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Current Trends in Resin Composites

Over the past 50 years, resin composites have undergone tremendous improvements in strength, wear resistance, reduced polymerization shrinkage, esthetics, and handling characteristics. The addition of nanofillers to composites has resulted in better polishability, surface smoothness and translucency. Recently, new formulations of composites provide the ability for bulk filling, adhesion without a separate bonding agent, and improved flowability in a universal composite.

This issue of THE DENTAL ADVISOR describes current trends in resin composites including bulk-fill, self-adhesive and universal flowable composites and recommends highly rated products.

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Current Trends in Resin Composites

Classification of Composites

The most common classification system for resin composites considers the distribution and average particle size of the composite filler. Most resin composites can be classified into three main categories: microfills, microhybrids, and nanofills.

Microfills: Particle size: 0.02- 0.04 µm

Microfilled composites work best for anterior restorations due to their translucency and high luster polish (due to small particles). However, because they are less filled than other composites, they lack strength and should not be used in heavy stress-bearing areas. Microfills are declining in popularity due to advances in microhybrid and nanohybrid composites.

Microhybrids: Particle size: 0.4-1.0 µm

Microhybrids have the needed strength and wear for posterior composites due to their particle size and filler load. They have the polish and esthetic characteristics for anterior restorations but these properties are not sustained long term. They are the most opaque of all composites and, therefore, are great for supporting a microfill layer. Microhybrids are considered a universal composite that can be used in anterior and posterior teeth.

Nanofills: Particle size: 0.01-0.10 µm

Nanofills contain the smallest particles and are the most recently introduced composite. The two types, nanofills and nanohybrids, are composed of various nano-sized particles and fillers. They share the excellent wear and strength properties of microhybrid composites. They are superior to microhybrids in surface smoothness and polish. Nanofills and nanohybrids continue to gain popularity and acceptance due to their excellent strength, wear resistance and polishability.

What type of composites should I use in direct composite veneering procedures?

The best composites for anterior bonding are nanofills because of their strength and high polishability. Products that have a greater shade selection and can be layered with dentin and enamel shades are ideal. We recommend products like **Beautiful II** (SHOFU DENTAL CORPORATION), **Estelite Sigma Quick** (Tokuyama Dental America), **Esthet.X HD High Definition Micro Matrix Restorative** (DENTSPLY Caulk), and **3M ESPE Filtek Supreme Plus Universal Restorative System** (3M ESPE). All four of these products have the above characteristics and have received very high ratings from our clinical consultants. Please see our Product Comparison Tables on our website for more information. Other systems that have not been evaluated but are similar in composition include **Artiste** (Pentron Clinical), **Estelite Omega** (Tokuyama Dental America), and **Venus Diamond** (Heraeus).



Beautiful II
(SHOFU DENTAL CORPORATION)



Estelite Sigma Quick
(Tokuyama Dental America)

Innovations in Resin Composites

I. Bulk-fill Composites

All resin composites exhibit some degree of polymerization shrinkage. To reduce the amount of shrinkage, incremental layering during placement is recommended. Voids or gaps in the restoration can occur if the technique is not done properly, leading to postoperative sensitivity or secondary caries. Curing between layers also adds additional time to the procedure.

To address the issues with incremental layering, some manufacturers have developed bulk-fill flowable composites (**SureFil SDR flow**, **DENTSPLY Caulk**; **Venus Bulk Fill**, **Heraeus**). Another approach is a bulk-fill composite utilizing sonic technology (**SonicFill**, **Kerr Corporation**). The high translucency of these materials allows for high light penetration, ensuring a deep depth of cure.

A. Bulk-fill Flowable Composites

These composites can be used as a bulk-fill base (up to 4 mm in depth), a timesaving feature. The high viscosity allows for good adaptation to walls and proximal boxes. A shortcoming is that these composites are not highly filled and exhibit low wear resistance; therefore, they must be layered with a stronger composite.

SureFil SDR flow (**DENTSPLY Caulk**) releases fluoride and is available in three shades: A1, A2, and A3. When compared to traditional flowable composites, **SureFil SDR flow** has shown reduced shrinkage stress and a high depth of cure.

B. Bulk-fill: Sonic Technology

SonicFill (**Kerr Corporation**) is a single-step, bulk-fill composite (up to 5 mm) that does not require an additional composite layer. Sonic activation lowers the viscosity of the highly filled composite, allowing for easy placement and adaptation. After the composite has been placed, it returns to a stackable, sculptable state. The low-shrink, highly filled composite has a high depth of cure and can be placed in increments of 5 mm. **SonicFill** is available in three shades: A1, A2, and A3.

TDA RESEARCH REPORT: In a recent study, several composites were tested to check the depth of cure as compared to the manufacturer's recommended maximum curing depth. The results of the study showed that the increased levels of photoinitiators in **SonicFill** allowed a 5 mm depth of cure in 20 seconds with a 550 mW/cm² light source. *For more information, refer to: THE DENTAL ADVISOR Research Report, No. 33, February 2011 (<http://www.dentaladvisor.com/publications/research-reports/index.shtml>).*

II. Self-adhesive Flowable Composites

Traditional composite restorations require the application of an adhesive system to the tooth before the placement of the composite. While a two-step procedure works well in a majority of cases, there are some situations where a one-step composite restoration would be beneficial, especially when working with pediatric patients where you need to work quickly. In recent years, two manufacturers have introduced self-adhesive composites (**Fusio Liquid Dentin**, **Pentron Clinical**; **Vertise Flow**, **Kerr Corporation**). These composites bond to tooth structure without the need of a separate bonding agent, thus reducing the number of steps, saving time, and potentially reducing postoperative sensitivity. Self-adhesive composites are ideal for use as a liner under larger restorations, as pit and fissure sealants, and as small Class I and Class II restorations (Figure 1).

