

Indirect Bonding with a Flowable Light-Cured Adhesive

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Filtek Flow,* a filled flowable composite, is used in restorative dentistry for air abrasion and tunnel preparations, for shallow Class V cavities, as a cavity liner or base, and as a fissure sealant. This article describes its use in indirect bonding.¹⁻⁹

Filtek Flow comes in a syringe with a fine metal tip to allow precise application of a controlled amount of composite material directly to each custom base (Fig. 1). It is available in a variety of tooth shades (we use A2, which transmits light more readily and blends better than darker shades).

Technique

The laboratory technique we use for tray fabrication is similar to that previously described by Cooper.³ Adhesive Precoated Brackets** save chairtime, and it has been demonstrated that light-cured custom bases are clinically stronger than thermally cured bases.¹⁰

Clear transfer trays must be used to allow

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Fig. 1 Filtek Flow Flowable Restorative (shade A2) with fine metal tip for precise application of composite.

light curing. Each custom base is lightly microetched before being cleaned, rinsed, and thoroughly dried. The base is painted with a small amount of acrylic monomer about 10 minutes prior to bonding and then thoroughly dried.⁸

The teeth to be bonded are isolated, cleaned, etched, and primed with Moisture Insensitive Primer.** Only a small amount of Filtek Flow is required to moisten the surface of each base (Fig. 2). The hard outer tray is positioned and accurate placement confirmed (Fig. 3).

Plasma light-curing systems such as the ORTHO Lite** have dramatically reduced the time required for bonding (Fig. 4). Each metal bracket is cured for six seconds (three seconds occlusally, three seconds gingivally); a bondable buccal tube is cured for 12 seconds, and a Clarity** ceramic bracket is cured for three seconds directly on top of the bracket. Protective eyewear must be worn when using the light.

The hard and soft trays are then removed. We have found minimal flash with this technique, and less staining over time than with chemically cured indirect bonding adhesives.



Fig. 2 Small amount of Filtek Flow applied to custom base of each bracket in clear indirect bonding tray.



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Discussion

The use of a filled flowable composite as described here has several advantages:

- It reduces voids at the enamel-resin interface, which have been shown to weaken the strength of the indirect bond.¹¹
- It is fluid enough to allow easy application to the bracket base, but viscous enough to stay in place before the tray is seated.
- The syringe's fine metal tip allows precise and controlled application of the required amount of composite to the custom base.
- It allows command setting of the adhesive once correct tray placement has been verified.
- When a plasma light is used for curing, complete bonding from first molar to first molar can be carried out in less than eight minutes.

REFERENCES

1. Mah, J. and Sachdeva, R.: Computer-assisted orthodontic treatment: The SureSmile process, *Am. J. Orthod.* 120:85-87, 2001.
2. Newman, G.V.: Epoxy adhesives for orthodontic attachments: A progress report, *Am. J. Orthod.* 51:901-912, 1965.



Fig. 3 Indirect bonding tray placed in patient's mouth after etching and priming.

3. Silverman, E.; Cohen, M.; Gianelly, A.A.; and Dietz, V.S.: A universal direct bonding system for both metal and plastic brackets, *Am. J. Orthod.* 62:226-244, 1972.
4. Thomas, R.G.: Indirect bonding: Simplicity in action, *J. Clin. Orthod.* 13:93-106, 1979.
5. Read, M.J.F. and O'Brien, K.D.: A clinical trial of an indirect bonding technique with a visible light-cured adhesive, *Am. J. Orthod.* 98:259-262, 1990.
6. Sinha, P.K.; Nanda, R.S.; and Ghosh, J.: A thermal-cured, fluoride-releasing indirect bonding system, *J. Clin. Orthod.* 19:97-100, 1995.
7. Cooper, R.B. and Sorenson, N.A. Jr.: Indirect bonding with adhesive precoated brackets, *J. Clin. Orthod.* 27:164-167, 1993.
8. Hickham, J.H.: Predictable indirect bonding, *J. Clin. Orthod.* 27:215-217, 1993.
9. Sondhi, A.: Efficient and effective indirect bonding, *Am. J. Orthod.* 115:352-359, 1999.
10. Miles, P.G.: A comparison of retention rates of brackets with thermally-cured and light-cured custom bases in indirect bonding procedures, *Austral. Orthod. J.* 16:115-117, 2000.
11. Hocevar, R.A. and Vincent, H.F.: Indirect versus direct bonding: Bond strength and failure location, *Am. J. Orthod.* 94:367-371, 1988.



Fig. 4 Plasma light for rapid curing of adhesive.