

THE DENTAL ADVISOR™

“Improving Patient Care Through Research & Education”



Photography by Charles McLaren DDS

Esthetic Fiber Posts

The use of metallic posts in the restoration of endodontically treated teeth has been a mainstay in dentistry. However, metallic posts have several clinically significant deficiencies. A dark shine-through effect may be evident when using metallic posts and cores. Metallic posts may also cause discoloration of the surrounding tissues due to corrosion products. The advent of non-metallic, fiber posts addresses these concerns. Carbon and glass fiber-reinforced posts have been developed with stiffness values closer to that of human dentin. Esthetic posts made from glass or quartz fiber allow improved esthetics when all-ceramic crowns are to be placed. With the wide range of non-metallic posts being introduced and used in clinical dentistry, it is important to understand the properties of these materials and their limitations.

This issue of THE DENTAL ADVISOR presents information to assist the dentist in the selection of esthetic posts. Twenty-three esthetic fiber posts are compared.

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

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

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Esthetic Fiber Posts

Selecting a fiber post vs metal post

The basic function of a post is to provide sufficient retention for a core and/or crown and in some instances to provide lateral resistance for a tooth to masticatory forces, preferably without causing root fracture. While both metallic and fiber posts can provide sufficient retention, the resistance to lateral forces is different. Metallic posts are typically stiff and place more stress on the root structure. Fiber posts have stiffness closer to dentin allowing it to function with the tooth and not against it, thereby minimizing the risk of root fracture.

Additional advantages of fiber posts include:

- + Aesthetics - glass or quartz fiber posts are tooth-colored or translucent.
- + Fiber posts do not corrode like base metal posts.
- + Bondable to remaining tooth structure and composite core.
- + Easier to remove if the tooth needs to be retreated endodontically.
- + Tapered designs allow for more conservative preparations.

In circumstances where there is insufficient coronal tooth or a small ferrule, fiber esthetic posts may not provide adequate resistance to lateral forces, resulting in crown debonding, core fracture, or post failure. It is particularly important for anterior teeth with little coronal tooth and posterior teeth with heavy occlusal forces to select a stiffer post.

Guide to Post Selection

Diameters and Sizes

The diameter of the post has little or no impact on retention but is important for strength and resistance to fracture. The diameter selected should be as closely matched to the canal size as possible without undue widening of the canal.

Radiopacity

High radiopacity of a post makes radiographic visualization and verification easier and may reduce unwarranted retreatment of teeth. Knowing the radiopacity is critical since follow-up radiographs need to be interpreted correctly to identify esthetic posts.

Retentive Head

Retentive heads (grooves, taper, ball) mechanically retain a core to the coronal portion of the post. Larger heads may limit their use in shortened or narrow teeth. Adjust the length from the apical portion of the post.

Length

The length of the post plays an important role in its retention, and as a rule of thumb, the ideal post length should be equal to the height of the clinical crown.

Post Shape/ Surface

Non-metal posts are passive/non-threaded and come in three basic shapes: Parallel, tapered, and parallel-tapered. Retention is increased by using a parallel post, increasing post length, and adhesive resin cementation. Long, tapered posts are less retentive than parallel posts but require less dentin removal. In cases where a significant portion of the canal is compromised, a tapered post may be a more conservative option. The parallel-tapered post offers the advantages of both designs, parallel sides aiding in retention and tooth preservation at apex. Passive posts are retained solely by a luting agent. Some manufacturers have added surface features such as serrations to aid in retention.

General Guidelines For Post Design/ Location

- Leave at least 3-5 mm of gutta percha at the apex to maintain effective apical seal.
- Anterior endodontically treated teeth missing no tooth structure other than the access preparation, do not require a post and can be restored with an adhesive composite restoration.
- Post should be placed in distal canals of mandibular molars, and palatal canals in maxillary molars.

Luting Materials

Esthetic posts should typically be bonded with either self- or dual-cured resin cement. Eugenol-based endodontic sealers inhibit the set of resin cement; therefore, a non-eugenol sealer should be used when the placement of an esthetic post is anticipated. The apical portion of the post space should be accessed for etching and priming by special microbrushes designed for post spaces. If dual- or light-cured resin cement is to be used (only with specific systems that transmit light), the cement should be cured for a minimum of two minutes to ensure setting at the apical portion.

