Have you ever asked yourself while seemingly standing on your head, fighting saliva, cheeks, tongues, and time to get to the next patient that there has to be an easier way to bond?

There are many seemingly undisputed advantages to various indirect bonding techniques:

- Precise bracket placement via the ability of the clinician to fully visualize and access the teeth to be bonded on a model.
- Patient is more comfortable due to the minimum amount of time spent with the mouth open.
- Clinician is ergonomically and physically more comfortable vs. awkward contortions of direct access.

The usual disadvantages to implementing indirect bonding are:

- In many indirect bonding systems there are issues with technique sensitivity, adhesive flash, bond failures when removing trays, and time intensive lab procedures.

RMO’s RM bond Indirect Bonding System has been developed to maximize the advantages of indirect bonding while utilizing products specifically formulated to minimize the problems associated with implementation:

- RMO’s RM bond Inner Tray Material is a transparent PVS material that fully encapsulates each bracket for precise transfer and minimizing of flash. The intimate fit of the trays does not allow the bracket to be inadvertently displaced by the curing light bumping the bracket, which can occur routinely with direct bonding. The transparency of the material allows for rapid light curing and visual assurance of seating the tray properly. Its consistency and handling qualities allow for rapid in-house lab tray fabrication with no time consuming block out of undercuts or hooks. It has a low tear strength so that when the tray is peeled from the bonded brackets, the material gives, ensuring the brackets remain on the teeth.

- The RMO RM bond LC Flowable Adhesive is a light cured flowable composite in a precision delivery system. This allows for maximum control, no working time constraints, minimal flash and minimal chair time. The RM bond LC Flowable Adhesive material also has a curing booster to cut light curing time in half as well as fluoride for added protection.

- RM bond LC Bonding Resin has been proven to create the ideal sealed surface and interpenetrated network of the polymerized primers and unfilled resin, resulting in a high bond with a low film thickness of only 8µm to ensure ideal intimate fit of the custom pad to the tooth.

LABORATORY STEPS

1. Start with an excellent alginate impression poured in a high quality dental stone (orthodontic plaster is not recommended) and trimmed so that the model allows clear access to all surfaces of the teeth. Because of the RM bond Inner Tray Material’s unique qualities, the records model can serve as the indirect model (a second set of indirect models is not needed). TIP: Do not pick off any bubbles or alter the anatomy of the model as this will potentially cause a negative in the model that can cause the Indirect Bonding Tray to fit improperly in the mouth.
2. Allow the models to dry completely (over night). Apply two liberal coats of tinted separating medium or tinfoil substitute to teeth and allow to dry to the touch (min 10 minutes). TIP: The tint in the separating medium distinguishes the separated model from one that is not.

3. RMBond LC Model Adhesive (or clinician’s choice) is fully worked into the bracket mesh and the brackets are placed on the model and stored in the patient model storage box (light insensitive) supplied with the RMO RMBond Indirect Bonding Kit before final positioning adjustments by the doctor. TIP: Articulate the models together before final positioning to determine bracket interferences. This gives the opportunity to reposition brackets or introduce use of posterior “bite turbo’s” utilizing RMBond LC Turbo Material to temporarily open the bite. (These turbo’s are placed on the patient’s model and are included in the indirect set-up tray). (See step 4 below)

4. Once all brackets are in their final position with all excess flash removed, the light cure adhesive is activated using a light source. TIP: An alternate color dental stone material provides excellent contrast to the RMBond LC Model Adhesive, allowing for easy flash clean up (Fig 2). A light curing unit, having a bulb positioned above a rotating table is recommended; the table is set to rotate 8-10 minutes. A light gun will work as well. Be aware that the stone is dense, and thorough curing must occur to reach the adhesive center of the bracket pad. After all brackets are fully cured, the turbo’s can be placed. Models are then replaced in the patient model storage box.

Turbo construction: Place a small amount of RMBond LC Turbo Material on the buccal cusps of the lower molars where you want turbo’s located (Fig 3a). Light cure. Place another small amount on RMBond LC Turbo Material on the top of the cured material and flatten with a wet microbrush, (this creates undercuts for the RMBond Inner Tray Material to secure the buildups). (Fig 3b & 3c) Light cure.

