

DENTAL ADVISOR™

Product insights you can trust.

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Vol. 43, No. 02

NAVIGATING
ADVANCEMENTS IN

DIRECT RESTORATIVE MATERIALS

DIRECT RESTORATIVE TECHNIQUES

CLINICAL CASE REPORT:
SOVENTUM RESTORATIVE WORKFLOW

RESEARCH REPORTS:
Q-MATCH™ UNIVERSAL FLOW & Q-MATCH™ UNIVERSAL

TRANSLATING THE SCIENCE:
CLEARFIL™ MAJESTY™ ES FLOW UNIVERSAL



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Dr. Ashton A. Prince
Chief Editor

Welcome to this special issue dedicated to one of dentistry's most foundational disciplines: direct restorative dentistry.

In an era defined by digital innovation, implant breakthroughs, and regenerative advances, it is easy to be captivated by what is new. Yet, the direct restoration remains the cornerstone of everyday practice. It is in these procedures that clinical artistry and material science truly intersect.

This issue takes a closer look at topics that range from resin composites and adhesive strategies to practical guidance on shade matching, finishing, and polishing. Together, they reflect a discipline that continues to evolve in response to emerging evidence and rising patient expectations for durability and aesthetics. Whether you are a seasoned practitioner looking to refine your technique or an early-career clinician building your clinical foundation, there is something here for you.

Direct restorative dentistry may be familiar territory, but it is always changing. New materials continue to challenge what we thought we knew. Evidence-based updates are redefining long-held protocols, and patients' expectations for both function and aesthetics have never been higher. We believe great dentistry begins with getting the basics right. Learn with us, grow with us, be curious, and as always, enjoy the journey.

— Ashton A. Prince

CLINICAL AMBASSADOR PROFILE

Dr. Troy Schmedding is a trusted provider of esthetic and functional dentistry, committed to delivering personalized care at his private practice in Walnut Creek, California.

A graduate of the University of the Pacific School of Dentistry in San Francisco, Dr. Schmedding also served as an Associate Professor in the Department of Integrated Restorative Sciences for many years, where he helped train the next generation of dental professionals.

As an Accredited Member of the American Academy of Cosmetic Dentistry (AACD), Dr. Schmedding is dedicated to the highest standards in cosmetic and restorative care. He is a nationally and internationally recognized speaker, regularly lecturing on topics such as dental esthetics, function, clinical protocols, and the latest materials in dentistry.

Outside of dentistry, Dr. Schmedding enjoys spending time with his wife and two children. The family loves to travel and explore new destinations together. He's also passionate about fly fishing, which he considers the perfect way to relax and recharge.





Direct Restorative

TECHNIQUES & PROCEDURES



CONTRIBUTING AUTHOR

Taiseer Sulaiman,
DDS, PhD, FICD
Clinical & Scientific
Ambassador

As restorative specialists, the desire to be at our best and stay current with the times is extremely high. To stay up to date with the ever-changing standards of care in the field of dentistry, we attend numerous conventions and continuing education venues to be informed, taught, and inspired. Many are initially intrigued to hear more about things like advanced rehabilitation procedures, but the classes that seem to be the most sought out are those involving the clinical basics. "The Simplified Class 2 Procedure", "Beautiful

Esthetics with Anterior Composites", or "Tips and Tricks to Efficient Composite Restorations" are all class titles that catch our eyes. Usually, however, these courses discuss what many would refer to as boring and overly common day-to-day procedures... so why are we so interested? No matter the length of time that has passed since graduation, we all want to enhance our skills and create restorations that make our patients say "Wow!" Why are the "basics" considered the hardest and least fulfilling procedures where we need the most help, and why are there so many methods, differences, and varied opinions in how dentists perform these procedures?

VARIANCE IN CLINICAL SKILL AND MENTALITY

During clinical training, certain techniques are taught to develop a higher level of confidence for those to be treating patients. As the experience and history of the instructors will vary, not every institution will train its students the same, causing the level of skill that is developed from these programs to vary. After graduation, those same techniques and skills will remain for diagnosing and treating oral disease.

Across the country, 100% of dentists are required to attend continuing education courses to maintain their licensure, with the average state requirement being 20 hours per year. What is being sought out during these lectures? A 2022 Spear Education survey reviewed "The State of Dental CE: Trends for 2022" and found the primary motivation for those attending courses was the learning of new dental skills for dentists of all levels and training. Of those surveyed, the top 2 factors that influenced their class selection were the perceived level of mastery by the instructor and the reputation of the institution that is providing the education.¹

The highly esteemed actress Helen Hayes said, "The expert in anything was once a beginner." The desire to be better and to offer more to our patients is internally contagious. We are always looking for answers to the simple question... "Is there a better way?"

1. Rojek, B. (2022, February 11). The State of Dental CE. Spear Education. https://issuu.com/speareducation/docs/spear_s_state_of_dental_ce



RESTORATIVE TECHNIQUES

In discussion with **DENTAL ADVISOR Evaluators and Clinical Ambassadors**, it was further confirmed that each clinician has “their way.” As we see the beautiful results from educators we view as “Restorative Masters,” we want to hear from and emulate those who appear to have a heightened clinical understanding.

With so many different protocols, what do we actually know besides opinions? What does scientific research show when we consider “proper techniques” that should be routinely performed? And are we simply basing our material selection on what was placed in front of us by our local company representatives or those we worked with when starting our careers?

The breakdown of the restorative process includes many steps that need to be taken into consideration. Cutting corners or failure to address the following areas may result in a weakened final restoration or unesthetic characteristics.



Photo courtesy of Dr. Marc Harrison Lai

ISOLATION

Use of a rubber dam has long been deemed a necessity for clinical success. Even though we are aware of the benefits of moisture control, prevention of contamination, and an increase in adhesive abilities, the potential discomfort to the patient and time spent placing the rubber dam keep many from performing this step. A 2007 survey from Hill and Rubel showed that among 400 dentists located around the country, when discussing anterior restorations, only 17% said they always used a rubber dam, with only 18% always using one in the posterior.² In asking our own Clinical Evaluators, 41% indicated that using a rubber dam was their general mode of isolation, with the majority being the use of a simple cotton roll. It does involve more time, but the benefits and value are undeniable.

For those concerned with the potential difficulties in placing a rubber dam but looking to achieve improved isolation, other advanced isolation devices such as **Isolite® Pro** (Zyris) or **DryShield®** (Solometex) are excellent alternatives to consider.

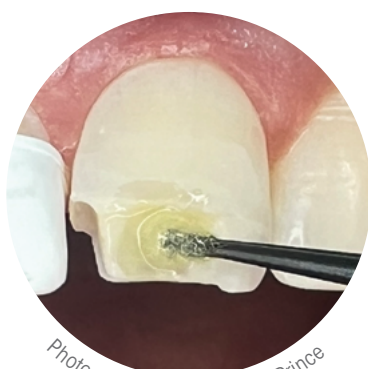


Photo courtesy of Dr. Ashton Prince

PREPARATION

The use of a 37% phosphoric acid to condition the prepared surface before placing a bonding material is a commonly performed practice that creates greater depths for resin penetration. The usual length of time to allow for the material to interact with the tooth structure is 15 seconds, whether it be on enamel or dentin, with more conservative practices being a time length of only 3-5 seconds.

To enhance the procedure and increase the bonding strength and success, an additional pre-step of air abrasion can be included. The protocol of 50-53 µm aluminum oxide particles at 160 psi (>5 bar) for 5 seconds can remove the smear layer and allow for the bonding materials to interact with sound dentin instead of the hydroxyapatite that is associated with exposed dentinal tubules. If using a self-etching bonding material, the use of air abrasion can increase the bond strength to dentin by over 40%. Air abrasion products commonly used by our Clinical Ambassadors are **EtchMaster®** (Groman Inc.), **PrepStart** (Danville), and the **RONDOflex™ plus 360** (KaVo).

In asking our Evaluators if they traditionally used air abrasion as a part of their protocols, 24% indicated they routinely performed this step, with 58% saying they rarely used air abrasion on their direct restorations.

Another step that may be considered to gain confidence in clinical success is the use of a caries indicator like **Sable™ Seek™** (Ultradent) or **CARIES DETECTOR** (Kuraray Noritake Dental America). Performing this step prior to air abrasion can ensure you are working with sound dentin foundations instead of a questionable surface.

2. Hill, Edward & Rubel, Barry. (2008). Do Dental Educators Need to Improve Their Approach to Teaching Rubber Dam Use?. *Journal of dental education*. 72. 1177-81. 10.1002/j.0022-0337.2008.72.10.tb04596.x.



ADVANCEMENTS IN DIRECT RESTORATIVES

from Bisco Inc.

Start Strong. Finish Beautifully. The Power Pair for Restorative Success.

Pair **All-Bond Universal**'s trusted adhesion with **Quantium**'s precise handling and esthetics for a restorative workflow you can count on, from bond layer to final polish. Fewer variables. More confidence. Predictable results every time.



Learn More:



All-Bond Universal®

Light Cured Dental Adhesive

+++++ (96%)

Backed by decades of bonding research, **All-Bond Universal** delivers proven adhesion and versatile performance in one easy-to-use, single-bottle system.

Evaluator Comments:

- "Easy to use and works for everything!"
- "Less technique sensitive than other adhesives."
- "The built in desensitizer eliminates one step from our previous protocols."
- "Works great with my dual-cure core material."

Quantium™

Universal Composite

+++++ 1/2 (91%)

Engineered with advanced PPF filler technology, **Quantium** combines smooth sculpting, fast polishability, and dependable performance to help deliver restorations that look great and last.