Post Removal

Piezo electric ultrasonics are a tremendous help in post removal and are often safer to use than post removal kits. When removing a post, it is critical to break the seal between the post and the tooth structure. This can be accomplished initially through the use of a surgical length 1/4-round bur, making sure you are along the long axis of the post. After creating a groove around the post, place an ultrasonic tip into the trough. Using a low setting and copious water will allow breakage of the seal between the tooth and post. Patience is always recommended when removing posts from canals.

Clinical Tips

- Use resin cement to increase retention of tapered posts.
- Select a stiffer post for anterior teeth with little coronal tooth and posterior teeth with heavy occlusal forces.
- For working length measurements, record from the orifice-to-apex. This will keep the measurement constant in cases where a cusp or reference point is reduced or breaks off.
- Color-coded systems allow visual size matching of posts to respective post drills and makes re-ordering easier.
- Size-matched systems allow for quicker selection and better adaptation of the appropriate posts.
- Use bonding agents and core materials recommended by the manufacturer whenever possible.

What's new in Fiber Posts

Bisco recently improved its most recent post, **D.T. LIGHT-POST ILLUSION X-RO**. With its color-on-command technology, when placed, the intrinsic color of the post disappears allowing it to blend into the natural dentition. If retreatment or removal is ever required, the post will reappear on command by simply spraying cold water on the tooth.

Q: What type of preparation to the post space is necessary before bonding a fiber post?

A: Post space preparation is dependent upon the type of bonding system used. Some cementation systems which bond the post to the tooth require acid etching, priming, and adding bonding agent to the space before post cementation. **RelyX Fiber Post (3M ESPE)**, comes with **3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement**, a self-adhesive resin cement that requires no pre-treatment of post space. Thus, bonding of the post to the post space is accomplished quickly and easily.

Visit the Ask The Editors section of THE DENTAL ADVISOR Online to see more clinically relevant answers to questions we receive from attendees at lectures and online. The answers provided by our editors offer useful information and often highlight products that have been evaluated clinically.

Translating the Science

Product	Three-point Bend Yield Strength, MPa	Three-point Bend Flexural Strength, MPa	Three-point Bend Flexural Modulus, GPa	Radiopacity, mm Al/mm Ø
3M ESPE RelyX Fiber Post	443	788	26	2.3
D.T. LIGHT-POST ILLUSION X-RO	480	709	22	3.8
FibreKleer Post	745	1082	27	2.0
Snowlight	443	743	22	2.3
Snowpost	407	726	21	2.1

Yield Strength and Flexural Strength

Testing Method: Three-Point Bend

Clinical Significance: High flexural strength and high yield strength indicate durability and fracture resistance in function. The higher the strength, the longer the material will take to fray and break under loading and bending.

Flexural Modulus

Testing Method: Three-Point Bend

Clinical Significance: Low flexural modulus similar to dentin is responsible for the prevention of root fracture.

Radiopacity

Testing Method: Radiographs are taken each post alongside an aluminum step-wedge varying in thickness from 0.5 to 6 mm. The radiographic density of each post was measured and correlated with the equivalent thickness of aluminum. Generally, 1 mm of dentin has a radiopacity of about 1.5 mm of aluminum.

Clinical Significance: High radiopacity makes a post easy to detect on an x-ray. It is imperative for a post to contrast with both the cement and tooth structure. This provides clinical certainty that the post has seated properly.

Summary

An ideal fiber post would have both high yield and flexural strength, a flexural modulus similar to dentin, and good radiopacity.

Testing Esthetic Fiber Posts in the Laboratory

The three-point bend yield strength, flexural strength and modulus (similar to stiffness) of esthetic fiber posts are important because the post occupies the center of the core portion of a restoration and should not be weaker than the core. The post can provide toughness to the more brittle core material. The post also should be about the same stiffness as the surrounding dentin. The flexural strength and modulus of composite core materials range from 100-165 MPa and 7-17 GPa, respectively. The flexural modulus of dentin is approximately 17 GPa. If the post is significantly stiffer than the surrounding dentin as with metal and ceramic posts, a stress discontinuity can exist, which can put the tooth root at risk in the event of an impact to the tooth.

