EDGEENDO®

# EDGEBIOCERAMIC™


*With over 50 million cases, over 16 years of clinical use and over 150 published studies, EdgeBioCeramic Sealer™ is the biologic standard of care in endodontic obturation.*

EDGEENDO.COM

# YOUR TRUSTED LEADER IN BIOCERAMICS
## (Hydraulic Calcium Silicate Cements)

**Edge Bioceramics are the same exact product as the world leading EndoSequence Bioceramics, used clinically in over 50 million cases and for over 16 years!**

EdgeEndo's BioCeramic products consist of premixed bioceramics with different viscosities that are designed for specific clinical applications. EdgeEndo's bioceramics are pure calcium silicate, calcium phosphate-based bioceramics that are designed to repair or replace the presence of the moisture naturally present in dentin.

## EdgeEndo's Pure Premixed Bioceramic Materials

The product line includes the EdgeBioCeramic™ Sealer, EdgeBioCeramic™ ThermalFlow™ Root Canal Sealer, and EdgeBioCeramic RetroFill™ and Perforation Repair. They are patented premixed calcium silicate, calcium phosphate based bioceramics designed for maximum biocompatibility, healing, and optimal handling. In addition, they are void of any non-bioceramic components such as metals and resins.

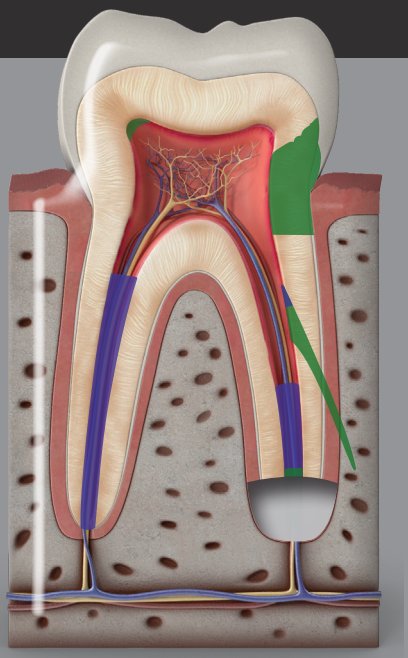


Fig.**1**

EDGEBIOCERAMIC™ SEALER

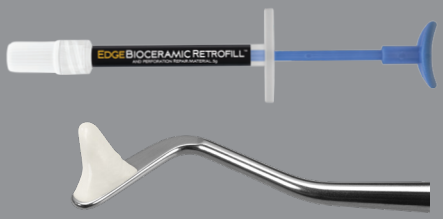
Ideal for cold obturation


EDGEBIOCERAMIC™ THERMALFLOW

Ideal for warm obturation


EDGEBIOCERAMIC RETROFILL™ AND PERFORATION REPAIR MATERIAL

For all repair procedures




## Clinical Applications

Figure 1 shows the applications for EdgeEndo's full line of Bioceramic Materials.

• **EdgeBioCeramic Sealer** and **EdgeBioCeramic ThermalFlow** are used for obturation (ortho or retrograde as a root end filling capped with a plug of putty). ThermalFlow is optimized for warm condensation methods and BC Sealer is optimized for cold hydraulic condensation.

• **EdgeBioCeramic RetroFill and Perforation Repair** (moldable putty) is used for all repair procedures where you would like to condense the material and where you need strong resistance to washout. It is and approved for retro filling, pulp capping, pulpotomies (adult and pedo), resorptive defect repair (internal and external), apexification and apexogenis.

EdgeEndo's complete line of bioceramic products has been thoughtfully developed to cover all your Endodontic material needs while providing you with the best healing and handling characteristics.

**To learn more and to read our extensive research bibliography please visit www.edgeendo.com**

# HOW DOES YOUR CURRENT SEALER COMPARE?

| | Edge Bioceramic Sealer | Your Current System |
|---|---|---|
| Biocompatible and Osteogenic | ✓ | ? |
| Superior chemical Bond of Sealer to Dentin | ✓ | ? |
| Chemical Bond of Sealer to Filling Material | ✓ | ? |
| Cost Effective | ✓ | ? |
| Highly Antibacterial (12+ pH upon setting) | ✓ | ? |
| Highly Radiopaque | ✓ | ? |
| Hydrophilic | ✓ | ? |
| Hydroxyapatite Producing | ✓ | ? |
| Ideal Working and Setting Time | ✓ | ? |
| User Friendly (Premixed Syringe Sealer) | ✓ | ? |
| Zero Shrinkage of Sealer and Filling Material | ✓ | ? |
| 3-D Bonded Obturation at Room Temperature | ✓ | ? |

