

THE DENTAL ADVISOR

Improving Patient Care Through Research & Education

March-April 2017

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Simplifying composite restorations

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RATINGS :

Excellent + + + + +

Very Good + + + +

Good + + +



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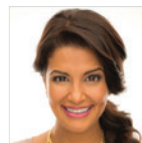
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THE DENTAL ADVISOR team just got back from the Chicago Dental Society's Midwinter Meeting, where we saw countless new and innovative products. The sheer volume of products currently on the market is enough to overwhelm even the most experienced clinicians. The variety of different resin composites in particular marks one of the most significant changes in technology, as it has resulted in the creation of several categories and sub-categories of composites, which increase the complexity of choosing an appropriate product for a given application.

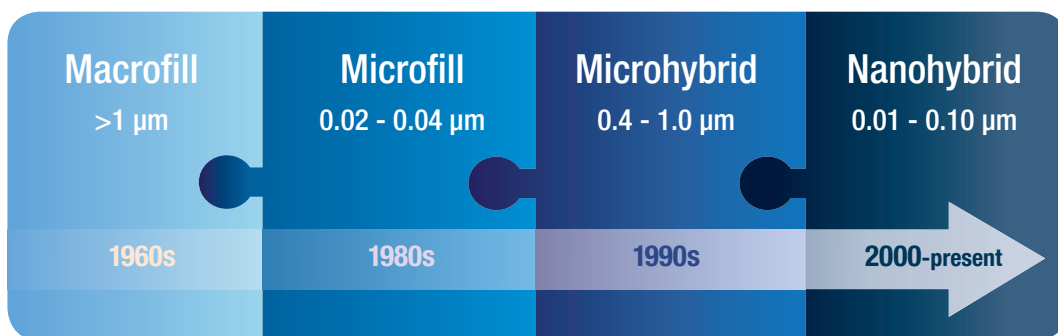
The goal of this issue is to simplify both the product selection process and the composite procedure from start to finish. We explain new terms and technology, recommending products evaluated by THE DENTAL ADVISOR, and offering clinical tips for use for both anterior and posterior restorations. Finishing and polishing and LED light curing units are discussed as well. I hope you find this information useful in your daily practice.

This issue is my personal favorite because it illustrates our new approach to presenting information. You can explore each step of resin composite procedures in one concise issue. As always, I welcome your comments and suggestions. You can reach me at drbunek@dentaladvisor.com. Thank you for your continued support and reading!



Evolution and Classification of Composites

The most common classification system for resin composites considers the distribution and average particle size of the composite filler. The first composites, macrofills, were highly filled (70-75% by weight) and contained large particle sizes ($>1\mu\text{m}$) making them prone to plucking, resulting in excessive wear. As a result, the composites introduced thereafter all contained smaller filler particles and can be classified into three main categories: **microfills**, **microhybrids**, and **nanohybrids**.



Microfills: Particle size: 0.02-0.04 μm

The extremely small filler particles ($0.02\mu\text{m}$ to $0.04\mu\text{m}$) and lower filler load (35%-50%) of microfills contribute to the translucency, long lasting high polish, and best wear resistance of this class of materials. The ability to mimic the appearance of enamel make them most suitable for direct composite veneers and Class III, IV, and V restorations. The reduction in filler lowers the strength of these materials; therefore, they should not be used in high-stress areas.

Microhybrids: Particle size: 0.4-1.0 μm

Microhybrids were developed to combine the strength of larger particle size with the esthetics of smaller microfill particles. Microhybrids generally have a filler content of approximately, 75% by weight, with particles ranging in size from ($0.4\mu\text{m}$ to $1.0\mu\text{m}$). The particle size and filler load give the material the strength and wear resistance needed to perform in the posterior. The polish of these materials is initially satisfactory; however, they lose luster over time. They are the most opaque of all composites and, therefore, work ideally in combination with a microfill layer.

Universal Nanohybrids: Particle size: 0.01-0.10 μm

Nanohybrids contain the smallest particles and are the most recent class of resin composite materials. They continue to gain in popularity because of their excellent strength, esthetics, wear resistance, handling, and polishability. They are referred to as universal composites because the combination of strength and esthetics make them suitable for both anterior and posterior applications.

Simplifying Universal Composites

Filtek Supreme Ultra Universal Restorative 3M

Awarded Top Universal Composite Multilayer for 5 years in a row, **3M™ Filtek™ Supreme Ultra Universal Restorative** provides outstanding strength, wear resistance and polish retention to give patients beautiful, long-lasting results. With a wide range of shades and opacities, **Filtek Supreme Ultra Universal Restorative** offers excellent polish retention for unsurpassed esthetics. By providing versatility and a wide range of indications, **Filtek Supreme Ultra Universal Restorative** is strong enough for posterior fillings and esthetic enough for anterior work, preparing dentists for any clinical situation.



