



## One-step etch/primer for bracket bonding

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### Abstract

*A single step etch/primer that can be used for bonding orthodontic brackets with virtually any light polymerized resin-based composite bracket adhesive material that has been introduced. Clinical trials have shown it to be especially useful in re-bonding detached metallic or ceramic brackets, and for bonding brackets to fluorosed enamel. This technique report describes the PROMPT L-POP\* system and demonstrates its use. (Pediatr Dent 23:145-146, 2001)*

Early in 2000, ESPE introduced PROMPT L-POP,\* a bonding agent formulated specifically to bond to all available brands of resin-based composite to dentin and enamel. The main feature of the new bonding system is that no separate acid etching of the enamel or dentin is required; the liquid adhesive agent itself has an acid component that demineralizes tooth structure. In November 2000, 3M Unitek (Monrovia, CA) introduced "Transbond TM Plus Self Etching Primer," which is another brand name for the Prompt L-POP\* system.

The PROMPT L-POP system consists of an individual foil mixing/dispensing unit with three bubble chambers. The first two contain methacrylated phosphates, a fluoride complex, initiators, and stabilizers in an aqueous solution. Once blended,

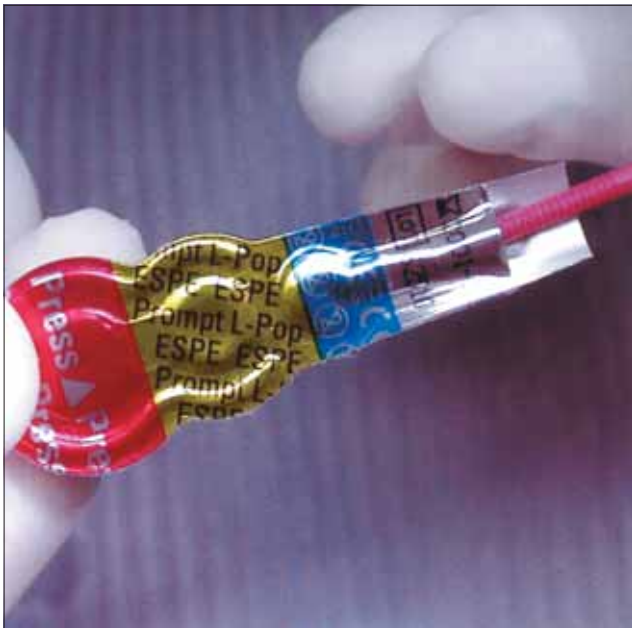


Fig 1. PROMPT L-POP mixing/dispensing packet.

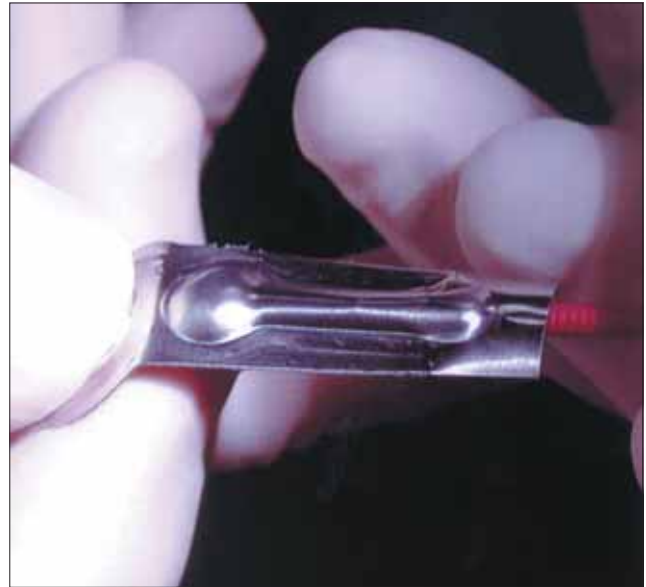


Fig 2. Fluids blended by alternately squeezing the first two bubble chambers.



Fig 4. Bracket with resin-base composite adhesive positioned on tooth.



Fig 3. After pumicing, rinsing and drying enamel, PROMPT L-POP fluid is rubbed upon the tooth surface for 3-5 seconds and allowed to penetrate for 30 seconds.

the fluid is expelled into the third bubble section that houses a small applicator tip.