Research and other support materials available at www.edgeendo.com/studies

# NOT ALL HYDRAULIC CALCIUM SILICATE CEMENTS ARE THE SAME!

Sealer chemistry, particle size and handling characteristics are key factors in clinical performance of endodontic sealers. High charged hydraulic sealer (TCS + DCS >40%) allow a more efficient hydration reaction resulting in proper CaOH2 formation with valid antimicrobial properties, bioactivity, solubility, leaching and biocompatibility.

| Sealer name | Company | MS DS | Presentation | | | Composition % in MSDS | Composition | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Single syringe | Auto mix | Powder/ Liquid | | Cement | | | Radiopacifier | Additives | Vehicle | Other |
| | | | | | | | Tricalcium silicate | Dicalcium silicate | Other | | | | |
| AH Plus Bioceramic | Dentsply Sirona | + | X | | | + | 5-15 | | | 50-70 zirconium oxide | | 10-30 dimethyl sulphoxide | ‹ 0,5 lithium carbonate ‹ 6 thickening agents |
| Bio Root Flow | Septodont | + | X | | | + | | | | 25-50 zirconium oxide | ‹ 5 calcium carbonate | 25-50 propylene glycol | |
| Edge Bioceramic | Edgendo | + | X | | | + | 20-35 | 7-15 | | 35-45 zirconium oxide | | | 1-4 calcium hydroxide |
| Endosequence | Brasseler | + | X | | | + | 20-35 | 7-15 | | 35-45 zirconium oxide | | | 1-4 calcium hydroxide |
| Endosequence Hi Flow | Brasseler | + | X | | | + | 20-35 | 7-15 | | 35-45 zirconium oxide | | | 1-4 calcium hydroxide |
| iRoot SP | Innovative Bioceramix | + | X | | | + | 20-35 | 7-15 | | 35-45 zirconium oxide | | | 1-4 calcium hydroxide |

EdgeBioCeramic RetroFill and Perforation Repair.

F. Cardinali1 • J. Camilleri2. 2 July 2023. Clinical Oral Investigations. https://doi.org/10.1007/s00784-023-05140-w



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***Order Now:*** *EdgeEndo.com*

# TESTIMONIAL AND CLINICAL CASE

*"The EdgeBioCeramic Sealer's favorable handling attributes and exceptional flowability enable the ease of performing uncomplicated root canal obturation procedures."*

**Professor Gianluca Gambarini,** DDS, Italy

**Fig. 1.** Patient was referred from the general dentist because of pulpitis in a left third upper molar which was part of a metal-porcelain bridge. The previous dentist made a panoramic radiograph, removed the bridge, and asked for an endodontic treatment, because patient had undergone therapy with bisphosphonates and refused extraction, fearing the risk of osteonecrosis.

**Fig 2.** Third molars can show unpredictable anatomy, however in this case the roots were merging, and three canals were present. The main difficulty was limited access in the posterior area and the presence of double/triple curvature. To minimize operative time and optimize resistance to fatigue a single-file reciprocation technique was used and canals were shaped using EdgeOneR Utopia size 25 (EdgeEndo), which is a very efficient and safe instrument, due to its unique thermal treatment. Using progression in steps and frequent irrigation the EdgeOneR Utopia was able to negotiate properly the complex root canals (especially the mesial buccal one), respecting the original trajectories with no iatrogenic errors, due to its flexibility, less bounce back and non-cutting pilot tip.

**Fig 3.** Single-cone hydraulic technique using EdgeBioCeramic Sealer (EdgeEndo) was performed. The selection of this method aimed to streamline cone fitting processes within intricate anatomical structures, as the sealer, rather than gutta-percha, is responsible for establishing the apical hermetic seal. The gutta-percha cone only acts as a carrier and there is no need to get a proper tugback, which would be difficult to achieve in such complex anatomy. The favorable handling properties and flowability of the EdgeBioCeramic Sealer allowed easy root canal obturation procedure.

