

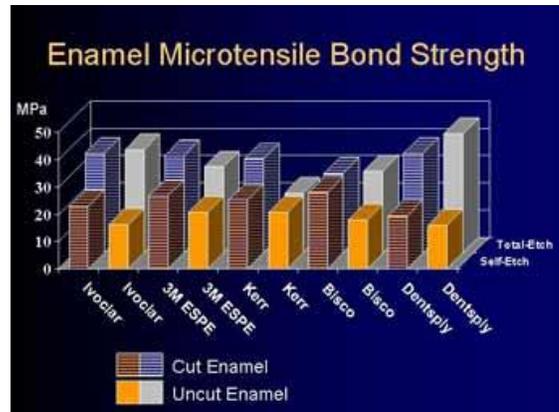
## Bond Strengths on Cut or Uncut Enamel (9/05)

Perdigao J, Gomes G, Duarte S, Lopes MM. Enamel bond strengths of pairs of adhesives from the same manufacturer. Oper Dent 2005;30:492-499.

Current dental adhesives utilize either the self-etch or total-etch technique (aka etch-and-rinse). Total-etch adhesives include a separate phosphoric-acid gel while self-etch adhesives condition and prime simultaneously without rinsing. The self-etch adhesives typically have a higher pH than total-etch adhesives (i.e., less acidic) and have been reported to have a weaker bond to intact enamel.<sup>1,2</sup>

The purpose of this study was to compare the microtensile bond strength of self-etch and total-etch adhesives on both cut and uncut enamel. Proximal surfaces of 25 extracted human molars were sectioned. Half were roughened with a bur, while the other half remained intact. Five pairs of adhesives (i.e., self-etch and total-etch from the same manufacturer) were applied (Adper Prompt, Single Bond, 3M ESPE; AdheSE, Excite, Ivoclar Vivadent; Optibond Solo Plus SE, Optibond Solo Plus, Kerr; Tyrian SPE/One-Step Plus, One-Step Plus, Bisco; Xeno III, Prime & Bond NT, Dentsply) according to the manufacturers instructions.

Composite (Z250, 3M ESPE) was incrementally placed on the enamel surface, light-cured, and sectioned into beams with a cross section of 0.8 x 0.2 mm<sup>2</sup>. The beams were tested to failure in a testing machine (Instron). The microtensile bond strengths were recorded and a mean and standard deviation were determined. A two-way ANOVA followed by Duncans post-hoc test was computed. **The highest mean bond strengths were obtained with total-etch adhesives. Self-etch adhesives resulted in lower bond strengths on intact enamel than on roughened enamel.**



**DECS Comment:** The lower adhesion of self-etch adhesives to intact enamel may be the result of a less pronounced etching pattern. Intact enamel is hypermineralized and may contain more fluoride. Also, the outmost enamel may be more prismless, preventing further penetration of the less acidic self-etch adhesives. The authors note that the inability of some self-etch adhesives to bond adequately to roughened enamel raises an important clinical question as to whether dentists are currently considering the ease of application to be more important than the longevity of the bonded restorations.

## References

1. Pashley DH, Tay FR. Aggressiveness of contemporary self-etching adhesives. Part II: Etching effects on unground enamel. Dent Mater 2001;17:43-444.
2. Perdigao J, Geraldini S. Bonding characteristics of self-etching adhesives to intact vs prepared enamel. J Esthet Restor Dent 2003;15:32-42.