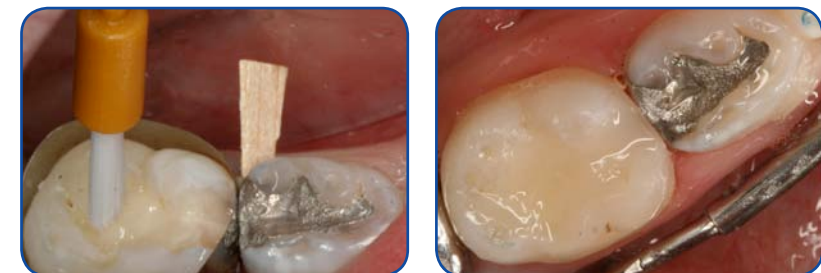


Figure 1. Use of **Vertise Flow** for a Class II restoration for a pediatric patient. (Images courtesy of Dr. Gytis Udrys.)

Innovations in Resin Composites (continued)

III. Universal Flowable Composites

Traditional flowable composites are known to adapt well to cavity preparations and are easy to place. Unfortunately, some flowable composites lack strength and wear resistance due to their low filler content and have primarily been used as a base or liner or for minimally invasive restorations.

Recently, manufacturers have developed a new generation of highly filled flowable composites indicated for Class I-V restorations (*BEAUTIFIL Flow Plus*, SHOFU DENTAL CORPORATION; *G-aenial Universal Flo*, GC America (Figure 2); *GrandioSO Heavy Flow*, VOCO America). The high filler content increases strength and wear resistance, lowers polymerization shrinkage, and allows the material to be stacked. The addition of nanofill particles assists in creating highly esthetic restorations.



Figure 2. Use of *G-aenial Universal Flo* (GC America) to repair a small anterior chip on tooth # 8^{DIF}. (Images courtesy of Dr. Sabiha S. Bunek.)



BEAUTIFIL Flow Plus
(SHOFU DENTAL CORPORATION)

IV. What's New in Composite Technology?

The *ET 3000* (Brasseler USA) is an oscillating composite instrument that increases the flow of resin composites and reduces stickiness. The instrument is lightweight, cordless, portable, and has an extensive selection of titanium nitride-coated tips that mimic the shapes of the most popular composite placement instruments. *ET 3000* utilizes a lithium ion battery and operates for hours on a single charge.

Q I know there are pink porcelains, but are there any pink composites for restoring Class V lesions so that they appear as gingival tissue rather than very long teeth?

A Yes, a composite called *Amaris Gingiva* (VOCO America) comes with three different shades of opaques and a natural gingiva shade to create the effect of gingival tissue rather than long teeth when restoring Class V lesions. The opaques are a flowable consistency and the natural translucent gingival shade composite is sculptable. It can be used with any bonding agent system.

Q If there is a layer of adhesive between a composite restoration and the underlying enamel or dentin, how does the fluoride released in the composite reach tooth structure?

A Resin composites release very little fluoride, even though it may be included in their composition. Their chemistry is very different than glass ionomers, which truly do release fluoride into the surrounding tooth structure. Bonding agents would block fluoride uptake from the tooth structure below. However, glass ionomers do not need bonding agents to bond to tooth structure. Therefore, if you are truly interested in fluoride release, you should think about lining the base of the preparation with a glass ionomer liner before placing the bonding agent and subsequent composite. Another option is to use a fluoride-containing bonding agent.

Composite					
Product	Company	Type	Flexural Strength	Flexural Modulus	Clinical Rating
3M ESPE Filtek Supreme Ultra Universal Restorative	3M ESPE	Nanofill	nt	nt	92%
Alert	Pentron Clinical	Posterior	nt	nt	92%
ALPHA II AP	Dental Technologies	Microhybrid	High	High	92%
Amaris	VOCO America	Microhybrid	nt	nt	91%
Beautifil II	SHOFU DENTAL CORPORATION	Nanohybrid	High	High	94%
CLEARFIL Majesty Esthetic	Kuraray America	Nanohybrid	nt	nt	91%
CLEARFIL Majesty Posterior	Kuraray America	Nanohybrid	nt	nt	88%
Estelite Sigma Quick	Tokuyama Dental America	Supra-nano	High	High	99%
Esthet-X HD High Definition Micro Matrix Restorative	DENTSPLY Caulk	Microhybrid	High	High	93%
GC KALORE	GC America	Nanohybrid - low shrink	High	High	91%
GRADIA DIRECT	GC America	Microhybrid	High	Medium	98%
GrandioO	VOCO America	Microhybrid	High	Very high	96%
ice	SDI (North America), Inc.	Nanohybrid	High	High	87%
IPS Empress Direct	Ivoclar Vivadent	Nanohybrid	nt	nt	93%
N'Durance Cristal	Septodont	Nanohybrid	High	High	na
Nuance Universal Composite	Discus	Nanohybrid	nt	nt	89%
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 - nanohyrid - low shrink; enamel - reinforced nanofil	High	High	86%
SpectraFill	GlasSpan, Inc.	Nanohybrid	High	High	91%
SYNERGY D6	Coltene/Whaledent	Microhybrid	Very high	High	91%
Tetric EvoCeram	Ivoclar Vivadent	Nanohybrid	High	High	96%
TPH3 Micro Matrix Restorative	DENTSPLY Caulk	Microhybrid	nt	nt	91%
Virtuoso Universal	Den-Mat Holdings, LLC	Nanohybrid	Med-high	Medium	96%



TDA Recommends The Following Products:

- **Universal Composite:** *Estelite Sigma Quick* (Tokuyama Dental America)
- **Universal Flowable Composite:**
G-aenial Universal Flo (GC America)
BEAUTIFIL Flow Plus (SHOFU DENTAL CORPORATION)
- **Bulk-fill Composite:** *SureFil SDR flow* (DENTSPLY Caulk)



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NeoDiamond + + + + +

Microcopy
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Description

NeoDiamond is a disposable, individually packaged and sterilized diamond bur. It uses **Triton™** bonding to fasten diamonds to a Swiss-made stainless steel shank which exposes 20% more diamond cutting surface. These single-use diamonds are available in extra coarse, coarse, medium, fine, and very fine grits in packs of 25. **NeoDiamond** is color-banded for ease of grit identification. The burs evaluated included:

- #2133C occlusal reduction - coarse grit;
- #3923VF finishing diamond, football - 30 micron very fine grit;
- #1923C football - coarse grit;
- #118.9C round end taper - coarse grit;
- #0916.8C flat end taper - coarse grit; and
- #0710C flat end cylinder - coarse grit.

Numerous other shapes and sizes are available. **NeoDiamond** was evaluated by 25 consultants in 837 uses. This product received a 96% clinical rating.

Suggested Retail Cost

- As low as \$1.30 per diamond / 25 per pack

Product Features

Consultants liked the sterile packaging and the wide variety of

Consultants' Comments

- ♦ "Sterile packaging, good quality, wide variety of shapes."
- ♦ "I liked the speed of reduction and lack of clogging."
- ♦ "An excellent bur for gross reduction of a crown preparation."
- ♦ "The #0710C flat end cylinder is my new favorite bur for composite preparations and removing amalgam."
- ♦ "I was very pleasantly surprised how well this disposable diamond cut."

shapes of **NeoDiamond**. The most popular shape evaluated was the round-end taper. The majority of consultants reported that cutting efficiency was excellent. The coarse grit cut through enamel and was durable enough for multiple preparations. Having a fresh diamond for each procedure resulted in speedy reduction without clogging. The clear packaging allows the user to see product, and it is well labeled for re-ordering. Twenty-four percent of consultants reported that **NeoDiamond** was better than their current diamond burs and 60% reported that it was equivalent. Eighty-four percent would switch to **NeoDiamond** and 92% would recommend it.

Clinical Tip

- Keep a cleaning block handy. ■

Introducing THE DENTAL ASSISTANT corner!

Adding to our "Corners of Information" is the **Assistant Advisor**, a place specifically for the Dental Assistant professional. Jennifer Ireland, C.D.A., R.D.A., of THE DENTAL ADVISOR Editorial Board will provide an overview of our monthly main topic from the assistant's perspective. The area will also highlight review of products to assist the assistant, answers to questions, and an opportunity for assistants to make suggestions and submit questions. Be sure to let your assistants know of the valuable information available at THE DENTAL ADVISOR Online, the **Assistant Advisor** corner is under Clinical Evaluations (<http://www.dentaladvisor.com/clinical-evaluations/assistant-advisor.shtml>)



Ask the Assistant

HD-17 CAM Blocks 1-year Clinical Performance + + + + ½

Benco Dental
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www.benco.com

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Description

HD-17 CAM Blocks are leucite-reinforced blocks of ceramic on mandrels that fit *CEREC* mills, up to the *CEREC 3* and the *inLab*, but not the *MC XL* machines. The blocks are available in eight *Vita* shades plus Bleach Light shade, in block sizes 8, 10, 12, and 14. The clinical performance of **HD-17 CAM Blocks** was evaluated using the *CEREC System* within an esthetic practice over a 12-month period.

Clinical Evaluation Protocol

- A total of 40 posterior restorations were placed. Restoration types included inlays, onlays, and full crowns.
- When patients return for their hygiene appointments (recall), their restorations are checked. Thirty-six restorations were evaluated at 12 months.
- Of the recalled restorations, 26 were placed in molars and 10 were placed in premolars.
- Restorations were bonded with a total-etch system (*Prime & Bond NT*, *DENTSPLY Caulk*) and an esthetic resin cement (Variolink II, Ivoclar Vivadent).
- Restorations were evaluated and rated on a scale of 1 to 5: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent.

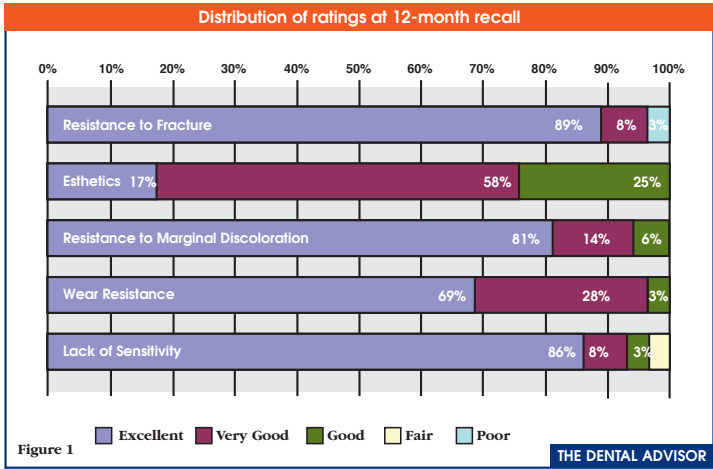
Clinical Observations

Resistance to Fracture

Thirty-five of the 36 recalled restorations were intact when evaluated at 12-months. Eighty-nine percent of restorations were rated as excellent for fracture resistance, and 8% were rated very good (Figure 1). One restoration, an MOD inlay on tooth #13, had a critical fracture, which required replacement within the first six-month period. No other restorations were found to have any fractures or chipping at recall, including several clinical situations where the patient was reported to be a clinical bruxer. This result is consistent with other material options for the *CEREC* system.