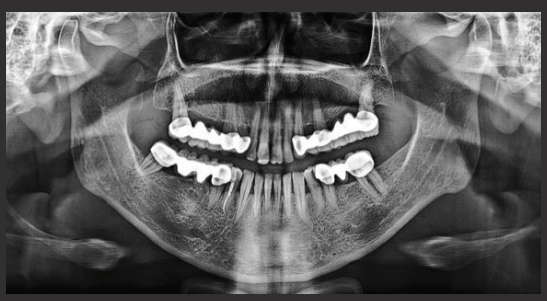


Fig. 1

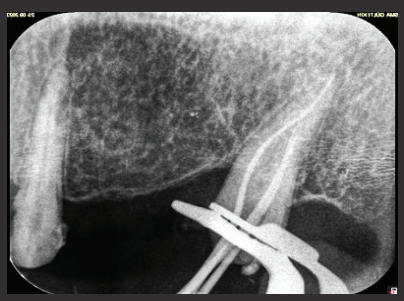


Fig. 2

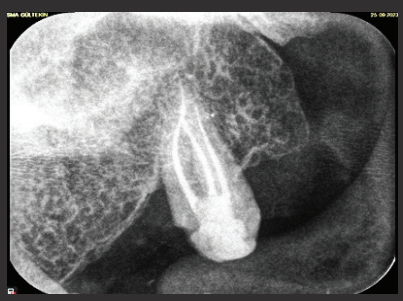
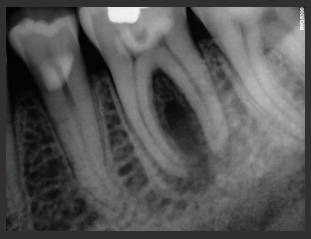
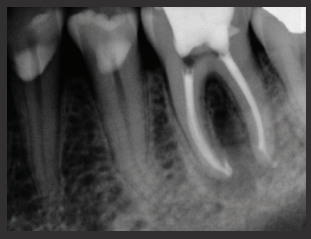
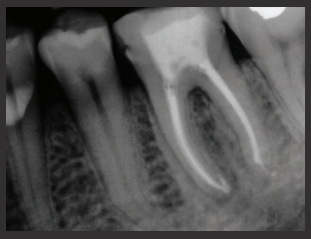


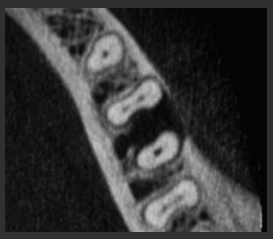
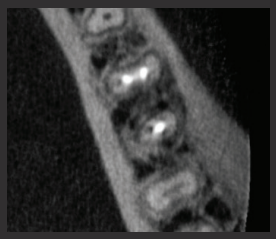
Fig. 3

*"I am confident that EdgeBioCeramic stands out not just for its composition but also for its clinical efficacy. From a clinical perspective, its handling proves to be both intriguing and suitable for daily use, yielding excellent results in follow-up procedures."*

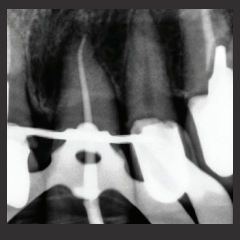
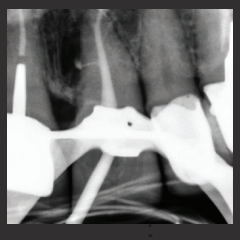
**Maya Feghali,** DDS, France

**Case 1:** 48 years old female patient, ASA 1, presented for the evaluation and the treatment of tooth #36. On clinical examination the tooth was sensitive to percussion and palpation. The radiographic examination showed a very large radiolucency on both mesial and distal roots. The evaluation included the diagnosis of necrosis and apical periodontitis, leading to the indication of endodontic treatment.
Following aesthesia and rubber dam placement, access was performed, and canals were located and instrumented using EdgeTaper Platinum files (EdgeEndo) to size F1 #20. Treatment was completed in 2 visits with calcium hydroxide placement between appointments. Canals were obturated using hydraulic condensation using EdgeBioCeramic Sealer (EdgeEndo). Bioceramic cement was used for its antibacterial and bioactive properties.
The one year follow up shows a complete healing of the lesion.