Estelite Sigma Quick® Tokuyama Dental America

Awarded Top Universal Composite 8 years in a row, **Estelite Sigma Quick** is a supra-nano filled resin composite with patented spherical filler technology. With a filler weight of 82% (71% volume) this unique world-class technology delivers a flexible shade matching process, exceptional handling and long-term wear resistance. **Estelite Sigma Quick** can be used for anterior and posterior restorations, composite veneers, diastema closures and composite/porcelain repairs.



Product	Company	Evaluation Rating
Admira Fusion	VOCO	93%
Aura EASY	SDI (North America) Inc.	91%
BEAUTIFIL II	SHOFU Dental Corporation	94%
Estelite Sigma Quick	Tokuyama Dental America	99%
Filtek Supreme Ultra	3M	92%
Kalore	GC America	91%
NovaPro Universal	Nanova	91%
Reflectys	Itena North America	91%
Tetric EvoCeram	Ivoclar Vivadent, Inc.	96%
Venus Diamond	Kulzer	91%
Venus Pearl	Kulzer	91%

What's New: Harmonize (Kerr Restorative)

Harmonize™ begins with ART, Adaptive Response Technology, a nanoparticle filler network that helps you achieve lifelike restorations with more ease and simplicity than ever. With better blending capabilities and enhanced structural integrity, the ART of **Harmonize** provides your restorations with exceptional strength and unmatched esthetics.



The special controlled size and spherical shape of the ART nanoparticle filler network allows for light diffusion and reflection similar to human enamel. This leads to an enhanced chameleon effect for better blending and improved esthetics overall. Furthermore, the adaptive viscosity of **Harmonize** delivers easier handling and shaping without stickiness, slumping, or pullback.

The reinforced nano-scale filler particle network also has improved mechanical properties and it's more reactive with resin for efficient polymerization, ensuring your restorations have increased strength and durability. **Harmonize** removes the complexity of esthetic restorations that last, it's everything you've been looking for in a universal composite. **Website:** KerrHarmonize.com

Tetric EvoCeram Ivoclar Vivadent

A multiple year award winner at THE DENTAL ADVISOR, **Tetric EvoCeram** is a universal, nanohybrid composite.

It is indicated for Class I, II, III, IV, and V restorations; veneering anterior teeth, splinting of mobile teeth; and repair of ceramic and composite veneers.

Tetric EvoCeram takes advantage of nanotechnology to allow for better polishing and lower shrinkage. Esthetics as well as handling are the highest rated features of the product. Natural shade blend with surrounding dentition ensures outstanding restorative results. The filler technology employed in **Tetric EvoCeram** is based on an optimum blend of different fillers and filler sizes. Clinicians enjoy a longer working time due to the patented light sensitivity filters. THE DENTAL ADVISOR has followed **Tetric EvoCeram** for 10 years in vivo and it continues to receive excellent ratings for esthetics, resistance to fracture and chipping, resistance to marginal discoloration and wear.



Venus Pearl Kulzer

Awarded Top Esthetic Composite for 3 years in a row, **Venus Pearl** was highly rated by our clinical consultants for its excellent life-like translucency, handling, and polishability. This universal composite can be used in single shades or layered when desired. The full range of shades available offer three levels of translucency, including incisal shades, a pink shade for gingiva, and a green shade for cores. Consultants especially appreciated the sculptability of **Venus Pearl**. The material polishes to a high luster, which makes it an excellent choice for esthetic restorations.



Clinical performance of composites over time

Venus Pearl with iBond TE & SE (Kulzer)

1-YEAR CLINICAL PERFORMANCE



190
Restorations
placed

169
Reviewed
at recall

*This product received a
**99% clinical
performance rating
at the 1-year recall.***

Venus Pearl used with *iBond Total Etch* and *iBond Self Etch* received excellent ratings for resistance to fracture/chipping, esthetics, resistance to marginal discoloration, wear resistance, lack of sensitivity, and retention at one year.

A DETAILED REPORT CAN BE FOUND AT:

www.dentaladvisor.com/evaluations/venus-pearl-with-ibond-total-etch-and-ibond-self-etch-1-yr

Herculite™ Ultra and Optibond™ XTR (Kerr Restoratives)

5-YEAR CLINICAL PERFORMANCE



165
Restorations
placed

165
Reviewed
at recall

*This product received a
**98% clinical
performance rating
at the 5-year recall.***

Herculite™ Ultra and Optibond™ XTR performed well at the five-year recall. Restorations received excellent ratings for esthetics, resistance to fracture/chipping, resistance to marginal discoloration, wear resistance, and lack of postoperative sensitivity as reported by patients.