Esthetics/Vitality

HD-17 CAM Blocks are monochromatic blocks by design. Naturally that limited the clinical situations in which **HD-17 CAM Blocks** could be used without characterization with custom stains and glazes. The esthetics were found to be very good (58%) to excellent (17%) when used with proper case selection (Figure 1). In general, shades with higher values were found to have better translucency than the shades with lower values. At the time of placement several restorations were found to be too opaque; however, esthetics was often rated higher at recall, which perhaps may be attributed to rehydration of the tooth.



Resistance to Marginal Discoloration

Ninety-four percent of restorations rated as either excellent or very good for lack of marginal stain during the first year (Figure 1). Most restorations were designed to avoid areas of heavy occlusal contact and most restorations were bonded with rubber dam isolation.

Wear Resistance

Wear of the restoration was more patient dependant than material specific. Nearly all restorations were rated as excellent (69%) or very good (28%) (Figure 1). Patients with a history of bruxism and evidence of clinical wear were not excluded from this evaluation; however, occlusal design and margin placement were meticulously considered in those individuals.

Sensitivity

Sensitivity was rated as excellent (86%) in most cases at evaluation (Figure 1). In general little to no post-operative sensitivity was present at the recall examinations.

Overall, the categories of resistance to fracture, esthetics, resistance to marginal discoloration, wear, and lack of sensitivity all received high ratings (Figure 2).

Sparkle V + + + + ½

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Description

Sparkle V is a 5% sodium fluoride varnish indicated for dentin sensitivity. It is designed to be great tasting and to dry to a natural tooth shade. **Sparkle V** contains Xylitol and is gluten-, aspartame- and saccharin-free. It is dispensed in single-dose packages with bendable brush applicators. Each box contains 120 unit doses in bubble gum flavor with manufacturer's instructions. **Sparkle V** was evaluated by 44 consultants in 1025 uses. It received a 91% rating.

Suggested Retail Cost

- 169.95/kit

Product Features

Sparkle V applies smoothly to tooth surfaces without the clumping that similar products exhibit. After application, no color is visible on the teeth. Consultants used **Sparkle V** as a fluoride treatment during hygiene appointments and found it effective in reducing dentin sensitivity in adults. The majority of patients liked the bubblegum flavor, but some found it too sweet; hygienists would like other flavors. Some of the brushes fell out of the unit-dose packets in the box, resulting in consultants' opinions that the packaging could be improved. Thirty-nine percent of consultants reported that **Sparkle V** was better than their current fluoride varnish and 36% reported that it was equivalent. Sixty-six percent would switch to **Sparkle V** and 77% would recommend it.



Consultants' Comments

- ♦ "Easy to apply and patients liked both the feel and flavor."
- ♦ "The decrease in hypersensitivity was great."
- ♦ "Goes on smoother and without clumps than most other varnishes I have tried."
- ♦ "The brush has a long handle that offers excellent access to third molars."
- ♦ "Some patients found that the taste lingered."
- ♦ "The brushes fall out of the package when opening."

Clinical Tip

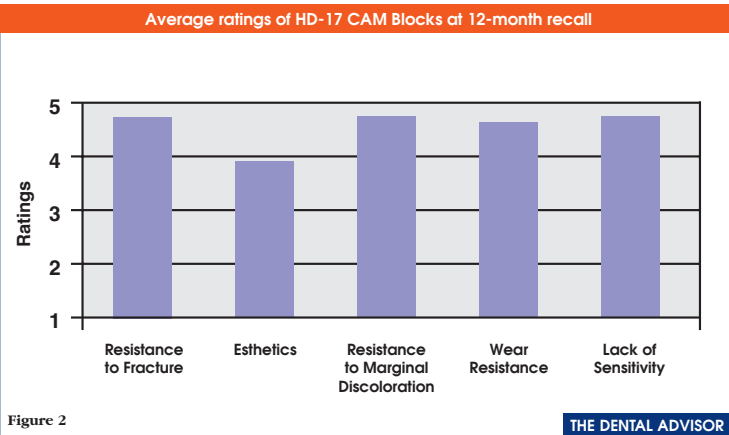
- Make sure teeth are dry during application. ■

HD-17 CAM Blocks 1-year Clinical Performance + + + + ½

Summary

HD-17 CAM Blocks are leucite-reinforced ceramic for the *CEREC* chairside CAD/CAM milling unit. Restorations were placed and recalled at 6 and 12 months during the patients' subsequent hygiene appointments. Restoration types included inlays, onlays and crowns. There was one clinical failure of a restoration and one restoration was replaced because the patient preferred to have a gold restoration. The categories of resistance to fracture, esthetics, resistance to marginal discoloration, wear, and lack of sensitivity all received high ratings. **HD-17 CAM Blocks** received a 92% clinical rating.

Editor's Note: Since the evaluation of the **HD-17 blocks** Benco has updated their product to also be used in the *CEREC MC XL* mill. ■



3M ESPE Filtek LS Low Shrink Posterior Restorative System 3-year Clinical Performance + + + + +

