

THE DENTAL ADVISOR™

“Improving Patient Care Through Research & Education”

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

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



Photography by Chris Brown

Cone Beam CT Scanners

Three-dimensional, high-resolution imaging is a reality in dentistry. With the advent of Cone Beam Computed Tomography (CBCT), implants can be placed with unparalleled accuracy, third molar surgery can be planned with precise knowledge of mandibular nerve location, and accurate diagnosis and treatment planning can now be accomplished at one time and in one location. Cone Beam CT imaging is quickly becoming the standard of care in oral surgical procedures, orthodontics, and in implant dentistry. Cone Beam CT Scanners are similar in size and appearance to panoramic x-ray units, yet they offer many more applications using high resolution with low radiation exposure to patients.

This issue of THE DENTAL ADVISOR will explore the exact nature of Cone Beam CT scanning, define the terminology of this new treatment modality, and provide a guide for dentists considering purchasing a Cone Beam CT Scanner.

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Cone Beam CT Scanners

What is Cone Beam Computed Tomography (CBCT)?

For many years, dental professionals have relied on intraoral radiography, panoramic radiography, and conventional tomography for diagnosis and treatment planning. These commonly used imaging modalities produce only two-dimensional and/or distorted images with superimposition of structures outside the area of interest. There has always been a need for three-dimensional (3D) imaging, but the technology has only recently become readily available. Cone Beam Computed Tomography (CBCT) uses a cone-shaped beam and digital processing to reconstruct a virtually distortion-free 3D image using a single rotation in a sitting/standing position, similar to that of a panoramic radiograph. CBCT scanners are compact in size, capable of producing high-resolution 3D imaging of hard tissues, and are compatible with computer-aided imaging software for improved diagnosis and treatment planning.

CBCT Specifications

Field of View (FOV)

"Field of View" is the size of the field to be examined. Some units have several options for the size of the field. With three Fields of View the proper image volume can be selected for each diagnostic task.

- Large FOV- ideal for the examination of complete dentition, both TM joints and upper cervical spine, or maxillofacial area with airways
- Medium FOV- ideal for the examination of the entire dental complex, including mental and mandibular foramen
- Small FOV- ideal for the examination of single implant sites, planning third molar extractions, endodontics, or localized dental problems

Voxel Size

The volume element (voxel) is the smallest element of a 3D image. This is analogous to a pixel, which represents 2D image data. The size of each voxel determines the resolution of the image. CBCT machines provide voxel resolutions that are equal in all 3 dimensions, therefore, producing submillimeter resolution, currently ranging from 0.4 mm³ to as low as 0.07 mm³.

Scan Time (Sec)/Image Reconstruction Time (Sec)

Cone Beam CT scanners are able to acquire all basic images in a single rotation, accomplishing a very quick scan. Additionally, the reconstruction rate (time it takes for the images to display on the computer monitor) is also fast. The combination of fast scans and reconstruction times mean that the practitioner can use the images immediately to diagnose and better explain the treatment planning process to patients.

File Size/Format/Third Party Software

The patient's image data can range from 5 - 300 MB, and can vary based on factors such as the size and the type of image resolution being used. The images produced from a CBCT machine are in DICOM format (Digital Imaging and Communications in Medicine). These images can be imported to third party software programs, allowing the clinician to diagnose, treatment plan, document, and present cases. By utilizing the technology of both CBCT scans and third party software, the clinician can create and take advantage of 3D planning.

For more information on third-party software, visit Product Comparison Tables or the online issue at www.dentaladvisor.com

Radiation Exposure to Patient (microsievert, μSv)

Cone Beam 3D imaging has a significantly lower radiation level for the patient compared to medical CT scans because the kV and mA are much lower. The radiation dose from CBCT imaging depends on the manufacturer as well as the exposure factors used. The current unit for describing radiation dose is the microSievert (μSv). Patient effective exposed dose from CBCT scans have been reported to range from 20-500 μSv .

Cost

While the cost has lowered significantly since their introduction, CBCT systems are still a big investment, ranging anywhere from \$100 – \$300K. In addition to the cost of the machine, other costs include annual maintenance contracts, necessary computer system upgrades, and digital storage hardware. Fortunately, there are options to utilize 3D technology without buying the machine. Options include sending patients to dental imaging centers, purchasing and sharing a system with other practitioners, or purchasing your own unit and letting other practitioners send patients to you for a fee.

Clinical Applications of CBCT Imaging

- Implant planning and site development
- Extractions- helps determine location of nerves, sinus, and roots
- Orthodontia- jaw symmetry, configuration of roots, impacted canines
- Maxillofacial- orthognathic surgery, fractures, jaw pathology
- Periodontics- sinus augmentation, advanced grafting procedures, periodontal defects
- Endodontics- canal measurements, additional canals, configuration of root canals
- TMJ/TMD- detection of bony defects, asymmetry, spurs, condylar changes
- ENT specialists- sinus and airway studies

Benefits of CBCT Imaging

- Imaging exposes patients to less radiation than traditional CT scans.
- The scan is fast and comfortable to the patient.
- Reduction in metal artifacts.
- One scan produces a volume of images that can be viewed and manipulated.
- Clinicians can illustrate recommended treatment plans to patients via 3D software.
- No superimposition and minimal distortion.
- Allows clinician to visualize internal anatomy that cannot be diagnosed externally.
- Lower cost for patient when compared to traditional CT.
- Enhanced communication with patients and colleagues.

CBCT Options

As the trend towards Cone Beam technology is increasing, newer CBCT systems are emerging with many options:

- Patient positioning: seated, standing, supine (*SkyView 3D*, *NewTom 3G*)
- Mobile CBCT units (*NewTom VG Flex*)
- Stand alone CBCT units and those combined with panoramic radiographic sensors (*Kodak 9000 3D*, *Veraviewepocs 3D*, *Promax 3D*, *Scanora 3D*, *GXCB-500*, *Picasso Duo*)
- 3 functions in 1 unit; CT+ Pan+ Ceph (*Picasso Trio OS Pro*)
- Newer units, marketed towards implant placement, have a smaller field of view and small sensors. Manufacturers are providing two options for increasing the FOV with these units; larger sensors or an extended scanning time feature (*GXCB-500*)
- Larger FOV systems that can be collimated to a specific region (*i-CAT*)

Factors to Consider in the use of CBCT Technology

The decision to incorporate Cone Beam CT technology into a dental practice is one that requires serious consideration and careful planning. CBCT scanners are relatively easy to use and maintain. However, with new technology comes new responsibility. Unlike most traditional x-rays, CBCT scans can reveal medical problems. If dentists decide to read their own scans, they become responsible for all findings. This could pose potential legal liability. Many practitioners who are not comfortable diagnosing medical issues send their x-rays to oral and maxillofacial radiologists for interpretation.

