter (ΔTP^*) after alternate thermal loading (5000 cycles, 5 / 55 °C)

From the examination of the change in translucency, the study came to the conclusion that the materials that retain their translucency are especially the ones that already attain a high degree of polymerisation during light-induced polymerisation. Additionally, low water absorption has a positive effect on the retention of the opacity. Another point mentioned is the thermal fatigue, which leads to a change in the refractivity of the material. By implication, it can be deduced that Grandio, the highly-filled nano-hybrid composite, has a high degree of polymerisation with low water absorption and is additionally scarcely subject to thermal wear.

Conclusion: Grandio distinguished itself with significantly better shade stability in comparison to all of the other likewise tested competing products in a study at the University of Seoul. This outstanding performance affects both the retention of the colour and translucency.

[1] S.-H. Lee, Y.-K. Lee, *Am. J. Dent.* **2008**, *24*, 361-367.

[2] R. D. Douglas, J. D. Brewer, *J. Prosthet. Dent.* **1998**, *79*, 254-260.