

## Rebilda DC - Fracture resistance

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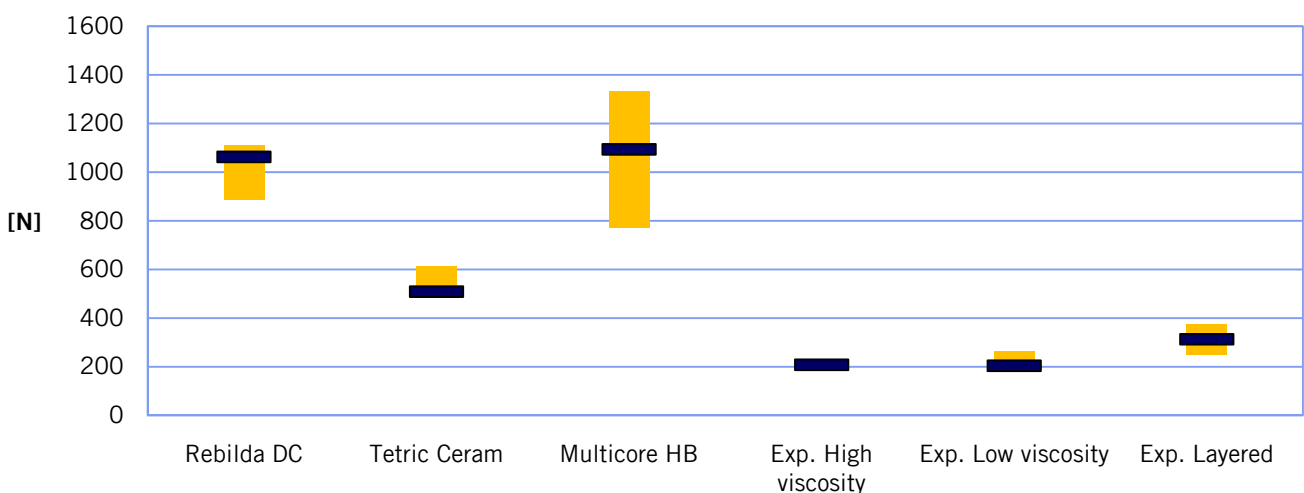


**Rebilda DC is a dual-curing composite material designed especially for core build-up. In addition to simple handling and processing of the material, the special requirements for core build-up were considered for Rebilda DC's material properties.**

Fracture resistance is especially an important parameter for core build-up materials. Crowns are always fabricated from materials with immense stability and extremely low elasticity (e.g.: ceramic, metal alloys, etc.). This means that the forces which affect a crown are virtually as powerful when they reach the material underneath the crown. The core build-up material must therefore be able to withstand these occurring forces. Moreover, the marginal integrity must remain unharmed in the course of loading. The development of marginal leakage leads to the loss of the crown in the long run.

### Fracture resistance and marginal leakage study

In 2008, several materials (two core build-up composites, three experimental materials and a universal composite) were examined for their fracture resistance and marginal integrity at the University of Regensburg.<sup>[1]</sup> In the course of the study, test specimens for the examination were created by using system bonds. The specimens were subsequently exposed to thermal loading (6000 cycles, 5/55° C) and simulating chewing (1,200,000 cycles, 50N).



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

The results of the analysis of the fracture resistance test are illustrated in Figure 1. Only Rebilda DC and Multicore HB, the two core build-up materials, exhibited adequate fracture resistance. These two materials, however, are considerably different with respect to their marginal integrity. Rebilda DC delivered marginal integrity of almost 100% on both the composite-dentine and composite-crown interfaces before and after loading. The respective values for Multicore HB were significantly inferior.

**Conclusion: Rebilda DC, a core build-up material, was the only material in this study to combine a high resistance to fracture with excellent marginal integrity. The loading experiments conducted in this study especially support using Rebilda DC to facilitate long-term intact treatment of endodontically restored teeth.**

[1] M. I. Reill, M. Rosentritt, M. Naumann, G. Handel, *Int. Endo. J.* **2008**, *41*, 424-430.