Evaluator Comments:

- "Handling is awesome. It sticks to the tooth but not to the instruments."
- "It heated up well with my composite warming dispenser and handled very nicely."
- "Great variety of shades and amazing polishability."
- "The handling was great, not too soft or hard. Texture and ability to shape is excellent."



Learn More:



DIRECT RESTORATIVE MATERIALS

BONDING PROTOCOLS

The most common style of bonding materials preferred by dentists across the country are universal single-step systems as opposed to two-bottle systems. Ease of use, less sensitivity to the technique, and high success rates are all reasons for the preference. 78% of our polled evaluators helped confirm the move to universal systems with the most commonly used being **CLEARFIL™ Universal Bond Quick 2** (Kuraray Noritake Dental America).

Many other products were utilized such as **3M™ Scotchbond™ Universal Plus Adhesive** (Solventum), **G-Premio BOND™** (GC America Inc.), **All-Bond Universal®** (Bisco Inc.), **Adhese® Universal** (Ivoclar), and **OptiBond™ Universal 360** (Kerr Dental). As many materials vary in their own scientifically proven protocols, the easiest method for proper techniques is referring to the IFU and directions from each company. If the isolation is providing a clean environment free of contamination and the surface has been properly cleaned, the bond used simply needs to be applied correctly to achieve successful results.

Photo by Dr. Chris Mazzola

MATERIAL PLACEMENT

Multi-layering of a chosen composite material in the anterior is the preferred method, with a dual-curing composite for the base layer of deeper preparations being considered in the posterior. For those dual-curing composites, an additional veneering increment should be applied on the occlusal surface.

Bulk filling materials are being advertised more and more, although it is interesting to see the even split within our evaluators for those who use them and for those who rarely use them. 35% routinely use bulk fill materials, 35% occasionally use them, and 30% rarely use them. Of those that are using these materials, the preferred bulk-fill composites were **3M™ Filtek™ One Bulk Fill Restorative** (Solventum), **SDR® Flow+** (Dentsply Sirona), and **SimpliShade™ Bulk Fill Flow** (Kerr Dental).



Photo courtesy of Dr. Sabiha Buneek

In discussing these materials, trends are also moving to materials that exhibit a chameleon effect characteristic. Clinicians are moving from traditional multi-shade systems to more simplified (2-5 shade systems) such as **G-aenial™ A'CHORD** (GC America Inc.) or single shade systems (one universal color). 58% of our evaluators prefer a simplified system, showing proof of the trend, with 27% routinely using a single-shade system such as materials from the **OMNICHROMA** (Tokuyama Dental America) composite family.

Those still preferring the multi-shade systems should look towards the **Tetric EvoCeram** (Ivoclar) or the **3M™ Filtek™ Supreme Ultra Universal Restorative** (Solventum), as both have been thoroughly tested within the DENTAL ADVISOR Research Department with very positive long-term studies being performed over a number of years.

REQUIREMENTS WITH LIGHT CURING

Failure to properly polymerize a composite material will lead to failure of the restoration both structurally and esthetically. There are 4 main options of curing lights on the market with the most common being the LED light due to the light weight, portability, and lower heat generation during use. The commonly used blue spectral output works well with the camphorquinone photoinitiator (400-500 nm) found in most composite materials, thus making it a convenient light to use in most situations.

Maintenance of the curing lights is also essential to the effectiveness of the curing ability. Checking on the light output of the unit is not difficult, however, according to an ADA survey performed in 2020, only 3% of dentists are checking their lights daily. 19% said they check weekly, 31% said they checked theirs in the range of every 1-6 months, and 11% said they checked annually.³ The alarming thought is most clinicians are unsure if their equipment is adequately securing the materials. Simply put, if the materials are not properly cured, it will not matter if the isolation and cleanliness of the preparations are ideal... the resulting restoration stability will be inadequate.

For our own evaluators, only 2% checked their curing lights daily, with most (25%) saying they checked annually. Sadly, just as the ADA report indicated, 14% answered that they never check their curing light efficacy.

As a safeguard to make sure the curing lights are functioning properly, companies such as BlueLight Analytics or Ivoclar (**Bluephase® Meter II**) can monitor the effectiveness of the light. In consideration of which lights have been tested within the walls of DENTAL ADVISOR, the **Bluephase® PowerCure** (Ivoclar) and **Radii Xpert** (SDI Limited) each tested very well.

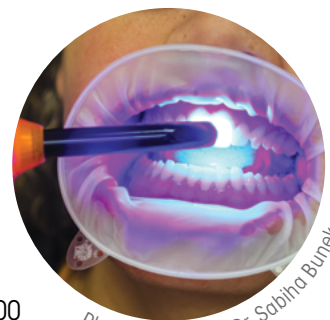


Photo courtesy of Dr. Sabiha Buneek

3. Frazier K, Bedran-Russo AK, Lawson NC, Park J, Khajotia S, Urquhart O; Council on Scientific Affairs. Dental light-curing units: An American Dental Association Clinical Evaluators Panel survey. J Am Dent Assoc. 2020 Jul;151(7):544-545.e2. doi: 10.1016/j.adaj.2020.03.001. Epub 2020 Jun 1. PMID: 32498964.



Adhese® Universal

With VivaPen Applicator

+++++ (99%)

Adhese Universal is a single-component, light-cured adhesive for direct and indirect bonding procedures. The VivaPen applicator has an internal locking mechanism and disposable angled brush cannula to keep material fresh and minimize waste. The brush tip is saturated with two to three clicks of the button on the pen, a single coat (applicable with any etching technique) is applied and agitated for 20 seconds, then dispersed with air, and light cured for 10 seconds.

DENTAL ADVISOR Conducted a Long-term Evaluation with Adhese Universal.

Eighty-three direct and indirect restorations were placed using Adhese Universal bonding system. Seventy-three of these restorations were available for recall after one year. All restorations received excellent ratings for lack of postoperative sensitivity, resistance to marginal discoloration and retention. One anterior composite restoration debonded. Adhese Universal received a clinical performance rating of 99% at one year.



Learn More:



"I LOVE THE VIVAPEN DISPENSING SYSTEM – VERY CONVENIENT AND MINIMAL WASTE."

Features & Benefits:

- Universally suitable for direct and indirect bonding procedures and all etching protocols.[†]
- High bond strength (> 25 MPa) on wet and dry dentin.
- Adhese Universal features an integrated desensitizing effect, which eliminates the need for a separate desensitizing agent.
- Lack of postoperative sensitivity.^{††}
- Fast and convenient direct intraoral application with the user-friendly VivaPen.
- Efficient VivaPen delivery form provides up to four times more applications per ml compared to conventional bottles.

Evaluators' Comments

"I like having one bonding system that allows both self-etch and total-etch techniques."

"Versatile material that can be used for most bonding applications."

"Less waste than a dropper bottle or unit-dose delivery."

[†] Except in cases, where sufficient exposure to curing light cannot be ensured (e.g. adhesive cementation of endodontic posts).

^{††} DENTAL ADVISOR. (2017, January 2). Adhese® Universal – One Year Clinical Performance. DENTAL ADVISOR. <https://dentaladvisor.com/clinical-evaluation/adhese%20universal-one-year-clinical-performance-2/>

DIRECT RESTORATIVE MATERIALS



FINISHING AND POLISHING

When looking to enhance the characteristics of a composite restoration, many different protocols appear to be used. Initially, the use of glycerin gel has been known to increase the surface hardness of the composite and improve the degree of conversion, resulting in better physical properties of the material. The process is extremely simple: Place your restoration and cure for the manufacturer's suggested period of time. Apply a thin layer of the glycerin gel over the composite to create an oxygen barrier and light-cure the material again. The final step is to rinse the glycerin with water, then begin polishing the restoration. Even though the protocol is easy, interestingly only 16% of our evaluators performed this procedure as a part of their protocol. Commonly used glycerin gel products are the **Liquid Strip** (Ivoclar) or **Liquid Lens™** (Zest Dental Solutions).

Polishing protocols can vary significantly depending on the clinician asked. For a patient, a change in the polished esthetics, alteration to the base color, or a difference in the external staining of a restoration compared to an adjacent tooth can lead to dissatisfaction and a return to the office with frustration and a desire for repair. Not every situation will be perfect, but an avoidance of "cutting corners" and setting your procedures up for success will be worth the time and effort in the long run.

Protocols for our Clinical Ambassadors included diamond finishing burs at a lower rpm, **Brownies®** (Shofu) with water at a higher speed, then **3M™ Sof-Lex™** (Solventum) discs and **Enamelize™** (Cosmedent) polish to finish. Other clinicians also liked to use **Enhance® Polishing Cups** (Dentsply Sirona) polishing cups or **Diamond Polishing Paste** (Premier Dental) for a greater shine. A final process that was suggested involved a pre-polish with **NTI® Brown Silicone Polishers** (Kerr Dental) then a final polish with **Sof-Lex** (Solventum) discs and **Zircon-Brite** (Dental Ventures).

The intent is to give a smooth and shiny surface that the tongue will accept, that staining materials will not interact with, and provide an ability for patients to gain confidence in their functionality and esthetics. If staining of the restorations is desired, **GC OPTIGLAZE™ Color** (GC America Inc.) was the heavy winner for preferred products; however, only 11% of our evaluators routinely used stain to characterize their final restorations.



Photo courtesy of Dr. Marc Harrison Lai

Learn More:



OMNICHROMA & OMNICHROMA Flow

(Tokuyama Dental America Inc.)

