
LOOKS GREAT - LESS LEAKAGE

Why just "re-seal" when you can re-seal even better - AND polish at the same time?

The concept of "re-sealing" a restoration is nothing new.

I'm not talking about re-sealing an old restoration that's starting to show signs of staining. I mean routinely curing a thin resin coat over a new composite restoration to improve durability of the marginal seal.

Some dentists re-seal all their composites. Most don't.

This is surprising, because laboratory and clinical studies have pretty much agreed that sealed restorations perform better than unsealed restorations in terms of reduced leakage and marginal discoloration.

Over the years, a bunch of materials have been suggested for re-sealing margins: bonding agents, unfilled resins, as well as a number of specialized materials developed specifically to protect composite.

A team of researchers at the University of Tennessee recently investigated how re-sealing margins affects the leakage around Class 5 restorations.¹

Ninety-six Class 5 restorations were placed using EsthetX® composite bonded with Scotchbond® Multipurpose. Following finishing and polishing, the margins were either left unsealed ... sealed with more Multipurpose ... or sealed with one of 6 finishing resins specifically promoted for application over composite. The teeth were then thermocycled and placed in dye to see where they leaked.

All restorations (including those that hadn't been re-sealed) performed pretty well at the enamel margin. So I'm fairly sure you wouldn't see much clinical difference between the materials when the margins were in enamel.

However, the gingival margin was a different matter.

As you can see in the table on the next page, 100% of the unsealed restorations showed the maximum possible leakage at the gingival margin. The dye penetrated all along the cavity wall and across the axial wall.

All re-sealed restorations performed better than the unsealed restorations. And of all the sealing materials investigated, DuraFinish™ performed best ... by FAR.

In fact, restorations re-sealed with DuraFinish had 3 times as many leak-free restorations as the next closest sealant. At the enamel margins 20 of the 24 DuraFinish samples showed no leakage at all.

Now remember, this was a lab study. As we've warned many times in these pages, making the leap from lab-data to clinical-practice involves considerable risk. That's why the same researchers are now planning a clinical study to confirm their findings in the mouth.

Being a conservative sort, I'm not suggesting you re-seal all your restorations with DuraFinish because of this study. I'm suggesting that if you're using DuraFinish to create a dazzling glaze, it makes sense to extend the material onto the surrounding tooth structure - because this research suggests you may get the added bonus of better margins at no extra charge.

How to reseat with DuraFinish

1) After shaping and roughly finishing the restoration, apply phosphoric acid to the restoration and slightly beyond the margins onto the enamel. Rinse and dry. This acid treatment will clean the restoration and etch the surrounding tooth surface.

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2) Brush a thin coat of DuraFinish over the restoration and extend it onto the surrounding etched tooth surface. Smooth the surface to remove bubbles.

Hint: A terrific way to assure a thin, even, bubble-free layer of DuraFinish is to first dip the brush in a little acetone, then into the DuraFinish and finally onto the restoration. The DuraFinish will ride the acetone, leaving a thin, glasslike surface. (If you use this technique, be sure to allow the acetone to evaporate before curing the DuraFinish.)

3) Cure with a halogen light. (Most LEDs and Plasma lights will not cure DuraFinish.)

LEAKAGE AT THE GINGIVAL MARGIN				
SAMPLE	NO LEAKAGE	SLIGHT LEAKAGE	MODERATE LEAKAGE	MAXIMUM LEAKAGE
DURAFINISH	9	4	1	10
UNSEALED RESTORATION	0	0	0	24
BISCOVER	0	0	1	23
OPTIGUARD	3	6	1	14
SEAL-N-SHINE	2	2	2	18
HELIOSEAL	2	1	3	18
MULTIPURPOSE	2	4	2	16
PERMASEAL	1	1	0	22

What the world needs now -

A couple of years ago we got a call from a representative of the ADA. She told us the Association was thinking about publishing a materials newsletter. She was polling manufacturers to see what they thought.

