Mechanical properties of four photo-polymerizable resin-modified base/liner materials

**Objective:** The purpose of this study was to evaluate and compare the flexural strength and compressive strength of the newly developed Activa Bioactive base/liner material to other commercially available base/liners.

**Materials and Methods**
Activa Bioactive Base/Liner (Pulpdent), TheraCal (resin-modified calcium silicate, Bisco), Fuji Lining LC (RMGI, GC), and Vitrebond Plus (RMGI, 3M) were tested. Compressive strength specimens (n=5) were fabricated in a polypropylene cylindrical mold with dimension of 4 mm diameter (id) and 8 mm long by light curing for 40 sec on either side of the specimen. The flexural strength specimens (n=5) with dimensions of 2 mm x 2mm x 25mm (width, thickness and length) were prepared in a split polypropylene mold by light curing 40 sec on either side of the specimen. The specimens were then placed in distilled water in an incubator at 37°C for 24h. Compressive strength and flexural strength measurements were tested until failure of the specimens and were obtained using a Universal testing machine (Instron Model T1104, Canton, MA) at an overhead speed of 4mm/min and 1mm/min respectively.

**Results:**
Activa Bioactive base/liner material shows significantly higher flexural strength and compressive strength compared to other materials tested. Activa bioactive material would withstand greater loads under restorative materials.
Figure 1: Compressive Strengths of Base Liner Materials

Figure 2: Flexural Strengths of Base Liner Materials
Figure 3: 7 day Water Absorption of Base Liner Materials