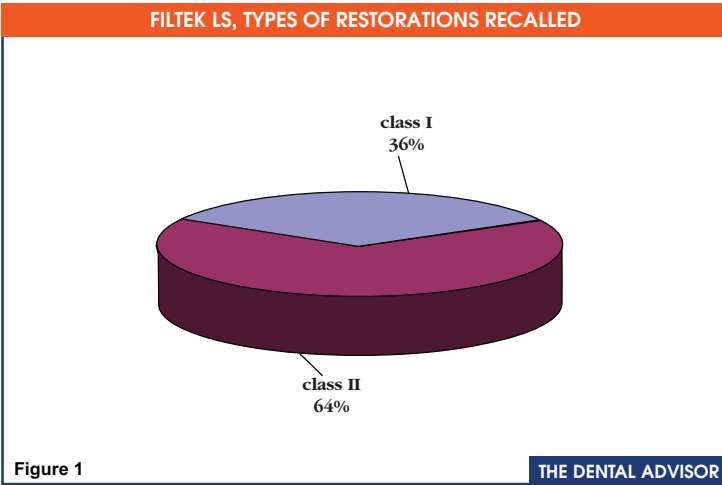
3M ESPE
800.634.2249
www.3mespe.com

Description

3M ESPE Filtek LS Low Shrink Restorative is a posterior composite formulated to minimize polymerization shrinkage. The composite is light cured, radiopaque and is filled 55% by volume with inorganic fillers. The silorane chemistry of **Filtek LS** is very different compared to methacrylate-based resins, and a compatible bonding system is required. The **LS System Adhesive Self-Etch Primer and Bond** must be used with **Filtek LS** composite. The composite is available in shades A2, A3, B2, and C3 in syringes and unit-dose capsules. Both the composite and adhesive can be cured by a halogen or LED light. This composite received a 96% clinical rating.

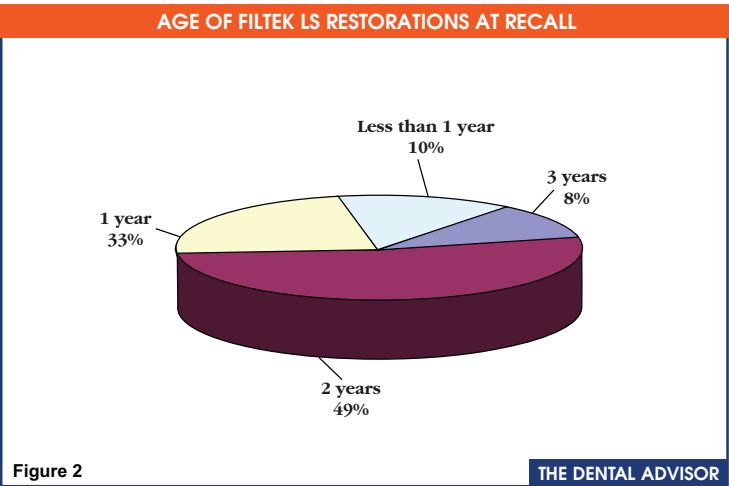
Clinical Evaluation Protocol

- 280 **Filtek LS** restorations have been placed during a three-year period.
- **LS System Adhesive** was used to bond all restorations.
- Class I and Class II posterior restorations were placed (Figure 1).
- 148 restorations have been evaluated for clinical performance at various stages since placement (Figure 2).
- Clinical performance of restorations involved evaluation of Resistance to chipping/fracture, esthetics, resistance to marginal discoloration, wear resistance and lack of Post-operative sensitivity. Restorations were rated on a 1-5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent (Figure 3).



Consultants' Comments

- ◆ "Good durability for large posterior restorations."
- ◆ "No postoperative sensitivity."
- ◆ "Opacity provides good masking of stained dentin, which can be an advantage in posterior teeth."
- ◆ "Radiopacity is less apparent than I would like."



Clinical Observations

Resistance to chipping/fracture

All **Filtek LS** restorations were still in function during the first three years of placement (Figure 3). Two molar restorations exhibited small chips that did not require repair or replacement.

Esthetics

All **Filtek LS** restorations had acceptable esthetics at recall (Figure 3). The esthetic demands of posterior restorations are limited to general shade match and blending, which **Filtek LS** accomplished. Six restorations rated "good" to "very good" rather than excellent, as a result of a darkening or yellowing of the composite. The limited number of shades was adequate for most cases. One restoration was reported to have a rough, grainy surface.

Resistance to Marginal Discoloration

Filtek LS restorations remained well sealed, with very little marginal staining or leakage noted (Figure 3). The proprietary self-etch bonding agent, **LS System Adhesive** was used for bonding in all cases. Only three of the 148 restorations had visible staining at the margins.

Wear Resistance

No signs of wear were seen on most of the restorations recalled (Figure 3). One restoration, tooth #30-occlusal, sustained wear at the margin, requiring repair of that area.

OneGloss PS + + + + 1/2

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CORPORATION
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760.736.3277
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a sample or more information!



Description

OneGloss PS are disposable, one-step aluminum oxide finishers and polishers for use on composite restorations and temporary crowns and for removal of excess cement and stains from enamel. **OneGloss PS** (Plastic Shank) is designed for slow-speed, latch-head handpieces at 3,000-10,000 rpm. **OneGloss PS** is available in three different shapes (cups, cones, midi points). The aluminum oxide finishers and polishers are mounted on sturdy plastic mandrels and are individually wrapped. The **OneGloss PS Assortment Kit** contains 15 cups, 15 inverted cones, 20 midi points, product literature, and manufacturer's instructions. **OneGloss PS** was evaluated by 15 consultants in 362 uses. This product received a 91% clinical rating.

Suggested Retail Cost

- \$98.14

Product Features

Nearly all of the consultants liked the selection of shapes and the durability of the finishers and polishers. The polishers are individually packaged in clear cellophane that is easy to open at the time of use and keeps them clean during storage. **OneGloss PS** produces a smooth finish and a light polish to composite surfaces. For a high luster, other products may be used after **OneGloss PS**. Fifty-three percent of consultants reported that **OneGloss PS** finishers and polishers were better than their current composite finishers and polishers and 13% reported that they were equivalent.



Consultants' Comments

- ◆ "I like the shape selection, ease of use and individual packaging."
- ◆ "Polishers are very durable - they don't break down when you exert pressure."
- ◆ "Shapes were good and instruments were flexible."
- ◆ "Does not leave grit on the tooth after use."
- ◆ "The points wobbled in the handpiece."
- ◆ "I prefer multiple-use finishers and polishers."
- ◆ "Final polish did not produce a high luster."

