

THE DENTAL ADVISOR™

“Improving Patient Care Through Research & Education”



Photography by Tricia Price, Ann Arbor, Michigan

Composite Update

Composite technology has changed the practice of restorative dentistry significantly since its introduction in the late 1960s. While many composites continue to be formulated from Bis-GMA resin, the composition and distribution of filler particles have changed dramatically. The development of new fillers with particle sizes in the range of 0.01 to 0.10 μm has led to composites with improvements in esthetics, polymerization shrinkage, strength, wear resistance, and handling. More recently, with the growing concern of polymerization shrinkage, companies have developed low-shrinkage composites.

This issue of THE DENTAL ADVISOR will focus on microfills, microhybrids, nanofills, and nanohybrid composites. New techniques and innovations will be discussed, as well as clinical tips. Clinical advantages and limitations of low-shrinkage composites will be discussed as well.

October 2009

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An Editors' Choice award is given to products recognized by our editors as being a unique or significant product.

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Excellent	++++
Very Good	+++
Good	++

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Types of Composites

The most commonly used classification system for composite resins considers the distribution and average particle size of a given composite's filler load. Most resin composites can be classified into three main categories: microfilled, microhybrids, and nanofilled.

MICROFILLS

Particle size: 0.04- 0.1 μm

Main characteristics: High polish that can be achieved and maintained over time and excellent enamel-like translucency.

Clinically: Microfilled composites work best for anterior restorations, where esthetics is a main concern. Their small particles allows for high luster polish; however, because they are less filled than any other composite, they do lack strength. Many dentists use microfills as an "enamel" layer placed over stronger microhybrid resin.

Indications: Anterior restorations, cervical abfraction lesions

Contraindications: Should not be used in heavy stress-bearing areas.

MICROHYBRIDS

Particle size: 0.4-0.6 μm

Main Characteristics: High strength and most closely stimulate dentin. They are the most opaque of all composites, and therefore, great for supporting a microfill layer. They can be finished and polished well, but lack long-term smoothness and gloss.

Clinically: Microhybrids have the needed strength and wear for posterior composites, while having the polish and esthetic potential for anterior restorations.

Indications: Microhybrids are considered a universal composite that can be used in anterior and posterior teeth.

NANOFILLS

Particle size: 0.01-0.10 μm

Main Characteristics: Nanoparticles are the smallest particles used in conjunction with composite resins. While conventional particles are generated from ball-milled or ground from larger-sized particles into smaller ones, nanoparticles are built up on the molecular level. There are two types:

1. Nanofills - contain nanometer-sized particles throughout the resin matrix.
2. Nanohybrids - consist of larger particles surrounded by nanometer-sized particles.

Clinically: Unlike microhybrids, nanofills have a lifelike, opacious translucency that is very natural in appearance. When compared to microhybrids, nanofills will maintain better surface smoothness and polish and are great for the single-product user.

Indications: posterior restorations, lower anteriors, composite veneers, building up incisal edges, class IV restorations, and when restoring or increasing cuspid rise.

Ideal Characteristics of Composites

- Low polymerization shrinkage
- Highly esthetic
- Good depth of cure
- Low ambient light sensitivity
- Color stability
- Good handling characteristics
- Adequate translucency
- High polishability and longevity
- High strength and wear resistance
- Biocompatibility
- Radiopacity

Layered Resin Composites

Clinical techniques that use layering of composites to mimic the natural layering of dentin and enamel remain popular among dentists with high esthetic expectations. Natural teeth are intricate with variations of shades, opacities, and textures. Layering of composites to stimulate natural teeth involves the use of opaque dentin shades, which are overlaid by more translucent enamel shades. Mimicking natural teeth may also involve the use of color modifiers, opaquers, tints, and bleach shades.

Opaquers: Use opaque shades to block light transmission, mask dark areas of the tooth, and lighten the tooth (increase value).

Tints: Tints transmit light and are therefore great for adding translucency to restorations, to help increase coloration, and darken the tooth (decrease value).

Tips for layering composites:

- Place a translucent shade for the outer “enamel” layers on lingual, proximal, and facial surfaces. Enamel translucency should be most evident at incisal portion of the tooth.
- Select the dentin shade to be one to two shades darker than the cervical shade of the tooth.
- Select the enamel shade from the incisal 1/3 of the tooth to be restored or from adjacent teeth.
- Translucent shades can mimic the edge of the teeth between mamelons, where enamel is naturally thickest.
- Cure each layer separately to reduce polymerization shrinkage stress.

Addressing Post-operative Sensitivity

Causes	Solutions
Over heating the pulp	Use lots of water while preparing tooth
Moisture contamination	Rubber dam placement or cotton roll isolation
Desiccation	Do not over-dry tooth
Bonding protocol	Follow manufacturer's directions
Inadequate cure	Check curing lights regularly to ensure effectiveness
Polymerization stress	Place composite in small 2 mm increments

Open Contacts

The proper use of sectional matrix systems can aid in achieving anatomically correct tight contacts. Sectional matrix systems (*V3 Ring*, Triodent Ltd.; *Composi-Tight Gold*, Garrison Dental Solutions) assure tight interproximal contacts. The retainer rings assist in retraction and isolation so cotton rolls can be secured under both sides of the arch. Burnishing the surface of the bands following placement of the bonding agent and before addition of composite further assists in providing tight contacts and helps prevent bonding of the composite to the band.