Radiopacity of an esthetic fiber post is important to the extent that it allows the post to be clearly identified on an x-ray (Figures A and B). Values of radiopacity are reported in equivalent thicknesses of pure aluminum, which are matched to the post by including a standard aluminum step wedge (Figure C) in the radiograph with the post. X-ray photographic grey levels of the different thicknesses of the step wedge are compared to the grey level of the post at the level where the post is cylindrical.

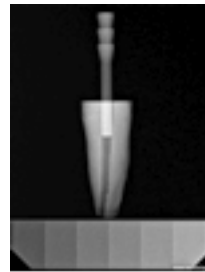


Figure A Post in tooth to show effect of 2.0 mm aluminum radiopacity per diameter of the post (post Ø = 1.5 mm).

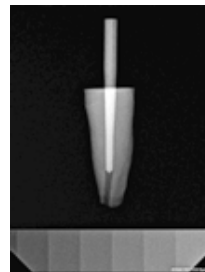


Figure B Post in tooth to show effect of 3.8 mm of aluminum per diameter of the post (post Ø = 1.8 mm)

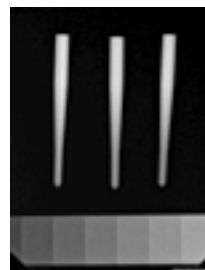


Figure C Measurement of grey level using aluminum step wedge (at bottom of x-ray)

Esthetic Fiber Post Properties

Product	Company	Material	Shape	Diameters Available	Rating
3M ESPE RelyX Fiber Post	3M ESPE	Glass	Parallel, tapered	3	96%
ACHROMAT	AXIS Dental	Glass	Parallel	3	na
ACHROMAT-T	AXIS Dental	Glass	Tapered	2	na
CI White Post	Parkell	Fiberglass-reinforced	Tapered	2	na
Core-Post	Den-Mat Holdings, LLC	Glass	Parallel, tapered	5	91%
Core-Post	Den-Mat Holdings, LLC	Carbon Fiber	Parallel, tapered	5	na
Cure-Thru IntegraPost	Premier Dental Products	Zirconia	Parallel, tapered	4	ce
D.T. Light-Post Illusion X-RO	Bisco Dental Products	Quartz	Tapered	4	na
DentinPost X	Komet USA	Glass	Tapered	4	na
FibreKleer Post	Pentron Clinical Technologies	Glass	Parallel, serrated, tapered	3	na
FibreKor Post	Pentron Clinical Technologies	Glass	Parallel	6	91%
FRC Postec Plus	Ivoclar Vivadent	Fiber-reinforced composite	Tapered	3	91%
GF Glass Fiber Post	J. Morita USA	Glass	Parallel	4	na
GT Fiber Posts	DENTSPLY Tulsa Dental Specialities	Fiber	Passive parallel	3	na
ICELight	Danville Materials	Glass	Parallel, tapered	4	na
ICEpost	Danville Materials	Glass	Parallel, tapered	4	na
Lucent Anchors	Dentatus	Resin fiber	Parallel, tapered	3	na
Mirafit White	Hager Worldwide	Glass	Tapered	3	na
ParaPost Taper LUX	Coltène/Whaledent	Glass	Tapered	4	98%
Rebilda Post System	VOCO America	Glass	Tapered	3	ce
Snowlight	Abrasive Technology	Glass	Parallel, tapered	4	91%
SnowPost	Abrasive Technology	Glass	Parallel, tapered	4	91%
Twin Lucent Anchors	Dentatus	Resin fiber	Parallel w/ tapered midsection	3	na

ce = Currently Evaluating, na = Not Clinically Evaluated.

For more information on Esthetic Fiber Posts, visit Product Comparison Tables or the online issue at www.dentaladvisor.com.



ParaPost Taper Lux
(Coltène-Whaledent, Inc.)