OMNICHROMA and **OMNICHROMA Flow** are single-shade composites which utilizes Smart Chromatic Technology, with supra-nano, uniformly-sized spherical fillers. **OMNICHROMA**'s paste consistency excels in sculpting and creating anatomical details, making it ideal for Class III, IV, diastema, and veneer cases. **OMNICHROMA Flow**, with its medium flowability, provides precise control for Class II and V restorations, particularly in preps of 2 mm or less, and serves as an excellent base layer or liner.

Evaluator Comments:

- "The transition from opaque-white to tooth shade blending after curing is amazing."
- "The color matching was superb."
- "It streamlined our workflow by limiting the need for additional shades."

Online: OMNICHROMA.com



++++ 1/2

++++ 1/2

Product Highlights

Learn More:



Hi-Bond® Universal

(MEDICLUS Co., Ltd)

Hi-Bond Universal is a light-cured, one-step dental adhesive that combines etching, primer and bonding agent in a single bottle. It is able to be used in total-etch, selective-etch, or self-etch procedures and features a controlled drop system that minimizes material waste. The incorporation of MBG (Mesoporous Bioactive Glass) as a filler, which features nano-sized pores and a large specific surface area. The adhesive promotes the formation of HAP (Hydroxyapatite) on the dentin surface and helps reduce sensitivity in patients.



++++ 1/2

Evaluator Comments:

- "Good alternative to my usual."
- "I liked that you could open and close the dispenser with one hand and the little lock helped."
- "Very clear material – worked great in anterior bondings and indirect restorations."
- "Ideal viscosity – not too thick."

Online: mediclus.co.kr



DIRECT RESTORATIVE SOLUTIONS

from GC America Inc.

G-Premio BOND™

One Bond for Every Technique

+++++ (96%)



G-Premio BOND is a universal, single component, light-cured bonding agent. It is compatible with total-etch, self-etch and selective-etch techniques and indicated for use in all classes of direct restorations. The addition of an MDP monomer enhances chemical adhesion to zirconia, alumina and other non-precious metals; increased water content improves removal of the smear layer; and increasing the amount of carboxylic monomer maintains an acidic pH.



Evaluator Comments:

- "I like the unit-dose container; it stands nicely on the tray and the lid closes securely."
- "No problems with post-op sensitivity during the evaluation."
- "Can be stored at room temperature."
- "The foil wrappers keep the liquid fresh and the material from drying out."

Learn More:



G-ænial™ A'CHORD

Streamline Your Shades.
Simplify Your Workflow.

+++++ 1/2 (94%)



G-ænial A'CHORD is a simplified unishade universal composite with five core shades to cover the spectrum of the 16 classic Vita shades. It has a unique filler technology that mimics natural light reflection, non-sticky Bis-MEPP monomer and optimized filler-monomer combination to improve handling. Its uniform nanofiller distribution and high filler load delivers exceptional polishing.

Evaluator Comments:

- "I redid anterior bonding on a bride to be and she said she couldn't tell that it was even filling material."
- "Creates invisible restorations."
- "Excellent composite that should be in every dentist's restorative tool kit."
- "Excellent handling with predictable shade matching and esthetics."



Learn More:





EXPECTATIONS FOR AGED COMPOSITE RESTORATIONS

We have seen that proper protocols, polishing, and the use of finishing materials can create a durable and beautiful final restoration.

The primary and most common concern for the longevity and sustainability of a restoration is associated with recurrent decay. Items that generally lead to this type of failure are poor oral hygiene, microleakage, polymerization shrinkage, and a failure in bonding. Thankfully, only 2% of our evaluators expressed frequent complications with their direct restorations with post-placement staining, but for many, it may be more common.

Discoloration issues can arise from:

Incomplete Polymerization - results in increased solubility and incomplete monomer conversion that can then undergo oxidation and lead to yellowing of the material.

Water Absorption - weakens the filler particles linked to the resin matrix and results in microcracks and gaps that may lead to discoloration.

Material Content - composite with a higher resin content and lower filler percentage increases the water absorption, which leads to a lack of color stability. Nanohybrid composites are also known to absorb staining substances more easily than microhybrid materials, which indicates the need to use the right style of material in the right locations.

Photoinitiator Systems - Dual-cure composites with benzoyl peroxide initiators can create discoloring oxidation products. The photoinitiator camphorquinone is also a material that is known to have a yellowing characteristic that can alter the final color.

Surface Roughness - a lack of a proper polish is a major contributor to extrinsic staining as it increases retention of pigment. Concerns such as water absorption, the conversion rate of the material, and the overall chemical characteristics of the material can alter the long-term maintenance of the outward appearance. Utilizing procedural steps such as curing the materials with a glycerin gel can further assist with reducing the material from discoloring.

Product Highlights

OPTIM OS1

(SciCan)

OPTIM OS1 is a one-step cleaner-disinfectant that removes soil and hard-to-kill organisms. Its LAS Active System enhances cleaning and provides rapid disinfection, killing bacteria, viruses, TB, and emerging pathogens in just one minute. **OPTIM OS1** is safe to use on dental chair upholstery, metals including stainless steel and anodized aluminum, countertop materials including laminate, Corian and Krypton, silicone, plastics, and other hard, nonporous materials common in dental offices. Listed on EPA List-N, **OPTIM OS1** destroys SARS-CoV-2 in 30 seconds, making it reliable for COVID-19 protection.

- 60-second kill times for 40+ organisms.
- Cleans and disinfects in one step for fast turnaround.
- Won't dry up before the contact time.
- VOC-Free, Dye-Free and Fragrance-Free.

Online: scican.com

Learn More:



HYDRIM 112 G4+

(SciCan)

The **NEW HYDRIM 112W G4+** automated instrument washer is engineered to streamline instrument reprocessing with its advanced touchscreen interface and expanded capacity. By minimizing physical contact with contaminated instruments, it helps reduce the risk of sharps injuries, promoting a safer environment for your team. This innovative system is designed to optimize workflow efficiency and support your bottom line, making instrument reprocessing easier and quicker than ever before.

- Free up 6.5 hours per week for patient care.
- Cut instrument cleaning costs by up to 70%.
- Automated washing minimizes handling of sharp instruments.
- Automation ensures instruments come out clean, dry and autoclave-ready.
- Clean more instruments per cycle than manual or ultrasonic cleaning.

Online: scican.com



CONCLUSION

When considering all of the suggestions and techniques that are being utilized by our evaluators and Clinical Ambassadors, some steps seem to be essential while others are simply done because of previous habits in which they have gained clinical confidence. The use of proper isolation, namely a rubber dam, is first. A conservative approach to the reduction of the tooth is then to be performed with a cleaning of the surface with air abrasion and selective-etching of enamel. Follow the directions within the IFU of the manufacturer for the correct bonding protocols and cure the bond as instructed with an efficient curing light. Use of glycerin gel to further strengthen the material can be performed, followed by finishing and polishing of the restoration.

An understanding of the basic steps required for ideal direct restorations is essential to providing patients with the best treatment possible. As the great Brazilian soccer player Pelé stated, "Success is no accident. It is hard work, perseverance, learning, studying, sacrifice, and most of all, love of what you are doing." **Choose to continue learning. Master inspiring techniques through practice, transform them into habits, and you may become the instructor who inspires the next generation to do the same.**

Product Highlights

- SOLVENTUM RESTORATIVE WORKFLOW -

Learn More:



3M™ Scotchbond Universal Plus Adhesive



Scotchbond Universal Plus Adhesive is a light-cured, single-component, universal adhesive compatible with light-, dual-, and self-cured materials and all etching techniques. BPA- and BisGMA-free, it bonds and seals caries-affected dentin, provides high bond strength to glass ceramics, and is the first radiopaque, universal adhesive available on the market.

Evaluator Comments:

- "It did not run all over the tooth when being air dried – it stayed where I put it."
- "After drying, it was easy to tell if you have a nice layer of material over the entire surface to be bonded."



Solventum™ Filtek™ Easy Match Flowable



Filtek Easy Match Flowable is a three-shade flowable restorative (Bright, Natural, Warm) designed for simple shade selection and single-layer restorations, no blocker required. Its body-like opacity delivers natural esthetics for anterior and posterior cases, and the syringe tip virtually eliminates bubbles and prevents material run-on during dispensing.

Evaluator Comments:

- "Excellent shade match and final polish."
- "It's a good flowable and nice that it has 3 shades."
- "The final polish of the restoration is very good."



3M™ Filtek™ Easy Match Universal



Filtek Easy Match Universal is a simplified shade composite system with bright, natural, and warm shades to enable a faster shade selection process. Indicated for all classes of anterior and posterior composite restorations, it mimics dentin at thicknesses above 2 mm and enamel translucency at 0.5–0.75 mm.

Evaluator Comments:

- "Deep posterior Class II restorations were done with exceptional ease of handling and polishing."
- "I thought in Class V situations the esthetics were especially good."



Solventum™ Filtek™ Composite Warmer



Solventum Filtek Composite Warmer heats **Filtek** composites in capsules and syringes up to 70°C to improve flowability, handling, and adaptation to cavity walls. Designed specifically for **Filtek** materials, it features an easy one-button operation, and a removable holder that maintains heat and can be moved and used at point of care.

Evaluator Comments:

- "Using a warmer will make your restorative life 100% easier."
- "Produces better flow and adaptation, especially in deep areas and tight spaces."