Matrix Systems

Product	Company	Type	Size	Clinical Rating
Composi-Tight Gold	Garrison Dental Solutions	Sectional	4 sizes	97%
FENDER WEDGE	Directa Dental	Pre-wedge	4 sizes	86%
Greater Curve Tofflemire Band	Greater Curve	Band		92%
Maximat Plus	POLYDENTIA	System	5.5, 6.3 mm	88%
OptraMatrix	Ivoclar Vivadent, Inc.	Band	6 sizes	87%
Quickmat Deluxe	POLYDENTIA	Sectional	5.0, 6.4 mm	87%
The Palodent Sectional Matrix System	DENTSPLY Caulk	Sectional	3 sizes	92%
V3 Ring Sectional Matrix System	Triodent Ltd.	Sectional		96%

For more information on matrix systems visit the Product Comparison Tables or the online issue at www.dentaladvisor.com.



Maximat Plus
(POLYDENTIA)



Quickmat Deluxe
(POLYDENTIA)

Composites

Low-shrinkage Composites

Dental composite products undergo shrinkage during curing due to the conversion of monomers to polymers. This shrinkage is proportional to the conversion efficiency and can contribute to shortcomings in restorative procedures, i.e., marginal leakage, discoloration, tooth fracture, dental decay, and gross failure.

Numerous approaches to minimize cure-shrinkage ratios have been investigated. These include various curing light intensities and ramping of light application and duration of application; particle wettability, size, shape and surface area; pre-polymerized filler particles, and additions to the basic Bis-GMA/TEGDMA resin systems. Examples of low-shrink composites with new monomers are **GC Kalore** (GC America) and **N'Durance** (Septodont).

Improvements in polymerization methods have produced longer wearing, harder, denser, restorations with expanded use potential and improved predictability. As always, precise attention to each manufacturer's instructions and proven restorative techniques are required to maximize the potential of each product.

Self-adhesive Composites

With the recent market entries of self-etching resin cements and adhesives, there has also been a push to develop a resin composite system with self-etching capability. Currently, the only self-adhesive composite on the market is **Fusio Liquid Dentin** (Pentron Clinical Technologies). **Fusio Liquid Dentin** is a self-adhering flowable composite that bonds to both dentin and enamel without a separate adhesive. It shares the same indications as a traditional flowable composite, but also serves as a dentin replacement material or a self-adhesive liner.



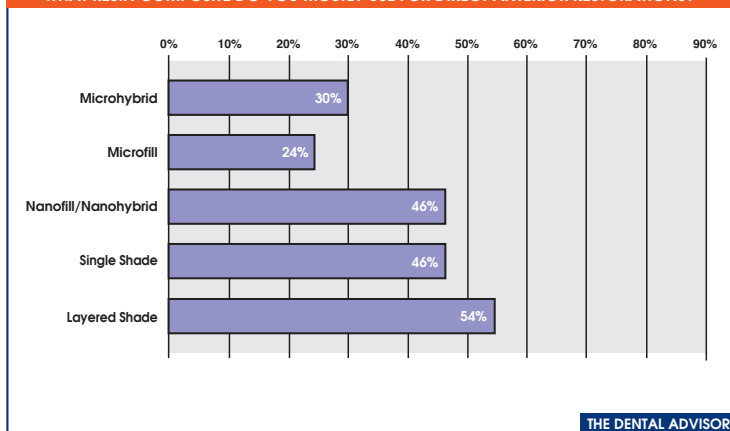
Fusio™ Liquid Dentin Self-Adhering Flowable Composite
(Pentron Clinical Technologies)

Survey of Clinical Consultants

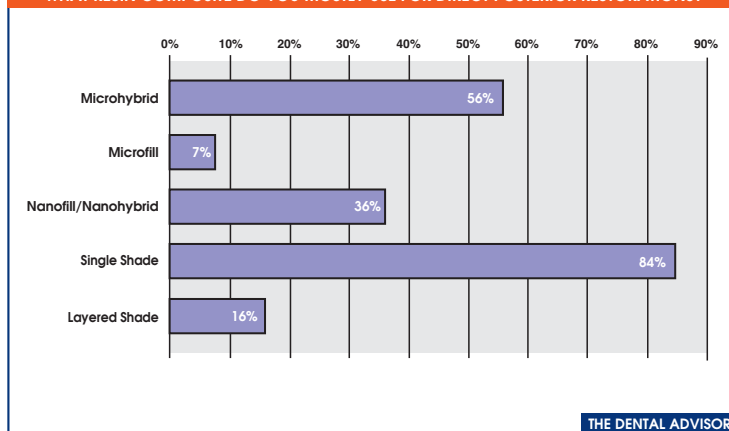
Seventy-one of our clinical consultants responded to a survey on usage of composites - the results are listed below.

Editors' Note: The survey results were not used to rate products.

WHAT RESIN COMPOSITE DO YOU MOSTLY USE FOR DIRECT ANTERIOR RESTORATIONS?



WHAT RESIN COMPOSITE DO YOU MOSTLY USE FOR DIRECT POSTERIOR RESTORATIONS?



Do you use a sectional matrix system?

Yes	78%
No	22%

What type of polishing system do you generally use?

Single Step	34%
Multiple Steps	65%
Liquid Glaze	1%

Q: I am looking for an easy way to polish anterior composites. Do you have any recommendations?