"Don't do it," we advised her.

From the tone in her voice I sensed this wasn't what she wanted/expected to hear. "But there's so much confusion about materials. *Don't you think this would be a huge service to our members?*" she asked.

"No" we replied. We went on to explain that unless this new venture intended to focus on clinical in-the-mouth performance, it would probably just contribute to the confusion. There are already too many sources for irrelevant lab data and misleading conclusions. I listed several newsletters devoted to the topic.

She said she'd mention our concerns to the Council.

A year or so passes. Today I received a message from a member of the ADA Council on Scientific Affairs asking for our input concerning the newsletter's exciting next project - which is (Are you ready?)

a shear bond strength study of current bonding agents - "to provide meaningful information ... to assist (our members) in product selection."

They asked for comments. I didn't bother.

How to save money on Brush&Bond

I understand from Cindy (one of our Customer Service Specialists) that a dentist recently mentioned that when he opened a new package of Brush&Bond, he threw away the brushes left over from the old package.

That's great for our business - but not so good for yours.

Those brushes are pretty expensive, so she suggested that he order just a bottle of the B&B liquid instead of the full kit.

She asked me to point out that Brush&Bond liquid and Brush&Bond brushes can be ordered separately. So buying a complete kit only makes sense if you need both components. If not, you'll come out ahead by ordering the individual components.

Maybe you should think of them as "wands"

I want to devote a few paragraphs to discussing that extraordinary brush that comes in our Brush&Bond system - specifically to explain why you should use it.

As you know the fuzzy end of the brush is impregnated with some nifty proprietary polymerization enhancers that eliminate the need to mix two components. They give the adhesive polymer a number of unique characteristics and dramatically reduce its technique-sensitivity.

For example, most self-etchers are not compatible with dual-cure and self-cure adhesives. Try bonding a core material with many self-etchers, and you'll find yourself pulling the core out with your impression.

Because of its brush, Brush&Bond is the exception to this rule. It bonds quite nicely to self- and dual-cure materials.²

In fact, about 70% of all B&B users say they're currently using it to bond dual-cure or self-cure core resins.

Because of its brush, Brush&Bond won't be critically affected if your light is a bit deficient.³

Suppose for example, you're using B&B in a post hole. Clearly the light at the bottom of the hole will be weaker than at the top, right? Yet because of the polymerization enhancers in the brush, Brush&Bond will still cure well at a distance of 10mm from the light.⁴ In fact, because of its brush, Brush&Bond will eventually cure even if you forget to use the light at all. That's right. It will self-cure!⁵

Because of the brush, Brush&Bond bonds not only to sound dentin, but also to dentin that has been partially demineralized by acid (say, by caries or accidental etching.)

It's partly because of that brush that B&B forms such a wear-resistant film when you use it to treat cervical sensitivity.

And it's partly because of the brush that Brush&Bond resists marginal staining so much better than most other one-bottle systems.

Here's one final demonstration of just how generally cool that brush is ...

In a paper presented at the latest convention of the American Association of Dental Research, researchers reported that all other self-etchers they tested (everything from Prompt to Clearfil S3) seemed to perform better when they were applied using the B&B brush!⁶

But that wonderful brush comes only with Brush&Bond.

FINISHING TOUCHES and the "ouch" factor

In a recent newsletter you talked a bit about the frequency of post-op sensitivity with cervical restorations.

After restoring roughly 5000 facial/buccal abfraction-type lesions, I've come to the conclusion that many cases of post-op sensitivity are caused by the finishing procedure.

Whether you're adjusting a cervical overhang, smoothing the composite surface or just polish-

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ing, it's important to avoid over-finishing the cementum surface. Tubules beyond the restoration can be opened by acid-etching or the acidic monomers in the self-etcher. These generally don't pose a problem because they are immediately resealed by the adhesive. But if you exert a heavy hand during finishing you may remove the adhesive and re-expose the tubules.