Regulations for running a CBCT system vary from state to state. If you are considering purchasing a unit it is important to contact your state board first to ensure that you will be permitted to run your system.

Conclusion

Two-dimensional diagnostic imaging has served dentistry well, and despite its drawbacks, has an important role in the diagnosis of caries and periodontal disease. However, with the advent of CBCT, practitioners are now able to visualize an accurate, three dimensional image of the entire oral and maxillofacial complex, with less radiation than a traditional CT scan. The rapid development of CBCT technology will undoubtedly increase accessibility of Cone Beam CT radiographic assessment in today's dental practices. The extra information provided by CBCT scans will aid dental professionals in diagnosis and treatment planning, which in turn improves accuracy and minimizes risk of error, ultimately providing better treatment for patients.

Cone Beam CT Scanners

Product	Company	Field of View, cm	Image Resolution, Voxel Size (mm ³)
3D Accuitomo 80	J. Morita USA, Inc.	4x4, 6x6, 8x8	0.08, 0.125, 0.16
Alphard 3030	Belmont Equipment	Dental: 5.1x5.1, Impant: 10.2x10.2, Pan: 15.4x15.4, Ceph: 20x17.9	0.1, 0.2, 0.3, 0.4
Galileos Comfort	Sirona Dental Systems	Medium, 15x15x15	0.3, 0.15
Galileos Compact	Sirona Dental Systems	Medium, 15x15x12	0.3
GXCB-500	Gendex Dental Systems	Standard scan: Either 4 or 8 cm height by 8 cm diameter; Extended Diameter scan: 8 cm height by 14 cm diameter	0.125, 0.2, 0.25, 0.3, 0.4
ILUMA Elite CBCT Scanner	3M ESPE/IMTEC	Plate Size: 13x13, 24x20; Reconstruction Volume: 10.8x9.6, 21.1x14.2	0.4, 0.3, 0.2, 0.09
KODAK 9000 3D	PracticeWorks, Inc.	8x8, 5x8, 4x8	0.076
KODAK 9500 Cone Beam 3D System	PracticeWorks, Inc.	Large-field program: 18.4x20.6+C1, medium-field: 9x15	Large-field: 0.3, med-field: 0.2
NewTom 3G	AFP Imaging Corp	Small: 15.2, med: 22.9, large: 30.5	0.16, 0.25, 0.36
NewTom VG	AFP Imaging Corp	Med: 20.3x25.4	0.3
NewTom VG Flex	AFP Imaging Corp	Med: 20.3x25.4	0.3
Next Generation i-CAT	Imaging Sciences International	Standard scan: 4, 6, 8, 10, or 13 cm height by 16 cm diameter; extended field of view (cephalometric): 17 cm height by 23 cm diameter	0.125, 0.2, 0.25, 0.3, 0.4
Picasso Duo	E-WOO Technology USA, Inc.	Med: 8x8	0.3, 0.2, 0.1
Picasso Master	E-WOO Technology USA, Inc.	Large: 20x19 or 20x15	0.4, 0.3, 0.2
Picasso Trio OS Pro	E-WOO Technology USA, Inc.	Med: 12x7	0.4, 0.3, 0.2, 0.1
PreXion 3D	PreXion Inc.	8x8, 6x5	0.11, 0.16
ProMax 3D	Planmeca, Inc.	8x8, 5x8, 4x5	0.16, 0.32
SCANORA 3D	Soredex, Inc.	Small: 6x6, med: 7.5x10, large: 7.5x14.5	0.13-0.35
SkyView 3D Panoramic Imager	MyRay	Med: 11x11x11	0.2, 0.14
Veraviewepocs 3D	J. Morita USA, Inc.	4x4, 4x8, 8x8	0.125
Veraviewepocs 3De	J. Morita USA, Inc.	4x4, 4x8	0.125

For more information on Cone Beam CT Scanners, visit [Product Comparison Tables](#) or the online issue at www.dentaladvisor.com

Scan Time, sec	Image Recon Time, min	Radiation Exposure to Patient, μ Sv	Patient Positioning	Cost of Equipment
18 (360 deg scan)	4	14	Seated	\$259,000
17	<2	50	Seated	\$289,000
14	2.5-4.5	29	Standing, seated	\$199,995
14	4.5	<29	Standing, seated	\$149,995
8.9 or 23	0.3	30-32	Seated	\$129,000
7.8, 26 for 13x13 size, and 7.8, 20, 40 for 25x20 size	2	27.4-555	Seated	\$149,000-\$225,000
18	<2	38	Standing	\$99,500
23 sec scan time (10.8 sec exposure time)	<2.3	Pending	Standing	Large-field system: \$180,000, Medium-field system: \$129,500
36	1.5	36	Supine	\$225,000
18	1.6	50	Standing, seated, wheelchair	\$189,000
18	1.6	50	Standing, seated, wheelchair	\$189,000
5, 8.9 or 26.9	<0.5	36-74	Seated	\$169,999
CT: 15, Pano: 9.7	Normal: 18, high: 25	60	Standing	\$145,000
Normal: 15, High: 24	29	80	Standing, seated	\$175,000
CT: 15, Pano: 13, Ceph: 0.09	29	60	Standing	\$165,000
Std: 19, high res: 37	0.5	67	Seated	\$139,900
16-18	<3	18-45	Standing, seated, wheelchair	\$125,000
10-20	1-2	25	Seated	\$169,000
10-20	<4	24-71	Supine	\$144,000
9.4	1	20	Standing, wheelchair	\$179,000
9.4	1	20	Standing, wheelchair	\$129,000



ILUMA ELITE
(IMTEC (3M))



PreXion 3D
(PreXion, Inc.)