**Case 2:** A 52-year-old female referred to the clinic for the treatment of tooth 21. Intra-oral examination showed a poor restoration on tooth 21. Percussion and palpation were negative with mobility grade 1. Radiographic examination showed an unsatisfactory restauration on tooth 21 with an apical radiolucency. After obtaining the written consent, the treatment was carried out. The area was anesthetized. Tooth was isolated using the rubber dam and access cavity was opened. The root canal used for shaping was the EdgeTaper Blaze Utopia to size F2 #25. The final irrigation protocol was performed by a continuous delivery of EDTA and NaOCl. Solutions were activated using ultrasonic activation - 1 minute per solution. Canals were dried and obturated using hydraulic condensation with EdgeBioCeramic Sealer (EdgeEndo). Lateral and secondary canals are visible on the post operative radiograph.


# TESTIMONIAL AND CLINICAL CASE

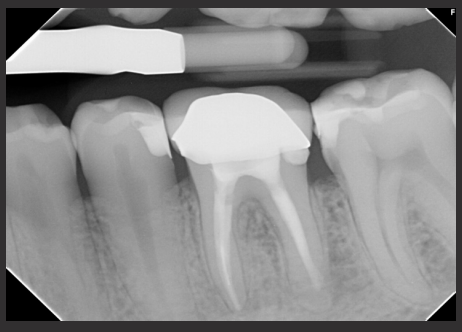
*"EdgeBioCeramic truly shines with its exceptional composition and clinical efficacy. Clinically, its handling is both intriguing and ideal for daily use, consistently delivering excellent results in follow-up procedures. I am confident in its effectiveness and highly recommend it for endodontic applications."*

**Dr. Biraj Patel**
American Trained Endodontist, Diplomate of the American Board of Endodontics (ABE)

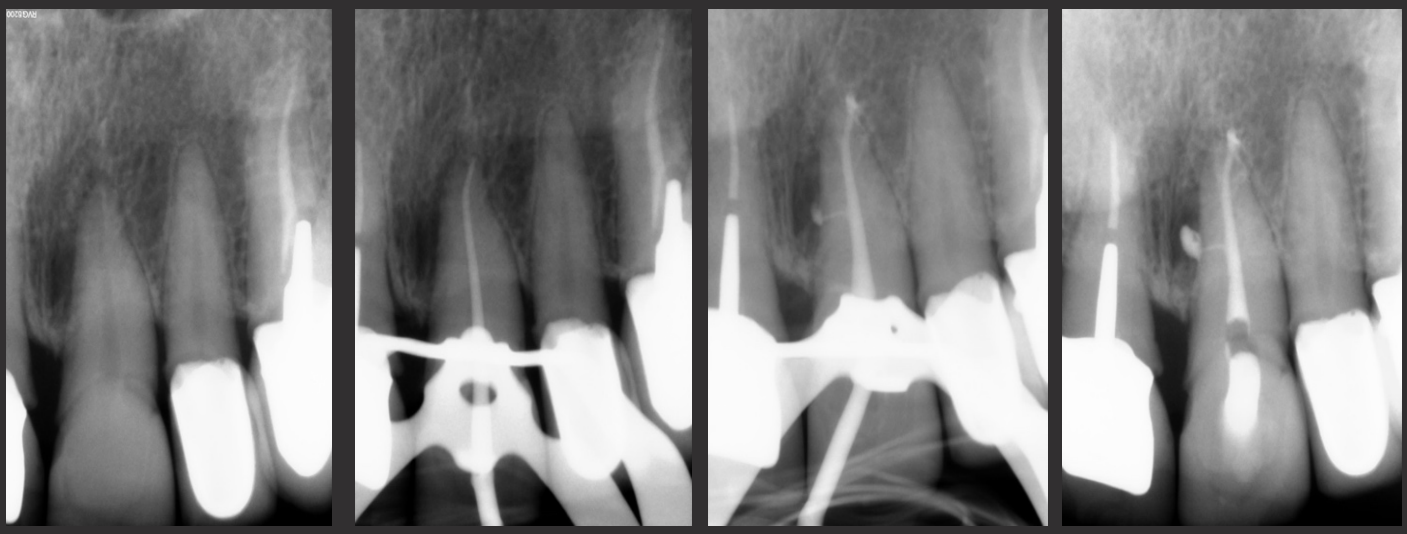
**Case 1:** 46 years old Male patient, ASA 1, presented for the evaluation and the treatment of tooth #36. On clinical examination the tooth was sensitive to percussion and palpation. The radiographic examination showed a very large radiolucency on both mesial and distal roots, a separated instrument in the mesio-lingual canal. The diagnosis of previously initiated with symptomatic apical periodontitis was made, and the endodontic treatment was indicated. Following aesthesia and rubber dam placement, access was performed, and canals were located. The coreonal fragment was removed and the apical fragment was bypassed. The canals were instrumented using Edge endo X7 files (EdgeEndo) to size 35.04 in the mesial canals and 40.04 in the distal canal. Canals were obturated using hydraulic condensation using EdgeBioCeramic Sealer (EdgeEndo). Bioceramic cement was used for its antibacterial and bioactive properties. The one year follow up shows a complete healing of the lesion.

