THE DENTAL ADVISOR™

"Improving Patient Care Through Research & Education"

Photography by Aini Karani

Infection Control Update: Instrument Reprocessing

An evolution of infection control strategies, technologies and products continues as ongoing scientific-, epidemiological-, and clinical-based reports identify and describe healthcare occupational infectious disease risks. Despite advances in technology and product development, however, the basic principles of infection control and asepsis remain unchanged.

This issue of THE DENTAL ADVISOR focuses on the area of instrument reprocessing, a complex process that requires multiple steps, including cleaning, packaging, sterilization, and storage. There are a number of available products, which can allow clinical personnel to accomplish the primary goal of instrument reprocessing – delivery of sterile instruments to patients.

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MAIN TOPIC

CLINICAL EVALUATIONS

EDITORS' CHOICE

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

RATINGS

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

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Infection Control Update

The Centers for Disease Control and Prevention (CDC) list four major principles with suggested preventive approaches in the most recent comprehensive infection control recommendations for dentistry (CDC. Morbid Mortality Wkly Rpt. 52:1-66, 2003).

Principles of Infection Control

Take action to stay healthy
- Protect with immunizations.
- Report occupational injuries exposures to blood.
- Perform hand hygiene.
- Keep hands healthy.

Avoid contact with blood and body fluids
- Handle sharp instruments with care.
- Use safety devices where appropriate.
- Manage occupational exposures to blood.
- Wear gloves, protective clothing, and face and eye protection.

Limit the spread of contamination
- Cover surfaces that may become contaminated.
- Disinfect surfaces.
- Minimize sprays and splashes.
- Properly dispose of medical waste.

Make objects safe for use
- Clean and heat sterilize patient care items that contact bone, enter previously sterile tissues, or touch membranes.
- Monitor processes (biological).
- Follow manufacturer's instructions.

Components of an Instrument Processing Protocol

Reusable instruments, supplies, and equipment should be cleaned and decontaminated in a specific processing area. If at all possible contaminated and clean areas should be separated. Whether the practice has a large or small area available for this process, the basic premise for instrument flow remains the same with clinical personnel understanding the rationale and sequence. Contaminated instruments should be handled as little as possible and carefully to prevent sharps exposure accidents. Some facilities which are unable to clean and sterilize items soon after patient treatment use a "pre-cleaning" or holding solution as an initial procedure.

Q: What is a precleaning solution?

A: A precleaning solution is formulated to prevent biological debris from drying on instruments, which can challenge subsequent cleaning procedures and increase the risk of an accident. One approach is to immerse instruments in an enzymatic ultrasonic cleaning solution in order to keep debris moist until personnel can get to them. Gels and sprays ***(EmPower Foam & Touch-N-Spray Trigger,*** *Kerr TotalCare/Metrex;* ***Enzymax® Spray Gel,*** *Hu-Friedy;* ***ProEZ foam,*** *Certol;* ***ZymeX Super Foaming Enzymatic Spray,*** *Sultan Healthcare),* when applied onto contaminated instruments, loosen debris and keep the instruments wet for extended periods.

Three options are available for cleaning instruments: mechanical (i.e., hand scrubbing), ultrasonic cleaners, and instrument washers.

Hand Scrubbing

Although manual instrument cleaning has the longest history, this approach is not as

efficient as mechanical cleaning units and carries an increased risk for injury. However, the 2003 CDC infection control recommendations for dentistry include this option with the precaution of using engineering controls, including heavy duty utility gloves and other personal protective equipment (PPE). Wearing properly fitting puncture-resistant utility gloves during this process is important, and yet, often overlooked. While a number of gloves are available, ***IMS Lilac Gloves*** *(Hu-Friedy)* offer good tactile sensation and grip when handling contaminated, wet instruments.

Ultrasonic Cleaners

The overwhelming majority of dental facilities utilize ultrasonic cleaners: ***(UC125,*** *Coltene/Whaledent*; ***PRO-SONIC,*** *Sultan Healthcare;* ***SweepZone Ultrasonic Cleaning System,*** *L&R Manufacturing;* ***Midmark Soniclean M250,*** *Midmark Corporation,* TDA Rating: + + + + ½, 92%***)*** for preparing instruments before sterilization. These units remove debris by using electrical energy to generate sound waves, which cause millions of bubbles to continuously form and burst in the liquid. This cavitation process disrupts the bonds that hold debris on instrument surfaces. The resultant cleaning of contaminated instruments is more efficient cleaning when compared to hand scrubbing.

Proper Use of an Ultrasonic Unit

- Wear personal protection equipment (PPE).
- Do not overload the chamber.
- Keep the lid on during use.
- Rinse instruments after the cleaning cycle to remove residual chemicals.
- Use only solutions formulated specifically for an ultrasonic unit.
- Change cleaning solutions s at least daily or more frequently if visibly contaminated.

The chemical composition of ultrasonic solutions has been modified over the years in order to improve their cleaning capability. The latest generations of these products contain protolytic enzymes, which function to breakdown adherent proteinaceous bioburden. Some products have been formulated as dual enzymatic cleaners, where proteolytic enzymes work with detergent to achieve enhanced instrument cleaning ***(Biosonic Enzymatic Cleaning Solution,*** *Coltene/Whaledent;* ***Purit Enz-it*** *and* ***BiozymeLT Concentrate,*** *Biotrol;* ***Clean & Simple,*** *Tuttnauer USA;* ***EmPower Dual Enzymatic Detergent****, Kerr TotalCare/ Metrex;* ***sani-treet GREEN,*** *Enzyme Industries, Inc.,* TDA Rating: + + + +, 87%; ***ZymeX Enzymatic Cleaner Concentrate,*** *Sultan Healthcare****).*** Other products ***(Enzymax®,*** *Hu-Friedy;* ***Vigilance,*** *Harry J. Bosworth*; ***Cetyl-Zyme Pro-Am,*** *Cetylite Industries)* contain both a proteolytic enzyme to remove accumulated proteinaceous material and an amylase, which removes carbohydrate-containing organic debris, including difficult-to-remove extracellular plaque polysaccharides.

sani-treet GREEN *(Enzyme Industries, Inc.)*

Enzymax® *(Hu-Friedy)*

Instrument Washers

The most recent cleaning equipment innovations are instrument washers and washer-disinfectors ***(G 7881 Dental Washer-Disinfector,*** *Miele Professional;* ***HYDRIM C51w Washer and HYDRIM C51wd Washer-Disinfector,*** *SciCan****).*** They are generally larger than ultrasonic units, thereby accommodating more instruments. They also use automated washing cycles compared to many ultrasonic units. These efficient cleaners eliminate the need for manual pre-soaking or hand-scrubbing, rinsing, and drying. Some instrument washers: (***G 7881 Dental Washer-Disinfector,*** *Miele Professional*) also have a high-temperature cycle that allows the unit to achieve thermal disinfection in addition to cleaning. While these washers may look similar in appearance to home dish washers, instrument washing equipment are considered to be medical devices and are strictly regulated by the Food and Drug Administration (FDA).