A: The multiple-step systems, such as *Super-Snap Singles*, Shofu Dental Corp., result in a great surface finish. The disks have soft, plastic snap-on mounts for mandrels and are available in four different color-coded grits. The mandrels are made of plastic and, therefore, there is no need to worry about metal centers that can gouge composite restorations. The mini disks provide perfect control while polishing cervical and interproximal areas.

If you are looking for a quick and easy polishing system, an alternative is to apply a protective coating as the final step in the placement of new composite restorations. These coatings are most commonly referred to as liquid polishes (*ClearCheck SLP*, Shofu Dental Corp; and *G-COAT PLUS*, GC America). Provided in a variety of delivery systems, they are designed to reduce chair-time and the number of polishing steps needed to provide a long-lasting esthetic finish. In addition to giving a smooth, glossy finish, liquid polishes may seal margins and microscopic cracks, fissures, and provide resistance to staining from food and beverages.



ClearCheck SLP
(Shofu Dental Corp.)



G-COAT PLUS
(GC America)

Polishing Systems

Product	Company	Shape	No. of Grits	Clinical Rating
3M ESPE Sof-Lex Contouring and Polishing Disc Kit #1980	3M ESPE	D	4	91%
Astropol	Ivoclar Vivadent	C, D, Small F, Large F	3	91%
Diacomp	Brasseler USA	C, D, P	2	90%
fini Polishing Disks Kit	Pentron Clinical Technologies	D	4	91%
Jazz Supreme Polishers	S.S. White Burs, Inc.	C, F, KE, SF	1	92%
Moore-Flex Advantage Kit	E. C. Moore	D, S	4-discs; 2-strips	88%
NTI PDQ2 Composite Polishing System	AXIS Dental	C, D, P	1	94%
OptraPol Finishing & Polishing System	Ivoclar Vivadent	C, D, Small F, Large F	1	92%
PoGo One-Step Diamond Micro Polishers	DENTSPLY Caulk	C, D, P	1	94%
Poli-Pro Disks Composite Polishing System	Premier Dental Products	D	4	na
Super-Snap Singles	Shofu Dental Corporation	D	4	96%

C = Cup, D = Disk, F = Flame, KE = Knife Edge, LF = Large Flame, SF = Small Flame, P = Point, na = Not Clinically Evaluated. For more information on polishing systems visit the Product Comparison Tables or the online issue at www.dentaladvisor.com.

Q: In my practice I have many patients who want “tooth-colored” fillings but they present with a moderate-high caries risk. Are there any composites that are esthetically pleasing but also release fluoride?

A: *Beautiful II* (Shofu Dental Corp.) is a fluoride-releasing, light-cured, nano-hybrid composite indicated for Class I-V restorations, wedge-shaped defects and root caries, direct laminate veneers, core build-ups, and repair of restorations. It has proven to be a good restorative choice when the benefits of a glass ionomer (fluoride release and recharge) and composite (esthetics and polishability) are desired. The manufacturer classifies it as a GIOMER, an esthetic restorative material that combines the characteristics of both composite and glass ionomer.



Beautiful II
(Shofu Dental Corp.)

Director of Infection Control

John A. Molinari, Ph.D.

I am honored to join the THE DENTAL ADVISOR team after 44 years in academia. I have observed the publication's 26-year growth as an independent, respected, quality source of clinical and science-based information for the dental profession, and look forward to expanding the group's efforts into the areas of microbiology and infection control.



As Director of Infection Control, I will be able to do much of the work I did in a dental school setting, including writing articles, conducting clinical and research investigations, and teaching in both seminar and classroom settings. This article represents the first installment of the new Infection Control Corner feature of THE DENTAL ADVISOR. Subsequent columns will address current and emerging infectious disease and control issues of interest to health care providers, with the emphasis focused on you the dental professionals. Those of you who have worked with me know I believe that whenever possible, infection control guidelines, regulations, and practices should be based on sound scientific data and the appropriate applications of those data. The overwhelming majority of clinical recommendations for dentistry fit these criteria. There is excellent evidence to demonstrate the effectiveness of routine, standard, infection control precautions in minimizing the potential for cross-contamination and cross-infection.

In addition to providing you with updated information on major infection control areas, such as hand washing/hand hygiene, personal protective equipment, vaccines, sterilization, instrument reprocessing, surface disinfection, and dental water asepsis, I hope to consider questions commonly directed to me pertaining to current and emerging infectious disease challenges.

I welcome the opportunity to answer these and any other questions or concerns our readers have. Visit www.dentaladvisor.com to submit your questions, and we will personally respond. I welcome any ideas on protocols you have found to be successful in your office, and we will share with other through this column and in lectures. With your input my goal is to make this column as useful as possible to your whole dental team, so that we can continue to observe dentistry's leadership role in infection control.

For more information on Dr. Molinari visit the online issue at www.dentaladvisor.com.



TDA Recommends The Following Products

Composites

- **Tetric EvoCeram** (Ivoclar Vivadent)
- **GrandiO** (VOCO America)
- **GRADIA DIRECT** (GC America)
- **Estelite Sigma Quick** (Tokuyama Dental Corp./Tokuyama America Inc.)
- **Synergy D6** (Coltène/Whaledent, Inc.)
- **CLEARFIL Majesty Posterior** (Kuraray America)
- **CLEARFIL Majesty Esthetic** (Kuraray America)
- **3M ESPE Filtek Supreme Plus Universal Restorative** (3M ESPE)

Matrix Systems

- **V3 Ring Sectional Matrix System** (Triodent Ltd.)