Pre op

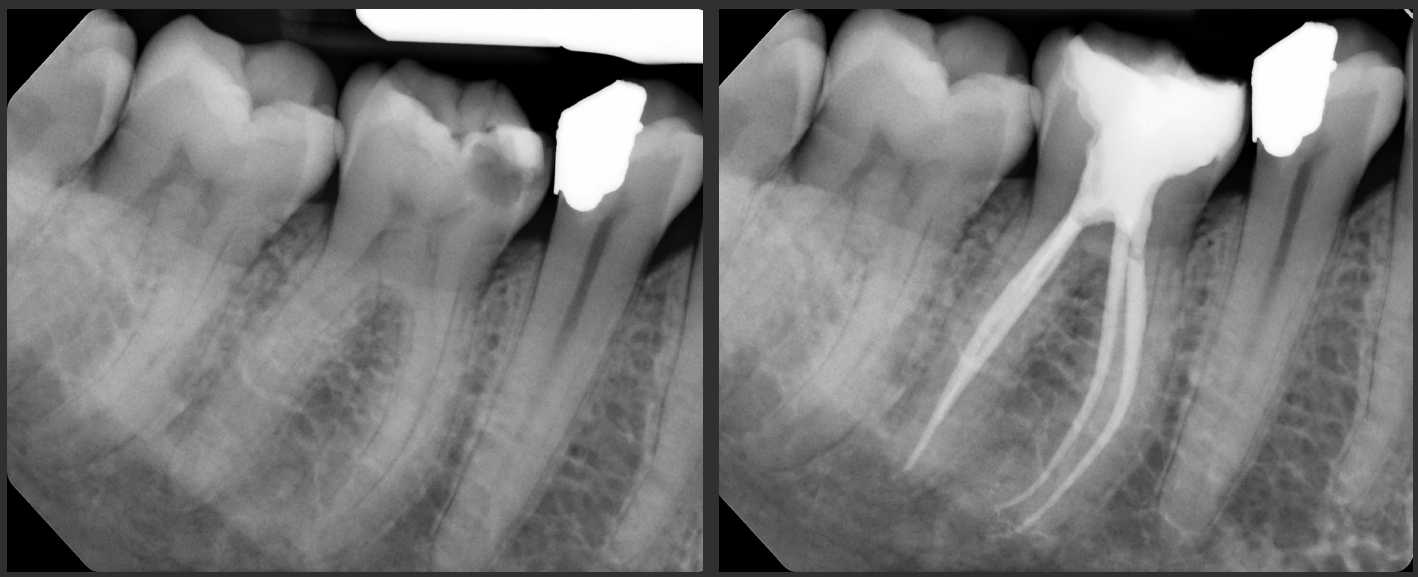
Post op



1 year follow up



**Case 2:** A 36-year-old female referred to the clinic for the treatment of tooth #46. Intra-oral examination showed a deep caries lesion on tooth #46. The tooth was Percussion tender and lingering to cold testing. Radiographic examination revealed a deep caries. The area was anesthetized. Tooth was isolated using the rubber dam and access cavity was opened. The root canal used for shaping was the EdgeEndo Utopia X7 to size 30.04 in the mesials and 35.04 in the distal canal. The final irrigation protocol was performed by a continuous delivery of EDTA and NaOCl. Solutions were activated using ultrasonic activation - 1 minute per solution. Canals were dried and obturated using hydraulic condensation with EdgeBioCeramic Sealer (EdgeEndo).



# CLINICAL STUDIES

Edge BC Sealer is alkaline +( 12pH) making it highly antibacterial. A recent study showed that EdgeBC Sealer killed Enterococcus faecalis within 2 minutes of contact.