When this happens, the sensitivity often manifests itself as soon as the anesthetic wears off.

Morton Julius, DDS
New York, NY

Excellent point, Morton!

Funny how things come in bunches. Just a week or so ago, Harvey Jay Mahler, DDS in Chicago was telling me about his "no-prep" sandwich technique for restoring non-carious cervical abfraction/erosions, and he happened to mention that he'd found Brush&Bond helpful in preventing sensitivity from damaging the tooth during finishing.

Huh? I couldn't imagine how bonding with B&B could prevent finishing damage. So he explained.

After he places his RMGI base, he coats everything with Brush&Bond and cures it. Then he applies and cures a composite to create a harder, more esthetic surface. Finally, if he suspects that finishing may have opened some tubules apical to the margin, after polishing he cures another coat of Brush&Bond over the entire area.

He tells me it works great. (Both the sandwich technique - and the final desensitization.)

A real clinical study!

A bunch of research papers involving Brush&Bond were presented at the March meeting of the American Association for Dental Research in Orlando.

The one with the greatest relevance to you folks who practice on living human beings was a clinical study conducted at the University of Mainz in Germany. It compared the in-the-mouth performance of Brush&Bond with that of Xeno® III.

This was a particularly well-designed study.

Fifty patients were selected who needed two similar Class V restorations. One restoration was bonded with Brush&Bond - the other bonded with Xeno III. In both cases the restorations were built using Filtek® Supreme. So in a nutshell: same composite ... same patient ... same type of restoration. The only difference was the bonding agent. At each patient recall the two restorations were compared on a number of criteria.

At six months there was no significant difference between bonding agents.

At the one-year recall, however, Brush&Bond had pulled decidedly ahead. It showed 100% retention. In contrast, 10% of the Xeno-retained restorations had either fallen out or been partially lost.

When the evaluators compared the remaining restorations, Brush&Bond showed much better marginal integrity, less marginal discoloration, and superior overall shade match.

Two interesting things -

#1) It's unusual for clinical studies to have a clear winner. As I mentioned in the last newsletter, studies done on a laboratory bench almost always have a "winner." That's why manufacturers and researchers like them so much.

Clinical studies are different. They typically do not discover significant differences between materials. Believe it or not, of the 15 clinical papers presented at this session, just two found a difference in the performance of materials in the

mouth. One was this Brush&Bond vs Xeno paper ... the other was a study suggesting that amalgam still demonstrates a slightly higher success rate than composite when used in primary teeth.

#2) One thing is certain: Xeno's problems in this study have nothing to do with its laboratory bond strength. Independent researchers report dentin bonds ranging from 21 to 32 MPa. That's very good. In fact, in some studies Xeno III has "out-MPa'd" Clearfil SE, Scotchbond MP, Excite and One-up Bond. It's high bond strength was confirmed when REALITY tested it as part of its "RATED" list for 2004.

So THAT's probably why Xeno III outperformed Brush&Bond in the mouth.

Oh wait ...*

More B&B at the latest research meeting

While we're on the subject of research, here are summaries of a few other papers that involved B&B presented at the latest AADR meeting. Unlike the clinical "Brush&Bond vs. Xeno" study, the following papers involve research performed in the lab. So they don't rank as high on the evidence scale. Nevertheless, they support what we've been telling you about this remarkable adhesive/sealer/desensitizer.

Using Brush&Bond to desensitize a prep, also seals it against leakage. Using Gluma® to desensitize does not. This study also suggests that Brush&Bond is more effective in preventing leakage than Touch&Bond.

Chang JC, et al. Microleakage at the margins of crown preparations treated with bonding agents. IADR abstract submission 2006

Brush&Bond and Absolute Dentin are a great combo for restoring root canals. B&B and AD effectively bond fiber posts into instrumented canals whether the canals are simply rinsed with water, treated with phosphoric acid, or treated with phosphoric acid followed by NaOCl. Good bonds were achieved whether the Absolute Dentin was light-cured or self-cured.

