

# Predictable Aesthetics With Direct Resin Veneers: The CEBL Technique

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**Many clinicians use a freehand layering technique with varying resin opacities and shades to enhance aesthetics for directly bonded restorations. This process, although successful in its purpose, has proven difficult for many clinicians due to the numerous variables that can affect the final results. The author has developed the Cut-back, Etch, Bond, Layer (CEBL) Technique to act as an alternative to freehand layering.**

Clinicians are beginning to embrace the concept of layering varying resin opacities and shades to enhance the aesthetic outcome of directly bonded restorations. This is evident in the fact that most modern composite systems include an assortment of resin shades and opacities designed to be used with a type of stratified layering technique. Pioneers in the field of bonding have long advocated the freehand placement of varying shades and opacities onto the air-inhibited layer of its precursor, which is thought to ensure the chemical coupling between layers. Some dental professionals, however, continue to struggle with freehand sculpting of the internal and external morphology required to generate lifelike restorations.

There are several common problems that exist with freehand layering. These problems are related to the fact that this technique is highly dependent on the skill of the clinician. Predicting the exact thickness and shape of each layer is quite difficult, and the artistic capabilities of dental professionals are highly variable. Additionally, these techniques are dependent on the physical properties of the composite being used. Properties such as ambient working time, viscosity, and “stickiness” of the composite vary greatly and all these properties can have a dramatic effect on one’s ability to freehand sculpt each layer.

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**FIGURE 1.** Preoperative condition of the patient demonstrating diastemata and discolored teeth.



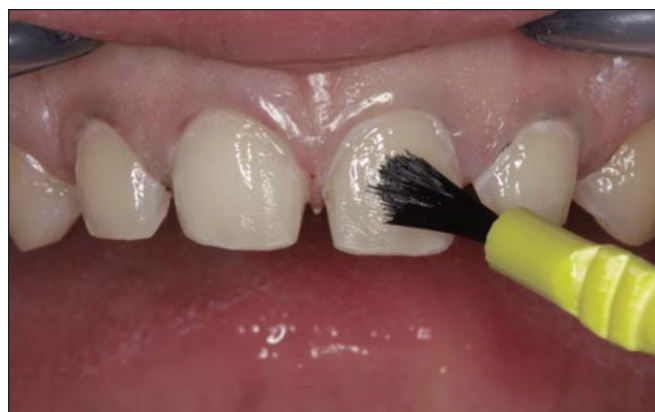
**FIGURE 2.** A comprehensive examination was completed, and minimally invasive direct composite veneers were accepted by the patient.

An alternative to freehand bonding is the Cut-back, Etch, Bond, and Layer (CEBL) Technique. It is defined by the author as the deliberate, immediate “cutting back” of a cured layer of composite followed by the application of acid etchant and bonding resin prior to the placement of a second layer of composite. This technique is a clinical necessity when layers are inadvertently placed beyond anatomic contour. It can also offer clinicians the option of intentionally building a restoration to full contour and then cutting back to the appropriate shape and contour with a diamond bur prior to the application of tints or other shaded materials.<sup>1</sup>

The CEBL Technique was tested at Creighton University School of Dentistry.<sup>2</sup> Results of this study concluded that even after removing the air-inhibited layer, the CEBL Technique generated similar bond strengths



**FIGURE 3.** Silicone index created from an anatomical waxup. Note the conservative preparations for direct veneers and the accuracy of the lingual interproximal embrasures.