## SUPERIOR BIOCOMPATIBILITY

Edge BC Sealer is essentially a root repair material with a flowable consistency. The unique osteogenic properties of EdgeBC Sealer make it particularly effective on non-vital cases with extensive bone loss or apical periodontitis. A recent study showed EdgeBC Sealer to be much more biocompatible than AH Plus®.

### Cytotoxicity Comparison (at 24 hours)

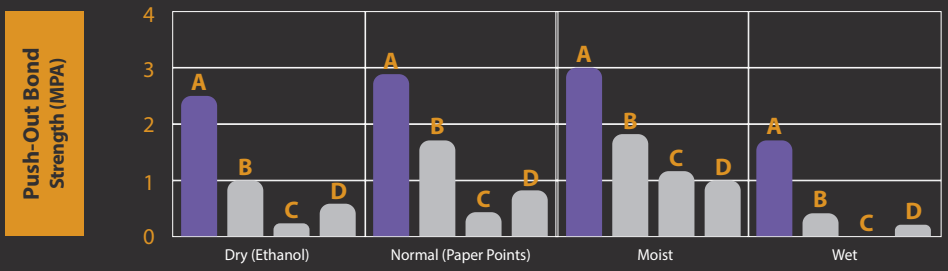

**Cytotoxicity Ranking Classification (based on Lodienet al.2008):**
**0.0 - 0.4 = non cytotoxic**
**0.5 - 1.4 = slightly cytotoxic**
**1.5 - 2.4 = moderately cytotoxic**
**2.5 - 3.5 = severely cytotoxic**

Source:
Zhang W, Li Z, Peng. Ex vivo cytotoxicity of a new calcium silicate-based canal filling material. International Endodontic Journal. 2010; 43(9): 769. DOI:10.1111 /j.1365-2591.2010.01733.

## SUPERIOR BONDING

Edge BC Sealer's hydrophilic/hydroxyapatite producing formula and excellent flowability allow it bond readily to both dentinand to bioceramic filling materials. A recent study showed that Edge BC Sealer has superior bond strength when compared to other popular sealers. The study varied the moisture content to determine its effect on bond strengths. EdgeBC Sealer outperformed all the other sealers at all moisture levels.

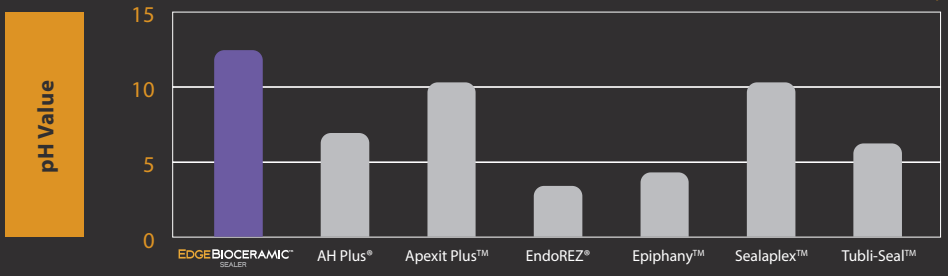
### Bond Strength Comparison in Different Moisture Conditions




**A = BC Sealer® + gutta percha**
**B = AHPlus® + gutta percha**
**C = MTA Fillapex™ + gutta percha**
**D = Epiphany™ + Resilon®**

Source:
Nagas E, Uyanik MO, Eymirli A, Cehreli ZC. Vallittu PK. Lassila LVJ, Durmaz V, Dentin moisture conditions affect het adhesion of root canal sealers. JOE. 2011: 38 (2): 240-4

### Antibacterial (pH) Comparison (at 1day)

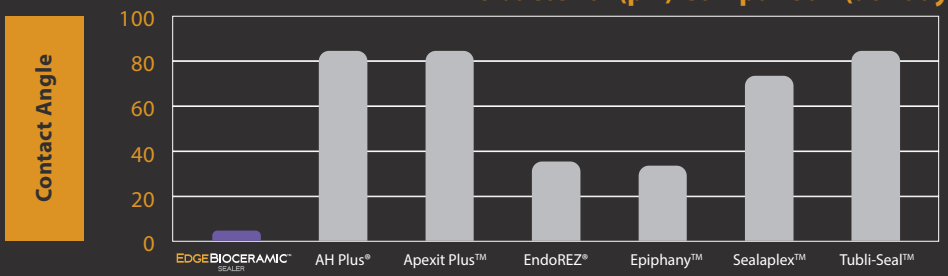



Source:
Zhang HS, Shen Y, Ruse ND, Haapasalo M. Antibacterial activity of endodontic sealers by modified direct contact test against enterooccus faecalis JOE. 2009; 35 ( 7 ) : 1051 - 5