Nakano K, et al. In-vitro evaluation of self-etching adhesive with build-up composite resin. AADR -Orlando, #1827, Mar 06

It's safe to use the B&B brush for several restorations. A single Brush&Bond brush activator was used to bond several restorations. There was no difference between the first restoration bonded ... and the last. Remains of the smear layer do not seem to contaminate the brush and affect subsequent bonding.

Okir D, Suzuki S. Microtensile bond strengths of self-etching adhesives with different application procedures. AADR-Orlando, #0277, Mar 06

Brush&Bond creates a bond even when there isn't sufficient light to totally photo-cure it. In low-light conditions B&B demonstrates self-cure properties. However, for best performance, a light should be used.

Ort T, et al. Degree of polymerization and TBS of self-etching adhesives. AADR -Orlando, #0278, Mar 06

Brush&Bond bonds well to partially demineralized dentin, but only if you use the brush. Use of B&B's special brush is particularly important when creating a bond to partially demineralized dentin. The same bonding agent

showed 24.2 MPa to partially demineralized dentin when it was applied with the B&B brush, but no bond at all (0.0 MPa!) when it was applied with a conventional brush

Wakamatsu S, et al. A study of self-polymerizing catalyst in one-step adhesive. AADR-Orlando, #1828, Mar 06

B&B's brush is particularly important when bonding a self-cure composite. If you just look at the bond-strength numbers generated in this study, Brush&Bond's brush contributed just an insignificant MPa or two to the bond of self-cured Absolute Dentin. However, when the special brush was used 100% of the composite-to-dentin samples survived preparation. In contrast, when a conventional brush was used, 30% of the samples broke before they could be tested.

When the Absolute Dentin was light-cured, however, 100% of the samples survived preparation whether or not the special brush was used.

Wakamatsu S, et al. A study on self-polymerizing catalyst in one-step adhesive. Jour Dent Res, AADR-Orlando Abstr #1828, Mar 06

Even if you protect your crown preps with Brush&Bond before temporizing, always apply a second coat before bonding the definitive restoration.

In this study, dentin was coated with B&B and then aged in warm water for a week. If a second coat of B&B was applied and cured immediately before cementing, the bond was identical to that created by etching unprotected dentin and cementing with an adhesive cement. However, if the second application of Brush&Bond was skipped, the bond was less than half as strong.

Ueki H, et al. Bond strengths of resin cement to resin-coated dentin. AADR-Orlando, #1832, Mar 06

* Yeah, I know. Xeno III has now been superceded by Xeno IV. So it's possible that the new improved Xeno will show even higher bond strength.

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Cleaning up C&B-Metabond

I've used C&B-Metabond in the past, primarily for emergency situations. It worked well, but cleaning up the flash at the margin was a real struggle. Because these were salvage situations, it was worth the effort and if a little remained it was acceptable.

However, I'm now cementing a 5-unit bridge with a short terminal molar abutment and less-than-perfect mechanical retention.

Do you have any hints that would make intraoral cleanup any easier in a case like this?

Alan Rosenberg, DDS
Portland, OR

Over the years, improvements in the C&B-Metabond chemistry have made the-world's-most-adhesive-cement a lot easier to use. In the late '90's the L powders (L for "long") extended its famously short working time. And more recently, the new QUICK formula dramatically shortened its famously long setting time.

The one thing that hasn't changed is C&B-Metabond's unbelievable adhesiveness. This tendency to fuse to everything can pose problems during cleanup. So I asked Dr. Rich Goldman (VP of Clinical Dentistry) to write down his thoughts on the easiest way to clean up after bonding with C&B-Metabond.

One of Rich's many roles here is dentist-in-residence at our company clinic. Rich bonds all his restorations (including bridges) with C&B-Metabond, and he tells me post-cementation cleanup is "easy." Now that Anita, his super-wife and super-assistant, has retired to be a full-time super-mom, Rich often practices alone.