Snowlight
(abrasive technology)



Snowpost
(abrasive technology)

3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement

3M ESPE
800.634.2249
www.3mespe.com

2009 Product Award Winner

Ask The Editors:

Visit online at www.dentaladvisor.com to view Q & A about this product!



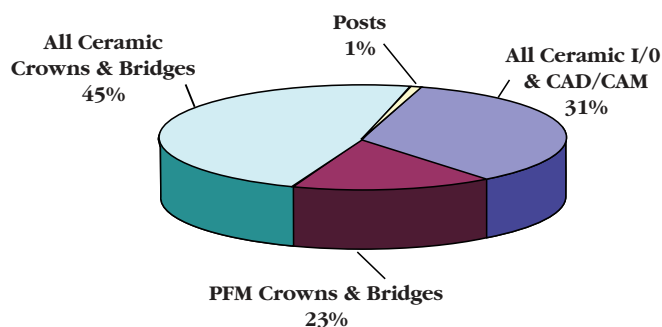
Description

3M ESPE RelyX™ Unicem Self-Adhesive Universal Resin Cement (3M ESPE) is a dual-cured resin cement. It is self-adhesive, requiring no tooth surface preparation such as etching, priming or bonding. The cement is filled 72% by weight and contains fluoride. **RelyX Unicem** is available in two capsule sizes (*Aplicap* and *Maxicap*) in shades A1, A2, A3-opaque, white opaque, and translucent. **RelyX Unicem** cement is also available in a paste/paste formulation delivered by Clicker™ Dispenser in shades A2 universal, A3-opaque and translucent. **RelyX Unicem** cement is indicated for the cementation of metal, PFM, etchable and high strength ceramic and laboratory composite crowns, bridges, inlays, onlays, and endodontic posts. It is also recommended for cementing CAD/CAM restorations. It is not recommended for the cementation of veneers. Working time is 2 minutes for the *Aplicaps* and the Clicker and 2.5 minutes for the larger *Maxicaps*. The *Aplicaps* have enough material to cement one to two restorations, whereas the *Maxicaps* have enough material for three to six restorations. This product received a 99% clinical rating.

Suggested Retail Cost

- \$122.60/Aplicap trial kit (20 Aplicaps + hardware)
- \$359.50/Aplicap introductory kit (50 Aplicaps + hardware)
- \$262.50/Maxicap introductory kit (20 Maxicaps + hardware)
- \$277.10/Aplicap refill (50 Aplicaps)
- \$196.60/Clicker Dispenser kit

TYPES OF RESTORATIONS CEMENTED WITH UNICEM



THE DENTAL ADVISOR

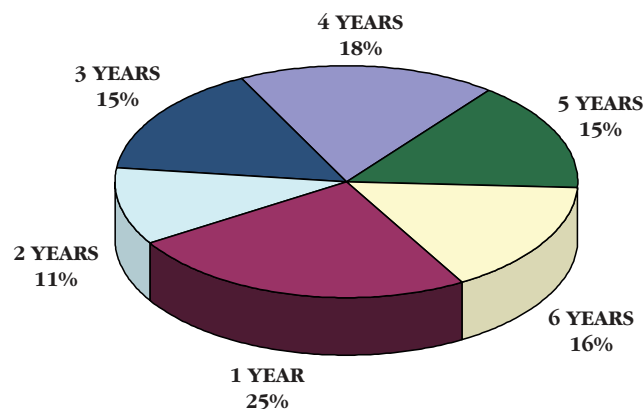
Figure 1



Consultants' Comments

- ♦ "RelyX Unicem has really proven to be an excellent choice for the cementation of a variety of restorations"
- ♦ "It is definitely the most widely used cement in our practice"
- ♦ "When I first started using RelyX Unicem, I was not sure of how well it will perform over time. After six years its performance has been exceptional."
- ♦ "As an assistant, RelyX Unicem has been my first choice - it is just so easy to use and clean up."

