



“FILLING THE GAP” IN OUTCOMES AND PRODUCTIVITY WITH POSTERIOR COMPOSITE RESTORATIONS

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Bulk fill composites can go a long way toward filling both the outcomes and productivity gaps. Learn how to have an even greater impact on the clinical and financial success of your dental practice.

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Introduction

According to an ADA published estimate, well over 76 million posterior composite restorations get placed every year in U.S. dental practices.¹ If we truly want to deliver clinical excellence to our patients and operational excellence to our practices, we must master the posterior composite restoration. And if we do not, we will experience gaps in both clinical outcomes and practice productivity.

Bulk fill composites can go a long way toward filling both the outcomes and productivity gaps. And one particular kind of bulk fill composite – Ecosite Bulk Fill (DMG) – can have an even greater impact on the clinical and financial success of dental practices.

WHAT YOU CAN EXPECT TO GAIN FROM THIS WHITEPAPER:

- › Problems with the traditional multi-layer approach for posterior composites
- › Overview and introduction of Bulk Fill composites
- › Properties and indications of Ecosite Bulk Fill
- › How Ecosite Bulk Fill's single-layer application can save time and money at your practice



Problems with the Multi-Layer Approach

In our three-dentist practice, our workhouse procedure is the posterior composite. Historically, practices like ours relied on flowable composites and a technique-sensitive, multi-layer approach. We had little choice but to incrementally fill, for three primary reasons. First, it was necessary to avoid shrinkage stress. Second, it was necessary to maximize esthetics in order to create restorations that had great harmony. Third, it was necessary to achieve a complete cure. This last reason is of particular importance given that the cure is the #1 failure point for composite resins.

Because traditional posterior composites – according to the manufacturers’ own instructions – cure in 2mm increments, a multi-layer approach was unavoidable for most restorations. The combination of the multi-layer approach and incremental filling was essentially the only way for dentists to generate outstanding results. However, this approach took a great deal of time, which was unfortunate for the productivity of both our practices and our patients. Think of it: Layer 1 required placing a flowable composite, then sculpting and packing it, and then curing it. And then Layer 2 required the same three steps. As did Layer 3. And Layer 4. And so on.

But it gets worse. Any of the four or five curing steps could result in failure, for any of the following reasons:

- An under-performing curing light
- Insufficient curing time
- The wrong tip on the curing light, whether it be straight, tapered, curved or a flathead
- An excessive amount of composite in the layer

But the risk of incomplete cures is not the only downside to the multi-layer approach. Another is inaccuracy. The more layers placed, the more opportunity there is for one or more micro-gaps somewhere in the restoration, which means a significant risk of failure. How soon this results in a failure depends of the locations of the micro-gaps. And of course a failed restoration means re-treatment, the cost of which can be significant. Unfortunately, many practices fail to calculate the costs of re-treatment, which include:

- The cost of your hygienist taking a set of bite wings
- The cost of your time to diagnose the marginal breakdown
- The cost of your redoing the restoration, which is often in the floor of the proximal box and time-consuming to access



To make matters worse – at least the way we run our practice – there is no revenue to cover these costs. If a patient has a failure within five years of the restoration’s placement and has been following our prescribed routine for re-care, we do not charge for re-treatment.

Clearly, then, the cost of re-treatment is considerable. But there is a related cost associated with re-treatments that almost no practices ever consider: the cost to their brand. The title of a recent book says it all: *Satisfied Customers Tell Three Friends, Angry Customers Tell 3,000: Running a Business in Today’s Consumer-Driven World*. And, according to newvoicemedia.com, 51 percent of people who have a negative experience with a company will never use that company again. In the dental industry, we work in a very invasive space, which means the stakes are especially high for us. Our patients are uncomfortable even when things go well; if things go badly, the repercussions for our practices’ brands can be severe.

Enter the Bulk Fill Composites

Given the time, cure, re-treatment and branding drawbacks of the multi-layer approach, it’s little wonder the bulk fill composite movement eventually entered the picture. Depending on the manufacturer, today’s bulk fill composites generally allow for a 4-5mm incremental fill and cure versus the traditional 2mm, and require one or at most two increments for the procedure as well as a capping layer. This represents a clear improvement in efficiency compared to the multi-layer approach with flowable composites.

