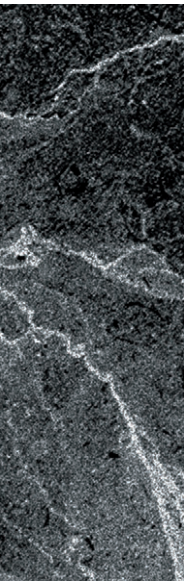

# Ask the Experts

## DENTIN/ENAMEL BONDING

**Guest Expert**
Patricia N.R. Pereira, DDS, PhD*

**Associate Editor**
Edward J. Swift, Jr., DMD, MS

QUESTION: Several different types of dentin/enamel adhesives are available and I am confused about which one(s) to use in my practice. Can you rate the various categories of resin-based adhesives for me?

ANSWER: I will answer this question with another question: "how many dentin/enamel adhesives do you want to have in your practice?" If you only want one adhesive system, the best option would be the category of the three-step total etching systems, which have universal application. This category is still considered the gold standard according to both research and clinical studies, and bonds well to enamel and dentin. These adhesive systems can be safely used with both direct and indirect composites, and ceramic restorations. However, because these systems use phosphoric acid, which is very aggressive on dentin, they should be avoided on deep dentin.

If you do not mind having a second adhesive system, I would recommend a two-step self-etching system. This category is also considered a gold standard in dentin adhesives with long research and clinical track records. These systems bond very well to dentin; however, bonding to enamel remains a problem. Therefore, to ensure reliable bonding to enamel when using these systems, enamel margins (only) should be etched with phosphoric acid. The two-step self-etching systems are mild enough to be used in deep dentin, and when associated with phosphoric acid etching on enamel margins, they provide clinicians with the best qualities of both total-etch and self-etch categories. However, most of these systems are not compatible with dual-cure and self-cure luting systems.

If you can afford having a third category, I would recommend the two-step total etching systems. These systems are simplified, and include the primer and adhesive in a single bottle. The primer–adhesive solutions, once applied and light-activated, provide a thin adhesive film, which is highly recommended for esthetic restorations. Although simplified, these systems are more technique-sensitive regarding dentin moisture, and are more permeable than the previously described categories. Most are only compatible with

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direct composites only because of the low pH of the primer/adhesive solution. Some manufacturers include a second bottle with the purpose of making the solution compatible with dual-cure resin luting systems.

The fourth category is the one-step self-etching systems, which are acidic solutions containing both primer and adhesive. According to recent research publications, this category seems to have great future promise. However, laboratory and clinical research still rate the current one-step adhesive as inferior to the categories described previously.

Regardless of the category, operator variability has been reported in the literature as very important, because the adhesive systems might function differently with different operators. The manufacturer's instructions should be read and followed in order to ensure the greatest longevity of your bonded restorations.

SUGGESTED READINGS

De Munck J, Van Landuyt K, Peumans M, et al. A critical review of the durability of adhesion to tooth tissue: methods and results. J Dent Res 2005;84:118–32.

Van Landuyt KL, Snauwaert J, De Munck J, et al. Systematic review of the chemical composition of contemporary dental adhesives. Biomaterials 2007;28:3757–85.

Peumans M, De Munck J, Van Landuyt K, et al. Five-year clinical effectiveness of a two-step self-etching adhesive. J Adhes Dent 2007;9:7–10.

Editor's Note: If you have a question on any aspect of esthetic dentistry, please direct it to the Associate Editor, Dr Edward J. Swift, Jr. We will forward questions to appropriate experts and print the answers in this regular feature.

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