Shofu Dental Corp.
800.827.4638
www.shofu.com

2009 Product Award Winner

Description

Beautiful II is a fluoride releasing, light-cured, nano-hybrid composite indicated for Class I-V restorations, wedge-shaped defects and root caries, direct laminate veneer, core build-up, and repair of restorations. The manufacturer classifies it as a GIOMER, an esthetic restorative material that combines the characteristics of both composite and glass ionomer. **Beautiful II** is resin-based, containing filler particles that are derived from S-PRG (Surface Pre-reacted Glass Ionomer) technology. The average filler particle size is 0.8 µm with a range of particle sizes from 0.01 to 4.0 µm. The filler content is 83% by weight and 69% by volume. Incremental layering and light curing are advised for placement of **Beautiful II** in a manner typical of traditional composites. A fluoride-releasing bonding agent like **FL-BOND II** is highly recommended. **Beautiful II** is available 12 shades: A1, A2, A3, A3.5, A4, B1, B2, C2, Incisal, BW, A20, and A30. It is packaged in kits containing six-color, 4.5-g syringes or 120 unit-dose tips, Dura-White Stone, Super-Snap Single, and OneGloss Trial Set. Twenty-six clinical consultants evaluated **Beautiful II** in over 700 procedures. This product received a 94% clinical rating.

Suggested Retail Cost

- \$ 200.00/6-color syringe kit
- \$ 373.00/6-color unit-dose tip sets (120 count)
- \$ 65.67/20 Refill tips
- \$ 30.71/ Refill syringe

Product Features

Quality of final polish, ease of finishing, final esthetics, and packaging of **Beautiful II** were rated very good to excellent by all consultants. There is no noticeable shade shift after curing, and the cured composite has a good amount of translucency, allowing it to blend well with the tooth. The material has a workable viscosity for easy placement and shaping. Some consultants noted that **Beautiful II** is sensitive to ambient light, limiting the amount of time the material can be manipulated. Generally, consultants found **Beautiful II** was especially useful for children and patients with high-caries risk, where high fluoride release is important. Seventy-three percent of consultants rated **Beautiful II** equivalent to or better than the current product they were using, and 70% would recommend **Beautiful II** to their colleagues.

Clinical Tips

- Dim overhead light source when packing material to prevent premature curing.
- **OneGloss** (Shofu) gives restorations a nice luster. ■



Consultants' Comments

- ◆ "Good handling characteristics - easy to pack and does not stick to my instrument."
- ◆ "Fluoride release makes it an excellent choice for pediatric patients!"
- ◆ "The shades blend beautifully and polish nicely."
- ◆ "The flip-cap on the syringe was well liked by my assistants."
- ◆ "I would prefer to have a little more material in the unit-dose tip."

THANK YOU!

THE DENTAL ADVISOR would like to say a big thank you to everyone who visited our booth at the Chicago Mid-Winter Meeting. Our treasure hunt promotion was a resounding success and we could not have done it without the support of these manufacturers:

We would also like to extend congratulations to our **GRAND PRIZE WINNERS**:

✧Faith Montgomery ✧Tina Moseley ✧Chris Siebrasse

3M ESPE
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Den-Mat Holdings LLC
Ivoclar Vivadent
Kuraray America
S.S. White
Shofu
Tokuyama America, Inc.
Triodont, Ltd.
Ultradent
Voco America, Inc.
Zenith Dental/DMG

3M ESPE Filtek™ LS Low Shrink Posterior Restorative System

1-Year Clinical Performance + + + + +

3M ESPE
800.634.2249
www.3mespe.com

Description

3M ESPE Filtek LS Low Shrink Posterior Restorative System is a posterior composite based on new resin chemistry, silorane, which minimizes polymerization shrinkage and stress.

The composite is a light cured, radiopaque composite with 55% by volume of inorganic fillers. The *LS System Adhesive Self-Etch Primer and Bond* must be used with Filtek LS composite exclusively. 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 product received a 96% clinical rating.

Clinical Evaluation Protocol

- 225 **Filtek LS** restorations were placed in 143 patients.
- *LS System Adhesive* was used to bond all restorations.
- Class I and Class II posterior restorations were placed (Figure 1).
- 39 restorations were available for evaluation of clinical performance at one year after placement.
- At recall restorations were evaluated on a 1-5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

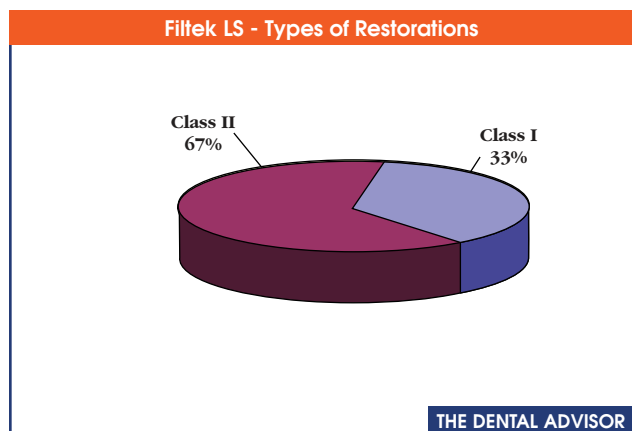


Figure 1

Clinical Observations

Fracture Resistance

Ninety-seven percent of **Filtek LS** restorations were intact during the first year in service (Figure 2). One molar restoration exhibited a small chip that did not require repair or replacement.

Esthetics

All **Filtek LS** restorations were rated very good to excellent at recall (Figure 2). The limited number of shades was adequate for most cases. The cured composite has a very hard surface.

Consultants' Comments

- ◆ "Excellent esthetics."
- ◆ "No post-op sensitivity."
- ◆ "The composite is slightly opaque, which can be an advantage in posterior teeth."
- ◆ "Nice radiopacity."

With adequate attention to finishing and polishing, a smooth surface can be obtained.

Resistance to Marginal Discoloration

Filtek LS restorations were placed with its dedicated self-etch bonding agent, *LS System Adhesive*. Ninety-five percent of restorations had no visible staining at the margins (Figure 2).

Wear resistance

No visible signs of wear were seen on 97% of the restorations recalled (Figure 2). No apparent wear was noted on the opposing dentition.

Sensitivity

No post-operative sensitivity to temperature or pressure was reported by patients when they were asked at their recall appointments (Figure 2).