YEARLY PERCENTAGE OF RESTORATIONS CEMENTED WITH UNICEM



THE DENTAL ADVISOR

Figure 2

Clinical Evaluation Protocol

- More than 5600 restorations have been cemented with **RelyX Unicem** over the past 6.5 years. These restorations include all-ceramic inlays, onlays, crowns, bridges; PFM crowns and bridges; posts and CAD/CAM restorations (Figure 1).
- 1739 restorations were available for recall. See Figure 2 for the yearly distribution of the 1739 restorations recorded.
- Characteristics evaluated at recall include:
 - Postoperative sensitivity
 - Discoloration at margins
 - Debonding

continued on page 7

continued from page 6

Clinical Observations

Postoperative sensitivity

Since its introduction and subsequent yearly recall *RelyX Unicem* has had very few instances of postoperative sensitivity. The postoperative sensitivity was less than 1.2% of the seated restorations and usually occurred in the first year, post cementation (Figure 3). In most cases, the postoperative sensitivity was of short duration.

Discoloration at margin

Discoloration at the margins is exhibited by graying or microleakage at the margin of all-ceramic restorations and in rare cases, the graying results in darkening of the whole restoration making it unattractive. Graying at the margins was noted in 5.3% of the restorations and it seemed to be time related (Figure 3). 1.3% of the restorations needed to be replaced as a result of the graying. Several factors can contribute to microleakage:

- Improper isolation during cementation
- Bruxism compromising the bond between the cement and the tooth, especially at the cervical margin.
- Thermal cycling - as the patient ingests hot and cold foods or drinks, weakening of the bond to the tooth or the restoration occurs allowing the egress of fluid and bacteria and causing graying at the margin. The rate of microleakage of restorations cemented with *RelyX Unicem* is comparable to restorations cemented with 5th- and 6th-generation bonding agents and corresponding light- or dual-cured resin cements.

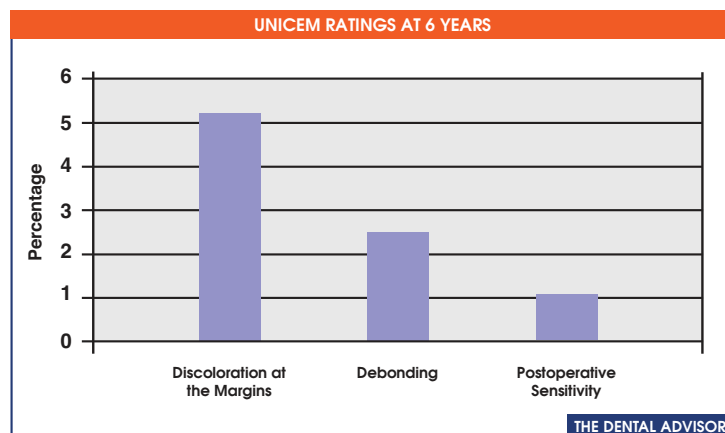


Figure 3

Debonding

A low debonding rate of 2.6% was documented over the six-year evaluation period. Among 1739 recalled restorations cemented with *RelyX Unicem*, 46 required re-cementation (Figure 3). These included 24 ceramic onlays, 10 ceramic crowns, and 12 PFM crowns. Of the 24 ceramic on-lays that debonded, 12 had little direct retention. In five of these debonding cases, a portion of the tooth fractured.

Summary

3M ESPE RelyX™ Unicem Self-Adhesive Universal Resin Cement has proven to be excellent and reliable self-adhesive resin cement in the six years since its introduction. ■

Clinical Case Reports



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We strive to present information that is relevant, timely, and applicable to daily practice. Be sure to visit www.dentaladvisor.com and review the cases posted for clinical tips on using products featured in THE DENTAL ADVISOR.

