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Initial Paste pH of New Hybrid-RMGI Liner/Base/Pulp-Protectant Material

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Objectives A low, acidic initial pH is a necessary (but not sufficient) factor needed to facilitate tooth adhesion. The aim of this study is to measure/compare the early-stage pH of an experimental hybrid-RMGI material from Solventum to commercially available liner/base/pulp-capping materials.

Methods For initial pH measurements, a pH electrode was calibrated with three pH buffers. For each material, all stages prior to light curing were followed according to the manufacturers' IFU preparing 2 mL of material. The mixed material was transferred to a capped 10 ml syringe-tube. The pH probe was submerged in a cup of DI water and gently removed leaving a thin layer of the DI water on the surface of the pH probe bulb. The probe was gently submerged into the mixed paste and stabilized for 30 sec. Subsequently, the pH was recorded every 30 sec for 5 min. After the last measurement, the probe was removed, cleaned, and recalibrated.

Results The mean values for pH measured at 1,3,5 minutes along with the resulting standard deviations (n=3) are shown below. Data was analyzed using one-way ANOVA with 95% confidence Tukey's method. The pH of the DI water, which could not be tested accurately via the pH probe, was 5.0 via a pH strip.

Conclusions The pH of the experimental hybrid-RMGI material at 1,3,5 minutes was low, around 3.6-3.7, and statistically similar to VBP, ABA, and FLP. LLE showed a pH around 5.4 similar to DI water and did not seem to have the potential to impact the pH. LLE was also not statistically similar to any other material. TLC showed a pH around 10.5 and PVD showed a pH around 11.7. The 1 min mark of PVD was statistically similar to the 3 min and 5 min mark of TLC.