A DETAILED REPORT CAN BE FOUND AT:

www.dentaladvisor.com/evaluations/herculite-ultra-and-optibond-xtr-5-yr

Estelite Sigma Quick® (Tokuyama Dental America)

5-YEAR CLINICAL PERFORMANCE



2,800
Restorations
placed

1,511
Reviewed
at recall

*This product received a
**96% clinical
performance rating
at the 5-year recall.***

Among over 1500 *Estelite Sigma Quick* recalled restorations, the vast majority performed exceptionally well over the 5-year period. The composite has excellent translucency and blends very well with surrounding tooth structure. The material sculpts very easily especially when cosmetically bonding anterior composites.

A DETAILED REPORT CAN BE FOUND AT:

www.dentaladvisor.com/evaluations/estelite-sigma-quick-5-yr

Filtek™ Supreme Ultra Universal Restorative (3M)

6-YEAR CLINICAL PERFORMANCE



598
Restorations
placed

302
Reviewed
at recall

*This product received a
**98% clinical
performance rating
at the 6-year recall.***

Overall *Filtek™ Supreme Ultra Universal Restorative* performed exceptionally well in the categories of esthetics, resistance to fracture/chipping, resistance to marginal discoloration, and wear resistance.

A DETAILED REPORT CAN BE FOUND AT:

www.dentaladvisor.com/evaluations/filtek-supreme-ultra-universal-restorative-6-yr

Flowable Materials: New Trends & Terminology

TRADITIONAL LOW-FILLED FLOWABLES

Many flowable composites have been introduced to the dental profession since the first light-cured flowable composite arrived on the market in the mid 1990s. This small accessory once only used as an adjunct to certain procedures has now become widely accepted, providing expanded options for restorative dentistry. Until recently, most flowables contained higher resin content and lower filler loading when compared to conventional composites. In general, the reduction in filler lowers the mechanical properties and increases the flowability, while the increase in resin content makes them more prone to polymerization shrinkage. Some indications include: cavity liner, pit and fissure sealants; minimally invasive class I, II, or III restorations; class V restorations, and the repairs of small defects in direct and indirect restorations (*3M Filtek Supreme Plus Flowable*, 3M; *Tetric EvoFlow*, Ivoclar Vivadent, Inc.; *GRADIA DIRECT LoFlo*, GC America, Inc.; and *Estelite Flow Quick*, Tokuyama Dental America).

ESTELITE FLOW QUICK®

Tokuyama Dental America

Estelite Flow Quick is a universal supra-nano filled medium-flow, light-cured resin composite. Building on the proven success of Estelite's spherical filler technology, *Estelite Flow Quick* delivers superior esthetics, ideal handling, excellent polishability and outstanding long-term mechanical strengths. *Estelite Flow Quick* can be used for direct anterior and posterior restorations (particularly for small/shallow/tunnel shaped preps), cavity lining, blocking out cavity undercuts (before fabrication of indirect restorations) and composite/porcelain repair.



Camouflage Flowable

Glidewell Laboratories

Camouflage® NanoHybrid Composite is specially formulated to have uncompromising esthetics and strength, positioning itself as a versatile, affordable addition to any dental practice. Deliverable via either syringe or capsule method, light-cured material that can be quickly polished to resemble glazed enamel. It blends beautifully with the surrounding tooth and is available in two viscosities: Universal (21 shades) and Flowable (9 shades). When tested in THE DENTAL ADVISOR Biomaterials Research Center, *Camouflage Flowable* was found to have a high flexural strength of 126 MPa.



UNIVERSAL HIGHLY-FILLED FLOWABLES

In recent years, manufacturers have introduced flowables with higher filler content in varying viscosities. The higher filler content increases strength and wear resistance, lowers polymerization shrinkage, and allows the material to be stacked, making the composite suitable for class I-V restorations (*BEAUTIFIL Flow Plus*, SHOFU DENTAL CORPORATION; *G-aenial Universal Flo*, GC America; *GrandioSO Heavy Flow*, VOCO; *CLEARFIL MAJESTY ES Flow*, Kuraray Noritake Dental Inc.).



Increase in fillers
results in increase in strength
and decrease in flowability

G-aenial Universal Flo

GC America

G-aenial Universal Flo

is a universal light-cured composite with a flowable viscosity. Unlike other flowable composites that have limited indications, *G-aenial Universal Flo* is indicated as a direct restorative for class I, II, III, IV, and V cavities. It may also be used as a pit and fissure sealant, for sealing hypersensitive areas, for the repair of direct esthetic restorations, as a temporary crown and bridge material, for blocking out undercuts, and as a liner or base. The material self-levels after placement. Esthetics and blending to existing tooth were rated highly. The material has a unique intra-oral tip, designed to minimize dripping and can be bent for use in difficult to reach areas.