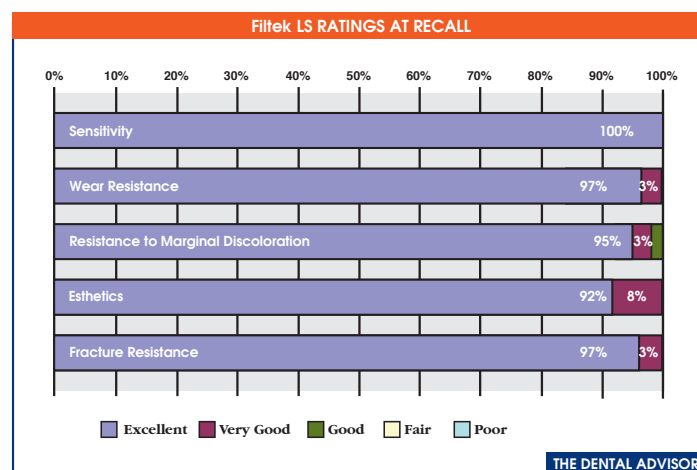


Figure 2

Summary

Filtek LS is a composite for direct restoration of posterior teeth based on a new silorane resin chemistry which enables minimal polymerization shrinkage and stress. **3M ESPE Filtek™ LS Low Shrink Posterior Restorative System** was used in conjunction with its self-etch bonding agent *LS System Adhesive* in restoring 225 teeth in 143 patients. The restorations were evaluated at recall up to one year after placement. All restorations remained intact during this time. Marginal staining was minimal, and no sensitivity was reported with the restorations. ■

G-CEM 1-year Clinical Performance + + + + +

GC America, Inc.
800.323.7063 • 708.597.0900
www.gcamerica.com

Description

G-CEM is a general purpose, self-adhesive resin cement indicated for use with all crowns, bridges, inlays, onlays, and posts. **G-CEM** is self-etching and can be applied to a moist or dry tooth; no special tooth preparation is required before cementation. The cement is dual-cured, with a self-cured setting time of 2:15. **G-CEM** comes in individual capsules and is available in shades A2, A03, BO1, and translucent. This product received at 96% clinical rating.

Suggested Retail Cost

- \$199.00/box of 50

Clinical Evaluation Protocol

- 78 restorations were cemented with **G-CEM**.
- Restorations included crowns, bridges and inlays/onlays (Figure 1).
- Categories evaluated at cementation:
 - Removal of excess cement
 - Total setting time
- Categories evaluated post-cementation:
 - Sensitivity at six months
 - Marginal discoloration
 - Retention of restoration at one year
- Categories were rated on a 1-5 scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

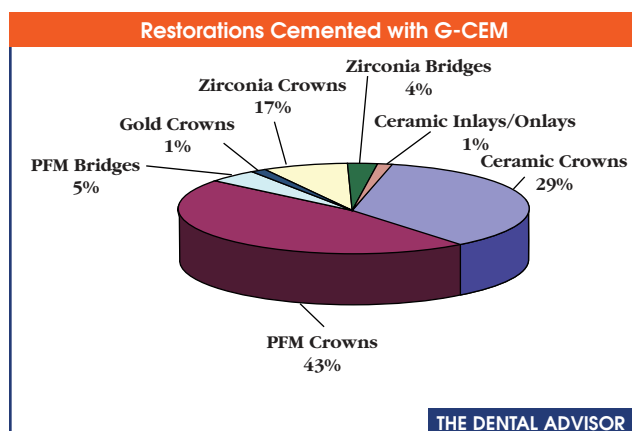


Figure 1

Clinical Observations

Removal of excess cement

Consultants found **G-CEM** easiest to clean at the margins following brief (two to three seconds) light curing (Figure 2).



Consultants' Comments

- ◆ "This cement is very versatile."
- ◆ "Easy clean-up when used on bridges."
- ◆ "Excess cement removes easily with an explorer."
- ◆ "Virtually no postoperative sensitivity."

The viscosity of the cement prevented running of excess material beyond the marginal areas. If allowed to self cure or light cure too long, the cement sets very hard and can be difficult to remove.

Total setting time

Consultants rated the setting time as excellent in most cases (Figure 2). If allowed to self cure only, consultants found the two- to three-minute setting time to be a little long. Under bright operatory lighting the cement sets quickly, and consultants would often dim or remove the overhead light to lengthen the working time.

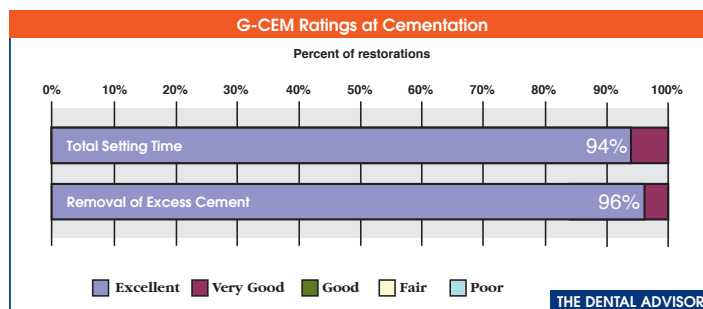


Figure 2

Postoperative sensitivity (six months)

Only one patient reported sensitivity at six months after cementation of the restoration with **G-CEM** (Figure 3.) This cement produces little to no sensitivity to the unanesthetized tooth during cementation.

Continued on page 9

G-CEM 1-year Clinical Performance + + + + +

Continued from page 8

Marginal discoloration

No marginal discoloration was reported in any of the restorations during the evaluation period (Figure 3). Over half of the restorations in this evaluation were all-ceramic restorations, in which marginal discoloration, typically manifested as a gray or brown stain, would have been most easily seen.

Retention at one year

All of the 78 restorations cemented with **G-CEM** were intact at one year (Figure 3). No debonding had occurred.