36 CLINICAL EVALUATORS

727 TOTAL USES

93% CLINICAL RATING

Category: Small Equipment | Composite Warmer

Description

Solventum Filtek Composite Warmer is a device designed to warm **Filtek** dental composites in capsules and flowable syringes to temperatures up to 70 °C (158 °F) to increase flowability and improve handling. The unit has been specifically designed for use with **Filtek** composites to support placement and enhance adaptation to cavity walls. Featuring a silicone sleeve for safe operation, the **Solventum Filtek Composite Warmer** is easy to use, requires no maintenance, and can be easily cleaned and disinfected for routine clinical use.

Indication

Warming **Filtek** dental composites validated to be warmed, in capsules and flowable syringes.

Unique Attributes

- Produces consistently warmed composite that improves flow, adaptation, and ease of placement, particularly for injection molding, bulk filling, and deep preparations.
- Compact, low-profile design with a small footprint that fits well in the operatory and is easy to position chairside.
- Simple, one-button operation with intuitive use, allowing easy integration into restorative workflows with minimal training.
- The removable composite holder maintains heat and can be moved and used at point of care.
- Quick initial heat-up time of 10 minutes, warms capsules in 2 minutes after preheating.

Clinical Tips from Evaluators

- Turn the warmer on early (ideally at the start of the appointment or during anesthesia) to allow adequate time for the composite to reach working temperature.
- Use slow, controlled extrusion with warmed composite, especially flowables, as material will dispense more quickly and excessive force may lead to overfilling.
- Return compules to the warmer between increments when performing multi-layer or multi-quadrant restorations to maintain consistent handling characteristics.
- Take care to avoid incorporating bubbles when placing warmed flowable composite, as increased fluidity may increase the risk of voids if placed too aggressively.

**"USING A WARMER
WILL MAKE YOUR
RESTORATIVE LIFE
100% EASIER."**

Evaluators' Comments

"Produces better flow and adaptation, especially in deep areas and tight spaces."

"Looks more professional than my current warmer."

"I enjoyed the ease of use with one button, and the finishing of the product is high quality."

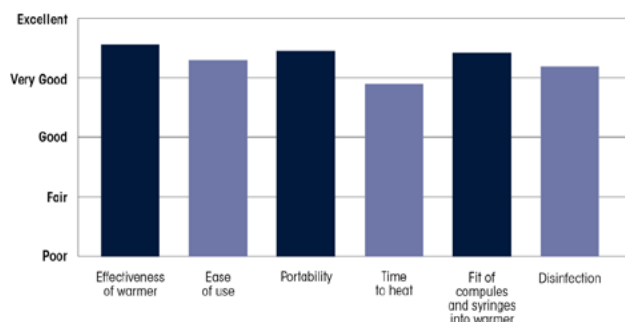
"Be careful when placing the filled composite not to incorporate bubbles as the warmed flowable is very fluid."

Consultants who would
want to stock in office:

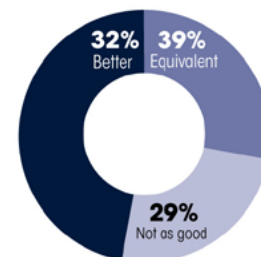
36% Yes, instead of
current product

22% Yes, in addition to
current product

Evaluation Summary:



Compared to Competitive Products:





40

CLINICAL EVALUATORS

908

TOTAL USES

91%

CLINICAL RATING

Description

Quantium™ is a light-cured, radiopaque universal dental composite designed for both anterior and posterior restorations. It blends excellent handling, esthetics and strength into one material. Key design attributes include a nano-micro filler blend that enhances strength and polishability, low shrinkage to minimize stress and micro-leakage, and high radiopacity for better detection on radiographs. **Quantium** is available in syringe and unit-dose delivery in 14 shades, including 6 body, 6 enamel, bleach, and incisal.

Indications

- Direct anterior and posterior restorations (Class I through V)
- Core build-up material
- Splinting
- Indirect restorations, including inlays, onlays, and veneers

Unique Attributes

- Excellent handling characteristics, maintains shape when sculpted and isn't sticky.
- Polishes easily to a smooth, glossy finish with long-lasting shine.
- Versatile system with enamel and body shades that layer well for natural depth.
- Low-volumetric shrinkage, allowing for better margins.
- High radiopacity for radiographic visibility.

Before



After



Photos courtesy
of Dr. Tiffani Dunn



Clinical Tips

- Warm the composite before placement for improved flow and sculptability.
- Use a brush or wetting resin for ideal contour and polish.
- Perform shade matching before starting restorations to ensure the best aesthetic result.
- For anterior cases, layer body and enamel shades to achieve optimal depth and translucency.
- Works especially well for posterior restorations due to its packability and firmness.

"HANDLING IS AWESOME.
IT STICKS TO THE TOOTH BUT
NOT TO THE INSTRUMENTS."

Evaluators' Comments

"It heated up well with my composite warming dispenser and handled very nicely."

"It was not a chameleon effect, but the shade match was great."

"Great variety of shades and amazing polishability."

"The handling was great, not too soft or hard. Texture and ability to shape is excellent."

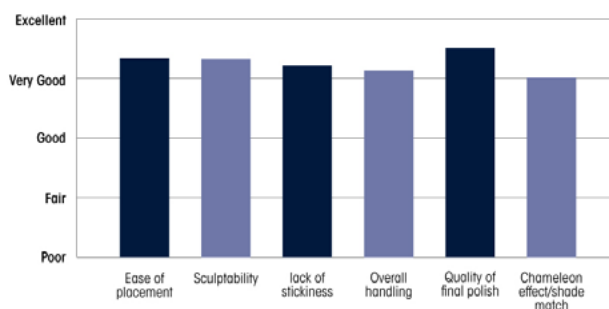
"This would be a great composite to use with deep margin elevation due to its radiopacity, handling, and low shrinkage."

Consultants who would
want to stock in office:

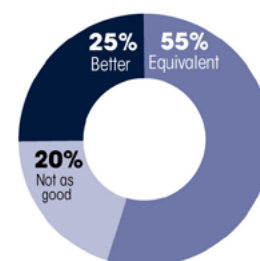
48% Yes, in addition to
current product

10% Yes, instead of
current product

Evaluation Summary:



Compared to Competitive Products:





35

CLINICAL EVALUATORS

559

TOTAL USES

86%

CLINICAL RATING

Description

Visalys Bulk Flow is a Bis-GMA-free, single-shade, bulk-fill flowable composite. It can be placed in increments up to 4 mm, without a capping layer, and offers high stability, excellent radiopacity, and low shrinkage. Its chameleon effect and natural fluorescence help the material blend seamlessly with surrounding tooth structure, enhancing esthetics in both posterior and anterior use. **Visalys Bulk Flow** is available in syringe or compules.

Indications

- Class I and II restorations
- Non-tunneled class III restorations
- Class V restorations
- Core build-ups
- Cavity lining
- Cavity floor elevation
- Blocking out undercuts
- Repair of direct and indirect restorations after appropriate pretreatment

Unique Attributes

- Strong radiopacity with reliable depth of cure, giving clinicians confidence in posterior restorations.
- Thicker, more stackable consistency compared to many bulk-flow materials, offering stability during placement.
- Versatile delivery options, including compules with a long metal tip that improves access to difficult areas.
- Performs well for specific applications such as core build-ups, clear aligner attachments, and deep proximal boxes.
- Single-shade, bulk-fill flowable that can be placed in up to 4 mm increments and no capping layer required.

Before



After



Photos courtesy of
Dr. José C. Félix



Clinical Tips

- Use small 2–3 mm increments, especially in deep Class II boxes, to improve adaptation and color blending.
- Avoid overhead light exposure during placement, as the material becomes stickier over time.
- Take additional time expressing the material to ensure it fully adapts to cavity walls; use an instrument to spread it evenly.
- Consider using it in applications such as core build-ups, pulpal floors, and areas where a stable base layer is needed.
- Start flowing the material at the base of the preparation and work upward, overfilling slightly (5–10%) to compensate for minimal slump.

"THE MATERIAL
POLISHED VERY WELL,
EVEN ON VISIBLE
BUCCAL SURFACES."

Evaluators' Comments

"I felt very confident in the depth of cure, and it worked great for core build-ups."

"The compule design with the metal tip gave excellent access and made delivery straightforward."

"It was a little too thick, which made it harder to express and required more effort to adapt to the preparation."

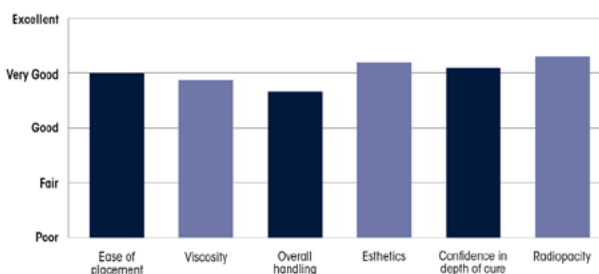
"Not perfect with color adaptation; the esthetics were lower than I would have liked."

Consultants who would
want to stock in office:

51% Yes, in addition to
current product

11% Yes, instead of
current product

Evaluation Summary:



Compared to Competitive Products:





24

CLINICAL EVALUATORS

272

TOTAL USES

92%

CLINICAL RATING

Key features: Strong adhesion with fluoride release • Dual-cure, durable resin-ionomer chemistry • Moisture-tolerant RMGI formulation • Low film thickness for easy seating

Description

EsCem® RMGI is a resin-modified glass ionomer luting cement designed to provide strong, long-lasting adhesion for a wide range of indirect restorations. Its formulation combines the benefits of conventional glass ionomers with the enhanced mechanical strength and reduced solubility of resin-based chemistry.