CLEARFIL MAJESTY ES Flow

Kuraray Noritake Dental

Awarded top highly-filled flowable composite 2 years in a row,

CLEARFIL MAJESTY ES Flow has excellent esthetics and polishability when used as a filling on the surface. It can also be used as a base or liner under restorations. The viscosity allows placement without running or slumping, and it adapts readily to cavity walls and flows into narrow areas and undercuts. The composite is fairly translucent and blends imperceptibly with enamel. In cases where no occlusal adjustment or finishing is needed, the surface of *CLEARFIL MAJESTY ES Flow* can be wiped with alcohol rather than polishing with rotary instruments.



Bulk-fill Composite: *Comparing differences*

Direct posterior composites are among the most performed restorative treatments in dentistry; however, placement can be challenging and time-consuming. To save time and deliver predictable posterior restorations, manufacturers developed bulk-fill composites. Where once it was required to cure composites in increments of 2 mm, newer bulk-fill products can be cured up to 4-6 mm, while decreasing shrinkage stresses generated during polymerization. The quicker placement of these materials has made them quite popular; and with the availability of long-term clinical data, clinicians are becoming more confident in their use.



Advantages: *less technique sensitivity, reduced chair time, fewer voids.*



Disadvantages: *esthetics (sometimes too translucent), limited choice of shades.*

Understanding the Differences: Types of Bulk-fill Composites

Bulk-fill composites are not all the same. It is important to understand how they differ and to use them accordingly. The main difference among bulk-fill composites can be seen in the viscosity of the material and its delivery.

BEAUTIFIL-Bulk Flowable (SHOFU DENTAL CORP.)

Filtek Bulk Fill Flowable Restorative (3M)

SureFil SDR *flow+* (DENTSPLY Sirona)

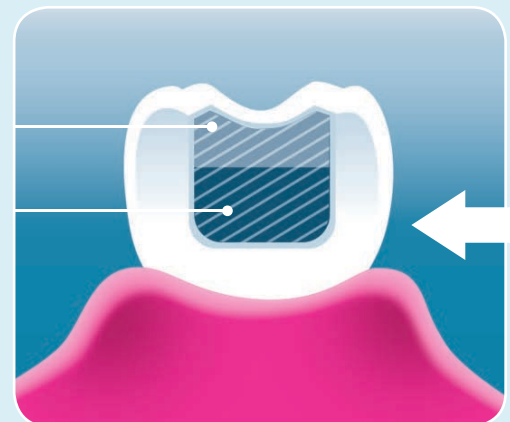
Venus Bulk Fill (Kulzer)

x-tra Base (VOCO)

Bulk-fill Flowable (Base)

Cap off with
Universal
Composite

4mm
increment
(base)



SureFil® SDR *flow+* DENTSPLY Sirona

SDR Flow was the first self-leveling, flowable bulk fill base composite.

SDR flow+ is a modification on the original **SDR flow**.

SDR flow+ has now been approved for use in several indications (including base in cavity

Class I and II direct restorations, liner under direct restorative materials, Class II box liner, sealant, conservative Class I restorations, core buildup, Class III and V restorations). **SDR flow** was originally evaluated in April 2010, and received our highest rating of 5 +, Editor's Choice. Consultants especially liked the self-leveling nature of the product and its adaptation to cavity walls.



BEAUTIFIL BulkFill Flow SHOFU DENTAL CORP.

BEAUTIFIL-Bulk Flowable

is a low-viscosity, bulk-fill composite indicated for use as a base in composite restorations. It offers continuous fluoride release and rechargability and low shrinkage stress. The material adapts well to cavity walls and self-levels on the surface. The 4 mm depth of cure allows efficient filling of deep areas without air bubbles or voids. This high-viscosity **bulk** flowable is easiest to extrude through the large gauge tips included. Consultants appreciated the fluoride release as a positive feature, especially when used to fill cervical areas.