Editors' Note: **G-CEM** is now also available in 4.8-g automix syringes (A2 and Translucent) with mixing tips and endo extension tips. This new delivery system is suggested for use in multiple-unit cases. ■

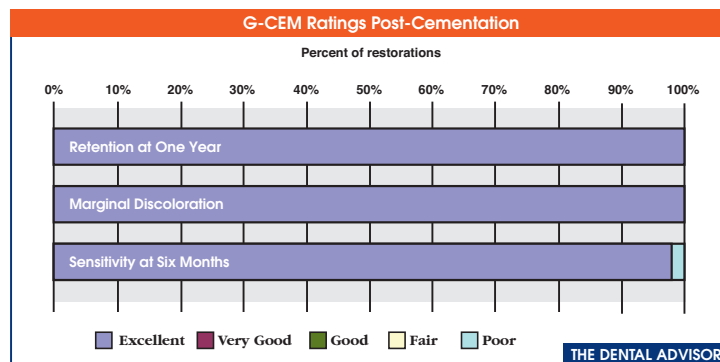


Figure 3

Patient Safety Mask with Shield + + + +

Crosstex

888.CROSSTEX • 631.582.6777

www.crosstex.com

Description

The **Patient Safety Mask with Shield** is a non-latex, single-use face mask designed for the patient. With this device, the patient is partnered with the dentist/hygienist and assistant in the concept of infection control. The mask is in an ear-loop style with a pleated, fluid-resistant nose cover and a clear plastic shield eye cover. The mask was designed to protect the patient's nasal mucosa and eyes from flying debris, aerosol overspray, contaminated overspray, as well as particulates and blood splatter. The mask is fabricated of white spun-bound inner and outer layers of fibrous material and is non-allergenic. These safety masks are available as a box of 25. The **Patient Safety Mask with Shield** was evaluated by 29 clinicians with over 339 patients. This product received an 85% clinical rating.

Suggested Retail Cost

- \$24.95/box of 25

Product Features

Consultants found the woven, pleated material of the **Patient Safety Mask with Shield** to be form-fitting and flexible mask that stayed out of the way, allowing maximum access to the mouth. The ear-loop design provides simple placement with a minimum of discomfort for the patient.

Consultants' Comments

- ◆ "I love that this mask is protecting my patient's eyes."
- ◆ "This is a great concept for patient safety!"
- ◆ "The mask is useful while working on anterior restorations."
- ◆ "The mask interferes with nitrous oxide delivery and rubber dam placement."
- ◆ "Some of my patients felt uncomfortable and confined when using the mask."

The woven material of the mask is soft and smooth to the touch, and the clear shield provides the patient a full field of vision, adding to their feeling of comfort and security. The concept of providing a safer environment for the patient was well received by consultants and their patients. Some patients reported that the mask over the nose was thick and would have preferred a thinner fabric. Many consultants reported the **Patient Safety Mask with Shield** slipped up or down the patient's faces on occasion, hampering dental treatment. Consultants thought that the placement of a wire in the bridge of the mask would allow better contouring to the nose. One third of the consultants would switch to this product and recommend it to their colleagues.

Clinical Tip

- Fold the bottom edge of the mask under the nose to enhance the fit and prevent the mask from sliding up and down the patient's face. ■

Transcoject America, LP
TCAMERICA@EARTHLINK.NET
www.transcodent.com

Description

Transcodent Painless Steel Injection Needles are single-use, sterile needles for the delivery of anesthetic. Each needle has a three-edge lancet grinding and a siliconized cannula for smooth entry and patient comfort. Each hub has a bevel marking and is threaded to ensure easy and safe handling. The needles are to be used with imperial thread injection syringes. To use, bend the cap to break the heat seal, and remove the back-cap. Screw the needle on an anesthetic syringe and pull off the front cap. Note the bevel mark for optimal needle point location during injection. **Transcodent Painless Steel Injection Needles** are available in 25 G short/long, 27 G short/long, and 30 G short/x-short. Twenty-six clinical consultants used these injection needles in over 900 procedures. This product received a 95% clinical rating.

Suggested Retail Cost

- \$ 14.00/ box of 100

Product Features

Overall, clinical consultants found the characteristics of **Transcodent Painless Steel Injection Needles** superior compared to their current brand of injection needles. Patient comfort and smoothness of the injection were among the highest rated characteristics. The sharpness of the bevel, in combination with the good stiffness of the siliconized cannula, allows for smooth entry into tissue with improved comfort to patients. No problems were reported with the fit of the needle to the syringe or removal from the syringe.



Consultants' Comments

- ◆ "Needle is very sharp and slides smoothly into tissue."
- ◆ "Once screwed on, the threads of the hub lock onto the syringe better than other needles."
- ◆ "Dependable, high quality product!"
- ◆ "I like the bevel orientation mark."
- ◆ "Needle seems to be slightly flexible."
- ◆ "I prefer needles packaged in a plastic tub insert or a box that can act as a dispenser."
- ◆ "The diameter of the needle is printed on the cap in millimeters (European designation) instead of gauge."
- ◆ "Needles seemed less painful to patients."

Ninety-one percent of consultants rated **Transcodent Painless Steel Injection Needles** equivalent to or better than their current injection needle, 70% indicated they would switch, and 78% would recommend **Transcodent Painless Steel Injection Needles** to their colleagues.

Editor's note: The manufacturer will be printing the needle measurements onto the cap in gauge (e.g., "G27 long"). ■

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Zenith Dental/DMG
800.662.6383 • 201.894.5500
www.dmg-dental.com

2009 Product Award Winner

Description

LuxaCore Z-Dual is a radiopaque, dual-cured composite core material used for build-ups and post cementations. With the addition of zirconium oxide and nanofillers, the compressive strength and physical properties of **LuxaCore Z-Dual** have been enhanced compared to the original LuxaCore material. **LuxaCore Z-Dual** is offered in two delivery systems: the small *SmartMix* dual-barrel syringe and the larger auto-mix cartridge. It is available in three shades: A3, Blue, and Light-Opaque. Working time is 1:30 minutes, chemical curing time is 5:00 minutes, and light-curing depth is 2 mm at 20 seconds and 4 mm at 40 seconds. The *SmartMix* syringe kit contains two, 9-g syringes; 10 *SmartMix* tips; and 10 intraoral tips. The auto-mix cartridge kit contains one, 50-g cartridge; 35 auto-mix tips; and intraoral tips. The manufacturer recommends using a dual-cured adhesive such as *LuxaBond-Total Etch* bonding system. Thirty-two consultants evaluated **LuxaCore Z-Dual** in 450 clinical cases. This product received a 98% clinical rating.

Suggested Retail Cost

- \$ 135.75/ *SmartMix* syringe kit
- \$ 187.50/ auto-mix cartridge kit

Product Features

LuxaCore Z-Dual was well received by consultants. The ease of dispensing and trimming the material were the most frequently cited positive features.

Consultants' Comments

- ◆ "Dual-cured feature gives me more confidence in deep-layer polymerization."
- ◆ "Viscosity is ideal."
- ◆ "Shade differentiation made prepping easier."
- ◆ "Cured material is hard and cuts like dentin!"
- ◆ "Good radiopacity."
- ◆ "My assistants loved that **LuxaCore Z-Dual** did not require refrigeration."