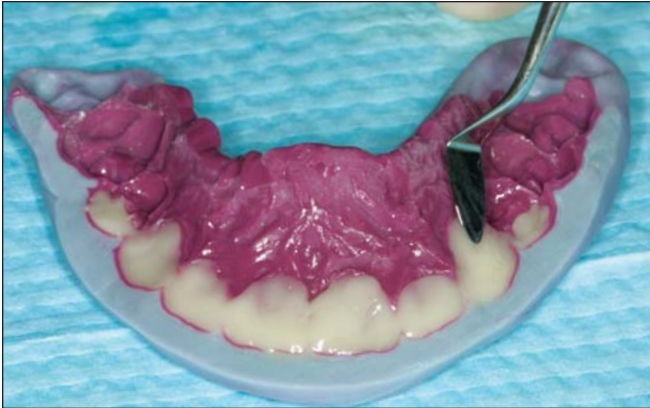


**FIGURE 4.** After etchant is applied to the teeth requiring diastema closure, a primer/adhesive is applied and light cured.

and fracture patterns as those for bonding to the air-inhibited layer. One possible explanation of the success of this technique is that in freshly cured composite resin, even after the air-inhibited, resin-rich layer is removed, radicals remain available for reaction in the body of the cured composite.<sup>3</sup> The stability of these radicals is temperature- and formula-dependent, however, it is reasonable to presume that in the time frame of a direct resin clinical procedure, they may affect a chemical union between a cut-back layer and freshly placed composite.

### CLINICAL PROCEDURE FOR CEBL

A 21-year-old female presented with the chief complaint of discolored teeth and “gaps” between her anterior teeth (Figures 1 and 2). A comprehensive examination was completed, and her healthy occlusion, lack of decay



**FIGURE 5.** The silicone index is lubricated with unfilled bonding resin and an opaque shade of microhybrid is placed where the diastemata are to be closed.



**FIGURE 6.** The loaded index is seated. The facial embrasure is formed by "feeling" for the lingual "septum" of the silicone index that forms the lingual embrasure.



**FIGURE 7.** Once the opaque material is properly shaped and adapted, it is light cured. The index is removed, and light curing continues from the lingual aspect.



**FIGURE 8.** Excess resin material is "cut-back" to expose the facial enamel. The embrasures are scored with a diamond bur; the cuts are continued with an interproximal saw.

or restorations, and excellent oral hygiene and periodontal status were noted. The patient declined orthodontic treatment and porcelain veneers, preferring minimally invasive direct composite veneers to accomplish her goals.

Eight polychromatic, stratified direct veneers were treatment planned utilizing a preoperative diagnostic waxup on a semiadjustable articulator as a guide for incisal edge position, lingual anatomy and occlusion, lingual embrasures, and general smile line. The diagnostic waxup was presented to the patient for approval, and a silicone index was created directly on the waxup.

The teeth were prepared by reducing sharp line angles, general abrasion of the enamel surface to prepare the enamel for etching, and rounding off ectopic rotations. The incisal edges were reduced approximately

1 mm to permit the creation of the desired new edge position out of composite resin, and the index was repeatedly seated to verify sufficient reduction (Figure 3).

The teeth were etched with a 35% phosphoric acid etchant for 20 seconds and rinsed and dried. Three consecutive coats of a single-bottled primer/adhesive were applied and cured for 10 seconds with a halogen light (Figure 4). The silicone index was lubricated with a new "releasing" agent (ie, Solid Bond S, Heraeus Kulzer, Armonk, NY) and air-thinned but not cured.

The index was filled with a universal microhybrid material (ie, Matrixx, Discus Dental, Culver City, CA) and sealed intraorally (Figure 5). An opaque shade was chosen to ensure that the interproximal areas would be dense enough in color to prevent the darker oral cavity behind the restorations from showing through.





**FIGURE 9.** View after excess material has been removed and separation of the teeth completed.



**FIGURE 11.** Facial view after building of teeth #5 through #12 to full contour in the body shade.



**FIGURE 10.** Each tooth is then built to full contour. This layer is kept thin at the cervical neck and progressively thickens towards the incisal edge.



**FIGURE 12.** The incisal third of the incisors is cut-back to create dentin lobes. After re-etching, rebonding, and light curing, these areas are layered with translucent enamel.