Q: Is it ok to use a household dishwasher to process medical instruments?

A: Commercial household dishwashers are not designed to process medical instruments and do not meet FDA requirements for safety and effectiveness, and, therefore, are not substitutes for tested and approved instrument washers.

Packaging

Cleaned instrument should be packaged before being placed in a sterilizer. Quality packaging materials must be used to allow penetration of the sterilization agent and ensure that sterility is maintained. Included here are heat-sensitive bags, wraps, pouches,

and perforated instrument cassettes. Cassettes ***(American Eagle,*** *American Eagle Instrument;* ***IMS®,*** *Hu-Friedy;* ***Steri-Cage,*** *DUX Dental)* are included in the category of instrument packaging because, among other features, they reduce the potential for sharps injury, facilitate instrument processing, and enhance instrument organization for specific procedures. Because instruments are tightly secured, cassettes also minimize instrument damage during cleaning, packaging, and sterilization.

The design and configuration of these instrument containers are also noteworthy in that, when loaded properly, it is very difficult to overload the cassette with instruments. Instrument rails or racks inside the cassette are specifically designed to hold a certain number of instruments in place. Rails that are made of soft, flexible material can even prevent scratching of instrument surfaces and possibly extend instrument life. This design feature also can help to maintain instrument sterility during storage as processed items are less able to move in the holder and subsequently poke through sterilization wraps.

Critical and semi-critical items should be wrapped before sterilization and kept wrapped after processing. Not just any paper or plastic container will suffice.

Ideal Characteristics of a Packaging Material

- Cleared by the FDA.
- Compatible with a heat sterilizer.
- Ensure adequate penetration of the sterilizing agent.
- Maintain sterility of items by providing an adequate barrier to outside microorganisms.
- Puncture-resistant and tear-resistant.
- Can be easily and completely sealed.
- Contents can be easily removed while maintaining sterility.
- Material is free of toxic elements and dyes.
- If material is fabric, it should be low-linting.
- Cost-effective.

A significant innovation developed for instrument sterilization has been the addition of an external chemical indicator that changes color when sterilization conditions are reached in the unit chamber. Autoclave tape is the historical example of such an indicator. It was used to both seal the instrument wrap or pouch and also serve as visible proof that items were exposed to a heat sterilization process. Unfortunately, this temperature sensitive tape is not reliable as a temperature indicator. Colored stripes begin to develop on the tape within a few minutes after exposure to steam in an autoclave, long before sterilization conditions are reached.

Because the heat and pressure conditions may be different on the inside of a loaded pouch from the outside of the container, guidelines currently call for placing a chemical indicator on the inside of each package in order to verify penetration of sterilizing vapor. If the internal indicator is not visible from the outside, use of an external chemical indicator is also recommended. Use of these separate time, pressure, and/or temperature-sensitive impregnated strips has become a routine component of instrument processing and sterilization protocols in many dental practices.

Pouches ***(ASSURE PLUS Self Seal Sterilization Pouches,*** *Sultan Healthcare;* ***IMS Bagette,*** *Hu-Friedy;* ***Peelvue+,*** *DUX Dental,* TDA Rating: + + + + + 96%*)* are available that contain built-in internal and external Class I indicators that measure temperature. Pouches with Class IV multi-parameter internal and external indicators providing visible information concerning time, temperature, and exposure of items to steam in an autoclave are also available ***(SURE-CHECK Sterilization Pouch,*** *Crosstex International,* TDA Rating: + + + + ½ 93%***).*** When packages are removed upon completion of a cycle, failure of these quality control indicators to change color alerts a person inspecting processed packages to a situation where the sterilization cycle has failed, and the instruments should not be used. Chemical indicators and integrators do not replace the weekly use of biological monitors containing highly resistant bacterial spores as the main guarantee of sterilization.

Peelvue+ (*DUX Dental*)

SURE-CHECK SterilizationPouch (*Crosstex International)*

After sterilization of wrapped items in an FDA-cleared heat sterilizer, they should be stored in a dry, closed containment. They should remain wrapped until patient treatment. These procedures accomplish the goal of providing sterile instruments for patient care and also allow patients to feel more comfortable about the practice's infection control program by providing a visible "perception" of sterility for their treatment instruments.

Q: How long do sterilized instruments remain sterile?

A: When storing sterilized instruments, an event-related shelf life approach is recommended. This procedure recognizes that items should remain sterile indefinitely, unless an event (e.g., packaging becomes torn) causes it to become compromised and contaminated. The integrity of the packaging material can be examined before use to ensure sterility has been maintained. If packaging has been compromised, the items must be recleaned, repackaged, and resterilized before use.

Summary

Correct cleaning, packaging, sterilization methods, and storage practices are essential to ensure that instruments are adequately processed for use on patients. Office clinical personnel should be familiar with each procedure and practice training programs should include pertinent information about instrument reprocessing. ■

Cavex ImpreSafe + + + + +

Cavex Holland B.V.
+31 (0)23 530 77 00
www.cavex.nl
www.practicon.com/cavex

Description

Cavex ImpreSafe is a highly concentrated disinfectant for alginate, polyether and silicone impressions. The solution is aldehyde-free and has a neutral odor. The manufacturer states that ***Cavex ImpreSafe*** needs only three minutes to kill bacteria, fungi and viruses and has no negative effect on the impression surface. The system includes a disinfection container, one liter of disinfection fluid concentrate, shipping bags and a timer. Each liter of concentrate makes 33 liters of usable solution. ***Cavex ImpreSafe*** was evaluated by 24 consultants in over 800 uses. It received a 96% clinical rating.

Suggested Retail Cost
- $104.99/kit

Product Features

Cavex ImpreSafe is easy for dental staff to integrate into their daily workflow. The three-minute immersion time is faster than that of other immersion disinfectants, and the timer included with the kit encourages compliance with soaking for the recommended time. Consultants commented on the lack of residue after rinsing. Seventy-one percent of consultants reported that ***Cavex ImpreSafe*** was better than their current method of impression disinfection, 79% would switch to ***Cavex ImpreSafe*** and 67% would recommend it.