Indications

Cementation of the following indirect restorations:

- Metal-based inlays, onlays, crowns and bridges
- All high-strength (zirconia-based) all-ceramic crowns and bridges
- Metal, ceramic, and fiber posts
- Resin inlays, onlays, crowns and bridges
- All ceramic inlays, requires a primer

Unique Attributes

- Excellent retention and strong bonding to zirconia and metal-based restorations
- Moisture-tolerant RMGI chemistry with minimal sensitivity
- Great radiopacity for easy verification on implant crowns
- Smooth handling with predictable tack-cure cleanup
- Versatile performance across zirconia, gold, stainless steel crowns, bridges, and space maintainers



Photos courtesy of Dr. José C. Félix



Clinical Tips

- Use the recommended tack-cure time to prevent restoration displacement during flossing.
- The light-cure option should be only for tack curing and removing excess cement, and final setting must be achieved solely through self-cure.
- A little goes a long way, dispense conservatively to reduce waste.
- Follow IFU closely, especially regarding placement on slightly moist tooth structure.

"GREAT CEMENT WITH EXCELLENT RETENTION."

Evaluators' Comments

"Cleanup was very simple and predictable, rarely any residual cement."

"A reliable RMGI product with no failures or sensitivity during the evaluation."

"Impressed with the bond strength to zirconia."

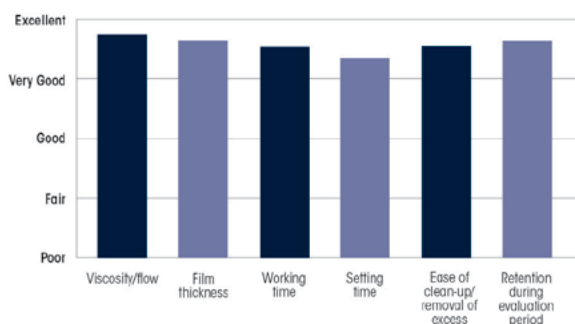
"The mixing tip wastes a significant amount of material, a smaller tip would help."

Consultants who would want to stock in office:

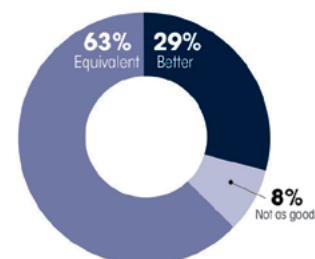
42% Yes, in addition to current product

29% Yes, instead of current product

Evaluation Summary:



Compared to Competitive Products:





14

CLINICAL EVALUATORS

118

TOTAL USES

94%

CLINICAL RATING

Category: Endodontic | Root Canal Sealer

Description

One-Fil by Medclus is a premixed, calcium silicate-based bioceramic root canal sealer supplied in one 2 g syringe with 15 intra-canal tips, offering convenient, ready-to-use delivery with consistent handling. The bioceramic formulation provides high biocompatibility and effective sealing, supporting predictable outcomes across a wide range of clinical scenarios. **One-Fil** is compatible with cold lateral condensation, single-cone obturation, warm vertical compaction, and thermoplastic techniques, allowing flexibility based on clinician preference. It is well suited for anatomically complex canals, retreatment cases, teeth with wide or immature apices, and reinforcement of the root canal seal in teeth with resorption defects.

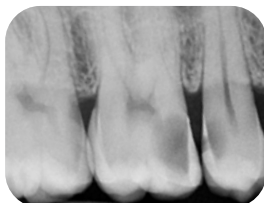
Indications

- Root canal sealing
- Direct and indirect pulp capping
- Pulpotomy, perforation repair, apexification, and as a root-end filling
- Also used in pulp revascularization procedures

Unique Attributes

- Excellent flow and viscosity for accessory and lateral anatomy
- Forgiving handling with no technique modification required
- Long, thin, bendable tips allow access to difficult canals and molars

Before



After



Photos courtesy of
Dr. Adam Hodges



Clinical Tips from Evaluators

- Avoid excessive force during placement due to the material's fluidity.
- After confirming the master cone fit, gently place gutta-percha, pumping is unnecessary.
- Ensure the canal is adequately shaped and dry before placement.
- Bleed the syringe prior to insertion and dispense slowly, using light pressure.

"NICE PRODUCT
WITH NO ADVERSE
REACTIONS, EVEN
WITH AN OVERFILL."

Evaluators' Comments

"One-Fil flows extremely well and presumably gets into all sorts of accessory anatomy due to its great viscosity."

"One-Fil has very forgiving handling for any clinicians wanting to try a bioceramic sealer for the first time."

"It cleans up really easily."

"Its viscosity is a bit more fluid that may allow more extravasation."

Consultants who would
want to stock in office:

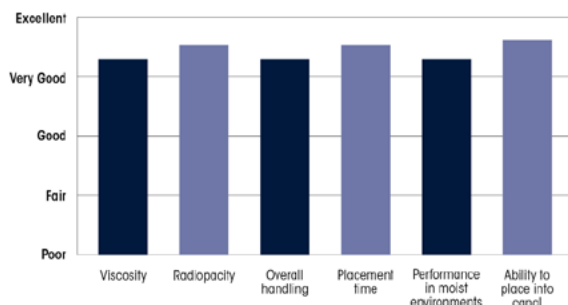
50%

Yes, in addition to
current product

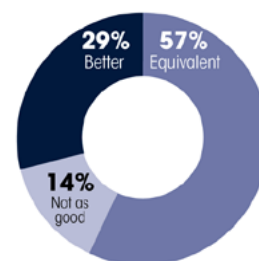
29%

Yes, instead of
current product

Evaluation Summary:



Compared to Competitive Products:





8

CLINICAL EVALUATORS

27

TOTAL USES

93%

CLINICAL RATING

Category: Orthodontics | Clear Aligner Systems

Description

Clarity™ Aligners with Clarity™ Precision Grip Attachments from Solventum are designed to accurately reproduce the attachments in the digital plan without introducing composite flash, which can affect planned engagement with the aligner and introduce unplanned tooth movement.

Clarity Precision Grip Attachments are bar and bevel attachments that can be adjusted in size, depth and position within **Clarity Portal**. The attachments support movements such as extrusion, intrusion, rotation, tipping, translation, torque, expansion, and space closure. The system offers proprietary staging and setup protocols designed to deliver consistency and treatment efficiency when applied to deep bite, anterior lingual root torque, open bite, and sequential posterior distalization/mesialization. Clarity Aligners are indicated for simple to complex cases in growing patients and adults.

Unique Attributes

- **Clarity Precision Grip Attachments** are fabricated with 3D printed composite and preloaded into a bonding tray. 3D printed precision delivers good aligner engagement and eliminates the presence of composite flash, which can introduce undesired contact with the aligner.
- Consistent, well-fitting aligner trays with good clarity and esthetics contributed to positive patient acceptance.
- Staging protocols and attachment engagement supported predictable tooth movement with minimal mid-treatment modification.

Close up of **Clarity Precision Grip Attachments**



Excellent adaptation of tray to **Clarity Precision Grip Attachments**



Photos courtesy of Dr. Sabiha Bunek



Clinical Tips from Evaluators

- Ensure attachments are properly bonded and that bonding agents are completely cured to maximize benefit of aligner engagement and force expression.
- Emphasize patient compliance with recommended wear time to achieve predictable movement, especially in cases involving extrusion or rotation.
- Monitor tracking closely at early follow-up visits and address minor misfits promptly to avoid mid-treatment refinements.
- Use chewies or seating tools during initial delivery and after aligner changes to improve adaptation around **Clarity Precision Grip Attachments**.

"PATIENTS APPRECIATED THE CLARITY AND COMFORT OF THE ALIGNERS."

Evaluators' Comments

"The **Clarity Precision Grip Attachments** provided excellent control, especially for rotations and extrusion cases."

"**Clarity Aligners** fit very well and tracked predictably throughout treatment."

"The staging protocol made complex movements more efficient and easier to manage."

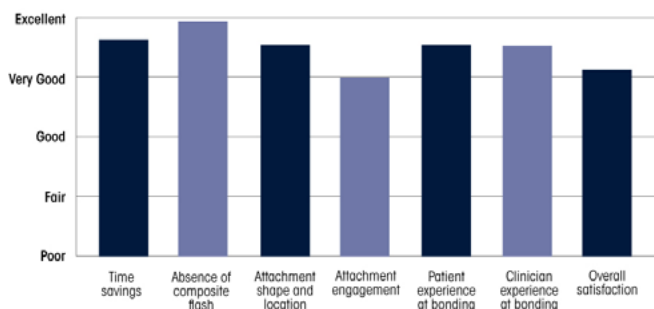
"Attachment placement requires precision if not bonded accurately, tracking can be affected."

Consultants who would want to stock in office:

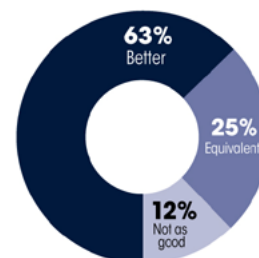
63% Yes, in addition to current product

25% Yes, instead of current product

Evaluation Summary:



Compared to Competitive Products:



Solventum™ Filtek™ Easy Match Flowable Restorative and 3M™ Filtek™ Easy Match Universal Restorative in Combination with 3M™ Scotchbond Universal Plus Adhesive and Solventum™ Filtek™ Composite Warmer (Solventum)

Introduction

Many aspects of dentistry can be quite difficult. From clinical performance, to business operations, to patient and staff management, dentistry can be incredibly challenging. So much so that dentists and practice managers are always in search of equipment, materials and treatment modalities that can not only help in alleviating the many stressors that present challenges to business operations, but those that can also help to clinically problem solve. One of the foundation blocks of daily clinical practice are direct resin restorations. Despite it being one of the most common procedures that dentists perform, direct resin restorations can be challenging and rather complex. The decision making process of shade selection and the method of placing the restoration with respect to the accessibility, skill level, and technique of the operator and auxiliary can present complications. Thus, having materials that may streamline our workflows as clinicians, simplify procedures, and decrease inventory can lead to increased predictability, productivity and ultimately profitability. Materials and restorative systems that provide these benefits can certainly alleviate problems and can help elevate the performance and delivery of the most common restorative procedures for dentists and team members, while making an overall better experience for patients.