The narrow, curved intraoral tips ensure precise, direct application of the material, while minimizing voids. **LuxaCore Z-Dual** flows and adapts well to preparations and posts. Clinicians who prefer a condensable core material did not rate the stackability of **LuxaCore Z-Dual** well because packability of this material is minimal, limiting instrument manipulation. Working and setting times provide adequate time for application and the ability to light-cure for rapid set. The A3 shade provides a natural dentin color suitable for use under all-ceramic restorations. Eighty-eight percent of consultants rated **LuxaCore Z-Dual** equal to or better than their current core material, and 78% of consultants would recommend **LuxaCore-Z Dual** to a colleague.

Clinical Tips

- The use of one-bottle, self-etching (7th-generation) bonding system is contraindicated; read the instructions for use carefully.
- Use of *LuxaBond-Total Etch* shortens the working time of **LuxaCore Z-Dual** in the root canal to 30 seconds due to the contact with the Pre-bond.
- Cure in layers for larger core build-ups because of low viscosity. ■

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Clearfil Majesty Posterior with Clearfil S3 BOND

Kuraray America, Inc.
800.879.1676 • 212.986.2230
www.kuraraydental.com

Description

Clearfil Majesty Posterior is a light-cured, nano-hybrid, radiopaque composite for posterior use. The composite is filled 92% by weight, 82% by volume with alumina and glass-ceramic particles. **Clearfil Majesty Posterior** is available in four Vita shades (A1, A2, A3 and B2) and two enamel shades (E1 and E2). It is packaged in 2-mL (4.9-g) syringes or 20, 0.25-g unit-dose tips.

Clinical Evaluation Protocol

- 468 Clearfil Majesty Posterior restorations were placed in 179 patients.
- Clearfil S³ BOND was used to bond all restorations.
- Class I and Class II posterior restorations were placed.
- 93 restorations were available for evaluation of clinical performance up to 20 months after placement (Figures 1 and 2).
- At placement and at recall, restorations were evaluated in various categories on a 1-5 rating scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

Clinical Observations at Placement

Ease of Placement, Packability, Carveability

Clearfil Majesty Posterior has adequate firmness for packing against a matrix band and maintaining its position where placed (Figure 3). While the composite has a fairly high viscosity, it is easy to extrude from the unit-dose capsules. The unit-dose delivery was overwhelmingly preferred by consultants, compared to the bulk syringes. Sculpting and carving occlusal anatomy is easier with an instrument wetted with unfilled resin. The consistency of **Clearfil Majesty Posterior** is somewhat waxy which drags and pulls with a dry instrument.

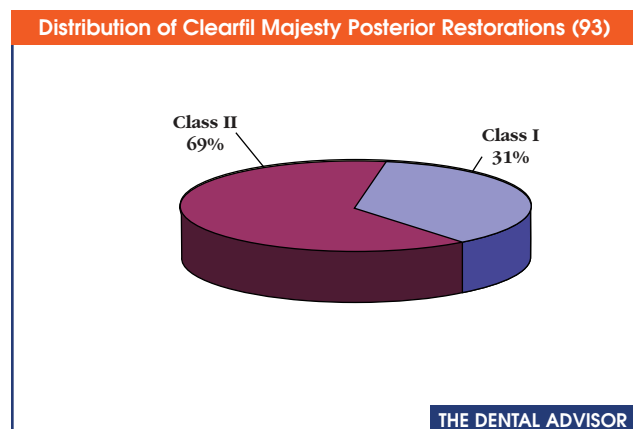


Figure 1

Consultants' Comments

- ♦ "Produces firm interproximal contacts."
- ♦ "Simple shading system."
- ♦ "Restorations look good at one year."

Shade Match/Esthetics, Vitality

Clearfil Majesty Posterior exhibits a nice balance of translucency and opacity to block underlying stained dentin yet achieves very good blending with the enamel margins. All restorations were rated very good to excellent for esthetics and vitality regardless of whether a single Vita shade was used or if it was overlaid with an enamel shade (Figure 3).

Finish/Polish

The composite is easy to finish with standard rotary diamonds and finishing instruments (Figure 3). The polish is acceptable for posterior restorations. The final surface was often reported to be slightly grainy.

Age of Clearfil Majesty Posterior Restorations (93) at Recall

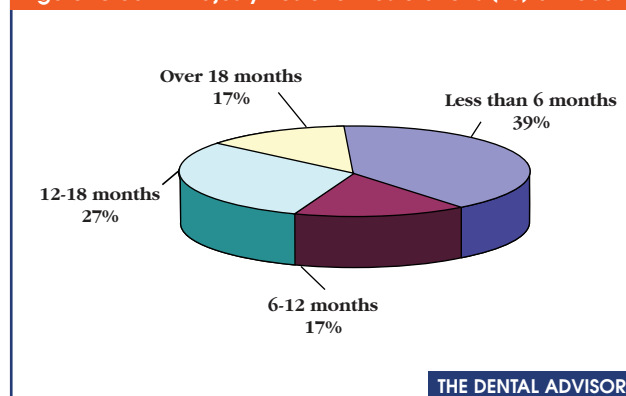


Figure 2

Clinical Observations at Recall

Fracture Resistance

Ninety-nine percent of **Clearfil Majesty Posterior** restorations recalled showed no chips or fractures (Figure 4). One molar restoration fractured at the marginal ridge, requiring replacement.

Esthetics

Clearfil Majesty Posterior maintained very good esthetics at all stages of recall (Figure 4). The initial comments of slight graininess at placement were not reported at recall. The composite surfaces were actually smoother after some time in function. No loss of anatomy or surface wear was noted. Shades exhibited stability, and restorations blended well with the surrounding tooth structure.

