

## Grandio – Abrasion resistance

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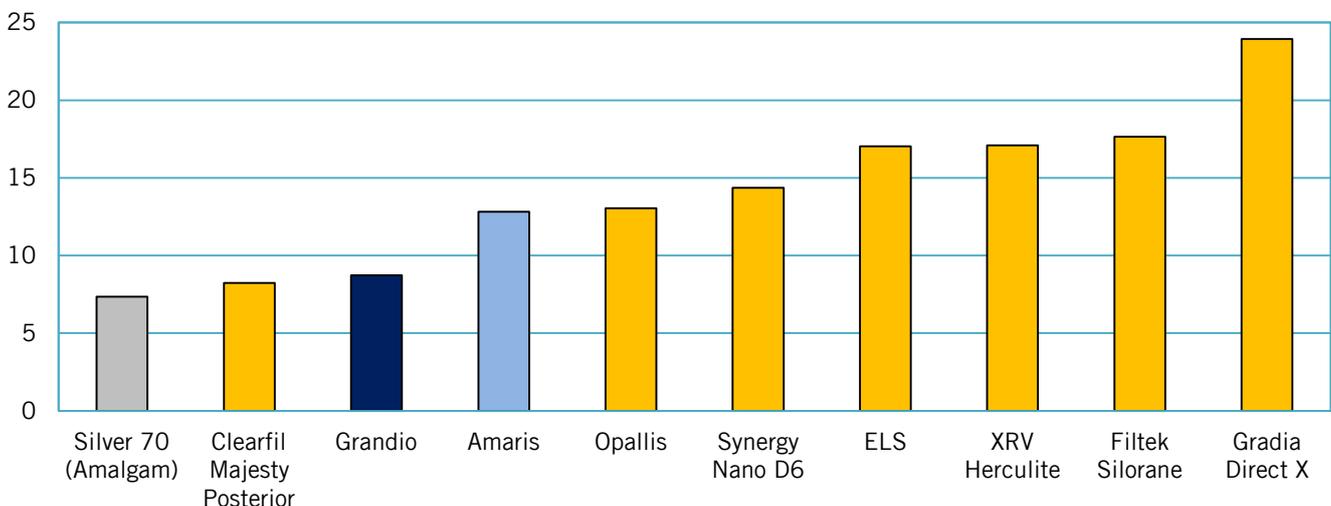
**The nanohybrid composite Grandio by VOCO features extremely low abrasion, also under high loads, and it may even approximately match the abrasion resistance of amalgam.**

The leucite-reinforced IPS Empress glass ceramic material has been used million-fold to restore teeth indirectly. The long-term clinical success of these restorations do not only depend on the physical properties of the ceramic material, but also on the quality of the adhesive luting. A study by Burgess et al. carries out an evaluation of various luting materials in the luting of IPS Empress crowns.<sup>[1]</sup>

In daily life, teeth and, accordingly, restorative materials are exposed to great stress. The wear and tear caused by masticatory stress is a fundamental factor, especially as the high masticatory loads (45-70 MPa)<sup>[1]</sup> occur several times daily. In the case of advanced abrasion, a loss of occlusion and consequential damages such as isthmus fractures may occur.

### Study of the abrasion of plastic restorative materials<sup>[2]</sup>

At the University Hospital Erlangen, three-media abrasion (ACTA) was used to abrade various restorative materials through 200,000 revolutions. The average abrasion depth was subsequently determined. Fig. 1 shows the results of this measurement:



**Figure 1:** Abrasion [µm] determined by three-media abrasion (ACTA)

As can clearly be seen in the figure, only three materials show an abrasion depth of below 10 µm. In this study, the composite materials Grandio and Clearfil Majesty Posterior (Kuraray) show distinctly better values than any other composites tested, whilst there is no significant difference between the results of Clearfil and Grandio.

**Conclusion: The high filler content of the nanohybrid composite Grandio by VOCO achieves extremely high values in regard to abrasion resistance. This minimal wear and tear is a prerequisite for durable restorations.**

[1] K. Miyaura, Y. Matsuka, M. Morita, A. Yamashita, T. Watanabe, *J. Oral Rehabil.* **1999**, *26*, 223-227.

[2] PD Dr. -Ing. U. Lohbauer, Materials Science Laboratory of the University of Erlangen, 2008, data on file.