SCIENTIFIC INFORMATION

Glasiosite - Curing depth

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As a compomer, Glasiosite is particularly useful in paediatric dentistry. The treatment duration plays a critical role here, since the opportunity for 2 mm thick increment applications s is gladly used to the full extent. To what extent the light-induced polymerisation still led to adequate polymerisation on the bottom side of increments with a depth of 2 mm was examined in a study at Ghent University (Belgium).[1]

The polymerisation degree of composites is difficult to directly determine. For this reason, parameters that are closely linked to the degree of polymerisation are often used in the examination. In the study presented here, this is the surface hardness, which was determined according to Knoop. Not only is the "effect" of the polymerisation reaction crucial in this process, but the degree of crosslink in the resulting polymer also has a substantial influence. In this test, all test specimens were light-cured for 40 s with an 800 mW/cm^2 device and stored at room temperature in the dark before measuring the surface hardness.

Examination of the degree of polymerisation of the shade A2

Test specimens in the shade A2 were examined. The results are displayed in Figure 1. Diverse compomers and three composites (Z100, Herculite XRV and Durafill VS) were tested. Z100, the hybrid composite, exhibited the best values in this study as expected. Surprisingly, the composite Herculite XRV was comparable to the compomers.

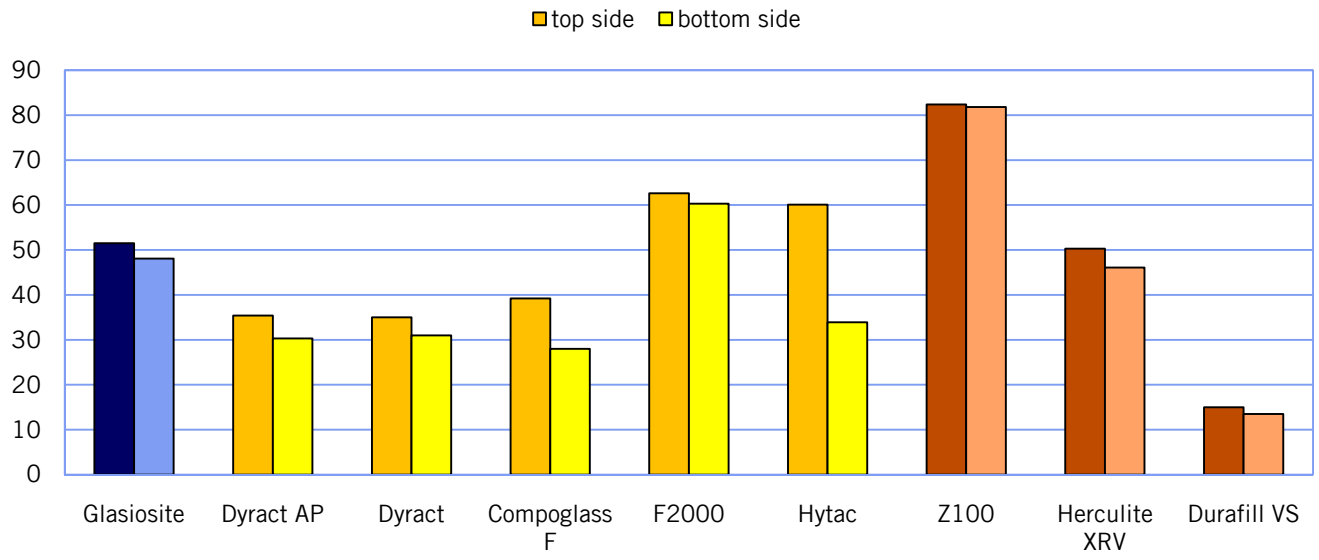

Figure 1: Knoop hardness on the top side and bottom side of test specimens in the shade of A2

The poor performance of Durafill VS illustrates the inadequate physical properties of pure micro-fill composites. In the comparison of the compomers, it should first be noted that Glasiosite, F2000 and Hytac exhibited good values. While the decrease in hardness from the top side to the bottom side was extremely low with Glasiosite and F2000 (7% and 4% respectively), the bottom side of Hytac only had 56% of the hardness measured on the surface.