Consultants' Comments

- *"I like the photo step by step guide; we posted it above the solution so any staff member could easily see how to use the product."*
- *"I feel I am acting more responsibly to my lab."*
- *"Offer a larger bath for orthodontic offices."*
- *"I loved the whole system. It was very easy to use and implement into our office."*
- *"Solution is easy to mix."*
- *"No mess and no smell."*
- *"Make timer louder."*

Laboratory Comments

- *"I like that the impression is being thoroughly disinfected quickly."*
- *"Offer a larger bath for laboratories."*

Clinical Tips

- Rinse the impression before disinfection.
- Replace the solution weekly or when it is visibly contaminated.
- Keep track of how old the solution is - write date of preparation in pencil on the top. ■

Studio Light 2 + + + +

Dent'N Co.
+33 (0) 4 72 54 82 99
www.dentnco.com

Description

Studio Light 2 system is a portable light unit that uses multiple LED (light-emitting diode) sources to produce photo-activated teeth whitening. The LED technology uses cold light to reduce sensitivity. The ***Studio Light 2*** system has 100V to 240V auto selection power with a light output of greater than 500 mW/cm^2 over a spectrum of 430 to 490 nm. The accompanying pre-mixed whitening gel *(EZ White)* is 35% hydrogen peroxide that releases oxygen to remove stains and discolorations. The gel is light sensitive and pH balanced. The ***Studio Light 2*** has a short preparation time before whitening and allows both upper and lower bleaching simultaneously in only 45 minutes. The system includes ***Studio Light 2***, power cord, converter, protective eyewear, bleaching gel (2 each, *XX-White EZ mix*), gingival protection, operator's manual, and product literature. ***Studio Light 2*** was evaluated in nine whitening procedures. The ***Studio Light 2*** received an 86% clinical rating.

Suggested Retail Cost
- $1,999.00

Consultants' Comments

- *"Buttons are easy to use and unit does not get hot."*
- *"Great results with little sensitivity."*
- *"No objectionable taste or odor to the gel."*
- *"Improve design to make the light unit sturdier and easier to move around."*

Product Features

Studio Light 2 is a portable light on a wheeled base that is simple to operate. It provided effective teeth whitening while earning high ratings for patient comfort - the light was not too bright or too hot. Positioning the light over the patient's mouth was somewhat challenging because of a short power cord and cumbersome articulation of the arm that holds the light. The *EZ White* whitening kit that was used with the ***Studio Light 2*** includes a well-received isolation kit with light-cured dam material that works very well. The dam stays in place and seals well, preventing the whitening gel from contacting the gingiva. The whitening gel is neat and easy to mix in a syringe-to-syringe system. It received high ratings from patients for whitening results and overall satisfaction. Thirty-three percent of consultants reported that ***Studio Light 2*** was better than their current whitening light and would switch to it and recommend it. ■

Multi-Hold + + + 1/2

Denbur, Inc.
800.992.1399
www.denbur.com

Description

Multi-Hold is a disposable handle for use with *Denbur* dental applicators and brushes. It is designed to provide the length and feel of a dental instrument and is contoured to fit comfortably in the hand. ***Multi-Hold*** can be autoclaved up to 15 times before disposal. Once inserted, an applicator or brush can be adjusted to the desired length. ***Multi-Hold*** is packaged with 20 handles in a simple, clearly marked box, and is sold separately from the applicators. ***Multi-Hold*** was evaluated by 20 consultants in over 348 clinical cases. It received an 82% clinical rating.

Suggested Retail Cost
- $17.95/20 handles

Product Features

Multi-Hold received good ratings for size, light weight and ease of use. Consultants reported ***Multi-Hold*** was versatile and handy for applying materials in hard-to-reach areas of the oral cavity. For dentists who use multiple applicators during a procedure, multiple handles can be used. Some consultants used the flat instrument on the opposite end of the handle for composite shaping. Sixty-three percent of consultants reported that ***Multi-Hold*** was the same as or better than their current brush; 20% would switch to it and 50% would recommend ***Multi-Hold*** to their colleagues.

Consultants' Comments

- *"Aids in better vision for placement of bonding agents."*
- *"Provides extension to reach molars."*
- *"Withstands multiple autoclave cycles."*
- *"Handle only fits Denbur applicators."*
- *"Redesign handle with rounded, more comfortable shape."*
- *"The flat end is too flexible."*

Clinical Tip

- Keep a few in each operatory with applicators inserted for quick use. ■

3M ESPE Filtek LS Low Shrink Posterior Restorative System 2-year Clinical Performance + + + + +

3M ESPE
800.634.2249
www.3mespe.com

Description

3M ESPE Filtek LS Low Shrink Posterior Restorative System is based on silorane chemistry that minimizes polymerization shrinkage and stress. It is light cured and radiopaque with 76% by weight (55% by volume) of inorganic fillers and has its own proprietary *LS System Adhesive Self-Etch Primer* and *Bond* that are also light cured. The composite is dispensed from syringes or unit-dose capsules in A2, A3, B2 and C2 shades. This composite received a 97% clinical rating.

Clinical Evaluation Protocol

- 149 restorations qualified for a 2-year recall; 125 of these in 104 patients were recalled over a 6-month period.
- The recalled restorations represented 1-,2-, 3- and 4-surface composites (Figure 1).
- At recall the restorations were evaluated in the following areas: fracture/chipping, esthetics, marginal discoloration, wear resistance, and sensitivity. Each area was rated on a 1-5 scale: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent.

Results of Recall

Fracture and Chipping
Ninety-seven percent of ***Filtek LS*** restorations were intact during the two years in service (Figure 2). Only four out of the 125 recalled restorations exhibited slight chipping and none required replacement.