5. The models are returned to the lab where the border of the tray is defined by red utility rope wax (RMBond Round Rope Wax). The wax is applied very simply by starting at the most distal tooth to be bonded and wrapping around to the opposite most distal tooth (Fig 4). From the buccal view it is important to place the rope wax so there is 1 mm of clearance above the most gingival aspect of the bracket (including hooks). This allows the uniquely formulated RMBond Inner Tray Material to fully encapsulate the entire bracket.

6. The RMBond Inner Tray Material should be stored in a refrigerator prior to use to extend its working time. It is applied with the RMBond Dispensing Gun delivery system starting at the distal buccal with the mixing tip at a slight gingival bias expressing the translucent material in a single bead with a deliberate and continuous motion. The rope wax will act as a stop for the material, further enhancing its ability to fully encapsulate the gingival aspect of the brackets. The specific thickness of the rope wax also gives a visual cue to the thickness of the Inner Tray Material. Now that the buccal is covered, the same motion is used to apply a bead to the entire occlusal and lingual surfaces (Fig 4a & 4b)

7. A wet paper towel is then used to intimately adapt the material to the teeth and brackets and shape the tray. Before the material sets up, a liberal amount of RMO separating medium should be placed on a finger and rubbed across the facial and occlusal aspect of the Inner Tray Material in a mesial-distal motion giving these surfaces a uniform flat surface parallel to the brackets and occlusal surfaces. Doing this gives a crystal clear finish to the tray. TIP: use enough separating medium so that it acts as a lubricant and doesn’t allow the material to stick to your finger (Fig 5). Remember to use the red rope wax border as the visual cue, as well as a tactile cue, for thickness of the tray as well as the gingival border. RMBond Inner Tray Material should be allowed to harden (2-4 min). Rinse off any residual separating medium from the outside of the tray and then remove the rope wax, revealing a tray that is well defined and not in need of trimming.

8. Take a sharp scalpel and section the tray on the model between the lateral and canine from the lingual to the buccal aspect of the tray. If access does not allow this, section the tray between the canine and the first bicuspip (Fig 6).

9. Apply a 1mm thick clear thermal forming suck down material using a vacuum forming machine. This forms a hard outer tray. Trim excess material away from the model with scissors and use a wheel saw to trim the hard outer tray at the gingival border of the soft inner tray (Fig 7).

10. Soak the model in a pan of warm water for 15 minutes. To remove the tray from the model place a finger under each bracket starting at the distal to make sure each bracket is free to move with the tray, then slowly remove the tray. The tray should release very easily. Blow any excess water from the tray.
CLINICAL PROCEDURES:

1. Proper cleaning of the surfaces of all teeth, especially the first and second molars, is imperative for success. After preparation of teeth via a non oil containing pumice, the assistant places a NOLA dry field system and dry angles. Upper and lower arch are acid etched with 37% phosphoric acid for a minimum of 20 seconds. **TIP:** Make sure the assistant examines the indirect trays to verify what surfaces should be etched, including OCCCLUSAL SURFACES of teeth with bite turbo’s in the tray.

2. The assistant rubs a very light layer of RMbond LC Bonding Resin to the custom pad of each custom bracket base and turbo’s if used (there should be no pooling of the liquid) and replaces the tray in the patient model storage box (Figure 8a). The doctor is called to the patient where close inspection of all etched surfaces takes place (it is nearly impossible to tell whether a tooth is sealed or wet - using this technique, contamination risks are minimized).

3. After verification Dr. then seals the lower arch only with RMbond LC Bonding Resin. A light air dry to thin any pooling of the sealant may be necessary. At the same time the Dr. is sealing the lower arch the assistant is applying the RMO RMbond LC Flowable Adhesive to the lower arch bracket pads. Apply a small amount of LC Flowable Adhesive on the entire gingival edge of the 7’s and 6’s to cover the lower 50% of the pad. Apply a small amount of LC Flowable Adhesive to the gingival center of 5-5 brackets. This allows the adhesive to flow as the tray is seated in a gingival to occlusal direction (Fig 8b). Apply Flowable Adhesive to posterior bite turbo’s if in tray also.