Tri Hawk Talon Burs + + + +

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Description

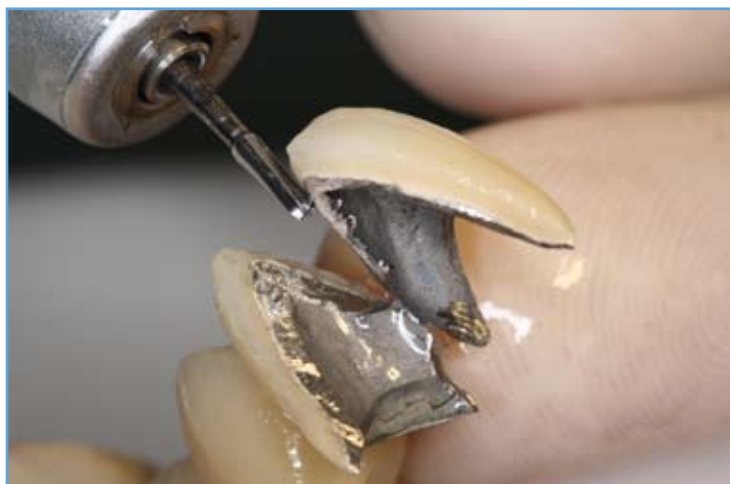
Tri Hawk Talon Burs are disposable high-carbon steel shank burs with a carbide tip designed for strength and cutting efficiency. Indicated for all operative procedures, the 1158 series burs feature a proprietary rake-blade angle and end cut, allowing the clinician to cut vertically and horizontally through all types of metal, as well as tooth structure, without having to change burs. The color of the bur is matte black to help reduce eyestrain and to provide contrast between the bur and tooth structure. **Tri Hawk Talon Burs** come in rolls of 100, are available in 3 sizes, and they are indicated for single use. Twenty-nine consultants evaluated **Tri Hawk Talon Burs** in sizes 10 and 12 in over 250 clinical cases. This product received an 87% clinical rating.

Suggested Retail Cost

- \$229.00/100-ct roll

Product Features

The fit in handpiece, cutting efficiency, and sharpness of **Tri Hawk Talon Burs** were highly rated by evaluators. The cutting efficiency allows for fast reduction of tooth material and very quick sectioning of metal crowns and substructures. Selection of sizes was rated as good; however, some consultants would like to see additional shapes, whereas 62% found Talon 10 the most useful of the two burs evaluated. While the dark-colored shank provides good contrast when cutting on enamel and dentin, the bur may blend when preparing endodontic access through crowns or sectioning substructures.



Consultants' Comments

- ◆ "Very sharp and very efficient!"
- ◆ "This bur cuts very fast."
- ◆ "Excellent for cutting through old crowns."
- ◆ "A quadrant of preparations can typically be completed with a single bur."
- ◆ "The bur tends to chatter at initial penetration."

Some consultants stated that the bur was extremely sharp and efficient at the beginning of a procedure but did tend to dull during crown removal. Ninety-three percent of consultants rated **Tri Hawk Talon Burs** equivalent to or better than the carbide burs they were currently using. Sixty-two percent said they would switch to this bur, while 89% would recommend it.

Clinical Tip

- Use light pressure and the side of the bur when first starting a preparation to prevent "skip off" and decrease chatter. Then more pressure can be used to complete the preparation. ■

Request a Sample

Free product samples or additional information from companies including:

- | | |
|--|-----------------------------|
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| • DiaDent Group International | • DentalEZ Group |
| • DUX Dental | • Greater Curve |
| • Kerr Corp | • Kuraray America |
| • MEDICOM, Inc. | • NEO Dental International |
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| • Water Pik | • Zenith Dental-DMG |



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Description

D.T. Light-Post Illusion posts are fabricated from unidirectional, pretensed fibers in a resin matrix. These posts have flexural strengths exceeding that of metal posts but their modulus of elasticity is very close to that of dentin. The low modulus distributes stresses along the post instead of concentrating the stresses in the remaining root structure as seen with metal posts.

D.T. Light-Post Illusion posts are color coded for easy size identification, but the color disappears when the post is placed in the canal. The color will reappear when the post is sprayed with cold water to aid in post removal, if endodontic re-treatment becomes necessary. The posts are double tapered - they are parallel in the coronal section and have two separate tapers in the apical section. The posts are translucent to transmit light, allowing cementation with light- or dual-cured adhesives and cements. The posts are supplied in four diameters with corresponding reamers. Twenty-seven consultants evaluated **D.T. Light-Post Illusion** Intro Kit, which contains a selection of all four sizes with reamers in 164 clinical applications. This product received a 97% clinical rating.