Description

Filtek Easy Match Universal Restorative and **Flowable Restorative** from Solventum, used in conjunction with **Scotchbond Universal Plus Adhesive**, can serve as an excellent restorative system to aide dentists in easing many of the challenges in daily clinical practice. Beginning with the **Scotchbond Universal Plus Adhesive** on prepared tooth surfaces, the bonding agent is a truly universal adhesive with dentin-like opacity that works with all substrates and in all etching techniques. **Filtek Easy Match Universal Restorative** composite has a structural composition that provides great strength and wear resistance characteristics, allowing it to be used in all cavity classifications. The flowable material and its unique syringe design and tip allow for great handling, reducing bubbles and waste. Along with these characteristics, the material is intuitive, which allows for an easy shade selection technology and a simplified approach using just three shades: Bright, Natural and Warm. Furthermore, the resin materials contain a proprietary technology that allows for appropriate and natural opacity, eliminating the need for a separate blocker and making the material adaptive and aesthetic in both the anterior and posterior.

Another distinguishing feature of the material is the ability to be warmed for up to one hour, providing the operator with lower extrusion strain, increased handling, and cavity adaptation of the material without changing or diminishing the physical properties of the resin. As heating or warming composite becomes more of a hot topic in the field of dentistry, and more commonplace for many clinicians, having materials that do not lose any of their chemical or physical features with these processes can be incredibly beneficial. Some dentists have chosen to heat their composite for restorative procedures for better handling, but also because some data suggests that preheating composite can also lower shrinkage stress, encourage better monomer conversion and better depth of cure. By having a composite heater that was designed specifically to work with the **Filtek Easy Match** and **Filtek Family of Composites**, it provides for a seamless integration. The **Solventum Filtek Composite Warmer** can hold six Filtek resin capsules and has a center slot for a Filtek flowable syringe. Its unique and compact design makes it light weight, portable, and easy to disinfect. The one button feature is simple to use and will initiate rapid heating of the composite to a maximum of 70 degrees Celsius (158 degrees F) in just two minutes for increased efficiency.

The combination of all the restorative materials beginning with **Scotchbond Universal Plus Adhesive** and the **Filtek Easy Match Universal Restorative** and **Filtek Easy Match Flowable Restorative** with the **Filtek Composite Warmer** can provide a perfect trinity to help in cavity adaption and standardizing the handling of the material for seamless integration of the restoration. With the simplicity of use of all three materials, dentists and team members can see immediate results with a decreased learning curve, bringing about immediate value.

Case Presentation

To highlight the simplicity of shade selection, seamless handling, and adaptation of the resin material to yield exceptional results, a large class II restoration will be examined in detail. The case involves a 38-year-old female patient presenting with recurrent caries under an existing occluso-lingual resin restoration (Fig. 1) and radiographic interproximal caries on the distal surface which were detected during a routine re-care examination.

Although the case required a rather large cavity preparation and difficult shade matching due to decalcification spots and discolored dentin in the deepest parts of the gingival floor, the physical properties and excellent block out ability of the material allowed for confidence in structural longevity and resulted in an excellent aesthetic result.



Fig. 1: Pre-operative view of tooth #3 with existing occluso-lingual restoration



Fig. 2: Restorative materials : Scotchbond Universal Plus Adhesive, Filtek Easy Match Flowable and Filtek Easy Match Universal Restorative in Filtek Composite Warmer



Fig. 3: Restoration removal and caries excavation



Fig. 4: Air abrasion to prepare the tooth surface for adhesive bonding

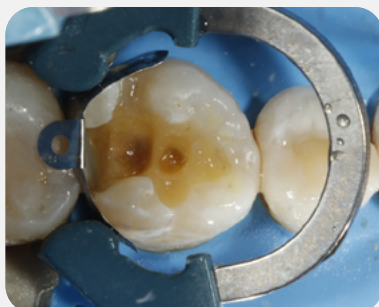


Fig. 5: Section matrix band placement



Fig. 6: Selective etch treatment of the enamel



Fig. 7: Application of Scotchbond Universal Adhesive

Procedure

Prior to the administration of anesthesia, a quick color selection protocol was used in order to evaluate the most appropriate shade. This was accomplished by placing a small piece of each shade (Bright, Natural and Warm) onto the surface of the tooth and light cured. Though the tooth had a varying range of shades due to decalcification and discoloration, the Natural shade was selected, as it had the most accurate color match. The treatment area was then anesthetized. While the patient was waiting for the onset of profound anesthesia, the Solventum **Filtek Composite Warmer** was loaded with the selected materials and powered on (Fig. 2). The quadrant of teeth was then isolated using a rubber dam. All existing restorative materials and caries were meticulously excavated and removed (Figs. 3 and 4), followed by the necessary steps to prepare the tooth surfaces for bonding. First, air abrasion with a **PrepStart** (Zest Dental Solutions) was used to clean the preparation. Then a sectional matrix system and wedge were placed, followed by a selective-etching technique with 38% phosphoric acid (Figs. 5 and 6). After the rinsing and drying of the prepared surfaces, **Scotchbond Universal Plus Adhesive** was applied in accordance to the manufacturer's instructions for use. A thorough rubbing motion was performed using a microbrush to properly ensure good surface application of the adhesive (Fig. 7). The resulting layer of bonding adhesive was then air thinned until no movement of the material was observed. This is a critical step to avoid any pooling of the material and to evaporate the solvent. The bonding agent layer was then light-cured for ten seconds.

Due to the darkness of the deepest parts of the cavity preparation, a thin layer of **Filtek Easy Match Flowable** (shade Bright) was placed in order to help in masking the discoloration and increase the overall value of the restoration (Figs. 8 and 9). Incremental layering of warmed **Filtek Easy Match** (shade Natural) paste composite was subsequently placed into the tooth preparation and sculpted, shaped, and adapted to the cavity walls with ease due to the warming of the material. Each incremental layer was light cured for 20 seconds (Fig. 10). Cure time is dependent on light intensity. 20 second cure for lights with 550-1000 mW/cm². 10 second cure for lights with 1000-2000 mW/cm².

Following completion, the sectional matrix system and associated materials were removed and the resin was re-cured. The restoration was then finished and polished with a combination of finishing diamond burs (Brasseler), polishing points (Brasseler), and discs (Shofu) (Fig. 11). Isolation materials were removed and interproximal contacts were checked with floss and occlusion was verified and adjusted accordingly (Fig. 12). Lastly, the restoration was repolished where necessary (Fig. 13).



Fig. 8: Application of a thin layer of Filtek Easy Match Flowable (Bright)



Fig. 9: View of cured flowable layer



Fig. 10: Application of warmed Filtek Easy Match Universal Restorative (Natural)



Fig. 11: View of polished restoration



Fig. 12: View of occlusion marks after adjustments



Fig. 13: View of final restoration

Summary

Utilizing the Solventum **Filtek Easy Match Universal Restorative** system of flowable and paste composite with Solventum **Scotchbond Universal Plus Adhesive** provided a streamlined workflow that increased efficiency during the clinical case. Combining the simplified and true shade matching capabilities of the materials with the Solventum **Filtek Composite Warmer** allowed for even better handling and cavity wall adaption of the composite resin. The easy-to-polish restoration following the final cure yielded an exceptional aesthetic result, comparable to all other restorative products in the Filtek family. As dentists continue to search for equipment and restorative materials that can be used efficiently in numerous situations in their clinical practice, it is materials such as these that can simplify procedures and serve as clinical problem solvers. Along with reducing inventory and decreasing treatment times, restorative systems like this can ultimately assist dentists and team members in creating more predictable situations that decrease stress when performing some of the most common procedures in dentistry.

Again, dentistry can be difficult, however the **Filtek Easy Match System** can fundamentally help change that.

In April 2024 3M spun off its 3M Health Care Business including Oral Care and is now Solventum - a new publicly traded healthcare company. For more information on Solventum and the spin-off please visit [solventum.com](https://www.solventum.com)



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President & CEO



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Chief Editor



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Clinical Ambassador



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Clinical Ambassador



DR. MICHELLE LEE
Clinical Ambassador



DR. CHARLIE WARD
Clinical Ambassador



DR. TROY SCHMEDDING
Clinical Ambassador



MICHELLE STRANGE, MS Dh, RDHE
Clinical Ambassador

MAY 8

CHARLOTTE, NC
Fairfield Inn & Suites
Charlotte Uptown



SEPT 11

ANN ARBOR, MI
The Kensington Hotel
State Street



OCT 23

DENVER, CO
Metro Denver
Dental Society



NOV 6

PHOENIX/
SCOTTSDALE, AZ
Location TBA

ASK DENTAL ADVISOR: Lab To Lecture Series

PROGRAM SERIES SUMMARY

This continuing education series provides an evidence-based review of contemporary restorative and preventive dentistry with an emphasis on clinical decision-making, material selection, and clinical protocols. Through expert-led lectures, participants will review direct restorative techniques, ceramic material selection and cementation, post-endodontic restoration principles, preventive maintenance philosophies and the scientific foundations influencing material performance. The program is designed to support improved clinical predictability, long-term restorative outcomes, and the delivery of high-quality patient care. Choose a program location near you and take advantage of this opportunity to strengthen your clinical expertise.