Polishing Systems

- **Super-Snap Singles** (Shofu Dental Corp.)



GrandiO
(VOCO America)



Super-Snap Singles
(Shofu Dental Corp.)



V3 Ring Sectional Matrix System
(Triodent Ltd.)

Composites

Product	Company	Type	Flexural Strength	Flexural Modulus	Rating
3M ESPE Filtek Supreme Plus Universal Restorative	3M ESPE	Nanofill	Very High	High	97%
ALPHA II AP	Dental Technologies	Microhybrid	High	High	92%
Artiste Nano Composite	Pentron Clinical Technologies	Nanohybrid	nt	nt	na
AXCEL Universal Restorative	Tri Dental Innovators	Nanohybrid	High	High	86%
Beautifil II	Shofu Dental Corp.	Nanohybrid	nt	nt	94%
CLEARFIL Majesty Esthetic	Kuraray America	Nanohybrid	nt	nt	91%
CLEARFIL Majesty Posterior	Kuraray America	Nanohybrid	nt	nt	88%
Estelite Sigma Quick	Tokuyama Dental Corp./ Tokuyama America Inc.	Supra-nanofill	nt	nt	99%
Esthet.X HD High Definition micro matrix restorative	DENTSPLY Caulk	Microhybrid	High	High	94%
GC Kalore	GC America	Nanohybrid	High	High	91%
GrandiO	VOCO America	Microhybrid	High	Very high	96%
Herculite Ultra	Kerr Corporation	Nanohybrid	nt	nt	na
ice	SDI North America	Nanohybrid	High	High	87%
IPS Empress Direct	Ivoclar Vivadent	Nanohybrid	nt	nt	ce
Matrixx Restorative System	Discus Dental	Microfill, microhybrid	nt	nt	na
N'Durance	Septodont	Nanohybrid	High	High	ce
Prime-Dent Nano-Hybrid Light Cure Composite	Prime Dental Manufacturing, Inc.	Nanohybrid	nt	nt	90%
ProFil	Silmet Ltd.	Microhybrid (Advanced Nano Technology)	Very high	Very high	87%
Quadrant Anterior Shine	Cavex Holland B.V.	Nanohybrid	nt	nt	88%
RefleXions	Bisco Dental Products	Dentin= low shrink nanohybrid; enamel=reinforced nanofil	nt	nt	86%
SpectraFill	GlasSpan, Inc.	Nanohybrid	High	High	91%
Tetric EvoCeram	Ivoclar Vivadent	Nanohybrid	High	High	96%
Venus Diamond	Heraeus	Nanohybrid	nt	nt	na
VersaLite	Centrix	Microhybrid	High	Very high	na
Virtuoso Universal	Den-Mat Holdings, LLC	Nanohybrid	Med-high	Medium	96%

nt = Not Tested, ce = Currently Evaluating, na = Not Clinically Evaluated.

For more information on composites visit the Product Comparison Tables or the online issue at www.dentaladvisor.com.



Beautifil II
(Shofu Dental Corp.)



GC Kalore
(GC America)



ice
(SDI North America)



N'Durance
(Septodont)

S3 Mint Face Mask + + + +

Cranberry USA
888.811.6839 - 707.553.6190
www.cranberryusa.com

Description

S3 Mint Face Mask is an ear-loop face mask for use in medical or dental procedures. The mask is latex-free, non-irritating, and free of glutens, chemicals, and fiberglass. It is designed for moisture-free breathing while delivering 99% Bacteria Filtration Efficiency (BFE) and Particle Filtration Efficiency (PFE) at 0.1 micron. It is available in green, lavender, blue, and yellow and has a light mint scent. Thirty-three consultants evaluated **S3 Mint Face Mask** in over 867 clinical procedures. The product received an 86% clinical rating.

Suggested Retail Cost

- \$7.99/50-count box

Product Features

S3 Mint Face Mask has a *CoolSilk™*, lint-free inner layer without fluffy irritation.

Consultants' Comments

- ◆ "It fit my ears better than others with the same design."
- ◆ "Thicker than the brand we are currently using."
- ◆ "I liked the subtle mint scent, and the rounded ear loops were comfortable."
- ◆ "Very soft to the skin."
- ◆ "It needs a thicker metal band to improve the fit on the nose."

Most consultants rated the size and shape of the mask as excellent, although some reported the nose fit could be improved. The metal nose band does not fully maintain its bend and tends to creep up over time. The rounded ear loop straps are very comfortable while effectively securing the mask in place. All consultants ranked comfort as the most important feature in a face mask, while 70% ranked the hypoallergenic feature as very important. Sixty percent of evaluators reported they liked the mint scent and 45% rated the **S3 Mint Face Mask** as the same or better than their current mask. Seventy-two percent of consultants reported they would switch to **S3 Mint Face Mask** and recommend it to their colleagues. ■



Vident's Art, Science and Business of Dental Laboratory Management Program

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ProFil Flow + + + + 1/2

Silmet Ltd
972-3-5331474
www.silmet.co.il

Description

ProFil™ Flow is a low viscosity, light-cured, radiopaque, flowable composite that contains fluoride. It is indicated for use in Class III, Class V, smaller Class IV, as well as a base/liner in Class I and Class II restorations. It can also be used to repair resin, porcelain and acrylic temporary materials, as a pit and fissure sealant, an undercut blockout and for restoration of minimally invasive cavity preparations. **ProFil** Flow is available in 1-g and 3-g syringes in shades A1, A2, A3, A3.5, B2, and C2. The economy kit contains four 1-g syringes in a variety of shades. **ProFil** Flow was evaluated by 25 consultants in over 600 clinical applications and received a 91% clinical rating.