However, there have traditionally been two drawbacks of bulk fills. First, most are not pretty; manufacturers have had to make them highly translucent to account for the depth-of-cure promise. The result is often that the final restoration experiences a significant value shift and appears gray as opposed to the shade that was present before curing. Second, traditional bulk fills typically allow little working time. The reason is generally because the manufacturer had to tinker with the filler content to account for that same depth-of-cure promise, which compromises the time available to successfully pack the restoration.

Ecosite Bulk Fill & Ecosite Bond: The New State of the Art



Based on our experience in our practice, Ecosite Bulk Fill (DMG) does not suffer from the traditional drawbacks associated with bulk fill composites. Instead, it offers a maximum depth of 5mm, a single 20-second composite cure, low shrinkage stress, and excellent adaptability, packability and handling. It also delivers high polishability, extra fluoride release, truly exceptional esthetics, does not require a capping layer, and does not stick to instruments.

Ecosite's 5 mm depth is particularly advantageous when replacing amalgam restorations, which are typically rather deep.

The illustration below shows Ecosite's superior simplicity versus both conventional bulk fill composites (Fig. 1) and the multi-layer technique using a typical flowable composite. (Fig. 2)

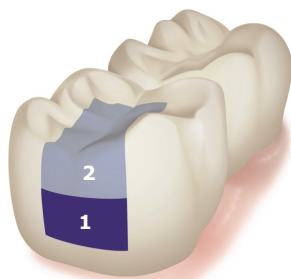


FIG. 1: FLOWABLE BULK FILLING MATERIAL WITH A CAPPING LAYER, TWO LAYERS

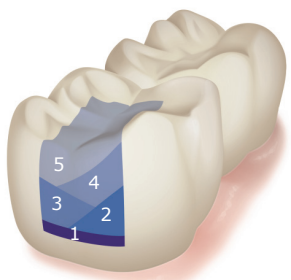
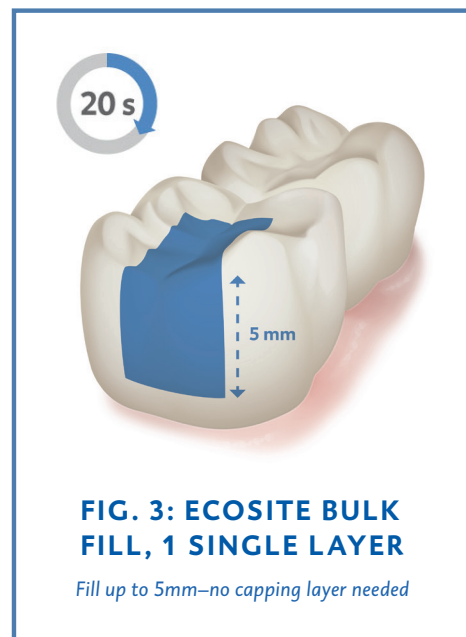


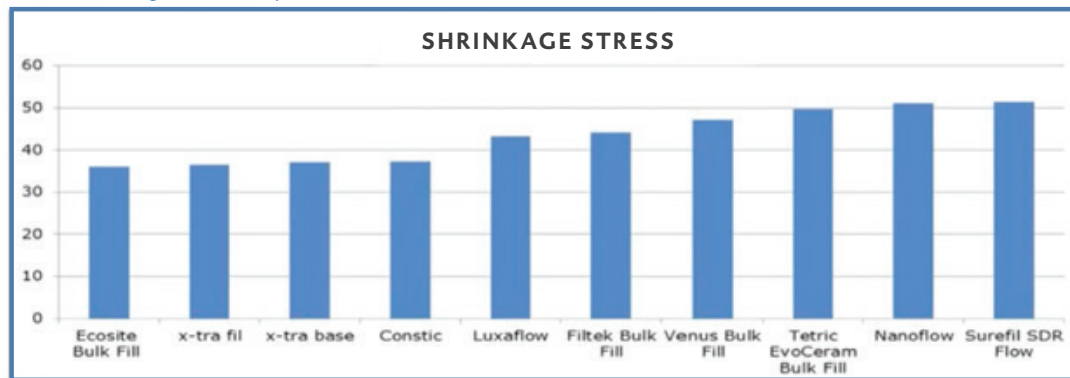
FIG. 2: REGULAR RESTORATIVE MATERIAL, MULTI-LAYER TECHNIQUE



Shrinkage Stress

Ecosite Bulk Fill performs particularly well when it comes to shrinkage stress. In fact, it outperforms all other bulk fill and flowable composites shown in the chart below.