Ideal Characteristics of Bulk-fill Composites:

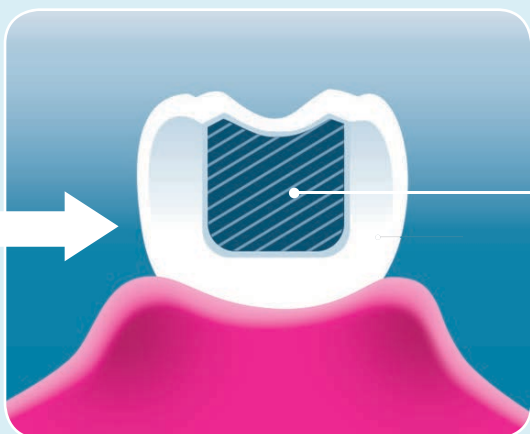
- Increased Depth of Cure (≥ 4 mm)
- Lower Polymerization Shrinkage
- Acceptable Esthetics (Posterior Use)
- Increased Wear Resistance
- Good Handling and Adaptability

Coming soon: Filtek ONE (3M)

3M™ Filtek™ One Bulk Fill Restorative is a simple one-step placement restorative material. Designed for the posterior, its unique optical properties and increased opacity allow for the simplicity of one-step placement without compromising esthetic results. With excellent adaptation and handling, it can be placed in one fast, easy increment up to 5 mm—no need for layering or expensive dispensing devices. 3M's true nanotechnology results in superior wear resistance and excellent polish retention. Available in five shades, **Filtek One Bulk Fill Restorative** enhances the 3M lineup of composites by improving the esthetic properties of a one-step placement material.



Bulk-fill Restorative



Can use bulk fill to occlusal surface in 4-5mm increments

Admira Fusion xtra Bulk Fill (VOCO)

Aura Bulk Fill (SDI North America Inc.)

BEAUTIFIL Bulk Restorative (SHOFU Dental Corporation)

Filtek Bulk Fill Posterior Restorative (3M)

Sonicfill II (Kerr Restorative)

Tetric EvoCeram Bulk Fill (Ivoclar Vivadent, Inc.)

x-tra fil (VOCO)

BulkeZ Bulk Fill Danville Materials

With **Bulk EZ**, Danville has reinvented bulk-fill composites by addressing the limitations in bulk fills that plague current products, such as gap formation and stress from rapid curing. It is an easy-to-place, dual-cure composite that combines flowable cavity adaptation with high strength and wear resistance—all in one, simple step. Its self-cure, patent-pending IntelliTek Technology is designed to specifically control and direct shrinkage while eliminating leakage in all posterior restorations. Additionally, **Bulk EZ** provides unlimited depth of cure, and utilizes a unique curing mechanism that is highly color stable and compatible with all bonding agents. **Bulk EZ** is available in Vita shades A1, A2, and A3.



Tetric EvoCeram Bulk Fill Tetric EvoFlow Bulk Fill Ivoclar Vivadent

Tetric EvoFlow Bulk Fill and **Tetric EvoCeram Bulk Fill** represent a further developed version of the proven **Tetric EvoCeram**. Both products can be used together and applied in layers of up to 4 mm, depending on technique desired.

Tetric EvoFlow Bulk Fill is a self-leveling, flowable, bulk fill composite, which can be capped with **Tetric EvoCeram Bulk Fill** or any universal composite. **Tetric EvoFlow Bulk Fill** has low translucency, making it excellent for masking dentin. If a one-step procedure is desired, **Tetric EvoCeram Bulk Fill** can be utilized alone with no additional capping layer required. Due to the Aessencio technology and the patented light initiator called Ivocerin the product combines efficiency and esthetics in a very special way requiring only a 10 sec cure.



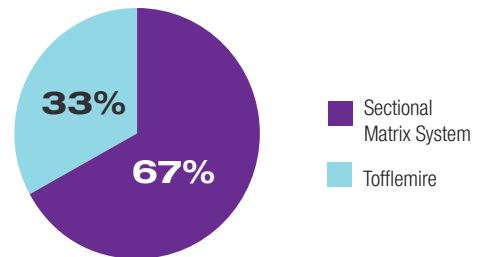
Posterior Composites: *Sectional Matrix Systems*

Posterior Composites: Sectional Matrix Systems

Successful class II restorations require clinicians to utilize a matrix system to recreate missing proximal tooth structure. The goal is to create an ideal contact with the adjacent tooth, restore optimal interproximal contour, and minimize time spent finishing and polishing.