Fifty-three percent would switch to **OneGloss PS** finishers and polishers and 73% would recommend them.

Clinical Tips

- Use higher pressure for finishing and lighter pressure for polishing.
- Use with water spray with latch-type slow-speed handpiece.
- Do not exceed 15,000 rpm. ■

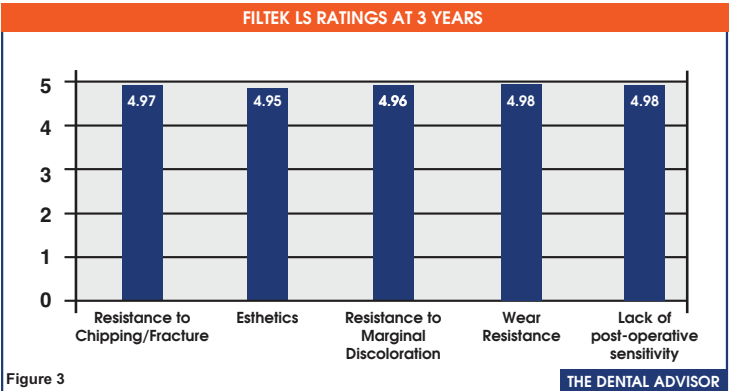
3M ESPE Filtek LS Low Shrink Posterior Restorative System 3-year Clinical Performance + + + + +

Lack of Post-operative Sensitivity

One instance of slight post-operative sensitivity was reported by patients when asked at their recall appointments (Figure 3).

Summary

3M ESPE Filtek LS Low Shrink Restorative was used in conjunction with the self-etching bonding agent **LS System Adhesive** in restoring 280 teeth. This low-shrink composite is based on a new chemistry for direct restoration of posterior teeth. Placement and recall of restorations has been ongoing for three years. All restorations remained intact during this time. Marginal staining, wear and post-operative sensitivity were minimal. ■



BEAUTIFIL Flow Plus + + + + ½

SHOFU DENTAL CORP.
800.827.4638
760.736.3277
www.shofu.com

Request a Sample:
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a sample or more information!



Description

BEAUTIFIL Flow Plus is a fluoride-releasing and recharging, light-cured flowable restorative material that incorporates *Giomer* technology. It is indicated for all classes of anterior and posterior restorations and for the repair of restorations and prostheses. **BEAUTIFIL Flow Plus** is designed to be a base, a liner and a final restorative all in one. This flowable composite is available in two viscosities and is delivered from syringes designed for no dripping or oozing. **BEAUTIFIL Flow Plus** cures in 20 seconds with a halogen light unit and in 10 seconds with an LED light-curing unit when placed in 2 mm increments. *Zero Flow* (F00) shades are: Bleach White , A0.5, A1, A2, A3, A3.5, A4, Opaque shades A0.5-O, A1-O, A2-O, and *Incisal*. *Low Flow* (F03) shades are: Bleach White, A0.5, A1, A2, A3, A3.5, A4, Opaque shades A2-O, A3-O, Incisal, Milky White, and Cervical. The **BEAUTIFIL Flow Plus Introductory Kit** (available for a limited time only) contains four 2.2-g syringes of composite: one each of shades A2 and A3 in each of the two viscosities; manufacturer’s instructions; and product information. **BEAUTIFIL Flow Plus** is also available in refill syringes. **BEAUTIFIL Flow Plus** was evaluated by 15 consultants in 377 uses. **BEAUTIFIL Flow Plus** received a 91% clinical rating.

- Suggested Retail Cost
- \$99.95/Introductory Kit (available for a limited time only)
 - \$34.00/2.2 g syringe refill

Clinical Observations

Packaging/Manufacturer’s Instructions
BEAUTIFIL Flow Plus is packaged in familiar syringes. Color-coded labels distinguish the two different viscosities. A laminated technique guide, for chairside use, is available upon request, as a reference for the layering technique.

Ease of Dispensing
Consultants rated ease of dispensing as good. There were no air inclusions or bubbles observed during dispensing.

Ease of Placement/Stackability/Viscosity
Consultants rated ease of placement, stackability and viscosity as good to very good. The material doesn’t slump. Seventy-seven percent of the consultants liked the choice of two viscosities of **BEAUTIFIL Flow Plus**. The ability to use a flowable composite for all restorations was an advantage for select cases.

Resin Cone Technique
Sixty percent of the consultants used the resin cone technique – a four-layer technique utilizing both viscosities for posterior



Consultants’ Comments

- “I can control the flow – composite doesn’t slump.”
- “I achieved good surface finish.”
- “I liked the option of two viscosities.”
- “The composite is translucent and has a great color match.”
- “Interproximal voids sometimes occurred when using the resin cone technique.”

restorations. With proper matrix band adaptation, class II restorations with tight contacts can be produced.

Shade Match Before and After Curing
Shade match before and after curing was good. The translucency of the composite enables blending with the surrounding enamel.

Ease of finishing and Polishing/Final Esthetics
Since occlusal anatomy cannot be sculpted, additional finishing is required. Ease of finishing and final esthetics were rated as good to very good. Consultants liked the polishability.

