

## 0023 Incompatibility Profiles of All-in-one Adhesives. I. True vs Apparent Incompatibility

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**Objectives:** Some manufacturers claim that their all-in-one adhesives may be used for bonding of indirect restorations. This study examined the compatibility of some of these adhesives to auto-cured composites, using deep dentin from extracted human third molars as a permeable bonding substrate, and processed composite as an impermeable bonding substrate. **Methods:** Four all-in-one adhesives were examined. Xeno III (XE, Caulk-Dentsply), Adper Prompt (AP, 3M ESPE) and One-Up Bond F (OU, Tokuyama) are recommended to be used with light-cured composites only, while iBond (IB, Heraeus-Kulzer) is claimed to be suitable for indirect restorations. An auto-cured composite (Bisfil 2B, Bisco) was coupled to both hydrated dentin (H) and processed composite (C) using these adhesives. The control consisted of an experimental dual-curable version of BisFil 2B that was bonded to hydrated dentin using the light-activation mode (HL). Microtensile bond strength evaluation was performed after 24 h of water storage, using beams of approximately 0.9 mm<sup>2</sup> in cross-sectional area. TEM was performed following exposure to ammoniacal silver nitrate.

**Results:** Microtensile bond strengths ( $X \pm SD$ , n=20 in MPa; Kruskal-Wallis/Dunn's). For each column, different superscripts indicated significance difference at  $P < 0.05$ .

	XE	IB	OU	AP
H	11.9±4.8 <sup>b</sup>	7.3±4.0 <sup>b</sup>	5.5±2.1 <sup>b</sup>	0.0±0.0 <sup>b</sup>
C	52.8±9.8 <sup>a</sup>	24.3±5.1 <sup>a</sup>	45.0±7.3 <sup>a</sup>	0.0±0.0 <sup>b</sup>
HL	52.1±10.3 <sup>a</sup>	23.7±4.7 <sup>a</sup>	39.8±8.0 <sup>a</sup>	37.2±9.4 <sup>a</sup>

In group H, XE, IB and OU contained silver-filled water blisters along the adhesive-composite interfaces. They were not observed when dentin was replaced with composite in group C. Groups H and C in AP did not bond to the auto-cured composite.

**Conclusion:** Of the four all-in-one adhesives, only AP demonstrates true adverse acid-base reaction when coupled with auto-cured composites. When bonded to hydrated dentin, the "apparent" incompatibility of XE, IB and OU with auto-cured composites is due to their inherent permeability that permit water movement from the bonded dentin.

[Seq #8 - Keynote Address and Self-etching Adhesives 1](#)

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