Table 1: Shrinkage Stress Comparative Chart



SOURCE: EXTERNAL MEASUREMENT, PROTOTECH, 2013

Durability & Reliability: Nanotechnology

As can be seen in the image below, Ecosite Bulk Fill is an exceptionally homogeneous nano-filled material, which helps account for its superior durability and reliability.

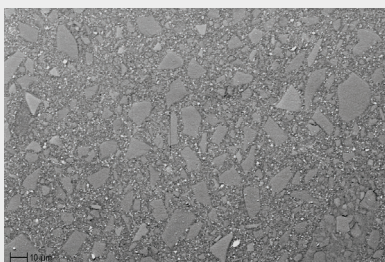


FIG. 4: SONICFILL™ (KERR)*

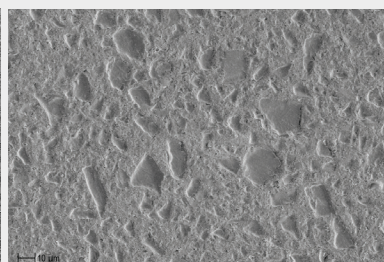


FIG. 5: X-TRA FIL™ (VOCO)*

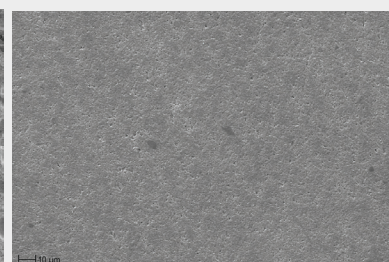



FIG. 6: ECOSITE BULK FILL (DMG)

Image Source: Internal REM images, DMG 2018
*These brands are not registered trademarks of DMG



Practice Management: Ecosite Bulk Fill vs. Traditional, Multi- Technique Bulk Fills

The time savings generated by Ecosite Bulk versus the traditional multi-layer technique are significant, as can be seen in the table below that is based on the experience in our practice.

Table 2: Total Time for Traditional Multi-Layer Technique

TRADITIONAL COMPOSITE: PER LAYER			
Place	Sculpt	Cure	Total
5 sec	25 sec	10 sec	40 sec
Total Time, Assuming 4 layers = 160 seconds			

Table 3: Total Time for Ecosite Bulk Fill Single-Layer Technique

ECOSITE BULK FILL: SINGLE LAYER			
Place	Sculpt	Cure	Total
5 sec	25 sec	20 sec	50 sec
Total Time = 50 seconds			
Total Time Savings = 110 sec			

And when you do the math, that 110 seconds saved per tooth really adds up over the course of a year. Here's how the math works in our practice:

3 dentists x 36 teeth/day x 4 days/week x 48 weeks = 2,280,960 seconds = 633 hours/year
This works out to 211 hours/year - or 28 days/year - per dentist

Using the \$216 U.S. average hourly production rate for dentists reported by Sikka Software², these freed-up hours could conceivably be used by each dentist to generate roughly \$48,000 in additional production each year. Alternatively, the average clinician could theoretically choose to work 28 fewer days per year without sacrificing production.



While the numbers will obviously vary from dentist to dentist, there can be no denying that Ecosite Bulk Fill's impact on a practice's productivity – and its profitability – can be profound. And when you add the impact of lower re-treatment expense and the strengthening of the practice's brand, the financial advantages become even more impressive. That has certainly been the case in our practice. Equally important, the durability and esthetics are actually superior to what we had experienced with the multi-layer technique.