INTENDED AUDIENCE

This continuing education series is designed for general dentists, dental hygienists, and dental team members involved in restorative, minimally invasive, and preventive dental care who are looking to expand their knowledge of current materials, techniques, and evidence-based clinical protocols. Each program in the series offers focused clinical insights tailored to everyday practice. Explore the programs in detail and choose a convenient location near you to attend.

Register Now:



Strength, Radiopacity and Gloss Retention Q-Match Flow™ Universal

Matt Cowen, B.S., Margaret Gilmartin, B.S., John M. Powers, Ph.D.

Introduction:

Q-Match Flow™ Universal (B.J.M. Laboratories Ltd.) is a new highly-filled, universal shade flowable composite indicated for all classes of direct restorations in the anterior and posterior regions in a flowable viscosity. This study compared the critical material properties of flexural strength, modulus, fracture work, compressive strength, and gloss retention of **Q-Match Flow Universal** to **3M™ Filtek™ Supreme Flowable Restorative** from Solventum™.



Conclusion:

Q-Match Flow Universal has excellent flexural strength, modulus and compressive strength consistent with a very strong, highly-filled flowable composite ideal for resisting occlusal chewing forces. **Q-Match Flow Universal** is highly radio-opaque and is easily distinguishable from tooth structure on radiographs. It can also be highly polished and has clinically acceptable gloss retention after 5 years of simulated toothbrushing.

MATERIALS:

Q-Match Flow Universal (B.J.M. Laboratories), **3M Filtek Supreme Flowable Restorative** (Solventum)

Methods:

Flexural Strength, Modulus, and Fracture Work: 2 mm x 2 mm x 25 mm bar specimens (n=5) were tested after each set of specimens had been stored in deionized water for 24 hours at 37 °C according to ISO 4049:2019. Fracture work, also called Flexural Toughness or Work to-Fracture, was automatically calculated by measuring the area under the load deflection curve giving units of J and dividing by the cross-section of the specimens. They were tested using a Shimadzu AGX-V universal test machine with a 1 mm/min crosshead speed and 20 mm span.

Compressive Strength: 4 mm diameter x 6 mm cylinder specimens (n=8) were tested after each set of specimens has been stored in deionized water for 24 hours at 37 °C. Cylinders were cured for 20 seconds on the top, bottom while in the mold and sides after removal from the mold, and the ends flattened with 600-grit SiC paper. They were tested using a universal test machine (Instron 5866) with a 1 mm/min crosshead speed.

ISO 4049 Radiopacity: Specimens (n=3) were prepared to be 10 mm diameter and 1 mm thickness. Specimens were tested according to ISO 4049:2019 using an aluminum step wedge and digital sensor (Dexis Titanium).

Toothbrush Abrasion and Gloss Retention: Specimens (n=6) were prepared for toothbrush abrasion by curing composite in a 10 mm in diameter mold and 2-mm thick. They were uniformly polished through 0.25-micron diamond grit suspension paste (Buehler), and their gloss and surface roughness measured. Gloss was measured with a Novo-curve small area glossmeter at 3 angles per measurement and averaged, and surface roughness measured with a SJ-310 Profilometer (Mitutoyo) with 2 measurements per specimen using the ISO-R profile over 1.5 mm measurement length. Half of the specimens were protected with a single-sided tape and subjected to over 5 years of simulated toothbrush abrasion in a figure-8 pattern, with a 500-g (4.9 N) load and 15,000 cycles or 30,000 total strokes. Colgate medium toothbrush and **Colgate Cavity Protection** toothpaste were used. The gloss, average surface roughness (Ra) and mean roughness depth (Rz) compared to the initial state are presented in the results. ΔRa and ΔRz are calculated based on pairwise comparisons on the same sample.

Results:

Product	Flexural Strength, MPa	Flexural Modulus, GPa	Work to Fracture, kJ/m²	Compressive Strength, MPa	Radiopacity, mm alum eq
Q-Match Flow Universal	174 (6)	11.9 (0.2)	3.7 (0.3)	369 (15)	2.9 (0.0)
3M Filtek Supreme Flowable	146 (7)	7.7 (0.3)	4.2 (0.5)	397 (14)	1.8 (0.0)

Data presented with means (standard deviations)

Q-Match Flow Universal has higher flexural strength, modulus and radiopacity than **3M Filtek Supreme Flowable**. This is the highest flexural strength recorded for a flowable composite in our laboratory testing and rivals the strongest packable composites. The flexural modulus of **Q-Match Flow Universal** is also among the highest recorded for the flowable composite and is stiffer than many packable composites on the market. The compressive strength of **Q-Match Flow Universal** is within range of the compressive strength of natural tooth structure indicating it is strong enough to withstand compressive occlusal forces. The radiopacity of 290% makes this composite easily distinguishable from tooth structure on radiographs.

Toothbrush Abrasion Comparison:

Product	Toothbrush Period	Ra, nm	Rz, nm	ΔRa	ΔRz	Gloss, qu	ΔGloss, qu
Q-Match Flow Universal	Initial	28 (3)	332 (72)	23 (9)	218 (74)	85.9 (3.2)	-13.0 (1.6)
	15,000 cycles	51 (1.1)	550 (119)			72.9 (4.5)	
3M Filtek Supreme Flowable	Initial	17 (4)	168 (41)	6 (3)	105 (53)	94.0 (2.4)	-3.3 (1.6)
	15,000 cycles	23 (5)	272 (49)			90.7 (3.0)	

Both composites retained a clinically acceptable gloss after toothbrush abrasion (>70 gu) and maintained below 100-nm average roughness value to minimize bacterial adhesion.

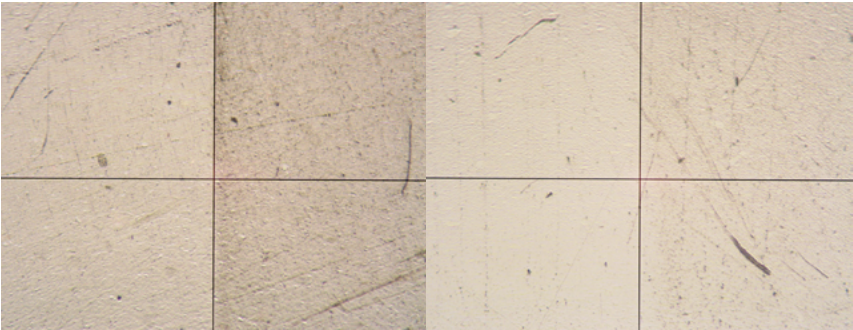


Fig. 1. Images taken with a light microscope and 2 mm FOV after toothbrush abrasion with the initial polished side on the left, and toothbrush abraded side on the right. Composites ordered from left to right: **Q-Match Flow Universal**, **3M Filtek Supreme Flowable**.

Strength, Radiopacity and Gloss Retention of Q-Match™ Universal Composite

Matt Cowen, B.S., Margaret Gilmartin, B.S., John M. Powers, Ph.D.

Introduction:

Q-Match™ Universal (B.J.M. Laboratories Ltd.) is a new simplified shade composite indicated for all classes of direct restorations in the anterior and posterior regions in syringes and unit-dose applications. It comes in 3 shades (Light, Medium, Dark) to match all vita shades. This study compared the critical material properties of flexural strength, modulus, fracture work, compressive strength, and gloss retention of **Q-Match Universal** in comparison to **3M™ Filtek™ Supreme Ultra Universal Restorative** from Solventum™.



Conclusion:

Q-Match Universal has excellent flexural strength, modulus and compressive strength consistent with a very strong, highly-filled composite ideal for resisting occlusal chewing forces. **Q-Match Universal** is highly radio-opaque and is easily distinguishable from tooth structure on radiographs. It can also be highly polished and has clinically acceptable gloss retention after 5 years of simulated toothbrushing.

MATERIALS:

Q-Match Universal (B.J.M. Laboratories Ltd.), **3M Filtek Supreme Ultra Universal Restorative** (Solventum)

Methods:

Flexural Strength, Modulus, and Fracture Work: 2 mm x 2 mm x 25 mm bar specimens (n=5) were tested after each set of specimens had been stored in deionized water for 24 hours at 37 °C according to ISO 4049:2019. Fracture work, also called Flexural Toughness or Work-to-Fracture, was automatically calculated by measuring the area under the load deflection curve giving units of J and dividing by the cross-section of the specimens. They were tested using a Shimadzu AGX-V universal test machine with a 1 mm/min crosshead speed and 20-mm span.

Compressive Strength: 4-mm diameter x 6 mm cylinder specimens (n=8) were tested after each set of specimens has been stored in deionized water for 24 hours at 37 °C. Cylinders were cured for 20 seconds on the top, bottom while in the mold and sides after removal from the mold, and the ends flattened with 600-grit SiC paper. They were tested using a universal test machine (Instron 5866) with a 1 mm/min crosshead speed.

ISO 4049 Radiopacity: Specimens (n=3) were prepared to be 10 mm diameter and 1-mm thickness. Specimens were tested according to ISO 4049:2019 using an aluminum step wedge and digital sensor (Dexis Titanium).