Continued on page 13

1-year Clinical Performance + + + + +

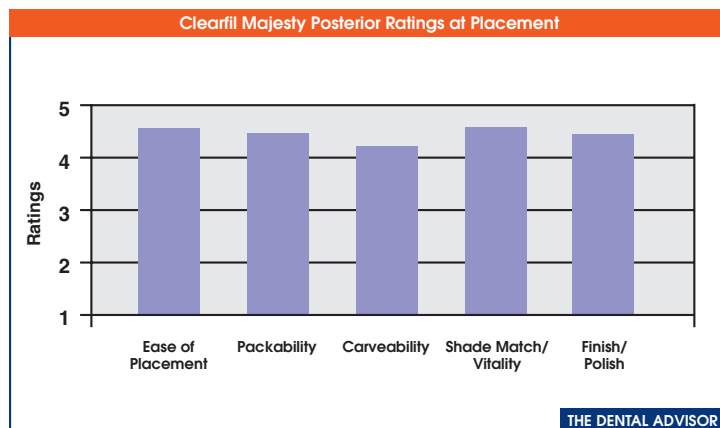


Figure 3

Continued from page 12

Resistance to Marginal Discoloration

Clearfil S³ BOND was used to bond the *Clearfil Majesty Posterior* restorations; no additional etching of peripheral enamel was done at the time of placement. Ninety-nine percent of restorations had no visible staining at the margins (Figure 4).

Sensitivity

No post-operative sensitivity to temperature or pressure was reported by patients when they were asked at their recall appointments (Figure 4).

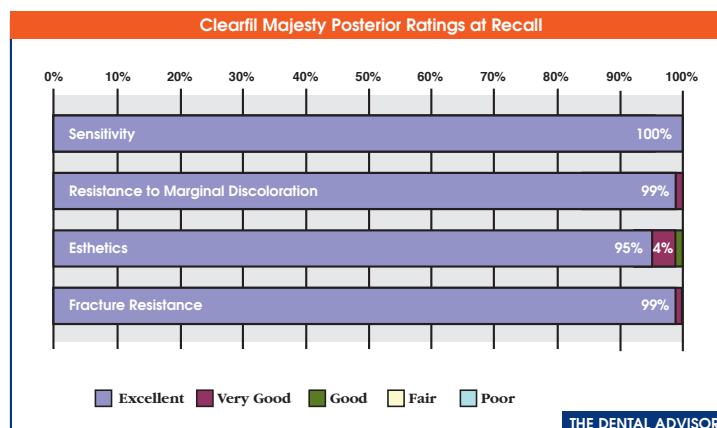


Figure 4

Summary

Clearfil Majesty Posterior was used with the 7th-generation bonding agent, *Clearfil S³ BOND*, in restoring 438 teeth in 179 patients. The composite was easy to place from the unit-dose capsules. Sculpting/carving was best accomplished with a resin-wetted instrument. The restorations were evaluated as the patients reported for their next scheduled dental appointments, ranging from two months to 20 months after placement. One restoration was replaced during the recall period. This restoration had a fractured marginal ridge after 13 months in function. Marginal staining was minimal, and no sensitivity was reported with the restorations. Overall, *Clearfil Majesty Posterior* was highly rated for producing esthetic posterior restorations. ■

Product Update

Cetacaine Topical Anesthetic Liquid (*Cetylite Industries, www.cetylite.com*) *Cetacaine Topical Anesthetic Liquid's* triple-active formula (Benzocaine 14.0 %, Butamben 2.0 %, Tetracaine Hydrochloride 2.0 %) provides onset of anesthesia within 30 – 60 seconds and duration typically lasts 30 –60 minutes. *Cetacaine* is indicated to produce anesthesia on all accessible mucous membrane except the eyes. It is an effective alternative to injections for scaling and root planning or as a topical anesthetic before injections. The newly designed cap allows for direct loading of luer-lock syringes. Our consultants found this newly designed dispensing cap easier to use and more cost efficient, resulting in accurate dispensing and less product waste. Some commented that the new cap featured with the *Cetacaine Liquid* topical anesthetic kit results in a “great delivery system.”

Kolorz™ ClearShield Fluoride Varnish + + + + 1/2

Zenith Dental/DMG
800.662.6383 • 201.894.5500
www.zenithdental.com

2009 Product Award Winner

Description

Kolorz ClearShield Fluoride Varnish is a 5% sodium fluoride varnish indicated for use as both a treatment for dentinal hypersensitivity and as a cavity liner under amalgam restorations. It is moisture tolerant; therefore, it adheres in a moist environment. However, for optimum results the manufacturer recommends blotting the tooth surface to remove excessive saliva before application. Each milliliter of **ClearShield** contains 50 mg of sodium fluoride, which is equivalent to 22.6 mg of fluorine. It contains xylitol and other natural sweeteners and is gluten-free. **ClearShield** is available in 35-count,

Consultants' Comments

- ◆ "Less opaque than other fluoride varnishes."
- ◆ "Very smooth, easy application."
- ◆ "Because of the clear color and great taste, patients think it's terrific."
- ◆ "Our office has switched to ClearShield!"
- ◆ "I would like more flavor options."
- ◆ "Increase the length of the brush handle."

0.4-ml unit-dose packages (watermelon-flavored). The unit-dose package contains the varnish and a disposable brush with a mixing well and also includes doctor's instructions for use and a pad of post-treatment instructions for patient care after application. **ClearShield** was evaluated by 31 consultants in over 600 applications. This product received a 91% clinical rating. *Continued on page 15*

Great White Z + + + +

S.S. White Burs, Inc
800.535.2877 • 732.905.1100
www.sswwhiteburs.com

Description

Great White Z is a line of diamonds designed for use on sintered zirconia. Used at high speed, this cutting instrument is intended to provide cutting efficiency for removal or adjustment of zirconia crowns and copings as well as endodontic access. The introductory kit includes four diamonds - small round, large round, round-end taper and football - in an autoclavable bur-block. The round diamonds are used for endodontic access, the round-ended taper diamond is for slot crown removal, and the football is for adjustment procedures. More than 20 consultants used **Great White Z** diamonds in over 360 uses. This product received an 86% clinical rating.

Suggested Retail Cost

- \$49.95 Introductory kit
- \$33.50 5-Pack refill kit

Product Features

Consultants responded favorably to an instrument specifically designed to remove zirconia. **Great White Z** diamonds do an excellent job cutting through the veneer porcelain of a crown and better than a regular diamond when entering the zirconia substructure. The round diamonds were reported to be the most effective shape for preparing an endodontic access. The grit of **Great White Z** is not extremely coarse; therefore, it produces a smooth opening and does not cause chipping of the crown. For removing crowns using the slot technique, the round-end tapered diamond is effective but would benefit from a thinner diameter with coarser grit. Overall, 86% of consultants found **Great White Z** to be equal to or better than their current zirconia-removal diamonds, and 62% would recommend **Great White Z** to a colleague.