Summary

Forty-seven percent of consultants reported that **BEAUTIFIL Flow Plus** was better than their current flowable composite and 38% reported that this universal flowable composite was better than their current packable universal composite. Fifty-three percent would switch to **BEAUTIFIL Flow Plus** and 73% would recommend it. ■



Esthet-X HD High Definition Micro Matrix Restorative + + + + ½

DENTSPLY Caulk
800.532.2855
www.caulk.com

Description

Esthet-X HD High Definition Micro Matrix Restorative is a visible-light-cured, radiopaque, composite restorative material for anterior and posterior restorations of primary and permanent teeth. It is available in pre-dosed .25gm Compules tips and 3 gm *Easy Twist* syringes in five translucent enamel shades, 19 regular body shades, and seven opacous dentin shades, for a total of 31 shades. It may be used in a single shade or in a layering technique and offers a number of unique shades for hard-to-match cases. **Esthet-X HD** is indicated as a direct restorative for all cavity classes in anterior and posterior teeth, for direct esthetic veneering and cosmetic reshaping, and for indirect fabrication of inlays and onlays. **Esthet-X HD** is compatible with all methacrylate-based bonding agents. The *Compules Tips* complete kit contains: 156 0.25 g compules tips each; three of each shade - AE, GE, A4, B5/DY, C4 D3, WO, A4-0, B2-0, C1-0, C4-0, D3-0; five of each shade - CE,WE, YE, W, XL, B1, B2, B3, C1, C2, C3, C5/XGB, D2, U; 10 of each shade: A1, A2, A3, A3.5, A2-0; *TruMatch Shade Guide*; *Compules Tips* gun; 10 *Prime & Bond NT Unit doses*; unit dose holder; one syringe of *Esthet X Flow* and 15 syringe tips; one 3-ml syringe of *Caulk* 34% Tooth Conditioner Gel with 25 applicator tips; *Enhance Finishers* - 10 discs, 5 cups, 5 points; 50 flocked applicator tips; *PoGo Micro-Polishers* - 5 cups, 5 points, 10 discs; product literature; manufacturer instructions; and MSDS. **Esthet-X HD** was evaluated by 31 consultants in 1227 uses. It received a 93% clinical rating.

- Suggested Retail Cost
- \$777.90/Compules Tips complete kit

Product Features

The shade selection of **Esthet-X HD** is excellent for creating

Consultants’ Comments

- “Very complete kit.”
- “Great final polish – high shine.”
- “Excellent for anterior esthetic cases.”
- “Handling was good.”
- “Good selection of shades – allows for layering technique. Shades are not too opaque, and the translucency is good for most cases.”
- “Composite has a chameleon effect - picks up underlying tooth color.”
- “Shades are difficult to read on the compules.”

esthetic restorations with the layering technique. The shade match and translucency create very good blending with the surrounding tooth enamel. The composite is an excellent choice for anterior cases. If layering is not desired, any of the shades may be used alone. When sculpting the surface of the composite, the material is moderately sticky and drags with the instrument. A nice polish is easily achieved with conventional rotary instruments. The kit is complete and includes everything needed for the procedure. The printing on the Compules Tips is small and difficult to read. Consultants suggested that labeling of the individual compartments in the kit with shades would improve chair-side efficiency Thirty-six percent of consultants reported that **Esthet-X HD** was better than their current resin composite and 52% reported that it was equivalent. Eighty percent would switch to **Esthet-X HD** and 94% would recommend it.

Clinical Tips

- Use an opaque shade layer in class III and class IV restorations. If not, the translucency may result in a darker (gray) look to the restoration. The opaque shades are more saturated in color and help give depth to the color in the final restoration.
- Ambient light causes the material to begin setting. ■

Correction - Estelite Sigma Quick 2-year Clinical Performance + + + + +

Estelite Sigma Quick is a supra-nano filled, low-shrinkage composite indicated for anterior and posterior class I-V restorations. **Estelite Sigma Quick** implements RAP technology (Radical-Amplified Photopolymerization initiator technology), which offers increased working time of 90 seconds under ambient light and decreases the curing time to 10 seconds with a halogen light. **Estelite Sigma Quick** is available in both syringes and pre-loaded tips (PLTs) in shades: A1, A2, A3, A3.5, A4, 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.

Estelite Sigma Quick was incorrectly listed with + + + + in THE DENTAL ADVISOR, Vol. 28, No. 5, June 2011. This product received + + + + + for the two-year performance evaluation.

BEYOND StayWhite Professional Take-home Tray Whitening System with InFORM Vacuum Forming Machine + + + +

Beyond Dental & Health
281-277-4352
www.beyonddent.com

Request a Sample:
Visit www.dentaladvisor.com to request a sample or more information!



Patients' Comments

- ♦ "Fast, easy to use and worked well."
- ♦ "Gel stays in the tray - does not leak onto my gums."
- ♦ "My teeth are whiter."
- ♦ "Too much sensitivity."
- ♦ "Bad taste."

Consultants' Comments

- ♦ "Setup is easy, time is programmed, and quality is excellent."
- ♦ "Appliances fit snug and tight."
- ♦ "The pause feature is great if the program needs to be interrupted."
- ♦ "Both square and round tray materials can be used."
- ♦ "The beads are too big and the model moves during vacuuming - these factors can result in remakes."
- ♦ "The perforated surface should have more holes in it."
- ♦ "Instructions are not very thorough."