Toothbrush Abrasion and Gloss Retention: Specimens (n=6) were prepared for toothbrush abrasion by curing composite in a 10-mm diameter mold and 2-mm thick. They were uniformly polished through 0.25-micron diamond grit suspension paste (Buehler), and their gloss and surface roughness measured. Gloss was measured with a Novo-curve small area glossmeter at 3 angles per measurement and averaged, and surface roughness measured with a SJ-310 Profilometer (Mitutoyo) with 2 measurements per specimen using the ISO-R profile over 1.5-mm measurement length. Half of the specimens were protected with a single-sided tape and subjected to over 5 years of simulated toothbrush abrasion in a figure-8 pattern, with a 500-g (4.9 N) load and 15,000 cycles or 30,000 total strokes. Colgate medium toothbrush and Colgate Cavity Protection toothpaste were used. The gloss, average surface roughness (Ra) and mean roughness depth (Rz) compared to the initial state are presented in the results. ΔRa and ΔRz are calculated based on pairwise comparisons on the same sample.

Results:

Product	Flexural Strength, MPa	Flexural Modulus, GPa	Work to Fracture, kJ/m²	Compressive Strength, MPa	Radiopacity, mm alum eq
Q-Match Universal	162 (9)	12.7 (0.8)	2.7 (0.3)	365 (26)	4.2 (0.0)
3M Filtek Supreme Ultra	165 (12)	12.5 (0.6)	3.1 (0.8)	413 (25)	2.6 (0.0)

Data presented with means (standard deviations)

Q-Match Universal has similar flexural strength, flexural modulus, and work to fracture as **3M Filtek Supreme Ultra** which are all excellent values for a direct composite to resist peak bending forces without fracturing. The compressive strength of **Q-Match Universal** is within range of the compressive strength of natural tooth structure indicating it is strong enough to withstand compressive occlusal forces. The radiopacity of 420% equivalence to aluminum means it has over twice the radiopacity of enamel and will be easily distinguishable on radiographs.

Toothbrush Abrasion Comparison:

Product	Toothbrush Period	Ra, nm	Rz, nm	ΔRa	ΔRz	Gloss, qu	ΔGloss, qu
Q-Match Universal	Initial	18 (2)	202 (39)	14 (7)	167 (58)	91.4 (2.1)	-11.4 (4.7)
	15,000 cycles	31 (7)	370 (64)			80.0 (4.9)	
3M Filtek Supreme Ultra	Initial	16 (1)	142 (21)	3 (2)	50 (34)	96.1 (0.7)	-2.3 (0.7)
	15,000 cycles	19 (2)	193 (21)			93.8 (1.4)	

Both composites had an initial gloss over 90 indicating a highly polished surface and retained clinically acceptable gloss after toothbrush abrasion (>70 gu) and maintained below 100-nm average roughness value to minimize bacterial adhesion.

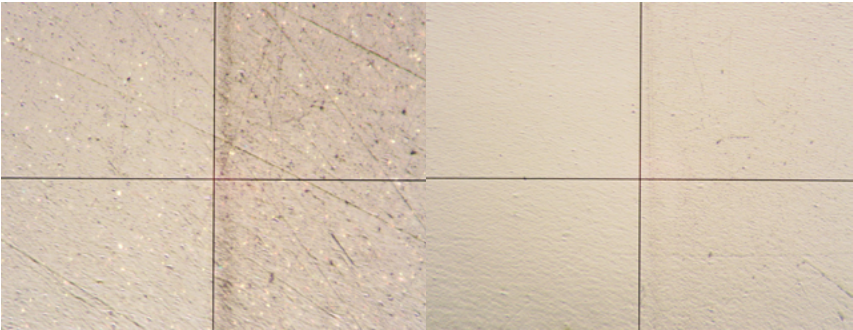


Fig. 1. Images taken with a light microscope and 2 mm FOV after toothbrush abrasion with the initial polished side on the left, and toothbrush abraded side on the right. Composites ordered from left to right: **Q-Match Universal**, **3M Filtek Supreme Ultra**.

CLEARFIL™ MAJESTY™ ES Flow Universal In Vitro Evaluation

M. Gilmartin, T. Sulaiman



INTRODUCTION

This study compared flowable composite resins, **CLEARFIL™ MAJESTY™ ES Flow Universal** (Kuraray Noritake Dental, Inc.) with a leading competitor, and demonstrates the fundamental mechanical properties and handling superiority found with the Kuraray material. **CLEARFIL MAJESTY ES Flow Universal's** exhibits higher flexural strength (160 MPa vs. 128 MPa) and compressive strength, providing a robust structural foundation that the competitor lacked. Furthermore, **CLEARFIL MAJESTY ES Flow Universal's** no-slump viscoelasticity provides positional stability, and its engineered tip design minimizes the risk of incorporating voids. Diagnostically, **CLEARFIL MAJESTY ES Flow Universal** offers ideal contrast (230% aluminum equivalence), whereas the lower radiopacity of the competitor (140% aluminum equivalence) can present a diagnostic safety risk. Collectively, the data confirms that **CLEARFIL MAJESTY ES Flow Universal** shifts the flowable category from a limited liner material to a highly durable and diverse mode of restorative application.

In a comparison against a commonly used packable composite that challenges the traditional mechanical limitations of flowable systems, **CLEARFIL MAJESTY ES Flow Universal** successfully matched the packable material's compressive strength and exceeded its flexural strength. Crucially, **CLEARFIL MAJESTY ES Flow Universal** offers dramatically superior Work to Fracture (5.9 kJ/m² vs. 1.7 kJ/m²). This superior toughness, combined with its intermediate modulus (7.2 GPa vs. 11.8 GPa), dictates that **CLEARFIL MAJESTY ES Flow Universal** is mechanically less brittle and better able to absorb stress and accommodate tooth flexure, leading to better marginal longevity, particularly in dynamic loading scenarios. The material effectively bridges the gap between injection efficiency and conventional packable durability, allowing clinicians to achieve equivalent or superior mechanical outcomes using a less technique-sensitive injectable approach.

Product	Flexural Strength, MPa	Flexural Modulus, GPa	Work to Fracture, kJ/m ²	Compressive Strength, MPa	Radiopacity, mm alum eq
CLEARFIL MAJESTY ES Flow Universal	160 (6)	7.2 (0.3)	5.9 (0.8)	394 (35)	2.3 (0.0)
OMNICHROMA FLOW	128 (4)	5.7 (0.3)	4.4 (0.4)	359 (28)	1.4 (0.0)
Transcend UB	125 (5)	11.8 (1.0)	1.7 (0.2)	390 (23)	3.2 (0.0)

The convergence of high flexural strength rivaling packable composite resin, high toughness, ideal marginal adaptation, and anti-slump elasticity may justify an expanded clinical scope for **CLEARFIL MAJESTY ES Flow Universal**. Although resistance to wear was not evaluated in the study, it is very important to consider when using it in a load-bearing area. More studies are required to confirm the wear resistance of highly filled flowable composite resin before considering their use in these areas. However, it is mechanically suitable for small Class I and Class II restorations and extensive Class V restorations where its optimized modulus and high WTJ are critical for surviving cyclic flexural forces. Furthermore, the simplified shading system combined with optimized injectable delivery results in significant efficiency gains in clinical workflows without compromising mechanical or esthetic requirements.

CLINICAL TIPS

Injectable Posterior Technique:

Leverage the no-slump, high-viscosity nature of **CLEARFIL MAJESTY ES Flow Universal** for direct incremental layering in small posterior Class I and Class II cavities. Inject slowly to allow the material's optimized flowability to the cavity walls, thereby reducing the need for instrument manipulation and simplifying anatomical contouring.



Void Mitigation Protocol: To capitalize on the engineered syringe and tip design, always dispense a small "purge" line of composite onto a mixing pad before insertion into the preparation. This simple step clears any transient air introduced during tip attachment or handling, maximizing the internal structural homogeneity and ensuring the restoration achieves its full potential strength and toughness.

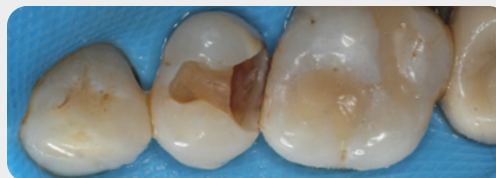
Cervical Margin Management: For deep Class V/NCCLs, **CLEARFIL MAJESTY ES Flow Universal** is a wonderful injectable material due to its high Work to Fracture (5.9 kJ/m²) and its Flexural Modulus (7.2 GPa). This balance of strength and flexibility is essential for accommodating the cyclic stresses induced by tooth flexure, providing superior long-term resistance to marginal debonding and fatigue failure.

Radiographic Confirmation: Utilize the material's 230% aluminum-equivalent radiopacity during post-cure evaluation. This contrast allows for clear visualization against both enamel and dentin, facilitating accurate confirmation of complete material filling, accurate margin integrity, and efficient long-term diagnosis for recurrent caries.

CONCLUSION

CLEARFIL MAJESTY ES Flow Universal represents a new tier of injectable restorative material. It has a high filler load (78% by weight) provides packable-rivaling flexural strength (160 MPa) and compressive strength, but its defining feature is its superior toughness, measured by a Work to Fracture of 5.9 kJ/m².

This robust mechanical profile, coupled with ideal no-slump handling, exceptional adaptation verified by microCT analysis, and strategically optimized diagnostic radiopacity (230% Al eq), makes it a reliable and superior choice for simplified, high-performance restorations, effectively redefining the functional capabilities of the flowable composite category.



Caries removal



Post-op view with **CLEARFIL MAJESTY ES Flow Universal**

Photos courtesy of Dr. Marc Lai

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