Suggested Retail Cost

- \$195.00/Intro Kit

Product Features

The **D.T. Light-Post Illusion** Intro Kit has a sufficient variety of posts for evaluation. The posts are packaged in clear plastic vials and the color coding of the posts matches the drill markings, which makes organization and size identification easy. The color-changing feature received positive comments. The pastel colors of the posts are apparent when cool water is applied, such as during tooth preparation. Upon warming, the color disappears, leaving a translucent natural color. None of the consultants could comment on the usefulness of the color change feature for post removal, since no re-treatments were required during this evaluation period. The reamers are effective in preparing a post hole and they are well matched to the corresponding posts, particularly with the double-taper design.



Consultants' Comments

- ◆ "Very esthetic and blends well with tooth-colored core materials."
- ◆ "The drills are accurate in diameter to their corresponding posts."
- ◆ "Trim the post after cementation and core build-up during tooth preparation."
- ◆ "I would like to have more sizes available to match a larger variety of teeth."
- ◆ "The drills dull quickly."

Complete seating of the posts can be accomplished with a variety of different adhesives and cements, and the light transmission of the posts enhanced complete cure in the canal space. The composite cores bonded well to the roughened surface of the posts (pretreated by manufacturer) for excellent retention of the core material. The radiopacity of the posts was judged to be the best of currently available systems. Eighty-nine percent of the consultants rated **D.T. Light-Post Illusion** the same as or better than other fiber posts. Seventy-four percent would switch to this post and 92% would recommend it.

Editors' Note: Since completing this evaluation, Bisco has introduced the New DT Light Post Illusion X-RO (pictured above), which is indicated to have greater radiopacity, more retention and improved strength. Results of radiopacity and flexural strength testing of this product by THE DENTAL ADVISOR are published in the table on page three of this issue. ■

3M ESPE RelyX™ Fiber Post + + + + +

3M ESPE
800.634.2249
www.3mespe.com

Description

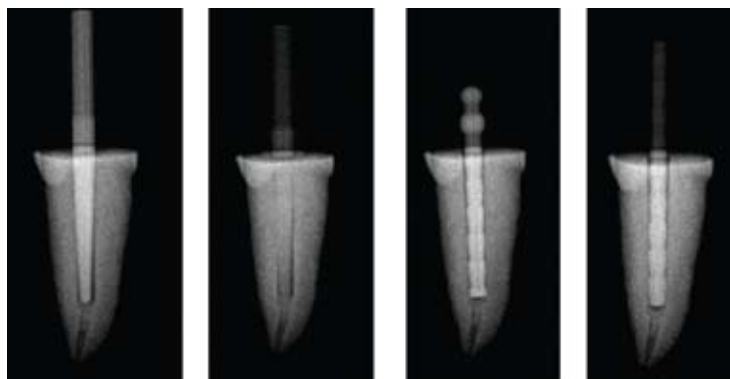
3M ESPE RelyX™ Fiber Post is a radiopaque, glass fiber-reinforced composite post. The translucent post allows transmission of light from a light-curing unit along the length of the post during cementation. The posts are available in three diameters and are color-coded to match the drills. The introductory kit includes **3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement** with Elongation Tips for the *Aplicap*™ Capsule. The tip is 20-mm long with a narrow diameter to allow delivery of the cement to the apical end of the post preparation. The kit also contains five posts of each diameter with three corresponding drills. A universal drill is also included to initiate the post space preparation. Eleven editors and consultants used **RelyX Fiber Post** in restoring 85 endodontically treated teeth. This post system received a 96% clinical rating.

Suggested Retail Cost

- \$249.00/introductory kit
- \$109.00/post refill kit (10 posts and elongation tips)
- \$18.00/bag of Aplicap Elongation Tips (10 tips)

Product Features

The **RelyX Fiber Post** introductory kit was well received by evaluating consultants. They rated the packaging post size selection, usefulness of elongation tips and effectiveness of drills as excellent. The most notable change with this product from the previous evaluation is the increased radiopacity. THE DENTAL ADVISOR Biomaterials Research Laboratory conducted testing that indicates that the new **RelyX Fiber Post** is 2.5 times more radiopaque than



Comparison of radiopacity of **RelyX Fiber Post** (3M ESPE) - far left, with competitive products.