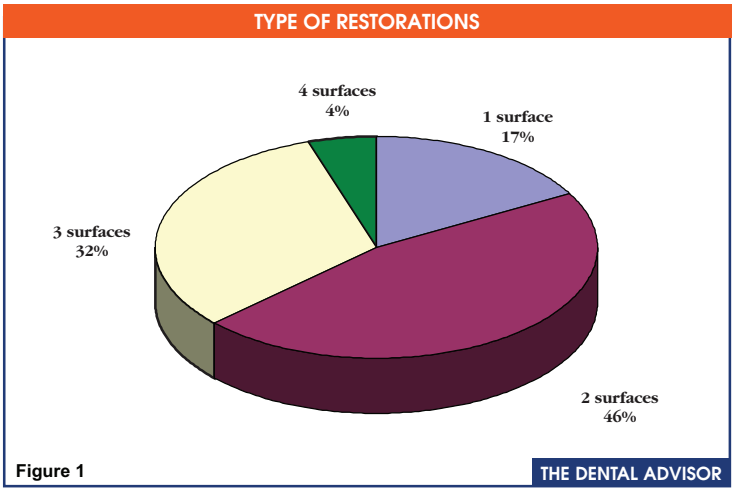
Esthetics
The vast majority (94%) of the restorations received an excellent rating (Figure 2). Even though the shade selection was limited at placement, the available shades fulfilled most needs for posterior restorations. The shades seemed to blend even better with the surrounding tooth structure over time and at two years exhibited more smoothness and gloss.

Marginal Discoloration
Filtek LS restorations were bonded with its proprietary self-etch bonding agent. Ninety-five percent of the restorations had no visible staining at the margins (Figure 2). Four percent had very light stains at the margin, while only 1% had more moderate stains.

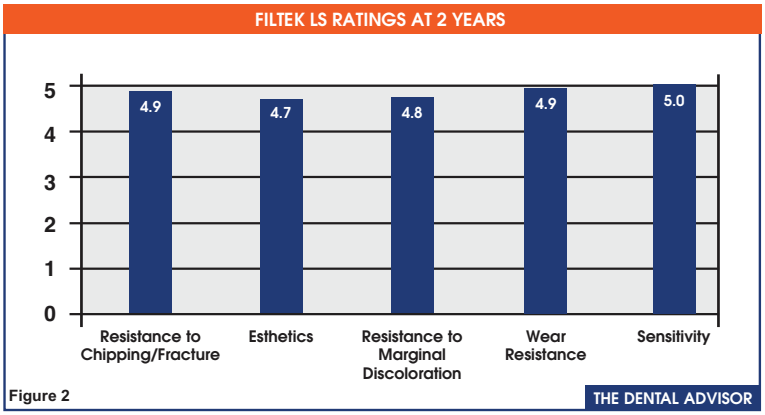
Wear Resistance
No visible signs of wear were seen on 98% of the recalled restorations (Figure 2). Likewise no apparent wear was noted on the opposing dentition.

Consultants' Comments

- *"The esthetics are excellent - most times it is hard to tell the filling from the tooth."*
- *"Nice composite, holds up very well."*



Sensitivity
None of the recalled patients reported any sensitivity to cold or hot temperatures (Figure 2).



Summary

Filtek LS is a posterior composite based on silorane chemistry that minimizes polymerization shrinkage and stress. One hundred and twenty-five restorations were recalled at two years. In all monitored categories including lack of chipping, esthetics, wear resistance, resistance to marginal discoloration, and lack of sensitivity, the composite performed extremely well and is recommended for use in any posterior restoration. ■

Dazzle Advanced Teeth Whitening System + + + +

DiaDent Group International
877.342.3368 604.451.8851
www.diadent.com

Technique Videos:
Visit online at www.dentaladvisor.com
to view an Information Video on this product

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

Consultants' Comments

- *"I liked the shorter time to complete whitening and easier isolation."*
- *"Storage is easy since it does not require refrigeration."*
- *"Mixture was difficult to extrude from syringe."*
- *"Provide cheek retractors in kit."*

Patients' Comments

- *"No odor and no sensitivity."*
- *"My teeth look great."*
- *"Color change not as much as I expected."*

Description

Dazzle Advanced Teeth Whitening System is an in-office, light-activated whitening material that contains 39% hydrogen peroxide. It is prepared by combining the ***Dazzle*** powder which is pink in color, with the ***Dazzle*** hydrogen peroxide liquid, which results in a final concentration of hydrogen peroxide of 29.5%. Mixing of the powder and the hydrogen peroxide for 10 seconds or longer is necessary to gain a creamy and easy to extrude gel. The gel is then applied using the *DiaDent* application syringe. The manufacturer recommends a 0.8 – 1.0 mm layer of whitening gel be applied to the teeth and if a thicker layer is applied that the excess be removed with the use of a spatula. The material is activated by the light source, which causes the mixture to change from pink to a whitish/clear color, and to bubble. These visual features indicate when the whitening gel has achieved full activation. Length of time needed for light activation is dependent on the type of light source used, but ranges from 5 to 20 seconds per tooth. Appropriate light sources would include LED, halogen, metal halide, and plasma ARC with a minimum power requirement of 800 mW/cm^2. The box contains 3 kits; each including 1, *Dazzle Active Shield Gingival Protection Gel* syringe and tip; 5-ml bottle of 39% *Dazzle Hydrogen Peroxide*; *Dazzle Powder Mix*; *Photo Active Booster*; syringe piston and syringe tip; spatula; pair of latex gloves; treatment illustrations; MSDS; and manufacturer's instruction sheet. Seven consultants utilized ***Dazzle Advanced Teeth Whitening System*** on 32 patients. This whitening kit received an 86% clinical rating.

Suggested Retail Cost

- $85.00/Single Kit, $240/Bulk Kit (contains 3 Single Kits)

Product Features

Dazzle Advanced Teeth Whitening System proved to be effective in whitening patients' teeth in the majority of cases. Consultants liked the pink-to-white color change feature to ensure complete activation of the material. While the ease of use is good, mixing of powder and liquid is not as neat and convenient as some other systems on the market. The light-cured dam material is easy to use and effectively isolates the gingiva from the bleaching material. The mixed powder/liquid has a low viscosity and must be applied carefully to avoid contact with the soft tissue. Shade changes ranged from 0 to 8 (on the Vita value-arranged shade guide) with an average of 4. Most patients experienced light to no sensitivity or gum irritation during the procedure. Eighty-four percent of patients reported their teeth were lighter. Fifty-seven percent of consultants would switch to ***Dazzle Advanced Teeth Whitening System*** and 71% would recommend it.