Suggested Retail Cost

- \$39.00/economy kit (4X1-g syringe)
- \$26.00 / 3-g syringe
- \$12.00 / 1-g syringe refill

Product Features

ProFil Flow has a fairly ideal viscosity, and consultants reported that it adapted, flowed and stacked very well.

Consultants' Comments

- ◆ "Polishes very well."
- ◆ "Flows well and seems to adapt well to tooth surface."
- ◆ "Good viscosity, stays in place."
- ◆ "A smaller lumen tip would help with precise placement."

Very few bubbles are noted upon dispensing. The composite has a low sensitivity to ambient light. The shade selection is adequate and final match rated as very good. Overall, consultants reported that **ProFil** Flow was a very good flowable composite with 44% rating it as better than other flowable composites they currently use. Fifty-three percent would switch to and 84% would recommend **ProFil** Flow to their colleagues.

Clinical Tips

- Spread thinly on pulpal floor.
- Extrude slowly from the syringe.
- Only place the amount needed to minimize the amount of finishing needed. ■



Cutting Through The Red Tape: Infection Control & OSHA Update

presented by

Dr. John Molinari,
Director of Infection Control

Available on 3 dates:
Friday, 25th Sept 2009
Wednesday, 4th Nov 2009
Wednesday, 9th Dec 2009

Time: 9am-noon
Credit Hours: 3

This course includes:

- Infection control recommendations vs. OSHA regulations
- OSHA bloodborne pathogens standard
- Components of standard
- Bloodborne pathogens update
- Post-exposure management protocols
- Hand hygiene
- Handwashing & alcohol-based hand sanitizers
- Infection control techniques
- Personal protective equipment
- Instrument sterilization & reprocessing
- Environment surface asepsis
- Disposable covers
- Surface disinfectants - sprays vs. wipes
- Dental waterline asepsis

Venue: The Education Center, The Dental Advisor, Ann Arbor, Michigan
3 Credit Hours • \$125.00 • Early Registration Special \$99.00 by 1st Sept 2009
For registration information visit www.dentaladvisor.com or contact:
Jackie Lane 734.665.2020 ext.105 or jackie@dentaladvisor.com



Tokuyama Dental Corp./
Tokuyama America Inc.
877.378.3548
www.tokuyama-us.com



Description

Estelite Sigma Quick is a low-shrinkage, submicronfilled composite for use in both anterior and posterior restorations. This enhanced version of Estelite Sigma implements RAP technology (Radical-Amplified Photopolymerization initiator technology), which offers increased working time of 90 seconds under ambient light, while decreasing curing time to 10 seconds with a halogen light. **Estelite Sigma Quick** contains 82% by weight of silica-zirconia filler. The composite is available in both syringes and pre-loaded tips (PLTs) in shades A1, A2, A3, A3.5, A4, A5, B1, B2, B3, B4, C1, C2, C3, OA1, OA2, OA3, OPA2 (opalescent), BW (bleach white), WE (white enamel), and CE (clear enamel). This product received a 99% clinical rating.

Suggested Retail Cost

- \$62.00/syringe refill
- \$74.00/PLT refill
- \$54.00/PLT mini kit

Evaluation Protocol

- **Estelite Sigma Quick** was evaluated by 21 editors who placed nearly 1200 restorations.

Editors' Observations

Manufacturer's instructions/Packaging

Editors rated both the packaging and instructions as very good. The instructions are clear and thorough. Packaging is clearly marked and easy to store; however, some editors commented they would prefer having all the shades available in one box. The pre-loaded tips (PLT) are each labeled with the name and shade for easy identification.

Ease of dispensing/Viscosity

The ease of dispensing from the PLT is among the highest rated features. It flows well and stays where placed.

Ease of placement/Non-stickiness to instrument

The ease of placement and workability of this composite are excellent. Editors liked the packability as well as the capacity to work well with most bonding agents. The lack of stickiness to instruments was also rated very good.



Consultants' Comments

- ◆ "Works well with all of the bonding systems I use in my office."
- ◆ "Great handling!"
- ◆ "Not as sensitive to the operating light as other composites."
- ◆ "Huge variety of shades that blend very well with tooth."
- ◆ "It's rare that I would get this excited about a composite, but this one blew me away!"
- ◆ "One box that holds several components would aid in the ease of transporting the kit from operator to operator."

Shade availability/Shade match before and after curing

The complete assortment of shades offers superior versatility. The system is comprised of 20 shades, 4 opaque, bleach white, as well as white and clear enamel. Shade matching both before and after curing is excellent with minimal shade shift.

Blending of composite with tooth

The composite blends exceptionally well with the surrounding tooth structure. Editors felt the material was not too opaque and had very good translucency.

