

# A Cutting-Wire System for Removal of Indirect Bonding Trays

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**A**lthough indirect bonding has many advantages in terms of accuracy and effectiveness,<sup>1-10</sup> the removal of the transfer tray can sometimes dislodge newly bonded brackets or adversely affect bond strength.<sup>6-10</sup> This article presents a safe, fast, and easy method for cutting the silicone or polyvinyl siloxane trays that are used in most indirect-bonding techniques.

## Laboratory Procedures

1. Take an accurate alginate impression of the patient's full dental arch, and cast it immediately in hard stone. After the stone has set, remove and trim the cast. Paint the cast with a separating medium, and allow it to dry. Mark reference lines

for bracket placement on the cast with a pencil (Fig. 1), using the panoramic radiograph as a guide to the long axes of the teeth. Apply your choice of bonding material (such as Phase II\*) to the bracket bases, and position the brackets on the cast according to the pencil marks, carefully checking their heights and angulations (Fig. 2).

2. Twist a length of ligature wire around an acrylic ring to make the cutting system (Fig. 3).

3. Apply a light-bodied silicone tray material<sup>11-15</sup> over the teeth on the cast, encapsulating the brackets (Fig. 4). Before the silicone sets, position the cutting wire directly above the occlusal edges of the brackets (Fig. 5). Cover the light-

\*Reliance Orthodontic Products, P.O. Box 678, Itasca, IL 60143.



Fig. 1 Pencil guide marks for bracket placement on working cast.



Fig. 2 Brackets positioned on cast with adhesive resin paste.



Fig. 3 Ligature wire twisted around acrylic ring to make cutting system.



Fig. 4 Brackets covered with light-bodied silicone material on cast.

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bodied material and the cutting wire with a heavy-bodied silicone material (Fig. 6). Using the acrylic ring, bring the tail of the cutting wire around to the anterior, and secure the wire within the heavy-bodied material in the incisor region (Fig. 7). After the silicone has polymerized, soak the cast in water for a few minutes so that the tray can be safely removed with the brackets intact<sup>7</sup> (Fig. 8).

### Clinical Procedures

4. Clean, isolate, etch, rinse, and dry the teeth. Coat the etched enamel surfaces with the liquid

component or activator while the assistant coats the bases of the brackets (Fig. 9) with the adhesive of your choice (such as Maximum Cure\*). Place, seat, and support the tray on the dental arch until the adhesive has set (Fig. 10).

5. Wait about five more minutes for full poly-



Fig. 5 Cutting wire placed within light-bodied silicone, directly above occlusal edges of brackets.



Fig. 6 Light-bodied tray and brackets covered with heavy-bodied silicone material.

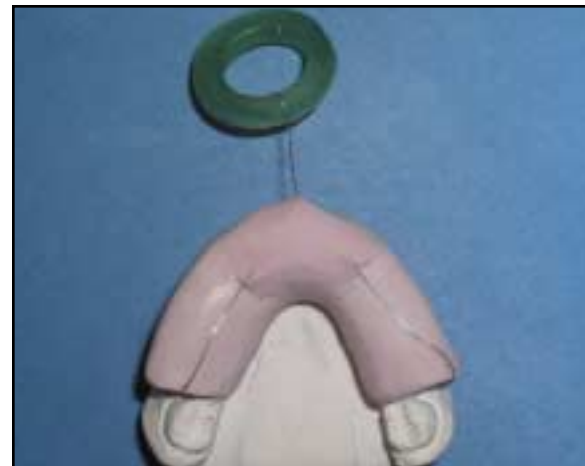


Fig. 7 Cutting wire brought around to anterior of tray and secured within heavy-bodied silicone in incisor region.



Fig. 8 Complete transfer tray after removal from cast.

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Fig. 9 Bonding agent applied to bracket bases.



Fig. 10 Transfer tray supported in place until adhesive has set.

merization. Retract the oral commissures and support the tray by pressing it against the posterior occlusal ridges, then engage the finger ring and pull the wire forward (Fig. 11). The wire will cut the silicone along the occlusal surfaces of the brackets (Fig. 12), separating the tray into occlusolingual and buccal portions. Be sure to maintain the distal pressure on the tray while pulling. 6. Remove the larger, occlusolingual piece simply by inserting a scaler into the cut and lifting it in an occlusal direction (Fig. 13). The remaining buccal piece can then be safely and gently removed by peeling it away, minimizing the force transmitted to the newly bonded brackets (Fig. 14). Scale away the excess adhesive from the brackets and interproximal contacts (Fig. 15).

### Discussion

The procedure shown here can be adapted to any labial or lingual indirect-bonding technique that uses silicone or polyvinyl siloxane



Fig. 11 Cutting wire pulled forward with acrylic ring while oral commissures are retracted and tray is held firmly at distal ends.



Fig. 12 Cutting wire almost completely removed.

transfer trays. It works with light-cured bonding in conjunction with transparent silicone tray materials (such as Memosil\*\*),<sup>2</sup> or even with a hot-glue matrix made from a polymer of ethylene vinyl acetate.<sup>3</sup> It cannot be used to section thermoformed trays or other materials that are not easily sliced by a wire.

Because the tray is separated into two pieces before removal, the clinician does not have to perform the difficult task of peeling or rolling an intact tray over the teeth, which risks debonding. Careful positioning of the cutting wire directly above the occlusal edges of the brackets is the key to obtaining a small and easily removable buccal portion of the tray.

This wire-cutting method is simple, efficient, gentle, and safe. It has the potential to reduce bond failures in most indirect techniques, as well as to improve patient comfort and practice efficiency.

\*\*Registered trademark of Heraeus Kulzer, Inc., 4315 S. Lafayette Blvd., South Bend, IN 46614.



Fig. 13 Scaler used to lift away occlusolingual portion of transfer tray.



Fig. 14 Buccal portion of tray gently peeled off bonded brackets.

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Fig. 15 Excess adhesive removed with scaler.