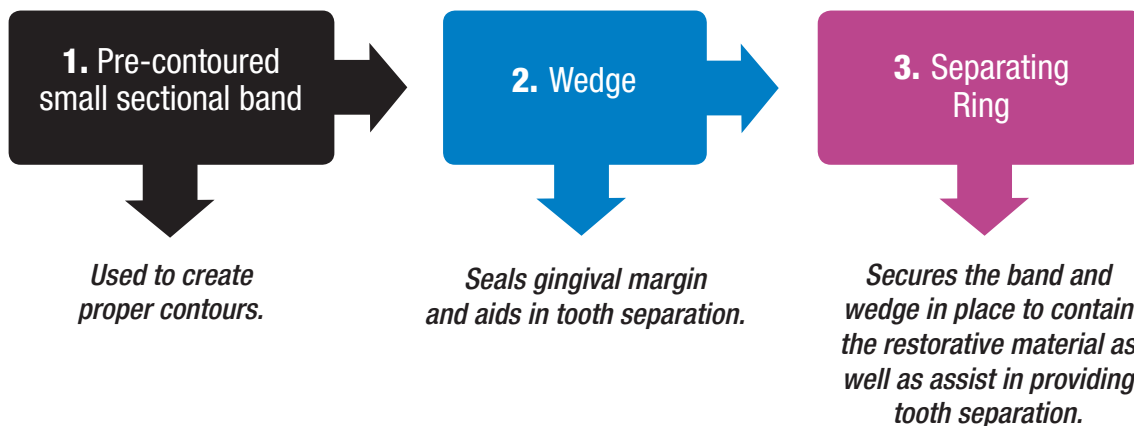
Restoring class II restorations with amalgam requires circumferential bands/retainer matrix systems. Due to its plasticity, amalgam can be condensed into the proximal cavity, resulting in tight interproximal contacts. Resins cannot be compressed against the matrix band as well as amalgams can, and when used in conjunction with conventional matrix systems, a tight contact is not always consistently achievable. Manufacturers have developed sectional matrix systems, such as **Composi-Tight 3D™** (Garrison Dental Solutions) and the **Palodent Plus** (DENTSPLY Sirona). These easy to use systems utilize three components, allowing clinicians to predictably and efficiently create interproximal contacts.

Survey of Clinical Consultants:
What are you using for class II restorations?



Some dentists still prefer using a Tofflemire style matrix system for their posterior composites, and clinicians who prefer sectional matrix systems will keep Tofflemire systems in the office for certain indications. **PinkBand® Silicone Coated Dental Matrix Bands** (Pink Band) and **Greater Curve** (Greater Curve).

Sectional Matrix Systems require the use of three components:



Composi-Tight 3D XR

Garrison Dental Solutions

Awarded Top Sectional Matrix system for the 5th year in a row, **Composi-Tight 3D XR** Sectional Matrix System is designed to create tight, anatomical contacts on Class II composite restorations. The rings in the **3D XR system** are produced with **Soft Face™** silicone to enhance matrix band adaptation and improve contacts, reducing flash and finishing time. **Composi-Tight 3D XR** and 3D Rings are angled to allow stackability in any combination for MOD and multiple-tooth restorations. Consultants continue to rate this system highly due to the contacts obtained, the reduction of flash, and retentiveness of the silicone rings.



Palodent Plus

DENTSPLY Sirona

Palodent Plus offers wide applications for sectional matrix system use and delivers predictable, accurate contacts consistently. The system includes a molar and pre-molar ring, 5 different size matrices and wedges, and **WedgeGuards**. The rings offer consistent separation force and are made of Nickel Titanium which ensures they will last longer than traditional stainless steel rings. The tines on the rings help to provide excellent retention on the tooth and the system seals the restoration to minimize the amount of finishing required.



Anterior Composites: *Aids/Instruments*

Anterior Composites:

Achieving esthetic outcomes for direct composite veneers can be a daunting process. Some clinicians stay away from the conservative restorative option because of the difficulty in creating ideal contours and the amount of time that goes into layering, shade selection, and finishing/polishing of the final restoration. To assist clinicians with this procedure, templates and prefabricated direct composite veneers systems are available. Composite veneer kits which have prefabricated composite veneers such as *Visalys Veneer* (Kettenbach) and *Componeer* (Coltene) assist in the process, providing all items needed to bond and reduce excess flash. Another recommended kit is *Uveneer* (Ultradent), which is an easy-to-use translucent template system that allows clinicians to utilize any composite material.

Clinical Problem Solver: OptraSculpt Pad (*Ivoclar Vivadent*)

The *OptraSculpt Pad* is an instrument with non-stick foam pad attachments used to place and contour composites, particularly Class III, IV, or V restorations. I personally like the *OptraSculpt Pad*, because I can spread the composite on the tooth easily without it adhering to the instrument, and it creates a smooth surface. I have also found the *OptraSculpt Pad* useful to hold veneers in place during cementation. The kit comes with two sized pads (4 mm and 6 mm) that can be inserted into a handle. Definitely a must-have product!