## EXCELLENT FLOW

Edge BC Sealer's extremely small particle size and hydrophilic nature allow it flow into all aspects of the canal anatomy. A recent study proved that Edge BC Sealer has a contact angle which is lower than all other sealers tested. This unique feature of EdgeBC Sealer improves its ability to bond to dentin and obturation materials and also improves its ability to effectively kill microbes throughout all aspects of the root canal system.

### Antibacterial (pH) Comparison (at 7day)

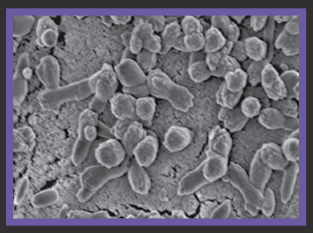



Source:
Zhang HS, Shen Y, Ruse ND, Haapasalo M. Antibacterial activity of endodontic sealers by modified direct contact test against enterooccus faecalis JOE. 2009; 35 ( 7 ) : 1051 - 5

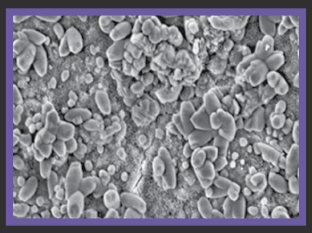
## BIOACTIVE

The following SEM images illustrate the similarities between MTA and EdgeBC Retrofill. "Group A" shows the crystalline surfaces of MTA and EdgeBC Retrofill. Both surfaces are composed primarily of calcium, carbon, and oxygen. More notably, "Group B" shows the extent of human gingival fibroblast adhesion to MTA and EdgeBC Retrofill (after 7 days of incubation). Notice the extensive matrix- like overlay on the surface of the EdgeBC Retrofill.These SEMs visually confirm that Edge BC Retrofill is highly bioactive and efficiently promotes biomineralization.

**Group A***

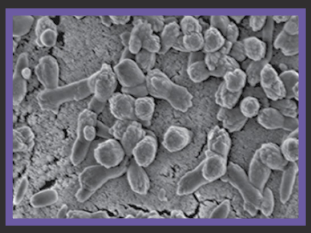


MTA Crystaline Surface

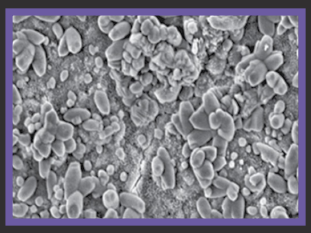


RRM Crystaline Surface

**Group B***



MTA Fibroblast Adhesion

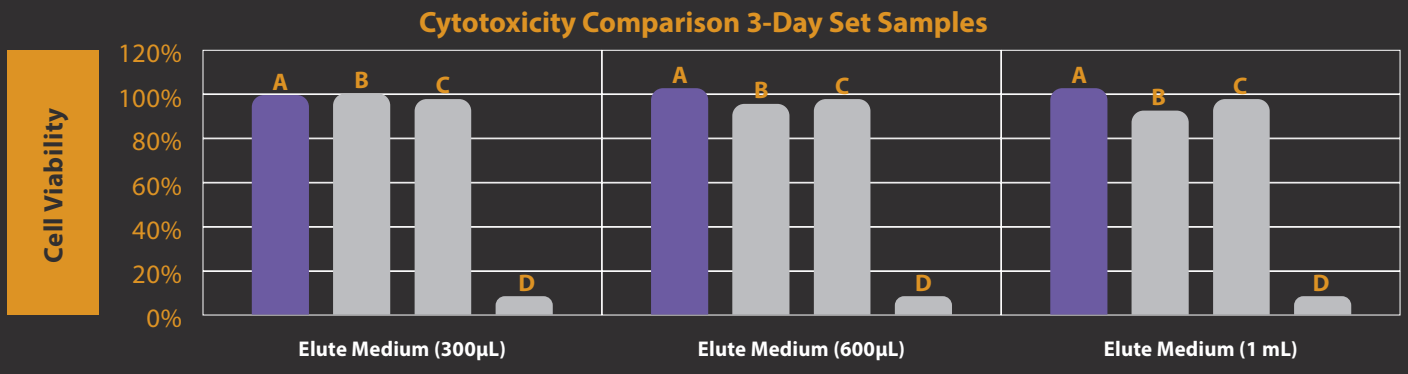


RRM Fibroblast Adhesion

Source: Jingzhi M, Shen Y, Stojicic S, Haapasalo M. Biocompatibility of Two Novel Root Repair Materials. JOE. 2011; 37(6): 793-8