Clinical Tips

- Make sure gingival tissue is extremely dry before isolation.
- Teeth have to be dry.
- After the last cycle, remove gel from teeth with gauze or suction device before rinsing. ■

MACRO-LOCK POST ILLUSION X-RO + + + + 1/2

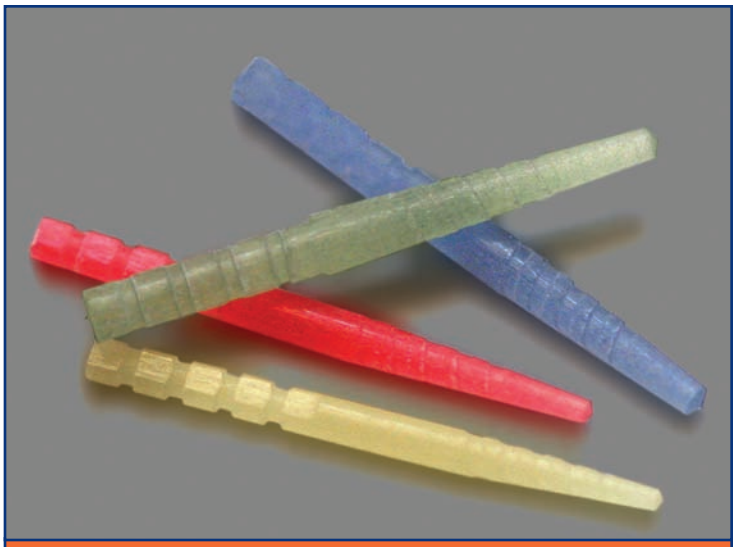
RTD (Recherches Techniques Dentaires)
www.rtd.fr
Clinician's Choice (N. American Distributor)
www.clinicianschoice.com
800-265-3444

Exclusive Review

Description

MACRO-LOCK POST ILLUSION X-RO is a tapered fiber post designed for enhanced retention. The translucent fiber post has a colored resin matrix, the color of which disappears at oral temperature. The post color reappears on command with cold water spray. ***MACRO-LOCK POST ILLUSION X-RO*** uses proprietary, radiopaque quartz fibers for improved radiopacity, flexural strength and fatigue resistance. The post is designed with a series of serrations and passive threading cut into the surface, to provide self-retention regardless of the cementation media used. The Intro Kit includes 20 posts (5 each of 4 sizes - #1, #2, #3, #4), four Finishing Drills (corresponding to post dimensions), one Starter Drill, manufacturer's instructions, and a size selection guide. Fourteen Editors placed 172 restorations utilizing this product. ***MACRO-LOCK POST ILLUSION X-RO*** received a 95% clinical rating.

Suggested Retail Cost
- $219.95/Intro Kit
- $110.00/refill (10 posts)



Editors' Comments

- *"I liked the shape and fit of the posts - good size selection."*
- *"Hands down the single best post drills I have ever used. They cut so easily and the posts fit perfectly every single time, absolutely no binding!"*
- *"Color feature makes post visible during crown preparation."*
- *"I found the drills dulled before we could use all the posts."*
- *"Packaging is flimsy."*
- *"Retentive head often has to be removed when trimming the post to the proper length. Make the retentive head further down the length of the post."*

Editors' Observations

Manufacturer's Instructions
Illustrated step-by-step instructions provide a guide to the complete preparation, cementation and core buildup. Separate written directions provide additional details. Both are clearly written and easy to follow.

Packaging
Finishing drills are packaged in clear plastic vials that are re-closable and re-usable. The posts are in foil blister packs. Editors would have preferred sturdier packaging in which an unused post could be replaced if needed.

Ease of Identification (Color Coding)
The color of ***MACRO-LOCK POST ILLUSION X-RO*** makes it easy to identify the size, both in the package and in the mouth. Post colors correspond to colored rings on the drills. Editors rated the color coding as very good. The Editors appreciated the distinct colors of the posts and rings on the drills.

Convenience of Color-changing Feature
The color change of ***MACRO-LOCK POST ILLUSION X-RO*** was a favorite feature of the Editors. The pink, blue and green posts are much easier to see than the yellow color posts. The color disappears and the post becomes completely translucent at body temperature; no color is visible through restorations.

Effectiveness of Drills
Editors rated the effectiveness of the drills of ***MACRO-LOCK POST ILLUSION X-RO*** as good. While Editors liked the fit produced by the post drills, the drills became dull more quickly than expected.

Size Selection
The size selection of ***MACRO-LOCK POST ILLUSION X-RO*** is adequate for the majority of cases. Some Editors noted the need for a larger diameter, mainly for central incisors with large canals, which are available separately in most countries. A greater quantity of the smaller posts in the kit would be useful.

Post Design and Retention of Core Material
Editors rated the tapered shape of ***MACRO-LOCK POST ILLUSION X-RO*** as very good. The passive threads along the body of the post and the serrations in the head increase the potential for a high level of retention of the composite core. The overall length of each post is 20 mm, requiring shortening in most cases. Often many of the retentive serrations had to be cut off when shortening the post.

continued on pg 11

e-Dx + + + +

Jordco, Inc.
800.752.2812 - 503.531.3904
www.jordco.com

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

Description

e-Dx is a diagnostic instrument used to test teeth for fracture and sensitivity to cold. One end of the blue plastic instrument is shaped for bite testing. The opposite end holds pliers with a foam insert to test for cold sensitivity. Refrigerant (not supplied) is sprayed on the foam then applied to the tooth. The kit contains three ***e-Dx*** handles, 36 plier tips and 36 foam inserts. The instrument can be cold sterilized. ***e-Dx*** was evaluated by 16 consultants in 223 uses. It received an 86% clinical rating.

Suggested Retail Cost
- $29.95/Kit

Consultants' Comments

- *"Easy to use - curved handle allows good visibility."*
- *"The foam insert is easy to use and holds the cold spray for a long time."*
- *"It's nice having the cold and bite tests in one instrument."*
- *"Make the foam insert stiffer."*
- *"Make the handle autoclavable."*
- *"Provide larger quantities of foam inserts."*

Product Features

e-Dx is a simple product that is effective for testing multiple teeth. When refrigerant is sprayed on a foam insert, it remains cold for a sufficiently long time. The size of the foam insert is large, making it hard to isolate a specific area and avoid touching the gingival tissue. Its flexibility causes it to bend over when any pressure is applied to the tooth. The bite stick has a depression to cradle a cusp tip and help prevent the instrument from slipping. Eighty-eight percent of consultants reported that ***e-Dx*** was equivalent to or better than their current diagnostic instruments; 38% would switch to it and 56% would recommend ***e-Dx*** to their colleagues.