Radiopacity/ Sensitivity to ambient light

The radiopacity was very good. The composite is not overly sensitive to ambient light and has an extended working time compared to the original *Estelite Sigma*.

Ease of finish, polish/Quality of final polish/Final esthetics

Editors reported **Estelite Sigma Quick** was easy to polish and provided a highly satisfactory finish. Overall they were extremely impressed with the final polish and excellent esthetics of this material.

Clinical Tip

- Use a nylon (plastic) instrument for anterior incisal edge/ angle restorations when layering shades. The flexibility of the instrument and viscosity of the composite work well together to allow feathering of the composite before curing. ■

Silmet Ltd
972-3-5331474
www.silmet.co.il

Description

ProFil™ is a micro hybrid light-cured, radiopaque, restorative composite. It contains Bis-GMA and TEGDMA resins plus non-agglomerated nanofill silica filler and is indicated for Class I-V anterior and posterior restorations plus veneering of discolored anterior teeth, splinting of loose teeth, and anchoring of orthodontic appliances. It is available in shades A1, A2, A3, A3.5, B1, B2, B3, C2, C3; opaque shades OA2, OA3, OA3.5, OB2; and Incisal. Two-gram syringes are offered with most shades to minimize waste of less frequently used shades. **ProFil** was evaluated by 28 consultants in 809 clinical cases. It received an 87% clinical rating.

Suggested Retail Cost

- \$29.00/2-g syringe
- \$59.00/4-g syringe
- \$64.00/20 unit-dose capsules
- \$375.00/working kit with durable multi options (Self Etch/ Total Etch)

Product Features

ProFil is a light-cured composite formulated to have low polymerization shrinkage. It comes in 14 radiopaque shades that correspond with the familiar Vita Classic shade guide. Consultants reported the shade selection and color match were very good. Although the thicker viscosity makes it somewhat difficult to extrude, **ProFil** is very easy to use and stays where placed with no slumping. Consultants reported that it was easy to finish and polish. Blending with natural tooth color, as well as final polish and esthetics, are very good. Sixty-four percent of evaluators felt that **ProFil** was the same or better than their most frequently used composite, 43% would switch to it and 71% would recommend it to a colleague.

Consultants' Comments

- ◆ "Blends and polishes well."
- ◆ "Opaque shades are very effective at covering dark dentin or metal."
- ◆ "Easy to handle and looked great."
- ◆ "It's nice to have opaque shades in a kit."
- ◆ "Hard to express out of the tip."

Translating the Science

Mechanical Properties of Composites

Resin composites have replaced amalgams because of their acceptable mechanical and physical properties and tooth-colored esthetics. The important mechanical properties of composites include their flexural strength and modulus and compressive strength. These properties are important because the durability of a composite restoration is dependent on its being capable of withstanding high occlusal loads that cause both compressive and flexural stresses in the material. A composite should have a compressive strength in the range of 250-450 MPa and a flexural strength and modulus in the range of 80-160 MPa and 8.8-13 GPa, respectively. **ProFil** (Silmet Ltd.) has a flexural strength of 143 MPa and flexural modulus of 10.5 GPa. These mechanical properties indicate that **ProFil** is a mechanically sound resin composite.

Clinical Tips

- It helps to warm the composite first.
- Knead the composite on a mixing pad if a lower viscosity is desired. ■

Alert 10-yr Clinical Performance + + + + 1/2

Pentron Clinical Technologies
 800.551.0283 - 230.265.7397
 www.pentron.com

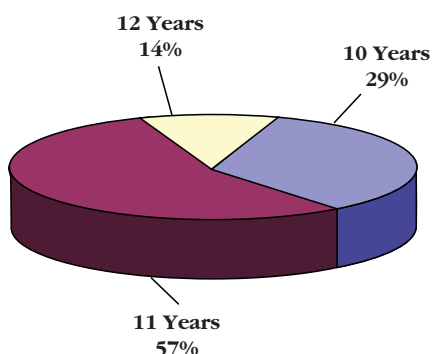
Description

Alert is a packable posterior composite first introduced and evaluated by THE DENTAL ADVISOR in March 1999. **Alert** is highly filled (84% by weight) with glass fibers of various dimensions. It is stiff in consistency, packs well, is non-sticky, and can be cured in 5-mm increments. This product received a 92% clinical rating.

Clinical Evaluation Protocol

- A total of 651 posterior restorations were placed from 1998 to 2002.
- Three hundred and twenty four of these restorations have been in function for 10 years or longer (Figure 1).
- One hundred and thirty one restorations were available for recall and evaluation. They represented 1-, 2-, 3-, and 4-surface composites and were evaluated in the follow areas:
 - Resistance to fracture/chipping
 - Esthetics
 - Resistance to marginal discoloration
 - Wear resistance
- Each category was rated on a scale of 1 to 5: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent

DISTRIBUTION OF RESTORATIONS BY YEARS IN SERVICE



THE DENTAL ADVISOR

Figure 1

Clinical Results

Resistance to Fracture/Chipping

Alert restorations have proven to be very durable at 10 years or more in function. Seventy-seven percent of the recalled restorations showed no fractures or chipping, while 15% exhibited very slight chipping and 5% more moderate chipping necessitating repair (Figure 2). Only 3% needed to be replaced.