Examination of the degree of polymerisation of shade A4

Test specimens in shade A4 were examined in an additional measurement (Figure 2).

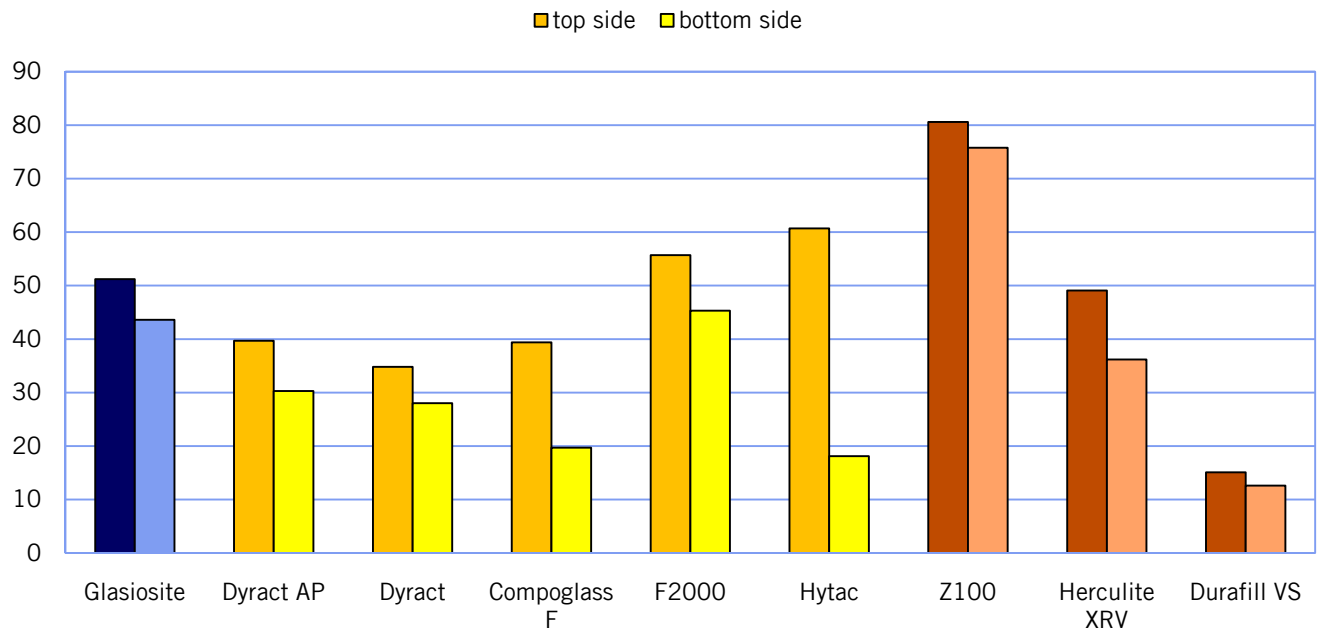

Figure 2: Knoop hardness on the top side and bottom side of test specimens in the shade A4

In comparison to the lighter A2 shade, the difference in hardness of the top and bottom sides is more obvious; which is not remarkable for the more opaque shade A4. The limited amount of light conduction through the material is interesting. Hytac, which already had a poor rating in the A2 test, achieved just 30% of the top side's hardness on the bottom side in this experimental setup. If one limits the examination to the compomers, Glasiosite and F2000 delivered the significant best values on the surface in connection with a low decrease of hardness in the increment (Glasiosite: 15%, F2000: 19%).

Conclusion: The compomer Glasiosite offers a high surface hardness that is exhibited in the study presented here. Additionally, the polymerisation reaction occurs in the depth of the restoration to cause sufficient curing depth of the entire increment.

[1] N. S. Koupis, L. C. Martens, R. M. H. Verbeeck, *Dent. Mater.* **2006,** *22*, 1045-1050.