Clinical Tips

- Cut the foam tip to make a point for fossa.
- ***e-Dx*** is not autoclavable; use cold sterilization solution.
- Use an acrylic bur to broaden the cusp depression in the bite stick for teeth with wear or flat anatomy. ■

MACRO-LOCK POST ILLUSION X-RO + + + + 1/2

Editors' Choice

continued from pg 10

Ease of Cementation and Effectiveness of Light Transmission
As with other fiber posts, ***MACRO-LOCK POST ILLUSION X-RO*** can be luted with a resin cement. The manufacturer recommends applying the primer or bonding agent to the post as well as the tooth. Alternatively, self-adhesive resin cement or traditional cement can be used. Editors indicated using dual- or self-cured cements rather than relying on light transmission through the post for light-cured products.

Radiopacity and Fit of Post (Radiographically) to Canal
Posts are radiographically apparent and appeared to have good adaptation to the prepared space within the tooth.

Ease of Use
Editors rated the ease of use of ***MACRO-LOCK POST ILLUSION X-RO*** as very good. They commented that ***MACRO-LOCK POST ILLUSION X-RO*** is much easier to work with than some of the similar posts on the market - more user friendly. Editors rated ***MACRO-LOCK POST ILLUSION X-RO*** overall as very good. Fifty percent of Editors reported that ***MACRO-LOCK POST ILLUSION X-RO*** was better than their current esthetic post, 71% would switch to it and 86% would recommend it.

Clinical Tips

- Use dual-cured bonding agents and cements for increased retention.
- Try in the post before cementation – use good locking pliers to hold onto it.
- Clean post surface with alcohol before cementation.
- Unused posts may be autoclaved. ■

IPS e.max CAD and IPS Empress CAD Blocks using E4D Dentist and Mill 1-year Clinical Performance + + + + +

Ivoclar Vivadent, Inc.
800.533.6825 • 716.691.0010
www.ivoclarvivadent.com

Description

IPS e.max CAD *(Ivoclar Vivadent)* is a high-strength, lithium disilicate ceramic block used for anterior and posterior restorations as well as three-unit bridges. ***IPS Empress CAD*** *(Ivoclar Vivadent)* is a leucite-reinforced ceramic block used for anterior and posterior restorations. The purpose of this evaluation was to determine the clinical results of ***IPS e.max CAD*** and ***IPS Empress CAD*** when prepared using the ***E4D Dentist*** and ***Mill*** *(D4D Technologies)* and placed over a 12-month period. These ceramics received a 97% clinical rating.

Clinical Evaluation Protocol

Editors of THE DENTAL ADVISOR placed 130 ***IPS e.max CAD*** *(Ivoclar Vivadent)* and 120 ***IPS Empress CAD*** *(Ivoclar Vivadent)* restorations prepared using ***E4D Dentist*** and ***Mill*** *(D4D Technologies).* ***IPS e.max CAD*** was used in 125 crowns and 5 onlays (Figure 1a) for 1 anterior tooth, 5 premolars and 124 molars (Figure 1b). All restorations were cemented with *Multilink Automix Easy (Ivoclar Vivadent).* ***IPS Empress CAD*** was used in 45 crowns and 75 inlays/onlays (Figure 2a). One anterior tooth, 39 premolars and 80 molars (Figure 2b) were treated. A variety of block shades were selected.

At placement, restorations were evaluated for proper fit, esthetics/vitality, margin accuracy, and anatomy on a scale of 1 to 5 (1=poor, 2=fair, 3=good, 4=very good, 5=excellent).

Consultants' Comments

- *"Excellent translucency - blends well."*
- *"Glossy."*
- *"Easy product to use, especially on sensitive cervical areas."*
- *"Add an opaque shade."*

Results of Recall

Fit
The fit of the restorations was excellent (Figure 3). A precise fit minimizes the cement layer and increases the amount of porcelain in the restoration. Firm broad contacts were easily achieved with proper interproximal emergence profile. An advantage of ***IPS e.max CAD*** is the ability to try-in and adjust the restoration in the blue phase. This technique minimizes adjustments made after staining and glazing.

Esthetics/Vitality
The esthetics/vitality of the restorations was excellent (Figure 3). ***IPS e.max CAD*** and ***IPS Empress CAD*** are highly esthetic materials and produce very smooth milled surfaces using *Premier Two Striper Diamond Burs.* In many cases, ***IPS Empress CAD*** onlays were simply polished to achieve excellent esthetics. All ***IPS e.max CAD*** and ***IPS Empress CAD*** restorations were stained and glazed to optimize final esthetics.

Margin Accuracy
The margin accuracy was excellent (Figure 3). Margin accuracy depends on identification of the margins, which must be clearly visible. In areas of minor inflammation, packing cord or retraction paste provided adequate retraction. In areas of greater

TYPES OF RESTORATIONS PREPARED WITH IPS E.MAX CAD

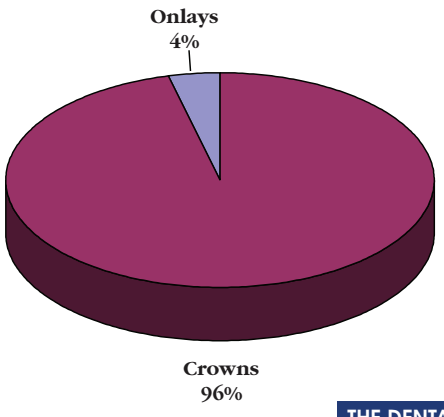


Figure 1a

THE DENTAL ADVISOR

TEETH TREATED WITH IPS E.MAX CAD

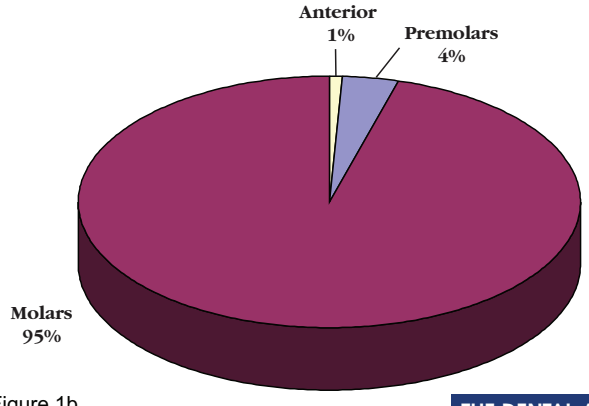


Figure 1b

THE DENTAL ADVISOR

inflammation, the *Odyssey Navigator (Ivovclar Vivadent)* a soft tissue diode laser did an exceptional job removing unhealthy tissue and eliminating bleeding.