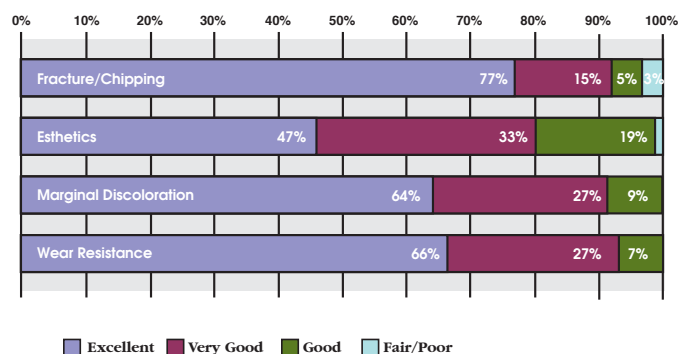
Consultants' Comments

- ◆ "Overall the restorations have held up very well over time."
- ◆ "Very slight wear was observed with some of the restorations, mostly at the occlusal surface."
- ◆ "Looks very nice at 11 years."
- ◆ "Even very large four-surface restorations have held up very well."
- ◆ "I have noticed some yellowing in a few of the restorations."
- ◆ "At times the surface is grainy, not perfectly glossy."

Esthetics

Forty-seven percent of restorations were rated excellent for shade and esthetics blending well with the surrounding tooth (Figure 2). Thirty-three percent showed slight discoloration, while 19% showed moderate discoloration with consultants describing them as slightly yellow or opaque. While esthetics ratings have decreased over the 10 years, most restorations were still considered clinically acceptable. Only 1% was considered clinically unacceptable.

CLINICAL PROPERTIES AT 10-YEAR RECALL



THE DENTAL ADVISOR

Figure 2

Alert 10-yr Clinical Performance + + + + 1/2

Resistance to Marginal Discoloration

Sixty-four percent of **Alert** restorations did not exhibit any marginal staining at 10 years (Figure 2). Twenty-seven percent showed slight staining while 9% showed more moderate staining at the margins. None of the restorations needed to be replaced because of staining.

Wear Resistance

Occlusal wear was not an issue at the five-year recall and it continues not to be an issue at the 10-year recall. Sixty-six percent of the restorations exhibited no wear at 10 years and 27% exhibited slight wear (Figure 2). Only 7% of the restorations exhibited moderate occlusal wear.

Conclusions

Alert performed very well at the 10-year recall with each category rating very highly:

- 92% of the restorations received very good to excellent ratings in lack of fracture or chipping.
- 80% of the restorations received very good to excellent ratings in the area of esthetics.
- 91% of the restorations received very good to excellent ratings in lack of marginal staining.
- 93% of the restorations received very good to excellent ratings in wear resistance. ■

Gorilla Seal + + + +

Harry J. Bosworth Co
800.323.4352 - 847.679.3400
www.bosworth.com

Description

Gorilla Seal is a clear, light-cured dental resin formulated to cure to a gloss finish for reduced polishing. **Gorilla Seal** is indicated for sealing composite and temporary restorations and for sealing over I.D. or decorative designs. **Gorilla Seal** is a modified diacrylate-based resin that cures in 20 seconds with a standard high-intensity curing light. It may be used with any 6th-generation bonding agent. The standard kit comes with one, 6-ml bottle or four, 1.2-ml syringes of **Gorilla Seal** including 20 dispensing tips or 12 mixing wells, brushes and handle. Refrigeration is recommended. **Gorilla Seal** was evaluated by 28 consultants in sealing 480 restorations and received an 86% clinical rating.

Suggested Retail Cost

- \$80.00/standard kit

Product Features

Gorilla Seal is clear when cured, leaving the shade of the sealed restoration unchanged. The resin is easy to dispense, and the high viscosity makes it easy to apply. While the brushes included in the kit are useful, many consultants found that a fine sable brush produced a more even coat. The procedures in which **Gorilla Seal** was most often used included sealing temporary restorations and composite restorations. Consultants reported the esthetics of the final surface above average at the time of placement. Several evaluators commented on the glossy shine of temporary restorations when used. Some flaking and roughness of the sealed surfaces was observed at patients' return visits. Overall, 65% of consultants rated **Gorilla Seal** equivalent to or better than their most frequently used material, while fifty percent would switch to it and 43% would recommend **Gorilla Seal** to colleagues.



Consultants' Comments

- ◆ "Nice gloss, especially on temporary crowns."
- ◆ "Crystal clear; unlike some resins that have a yellow tint."
- ◆ "Viscosity is great; it doesn't run."
- ◆ "I would like better brushes in the kit."
- ◆ "I would like the glaze to last longer."

Clinical Tips

- If using **Gorilla Seal** as a sealant before bonding braces, apply the resin and then thin the layer of resin with an air syringe.
- Use as thin a layer as possible to reduce the oxygen-inhibited layer.
- Coat temporaries and fully cure outside of the mouth before seating.

Editors' Note: To cure material, use a halogen light with a wavelength of 400-500 nm. ■

Bisco Dental Products
800.247.3368
www.bisco.com

Description

RefleXions is a nano-technology composite system with low-shrinking nanohybrid dentin shades, and translucent reinforced nanofil enamel shades. It is indicated for use in all anterior and posterior direct restorations. The composite is intended to be layered, with the highly chromatic dentin shades (Light, Medium, Dark, Bleach) overlaid with enamel shades (Clear, Neutral, Gray and Frost). **RefleXions** can be used with either self-etch or total-etch bonding agents. The kit includes eight shades, available in both syringe and uni-dose, *ÆLITEFLO™ LV Shade A2*, *UNI-ETCH®* with BAC, *BisCover™ LV Liquid Polish*, *MODELING RESIN*, accessories and instructions. **RefleXions** received an 86% clinical rating, with 29 consultants evaluating the system in placing over 600 restorations.