It should be pointed out that choosing the right bonding agent is also critical to successful posterior composite restorations. In our practice, we have found that Ecosite Bond (DMG) offers three advantages over other bonding agents. First, it allows the clinician to vary the conditioning technique depending on the procedure. For example, with posterior restorations I prefer selective etching: specifically, I etch the enamel to maximize bond strength, but I do not etch the dentin as I find that it does not strengthen the bond. However, Ecosite Bond is also effective should I choose total etching or no etching. Second, its bond strength is unsurpassed in our experience. And third, it requires no cure. This saves 10 seconds per tooth, which only adds up to the very significant time savings generated by Ecosite Bulk Fill.

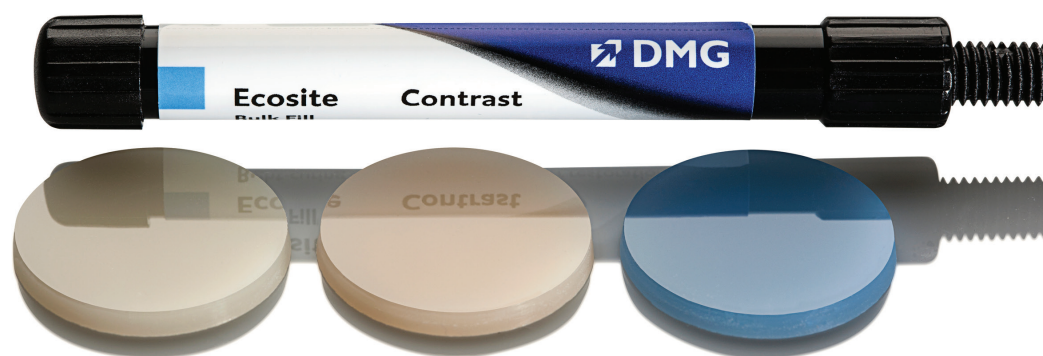


FIG. 7: ECOSITE BULK FILL'S FUNCTIONAL SHADE SYSTEM

Case Example

The following clinical case demonstrates how choosing the right restorative materials makes it possible to fill both the clinical outcomes gap and the practice productivity gap with posterior composite restorations.

A 52-year-old male presented with back-to-back, 35-year-old-plus, failing amalgam restorations on teeth #14 and #15. Both molars tested WNL to thermal stimuli, EPT, percussion and palpation. They also presented normally upon radiographic exam. (Fig. 8)



FIG. 8: PRE-TREATMENT #14 AND #15 FAILING AMALGAM RESTORATIONS.



FIG. 9: FAILED AMALGAM RESTORATIONS AND DECAY REMOVED.

After verifying the pulpal status, 0.5 carpule of 4% Septocaine (Septodont) anesthetic with 1:100,000 was buccally infiltrated adjacent to both #14 and #15. Following the infiltration, rubber dam isolation was achieved, and amalgam restorations were removed under high-speed evacuation, decay was also removed, and preparations were refined. Sectional matrices were then placed to restore #15 first and #14 second. (Fig. 9)

Next, I conditioned the teeth with Ecosite Bond and then placed a single increment of Ecosite Bulk Fill. After quickly sculpting, I did a 20-second cure and rough-finished the restorations following the teeth's natural contours. After verifying that the proximal contacts were ideal, I removed the rubber dam and had the patient rinse. I then checked the occlusion and did a final polish. The shade of the restoration was a very close match to the surrounding teeth. The total procedure took less than one hour. (Fig. 10)

Conclusion

Choosing the optimal restorative materials is critical to mastering posterior composite restorations, and hence to filling gaps in both clinical outcomes and practice productivity. Based on the results observed in our practice, Ecosite Bulk Fill and Ecosite Bond are two such materials.



FIG. 10: FINAL POLISH OF ECOSITE RESTORATIONS #14 AND #15.

References:

- 1 American Dental Association (2007) 2005-06 Survey of Dental Services Rendered. American Dental Association, Survey Center. Chicago, IL
- 2 <https://www.dentistryiq.com/articles/apex360/2017/04/here-s-the-current-net-production-per-hour-dollar-amount-for-dentists-and-where-the-trend-is-headed.html>

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