Anatomy

The anatomy was excellent (Figure 3). The combination of the E4D proposal and design tools, *Premier Two Striper burs* and ***IPS e.max CAD*** and ***IPS Empress CAD*** ceramics resulted in a restoration with excellent defined anatomy. The contours and overall anatomy were reflective of natural dentition.

TYPES OF RESTORATIONS PREPARED WITH IPS EMPRESS CAD

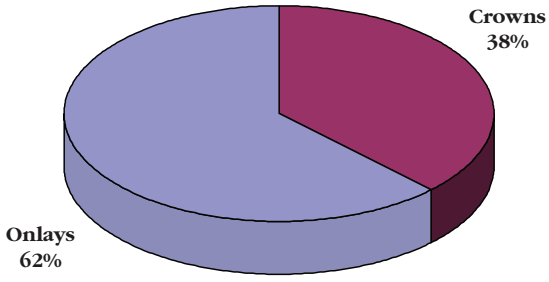


Figure 2a

THE DENTAL ADVISOR

TEETH TREATED WITH IPS EMPRESS CAD

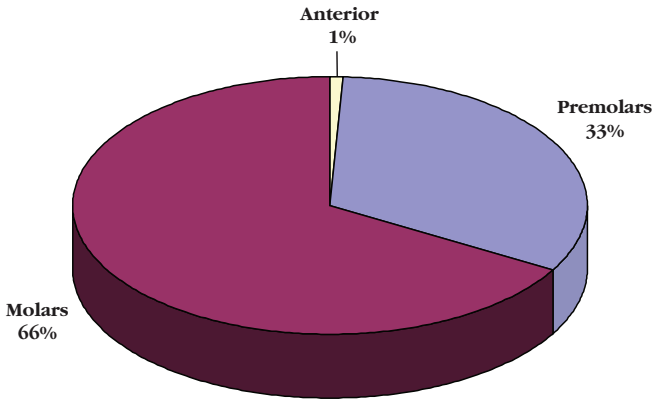


Figure 2b

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Summary

Restorations of ***IPS e.max CAD*** and ***IPS Empress CAD*** blocks were designed and milled using the ***E4D Dentist System***. At placement, fit, esthetics/vitality, margin accuracy, and anatomy were rated excellent. Patients and clinicians appreciated the accuracy and convenience of fabricating a high quality esthetic restoration in one visit. ■

RESULTS AT PLACEMENT

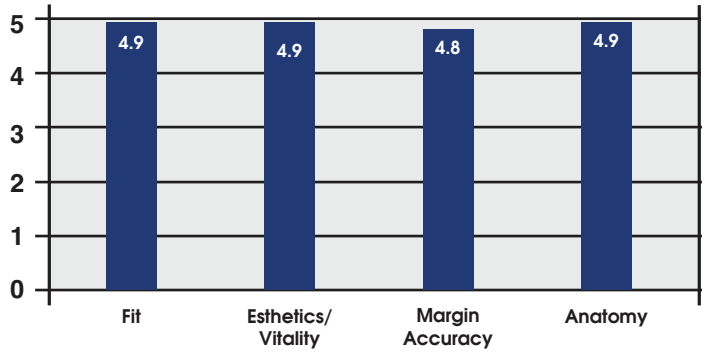

Figure 3

THE DENTAL ADVISOR

Fusio Liquid Dentin1-year Clinical Performance + + + + +

Pentron Clinical
800.551.0283 - 230.265.7397
www.pentron.com

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

Description

Fusio Liquid Dentin is a self-adhesive, low-viscosity composite available in shades A1, A2, A3 and B1. This new class of composite bonds to enamel and dentin without the use of a separate etchant or bonding agent. Placement involves dispensing material from the syringe directly on the tooth, agitation for 10 seconds followed by a 20-second light cure. ***Fusio Liquid Dentin*** is indicated for pit & fissure sealants, blocking out undercuts, base/liner, small class I, class III, and class V restorations. ***Fusio Liquid Dentin*** is available in 1 ml syringes with 19-guage tips. ***Fusio Liquid Dentin*** received a 96% clinical rating.

Consultants' Comments

- *"Excellent translucency - blends well."*
- *"Glossy."*
- *"Easy product to use, especially on sensitive cervical areas."*
- *"Add an opaque shade."*

Clinical Evaluation Protocol

- This evaluation was limited to Class V restorations.
- During a 9-month period, 202 ***Fusio*** restorations were placed in 90 patients.
- Teeth with cervical erosion/abrasion or cervical caries were selected for treatment. 160 non-carious erosion lesions and 42 carious lesions were treated.
- Non-carious teeth were prepared by either placing a retention groove with a ¼-round bur or using a diamond to develop V-shaped retention.
- Thirty patients with 56 ***Fusio*** restorations have had return visits in which their restorations were evaluated (Figure 1).
- At recall restorations were evaluated for surface smoothness, esthetics, margin staining, retention and sensitivity. Restorations were evaluated on a 1-5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

AGE OF FUSIO RESTORATIONS AT RECALL

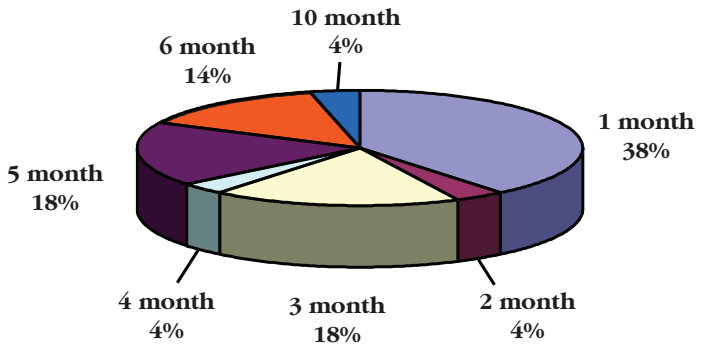

Figure 1 THE DENTAL ADVISOR

FUSIO RATINGS AT ONE-YEAR RECALL

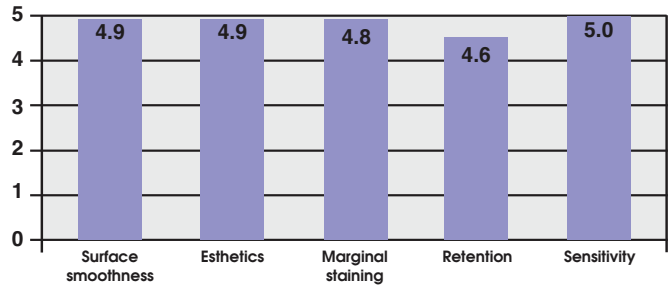

Figure 2 THE DENTAL ADVISOR

Clinical Observations

Surface Smoothness and Esthetics

Fusio Liquid Dentin restorations have retained their polish with glossy surfaces (Figure 2). No change in color has been noted, and esthetics was highly rated. No roughness or graininess of the composite was evident. Three restorations were judged to be too translucent. Yet in most cases the translucency of the material contributed to the excellent visual blending of the composite with the enamel.