A solo dentist who claims C&B-Metabond clean-up is "easy" must have some secrets to share. Rich?

Not secrets really. Many of these suggestions have appeared before in Parkell publications. I've just put them together with a couple of other ideas.

1) BluSep everything - and I mean everything.

As Metabonditos know, the excess cement expressed when the crown is seated will bond like crazy to everything it touches. Not just to the exterior of the restoration, but also to the gingiva and the proximals.

So after checking the fit, I carefully paint the exterior of the restoration with BluSep, taking care to avoid getting any on the interior. Some dentists like to use an artist's brush, but I apply it with a disposable UltraBrush.

While the restoration is sitting on the bracket table drying, I apply it onto the proximal teeth and the gingiva. Then I use my air-syringe to dry it about 10 seconds.

BluSep is a releasing agent specifically designed for C&B-Metabond. The blue polymer emulsion lets you clearly see what's covered and what isn't. It dries to a thin, flexible microfilm that won't dislodge when the crown is seated, and it keeps the C&B-Metabond from contacting the surface.

Lubricants like mineral oil or Vaseline® leave surfaces slippery. BluSep leaves them rubbery. So there's less chance that at some critical moment, the crown will go shooting across the room.

And the BluSep film is water-soluble, so when the cementing process is over you can wash it off with your 3-way.

2) Line the crown with cement - Don't overload it.

After wetting the prep and interior of the restoration with the mixed C&B-Metabond liquid, I paint the prep and the interior of the restoration with the mixed cement. I don't load the crown like I used to load it with ZOP. That would just create more cleanup.

3) For the margins and interproximals: SuperFloss and pledgets with glycerin

Historically we've suggested using Metabond base on a pledget to clean up the marginal area. This definitely works - but I've found another technique that works just as well for me. And since I'm congenitally cheap, I like the fact that I don't have to use that expensive monomer.

Before beginning the cementation procedure, I fully saturate several cotton pledgets and several strings of SuperFloss with glycerin and lay them on the bracket table. I prepare four pledgets for each crown, and a string of SuperFloss for each interproximal area plus one for each pontic. (That's 4 pledgets and 2 strings for a crown. 8 pledgets and 3 strings for a 3-unit bridge.)

And when I say "saturated", I mean disgustingly,

slobberingly, droolingly saturated.

Why glycerin? Glycerin gives the absorbent pledgets and floss some bulk and provides a smooth, flexible surface. Glycerin isn't a solvent, so it won't contaminate the Metabond. Unlike mineral oil, it's water-soluble ... so getting rid of the glycerin after cleaning up the C&B-Metabond is easy. And glycerin is super-cheap at any pharmacy.

As soon as the crown is seated, I stabilize it with a finger and use one of the saturated pledgets to wipe up as much cement from the lingual as possible before it starts to set. I push the pledget as far as possible from the lingual into a proximal embrasure to force the excess cement through. Then I use another pledget on

the other proximal embrasure. Using a third pledget, I wipe up the excess cement from the buccal. By sweeping the pledget diagonally from crown to root I assure that any cement left will be smooth.

I thread a SuperFloss through one proximal embrasure, and pull the floss to remove the remains of excess cement. After tossing the floss, I do exactly the same procedure for the other embrasures.

Since I've coated everything with BluSep, I don't worry about smearing the C&B-Metabond and leaving surfaces coated with a thin layer of the adhesive.

After everything dries, I just pop the excess off with a hand scaler.

Six things a dental speaker won't tell you

1) Half my lecture is nonsense. Guess which half!

A dentist may be an absolute genius in clinical dentistry - yet know virtually nothing about the chemistry of those materials.

Dental Materials is a highly specialized field. Even respected researchers can get in over their heads when they wander out of their specialty. One of the smartest composite researchers I know is pretty much an idiot on the subject of dentin bonding. He proves it every time he lectures.