Equipment Features

The **InFORM Vacuum Forming Machine** includes features not seen on other machines. By accepting commonly available square sheets of plastic as well as round sheets, the machine provides the user with flexibility in material selection. After loading the sheet and choosing the proper program, the machine automatically raises the sheet, heats it, and lowers it over the prepared model. If the model has been trimmed, it may be placed directly on the perforated surface for vacuforming. For untrimmed models, the perforated bowl is filled with steel beads, and the model is nestled in place, leaving only the desired area exposed. Care must be taken to properly position the model in the beads. During vacuforming, vibration occurs and the model can sink into the beads, and beads may rise up out of the bowl and fall onto the floor. The machine comes programmed for use with the **StayWhite** tray material. Consultants reported that the vacuum forming system worked well for bleaching trays. Results were less consistent for other applications, mainly due to a lack of information available

Build-It Light Cure Core Material + + + +

Pentron Clinical
800.551.0283 - 230.265.7397
www.pentron.com

Description

Build-It Light Cure Core Material is a light-cured, Bis-GMA & BPA-free composite indicated for use as a core build-up material on vital and non-vital teeth and as a restorative material. It is compatible with 4th- to 7th-generation bonding agents. The material is radiopaque, highly translucent, and available in syringe or single dose in a translucent shade. **Build-It Light Cure Core Material** is cured for 20 seconds per surface with a curing light with an output in excess of 600 mW/cm². According to the manufacturer, the material has a 10 mm depth of cure. The **Syringe Kit** contains two, 2.2-ml syringes. Single doses of 0.25 g are provided in a 30-count bottle. **Build-It Light Cure Core Material** was evaluated by 30 consultants in 613 uses. It received a 90% clinical rating.

Suggested Retail Cost

- \$39.95/syringe kit
- \$54.95/30 single dose

Product Features

Most of the consultants liked the handling characteristics of **Build-It Light Cure Core Material**. It is sculptable without being sticky to instruments, and it stays where placed without slumping. For certain indications, such as adaptation around pins, posts and undercuts, consultants preferred a more flowable material. After light curing, the material has a very hard surface, and consultants commented that the material cuts like dentin. The translucent shade blends well enough with the tooth to be used under esthetic ceramic restorations, yet it can be visually differentiated from dentin. The tip of the single-dose capsule has a wide opening to allow easy extrusion of the material; however, in some cases, the tip was too wide for access into narrow areas. Twenty-seven percent of consultants reported that **Build-It Light Cure Core Material** was better than their current composite core material and 37%



Consultants' Comments

- ♦ "Packs and sculpts easily."
- ♦ "I like the single dose capsules."
- ♦ "Great for those large post and core build ups; it cuts and feels like dentin."
- ♦ "I would like the syringe tip to be a slightly smaller diameter to make for an easier injection around tight corners and small spaces."
- ♦ "I would like more contrast in color between core material and tooth."

reported that it was equivalent. Forty percent would switch to **Build-It Light Cure Core Material** and 70% would recommend it.

Clinical Tips

- Dim overhead light while using this material to avoid premature setting.
- Ensure that the light tip is in close proximity to the material to achieve maximum curing.
- Place an initial increment into the deepest areas and cure. Use a contact former to enhance proximal contacts. ■

BEYOND StayWhite Professional Take-home Tray Whitening System with InFORM Vacuum Forming Machine + + + +

on heating/vacuum times for those materials. Sixty percent of consultants reported that **InFORM** was better than their current vacuum forming system and 10% reported that it was equivalent. Seventy percent would switch to **InFORM** and 80% would recommend it.

Clinical Tips

- With the **StayWhite** tray material, the **InFORM** should be set at a heating time of two minutes and a forming time of one minute. For other materials, refer to heating recommendations

- of the manufacturer.
- A handheld magnet included with the machine can be used to remove the beads from the formed tray or to collect those that overflow out of the machine.
- Use of a block-out resin on models is recommended to create reservoirs in whitening trays.

Editor's Note: Since the completion of the evaluation of the **InFORM Vacuum Forming Machine** the manufacturer has completed a comprehensive instruction manual that includes heating and vacuuming times for a variety of materials. ■

implantlink semi + + + + 1/2

DETAX GmbH
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www.detax.de

Description

implantlink semi is a dual-cured, temporary resin cement for luting restorations to implants. **implantlink semi** is designed to have very low displacement resistance and the possibility of a low film thickness of less than 10 µm. The manufacturer claims a high compressive strength and hermetic sealing. **implantlink semi** can be used with all conventional material combinations. It is eugenol-free, odorless and tasteless and available in a natural opaque color for screening metallic abutments. The working time at room temperature is about 80 seconds and the cement self cures in 5-6 minutes. Light curing for approximately 20 seconds per surface produces setting to a gel phase. The kit contains one, 5 mL automix syringe of cement; 10 mixing tips; manufacturer's instructions; and MSDS. **implantlink semi** was evaluated by 23 consultants in 185 uses. This product received a 91% clinical rating.

Suggested Retail Cost

- \$53.00/kit

Product Features

implantlink semi is neat and easy to use from the automix syringe. The low viscosity resin spreads easily inside the restoration, and the thixotropic nature of the cement allows complete seating of the restoration with pressure. Tack curing allows easy removal of excess cement at the margins during the gel phase. The complete setting of the cement in areas not exposed to the light, 5-6

Consultants' Comments

- ◆ "Nice mix, nice shade, easy to handle."
- ◆ "Ease of dispensing."
- ◆ "I liked the gel phase clean-up."
- ◆ "Ease of removal of restoration."
- ◆ "Sporadically, I had some issues with retention."

minutes as recommended by the manufacturer, was considered too long, however, this is the standard self-cure setting time of other temporary implant cements on the market. While **implantlink semi** is designed for semi-permanent cementation, some consultants experienced, in a few cases, retention problems with crowns coming off during the three-month evaluation period. Forty-four percent of consultants reported that **implantlink semi** was better than their current temporary cement and 35% reported that it was equivalent. Seventy percent would switch to **implantlink semi** and 78% would recommend it.

Clinical Tips

- In order to avoid adhesive problems, do not block screw channel with petroleum jelly or wax.
- Do not use bonding agents, adhesives or primers with this product.
- Tack cure with light is recommended to reduce setting time.
- If transparent material (e.g. translucent ceramics) is used, additional light exposure will accelerate curing.

Editor's Note: *implantlink semi Forte is available for cases in which more retention is required.* ■

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