4. Tray is handed to Dr. for insertion. It is very important to make sure the distal and lingual aspects of the tray are under and/or not interfering with the NOLA tongue crib. Line up the midline and seat the tray. One of the valuable aspects of a clear tray is the ability to visually verify the tray is properly seated. Verify tray does not rock and is fully seated around all teeth.

5. We have found that having a uniform curing sequence is invaluable. In our office when bonding 7-7 we start on the LL7 working our way forward to the LL1, then repeat the process for the LR7 forward to the LR1. **TIP:** If any area of the mouth is an isolation problem, cure that area first.

6. Using two scalers the Dr. places a finger rest on the occlusal of the anterior aspect of the tray, a scaler on the occlusal aspect of the tray and a scaler on the buccal aspect of the bracket to be light cured (Fig 9). Only light pressure is used with the scalers as this assures intimate contact with the tooth/adhesive/bracket interface. The assistant then light cures the bracket from the occlusal/buccal aspect through the transparent tray for the appropriate time. In my office we use a plasma arc light and cure molar bonds for 6 seconds and brackets for 3 seconds before moving on to the next bracket to be cured. This time will vary depending upon the light utilized (led/halogen/plasma) (Fig 10). **TIP:** Placement of the scalers gives a visual cue to the assistant on proper placement of light curing tip.

7. When the lower Arch is complete the clinician air dries the previously etched upper arch, verifies the frosty appearance, and steps 3 through 7 are repeated for the upper arch. Doctor is done! **TIP:** In my office upper and lower 7-7 including turbo’s takes 6 minutes of Dr. time.

FINAL STEPS

8. Assistant then re-cure’s upper and lower arch from a gingival/occlusal aspect for appropriate time (again depending upon light utilized).

9. The hard outer plastic tray is removed first. The soft inner trays that were sectioned are removed by starting with the posterior section in a peeling motion from the lingual/gingival edge of the tray and continuing in a rolling motion towards the buccal/gingival (Fig 11a, 11b, & 11c). The RMbond Inner Tray Material is specially formulated to shear if caught in an undercut, leaving the bracket bond intact. This same motion applies to the rest of the inner tray sections.

10. Since the RMbond LC Flowable Adhesive syringe applies a precise amount of adhesive, we have minimal to no flash on our bondings (Fig 12).
TIP: On your initial indirect bondings, inspect for flash and floss each tooth to calibrate the amount of LC Flowable Adhesive placed on the custom pads. This step will not be necessary once your assistants are familiar with the system and a learning curve has been established.

11. Turbo’s should be adjusted for even occlusion. Arch wires are ready for immediate insertion. TIP: Although it is not necessary for me to be involved in the clinical bonding process (I have checked final positions of all the brackets on the model already), I find that the 6 minutes I am at the chair gives me a chance to talk with the patient. And since I am not standing on my head fighting moisture and visual impossibilities, I find it to be quality time spent with my patients building the relationships upon which the growth of the practice depends.

CLINICAL TIPS

Because the indirect bonding happens so quickly it is advisable to have the arch wire selected prior to bonding so the orthodontist doesn’t have to return to the chair.

Prior to having the Dr. over to insert the tray, the assistant will cut the arch wire using the indirect trays as a guide (Figure 13) and anneal the wire for easier insertion through RMO’s SWLF Synergy R bracket system (cuspids, bicuspid, and tubes) - (leave an additional 5mm length to allow for annealing).

Since hooks are great when you need them and a discomfort when not, we bend the very pliable SWLF Synergy R bracket hooks in towards the buccal surface (Fig 14a & 14b). Prior to arch wire insertion, this verifies bond strength and ensures patient comfort.

The RM bond LC Flowable Adhesive is excellent to place on the distal of the arch wire if the wire is to be left long for unraveling of crowding, and ensures the very light wires used in the SWLF Synergy R system do not slip through the terminal molar tube preventing emergency appointments (Fig 15a & 15b).