

Grandio Seal - Abrasion

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Deep and narrow fissures, especially the crevices between the mineralization fronts after eruption, represent preferred colonization areas for cariogenic bacteria. Fissure caries that arise as a result of this phenomenon cannot always be detected during an oral examination or be seen in an x-ray. Fissures cannot be reached with a tooth brush and should be sealed within the scope of prophylaxis measures to minimize further damage.

A fissure sealant must be resistant to abrasion without additional adhesive bonding to guarantee long-lasting durability under daily chewing load. This is achieved with the addition of fillers. The problem is that traditional fillers also increase the viscosity resulting in even flowable composite restoratives being too viscous to safely flow into a fissure. With Grandio Seal's nano-hybrid filler technology, it is now possible to provide an extremely durable fissure sealant with low viscosity yet 70 w/w % filler content.

ACTA 3-body abrasion, University of Regensburg study

The University of Regensburg tested the abrasion behavior of several fissure sealants. The abrasion values after 120,000 cycles are presented in Fig. 1.

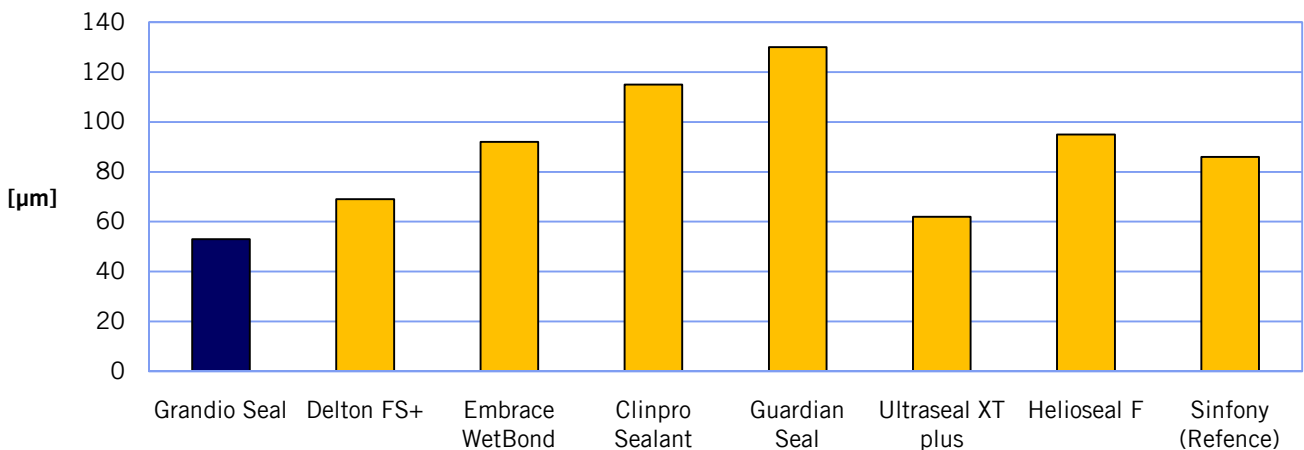


Figure 1: Shear bond strength of various luting materials (24 h, 37 °C water storage, then thermocycling 6/60 °C, 1000 cycles)

Grandio Seal exhibited the lowest abrasion of all the tested materials. The material retains its low viscosity, yet exhibits the typical high stability from the cross-linking of the filler in the resin matrix. The mechanical values are supplemented with SEM micrographs of the abrasion surface.