Consultants' Comments

- ◆ "This post is noticeably more radiopaque than the original version."
- ◆ "Elongation tips make this kit unique."
- ◆ "Great fit and easy to place."
- ◆ "Complete system; easy to use."

the previous version.

As a result of the product modification, 82% of evaluators rated the radiopacity of the **RelyX Fiber Post** equivalent to or better than before, and 100% found the post equivalent to or better than the post they most frequently use. Eighty-two percent stated they would switch and 92% said they would recommend **RelyX Fiber Post** to colleagues.

Clinical Tip

- Use the elongation tip to place the cement as far down the canal as possible. ■

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1 Shot Dental X-Ray Holder + + + 1/2

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Description

1 Shot Dental X-ray Holder is a one-piece design for placement in taking bitewings, anterior and posterior periapicals, and endodontic views. It is available in various designs for compatibility with film, phosphor plates, and some hard digital sensors. The flat planes of the holder and the markings on it are designed to aid in aligning the x-ray tube to the film/sensor. **1 Shot** is made of medical-grade plastic that is reusable and autoclavable 100 times or more. Each package contains either eight color-coded holders, four each for horizontal and vertical orientations or eight horizontal holders. **1 Shot** was evaluated by 27 consultants in over 4000 clinical cases. It received an 85% clinical rating.

Suggested Retail Cost

- \$95.00 per kit

Product Features

1 Shot was used by dentists, dental hygienists and dental assistants in conjunction with various digital sensors. The greatest success was achieved in positioning for bitewing images. The markings on the holder for alignment of the x-ray cone were minimally helpful. Many consultants felt there was a significant learning curve to comfortable and accurate positioning.



Consultants' Comments

- ◆ "Great idea."
- ◆ "Lightweight."
- ◆ "Reduces the inventory of different holders."
- ◆ "Hard to position for periapicals."
- ◆ "Holder tears the plastic barrier on the sensor."

1 Shot is durable after repeated sterilization. Most consultants commented that the holders often tore sterilization bags. Forty percent of evaluators felt the **1 Shot** was equivalent to or better than their current method used, while 53% would switch and/or recommend this product to their colleagues.

Clinical Tip

- Place the sensor as far down as possible in the holder for accurate periapical images. ■

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Denbur, Inc.
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Description

Nano-Brush is an elongated brush/applicator designed for use in endodontic procedures. It can be used to clean pulpal debris from the chamber and canal or apply materials in the canal. The shaft of the applicator can be bent to any angle. The applicator has a 3 1/2-inch handle which may be shortened by breaking it at a perforation. The shortened access handle has the size and shape of an endodontic file handle. Brush handles are color-coded by size: black=size 40-45 and green=size 30-35. Each size is available with either short or long tips. **Nano-Brush** is packaged in the Easy-Shake plastic dispenser that allows only one applicator at a time to be dispensed. Each dispenser contains 120 applicators. Twenty-six consultants evaluated **Nano-Brush** in over 880 clinical cases. This product received a 92% clinical rating.

Suggested Retail Cost
 • \$26.95/120 applicators

Product Features

Nano-Brush is made of a pliable, non-linting material. The Easy-Shake container allows one applicator at a time to be dispensed, reducing the chances for cross contamination. Overall, consultants found **Nano-Brush** more than adequate for applying bonding agents, cements, and sealants.

Consultants' Comments

- ♦ "Just try them once and you will see the benefit."
- ♦ "Absolutely fantastic for placing root canal sealer and post cement. It is worth it for just those two procedures."
- ♦ "Easy dispensing system."
- ♦ "I liked the variety of shapes and sizes."
- ♦ "Small size could be stiffer."

The smaller size brush was more useful than the larger size when used within canals. Eight-eight percent of consultants found **Nano-Brush** equivalent to or better than their current product. Fifty-four percent of consultants would recommend Nano-Brush and 58% would switch to it.

Clinical Tip

- At the end of root canal preparation, work the brush down into a wet canal the same way you would with an endodontic file, twisting in half turns back and forth while moving up and down with frequent irrigation. ■

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