Phosphoric acid esters demineralize enamel and dentin in the same manner as 30% - 50% phosphoric acid used in the traditional acid etching technique. The light polymerization reaction neutralizes the acid. **Prompt L-Pop does not bond with self-curing resin composite materials. It works only with light-cured resins.**

Much research has been completed regarding enamel and dentin bond strengths using the self-etching system; etching patterns, ultramorphology of the tooth structure/Prompt bond, and associated microleakage. The self-etching system has been used extensively for many adhesive dentistry applications and compares favorably in its first year of use.<sup>1,2</sup> One study compared the strength of the bond using PROMPT L-POP to attach orthodontic brackets to bovine incisors vs. traditional acid etching methods, and found no significant differences.<sup>3</sup> Those findings are consistent with our clinical experience with the etch/prime solution.

### Methods

For bracket bonding, the following technique is employed:

1. Pumice, rinse, and dry the teeth. For reattachment of a loose bracket, remove as much residual adhesive as possible.
2. By alternately squeezing the end and middle bubble chambers, mix the PROMPT in the foil package. Force the mixture into the third bubble section, which contains the applica-

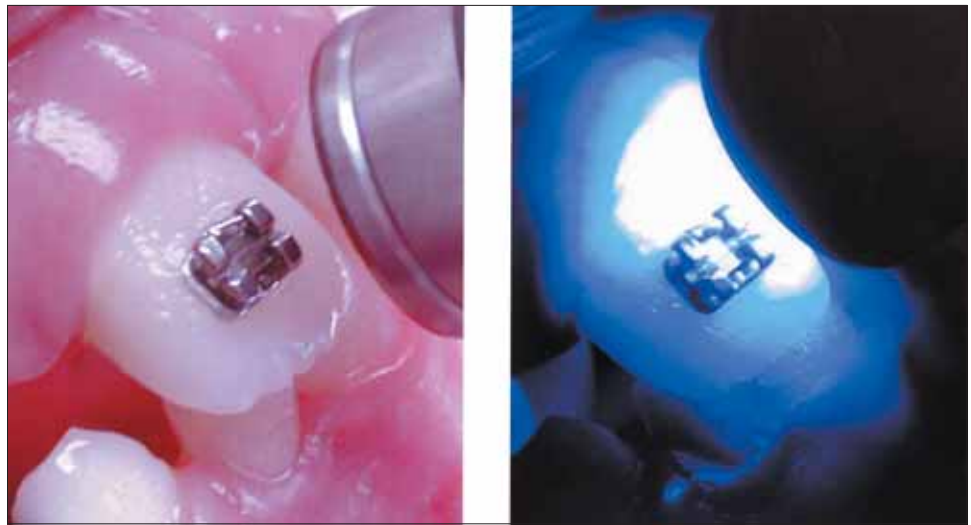


Fig 5. Visible light polymerizes the PROMPT L-POP and light-cured composite adhesive.

3. Remove the applicator tip and make sure it is moist with etch/primer solution.
4. Using the applicator, rub the solution on the enamel surface for 3-5 seconds and allow to work for 30 seconds. (Note: Although the manufacturer recommends rubbing the solution on teeth to be restored for 15 seconds, we have achieved excellent bracket adhesion with minimal rubbing and a minimum 30-second etch (as other teeth are prepared). Avoid contact of the solution with soft tissues.
5. Use a dry air syringe to thin out the surface layer of the bonding agent. (A dry airblower is ideal for this step and appears to enhance adhesion.)
6. Apply adhesive to the bracket, position the bracket on the tooth, and apply a visible light beam to polymerize the self-etching bonding solution and paste adhesive.

One PROMPT L-POP packet is sufficient for 4-5 teeth, making it especially convenient for repairing detached brackets, and for limited treatment bonding. Since the etchant is self-limiting and does not have to be rinsed off, the hazard of acid aerosol to the patient and personnel is eliminated.

\*PROMPT L-POP is manufactured by ESPE America, Inc., Plymouth Meeting, PA.

Disclosure: Dr. Croll (TPC) is remunerated by dental manufacturers, including ESPE, for certain consultation services regarding research and development of products.

### References

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3. Rueggeberg FA, Fortson WM, Mettenburg DJ. Orthodontic bracket retention strength using a self-etching resin primer. *J Dent Res* (Special Issue) 79:282, (IADR Abstract #1110), 2000.