A thin composite instrument was used to blend the composite with the facial line angles of the teeth and to define the facial embrasures (Figure 6). By using the lingual contours established by the index to guide the interproximal line angles and edge position, the need for chairside improvisation was greatly reduced.

Once the facial contours were defined, the entire bulk of composite was polymerized with a halogen curing light for 30 seconds per tooth. The interproximal aspects of the restoration were inspected for adaptation and cure.

The excess facial composite resin was removed with a diamond bur, exposing the facial enamel. A diamond flame-shaped bur was used to score the facial and lingual interproximal embrasures and an interproximal saw was used to complete the separation (Figures 7 and 8). The separated teeth were now ready for veneering (Figure 9).

Each tooth was isolated from the adjacent teeth with foil, re-etched for 20 seconds with phosphoric acid, rinsed, and dried. A primer/adhesive (ie, Cabrio, Discus Dental, Culver City, CA) was applied and light cured. The CEBL Technique was utilized to create dramatic porcelain edge effects. A single-body shade (BL2) of composite (ie, Matrixx, Discus Dental, Culver City, CA) was applied to each tooth to full anatomic contour. This semitranslucent microfill was kept thin at the cervical third of the tooth to allow natural “show-through” of the darker underlying enamel and was placed with increased thickness in the middle and incisal portions of the tooth. This created more saturation, influenced by the darker preoperative shade of the natural teeth in the cervical third and permitted aesthetic enhancement of the incisal two-thirds of the tooth (Figure 10). Since the “dead soft” foil technique was utilized to isolate the



**FIGURE 13.** An optional incisal halo is added by placing a thin, ribbon-shaped edge or frame on the teeth using an opaque bleach body shade of resin.

adjacent teeth from the etchant and adhesive, each veneer could be built to passive interproximal contact without the use of mylar and wedges. With the completion of each veneer, the interproximal air-inhibited layer was removed with sand paper strips (ie, Epitex, GC America, Alsip, IL).

This process was continued for the remaining teeth, with each tooth being built to full anatomic contour (Figure 11). Once teeth #5 through #12 were completed, the CEBL Technique was utilized once again to create dramatic edge effects. A flame-shaped diamond bur was used to cut-back the incisal third of each of the incisors. The teeth were re-etched and rinsed; adhesive was applied and cured; and the application of a translucent (shade IM) incisal microfill (ie, Matrixx, Discus Dental, Culver City, CA) was applied to the cut-back area (Figure 12). Once carefully adapted, this clear incisal material was light cured.

To recreate an "incisal halo," the author placed a high-value bleached shade material (ie, Matrixx shade BL1, Discus Dental, Culver City, CA) on the incisal edge. This was applied directly to the air-inhibited layer of the translucent incisal material placed in the dentin lobes created during the cut-back (Figure 13). The material was light cured and trimmed to create a slight "frame" around each tooth near the incisal edge. The restorations were finished with traditional composite finishing burs, silicone points and cups, and a high shine was created with polishing paste and felt disks (Figure 14).



**FIGURE 14.** One week postoperative view of the definitive restorations exhibits natural aesthetics, the lifelike incisal edge effects, and the overall improvement of the smile.

## DISCUSSION

It is important to note that by using an accurate diagnostic waxup on a semiadjustable articulator, the occlusion, working and nonworking guidance and clearance, as well as general smile line and tooth proportion were established with little effort on behalf of the clinician. The remaining process at this point was limited to separating the teeth and adding facial color and edge effects.

## CONCLUSION

Freehand layering of multiple opacities and shades of direct composite is a valid technique for creating lifelike restorations. While careful placement of each layer of material directly to the air-inhibited layer of the previously placed shade is most desirable, predicting the exact anatomic thickness of each layer can be difficult. With this technique, dental professionals should no longer struggle with freehand sculpting of the internal and external morphology required to generate lifelike restorations. The CEBL Technique is shown to be an attractive alternative to freehand layering for clinicians to expedite and simplify direct veneer placement.

## REFERENCES

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