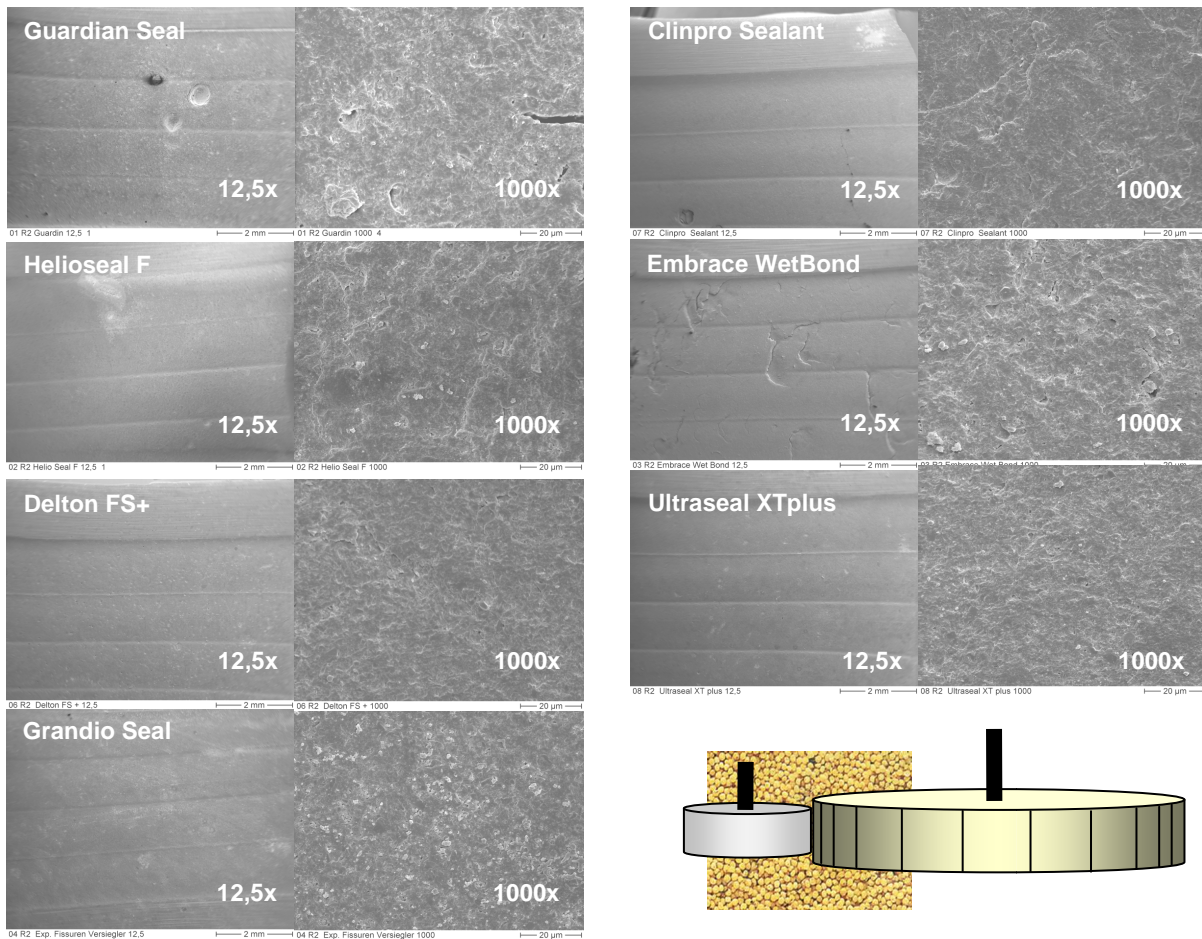


Figure 2: SEM micrographs of the abrasion surface (University of Regensburg)

The SEM images of Guardian Seal, Clinpro Sealant, Helioseal F and Embrace WetBond show inhomogeneities of the material or surface fractures; whereas, Delton FS+ and Ultraseal XT plus simply exhibit visible levels of abrasion on the loading edge. Grandio Seal exhibited neither levels of abrasion nor inhomogeneities of the material. This is ultimately responsible for the high abrasion stability.

Conclusion: With a filler content of 70%, Grandio Seal has the highest abrasion stability of all the fissure sealants tested. This ensures a high success rate when sealing fissures as caries prophylaxis.

[1] C. Mürnseer, M. Rosentritt, M. Behr, G. Handel, „Three-body Wear of Fissure Sealants“, Zentrum für Zahn-, Mund- und Kieferheilkunde, University of Regensburg, data on file.