What's New In the Evolution of Composite Technology? *Strength through Nanofiber Innovation*

The newly released *NovaPro™ Flow* and *Fill* composites from Nanova Biomaterials, Inc. have superior performance due to the incorporation of calcium phosphate nanofibers in conjunction with nanoparticle technology. This combination significantly improves the mechanical performance, bruxing durability, and longevity of restorative composites used today. *NovaPro™* composites are the first and only composites to add this patent pending nanofiber technology to the current nano-hybrid composites on the market.

By utilizing nanofibers with nanoparticles, the material is reinforced, providing a stronger, longer lasting composite with excellent esthetic effects and lower shrinkage stress. Nanova's nano-hybrid technology is best described as having a box of basketballs, tennis balls, golf balls, and marbles (nano) to achieve a higher fill percentage, thus improving the strength of the structure.

Nanova developed and manufactured this revolutionary nanofiber technology used in both their flowable and universal composite at their Columbia, Missouri headquarters. These single crystal nanofibers are under 100 nanometers in diameter, which is approximately 1,000 times smaller than hair. The single crystal form gives the fibers their strength by reducing the possibility of defects in a cross-section.



Q&A: BEAUTIFIL II Gingiva Shades (SHOFU DENTAL CORP.)

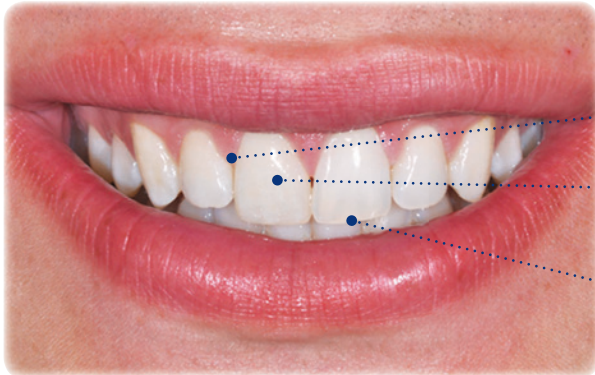
Q: *Is there a product or technique that can mimic or help disguise lost gingival tissue due to recession?*

A: Yes, *Beautiful II Gingiva* is intended for the cervical area, specifically—the esthetic correction of gingival recession, wedge-shaped defects, exposed roots, splinting, and re-balancing of pink and white esthetics. *Beautiful II Gingiva* provides additional shades to the award-winning *Beautiful II*, a fluoride-releasing, bioactive, nano-hybrid composite available in dentin shades. Available in 5 shades, *Beautiful II Gingiva* composite can be blended and layered to produce custom shades that will help effectively address patient's clinical needs. Indications of this novel gingiva-colored composite are not limited to defects in the cervical area of a tooth. *Beautiful II Gingiva* can be utilized chairside to camouflage the exposed implant abutments and crown and bridge margins, to repair and re-contour the gingival portion of indirect restorations, to modify the aesthetics of provisional restorations and to improve soft-tissue appearance in denture patients by revitalizing a worn or fractured denture.



Composite Finishing & Polishing Systems

Composite finishing and polishing kits are available in diamond and aluminum oxide single-step and two-step systems. One-step systems are faster and more convenient; however, two-step systems provide a higher polish. These systems can be single-use (disposable) or multi-use (autoclavable) and are available in both aluminium oxide and diamond abrasives.



Benefits of proper finishing vs. polishing

Smooth surfaces **resist bacterial adhesion** and plaque build-up.

Creates a **light-reflective surface**, enhancing the optical properties of the restoration.

Smooth surfaces **resist corrosion** and **decrease wear rates**. The rate of wear on composite resin and tooth structure opposing ceramic restorations is reduced with a proper finishing and polishing process.

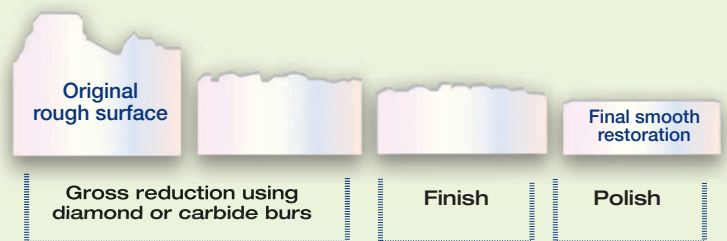
Finishing vs. Polishing

Finishing and polishing tooth structures and restorative materials not only improve esthetics but also improve soft tissue health and increase the longevity of various restorative materials. While finishing and polishing are used synonymously, they are two separate steps with different desired outcomes. Finishing generally refers to using abrasives to achieve the final contour and occlusion of restorations, and polishing refers to the process of obtaining a smooth final surface.

FINISHING refers to gross contouring of restorations to obtain the desired contour and appropriate occlusion.