2) I've never even seen some of the products I talk about.

The head of Operative Dentistry at a dental school was discussing the different types of resin cements.

"Chemically activated resin cements are supplied as a two-paste system. One paste contains a benzoyl peroxide initiator, the other a tertiary amine activator ... Examples include C&B-Metabond, etc."

Well, C&B-Metabond IS chemically cured. He got that right. But it contains NO tertiary amine activator. It DOESN'T contain benzoyl peroxide. And it's NOT a 2-paste system. Granted, you'd have to be pretty smart to know about the peroxide and amines - but anyone who ever looked in the box would know it wasn't a paste system.

3) And the best thing about this product is that it's absolutely FREE

One of my favorite stories involves an LLD ("Living Legend of Dentistry") who called here to order C&B-Metabond for the first time ... and was appalled that we expected him to actually pay for it. "But I never pay for ANYTHING," he protested.

4) I "borrowed" my schtick.

When you hear several speakers report exactly the same thing, it may mean there is a consensus on the point.

On the other hand, it may also mean that one speaker heard it at another presentation - thought the point sounded right or interesting or humorous - and decided to make it his own. As a result, some factoids spread flu-like through the guru population.

An example ...

If you attend lectures about ultrasonic scaling, you've probably heard more than one speaker report that the tip of a piezo scaler moves differently from that of a magnetostrictive scaler. According to these speakers, the piezo moves in a back-and-

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forth line and the magnetostrictive moves in an ellipse. This may be correct; however, I've never found any published studies to support it. In fact, the few studies that address the topic all suggest that both tips move pretty much the same.

Since the research we've done here at Parkell also suggests similar tip movement, I suspect this is a case of "factoidal influenza."

5) I'm good at cosmetic dentistry - I'm even better at Photoshop.

No comment.

6) I'll say practically anything for the right price.

A few years ago someone actually started a match-making agency to introduce lonely dental manufacturers to dentist-speakers looking for someone to love - for a price.

What if saliva contaminates the surface midway through self-etch bonding?

"Rubber dam recommended." It's part of every manufacturer's instructions for every bonding agent on earth, including ours.

But, truth be told, most dentists don't use dams for simple bonding. (I'm not saying they shouldn't - only that they don't.)

So what happens if, despite the cotton rolls, saliva ejector and good assistant armed with HVE, some spittle winds up on the surface you're bonding to?

The best reaction depends on where you are in the procedure.

If you haven't yet cured the Brush&Bond or Touch&Bond, rinse the tooth thoroughly ... dry the surface ... and start all over again by reapplying the bonding agent.

If you've already light-cured the bonding agent when the spit-incidence occurs, just wash and dry the surface thoroughly using your 3-way syringe. That should be enough to remove the contamination. Then proceed to build you restoration.



PS Got a question or interesting case to share? Drop me an e-mail (ngendusa@parkell.com) or give me a call (800-243-7446). By the way, we're now posting prior issues of this adhesive newsletter on our website (www.parkell.com) under "Technical Articles."

1University of TN - Research Monograph - To be publish in Operative Detnistry

2 Yamamoto T, et al. Relationship between self-etching adhesive and polymerization more of the resin composite. Jour Dent Res, AADR-Orlando Abstr #1830, Mar 06

3 Ori T, et al. Degree of polymerization and TBS of self-etching adhesives. Jour Dent Res. AADR-Orlando, Mar 06

4 Nakano K, et al. In-vitro evaluation of self-etching adhesive with build-up composite resin. Jour Dent Res, AADR-Orlando Abstr #1827, Mar 06

5 Wakamatsu S, et al. A study on self-polymerizing catalyst in one-step adhesive. Jour Dent Res, AADR-Orlando Abstr #1828, Mar 06

6 Yamamoto N, et al. The effect of the Catabrush in dentin bonding system. Jour Dent Res, AADR-Orlando Abstr #1829, Mar 06