Marginal Discoloration

Fusio has exhibited excellent resistance to staining at the margins of the restorations to this point (Figure 2). Ninety-six percent of restorations had no margin staining. Two restorations that did develop stain were on a single patient who is a heavy smoker.

Retention

Three early debonds were seen within the first month after placement - all on teeth treated for caries. Three later debonds were recorded at five and six months after placement; these were

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Surefil SDR flow + + + + +

DENTSPLY Caulk
800.532.2855
www.caulk.com

Exclusive Review

Description

Surefil SDR flow is a posterior bulk fill flowable base for Class I and II restorations. ***SureFil SDR flow*** has handling characteristics typical of a flowable composite but can be placed in 4 mm increments with minimal polymerization stress. It is a one-component, fluoride-containing, visible light-cured, radiopaque resin composite restorative material. ***SureFil SDR flow*** material has a self-leveling feature that allows intimate adaption to the prepared cavity walls with minimum manipulation. ***SureFil SDR flow*** is available in *Predosed Compula Tips* for direct intra-oral application and is supplied in a single universal shade. It is designed to be overlayed with a methacylate-based universal/posterior composite for replacing missing occlusal/facial enamel. The introductory kit evaluated contained 25 *Compula Tips,* and a *Compules Tip Gun*. Twenty-two consultants placed 570 restorations utilizing ***Surefil SDR flow*** with a variety of different composites for the surface layer. ***Surefil SDR flow*** received a 97% clinical rating.

Suggested Retail Cost
- $125.00/introductory kit

Product Features

The flow of ***Surefil SDR flow*** in the prepared tooth provides excellent adaptation to cavity walls and margins. By eliminating the need for packing or manipulation of this base layer, a definite time savings is realized. This is especially true for large or deep restorations where the clinician can take full advantage of the 4 mm depth of cure. The viscosity of the material contributed to high ratings for ease of dispensing, ease of placement, and adaptation to cavity walls. Consultants appreciated the high radiopacity of finished restorations. Seventy-three percent of consultants reported that ***Surefil SDR flow*** was better than their current flowable composite, and 73% would switch to it and 68% would recommend it.

Consultants' Comments

- *"It flowed and adapted to interproximal areas, and undercuts of preparations were completely filled each time."*
- *"Wonderful flow, perfect consistency. The self leveling feature is excellent."*
- *"Interproximal contacts were nice and tight."*
- *"Some posterior locations are hard to reach with the gun, and it can be difficult to bend the needle in these situations."*
- *"The material is quite translucent and does not mask dark dentin very well."*
- *"Make the metal tip easier to bend."*

Clinical Tips

- When dispensing, allow a few seconds for material to self level. Manipulation is optional as material will self level on its own.
- Use a light with output of at least 550 mW/cm^2 exposure for at least 20 seconds. ■

Fusio Liquid Dentin1-year Clinical Performance + + + + +

continued from pg 14

restorations in abrasion lesions. The overall retention rate was 89.3% (Figure 2).

Sensitivity
Only one case of postoperative sensitivity was reported when patients were asked at their recall appointments (Figure 2). In this case a tooth treated for cervical abrasion maintained some slight sensitivity even after the filling was applied.

Summary

Over 200 Class V ***Fusio Liquid Dentin*** restorations were placed. As patients returned for regularly scheduled dental visits, these restorations were evaluated. Fifty-six restorations were evaluated at recall, and the ages of the restorations ranged from one to ten months. In this group of patients, just over 10% of the restorations debonded. As recall is ongoing, THE DENTAL ADVISOR will continue to update this number. The remainder of the restorations maintained a high level of esthetics and lack of sensitivity. ■

Master-Brush + + + +

Denbur, Inc.
800.992.1399
www.denbur.com

Description

Master-Brush is a double-bending bristle applicator. It is designed with two indentations - one on the handle and one on the neck - to allow the applicator to bend in two separate areas, both independently and simultaneously. This double-bending feature is intended to be useful for applications requiring access from the lingual. ***Master-Brush*** is also designed to maintain a constant bent position. In each position the ***Master-Brush*** is designed to bend beyond 90 degrees. ***Master-Brush*** comes in two sizes: short, black strands (4.8 mm); and long, white strands (7.6 mm). ***Master-Brush*** is packaged with 120 applicators in the Easy-Shake hand-held dispenser. This dispenser allows only one applicator at a time to be dispensed, avoiding cross contamination. ***Master-Brush*** was evaluated by 22 consultants in over 800 uses. It received an 86% clinical rating.

Suggested Retail Cost
- $12.55/120-count container

Product Features

Master-Brush received the highest ratings for its Easy-Shake dispenser and the overall utility of the brushes. The applicators are easy to bend but do exhibit some rebound and occasional breakage. The very fine bristles hold an ample amount of bonding resin. The longer (white) brush was generally more useful and had better access into deep and narrow preparations compared to the one with shorter bristles. Seventy-three percent of consultants reported that ***Master-Brush*** was the same as or better than their current brush; 18% would switch to it and 73% would recommend ***Master-Brush*** to their colleagues.

Consultants' Comments

- *"Great for use on broad surfaces."*
- *"Double bend feature makes applicator adaptable for difficult to reach areas."*
- *"This brush is very versatile and can be used for just about anything chairside."*
- *"Hub of short brush is bulky."*

Clinical Tips

- There are four positions to the ***Master-Brush***: straight; short bend position at the upper end of the neck for most applications; long bend position at the lower end of the neck for hard to reach areas; and the double bend position at both the upper and lower ends of the neck for applications from the lingual side.
- Bend the brush and wait for rebound before use.
- Use the short brushes for easy cleanup of cement.
- Use brushes in the lab for applying die spacer.
- Store the dispenser on flat end so brushes do not distort.

Editor's Note: *According to the manufacturer, the brushes are now made with a tougher plastic to reduce breakage.* ■

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