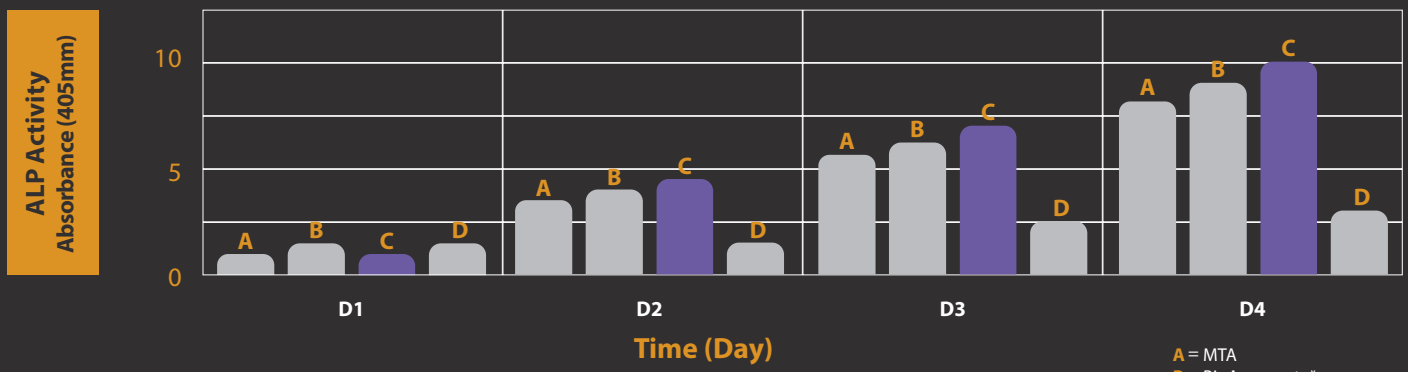
# EXCELLENT BIOCOMPATIBILITY AND MINERALIZATION ABILITY

The following graphs illustrate the biocompatibility and mineralization ability of EdgeBC Retrofill as compared to other commonly used root repair materials.




Source: AlAnezi AZ, Jiang J, Safavi KE, Spangberg LSW, Zhu Q. Cytotoxicity evaluation of EndoSequence Root Repair Material. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2010; 109 (3) : 122-5. DOI: 10.1016/j. tripleo.2009.11.028

A = EdgeBioCeramic RetroFill
B = Gray MTA
C = White MTA
D = AH26*




Source: Zhang S, Yang X., Fan M. BioaAreggate® and iRoot BP Plus (RRM™ Putty) optimize the proliferation and mineralization ability of human dental pulp cells. International Endodontic Journal. 2013; DOI: 10.1111/iej.12082

A = MTA
B = BioAggregate*
C = EdgeBioCeramic RetroFill
D = Control

# Obturation and Surgery have become easier with EdgeBioCeramic™



**EDGEBIOCERAMIC™ SEALER**



**EDGEBIOCERAMIC™ THERMALFLOW™**



**EDGEBIOCERAMIC™ RETROFILL AND PERFORATION REPAIR MATERIAL**

**Handles like putty/Cavit***
spatula not included in packaging

*Cavit™ is a registered trademark of 3M.

*Now includes the new reduced waste tips which preserve material by 62%**

| Product | Contents | REF |
|---|---|---|
| **EdgeBioCeramic™ SEALER** | 2g syringe with 15 tips disposable tips | **USEBIOCSEU** |
| **EdgeBioCeramic™ THERMALFLOW™** | 1.5g syringe with 15 tips disposable tips | **USEBIOTFEU** |
| **EdgeBioCeramic™ RETROFILL AND PERFORATION REPAIR MATERIAL** | 0.5g syringe | **USEBIORMEU** |
| **EdgeBioCeramic™ Replacement Tips** | 15 reduce waste tips | **USEBIOPTEU** |

MORE INFORMATION
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Rev. A 03/2024

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