Suggested retail price

- \$325.00/kit

Product Features

RefleXions is packaged in a nicely organized storage case that dental assistants found easy to transport and store. Consultants reported that the viscosity of **RefleXions** allowed easy dispensing and nice handling with no sticking to instruments. The *MODELING RESIN* is a surprisingly useful adjunct to sculpting the top layer. The shade recommendation chart is helpful for dentists who are familiar with Vita shades. The shade match of the final restoration and blending with the tooth were rated very good.



Consultants' Comments

- ◆ *"Kit is very complete."*
- ◆ *"Tremendous anterior esthetic composite - patients love the results."*
- ◆ *"Excellent handling and sculptability."*
- ◆ *"Composite is radiolucent."*
- ◆ *"Dentin shades are very opaque."*
- ◆ *"The shade system takes some time to get used to."*

Most evaluators reported that the polishability and final esthetics were some of the most liked features. Overall, 90% of consultants would switch and/or recommend **RefleXions** to a colleague.

Clinical Tips

- Use the *MODELING RESIN* to enhance adaptation of composite to margins.
- Avoid warming the composite as it becomes too soft.
- Use the "Frost" enamel shade on patients who have bleached their teeth. ■

VOCO America
888.658.2584
www.vocoamerica.com

Description

The **Rebilda Post System** is a complete kit that includes the **Rebilda Post**, a radiopaque, translucent fiberglass post. It is indicated for use in endodontic post build-up for support and anchorage of coronal restoration in situations with insufficient tooth structure. Posts have corresponding drills, are color-coded and are supplied in three sizes: 1.2, 1.5, and 2.0 mm. Also included in the kit are Rebilda DC core build-up material and FuturaBond DC dual-cured, self-etch adhesive. The kit includes application aids like endo tips for the cementation and endo brushes for the adhesive application. The **Rebilda Post System** was evaluated by 28 consultants in 212 clinical cases and received a 96% clinical rating.

Suggested retail cost:

- \$415.00/kit

Product Features

Rebilda Post System features all necessary materials in one kit. Each fiberglass post is individually sealed and has easily identifiable color-coding on the package that matches the color of the drill. A quick reference card is conveniently located inside the lid of the kit so that when the kit is opened for use, the card is easy to read. The taper and sizes of the posts were well received, and evaluators reported the drills cut very efficiently. **Rebilda Post System** contains **Futurabond DC**. Having a self-etching adhesive that is compatible with the core material is an asset to the system. Both the adhesive and the **Rebilda DC** core material are dual-cured and may be used to both lute the post and form the core. Overall, evaluators reported that the **Rebilda Post System** was comprehensive and easy to use. Sixty-four percent of consultants rated **Rebilda Post System** better than their current post system and would switch to it, while 61% would recommend the product to colleagues.



Consultants' Comments

- ◆ "Complete kit; good size selection."
- ◆ "This is the most complete packaging I have seen."
- ◆ "Excellent match of drills to post taper."
- ◆ "Smaller posts and extra drills would be great additions to this kit."
- ◆ "Include the bonding procedure on the quick reference card."

Clinical Tips

- Use a conservative amount of core material in the canal. Overfilling could prevent the post from seating completely.
- Briefly light cure the initial layer of core material to tack it in place, then incrementally add material until final contours are achieved. ■

Maxi-Brush + + + +

Denbur, Inc.
800.992.1399
www.denbur.com

Description

Maxi-Brush is an elongated style of fiber-tipped disposable applicator. It is designed to facilitate access to narrow, extended and confined spaces for a variety of applications. The non-lint brushes have fibers along the length and at the tip. Two bending points can create a long or short tip with multiple angles. **Maxi-Brush** is indicated for use in post spaces, proximal boxes, periodontal pockets, axial walls, and any other narrow space. **Maxi-Brush** handles are three shades of blue to identify the three diameters: small (0.90 mm), medium (1.50 mm) and large (1.60 mm). 150 brushes are packaged in an *Easy-Shake* dispenser. Thirty consultants evaluated **Maxi-Brush** in over 1500 clinical cases. This product received an 85% clinical rating.

Suggested Retail Cost

- \$23.10

Consultants' Comments

- ◆ "Bends very easily."
- ◆ "The length is very useful for post procedures."
- ◆ "Tips are stiff with short fibers."
- ◆ "The blue colors of the three sizes are hard to distinguish."

Product Features

Maxi-Brush is useful as a specialty applicator, especially for applying bonding agents and cements into post spaces. Because the brush tips contain a low density of fibers, they are most effective on broad, flat surfaces. The handle length of the applicator and the usefulness of the double bend feature were rated highly. **Maxi-Brush** is packaged in *Easy-Shake* dispenser that allows one applicator at a time to be dispensed, reducing the occurrence of cross contamination. Seventy-seven percent of evaluators rated **Maxi-Brush** equal to or better than their current application, 47% would switch and 70% percent would recommend **Maxi-Brush** to a colleague. ■

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