Clinical Tip

- For the best results, use copious water and do not press too hard - let the diamond do the cutting for you. ■



Consultants' Comments

- ◆ "For cutting zirconia, Great White Z is much better than most other diamonds."
- ◆ "The fine grit of Great White Z is ideal for use when the crown is to be retained."
- ◆ "Great to have in the office for when I need them."
- ◆ "A thinner, coarser diamond would be better for the sectioning and removal of a zirconia crown."

Kolorz™ ClearShield Fluoride Varnish + + + + 1/2

Continued from page 14

Suggested Retail Cost

- \$47.50/ 35-count box

Product Features

The ease of application of **ClearShield** and lack of pain during application were highly rated by consultants, hygienists and patients. Some patients did comment that a more “adult” flavor, such as mint, would be preferred. The ease of mixing to an even consistency and the handling characteristics of the varnish were noted as very good.

ClearShield was found by consultants to be easy to apply with good adherence to the teeth. The setting time of **ClearShield** is somewhat longer than similar products, a characteristic that allows more time for application of the varnish and was appreciated by consultants.

ClearShield was reported to be effective in reducing sensitivity immediately after application. Consultants commented that the varnish was not completely clear after application, but it was less opaque and less chalky than the products they were currently using and, therefore, less visible post-treatment. The postoperative instructions were well received and helped explain home care to the patient. Ninety-seven percent of consultants found **Kolorz ClearShield Fluoride Varnish** to be equal to or better than the desensitizer they were currently using, 71% would switch to ClearShield, and 55% would recommend it.

Clinical Tips

- Dry the tooth surface thoroughly for the best results.
- Send leftover material home with the patient for another application. ■

Venus Temp C&B + + + +

Heraeus

800.431.1785 • 914.273.8600

www.heraeus-kulzer-us.com

Description

Venus Temp C&B is an auto-mix, bis-acryl, self-curing provisional restorative material. It is free of methyl methacrylate and is intended for fabrication of provisional crowns and bridges, inlays/onlays and veneers. It is packaged in 50-ml cartridges in five VITA shades: A1, A2, A3.5, B1, and Bleach. Each package contains one cartridge and 12 mixing tips. **Venus Temp C&B** has a working time of 1 minute with a setting time of 1-3 minutes. Trimming and polishing can be done after complete set at 6 minutes. The material can be repaired by using freshly extruded **Venus Temp C&B** or a flowable composite. Thirty-three consultants evaluated **Venus Temp C&B** in 584 clinical applications. This product received an 86% clinical rating.

Suggested Retail Cost

- \$172.43/kit

Product Features

Venus Temp C&B dispenses with even pressure through the mixing tip and into the provisional matrix or impression. The working time is adequate even for multiple units, but the consultants found the setting time to be slow and would prefer a quicker complete set. The provisional is easily manipulated on and off the tooth without distortion to check fit and occlusion.

Consultants' Comments

- ◆ “Great translucency and shade matching.”
- ◆ “The material captures the margins of the preparation well for nice-fitting temporaries.”
- ◆ “This product seemed very strong and held up well during the period of temporization.”
- ◆ “The material is easy to remove from the mouth and doesn’t lock on the teeth.”
- ◆ “The 6-minute setting time is too long.”

Finishing and polishing produces a smooth, life-like provisional with very good esthetics. The shades of **Venus Temp C&B** blend very well with the surrounding teeth. The oxygen-inhibited layer, which forms on the surface, can be removed using alcohol. It is particularly important to remove this layer from the internal surface of the provisional so that retention is not compromised. The material has sufficient strength for single units but some fractures were reported for longer span provisionals. Seventy-six percent of the consultants rated **Venus Temp C&B** equal to or better than the material they were currently using and 64% would recommend it.

Clinical Tip

- To reduce the potential for voids, the material should be loaded from the bottom of the matrix upward. ■

Triodent Ltd.
800.811.3949
www.triodent.com

2009 Product Award Winner

Description

The **V3 Ring Sectional Matrix System** has three components: the **V3 ring**, a separator ring with V-shaped autoclavable tines, the **V3 matrix** and the **Wave-Wedge**. The **V3 ring**, which is available in Universal and Narrow sizes, is made of nickel-titanium alloy, which provides increased tension to establish a sound contact area. The **V3 Universal ring** (green) is a newly designed version of the original **V-Ring**. A narrow ring (yellow) is available for use on smaller teeth. The tines are reinforced glass fiber and are designed to match buccal and lingual contours of posterior teeth to prevent the ring from collapsing into preparations with wide proximal boxes. The matrix features a placement tab with removal holes for use with pin tweezers. The **Wave-Wedge** is plastic with flexible wings and a hollow underside to accommodate the gingival papilla. The starter pack contains one **Universal** and one **Narrow** ring, two pin tweezers, one forceps, **V3 matrices**, and **Wave-Wedges**. Thirty consultants evaluated the **V3 Sectional Matrix System** in more than 900 clinical applications. This product received a 96% clinical rating.

Suggested Retail Cost

- \$449.00/starter pack

Consultants' Comments

- ♦ "The new **V3 Sectional Matrix System** works better for wider proximal boxes when compared to the previous version."
- ♦ "This system creates the most anatomic, tight contacts of any system I have ever used."
- ♦ "Consistent separation of teeth and less for me to trim in the interproximal area."
- ♦ "Rings are tight, wedges are smooth and both are gentle to tissue."
- ♦ "Stacking the rings for multiple restorations is somewhat difficult."

Product Features

The starter pack that was evaluated contained the **V3 Ring Sectional Matrix System** in a small compartmentalized plastic box with illustrated instructions. Additional training information can be obtained from the company website or supplied on a CD or DVD. The color-coding and different sizes of the wedges are very useful and they adapt well to interproximal spaces. The two ring sizes are adequate for all posterior teeth with the **Narrow** ring being very effective for smaller teeth. The combination of the tension in the ring and the tines adapts the sectional matrix band to the proximal contours of the teeth to reduce excess composite and produce a reliable and consistent proximal contact. The forceps/ring combination is stable and the tension in the spring remains constant, although it can be reset by using the forceps and firmly squeezing the tines together. The thicker tines do not allow placement in some situations; however, the manufacturer is working to improve this. Eighty-seven percent of consultants rated the **V3 Ring Sectional Matrix System** better than the current matrix system they were using and 90% would recommend it. ■

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