POLISHING removes the finest surface scratches/imperfections using mild abrasives to produce a smooth, shiny surface.

Step-down approach to finishing & polishing



Sof-Lex Diamond Polishing System 3M

3M™ Sof-Lex™ Diamond Polishing System is a two-step system that imparts a gorgeous diamond paste-like gloss in the convenience of a rubberized system. The system contains two spirals: The **Sof-Lex Pre-Polishing Spiral** (beige) smooths and removes scratches in restorations that develop during contouring and prepares the surface for final polishing. The **Sof-Lex Diamond Polishing Spiral** (pink) is embedded with diamond particles to deliver a gorgeous paste-like gloss. The flexible spirals adapt to all tooth surfaces— anterior and posterior, convex and concave and can be used from any angle. As an economical choice, the spirals can also be sterilized and reused.



SuperSnap X-Treme SHOFU DENTAL CORP.

Super-Snap X-Treme is a 2-step polishing system with aluminum oxide grit embedded in each disk. The red disk has a new 3-D semispherical grit coating designed to create space for ground debris and to discharge that debris during polishing, resulting in a smoother finish with less heat production.

Super-Snap X-Treme produces a smooth, high-gloss finish to composite restorations, and is ideal for polishing broad, flat areas such as anterior teeth. **Super-Snap X-Treme** was tested in our biomaterial laboratory, producing **higher** gloss measurements when compared with other systems.



LED Curing Lights

Surveys of dental offices have shown that many light-curing units do not deliver their intended light output. Improper use of a curing light can result in inadequate curing of the composite and inadequate physical and mechanical properties. These outcomes may be common reasons for restoration failure that include: bulk fracture of the composite, secondary caries due to adhesive failure between the tooth and composite, and breakdown of the margin at the gingival portion of the proximal box. Arbitrarily increasing light exposure times in an effort to prevent under-curing is not the answer, as this may cause unacceptable thermal trauma to the pulp and surrounding tissues.

DESIRABLE PROPERTIES:

LED curing lights

Compatible with variety of initiators (3rd-generation)

1

Light tip 8-10 mm in diameter and probe long enough (> 7 cm) to reach posterior surfaces

2

Battery holds a charge for several hours of use, or can be quickly recharged - extra battery provided and has a low battery warning

3

Good ergonomics - portable, lightweight, easily accessible controls, and stable docking station/stand

4

Digital readout clearly displayed

5

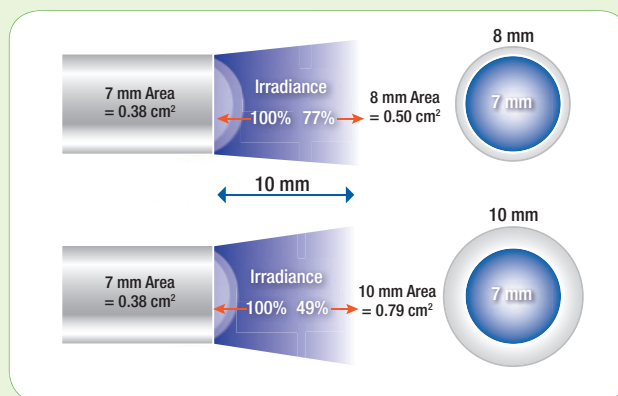
Easy to disinfect with autoclavable light tip or protective barrier

6

Effect of Distance on Irradiance

For some curing lights, even a small distance of 5 mm between the curing light and the resin can have a large negative effect on the irradiance received by the resin. Look for a curing light that emits a well-collimated light beam with minimal reduction in the irradiance at distances up to 10 mm away from the tip. A small increase in beam divergence causes a large increase in beam area which in turn produces a lower irradiance.

Effect of Light Beam Divergence on Area.



Elipar DeepCure-S 3M

Elipar DeepCure-S provides confidence of a complete cure due to optimized optics. This new innovation ensures practitioners will have a deep, uniform cure even when perfect light positioning is difficult.

Improved ease of use and durability features include:

- 1,470 mW/cm² Intensity spread evenly throughout 10mm tip diameter
- Black coating of light guide reduces stray light
- Radiometer on charging base
- Light guide tip height reduced to ease access to posterior restorations
- One-piece stainless steel housing
- One second tack cure feature



Translux Wave Kulzer

The **Translux Wave** is a new state-of-the-art curing light that delivers optimum polymerization for all common camphorquinone-based dental materials. Its lightweight, cordless and its ergonomic design provide a safe and easy method for consistent light-curing. Features include:

- Pen-style body in a lightweight and ergonomic pen-style design
- One-button operation
- Cordless design for maximum freedom of movement
- Reliable performance and built-in radiometer

